



2023 KX11 PHEV Service Manual

The manual provides specifications, diagnostics, and repair service information on KX11 PHEV

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1.1 Warnings and Cautions

1.1.1 Warnings and Cautions

1.1.1.1 Warnings and Cautions

Definitions of "WARNING", "CAUTION" and "TIP"

The diagnostic and repair procedures in this repair manual include both general and specific "WARNING", "CAUTION" and "TIP". Geely is committed to providing repair information to assist the Geely is committed to providing service information to help after-sale service technicians diagnose and repair vehicle systems so that the vehicle will operate properly. However, certain procedures may be hazardous to the technician if the technician does not follow the recommended methods.

The "WARNING", "CAUTION" and "TIP" have been prepared to prevent the above dangers, but not all dangers can be foreseen. This information is located in a prominent place in the service manual. This information has been prepared to prevent the following:

- Serious injury to personnel.
- Vehicle damage.
- Unnecessary vehicle maintenance.
- Unnecessary component replacement.
- Improper repair or replacement of vehicle components.

Definition of "Warning"

When you encounter a "Warning", you are asked to take necessary or prohibited measures. Ignoring the "Warning" may result in the following:

- Serious injury to personnel.
- Serious personal injury to the driver and/or passengers of this vehicle if the vehicle is not repaired properly.

Definition of "Caution"

"Caution" requires special attention to necessary or prohibited measures. Ignoring the "Caution" may result in the following:

- Vehicle damage.
- Unnecessary vehicle maintenance.
- Unnecessary component replacement.
- The operation or performance of the system or component being serviced is not normal.
- Damage to related systems or parts.
- Damage to fasteners, basic or specialized tools.
- Engine coolant, lubricant or other major fluid leaks.

Definition of "Hint"

"Hint" statements emphasize the necessity of a certain diagnostic or repair procedure, and the purpose of the "Hint" statements is as follows:

- Clarify the procedure.
- Additional information for completing a program.
- Clarify the reason for following the recommended procedure.
- Provide information that will help complete the program in a more efficient manner.
- Provide the technician with previous experience information to make the procedure easier to complete.

Warning about Lifting Vehicle

Warning !

To avoid damage to the vehicle, serious personal injury or even fatal accidents, jack stands should be used to support the part of the vehicle corresponding to the component to be removed for removing major components from the vehicle and supporting the vehicle with a lift.

Warning about Handling of Anti-lock Brake System Components

Warning !

Certain components in the Anti-Lock Braking System (ABS) cannot be serviced individually, and attempting to remove or disconnect certain system components could result in personal injury and/or improper system operation. Repair only those parts that are licensed for removal and installation.

Warning about Licensed Device for Collision Repair

Warning !

To avoid personal injury due to exposure to toxic fumes from welding arcs or plated (zinc oxide) metal while grinding/cutting any type of metal or sheet molded parts, work must be done in a well-ventilated area with a licensed respirator, goggles, ear plugs, welder's gloves, and protective clothing.

Warning about Assisted Driving

Warning !

An assistant should drive the vehicle while the mechanic inspects the reported defective part. Failure to do so may result in personal injury.

Warning about Battery Disconnection

Warning !

Before servicing any electrical component, the start switch power mode must be turned OFF and all electrical loads must be "OFF" unless otherwise noted in the operating procedures. Also disconnect the negative pole of the battery if tools or devices are likely to come into contact with exposed and energized electrical terminals. Failure to comply with these safety instructions may damage the vehicle or vehicle components and may even result in personal injury.

Warning !

If the airbag is being serviced, the negative pole of the battery must be disconnected for at least 90 s before other operations can be carried out.

Warning about Brake Dust

Warning !

Avoid the following when servicing wheel brake components:

- Do not use any dry brush or compressed air to clean wheel brake components.

Warning !

Some models or after-sale retrofit brake components may contain fibers that can be mixed in with dust. Breathing in dust containing fibers can cause serious bodily injury, use a damp cloth to clean any dust from brake components.

Warning about Brake Dust

Warning !

Brake fluid is highly susceptible to moisture and hygroscopicity, do not use brake fluid that may be contaminated with water in an open container, use of inappropriate or contaminated brake fluid may result in system failure, loss of vehicle control and personal injury.

Warning about Brake Fluid Irritation

Warning !

Brake fluid is irritating to skin and eyes. The following measures should be taken in case of contact:

- Eye contact - rinse thoroughly with water.
- Skin contact - wash with clear soap and water.

Warning about Brake Line Replacement

Warning !

When replacing the brake pipe, install and secure it carefully, making sure to use the correct fasteners. Otherwise damage to the brake pipe and the braking system may occur, resulting in personal injury.

Warning about Inhaling R134a

Warning !

Inhalation of air conditioning refrigerant R134a and lubricant vapors or mists should be avoided; contact with them can irritate the eyes, nose and throat. Work should be done in a well-ventilated area. When draining R134a from an air conditioning system, use service equipment (R134a recovery equipment) certified to meet the requirements of SAEJ2210. In the event of accidental draining of the system, the work area must be ventilated before continuing with repairs. Additional health and safety information is available from refrigerant and lubricant manufacturers.

Warning about Collision Profiling

Warning !

Profiling in the recommended areas only, otherwise the structural integrity of the vehicle could be disrupted, which could result in personal injury in the event of a vehicle collision.

Warning about Cracked Window

Warning !

If a window is cracked but still intact, protective tape should be applied to the window in a crisscross pattern to prevent further damage to the window or personal injury.

Warning about Exhaust System Repair

Warning !

To avoid burns, do not service any exhaust system when the exhaust system is hot. Allow the exhaust system to cool before servicing.

Warning about Window Up/Down Function

Warning !

When operating the power window switch in the driver's door, the window glass moves so fast that a window without anti-pinch cannot be stopped against resistance, which may result in personal injury.

Warning about Eye Protection

Warning !

Wear licensed goggles and gloves when performing this procedure to reduce the risk of personal injury.

Warning about Foam Acoustic Insulation

Warning !

When an open flame is to be used during body repair, the foam acoustic insulation must be removed within 152.4 mm (6 in) of the open flame, and inhalation of fumes should be avoided when reinstalling the foam acoustic insulation as it is hazardous to health.

Warning about Fuel and Evaporative Drain Line

Warning !

To reduce the risk of fire and personal injury, observe the following points:

- All fuel lines that have been bumped, scratched or damaged during installation should be replaced and no attempt should be made to repair the fuel line. -For installing a new fuel line, do not strike the fuel line bundle clamps directly with a hammer.
- Always cover the fuel vapor line with a damp towel when operating with a torch near the fuel vapor line. In addition, never expose the vehicle to the temperatures above 115 °C (239 °F) for more than 1 h, and do not leave it at the temperatures above 90 °C (194 °F) for extended periods of time.
- Always apply a few drops of clean engine oil to the male fitting before connecting the fuel line fitting, thus ensuring proper reconnection and preventing possible fuel leakage. (During normal operation, the O-ring seal in the yoke fitting expands and cannot be properly reconnected without lubrication).

Warning about Fuel Leakage

Warning !

For connecting the fuel pressure test gauge, a rag needs to be wrapped around the fuel pressure gauge connector to reduce the risk of fire or personal injury, the rag absorbs fuel that leaks out for connecting the fuel pressure gauge, and after the fuel pressure gauge is connected, the rag is placed in a suitable container.

Warning about Fuel Line Fittings

Warning !

Always apply a few drops of clean engine oil to the male fitting before connecting the fuel line fitting, thus ensuring proper reconnection and preventing possible fuel leakage. During normal operation, the O-ring seal in the yoke fitting expands and cannot be properly reconnected without lubrication.

Warning !

For assembling the fuel line, follow the steps of First Push, Second Click, Third Pull, and Fourth Push-backs to check that the quick-insertion connector of the fuel line are assembled in place.

Warning about Fuel Storage

Warning !

Fuel must not be discharged into any open container and must not be stored in any open container as it may misfire or explode.

Warning about Fuel Vapor in Evaporative Emission Components

Warning !

Do not breathe air from the evaporative drain tube or hose/ Fuel vapor from the evaporative emission components may cause personal injury.

Warning about Gasoline/Gasoline Vapor

Warning !

Gasoline or gasoline vapor is very flammable and may cause a fire if an ignition source is present. To prevent fire or explosion hazard, never use an open container to drain or store fuel. Keep a dry powder fire extinguisher nearby.

Caution

Fuel pressure must not exceed the specified value or the fuel pressure regulator or gauge may be damaged.

Warning about Fuel Releasing Pressure

Warning !

Before servicing the fuel system, remove the fuel tank cap and release the fuel system pressure to reduce the risk of personal injury. After releasing the fuel system pressure, a small amount of fuel may spill when servicing fuel lines, injectors or connectors. To reduce the risk of personal injury, wrap the fuel system component with a rag before disconnecting. This traps spilled fuel. After disconnecting, place the rag in a suitable container.

Fuel pressure must not exceed the specified value or the fuel pressure regulator or gauge may be damaged.

Caution for Fuel Tank Hoop Belt Damage

Caution

Do not bend the fuel tank band. Bending the fuel tank strap can damage the strap.

Warning about Glass and Sheet Metal Handling

Warning !

Wear licensed goggles and gloves to reduce the risk of personal injury when handling any glass or sheet metal with sharp edges or burrs.

Warning about Moving Part and Hot Surface

Warning !

When working around a running engine, avoid contact with moving parts and hot surfaces to prevent personal injury.

Warning about Goggles and Gloves

Warning !

Always wear goggles and gloves for removing exhaust system parts, otherwise rust and sharp edges falling from worn exhaust system parts can cause serious personal injury.

Warning about Reservoir Cap Removal

Warning !

To avoid burns, do not remove the reservoir cap until the engine has cooled. If the reservoir cap is removed while the engine and radiator are not cooled, the cooling system will release boiling hot and high-pressure liquid and steam, which could result in burns to personnel.

Warning about Cooling System Repair

Warning !

As long as there is pressure in the cooling system, the solution temperature will be much higher than the boiling temperature even if the solution in the radiator is not boiling. If the reservoir cap is opened to perform maintenance on the cooling system while the engine is not cooled and the pressure is still high, the engine coolant will boil immediately and could spray onto the operator and cause severe burns.

Warning about Road Test

Warning !

Carry out a vehicle road test in a safe manner and obey all traffic laws. Do not attempt any maneuver that could jeopardize the control of the vehicle. Violation of the above safety instructions could result in serious personal injury and damage to the vehicle.

Warning about Goggles and Fuel

Warning !

Always wear goggles when handling fuel to prevent splashing fuel in the eyes.

Warning about Assisted Restraint System

Warning !

This vehicle is equipped with an assisted restraint system. Failure to follow proper operating procedures could result in the following conditions:

- Airbag deployment
- Pre-tensioner blowout
- Injury to personnel
- Unnecessary auxiliary restraint system repair

Warning !

Observe the following guidelines to avoid the above situations:

- The Auxiliary Restraint System Components view should be consulted to determine if you are performing service operations on, around, or in the wiring of the Auxiliary Restraint System components.
- Disengage the auxiliary restraint system if you are performing maintenance operations on, around, or in the wiring of the auxiliary restraint system components.
- Before operating any of the assisted restraint system components, you must wait at least three minutes after disconnecting the battery to allow the ECU capacitors to fully discharge.
- Do not use pneumatic or electric repair tools when servicing.
- Always place the air bag with the deployed side up.
- The airbag must not be disassembled.

Warning about High Temperature of Deployed Airbag/Air Curtain**Warning !**

When unfolded, the metal surfaces of the auxiliary restraint system components may be hot. To avoid fire and personal injury:

- allow sufficient cooling time before touching any metal surfaces of the auxiliary restraint system components.
- Never place inflated auxiliary restraint system components next to any flammable material.

Warning about Assisted Restraint System Clock Spring**Warning !**

Incorrect installation of the steering wheel module (clock spring assembly) can damage the spiral coil inside the clock spring, which may cause the coil to malfunction resulting in the front airbag (occupant) not functioning properly, resulting in injury.

Warning about the Obsolescence of Auxiliary Restraint System Module**Warning !**

In order to prevent accidental airbag deployment (which could result in personal injury), un-deployed auxiliary restraint system modules must not be disposed of as regular shop waste. Some of the substances contained in the un-deployed module could cause serious illness or personal injury if the sealed container is damaged during the scrapping process. Safely scrap the un-deployed air bag module with the deployment procedure.

Warning about Airbag Pickup and Storage for Assisted Restraint System**Warning !**

For transporting an airbag that has not deployed:

- Do not carry wires or connectors from the airbag for handling.
- Make sure that the air bag opening is not facing you or anyone else.

Warning !

For storing an airbag that has not deployed, make sure that the airbag opening is not facing the surface on which the airbag is placed. The airbag opening must not be facing downward, it is prohibited to place any objects on the airbag, and there should be enough space around the airbag for the airbag to accidentally deploy or it could injure someone.

It is prohibited to immerse the un-deployed air bag module in water or contact other liquids.

Do not place an un-deployed airbag/air curtain near an ignition source or in a hot area to prevent injury from accidental deployment of the airbag.

Warning about Handling of Auxiliary Restraint System Impact Sensor**Warning !**

Never hit or shake the auxiliary restraint system impact sensor, make sure that Impact sensor is securely fastened before energizing the impact sensor, failure to follow proper installation procedures for operation may cause the auxiliary restraint system to detonate inadvertently or not to function when it is supposed to detonate, resulting in personal injury.

Warning about Power Battery

Warning !

The EV contains a sealed set of high-voltage lithium-ion power battery. If the power battery is improperly exposed, there is a risk of violent combustion and electric shock, which could result in serious injury or death and environmental contamination.

Warning about High Pressure Safety Precaution

Warning !

The vehicle's high voltage power battery is rated at 352 V. Do not touch high voltage parts with bare hands without disconnecting the high voltage.

The high voltage components of this vehicle include drive control unit, high voltage power distribution unit, on-board charger module, high voltage main cable, power battery, drive motor, slow charging socket, slow charging plug, electric compressor, and electric heater.

After the vehicle has been driven for a certain period of time, the surface of the drive motor, the drive control unit, and the surface of the electric vacuum pump become warmer, and if air conditioning is used for cooling, the surface of the electric A/C compressor and the surface of the radiator become warmer. In these cases, do not touch the above parts with bare hands.

It is strictly prohibited to disassemble the high-voltage electrical parts, unplug or disconnect the high-voltage connectors and cables in the vehicle. Otherwise it may cause serious electric shock injury and vehicle damage. The high voltage cables in the vehicle are wrapped with orange bellows, please pay attention to recognize them.

Warning about Vehicle in the Event of Collision

Warning !

If the vehicle is involved in a collision (including front, rear, left and right body collisions and ground impacts):

- Even if the vehicle is still drivable, it should be safely parked, Parking brake switch should be buckled up, start switch should be operated in the LOCK gear, and it is forbidden to touch the metal of the body.
- Under no circumstances is it permissible for any person to perform maintenance operations on the vehicle while it is not completely de-energized.
- Check the vehicle's high voltage components and wiring harnesses for breakage and exposure (the location of the components can be determined from the high voltage component layout diagram). To avoid personal injury, do not touch the high voltage wiring harness, connectors and other high voltage parts (PEU, Power battery, etc.). It is prohibited to touch broken or exposed wiring harnesses to avoid the risk of high-voltage electric shock. In particular, if the vehicle floorboard scrapes against the ground, the high-voltage wire harnesses distributed on the floorboard should be carefully inspected for breakage. If you need to touch any high voltage cables or parts, wear insulated protective clothing (including insulated gloves, insulated shoes, insulated clothing) with a voltage resistance of 1,000 V or more.
- If the extent of damage to the vehicle cannot be estimated, do not touch it. Stay away from the vehicle and immediately contact a professional technician at an authorized dealer to inspect and repair it. Be sure to inform emergency personnel responding to the accident at the first opportunity that the vehicle is an electric one and that no one else should approach, touch or move it.
- It is strictly prohibited to privately disassemble the high-voltage harness and high-voltage parts in the front compartment, which has a yellow or orange-colored skin.
- Leakage or damage to the power battery electrolyte may cause a fire. If it happens, contact an authorized vehicle dealer immediately. Do not touch the leaking electrolyte with your hands. If your skin or eyes come into contact with the electrolyte inadvertently, flush them immediately

with plenty of water and seek medical attention immediately to avoid injury.

- If the vehicle smokes or catches fire, leave the vehicle immediately and be sure to use plenty of water to extinguish the fire. Failure to do so may result in serious injury or death.
- If a trailer is required, be sure to raise the front wheels off the ground. If the front wheels are on the ground during towing, the drive motor may generate electricity, damaging the vehicle's high-voltage components or even causing a fire.
- If the vehicle needs to be repaired or painted after an impact, it must be handled at an authorized automobile dealer and must not be disassembled privately. High voltage parts such as power battery, high voltage wiring harness and motor controller must be removed before painting. Because the power battery is exposed to higher temperatures in the spraying operation room, it may affect the life of the power battery. In addition, the power battery on the vehicle, if not removed, may pose a safety hazard to service personnel not professionally trained in electric vehicle maintenance.
- After a vehicle breakdown or accident, immediately place a reflective tripod approximately 100 m behind the vehicle. On a highway, put it approximately 150 m behind the vehicle to warn passing vehicles or pedestrians to avoid them.

Warning about Vehicle Starting

Warning !

Continuous operation of the start switch to energize or dis-energize is prohibited.

Warning about Vehicle Driving

Warning !

It is prohibited to drive the vehicle under the influence of alcohol.

Operation of the start switch is prohibited while the vehicle is in motion.

Prohibit depressing the accelerator pedal sensor during a gear shift or prohibit shifting gears during depressing the accelerator pedal sensor to avoid loss of vehicle control.

To change gears or park in a garage, observe the gear information displayed on the instrument to verify that it is the gear you expect.

Do not depress the brake pedal and accelerator pedal sensor at the same time.

Emergency braking should be avoided while the vehicle is in motion.

Vehicles should slow down as much as possible during the turning process, and sharp turns are prohibited.

Avoid driving through deep water. If you must drive through water, do not wade deeper than the lower edge of the vehicle body and drive at low speed.

Do not open the front hatch by yourself when the vehicle breaks down in the rain or an accident. If a serious scratch occurs on the underside of the vehicle while the vehicle is in motion, contact an authorized vehicle dealer.

Warning about Stopping or Parking

Warning !

Improper parking may result in serious injury.

When parking or stopping the vehicle, always place the gear in N and snap up the parking brake switch to avoid accidental movement of the vehicle.

Never leave children or people with disabilities in the vehicle. They may release the parking brake switch, operate the shift lever and cause the vehicle to move, causing an accident that could result in serious injury.

Caution for Filling Brake System with Brake Fluid

Caution

When adding brake fluid to the brake master cylinder reservoir, use only brake fluid from a clean, sealed brake fluid container that complies with DOT 4. Failure to use the recommended brake fluid could result in contamination that could damage the rubber seals and/or rubber gaskets inside the hydraulic brake system components.

Caution for Brake Calipers

Caution

For removing a brake caliper, a wire should be used to suspend the caliper so as not to damage the brake pipe.

Caution for Effects of Brake Fluid on Paint and Electrical Components

Caution

Avoid splashing brake fluid on the paint, electrical connectors, wires or cables. Brake fluid can damage the paint and cause corrosion of electrical components. If brake fluid comes into contact with the paint, immediately flush the contact area with water. If brake fluid comes into contact with the electrical connectors, wires or cables, wipe off the brake fluid with a clean rag.

Caution for Installing Timing Belt

Caution

To avoid damage to parts, a wrench must be used on the hexagonal part of the camshaft for removing or installing. Failure to avoid the timing belt reaction torque will result in a timing error malfunction.

Caution for Belt Oil

Caution

Do not use belt oil on the drive belt. Belt oil can cause the drive belt material to break, and violation of this caution can damage the drive belt.

Caution for Engine Emission

Caution

Modifications to the following systems can affect the vehicle's emission control system and may cause the Malfunction Indicator Lamp (MIL) and Check Engine Lamp to illuminate:

- Engine
- Speed transmission
- Exhaust system
- Fuel system

Caution

Replacement tires that do not meet the performance standards of the original tires may also affect the vehicle's emission control, which may also cause the Malfunction Indicator Light (MIL) and "Check Engine" light to illuminate.

Caution

Modifications to these systems or the installation of tires with incorrect tire performance standards may result in repairs beyond the manufacturer's warranty, which could prevent the vehicle from passing required emissions tests.

Caution for Engine Lifting

Caution

When lifting or supporting the engine for whatever reason, do not support the jack under the oil pan, any sheet metal parts, or the crankshaft pulley. Lifting the engine in an incorrect manner can result in damage to components.

Caution for Engine Mount

Caution

If an engine mount breaks, it can result in misalignment of certain powertrain components, and misalignment of powertrain components can result in eventual damage to powertrain components.

Caution

If one engine mount breaks, the stress applied to the other engine mounts will increase, which could cause the remaining engine mounts to break.

Caution for Excessive Sealant on Flywheel Bolts

Caution

The proper amount of sealant should be applied to the fasteners when assembling this component. Excessive use of sealant can lead to improper assembly of parts or loosening of fasteners, and improper assembly of parts or fasteners can loosen or dislodge them, which can lead to serious engine damage.

Caution for Exhaust Manifold and Oxygen Sensor

Caution

Oxygen sensors can be difficult to remove at the engine temperature above 48 °C (120 °F), and excessive force can damage the exhaust manifold or exhaust pipe threads.

Caution for Exhaust System Inspection

Caution

When inspecting or replacing exhaust system parts, make sure there is adequate clearance to all underbody points to avoid overheating the floor and possible damage to the passenger compartment spacer and trim materials.

Caution for Removal of Exterior Trim Logo

Caution

Use plastic flat-bladed tools for removing placards/nameplates to avoid damaging the paintwork.

Caution for Fastener

Caution

Use a correct fastener in the correct location, the part number of the replacement fastener must be correct, fasteners that need to be replaced or those that require the use of thread locking adhesive or sealant are specifically noted in the service procedure, no paint, lubricant or corrosion inhibitor should be used on the fasteners or fastener attachment surfaces, unless otherwise noted. These coatings affect the torque and clamping force of the fastener and can damage the fastener. When installing fasteners, be sure to use the correct tightening sequence and tightening torque to avoid damage to parts and systems.

Caution for Handling Electrostatic Discharge Sensitive Part

Caution

Electrostatic discharge (ESD) can damage many solid state electrical components, parts susceptible to ESD are not always labeled with the ESD symbol, handle all electrical parts with care. Observe the following safety instructions to avoid damage from ESD:

- Before servicing any electrical component, touch metal grounding points to discharge static electricity from the vehicle body (especially after sliding on the vehicle seat).
- Do not touch exposed terminals, which may be connected to circuits susceptible to damage by electrostatic discharge.
- When servicing connectors, do not allow tools to touch exposed terminals.
- Do not remove parts from the protective housing unless requested to do so.
- Avoid the following operations unless specifically required by diagnostic procedures:
 - Leave parts or connectors jumped or grounded.
 - Connect test equipment probes to components or connectors, and when using test probes, connect the grounding lead first.

Ground the component before opening its protective housing. Solid state components must not be placed on metal workbenches or on top of televisions, radios and other electrical equipment.

Caution for Oxygen Sensor

Caution

Do not remove the heated oxygen sensor (HO2S) leads, removing the leads or harness connector will affect sensor operation.

Caution

Please pick up and place the oxygen sensor carefully, do not drop it, and keep the in-line electrical connector and grille heat sink free of grease, dirt or other contaminants.

Caution

Do not repair the oxygen sensor leads, harness connectors or terminals. If any lead, harness connector or terminal is damaged, the oxygen sensor must be replaced.

Caution

The outside clean air reference is obtained through the signal and heater wires. Attempting to repair the wires, harness connectors or terminals can clog the air reference and result in degraded oxygen sensor performance.

Caution

The following principles must be followed for repairing heated oxygen sensors:

- Never apply contact cleaner or other materials to the sensors or vehicle harness connectors. These materials can enter the sensors and cause poor performance.
- Do not damage the sensor leads and harnesses in such a way as to cause its internal wires to be exposed. This provides a pathway for foreign objects to enter the sensor and cause performance failures.
- Sensor and vehicle leads should not be bent or kinked, larger bends or kinks can block the air reference path through the leads.
- Ensure that the peripheral seal of the harness connector is intact to avoid damage due to water ingress.

Caution for Twisting or Bending during Hose Installation**Caution**

The inlet and outlet hoses must not be twisted during installation, and must not be bent or deformed to facilitate the installation as this may cause damage to components.

Caution for damage to Machined Surfaces**Caution**

Do not etch, scratch, or damage the sealing surfaces. The sealing surfaces are machined surfaces and damage to the machined surfaces can cause leaks.

Caution for Power System Control Module and Electrostatic Discharge**Caution**

Do not touch connector pins or solder components on circuit boards to prevent electrostatic discharge from damaging the electronic control module on the vehicle.

Caution for Sealant**Caution**

Do not allow any room temperature hardening sealant to enter the threaded blind holes. If some room temperature hardening sealant enters the threaded blind holes, the fasteners will have a hydraulic locking effect when tightened, hydraulic locking of the fasteners can cause damage to the fasteners and/or other components and will also prevent the fasteners from being tightened with the correct clamping force, the incorrect clamping force will prevent the components from being properly sealed, which will result in leakage, the fasteners failure to tighten properly can cause parts to loosen or separate, which could result in serious engine damage.

Caution for Wiring Harness**Caution**

After assembling the harness, check that all harness clips must be assembled in place.

Caution for Fault Diagnosis Instrument Use**Caution**

Before performing diagnostics on the vehicle, the following must be noted or damage to the control module may result.

- The software version of the fault diagnosis instrument and terminal must be up-to-date.
- The vehicle battery must be fully charged and the battery voltage should be between 12 V and 14 V.
- The connection between the fault diagnosis instrument and the terminal cable must be secure.
- The battery charger must not be connected to the battery when programming the control module.

Caution for Steering Wheel in Steering Limit Position**Caution**

Do not leave the steering wheel in the steering limit position for a duration of more than 5 s, otherwise the steering motor may be damaged.

Caution for Test Probes

Caution

Do not insert any test equipment probe (digital multimeter, etc.) into the wiring harness connector or fuse box terminal, the diameter of the test probe will deform most of the terminals, and the deformation of the terminal will result in poor contact and lead to system malfunction, be sure to use a special tool that probes the terminal from the front, do not use any paper clip or any other substitute to test the terminal.

Caution

When testing components with specialized tools, make sure that the terminal test adapter selected matches the dimensions of the connector terminals. Do not select a terminal test adapter by eyes, as some connector terminal holes may appear larger than the actual terminals in the holes, and using a large terminal test adapter can damage the terminals.

Important Note on Window Edge Damage

Caution

Avoid damage to the window by impacting objects due to exposed edges. The window must be 1 mm (0.025 in) below the sheet metal surface to avoid window damage.

Important Note on Automatic Transmission Lifting

Caution

When lifting or supporting the automatic transmission for any reason, do not support the jack under the oil pan and any sheet metal parts. Lifting the automatic transmission in any incorrect manner can result in damage to the components.

Important Note on Automatic Transmission in Vehicle Use

Caution

When the vehicle is in motion, it is prohibited to put the shift lever into Neutral to put the vehicle into a coasting condition, as this could result in damage to the internal parts of the transmission. If the shift lever is to be put into the P position, the vehicle must be brought to a standstill, otherwise the gearbox will be damaged.

Important Note on Towing Vehicle with Automatic Transmissions

Caution

Emergency towing on the drive wheels is not permitted, the drive wheels must be off the ground for emergency towing.

Caution for Power battery

Caution

To avoid damage to the power battery, observe the following points:

- Do not leave the vehicle at a high temperature of 45 °C for more than 1 day, and promptly park the vehicle in a cool environment.
- Do not store the vehicle at a low temperature of -20°C for more than 3 days, and promptly park the vehicle in a warm environment.
- Do not apply the power battery in your vehicle for other purposes.

1.1.1.2 Safety Notes on Hybrid Vehicle Repair

The electrical equipment on the hybrid vehicle is divided into low-voltage electrical components and high-voltage electrical components. Low-voltage electrical components include instrumentation, audio, lighting, Horn and blower, etc.. High-voltage electrical components include drive motor, drive motor controller (including high-voltage power distribution and DC-DC converter), high-voltage battery pack, on-board charger module, A/C compressor, air-conditioning heater (PTC) and so on.

This rated voltage of the model's high voltage power battery is 352 V.

An orange warning label is attached to a high-voltage component. Pay attention to the content requirements on the warning label.

Warning !

To avoid electric shock injury, it is prohibited to touch high-voltage parts, high-voltage cables (orange color) and their connectors.

It is prohibited to touch the cables on the vehicle if they are exposed or broken to prevent electric shock.

It is prohibited for non-professional maintenance personnel to remove, dismantle or modify the electrical equipment at will, otherwise touching the high voltage will lead to serious consequences such as burns or even death by electrocution.

1.1.1.3 Safety Measure for Hybrid Vehicle Repair

Insulated protection device

- Protective clothing for internal inspection
- Insulated rubber shoes
- Protective glasses
- Insulating gloves

Servicing personnel must wear insulating protective equipment before operation:

- Wear the insulating protective clothing.
- Wear insulated rubber shoes.
- Wear protective glasses.
- Wear insulated gloves: choose the appropriate anti-high-voltage electrician's gloves or anti-acid/alkaline gloves for battery electrolyte according to the work situation.

Caution

Before operation, the insulated protection devices must be checked to ensure that it is free of damage, holes and cracks, clean and dry internal and external surfaces, and cannot be operated with water to ensure safety.

Insulated tools

- Insulation mats
- Insulated tools
- Power battery workbench

Use of insulated tools:

- Pad the servicing area with insulating rubber mats.
- Maintenance personnel must use insulated tools when operating on energized parts.
- A professional workbench with insulating mats must be used when servicing the power battery and electronic control components.

Caution

Before operation, the insulated protection devices must be checked to ensure that it is free of damage, holes and cracks, clean and dry internal and external surfaces, and cannot be operated with water to ensure the safety.

Maintenance Site

- High voltage warning sign
- Carbon dioxide or ammonium phosphate fire extinguisher
- Warning line
- Dedicated maintenance workstation grounding wire

Servicing Site Requirements:

- Isolation measures need to be used before maintenance operations: isolate with warning fences and set up high-voltage warning signs to warn unrelated personnel to stay away from the area to avoid safety accidents.
- The designated location of the repair site must be equipped with a fire hydrant and use water to extinguish the fire.
- Before repairing high voltage equipment, connect the body with a hitch wire to the grounding wire of the special repair station for electric vehicles.
- Install a special AC circuit (220V50Hz16A) and power socket. If a dedicated circuit is not used when charging an electric vehicle, it may affect the normal operation of other devices on the circuit.
- Keep the working environment clean and well ventilated, away from liquids and flammable materials.

Maintenance Safety:**Caution****Safety precautions for maintenance operations:**

- After the low-voltage maintenance switch is disconnected, it is necessary to wait for more than 5 min for the motor controller, charger and other parts with capacitive elements inside to be fully discharged.
- When repairing the vehicle, a full-time guardian must be set up, and the guardian and the maintenance personnel must have the nationally recognized "Special Operation Certificate (Electrician)" and "Junior (including) or above Electrician's Certificate" (professional qualification certificate).
- The guardian's job duty is to supervise the whole process of maintenance:
 - Supervise whether the composition of maintenance personnel, the use of tools, the wearing of protection devices, the safety protection of spare parts, and the maintenance safety warning signs meet the requirements.
 - Check the connecting and disconnecting of the DC bus connector.
 - For being responsible for the maintenance process of the safety maintenance operating procedures for inspection, the guardian should be in accordance with the safety maintenance operating procedures for inspection, the guardian should be in accordance with the safety maintenance operating procedures to direct the operation of the maintenance personnel in the completion of an operation to inform the guardian, the guardian should be in the operation of the work flow sheet to make a mark.
- It is prohibited for untrained personnel to overhaul the high-voltage part, and all personnel are prohibited to carry out dangerous operation with a sense of chance to avoid safety accidents.

1.1.1.4 Safe Operation of Hybrid Vehicle**Maintenance of High Voltage System**

- Before powering up the vehicle, take care to verify that no one else is performing high-voltage maintenance operations to avoid danger.
- For servicing the high voltage system, disconnect the start switch power supply, disengage the connector between the negative cable of the battery and the DC bus, keep them in the custody of a full-time supervisor, and make sure that no one will reinstall them during the maintenance process.
- For servicing the high voltage wires, any exposed high voltage areas removed should be immediately wrapped and insulated with insulating tape.

– For installing the high voltage wires, the harness must be secured in accordance with the body fixing hole requirements.

– Do not touch the electrically charged parts of the high voltage wiring harness plugs with your fingers to avoid electric shock. In addition, you should prevent small metal tools or iron bars from touching the electrically charged parts of the plugs.

Measurement with Multimeter

– For overhauling the high voltage system, a multimeter should be used to measure the high voltage circuit of the whole vehicle to ensure that there is no electricity, the method is as follows: after unplugging the DC bus connector for 5 minutes, measure the voltage between the power battery and the body to initially determine if there is any leakage. If the voltage is detected to be greater than or equal to 50 V, the operation should be stopped immediately to check and determine the part of the leakage.

– For using a multimeter to measure high voltage, it is necessary to pay attention to the selection of the correct range, the accuracy of the multimeter for testing is not less than Level 0.5, and it is required to have a DC voltage measurement gear, with a range greater than or equal to 500 V.

– For using the multimeter to measure high voltage, it is necessary to comply with the principle of "One-handed Operation".

– The multimeter is equipped with insulated crocodile clips on one of the probes (with a required withstand voltage of 3 KV and an overcurrent capability greater than 5 V), and the crocodile clips should be clamped to one of the terminals of the circuit, and then the other pen should be connected to the terminal to be measured, and only one hand should be used to hold the probe during each measurement.

– For using a multimeter to measure high voltage, it is strictly prohibited to touch the metal part of the probe.

Vehicle Handling

– Vehicle abnormalities, accidents, fires and water intrusion:

– If the vehicle is involved in an accident, do not allow the vehicle to be started again and disconnect the negative electrode of the battery should be disconnected before rescuing it.

– If the vehicle catches fire, then immediately extinguish the fire with a fire extinguisher.

– If the vehicle is immersed in water, you must wait until the water surface is free of bubbles and nuisance noises, and the power is consumed before salvaging, and wear insulated protection devices before carrying out salvage operations to prevent electric shock.

1.1.1.5 Overhauling the Power battery

– In order to prevent electrolyte leakage and personal injury during servicing of the power battery, service personnel must wear gloves and protective glasses to prevent electrolyte from corroding the skin and splashing in the eyes.

- After unplugging the DC bus connector, take insulating tape to wrap the leaked part of the DC bus connector pins.
- When carrying the power battery to the battery maintenance professional workbench, a special bracket for the power battery should be used, and it is strictly prohibited to lift the power battery directly by hand.

1.2 Vehicle Inspection

1.2.1 Instructions and operations

1.2.1.1 Items to be Checked while Operating Vehicle

Horn Operation

The horn should be pressed occasionally to ensure that the horn is working properly and to check all button positions.

Operation of Braking System

When braking, be alert for abnormal brake system noises, increased brake pedal travel, or repetitive brake runout. In addition, if the brake system status indicator lights are illuminated continuously, a part of the brake system may be malfunctioning.

Operation of Exhaust System

Be alert to changes in system sound or smoke exhaust odor, which are signs that the system may be leaking or overheating and the system should be checked and repaired immediately.

Tire, Vehicle and Alignment Operation

Be alert to steering wheel or seat vibration that occurs while driving at normal highway speeds. This condition indicates that a certain wheel may need to be balanced. In addition, running from side to side on a flat, straight road indicates that tire pressure adjustments or an wheel alignment may be necessary.

Operation of Steering System

Be alert to changes in steering action, which need to be checked when the steering wheel is difficult to rotate or has too much free travel, or when there is an abnormal noise when steering or in park.

1.2.1.2 Items to Be Checked at Each Refueling

Loss of oil from any system (except windshield washer, starting air conditioner) indicates a possible system malfunction, and the system should be checked and repaired immediately.

Checking Engine Oil Level

After starting the vehicle, you can check if the oil level is normal through the combination instrument setting interface.

Check Engine Coolant Level and Condition

Check the fluid level in the expansion tank assembly, add engine coolant if necessary, check engine coolant and replace dirty engine coolant.

Check Windshield Cleaning Fluid Level

Check the glass cleaning fluid level in the reservoir and add glass cleaning fluid if necessary.

1.2.1.3 Items to Check at Each Engine Oil Change

Automatic Transmission Drive Axle

Check the fluid level and add fluid if necessary. See [Transmission Fluid Drain and Fill Procedure \(DHTPro\)](#).

Brake System Inspection

A low brake fluid level may indicate that the brake pads in the disc brakes are worn and need to be serviced. Additionally, if the brake system status indicator light remains illuminated, there may be a problem with the brake system. If the Anti-Lock Brake System (ABS) Malfunction Warning Light stays on or off, there may be a problem with the ABS. This check should be completed while the wheel is removed for the swap. Check for proper line and hose connection, as well as for blockage, leak, crack or scratches. Inspect the disc brake pads for wear. Check the surface condition of the brake discs, as well as other brake components, including the brake wheel cylinders, parking brakes, etc. Check the parking brake adjustment. If driving habits or conditions require frequent braking, check the brakes at a shorter interval.

Inspection of Steering System, Suspension and Front Drive Axle Shrouds and Seals

Inspect the front and rear suspension and steering systems for damaged, loose or missing parts and for signs of wear or inadequate lubrication. Clean and inspect the drive axle shrouds and seals for damage, cracks or leaks and, if necessary, replace the seals.

Exhaust System Inspection

Inspect the entire system, including the catalytic converter, and check the body area near the exhaust system for broken, damaged, missing or misaligned parts, cracks, holes, loose connections or other conditions that cause the floor to dissipate heat poorly or allow exhaust gas to enter the luggage or passenger compartment.

Engine Drive Belt

Check all drive belts for cracking, fraying, wear and proper tension and adjust or replace drive belts as necessary.

Operation of Engine Hood Latch

Before opening the hood, observe the operation of the auxiliary latch, which should prevent the hood from opening completely when the main latch is released, and the hood must be able to close tightly.

1.2.1.4 Items to Be Checked at Least Once a Month

Check of Tire and Wheel and Air Pressure

Check the tires for abnormal wear or damage, also check the wheels for damage, check the pressure when the tires are cold and maintain the recommended pressure on the tire label.

Operation of Vehicle Lights

Check the operation of license plate lights, headlights (both high and low beams), position lights, fog lights, tail lights, brake lights, turn signals, reverse lights and hazard warning lights.

Oil Leakage Check

After the vehicle has been parked for a period of time, the ground under the vehicle should be checked periodically for water, engine oil, fuel or other liquids. It is normal for the air conditioning system to drip after use. If fuel leakage or engine smoke is found, the cause should be identified and trouble-shooted immediately.

1.2.1.5 Items to Be Checked at Least Twice a Year

Fluid Level in Reservoir of Brake Master Cylinder

Check the fluid and keep it at the correct level, a low level may indicate that the brake pads in the disc brakes are worn and need to be serviced. Check the vent holes on the reservoir cover to ensure that they are free of dirt and that the air passages are clear.

Lubrication of Door and Window Sealing Strips

Apply a thin film of silicone-based grease to the sealing strip with a clean rag.

1.2.1.6 Items to Be Checked at Least Once a Year

Condition and Operation of Seat Belts

Check the seat belt system, including woven straps, buckles, locking plates, retractors, guide rings and fixing devices.

Body Lubrication Maintenance

Lubricate all door hinges, including engine hatch, fuel filler door, luggage compartment (back door) hinges and latches, glove box and console doors, and any folding seat components.

Under Body Flushing

First, loosen any sediment that accumulates in the enclosed area of the vehicle, then, rinse the under body with clean

water. After winter, rinse the under body at least once a year. Rinsing the under body removes corrosive substances used to remove snow, ice and dust.

Engine/Motor/Battery Cooling System

Caution

When working around a running engine/motor controller, avoid contact with moving parts and hot surfaces to prevent injury. Check the coolant in each cooling circuit. If the coolant is excessively dirty or rusty, drain, flush and refill the engine/motor/battery cooling system with new coolant. Maintain a proper motor controller coolant concentration to ensure proper freeze, boil, and corrosion protection properties and cooling component temperatures.

1.2.1.7 Checking for Intermittent faults

Description:

- a. Clear DTC.
- b. Perform a simulation test.
- c. Check and jiggle wiring harnesses, connectors and terminals.

When a malfunction cannot be confirmed by a DTC check and the malfunction occurs only occasionally in use, all circuits and parts that may cause the malfunction should be checked and confirmed. In many cases, the malfunctioning part can be identified quickly and efficiently by performing the basic checks shown in the flowchart below. This is especially true for malfunctions such as poor harness connector contact.

Fault definition: This fault does not currently occur, but the historical diagnostic fault code record indicates that the fault has occurred before. Or the customer has reported the fault, but because the fault is not related to the fault diagnostic trouble code, the fault symptoms cannot be reproduced currently.

Diagnostic Procedure:

Step 1	Check whether the battery voltage is normal?
--------	--

- a. Operate the start switch to set the power mode to OFF.
- b. Measure the battery voltage.
- c. Depending on the measured values, enter the corresponding diagnostic steps.

Test result	To Steps
11 - 12 V	Yes
Less than 11 V	No

No

Check the battery. See [Battery Instruction and Operation](#).

Yes

Step 2	Visual physical inspection.
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Performing this step is an important means of initially identifying the fault location:

- a. Check the wiring harness for damage, wear, tear and other faults.
- b. Check whether the wiring harness is improperly arranged, and it is strictly prohibited for the wiring harness to be close to the following high-voltage or high-current devices:
 - Electrical components such as starting motor and alternator. The operation of these components generates a high level of electromagnetic interference, which interferes with the correct transmission of signals and causes the system not to work properly.
 - Ignition coil, wiring harness, and other parts.
- c. Check module grounding point and body grounding point for oxidization, looseness, and misplacement. The grounding point of the control system must not be altered in position arbitrarily, as this will affect the normal operation of the control system.
- d. Check that the positive and negative battery cable connections are reliable, and that there is no looseness, oxidation, or corrosion.

Yes

Repair or replace the defective part.

No

Step 3	Inspection of wiring harness and connector.
--------	---

- A. Connect the diagnostic instrument to the diagnostic interface DLC.
- B. Operate the start switch to set the power mode to "ON."
- C. Access to the data flow of the switch you are checking.
- D. Turn on the switch manually.
- E. While monitoring the data flow, gently shake each connector or harness vertically and horizontally while viewing the data flow.
- F. Confirm that the data flow is stable

No

Repair or replace wiring harness and connectors.

Yes

Step 4	Actuator or relay check.
--------	--------------------------

- A. Connect the diagnostic instrument to the diagnostic interface DLC.
- B. Operate the start switch to set the power mode to "ON.
- C. Prepare the output status control function for the actuator or relay you are checking.
- D. After the output status control function has been activated, vibrate the actuator or relay with your finger for 3 s.
 - 1. If an erratic "Click" sound is heard, check for poor connections or improper installation of the actuator and/or relay.
 - 2. A strongly vibrating relay may cause the relay to disconnect.
- E. Verify that the actuator or relay is OK.

Yes

Repair or replace the actuator or relay.

No

Step 5 | Water pouring inspection.

If the malfunction occurs only in weather with high humidity or rain/snow, perform the following steps:
Indirectly change temperature and humidity by spraying water on the front of the radiator. If the vehicle is prone to water leakage, the control module may be damaged. Special precautions must be taken when testing a vehicle for water leaks.

- A. To check sensors or switches, connect the diagnostic instrument to the diagnostic interface DLC.
- B. Operate the start switch to set the power mode to "ON" (without starting the vehicle).
- C. To check the sensor or switch, access the data flow of the sensor or switch
- D. To check the switch, manually turn it ON.
- E. Spray water on the vehicle or drive the vehicle through a service rack.
- F. Confirm that the data flow is stable.

No

Repair or replace wiring harness and connectors.

Yes

Step 6 | Make the malfunction reappear.

- a. Connect the diagnostic vehicle fault diagnosis instrument and use the data recording function of the fault diagnosis instrument, test the vehicle on a road to record the data when an intermittent fault occurs. When the button of the vehicle data recorder is pressed, the engine control module data can be recorded when an intermittent fault occurs, and this data can be used to identify the fault location.
- b. Another diagnostic method is to connect a digital multimeter to a suspect circuit while the vehicle is in motion. If the digital multimeter reads a value, this circuit is faulty.

Next Step

Step 7	The fault indicator lights up intermittently, but the system has not set a fault code.
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The following conditions may cause that the fault indicator lights up intermittently, but the system will not set a diagnostic fault code:

- a. Electromagnetic interference caused by an abnormally operating relay, solenoid, or switch.
- b. Non-original or aftermarket retrofitting accessories such as on-board phones, alarms, lights or radios are not installed correctly.
- c. The fault indicator light control circuit is short-circuited to ground intermittently.
- d. Grounding point is loose.

Next Step

Step 8	Other inspections.
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- a. Test the diodes and other diodes on both ends of A/C compressor clutch for open circuits.
- b. Check the charging system for the following conditions:
 - A faulty alternator rectifier bridge may cause AC signal interference within the electrical system.
 - Is the alternator output voltage correct? Repair the charging system if the alternator output voltage is below 9V or above 16V.

Next Step

Step 9	Access the malfunction symptom table.
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1.3 Lifting vehicles

1.3.1 Instructions and operations

1.3.1.1 Lifting and Hoisting Vehicle

Warning !

See ["WARNING ABOUT LIFTING VEHICLE" in "WARNING AND CAUTION"](#).

To avoid personal injury, always use a jack stand when performing any work on or under a vehicle that is supported only by a jack.

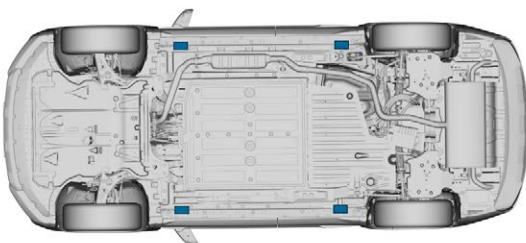
Caution

When you are lifting or raising the vehicle on the frame sidings or other designated lifting points, make sure that the jack pads are not touching the catalytic converter, brake fluid lines, or fuel lines. If it touches any of these areas, it could cause damage to the vehicle or a reduction in vehicle performance. Before starting any lifting procedure, make sure the vehicle is on a clean, hard, level surface. Ensure that all lifting devices meet weight standards and are in good working order. Ensure that all vehicle loads are evenly distributed and secured. If the vehicle is only supported from the frame struts, ensure that the lifting devices do not exert excessive force or damage the frame struts.

Caution

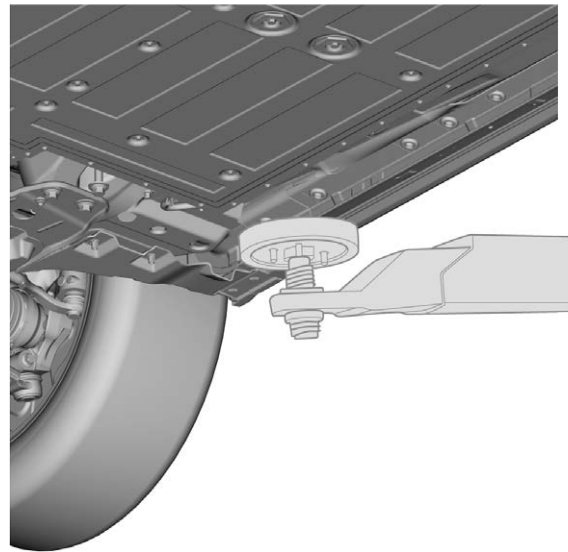
Vehicle lifting points are indicated on the four lower door trim panels (inverted triangle shape), remember to avoid touching the lower door trim panels for installing the lifter pads.

Vehicle lifting points



Lifting Vehicle - Frame Contact Lifter

Front end lifter pad



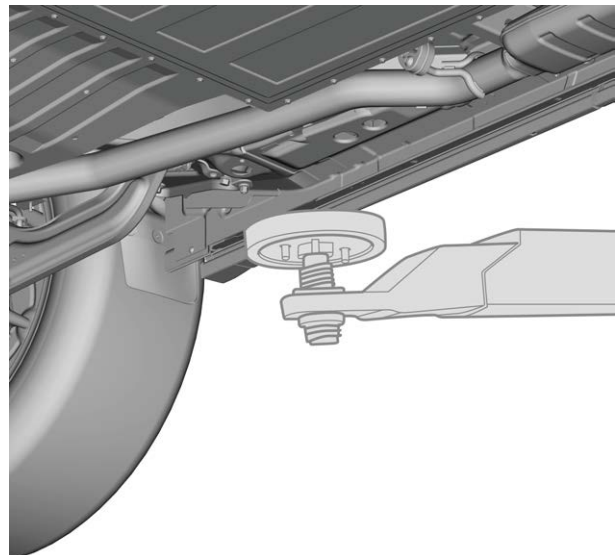
Caution

The front end lifter pads must not touch the door sill plates to the outside of the longitudinal frame members or the floor.

Place the front-end lifter pads in the following positions

- Below the connection between the front frame longitudinal beam and the side frame longitudinal beam.

Rear end lifter pads



Caution

The rear end lifter pads must not touch the door sill plates to the outside of the frame longitudinal beams or the floor.

Place the rear end lifter pads in the following positions

- Below the connection between the rear frame longitudinal beam and the side frame longitudinal beam.

1.4 Maintenance

1.4.1 Specification

1.4.1.1 Oil Capacity

Application:	Capacity
Gasoline	60L
Engine oil	5.8 L (Dry)
	5 L (Wet)
Engine coolant	8.5L
Power battery coolant	9.3L
Automatic transmission oil	4.0±0.2 L (oil change for first maintenance)
	3.8±0.2 L (subsequent maintenance and repair)
Braking	0.68L
Windshield washing solution	4L
Air conditioning refrigerant	650 g

1.4.1.2 Fluid Specifications

Application:	Specification
Gasoline	Grade 92 and above gasoline
Engine oil	Shell VCC RBS0-2AE 0W-20
Engine coolant	Ethylene glycol type coolant certified by Geely
Power battery coolant	Ethylene glycol type coolant certified by Geely
Automatic transmission oil	Shell E-Fluids New energy transmission fluid/Shell E-Fluids E6 i DHTF
Braking	DOT4
Windshield cleaning agent	Ethanol type
Air conditioning refrigerant	R134a

Caution

When the ambient temperature outside the vehicle is higher than 30 °C, it is recommended to use a low concentration washing solution (with an ethanol content <20%). When the ambient temperature outside the vehicle is lower than 30 °C, it is recommended to use a high concentration washing solution (with an ethanol content >20%), and the freezing temperature of windshield cleaning agent should be lower than the lowest local air temperature by more than 10 °C.

1.4.2 Instructions and operations

1.4.2.1 Tire Shift Instructions

Caution

If uneven tire wear is evident, the cause of this wear should be eliminated as a cause of failure.

If a tires are shifted, it is recommended to check the balance of both the tire and the wheel assembly simultaneously.

1. When performing a brake inspection on the tires according to the maintenance schedule described in the Warranty Maintenance Manual, it is recommended that the tires be cross-shifted, or that the tires be cross-shifted when the difference in tread depth between the front tires and the rear tires reaches 1.5 mm (0.08 in).

2. Lift and support the vehicle. See [Vehicle Lifting and Raising](#).

Caution

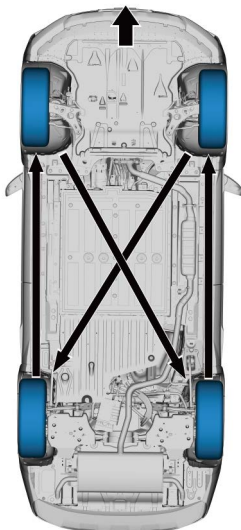
Record the original position of each tire and wheel assembly relative to the vehicle.

3. Remove the tire and wheel assembly. See [Replacement of Wheel Assembly](#).

4. Rotate the tire and wheel assembly as shown below.

Caution

Perform a cross rotation for a "non-single guide pattern" tire as shown below.



Caution

Perform a parallel transposition for a "non-single guide pattern" tire as shown below.



5. Install the tire and wheel assembly, see [Replacement of Wheel Assembly](#).

6. Remove the safety bracket.

7. lower the vehicle.

8. Check and adjust the tire inflation pressure.

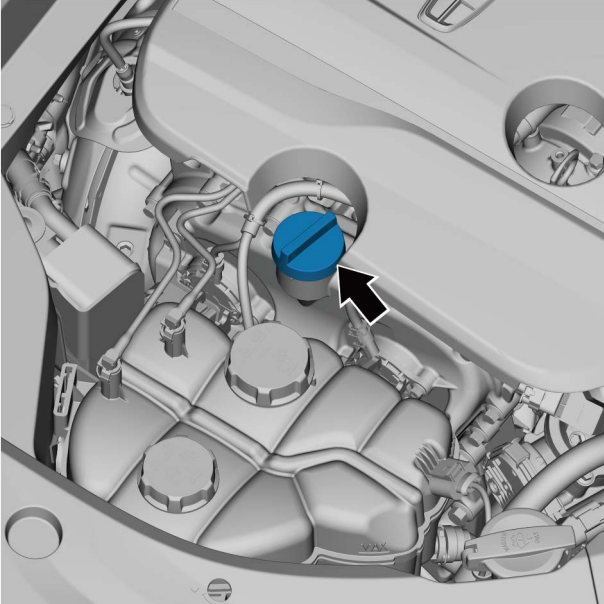
9. Learn and match tire pressure sensor, see [Sensor Learning](#).

1.4.3 Removal and Installation

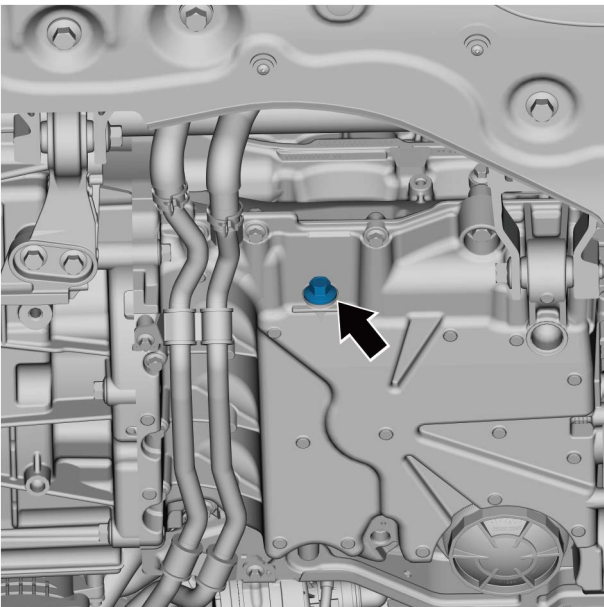
1.4.3.1 Engine Oil Drain and Fill Procedure

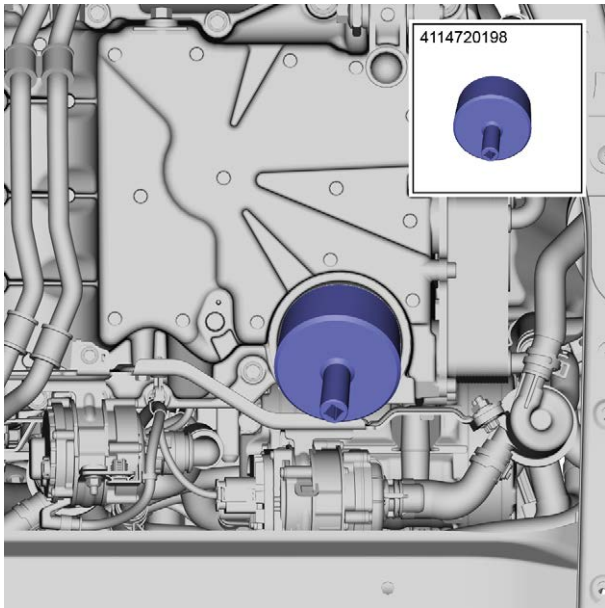
Removal Procedure

- 1 Open the engine compartment hood.
- 2 Open the oil filler cap.



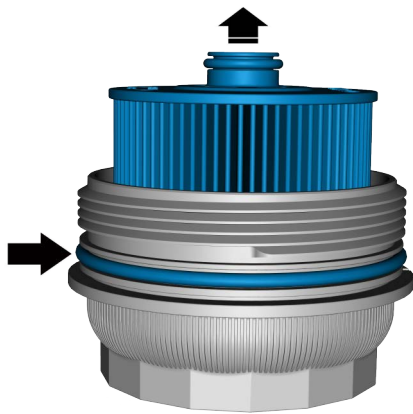
- 3 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 4 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 5 Remove the oil drain plug.
- 6 Drain the engine oil.



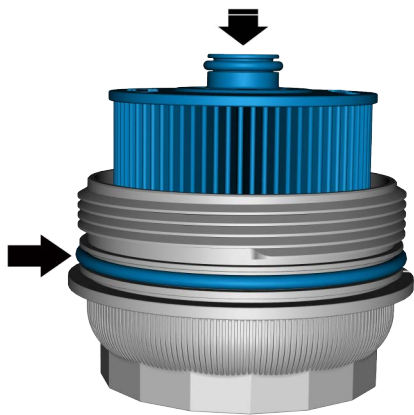


- 7 Remove the oil filter element housing with a special tool.
Special Tool for Oil Filter Element Removal:
4114720198

- 8 Remove the oil filter element.
- 9 Remove and discard the sealing O-ring.



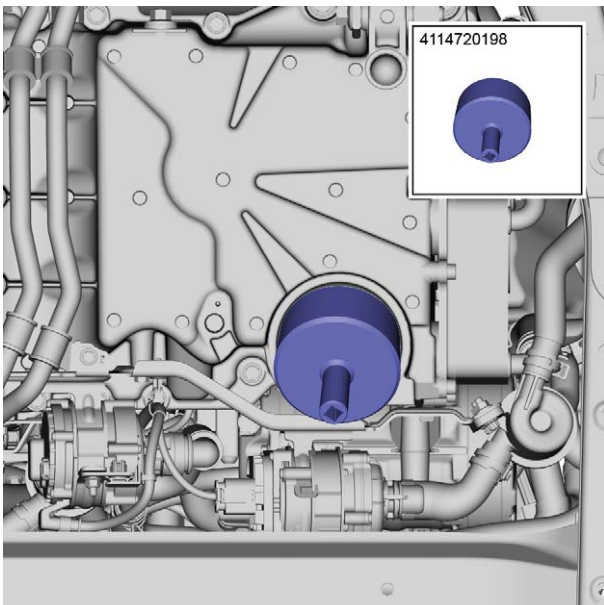
Installation Procedure



- 1 Install a new sealing O-ring by applying a coat of clean lubricant to the new sealing ring.
- 2 Install a new oil filter element into the oil filter element housing.

Caution

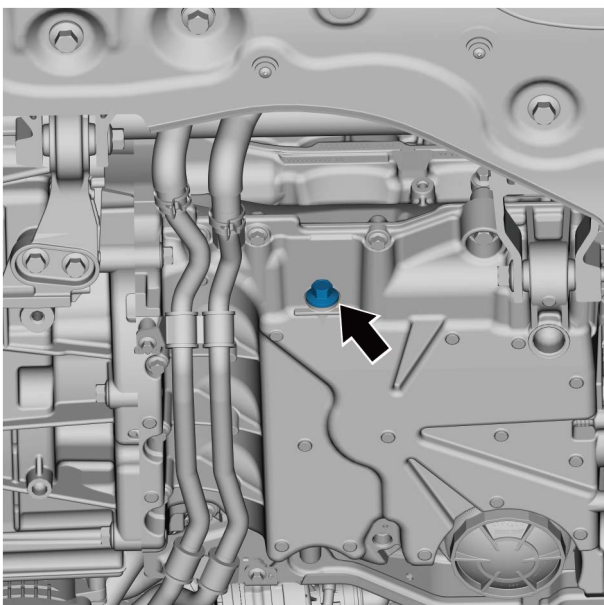
Verify that the oil filter check valve is installed correctly.



- 3 Install and tighten the oil filter element housing with a special tool.

Special Tool for Oil Filter Element Removal: 4114720198

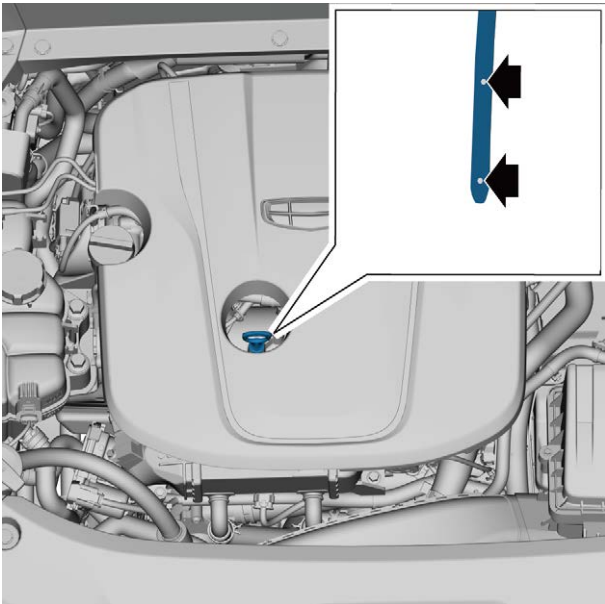
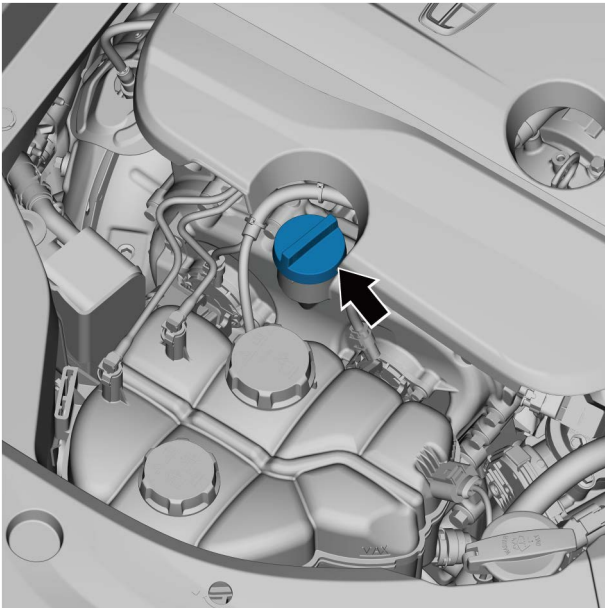
Torque: first tighten to 25~30 N·m, then rotate in reverse by 30°, and finally tighten to 25~30 N·m



- 4 Install an oil drain screw plug and a new sealing washer.
Torque: 35 N·m

Caution

The oil drain bolt is not damaged and does not need to be replaced, the washer is a disposable part that must be replaced.



- 5 Fill with a dosed amount of engine oil.
- 6 Install an oil filler cap.
- 7 Turn off the engine for 3 minutes after starting and wait for 10 minutes, pull out the dipstick and adjust the oil level so that the oil level is in the middle of the dipstick marking number.

Caution

1. When the instrument shows SOC below 85%, switch to hybrid mode: click the large screen parking power generation button to start the engine, or turn on the intelligent power preservation, SOC sliding adjustment to the adjustable maximum value of 85%, and select the charging speed priority to start the engine.

2. When the instrument shows SOC higher than 85%, depress the accelerator pedal to 100% to start the engine, lightly depress the accelerator pedal to maintain continuous operation for 3 minutes, then release the accelerator pedal to turn off the engine.

3. The oil level check requires the vehicle to be parked in a horizontal position.

- 8 Install the lower engine guard assembly.
- 9 lower the vehicle.
- 10 Close the engine compartment cover.

1.4.3.2 Transmission Fluid Drain and Fill Procedure (3DHTPro)

Drain Procedure

Caution

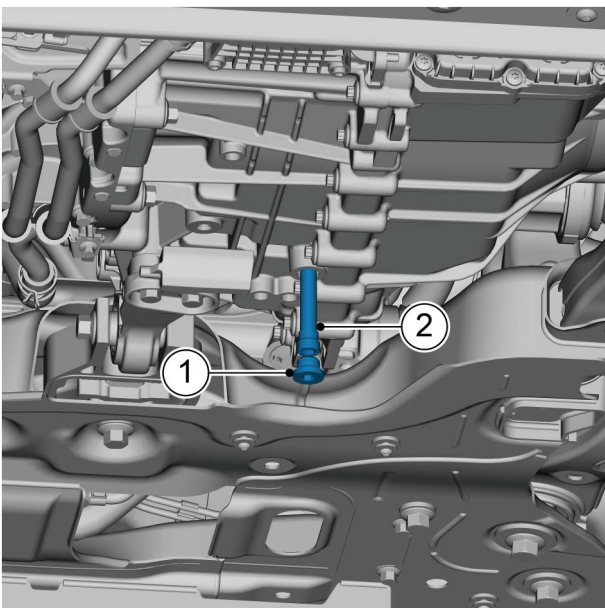
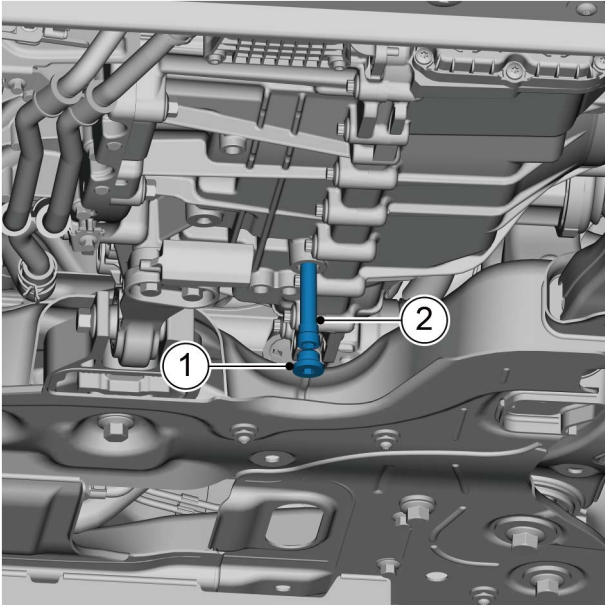
Do not mix different brands of lubricants.

For the first maintenance, it is necessary to change the transmission lubricant and replace the low pressure filter element.

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 3 Remove the oil drain plug 1.
- 4 The lubricant flows out of the transmission in a line. When it becomes dripping, remove the oil level limit pipe 2.
- 5 The fluid then continues to flow out of the transmission in a line. After it turns into drops, wait for 15 minutes before refueling.

Caution

1. The fluid is not reusable.
2. Measure the amount of oil I draining for guidance during refueling.

**Filling Procedure**

- 1 Install the oil limit pipe 2.
Torque: 4 N·m
- 2 Fill the transmission lubricant according to the amount of oil drained.
Transmission fluid specification: see [General Specifications](#).
- 3 After refilling, quickly install the drain screw 1.
- 4 Start the engine, shift all gears from "P" to "D", run each gear for 2 seconds and more, perform 2 shifts and return to "P".
- 5 Remove the oil drain plug 1.

Caution

1. If no lubricant overflows from the installation position of the drain screw 1, go to the next step.
2. If there is lubricant overflow from the installation position of the drain plug 1, wait until there is no lubricant overflow from the installation position of the drain plug 1, and turn to Step 8.

- 6 Continue to fill with transmission lubricant.

Transmission fluid specification: see [General Specifications](#).

Caution

Check the installation position of the drain plug 1 for several times during the refueling period until the transmission fluid flows in a line.

- 7 After refilling, wait until no lubricant overflows from the installation position of the drain screw 1.

- 8 Install the drain plug 1.

Torque: 40 N·m

Caution

The drain plug gasket is a disposable wearing part and must be replaced with a new drain plug gasket.

- 9 Install the bottom engine guard assembly.

- 10 lower the vehicle.

1.4.3.3 Electric System Coolant Drain and Fill Procedure

Drain Procedure

Warning !

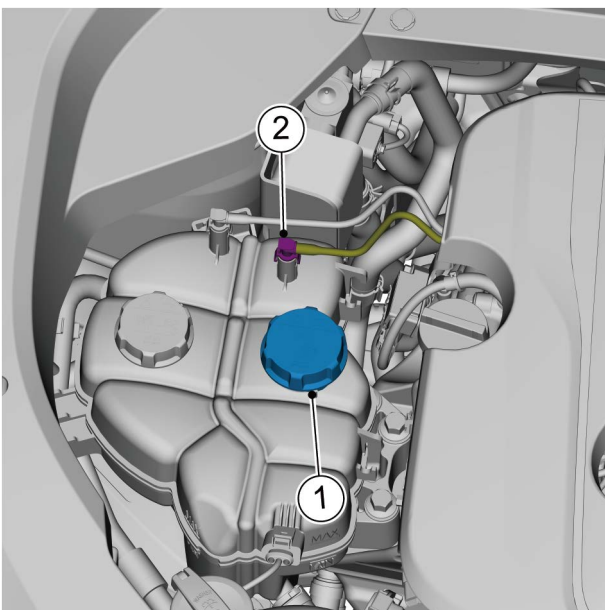
See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

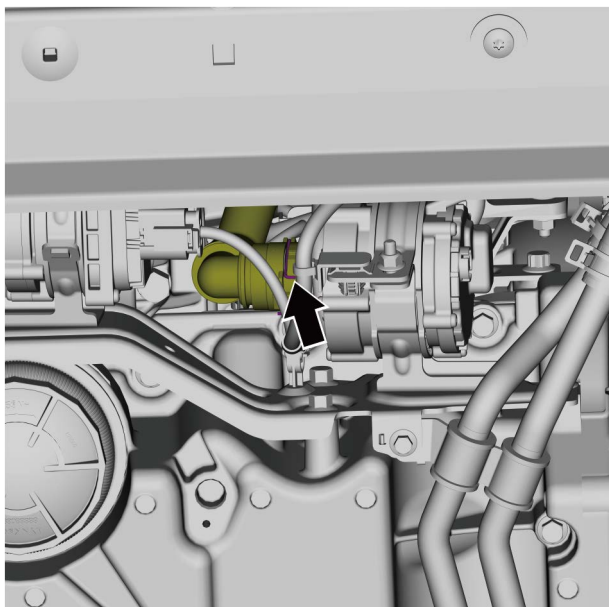
- 1 Open the engine compartment hood.
- 2 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 3 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 4 Remove the expansion water bottle cover 1.

Caution

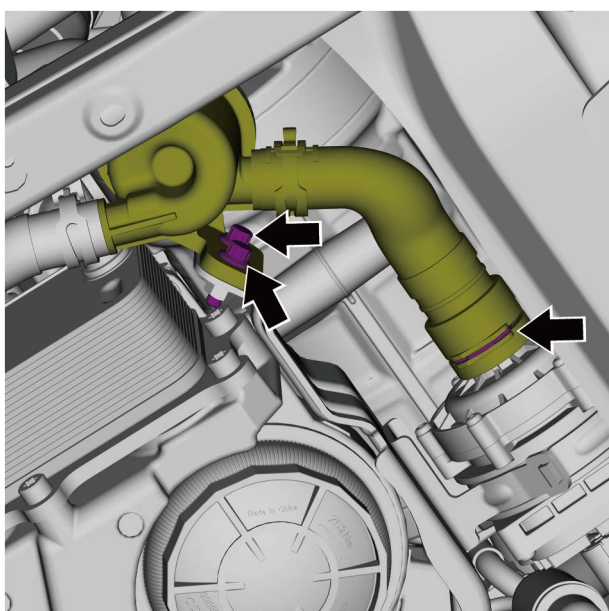
Do not open the expansion tank cap to prevent coolant from spraying out when the coolant water temperature is high. Wait for the water temperature to cool before slowly loosening the expansion tank cap to relieve expansion tank pressure.

- 5 Disconnect the quick connector 2 from the engine to the degassing hose of the expansion tank and the expansion tank.



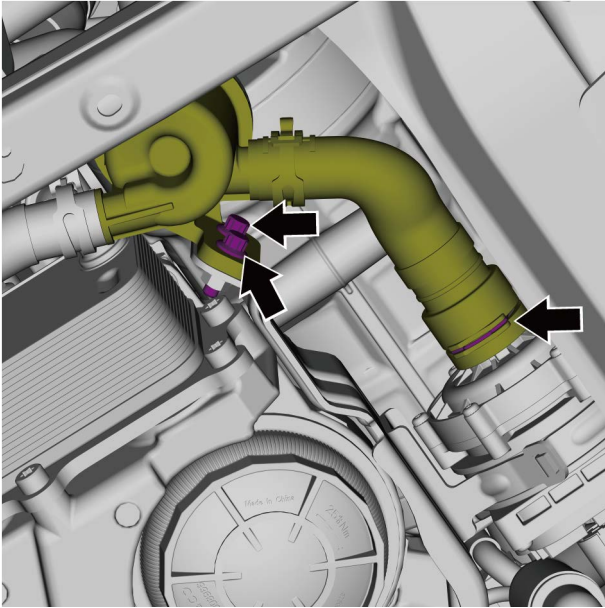


- 6 Disconnect the low-temperature radiator water outlet hose and the quick release clamp of the electric control powertrain cooling pump, and drain the coolant.

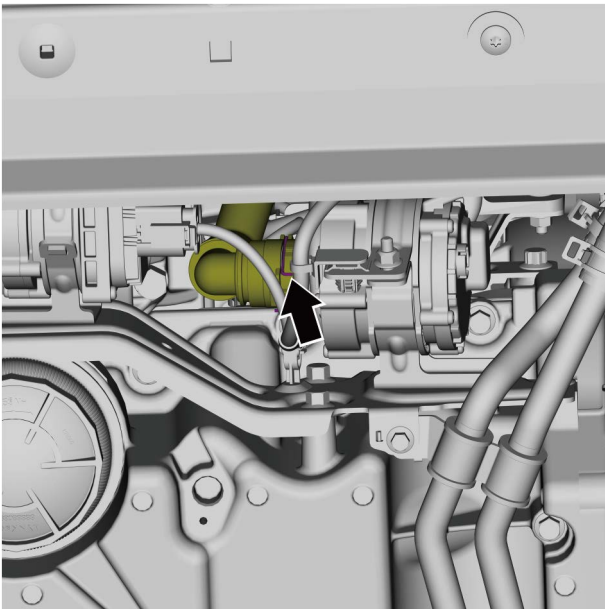


- 7 Remove the two fixing bolts of the battery water pump inlet pipe (2).
Remove the fixing clamp, disconnect the battery water pump inlet hose (2) from the battery water pump, and drain the coolant.

Filling Procedure

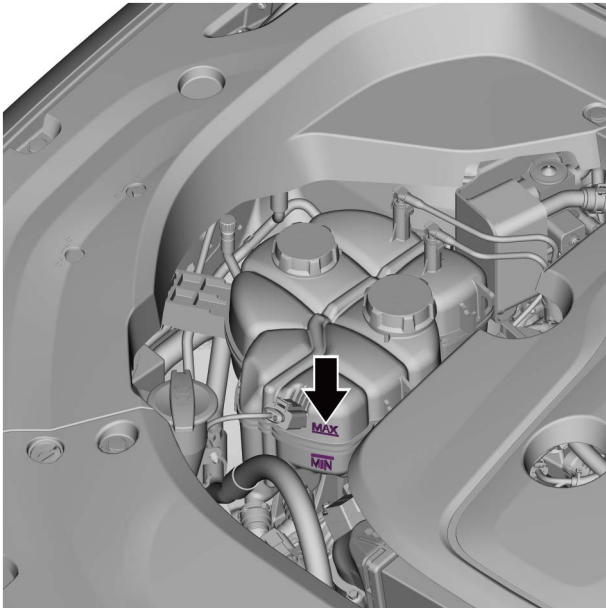


- 1 Connect the battery water pump inlet pipe (2) to the battery water pump and install the fixing clamp. Install the two fixing bolts of the battery water pump inlet pipe (2).
Torque: 10N·m

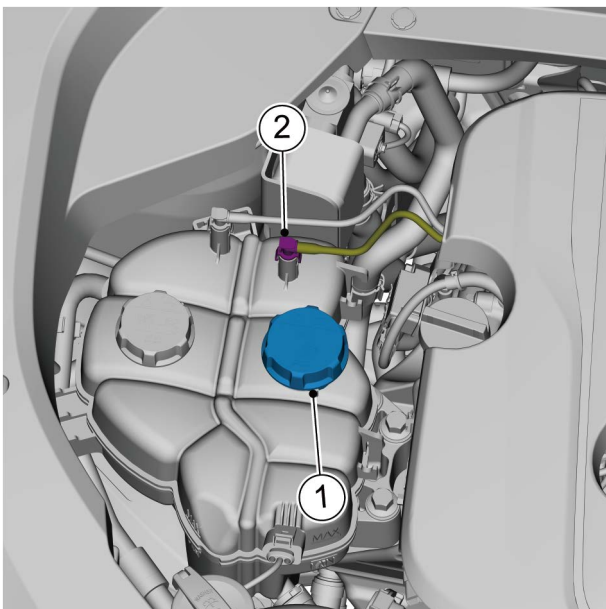


- 2 Connect the outlet hose of the low-temperature radiator to the connection joint of the electric control powertrain cooling pump.

- 3 Clean the expansion tank assembly.

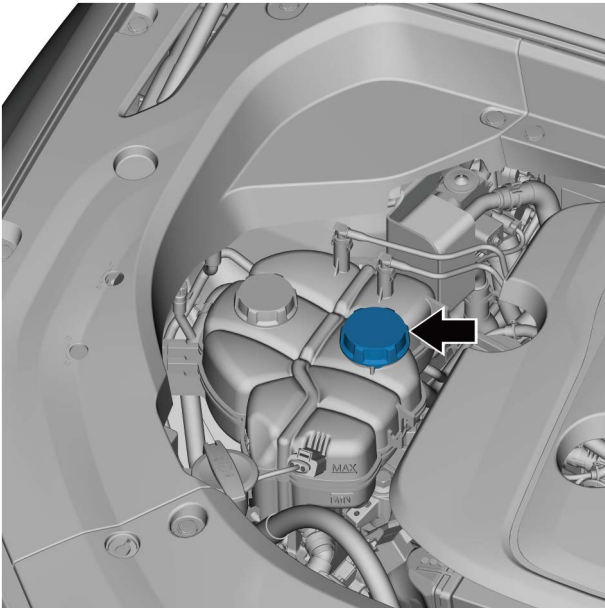


- 4 Slowly fill the engine coolant to the expansion tank mark.



- 5 Install the engine to the expansion tank degassing hose with the quick connector 2 of the expansion tank.
- 6 Tighten the expansion water tank cover 1.

- 7 Install the bottom engine guard assembly.
- 8 lower the vehicle.



- 9 Close the engine compartment cover.
- 10 Open the expansion tank cover after 10 minutes of road test, and check again to adjust the water level to the expansion tank scale (between MIN and MAX).

1.4.3.4 Draining and Filling of Engine Coolant

Drain Procedure

Warning !

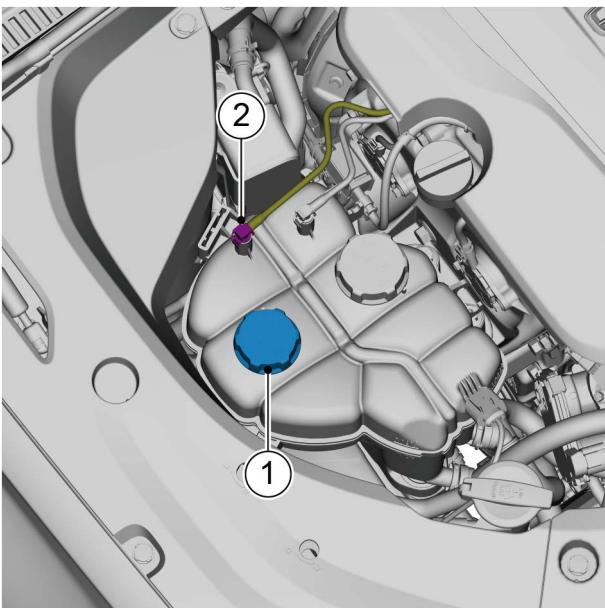
See "WARNING ABOUT COOLING SYSTEM MAINTENANCE" in "[WARNINGS AND PRECAUTIONS](#)".

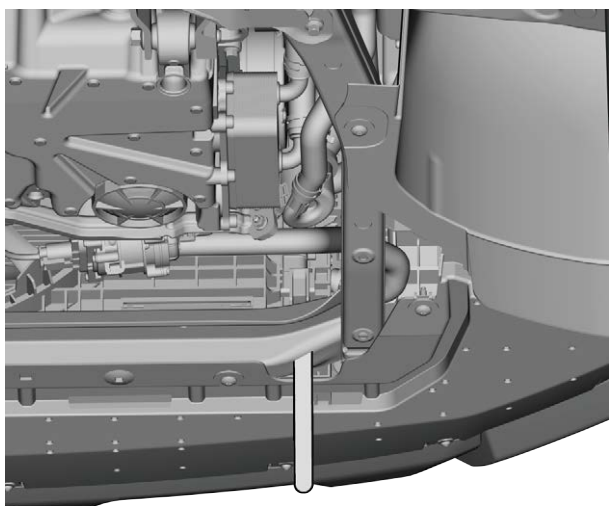
- 1 Open the engine compartment hood.
- 2 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 3 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard Assembly](#).
- 4 Remove the expansion water bottle cover 1.

Caution

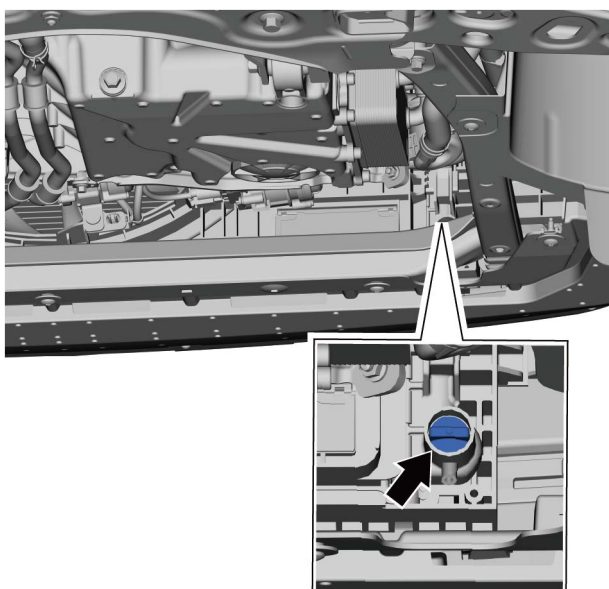
Do not open the expansion tank cap to prevent coolant from spraying out when the coolant water temperature is high. Wait for the water temperature to cool before slowly loosening the expansion tank cap to relieve expansion tank pressure.

- 5 Disconnect the quick connector 2 from the engine to the degassing hose of the expansion tank and the expansion tank.





6 Insert the drainage rod.



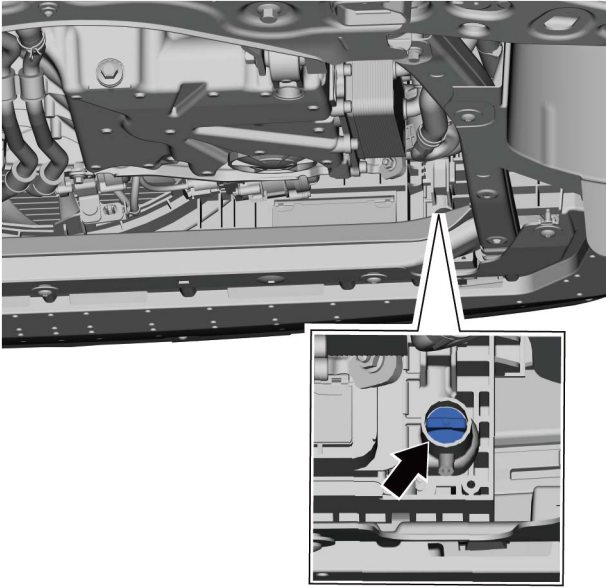
7 Loosen the radiator drain plug by rotating counterclockwise.

8 Receive the drained engine coolant in a recovery container.

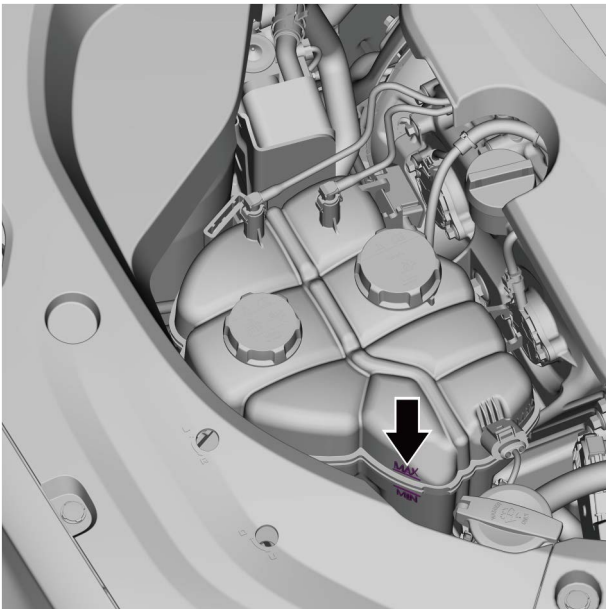
Caution

Concentrate the recycling and disposing of old engine coolant, wait for scrapping or recycling, and protect the environment by not draining old engine coolant into the drainage pipeline.

Filling Procedure

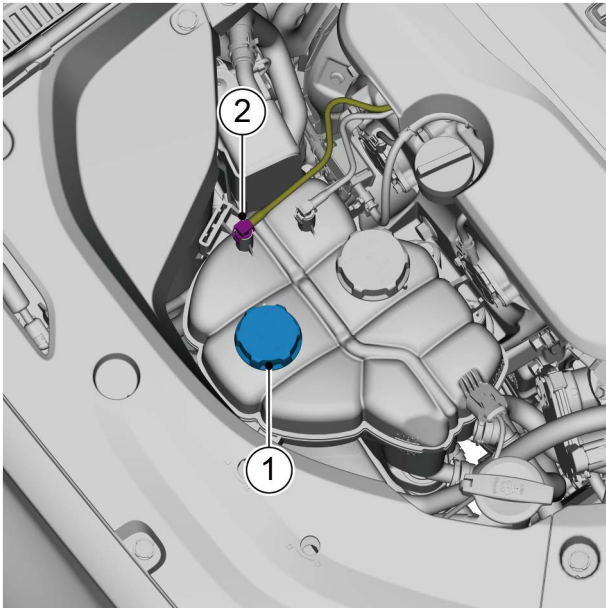


1 Tighten the radiator drain plug by rotating clockwise.

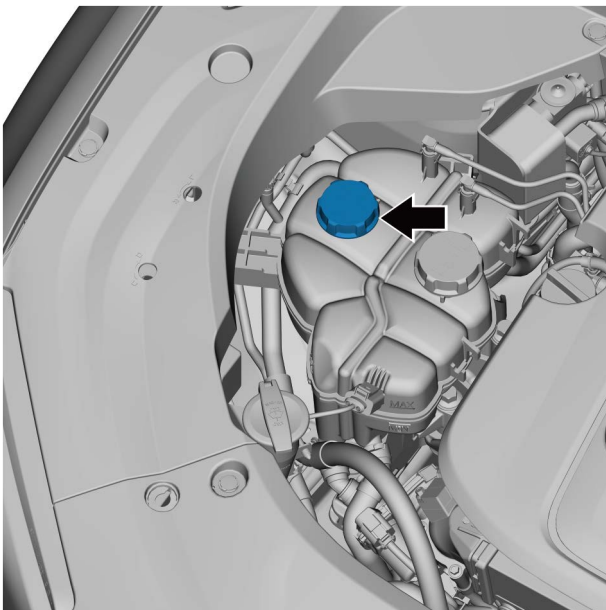


2 Clean the expansion tank assembly.

3 Slowly fill the engine coolant to the expansion tank mark.



- 4 Install the engine to the expansion tank degassing hose with the quick connector 2 of the expansion tank.
- 5 Tighten the expansion tank cap 1 and start the engine until the thermostat opens. (The thermostat is recognized as open when both radiator inlet and outlet hoses feel hot)

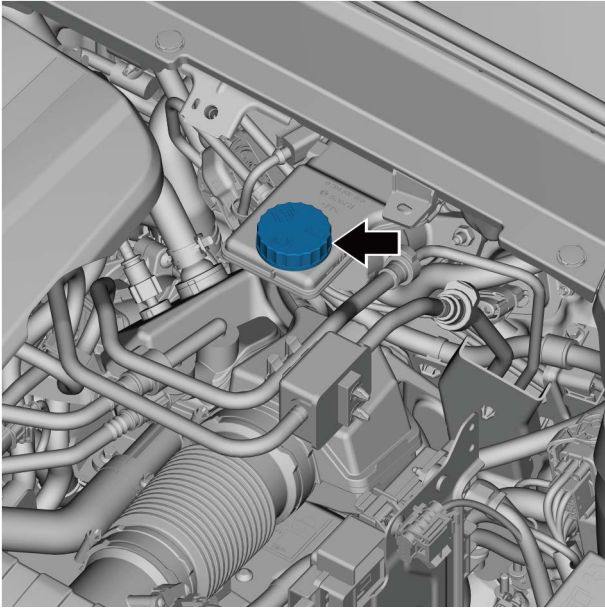


- 6 Turn off the engine and verify that the engine coolant drain valve is not leaking. (Repeat until no vapor bubbles come out of the fluid discharged from the degassing hose.)
- 7 Open the expansion tank cap and fill the engine coolant so that the level reaches the expansion tank scale (between MIN and MAX).

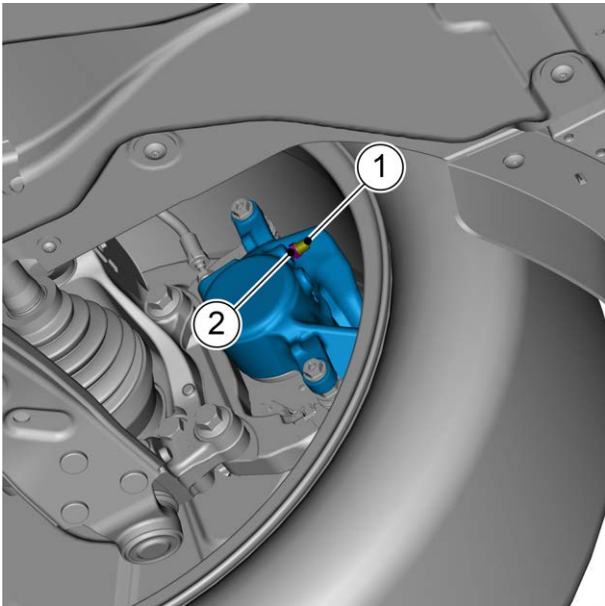
- 8 Install the bottom engine guard assembly.
- 9 lower the vehicle.
- 10 Close the engine compartment cover.

1.4.3.5 Draining and Filling Procedure of Brake Fluid

- 1 Open the engine compartment hood.
- 2 Lift the vehicle, see [Vehicle Lifting and Raising](#).



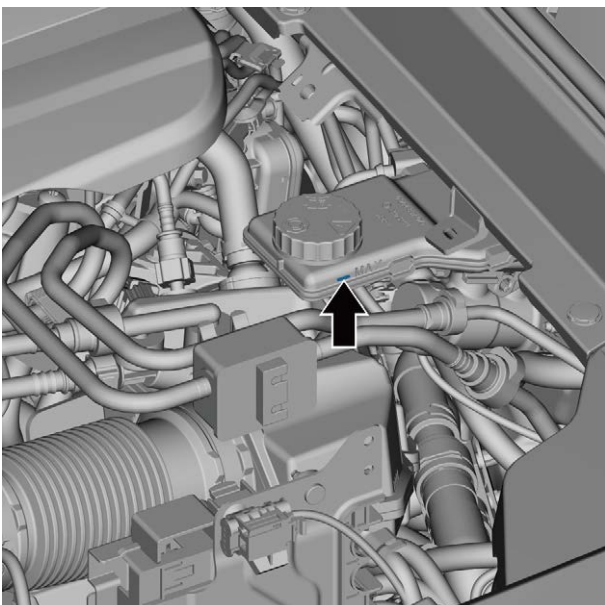
3 Remove the brake fluid kettle lid.



4 Remove the exhaust screw dust cover 1.

5 Connect a transparent tube to the exhaust valve 2 on the right transparent caliper and place the clear tube into a transparent container.

6 Slowly press the brake pedal several times to drain all brake fluid from the pipeline.



7 Fill the brake fluid to the MAX position of the reservoir.

- 8 Bleed the brake system.

Caution

The brake system should first exhaust the wheel brake pipes from far to near the master cylinder.

The brake system exhaust repair process requires two people to work together.

- 9 Slowly depress the brake pedal several times, then keep the pedal in the bottom position.

Caution

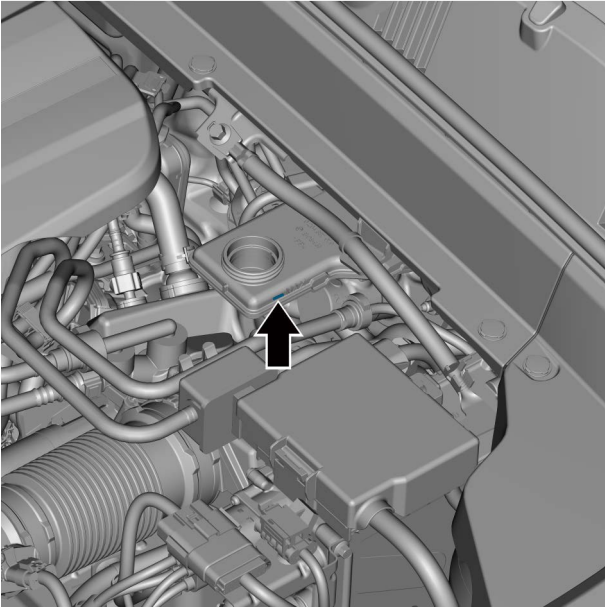
Do not press the brake pedal urgently.

- 10 While depressing the brake pedal, loosen the exhaust screws to exhaust air from the caliper.
- 11 When the brake fluid no longer overflows, tighten the exhaust screw and slowly release the brake pedal.
- 12 Repeat Steps 7 to 9 until the air is completely released from the brake fluid.
- 13 If no more bubbles appear in the container when the exhaust screw is loosened, the air has been completely bled out.

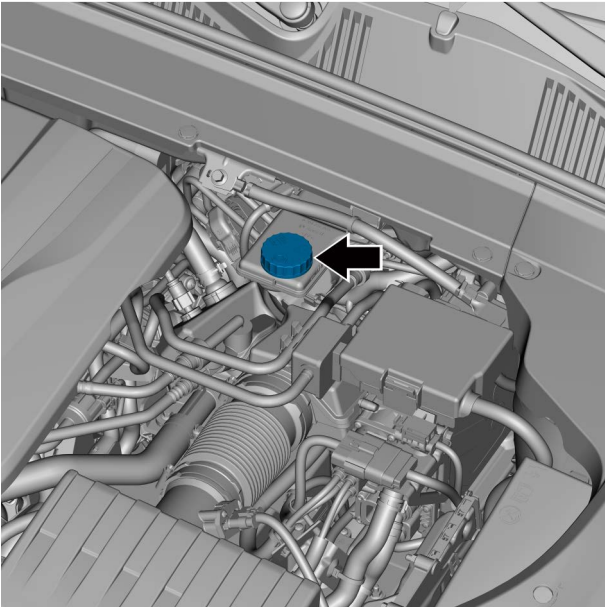
Caution

Keep the brake master cylinder reservoir level at least halfway or more during the exhaust process.

- 14 Sequence of brake system exhaust procedure: right rear wheel/left rear wheel/right front wheel/left front wheel.
- 15 Tighten the exhaust screws.
- 16 Follow the procedure in Steps 1-13. Vent air from the remaining brake calipers.
- 17 After exhausting all air from the brake calipers, check if the brake pedal is weak. If so, repeat the entire exhaust procedure until it is normal.



- 18 After the exhaust is completed, the brake fluid needs to be replenished to the MAX position of the reservoir.



- 19 Install the brake fluid kettle lid.

- 20 lower the vehicle.
21 Close the engine compartment cover.

1.5 Maintenance Information System

1.5.1 Instructions and operations

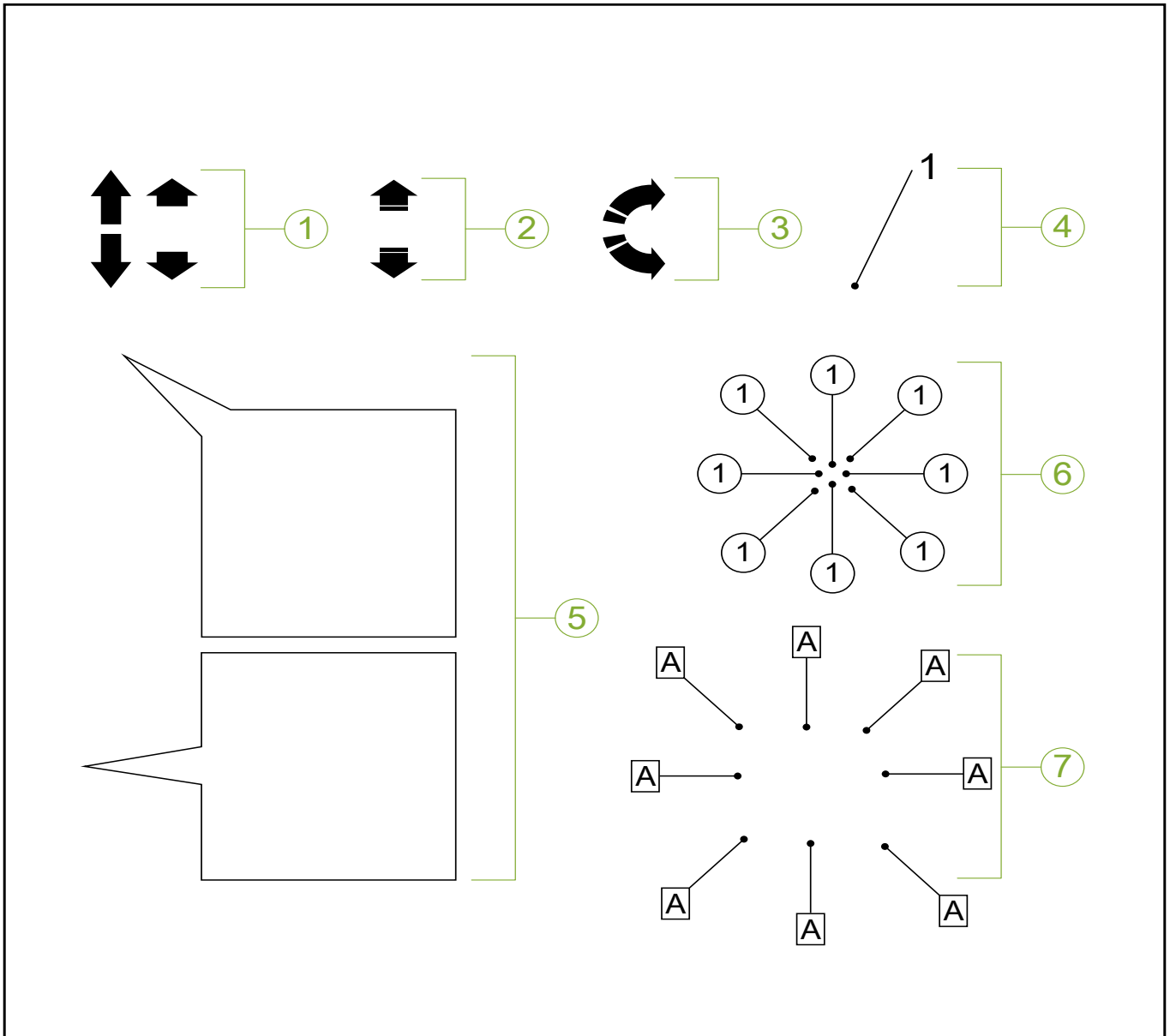
1.5.1.1 Description of Abbreviations in Manual

Abbreviation in English	Chinese Description
ABS	Anti-lock Brake Control System
AC	Air Conditioning Unit
ACC	Adaptive Cruise Control System
ADAS	Advanced Driving Assistance System
ADB	Adaptive Driving Beam
AEB	Automatic Emergency Braking System
AFS	Adaptive Front-Lighting System
ALCM	Ambient Lamp Control Module
ALT	Alternator
AMP	Power Amplifier
AUTO HOLD	Automatic Holding
AVM	Around View Monitor
AUD	Audio Control Module
CCD	Center Console Display
CEM	Central Electronic Module
CKP	Crankshaft Position Sensor
CMP	Camshaft Position Sensor
DLC	Diagnosis interface
EBD	Electronic Brakeforce Distribution
E-CALL	Emergency Call
B-CALL	Breakdown Call
ECT	Engine Coolant Temperature Sensor
EPB	Electronic Parking Brake
EPS	Electronic Power Steering
ESS	Emergency Stop Signal
EVAP	Activated Carbon Tank Solenoid Valve
GSM	Electronic Gear Selector Module
HAC	Hill Assist Control
HO2S	Oxygen Sensor
HVAC	Temperature Control Module
HVSM	Heated/ventilated Seat
IBS	Intelligent Battery Sensor
ICC	Intelligent Navigation System
IHBC	Intelligent High Beam Control system
IPK	Combination Instrument Control Unit
KS	Knock sensor

Abbreviation in English	Chinese Description
LDW	Lane departure warning
LDP	Lane departure prevention
LKA	Lane Keeping Assist System
LKS	Lane Keeping Assist
MAP	Manifold Absolute Pressure
MMI	Multimedia Interactive System
PAS	Parking Assistance System
PEPS	Passive Entry & Passive Start System
RDM	Rear Door Module
RFR	Radio Frequency Reception
SLIF	Speed Limit Information Function
TCS	Traction Control System
TCM	Transmission Control Module
TPMS	Tire Pressure Monitoring System
TPS	Throttle Position Sensor
VSS	Vehicle Speed Sensor
SWSM	Steering Wheel Switch Module
DIS	Driver Information Screen
DMSM	Drive Mode Switch Module
FLR	Forward Looking Radar
CCSM	Center Console Switch Module
SRS	Supplemental Restraint System Module
ASDM	Active Safety Domain Controller
FLC	Front Looking Camera
DIM	Driver Information module
IHU	Infotainment Head Unit
VGM	Vehicle Gateway Module
BNCM	BLE NFC Communication Module
TCAM	Telematics & Connectivity Antenna Module (Type I)
RLSM	Rain and Light Sensor Module
HCMR	Headlight Control Module - Right
HCML	Headlight Control Module - Left
BBM	Brake Booster Module
PSCM	Power Steering Control Module
VDDM	Vehicle Dynamics Domain Master
BECM	Battery Energy Control Module
HVCM	High Voltage Converter Module
SAS	Steering Angle Sensor

Abbreviation in English	Chinese Description
EGSM	Electronic Gear Selector Module
PCM	Powertrain Control Module
ECM	Engine Control Module
ACCM	A/C Compressor Module
EDCP	Electronic Drivetrain Coolant Pump
SWM	Steering Wheel Module
ALM	Ambient Lamp Module
DDS	Driver's Door Switch
DDM	Driver's Door Module
RLDM	Rear Left Door Module
RRDM	Rear Right Door Module
PDM	Passenger Door Module
SRM	Sunroof Module
POT	Power Tailgate Module
SMD	Seat Module - Driver
SMP	Seat Module - Passenger
CCM	Temperature Control Module

1.5.1.2 Description of Arrow Symbols in the manual

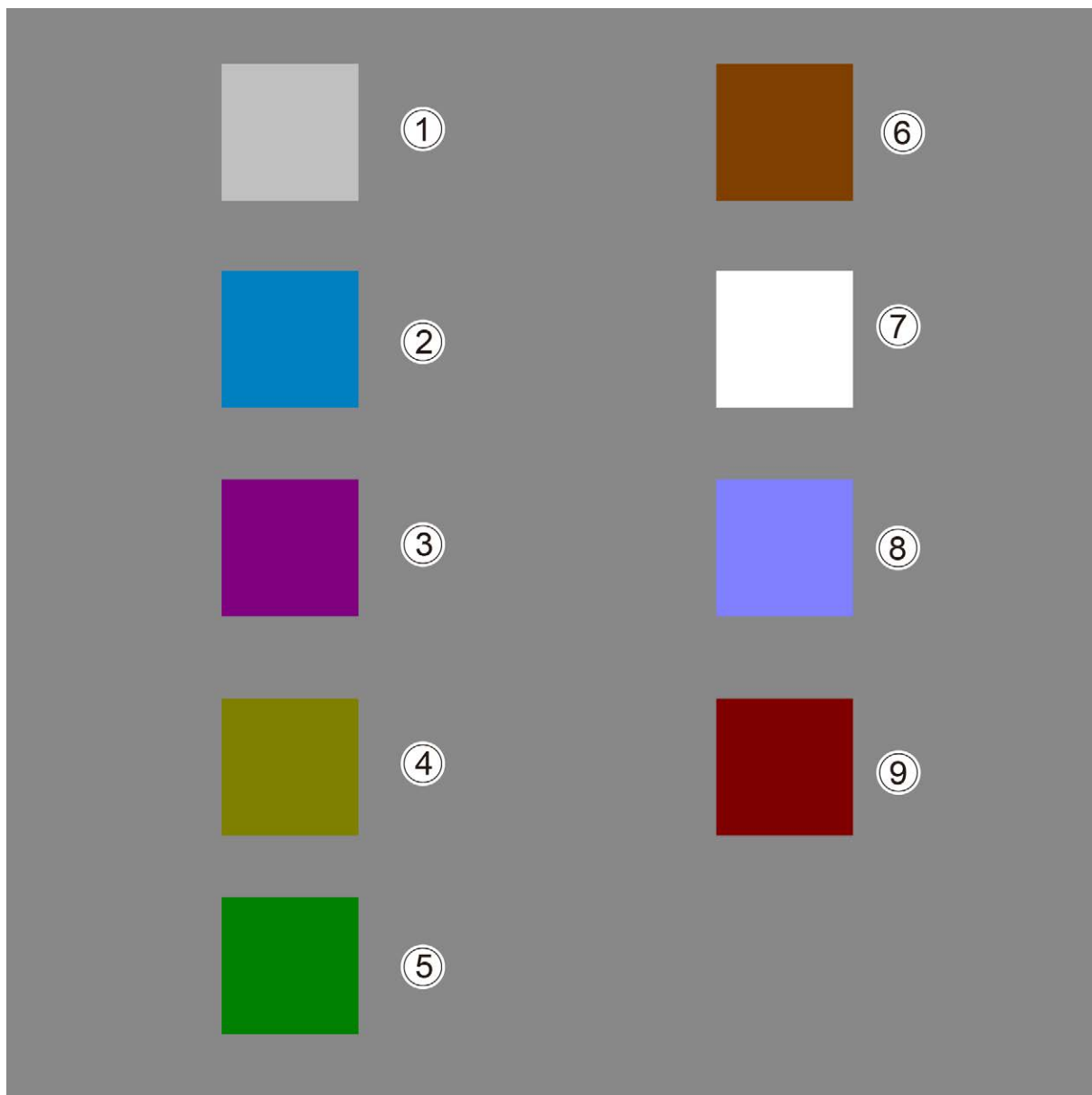


LEGEND

- | | |
|-----------------------------|--|
| 1. Indicator arrow | 5. Local zoom |
| 2. Move Direction Arrow | 6. Repair procedure fastener labeling |
| 3. Rotation direction arrow | 7. Repair Procedure Connector Labeling |
| 4. Part number labeling | |

1.5.1.3 Explanation of Color Codes in Manual

The different colors of the graphics in the maintenance information represent different meanings that inform the user of the operations to be performed. Learn the different color code meanings according to the above references, taking the standard maintenance procedures as an example.



- | | |
|--------------------------------|------------------|
| 1. Peripheral materials | 6. Sub-objects |
| 2. Target part | 7. Background |
| 3. Fastener and connector | 8. Special tools |
| 4. Parts moved but not removed | 9. Segmentation |
| 5. Preferred objects | |

Please note that the pictures may deviate from the actual view inside the vehicle. A perspective view may be used for some details. Some details may be omitted to avoid overly complex illustrations.

1.6 Health and Safety

1.6.1 Instructions and operations

1.6.1.1 Note

Many operations associated with vehicle maintenance and repair can affect personal safety or health issues, and this section lists some relevant harmful operations and materials and equipment, and sets out safety regulations to avoid such hazards.

This section does not cover all matters relating to health and safety, therefore all operations and procedures and the handling of materials should be carried out with safety and health in mind. Before operating any product, you should always refer to the instruction manual provided by the manufacturer or supplier.

1.6.1.2 Acid and Alkali

See [Battery Acid](#).

Examples include corrosive sodium carbonate and sulfuric acid.

Used for cleaning batteries and other materials.

Irritating or corrosive to eyes, skin, smell and throat, can cause burns to the human body and damage ordinary protective clothing.

Avoid splashing on eyes, skin and clothing, wear appropriate protective clothing, gloves and goggles, and avoid inhaling spray.

Be sure to have rinsing equipment such as eye rinse bottles, rosettes, and soap nearby to provide immediate assistance in the event of a splash. Display eye hazard signs in a conspicuous location.

1.6.1.3 Airbag

See [Fire](#) and [Chemical Materials](#).

For highly flammable and explosive materials - observe no-smoking regulations.

Airbags are installed as an auxiliary safety system in the steering wheel, in the front occupant seat, in the instrument panel in front of the occupants, and in the A-, B- and C-pillars.

The airbag expander contains a high-energy propellant that, when ignited, produces an extremely hot gas (2500°C/4532°F).

This propellant is hermetically sealed and stored in an airtight assembly, and the gas fills the entire air bag when the air bag is actuated. It is prohibited to open the airbag during servicing as this could result in dangerous contact with the propellant,

and if a rupture of the gas generator is detected, full protective clothing should be worn when handling the spilled material.

Safety goggles and gloves should be worn during handling of the airbag after normal detonation.

Detonated airbags should be handled in accordance with the relevant local laws and regulations.

Direct contact with gas derivatives should occur:

- Thoroughly rinse the contact area with clean water.
- Seek medical assistance as appropriate.

Airbag - operations to be performed (for your safety, please wear as much protective gear as possible before performing the following operations; when disassembling the airbag, be sure to set the vehicle's start switch power mode to "OFF", remove the key and disconnect the negative cable of the battery and wait 90 s before disassembling.

- Store the airbag assembly in an upright position.
- Keep the airbag assembly dry during storage.
- When handling the airbag assembly, keep your hands away from the electrodes and keep the airbag as far away from your body as possible.
- Place the air bag assembly with the cover facing up.
- Carefully inspect the air bag assembly for damage.
- For connecting the airbag, you should first disconnect the negative battery cable and wait 90 s before standing on the side of the airbag assembly.
- Accurately calibrate and maintain all devices and equipment.
- Always wash your hands after handling an airbag that has detonated.

Airbag - Operations to Avoid

- Do not store flammable materials with the assembly or gas generators.
- Do not immerse the airbag assembly into water or in contact with other liquids.
- Do not store the gas generator at the temperatures above 80°C/176°F.
- Do not store the assembly upside down.
- Do not attempt to open the gas generator housing.
- Do not expose the gas generator to open flame or heat source.
- Do not place other objects on the component cover.
- Do not use damaged components.

- Do not touch the airbag assembly or the gas generator within 10 min of detonation.
- Do not use any electrical probes on the circuit.

1.6.1.4 Air conditioning refrigerant

See [Chemical Materials](#).

Skin contact may cause frostbite.

The instructions provided by the manufacturer must be followed, with avoiding exposed light and wearing appropriate goggles and protective gloves.

If skin or eye contact occurs with refrigerant, immediately flush the contacted area with water. Eyes should be flushed with an appropriate rinse solution and should not be rubbed, seek medical assistance as necessary.

Air Conditioning Refrigerant - Operations to Avoid

Do not store refrigerant in sunlight or in areas with heat sources.

- Do not hold refrigerant bottles in an upright position when filling, keeping their valves facing downwards.
- Do not expose refrigerant bottles to frost or snow.
- Do not drop refrigerant bottles.
- Do not discharge refrigerants directly into the atmosphere under any circumstances.
- Do not mix refrigerants, e. g. R12 (dichlorodifluoromethane) and R134a (tetrafluoroethane).

1.6.1.5 Adhesive and Sealant

Note on the Use of Adhesive/Sealant

Before using adhesive/sealant, it is necessary to clean the surface of the adhesive application area and wipe it with a special cleaning agent to avoid affecting the bonding effect. Do not allow any room temperature hardening sealant to enter the threaded blind holes. If room temperature cured sealant enters the blind hole of the thread, it will cause hydraulic locking effect on the fastener during tightening, resulting in damage to the fastener and/or other components. Additionally, it will also prevent the fastener from obtaining the correct clamping force during tightening, resulting in poor sealing effect of the sealant, and thus prevent the fastener from tightening correctly, Loose or separate components, causing serious damage to engine and other components.

Adhesive for Body Repair

Health and Safety

The materials used in adhesives/sealants contain harmful substances, which can cause acute and chronic poisoning, occupational diseases, skin diseases and other diseases when exposed for a long period of time. When gluing, ventilation and air exchange devices are used to keep the workplace ventilated. Protective gloves, masks, protective clothing, etc. should be brought during operation, and hands should be washed carefully after work is finished to keep the workplace clean, tidy and sanitary.

- Waste glue or solvent-contaminated waste should be cleaned up promptly but not accumulate for long periods of time.
- The products should normally be kept in non-smoking areas and should be used with care and cleanliness, with applicators or containers for construction wherever possible.

Maintenance of Adhesive/Sealant

Automobiles in the event of failure or accident, generally lead to body deformation, steel plate cracking, weld joints detachment, and others, and sometimes cause the engine, chassis and other assembly parts of local damage, resulting in a number of adhesive/sealant products fall detachment and damage. In the process of automobile repair, the same performance of the adhesive, the following list of adhesives/sealants that can be used in the process of automobile repair, can be selected for use in the process of automobile repair according to the material and functional requirements of the components.

Body Repair

After the interior and steel plate of the vehicle body suffered deformation or cracking, the adhesive coated on the vehicle body falls off or rupture. During the repair process, repair the areas coated with adhesive necessarily.

- First use a knife to remove the adhesive from the surface of the vehicle body, and the remaining adhesive can be wiped clean with alcohol.
- Use a special cleaner to wipe the adhesive-coated area to avoid residual adhesive and other impurities from remaining on the applying surface.
- The repair adhesive is then applied to the original adhesive application area to achieve bonding and sealing.

Product	Base material	Purpose	Recommended model
Automotive sealant	Single -component polyurethane	Bonding of body skin, interior and exterior trim, body structure and other components. The adhesive should have strong adhesion and cohesion, and good adhesion to metals, many kinds of paintwork, etc.	Tianshan Cosyn®: 1922, 1923
Weld sealant	Single component polyurethane	Room temperature curing adhesive for sealing interior body welds, applied by hand with a brush; room temperature curing adhesive for fine sealing of engine hood, trunk and door folds, and wire assembly coating with a special extrusion gun.	China Auto Parts & Accessories Corporation: C8802
Anti-stoning primer	Rubber & Resin	Room temperature curing anti-collision adhesive for chassis protection forms a permanent aging resistant elastic corrosion resistant protective coating on the underbody and wheel cover. This product can replace PVC coatings and provides excellent functions such as rust prevention, sound insulation and stone impact resistance.	China Auto Parts & Accessories Corporation: C312DW
Windshield adhesive	Single -component polyurethane	Room temperature curing polyurethane adhesive is used for direct bonding and sealing of automotive windshield. The adhesive has good bonding properties, reacts with moisture in the air. After curing, it has excellent properties such as high strength, aging resistance, vibration fatigue resistance, low temperature resistance, and no corrosion.	Tianshan Cosyn®: 1956, 1924
Cleaning agent	-	Clean all surfaces in contact with the underlying coating and adhesive.	-
Pressure-sensitive adhesive tape	Acrylic tape	It is used for bonding of anti-friction strips, nameplates, guards, fenders, door edge protection, and various decorative strips on the vehicle body. This tape has excellent weather resistance and durability.	3M4229P, 4215 , 4221L

Product	Base material	Purpose	Recommended model
Heat-sensitive adhesive tape	Acrylic tape	It is mainly used for bonding rubber sealing strip systems on automobiles. This type of tape should have strong adhesion to avoid gaps and corrosion problems due to poor bonding and stronger sealing performance.	3M4237P
Adhesive tape primer	-	Depending on the material of the bonding surface, choose different primers. The bonding surface should be cleaned and left to dry thoroughly. Apply the primer evenly to the bonded surface with a brush and leave it to dry before applying the tape.	3MC-100, K-500\520, N-200

Parts Repair

Some interior parts, engine, transmission and other parts are damaged and need to be repaired by bonding and sealing.

When applying sealant, the bonding surface should be cleaned to avoid burrs and cracks that may affect the bonding effect.

Parts Maintenance Adhesive

Name	Purpose	Recommended model
Silicone Rubber Flat Sealant	For flat sealing of large gaps and flexible connectors, such as the box, flange, bottom shell, and end cover joint surface, the residual glue on the sealing surface should be removed before applying glue. After cleaning and drying, an appropriate diameter of sealing glue line should be applied to the sealing surface (or gasket). After applying glue, immediately align and close the parts to avoid misalignment. Tighten the bolts, wipe off the excess glue squeezed out, or use a blade to remove it after it solidifies. This type of sealant does not contain solvents and can cure at room temperature. It does not corrode machine parts, is resistant to impact, medium, and high temperature.	Tianshan Cosyn®: 1596, 1598
Anaerobic thread locking sealant	Tighten and lock bolts, nuts, screws, and other parts. When applying glue, clean the engaging area, dry it, and then drop the glue into the engaging place. After curing at room temperature, it has good performance such as impact resistance, vibration resistance, non-leakage and corrosion resistance.	Tianshan Cosyn®: 1243, 1242
Anaerobic sealant	It is used for the sealing and bolt locking of the plane part which has a small gap and needs to be isolated from air for curing. It has the properties of water, oil and corrosion resistance.	Loctite 204, Tianshan Cosyn®:1510

Other Repair Materials

Name	Purpose	Recommended model
Anti-Loosening liquid	It is used for locking fastening threads with a maximum size of M6, such as door glass lifter handles.	Loctite thread anti-loosening liquid
Rust preventive agent	A rust preventive agent with rubber as the basic material. It is used for soundproofing and rustproofing of automobile chassis with corrosion prevention and soundproofing effects.	Fulton

Construction Precautions

– The purpose of adhesive/sealant is to prevent water and dirt from entering the vehicle and it also provides corrosion protection. The original sealing joints are visible and should be resealed if these seals are damaged. When sealing open joints with adhesives/sealants, a high consistency filler should be used. Follow the instructions for the selected material.

– When spraying adhesive/sealant type materials, precautions must be taken to avoid spraying into component openings (e. g., door locks, window lift slots, window regulators, and seat belt retractors) as well as any moving, rotating parts, especially parking brake cable pulls. After spraying adhesive/sealant, make sure that all drain holes in the body are open.

– Special protective glasses and gloves should be worn during construction operations to prevent injury.

– When the vehicle is shipped from the factory, the metal sheets of the body are painted. After repair and/or replacement of the parts, all exposed metal surfaces must be treated with an antirust primer before the adhesive can be applied.

– After carrying out adhesive application and repair, some of the adhesives/sealants need to be dried and cured, the baking temperature is (70~80)°C and the baking lasts for 20~30 min.

1.6.1.6 Engine coolant

See [Fire](#).

Examples include isopropanol, ethylene glycol, ethylene glycol, and methanol.

Highly flammable combustibles.

It is used in the engine coolant circulation system of vehicles.

Engine coolant (ethylene glycol) may produce vapors when heated to high temperatures and inhalation of these vapors should be avoided.

The dose of engine coolant absorbed directly through the skin after direct contact with engine coolant may reach toxic or harmful doses. If engine coolant is accidentally swallowed, it may be life-threatening and should be taken to a hospital immediately for medical assistance.

These products should never be used in conjunction with ordinary foodstuffs or connected to a drinking water supply system.

1.6.1.7 Battery Acid

See [Acid and Alkali](#).

The gas released during charging is explosive. Do not operate an open flame in the vicinity of a charging battery or a battery that has just been charged.

Good ventilation must be maintained.

1.6.1.8 Braking

See [Fire](#).

Slightly irritating if splashed on skin and eyes, avoid direct contact of brake fluid with skin and eyes if possible, the risk of inhalation of brake fluid vapors at room temperature is not high because it has a very low vapor pressure.

1.6.1.9 Chemical Materials

Chemical materials such as solvents, sealants, adhesives, paints, resin foams, battery acids, engine coolants, brake fluids, fuels, lubricants and greases should be used, stored and handled with great care. They can be toxic, harmful, corrosive, irritating or highly flammable, and have highly dangerous odors and dusts.

The effects of prolonged overexposure to chemical environments may be immediate or chronic, temporary or permanent, cumulative, superficial, life-threatening, or may affect life span.

Chemical Materials - Operations to be Performed

– Carefully read and follow the warnings and precautions on the raw material container and any accompanying leaflets, posters or other instructions for operation. Health and Safety Information Forms for the raw materials can be obtained from the manufacturer.

– Remove chemical material from skin and clothing as soon as possible after it has been contaminated with chemical materials, immediately replace heavily soaked clothing and wash thoroughly.

– Strictly follow work procedure instructions and wear protective clothing to avoid direct contact with skin and eyes.

- When handling with chemical materials, clean and wash before taking breaks, eating, smoking, or using toilet facilities.

- Keep the work area clean and tidy, and do not spill chemical materials.

Chemical Materials - Operations to Avoid

- Unless otherwise specified by the manufacturer, do not mix chemical materials; some chemicals can form other toxic or harmful chemicals, which can release other toxic or harmful gases when mixed and can cause explosions and other accidents.

- Do not spray chemical materials in a closed environment.

- Do not heat chemical materials unless directed by the manufacturer as some are highly flammable and others may emit toxic or harmful gases.

- Do not leave containers of chemical materials open; gases may accumulate to toxic, harmful or explosive levels. Some gases are heavier than air and can accumulate in enclosed spaces.

- Do not put chemical materials in unlabeled containers.

- Do not use chemical materials to clean hands or clothing. Chemicals, especially solvents and fuels, can dry out the skin and may cause allergies, leading to skin inflammation or affect your health by absorbing toxic or harmful substances directly through the skin.

- Do not store other chemical materials in empty containers unless the containers have been cleaned under supervision.

- Do not sniff or smell chemical materials at will. Brief exposure to high concentrations may still result in poisoning or injury.

1.6.1.10 Dust

Powder, dust and dirt may be irritating, harmful or toxic. Avoid breathing powdered chemical materials and dust from dry friction operations, or if ventilation is poor, wear respiratory mask protection to prevent inhalation of dust.

Fine dust from combustible materials may pose an explosion hazard, avoiding explosions and ignition sources.

1.6.1.11 Electric Shock

Electric shock can be caused by using electrical equipment incorrectly without following the instructions or by misusing equipment that is in good condition.

Be sure to maintain electrical equipment within the specified period of time and test it frequently. Faulty equipment should be labeled and preferably moved out of the working area.

Do not subject wires, cables, plugs and sockets to abrasion, kinking, cutting, rupture or other damages, and do not allow electrical equipment and wires to come into contact with water.

Ensure that the electrical equipment is protected by the correct fuse.

Do not misuse electrical equipment and do not use equipment that has any potential for malfunction, as the results may affect personal safety.

It should be ensured that the cables moving the electrical equipment are not pinched and damaged.

Basic first aid training must be given to specialized electrical operators.

In the event of an electric shock:

- Turn off the power before making contact with the victim.
- If it is not possible to turn off the power, remove the power from the victim with dry insulator materials.
- If trained in specialized first aid, administer first aid at the scene immediately.
- Request medical assistance.

1.6.1.12 Exhaust Gas

The exhaust gas contains toxic and harmful chemicals such as carbon oxides, nitrogen oxides, acetaldehyde, lead and aromatic hydrocarbons. The engine should only be operated with proper exhaust air extraction or general ventilation and in an open space.

1.6.1.13 Fiber Isolation

See [Dust](#).

Used to isolate noise and sound.

The fibrous nature of the surface and sharp edges can cause skin allergies.

Follow procedure instructions and wear gloves to avoid excessive skin contact with fibers during operation.

1.6.1.14 Fire

Many materials associated with vehicle maintenance are extremely flammable. Some materials, when burned, produce toxic and harmful gases.

Do not follow fire safety when storing and handling flammable materials or solvents, especially in close proximity to electrical equipment or where welding operations are being performed.

Before operating electrical and welding equipment, make sure there is no risk of fire.

When welding or operating heating equipment, have a suitable fire extinguisher around the work area.

1.6.1.15 First Aid

Not only is it important to comply with legal regulations, it is advisable to have professionally trained first aiders in the workplace.

If the eyes are splashed, they should be flushed with water for at least 10 min.

If the skin is contaminated, wash the contaminated area with soap and water.

In case of frostbite, immerse the frostbitten area in ice or cold water.

Individuals who have inhaled toxic gases should be moved to fresh air immediately. If adverse reactions persist, they should be taken immediately to a hospital for medical assistance.

In case of accidental ingestion of liquids, inform the physician of the information indicated on the container or the label, and do not blindly induce vomiting unless instructed to do so on the label.

1.6.1.16 Foam

See [Fire](#).

Cooked foam is used as a cushion pad for seats and decorations.

Follow the manufacturer's instructions.

Components that do not produce chemical effects are irritating and may be harmful to the skin and eyes, requiring gloves and goggles for operation.

Individuals with chronic respiratory diseases, asthma, bronchial problems, or hereditary allergies should not handle or be near uncooked substances.

Spare parts, steam or spray can cause direct irritation as well as allergic reactions and may be toxic or harmful.

Never inhale vapors or sprays, these materials must be used under good ventilation and respiratory protection. Do not remove the mask immediately after spraying, wait until the vapors and sprays have completely dissipated before removing it.

The combustion of uncooked components with cooked foam produces toxic and noxious gases. Smoking, open flames, and electrical equipment are prohibited during foam operations unless the vapors and sprays have been completely removed, and any thermal cutting of foam or special foam materials should be done in a well-ventilated environment.

1.6.1.17 Fuel

Minimize direct skin contact with fuel as much as possible, and if you do come into contact with fuel, immediately wash skin in direct contact with fuel with soap and water.

Gasoline

Gasoline is highly flammable - smoking regulations should be followed.

If swallowed by mistake, it can cause irritation of the mouth and throat, absorption by the stomach can lead to general weakness and confusion, and small amounts of gasoline can be life-threatening to children, making it very dangerous if the liquid enters the lungs.

Gasoline can cause dry skin, and prolonged or frequent exposure can cause skin allergies and dermatitis, and liquid in the eyes can cause severe eye pain.

Automotive gasoline may contain a large amount of benzene, which can cause poisoning if inhaled, so the concentration of gasoline vapor must be kept very low. High concentrations of gasoline vapor can cause irritation of the eyes, nose, and throat, nausea, headaches, depression, and physical discomfort caused by drunkenness, and very high concentrations of gasoline vapor can cause rapid loss of consciousness.

When handling gasoline, it is important to maintain good ventilation, paying particular attention to avoiding the risk of inhalation of gasoline vapor due to splashing when operating in confined spaces.

Special care should be taken when cleaning and maintaining gasoline storage equipment.

Gasoline should not be used as a cleaning agent and should never be sucked by mouth.

1.6.1.18 General Workshop Tools and Equipment

It is very important to always keep all tools and equipment in good working condition and to operate them correctly at all times.

Never use tools or equipment for purposes other than those for which they were designed. Do not subject equipment such as cranes, jacks, axles and chassis stands, or slings to loads in excess of their maximum capacity. Damage caused by overloading is not always immediately apparent and may result in serious accidents the next time it is used.

Do not use tools or equipment that have been damaged or are in poor working condition, especially certain high-speed equipment such as grinding wheels. Damaged grinding wheels can shatter without warning and cause serious injury.

Wear appropriate eye protection when using grinding wheels, chisels or abrasive blasting devices.

Appropriate respiratory masks must be worn when using abrasive blasting equipment, handling asbestos-containing materials, or doing work with spray equipment.

Ventilation equipment must be available to control dust, spray and smoke content in the environment.

1.6.1.19 Lubricant and Grease

Avoid prolonged and repeated contact with mineral oils and greases. All lubricants and greases are irritating to the eyes and skin.

Used Engine Oil

Prolonged and repeated contact with mineral oils and greases can cause loss of the skin's natural oils, resulting in dryness, irritation and dermatitis. In addition, used engine oil may contain harmful substances that may cause skin cancer. Be sure to use skin protection equipment with proper rinsing facilities.

Do not use used engine oil as lubricant or for any other purpose that may come into direct contact with the skin.

Health Protection Safety Code

- Prolonged and repeated contact with engine oil should be avoided, especially with used engine oil.
- Wear protective clothing, including impermeable gloves.
- Do not put a wiping cloth soaked in engine oil into your pocket.
- Avoid contamination of clothing with engine oil, especially intimate apparel.
- Do not wear clothing or shoes that are highly contaminated with engine oil. Work clothes must be washed regularly and kept clean.
- First aid treatment for open wounds should be accessible in a timely manner.
- Avoid direct skin contact with engine oil by applying isolation cream to the skin as much as possible during work.
- Remove all engine oil by washing with soap and water. Applying a protective agent containing lanolin will help to replace the natural oils removed from the skin.
- If skin lesions occur, seek immediate medical attention for medical assistance.
- Whenever possible, remove grease residues from components before working on them.
- Goggles, such as chemical goggles or face masks, should be worn if there is a possibility of direct contact with the eyes. In addition, eye rinsing devices should be available.

Environmental Precautions

Used engine oil and oil filters should be recycled and disposed of through an authorized or licensed waste disposers or engine oil recyclers. If any question, contact your local authorities for disposal in a timely manner.

It is illegal to dispose of used engine oil directly into the ground, into a sewer or drainage facility, or into a water pipe.

1.6.1.20 Noise

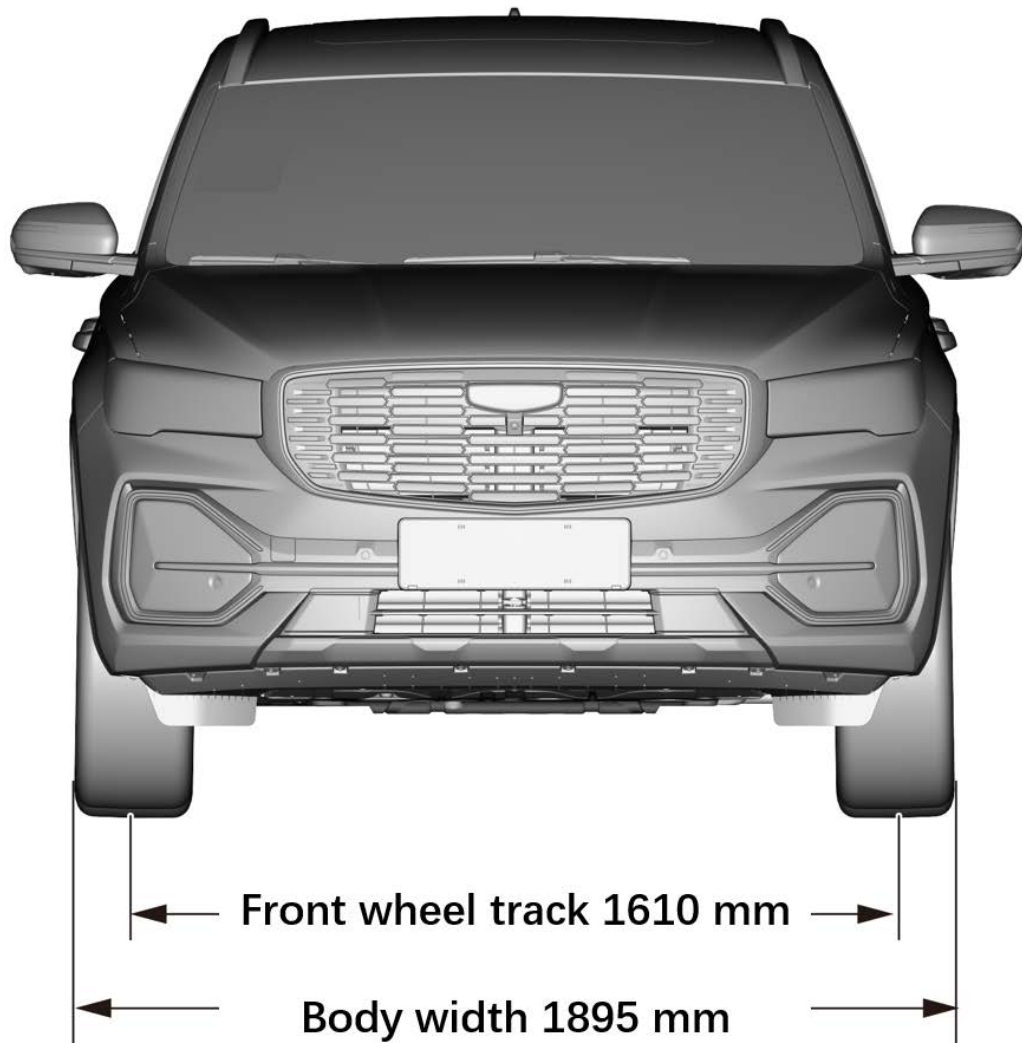
Certain operations can generate extremely high decibel noise levels that may cause hearing damage. In this case, appropriate hearing protection should be worn.

1.7 Vehicle specifications

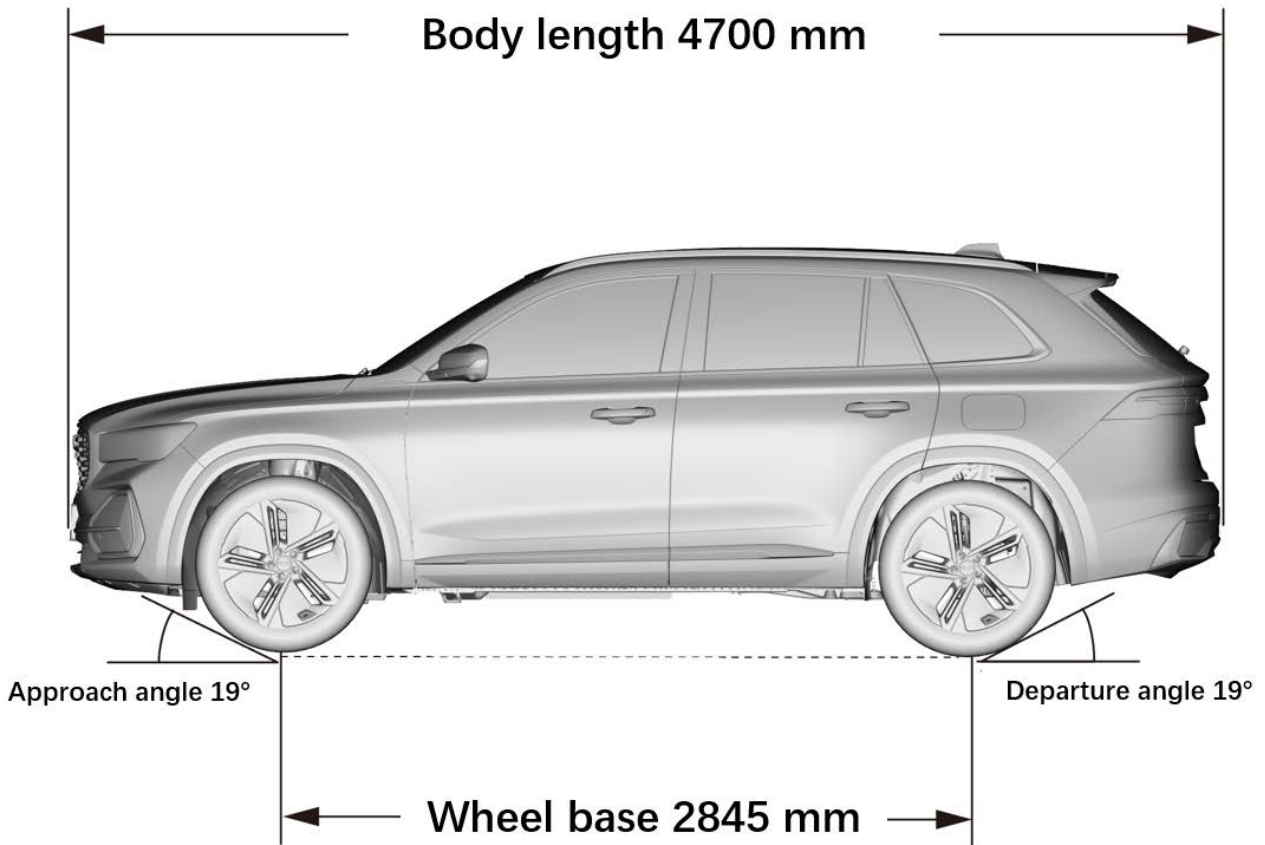
1.7.1 Specification

1.7.1.1 Dimension

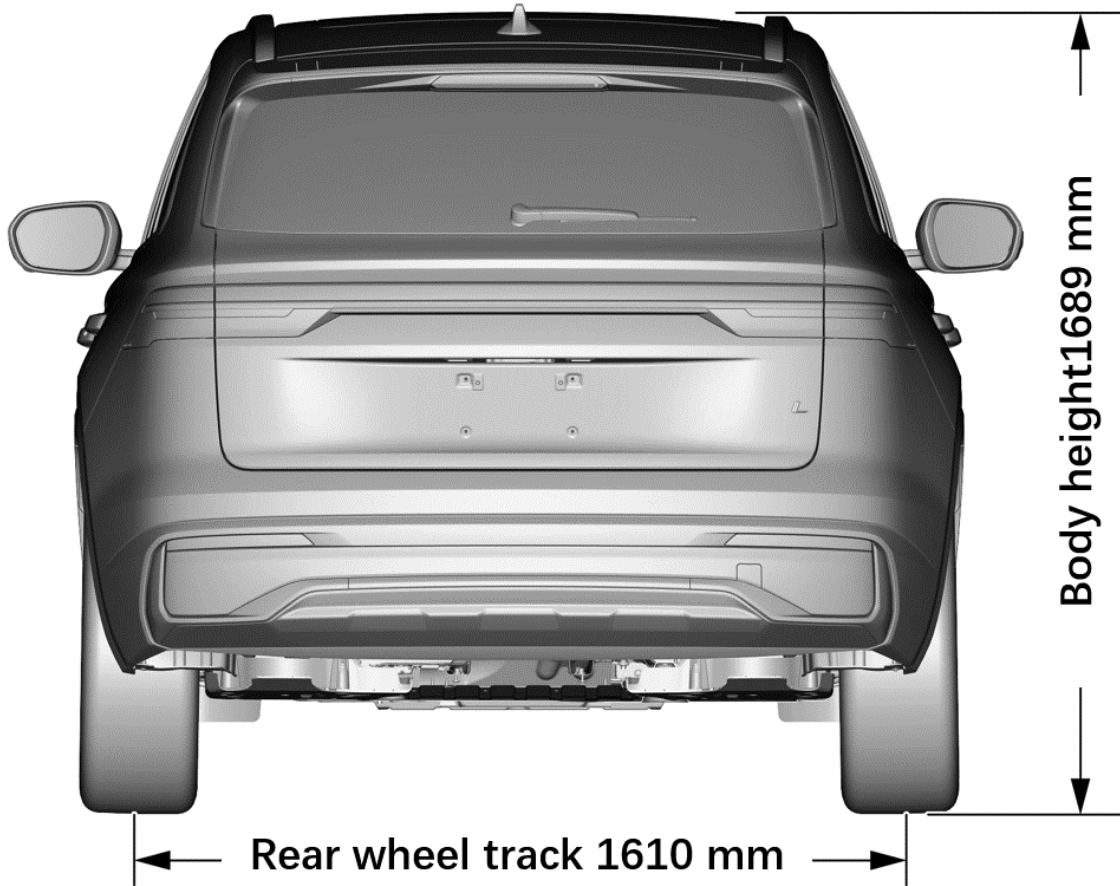
Front view



Side view



Rear view



1.7.1.2 Fastener specification

Fastener Specification Chart



4.6



4.8



5.6



8.8



9.8



10.8

A portion of the standard ISO-defined metric fastener sizes have been adopted by Geely's engineering standards with the goal of reducing the number of fastener sizes used while maintaining the optimal thread quality for each thread size. For metric bolts as shown above, the strength grade increases with the numbers.

1.8 Vehicle identification number

1.8.1 Instructions and operations

1.8.1.1 Vehicle Identification

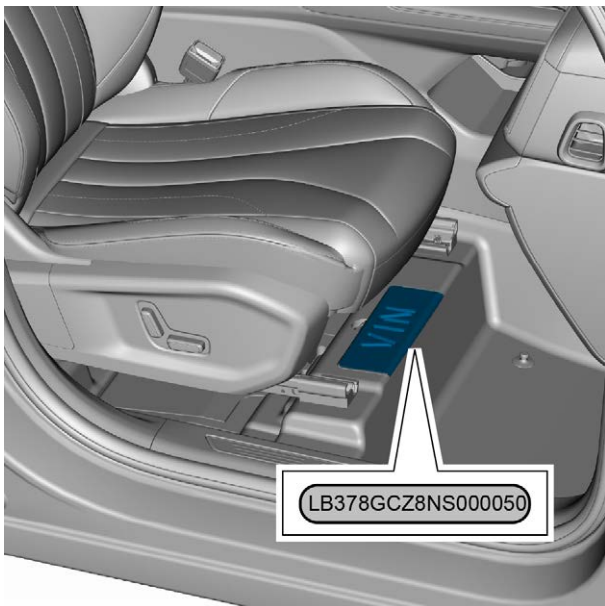
Vehicle Identification Number

The Vehicle Identification Number (VIN) is a legal identifier.

LB378GCZ8NS000050

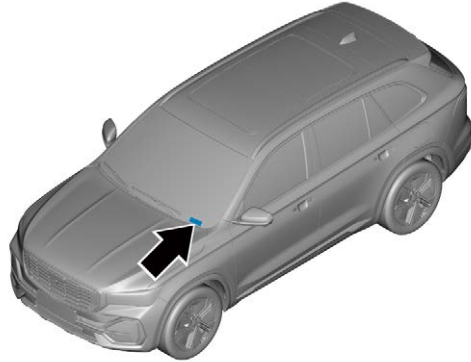
Where the Vehicle Identification Number (VIN) is engraved

The VIN is engraved on the crossbar of the occupant seat.



Where the Vehicle Identification Number (VIN) is pasted

The Vehicle Identification Number (VIN) is pasted to the body bracket on the lower left side of the front windshield and is visible from outside the vehicle through the front windshield.



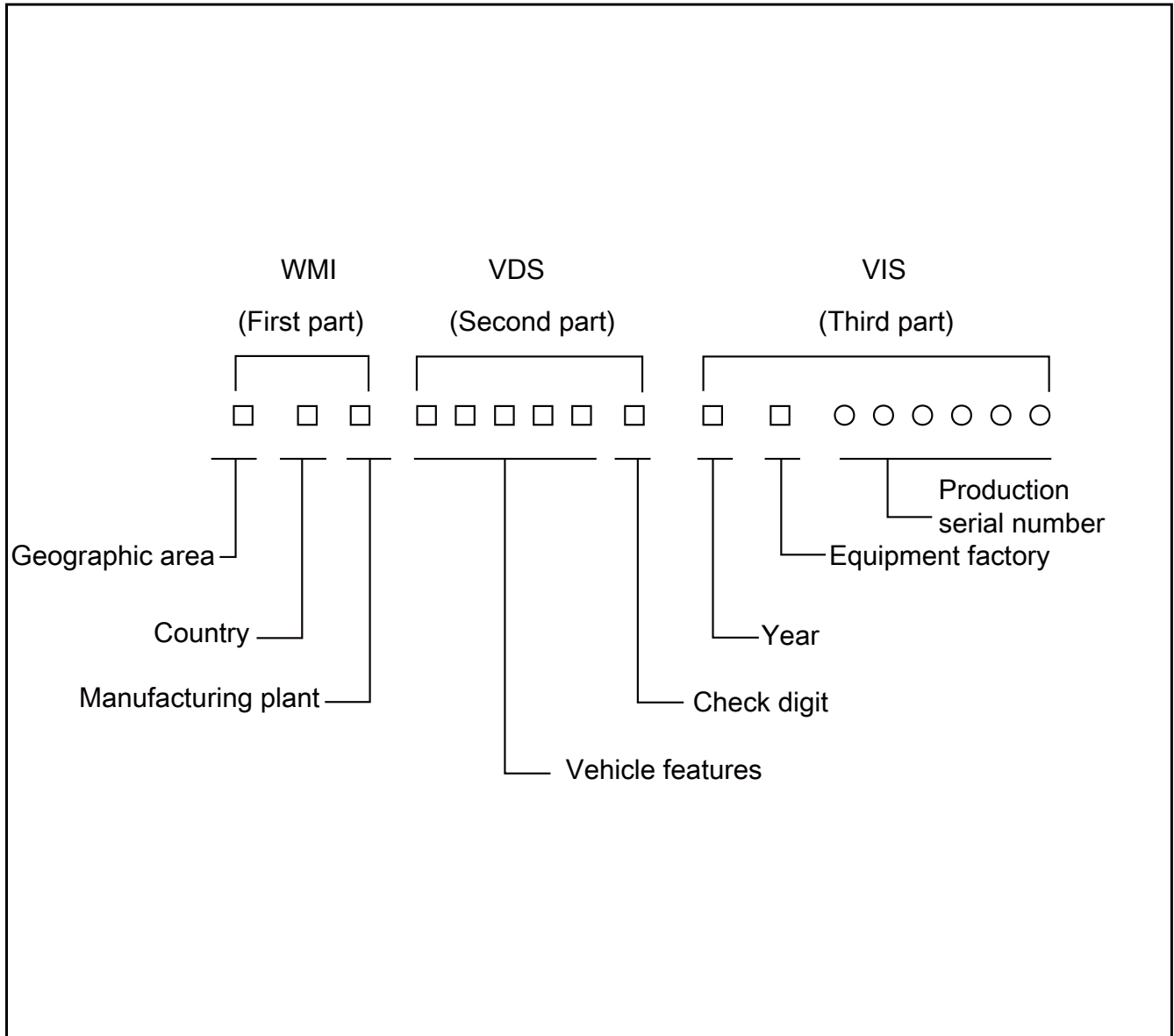
Other VIN arrangement locations:

1. Inner panel of rear back door
2. ECU
3. Front floor access
4. Brake pedal
5. Left B-pillar inner panel
6. Right B-pillar inner panel
7. Inner panel of cover (side)

1.8.1.2 Vehicle Identification Number (VIN) - Description

Composition of Vehicle Identification Number.

The Vehicle Identification Code (VIN) consists of three parts (17 digits in total): the World Manufacturer's Identification Code (WMI), the Vehicle Description Section (VDS) and the Vehicle Indication Section (VIS), as shown below.



Taking the vehicle identification number LB378GCZ8NS000050 as an example, the meaning represented by each digit is shown in the table below:

Location	Definition	Character	Note
1-3	World Manufacturer Identification Code	LB3	Zhejiang Haoqing Automobile Manufacturing Co. Ltd.
4	Vehicle Class Code	7	Passenger car
5	Main vehicle parameter code	8	Vehicle length is greater than 4.6-4.8 m

Location	Definition	Character	Note
6-7	Power, body type	GC	Displacement 1.480L, Drive motor, peak power sum 107 kW, 2-compartment 5-door
8	Drive mode	Z	Front-mounted, automatic transmission
9	Check digit	8	VIN verification code
10	Year code	N	2022
11	Manufacturer code	S	Zhejiang Haoqing Automobile Manufacturing Co. Ltd. Xi'an Branch
12-17	Manufacturer's serial number	000050	Production serial number

World Manufacturer Identification Code (WMI)

Located in the first part of the vehicle identification number (the 1st~3rd digit), it should be applied by the enterprise to the higher authority and can be used only after approval. The approved code for this enterprise is LB3

Regulation on the 4th Digit Code

It is used to distinguish the vehicle type

Serial No.:	Vehicle category	Code
1	Chassis (incomplete vehicle)	0
2	Truck	1
3	Specialty purpose vehicle	5
4	Passenger coach	6
5	Passenger car	7

Regulation on the 5th Digit Code

Used to differentiate between vehicle length (for occupant vehicles and buses) or gross mass (for chassis, trucks and special purpose vehicles)

Occupant vehicle/bus				Truck/special purpose vehicle			
Vehicle length, m	Code	Vehicle length, m	Code	Total mass, kg	Code	Total mass, kg	Code
≤3.5	0	> 4.0~4.2	5	≤1,000	K	> 3,000~3,500	R
> 3.5~3.6	1	> 4.2~4.4	6	> 1,000~1,500	L	> 3,500~4,000	S
> 3.6~3.7	2	> 4.4~4.6	7	> 1,500~2,000	M	> 4,000~4,500	T
> 3.7~3.8	3	> 4.6~4.8	8	> 2,000~2,500	N	> 4,500~5,000	U
> 3.8~4.0	4	≥4.8	9	> 2,500~3,000	P	≥5,000	V

Regulation on the 6th and 7th Digit Codes

The 6th and 7th digit combination codes are used to distinguish the powertrain characteristics and to the body type.

Serial No.:	Fuel type		Engine displacement (L)	Drive motor - sum of peak power (kW)	Body form	Code
1	Single fuel	Gasoline	≤1	/	2-compartment, 5-door	02
2			> 1~1.3			12
3			> 1.3~1.5			22
4			> 1.5~1.7			32
5			> 1.7~1.9			42
6			> 1.9~2.1			52
7			>2.1			62
8			≤1		04	
9			> 1~1.3		14	
10			> 1.3~1.5		24	
11			> 1.5~1.7		34	
12			> 1.7~1.9		44	
13			> 1.9~2.1		54	
14			>2.1		64	
15			≤1		07	
16			> 1~1.3		17	
17			> 1.3~1.5		27	
18			> 1.5~1.7		37	
19			> 1.7~1.9		47	
20			> 1.9~2.1		57	
21			>2.1		67	
22	Bi-fuel	Gasoline/ compressed natural gas (CNG)	≤1.3	/	2-compartment, 5-door	J2
23			> 1.3~3.0		K2	
24			≤1.3		3-compartment, 4-door	J4
25			> 1.3~3.0		K4	
26			≤1.3		Long-head compartment type of special-purpose vehicle	J7
27			> 1.3~3.0		K7	
28	Dual -fuel	Gasoline/ methanol fuel	≤1.3	/	2-compartment, 5-door	R2
29			> 1.3~3.0		S2	

Serial No.:	Fuel type		Engine displacement (L)	Drive motor - sum of peak power (kW)	Body form	Code
30			≤1.3		3-compartment, 4-door	R4
31			> 1.3~3.0			S4
32			≤1.3		Long-head compartment type of special-purpose vehicle	R7
33			> 1.3~3.0			S7

Serial No.:	Fuel type		Engine displacement (L)	Drive motor - sum of peak power (kW)	Body type	Code		
34	Electric vehicle	Battery Electric Vehicle (BEV)	/	60	2-compartment, 5-door	N2		
35			/	70		2C		
36			/	100		A2		
37			/	120		Y2		
38			/	150		U2		
39			/	240		V2		
40			/	350		W2		
41			/	400		5C		
42			/	450		X2		
43			/	155		CC		
44			/	20		2-compartment, 3-door	9D	
45			/	30			AD	
46			/	40	BD			
47			/	120	3-compartment, 4-door	Y4		
48			/	100		A4		
49			/	150		U4		
50			/	350	3-compartment, 5-door	W5		
51			/	450		X5		
52			/	550		Z5		
53			/	120	Long-head compartment type of special-purpose vehicle	Y7		
54			/	150		U7		
55			Gasoline/ electric hybrid		1.477	50	2-compartment, 5-door	E2
56					1.477	60		F2
57					1.477	120		G2
58					1.480	100		B2

Serial No.:	Fuel type		Engine displacement (L)	Drive motor - sum of peak power (kW)	Body type	Code
59			1.480	107	3-compartment, 4-door	GC
60			1.477	60		F4
61			1.499	100		4E
62			1.477	120	Long-head compartment type of special-purpose vehicle	G7
			63	Methanol/ electric hybrid	1.799	

Regulation on the 8th Digit Code

It is used to distinguish between the drive type and transmission type of the vehicle.

Serial No.:	Drive mode	Transmission type	Code
1	Front drive	Manual transmission	S
		Automatic transmission	Z
		No transmission	W
4	Rear drive	Manual transmission	A
		Automatic transmission	B
		No transmission	N
7	Four-wheel drive	Manual transmission	C
		Automatic transmission	D
		No transmission	E

Regulation on the 9th Digit Code

The value calculated by the manufacturer based on the remaining 16-digit code values and then by a certain formula, the code may be any number from 0-9 or the letter "X". After determining the other sixteen digits of the code in the vehicle identification number, the inspection digit should be calculated by the following method:

(a) The corresponding values of numbers and letters in the vehicle identification code are shown in Tables 1 and 2 respectively.

Numbers in VIN	0	1	2	3	4	5	6	7	8	9
Corresponding value	0	1	2	3	4	5	6	7	8	9

Table 2 Corresponding values for letters																							
L- et- te- rs in V- IN	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	W	X	Y	Z
C- or- re- s- p- o- n- di- ng v- al- ue	1	2	3	4	5	6	7	8	1	2	3	4	5	7	9	2	3	4	5	6	7	8	9

(b) Assign a weighting coefficient to each digit in the vehicle identification code as specified in Table 3.

Table 3 Weighting coefficient for each bit																	
Posi- tion in VIN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Cor- re- spo- ndi- ng val- ue	8	7	6	5	4	3	2	10	*	9	8	7	6	5	4	3	2

(c) Multiply the weighting coefficient of each bit other than the test digit by the corresponding value of the number or letter in this bit, and then add the respective products, and the resulting sum is divided by 11, and the remainder of the division is the test bit; if the remainder is 10, the test bit should be the letter X.

Regulation on the 10th Digit Code

It is used to distinguish the year of the vehicle, the year code is used as specified in the table below (30-year cycle).

Year	Code	Year	Code	Year	Code	Year	Code
2001	1	2011	B	2021	M	2031	1
2002	2	2012	C	2022	N	2032	2
2003	3	2013	D	2023	P	2033	3
2004	4	2014	E	2024	R	2034	4
2005	5	2015	F	2025	S	2035	5
2006	6	2016	G	2026	T	2036	6
2007	7	2017	H	2027	V	2037	7
2008	8	2018	J	2028	W	2038	8
2009	9	2019	K	2029	X	2039	9
2010	A	2020	L	2030	Y	2040	A

Regulation on the 11th Digit Code

It is used to distinguish between different assembly plants

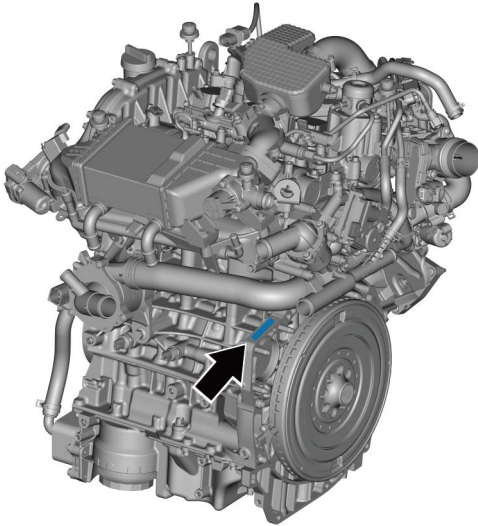
Serial No.:	Manufacturer	Plant name	Code
1	Zhejiang Haoqing Automobile Manufacturing Co. Ltd.	Zhejiang Haoqing Automobile Manufacturing Co. Ltd.	H
2		Zhejiang Haoqing Automobile Manufacturing Co. Ltd. First Branch	L
3		Zhejiang Haoqing Automobile Manufacturing Co. Ltd. Xiangtan Branch	X
4		Zhejiang Haoqing Automobile Manufacturing Co. Ltd. Ji'nan Branch	J
5		Zhejiang Haoqing Automobile Manufacturing Co. Ltd. Chengdu Branch	C
6		Zhejiang Haoqing Automobile Manufacturing Co. Ltd. Baoji Branch	B
7		Zhejiang Haoqing Automobile Manufacturing Co. Ltd. Shanxi Branch	A
8		Zhejiang Haoqing Automobile Manufacturing Co. Ltd. Xi'an Branch	S
9		Zhejiang Haoqing Automobile Manufacturing Co. Ltd. Changxing Branch	G

Regulation on the 12th ~13th Digit Code

It is used for the management of vehicle production sequence numbers, arranged in the order of vehicles produced by the same year and vehicle manufacturing company, starting from 00000 1 each year.

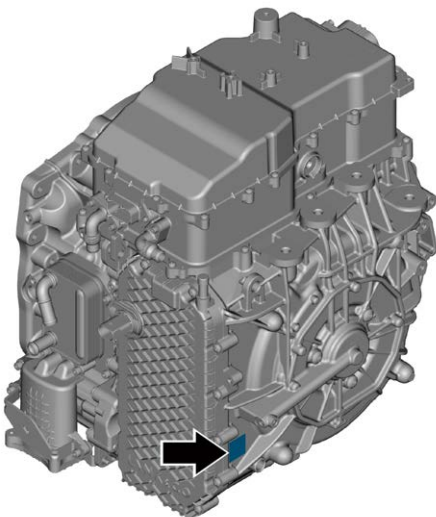
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Location of engine identification number (DHE15-ESZ)



1.8.1.4 Transmission Identification Number and Location

Automatic transmission (DHTPro) identification number and location



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2.1 Warnings and Cautions

2.1.1 Warnings and Cautions

2.1.1.1 Warnings and Cautions

Warning about Battery Disconnection

Warning !

Before servicing any electrical component, the start switch power mode must be set OFF and all electrical loads must be "OFF" unless otherwise noted in the operating procedures. Also disconnect the negative pole of the battery if tools or devices are likely to come into contact with exposed and energized electrical terminals. Failure to comply with these safety instructions may damage the vehicle or vehicle components and may even result in personal injury.

Warning about Exhaust System Repair

Warning !

To avoid burns, do not service any exhaust system when the exhaust system is hot. Allow the exhaust system to cool before servicing.

Warning about Fuel and Evaporative Drain Line

Warning !

To reduce the risk of fire and personal injury, observe the following points:

- All fuel lines that have been bumped, scratched or damaged during installation should be replaced and no attempt should be made to repair the fuel line.
- For installing a new fuel line, do not directly strike the fuel line bundle clamp with a hammer.
- Always cover the fuel vapor line with a damp towel when operating with a torch near the fuel vapor line. In addition, never expose the vehicle to the temperatures above 115°C (239°F) for more than 1 h, and do not leave it at the temperatures above 90 °C (194 °F) for extended periods of time.
- Always apply a few drops of clean engine oil to the male fitting before connecting the fuel line fitting, thus ensuring proper reconnection and preventing possible fuel leakage. (During normal operation, the O-ring seal in the yoke fitting expands and cannot be properly reconnected without lubrication).

Warning about Fuel Leakage

Warning !

Wrap a rag around the fuel pressure gauge connector to reduce the risk of fire or personal injury, the rag absorbs fuel that leaks out for connecting the fuel pressure gauge, and place the rag in a suitable container after connecting the fuel pressure gauge.

Warning about Fuel Line Fittings

Warning !

Always apply a few drops of clean engine oil to the male fitting before connecting the fuel line fitting, thus ensuring proper reconnection and preventing possible fuel leakage. During normal operation, the O-ring seal in the yoke fitting expands and cannot be properly reconnected without lubrication.

Warning about Fuel Storage

Warning !

Fuel must not be discharged into any open container and must not be stored in any open container as it may catch fire or explode.

Warning about Fuel Vapor in Evaporative Emission Components

Warning !

Do not breathe air from the evaporative drain tube or hose/ Fuel vapor from the evaporative emission components may cause personal injury.

Warning about Gasoline/Gasoline Vapor

Warning !

Gasoline or gasoline vapor is very flammable and may cause a fire if an ignition source is present. To prevent fire or explosion hazard, never use any open container to drain or store fuel. Keep a dry powder fire extinguisher nearby.

Warning about Radiator Cap Removal

Warning !

To avoid burns, do not remove the reservoir cap until the engine has cooled. If the reservoir cap is removed while the engine and radiator are not cooled, the cooling system will release boiling hot and high-pressure liquid and steam, which could result in burns to personnel.

Warning about Cooling System Repair

Warning !

If the pressure cap is opened to perform maintenance on the cooling system while the engine is not cooled and the pressure is still high, the engine coolant will boil immediately and could spray onto the operator and cause severe burns.

Warning about Fuel Releasing Pressure

Warning !

Before servicing the fuel system, remove the fuel tank cap and release the fuel system pressure to reduce the risk of personal injury. After releasing the fuel system pressure, a small amount of fuel may spill when servicing fuel lines, injectors or connectors. To reduce the risk of personal injury, wrap the fuel system component with a rag before disconnecting. This can absorb leaked fuel. After disconnecting, place the rag in a suitable container.

Warning about Road Test

Warning !

Road test the vehicle in a safe manner and obey all traffic laws. Do not attempt any operation that could jeopardize vehicle control. Failure to comply with the above safety instructions could result in serious personal injury and damage to the vehicle.

Precautions for Self-learning

Caution

After replacing the fuel injector components, ECM, and engine assembly, you need to use a diagnostic instrument and perform a matching self-learning.

2.2 Engine control system (DHE15-ESZ)

2.2.1 Specification

2.2.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Fixing screw for temperature sensor and resonator	M6×20	8.5-11.5
Fixing bolt between exhaust camshaft position sensor and camshaft bearing cover	M6×16	8.5-11.5
Fixing bolt between intake camshaft position sensor and camshaft bearing cover	M6×16	8.5-11.5
Fixing bolt between Intake air pressure and temperature sensor (water-cooled intercooler subassembly) and water-cooled intercooler subassembly	M6×18	8.5-11.5
Fixing bolt between air pressure and air temperature sensor 1 to intake manifold	M6×18	8.5-11.5
Fixing bolt between electric motor coolant valve and water-cooled intercooler subassembly	M6×16	8.5-11.5
Fixing bolt between differential filter pressure sensor bracket and timing belt guard	M6×10	8.5-11.5
Fixing bolt between VVT solenoid coil (exhaust side) and timing belt guard	M6×14	8.5-11.5
Fixing bolt between VVT solenoid coil (intake side) and timing belt guard	M6×14	8.5-11.5
Fixing bolt between differential filter pressure sensor and differential filter pressure sensor bracket	M6×20	8.5-11.5
Fixing bolt between engine control module bracket and vehicle body	M6×18×21.3M	8.5-11.5
Fixing bolt between engine control module and engine control module bracket	M6×30	8.5-11.5
Fixing nut between engine control module and engine control module bracket	M6×6	8.5-11.5
Air conditioning coolant temperature sensor (cylinder head)	M12×1.5	14-16

Fastener part	Model	Torque range (N·m)
Air conditioning coolant temperature sensor (cylinder block)	M12×1.5	14-16
Oil pressure sensor	M12×1.5	20-24
Oil pressure alarm	Rc1/8	15-16.5
Fixing bolt between knock sensor and cylinder block	M8×35	21-25
Fixing bolt between crankshaft position sensor and hybrid dedicated transmission assembly	M6	8.5-11.5
Fixing bolt between pressure regulating valve and intake pipe	M6×25	8.5-11.5
	M6×40	8.5-11.5
EGR temperature sensor	M12×1.5	23-27
Fixing bolt between EGR differential pressure sensor and turbocharger water pipe subassembly	M6×25	8.5-11.5
Fixing bolt between piston cooling solenoid valve and timing belt guard	M6×16	8.5-11.5
Fixing screw for EGR valve and exhaust gas circulation cooler	M6×25	8.5-11.5
Fixing bolt between accelerator pedal sensor and accelerator pedal sensor bracket	M6×16×19.3	8.5-11.5
Fixing bolt for engine wire harness	M6×20	8.5-11.5

2.2.1.2 Engine Coolant Temperature Sensor - Relationship between Input Temperature and Internal Resistance

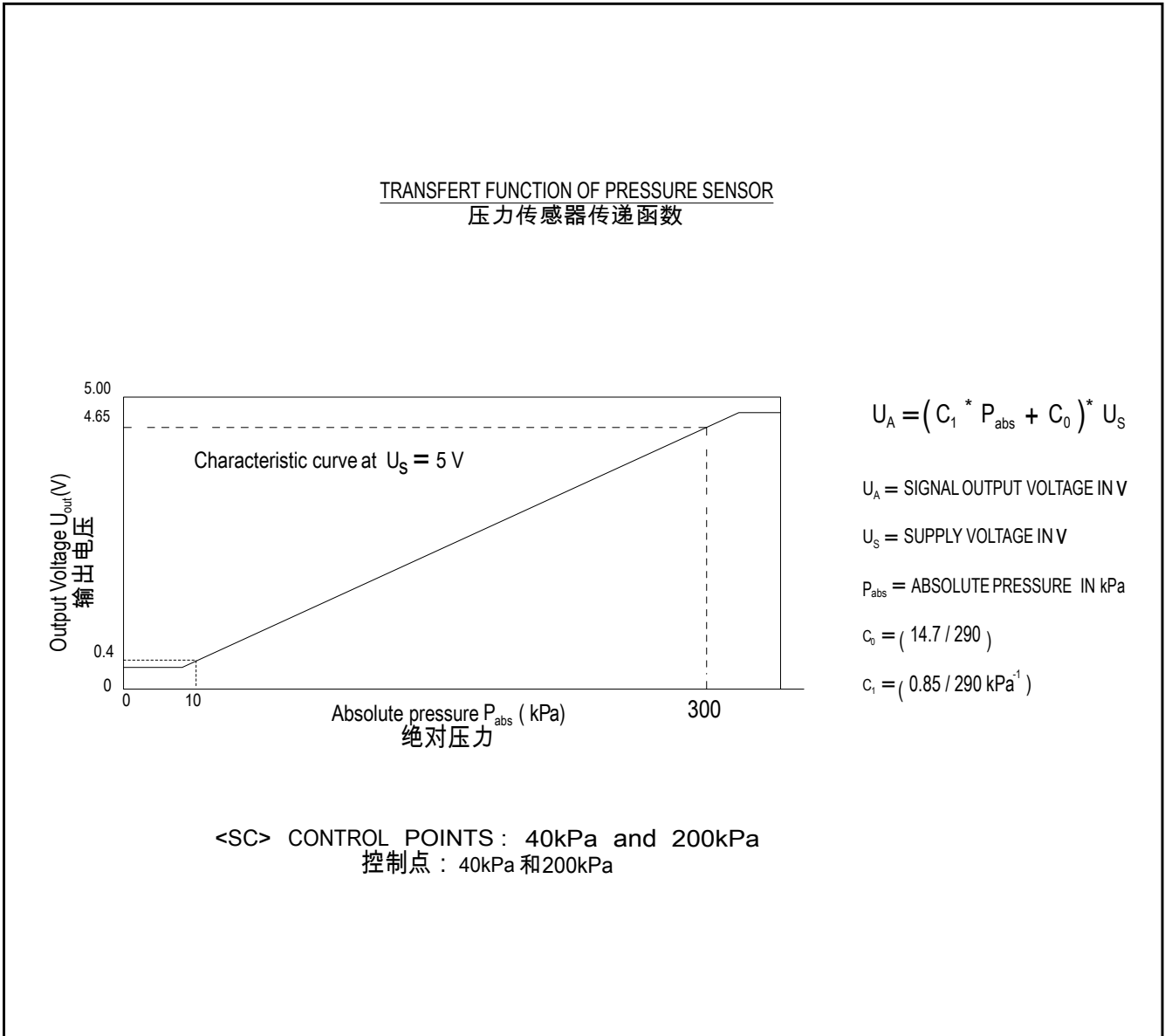
Temperature (°C)	Rmin (Ω)	Rnom (Ω)	Rmax (Ω)
-40	40660	43990	47570
-30	23270	25030	26900
-20	13710	14770	16490
-10	8477	9016	9584
0	5358	5671	6000
10	3480	3667	3862
20	2318	2432	2550
25	1825	1998	2155
30	1579	1660	1724
40	1099	1144	1191
50	779.6	808.9	839
60	563.1	582.4	602.1
70	413.5	426.4	439.4
80	303.0	317.1	326.0

Temperature (°C)	Rmin (Ω)	Rnom (Ω)	Rmax (Ω)
90	233.3	239.2	245.2
100	178.9	183.0	187.0
110	138.3	141.7	145.1
120	108.6	111.1	113.5
130	85.9	88.0	90.2

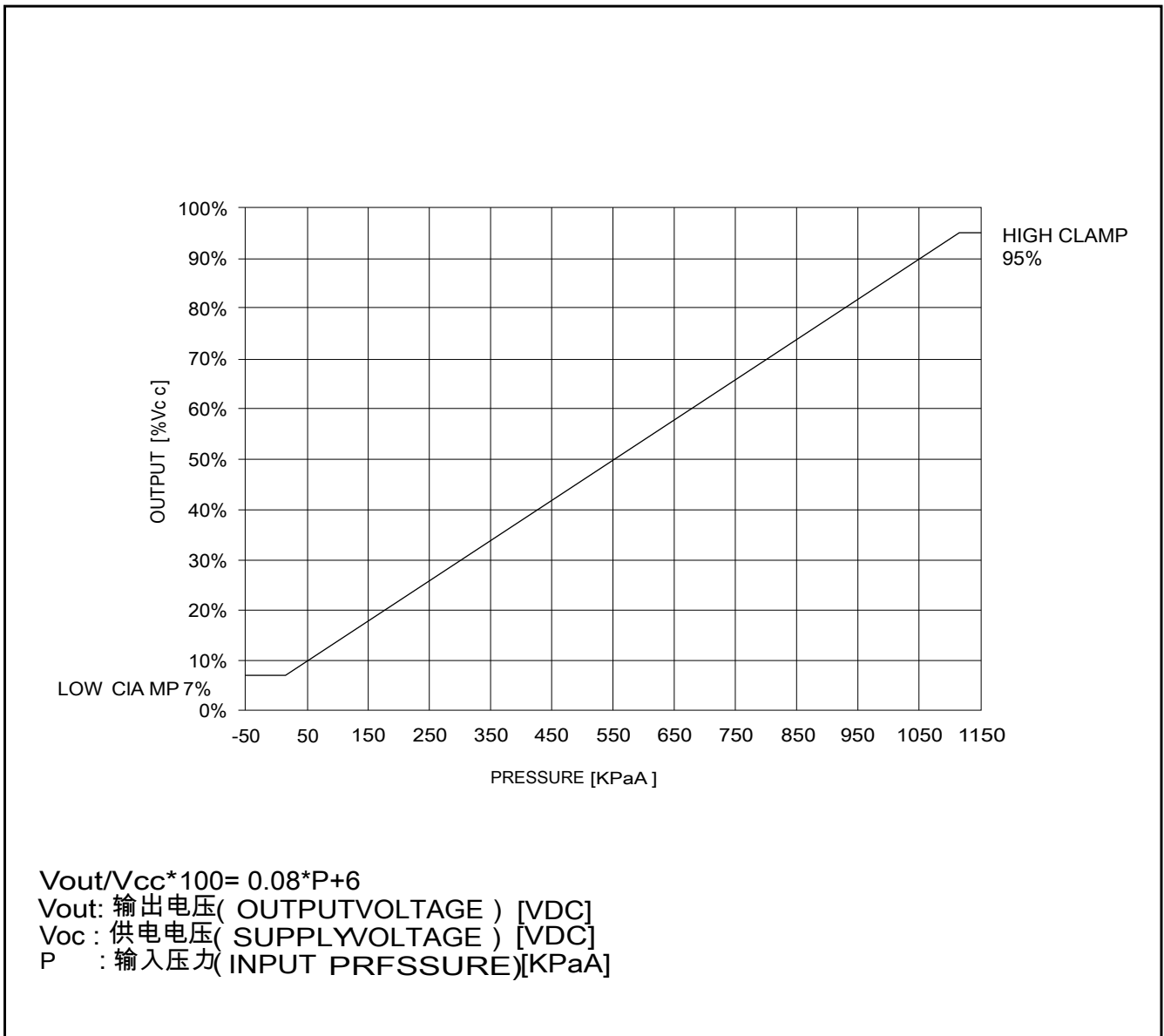
2.2.1.3 Relationship between Sea Level and Atmospheric Pressure

Altitude (m)/(ft)	Atmospheric pressure (kPa)/(psi)
4200/13,780	55/8
3900/12,795	58/8.4
3600/11,811	61/8.8
3300/10,827	64/9.3
3000/9,843	66/9.6
2700/8,858	69/10
2400/7,874	71/10.3
2100/6,890	74/10.7
1800/5,906	77/11.2
1500/4,921	80/11.6
1200/3,937	83/12
900/2,953	87/12.6
600/1,969	90/13.1
300/984	93/13.5
0	100/14.5

2.2.1.4 Air Pressure and Air Temperature Sensor 1 - Relationship Diagram between Input Pressure and Output Voltage



2.2.1.5 Air Pressure Sensor - Relationship Diagram between Input Pressure and Output Voltage



2.2.1.6 Specification for Engine Control Module

Item	Low value	Regular value	High value	Remarks
Operating voltage of DC motor	< 9 V	12V	16V	-
Position sensor operating voltage	-	5V	-	-
Operating temperature	-40°C	-	105°C	-
Storage temperature	15°C	-	25°C	-
Storage temperature	-40°C	-	140°C	Short time
Intake pressure	100 hPa	-	3000 hPa	-

2.2.1.7 Specification for Knock Sensor

Item	Low value	Regular value	High value	Remarks
Operating temperature	-40°C	-	150°C	-
Installation torque	15Nm	20Nm	25Nm	-

2.2.1.8 Specification for Throttle Unit

Item	Low value	Regular value	High value	Remarks
Operating voltage of DC motor	< 9 V	12V	-	-
Position sensor operating voltage	4.75V	5V	5.25V	-
Operating temperature	-40°C	-	140°C	-
Storage temperature	-10°C	-	50°C	< 2 years
Intake pressure	100 hPa	-	3000 hPa	-
Resistance	-	1.7 Ω	-	Room temperature

2.2.1.9 Specification for Camshaft Position Sensor

Data	Low value	Regular value	High value	Remarks
Position sensor operating voltage	4.75V	5V	5.25V	-
Operating temperature	-40°C	-	150°C	-
Target theory speed	0	-	4000 rpm	-
Air gap	0.4 mm	-	1.6mm	-
Working current	-	-	20mA	-
Output voltage	0V	-	5V	-

2.2.1.10 Specification for Intake Pressure and Temperature Sensor

Item	Low value	Regular value	High value	Remarks
Position sensor operating voltage	4.75V	5V	5.25V	-
Operating temperature	-40°C	-	130°C	-
Storage temperature	-40°C	-	130°C	-
Pressure output	20 kPa	-	300 kPa	-
Temperature output	-40°C	-	150°C	-

2.2.2 Instructions and operations

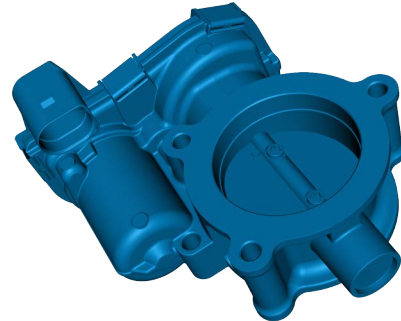
2.2.2.1 Overview

The engine is located in the engine compartment. The engine compartment also contains several other components. The engine is an in-line three-cylinder engine with transverse mounting. The ignition sequence of the cylinders is Cylinder 1, Cylinder 3 and Cylinder 2. When viewed in the direction of travel, the cylinder on the right is Cylinder 1 and the cylinder on the left is Cylinder 3. This engine uses a variable valve timing system and the throttle unit control system. The control system consists primarily of the engine control module ECM, the ECM operating circuit, and the system input and output components. The ECM is the control center for the engine control system, and it constantly monitors signals from various sensors and controls the various systems that affect the vehicle's performance. The ECM also performs system diagnostic functions, and it identifies operational faults and alerts the driver through a malfunction indicator lamp (MIL) and stores diagnostic fault codes indicating the location of the fault so that it can be repaired by service personnel. These control functions enhance engine performance, improve fuel economy and increase engine dynamics, and reduce harmful exhaust emissions.

Information parts include crankshaft position sensor, camshaft position sensor, intake pressure and temperature sensor, engine coolant temperature sensor, knock sensor, accelerator pedal sensor, oxygen sensor, fuel pressure sensor, oil pressure sensor, temperature sensor, throttle unit, Fuel injector assembly, oil pump relay and fuel pump, turbocharger subassembly, ignition coil, intake and exhaust VVTs and so on.

2.2.2.2 Information Components

1. Throttle unit



Throttle unit actuator motor is integrated in throttle unit assembly. Throttle unit opening size is provided to ECM by ECM according to the real-time torque demand of the engine by the driver through the accelerator pedal sensor, and the ECM sends the throttle unit opening signal to the throttle unit to drive the internal motor to rotate so as to make the throttle unit to obtain the required opening. According to the frequency and pulse width of the signal provided by the ECM, the actuator motor can stay at a fixed position or change a certain position as needed to meet the various real-time requirements of the engine under different working conditions.

2. Camshaft Position Sensor



With the rotation of the camshaft, the sensor recognizes the convex and concave teeth of the signal wheel on the camshaft and outputs corresponding voltage signals, the output signals can determine the position and rotation speed of the camshaft. The voltage signals are finally inputted into the ECM, and are calculated by the ECM software to determine the ignition timing of the engine. The camshaft position sensor is mainly used to monitor the position of the camshaft, and the actual values will be transmitted to the engine control module (ECM). The ECM utilizes the camshaft position sensor signal to determine the position and rotational speed of the camshaft, and cooperates with the crankshaft position sensor to determine the compression top dead center and exhaust top dead center of the cylinder, indicating the position of the piston of Cylinder 1 during the period of the actuation stroke. From this, the ECM can calculate the actual fuel injection sequence.

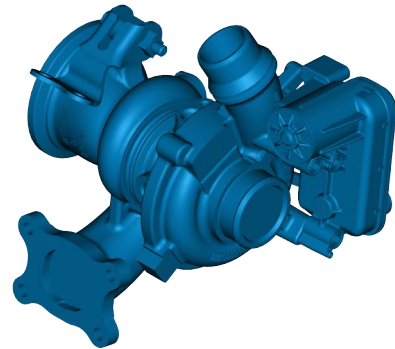
3. Intake pressure and temperature sensor



The intake pressure and temperature sensor is used to monitor the pressure of the intake in the intake manifold. The sensor measures the pressure and temperature of the air in the intake pipe between the intercooler and the throttle housing. The ECM regulates the turbine according to the signal provided by the intake pressure and temperature sensor. The intake pressure and temperature sensor chip provides the controller with a "load signal" based on the difference between the atmospheric pressure and the intake manifold pressure; the controller provides a voltage of 5V and feeds back 0.5V depending on the intake pressure. The intake pressure and temperature sensor chip can provide a "load signal" to the controller according to the difference between the atmospheric pressure and the intake

manifold pressure. The controller provides a 5V voltage and feedbacks 0-5V voltage to the controller according to the different intake pressures, thus achieving the purpose of measuring the absolute pressure of the intake manifold and providing engine load information. The intake pressure sensing element measures the changes in intake manifold pressure due to changes in engine load and speed, and it converts these changes into a voltage output. The ECM obtains the intake temperature by measuring the voltage, and the ECM utilizes this signal to make corrections to the injection pulse width and ignition timing.

4. Turbocharger subassembly



The turbocharging system presses the intake into the combustion chamber, and the high temperature and high pressure exhaust gas from the exhaust pipe drives the turbocharger subassembly turbine. The turbine drives the pressure wheel, and the pressure wheel pressurizes the intake pipeline air and sends it to the intercooler, the compressed gas is at a higher temperature, and the high pressure ambient air is cooled down by the intercooler and then sent to the engine Intake system and finally enters the combustion chamber.

5. Ignition coil



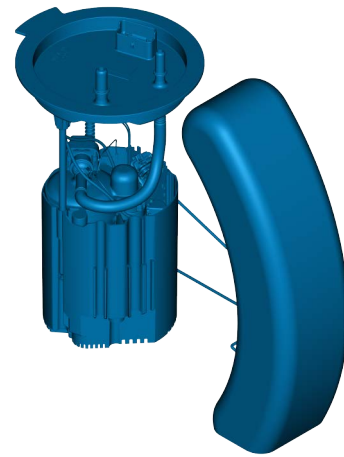
The ignition coil supplies high voltage to the spark plug. The ignition coil has an integrated voltage amplifier. The engine control module (ECM) controls the ignition coil to ensure that the spark plugs produce sparks at the correct time. The ignition coil is directly connected to the ECM and the spark plug.

With the performance determination failure mode, it can test the ignition coil ignition performance to connect all the system circuits, run the engine to detect the ignition performance. If the spark plug has no fire, then it needs to be replaced. If there is a fire but yellow, check the capacitor itself and its circuit. The normal ignition is blue and white.

The ignition coil is used in the electronically controlled fuel injection system to receive ECM ignition signals and provide high voltage electricity to the spark plug for ignition. The ignition coil works according to the principle of electric induction, the primary coil and secondary coil are two magnetically coupled copper coils that constitute an induction circuit. The instantaneous induced voltage generated by the disconnection of the primary circuit switch is amplified by the induction coil and generates an instantaneous high voltage in the secondary coil circuit. The high voltage is then ignited by the spark plug to ignite the mixture. In order to make the ignition coil work properly and have better EMC performance, the power and signal wires for the coil need to be as far away as possible from the wires of other parts. The ignition module should not share the same grounding wire with other electrical vehicle components, and the grounding wire should be as short as possible. Since the ignition coil generates high voltage, do not remove the ignition coil and spark plug with bare hands under energized condition, and do not touch the metal parts and the high

voltage connecting rod directly to avoid being hurt by the high voltage.

6. Oil pump relay and fuel pump



The oil pump relay is located in the engine compartment fuse box, and the fuel pump is installed in the fuel tank. The fuel pump operates when the engine ECU controls the closure of the oil pump relay. The pump and motor are coaxially mounted and enclosed in the same housing. The housing is filled with gasoline around both the pump and motor, using the fuel for heat dissipation and lubrication. The battery supplies power to the fuel pump through the oil pump relay as the oil pump relay is engaged, and the relay energizes the electric fuel pump circuit only when the engine is running. When the engine stops running due to an accident, the fuel pump automatically stops running. The maximum pressure at the outlet of the electric fuel pump is determined by the pressure relief valve mounted on the fuel pump.

7. Fuel pressure sensor



The fuel pressure inside the fuel rail acts directly on the sensor sensing element, which produces a micro displacement proportional to the fuel pressure, causing the sensor's resistance to change, and outputs a voltage value proportional to the pressure through the processing of the sensor's internal signal processing circuit. The fuel pressure sensor is located on the high-pressure fuel rail pipe, and directly measures the value of the fuel pressure inside the high-pressure fuel supply system. The closed-loop control of fuel pressure can be realized through a fuel pressure sensor. The ECM calculates the theoretically required rail pressure according to the signals input from the relevant sensors under the current engine operating conditions, realizes the rail pressure control by adjusting the fuel control valve of the high pressure fuel pump, and relies on the fuel pressure sensor to detect the actual rail pressure, and corrects it in comparison with the theoretical rail pressure to realize the closed-loop control. The high pressure fuel pump provides high oil pressure for the oil rail assembly. The high pressure fuel pump provides high oil pressure. If the oil pressure in the fuel rail exceeds a certain level, the safety valve in the high pressure fuel pump will open to introduce fuel to the low-pressure side. The fuel rail delivers fuel to each injector. The injectors are controlled to open by an electrical signal from the ECM to inject fuel into the cylinder in a defined spray pattern for combustion, with the amount of fuel injected adjusted according to the air pressure in the intake manifold.

8. Water temperature sensor

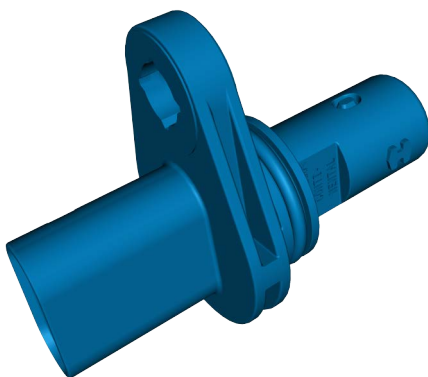
The coolant temperature can be measured. The ECM controls a number of functions via this sensor. The sensor is an NTC (Negative Temperature Coefficient) thermistor, whose resistance value varies according to the coolant temperature. When the engine coolant temperature is low, the resistance value is higher, while when the temperature is high, the resistance value is lower. The NTC thermistor is encapsulated in the temperature sensor, its resistance value changes with the change of temperature, so as to accurately and timely measure the ambient temperature where the temperature changes, determine the output resistance value, that is, the reaction to the temperature of the contact medium. It is used to monitor the coolant temperature of the engine. On the one hand, it outputs a resistance signal to enable the ECM to make judgments on the engine's operating conditions, correct fuel injection and ignition. On the other hand, outputting signals to relevant instruments allows operators to visually determine the working status of the engine. The ECM provides a 5 V reference voltage to the sensor, and by measuring the voltage change, the engine control module can determine the engine coolant temperature. This sensor is crucial for the engine control system to correct the ignition timing and fuel injection amount. At the same time, this signal is also transmitted to the instrument panel to display the current operating temperature of the engine.

9. Accelerator pedal sensor



The accelerator pedal sensor of the engine is integrated into the accelerator pedal assembly. The ECM calculates the position of the accelerator pedal by monitoring the voltage on the signal circuit of the accelerator pedal position sensor, thereby determining the driver's intention and transmitting the throttle unit opening signal to the throttle unit, thereby controlling the vehicle speed according to the driver's intention. The accelerator pedal sensor has two (primary and secondary) sensor circuits. If one of the sensor circuits malfunctions, the engine ECM will detect an abnormal signal multiple between the two sensor circuits and issue an alarm signal.

10. Crankshaft Position Sensor



The crankshaft position sensor is used to measure the speed and position of the engine crankshaft. By detecting the crankshaft, the sensor outputs a corresponding voltage

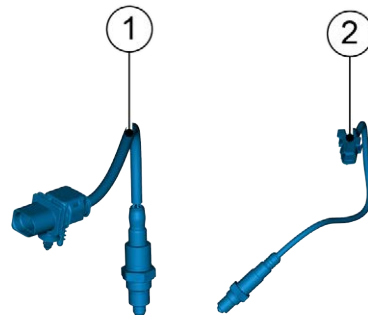
signal that is fed to the ECM to determine the engine speed and top dead center information. The crankshaft position sensor is mainly used to monitor the position and speed of the crankshaft. The actual values are transmitted to the ECM. The crankshaft position sensor is an important sensor for the engine. When the crankshaft position sensor fails, the engine cannot start or stop.

11. Knock sensor



A knock sensor is mainly used for detecting the actual value of cylinder knock. The knock sensor contains a piezoelectric element that records the actual value of each cylinder knock and transmits it to the ECM. Through the piezoelectric ceramics in the sensor, the amount of engine vibration is detected and a voltage signal is output to the ECM, which is processed through software calculations to determine whether the engine detonation occurs or not, preventing damage to the engine due to detonation.

12. Lambda probe



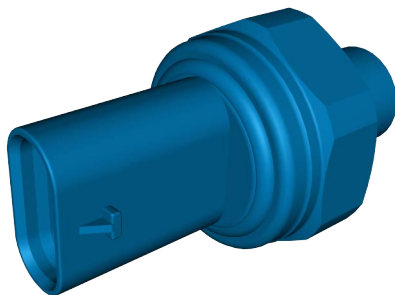
1. Lambda probe (upstream oxygen sensor)

2. Lambda probe (downstream oxygen sensor)

They are located in front and behind the GPF rear catalytic converter respectively. The oxygen sensor measures the oxygen content within the exhaust gas and sends the measurement value to the engine control module (ECM).

Two oxygen sensors measure the remaining oxygen content in the exhaust gas. The measured values from the oxygen sensors help the engine control module (ECM) to control the air-fuel ratio. The oxygen sensor consists of a zirconium probe and a heating element with a positive temperature coefficient resistor. In order to measure the oxygen content in the exhaust gas, the oxygen sensor needs to refer to the surrounding air, which comes into contact with the sensor via the oxygen sensor harness. The oxygen sensor only operates within a specific temperature range. In order to reach the operating temperature, a heating element is included in the oxygen sensor to heat the oxygen sensor. The operating temperature of the Lambda probe (upstream oxygen sensor) and Lambda probe (downstream oxygen sensor) varies.

13. Oil pressure sensor



The front of the engine is equipped with an engine oil pressure sensor. When the engine is operating, the sensor monitors the oil pressure in the engine oil duct in real time and feeds this pressure signal back to the ECU for control and diagnosis of the engine variable displacement oil pump.

2.2.3 System working principles

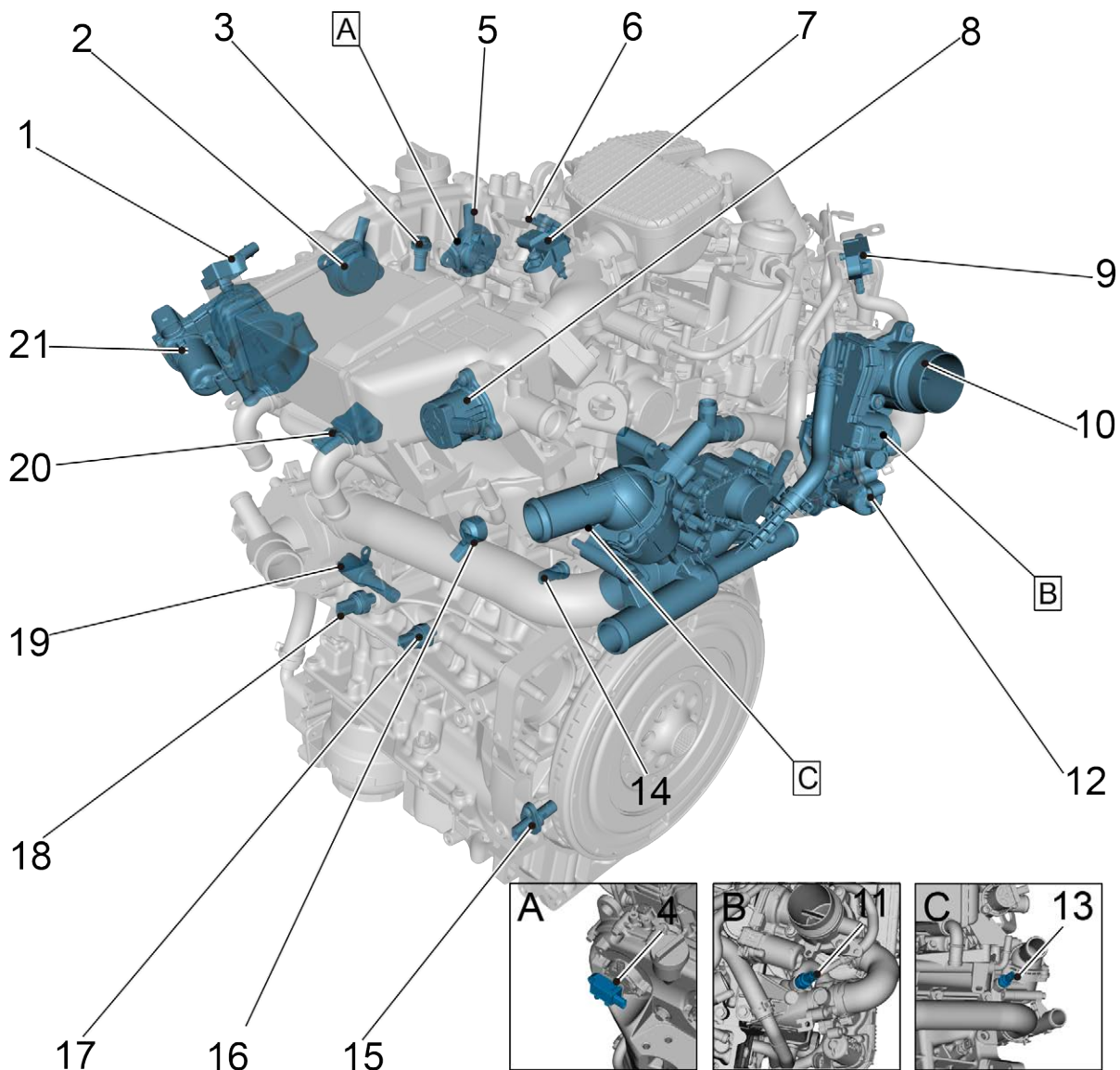
2.2.3.1 System working principles

The function of the control unit is to calculate the basic fuel injection duration according to the engine's intake volume and speed signals, to supply the engine with a mixture close to the ideal air-fuel ratio and to control its operation. For example, during a cold start, the engine control module increases the fuel injection volume based on the relevant signals, enables the engine to start smoothly and controls the idling speed. In addition, the engine control module also has the function of fault self-diagnosis and protection. When the engine fails, the control unit can automatically diagnose the fault and save the fault code, and issue a warning through the fault indicator light, and the saved code can also be output under certain triggering conditions. Once the sensor or actuator fails, the engine control module automatically activates its backup system to put it into operation to ensure the safety of the vehicle and maintain the vehicle's ability to continue driving. The control unit can also communicate with the maintenance and diagnostic instruments, which can view the fault diagnostic codes stored inside the control unit, scan the current control unit operation of the system parameters that is the data flow, and use diagnostic instruments to perform forced driving tests on the actuators of the control system. This can provide great convenience for maintenance diagnosis of the control system.

2.2.4 Part position

2.2.4.1 Location Diagram of Control System Components

Component Location Diagram



- | | |
|--|--|
| 1. Intake pressure and temperature sensor (water-cooled intercooler subassembly) | 12. EGR valve |
| 2. VVT solenoid coil (intake side) | 13. Air conditioning coolant temperature sensor (cylinder head) |
| 3. Intake camshaft position sensor | 14. Air conditioning coolant temperature sensor (cylinder block) |
| 4. Differential filter pressure sensor | 15. Crankshaft Position Sensor |
| 5. VVT solenoid coil (exhaust side) | 16. Knock sensor |
| 6. Exhaust camshaft position sensor | 17. Oil pressure alarm |
| 7. High temperature intake manifold pressure sensor | 18. Oil pressure sensor |

- | | |
|-------------------------------------|---|
| 8. Electric motor coolant valve | 19. Piston cooling solenoid valve |
| 9. EGR differential pressure sensor | 20. Air pressure and temperature sensor 1 |
| 10. Pressure regulating valve | 21. Throttle unit |
| 11. EGR temperature sensor | |

2.2.5 Diagnostic information and procedure

2.2.5.1 Diagnosis description

Before diagnosing a malfunction in the ignition system, see [Overview](#). Understanding and familiarizing yourself with the operating principles of the control system before starting system diagnosis will determine the proper troubleshooting steps to take in the event of a malfunction, and more importantly, this will determine if the condition described by the customer is normal operation. Any troubleshooting of the control system should start with a "Control System Inspection", which guides the service technician to the next logical step in the troubleshooting process. Understanding and using the diagnostic process correctly will shorten the diagnostic time and avoid misjudgment of the components.

2.2.6 Removal and Installation

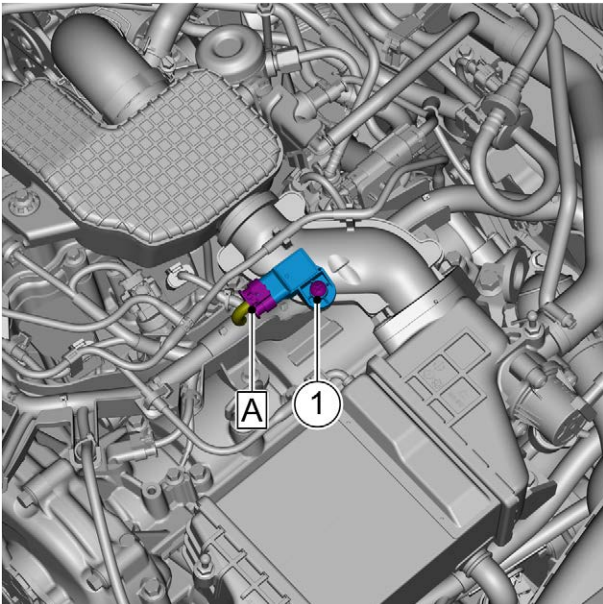
2.2.6.1 Replacement of Temperature Sensor

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 4 Disconnect the harness connector A of the temperature sensor.
- 5 Remove the fixing screw 1 of the temperature sensor and take off the temperature sensor.



Installation Procedure

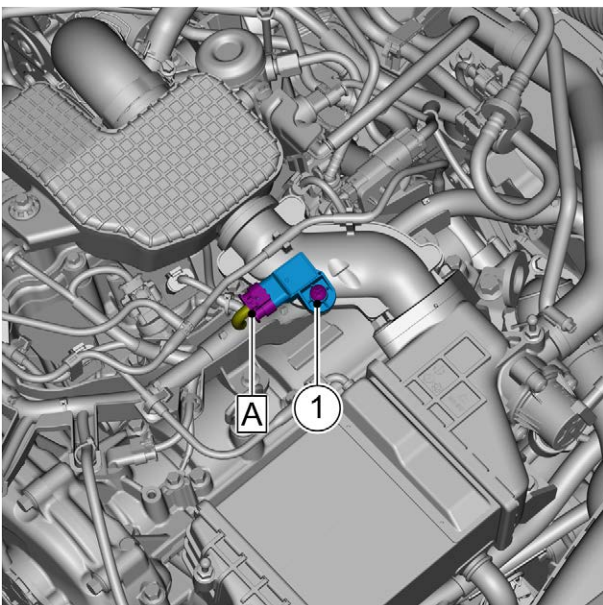
- 1 Install the temperature sensor and tighten the fixing screw 1 of the temperature sensor.

Torque: 10N·m

Caution

Take an appropriate amount of lubricating medium and apply it evenly to the chamfered sensor mounting holes or to the O-ring seal before assembly.

- 2 Connect the harness connector A of the temperature sensor.



- 3 Install the engine trim cover assembly.
- 4 Connect the negative cable of battery.
- 5 Use the GLDS diagnostic program. On the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software flash operation.
- 6 Close the engine compartment cover.

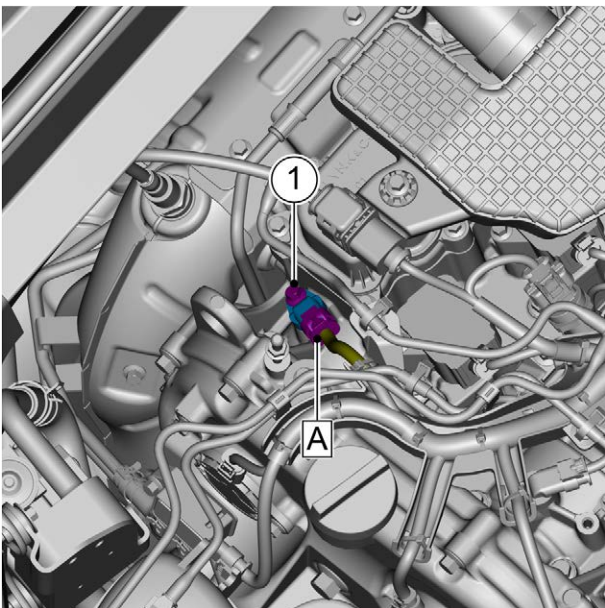
2.2.6.2 Replacement of Exhaust Camshaft Position Sensor

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 4 Disconnect the harness connector A of the exhaust camshaft position sensor.
- 5 Remove the fixing bolt 1 of the exhaust camshaft position sensor and take off the exhaust camshaft position sensor.



Installation Procedure



- 1 Install the exhaust camshaft position sensor and tighten the fixing bolt 1 of the exhaust camshaft position sensor.
Torque: 10 N·m

Caution

1. Take appropriate amount of lubricating medium and evenly apply it to the chamfered sensor mounting holes or O-ring seals before assembly.
 2. Before assembly, check sealing rings for damage or missing. If any, replace them.
 3. It is prohibited to touch the part pins.
 4. Avoid dropping parts or subjecting them to shocks. Dropped parts must be scrapped.
 5. The lubricating medium should be in the appropriate amount to avoid oil stains or seepage.
- 2 Connect the harness connector A of the exhaust camshaft position sensor.
 - 3 Connect the negative cable of battery.
 - 4 Install the engine trim cover assembly.
 - 5 Use the GLDS diagnostic program. On the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software flash operation.
 - 6 Close the engine compartment cover.

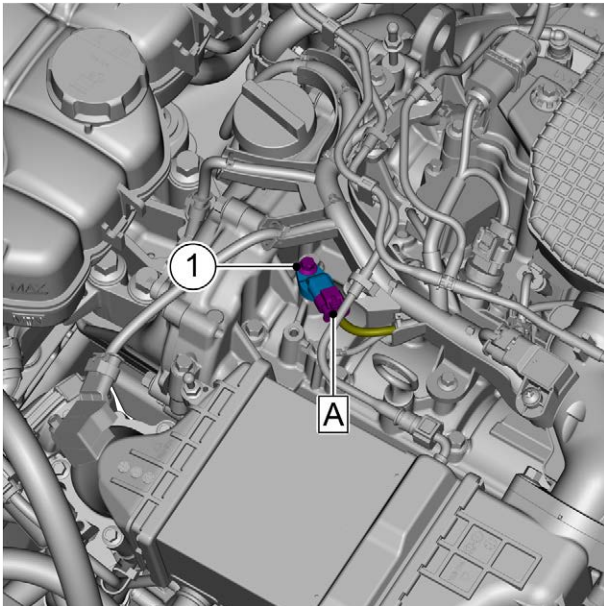
2.2.6.3 Replacement of Intake Camshaft Position Sensor

Removal Procedure

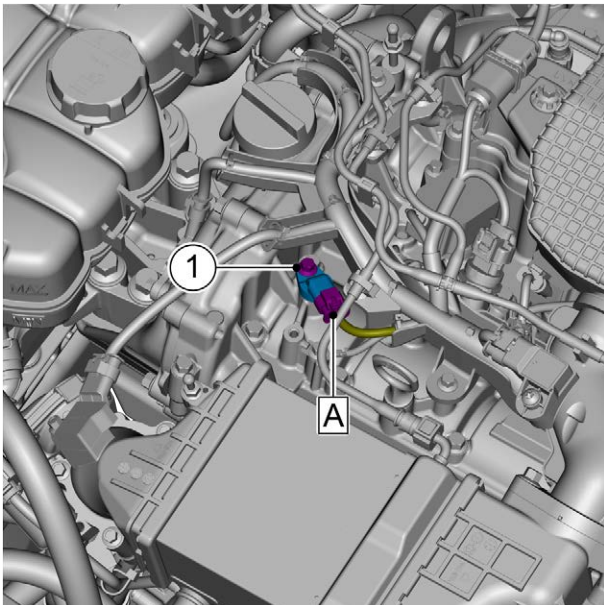
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).



- 4 Disconnect the harness connector A of the intake camshaft position sensor.
- 5 Remove the fixing bolt 1 of the intake camshaft position sensor and take off the intake camshaft position sensor.



Installation Procedure

- 1 Install the intake camshaft position sensor and tighten the fixing bolt 1 of the intake camshaft position sensor.

Torque: 10N·m

Caution

1. Take appropriate amount of lubricating medium and evenly apply it to the chamfered sensor mounting holes or O-ring seals before assembly.
 2. Before assembly, check sealing rings for damage or missing. If any, replace them.
 3. It is prohibited to touch the part pins.
 4. Avoid dropping parts or subjecting them to shocks. Dropped parts must be scrapped.
 5. The lubricating medium should be in the appropriate amount to avoid oil stains or seepage.
- 2 Connect the harness connector A of the intake camshaft position sensor.
 - 3 Install the engine trim cover assembly.
 - 4 Connect the negative cable of battery.
 - 5 Use the GLDS diagnostic program. On the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software flash operation.
 - 6 Close the engine compartment cover.

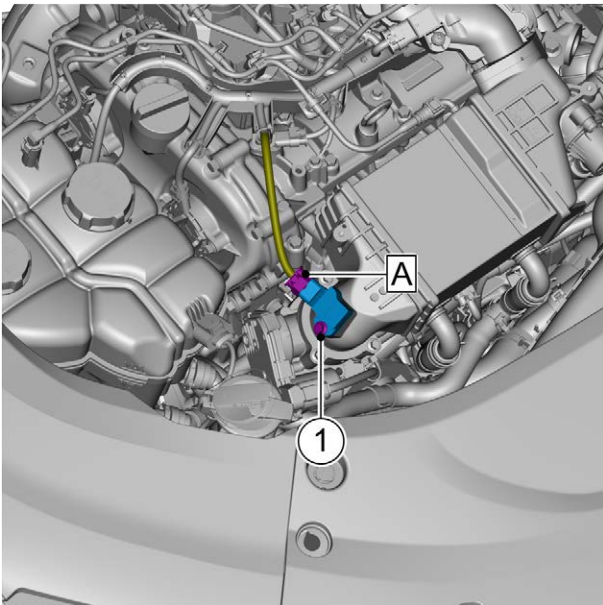
2.2.6.4 Replacement of Intake Pressure and Temperature Sensor (Water-cooled Intercooler Subassembly)

Removal Procedure

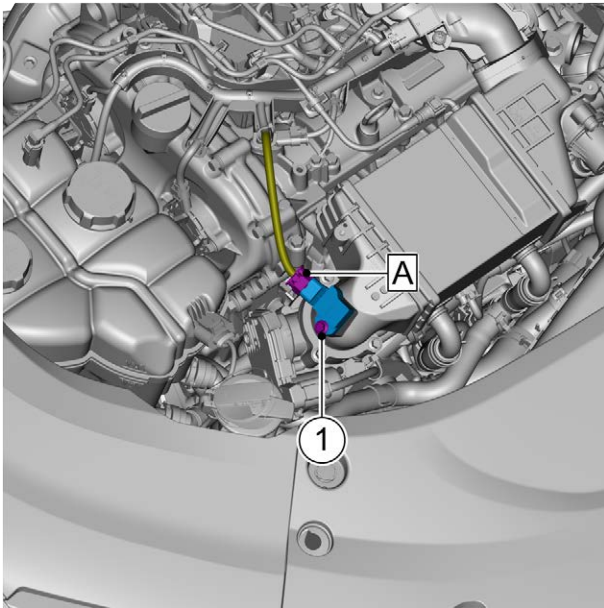
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 4 Disconnect the harness connector A of the intake pressure and temperature sensor (water cooled intercooler subassembly).
- 5 Remove the fixing bolt 1 of the intake pressure and temperature sensor (water-cooled intercooler subassembly) and take off intake pressure and temperature sensor (water-cooled intercooler subassembly).



Installation Procedure



- 1 Install the intake pressure and temperature sensor (water-cooled intercooler subassembly) and tighten the fixing bolts 1 of the intake pressure and temperature sensor (water-cooled intercooler subassembly).

Torque: 10N·m

Caution

1. Before installing the sensor, dip a grease stick into an appropriate amount of engine oil and apply it evenly to the chamfer of the sensor mounting hole.
 2. Before assembly, check sealing rings for damage or missing. If any, replace them.
 3. Storage, transportation and assembly processes must be protected against static electricity and touching the sensor pins is prohibited.
 4. Do not plug or unplug any sensor with electricity during the energizing operation such as cold or hot test.
- 2 Connect the harness connector A of the intake pressure and temperature sensor (water-cooled intercooler subassembly).
 - 3 Install the engine trim cover assembly.
 - 4 Connect the negative cable of battery.
 - 6 Use the GLDS diagnostic program. On the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software flash operation.
 - 5 Close the engine compartment cover.

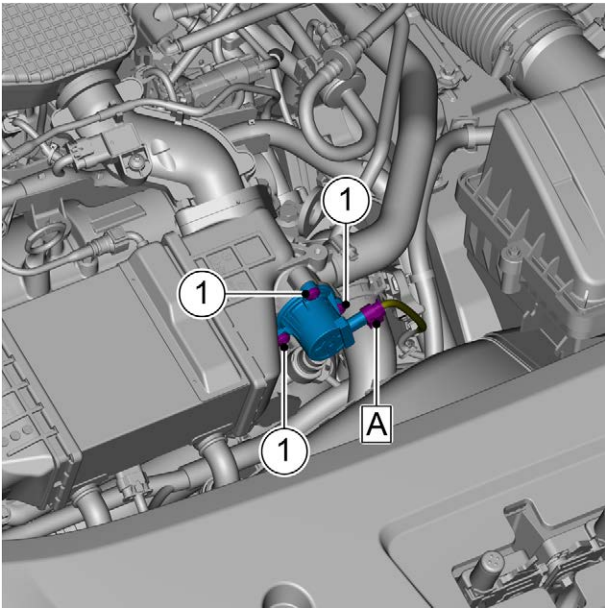
2.2.6.5 Replacement of Electric Motor Coolant Valve

Removal Procedure

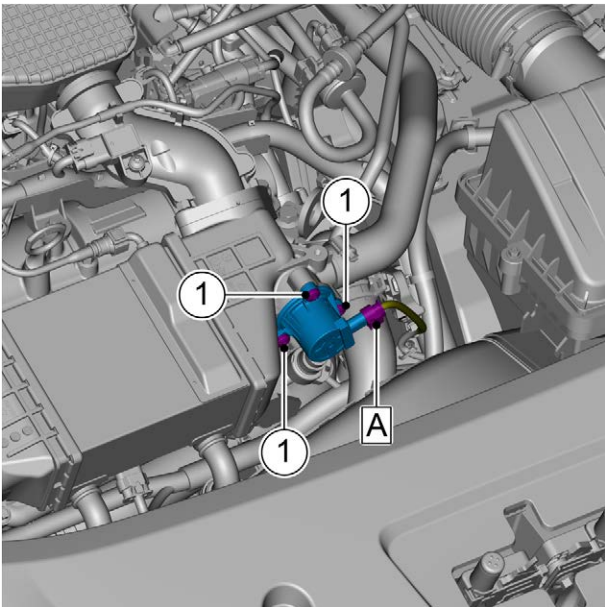
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).



- 4 Disconnect the harness connector A of the electric motor coolant valve.
- 5 Remove the three fixing screws 1 of the electric motor coolant valve, and take off the electric motor coolant valve.



Installation Procedure

- 1 Install the electric motor coolant valve and tighten the three fixing screws 1 of the electric motor coolant valve.
Torque: 10N·m

Caution

1. Make sure that the electric motor coolant valve is positioned correctly, and then screw in the three fixing screws in turn.
2. Before assembly, take care to check the rubber sealing ring of the electric motor coolant valve (A) for detachment/foreign material attachment to ensure sealing.
- 2 Connect the harness connector A of the electric motor coolant valve.
- 3 Install the engine trim cover assembly.
- 4 Connect the negative cable of battery.
- 5 Use the GLDS diagnostic program. On the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software flash operation.
- 6 Close the engine compartment cover.

2.2.6.6 Replacement of Throttle Unit

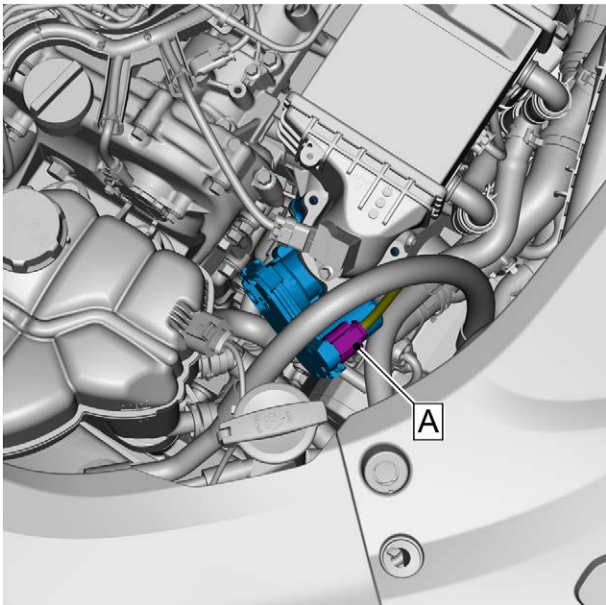
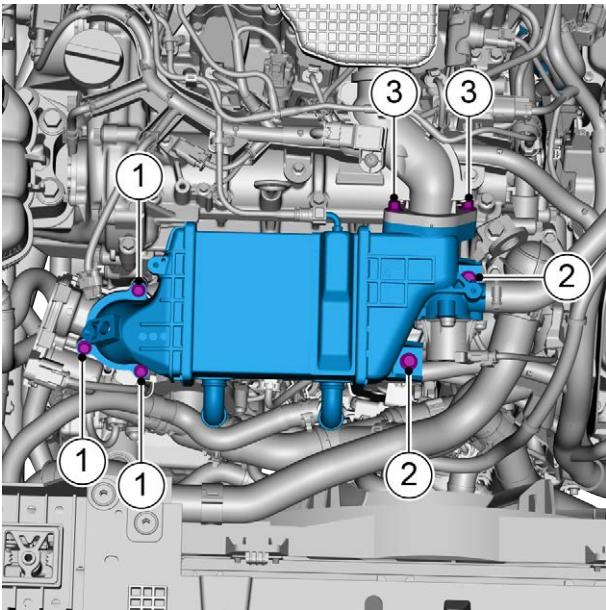
Removal Procedure

Warning !

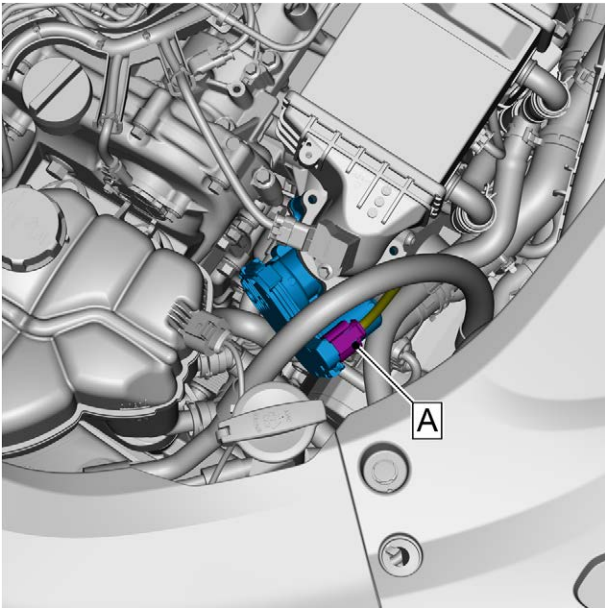
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 4 Remove the three fixing bolts 1 of the water-cooled intercooler subassembly.
- 5 Remove the two fixing bolts 2 of the water-cooled intercooler subassembly.
- 6 Remove the two fixing bolts 3 of the water-cooled intercooler subassembly.

- 7 Disconnect the harness connector A of the throttle unit, and remove the throttle unit and throttle body sealing gasket.



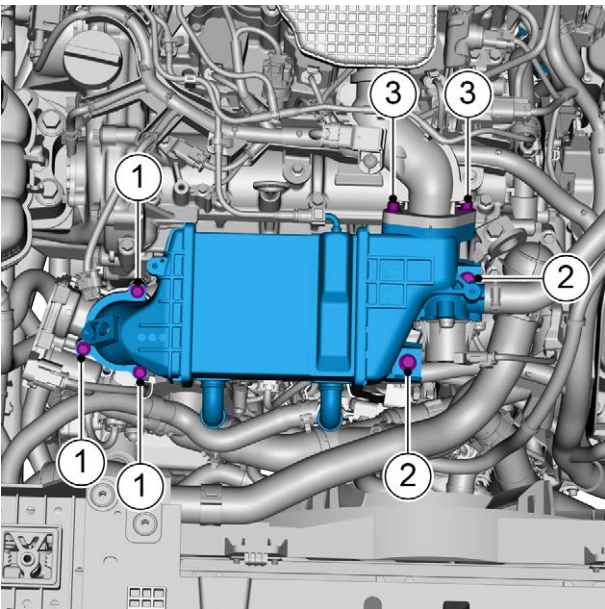
Installation Procedure



- 1 Install the throttle unit and connect the harness connector A of the throttle unit.

Caution

1. Before assembly, check the mounting surface on both sides of the throttle unit for scratches and other defects. If any, replace them before assembly.
2. Throttle body sealing gasket can be used without deformation or damage.



- 2 Tighten the three fixing bolts 1 of the water-cooled intercooler subassembly, then tighten the two fixing bolts 2 of the water-cooled intercooler subassembly, and retighten them once in order after tightening them all.

Torque of Bolt 1: 10 N·m

Torque of Bolt 2: 23 N·m

Caution

Before assembly, make sure that the throttle body sealing gasket on the intake manifold and water-cooled intercooler subassembly is in place, and check that the gasket is free from scratches, oil and dirt.

- 3 Install and tighten the two fixing bolts 3 of the water-cooled intercooler subassembly.

Torque of Bolt 3: 24 N·m

- 4 Install the engine trim cover assembly.
- 5 Connect the negative cable of battery.
- 6 Use the GLDS diagnostic program. On the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software flash operation.
- 7 Close the engine compartment cover.

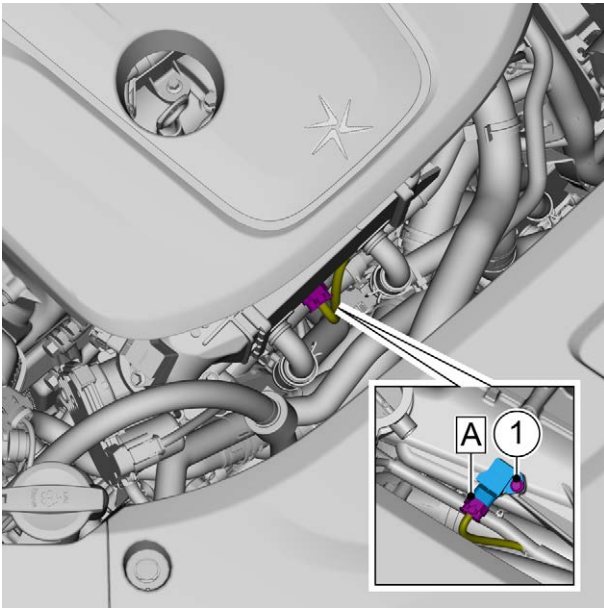
2.2.6.7 Replacement of Air Pressure and Temperature Sensor 1

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#).

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Disconnect the harness connector A of the air pressure and temperature sensor 1.
- 4 Remove the fixing bolt 1 of the air pressure and temperature sensor 1 and take off the air pressure and temperature sensor 1.

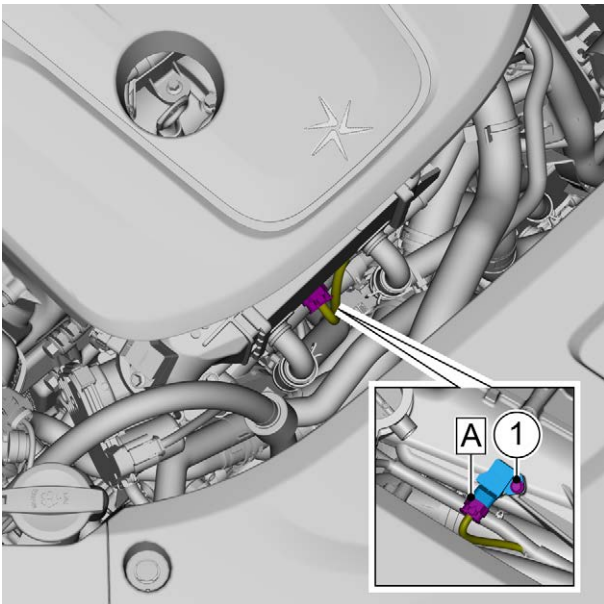
**Installation Procedure**

- 1 Install the air pressure and temperature sensor 1 and tighten the fixing bolt 1 of the air pressure and temperature sensor 1.

Torque: 10N·m

Caution

1. Before installing the sensor, dip a grease stick into an appropriate amount of engine oil and apply it evenly to the chamfer of the sensor mounting hole.
 2. Before assembly, check sealing rings for damage or missing. If any, replace them.
 3. Storage, transportation and assembly processes must be protected against static electricity and touching the sensor pins is prohibited.
 4. Do not plug or unplug any sensor with electricity during the energizing operation such as cold or hot test.
- 2 Connect the harness connector A of the air pressure and temperature sensor 1.
 - 3 Connect the negative cable of battery.



- 4 Use the GLDS diagnostic program. On the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software flash operation.
- 5 Close the engine compartment cover.

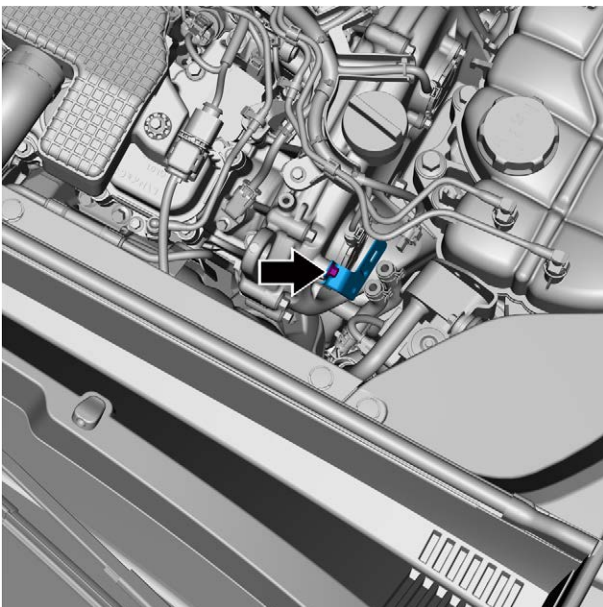
2.2.6.8 Replacement of VVT Solenoid Coil (exhaust side)

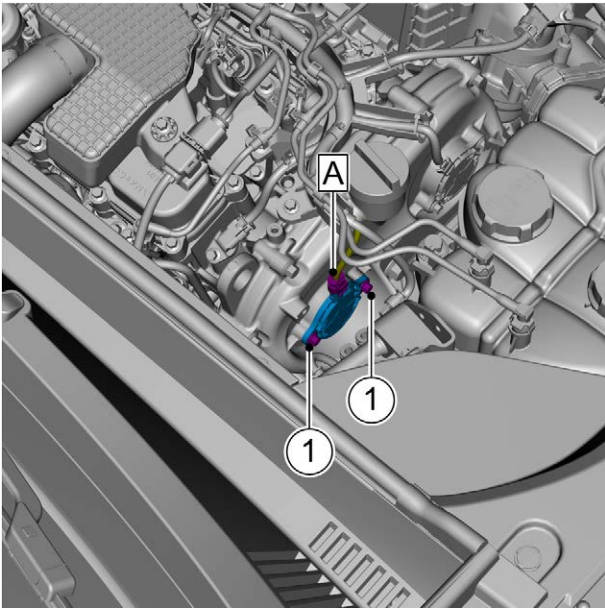
Removal Procedure

Warning !

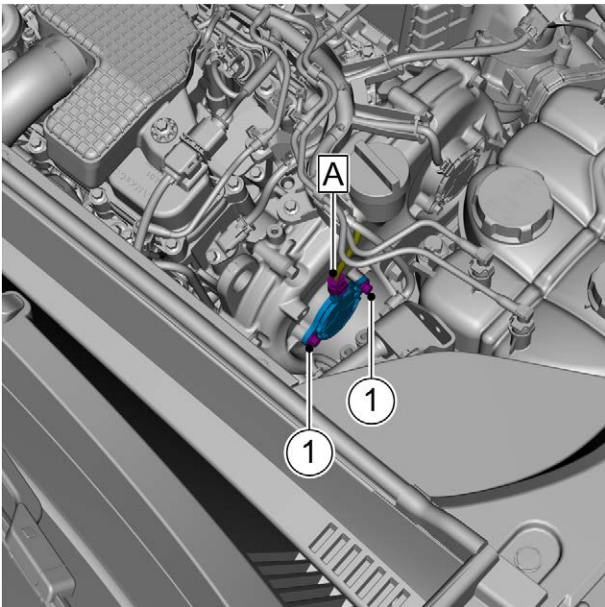
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the differential pressure filter pressure sensor, see [Replacement of Differential Filter Pressure Sensor](#).
- 4 Remove the fixing bolts of the differential filter pressure sensor bracket and take off the differential filter pressure sensor bracket.





- 5 Disconnect the harness connector A of the VVT solenoid coil (exhaust side).
- 6 Remove the two fixing bolts 1 of the VVT solenoid coil (exhaust side) and take off the VVT solenoid coil (exhaust side).



Installation Procedure

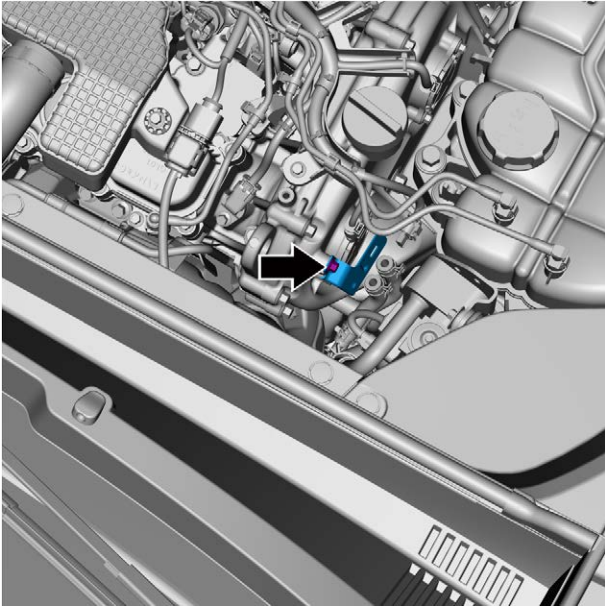
- 1 Install the VVT solenoid coil (exhaust side) and tighten the two fixing bolts 1 of the VVT solenoid coil (exhaust side).

Torque: 10N·m

Caution

Before installing the sensor, dip an oiling stick into an appropriate amount of engine oil and apply it evenly to the chamfer of the sensor mounting hole.

- 2 Connect the harness connector A of the VVT solenoid coil (exhaust side).



- 3 Install the differential filter pressure sensor bracket and tighten the fixing bolts of the differential filter pressure sensor bracket.

Torque: 10N·m

- 4 Install the differential filter pressure sensor.
- 5 Connect the negative cable of battery.
- 6 Use the GLDS diagnostic program. On the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software flash operation.
- 7 Close the engine compartment cover.

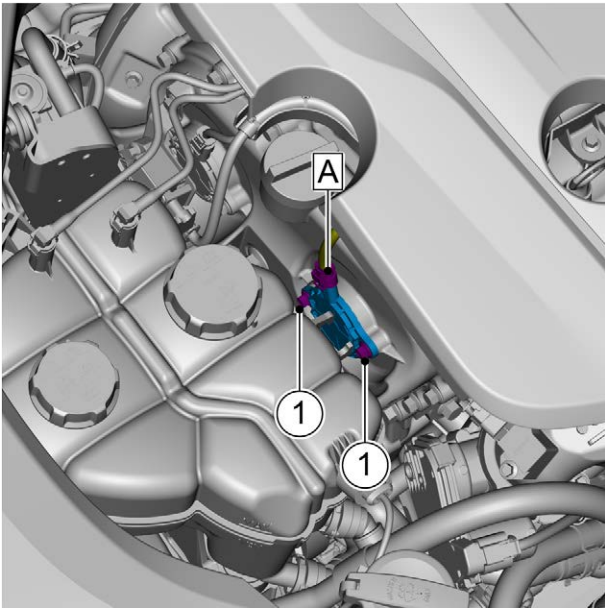
2.2.6.9 Replacement of VVT Solenoid Coil (intake side)

Removal Procedure

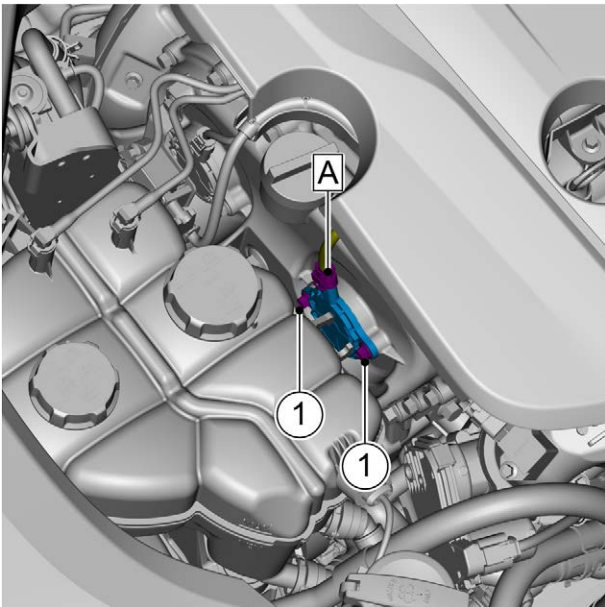
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).



- 3 Disconnect the harness connector A of the VVT solenoid coil (intake side).
- 4 Remove the two fixing bolts 1 of the VVT solenoid coil (intake side) and take off the VVT solenoid coil (intake side).



Installation Procedure

- 1 Install the VVT solenoid coil (intake side) and tighten the two fixing bolts 1 of the VVT solenoid coil (intake side).
Torque: 10N·m

Caution

Parts from the same supplier must be used, mixing of different suppliers is prohibited.

- 2 Connect the harness connector A of the VVT solenoid coil (intake side).

- 3 Connect the negative cable of battery.
- 4 Use the GLDS diagnostic program. On the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software flash operation.
- 5 Close the engine compartment cover.

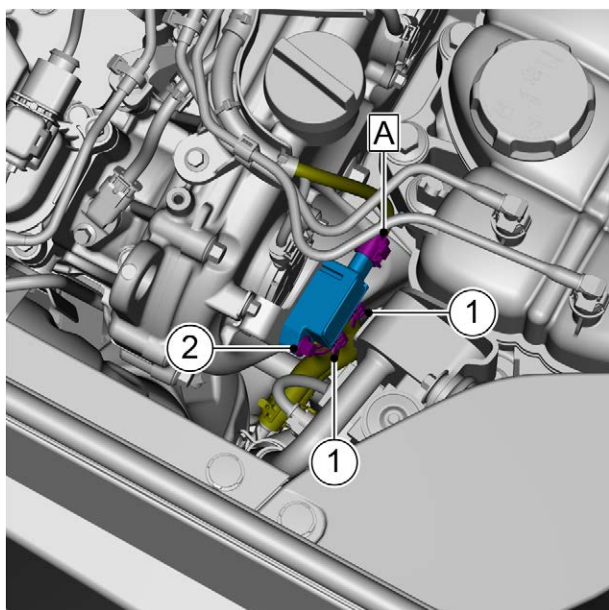
2.2.6.10 Replacement of Differential Pressure Filter Pressure Sensor

Removal Procedure

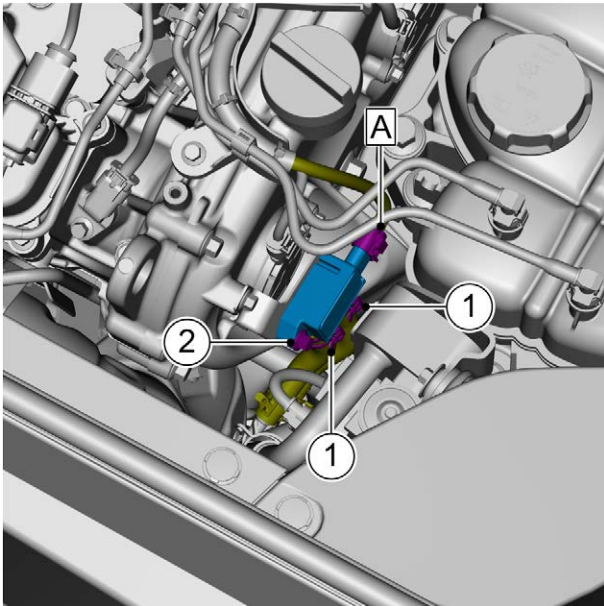
Warning !

Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#).

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the fixing clamp 1 that connects the differential pressure filter pressure sensor to the rubber pipe, and disconnect the rubber pipe that connects the differential pressure filter pressure sensor.
- 4 Disconnect the differential pressure filter pressure sensor harness connector A.
- 5 Remove the fixing bolt 2 of the differential pressure filter pressure sensor and take off the differential pressure filter pressure sensor.



Installation Procedure



- 1 Install the differential filter pressure sensor and tighten the fixing bolts 2 of the differential filter pressure sensor.
Torque: 10N·m

Caution

1. **Electrostatic protection:** storage, transportation and assembly process shall have electrostatic protection measures, prohibit contact with the sensor pins.
 2. Do not allow electrified plugging and unplugging of the sensor connector during the energized operation such as cold or hot testing.
 3. Avoid dropping parts or subjecting them to shocks. Dropped parts must be scrapped.
 4. Insert the high-pressure connector of the differential pressure sensor 2 into the connector of the hose at the high-pressure end of the differential pressure sensor to the end, align the marks.
 5. Apply an appropriate amount of a similar P80 insertion aid to the orifice of the differential pressure sensor before installation, and prohibit the use of oil and other oily substances as insertion aids.
- 2 Connect the differential pressure filter pressure sensor harness connector A.
 - 3 Connect the differential pressure filter pressure sensor to the rubber tube, and install the differential pressure filter pressure sensor to the rubber tub fixing clamp 1.
 - 4 Connect the negative cable of battery.
 - 5 Use the GLDS diagnostic program. On the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software flash operation.
 - 6 Close the engine compartment cover.

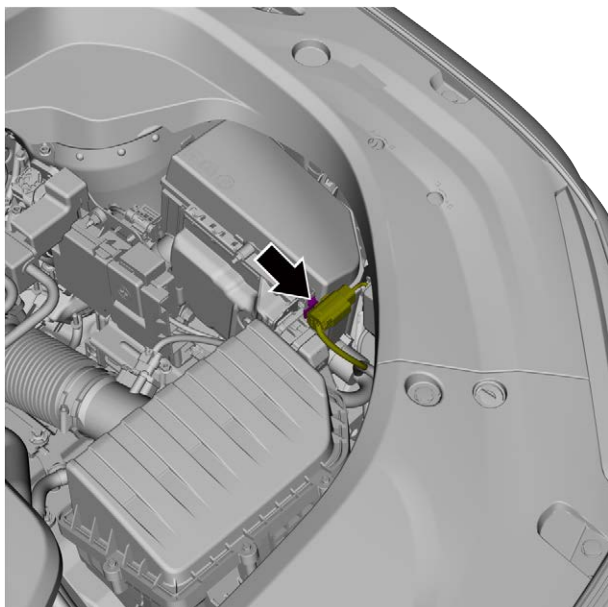
2.2.6.11 Replacement of Engine Control Module

Removal Procedure

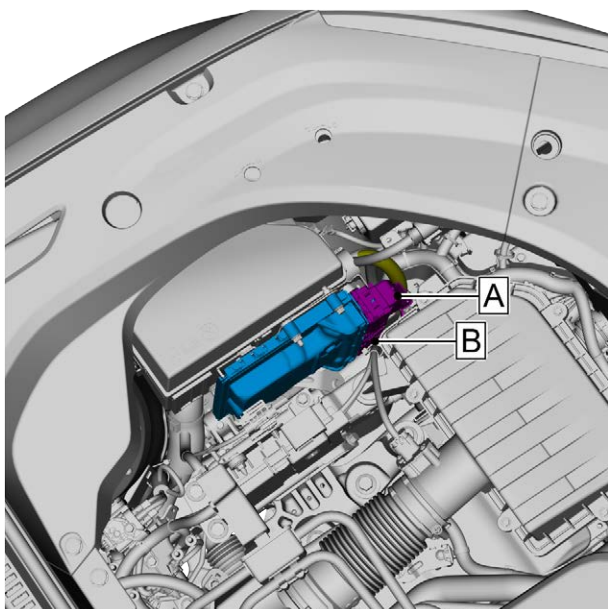
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

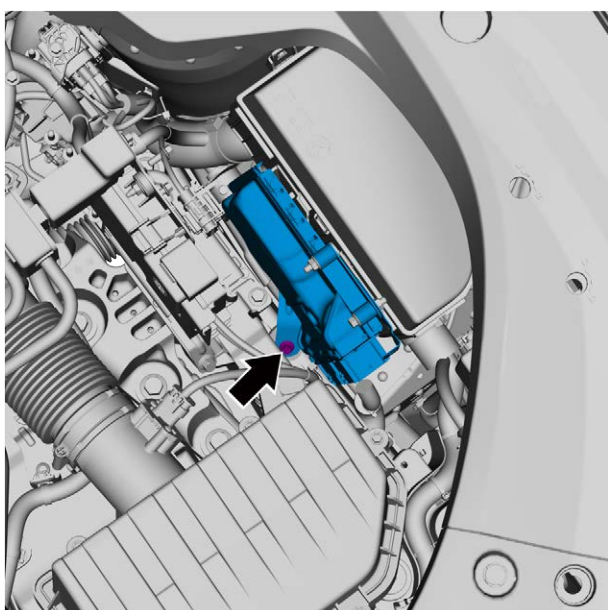
- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).



- 3 Disengage the fixing clips of the front compartment wiring harness.

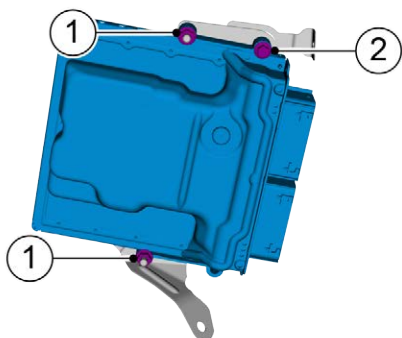


- 4 Disconnect the engine control module harness connector A.
- 5 Disconnect the engine control module harness connector B.



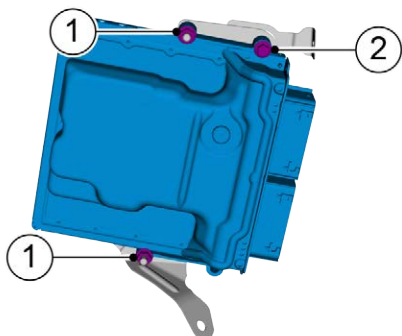
- 6 Remove the fixing bolts of the engine control module bracket, and take off the engine control module and its bracket.

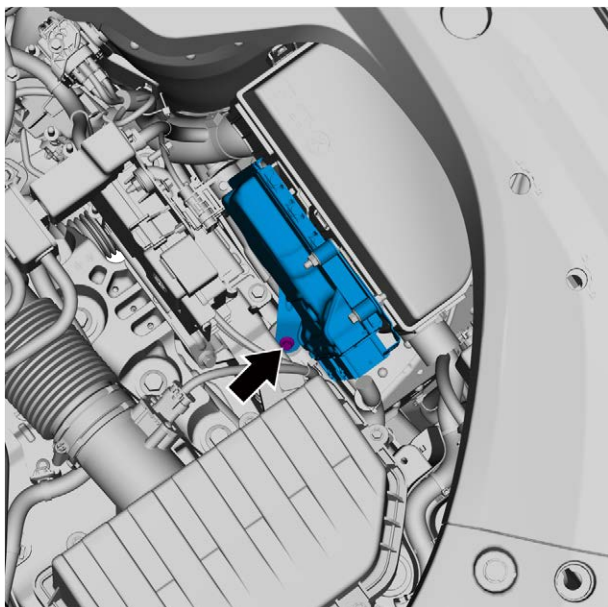
- 7 Remove the two fixing nuts 1 of the engine control module.
- 8 Remove the fixing bolt 2 of the engine control module and take off the engine control module.



Installation Procedure

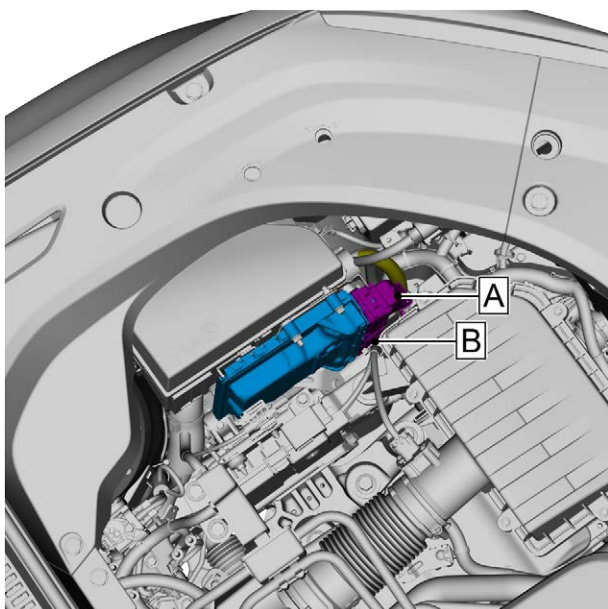
- 1 Install the engine control module and tighten the fixing bolts 2 of the engine control module.
Torque: 10N·m
- 2 Install and tighten the two fixing nuts 1 of the engine control module.
Torque: 10N·m



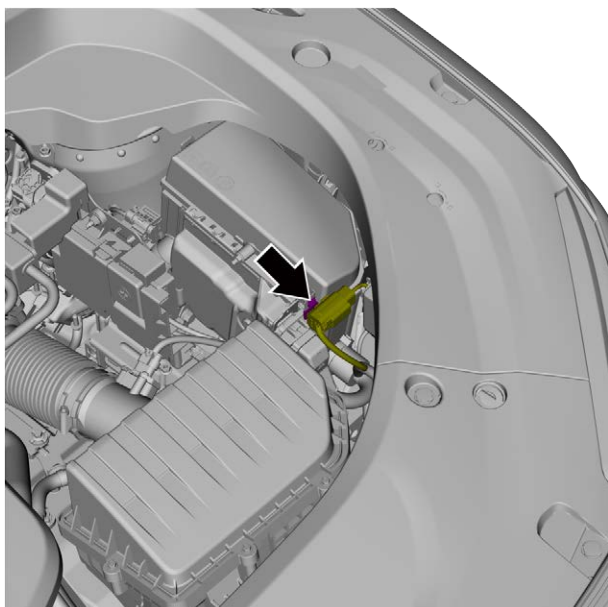


- 3 Install the engine control module and its bracket, and tighten the fixing bolts of the engine control module bracket.

Torque: 10N·m



- 4 Connect the engine control module harness connector B.
- 5 Connect the engine control module harness connector A.



- 6 Install the fixing clips for the front compartment wiring harness.

- 7 Connect the negative cable of battery.
- 8 Use the GLDS diagnostic program. On the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software flash operation.
- 9 Close the engine compartment cover.

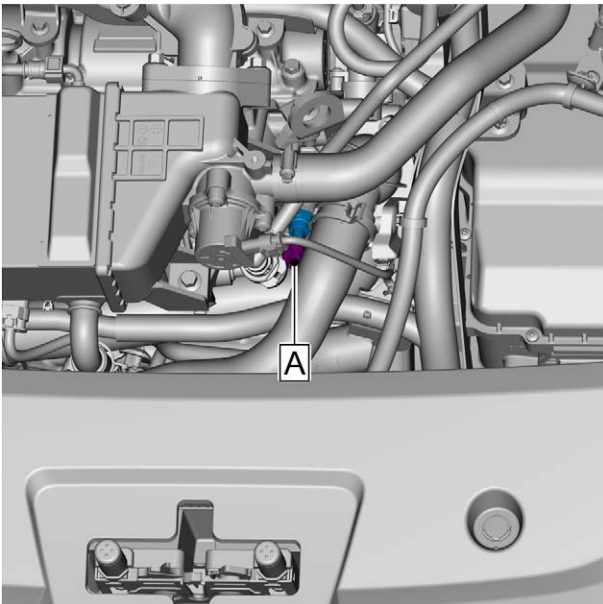
2.2.6.12 Replacement of Air Conditioning Coolant Temperature Sensor (cylinder head)

Removal Procedure

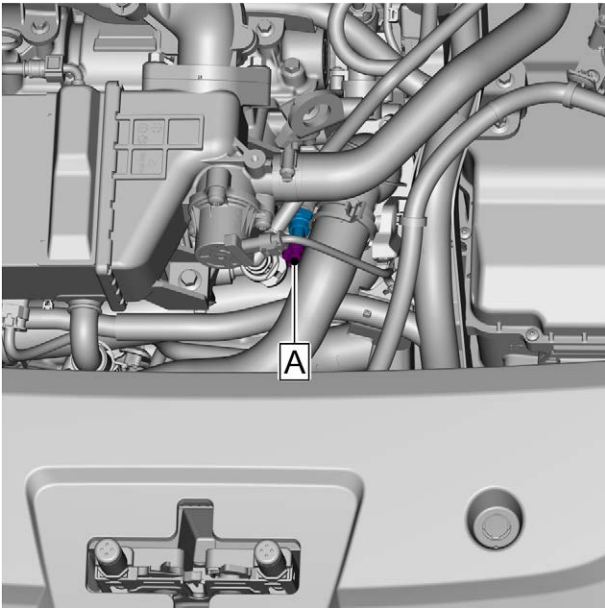
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 4 Remove the air filter assembly, see [Replacement of Air Filter Assembly](#).
- 5 Remove the air filter intake pipe assembly. refer to [Replacement of air filter intake pipe assembly](#).
- 6 Disconnect the harness connector A of the air conditioning coolant temperature sensor (cylinder head), and remove the air conditioning coolant temperature sensor (cylinder head).



Installation Procedure



- 1 Install and fasten the air conditioning coolant temperature sensor (cylinder head).

Torque: 15N·m

Caution

1. It is prohibited to touch the part pins.
 2. Electrical plugging or unplugging of part connectors is not permitted during energizing operations such as cold or hot test.
 3. Avoid dropping parts or subjecting them to shocks. Dropped parts must be scrapped.
 4. If replace the sensor necessarily with a new one, check that there is no obvious deformation or damage on the threads of the installation holes, and then install a new sensor according to the specified torque.
 5. If the sensor is reused, clean the residual glue inside the sensor mounting holes, check that the sensor gasket has no obvious damage and penetrating indentation, and that the sensor and its mounting hole threads have no obvious deformation or damage, and then tighten it in accordance with the specified torque after uniformly applying an appropriate amount of thread sealant on the sensor threads.
- 2 Connect the harness connector A of the air conditioning coolant temperature sensor (cylinder head).
 - 3 Install the air filter intake pipe assembly.
 - 4 Install the air filter assembly.
 - 5 Install the engine trim cover assembly.
 - 6 Connect the negative cable of battery.
 - 7 Use the GLDS diagnostic program. On the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software flash operation.
 - 8 Close the engine compartment cover.

2.2.6.13 Replacement of Air Conditioning Coolant Temperature Sensor (Cylinder Block)

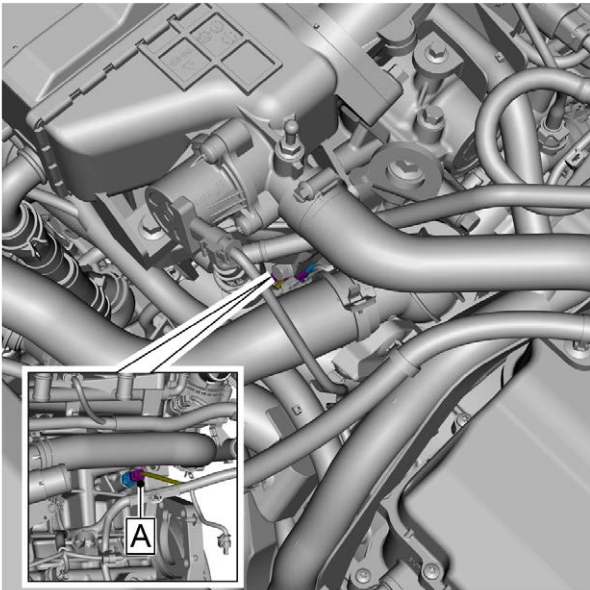
Removal Procedure

Warning !

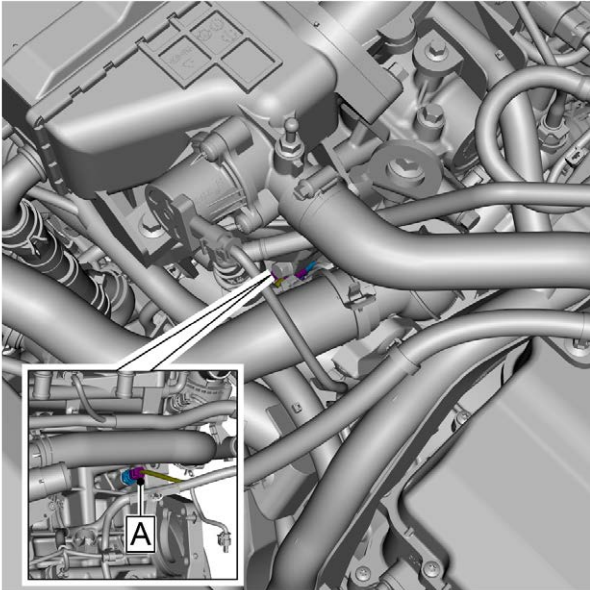
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.

- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 4 Remove the air filter assembly, see [Replacement of Air Filter Assembly](#).
- 5 Remove the air filter intake pipe assembly. refer to [Replacement of air filter intake pipe assembly](#).
- 6 Disconnect the harness connector A of the air conditioning coolant temperature sensor (cylinder block), and remove the air conditioning coolant temperature sensor (cylinder block).



Installation Procedure



- 1 Install and tighten the air conditioning coolant temperature sensor (cylinder block).

Torque: 15N·m

Caution

1. It is prohibited to touch the part pins.
 2. Electrical plugging or unplugging of part connectors is not permitted during energizing operations such as cold or hot test.
 3. Avoid dropping parts or subjecting them to shocks. Dropped parts must be scrapped.
 4. If replace the sensor necessarily with a new one, check that there is no obvious deformation or damage on the threads of the installation holes, and then install a new sensor according to the specified torque.
 5. If the sensor is reused, clean the residual glue inside the sensor mounting holes, check that the sensor gasket has no obvious damage and penetrating indentation, and that the sensor and its mounting hole threads have no obvious deformation or damage, and then tighten it in accordance with the specified torque after uniformly applying an appropriate amount of thread sealant on the sensor threads.
- 2 Connect the harness connector A of the air conditioning coolant temperature sensor (cylinder block).
 - 3 Install the air filter intake pipe assembly.
 - 4 Install the air filter assembly.
 - 5 Install the engine trim cover assembly.
 - 6 Connect the negative cable of battery.
 - 7 Use the GLDS diagnostic program. On the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software flash operation.
 - 8 Close the engine compartment cover.

2.2.6.14 Replacement of Oil Pressure Sensor

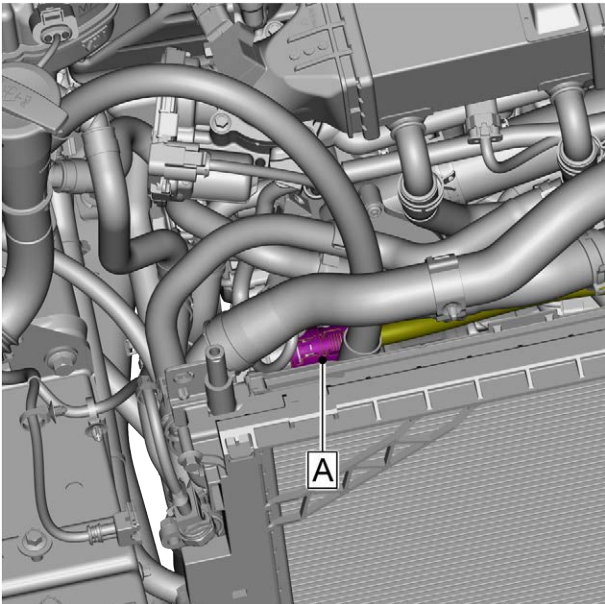
Removal Procedure

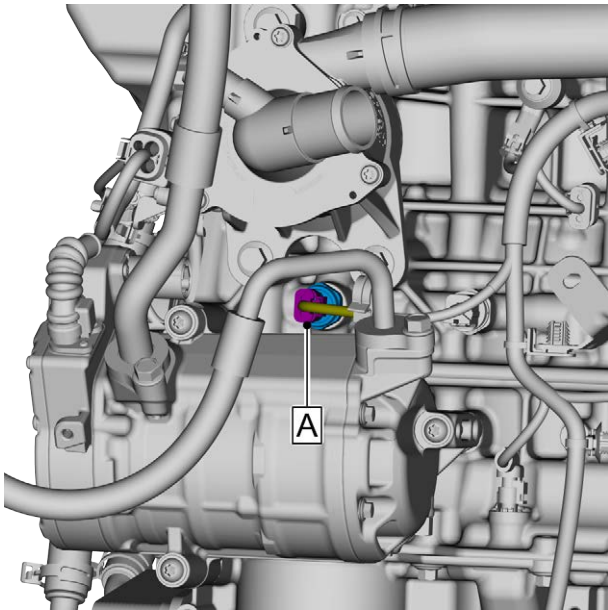
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

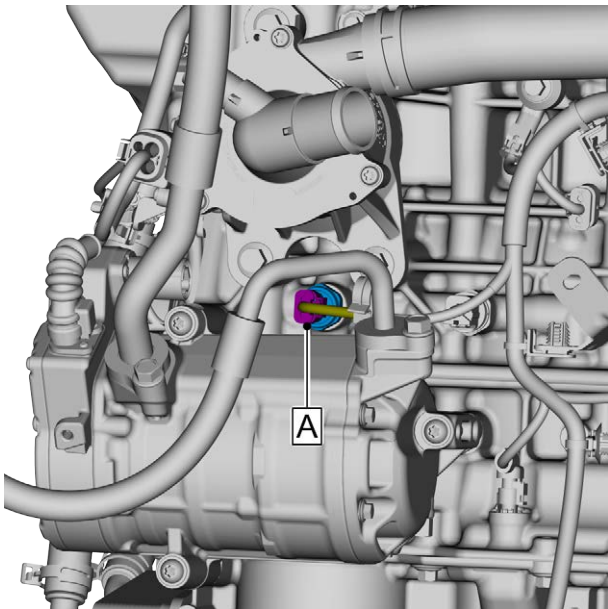
- 1 Open the engine compartment hood.

- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 4 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 5 Perform the normal power outage process for the high voltage system, see [Normal Power Outage Process for High Voltage System](#).
- 6 Remove the air filter assembly, see [Replacement of Air Filter Assembly](#).
- 7 Remove the air filter intake pipe assembly. refer to [Replacement of air filter intake pipe assembly](#).
- 8 Remove the engine cooling fan, see [Replacement of Engine Cooling Fan](#).
- 9 Disconnect the harness connector A of the DC bus assembly.





- 10 Disconnect the oil pressure sensor harness connector A.
- 11 Remove the oil pressure sensor.



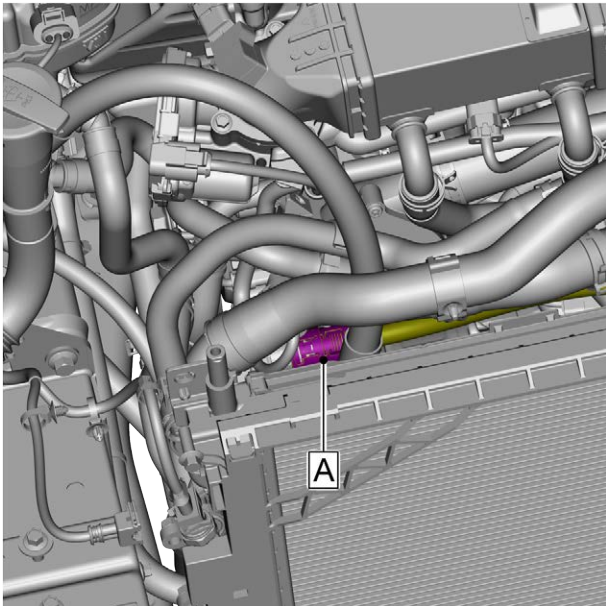
Installation Procedure

- 1 Install and tighten the oil pressure sensor.

Torque: 22 N·m

Caution

1. It is prohibited to touch the part pins.
 2. Electrical plugging or unplugging of part connectors is not permitted during energizing operations such as cold or hot test.
 3. Avoid dropping parts or subjecting them to shocks. Dropped parts must be scrapped.
 4. If replace the sensor necessarily with a new one, check that there is no obvious deformation or damage on the threads of the installation holes, and then install a new sensor according to the specified torque.
 5. If the sensor is reused, clean the residual glue inside the sensor mounting holes, check that the sensor gasket has no obvious damage and penetrating indentation, and that the sensor and its mounting hole threads have no obvious deformation or damage, and then tighten it in accordance with the specified torque after uniformly applying an appropriate amount of thread sealant on the sensor threads.
- 2 Connect the oil pressure sensor harness connector A.



3 Connect the DC bus assembly harness connector A.

- 4 Install the engine cooling fan.
- 5 Install the air filter intake pipe assembly.
- 6 Install the air filter assembly.
- 7 Carry out the normal power-on process of the high voltage system, see [Normal Power-on Process of High Voltage System](#).
- 8 Install the bottom engine guard assembly.
- 9 lower the vehicle.
- 10 Connect the negative cable of battery.
- 11 Use the GLDS diagnostic program. On the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software flash operation.
- 12 Close the engine compartment cover.

2.2.6.15 Replacement of Oil Pressure Alarm

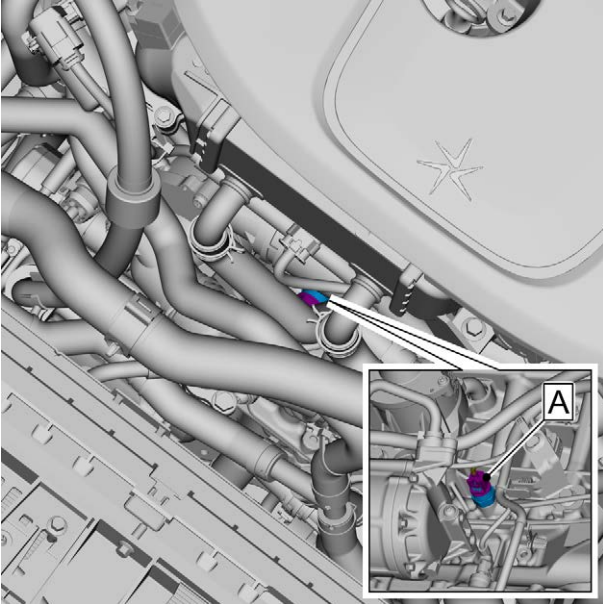
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the air filter assembly, see [Replacement of Air Filter Assembly](#).

- 4 Remove the air filter intake pipe assembly. refer to [Replacement of air filter intake pipe assembly](#).
- 5 Remove the engine cooling fan, see [Replacement of Engine Cooling Fan](#).
- 6 Disconnect the wiring harness connector A of the oil pressure alarm.
- 7 Remove the oil pressure alarm.



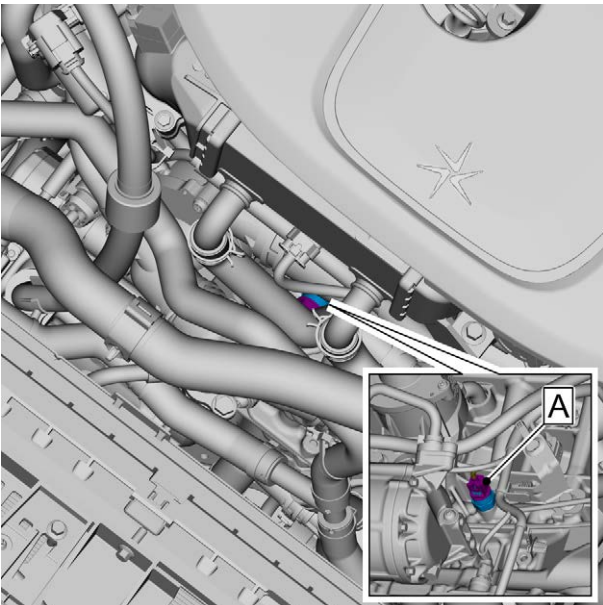
Installation Procedure

- 1 Install and tighten the oil pressure alarm.

Torque: 15.8 N·m

Caution

1. It is prohibited to touch the part pins.
2. Electrical plugging or unplugging of part connectors is not permitted during energizing operations such as cold or hot test.
3. Avoid dropping parts or subjecting them to shocks. Dropped parts must be scrapped.
4. If replace the sensor necessarily with a new one, check that there is no obvious deformation or damage on the threads of the installation holes, and then install a new sensor according to the specified torque.
5. If the sensor is reused, clean the residual glue inside the sensor mounting holes, check that the sensor gasket has no obvious damage and penetrating indentation, and that the sensor and its mounting hole threads have no obvious deformation or damage, and then tighten it in accordance with the specified torque after uniformly applying an appropriate amount of thread sealant on the sensor threads.



- 2 Connect the wiring harness connector A of the oil pressure alarm.
- 3 Install the engine cooling fan.
- 4 Install the air filter intake pipe assembly.
- 5 Install the air filter assembly.
- 6 Connect the negative cable of battery.
- 7 Use the GLDS diagnostic program. On the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software flash operation.
- 8 Close the engine compartment cover.

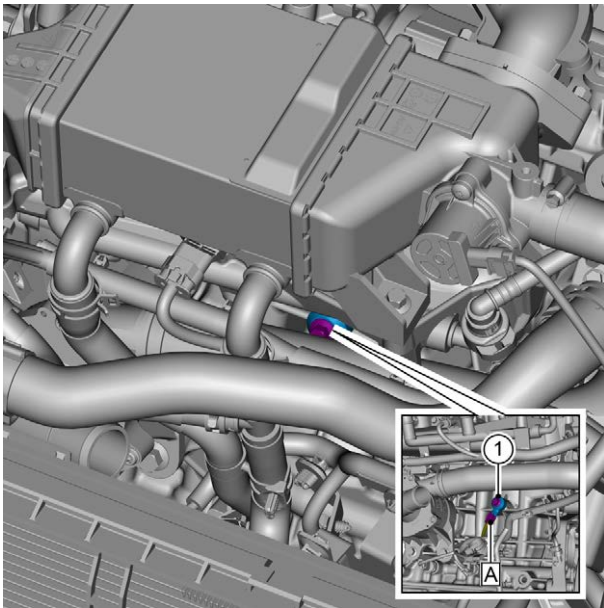
2.2.6.16 Replacement of Knock Sensor

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 4 Remove the air filter assembly, see [Replacement of Air Filter Assembly](#).
- 5 Remove the air filter intake pipe assembly. refer to [Replacement of air filter intake pipe assembly](#).
- 6 Remove the radiator outlet pipe assembly, see [Replacement of Radiator Outlet Pipe Assembly](#).



- 7 Disconnect the knock sensor harness connector A.
- 8 Remove the fixing bolt 1 of the knock sensor, and take off the knock sensor.

Installation Procedure

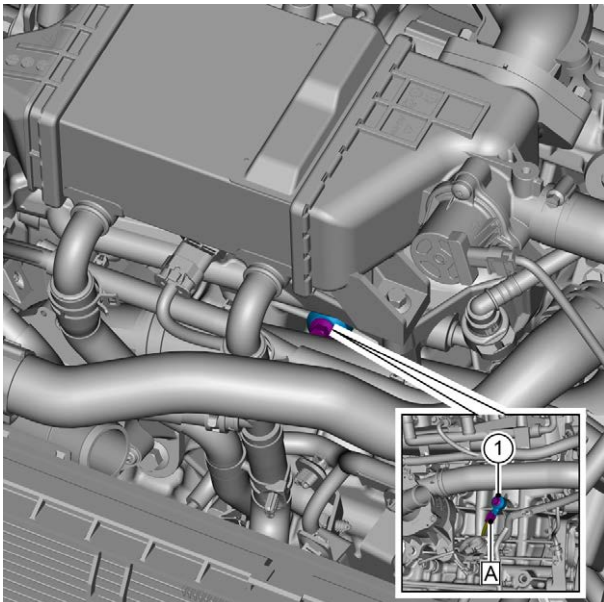
- 1 Install the knock sensor and tighten the fixing bolt 1 of the knock sensor.

Torque: 23N·m

Caution

The angle of the assembled knock sensor plug requires a $17^\circ \pm 5^\circ$ clockwise rotation vertically downward.

- 2 Connect the knock sensor harness connector A.



- 3 Install the radiator outlet pipe assembly.
- 4 Install the air filter intake pipe assembly.
- 5 Install the air filter assembly.
- 6 Install the engine trim cover assembly.
- 7 Connect the negative cable of battery.
- 8 Use the GLDS diagnostic program. On the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software flash operation.
- 9 Close the engine compartment cover.

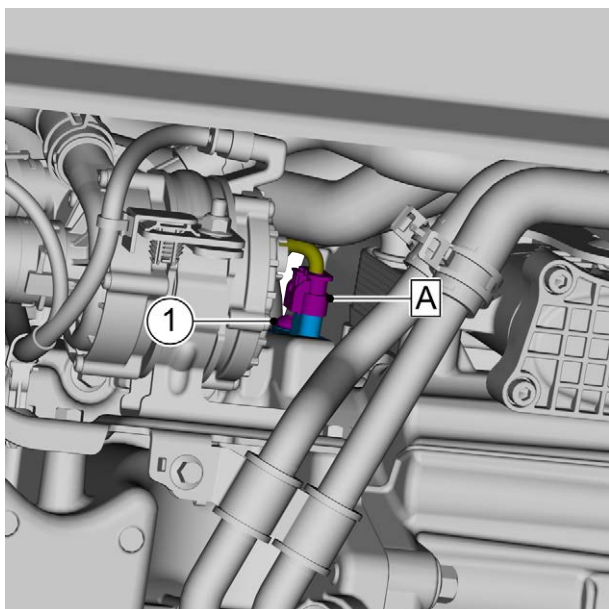
2.2.6.17 Replacement of Crankshaft Position Sensor

Removal Procedure

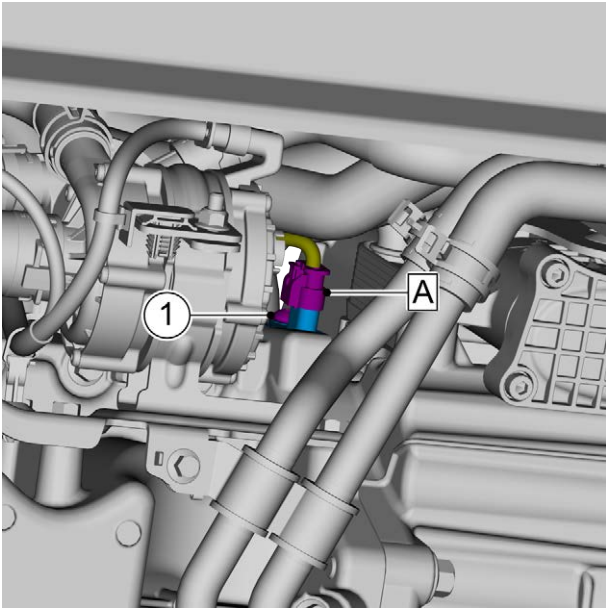
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 4 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 5 Disconnect the crankshaft position sensor harness connector A.
- 6 Remove the fixing bolt 1 of the crankshaft position sensor and take off the crankshaft position sensor.



Installation Procedure



- 1 Install the crankshaft position sensor and tighten the fixing bolt 1 of the crankshaft position sensor.

Torque: 10N·m

Caution

1. Take appropriate amount of lubricating medium and evenly apply it to the chamfered sensor mounting holes or O-ring seals before assembly.
 2. Before assembly, check sealing rings for damage or missing. If any, replace them.
 3. It is prohibited to touch the part pins.
 4. Electrical plugging or unplugging of part connectors is not permitted during energizing operations such as cold or hot test.
 5. Avoid dropping parts or subjecting them to shocks. Dropped parts must be scrapped.
 6. Be sure to install the crankshaft position sensor after the transformer is assembled.
 7. The lubricating medium should be in the appropriate amount to avoid oil stains or seepage.
- 2 Connect the crankshaft position sensor harness connector A.
 - 3 Install the bottom engine guard assembly.
 - 4 lower the vehicle.
 - 5 Connect the negative cable of battery.
 - 6 Use the GLDS diagnostic program. On the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software flash operation.
 - 7 Close the engine compartment cover.

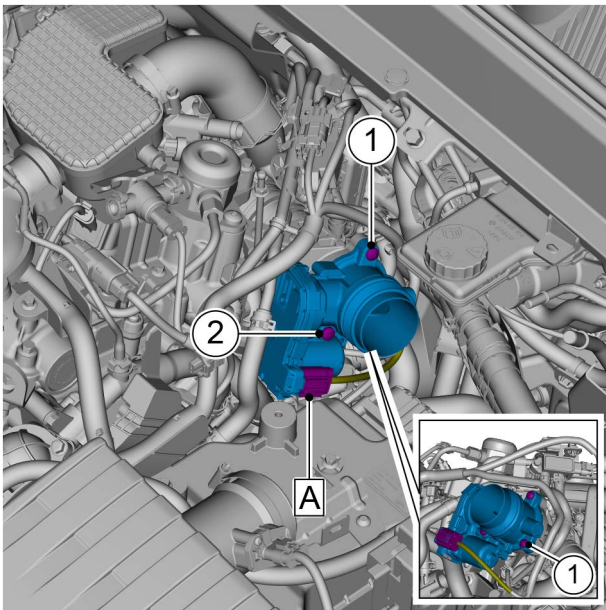
2.2.6.18 Replacement of Pressure Regulating Valve

Removal Procedure

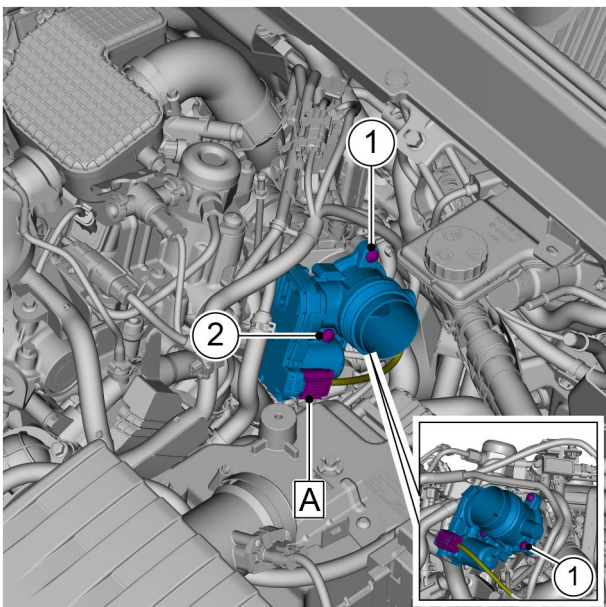
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).



- 4 Remove the resonator assembly, see [Replacement of Resonator Assembly](#).
- 5 Disconnect the harness connector A of the pressure regulating valve.
- 6 Remove the two fixing bolts 1 of the pressure regulating valve.
- 7 Remove the fixing bolt 2 of the pressure regulating valve, and take off the pressure regulating valve.



Installation Procedure

- 1 Install the pressure regulating valve and tighten the fixing bolts 2 of the pressure regulating valve.

Torque: 10N·m

Caution

Check the rubber sealing ring for detachment/foreign object attachment to ensure sealing.

- 2 Install and tighten the two fixing bolts 1 of the pressure regulating valve.

Torque: 10N·m

- 3 Connect the harness connector A of the pressure regulating valve.

- 4 Install the resonator assembly.
- 5 Install the engine trim cover assembly.
- 6 Connect the negative cable of battery.
- 7 Use the GLDS diagnostic program. On the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software flash operation.
- 8 Close the engine compartment cover.

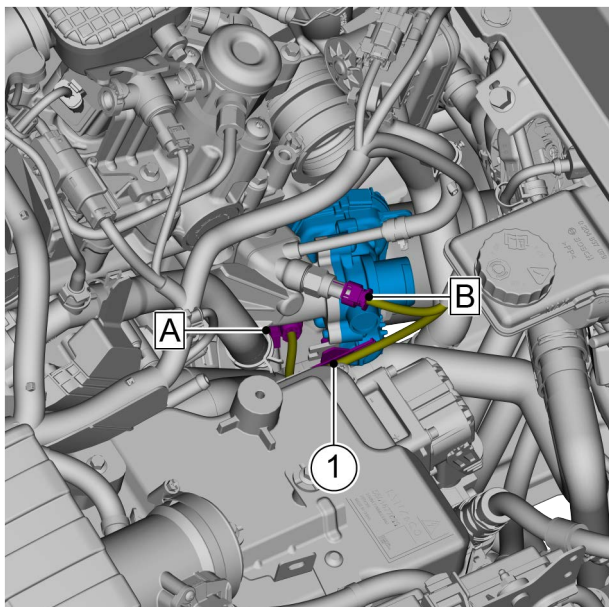
2.2.6.19 Replacement of EGR Valve

Removal Procedure

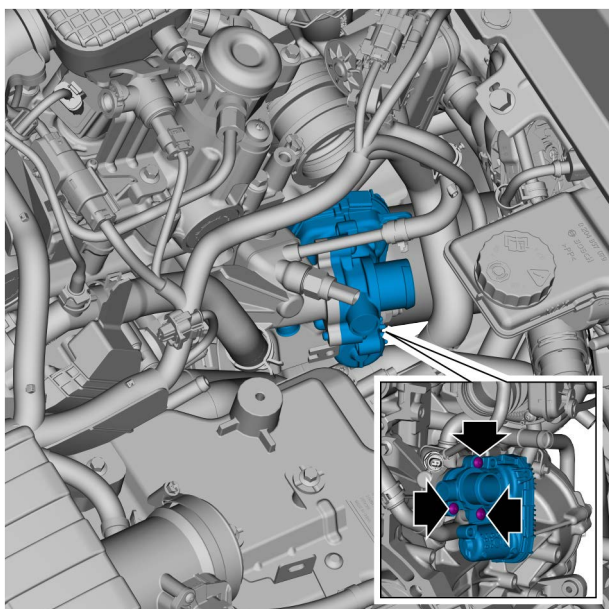
Warning !

Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#).

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 4 Remove the resonator assembly, see [Replacement of Resonator Assembly](#).
- 5 Remove the pressure regulating valve, , see [Replacement of Pressure Regulating Valve](#).
- 6 Remove the intake tube, see [Replacement of Intake Tube](#).

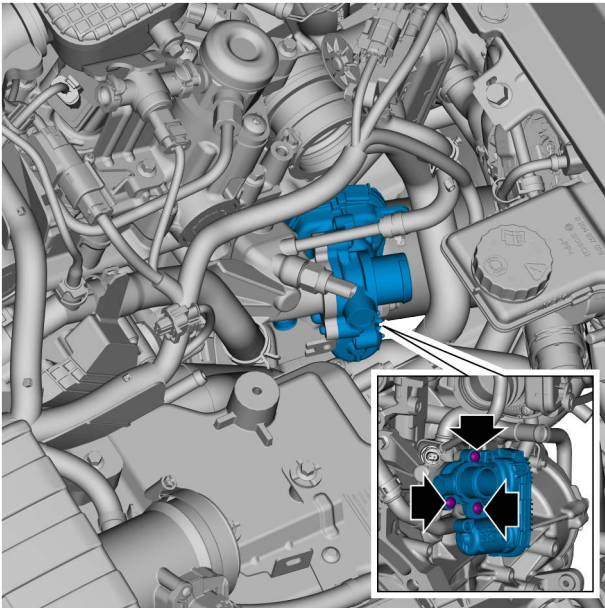


- 7 Disconnect the harness connector A of the EGR valve.
- 8 Disconnect the harness connector B of the EGR temperature sensor.
- 9 Remove the fixing clip 1 of the engine harness connector.



- 10 Remove the three fixing screws of the EGR valve, and take off the EGR valve.

Installation Procedure

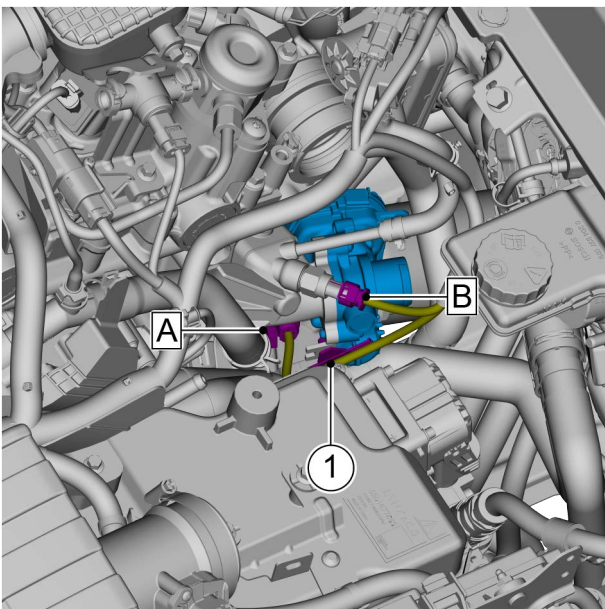


- 1 Install the EGR valve, and tighten the three fixing screws of the EGR valve.

Torque: 10N·m

Caution

Before assembly, take care to check the rubber sealing ring for any detachment/foreign object attachment to ensure sealing.



- 2 Install the fixing clip 1 of the engine harness connector.
- 3 Connect the harness connector B of the EGR temperature sensor.
- 4 Connect the harness connector A of the EGR valve.

- 5 Install the intake tube.
- 6 Install the pressure regulating valve.
- 7 Install the resonator assembly.
- 8 Install the engine trim cover assembly.
- 9 Connect the negative cable of battery.
- 10 Use the GLDS diagnostic program. On the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software flash operation.
- 11 Close the engine compartment cover.

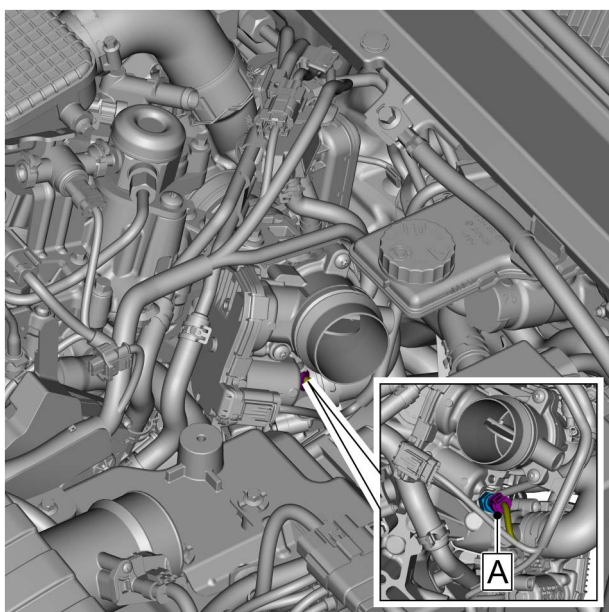
2.2.6.20 Replacement of EGR Temperature Sensor

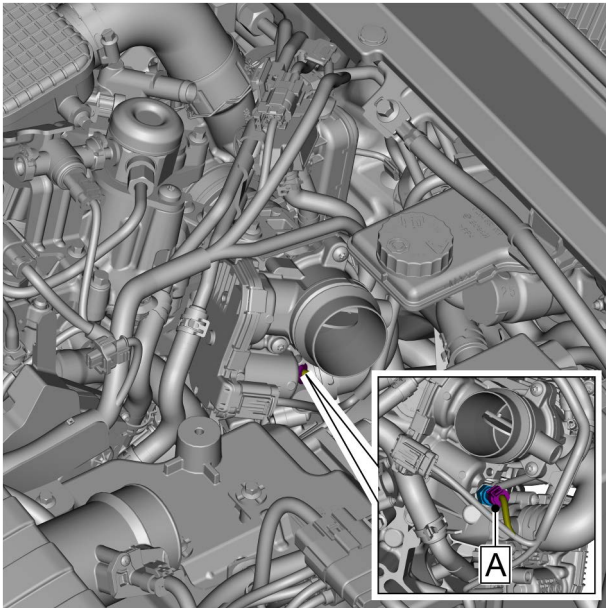
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 4 Remove the resonator assembly, see [Replacement of Resonator Assembly](#).
- 5 Disconnect the harness connector A of THE EGR temperature sensor and remove the EGR temperature sensor.

**Installation Procedure**



- 1 Install the EGR temperature sensor and connect the harness connector A of the EGR temperature sensor.

Torque: 25N·m

Caution

1. It is prohibited to touch the part pins.
 2. Electrical plugging or unplugging of part connectors is not permitted during energizing operations such as cold or hot test.
 3. Avoid dropping parts or subjecting them to shocks. Dropped parts must be scrapped.
 4. If replace the sensor necessarily with a new one, check that there is no obvious deformation or damage on the threads of the installation holes, and then install a new sensor according to the specified torque.
 5. If the sensor is reused, clean the residual glue inside the sensor mounting holes, check that the sensor gasket has no obvious damage and penetrating indentation, and that the sensor and its mounting hole threads have no obvious deformation or damage, and then tighten it in accordance with the specified torque after uniformly applying an appropriate amount of thread sealant on the sensor threads.
- 2 Install the resonator assembly.
 - 3 Install the engine trim cover assembly.
 - 4 Connect the negative cable of battery.
 - 5 Use the GLDS diagnostic program. On the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software flash operation.
 - 6 Close the engine compartment cover.

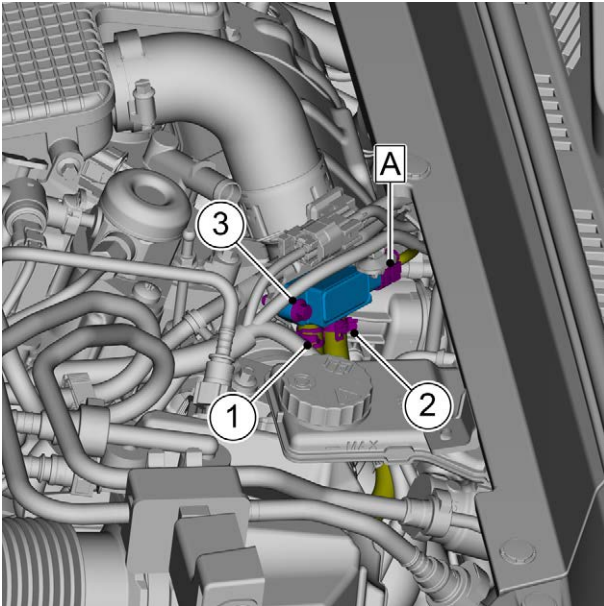
2.2.6.21 Replacement of EGR Differential Pressure Sensor

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).



- 3 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 4 Disconnect the harness connector A of the EGR differential pressure sensor.
- 5 Disconnect the high pressure end hose of the EGR differential pressure sensor from the EGR differential pressure sensor by removing the fixing clamp 1 from the high pressure end hose of the EGR differential pressure sensor.
- 6 Remove the fixing clamp 2 from the low pressure end hose of the EGR differential pressure sensor and disengage the low pressure end hose of the EGR differential pressure sensor from the EGR differential pressure sensor.
- 7 Remove the fixing bolt 3 of the EGR differential pressure sensor and take off the EGR differential pressure sensor.

Installation Procedure

- 1 Install the EGR differential pressure sensor and tighten the fixing bolts 3 of the EGR differential pressure sensor.
Torque: 10N·m

Caution

1. Storage, transportation and assembly processes must be protected against static electricity and touching the sensor pins is prohibited.

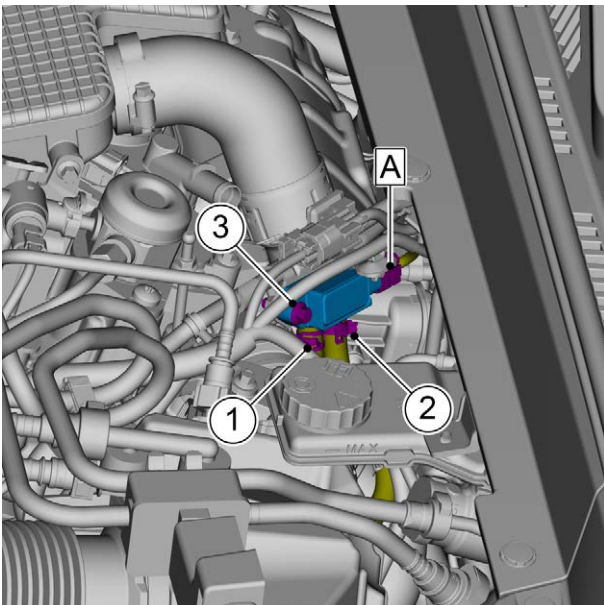
2. Do not allow electrified plugging and unplugging of the sensor connector during the energized operation such as cold or hot testing.

- 2 Connect the low pressure end hose of the EGR differential pressure sensor to the EGR differential pressure sensor, and install the fixing clamp 2 for the low pressure end hose of the EGR differential pressure sensor.

Caution

1. Apply an appropriate amount of P80-like insertion aid to the pipe orifice.

2. Do not use motor oil or other oils as an insertion aid.



- 3 Connect the high pressure end hose of the EGR differential pressure sensor to the EGR differential pressure sensor and install the fixing clamp 1 for the high-pressure end hose of the EGR differential pressure sensor.

Caution

1. Apply an appropriate amount of P80-like insertion aid to the pipe orifice.
 2. Do not use motor oil or other oils as an insertion aid.
- 4 Connect the harness connector A of the EGR differential pressure sensor.
 - 5 Install the engine trim cover assembly.
 - 6 Connect the negative cable of battery.
 - 7 Use the GLDS diagnostic program. On the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software flash operation.
 - 8 Close the engine compartment cover.

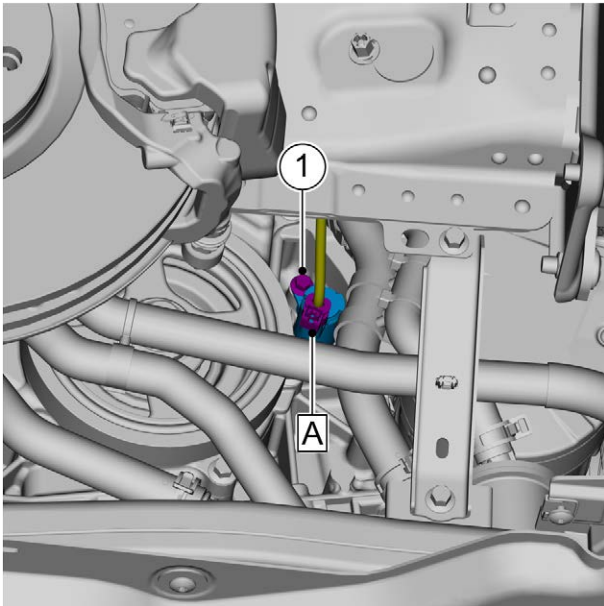
2.2.6.22 Replacement of Piston Cooling Solenoid

Removal Procedure

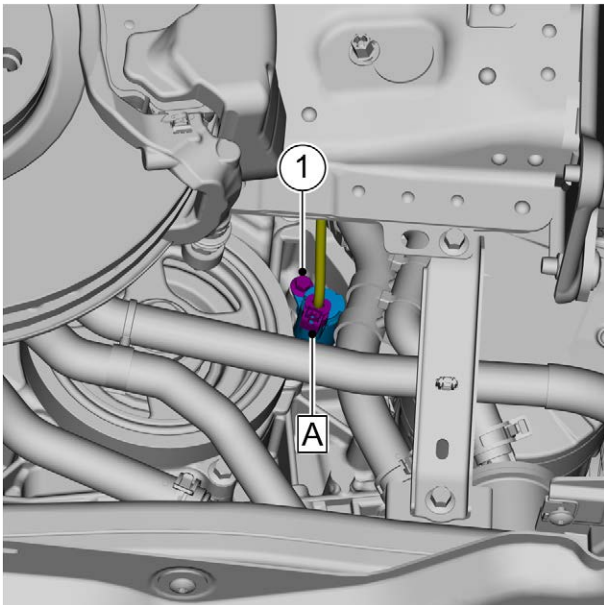
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the front right wheel cover fender assembly, see [Replacement of Front Left Wheel Cover Fender Assembly](#)



- 4 Disconnect the harness connector A of the piston cooling solenoid.
- 5 Remove the fixing bolt 1 of the piston cooling solenoid and take off the piston cooling solenoid.



Installation Procedure

- 1 Install the piston cooling solenoid and tighten the fixing bolt 1 of the piston cooling solenoid.

Torque: 10N·m

Caution

1. Take appropriate amount of lubricating medium and evenly apply it to the chamfered sensor mounting holes or O-ring seals before assembly.
 2. Before assembly, check sealing rings for damage or missing. If any, replace them.
 3. It is prohibited to touch the part pins.
 4. Electrical plugging or unplugging of part connectors is not permitted during energizing operations such as cold or hot test.
 5. Avoid dropping parts or subjecting them to shocks. Dropped parts must be scrapped.
 6. The lubricating medium should be in the appropriate amount to avoid oil stains or seepage.
- 2 Connect the harness connector A of the piston cooling solenoid.
 - 3 Install the front right wheel cover fender assembly.
 - 4 Connect the negative cable of battery.
 - 5 Use the GLDS diagnostic program. On the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software flash operation.
 - 6 Close the engine compartment cover.

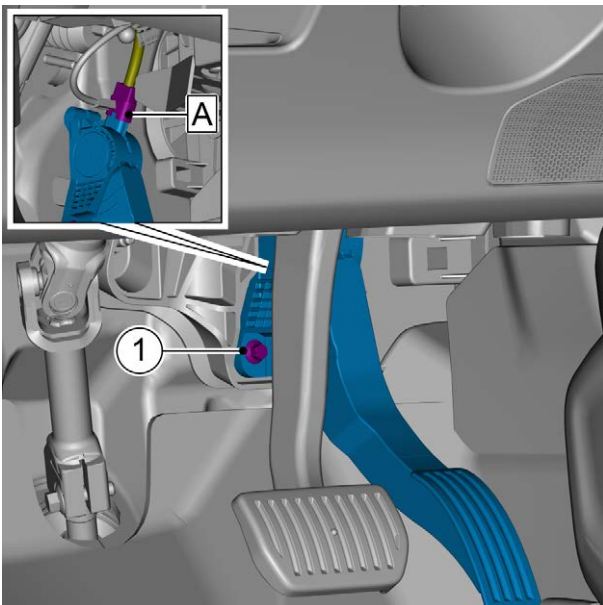
2.2.6.23 Replacement of Accelerator Pedal Sensor

Removal Procedure

Warning !

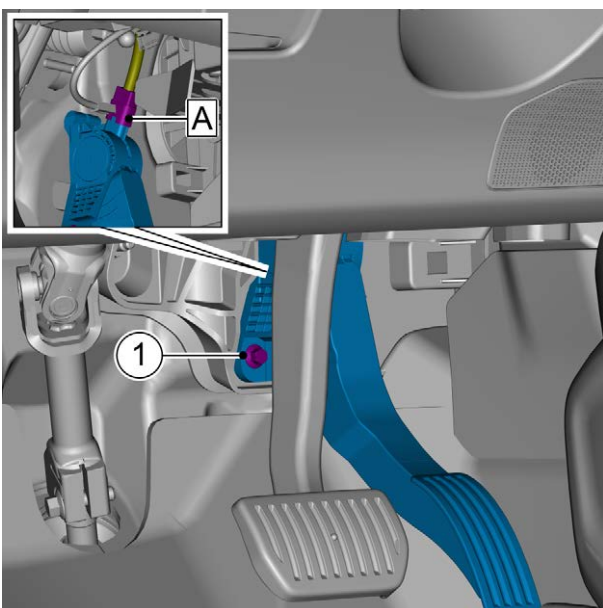
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left lower toe board assembly, refer to [Replacement of left lower toe board assembly](#).
- 3 Disconnect the harness connector A of the accelerator pedal sensor.
- 4 Remove the fixing bolt 1 of the accelerator pedal sensor and take off the accelerator pedal sensor.



Installation Procedure

- 1 Install the accelerator pedal sensor, and install and tighten the fixing bolt 1 of the accelerator pedal sensor.
Torque: 10 N·m
- 2 Connect the harness connector A of the accelerator pedal sensor.



- 3 Install the left lower toe board assembly.

- 4 Connect the negative cable of battery.
- 5 Use the GLDS diagnostic program. On the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software flash operation.

2.3 Fuel system (DHE15-ESZ)

2.3.1 Specification

2.3.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
High-pressure oil pipe	-	Pre-tightening 12~18
		Final tightening 22~28
Fixing bolt between high pressure fuel pump and camshaft bearing cover	M8×22	21-25
Fixing bolt between fuel rail injector subassembly and camshaft bearing cover	M8×35	21-25
	M6×16	8.5-11.5
Fuel tank strap to body	M8×45c	25-35
Fixing bolt between fuel tank filler pipe and vehicle body	M6×16	8.5-11.5
Fixing bolt between fuel tank isolation valve and fuel tank	M6×20	8.5-11.5

2.3.1.2 Specification for Fuel Tank

Item	Parameter
Model of fuel tank	P60H
Fuel type	Gasoline
Capacity	60 L
Ground clearance when fuel tank is empty	256.7mm

2.3.1.3 Specification for Fuel Rail Injector Subassembly

Data	Low value	Regular value	High value	Remarks
Operating temperature of injector	-40°C	-	130°C	-
Fuel temperature	-40°C	-	120°C	-
Storage temperature	5°C	-	40°C	-
Resistance	-	1.83Ω ± 5%	-	Room temperature

2.3.2 Instructions and operations

2.3.2.1 Instructions and operations

Fuel Tank

The fuel tank is made of high density polypropylene and other materials. It is held in place by 2 metal hoops attached to the bottom of the body. It also has a fuel vapor venting valve with rollover protection.

High Pressure Fuel system

The fuel system feeds fuel from the fuel tank to the engine, the high pressure fuel pump provides high oil pressure to the fuel injector assembly, and the fuel rail delivers fuel to each injector. The injectors are controlled to open by an electrical signal output from the ECM and inject fuel into the cylinder for combustion in a set spray pattern. The amount of fuel injected is adjusted according to the air pressure in the intake manifold.

Caution

A fuel control valve is a part of high pressure fuel pump and is not allowed to be replaced separately. The fuel control valve will be damaged if it is continuously energized for more than 3 s. So any external power supply cannot be connected to the fuel control valve.

Fuel Rail

To provide sufficient and enclosed fuel tanks to suppress the pulsation of oil pressure in the fuel supply system;

To ensure that sufficient and pressure-stabilized fuel is supplied to all fuel injectors.

To inject fuel according to the signal input from the ECM.

Fuel pressure sensor

The Fuel pressure sensor is located on the high-pressure fuel rail pipe and directly measures the fuel pressure value in the high-pressure fuel supply system. Closed-loop control of fuel pressure can be realized through a fuel pressure sensor. The ECM calculates the theoretically required rail pressure according to the signals input from relevant sensors under the current operating conditions of the engine, realizes the rail pressure control by adjusting the fuel control valve of the high pressure fuel pump, and relies on the fuel pressure sensor to detect the current actual rail pressure, corrects it in comparison with the theoretical rail pressure, and realizes a closed-loop control.

Fuel Injector

The fuel injector is mainly used to inject fuel into the engine combustion chamber. The timing and duration of the fuel injection is controlled by the engine control module (ECM). Fuel is

injected into the combustion chamber at a precise injection angle with high-pressure injectors for direct injection from United Automotive Electronics Co., Ltd.

Fuel Pump

A fuel pump is mainly used to pump fuel from a fuel tank into a fuel line.

Secondary Liquid Level Sensor

A secondary level sensor consists of a fuel level float and a sensor resistor, and is mainly used to assist the fuel pump in measuring the fuel level.

Refueling

Fuel is injected into the fuel tank through the refueling tube at the fuel tank cap. The fuel cap motor locks and unlocks the fuel cap under the control of the right front door module. If fuel spills out of the refueling device during refueling, the fuel drain hose from the refueling port module can be used. The fuel tank stores the fuel required by the engine. Depending on the model, the fuel tank has different capacities and shapes. When the fuel tank is filled, the high-pressure steam in the tank is evacuated back to the refueling device through a separate fuel hose.

Fuel Distribution System

The fuel distribution system is used to ensure that the engine receives an appropriate amount of fuel at the correct time and pressure.

Fuel Pump Module

The fuel pump module delivers fuel from the fuel tank to the injection pump through the fuel line. The fuel pump module is controlled by the fuel pump control module. The fuel level sensor sends a signal to the instrument park (IPK) control unit indicating the amount of fuel remaining in the fuel tank. When the engine is running, fuel is pumped through the fuel line to the fuel filter to remove contaminants. After that, fuel flows down the fuel line to the front of the vehicle, through the low pressure side of the fuel pressure sensor and finally to the injection pump.

Fuel Pump Control Module

Average Fuel Consumption = Accumulated Fuel Consumption After Resetting/ Accumulated Mileage After Resetting

The fuel pump control module controls the fuel pump as well as the output flow and pressure based on the pulse width modulation signals transmitted by the engine control module (ECM). The engine control module calculates the estimated fuel consumption and inputs the signals from the fuel pressure sensor on the high pressure side to the fuel pump control module.

Evaporative Emission System (EVAP)

The evaporative emissions system (EVAP) is an integral part of the fuel system and is used to prevent fuel vapor from exhausting into the surrounding air. The fuel vapor spilled from the fuel tank must not be discharged to the atmosphere. It must be sent through an activated carbon canister into the intake manifold. The fuel vapor will be burned in the engine.

2.3.3 System working principles

2.3.3.1 System working principles

The fuel system feeds fuel from the fuel tank to the engine. The high pressure fuel pump provides high fuel pressure to the fuel rail. If the rail pressure exceeds the opening pressure of the safety valve in the high-pressure fuel pump, the safety valve in the high-pressure fuel pump will open and introduce fuel to the low-pressure side. The fuel rail delivers fuel to the injectors. The injectors inject fuel directly into the cylinder. This process is called an in-cylinder injection. Advantages of in-cylinder injection include low fuel consumption, low emissions and high output power. Each cylinder is equipped with an injector. The injector solenoid coil is energized to produce a magnetic force that attracts the armature to lift the needle valve, causing pressurized fuel in the fuel rail to be injected through the nozzle. The nozzle injects fuel into the cylinder in a fine spray with the correct timing and sequence. The injector nozzle opens or closes according to the requirements of the engine control module. The amount of fuel injected into the cylinder by the injector nozzles is controlled by injector pulses. The engine control module controls the amount of fuel, i. e. pulse width, and determines the correct amount of fuel based on the information provided by the each sensor.

Starting Mode

When the start switch enters the starting power mode, the engine control module turns on the fuel pump relay. The fuel pump then establishes fuel pressure. The engine control module also checks the engine coolant temperature sensor and throttle unit position sensors and determines the most appropriate air-fuel ratio to start the engine. The engine control module controls the amount of fuel supplied for the starting mode by varying the length of time the fuel injector assembly is on and off. This is accomplished by controlling the fuel injector assembly in a pulsating manner of very short duration.

Acceleration Mode

The engine control module responds to rapid changes in throttle unit position and intake manifold pressure and provides additional fuel.

Deceleration Mode

The engine control module responds to changes in throttle unit position and intake manifold pressure and reduces the amount of fuel supplied. When decelerating quickly, the engine control module completely cuts off fuel for a short period of time.

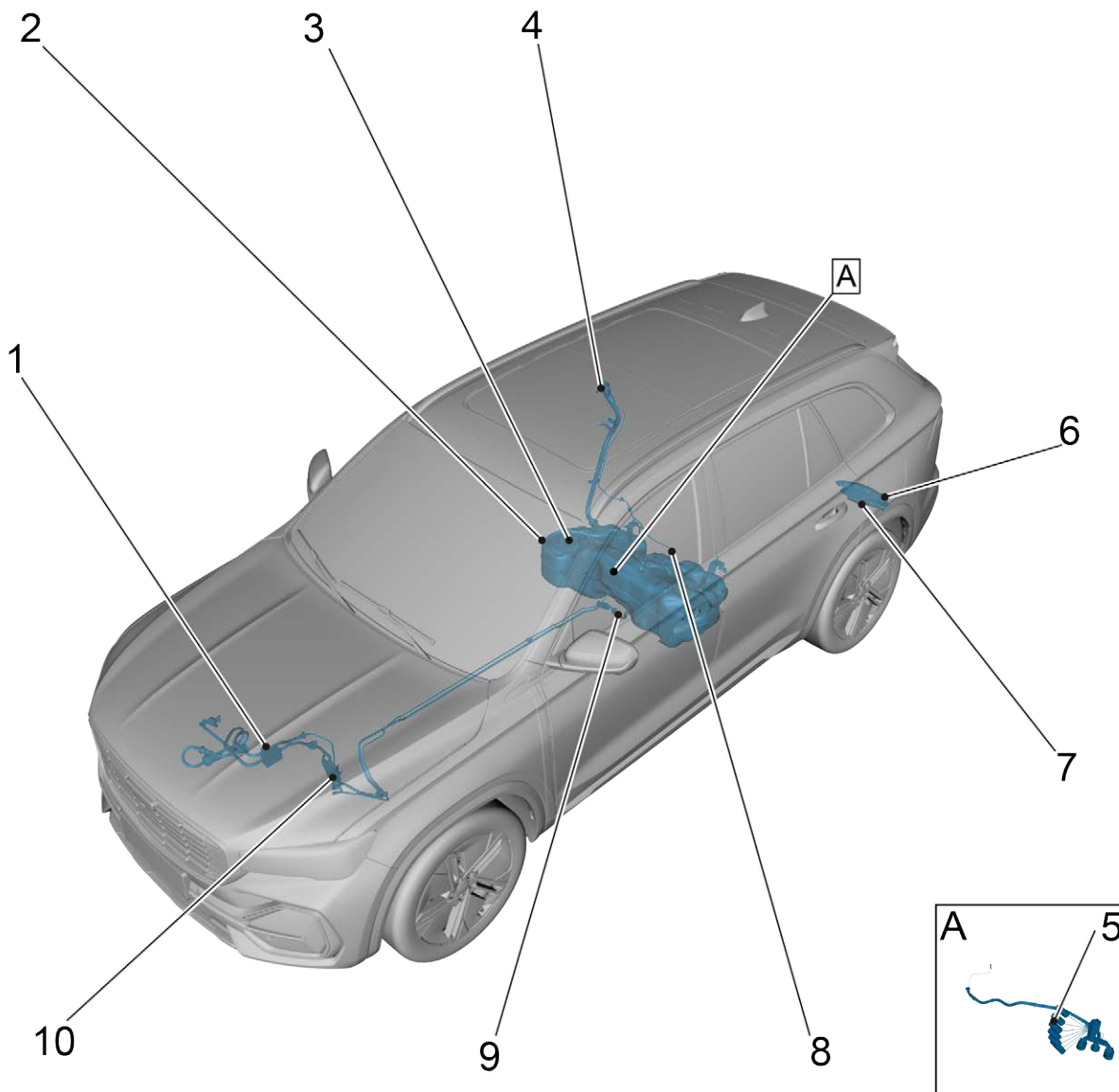
Fuel Cutoff Mode

When the start switch is OFF, the fuel injector assembly does not supply fuel. This prevents the engine from renewing

combustion or failing to stall. In addition, if a reference pulse from the electrical center is not received, fuel is not supplied, thus preventing oil spillage.

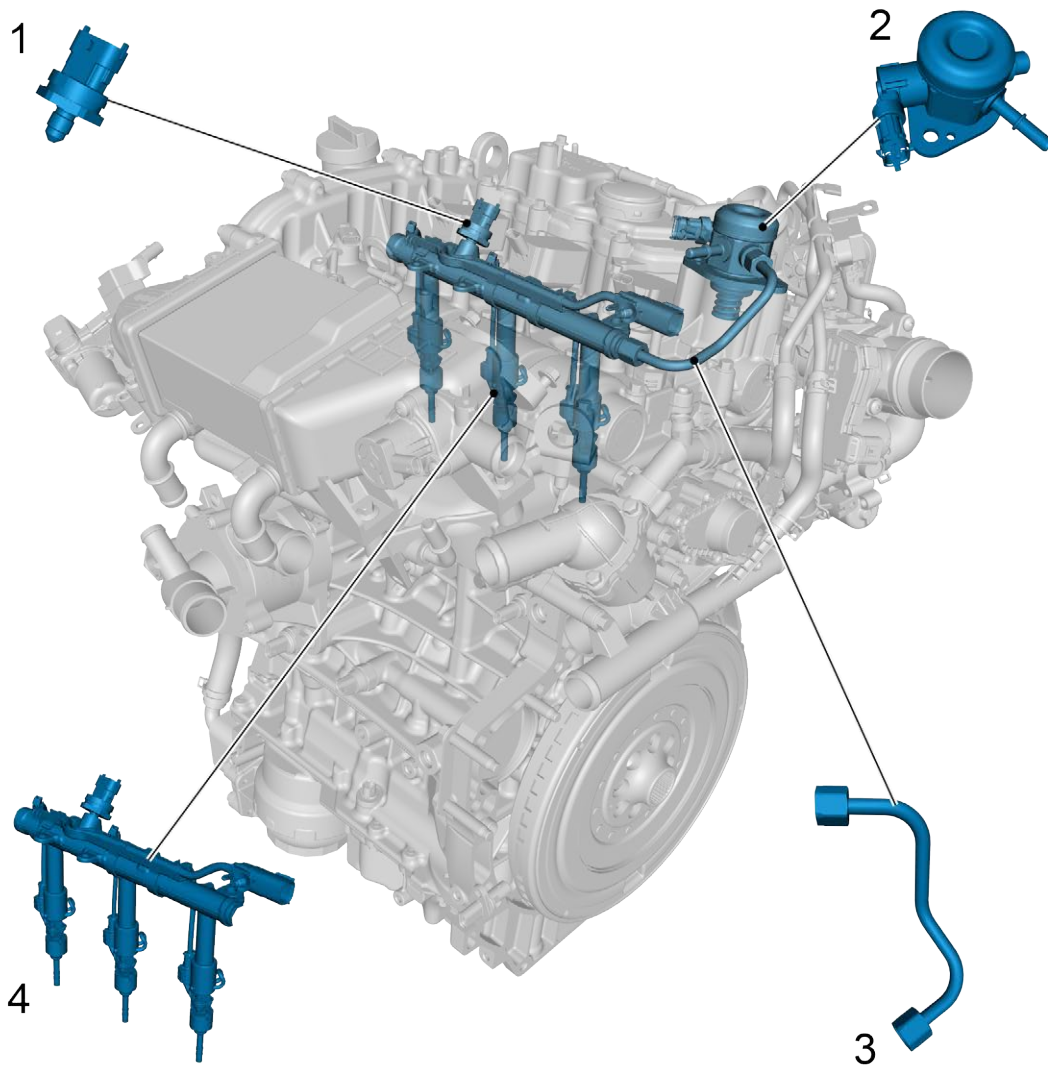
2.3.4 Part position

2.3.4.1 Low Pressure Fuel system Parts Location Diagram



- | | |
|---|--|
| 1. Carbon canister solenoid valve with piping | 6. Ash filter assembly |
| 2. Fuel tank body | 7. Leakage detection pump Charcoal tank solenoid valve |
| 3. Fuel Pump | 8. Leak diagnostic line |
| 4. Fuel tank filler tube | 9. Canister desorption pipe |
| 5. Secondary Liquid Level Sensor | 10. Lower floor fuel supply line assembly |

2.3.4.2 High Pressure Fuel System - Part Location Diagram

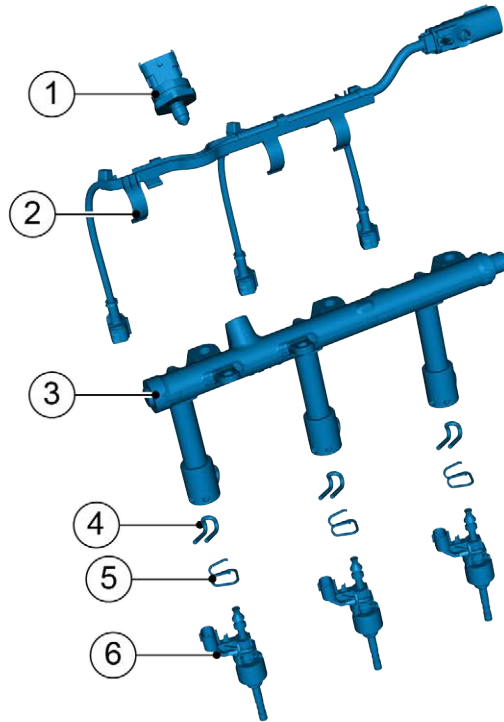


1. Fuel pressure sensor
2. High pressure fuel pump

3. High-pressure oil pipe
4. Fuel injector components

2.3.5 Breakdown drawing

2.3.5.1 Fuel injector components



1. Fuel pressure sensor
2. Injector harness
3. Fuel rail assembly

4. U-card
5. Clamp ring
6. Fuel Injector

2.3.6 Diagnostic Information and Procedures

2.3.6.1 Diagnosis description

Before diagnosing a malfunction in the ignition system, see [Description and Operation](#). Understanding and familiarizing yourself with the operating principles of the fuel system before beginning system diagnosis will determine the proper troubleshooting steps to take in the event of a malfunction, and more importantly, this will determine if the condition described by the customer is in normal operation. Any troubleshooting of the ignition system should begin with a visual inspection, which guides the service technician to the next logical step in the troubleshooting process. Understanding and using the diagnostic process correctly will shorten the diagnostic time and avoid misjudgment of the faulty location.

Visual Inspection

Check for aftermarket retrofitting devices that may affect the of the fuel system to ensure that these devices cannot interfere with the operation of the fuel system.

Inspect easily accessible or visible system components for obvious blockages or external leaks.

Check the harness and harness connector to ensure that there is no sign of loosening, damage, poor contact, aging, etc.

Check that the fuel in the fuel tank is the recommended fuel and that it is adequately filled.

2.3.6.2 Visual check

- Check for aftermarket retrofitting devices that may affect the of the fuel system to ensure that these devices cannot interfere with the operation of the fuel system.
- Inspect easily accessible or visible system components for obvious blockages or external leaks.
- Check the harness and harness connector to ensure that there is no sign of loosening, damage, poor contact, aging, etc.
- Check that the fuel in the fuel tank is the recommended fuel and that it is adequately filled.

2.3.6.3 Fuel Pressure Testing Procedure

Warning !

Gasoline or gasoline vapor is highly flammable. To avoid the risk of fire or explosion, keep away from sources of ignition and prohibit the operator from using a mobile phone while executing this procedure. Do not use any open container to drain or store discharged gasoline. Have a dry chemical fire extinguisher nearby before performing this procedure.

Warning !

Wrap a rag around the fuel pressure gauge and fuel distribution line fitting (disconnect the low pressure side line only), this will catch any fuel that leaks when connecting the fuel pressure gauge to minimize the risk of fire and injury. When the test is complete, place the rag in the designated container. Clean the fuel line fittings before removing the fuel line.

Warning !

Fuel must not be discharged into any open container and must not be stored in any open container as it may catch fire.

Diagnostic Procedure:

Step 1	Carry out a vehicle road test to confirm that the malfunction has been eliminated.
--------	--

Next Step

Step 2	Place the fuel pressure gauge exhaust hose into a designated gasoline container.
--------	--

Next Step

Step 3	Open the exhaust valve on the fuel pressure gauge to exhaust air from the gauge.
--------	--

Next Step

Step 4	Operate the start switch to set the power mode to ON.
--------	---

Next Step

Step 5	Use the "Function Test" in the fault diagnosis instrument to force the fuel pump to operate by driving the fuel pump relay until all air has been discharged from the pressure gauge.
--------	---

Next Step

Step 6	Close the exhaust valve on the fuel pressure gauge.
--------	---

Next Step

Step 7	Turn on the fuel pump with the fault diagnosis instrument commands and check for fuel leaks. If leaks occur, address the faulty area.
--------	---

Next Step

Step 8	Start the engine with no leaks in the lines and the fuel pressure should be at 350 kPa (50.75 psi).
--------	---

Next Step

Step 9	Operate the start switch to set the power mode to OFF, normally the system should maintain a system residual pressure of 200 kPa (29 psi) or more. If the system fuel pressure continues to drop, check the fuel pump or the fuel pressure regulator.
--------	---

Next Step

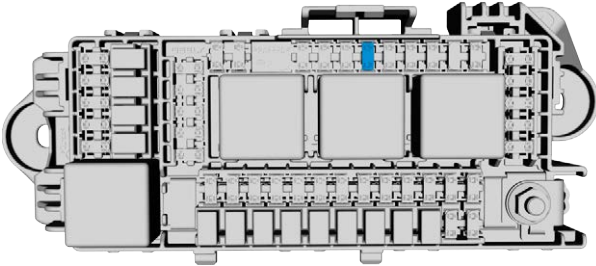
Step 10	End.
---------	------

2.3.7 Removal and Installation

2.3.7.1 Fuel Pressure Release Procedure

Release Procedure

- 1 Open the fuel tank cap.
- 2 Open the battery relay box cover and pull out the fuel pump fuse RF35.
- 3 Start the engine until it stops automatically.
- 4 Start the engine again after the engine has stalled so that the crankshaft continues to rotate for about 10 s.



2.3.7.2 Replacement of Carbon Canister Solenoid Valve with Line

Removal Procedure

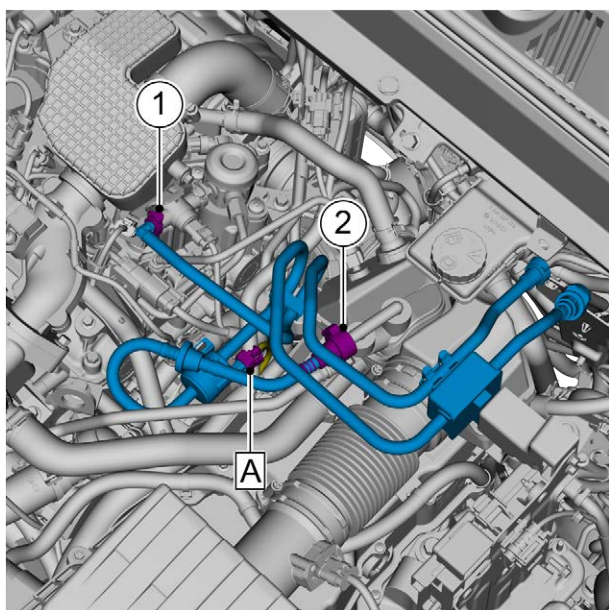
Warning !

See "WARNINGS ABOUT RELEASING FUEL PRESSURE" in "[WARNING AND PRECAUTION](#)"

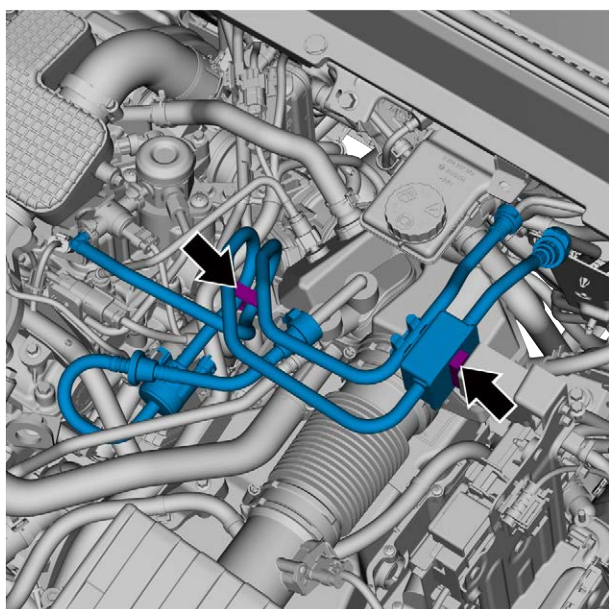
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

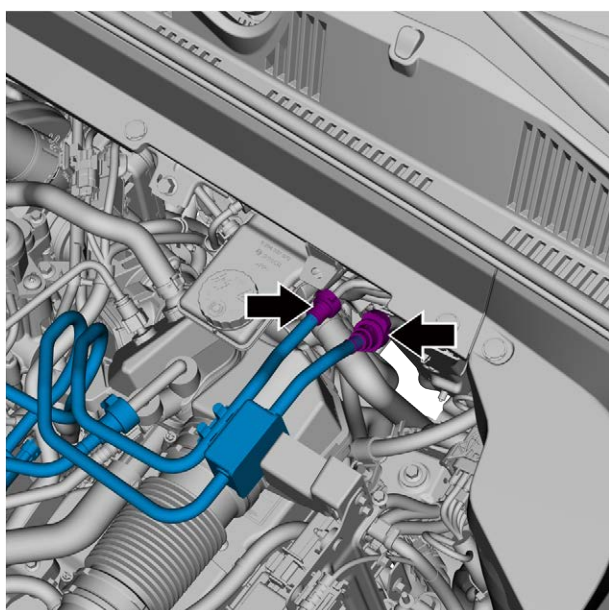
- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 4 Release the fuel pressure, see [Fuel Pressure Release Procedure](#).



- 5 Disconnect the harness connector A of the carbon canister solenoid valve.
- 6 Disconnect the quick connector 1 of the carbon canister solenoid valve with line from the fuel pressure sensor on low pressure side.
- 7 Disconnect the quick connector 2 of the carbon canister solenoid valve with line from the resonator assembly.



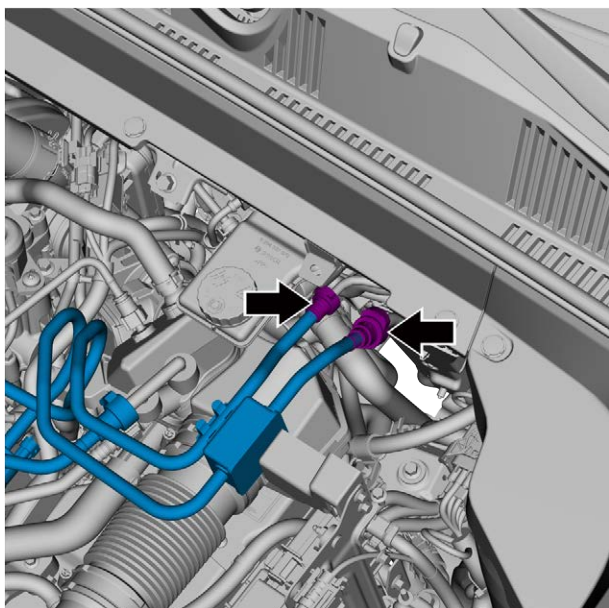
- 8 Remove the two fixing clips of the carbon canister solenoid valve with line.



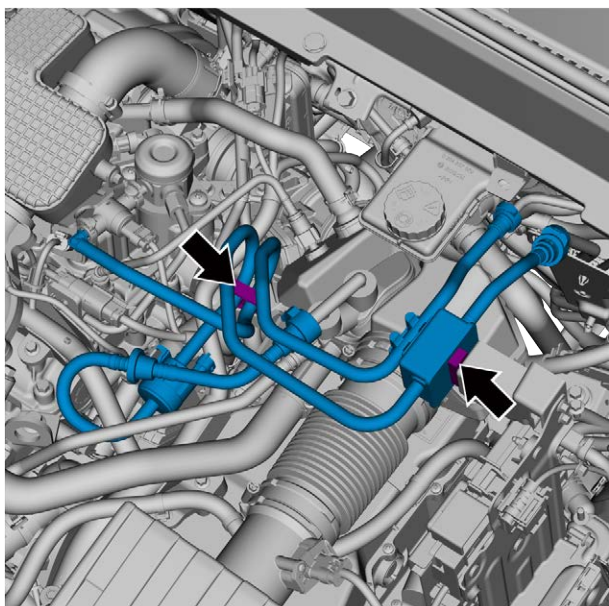
- 9 Disconnect the quick connector of the carbon canister solenoid valve with line from the lower floor fuel supply tube assembly.
- 10 Remove the carbon canister solenoid valve with line.

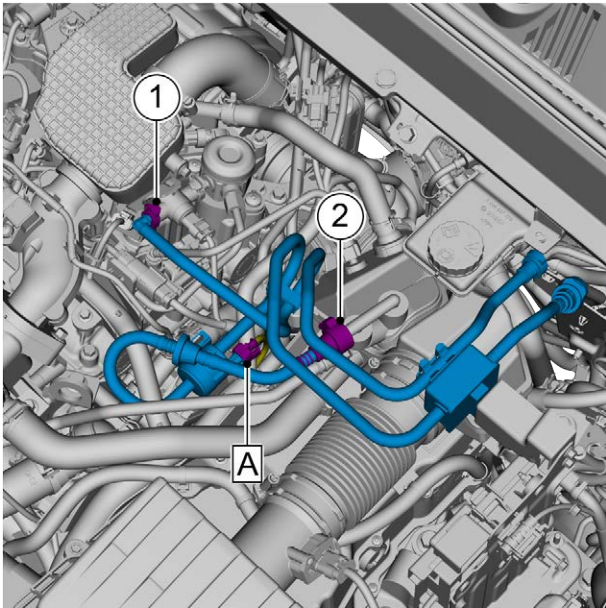
Installation Procedure

- 1 Install the carbon canister solenoid valve with line, and connect quick connector of the carbon canister solenoid valve with line to the lower floor fuel supply tube assembly.



- 2 Install the two fixing clips of the carbon canister solenoid valve with line.





- 3 Install the quick connector 2 of the carbon canister solenoid valve with line to the resonator assembly.
- 4 Install the quick connector 1 of the carbon canister solenoid valve with line to the fuel pressure sensor on low pressure side.
- 5 Connect the harness connector A of the carbon canister solenoid valve.

- 6 Install the engine trim cover assembly.
- 7 Connect the negative cable of battery.
- 8 Close the engine compartment cover.

2.3.7.3 Replacement of High-pressure Fuel Hose

Removal Procedure

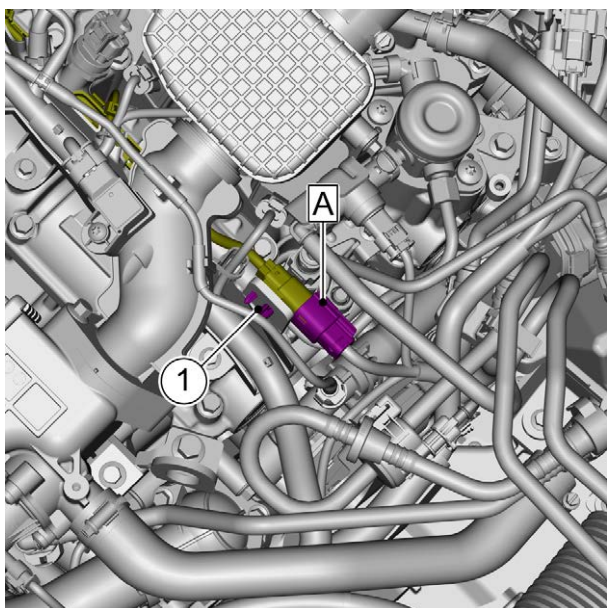
Warning !

See "WARNINGS ABOUT RELEASING FUEL PRESSURE" in "[WARNING AND PRECAUTION](#)"

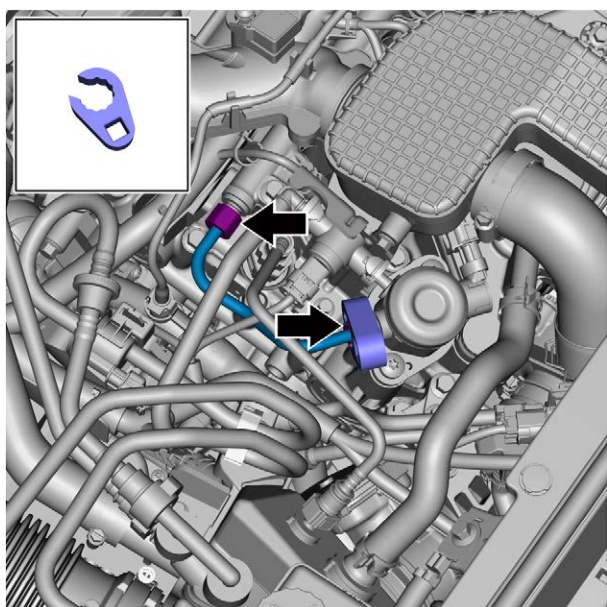
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Release the fuel pressure, see [Fuel Pressure Release Procedure](#).
- 3 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 4 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).



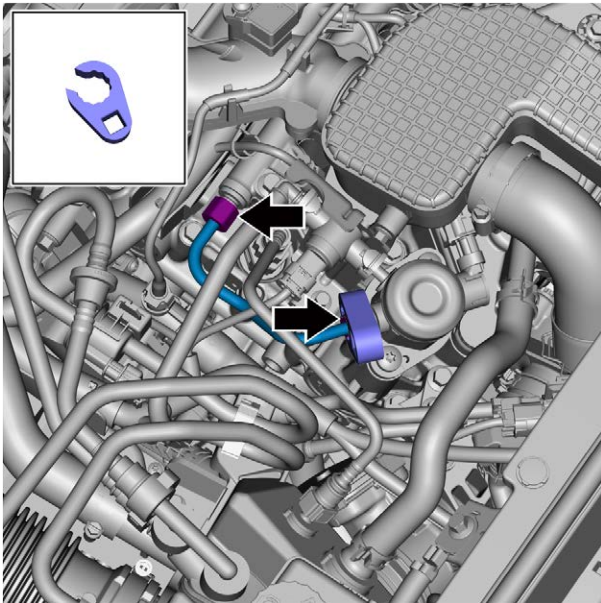
- 5 Disconnect the harness connector A of the fuel injector and remove the harness clip 1 of the fuel injector harness connector.



- 6 Remove the two fixing nuts of the high pressure fuel hose with a special tool and take off the high pressure fuel hose.

Special tool: 17 mm wrench

Installation Procedure



- 1 Install the high pressure fuel hose. Tighten the two fixing nuts of the high pressure fuel hose with a special tool.

Pre-tightening torque:

15 N·m

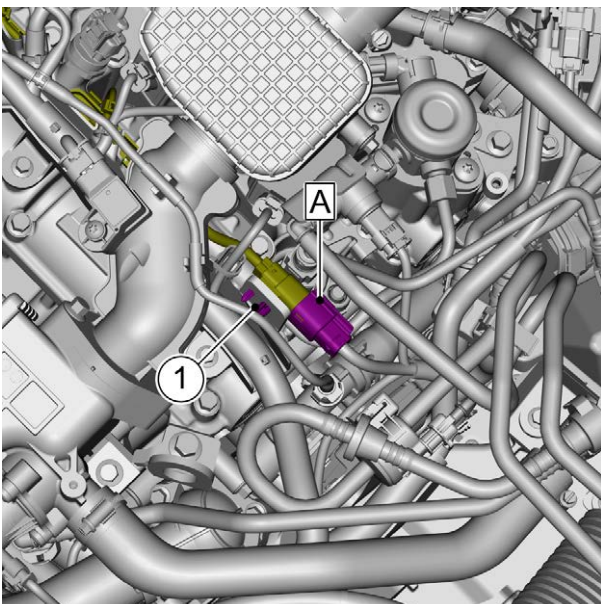
Final torque:

25 N·m

Special tool: 17 mm wrench

Caution

1. Align the header of the high-pressure fuel tube with the fuel rail injector subassembly port and the high-pressure fuel pump port at the same time to ensure that the header of the high-pressure fuel tube is pressed precisely into the part with which it is paired.
 2. Tighten the nuts on both ends of the high-pressure fuel tube at the same time by hand.
 3. Pre-tighten the nuts at both ends of the high-pressure fuel hose with a torque wrench according to the required torque, and then tighten them according to the required torque.
 4. The high pressure fuel hose is a disposable part and needs to be replaced after disassembly.
- 2 Install the fuel injector harness connector harness clip 1 and connect fuel injector harness connector A.



- 3 Install the engine trim cover assembly.
- 4 Connect the negative cable of battery.
- 5 Open the engine compartment hood.

2.3.7.4 Replacement of Fuel Pressure Sensor on Low Pressure Side

Removal Procedure

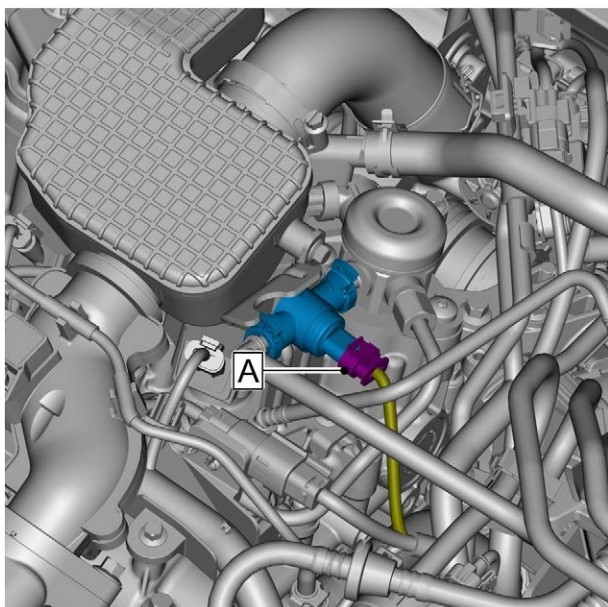
Warning !

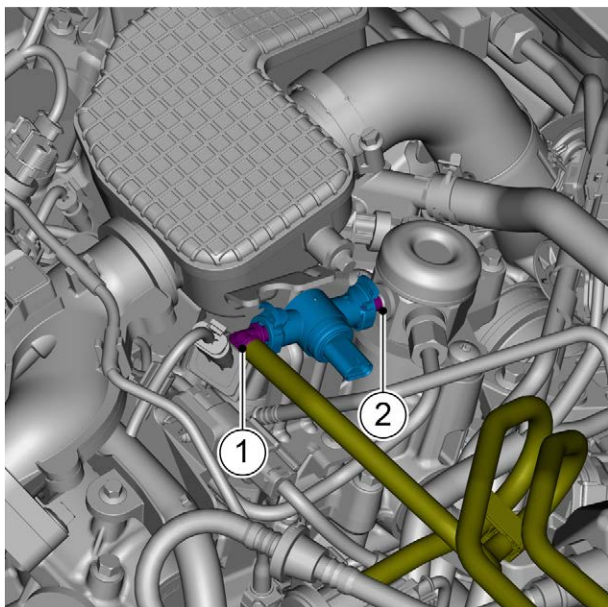
See "WARNINGS ABOUT RELEASING FUEL PRESSURE" in "[WARNING AND PRECAUTION](#)"

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Release the fuel pressure, see [Fuel Pressure Release Procedure](#).
- 3 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 4 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 5 Disconnect the fuel pressure sensor harness connector A on low pressure side.

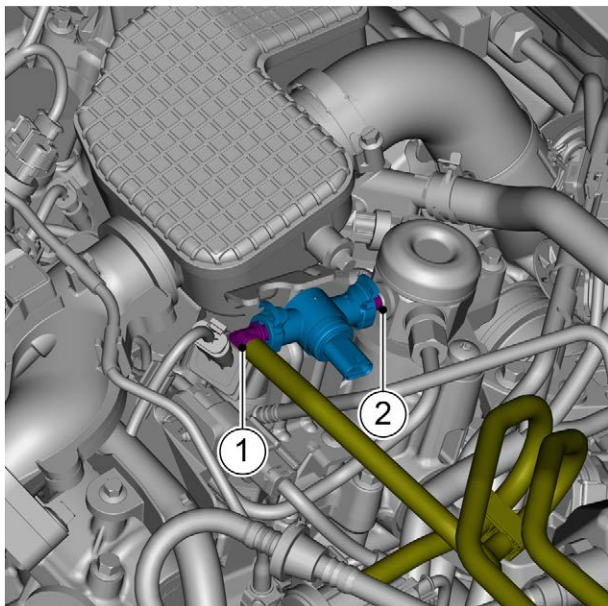


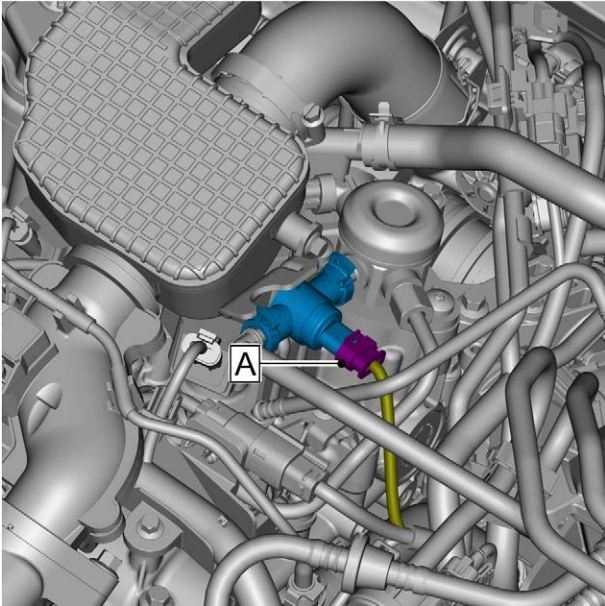


- 6 Disengage the fuel pressure sensor on low pressure side from the carbon canister solenoid valve with line.
- 7 Disconnect the connector 2 between the fuel pressure sensor on low pressure side and the high pressure fuel pump, and take off the fuel pressure sensor on low pressure side.

Installation and Removal

- 1 Install the fuel pressure sensor on low pressure side.
- 2 Connect the fuel pressure sensor on low pressure side to the high pressure fuel pump 2.
- 3 Connect the fuel pressure sensor on low pressure side to the carbon canister solenoid valve with line 1.





- 4 Connect the harness connector A of the fuel pressure sensor on low pressure side.

- 5 Install the engine trim cover assembly.
- 6 Connect the negative cable of battery.
- 7 Use the GLDS diagnostic program. On the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software flash operation.
- 8 Close the engine compartment cover.

2.3.7.5 Replacement of High Pressure Fuel Pump

Removal Procedure

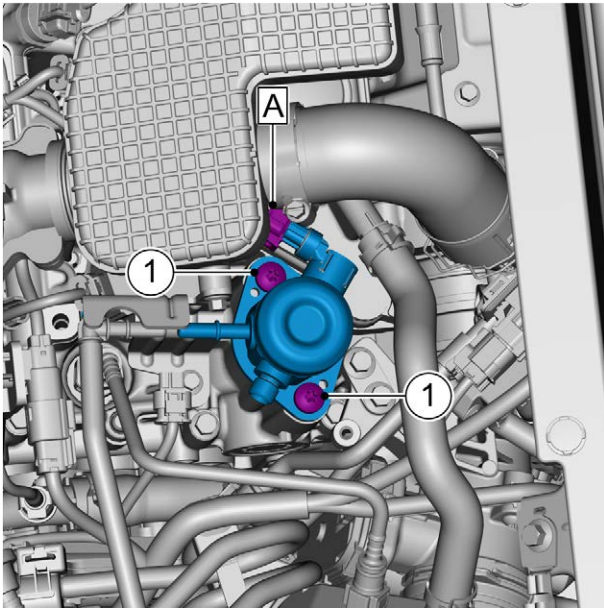
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

Warning !

See "WARNINGS ABOUT RELEASING FUEL PRESSURE" in "[WARNING AND PRECAUTION](#)"

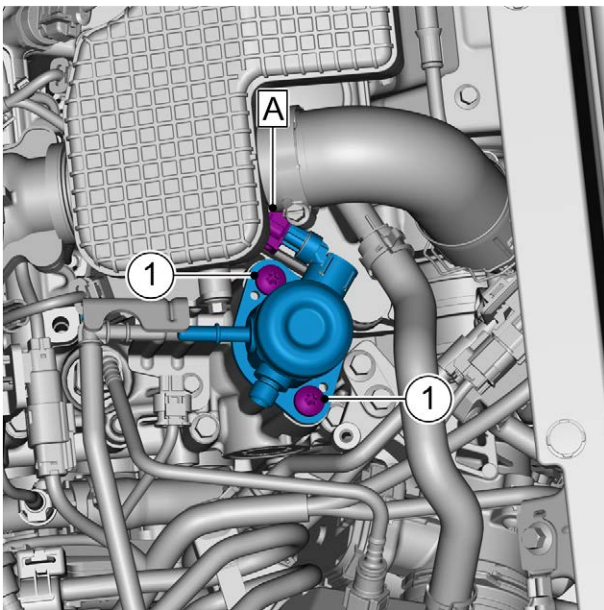
- 1 Open the engine compartment hood.
- 2 Release the fuel pressure, see [Fuel Pressure Release Procedure](#).
- 3 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 4 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 5 Remove the high pressure fuel tube, see [Replacement of High Pressure Fule Tube](#).



- 6 Remove the fuel pressure sensor on low pressure side, see [Replacement of Fuel Pressure Sensor on Low Pressure Side](#).
- 7 Disconnect the harness connector A of the fuel pressure sensor on low pressure side.
- 8 Remove the two fixing bolts 1 of the high pressure fuel pump and take off the high pressure fuel pump.

Caution

The two bolts should be loosened alternately in several times.



Installation Procedure

- 1 Install the high pressure fuel pump and tighten the two fixing bolts 1 of the high pressure fuel pump alternately.
Torque: 23N·m

Caution

1. Before assembly, check O-rings for damage. If any, replace them before assembly.
 2. Do not plug or unplug the connector of the high pressure fuel pump with power during power-on operation such as cold or hot testing.
 3. Keep the flange surface of the high pressure fuel pump be parallel to the upper surface of the oil pump mounting base during assembly.
 4. Tighten the bolts alternately several times during assembly, allowing a maximum of 1 to 2 turns at a time.
 5. Finally, retighten the two bolts to avoid false torque.
- 2 Connect the harness connector A of the high pressure fuel pump.
 - 3 Install the fuel pressure sensor on low pressure side.
 - 4 Install the high pressure fuel tube.
 - 5 Install the engine trim cover assembly.
 - 6 Connect the negative cable of battery.

- 7 Use the GLDS diagnostic program. On the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software flash operation.
- 8 Close the engine compartment cover.

2.3.7.6 Replacement of Fuel Pump Tappet

Removal Procedure

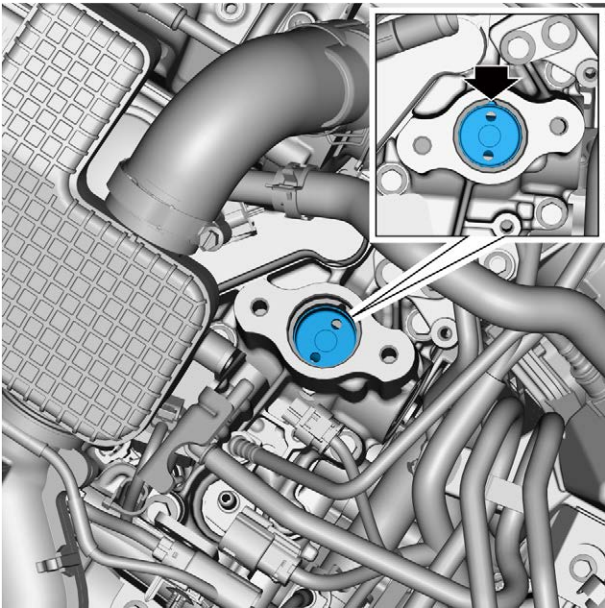
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

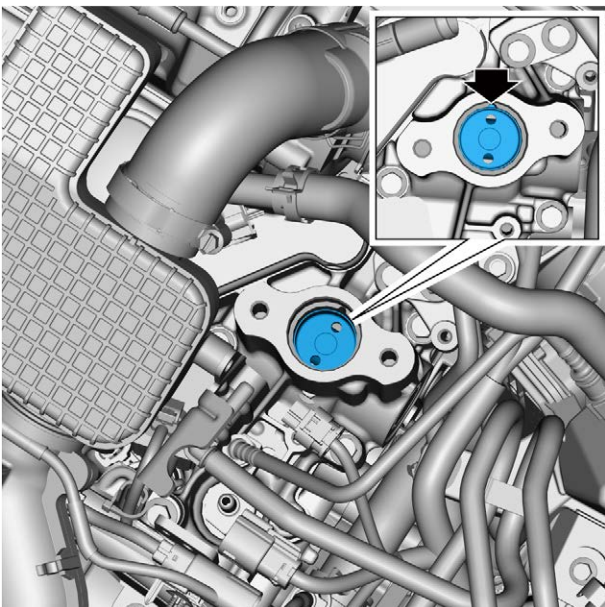
Warning !

See "WARNINGS ABOUT RELEASING FUEL PRESSURE" in "[WARNING AND PRECAUTION](#)"

- 1 Open the engine compartment hood.
- 2 Release the fuel pressure, see [Fuel Pressure Release Procedure](#).
- 3 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 4 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 5 Remove the high pressure fuel tube, see [Replacement of High Pressure Fule Tube](#).
- 6 Remove the fuel pressure sensor on low pressure side, see [Replacement of Fuel Pressure Sensore on Low Pressure Side](#).



- 7 Remove the high pressure fuel pump, see [Replacement of High Pressure Fuel Pump](#).
- 8 Take off the fuel pump tappet.



Installation Procedure

- 1 Install the oil pump tappet, and align the anti-rotation pin on the tappet with the mounting hole pin groove.

Caution

Apply appropriate engine oil lubrication to the mounting hole or outer wall of the fuel pump tappet before installing it.

- 2 Install the high pressure fuel pump.
- 3 Install the air filter assembly.
- 4 Install the fuel pressure sensor on low pressure side.
- 5 Install the high pressure fuel tube.
- 6 Install the engine trim cover assembly.
- 7 Connect the negative cable of battery.
- 8 Close the engine compartment cover.

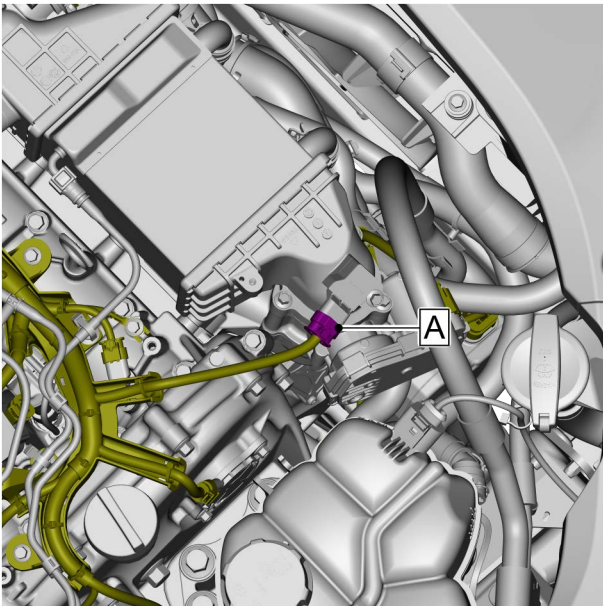
2.3.7.7 Replacement of Oil Rail Injector Subassembly

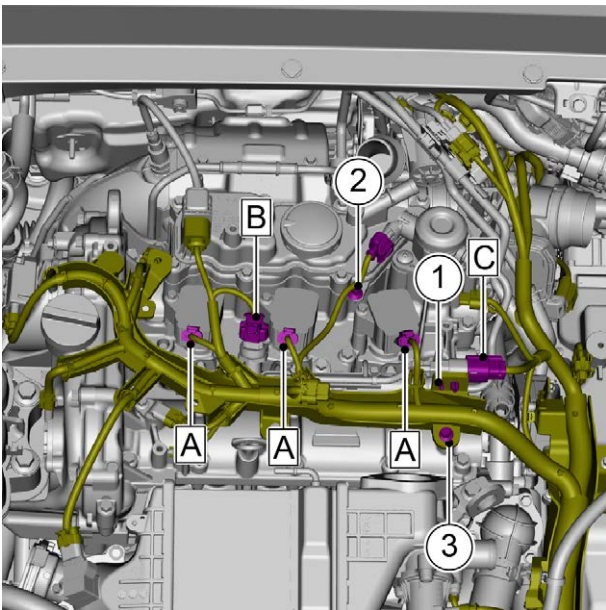
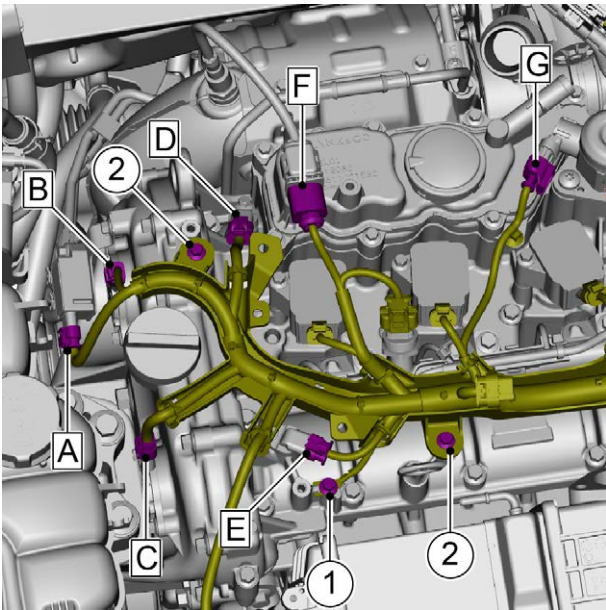
Removal Procedure

Warning !

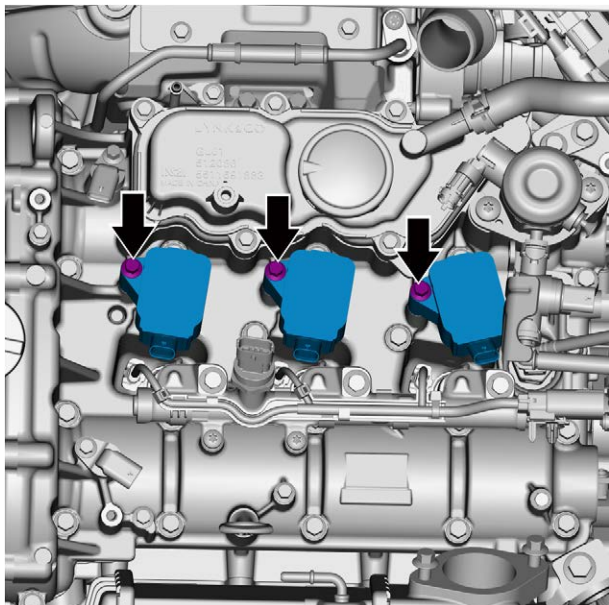
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Release the fuel pressure, see [Fuel Pressure Release Procedure](#).
- 3 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 4 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 5 Remove the high pressure fuel tube, see [Replacement of High Pressure Fuel Tube](#).
- 6 Remove the resonator, see [Replacement of Resonator](#).
- 7 Disconnect the harness connector A of the intake pressure and temperature sensor (water-cooled intercooler subassembly).

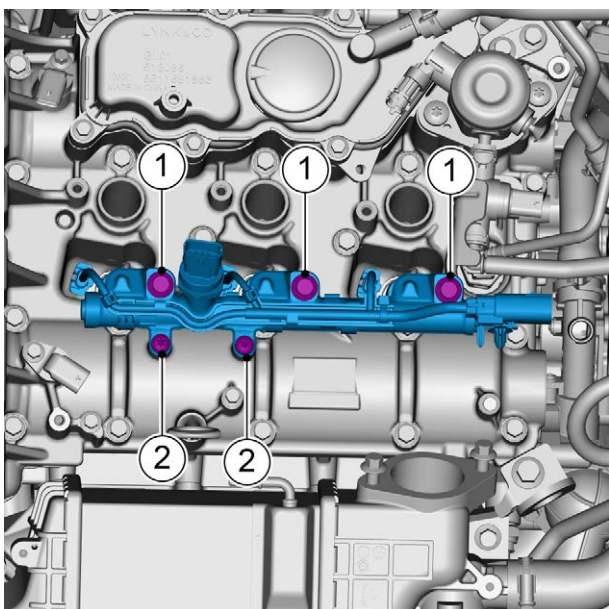




- 8 Disconnect the harness connector A of the differential filter pressure sensor.
- 9 Disconnect the harness connector B of the VVT solenoid coil (exhaust side).
- 10 Disconnect the harness connector C of the VVT solenoid coil (intake side).
- 11 Disconnect the harness connector D of the exhaust camshaft position sensor.
- 12 Disconnect the harness connector E of the intake camshaft position sensor.
- 13 Disconnect harness connector F of the Lambda probe (upstream oxygen sensor).
- 14 Disconnect the harness connector G of the high pressure fuel pump.
- 15 Remove the fixing bolt 1 of the engine wiring harness grounding.
- 16 Remove the two fixing bolts 2 of the engine wiring harness
- 17 Disconnect the harness connector A from the ignition coil.
- 18 Disconnect the harness connector B of the fuel pressure sensor.
- 19 Disconnect the harness connector C of the fuel rail injector subassembly.
- 20 Remove the harness clip 1 of the fuel rail injector subassembly.
- 21 Remove the fixing clip 2 of the engine harness.
- 22 Remove the fixing bolt 3 of the engine wiring harness.

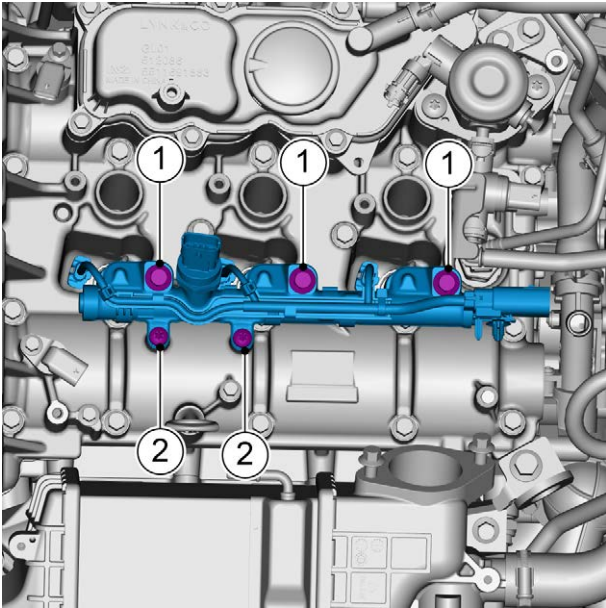


- 23 Remove the three fixing bolts of the ignition coil and take off the ignition coil.



- 24 Remove the three fixing bolts 1 of the fuel rail injector subassembly.
- 25 Remove the two fixing screws 2 of the fuel rail injector subassembly.

Installation Procedure



- 1 Align the injector with the mounting holes, apply downward force along the common axis of the fuel injector at an even speed, release the mounting force to allow for automatic alignment of the fuel injector, and apply the mounting force again to ensure a balanced distribution of the mounting force.

Caution

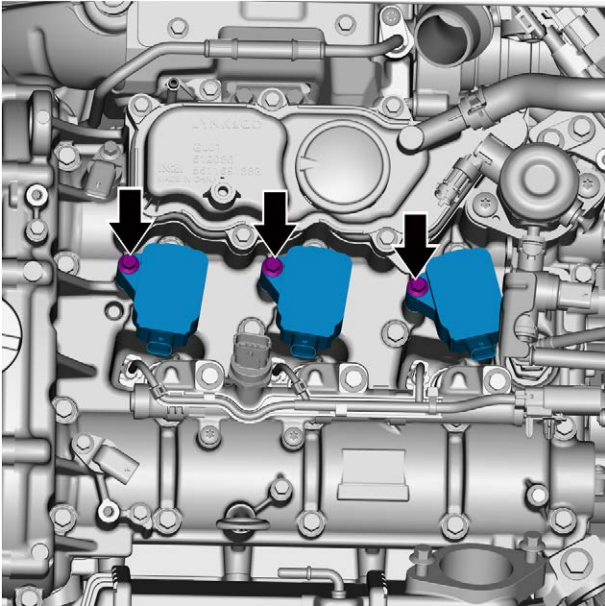
1. When moving the fuel rail injector subassembly, it is not permitted to hold the injector or fuel pressure sensor by your hand.
 2. If the sealing or compression ring is damaged, they must be replaced.
 3. Lubricant is not allowed to be applied at the fuel injector Teflon sealing ring.
 4. It is prohibited to touch the part pins.
 5. Do not plug or unplug parts and connectors with power during the power-on operation.
 6. Avoid dropping parts or subjecting them to shocks. Dropped parts must be scrapped.
- 2 Install and tighten the three fixing bolts 1 of the fuel rail injector subassembly.

Torque: 23 N·m

Caution

- To ensure parallel installation, tighten the bolts alternately several times, allowing the bolts to be screwed in a maximum of 2 to 3 turns at a time. Tighten in the order of cylinders 1, 3, and 2, until the fuel rail injector subassembly fits the camshaft bearing cover.
- 3 Install and tighten the two fixing screws 2 of the fuel rail injector subassembly.

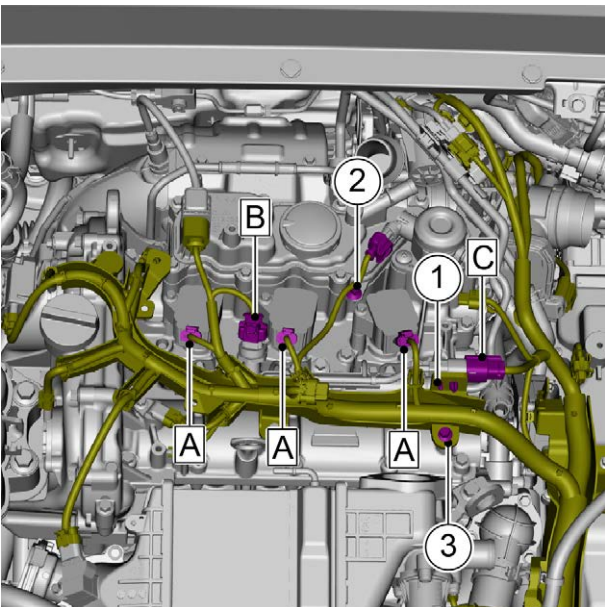
Torque: 10N·m



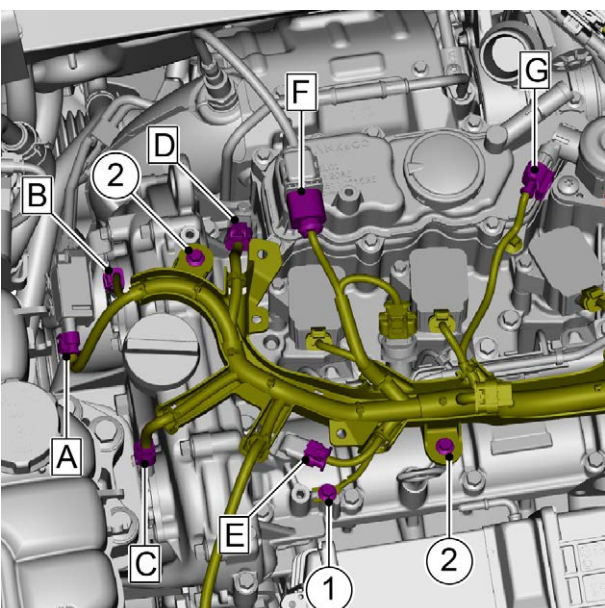
- 4 Install the ignition coil, and install and tighten the three fixing bolts of the ignition coil.

Caution

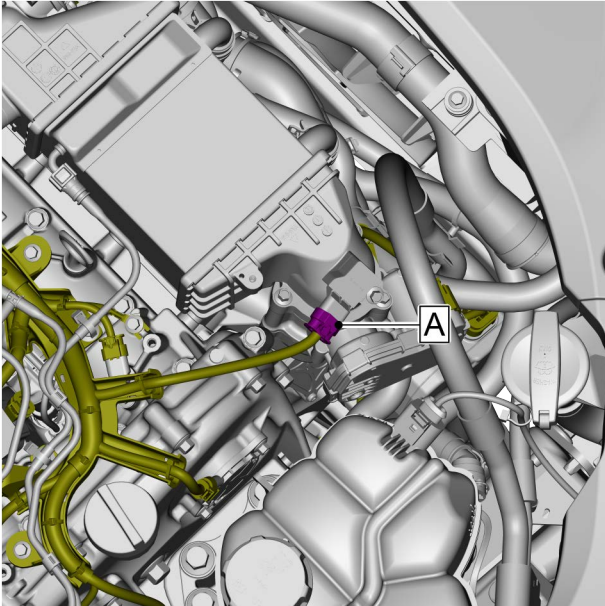
1. It is prohibited to mix ignition coils from different suppliers on the same engine.
2. Storage, transportation and assembly processes must be protected against static electricity and touching the Ignition coil pins is prohibited.
3. It is not allowed to plug and unplug the ignition coil connector with power during the energizing operation such as cold or hot testing.



- 5 Install and tighten the engine harness fixing bolts 3.
Torque: 10 N·m
- 6 Install the engine harness fixing clip 2.
- 7 Install the harness clip 1 of the fuel rail injector subassembly.
- 8 Connect the harness connector C of the fuel rail injector subassembly.
- 9 Connect the harness connector B of the fuel pressure sensor.
- 10 Connect the ignition coil harness connector A.



- 11 Install and tighten the two fixing bolts 2 of the engine harness.
Torque: 10 N·m
- 12 Install and tighten the fixing bolt 1 of the engine harness grounding.
Torque: 10 N·m
- 13 Connect the harness connector G of the high pressure fuel pump.
- 14 Connect the harness connector F of the Lambda probe (upstream oxygen sensor).
- 15 Connect the harness connector E of the intake camshaft position sensor.
- 16 Connect the harness connector D of the exhaust camshaft position sensor.



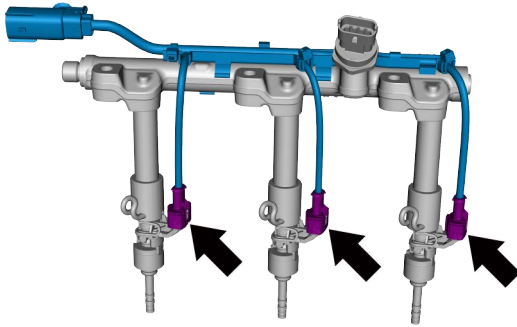
- 17 Connect the harness connector C of the VVT solenoid coil (intake side).
- 18 Connect the harness connector B of the VVT solenoid coil (exhaust side).
- 19 Connect the harness connector A of the differential filter pressure sensor.
- 20 Connect the harness connector A of the intake pressure and temperature sensor (water cooled intercooler subassembly).

- 21 Install a resonator.
- 22 Install the high pressure fuel tube.
- 23 Install the engine trim cover assembly.
- 24 Connect the negative cable of battery.
- 25 Close the engine compartment cover.

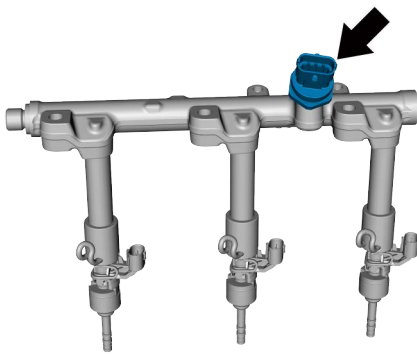
2.3.7.8 Disassembly of Fuel Rail Injector Subassembly

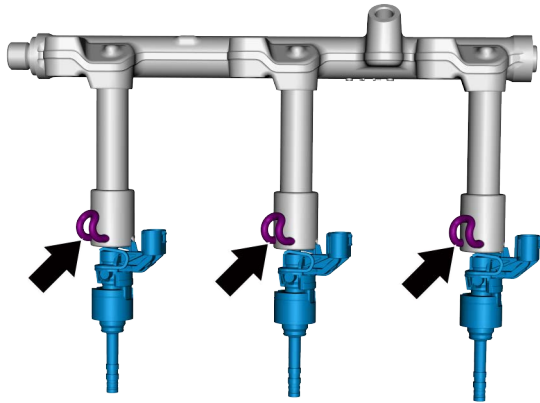
Disassembly Procedure

- 1 Disconnect the harness connector from the fuel injector harness.
- 2 Remove the fuel injector harness.



- 3 Remove the fuel pressure sensor.

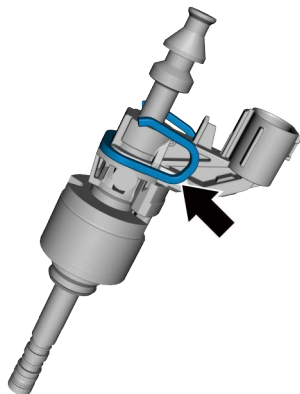




- 4 Remove the U-shaped card.
- 5 Remove the fuel injector and compression ring.

Installation Procedure

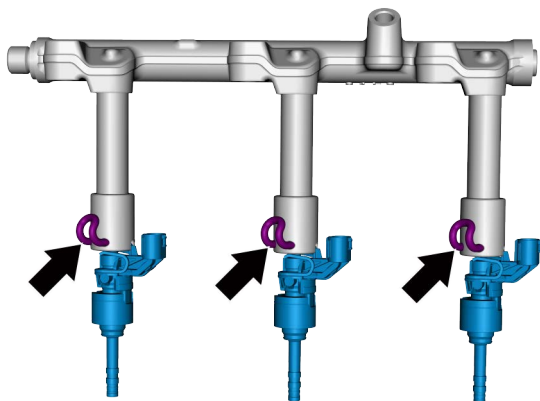
- 1 Install the compression ring and assemble it onto the injector nozzle so that the lower surface of the compression ring fits snugly with the mounting surface of the fuel injection nozzle compression ring.

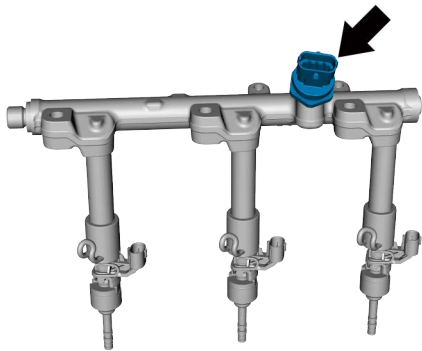


- 2 Install the U-shaped clip to secure the fuel injector to the fuel rail assembly.

Caution

1. Do not plug or unplug the fuel injection nozzle connector with power under the energized state, and do not touch the fuel injection nozzle pins.
2. Parts dropped or subjected to impact must be scrapped.

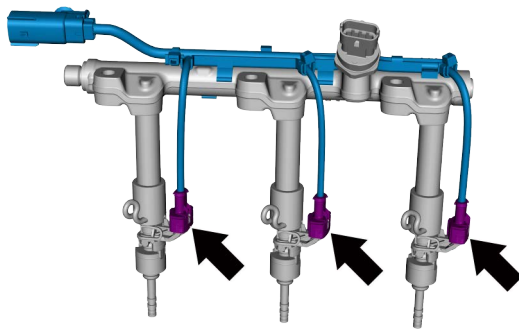




- 3 Install the fuel pressure sensor.

Caution

1. Purge the thread of the fuel pressure sensor and its mounting holes thoroughly.
2. Apply an appropriate amount of lubricant to the threads of the fuel pressure sensor.
3. Do not plug or unplug the fuel pressure sensor connector under power-on condition, and do not touch the fuel pressure sensor pin.
4. Parts dropped or subjected to impact must be scrapped.



- 4 Install the fuel injector harness.
- 5 Connect the harness connector of the fuel injector harness.

Caution

The injector harness and injector conductivity needs to be checked after assembly is complete.

2.3.7.9 Replacement of Fuel Tank Body

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#).

Warning !

See "Warning about Exhaust System Maintenance" in ["Warning and Precaution"](#).

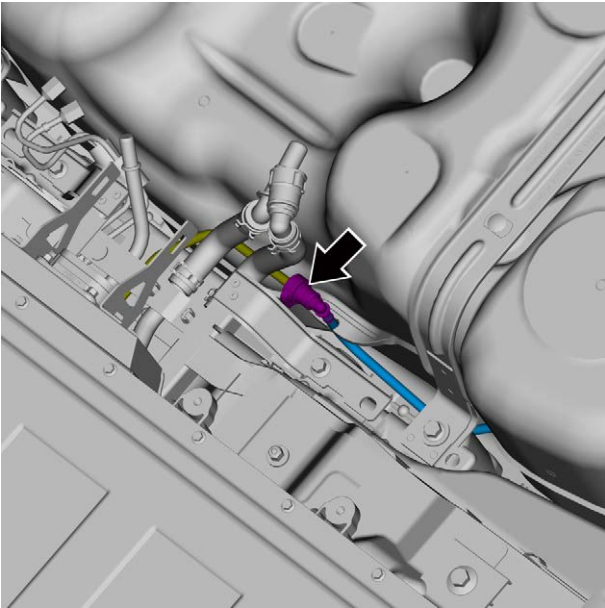
Warning !

Do not bend any brake pipe. Failure to do so may cause brake failure and result in an accident.

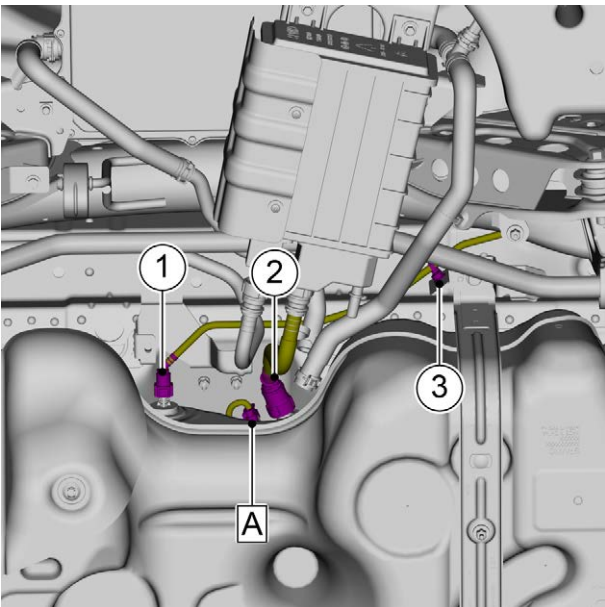
Caution

Do not spill brake fluid on the paintwork. Otherwise, it is likely to damage the paintwork.

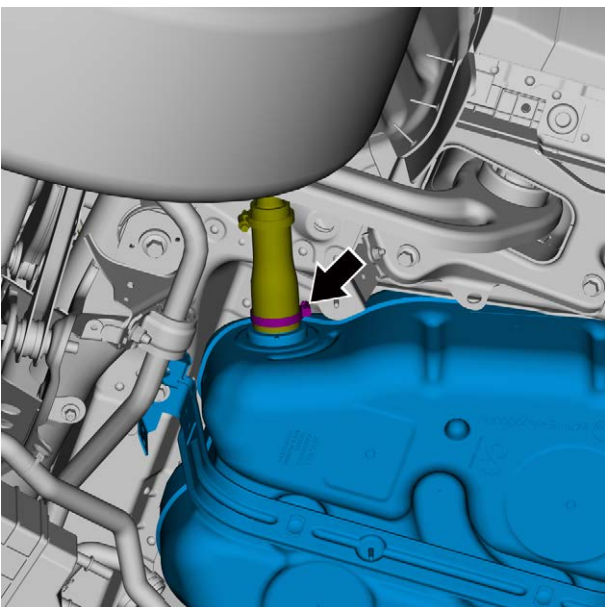
- 1 Open the engine compartment hood.
- 2 Release the fuel pressure, see [Fuel Pressure Release Procedure](#).
- 3 Press the refueling button to relieve pressure.
- 4 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 5 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 6 Remove the lower right fuel tank shield, see [Replacement of Lower Right Fuel Tank Shield](#).
- 7 Remove the DC charging socket and the wiring harness assembly, see DC [Replacement of DC Charging Socket and Wiring Harness Assembly](#).
- 8 Remove the rear connecting tube of the lower floor inlet and outlet hose, see [Replacement of Rear Connecting Tube of Lower Floor Inlet and Outlet](#).
- 9 Remove the rear left brake pipe, see [Replacement of Rear Left Brake Pipe](#).
- 10 Remove the rear right brake pipe, see [Replacement of Rear Right Brake Pipe](#).
- 11 Remove carbon canister desorption pipe, see [Replacement of Carbon Canister Desorption Tube](#).
- 12 Remove the exhaust pipe muffler assembly, see [Replacement of Exhaust Pipe Muffler Assembly](#).
- 13 Remove the fuel pump, see [Replacement of Fuel Pump](#).



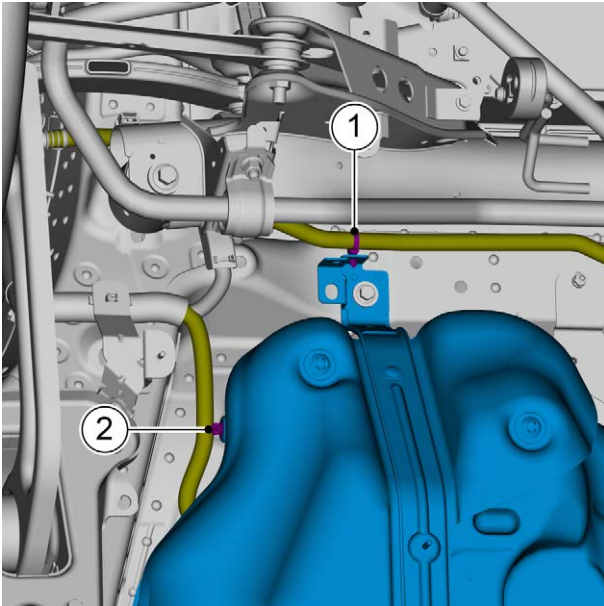
- 14 Remove the quick connector of the fuel pump assembly line and disconnect the fuel pump assembly line from the long line under the floor.



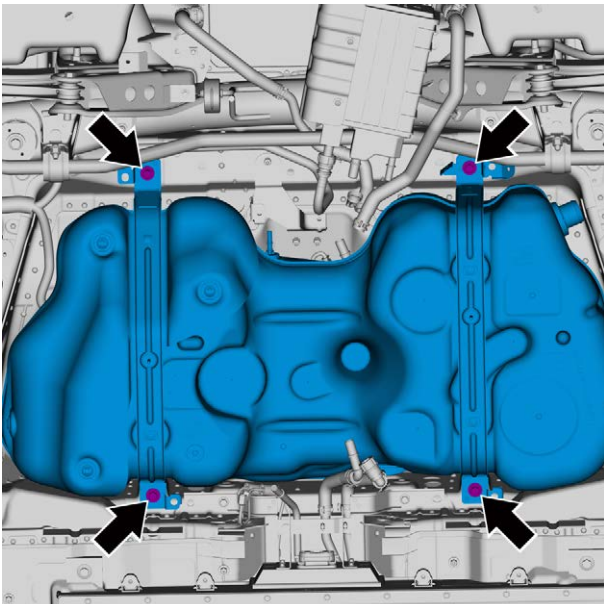
- 15 Disconnect the harness connector A of the fuel tank body isolation valve.
- 16 Remove the quick connector 1 of the leakage diagnosis line and disconnect the leakage diagnosis line from the fuel tank body.
- 17 Remove the quick connector 2 of the fuel tank isolation valve outlet tube and disconnect the connection between the fuel tank isolation valve outlet tube and the fuel tank body.
- 18 Remove the fixing clips 3 of the fuel tank isolation valve outlet tube.



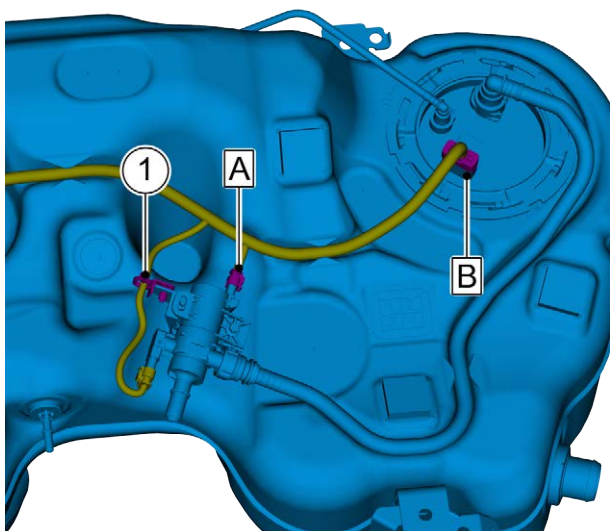
- 19 Loosen the fixing clamp of the fuel tank body refueling pipe and disconnect the fuel tank body refueling pipe from the fuel tank body.



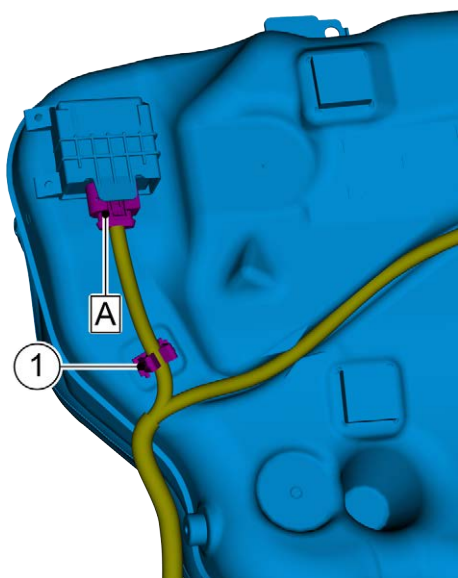
- 20 Remove the fixing clips 1 of the carbon canister vent tube.
- 21 Remove the harness clip 2 of the chassis harness.



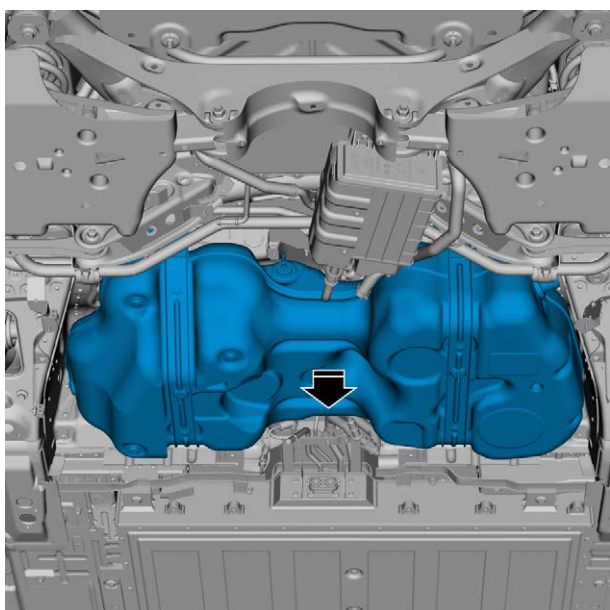
- 22 Drag the fuel tank body with a hydraulic lift.
- 23 Remove the four fixing bolts from the fuel tank body strap and slowly lower them some space.



- 24 Disconnect the harness connector A of the fuel tank body isolation valve.
- 25 Disconnect the harness connector B of the fuel pump.
- 26 Remove the harness clip 1 of the chassis harness.

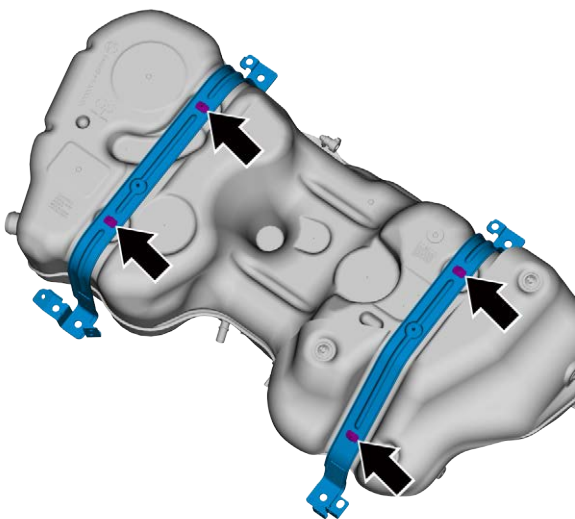


- 27 Disconnect the harness connector A of the fuel pump controller.
- 28 Disengage the fixing point 1 of the chassis harness.

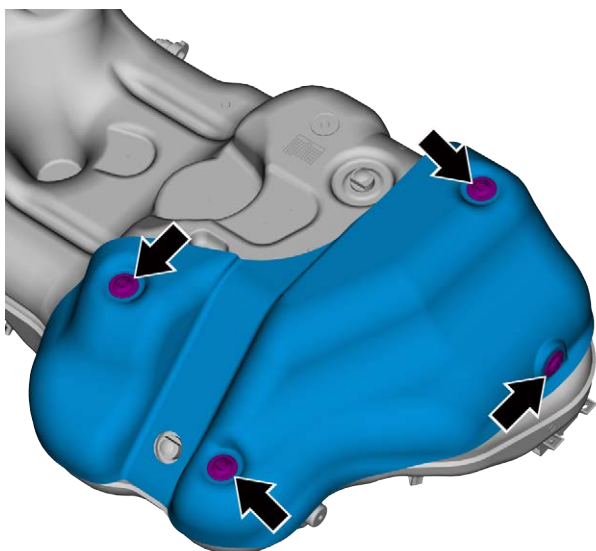


- 29 Take off the fuel tank body.

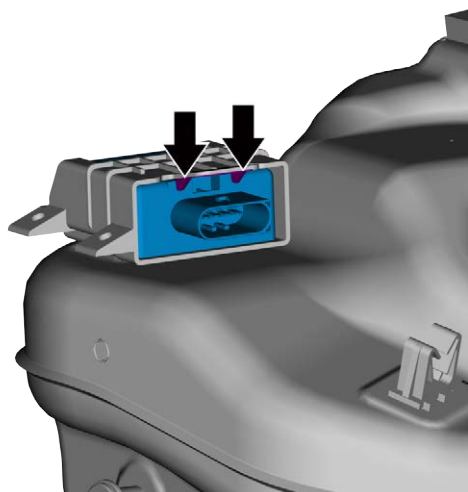
- 30 Remove the four fixing clips of the fuel tank body strap.
- 31 Remove the left and right straps of the fuel tank body.



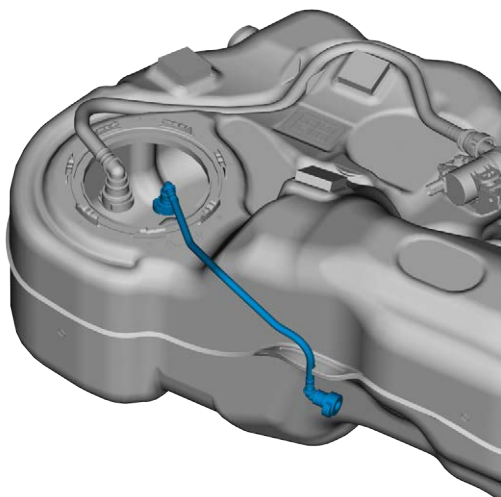
- 32 Remove the four fixing clips of the fuel tank heat shield.
- 33 Remove the fuel tank insulation board.



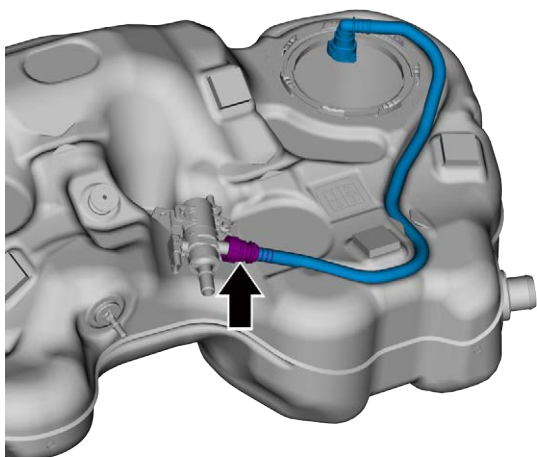
- 34 Remove the fuel pump controller by externally snapping the fuel pump controller snap.



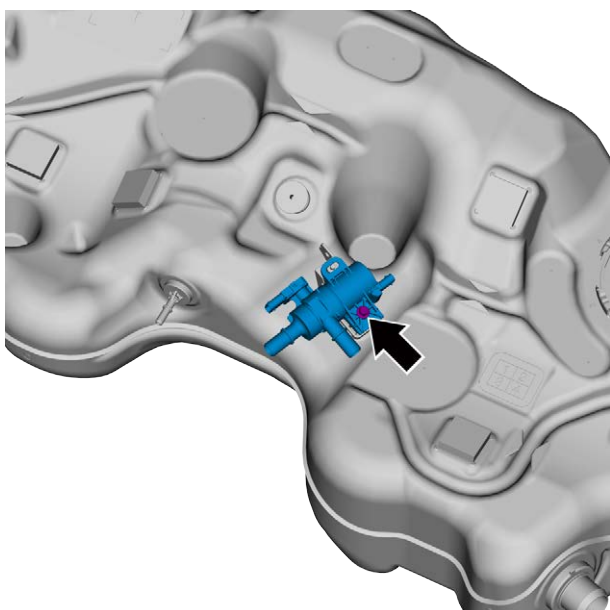
- 35 Remove the oil pump assembly pipeline.



- 36 Remove the quick connector of the fuel tank isolation valve inlet pipe and disconnect the fuel tank isolation valve inlet pipe from the fuel tank body isolation valve.

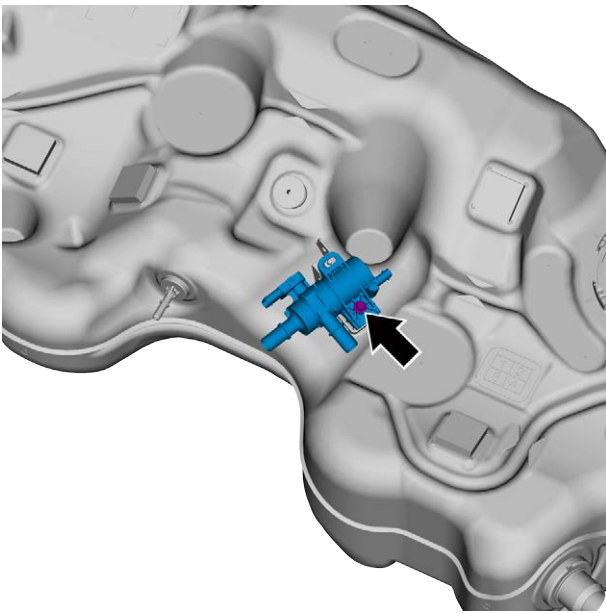


- 37 Remove the fixing bolts of the fuel tank body isolation valve.
- 38 Remove the fuel tank body isolation valve.

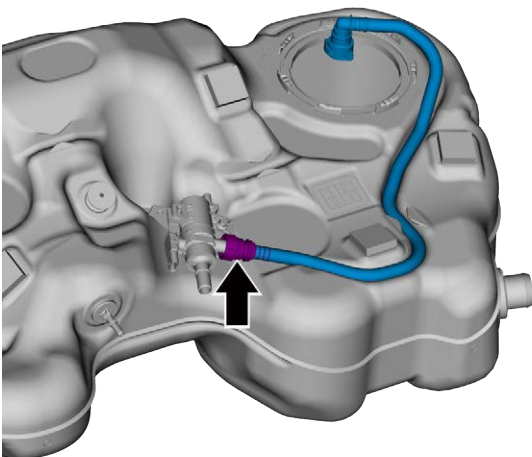


Installation Procedure

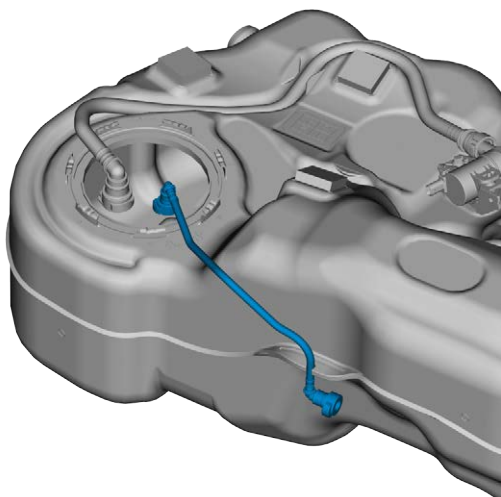
- 1 Install the fuel tank body isolation valve.
- 2 Install and tighten the fixing bolts of the fuel tank body isolation valve.
Torque: 10 N·m



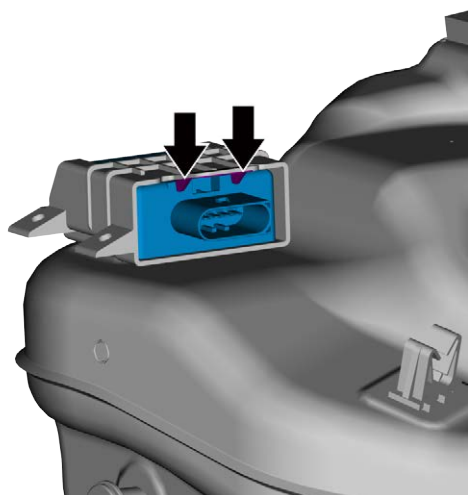
- 3 Connect the fuel tank isolation valve inlet pipe to the fuel tank body isolation valve and install the quick connector of the fuel tank isolation valve inlet pipe.



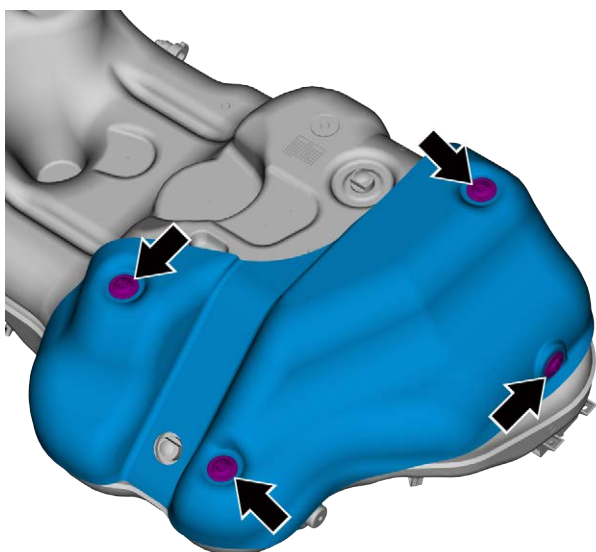
- 4 Install the fuel pump assembly line.

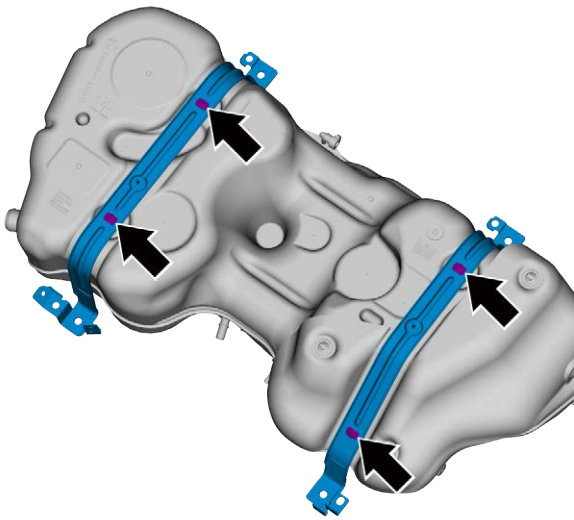


- 5 Install the fuel pump controller and snap into place.

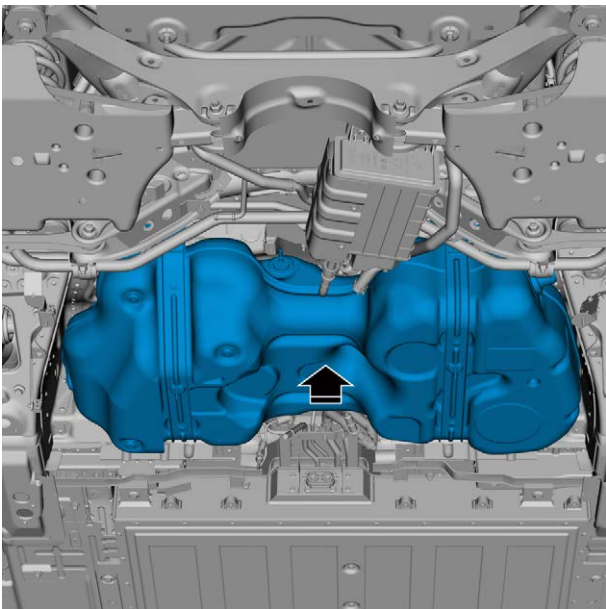


- 6 Install the gas tank heat shield.
- 7 Install the four fixing clips of the fuel tank heat shield.

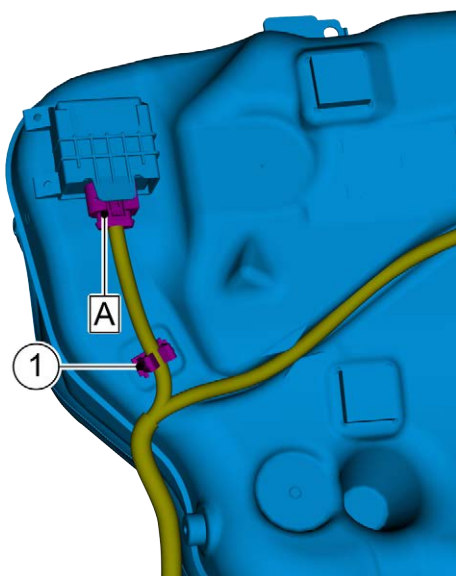




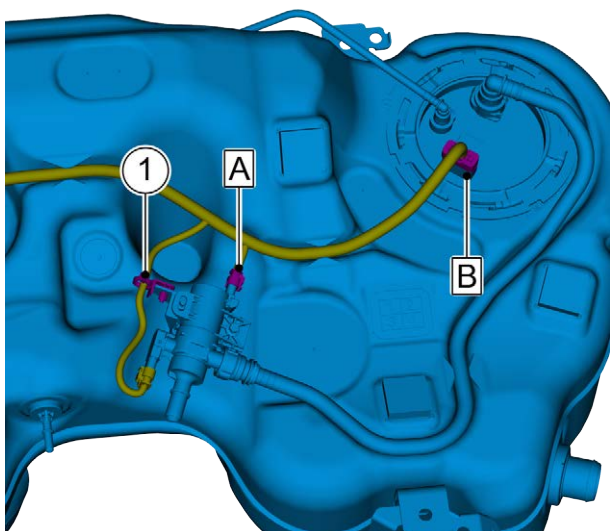
- 8 Install the left and right straps of the fuel tank body.
- 9 Install the four fixing clips of the fuel tank body straps.



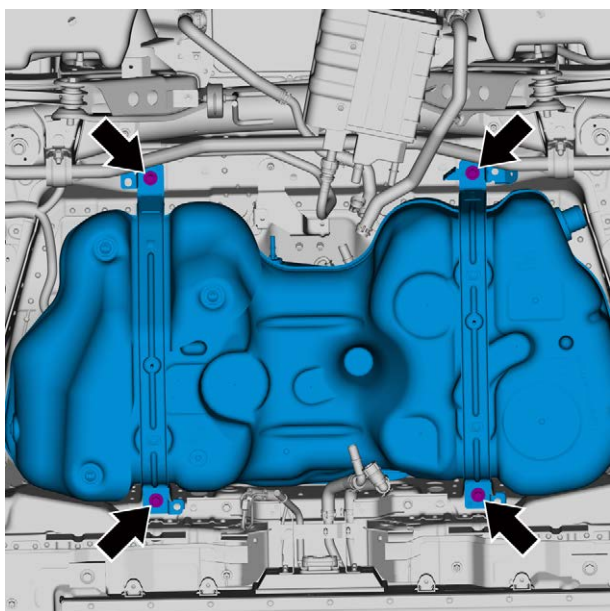
- 10 Install the fuel tank body.



- 11 Install the fixing points 1 for the chassis wiring harness.
- 12 Connect the harness connector A of the fuel pump controller.

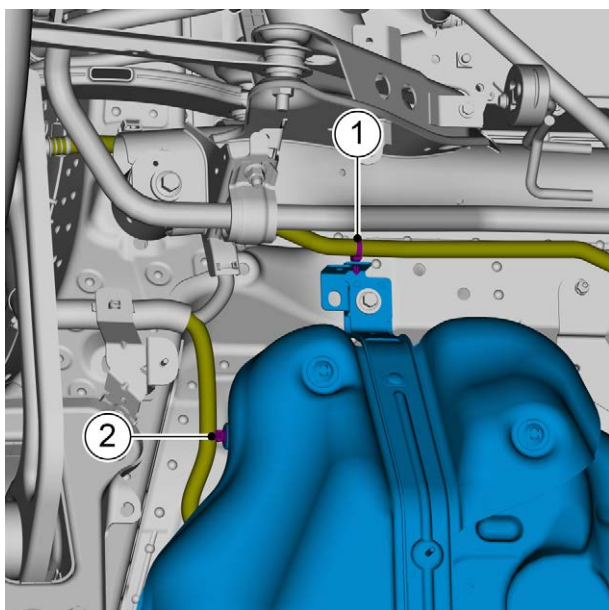


- 13 Install the harness clip 1 of the chassis harness.
- 14 Connect the harness connector A of the fuel pump.
- 15 Connect the harness connector A of the fuel tank body isolation valve.

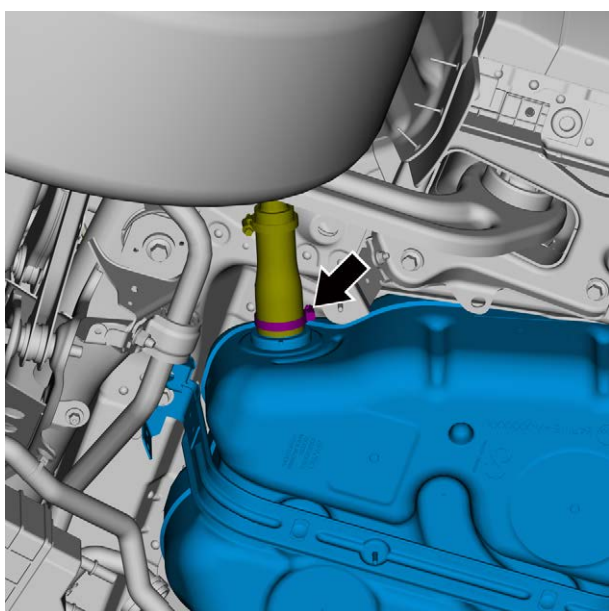


- 16 Install and tighten the four fixing bolts of the fuel tank body straps.
Torque: 30 N·m

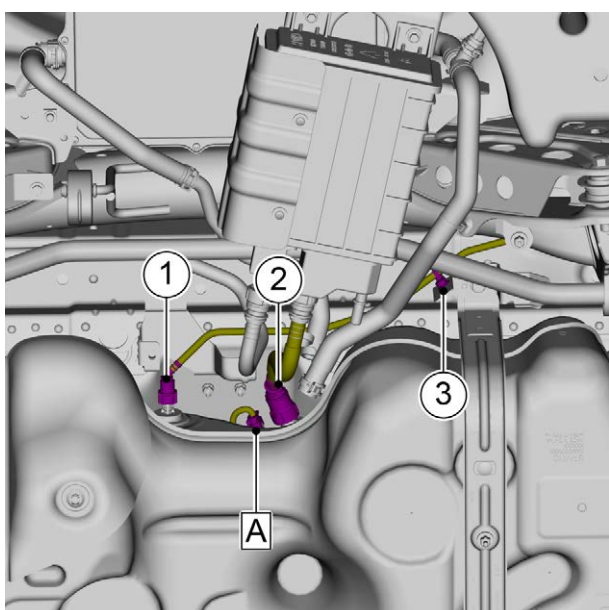
- 17 Drive off the hydraulic lift.



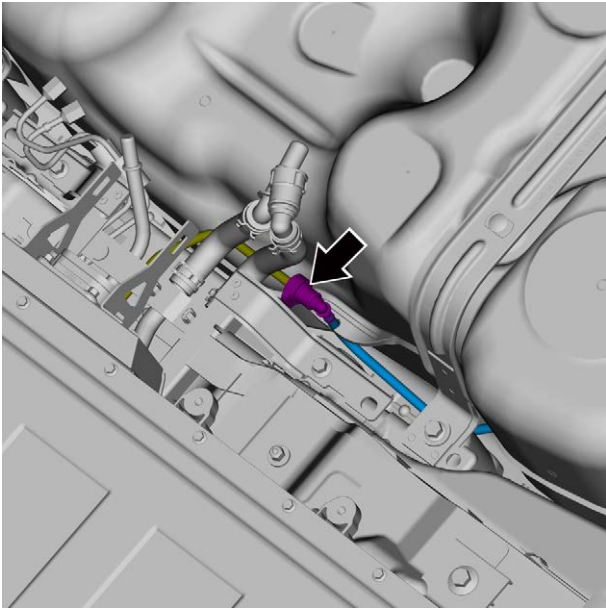
- 18 Install the harness clip 2 of the chassis harness.
- 19 Install the fixing clips 1 for the carbon canister vent tube.



- 20 Connect the fuel tank body refueling tube to the fuel tank body and install the fixing clips for the fuel tank body refueling tube.



- 21 Install the fixing clips 3 for the fuel tank isolation valve outlet tube.
- 22 Connect the fuel tank isolation valve outlet tube to the fuel tank body and install the quick connector 2 for the fuel tank isolation valve outlet tube.
- 23 Connect the leakage diagnosis line to the fuel tank body and install the quick connector 1 of the leakage diagnosis line.
- 24 Connect the harness connector A of the fuel tank body isolation valve.



- 25 Connect the fuel pump assembly line to the long underfloor line and install the quick connector of the fuel pump assembly line.

- 26 Install the fuel pump.
- 27 Install the exhaust pipe muffler assembly.
- 28 Install the carbon canister desorption tube.
- 29 Install the rear right brake pipe.
- 30 Install the rear left brake pipe.
- 31 Install the lower floor inlet and outlet tube, and connect the pipes.
- 32 Install the DC charging socket and wiring harness assembly.
- 33 Install the lower right fuel tank guard.
- 34 lower the vehicle.
- 35 Connect the negative cable of battery.
- 36 Close the engine compartment cover.

2.3.7.10 Fuel Pump with Oil Level Sensor and Replacement of Oil Level Sensor

Removal Procedure

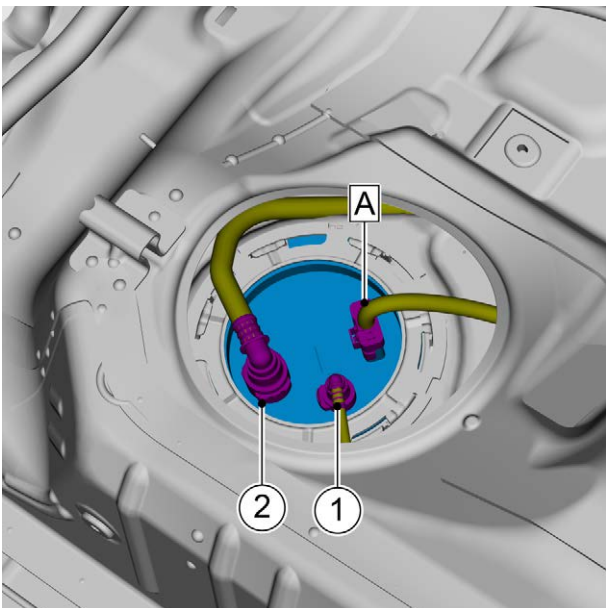
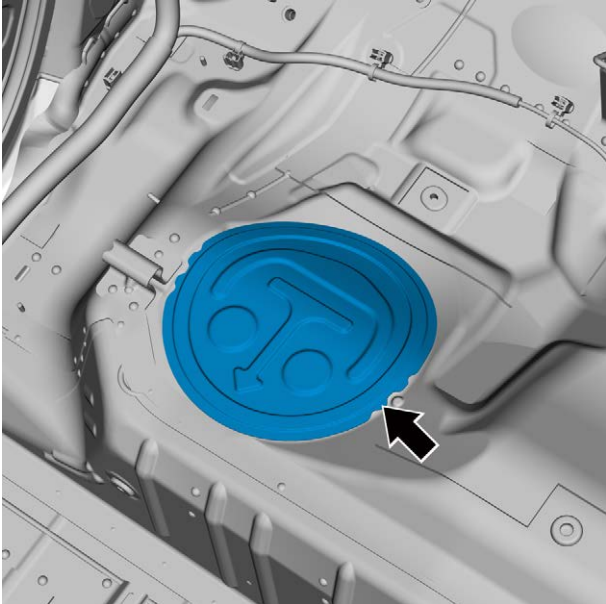
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

Warning !

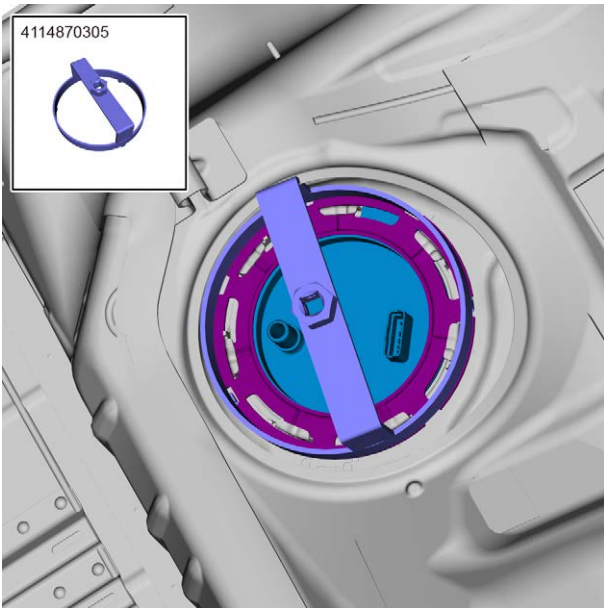
See "WARNINGS ABOUT RELEASING FUEL PRESSURE" in "[WARNING AND PRECAUTION](#)"

- 1 Release the fuel pressure, see [Fuel Pressure Release Procedure](#).

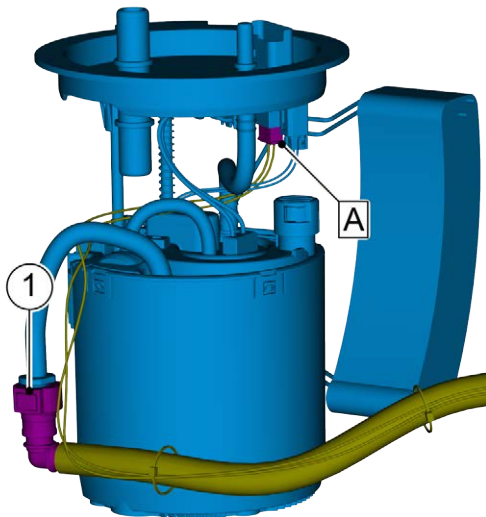


- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the rear seat cushion assembly, refer to [Replacement of rear seat cushion assembly](#).
- 4 Remove the center floor fuel tank access cover.

- 5 Disconnect the harness connector A of the fuel pump with oil level sensor.
- 6 Remove the quick connector 1 of the fuel pump assembly line and disconnect the fuel pump assembly line from the fuel pump with oil level sensor.
- 7 Remove the quick connector 2 of the oil pump assembly and disconnect the connection between the oil pump assembly pipeline and the fuel pump with oil level sensor.



- 8 Remove the oil pump locking ring with a special tool.
Special tool: 4114870305

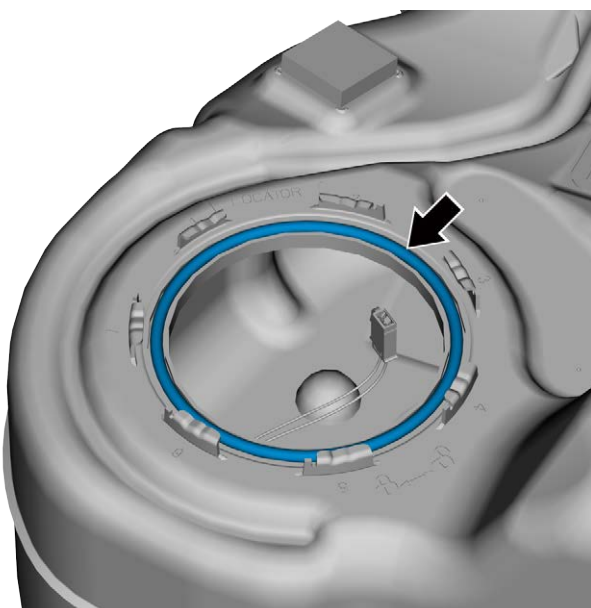


- 9 Lift the fuel pump slightly with the oil level sensor.

Caution

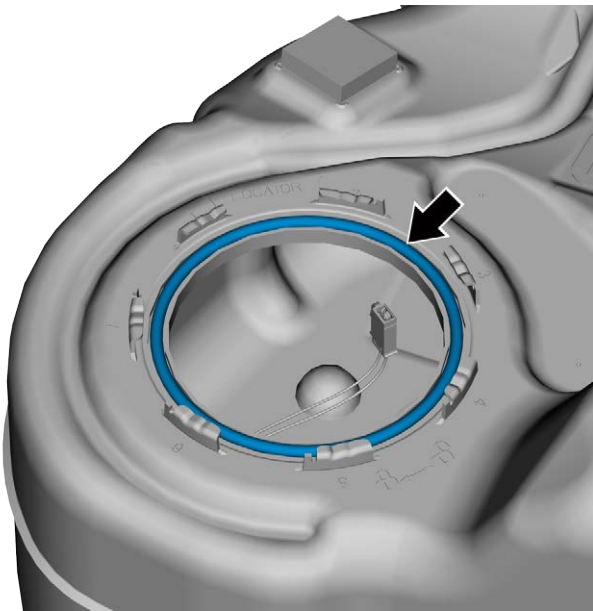
- 1. Be careful not to bend the float.
- 2. Be careful not to contaminate the fuel.

- 10 Disconnect the harness connector A of the secondary liquid level sensor.
- 11 Remove the quick connector 1 of the secondary liquid level sensor and disconnect the connection between the secondary liquid level sensor and the fuel pump with oil level sensor.
- 12 Remove the fuel pump with oil level sensor.

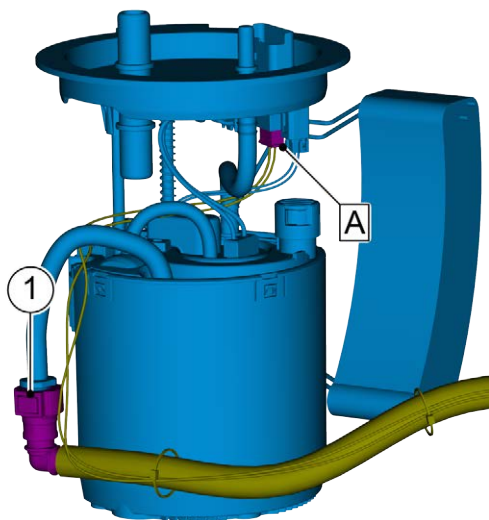


- 13 Remove the sealing ring of the fuel pump with oil level sensor.

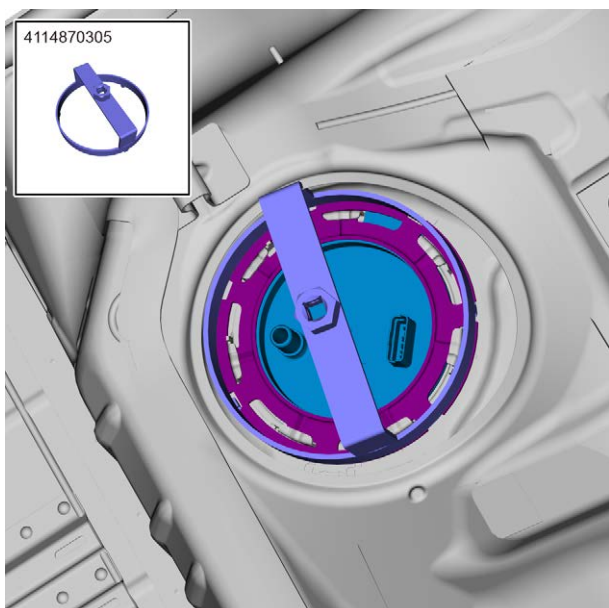
Installation Procedure



- 1 Clean the bonding surface between the fuel pump with oil level sensor and the fuel tank.
- 2 Install a new sealing ring for the fuel pump with oil level sensor.



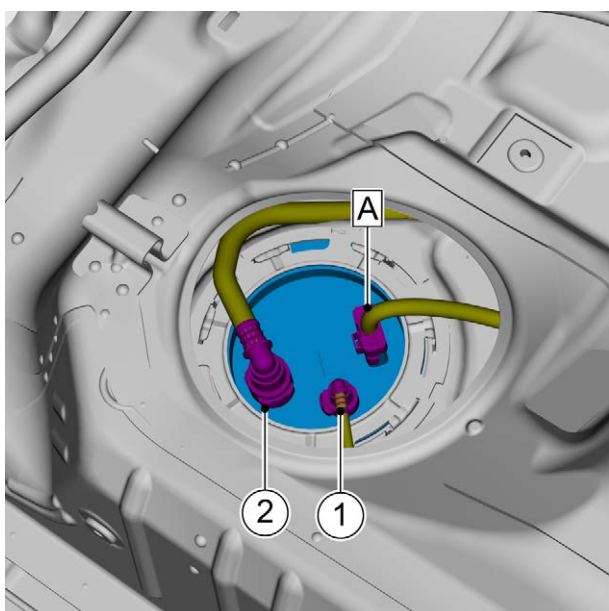
- 3 Connect the secondary level sensor to the fuel pump with oil level sensor and install the quick connector 1 of the secondary liquid level sensor.
- 4 Connect the harness connector A of the secondary liquid level sensor.
- 5 Install the fuel pump with oil level sensor.



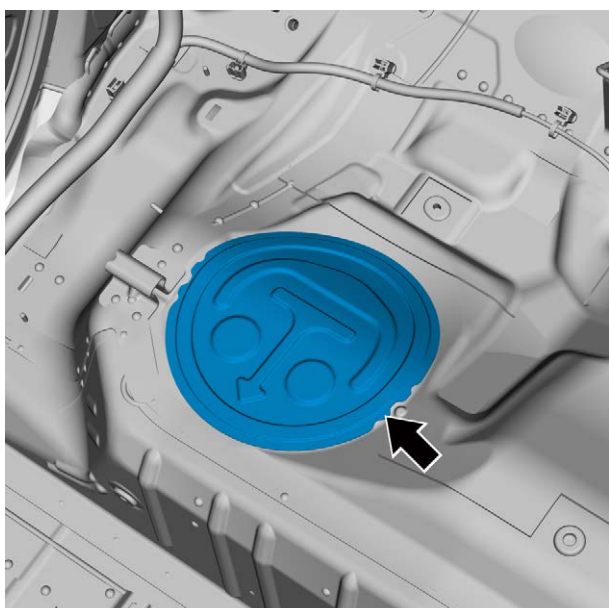
- 6 Install the oil pump locking ring with a special tool.
Special tool: 4114870305

Caution

1. Make sure that the fuel pump with oil level sensor is the same as before disassembly during installation.
2. Be careful not to bend the float.
3. Be careful not to contaminate the fuel.



- 7 Connect the intake pipe of the fuel tank isolation valve to the fuel pump with oil level sensor and install the quick connector 2 for the intake pipe of the fuel tank isolation valve.
- 8 Connect the oil pump assembly line to the fuel pump with oil level sensor and install the quick connector 1 of the oil pump assembly line.
- 9 Connect the harness connector A of the fuel pump with oil level sensor.



- 10 Install the center floor fuel tank access cover.

- 11 Install the rear seat cushion assembly.
- 12 Connect the negative cable of battery.

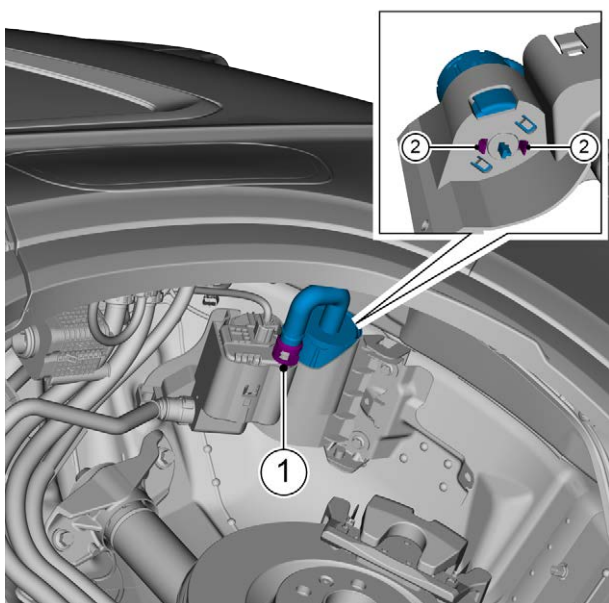
2.3.7.11 Replacement of Ash Filter Assembly

Removal Procedure

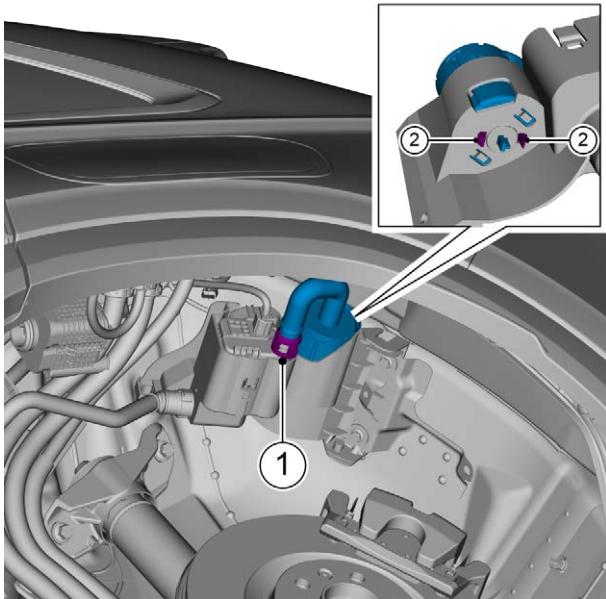
Warning !

See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the rear left wheels, see [Replacement of Wheel Assembly](#).
- 3 Remove the rear left wheel cover fender assembly, see [Replacement of Rear Left Wheel Cover Fender Assembly](#).
- 4 Remove the quick connector 1 of the ash filter assembly.
- 5 Disengage the two fixing points 2 of the ash filter assembly.
- 6 Remove the ash filter assembly.



Installation Procedure



- 1 Install the ash filter assembly through the two fixing points 2 of the ash filter assembly.
- 2 Install the quick connector 1 of the ash filter assembly.

- 3 Install the rear left wheel cover fender assembly.
- 4 Install the left rear wheel.
- 5 lower the vehicle.

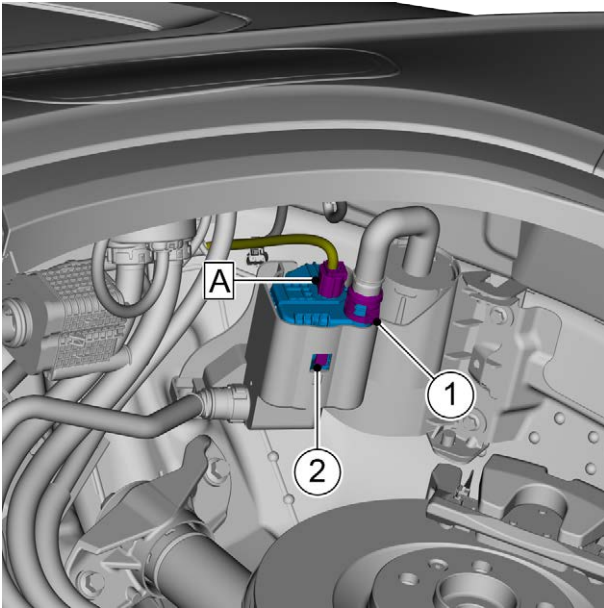
2.3.7.12 Leakage Detection Pump - Charcoal Canister Solenoid Valve - Replacement

Removal Procedure

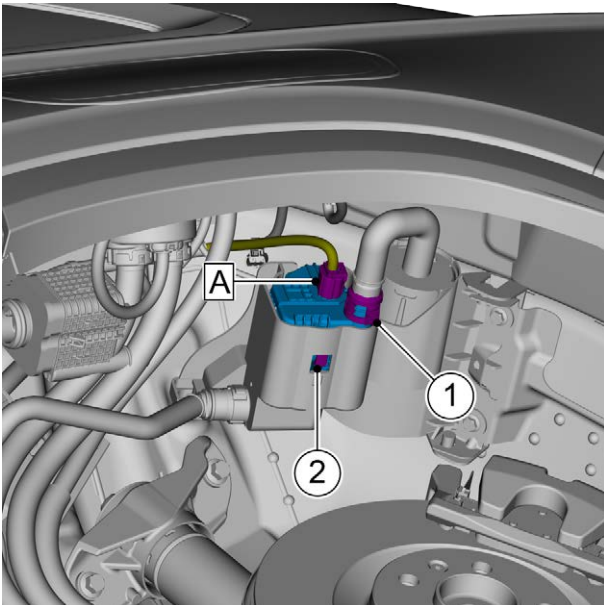
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 3 Remove the rear left wheels, see [Replacement of Wheel Assembly](#).
- 4 Remove the rear left wheel cover fender assembly, see [Replacement of Rear Left Wheel Cover Fender Assembly](#).



- 5 Disconnect the harness connector A for the charcoal canister solenoid valve of the leakage detection pump.
- 6 Remove the quick connector 1 of the ash filter assembly, and disengage the connection between the ash filter assembly and the carbon canister solenoid valve of the leakage detection pump.
- 7 Remove the charcoal canister solenoid valve of the leakage detection pump by prying off the fixing point 2 of the LDS bracket.



Installation Procedure

- 1 Install the charcoal canister solenoid valve of the leakage detection pump through the fixing point 2 of the LDS bracket.
- 2 Connect the ash filter assembly to the charcoal canister solenoid valve of the leakage detection pump and install the quick connector 1 of the ash filter assembly.
- 3 Connect the harness connector A for the charcoal canister solenoid valve of the Leakage detection pump.

- 4 Install the rear left wheel cover fender assembly.
- 5 Install the left rear wheel.
- 6 lower the vehicle.
- 7 Connect the negative cable of battery.

2.3.7.13 Replacement of Lower Floor Fuel Line Assembly

Removal Procedure

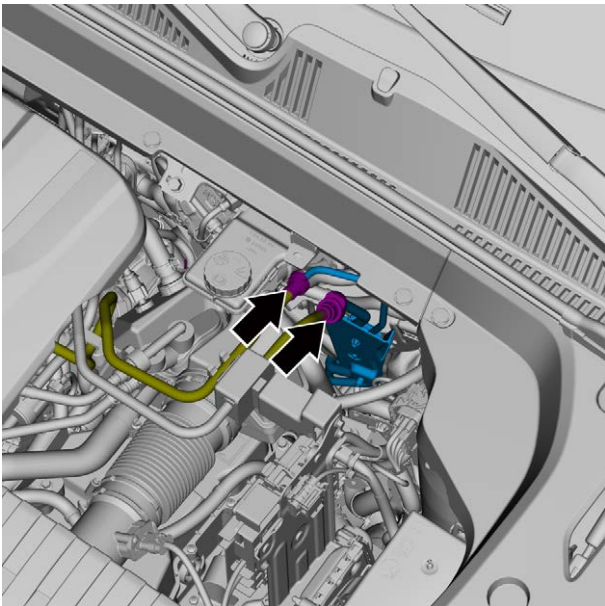
Warning !

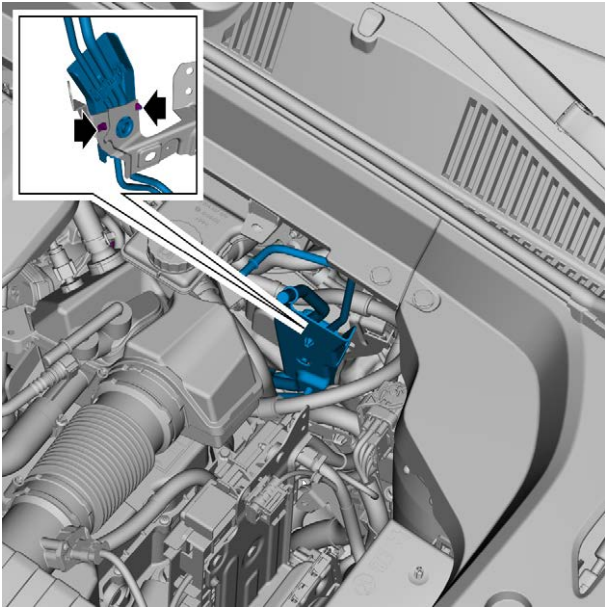
See "WARNINGS ABOUT RELEASING FUEL PRESSURE" in "[WARNING AND PRECAUTION](#)"

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

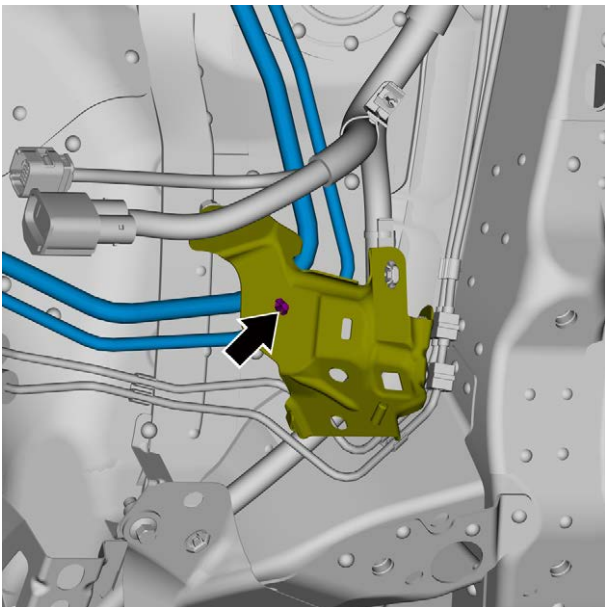
- 1 Open the engine compartment hood.
- 2 Release the fuel pressure, see [Fuel Pressure Release Procedure](#).
- 3 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 4 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 5 Remove the quick connector between the lower floor fuel supply hose assembly and the carbon canister solenoid valve with line.
- 6 Remove the quick connector of the lower floor vent tube to the carbon canister solenoid valve with line.

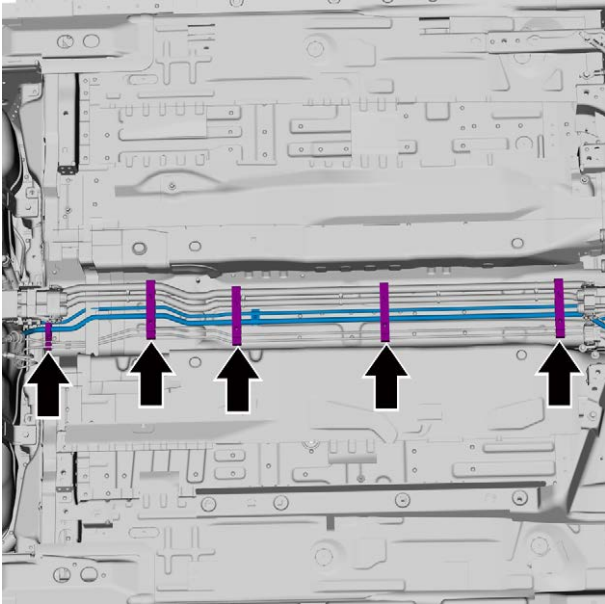




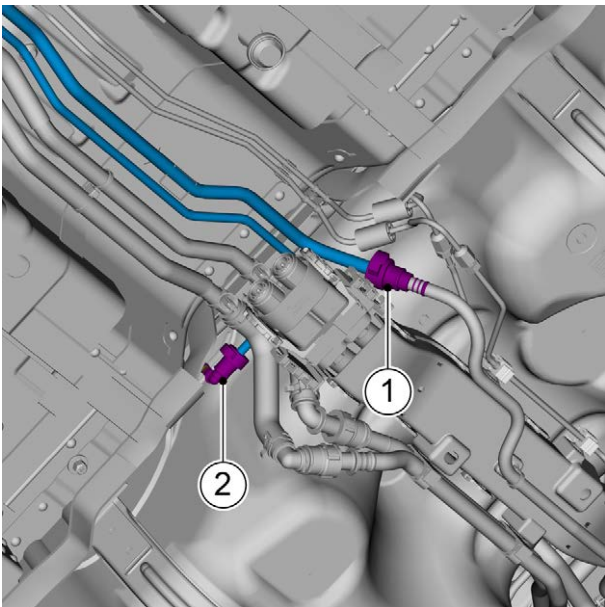
- 7 Disengage the fixing clips between the lower floor oil supply line assembly and the lower floor vent tube.

- 8 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 9 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 10 Remove the front subframe, see [Replacement of Front Subframe](#).
- 11 Remove the front access heat shield (2), see [Replacement of Front Access Heat Shield \(2\)](#).
- 12 Remove the hybrid power battery assembly, see [Replacement of Hybrid Power Battery Assembly](#).
- 13 Remove the center access line bracket, see [Replacement of Center Channel Line Bracket](#).
- 14 Remove the fixing clips for the left mounting bracket of the front access heat shield.

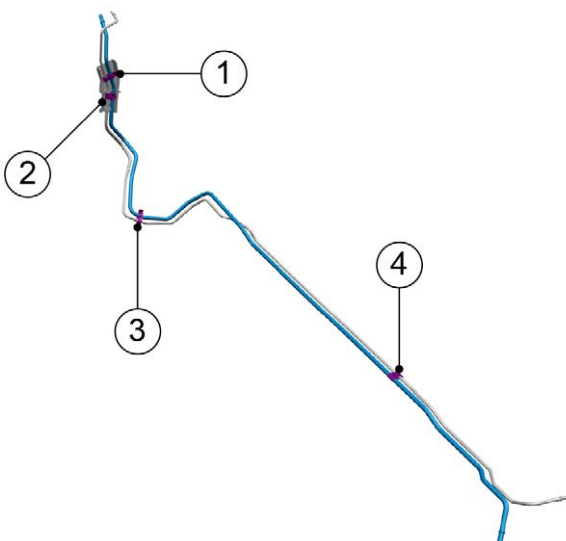




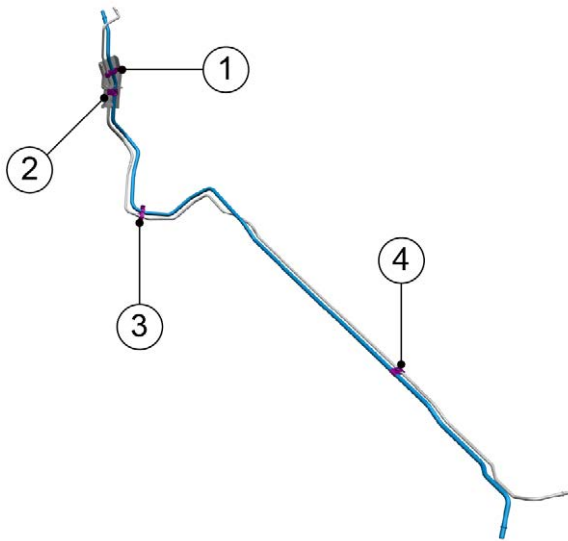
- 15 Remove the five 6-pipe clips between the lower floor oil supply line assembly and the lower floor vent tube.



- 16 Remove the quick connector 1 of the carbon canister desorption tube and disconnect the carbon canister desorption tube from the lower floor fuel supply tube assembly.
- 17 Remove the quick connector 2 of the fuel supply line and disconnect the fuel supply line from the lower floor vent tube.
- 18 Remove the lower floor oil supply line assembly and the lower floor vent tube.

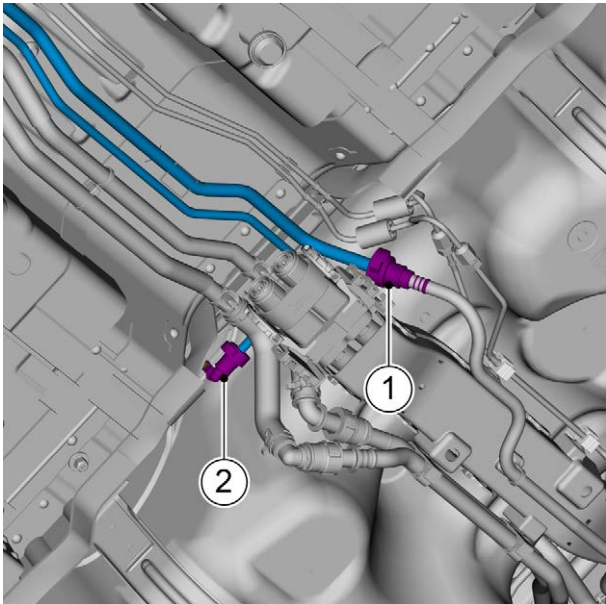


- 19 Remove the fixing clip 1 of the lower floor fuel supply hose.
- 20 Remove the fixing clip 2 of the lower floor fuel supply hose.
- 21 Remove the fixing clip 3 of the lower floor fuel supply hose.
- 22 Remove the fixing clip 4 of the lower floor fuel supply hose.
- 23 Remove the lower floor fuel supply hose.

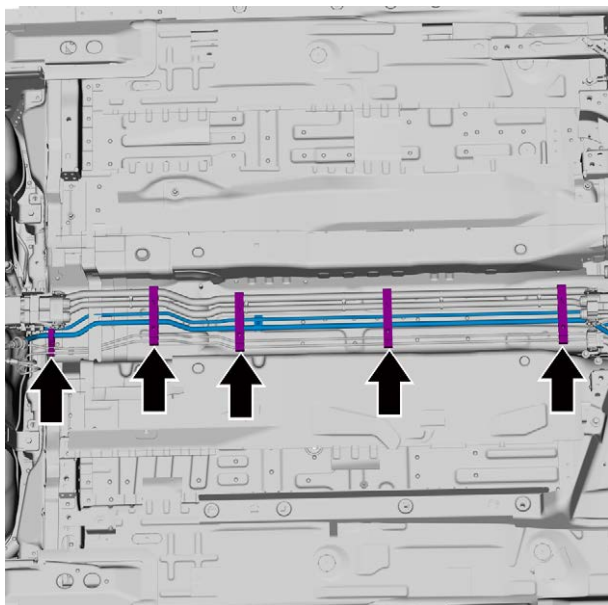


Installation Procedure

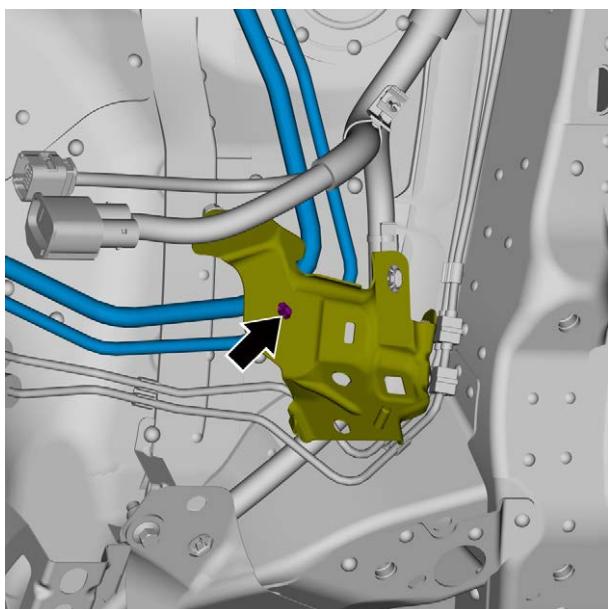
- 1 Install the fixing clip 1 of the lower floor fuel supply hose.
- 2 Install the fixing clip 2 of the lower floor fuel supply hose.
- 3 Install the fixing clip 3 of the lower floor fuel supply hose.
- 4 Install the fixing clip 4 of the lower floor fuel supply hose.
- 5 Install the fixing clip 1 of the lower floor fuel supply hose.



- 6 Install the lower floor fuel supply line assembly.
- 7 Connect the fuel pump assembly line to the lower floor fuel supply tube assembly and install the quick connector 2 of the fuel pump assembly line.
- 8 Connect the carbon canister desorption hose to the lower floor fuel supply hose assembly and install the quick connector 1 of the carbon canister desorption hose.

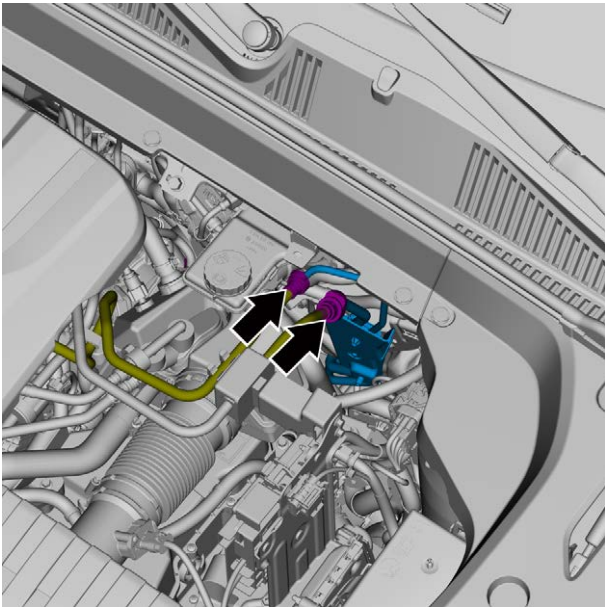
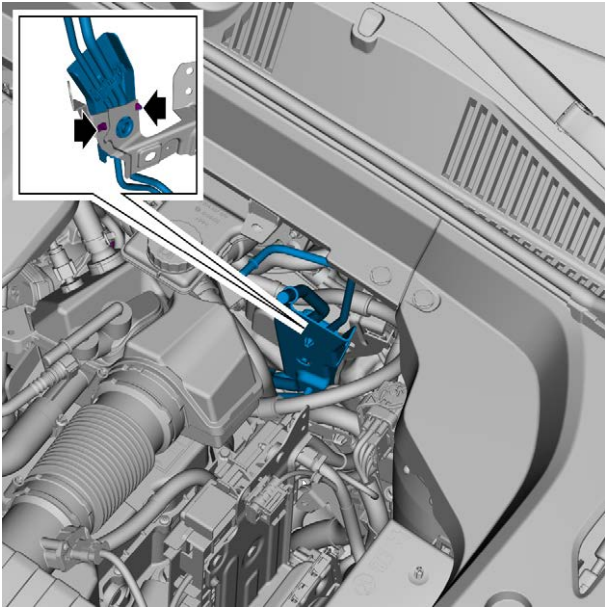


- 9 Install the five 6-pipe clamps of the lower floor fuel supply tube assembly.



- 10 Install the fixing clips of the left mounting bracket of the front access heat shield.

- 11 Install the center access line bracket.
- 12 Install the hybrid power battery assembly.
- 13 Install the front access heat shield (2).
- 14 Install the front subframe.
- 15 Install the bottom engine guard assembly.
- 16 lower the vehicle.



- 17 Install the fixing clips of the lower floor fuel line assembly.
- 18 Install the quick connector between the lower floor fuel line assembly and the carbon canister solenoid valve with line.
- 19 Install the quick connector between the lower floor vent tube and the carbon canister solenoid valve with line.

- 20 Install the engine trim cover assembly.
- 21 Connect the negative cable of battery.
- 22 Close the engine compartment cover.

2.3.7.14 Replacement of Fuel Tank Filler Tube

Removal Procedure

Warning !

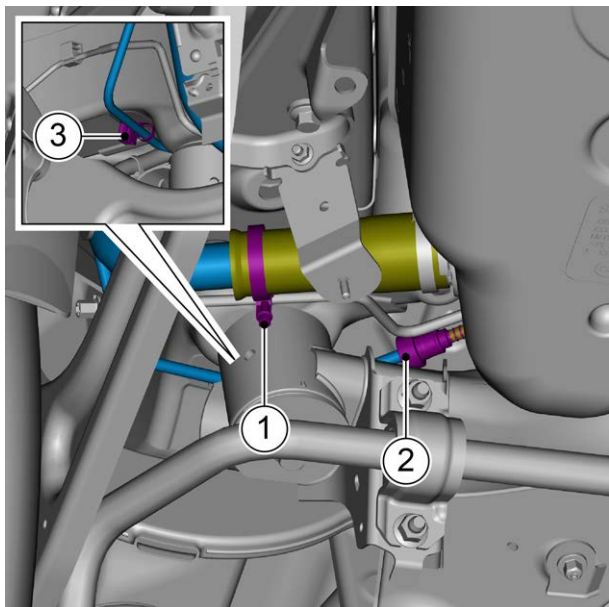
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

Warning !

See "WARNINGS ABOUT RELEASING FUEL PRESSURE" in "[WARNING AND PRECAUTION](#)"

- 1 Open the engine compartment hood.

- 2 Release the fuel pressure, see [Fuel Pressure Release Procedure](#).
- 3 Press the refueling button to relieve pressure.
- 4 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 5 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 6 Remove the rear right tire, see [Replacement of Wheel Assembly](#).
- 7 Remove the lower right fuel tank shield, see [Replacement of Lower Right Fuel Tank Shield](#).
- 8 Remove the rear left wheel cover fender assembly, see [Replacement of Rear Left Wheel Cover Fender Assembly](#).
- 9 Remove the fuel filler cap assembly, see [Replacement of Fuel Filler Cap Assembly](#).

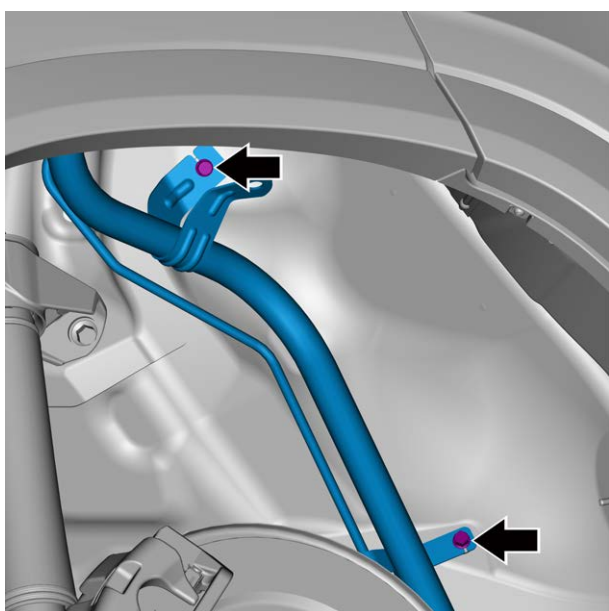


- 10 Loosen the fixing ring 1 of the fuel tank filler tube and disconnect the fuel tank filler tube from the fuel tank.

Caution

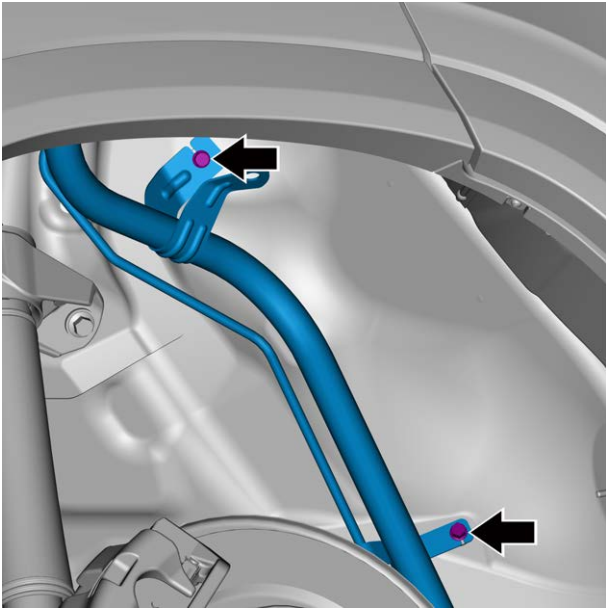
Plug the fuel tank filler tube with a rag to prevent contamination of the fuel tank.

- 11 Remove the quick connector 2 of the leakage diagnosis line and disconnect the fuel tank filler tube from the leakage diagnosis line.
- 12 Remove the fixing clip 3 of the fuel tank filler tube.



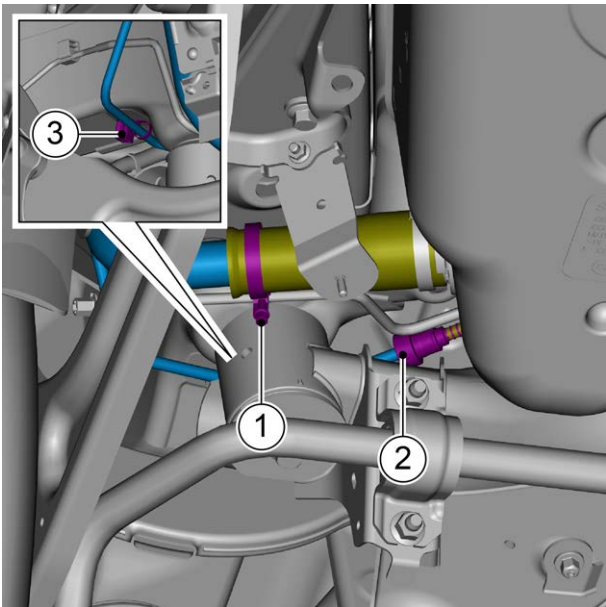
- 13 Remove the two fixing bolts of the fuel tank filler tube, and remove the fuel tank filler tube.

Installation Procedure



- 1 Install the fuel tank filler pipe, install and tighten the two fixing bolts of the fuel tank filler pipe.

Torque: 10N·m



- 2 Install the fixing clip 3 for the fuel tank filler tube.
- 3 Connect the fuel tank filler hose connection hose to the fuel tank filler hose, and tighten the fixing ring 1 of the fuel tank filler tube connecting hose.

Torque: 3.5N·m

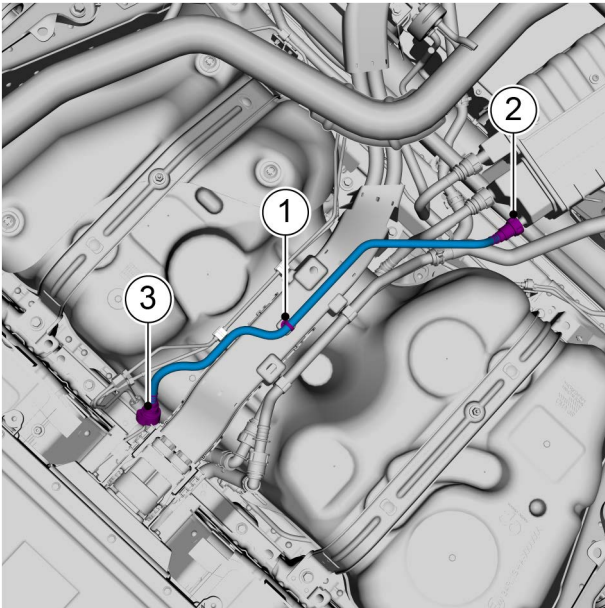
- 4 Install the connector 2 of the leakage diagnosis line.

- 5 Install the fuel filler cap assembly.
- 6 Install the rear right wheel cover fender assembly.
- 7 Install the lower right body guard.
- 8 Install the right rear tire.
- 9 lower the vehicle.
- 10 Connect the negative cable of battery.
- 11 Close the engine compartment cover.

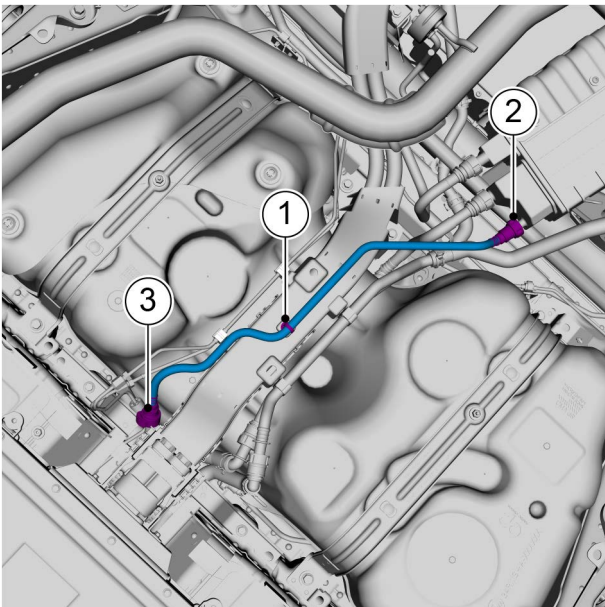
2.3.7.15 Replacement of Carbon Canister Desorption Tube

Removal Procedure

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the lower right fuel tank shield, see [Replacement of Lower Right Fuel Tank Shield](#).



- 3 Remove the fixing clips 1 of the carbon canister desorption tube.
- 4 Remove the quick connector 2 of the carbon canister desorption tube and disconnect the carbon canister desorption tube from the carbon canister.
- 5 Remove the quick connector 3 of the carbon canister desorption tube and disconnect the carbon canister desorption tube from the lower floor fuel supply tube assembly.
- 6 Remove the carbon canister desorption tube.



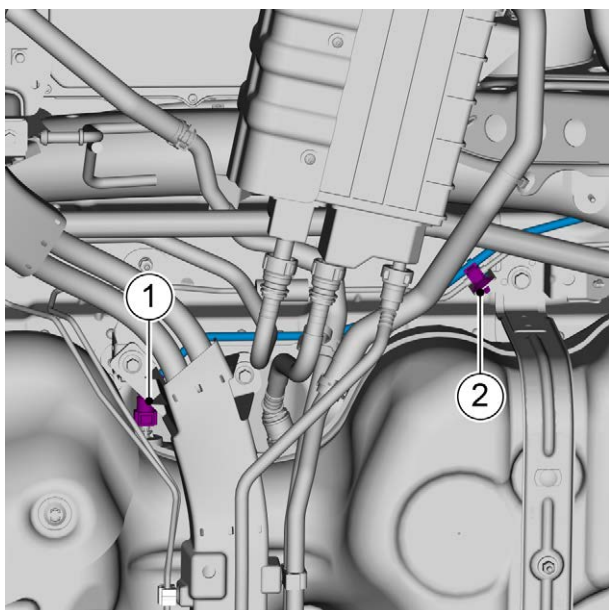
Installation Procedure

- 1 Install the carbon canister desorption tube.
- 2 Connect the carbon canister desorption hose to the lower floor fuel supply hose assembly and install the quick connector 3 of the carbon canister desorption hose.
- 3 Connect the carbon canister desorption tube to the carbon canister and install the quick connector 2 of the carbon canister desorption tube.
- 4 Install the fixing clips 1 of the carbon canister desorption tube.
- 5 Install the lower right fuel tank guard.
- 6 lower the vehicle.

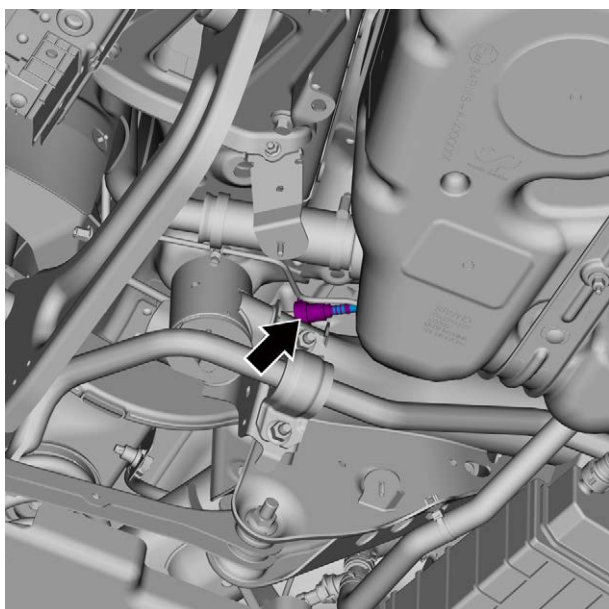
2.3.7.16 Replacement of Leakage Diagnosis Line

Removal Procedure

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the lower right fuel tank shield, see [Replacement of Lower Right Fuel Tank Shield](#).

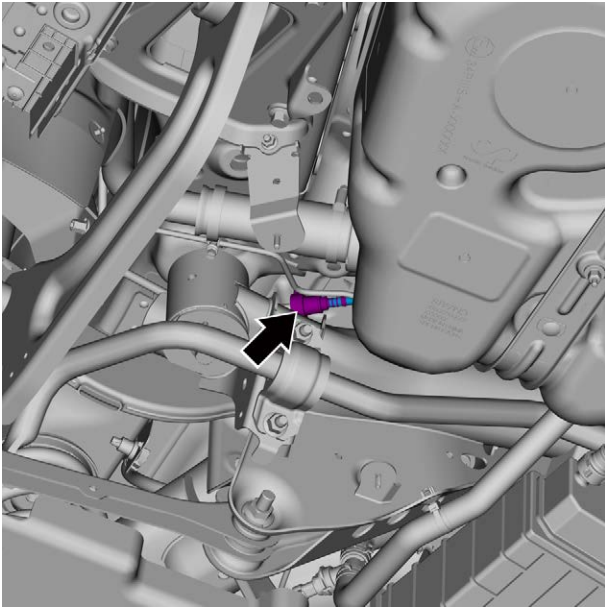


- 3 Disconnect the leakage diagnosis line from the fuel tank by removing the quick connector 1 of the leakage diagnosis line.
- 4 Remove the fixing clip 2 of the leakage diagnosis line.

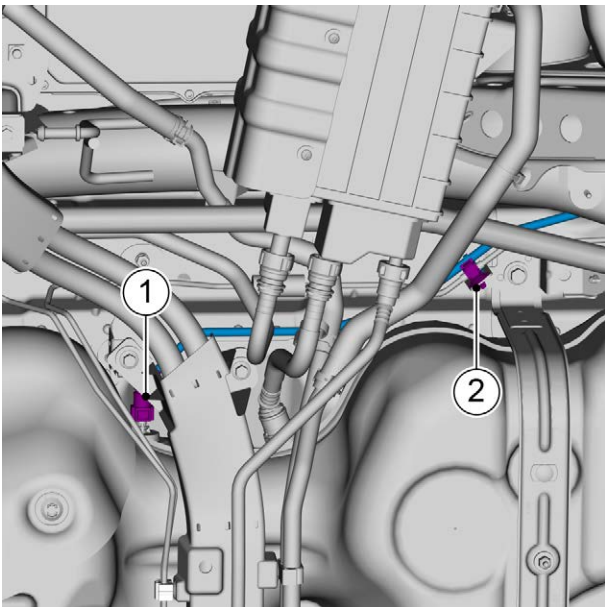


- 5 Remove the quick connector of the leakage diagnosis line and disconnect the leakage diagnosis line from the fuel tank filler tube.
- 6 Remove the leakage diagnosis line.

Installation Procedure



- 1 Install the leakage diagnosis line.
- 2 Connect the leakage diagnosis line to the fuel tank filler tube and install the quick connector of the leakage diagnosis line.



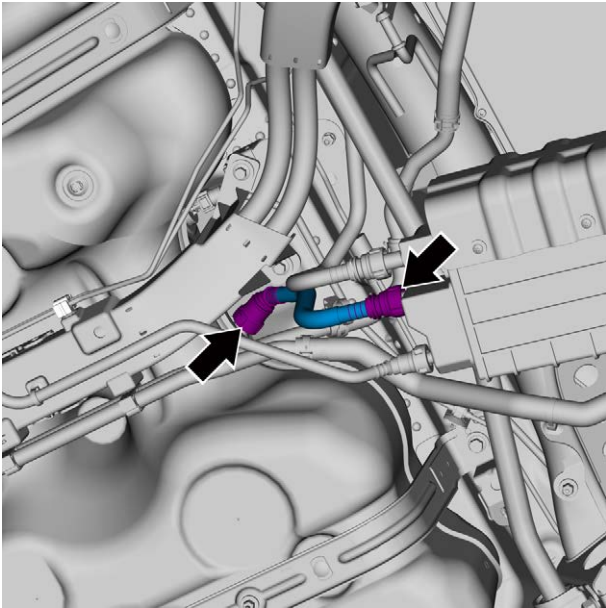
- 3 Install the fixing clip 2 of the leakage diagnosis line.
- 4 Connect the leakage diagnosis line to the fuel tank and install the quick connector 1 of the leakage diagnosis line.

- 5 Install the lower right fuel tank guard.
- 6 lower the vehicle.

2.3.7.17 Replacement of Fuel Tank Isolation Valve Outlet Tube

Removal Procedure

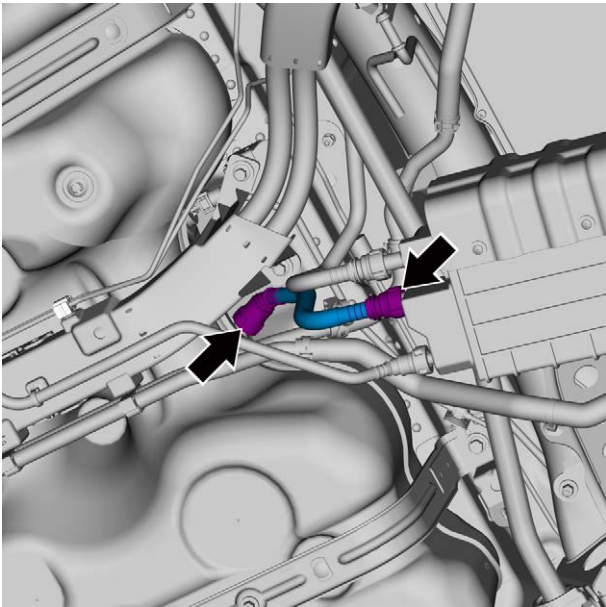
- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the lower right fuel tank shield, see [Replacement of Lower Right Fuel Tank Shield](#).



- 3 Remove the two quick connectors from the tank isolation valve outlet tube.
- 4 Remove the fuel tank isolation valve outlet tube.

Installation Procedure

- 1 Install the fuel tank isolation valve outlet tube.
- 2 Install the two quick connectors of the fuel tank isolation valve outlet tube.

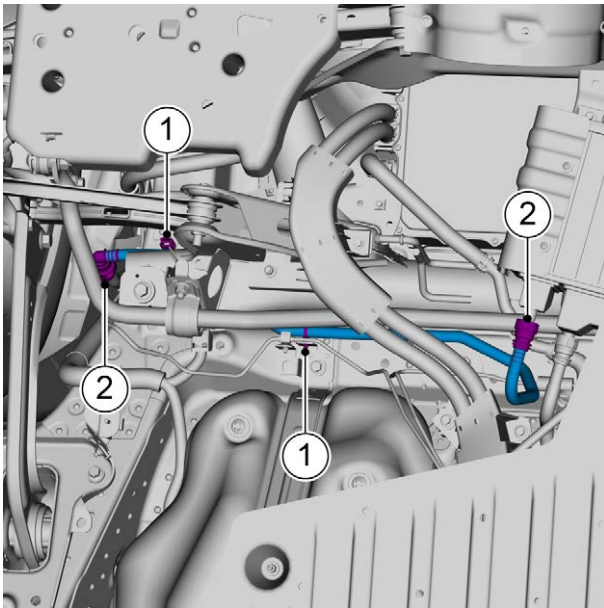


- 3 Install the lower right fuel tank guard.
- 4 lower the vehicle.

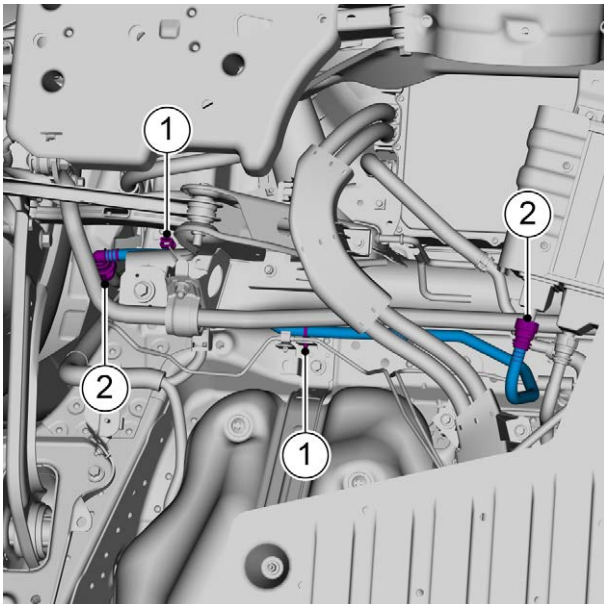
2.3.7.18 Replacement of Carbon Canister Vent Tube (1)

Removal Procedure

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the lower right fuel tank shield, see [Replacement of Lower Right Fuel Tank Shield](#).



- 3 Remove the two fixing clips 1 of the carbon canister vent tube (1).
- 4 Remove the two quick connectors 2 of the carbon canister vent tube (1).
- 5 Remove the carbon canister vent tube (1).



Installation Procedure

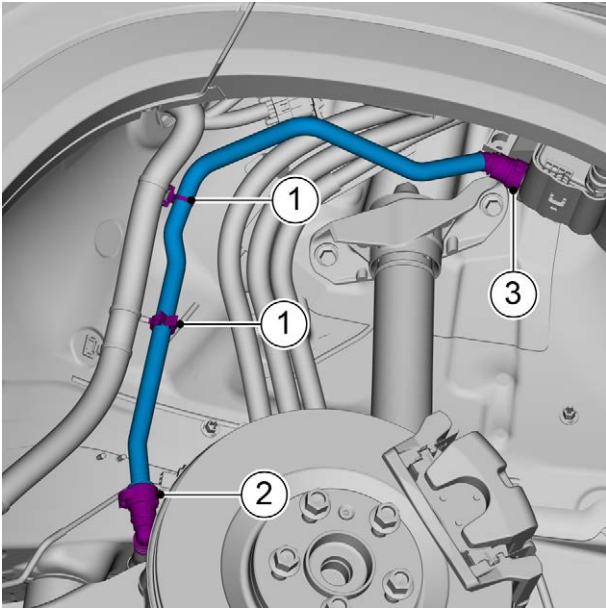
- 1 Install the carbon canister vent tube (1).
- 2 Install the two quick connectors 2 of the carbon canister vent tube (1).
- 3 Install the two fixing clips 1 of the carbon canister vent tube (1).

- 4 Install the lower right fuel tank guard.
- 5 lower the vehicle.

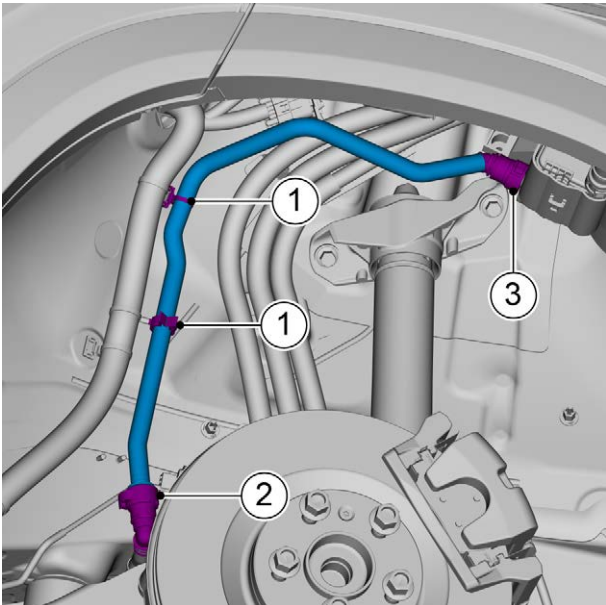
2.3.7.19 Replacement of Carbon Canister Vent Tube (2)

Removal Procedure

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the rear left wheels, see [Replacement of Wheel Assembly](#).
- 3 Remove the rear left wheel cover fender assembly, see [Replacement of Rear Left Wheel Cover Fender Assembly](#).



- 4 Remove the two fixing clips 1 of the carbon canister vent tube (2).
- 5 Remove the quick connector 2 of the carbon canister vent tube (1).
- 6 Remove the quick connector 3 of the carbon canister vent tube (2).
- 7 Remove the carbon canister vent tube (2).



Installation Procedure

- 1 Install the carbon canister vent tube (2).
- 2 Install the quick connector 3 of the carbon canister vent tube (2).
- 3 Install the quick connector 2 of the carbon canister vent tube (1).
- 4 Install the two fixing clips 1 of the carbon canister vent tube (2).

- 5 Install the rear left wheel cover fender assembly.
- 6 Install the left rear wheel.
- 7 lower the vehicle.

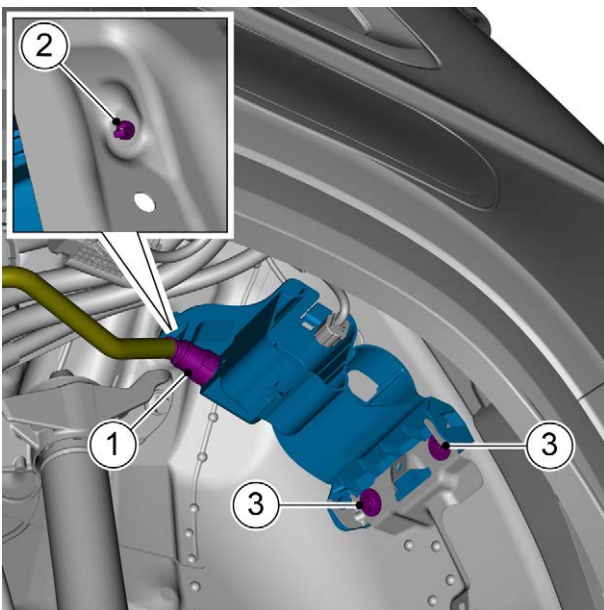
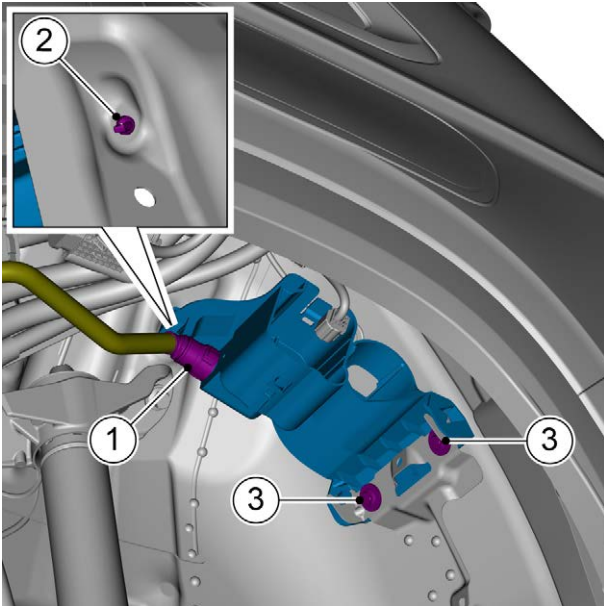
2.3.7.20 Replacement of Leakage Diagnosis Sensor Bracket

Removal Procedure

Warning !

See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the rear left wheels, see [Replacement of Wheel Assembly](#).



- 3 Remove the rear left wheel cover fender assembly, see [Replacement of Rear Left Wheel Cover Fender Assembly](#).
- 4 Remove the ash filter assembly, see [Replacement of Ash Filter Assembly](#).
- 5 Remove the carbon canister solenoid valve of the leakage detection pump carbon canister solenoid valve, see [Replacement of Carbon Canister Solenoid Valve in Leakage Detection Pump](#).
- 6 Remove the quick connector 1 of the carbon canister vent tube (2).
- 7 Remove the two fixing bolts 3 of the leakage diagnosis sensor bracket.
- 8 Disengage the fixing point 2 of the leakage diagnosis sensor bracket and remove the leakage diagnosis sensor bracket.

Installation Procedure

- 1 Secure the leakage diagnosis sensor bracket by installing the fixing points 2 of the leakage diagnosis sensor bracket.
- 2 Install and tighten the two fixing bolts 3 of the leakage diagnosis sensor bracket.
Torque: 10 N·m
- 3 Install the quick connector 1 of the carbon canister vent tube (2).
- 4 Install the carbon canister solenoid valve of the leakage detection pump.
- 5 Install the ash filter assembly.

- 6 Install the rear left wheel cover fender assembly.
- 7 Install the left rear wheel.
- 8 lower the vehicle.

2.3.7.21 Replacement of Lower Floor Vent Tube

Removal Procedure

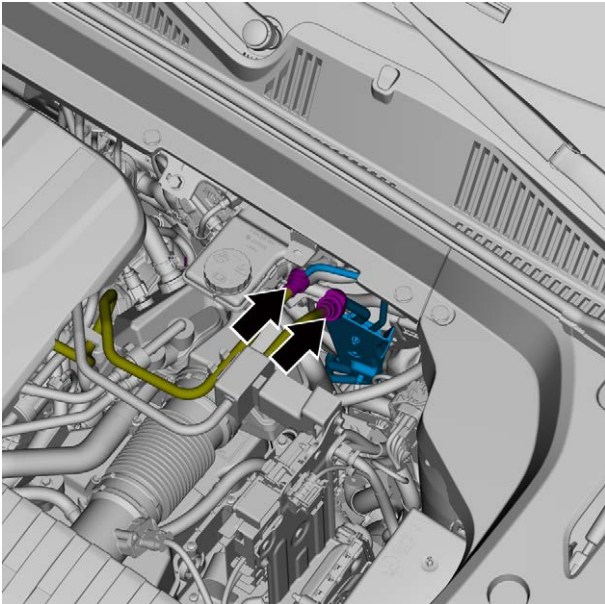
Warning !

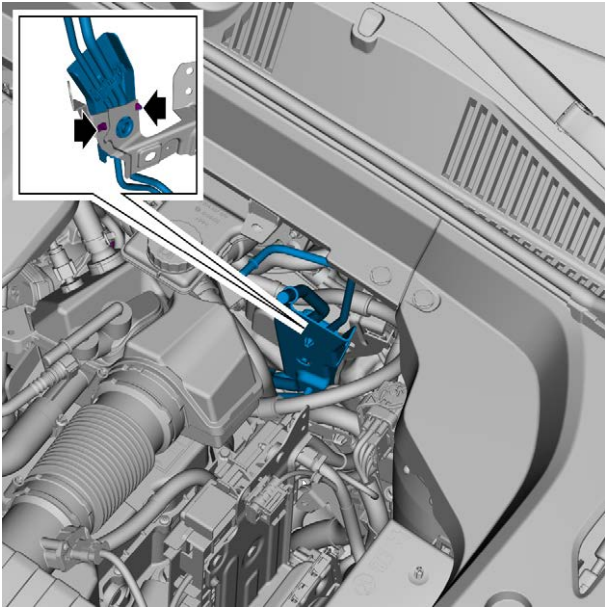
See "WARNINGS ABOUT RELEASING FUEL PRESSURE" in "[WARNING AND PRECAUTION](#)"

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

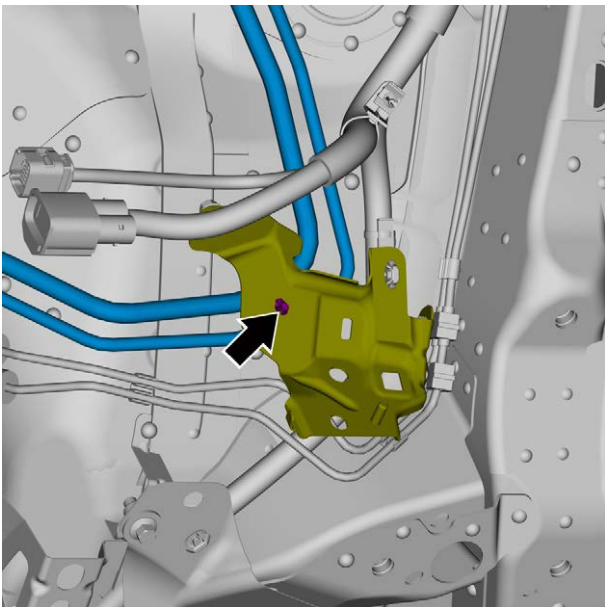
- 1 Open the engine compartment hood.
- 2 Release the fuel pressure, see [Fuel Pressure Release Procedure](#).
- 3 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 4 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 5 Remove the quick connector between the lower floor fuel supply hose assembly and the carbon canister solenoid valve with line.
- 6 Remove the quick connector of the lower floor vent tube to the carbon canister solenoid valve with line.

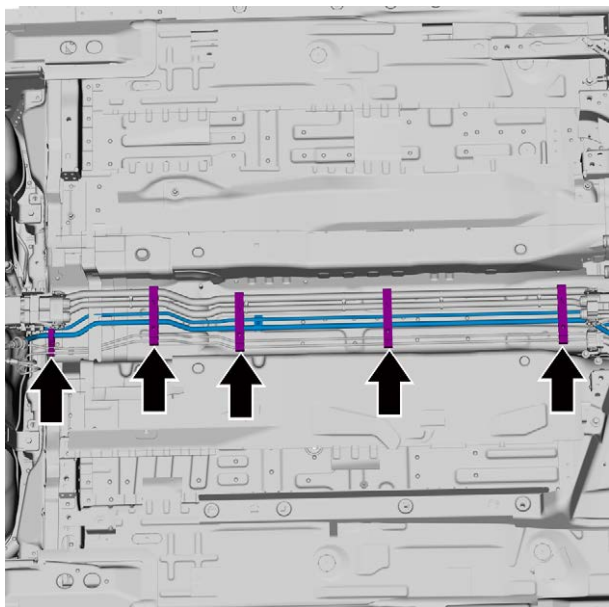




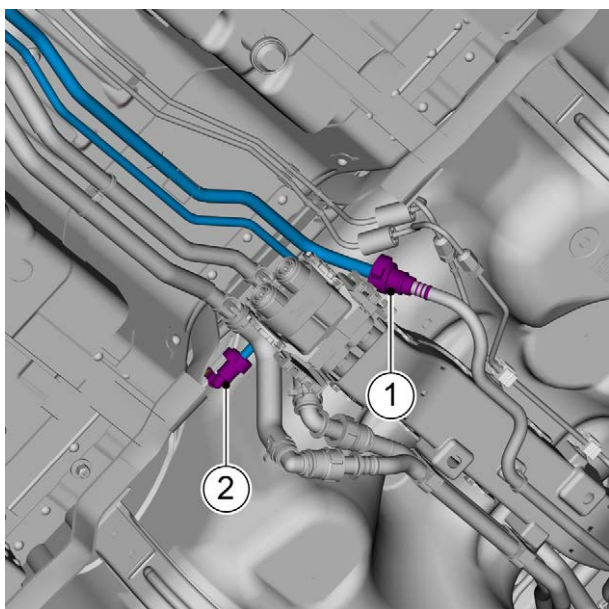
- 7 Disengage the fixing clips between the lower floor oil supply line assembly and the lower floor vent tube.

- 8 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 9 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 10 Remove the front subframe, see [Replacement of Front Subframe](#).
- 11 Remove the front access heat shield (2), see [Replacement of Front Access Heat Shield \(2\)](#).
- 12 Remove the hybrid power battery assembly, see [Replacement of Hybrid Power Battery Assembly](#).
- 13 Remove the center access line bracket, see [Replacement of Center Channel Line Bracket](#).
- 14 Remove the fixing clips for the left mounting bracket of the front access heat shield.

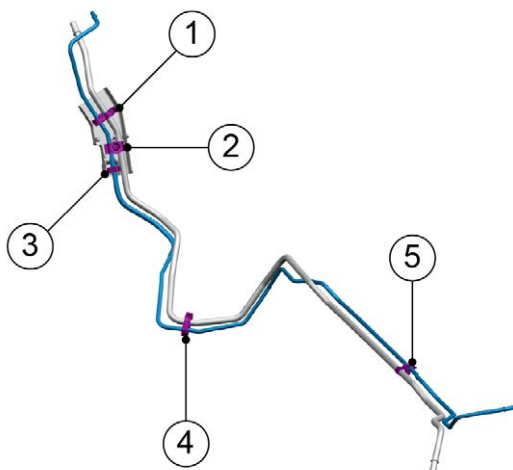




- 15 Remove the five 6-pipe clips between the lower floor oil supply line assembly and the lower floor vent tube.



- 16 Remove the quick connector 1 of the carbon canister desorption tube and disconnect the carbon canister desorption tube from the lower floor fuel supply tube assembly.
- 17 Remove the quick connector 2 of the fuel supply line and disconnect the fuel supply line from the lower floor vent tube.
- 18 Remove the lower floor oil supply line assembly and the lower floor vent tube.

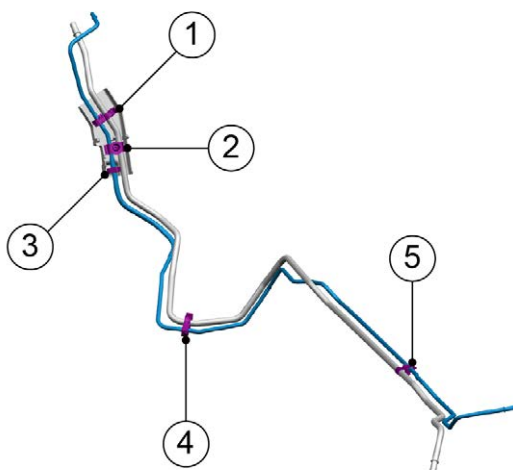


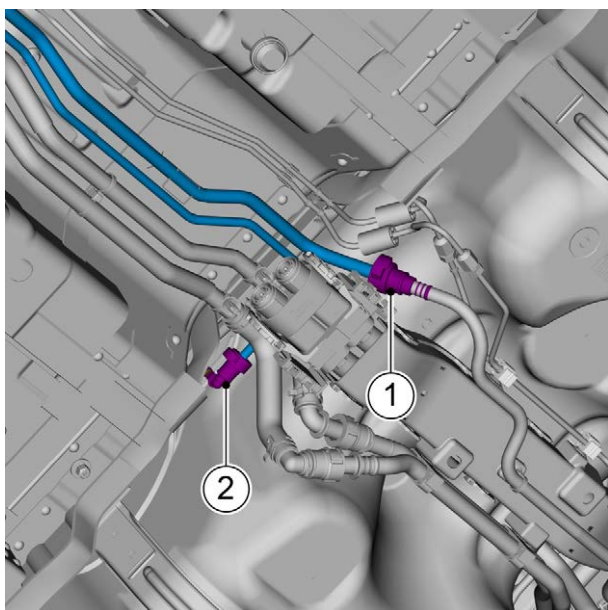
- 19 Remove the fixing clip 1 of the lower floor vent tube.
- 20 Remove the fixing clip 2 of the lower floor vent tube.
- 21 Remove the fixing clip 3 of the lower floor vent tube.
- 22 Remove the fixing clip 4 of the lower floor vent tube.
- 23 Remove the fixing clip 5 of the lower floor vent tube.

- 24 Remove the lower floor vent tube.

Installation Procedure

- 1 Install the fixing clip 1 of the lower floor vent tube.
- 2 Install the fixing clip 2 of the lower floor vent tube.
- 3 Install the fixing clip 3 of the lower floor vent tube.
- 4 Install the fixing clip 4 of the lower floor vent tube.
- 5 Install the fixing clip 5 of the lower floor vent tube.

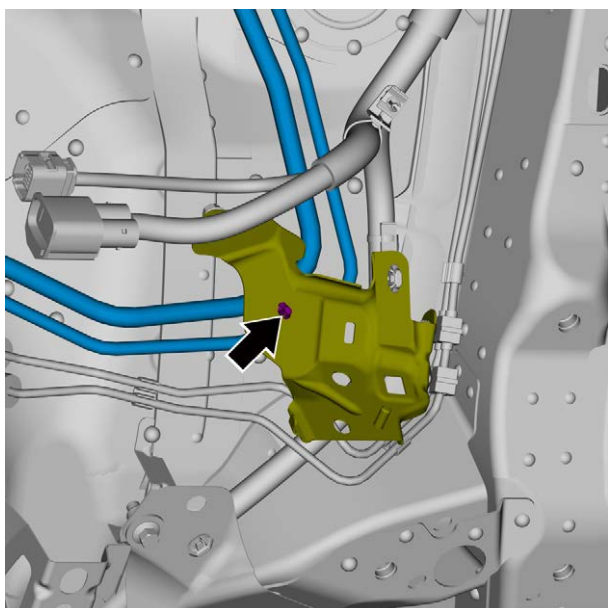




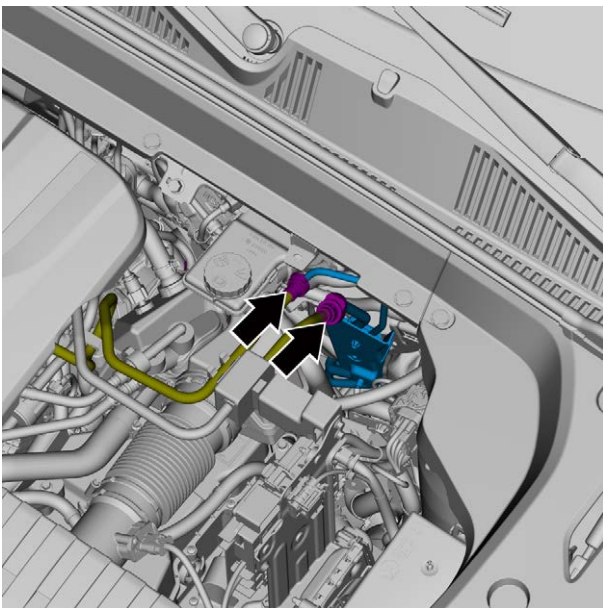
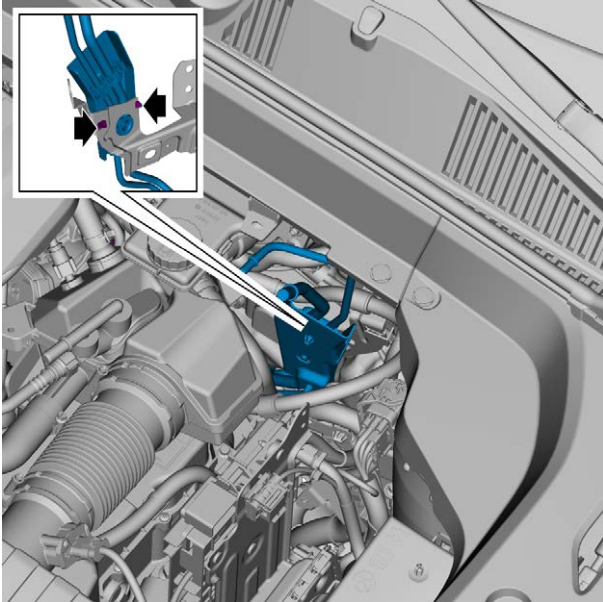
- 6 Install the lower floor oil supply line assembly and the lower floor vent tube.
- 7 Connect the fuel supply hose to the lower floor fuel supply hose assembly and install the quick connector 2 of the fuel supply hose.
- 8 Connect the carbon canister desorption tube to the lower floor vent tube and install the quick connector 1 of the carbon canister desorption tube.



- 9 Install the five 6-pipe clips between the lower floor fuel supply line assembly with the lower floor vent tube.



- 10 Install the fixing clips of the left mounting bracket of the front access heat shield.



- 11 Install the center access line bracket.
- 12 Install the hybrid power battery assembly.
- 13 Install the front access heat shield (2).
- 14 Install the front subframe.
- 15 Install the bottom engine guard assembly.
- 16 lower the vehicle.
- 17 Install the fixing clips for the lower floor fuel supply tube assembly and the lower floor vent tube.
- 18 Install the quick connector between the lower floor fuel line assembly and the carbon canister solenoid valve with line.
- 19 Install the quick connector between the lower floor vent tube and the carbon canister solenoid valve with line.
- 20 Install the engine trim cover assembly.
- 21 Connect the negative cable of battery.
- 22 Close the engine compartment cover.

2.3.7.22 Replacement of Front Compartment Fuel Supply Pipe

Removal Procedure

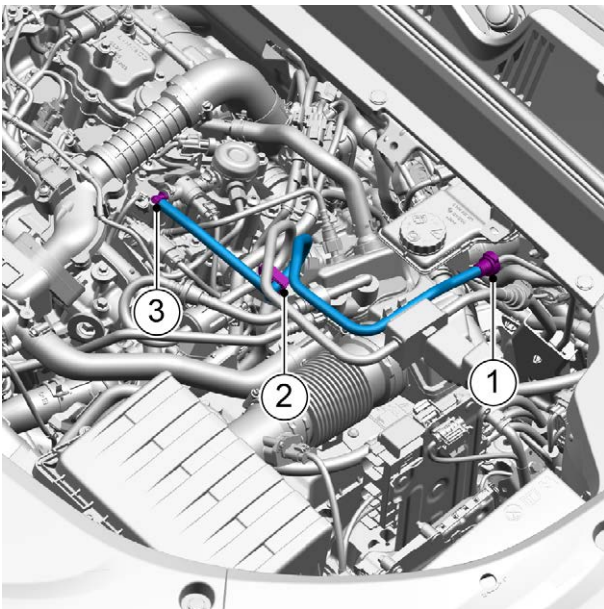
Warning !

See "WARNINGS ABOUT RELEASING FUEL PRESSURE" in "[WARNING AND PRECAUTION](#)"

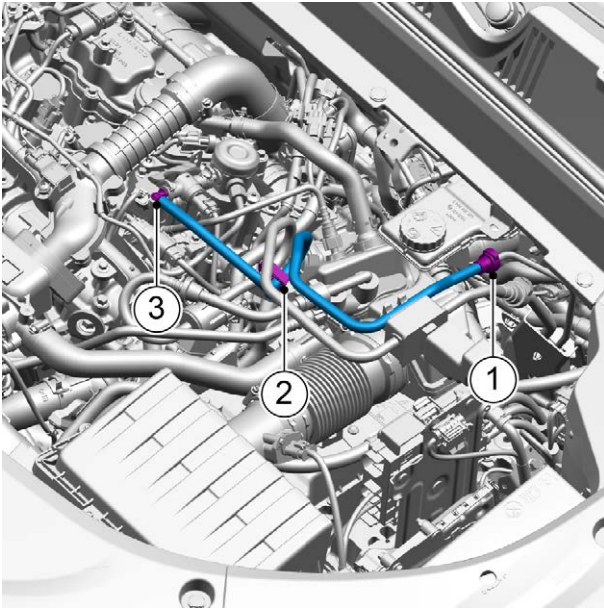
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 2 Release the fuel pressure, see [Fuel Pressure Release Procedure](#).
- 3 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 4 Remove the quick connector 1 of the front compartment fuel supply hose and disconnect the front compartment fuel supply hose from the lower floor vent tube.
- 5 Remove the fixing clips 2 of the front compartment fuel supply hose.
- 6 Disengage the connector 3 between the front compartment fuel supply hose and the fuel pressure sensor on the low pressure side.



Installation Procedure




- 1 Connect the connector 3 between the front compartment fuel supply hose and the fuel pressure sensor on the low pressure side.
- 2 Install the fixing clip 2 of the front compartment fuel supply hose. .
- 3 Install the quick connector 1 of the front compartment fuel supply hose, and connect the front compartment fuel supply hose to the lower floor vent hose.

- 4 Install the engine trim cover assembly.
- 5 Connect the negative cable of battery.
- 6 Close the engine compartment cover.

2.3.8 Specialized tools and equipment

2.3.8.1 Special tools

Serial No.:	Illustration	Tool No.	Name
1		4114870305	Removal and installation tool for oil pump locking ring

2.4 Auxiliary Emission Control Unit (DHE15-ESZ)

2.4.1 Specification

2.4.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Lambda probe (upstream oxygen sensor)	-	40-50
Lambda probe (downstream oxygen sensor)	-	40-50
Fixing bolt between carbon canister and body	M6×20	8.5-11.5

2.4.2 Instructions and operations

2.4.2.1 Evaporative Emission System (EVAP)

The basic principle used in the EVAP is the carbon canister storage method. This method transfers fuel vapors from the fuel tank to an activated carbon storage device to preserve vapors when the vehicle is not running. When the engine is running, fuel vapors are drawn from the carbon core by the intake airflow and consumed in the normal combustion process. Gasoline vapors flow from the fuel tank into the fuel vapor recovery pipe. These vapors are absorbed by the carbon canister. After the engine has been running for a specified period of time, the engine control module provides a grounding circuit to energize the evaporative emissions canister scavenging solenoid valve and air is drawn into the carbon canister and mixed with the vapors. This mixture is then drawn into the intake manifold. The evaporative emissions canister scavenge solenoid valve is controlled by a pulse width modulation (PWM) signal to open or close it. Depending on the operating conditions determined by air flow rate, fuel regulation, and intake temperature, the evaporative emissions canister scavenge pulse width modulation duty cycle changes.

The EVAP is an integral part of the fuel system and is used to prevent fuel vapors from exhausting into the surrounding air. Fuel vapors spilled from the fuel tank must not be discharged into the atmosphere. It must be sent through the carbon canister into the intake manifold. The fuel vapor will be burned in the engine.

Fuel vapors from the fuel tank are routed through a hose from the rollover (accident) safety valve at the top of the fuel tank to the carbon canister. The rollover (accident) safety valve prevents fuel leakage and closes in the event of a rollover accident. A carbon canister is an activated charcoal storage device that purifies the fuel vapors. After purification, the fuel vapors are distributed through the fuel line to the intake manifold and into the engine cylinders for combustion. Mounting the intake manifold to the fuel line should be fitted with the carbon canister solenoid valve. The carbon canister solenoid valve controls the fuel vapors introduced into the engine. A control valve opens and closes the connection between the carbon canister and the intake manifold. The flow rate of the carbon canister solenoid valve is controlled by the engine control module (ECM). The carbon canister has an intake port that compensates for the lack of pressure in the carbon canister when fuel vapors are released into the intake manifold. The carbon canister intake port includes an air filter.

The following conditions can cause poor idle, stalling and poor handling:

-Carbon canister solenoid valve does not operate.

-Carbon canister is damaged.

-Hose is disconnected, cracked, and not properly connected to the correct line.

The evaporative emission canister is an emission control device containing activated carbon particles. The evaporative emission canister is used to store fuel vapors from the fuel tank. When certain conditions are met, the engine control module will energize the carbon canister solenoid valve so that fuel vapors are sucked into the engine cylinder and burned off.

2.4.3 System working principles

2.4.3.1 Carbon Canister Solenoid Valve - Operating Principle

The activated carbon canister solenoid valve controls the fuel vapors introduced into the engine. The control valve opens and closes the connection between the activated carbon canister and the intake manifold. The flow rate of the activated carbon canister solenoid valve is controlled by the engine control module (ECM). The activated carbon canister has an air inlet that compensates for the lack of pressure that occurs in the activated carbon canister when fuel vapors are released into the intake manifold. The air inlet of the activated carbon canister includes an air filter.

The carbon canister solenoid valve consists of solenoid coil, armature, valve, etc., and the inlet is provided with a screen.

The air flow rate through the carbon canister solenoid valve is related, on the one hand, to the duty cycle of the electrical pulse output by the ECM to the carbon canister solenoid valve and, on the other hand, to the pressure difference between the inlet and outlet of the carbon canister solenoid valve. When there is no electrical pulse, the carbon canister solenoid valve is in a closed state.

The ECM controls the energizing time of the carbon canister solenoid valve according to the signals provided by various engine sensors, which indirectly controls the size of the cleaning airflow.

The ECM will control the carbon canister solenoid valve to work when the series of factors such as water temperature, engine working time, load and so on meet the predetermined requirements, and the carbon canister solenoid valve will not be involved in the work in the following cases:

- After engine cold start for a period of time.
- Engine coolant temperature is relatively low.
- Engine idling stage.
- Engine heavy load stage.
- There is a malfunction in the important sensors of the system.

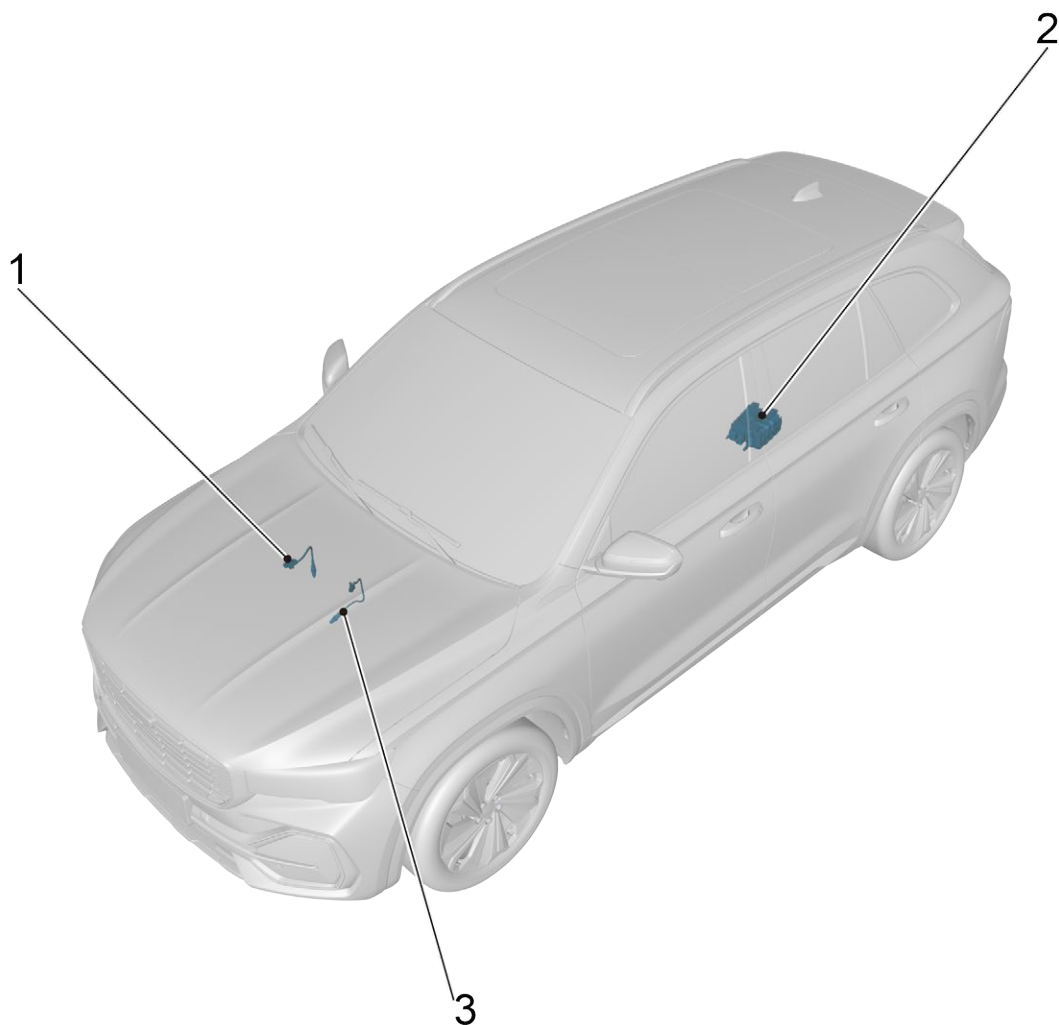
2.4.3.2 Operating Principle of Oxygen Sensor

Two oxygen sensors are used to measure the amount of oxygen remaining in the exhaust gas. The measured values from the oxygen sensors help the engine control module (ECM) to control the air-fuel ratio. In order to measure the oxygen content in the exhaust gas, the oxygen sensors need to refer to the surrounding air, which comes into contact with the sensors via the oxygen sensor harness. The oxygen sensor only

operates within a specific temperature range. In order to reach the operating temperature, the oxygen sensor contains a heating element that heats up the oxygen sensor. The heating element takes about a few tens of seconds to heat up the oxygen sensor. The operating temperature of the Lambda probe (upstream oxygen sensor) and Lambda probe (downstream oxygen sensor) will vary.

2.4.4 Part position

2.4.4.1 Location Diagram of Auxiliary Emission Components



LEGEND

- | | | | |
|----|---------------------------------------|----|---|
| 1. | Lambda probe (upstream oxygen sensor) | 3. | Lambda probe (downstream oxygen sensor) |
| 2. | Carbon canister | | |

2.4.5 Diagnostic Information and Procedures

2.4.5.1 Diagnosis description

Before diagnosing a malfunction in the auxiliary emission control device, see Description and Operation and How the System Works. Understanding and familiarizing yourself with the operating principles of the auxiliary emission control device before beginning system diagnosis will determine the proper troubleshooting steps to take in the event of a malfunction, and more importantly, this will determine if the condition described by the customer is normal operation. Any troubleshooting of the auxiliary emission control device should begin with a visual inspection, which guides the service technician to the next logical step in the troubleshooting process. Understanding and using the diagnostic process correctly will shorten the diagnostic time and avoid misjudgment of the faulty location.

Precautions for repairing carbon canister solenoid valve:

1. It must be installed so that the direction of airflow is as specified.
2. When it is found that the control valve fails due to black particles inside the carbon canister solenoid valve body and it is necessary to replace the Carbon canister solenoid valve, check the condition of the carbon canister.
3. Avoid water, oil and other liquids from entering the valve during maintenance.
4. To avoid the solid sound transmission, it is recommended that the charcoal canister control valve be installed and suspended on the hose.

Visual Inspection

Check for aftermarket retrofitting devices that may affect the operation of the auxiliary emission control devices to ensure that these devices cannot interfere with their operation.

Inspect easily accessible or visible system components for obvious blockages or external leaks.

Check the harness and harness connector to ensure that there is no sign of loosening, damage, poor contact, aging, etc.

2.4.5.2 Visual check

- Check for aftermarket retrofitting devices that may affect the operation of the auxiliary emission control devices to ensure that these devices cannot interfere with their operation.
- Inspect easily accessible or visible system components for obvious blockages or external leaks.
- Check the harness and harness connector to ensure that there is no sign of loosening, damage, poor contact, aging, etc.

2.4.6 Removal and Installation

2.4.6.1 Replacement of EVAP Valve

Removal Procedure

- 1 The EVAP valve is integrated into the carbon canister solenoid valve with line, see [Replacement of Carbon Canister Solenoid Valve with Line](#).

2.4.6.2 Replacement of Lambda Probe (upstream oxygen sensor)

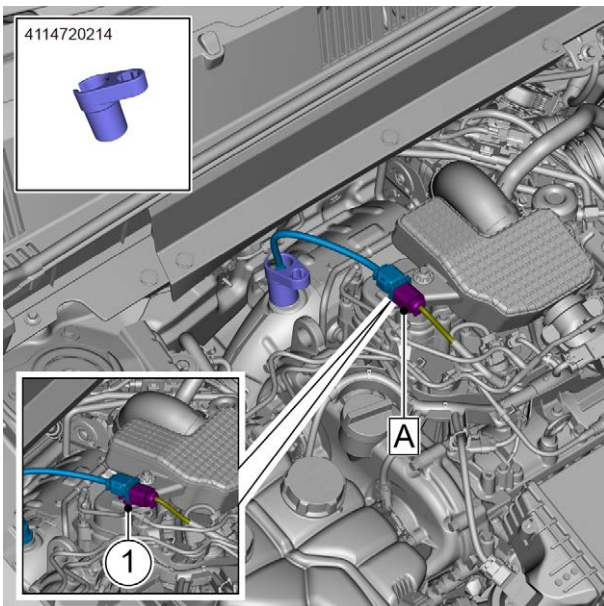
Removal Procedure

Warning !

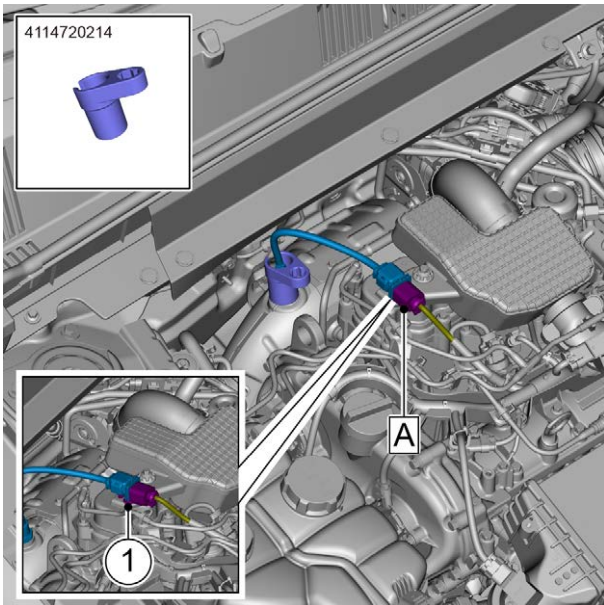
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 4 Disconnect the Lambda probe (upstream oxygen sensor) harness connector A and remove the fixing clip 1 from the Lambda probe (upstream oxygen sensor) harness connector.
- 5 Remove the Lambda probe (upstream oxygen sensor) with a special tool.

Special tool: 4114720214



Installation Procedure



- 1 Install and tighten the Lambda probe (upstream oxygen sensor) with a special tool.

Torque: 45N·m

Special tool: 4114720214

Caution

It is necessary to apply anti-sintering agent to the threads before assembly.

- 2 Install the fixing clip 1 of the Lambda probe (upstream oxygen sensor) harness connector and connect the Lambda probe (upstream oxygen sensor) harness connector A.

- 3 Install the engine trim cover assembly.
- 4 Connect the negative cable of battery.
- 5 Close the engine hood.

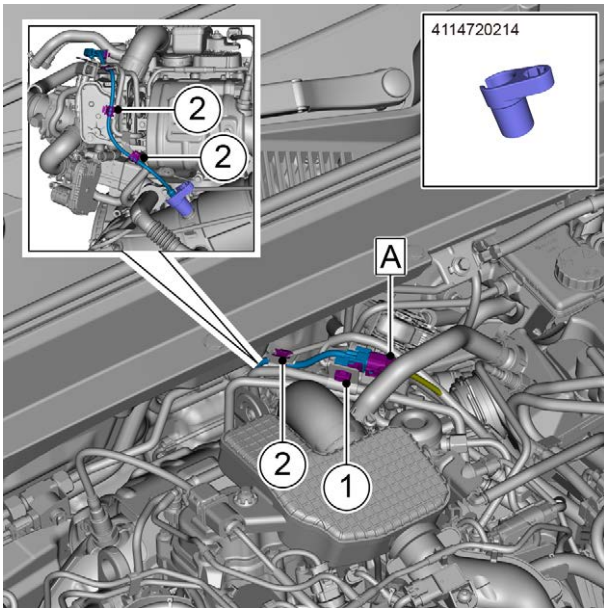
2.4.6.3 Replacement of Lambda Probe (downstream oxygen sensor)

Removal Procedure

Warning !

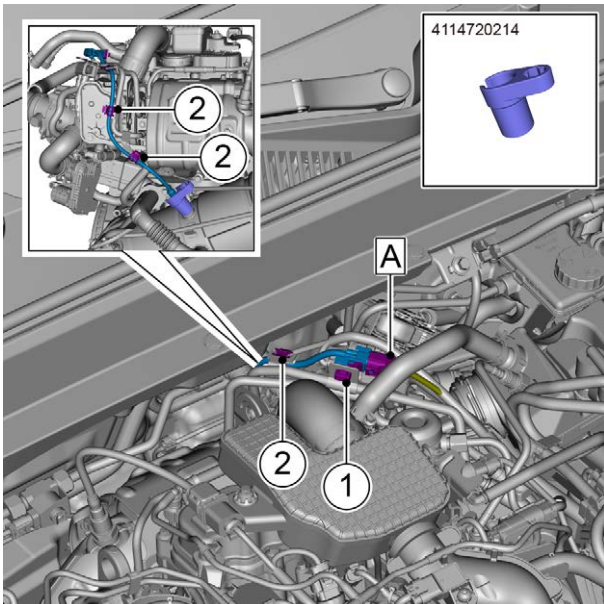
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).



- 4 Disconnect the Lambda probe (downstream oxygen sensor) harness connector A, and remove the fixing clip 1 of the Lambda probe (downstream oxygen sensor) harness connector.
- 5 Remove the three fixing clips 2 of the Lambda probe (downstream oxygen sensor) wiring harness, and remove the Lambda probe (downstream oxygen sensor) with a special tool.
Special tool: 4114720214

Installation Procedure



- 1 Install and tighten Lambda probe (downstream oxygen sensor) with a special tool.
Torque: 45N·m
Special tool: 4114720214

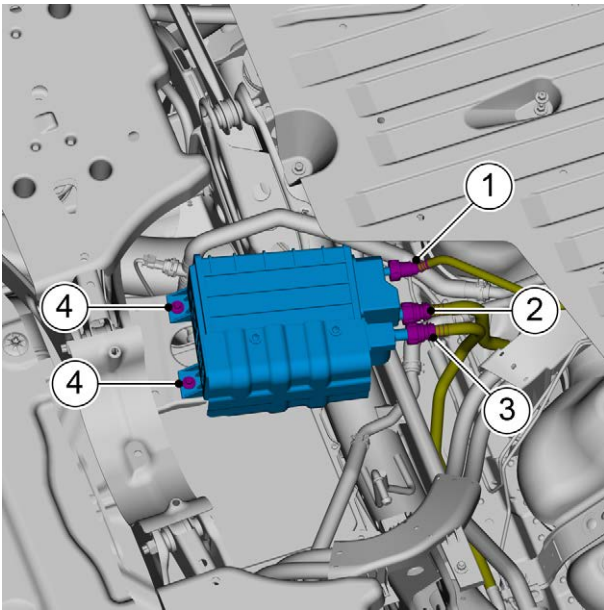
Caution

It is necessary to apply anti-sintering agent to the threads before assembly.

- 2 Install the three fixing clips 2 of the Lambda probe (downstream oxygen sensor) harness.
- 3 Install the fixing clip 1 of the Lambda probe (downstream oxygen sensor) harness connector and connect the Lambda probe (downstream oxygen sensor) harness connector A.
- 4 Install the engine trim cover assembly.
- 5 Connect the negative cable of battery.
- 6 Close the engine hood.

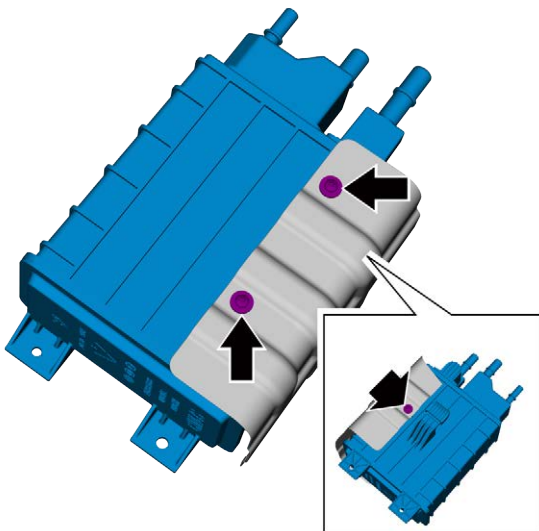
2.4.6.4 Replacement of Carbon Canister

Removal Procedure

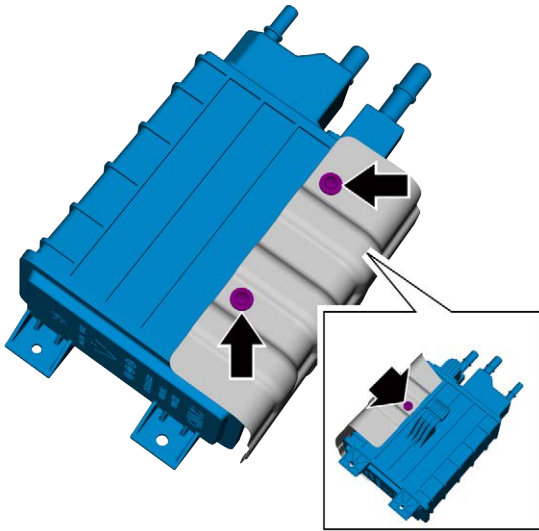


- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the quick connector 1 of the carbon canister desorption tube and disconnect the carbon canister desorption tube from the carbon canister.
- 3 Remove the quick connector 2 of the fuel tank isolation valve outlet tube and disconnect the fuel tank isolation valve outlet tube from carbon canister.
- 4 Remove quick connector 3 of the carbon canister vent tube and disconnect the carbon canister vent tube from the carbon canister.
- 5 Remove the two fixing bolts 4 of the carbon canister and take off the carbon canister & carbon canister and its bracket.

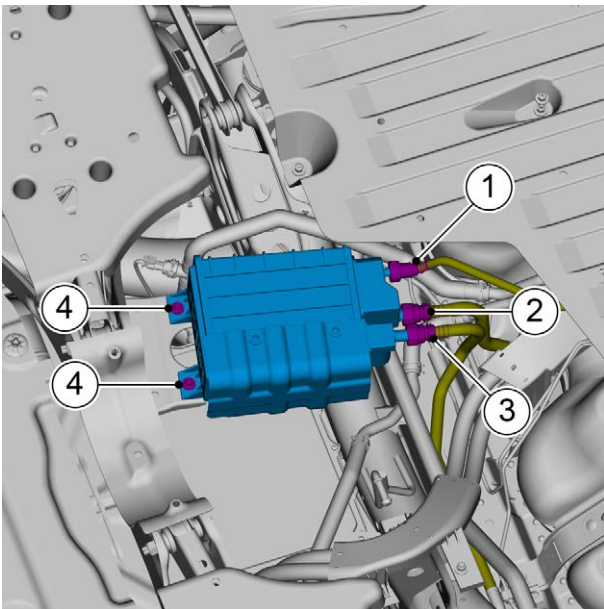
- 6 Separate the carbon canister from the carbon canister bracket by removing the three fixing screws of the carbon canister.



Installation Procedure




- 1 Connect the carbon canister to the carbon canister bracket.
- 2 Install and tighten the three fixing screws of the carbon canister.



- 3 Install the carbon canister & and the carbon canister bracket.
- 4 Install and tighten the two fixing screws 4 of the carbon canister.
Torque: 10 N·m
- 5 Connect the carbon canister vent tube to the carbon canister and install the quick connector 3 of the carbon canister vent tube.
- 6 Connect the fuel tank isolation valve outlet tube to the carbon canister and install the quick connector 2 of the tank isolation valve outlet tube.
- 7 Connect the carbon canister desorption tube to the carbon canister and install the quick connector 1 of the carbon canister desorption tube.
- 8 lower the vehicle.

2.4.7 Specialized tools and equipment

2.4.7.1 Special tools

Serial No.:	Illustration	Tool No.	Name
1		4114720214	Special tool for oxygen sensor removal

2.5 Mechanical Systems (DHE15-ESZ)

2.5.1 Specification

2.5.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Fixing bolt between rear left suspension vibration isolation pad and front subframe	M12×75	90+120°
Fixing bolts between rear left suspension lower bracket and rear left suspension vibration isolation pad	M12×70	95-125
Rear left suspension vibration isolation pad and fixing bolt for hybrid-specific transmission assembly	M10×45	50+90°
Fixing bolt between rear right suspension vibration isolation pad and engine	M12×70	95-125
Fixing bolt between rear right suspension vibration isolation pad and front subframe	M12×80	90+120°
Fixing bolt between left engine vibration isolation pad assembly and left longitudinal beam	M12×60	90+120°
Fixing bolt between left engine vibration isolation pad assembly and vehicle body	M10×50	50-70
Fixing bolt between left vibration isolation pad assembly and hybrid dedicated transmission assembly	M12×55	95-125
Fixing bolt between right engine vibration isolation pad assembly and vehicle body	M12×55	90+90°
Fixing bolt between right engine vibration isolation pad assembly and engine	M12×80	90+120°
Fixing bolt between fuse box bracket and left engine vibration isolation pad assembly fixing bolt	M6×25	8.5-11.5
Fixing bolt between fuel gas separator and camshaft bearing cover	M6×30	< 5 (pre-tightening)
		8.5-9.5
Fixing bolt between half shaft bracket and cylinder block	M8×30	20-28
Fixing bolt for vibration-damping pulley	M14×84×1.5	105+135°~115+135°

Fastener part	Model	Torque range (N·m)
Fixing bolt between left engine vibration isolation pad assembly and vehicle body	M10×50	50-70
Fixing bolt between left engine vibration isolation pad assembly and hybrid special transmission assembly	M12×55	95-125
Fixing bolt for camshaft bearing cover	M7×35	14-20
Fixing bolt between engine degassing hose and cylinder block	M6×12	8.5-11.5
Breather valve	1/8" -27- NPTF	10-14
Timing idler and cylinder block	M8	23-27
Fixing bolt between timing belt guard and cylinder block	M8×30	21-25
	M10×35	45-55
	M12×70	95-125
Fixing nut between timing belt tensioner and cylinder block	M8×10.2	8~12 (pre-tightening)
		22-28
Intake center oil control valve	M22×1	47+30°~53+30°
Exhaust center oil control valve	M22×1	47+30°~53+30°
Fixing nut between fuse box and wiring harness	M6	5-7
Fixing nut between fuse box and wiring harness	M8	13.5-18.5

2.5.1.2 Mechanical System Specifications

Item	Specification
Model	DHE15-ESZ
Type	In-line three-cylinder, liquid-cooled, turbocharged intercooling
Combustion chamber form	Pen-roof type
Intake method	Turbocharged intercooling
Cylinder diameter×stroke (mm×mm)	82×93.4
Compression ratio	13.0:1
Engine single-cylinder displacement (mL)	493
Rated power (kW/rpm)	110/5500
Maximum net power (kW)	108
Rated power speed (r/min)	5500
Maximum torque (N·m)	225
Maximum torque speed (r/min)	2500-4000
Fuel supply per stroke at maximum torque speed	3.64655
Fuel supply per stroke at rated power and speed	3.23009

Item	Specification
Maximum net engine torque (N • m)	220
Original gas distribution phase	Intake opening 1 mm lift 379°CA, closing 1 mm lift 533°CA
	Exhaust opening 1 mm lift 140°CA, closing 1 mm lift 336°CA
Stable speed at idle (r/min)	1200±50
Ignition sequence	1-3-2
Total exhaust pressure loss (kPa/kg/h) (rated point)	47±5
Oil pressure (kPa)	High pressure: 400±30
	Low pressure: 180±20
Piston leakage rate (L/min)	≤50
Outline dimension (L×W×H) (mm)	601×628×677 (exhaust-side backward tilt angle 11°)
Net engine weight (±2%) (kg)	118±2%
Emission level	State VI
Cylinder head	
Flatness of joint surface on cylinder block	0.015mm
Inlet side flatness	0.02mm
Exhaust side flatness	0.02mm
Piston	
Standard value of piston diameter	81.97mm
Standard oil film clearance	0.045mm
Maximum oil film clearance	0.057mm
Intake valve	
Length	105.48mm
Vine	Φ5.5 (-0.03/-0.045) mm
Disk diameter	Φ30± 0.15 mm
Valve angle	45°(+0.35°/+0.1°)
Catheter clearance	30~60 μm
Valve clearance	0
Valve seating angle	45°(0°/-0.5°)
Exhaust valve	
Length	104.42mm
Vine	Rod 20 position Φ5.442±0.007 mm
	Rod 78 position Φ5.434±0.007 mm
Disk diameter	Φ26± 0.15 mm
Valve angle	45°(+0.35°/+0.1°)
Catheter clearance	59- 88 μm
Valve clearance	0
Valve seating angle	45°(0°/-0.5°)
Timing belt	

Item	Specification
Length	8x159 mm
Width	20mm
Depth	3.02mm
Intake/exhaust camshaft	
Radial runout of camshaft	0.03
Maximum lift of intake camshaft	4.68mm
Maximum lift of exhaust camshaft	5.33mm
Camshaft shaft diameter No.1	Φ55 mm
Camshaft shaft diameter and others	Φ24 mm
Camshaft pulley exhaust camshaft top circle diameter	min Φ115.318 mm
	max Φ115.958 mm
Intake VVT adjustment range	60°±1°CA
Exhaust VVT adjustment range	30°±1°CA
Crankshaft	
Maximum radial runout of crankshaft	0.015mm
Crankshaft journal diameter	Φ50 mm
Maximum taper and roundness of crankshaft journal	0.004mm
Diameter of crankshaft connecting rod journal	Φ48 mm
Roundness of crankshaft journal	0.004
Oil film clearance of crankshaft main journal	0.025~0.041 mm
Oil film clearance of crankshaft connecting rod journal	0.040~0.058 mm
Axial runout of crankshaft	0.1 ~ 0.29 mm
Engine oil specification and capacity	
Engine oil specification	Shell VCC RBS0-2AE 0W20
Filling amount (overhaul)	5.8 L
Filling amount (filter replacement)	5 L
Filling amount (filter non-replacement)	4.7 L
Carbon canister	
Butane working capacity (BWC) of charcoal canister (g/100mL)	7
Effective volume and dry carbon mass of charcoal canister (mL)/ (g)	2000/670
Discharge	
Total precious metal content of catalytic converter	2.2336g
Platinum (Pt)	0g
Palladium (Pd)	2.037g
Rhodium (Rh)	0.1966g
Carrier volume of catalytic converter	1392 mL
Air filter element	
Maximum reservoir inflow	380 kg/h

Item	Specification
Dust holding capacity	135g
Engine coolant type and capacity	
Type	Ethylene glycol type coolant certified by Geely
Capacity	8.5 L
Spark plug	
Spark plug clearance (mm)	0.6-0.7
Piston ring	
Side clearance between first ring and piston (mm)	0.03 ~ 0.07
Side clearance between second ring and piston (mm)	0.025 ~ 0.07
Back clearance between first ring and piston (mm)	0.954 ~ 1.261
Back clearance between second ring and piston (mm)	0.954 ~ 1.261
First ring closure clearance (mm)	0.15 ~ 0.25
Second ring closure clearance (mm)	0.4 ~ 0.6

2.5.2 Instructions and operations

2.5.2.1 Instructions and operations

1. Cylinder head

The main function of the cylinder head is to seal the cylinder, which forms a combustion space with the piston and is subjected to the influence of high temperature and high pressure gases. The cylinder head is subjected to mechanical loads caused by gas forces and tightened cylinder bolts. Meanwhile, it also withstands high thermal loads caused by high temperature gases. In order to ensure good sealing of the cylinder, the cylinder head must not be damaged or deformed.

Therefore, the cylinder head should have sufficient strength and stiffness. The cylinder head adopts aluminum alloy casting process. The camshaft adopts double overhead arrangement, and a VVT actuator is also installed at the front end of each intake/exhaust camshaft to adjust the timing of the intake and exhaust valves.

2. Intake manifold

The intake manifold is mounted on the engine.

The intake manifold is primarily used to evenly distribute intake air to each intake port, which is important for optimizing engine efficiency and performance.

Manifold pressure sensors are located on the intake manifold to monitor the pressure of the intake air in the intake manifold.

The intake manifold is the intake line from the rear of the throttle unit the front of the cylinder head intake duct. Its function is to distribute air to the intake tracts of each cylinder.

3. Camshaft

The camshaft rotates continuously to drive the hydraulic tappet up and down. It then controls the opening and closing of the valve.

Double overhead camshaft (DOHC) is used, which means there are two camshafts. One camshaft controls the intake valves and the other controls the exhaust valves. The camshafts are located at the top of the engine, and the bearing seat of the cylinder head is held in place by the camshaft cover. Drilled holes in the camshaft journals of the cylinder head are used as oil passages. Engine oil flows under pressure to the camshafts to lubricate the individual camshaft journals. Engine oil returns to the oil pan through the oil return holes in the cylinder head. The cam lobes are machined to open and close the intake and exhaust valves at the appropriate time and amount according to the engine requirements. The cam lobes are lubricated by the splashing action of the high pressure engine oil escaping from the camshaft journal.

4. Timing belt

The timing belt is mainly used to synchronize the rotation of the crankshaft and camshafts (intake and exhaust camshafts) so that the intake and exhaust valves open and close at the proper time for the intake and exhaust strokes of each cylinder. The timing belt has teeth on its inner surface and is driven through the crankshaft.

5. VVT pulley

The main function of the VVT pulley is to transmit power from the crankshaft to the camshaft via the timing belt.

6. Piston

The function of the piston is to withstand air pressure and transmit it to the connecting rod through the piston pin to drive the crankshaft to rotate. The tip of the piston is also part of the combustion chamber.

7. Intake valve

An intake valve is mainly used to control the intake air. During the intake stroke, the camshaft movement opens the intake valve and the intake air flows into the chamber. After intake, the valve spring closes the exhaust valve. During the compression, combustion and exhaust strokes, the intake valve closes. Two intake valves per cylinder are used to improve the intake volume. The diameter of the intake valve disk is larger than that of the exhaust valve disk.

8. Exhaust valve

An exhaust valve is mainly used to control exhaust emissions. During the exhaust stroke, the camshaft movement opens the exhaust valves and the exhaust flows out of the chambers. After discharge, the valve spring closes the exhaust valve. During the intake, compression and combustion strokes, the exhaust valve is closed. Two exhaust valves per cylinder are used to improve the exhaust flow. The diameter of the exhaust valve disk is smaller than that of the intake valve disk.

9. Vibration damper

The vibration damper is mainly used to prevent the crankshaft from being affected by the torsional vibration caused by the engine power impact. The shock absorber can also drive the AC generator and air conditioning compressor solenoid valve through the transmission belt.

10. Balance shaft assembly

The main task of the balance shaft assembly is to reduce vibrations in the crank mechanism.

11. Intake/exhaust camshaft

The camshaft rotates continuously to drive the hydraulic tappet up and down. It then controls the opening and closing of the valve.

12. Timing belt tensioner

The timing belt tensioner is mainly used to adjust the tension of the timing belt. After a long time of use, the timing belt tensioner can automatically adjust the tension of the belt to prevent the timing belt from slipping. The timing belt tensioner can also reduce engine noise and make the timing belt run more smoothly.

13. Exhaust VVT

The exhaust VVT adjusts the angle of the exhaust camshaft to control the flow of exhaust gas from the combustion chamber, thereby reducing vehicle emissions. The exhaust VVT system is controlled by the engine control module (ECM).

14. Intake VVT

The intake VVT adjusts the angle of the intake camshaft to control the flow of intake into the combustion chamber, thereby improving the vehicle fuel economy. The intake VVT system is controlled by the engine control module (ECM).

15. Crankshaft

A crankshaft is the most important component of an engine. It carries the force transmitted by the connecting rod and converts it into torque, which is output through the crankshaft and drives other accessories on the engine. The crankshaft is affected by the centrifugal force of the rotating mass, the periodically varying inertia force and the reciprocating inertia force. The crankshaft is thus subjected to bending and torsional loads.

16. Crankshaft timing pulley

The main function of the crankshaft timing pulley is to transmit power from the crankshaft to the camshaft via the timing belt.

2.5.3 System working principles

2.5.3.1 System working principles

Working Principle

1. Intake stroke: exhaust valve is closed, intake valve is opened. The piston moves from the top dead center to the bottom dead center under the push of the crankshaft. During the movement of the piston, the cylinder volume increases and a certain vacuum is formed. The ECM controls the fuel injector assembly to inject fuel into the cylinder, the intake valve opens, and air is sucked into the cylinder through the intake tract, and a combustible mixture is formed.

2. Compression stroke: both intake and exhaust valves are closed. At the end of the intake stroke, the crankshaft drives the piston from the bottom dead center to the top dead center. With the movement of the piston, the volume of the cylinder gradually decreases, compressing the combustible mixture, so that its temperature rises rapidly.

3. Work stroke: the intake and exhaust valves are still closed. At the end of the compression stroke, the ECM controls the ignition coil to disconnect the primary coil circuit, generating an induced high voltage in the secondary circuit, which is rapidly conducted to the spark plug at the top of the cylinder head through the ignition wire, and eventually breaks through the gap of the spark plug to generate an electric spark, igniting the combustible mixture in the cylinder. The flame is rapidly transmitted to the entire combustion chamber, the cylinder mixture releases a large amount of thermal energy, the volume expands dramatically, the pressure and temperature also rise at the same time, the expansion of the pressure acts on the top of the piston, prompting the piston from the top dead center to the bottom dead center. The movement of the reciprocating piston is converted through the connecting rod into a rotary motion.

4. Exhaust stroke: the exhaust valve is open and the intake valve is still closed. Under the action of the connecting rod, the crankshaft pushes the piston to move from the bottom dead center to the top dead center, and the expanded combustion gas is discharged from the cylinder under the residual pressure and the push of the piston, and when the piston reaches the top dead center, the exhaust stroke ends and the exhaust valve is closed.

However, in the actual design, the intake valve will be opened earlier than the top dead center, closed later than the bottom dead center. This is to maximize the intake and minimize energy loss during the intake process. The exhaust valve opens earlier than the bottom dead center and closes later than the top dead center. This is to minimize residual combustion

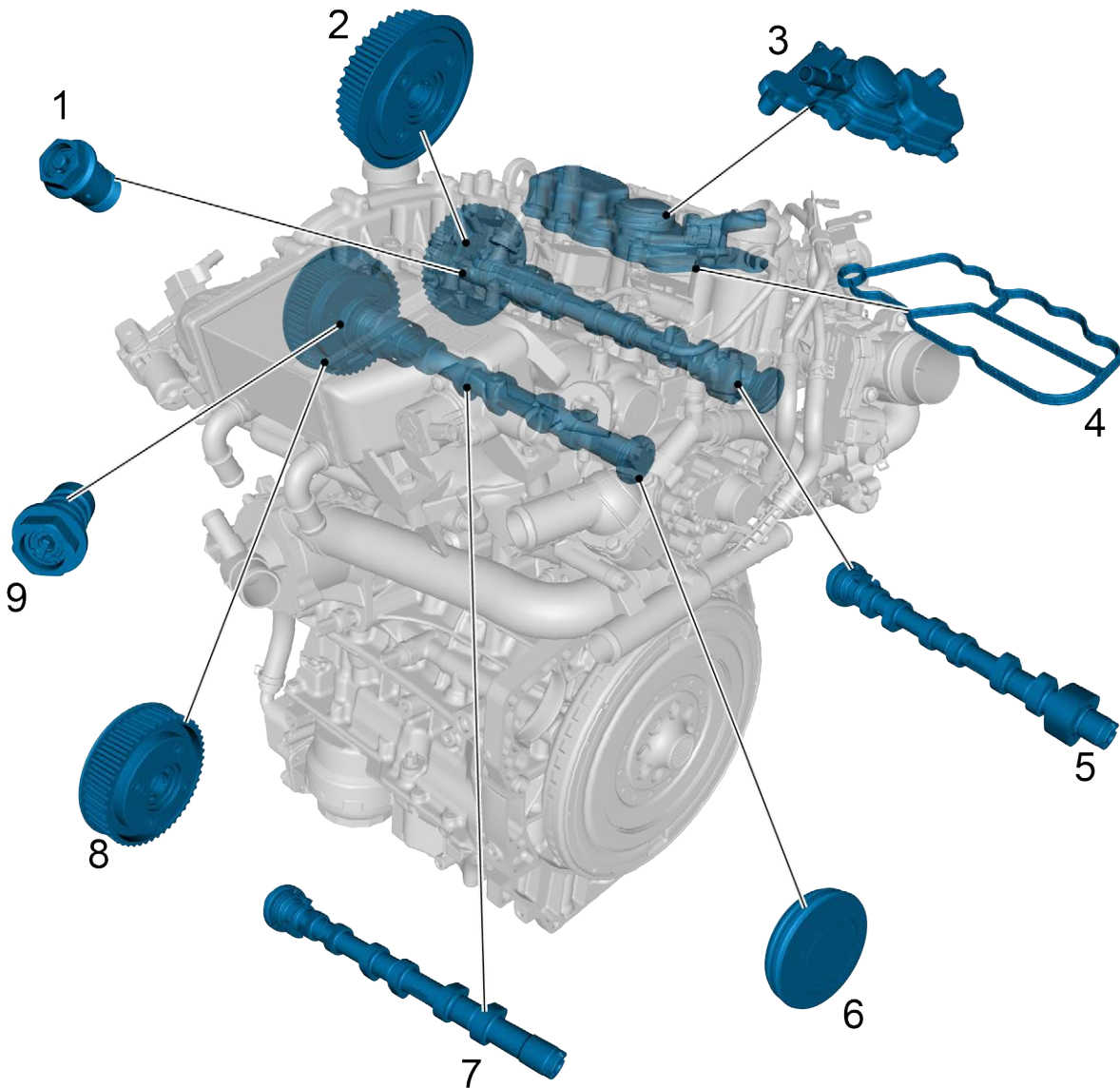
gases in the cylinder and to reduce energy losses in the intake process. Such a design will make the valve overlap angle, that is, in a certain crankshaft angle into the exhaust valve open at the same time, when the residual combustion gas excluded by the exhaust valve, there is a certain degree of inertia, can be driven into the mixture, so that to a certain extent it will make the intake more fully. But it's not that the greater the valve overlap angle, the better. Different working conditions of the engine for the valve overlap angle has different requirements, so the engine has a variable valve timing system, the purpose is to meet the engine in different working conditions for the valve overlap angle of the different operating conditions.

Working Principle of VVT System

When the engine is converted from idle to high speed, the ECM controls the oil control valve to press the oil to the rotor blade inside the VVT in the right time, the right amount and the right direction. Under the pressure, the rotor synchronously drives the camshaft to rotate forward or backward by a certain angle relative to the stator, thus changing the valve overlap angle and achieving the purpose of continuously adjusting the valve timing. Through the control of the ECM, the valve opening and closing times are adjusted within a certain angle, either in advance, delayed, or kept constant. VVT is the abbreviation of Variable Valve Timing, i.e., Variable Valve Timing System. Everything with mass has inertia. The air that is sucked into the cylinder also has inertia, so it still has a tendency to enter the cylinder after the intake process is over. And the level of RPM has an effect on the flow of intake and exhaust and the combustion process in the cylinder. When the rotational speed is high, the intake air flow rate is high, the inertia energy is large, so the intake valve opens early in favor of full intake. On the contrary, when the rotational speed is low, the intake air flow rate is low, the inertia energy is small, because the piston is moving towards the top dead center, but it will let the fresh air be discharged partly, resulting in a decrease in the intake of air, and the engine work is not stable. Therefore, at low speeds, it is better to open the intake valves slightly later. The design of the camshaft profile is a balanced compromise between high and low speeds.

2.5.4 Part position

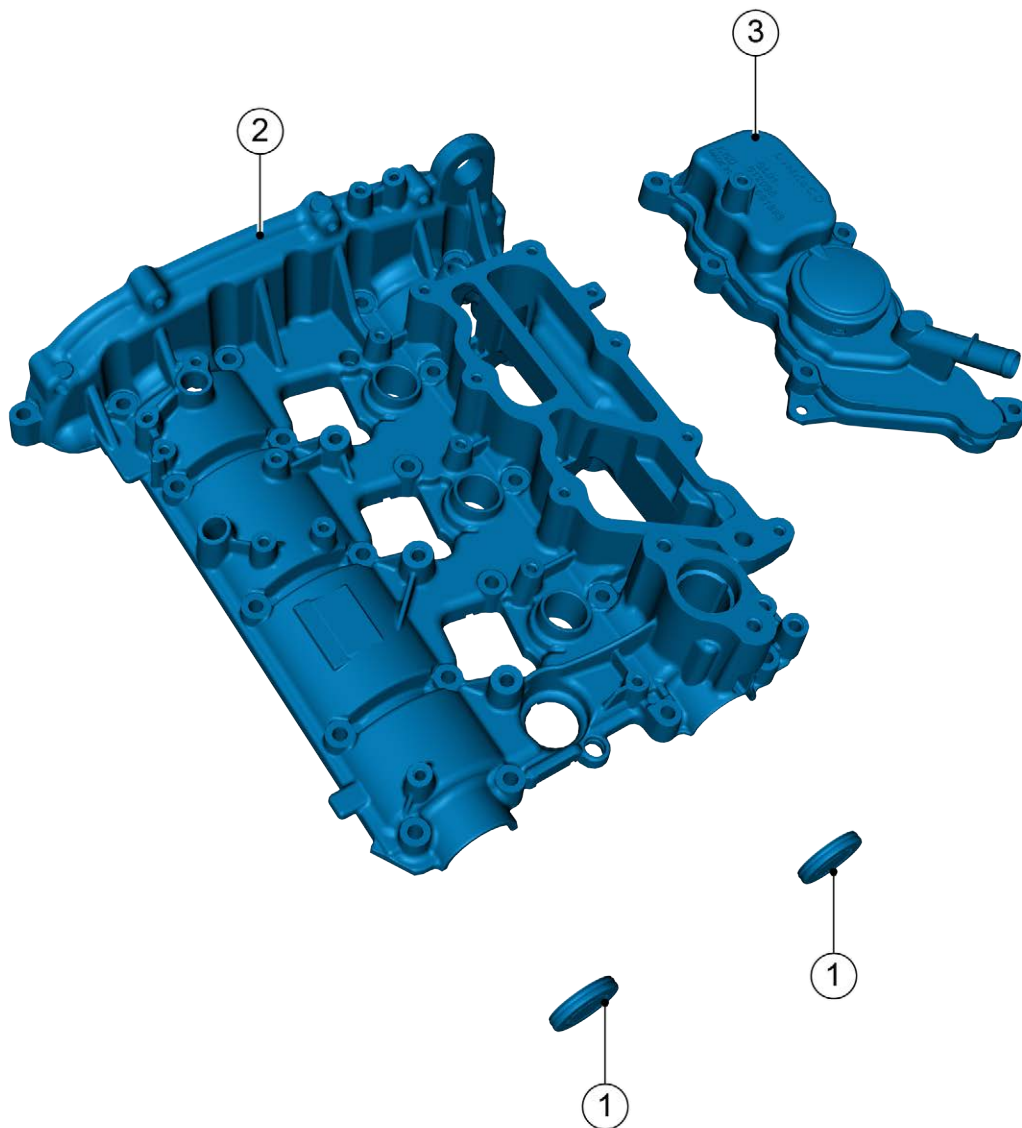
2.5.4.1 Location of VVT System Component



- | | | | |
|----|---|----|---------------------------------|
| 1. | Exhaust center oil control valve | 6. | Camshaft plug cover |
| 2. | Exhaust VVT | 7. | Intake camshaft |
| 3. | Oil-Air separator subassembly | 8. | Intake VVT |
| 4. | Sealing ring of oil-air separator subassembly | 9. | Intake center oil control valve |
| 5. | Exhaust camshaft | | |

2.5.5 Breakdown drawing

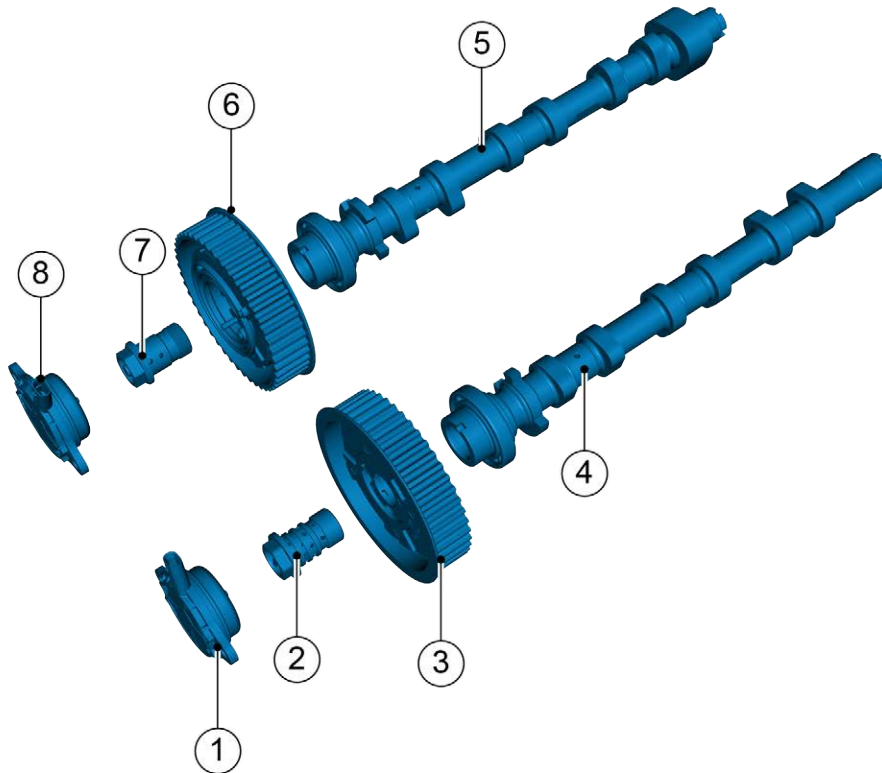
2.5.5.1 Camshaft Bearing Cover



1. Camshaft plug cover
2. Camshaft bearing cover

3. Oil-Air separator subassembly

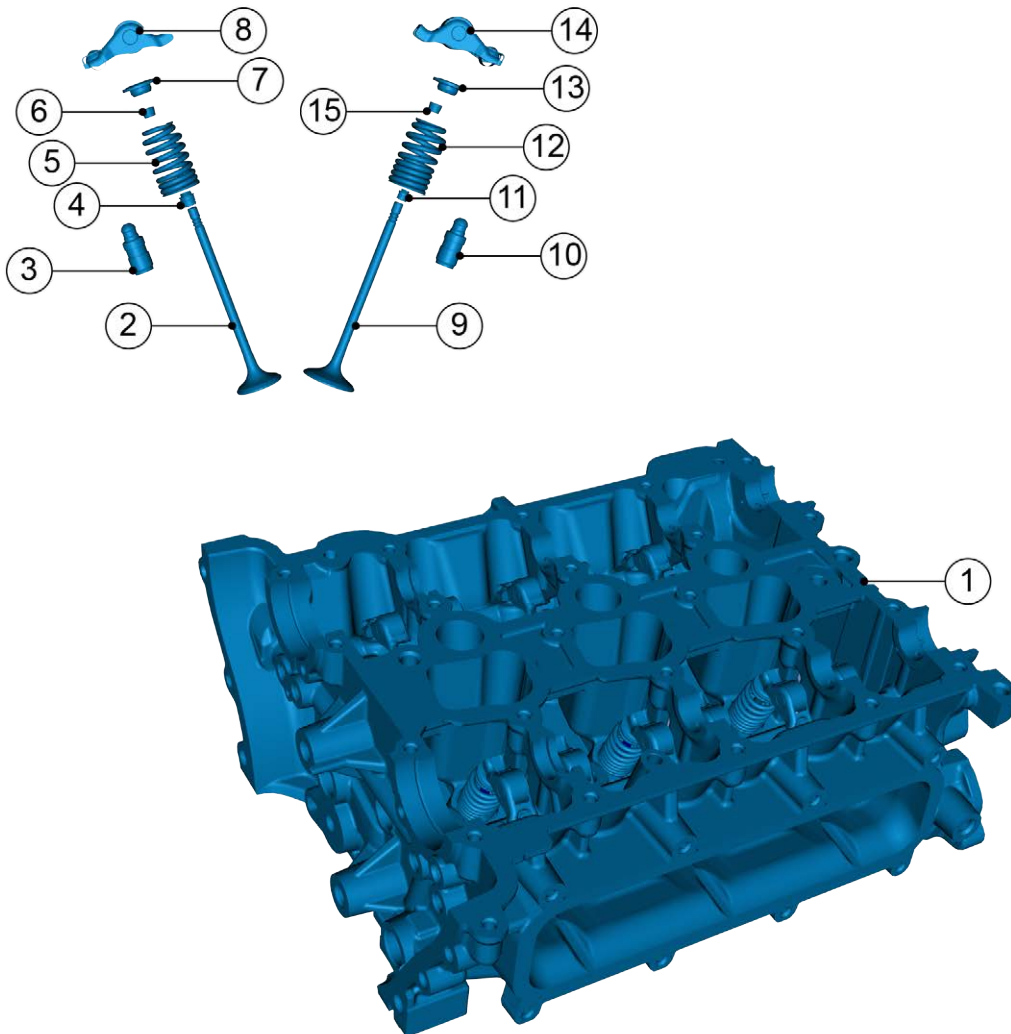
2.5.5.2 Camshafts and Accessories



- 1. VVT solenoid coil (intake side)
- 2. Intake center oil control valve
- 3. Intake VVT
- 4. Intake camshaft

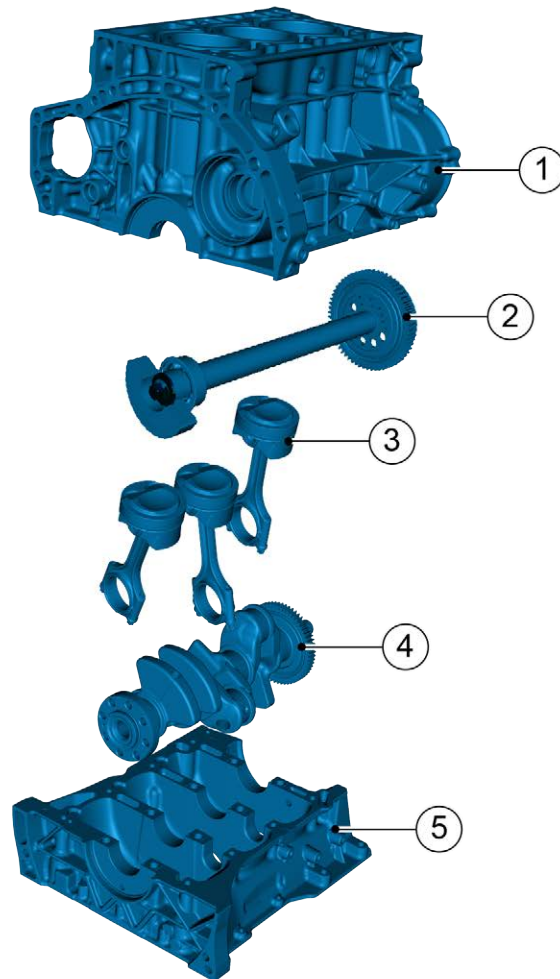
- 5. Exhaust camshaft
- 6. Exhaust VVT
- 7. Exhaust center oil control valve
- 8. VVT solenoid coil (exhaust side)

2.5.5.3 Cylinder Head Assembly



- | | |
|---------------------------|---------------------------|
| 1. Cylinder head | 9. Intake valve |
| 2. Exhaust valve | 10. Hydraulic tappet |
| 3. Hydraulic tappet | 11. Intake valve oil seal |
| 4. Exhaust valve oil seal | 12. Intake valve spring |
| 5. Exhaust valve springs | 13. Valve spring seat |
| 6. Valve locking clip | 14. Roller rocker arm |
| 7. Valve spring seat | 15. Valve locking clip |
| 8. Roller rocker arm | |

2.5.5.4 Cylinder Block



1. Cylinder head
2. Balance shaft assembly
3. Piston

4. Crankshaft
5. Crankcase

2.5.6 Diagnostic information and procedure

2.5.6.1 Diagnosis description

Before diagnosing a malfunction in the ignition system, see Description and Operation and How the System Works. Understanding and familiarizing yourself with the operating principles of the mechanical system before beginning system diagnosis will determine the proper troubleshooting steps to take in the event of a malfunction, and more importantly, this will determine if the condition described by the customer is normal operation. Any troubleshooting of the mechanical system should begin with a visual inspection, which guides the service technician to the next logical step in the troubleshooting process. Understanding and using the diagnostic process correctly will shorten the diagnostic time and avoid misjudgment of the faulty location.

2.5.6.2 Visual check

- Check for aftermarket retrofitting devices that may affect the performance of the mechanical system to ensure that these devices cannot interfere with the proper functioning of the mechanical system.
- Check system components that are easily accessible or can be seen to find out if there is any obvious damage or there is a situation that may cause a malfunction.
- Verify that the engine oil level is normal and that the viscosity is normal.
- Record engine speed, ambient temperature, and other specific factors.
- Compare with a known good engine to ensure that the current engine is in normal condition.

2.5.6.3 Comprehensive Engine Check

1. Check engine coolant
2. Check engine oil.
3. Check the battery.
4. Check spark plugs
5. Checking the air filter
 - Remove the air filter.
 - Check the air filter for dust, clogging, breakage, etc.
 - Clean dust with compressed air.
 - If it is still dusty or clogged after cleaning with compressed air, replace the air filter at this time.
6. Check the ignition timing

Before checking the ignition timing, the engine must reach normal operating temperature.

(1) Detection Method with Fault Diagnosis Instrument:

Step 1	Connect a fault diagnosis instrument.
--------	---------------------------------------

- A. Set the switch to "OFF".
- B. Connect the fault diagnosis instrument to the diagnostic testing interface.
- C. Start the engine to normal operating temperature.
- D. Turn off the A/C switch.
- E. Select in sequence: Engine/Data List/Ignition Advance Angle for One Cylinder.

(2) Detection Method with Timing Light:

Step 1	Remove the engine trim cover.
--------	-------------------------------

Next Step

Step 2	Pull out the ignition coil for Cylinder 1.
--------	--

- A. Connect the timing light snap to the ignition coil of Cylinder 1.

Next Step

Step 3	Check the ignition timing for acceleration.
--------	---

- A. Accelerate the engine and observe that the ignition timing of the engine moves to the advance side.

Next Step

Step 4	Remove the timing light and restore the ignition coil mounting position.
--------	--

Next Step

Step 5	End of test.
--------	--------------

(3) Cylinder Compression Test

Caution

Removed fuel and ignition related fuses to prevent the fuel and ignition systems from working. | Clear the diagnostic fault codes with a fault diagnosis instrument after completing the test.

Before doing a compression test, the following conditions must be met:

- The engine must reach the normal operating temperature.
- The throttle must be in the fully open position.
- Spark plugs for three cylinders must be removed.
- The battery must not have a loss of power and must be fully charged.

Step 1	Test the pressure of each cylinder. The cause of the pressure drop may be a malfunction such as poor valve closure or worn piston rings.
--------	--

Next Step

Step 2	Spray an appropriate amount of engine oil in each cylinder.
--------	---

Next Step

Step 3	Install a cylinder pressure test gauge to each spark plug mounting port.
--------	--

Next Step

Step 4	After starting, run each cylinder for 4 to 5 compression strokes.
--------	---

Next Step

Step 5	The minimum individual cylinder pressure reading should not be less than 75% of the maximum individual cylinder pressure reading, and no cylinder gauge reading should be less than 750 kPa.
--------	--

Next Step

Step 6	After each cylinder has completed four compression strokes, check the pressure gauge readings, which are explained below:
--------	---

- A. Normal: the pressure in all cylinders increases rapidly and evenly and reaches the specified pressure value.
- B. Piston ring failure: the first stroke pressure is low and increases on subsequent strokes, but the pressure does not reach any normal level. The pressure increases significantly after adding engine oil to the cylinder block.
- C. Valve failure: the pressure on the first stroke is low, and cannot increase in subsequent strokes. The force does not increase significantly after adding engine oil to the cylinder.

Next Step

Step 7	End of test.
--------	--------------

2.5.6.4 Engine Noise Diagnosis

Engine vibration is actually the co-oscillatory noise of the engine, and the noise is perceived when the frequency of the engine vibration is the same as the frequency of the vibration at the point of failure. Severe vibrations are usually loud and are produced by broken or severely worn internal engine parts. Slight vibration noise can be heard but is not loud. Slight vibrations are caused by wear and tear of internal engine parts, and loose or broken external engine parts can also cause severe or slight vibrations. When diagnosing noise faults, it is important to identify the source of the common vibration in order to eliminate the fault.

2.5.6.5 Noise when Engine Is Loaded

Step 1	Check the timing belt, is there any over-tightening or straining of the belt tension?
--------	---

Yes

Replace/adjust the belt to the specified value and confirm whether the fault is eliminated.

No

Step 2	Check the exhaust system. Does the system interfere with other body parts and does it scrape the ground?
--------	--

Yes

Reposition and install the exhaust system and confirm that the fault is eliminated.

No

Step 3	Check the flywheel for faults such as cracking, deformation and interference with other parts, is the flywheel normal?
--------	--

Yes

Replace the flywheel assembly and confirm whether the fault is eliminated.

No

Step 4	Check whether the clearance between the main bearing pads is too large and whether it exceeds the specified value?
--------	--

Standard value:
 0.015 ~ 0.031mm (excluding expansion)
 0.025 ~ 0.041mm (including expansion)

Yes

Replace the main bearing shell assembly and confirm whether the fault is eliminated.

No

Step 5	Check the clearance between the connecting rod bearing and the matching bearing, does it exceed the specified value?
--------	--

Standard value:
 0.027 ~ 0.045mm (excluding expansion)
 0.040 ~ 0.058mm (excluding expansion)

Yes

Replace the connecting rod bearing assembly and confirm whether the fault is eliminated.

No

Step 6	Check the mating clearance between the piston pin and the small head bushing of connecting-rod , does it exceed the specified value?
--------	--

Standard value:
 0.008 ~ 0.017 mm

Yes

Replace the piston pin and the small-end bushing of connecting rod and confirm whether the fault is eliminated.

No

Step 7	Check the clearance between the big end of connecting rod and the crankshaft crank, does it exceed the specified value?
--------	---

Standard value:
0.18 ~ 0.48 mm

Yes

Replace the connecting rod and confirm that the fault is eliminated.

No

Step 8	Check the clearance between the piston pin and the piston pin hold, does it exceed the specified value?
--------	---

Standard value:
0.004 ~ 0.011 mm

Yes

Replace the piston and confirm that the fault is eliminated.

No

Step 9	Check the clearance between the piston and cylinder, does it exceed the specified value?
--------	--

Standard value:
0.033 ~ 0.057 mm

Yes

Adjust the clearance between the piston and cylinder to the specified value or replace the piston to confirm whether the fault is eliminated.

No

Step 10	Confirm troubleshooting.
---------	--------------------------

2.5.6.6 Slight Engine Vibration

Step 1	Check whether the viscosity of the engine lubricating oil is abnormal.
--------	--

Yes

Refill the engine lubricating oil that is suitable for the current seasonal temperature and confirm if the fault is eliminated.

No

Step 2	Check if the A/C compressor is working properly, is it working with an abnormal sound emitted?
--------	--

Yes

Replace the defective part and confirm that the fault is eliminated.

No

Step 3 Check the operation of valve components such as hydraulic tappet and valve spring for malfunction.

Yes

Replace the defective part and confirm that the fault is eliminated.

No

Step 4 Check the piston pin clearance (clearance between piston and cylinder).

Standard value:
0.033~0.057 mm

Yes

Replace the defective part and confirm that the fault is eliminated.

No

Step 5 Check if the connecting rod is bent?

Yes

Replace the defective part and confirm that the fault is eliminated.

No

Step 6 Check the clearance between the piston pin and piston pin hole.

Standard value:
0.004~ 0.011 mm

Yes

Replace the defective part and confirm that the fault is eliminated.

No

Step 7 Check the axial displacement of the crankshaft exceeds the standard value?

Standard value:

0.1 ~ 0.29 mm

Yes

Replace the defective part and confirm that the fault is eliminated.

No

Step 8 Confirm troubleshooting.

2.5.6.7 Engine Misfiring with Abnormal Noise

Step 1 Take a fault diagnosis instrument to check the engine control system for any fault code.

Yes

Repair the faulty area according to the fault code prompt.

No

Step 2 Take a fault diagnosis instrument to check the "knock-related" data in the engine data stream, and compare with a normal vehicle to see if there is any abnormality.

Yes

Check whether the fuel is normal or not, check whether the timing system is normal or not, repair the defective part, and confirm whether the fault is eliminated or not.

No

Step 3 Check the valve springs. Is there any signs of excessive softness or breakage in the spring?

Yes

Repair and replace the faulty part.

No

Step 4 Check valves for sticking and bending?

Yes

Repair and replace the faulty part.

No

Step 5 Check the hydraulic tappet. Is there any evidence of sticking, wear, or other faults?

Yes

Repair and replace the faulty part.

No

Step 6 | Check the camshaft cams for excessive wear or obvious defects?

Yes

Replace the camshaft.

No

Step 7 | Check the valve guide for cracks and excessive wear.

Yes

Repair and replace the faulty part.

No

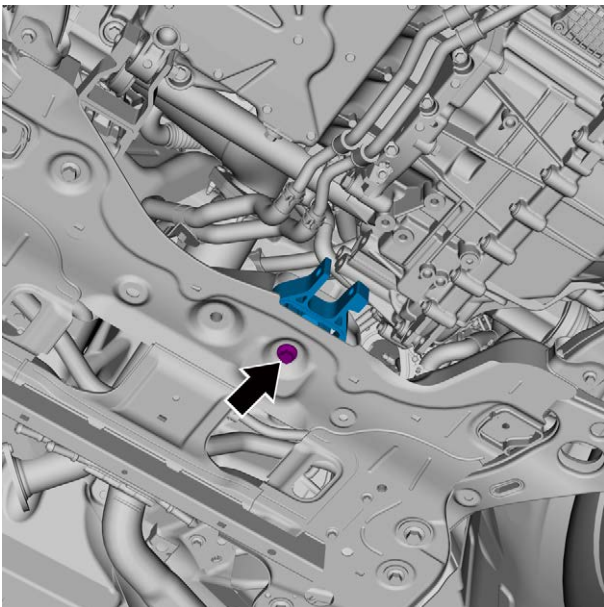
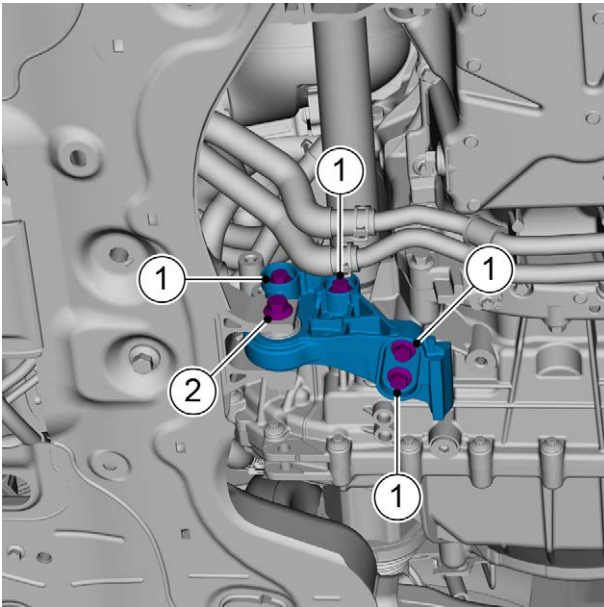
Step 8 | Confirm troubleshooting.

2.5.7 Removal and Installation

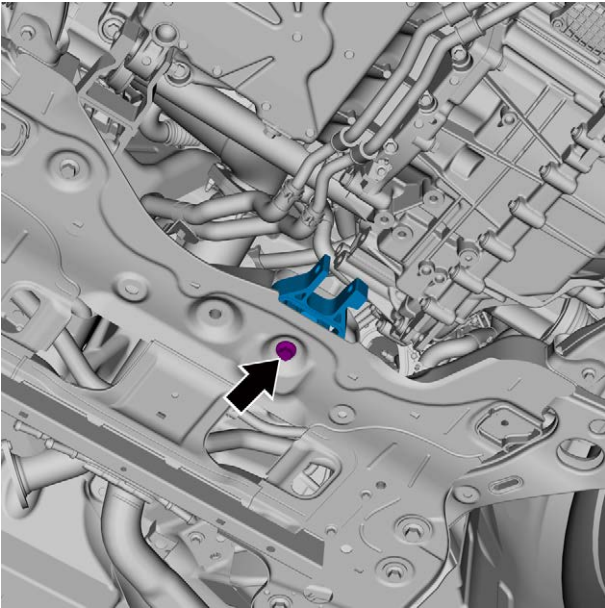
2.5.7.1 Replacement of Rear Left Vibration Isolation Pad

Removal Procedure

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 3 Remove the four fixing bolts 1 of the lower bracket 1 of the rear left suspension.
- 4 Remove the fixing bolts 2 of the lower bracket of the rear left suspension connected to the rear left suspension vibration isolation pad, and remove the lower bracket of the rear left suspension.
- 5 Remove the fixing bolts of the rear left suspension vibration isolation pad and take off the rear left suspension vibration isolation pad.

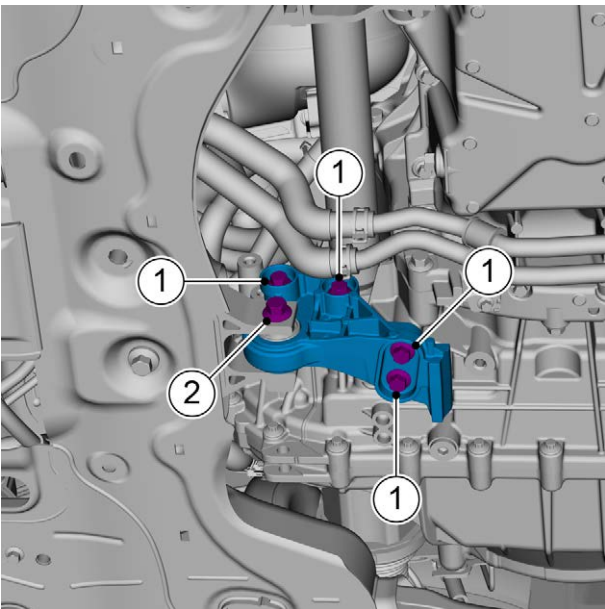


Installation Procedure



- 1 Install the rear left suspension vibration isolation pad and tighten the fixing bolts of the rear left suspension vibration isolation pad.

Torque: 90+120° N·m



- 2 Install the lower bracket of the rear left suspension and tighten the fixing bolts 2 of the lower bracket of the rear left suspension to the rear left suspension vibration isolation pad.

Torque: 110N·m

- 3 Install and tighten the four fixing bolts 1 of the rear left suspension vibration isolation pad to the hybrid special transmission assembly.

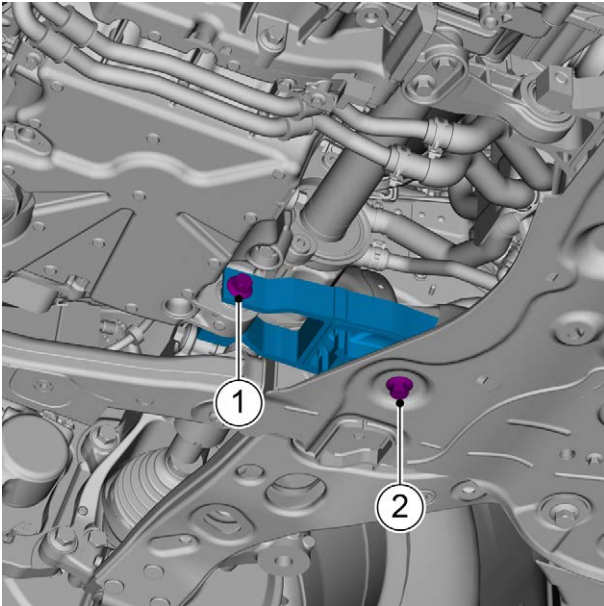
Torque: 50+90° N·m

- 4 Install the bottom engine guard assembly.
- 5 lower the vehicle.

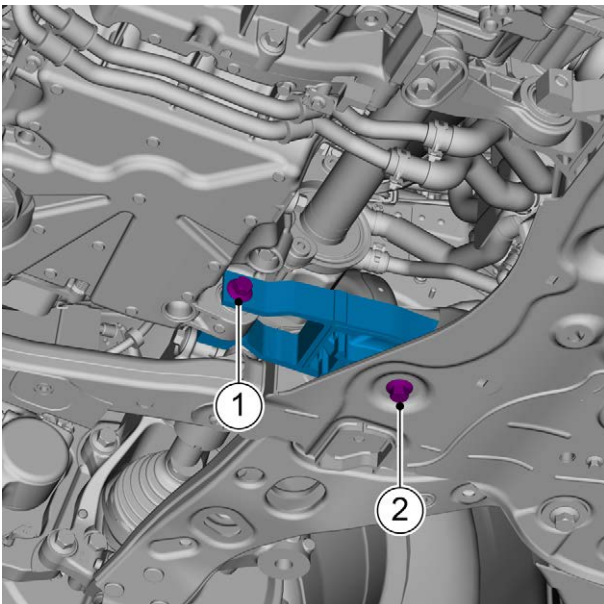
2.5.7.2 Replacement of Rear Right Suspension Isolation Pad

Removal Procedure

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).



- 3 Remove the fixing bolt 1 between rear right suspension vibration isolation pad and engine.
- 4 Remove the fixing bolts 2 of the rear right suspension isolation pad and take off the rear right suspension isolation pad.



Installation Procedure

- 1 Install the rear right suspension isolation pad and tighten the fixing bolts 2 of the rear right suspension isolation 2 pad.
Torque: 90+120° N·m
- 2 Install and tighten the fixing bolt 1 between the rear right suspension isolation pad and the engine.
Torque: 110 N·m

- 3 Install the bottom engine guard assembly.
- 4 lower the vehicle.

2.5.7.3 Replacement of Left Engine Vibration Isolation Pad Assembly

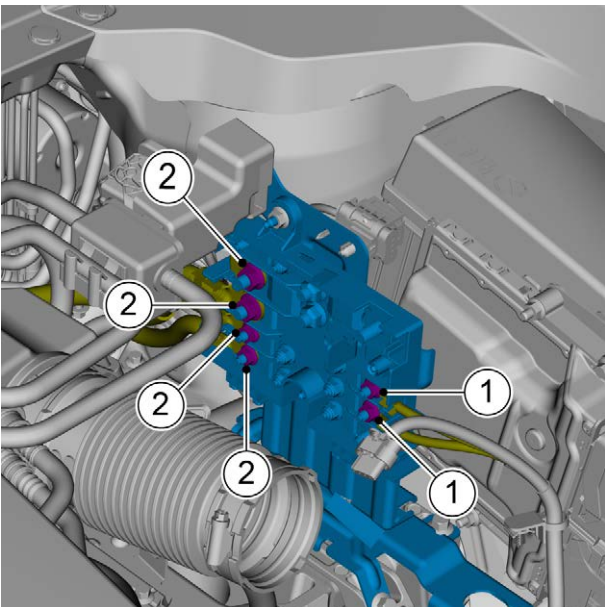
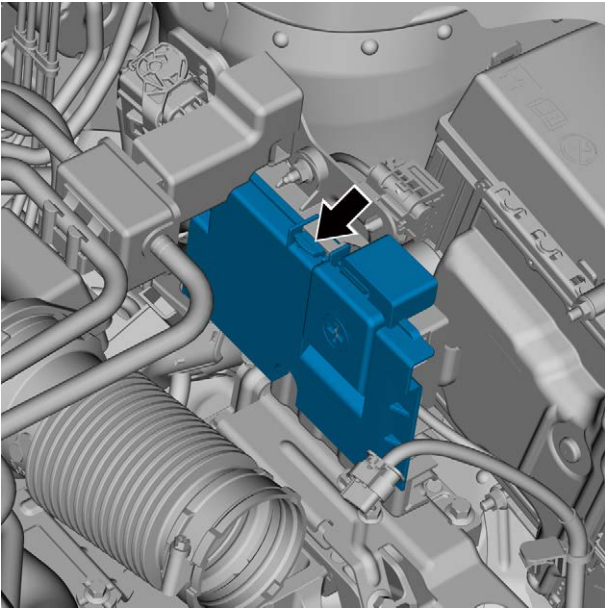
Removal Procedure

Warning !

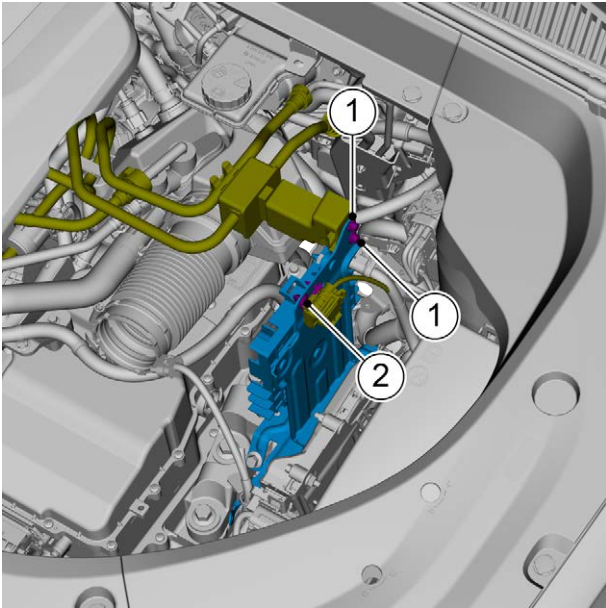
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

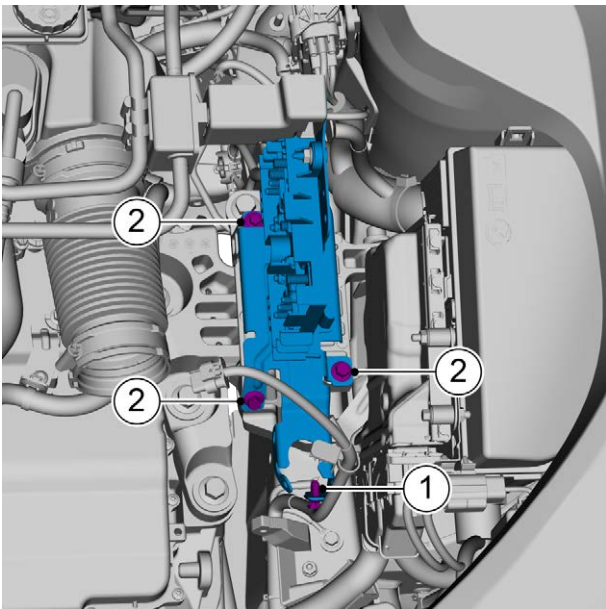
- 3 Perform the normal power outage process for the high voltage system, see [Normal Power Outage Process for High Voltage System](#).
- 4 Remove the air filter assembly, see [Replacement of Air Filter Assembly](#).
- 5 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 6 Support the transmission with a jack.
- 7 Remove the fuse box cover.



- 8 Remove the fixing nuts 1 and 2 of the wiring harness.
- 9 Set aside the engine harness, front compartment harness, 12 V power harness and high voltage battery pack harness.

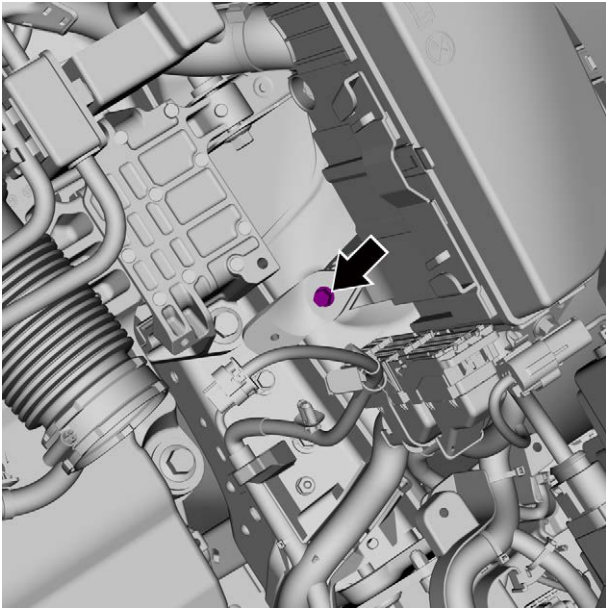


- 10 Remove the two fixing bolt 2 of the engine wiring harness bracket.
- 11 Remove the harness clip 2 from the front compartment harness.

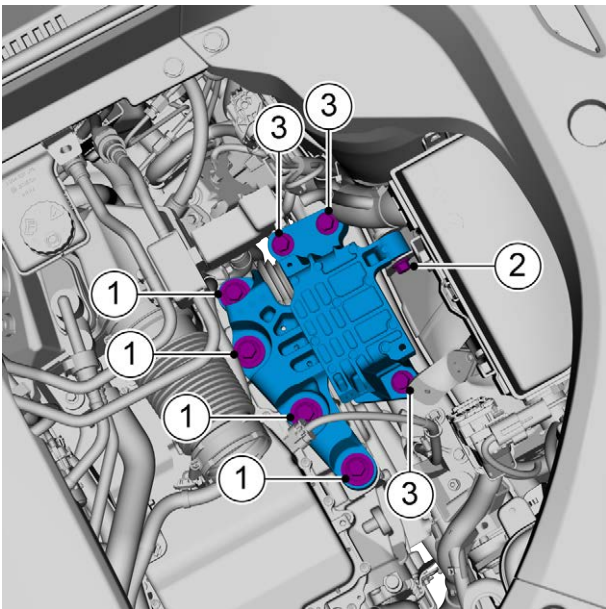


- 12 Remove the harness clip 1 of the front compartment harness fixing bracket.
- 13 Remove the three fixing bolts 2 of the front compartment harness fixing bracket.
- 14 Remove the front compartment wiring harness fixing bracket and fuse box.

- 15 Remove the engine control module , see [Replacement of Engine Control Module..](#)

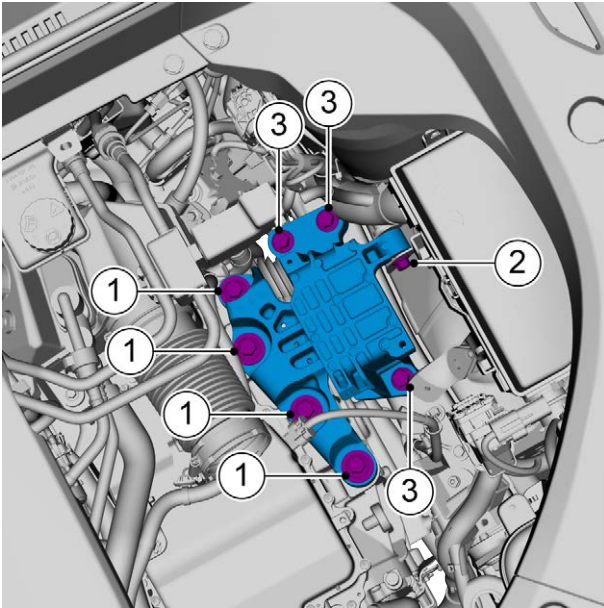


- 16 Remove the fixing bolts of the front compartment fuse box.

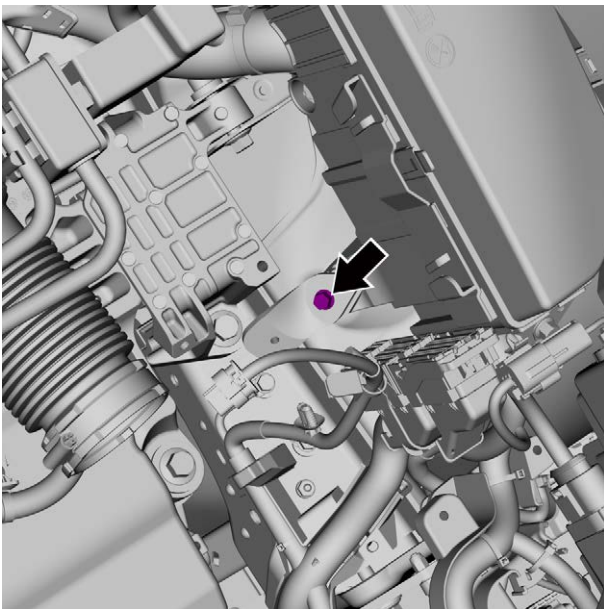


- 17 Remove the four fixing bolts connecting the left engine vibration isolation pad assembly to the hybrid special transmission assembly.
- 18 Remove the fixing bolts 2 connecting the left engine vibration isolation pad assembly connected to the vehicle body.
- 19 Remove the three fixing bolts 3 between the left engine vibration isolation pad assembly and the left longitudinal beam, and take off the left engine vibration isolation pad assembly.

Installation Procedure

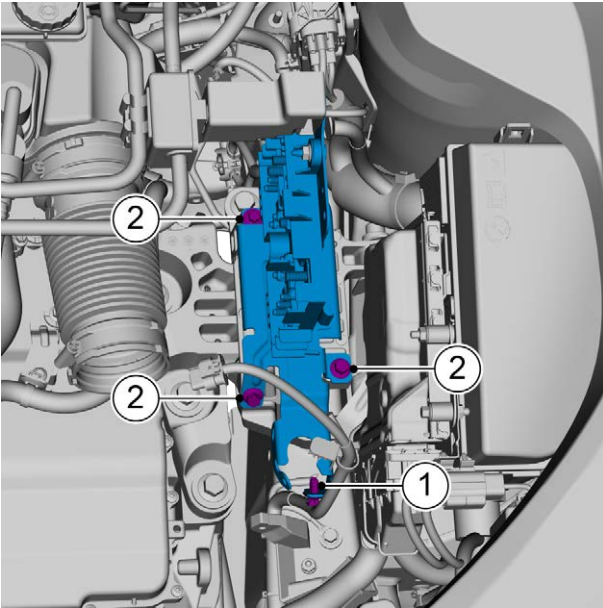


- 1 Install the left engine vibration isolation pad assembly and tighten the three fixing bolts 3 connecting the left engine vibration isolation pad assembly to the left longitudinal beam.
Torque: $90+120^\circ$ N·m
- 2 Install the fixing bolts 2 connecting the left engine vibration isolation pad assembly to the vehicle body.
Torque: 60 N·m
- 3 Install and tighten the four fixing bolts 1 connecting the left engine vibration isolation pad assembly and the hybrid special transmission assembly.
Torque: 110 N·m

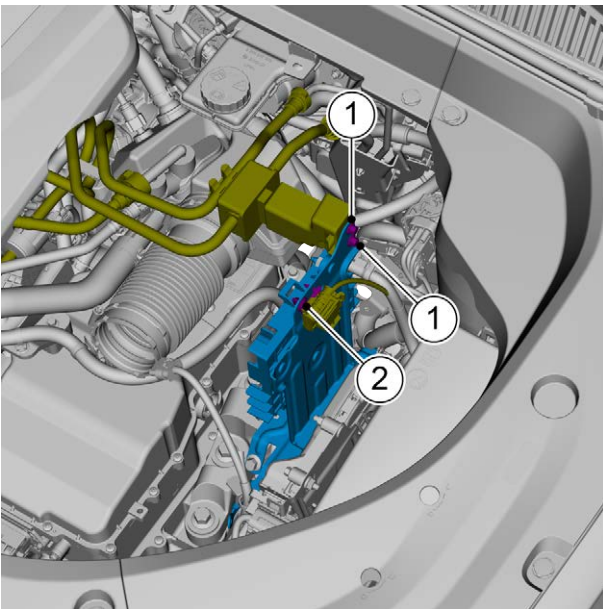


- 4 Install and tighten the fixing bolts of the front compartment fuse box.
Torque: 10 N·m

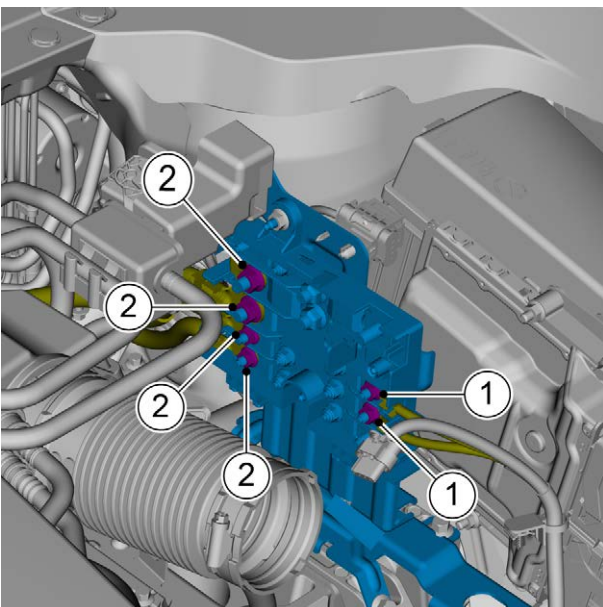
- 5 Install the engine control module.



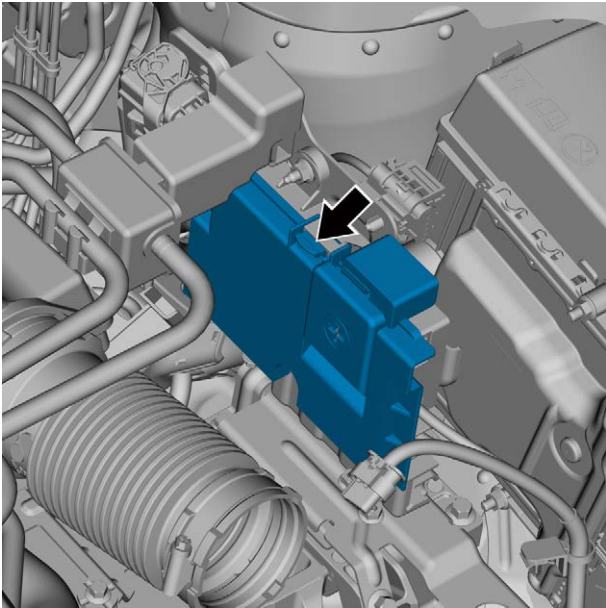
- 6 Install the front compartment wiring harness fixing bracket and fuse box.
- 7 Install and tighten the three fixing bolts 2 of the front compartment harness fixing bracket.
Torque: 10 N·m
- 8 Install the harness clip 1 of the front compartment harness fixing bracket.



- 9 Install the harness clip 2 for the front compartment harness.
- 10 Install and tighten the two fixing bolts 1 of the engine harness bracket.
Torque: 10 N·m



- 11 Install the engine harness, front compartment harness, 12 V power harness and high voltage battery pack harness.
- 12 Install and tighten the fixing nuts 1 and 2 of the wiring harness.
Torque of Nut 1: 6 N·m
Torque of Nut 2: 16 N·m



13 Install the fuse box cover.

14 Lower and take off the jack.

15 Install the bottom engine guard assembly.

16 Install the air filter assembly.

17 Carry out the normal power-on process of the high voltage system, see [Normal Power-on Process of High Voltage System](#).

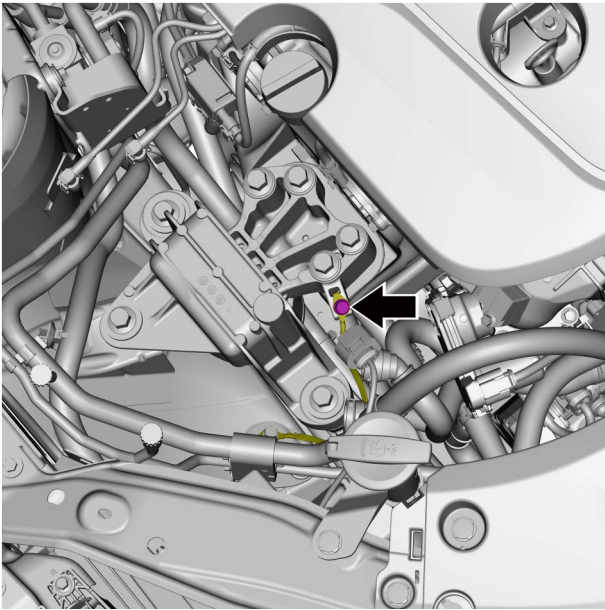
18 Connect the negative cable of battery.

19 Close the engine compartment cover.

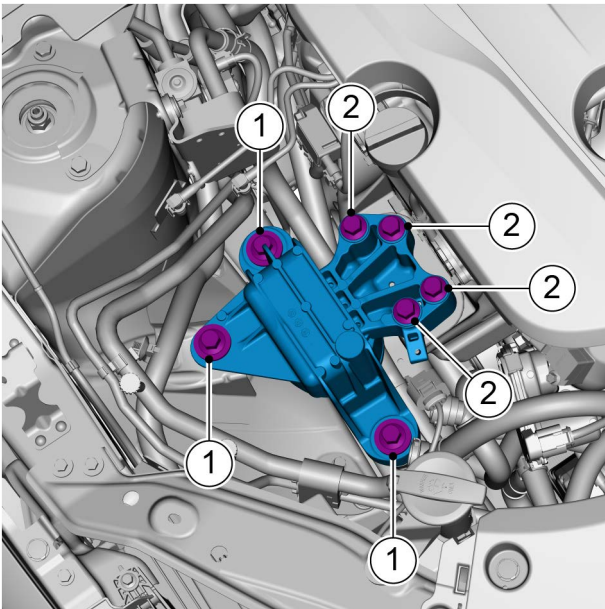
2.5.7.4 Replacement of Right Engine Vibration Isolation Pad Assembly

Removal Procedure

- 1 Open the engine compartment hood.
- 2 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 3 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 4 Remove the low-temperature radiator expansion kettle, see [Replacement of Low-Temperature Radiator Expansion Kettle](#).
- 5 Take a jack to slightly lift the engine assembly.

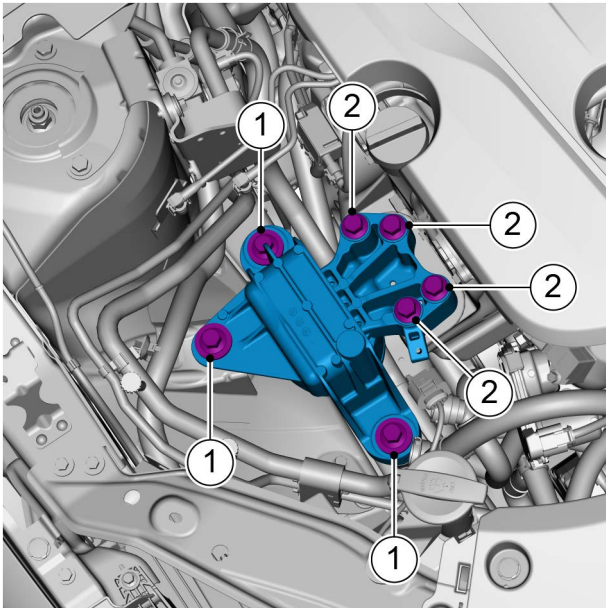


- 6 Remove the fixing bolts of the engine grounding wire and move it aside.

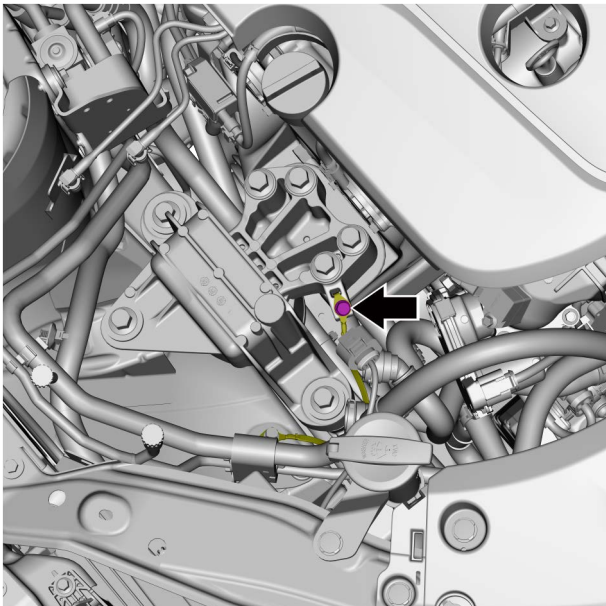


- 7 Remove the three fixing bolts 1 that connect the right engine vibration isolation pad assembly to the engine assembly.
- 8 Remove the four fixing bolts 2 that connect the right engine vibration isolation pad assembly to the engine assembly, and take off the right engine vibration isolation pad assembly.

Installation Procedure



- 1 Install the right engine vibration isolation pad assembly and tighten the four fixing bolts 2 of the right engine vibration isolation pad assembly to the engine.
Torque: $90+120^{\circ}$ N·m
- 2 Install and tighten the three fixing bolts 1 between the right engine vibration isolation pad assembly to the vehicle body.
Torque: $90+90^{\circ}$ N·m

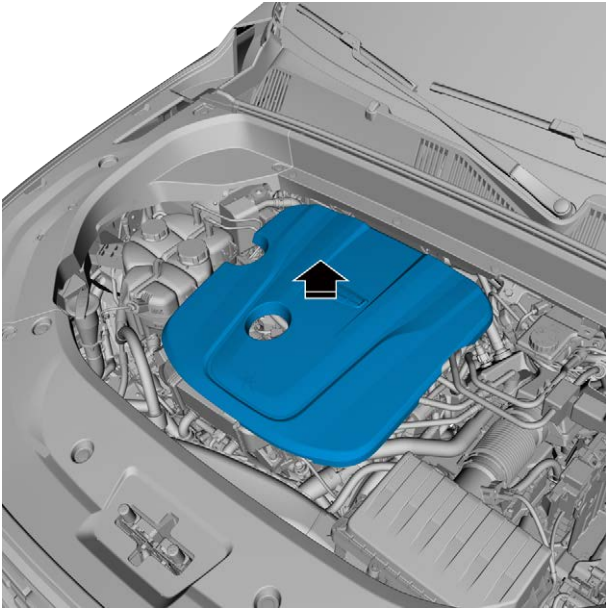


- 3 Install the engine grounding wire and tighten the fixing bolts of the engine grounding wire.
Torque: 10 N·m

- 4 Lower and take off the jack.
- 5 Install the low temperature radiator expansion kettle.
- 6 Install the bottom engine guard assembly.
- 7 Lower the vehicle.
- 8 Close the engine compartment cover.

2.5.7.5 Replacement of Engine Trim Cover Assembly

Removal Procedure



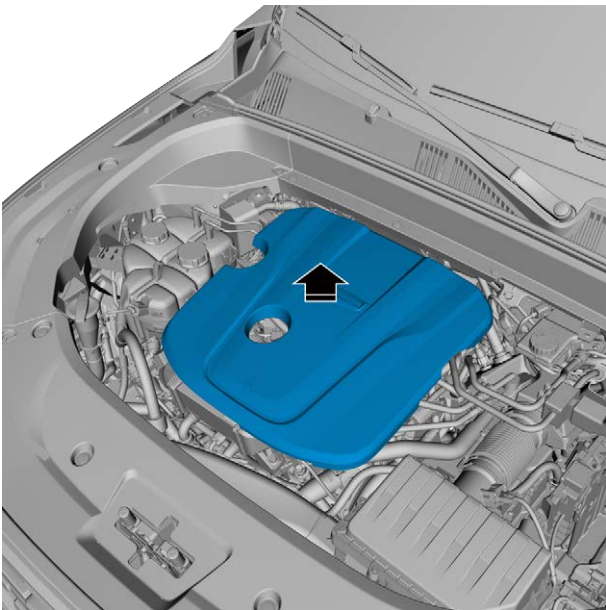
- 1 Open the engine compartment hood.
- 2 Remove the engine trim cover assembly.

Caution

Disconnect the engine trim cover assembly from the four engine trim cover ball head bolts in the direction of the arrow, and then remove the engine trim cover assembly. Failure to do so may cause the engine trim cover ball studs to break.

Installation Procedure

- 1 Install the engine trim cover assembly.



- 2 Close the engine compartment cover.

2.5.7.6 Replacement of Oil-Air Separator Subassembly

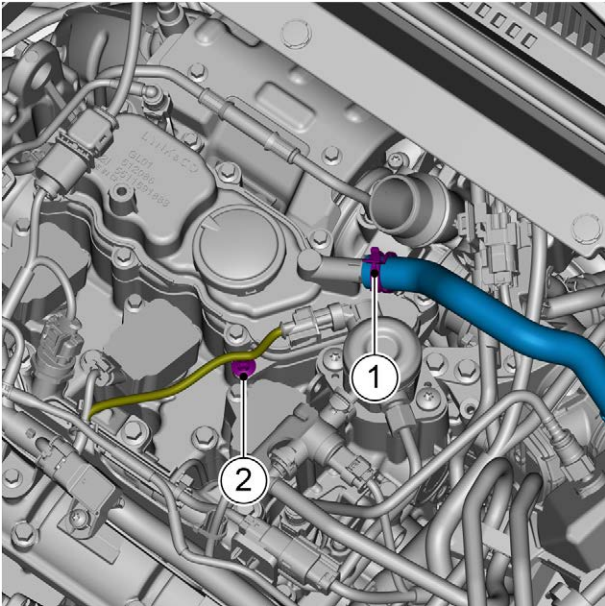
Removal Procedure

Warning !

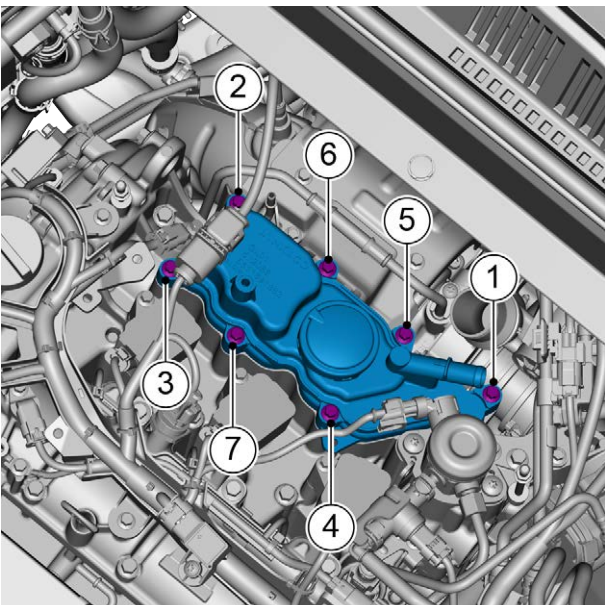
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.

- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 4 Remove the temperature sensor, see [Replacement of Temperature Sensor](#).
- 5 Remove the water-cooled intercooler subassembly, see [Replacement of Water-cooled Intercooler Subassembly](#).
- 6 Disconnect the crankcase ventilation pipe from the oil-air separator subassembly by removing the fixing clamp 1 of the crankcase ventilation pipe.
- 7 Remove the fixing clips 2 of the high pressure fuel pump wiring harness.



- 8 Remove the seven fixing bolts of the oil-air separator subassembly in the order shown in the diagram, and take off the oil-air separator subassembly and the sealing ring.

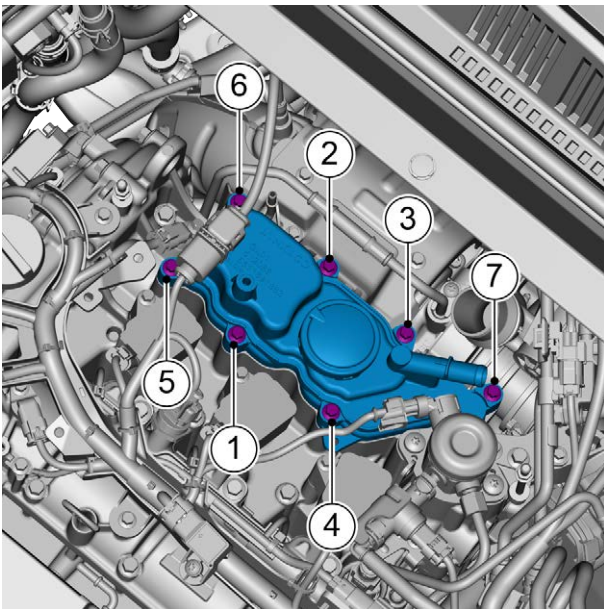
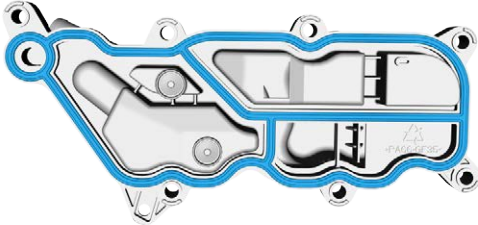


Installation Procedure

- 1 Clean the mounting contact surfaces of the oil-air separator subassembly and install the sealing ring and oil-air separator subassembly.

Caution

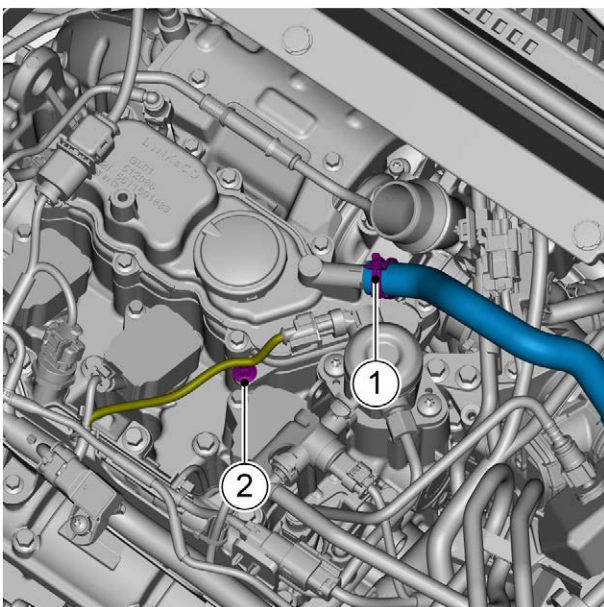
Make sure that the sealing ring is correctly positioned before installation (check that the sealing ring is not detached or misaligned).



- 2 Install the seven fixing bolts of the oil-air separator subassembly, pre-tightening then tightening in the order shown in the diagram.

Pre-tightening Torque: < 5 N·m

Tightening Torque: 9 N·m



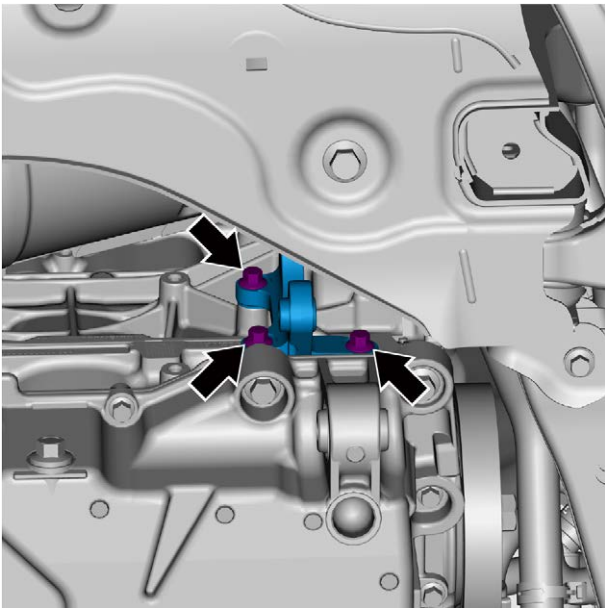
- 3 Install the fixing clips 2 of the high pressure fuel pump wiring harness.
- 4 Connect the crankcase ventilation pipe to the oil-air separator subassembly and install the fixing clamps 1 of the crankcase ventilation pipe.

- 5 Install the water-cooled intercooler subassembly.
- 6 Install the temperature sensor.
- 7 Install the engine trim cover assembly.
- 8 Connect the negative cable of battery.
- 9 Close the engine compartment cover.

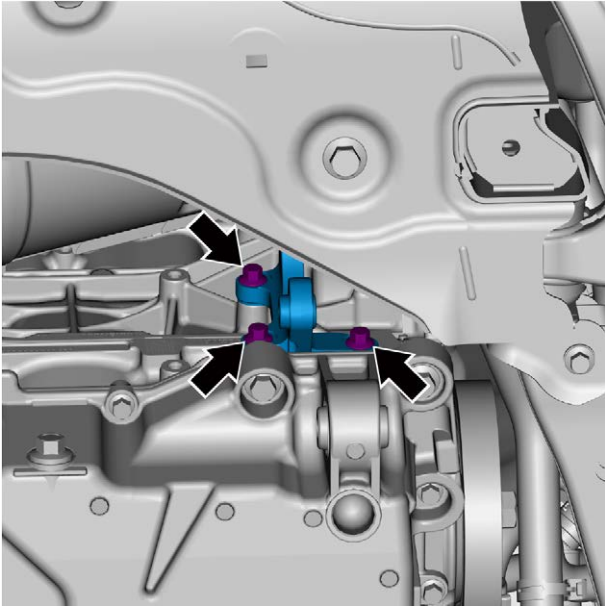
2.5.7.7 Replacement of Half Shaft Bracket Assembly

Removal Procedure

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 3 Remove the front right wheel, see [Replacement of Wheel Assembly](#).
- 4 Remove the front right constant velocity drive shaft, see [Replacement of Front Right Constant Velocity Drive Shaft](#).
- 5 Remove the three fixing bolt 2 of the half shaft bracket and take off the half shaft bracket assembly.



Installation Procedure



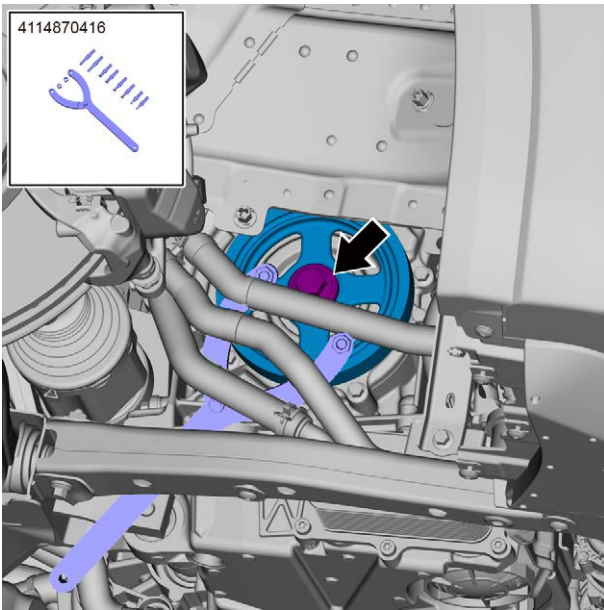
- 1 Install the half-shaft bracket assembly and tighten the three fixing bolts of the half-shaft bracket assembly.
Torque: 24N·m

- 2 Install the rear right suspension vibration isolation pad.
- 3 Install the front right constant velocity drive shaft.
- 4 Install front right wheel.
- 5 Install the bottom engine guard assembly.
- 6 lower the vehicle.

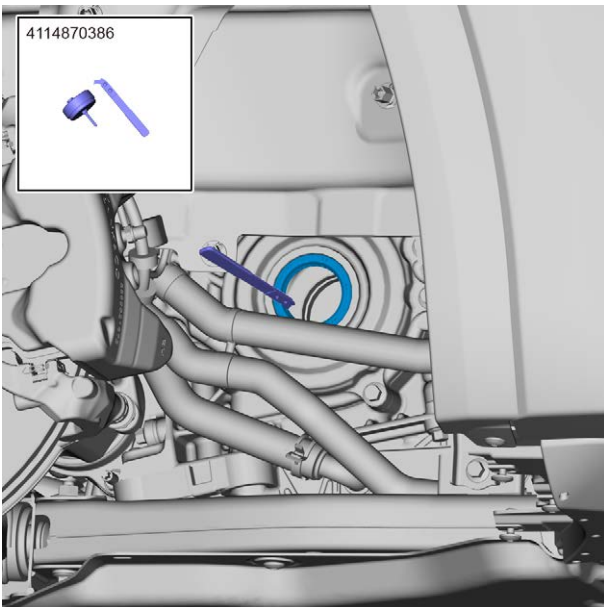
2.5.7.8 Replacement of Damping Pulley

Removal Procedure

- 1 Open the engine compartment hood.
- 2 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 3 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 4 Remove the front right wheel, see [Replacement of Wheel Assembly](#).
- 5 Remove the front right wheel cover fender assembly, see [Replacement of Front Left Wheel Cover Feeder Assembly](#).



- 6 Fix the damping pulley with a special tool.
Special tool: 4114870416
- 7 Loosen the fixing bolts of the damping pulley.
- 8 Remove the special tool for fixing the damping pulley.
Special tool: 4114870416
- 9 Remove the damping pulley.

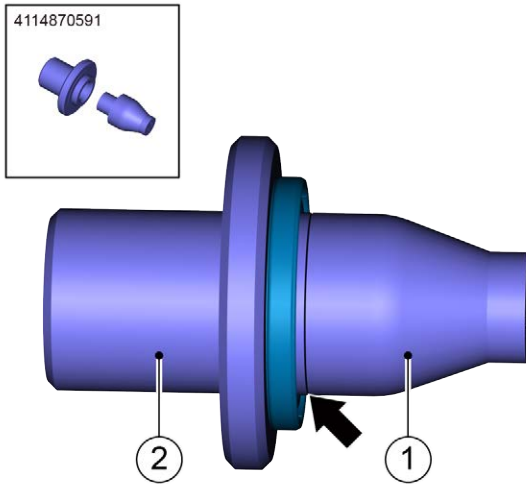


- 10 Remove the front oil seal of the crankshaft with a special tool.
Special tool: 4114870386

Caution

Some foreign objects and contaminants may be caught in the main lip with the secondary assembly of the vibration-dampening pulley, which may lead to oil leakage and therefore require the replacement of the front crankshaft oil seal.

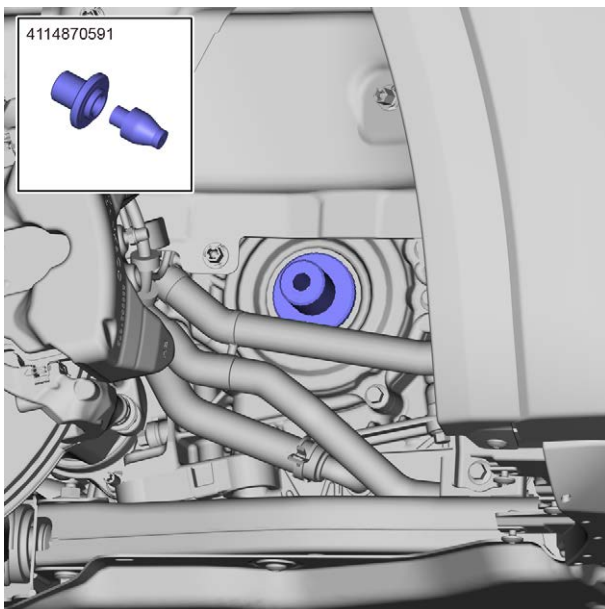
Installation Procedure



- 1 Install the front oil seal of the crankshaft to the special tool and remove the front end part 1 of the special tool.
Special tool: 4114870591

Caution

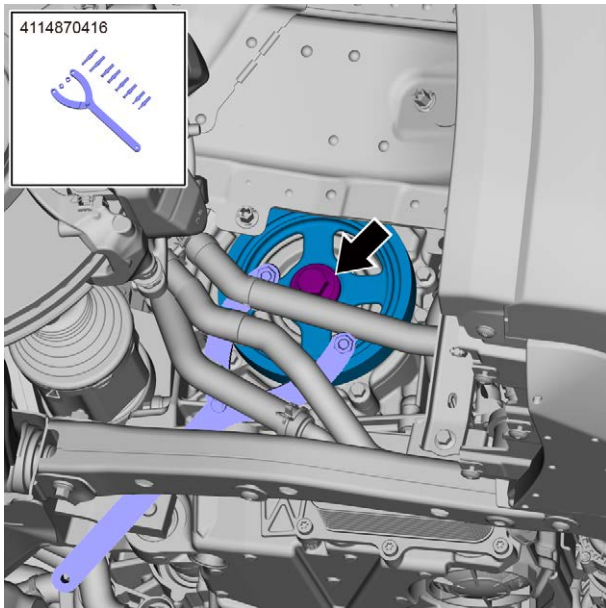
Ensure that the position of the rear end part 2 of the special tool needs to be higher than the front oil seal of the crankshaft.



- 2 Install the front oil seal of the crankshaft to the timing belt guard with a special tool.
Special tool: 4114870591
Oil seal pressing depth: 0.6 mm~ 1 mm
End parallelism: 0.25 mm

Caution

1. Before assembly, confirm that the installation journal and chamfer of the oil seal are clean and free of foreign objects. If any, it needs to be wiped away. Confirm that the installation journal and chamfer of the oil seal are free of visual defects such as bumps, scratches, indentations, rust, and excessive paint. If there are any defects, please replace the damping pulley with a new one.
2. For installing the oil seal, it is permissible to apply P80 or other insertion aids on the installation hole wall or outer ring of the oil seal.
3. Hands should not touch the oil seal mounting groove during installation.
4. Scrap the oil seal directly after landing.
5. Do not allow contact with the inner ring and lip of the oil seal.



- 3 Before assembly, make sure that the bolt mounting surface of the vibration-damping pulley is free of oil stains and foreign matter, and wipe it off if there are any. If the disassembled vibration-damping pulley needs to be reassembled, clean the vibration-damping pulley and wipe the surface of the vibration-damping pulley assembly shaft diameter evenly with a new clean non-woven cloth smeared with engine oil before assembly. The surface of the shaft diameter after wiping should be coated with as little oil as possible. Avoid scratching the sealing surface of the oil seal when assembling the vibration-damping pulley journal.

- 4 Install the damping pulley, pre-tighten the fixing bolts of the damping pulley, and fix the damping pulley with a special tool.

Special tool: 4114870416

- 5 Install and tighten the fixing bolts of the damping pulley.
Torque: 110 N·m +135°

Caution

The damping pulley bolt is a disposable part and must be replaced with a new damping pulley bolt.

- 6 Remove the special tool for fixing the damping pulley.
Special tool: 4114870416

- 7 Install the front right wheel cover fender assembly.

- 8 Install front right wheel.

- 9 Install the bottom engine guard assembly.

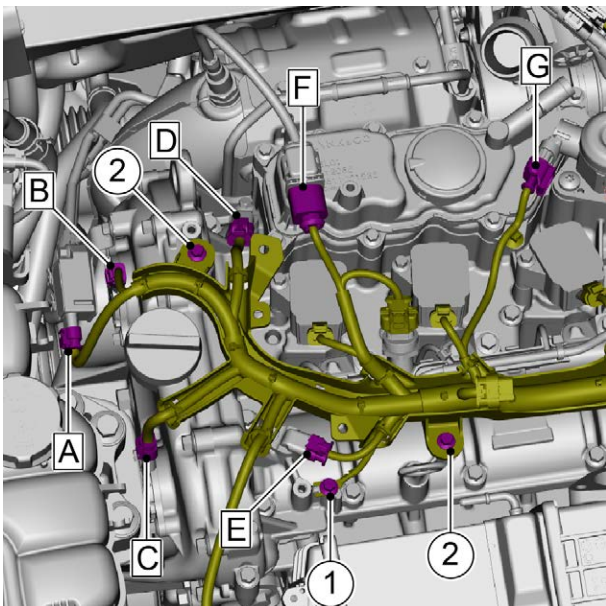
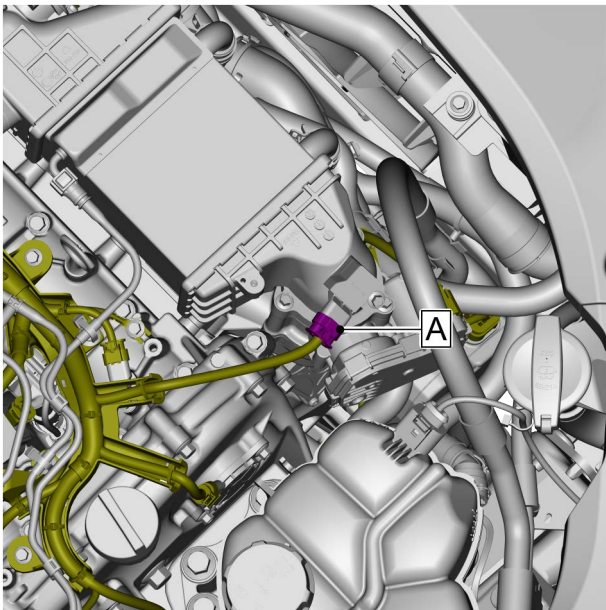
- 10 lower the vehicle.

- 11 Close the engine compartment cover.

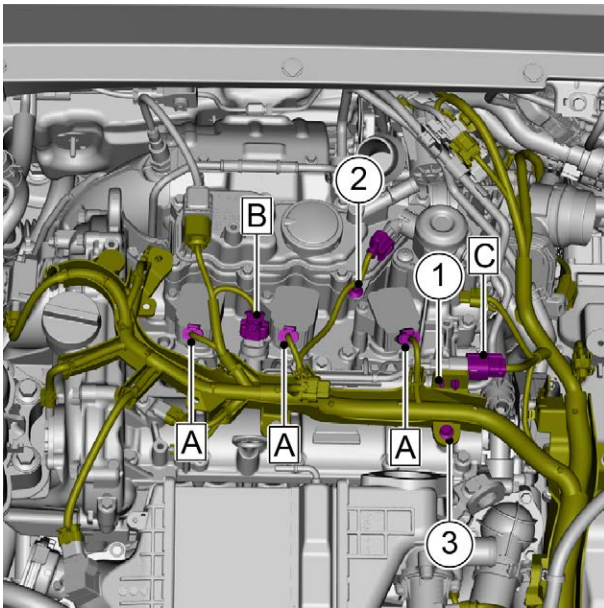
2.5.7.9 Timing Calibration

Removal Procedure

- 1 Open the engine compartment hood.
- 2 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 3 Release the fuel pressure, see [Fuel Pressure Release Procedure](#).
- 4 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 5 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).

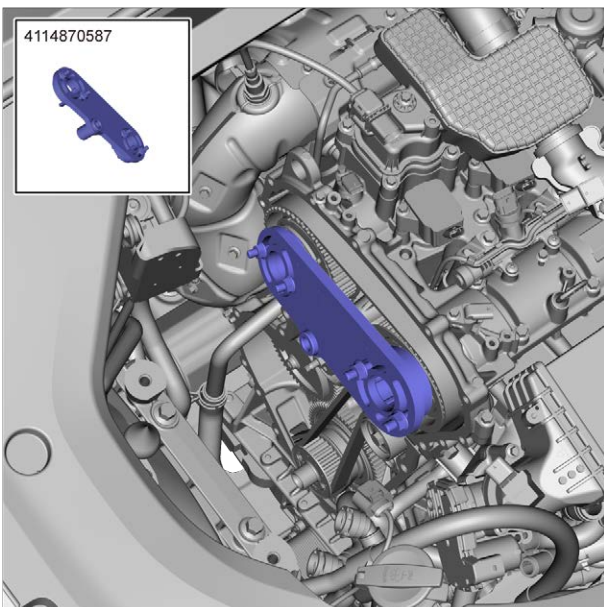


- 6 Remove the resonator assembly, see [Replacement of Resonator Assembly](#).
- 7 Remove the resonator, see [Resonator](#).
- 8 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 9 Remove the front right wheel, see [Replacement of Wheel Assembly](#).
- 10 Remove the front right wheel cover fender assembly, see [Replacement of Front Left Wheel Cover Feeder Assembly](#).
- 11 Remove the damping pulley, see [Replacement of Damping Pulley](#).
- 12 Disconnect the harness connector A of the intake pressure and temperature sensor (water-cooled intercooler subassembly).
- 13 Disconnect the harness connector A of the differential filter pressure sensor.
- 14 Disconnect the harness connector B of the VVT solenoid coil (exhaust side).
- 15 Disconnect the harness connector C of the VVT solenoid coil (intake side).
- 16 Disconnect the harness connector D of the exhaust camshaft position sensor.
- 17 Disconnect the harness connector E of the intake camshaft position sensor.
- 18 Disconnect harness connector F of the Lambda probe (upstream oxygen sensor).
- 19 Disconnect the harness connector G of the high pressure fuel pump.
- 20 Remove the fixing bolt 1 of the engine wiring harness grounding.

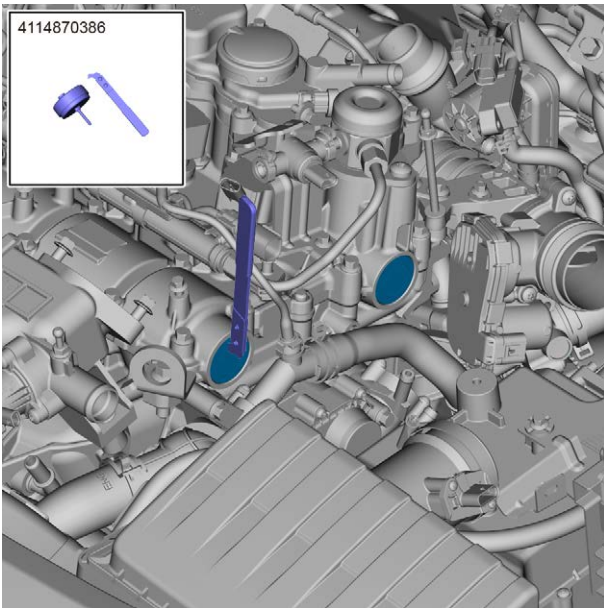


- 21 Remove the two fixing bolts 2 of the engine wiring harness
- 22 Disconnect the harness connector A from the ignition coil.
- 23 Disconnect the harness connector B of the fuel pressure sensor.
- 24 Disconnect the harness connector C of the fuel rail injector subassembly.
- 25 Remove the harness clip 1 of the fuel rail injector subassembly.
- 26 Remove the fixing clip 2 of the engine harness.
- 27 Remove the fixing bolt 3 of the engine wiring harness.

- 28 Take a jack to slightly lift the engine assembly.
- 29 Remove the right engine isolation pad assembly, see [Replacement of Right Engine Isolation Pad Assembly](#).
- 30 Remove the timing belt guard, see [Replacement of Timing Belt Guard](#).
- 31 Install and tighten the four fixing nuts of the special tool and loosen the center oil control valve.
Special Tool for VVT Fixation: 4114870587
Nut torque of special tool for VVT Fixation: 30 N·m +30°

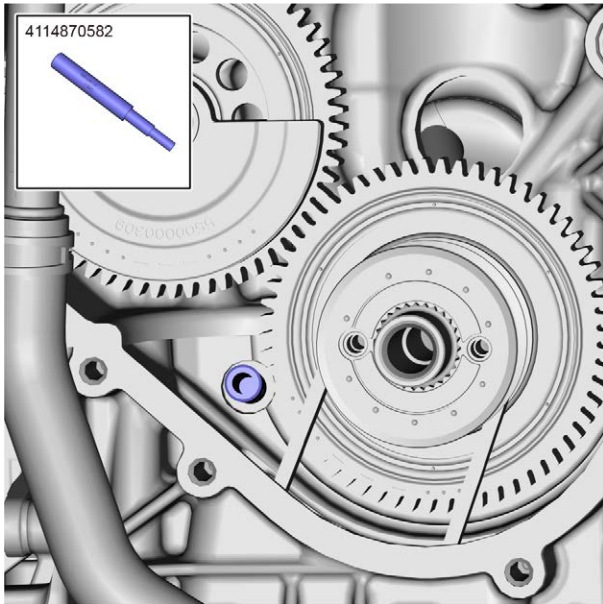


- 32 Remove the timing belt tensioner, see [Replacement of Timing Belt Tensioner](#).
- 33 Remove the timing belt, see [Replacement of Timing Belt](#).



- 34 Remove the turbocharger water pipe subassembly, see [Replacement of Turbocharger Water Pipe Subassembly](#).
- 35 Remove the camshaft plug cover with a special tool.
Special tool: 4114870386

Installation Procedure



- 1 Install the crankshaft zero position fixture to ensure that the crankshaft disk is at zero position.

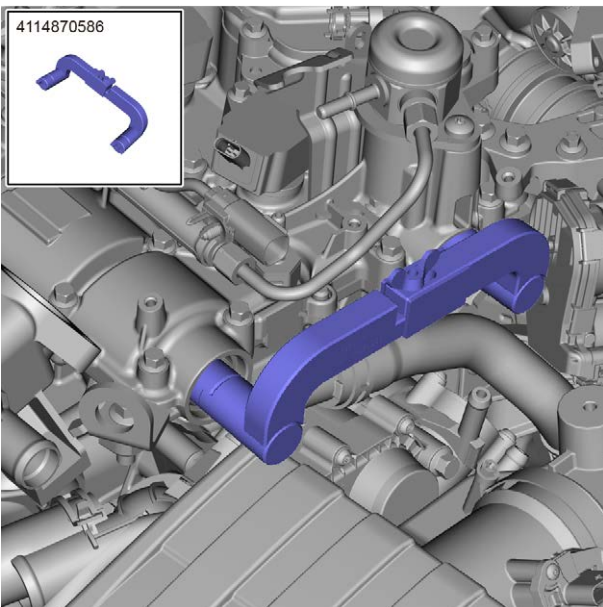
Special tool of zero position fixture for crankshaft:

4114870582

Caution

1. Insert the zero reference hole of the crankcase for positioning, ensuring that the fixture head is in contact with the small flat surface of the crankshaft first balance block.

2. Rotate the crankshaft counterclockwise, if it fails to rotate, it indicates that the crankshaft is in the zero position.

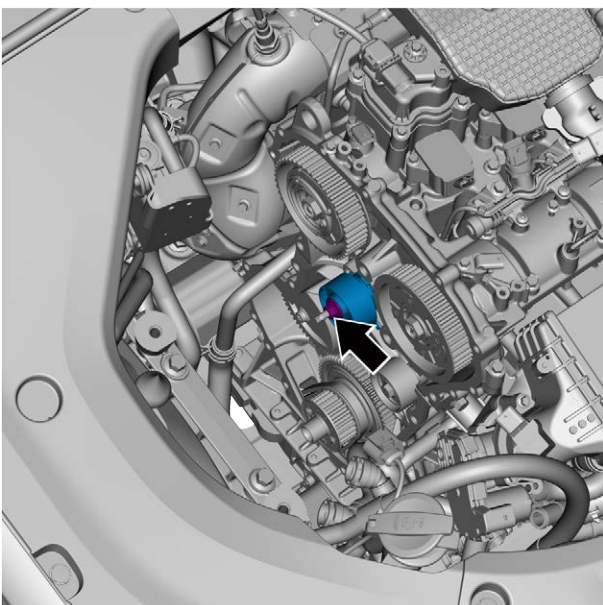


- 2 Install the camshaft positioning fixture and ensure that the camshaft is in the zero position.

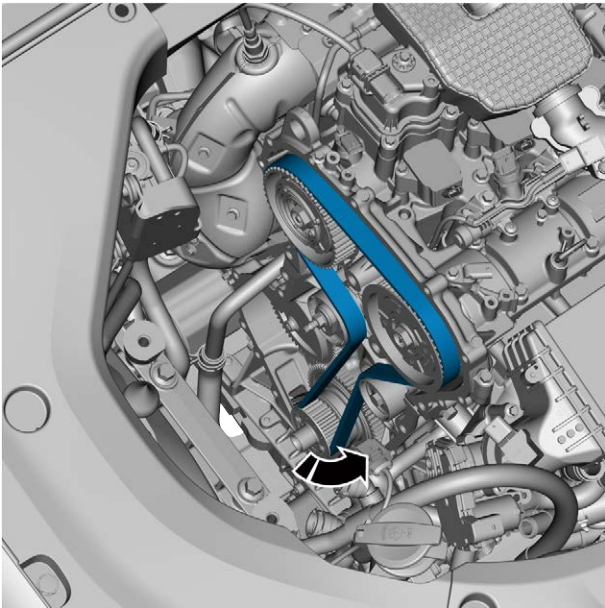
Camshaft Positioning Fixture: 4114870586

Caution

The camshaft notch is facing up, and the two tail grooves are horizontal.



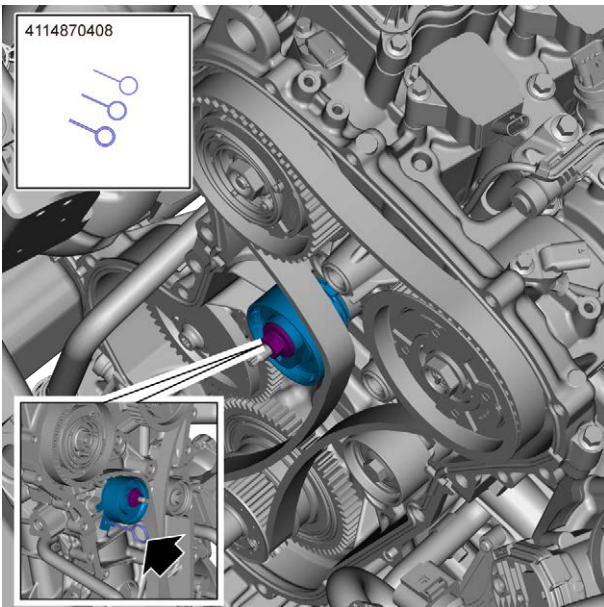
- 3 Install the timing belt tensioner and pre-tighten the fixing nut of the timing belt tensioner by hand.



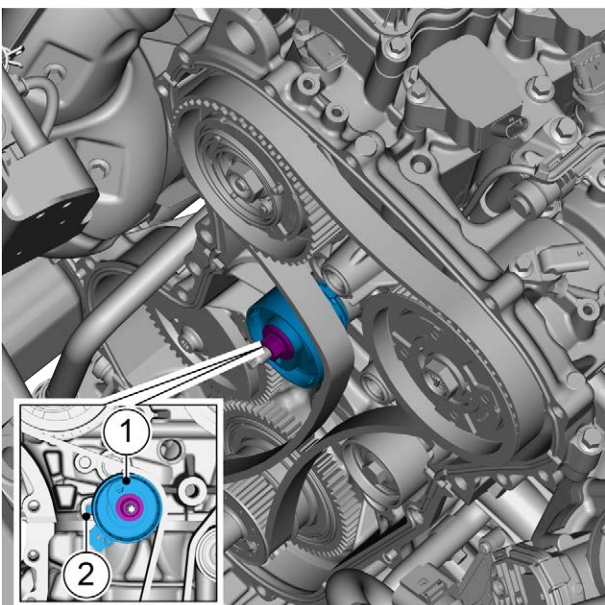
- 4 Install the timing belt counterclockwise from the crankshaft timing pulley assembly.

Caution

1. It is strictly forbidden to bend the timing belt. In case of special circumstances, the minimum bending radius must be greater than 50 mm.
2. After completing the belt assembly, make sure the belt position is in the middle of the VVT.

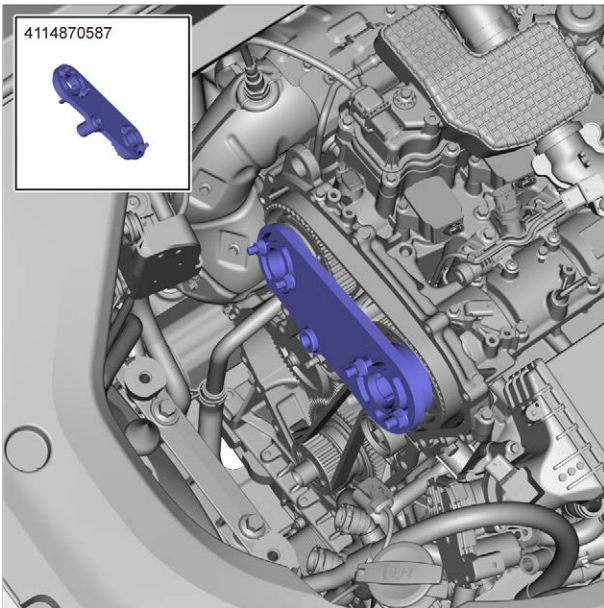


- 5 Remove the pins of the timing belt tensioner.
Special tool positioning pin set: 4114870408



- 6 Rotate the tensioner adjusting arm 1 counterclockwise, overtension the tensioner to the position shown in the assembly diagram 2. Pre-tighten the fixing nuts of the timing belt tensioner to ensure that the tensioner does not rotate.

Torque: 10 N·m



- 7 Tighten the intake/exhaust center oil control valve with a special tool.

Special tool for fixing of engine oil control valve:

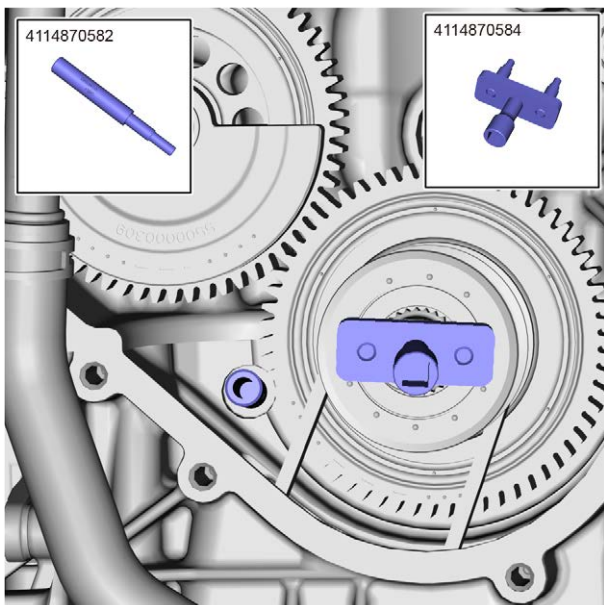
4114870587

Intake center oil control valve: 50+30° N·m

Exhaust center oil control valve: 50+30° N·m

Caution

The intake/exhaust center oil control valve is limited to 3 times.



- 8 Remove the special tool for fixing VVT, crankshaft zero position tool, camshaft rear end positioning tool. Use the crankshaft rotating tool to rotate the crankshaft clockwise for 2 turns, then insert the crankshaft zero position fixture, and finally install the camshaft rear end positioning fixture to check whether the camshaft is in the zero position or not., And if the camshaft is not in the zero position, repeat Steps 1 to 7.

Special tool of zero position fixture for crankshaft:

4114870582

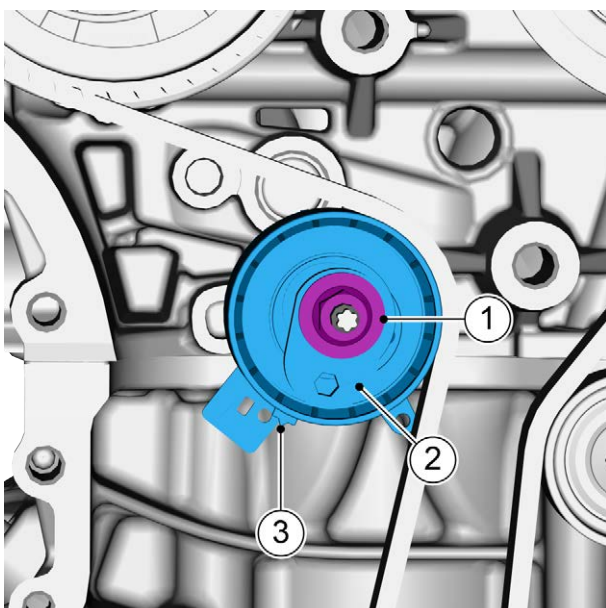
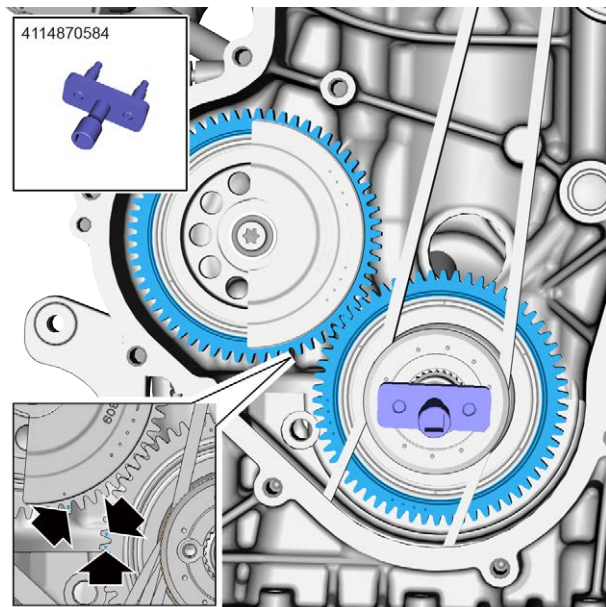
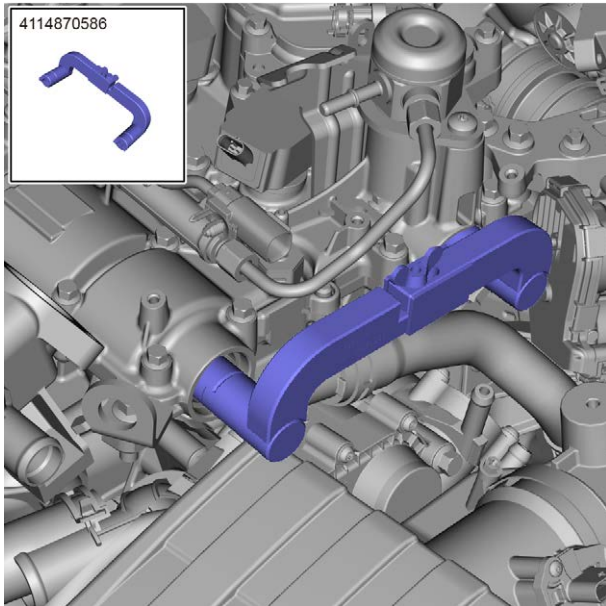
Crankshaft rotation tool: 4114870584

Special tool for camshaft rear end positioning fixture:

4114870586

Caution

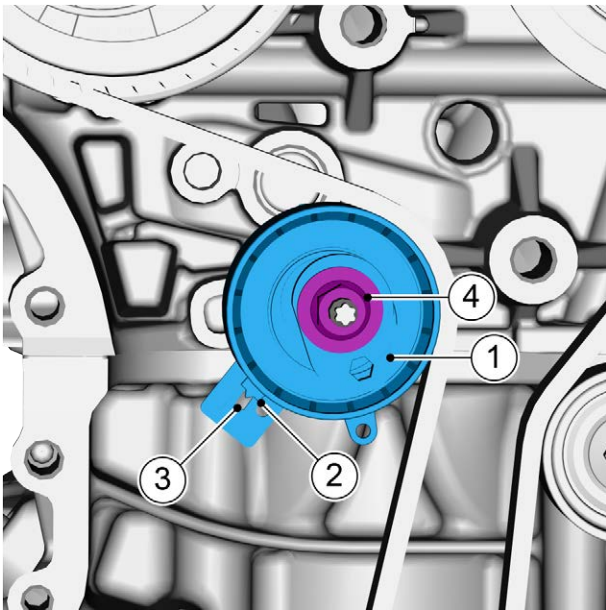
1. Insert the zero reference hole of the crankcase for positioning, ensuring that the fixture head is in contact with the small flat surface of the crankshaft first balance block.
2. Rotate the crankshaft counterclockwise, if it fails to rotate, it indicates that the crankshaft is in the zero position.



- 9 Use the crankshaft rotation tool to rotate the crankshaft clockwise by 690° until the 6th tooth of the balance shaft gear after the distance marking point is fully engaged with the crankshaft gear mark.

Crankshaft rotation tool: 4114870584

- 10 Loosen the fixing nut 1 of the timing belt tensioner and adjust the tensioner adjusting arm 2 clockwise until the tensioner pointer 3 reaches the lower edge of the tensioner base plate.

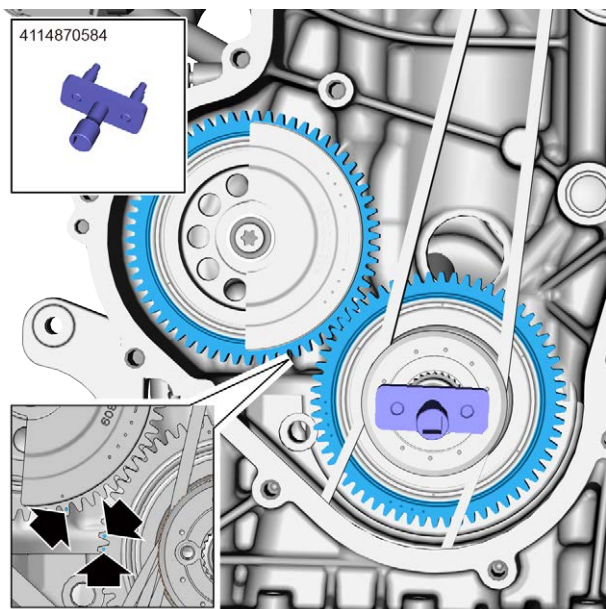


- 11 Adjust tensioner adjustment arm 1 counterclockwise until the tensioner pointer 2 is in the center of the notch 3. Lock the tensioner adjustment arm 1 and tighten the fixing nut 4 of the timing belt tensioner.

Torque: 25 N·m

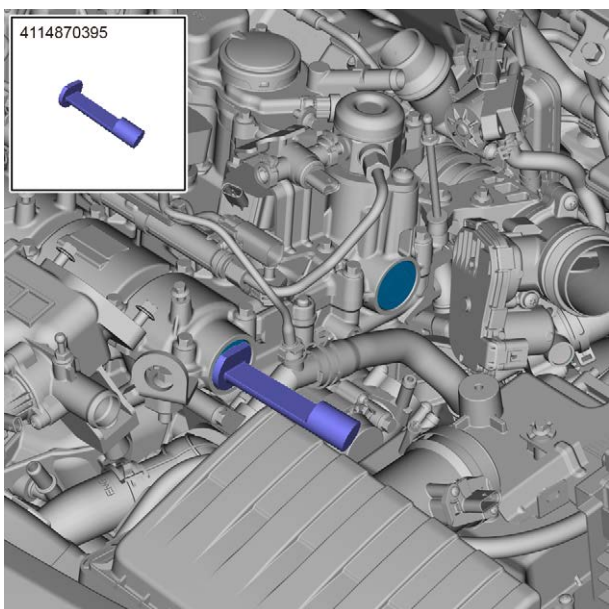
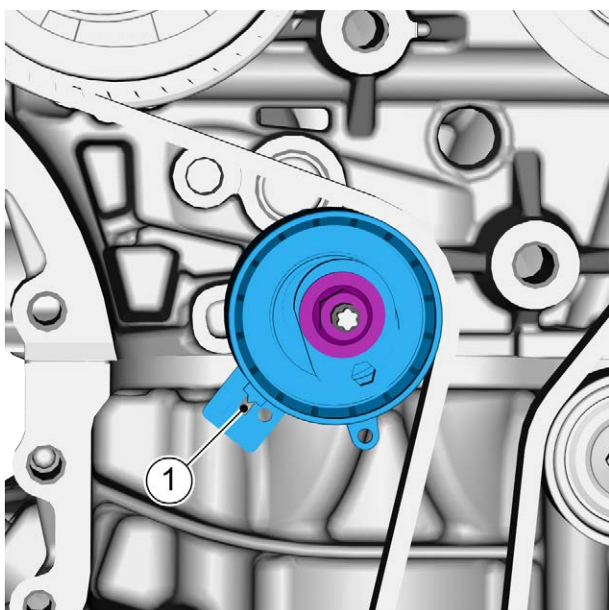
Caution

The pointer 2 must be in the middle of the notch 3 after tightening the fixing nut of the timing belt tensioner, if it is not in the middle of the notch 3, readjust the timing belt tensioner.



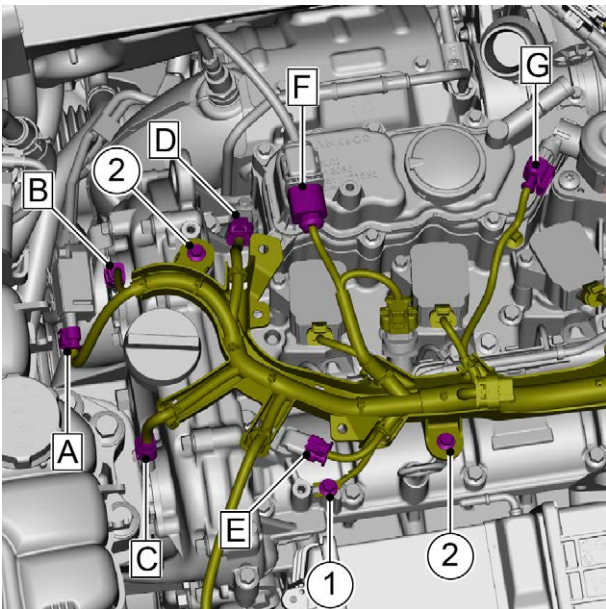
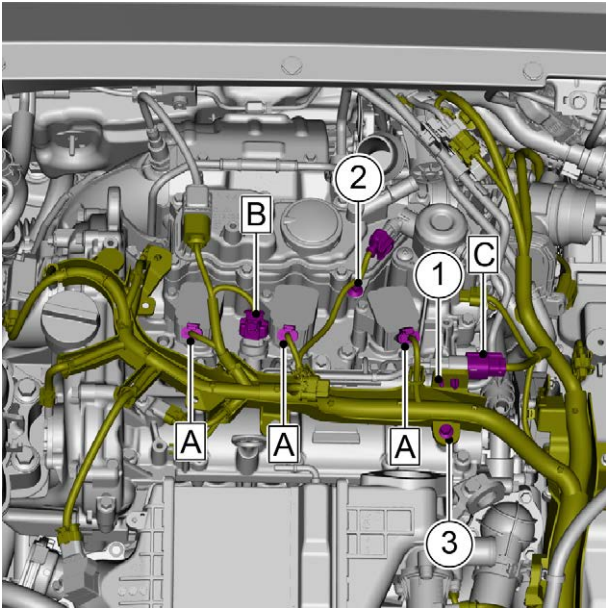
- 12 Using the crankshaft rotating tool to rotate the crankshaft clockwise 2 turns until the 6th tooth of the balance shaft gear after the distance marking point is fully engaged with the crankshaft gear marking position. Check that the tensioner pointer is still in the notch 1. If it is not in the notch 1, loosen the fixing nut of the timing belt tensioner and repeat Steps 10 through 11.

Crankshaft rotation tool: 4114870584

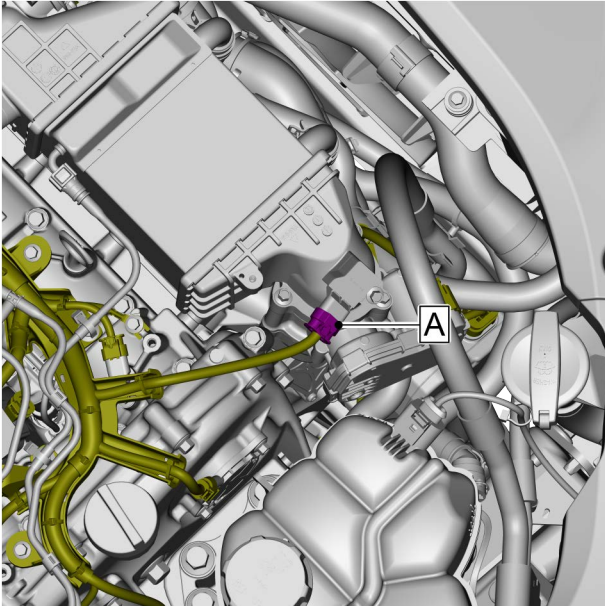


- 13 Install a camshaft plug cover with a special tool.
Special tool: 4114870386

- 14 Install the turbocharger water pipe subassembly.
15 Install the timing belt guard.
16 Install the right engine vibration isolation pad assembly.
17 Lower and take off the jack.



- 18 Install and tighten the engine harness fixing bolts 3.
Torque: 10 N·m
- 19 Install the engine harness fixing clip 2.
- 20 Install the harness clip 1 of the fuel rail injector subassembly.
- 21 Connect the harness connector C of the fuel rail injector subassembly.
- 22 Connect the harness connector B of the fuel pressure sensor.
- 23 Connect the ignition coil harness connector A.
- 24 Install and tighten the two fixing bolts 2 of the engine harness.
Torque: 10 N·m
- 25 Install and tighten the fixing bolt 1 of the engine harness grounding.
Torque: 10 N·m
- 26 Connect the harness connector G of the high pressure fuel pump.
- 27 Connect the harness connector F of the Lambda probe (upstream oxygen sensor).
- 28 Connect the harness connector E of the intake camshaft position sensor.
- 29 Connect the harness connector D of the exhaust camshaft position sensor.
- 30 Connect the harness connector C of the VVT solenoid coil (intake side).
- 31 Connect the harness connector B of the VVT solenoid coil (exhaust side).
- 32 Connect the harness connector A of the differential filter pressure sensor.



- 33 Connect the harness connector A of the intake pressure and temperature sensor (water cooled intercooler subassembly).

- 34 Install the damping pulley.
35 Install the front right wheel cover fender assembly.
36 Install front right wheel.
37 lower the vehicle.
38 Install the resonator assembly.
39 Install the bottom engine guard assembly.
40 Connect the negative cable of battery.
41 Install the engine trim cover assembly.
42 Close the engine compartment cover.

2.5.7.10 Powertrain Replacement

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#).

Warning !

See "WARNINGS ABOUT RELEASING FUEL PRESSURE" in ["WARNING AND PRECAUTION"](#)

Warning !

See "WARNINGS ON HIGH VOLTAGE SAFETY PRECAUTIONS" in ["WARNING AND PRECAUTION"](#)

Warning !

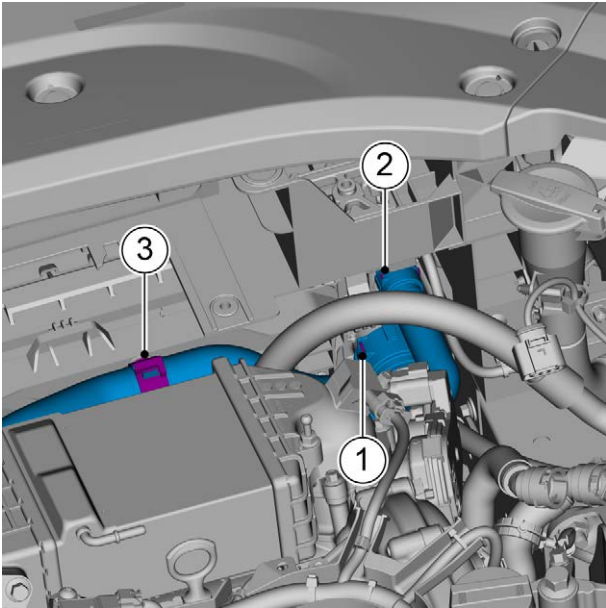
See "WARNING ABOUT COOLING SYSTEM MAINTENANCE" in ["WARNINGS AND PRECAUTIONS"](#).

Warning !

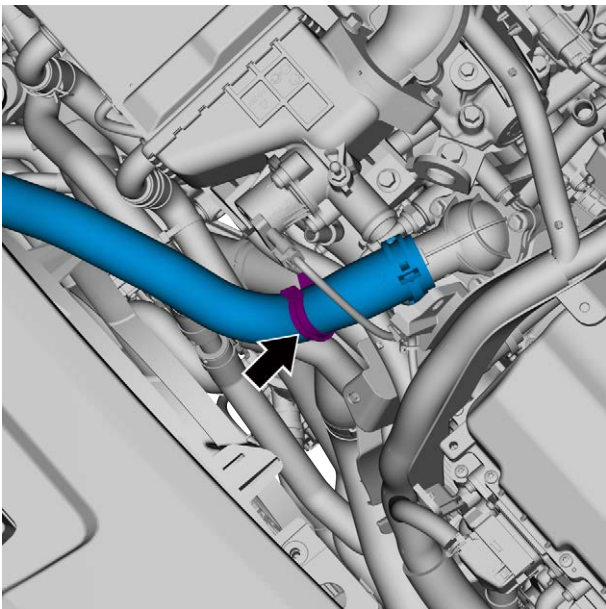
See "Warning about Exhaust System Maintenance" in ["Warning and Precaution"](#).

- 1 Open the engine compartment hood.
- 2 Release the fuel pressure, see [Fuel Pressure Release Procedure](#).
- 3 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 4 Perform the normal power outage process for the high voltage system, see [Normal Power Outage Process for High Voltage System](#).
- 5 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 6 Recover A/C refrigerant, see [A/C Refrigerant Recovery and Refill](#).
- 7 Drain the engine coolant, see [Draining and Filling of Engine Coolant](#).
- 8 Drain the electric system coolant, see [Draining and Filling Procedure of Electric System Coolant \(DHT Pro\)](#).
- 9 Remove the exhaust pipe muffler assembly, see [Replacement of Exhaust Pipe Muffler Assembly](#).
- 10 Remove the GPF rear catalytic converter, see [Replacement of GPF Rear Catalytic Converter](#).
- 11 Remove the air filter assembly, see [Replacement of Air Filter Assembly](#).

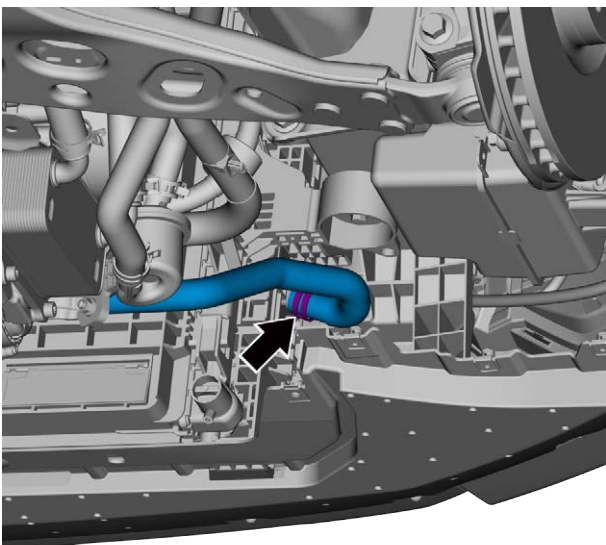
- 12 Remove the air filter intake pipe assembly. refer to [Replacement of air filter intake pipe assembly](#).
- 13 Remove the resonator assembly, see [Replacement of Resonator Assembly](#).
- 14 Remove the degassing hose, see [Replacement of Degassing Hose](#).
- 15 Remove the low-temperature radiator expansion kettle, see [Replacement of Radiator Expansion Kettle](#).
- 16 Remove the resonator, see [Replacement of Resonator](#).
- 17 Remove the fuel pressure sensor on low pressure side, see [Replacement of Fuel Pressure Sensore on Low Pressure Side](#).
- 18 Remove the DC bus assembly, see [Replacement of DC Bus Assembly](#).
- 19 Remove the front fenders of the left and front right wheel cover , see [Replacement of Front Fenders of Front Left Wheel Cover](#).
- 20 Remove the rear left suspension vibration isolation pad, see [Replacement of Rear Left Suspension Vibration Isolation Pad](#).
- 21 Remove the rear right suspension vibration isolator pad, see [Replacement of Rear Right Suspension Vibration Isolation Pad](#).
- 22 Remove the front left constant velocity drive shaft, see [Replacement of Front Left Constant Velocity Drive Shaft](#).
- 23 Remove the front right constant velocity drive shaft, see [Replacement of Front Right Constant Velocity Drive Shaft](#).
- 24 Remove the lower U-beam of the front suspension, see [Replacement of Lower U-beam of Front Suspension](#).



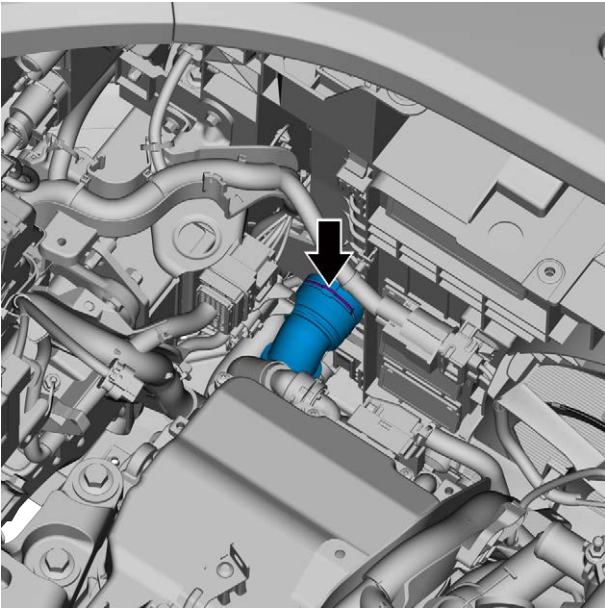
- 25 Disconnect the radiator inlet pipe from the radiator by removing the quick-insert circlip 1 of the radiator inlet pipe.
- 26 Disconnect the radiator inlet pipe (2) from the radiator by removing the quick-insert circlip 2 of the radiator inlet pipe (2).
- 27 Remove the fixing clip 3 of the radiator inlet pipe.



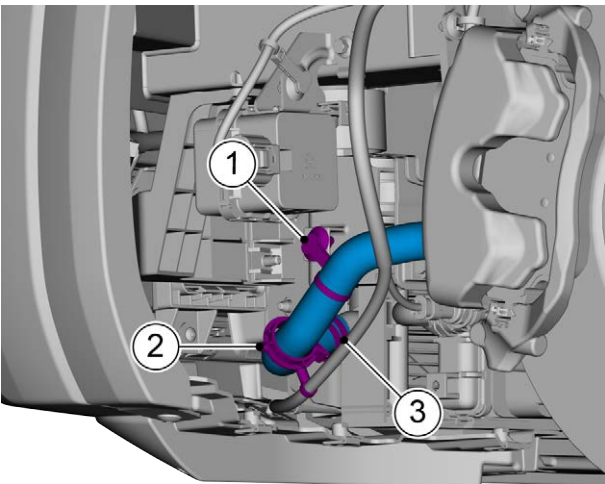
- 28 Disconnect the harness clips from the engine wiring harness.



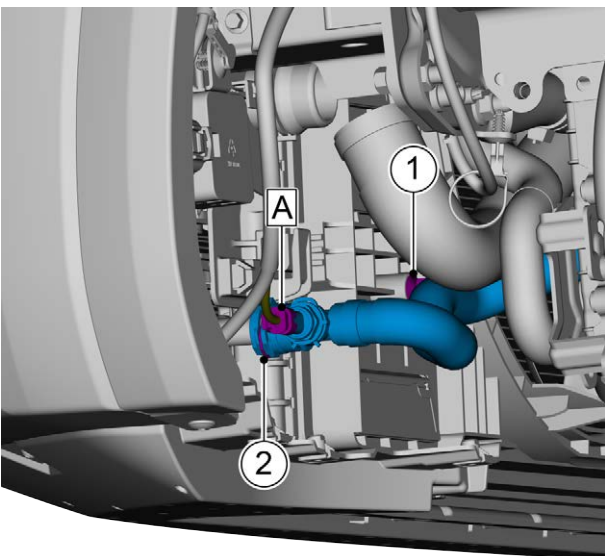
- 29 Remove the fixing clamp of the drive motor radiator inlet pipe, and disconnect the drive motor radiator inlet pipe from the low-temperature radiator.



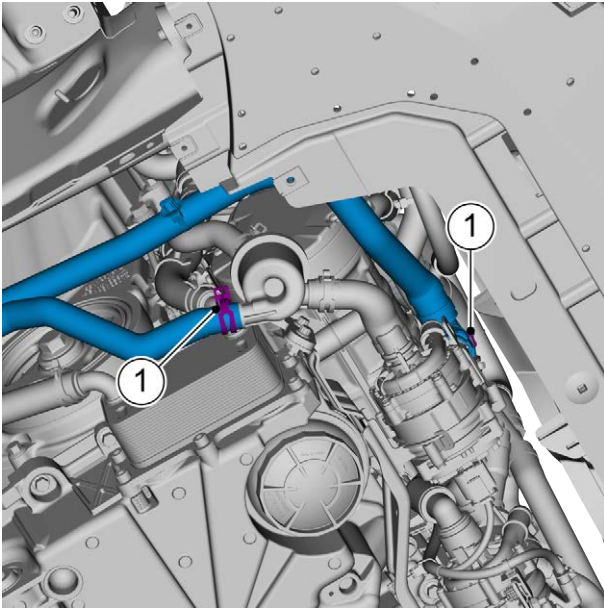
- 30 Remove the quick-insert circlip from the radiator outlet pipe and disconnect the radiator outlet pipe from the radiator.



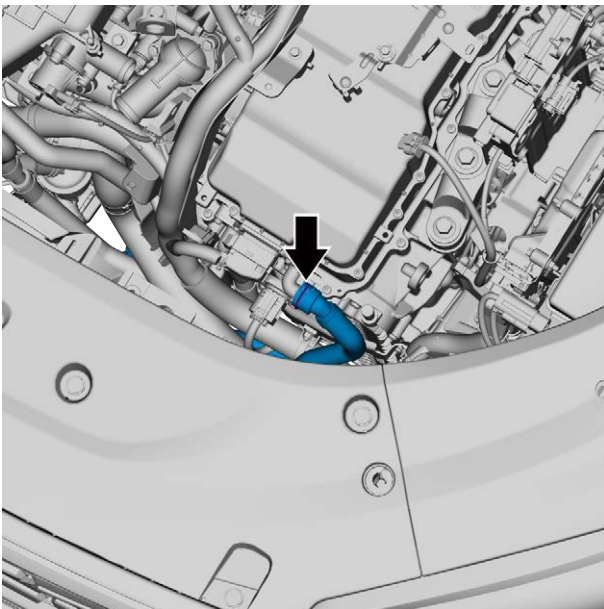
- 31 Remove the fixing clip 1 of the low-temperature radiator outlet pipe.
- 32 Disengage the harness clips 2 of the front compartment harness.
- 33 Remove the fixing clamp 3 of the low-temperature radiator outlet pipe, and disconnect the low temperature radiator outlet pipe from the low-temperature radiator.



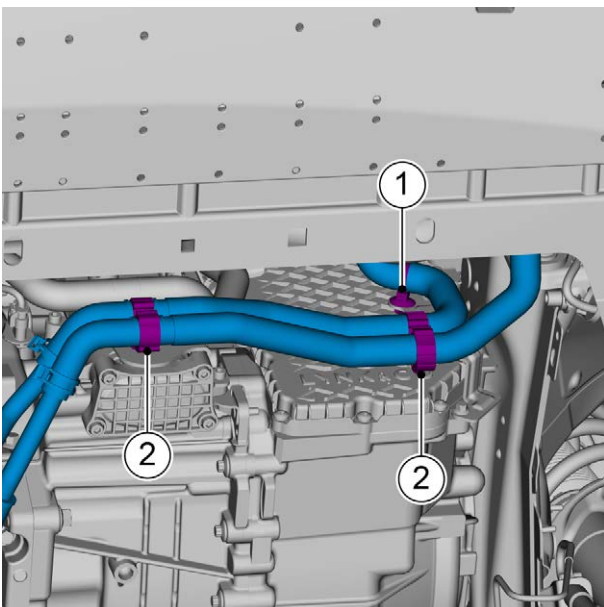
- 34 Disconnect the harness connector A of the radiator outlet pipe (2).
- 35 Remove the fixing clip 1 of the radiator outlet pipe (2).
- 36 Remove the quick-insert circlip 2 from the radiator outlet pipe (2) and disconnect the radiator outlet pipe (2) from the low temperature radiator.



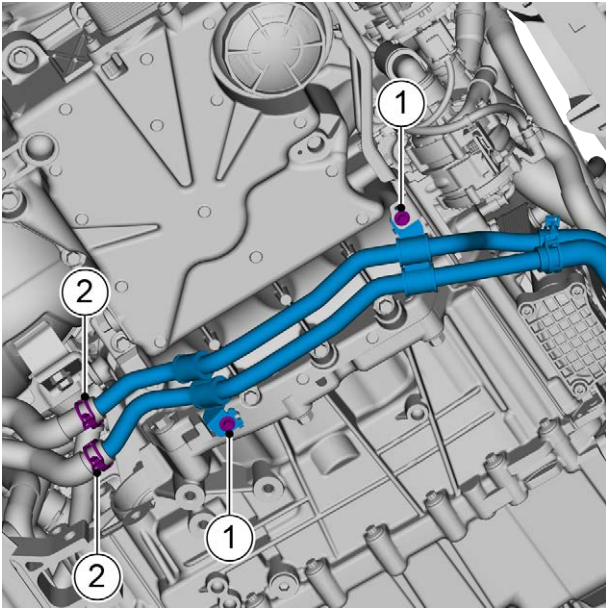
- 37 Remove the fixing clamp 1 of the battery outlet pipe and disconnect the battery outlet pipe from the battery water pump inlet pipe.
- 38 Disconnect the battery water pump outlet pipe from the electronic powertrain coolant pump by removing the quick-insert circlip 2 of the battery water pump outlet pipe.



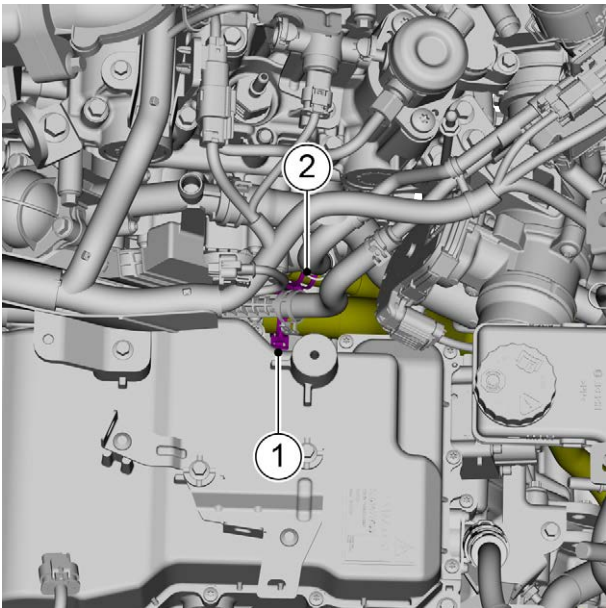
- 39 Disconnect the transmission inlet pipe from the power control module by removing the quick insert circlip of the transmission inlet pipe.



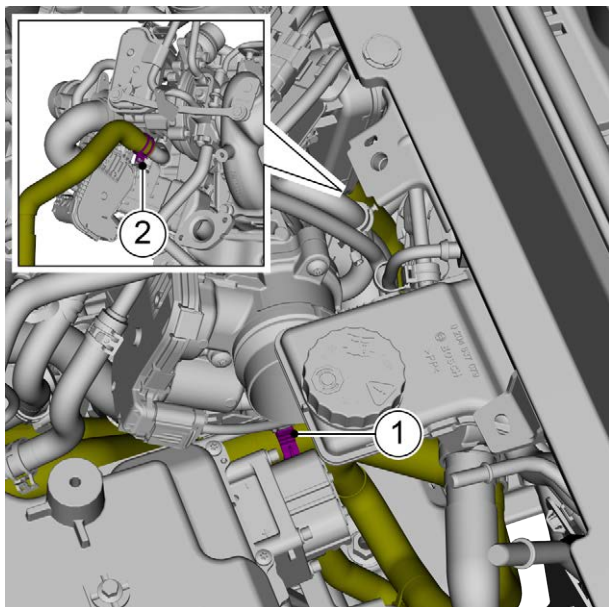
- 40 Remove the fixing clip 1 for the transmission inlet pipe.
- 41 Remove the two fixing clips 2 of the transmission inlet pipe and the low temperature radiator outlet pipe.



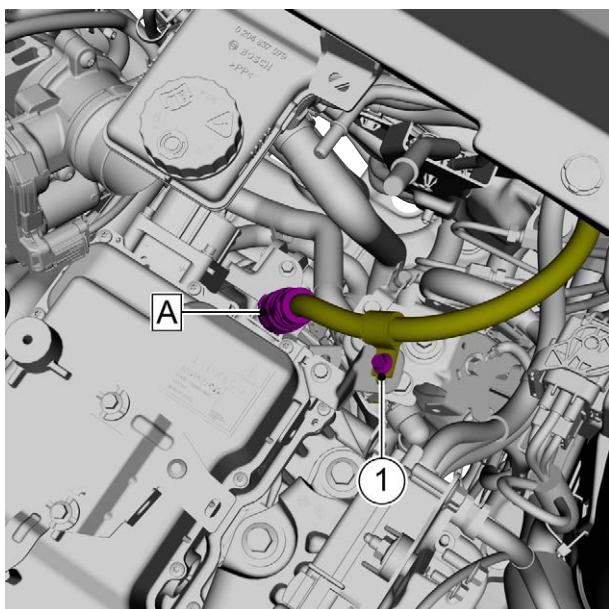
- 42 Remove the two fixing bolts 1 of the coolant inlet/outlet metal pipe.
- 43 Remove the two fixing clamps 2 of the coolant inlet and outlet metal pipes, and disconnect the coolant inlet and outlet metal pipes from the front connecting pipe of the lower floor inlet and outlet pipes.



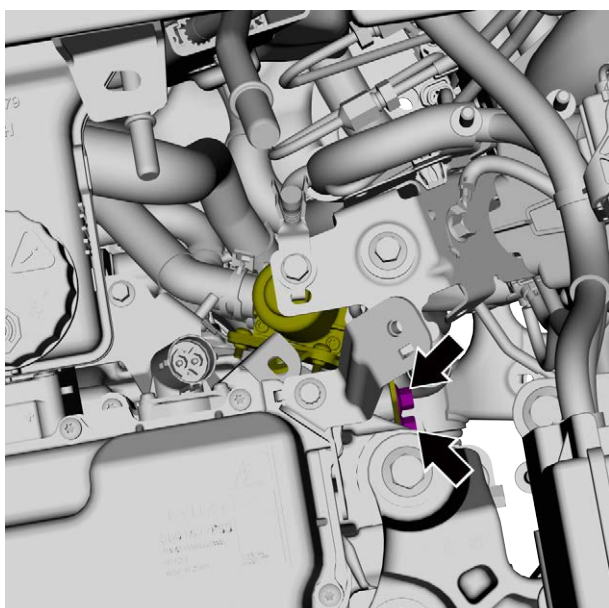
- 44 Remove the A/C compressor module, see [Replacement of A/C Compressor Module](#).
- 45 Remove the fixing clamps 1 of the transmission oil cooler inlet pipe assembly and disconnect the transmission oil cooler inlet pipe assembly from the thermostat housing subassembly.
- 46 Remove the fixing clamp 2 of the thermostat outlet pipe and disconnect the thermostat outlet pipe from the thermostat housing subassembly.



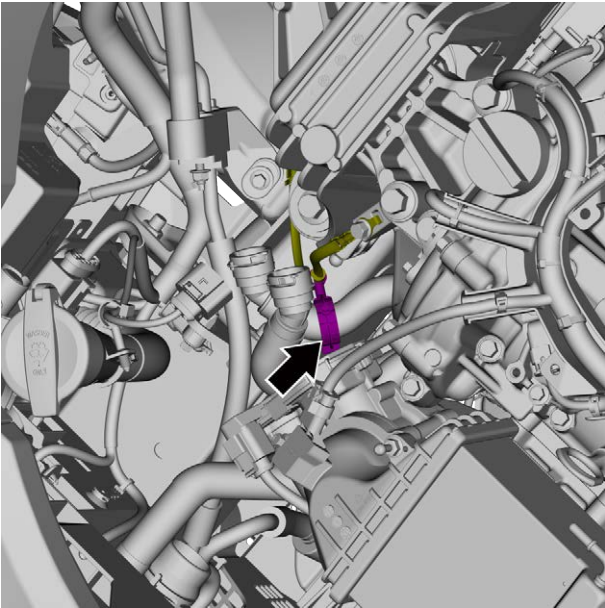
- 47 Remove the fixing clip 1 of the transmission oil cooler inlet pipe assembly.
- 48 Disconnect the exhaust gas circulation outlet pipe from the exhaust gas circulation cooler by removing the fixing clamp 2 of the exhaust gas circulation outlet pipe.



- 49 Disconnect the harness connector A of the heater harness.
- 50 Remove the fixing bolt 1 of the heater harness and set the heater harness aside.



- 51 Remove the two fixing bolts of the three-way solenoid valve (1) and set the three-way solenoid valve (1) aside.



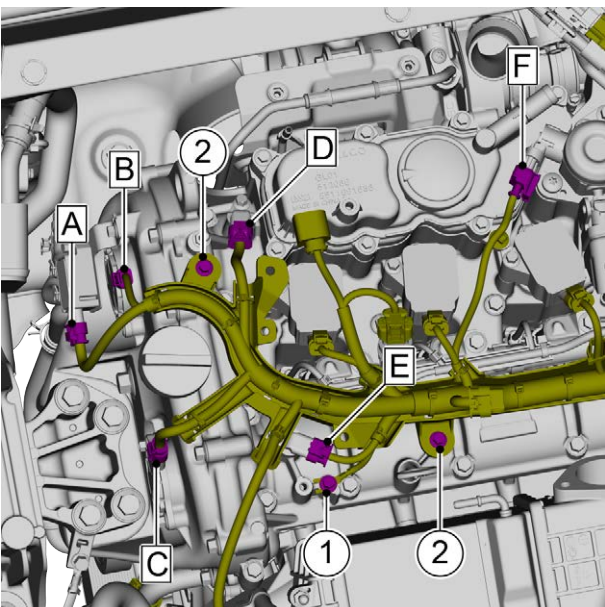
52 Disconnect the harness clip of the engine ground wire.



53 Disconnect the harness connector A of the intake pressure and temperature sensor (water-cooled intercooler subassembly).

54 Disconnect the harness connector B of the throttle unit.

55 Remove the harness clip 1 of the engine wiring harness.



56 Disconnect the harness connector A of the differential filter pressure sensor.

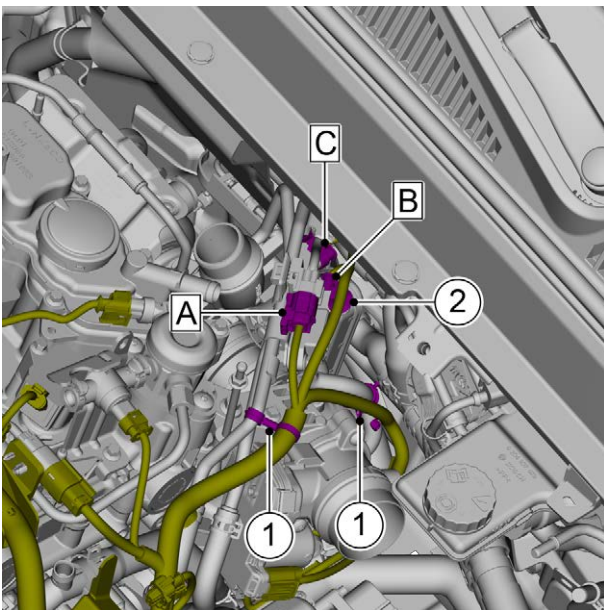
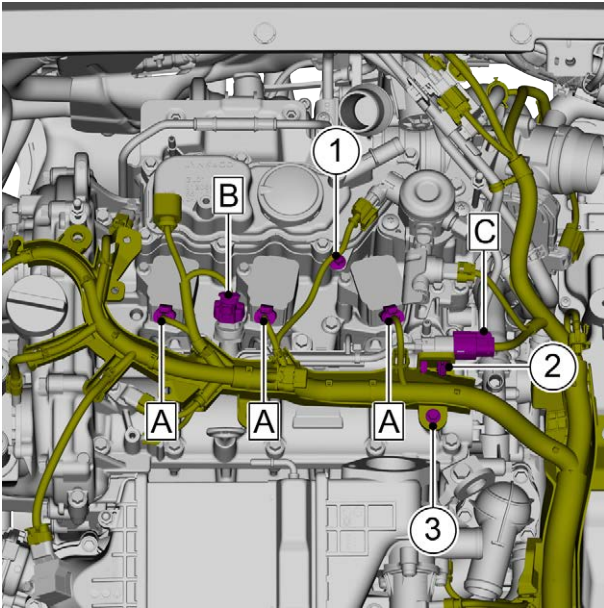
57 Disconnect the harness connector B of the VVT solenoid coil (exhaust side).

58 Disconnect the harness connector C of the VVT solenoid coil (intake side).

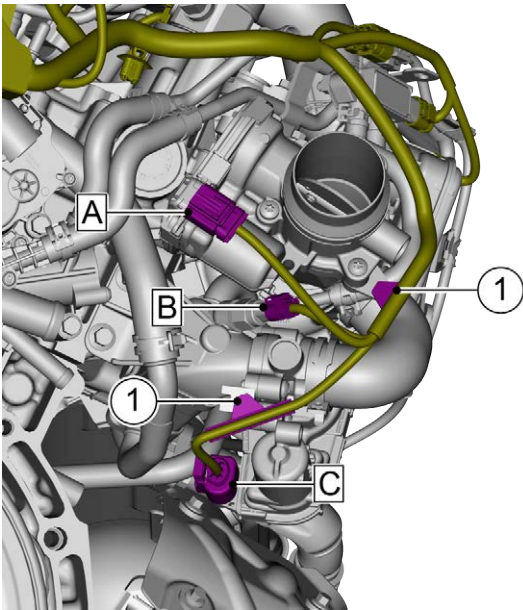
59 Disconnect the harness connector D of the exhaust camshaft position sensor.

60 Disconnect the harness connector E of the intake camshaft position sensor.

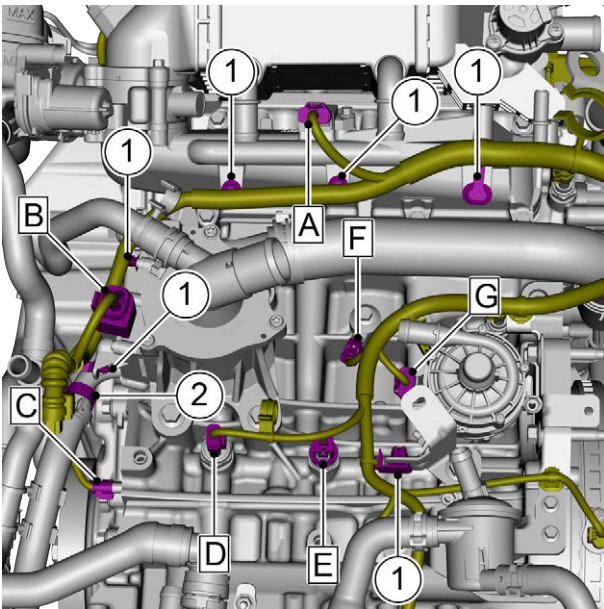
61 Disconnect the harness connector F of the high pressure fuel pump.



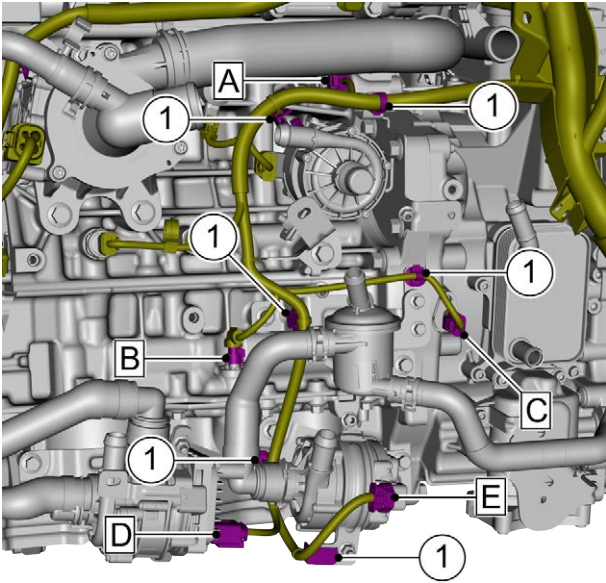
- 62 Remove the fixing bolt 1 of the engine wiring harness grounding.
- 63 Remove the two fixing bolts 2 of the engine wiring harness
- 64 Disconnect the harness connector A from the ignition coil.
- 65 Disconnect the harness connector B of the fuel pressure sensor.
- 66 Disconnect the harness connector C of the fuel rail injector subassembly.
- 67 Remove the harness clip 1 of the fuel rail injector subassembly.
- 68 Remove the fixing clip 2 of the engine harness.
- 69 Remove the fixing bolt 3 of the engine wiring harness.
- 70 Disconnect the two harness clips 1 from the engine wiring harness.
- 71 Remove the harness clip 2 of the engine wiring harness.
- 72 Disconnect the harness connector A of the Lambda probe (downstream oxygen sensor).
- 73 Disconnect the harness connector B of the EGR differential pressure sensor.
- 74 Disconnect the harness connector C of the turbocharger subassembly.



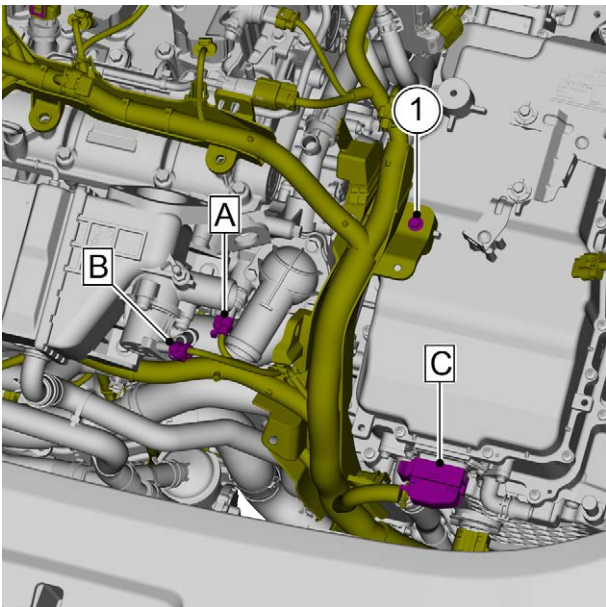
- 75 Remove the two harness clips 1 of the engine wiring harness.
- 76 Disconnect the harness connector A of the pressure regulating valve.
- 77 Disconnect the harness connector B of the EGR temperature sensor.
- 78 Disconnect the harness connector C of the EGR valve.



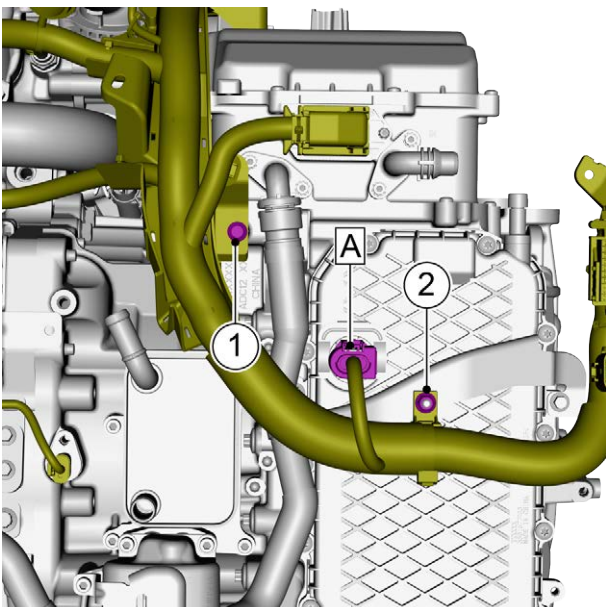
- 79 Remove the six harness clips 1 of the engine wiring harness.
- 80 Disconnect the harness clips 2 from the engine wiring harness.
- 81 Disconnect the harness connector A of the air pressure and temperature sensor 1.
- 82 Disconnect the harness connector B of the engine cooling pump.
- 83 Disconnect the harness connector C of the piston cooling solenoid.
- 84 Disconnect the harness connector D of the oil pressure sensor.
- 85 Disconnect the harness connector E of the oil pressure alarm.
- 86 Disconnect the harness connector F of the knock sensor.
- 87 Disconnect the harness connector G of the battery coolant pump.



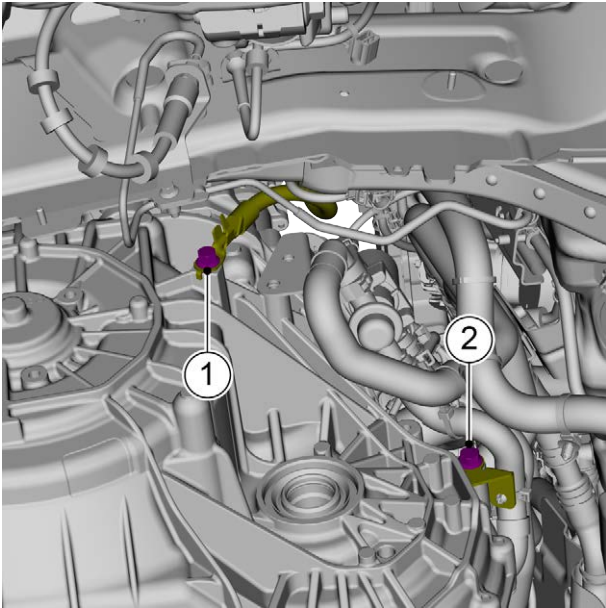
- 88 Remove the six fixing clips 1 of the engine wiring harness.
- 89 Disconnect the harness connector A of the air conditioning coolant temperature sensor (cylinder block).
- 90 Disconnect the harness connector B of the fuel pump.
- 91 Disconnect the harness connector C of the crankshaft position sensor.
- 92 Disconnect the harness connector D of the electronic powertrain coolant pump.
- 93 Disconnect the harness connector E of the electronic water pump (transmission).



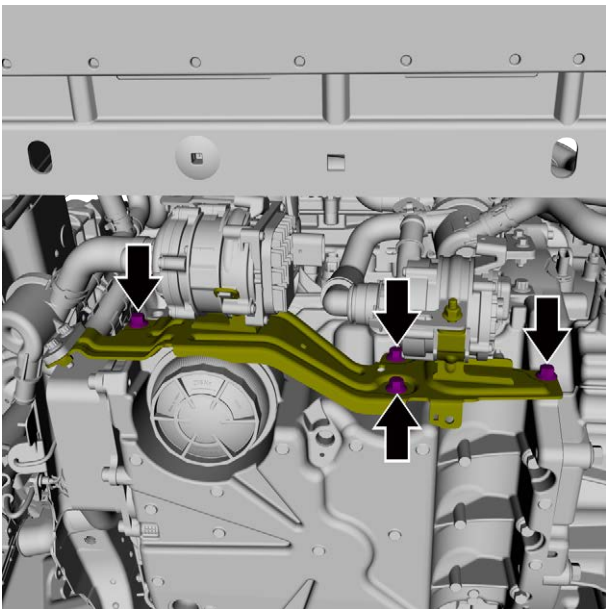
- 94 Remove the fixing bolt 1 of the engine wiring harness.
- 95 Disconnect the harness connector A of the air conditioning coolant temperature sensor (cylinder head).
- 96 Disconnect the harness connector B of the electric motor coolant valve.
- 97 Disconnect the harness connector C of the power control module.



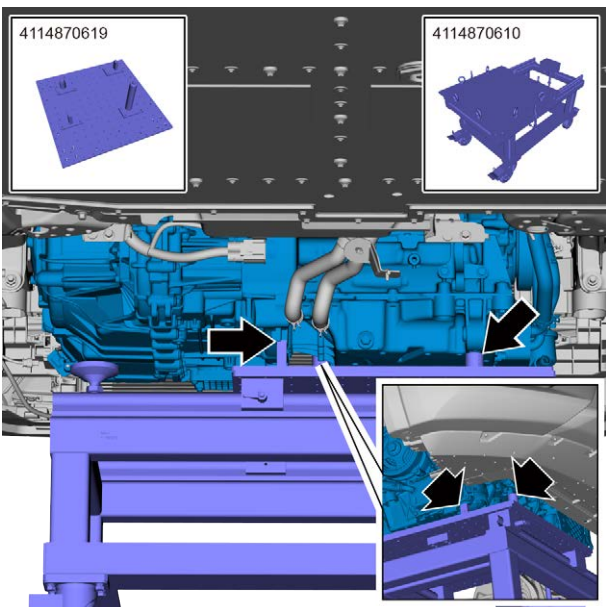
- 98 Remove the fixing bolt 1 of the engine wiring harness.
- 99 Remove the fixing nuts 2 of the engine harness.
- 100 Disconnect the harness connector A of the hybrid special transmission assembly.
- 101 Set the engine harness aside.



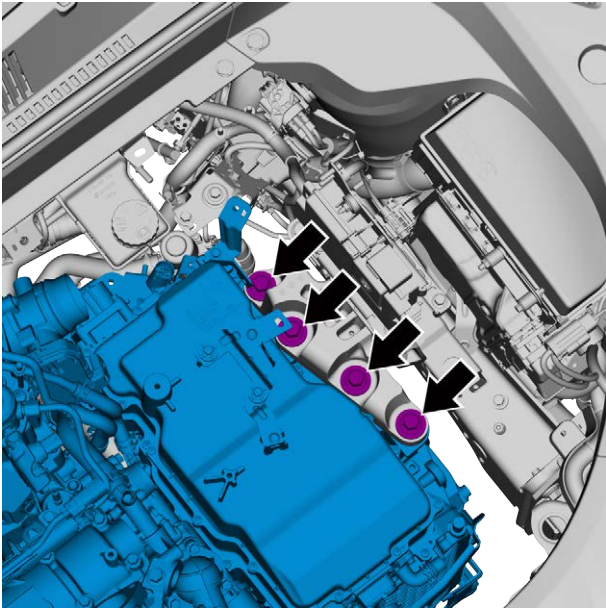
- 102 Remove the fixing bolt 1 of the transmission grounding harness.
- 103 Remove the fixing bolt 2 of the harness bracket.



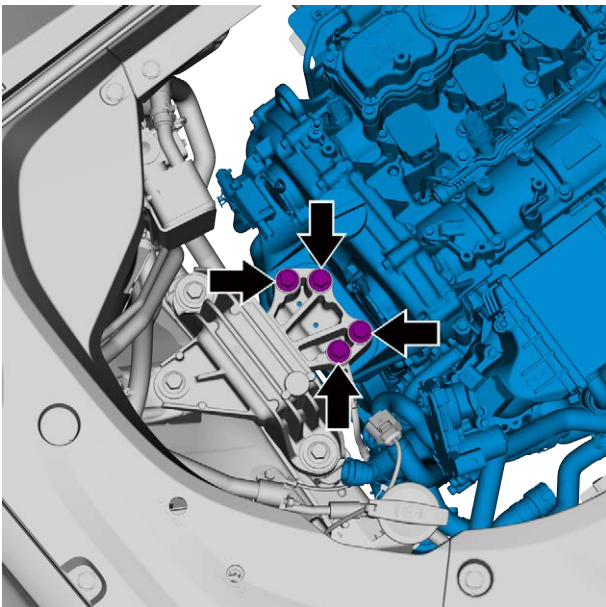
- 104 Remove the four fixing bolts of the water pump bracket subassembly.



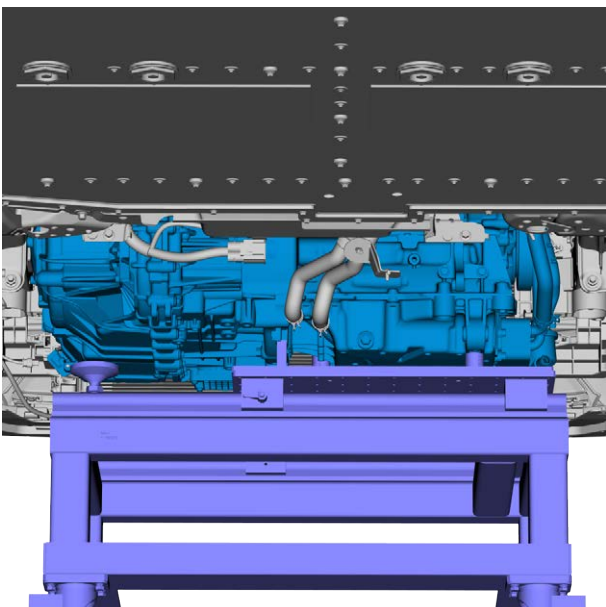
- 105 Take a special tool to support the powertrain.
Powertrain Positioning and Placement Bracket:
4114870610
Engine Pillar: 4114870619



- 106 Remove the four fixing bolts connecting the left engine vibration isolation pad assembly to the hybrid special transmission assembly.



- 107 Remove the four fixing bolts connecting the right engine vibration isolation pad assembly to the gasoline engine assembly.



- 108 Slowly raise the lift and tow out the powertrain positioning bracket.

Caution

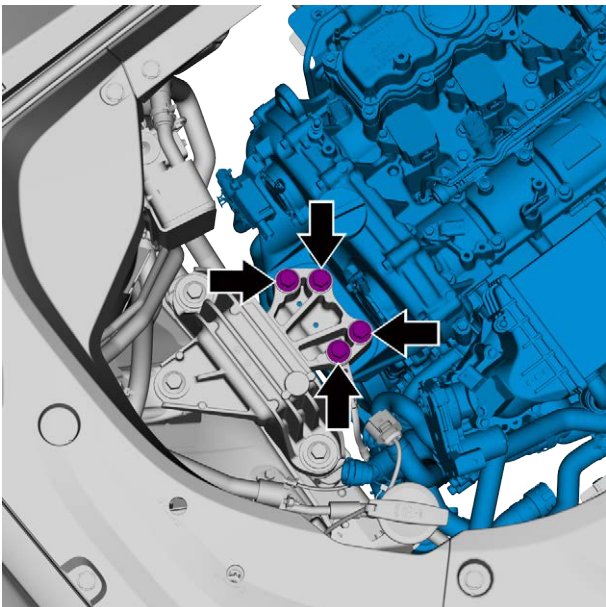
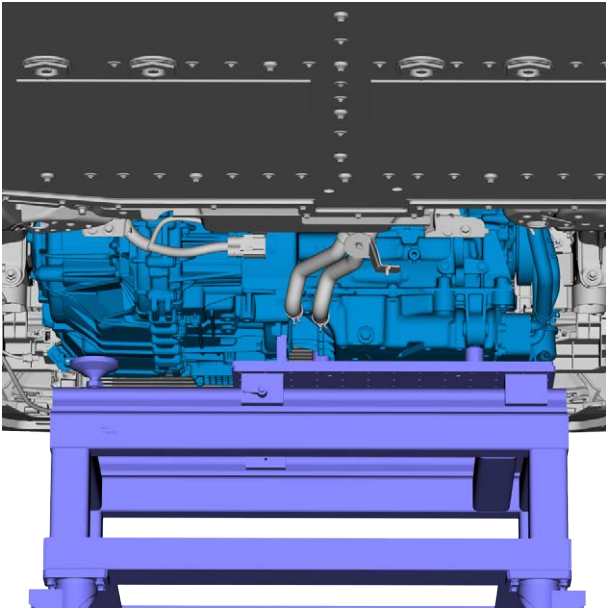
Perform the operation with the assistance of multiple service technicians.

Installation Procedure

- 1 Operate the powertrain positioning and placement bracket to place the powertrain in the mounting position and slowly lower the lift.

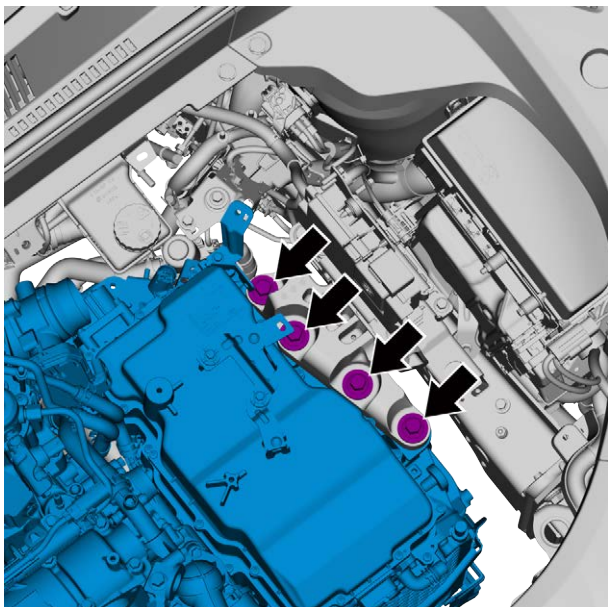
Caution

Perform the operation with the assistance of multiple service technicians.



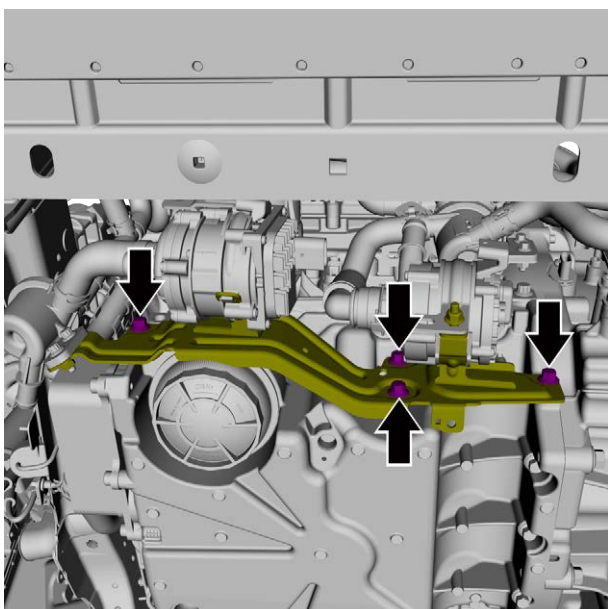
- 2 Install and tighten the four fixing bolts connecting the right engine vibration isolation pad assembly to the gasoline engine assembly.

Torque: 90+120° N·m



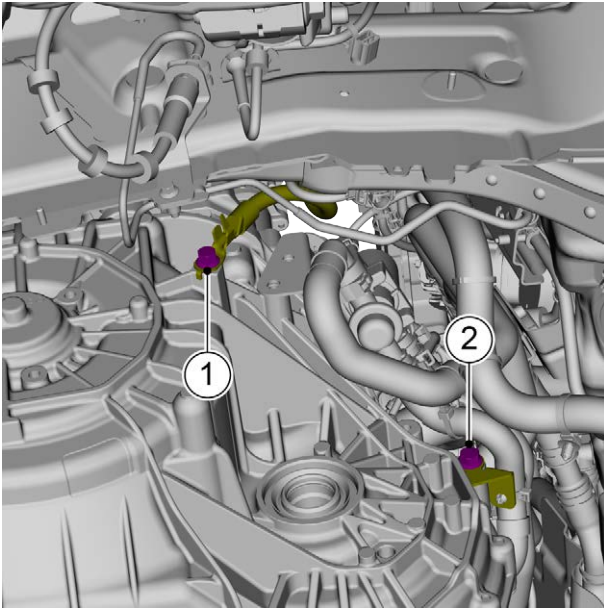
- 3 Install and tighten the four fixing bolts connecting the left engine vibration isolation pad assembly to the hybrid specialized transmission assembly.

Torque: 110 N·m

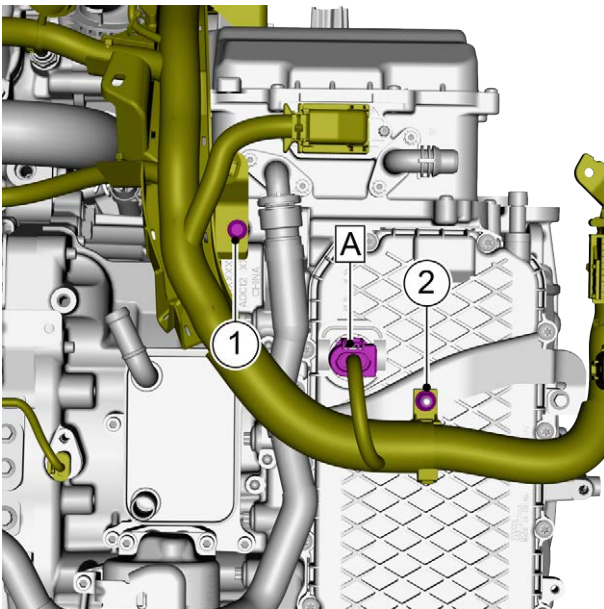


- 4 Remove the powertrain positioning bracket.
- 5 Install and tighten the four fixing bolts of the water pump bracket subassembly.

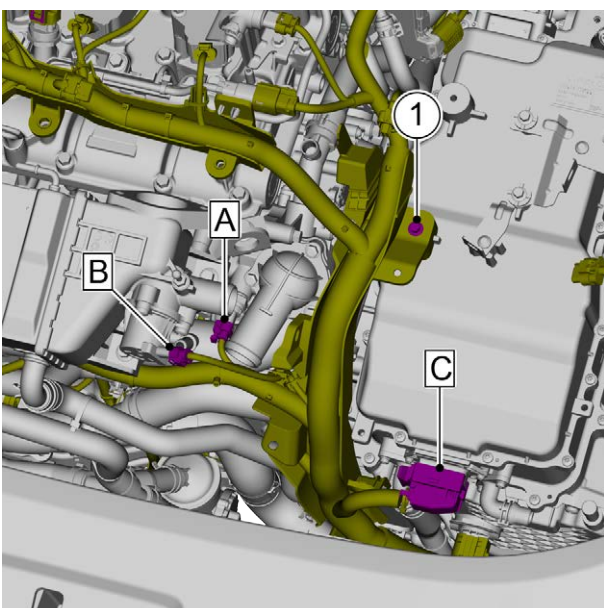
Torque: 24N·m



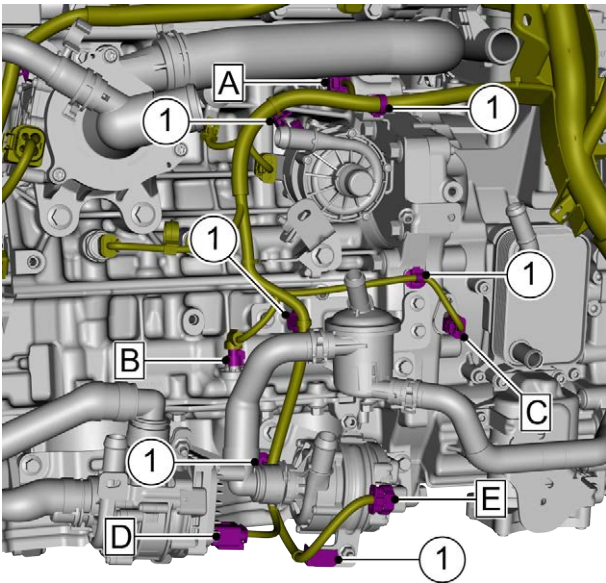
- 6 Install and tighten the fixing bolt 2 of the harness bracket.
Torque: 24N·m
- 7 Install and tighten the fixing bolt 1 of the transmission grounding harness.
Torque: 24N·m



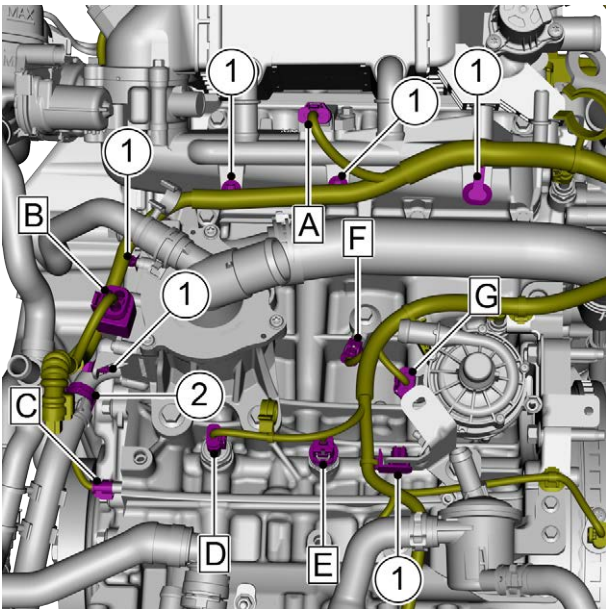
- 8 Install the engine wiring harness.
- 9 Connect the harness connector A of the hybrid specialized transmission assembly.
- 10 Install and tighten the fixing nut 2 of the engine wiring harness.
Torque: 10N·m
- 11 Install and tighten the engine harness fixing bolts 1.
Torque: 10N·m



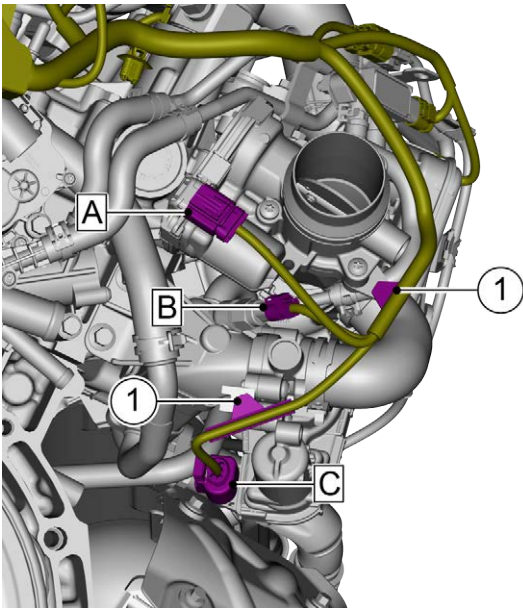
- 12 Connect the harness connector C of the power control module.
- 13 Connect the harness connector B of the electric motor coolant valve.
- 14 Connect the harness connector A of the air conditioning coolant temperature sensor (cylinder head).
- 15 Install and tighten the engine harness fixing bolts 1.
Torque: 10N·m



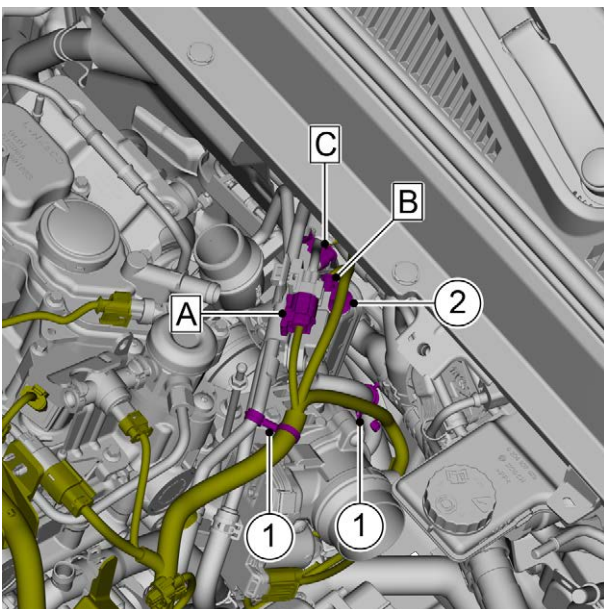
- 16 Connect the harness connector E of the electronic water pump (transmission).
- 17 Connect the harness connector D of the electronic powertrain coolant pump.
- 18 Connect the harness connector C of the crankshaft position sensor.
- 19 Connect the harness connector B of the fuel pump.
- 20 Connect the harness connector A of the air conditioning coolant temperature sensor (cylinder block).
- 21 Install and tighten the six fixing clips 1 of the engine wiring harness.



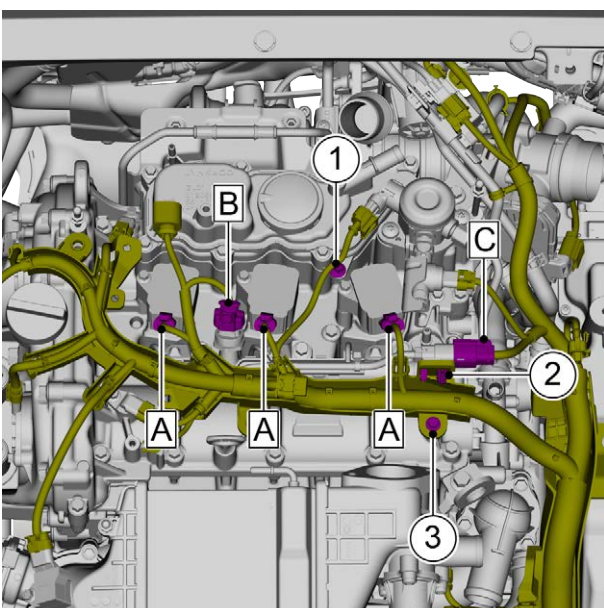
- 22 Connect the harness connector G of the battery coolant pump.
- 23 Connect the harness connector F of the knock sensor.
- 24 Connect the harness connector E of the oil pressure alarm.
- 25 Connect the harness connector D of the oil pressure sensor.
- 26 Connect the harness connector C of the piston cooling solenoid.
- 27 Connect the harness connector B of the engine cooling pump.
- 28 Harness connector A of air pressure and temperature sensor 1.
- 29 Install the harness clip 2 of the engine harness.
- 30 Install the six harness clip 1 of the engine harness.



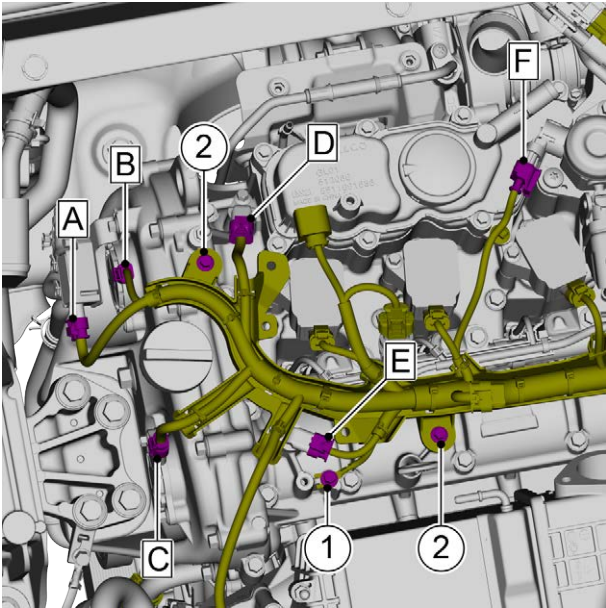
- 31 Connect the harness connector C of the EGR valve.
- 32 Connect the harness connector B of the EGR temperature sensor.
- 33 Connect the harness connector A of the pressure regulating valve.
- 34 Install the two harness clip 1 of the engine harness.



- 35 Connect the harness connector C of the turbocharger subassembly.
- 36 Connect the harness connector B of the EGR differential pressure sensor.
- 37 Connect the harness connector A of the Lambda probe (downstream oxygen sensor).
- 38 Install the harness clip 2 of the engine harness.
- 39 Install the two harness clip 1 of the engine harness.

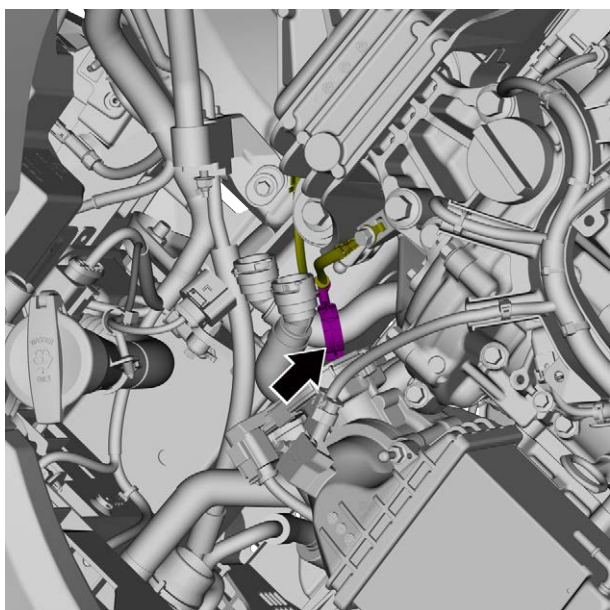


- 40 Install and tighten the engine harness fixing bolts 3. Torque: 10N·m
- 41 Install the engine harness fixing clip 2.
- 42 Install the harness clip 1 of the fuel rail injector subassembly.
- 43 Connect the harness connector C of the fuel rail injector subassembly.
- 44 Connect the harness connector B of the fuel pressure sensor.
- 45 Connect the ignition coil harness connector A.

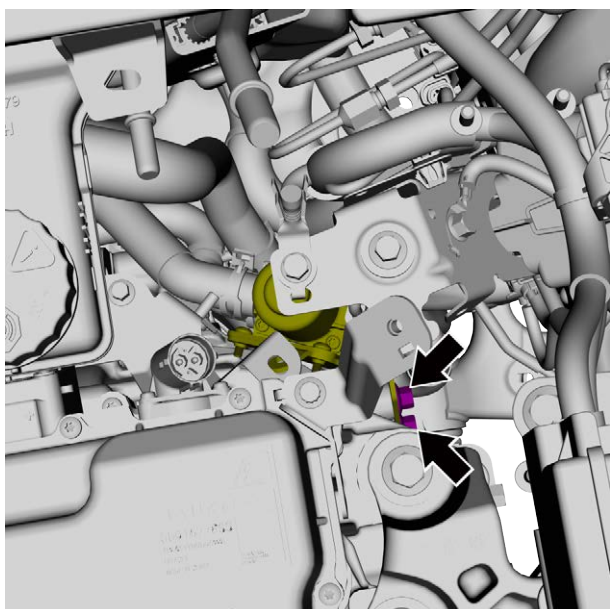


- 46 Install and tighten the two fixing bolts 2 of the engine harness.
Torque: 10N·m
- 47 Install and tighten the fixing bolt 1 of the engine harness grounding.
Torque: 10N·m
- 48 Connect the harness connector F of the high pressure fuel pump.
- 49 Connect the harness connector E of the intake camshaft position sensor.
- 50 Connect the harness connector D of the exhaust camshaft position sensor.
- 51 Connect the harness connector C of the VVT solenoid coil (intake side).
- 52 Connect the harness connector B of the VVT solenoid coil (exhaust side).
- 53 Connect the harness connector A of the differential filter pressure sensor.
- 54 Install the harness clip 1 of the engine harness.
- 55 Connect the harness connector B of the throttle unit.
- 56 Connect the harness connector A of the intake pressure and temperature sensor (water cooled intercooler subassembly).





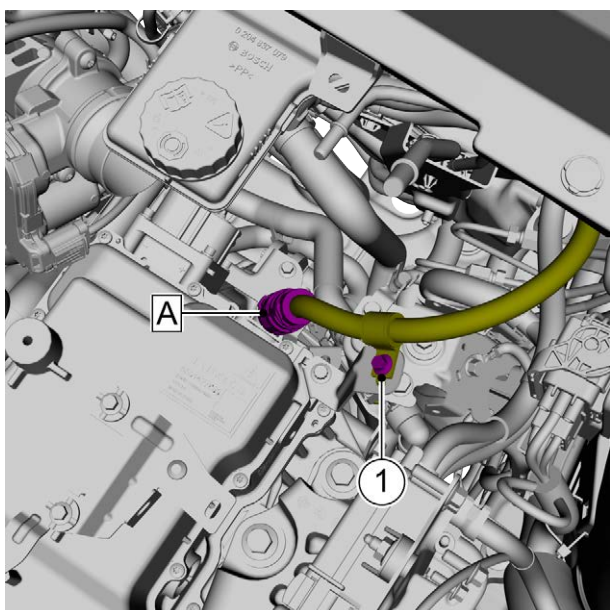
57 Install the harness clip of the engine grounding wire.



58 Install the three-way solenoid valve (1).

59 Install and tighten the two fixing bolts of the three-way solenoid valve (1).

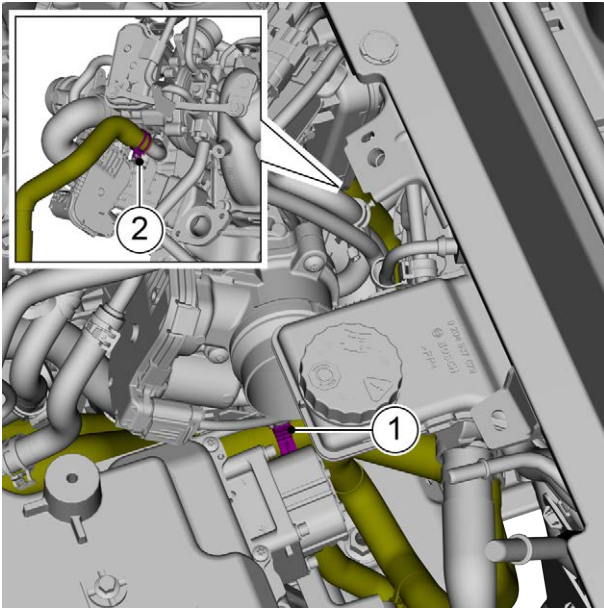
Torque: 24N·m



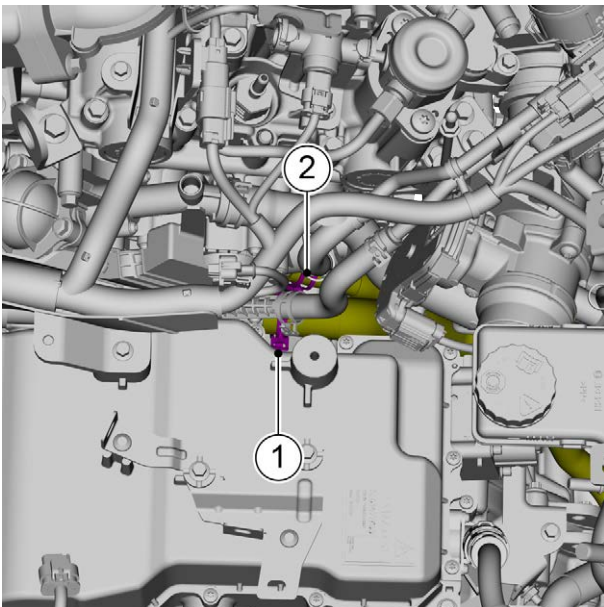
60 Install the heater harness.

61 Install and tighten the fixing bolt 1 of the heater harness.

62 Connect the harness connector A of the heater harness.

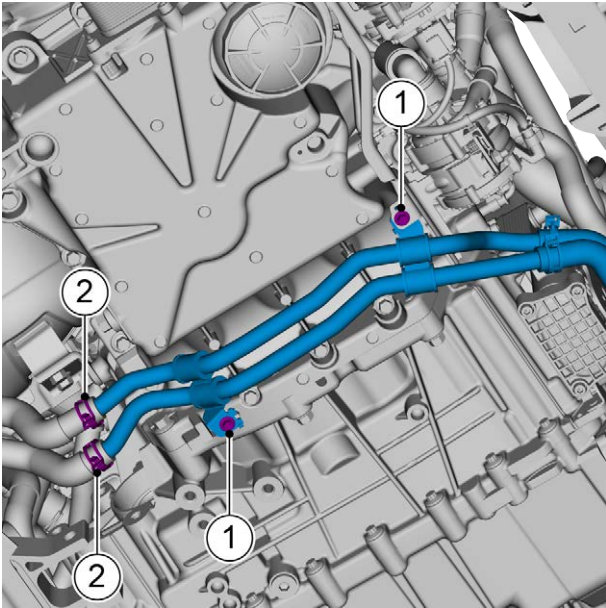


- 63 Connect the exhaust gas circulation outlet pipe to the exhaust gas circulation cooler and install the fixing clamp 2 of the exhaust gas circulation outlet pipe.
- 64 Install the fixing clip 1 of the transmission oil cooler inlet pipe assembly.

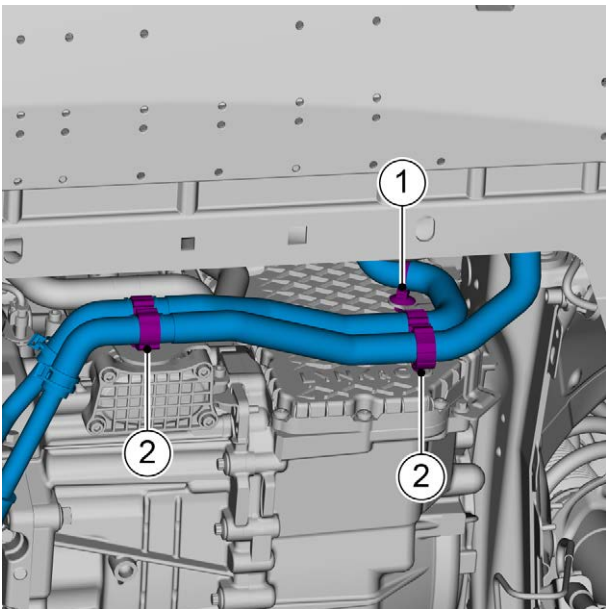


- 65 Connect the thermostat outlet pipe to the thermostat housing subassembly and install the fixing clamp 2 of the thermostat outlet pipe.
- 66 Connect the transmission oil cooler inlet pipe assembly to the thermostat housing subassembly and install the fixing clamp 1 of the transmission oil cooler inlet pipe assembly.

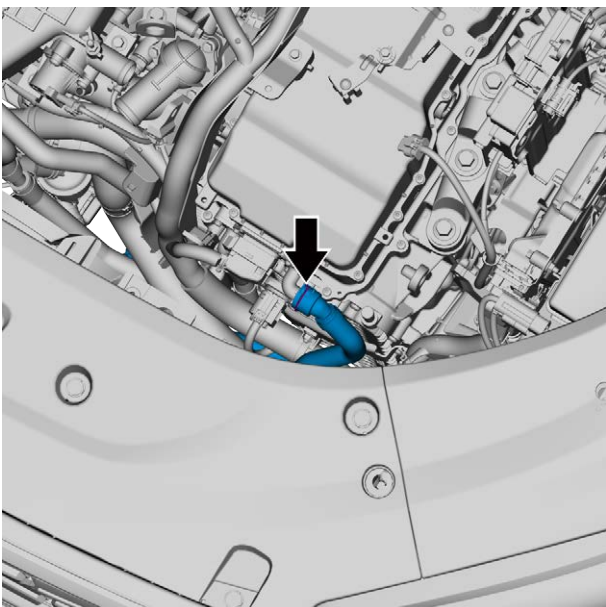
- 67 Install the A/C compressor module.



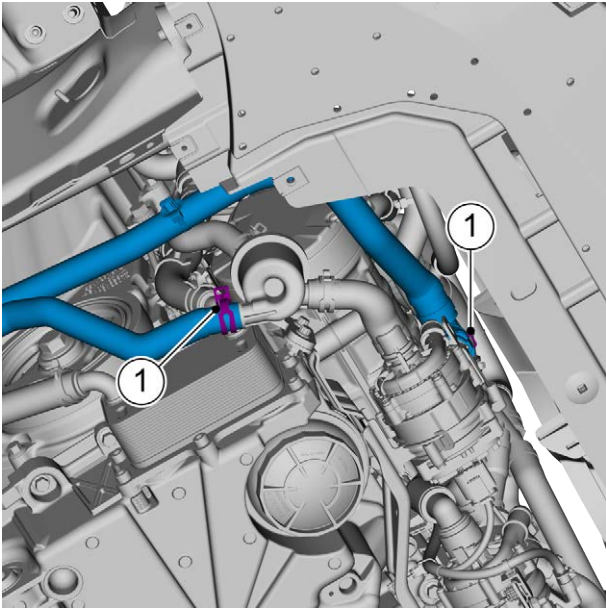
- 68 Connect the coolant inlet and outlet metal pipe to the front connection pipe of the lower floor inlet and outlet pipe, and install the two fixing clamps 2 of the coolant inlet and outlet metal pipe.
- 69 Install and tighten the two fixing bolts 1 of the coolant inlet and outlet metal pipe.
Torque: 10 N·m



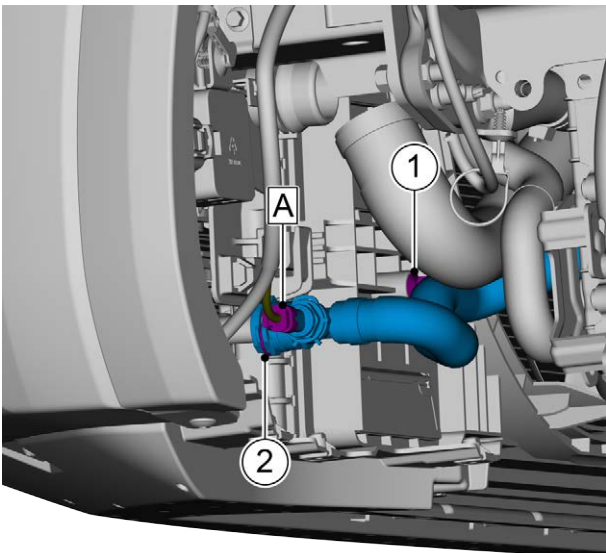
- 70 Install the two fixing clips 2 of the transmission inlet pipe and the low temperature radiator outlet pipe.
- 71 Install the fixing clip 1 of the transmission water inlet pipe.



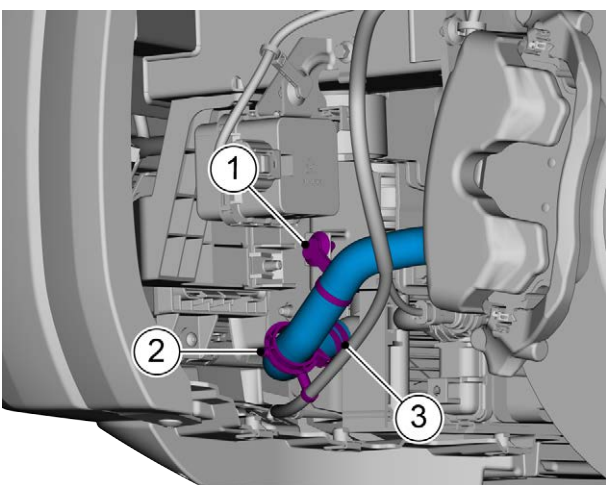
- 72 Connect the transmission inlet pipe to the power control module and install the quick-insert circlip of the transmission inlet pipe.



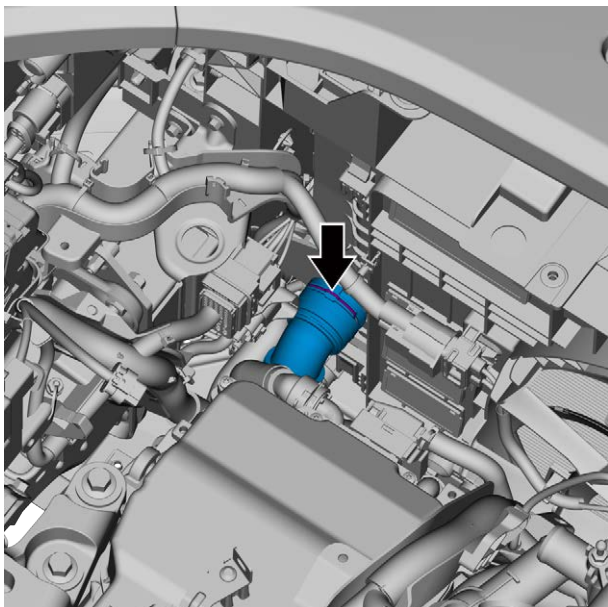
- 73 Connect the battery water pump outlet pipe to the electronic powertrain coolant pump, and install the quick-insert circlip 2 of the battery water pump outlet pipe.
- 74 Connect the battery outlet pipe to the battery water pump inlet pipe and install the fixing clamp 1 of the battery outlet pipe.



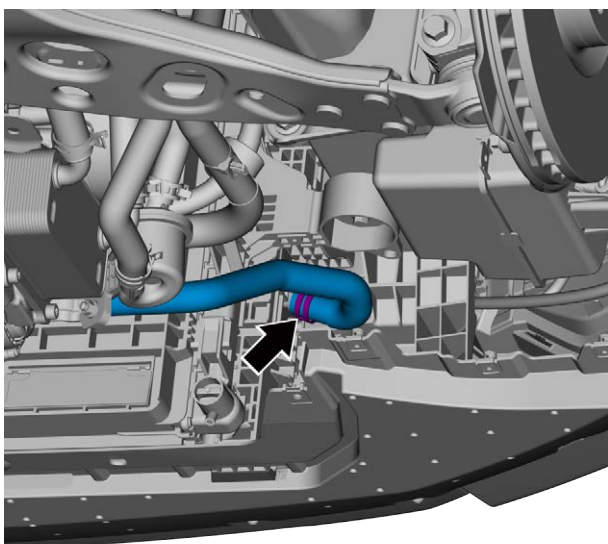
- 75 Connect the radiator outlet pipe (2) to the low-temperature radiator, and install the quick-insert circlip 2 of the radiator outlet pipe (2).
- 76 Install the fixing clips 1 of the radiator outlet pipe (2).
- 77 Connect the harness connector A of the radiator outlet pipe (2).



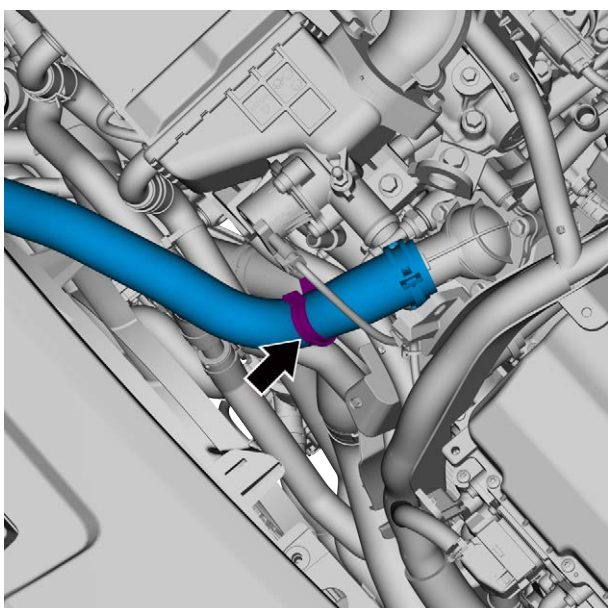
- 78 Connect the warm radiator outlet pipe to the low-temperature radiator, and install the fixing clamp 3 of the low-temperature radiator outlet pipe.
- 79 Install the harness clip 2 for the front compartment harness.
- 80 Install the fixing clip 1 of the low temperature radiator outlet pipe.



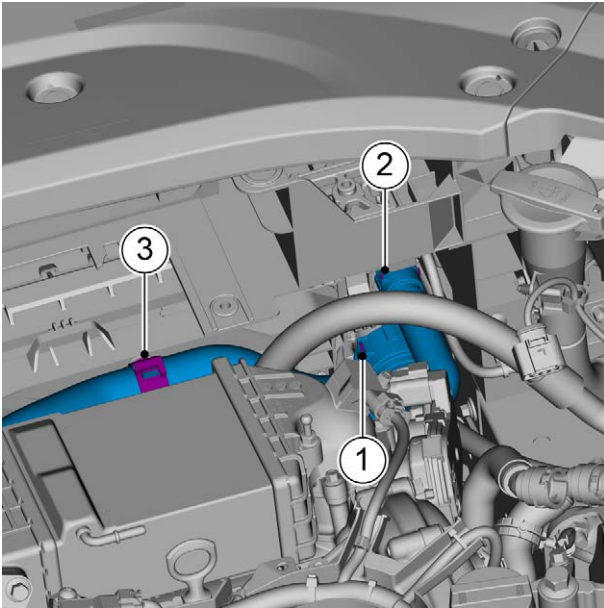
- 81 Connect the radiator outlet pipe to the radiator and install the quick-insertion circlip of the radiator outlet pipe.



- 82 Connect the drive motor radiator inlet pipe to the low-temperature radiator, and install the fixing clamp of the drive motor radiator inlet pipe.



- 83 Install the harness clip of the engine harness.



- 84 Install the fixing clip 3 of the radiator inlet pipe.
- 85 Connect the radiator inlet pipe (2) to the radiator and install the quick-insert circlip 2 of the radiator inlet pipe (2).
- 86 Connect the radiator inlet pipe to the radiator and install the quick-insertion circlip 1 of the radiator inlet pipe.

- 87 Install the lower U-shaped beam of the front suspension.
- 88 Install the front right constant velocity drive shaft.
- 89 Install the front left constant velocity drive shaft.
- 90 Install the rear right suspension vibration isolation pad.
- 91 Install the rear left suspension vibration isolation pad.
- 92 Install the front left and right wheel cover front fenders.
- 93 Install the DC bus assembly.
- 94 Install the fuel pressure sensor on low pressure side.
- 95 Install a resonator.
- 96 Install the low temperature radiator expansion kettle.
- 97 Install the degassing hose.
- 98 Install the resonator assembly.
- 99 Install the air filter intake pipe assembly.
- 100 Install the air filter assembly.
- 101 Install the GPF rear catalytic converter.
- 102 Install the exhaust pipe muffler assembly.
- 103 Fill with the electric system coolant.
- 104 Fill with the engine coolant.
- 105 Fill with the air conditioning refrigerant.
- 106 Install the engine trim cover assembly.
- 107 Carry out the normal power-on process of the high voltage system, see [Normal Power-on Process of High Voltage System](#).

- 108 Connect the battery cables, start the vehicle to connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the liquid level of the expansion kettle. If the liquid level drops, replenish coolant in a timely manner. Until the main circulation is open, replenish coolant to the expansion kettle on the scribe line, and tighten the lid of the expansion kettle.
- 109 Use the GLDS diagnostic program. On the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software flash operation.
- 110 Close the engine compartment cover.

2.5.7.11 Replacement of Intake and Exhaust Camshaft

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

Warning !

See "WARNING ABOUT COOLING SYSTEM MAINTENANCE" in "[WARNINGS AND PRECAUTIONS](#)".

Warning !

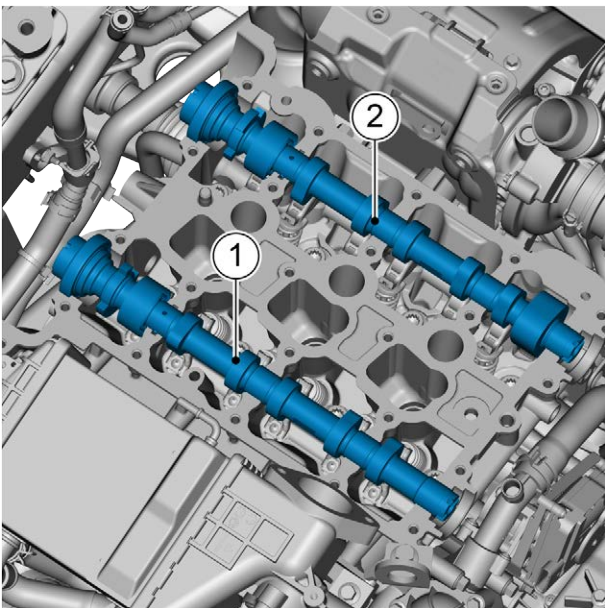
See "WARNINGS ABOUT RELEASING FUEL PRESSURE" in "[WARNING AND PRECAUTION](#)".

- 1 Open the engine compartment hood.
- 2 Release the fuel pressure, see [Fuel Pressure Release Procedure](#).
- 3 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 4 Drain the engine coolant, see [Draining and Filling of Engine Coolant](#).
- 5 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 6 Remove the resonator, see [Replacement of Resonator](#).
- 7 Remove the resonator assembly, see [Replacement of Resonator Assembly](#).
- 8 Remove the turbocharger water pipe subassembly, see [Replacement of Turbocharger Water Pipe Subassembly](#).

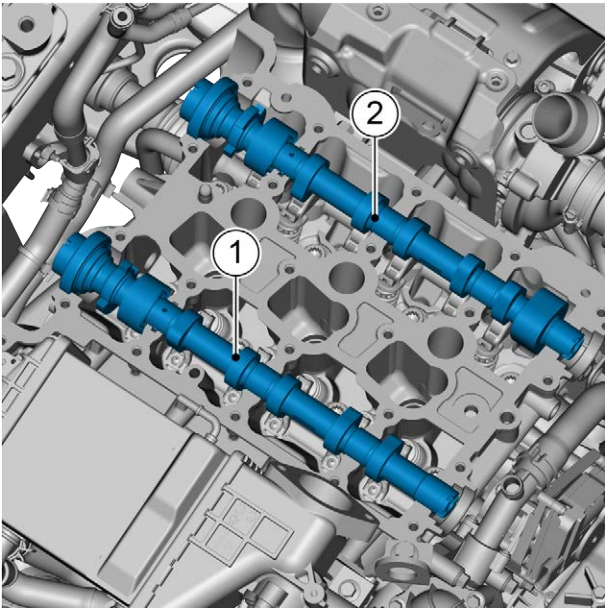
- 9 Remove the intake tube, see [Replacement of Intake Tube](#).
- 10 Remove the oil-air separator subassembly, see [Replacement of Oil-Air Separator Subassembly](#).
- 11 Remove the high pressure fuel pump, see [Replacement of High Pressure Fuel Pump](#).
- 12 Remove the fuel pressure sensor on low pressure side, see [Replacement of Fuel Pressure Sensore on Low Pressure Side](#).
- 13 Remove the high pressure fuel tube, see [Replacement of High Pressure Fule Tube](#).
- 14 Remove the ignition coil. See [Replacement of Ignition Coil](#).
- 15 Remove the spark plug, see [Replacement of Spark Plug](#).
- 16 Remove the fuel rail injector subassembly, see [Replacement of Fuel Rail Injector Subassembly](#).
- 17 Remove the exhaust camshaft position sensor, see [Replacement of Exhaust Camshaft Position Sensor](#).
- 18 Remove the intake camshaft position sensor, see [Replacement of Intake Camshaft Position Sensor](#).
- 19 Take a jack to slightly lift the engine assembly.
- 20 Remove the timing belt guard, see [Replacement of Timing Belt Guard](#).
- 21 Remove the intake/exhaust VVT, see [Replacement of Intake/Exhaust VVT](#).
- 22 Remove the intake camshaft 1 and the exhaust camshaft 2.

Caution

Mark when removing to distinguish when installing.



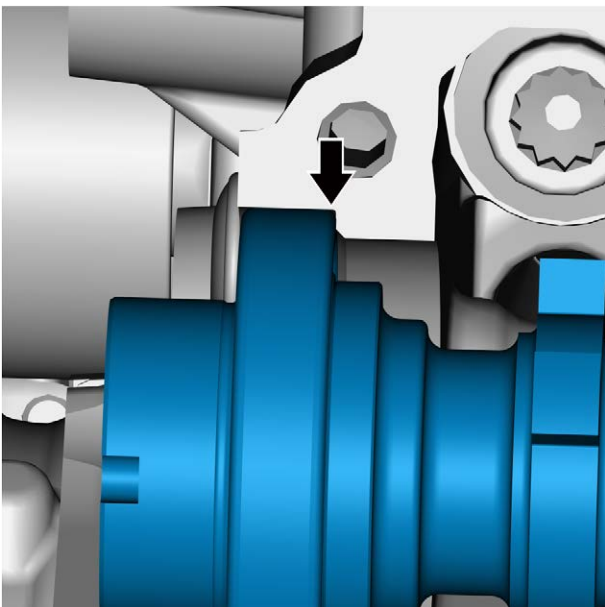
Installation Procedure



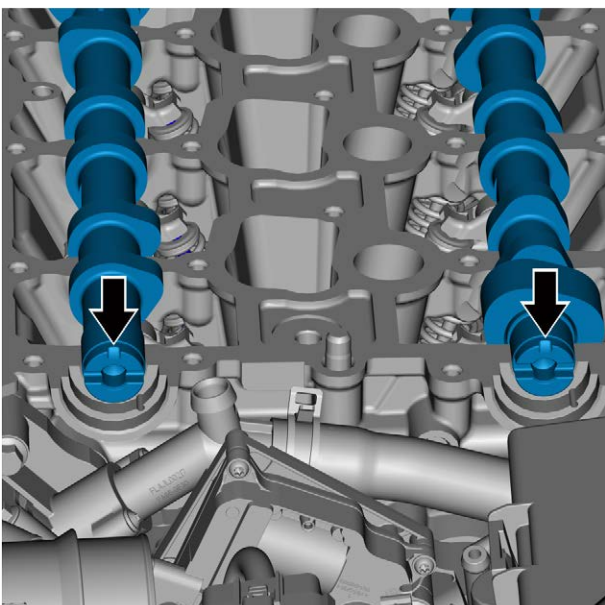
- 1 Install the intake camshaft 1 and the exhaust camshaft 2.

Caution

After assembling the camshaft, it is necessary to apply 1 to 2 drops of engine oil to all cam journals (except ball bearings) and cams.



- 2 When assembling, install the camshaft bearing into the mounting groove on the cylinder head, and make sure that the bearing is tightly affixed to the positioning end face of the cylinder head.



- 3 During assembly, the rear grooves of the two camshaft shafts need to be horizontal and the notch should be facing upwards.

- 4 Install the intake and exhaust VVTs.
- 5 Perform [Timing Calibration](#).
- 6 Install the timing belt guard.
- 7 Remove the jack.
- 8 Install the intake camshaft position sensor.
- 9 Install the exhaust camshaft position sensor.
- 10 Install the fuel rail injector subassembly.
- 11 Install spark plugs.
- 12 Installation of ignition coil.
- 13 Install the high pressure fuel tube.
- 14 Install the fuel pressure sensor on low pressure side.
- 15 Install the high pressure fuel pump.
- 16 Install the oil-air separator subassembly.
- 17 Install the turbocharger heat shield.
- 18 Install the turbocharger subassembly.
- 19 Install the GPF rear catalytic converter.
- 20 Install the intake tube.
- 21 Install the turbocharger water pipe subassembly.
- 22 Install the resonator assembly.
- 23 Install a resonator.
- 24 Install the engine trim cover assembly.
- 25 Fill with the engine coolant.
- 26 Connect the negative cable of the battery, start the vehicle and connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle level. If there is a drop in the level, replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the upper scribe line of the expansion kettle, and tighten the lid of the expansion kettle.
- 27 Install the engine compartment cover.

2.5.7.12 Removal of Camshaft Bearing Cover

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

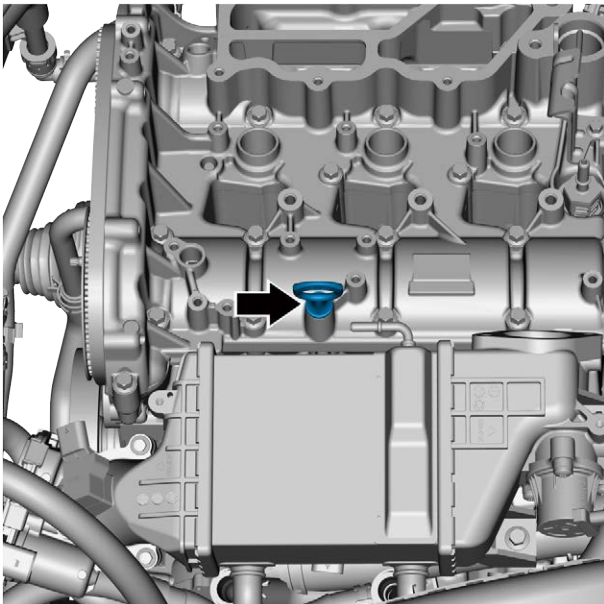
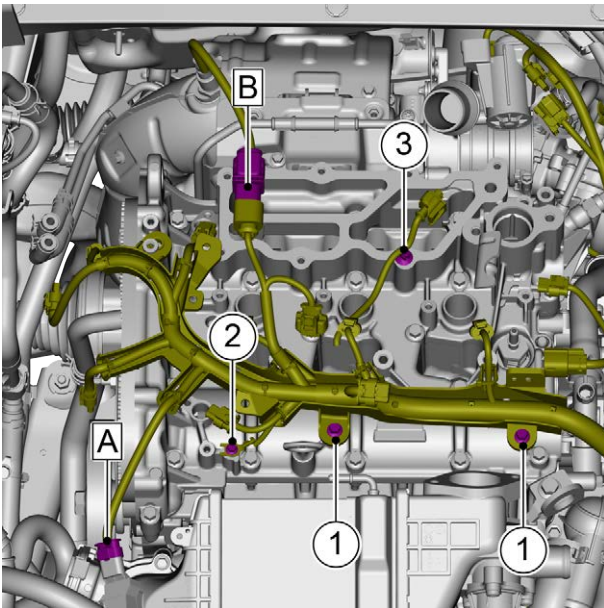
Warning !

See "WARNING ABOUT COOLING SYSTEM MAINTENANCE" in "[WARNINGS AND PRECAUTIONS](#)".

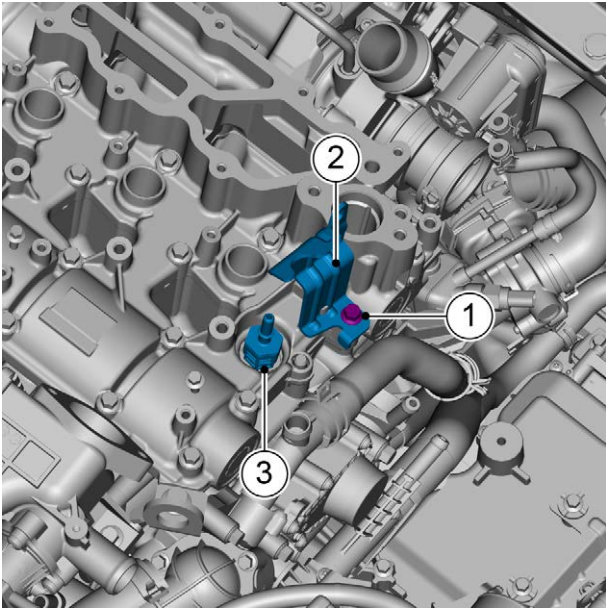
Warning !

See "WARNINGS ABOUT RELEASING FUEL PRESSURE" in "[WARNING AND PRECAUTION](#)".

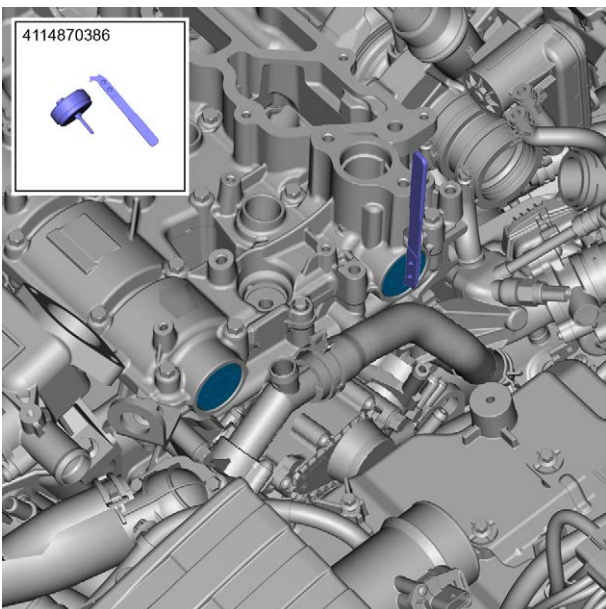
- 1 Open the engine compartment hood.
- 2 Release the fuel pressure, see [Fuel Pressure Release Procedure](#).
- 3 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 4 Drain the engine coolant, see [Draining and Filling of Engine Coolant](#).
- 5 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 6 Remove the resonator, see [Replacement of Resonator](#).
- 7 Remove the resonator assembly, see [Replacement of Resonator Assembly](#).
- 8 Remove the heat shield, see [Replacement of Heat Shield](#).
- 9 Remove the turbocharger water pipe subassembly, see [Replacement of Turbocharger Water Pipe Subassembly](#).
- 10 Remove the oil-air separator subassembly, see [Replacement of Oil-Air Separator Subassembly](#).
- 11 Remove the high pressure fuel pump, see [Replacement of High Pressure Fuel Pump](#).
- 12 Remove the fuel pump tappet, see [Replacement of Fuel Pump Tappet](#).
- 13 Remove the fuel pressure sensor on low pressure side, see [Replacement of Fuel Pressure Sensore on Low Pressure Side](#).
- 14 Remove the high pressure fuel tube, see [Replacement of High Pressure Fule Tube](#).
- 15 Remove the ignition coil. See [Replacement of Ignition Coil](#).
- 16 Remove the spark plug, see [Replacement of Spark Plug](#).



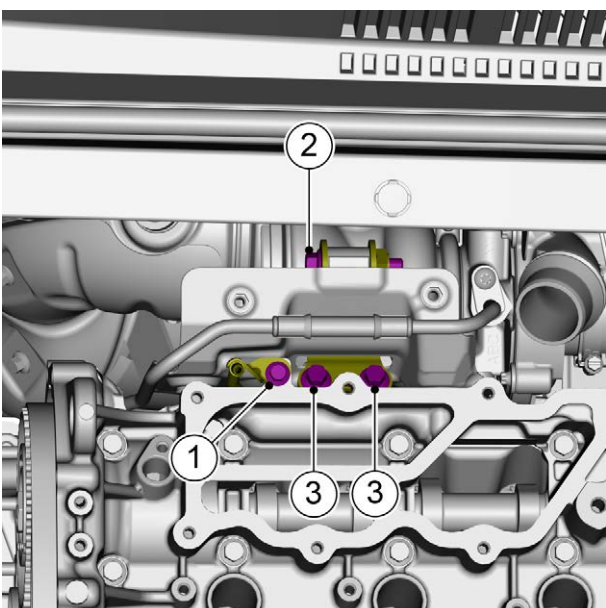
- 17 Remove the fuel rail injector subassembly, see [Replacement of Fuel Rail Injector Subassembly](#).
- 18 Remove the exhaust camshaft position sensor, see [Replacement of Exhaust Camshaft Position Sensor](#).
- 19 Remove the intake camshaft position sensor, see [Replacement of Intake Camshaft Position Sensor](#).
- 20 Take a jack to slightly lift the engine assembly.
- 21 Remove the timing belt guard, see [Replacement of Timing Belt Guard](#).
- 22 Remove the two fixing bolts 1 of the engine wiring harness
- 23 Remove the fixing bolt 2 of the engine wiring harness grounding.
- 24 Remove the fixing clip 3 of the engine harness.
- 25 Disconnect the harness connector A of the intake pressure and temperature sensor (water-cooled intercooler subassembly).
- 26 Disconnect the harness connector B of the Lambda probe (upstream oxygen sensor).
- 27 Set the engine harness aside.
- 28 Remove the oil dipstick.



- 29 Remove the fixing bolt 2 of the fuel pipe bracket and take off the fuel pipe bracket 2.
- 30 Remove the vent valve 3.



- 31 Remove the camshaft plug cover with a special tool.
Special tool: 4114870386

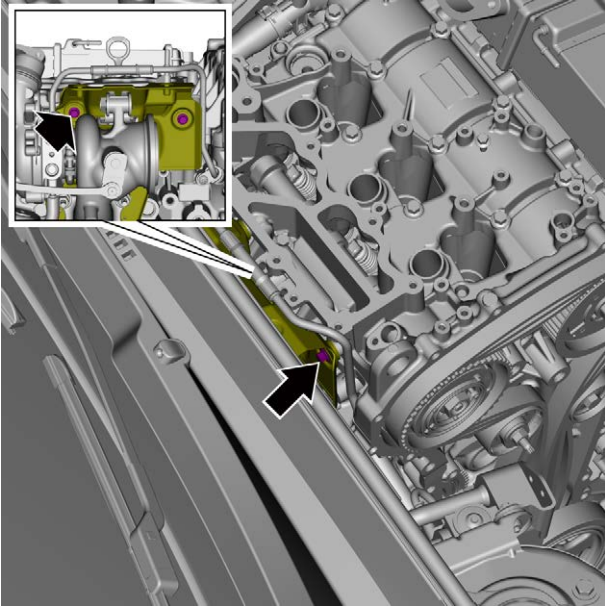


- 32 Remove the fixing bolt 1 of the engine degassing hose and set the engine degassing hose aside.
- 33 Remove the fixing bolts 2 of the turbocharger subassembly.

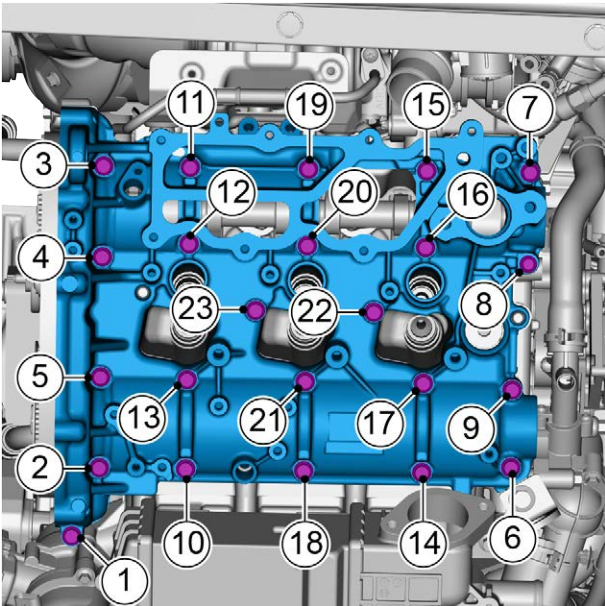
Caution

Before disassembling this bolt, spray the exposed threaded portion with thread loosening agent, it is recommended to use WD-40 universal lubricating rust remover, or apply lubricant to prevent disassembly. If the bolt breaks, the bracket will need to be replaced.

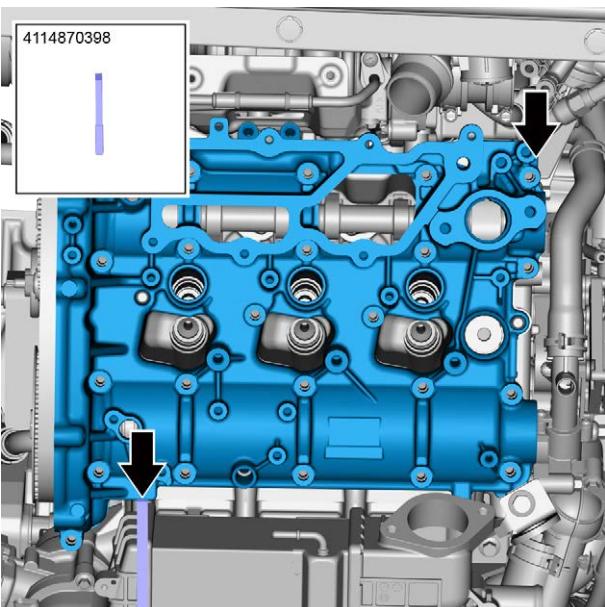
- 34 Remove the two fixing bolts 3 of the turbocharger bracket and set the turbocharger bracket aside.



- 35 Remove the two fixing bolts of the turbocharger heat shield and set the turbocharger heat shield aside.



- 36 Remove the twenty-three fixing bolts of the camshaft bearing cover in the order shown.



- 37 Pry off the camshaft bearing cover with a special tool.
Special tool: 4114870398

Installation Procedure

- 1 Clean the camshaft bearing cover mounting joint surface and apply sealant to the camshaft bearing cover mounting joint surface.

Caution

1. Inspect the camshaft bearing cover and cylinder head sealing surfaces to ensure that they are free of oil and grease, clean the surfaces with modified alcohol or similar media, and apply adhesive to the camshaft bearing cover sealing surfaces according to the traces shown above.

2. It is required to fit the assembly within 10 minutes. If time is exceeded, the adhesive must be cleaned up and reapplied.

3. Apply adhesive at A with a diameter of 1.5 ± 0.5 mm and at B with a diameter of 2 ± 0.5 mm.

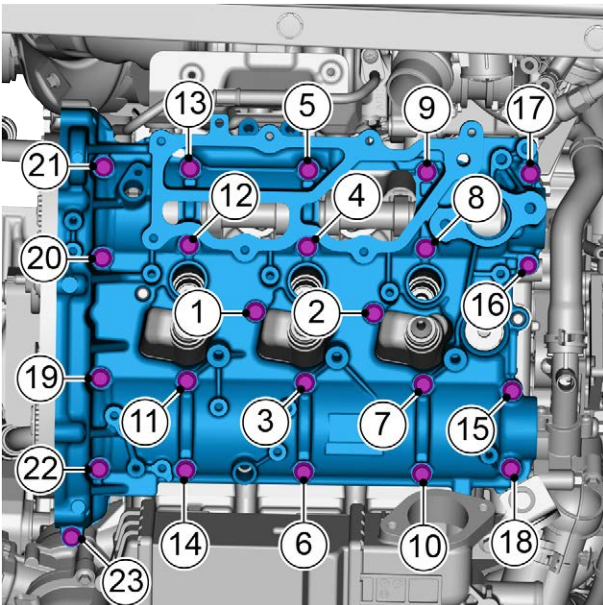
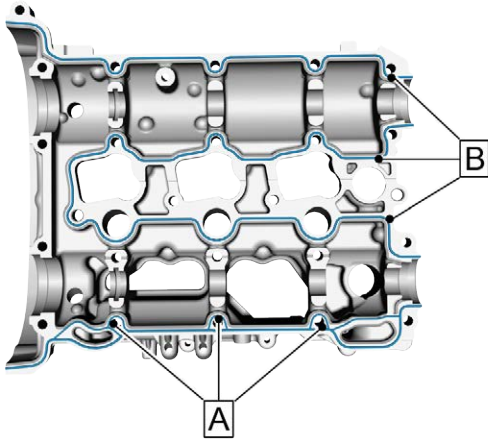
- 2 Install the camshaft bearing cover and tighten the twenty-six fixing bolts of the camshaft bearing cover in the order shown.

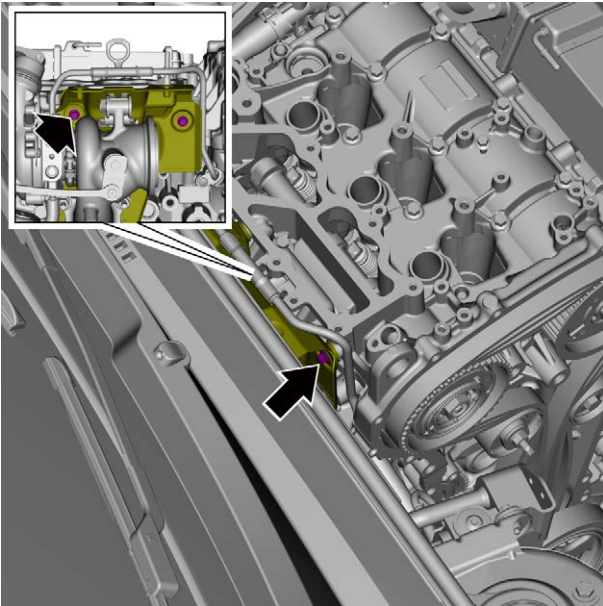
Torque: 17 N·m

Caution

Install the camshaft bearing cover bolts and pre-tighten all bolts in the order shown above, then tighten all the bolts according to the order shown above. After tightening the bolts, wipe the overflowed silicone from the spark plug holes and injector holes of the camshaft bearing cover so that it will not subsequently fall into the combustion chamber.

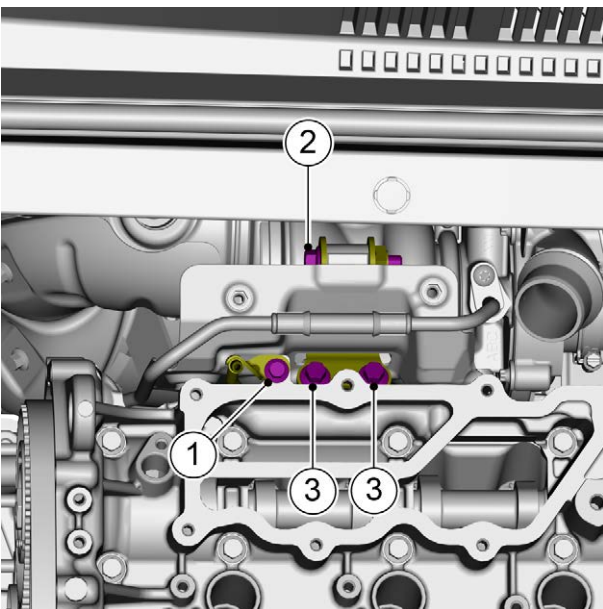
- 3 Perform [Timing Calibration](#).





- 4 Install and tighten the two fixing bolts of the turbocharger heat shield.

Torque: 10N·m



- 5 Install and tighten the two fixing bolts 3 of the turbocharger bracket.

Torque: 24N·m

- 6 Install and tighten the fixing bolts 2 of the turbocharger subassembly.

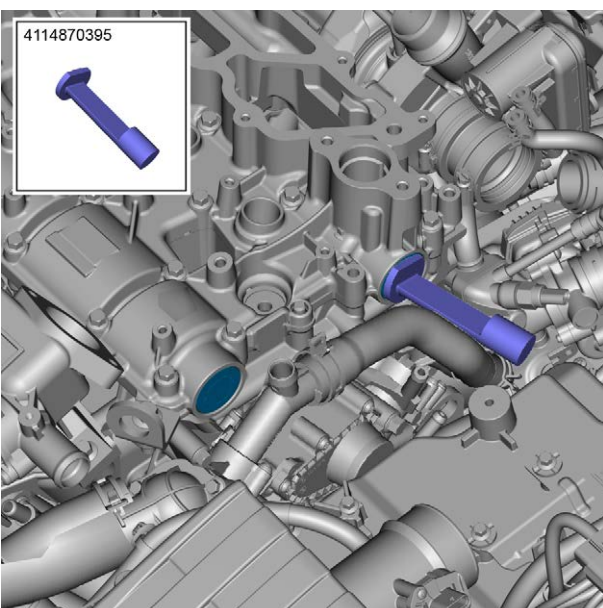
Torque: 24N·m

Caution

The exposed threaded ports of the bolts shall be treated by spraying a thread loosening agent and WD-40 universal lubricating rust inhibitor should be used.

- 7 Install the engine degassing hose and tighten the fixing bolt 1 of the engine degassing hose.

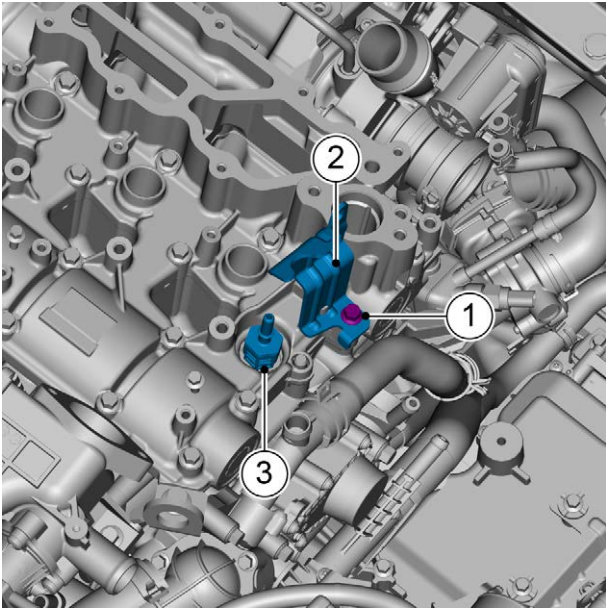
Torque: 10 N·m



- 8 Install a new camshaft plug cover with a special tool.

Special tool: 4114870395

Oil seal pressing depth: 0.7±0.4 mm



- 9 Install the breather valve 3.

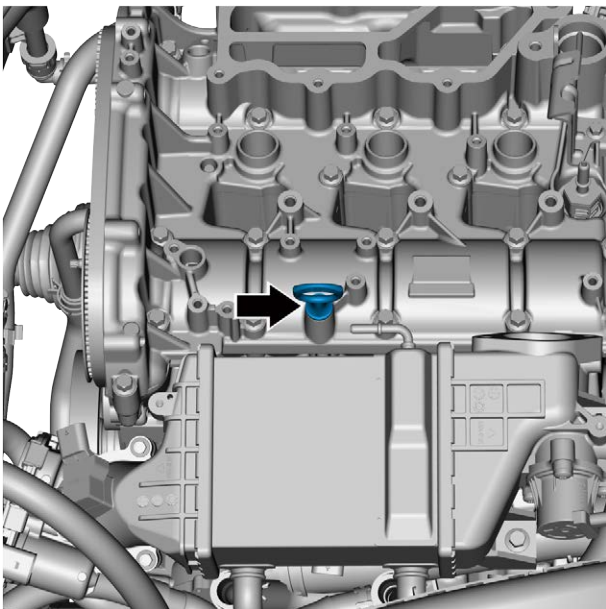
Torque: 12 N·m

Caution

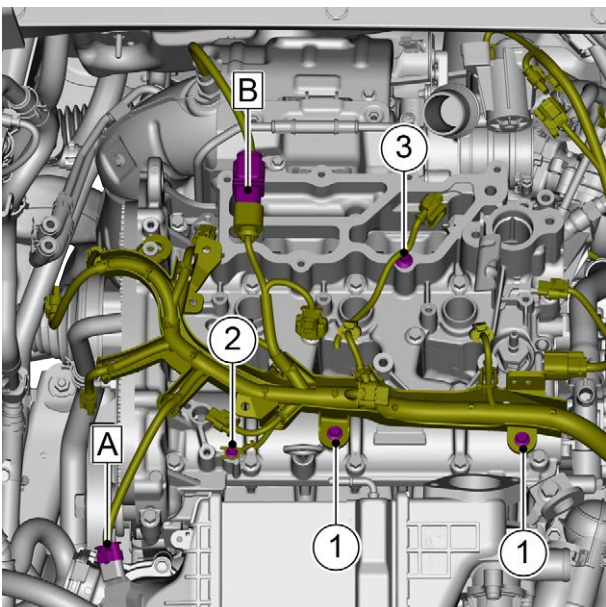
Replace with a new vent valve after disassembly.

- 10 Install the fuel pipe bracket 2 and tighten the fixing bolts 1 of the fuel pipe bracket.

Torque: 10 N·m



- 11 Install an oil dipstick.



- 12 Install the engine wiring harness.

- 13 Connect the harness connector A of the intake pressure and temperature sensor (water cooled intercooler subassembly).

- 14 Connect the harness connector B of the Lambda probe (upstream oxygen sensor).

- 15 Install the engine harness fixing clip 3.

- 16 Install and tighten the fixing bolt 2 of the engine harness grounding.

Torque: 10 N·m

- 17 Install and tighten the two fixing bolts 1 of the engine harness.

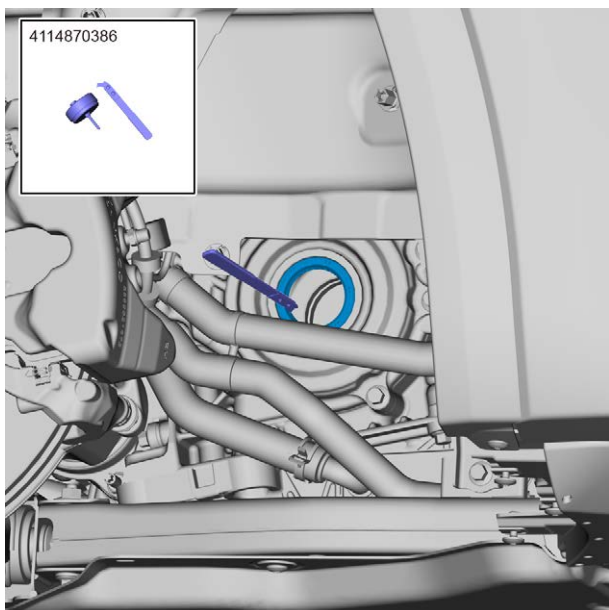
Torque: 10 N·m

- 18 Install the timing belt guard.
- 19 Remove the jack.
- 20 Install the intake camshaft position sensor.
- 21 Install the exhaust camshaft position sensor.
- 22 Install the fuel rail injector subassembly.
- 23 Install spark plugs.
- 24 Installation of ignition coil.
- 25 Install the high pressure fuel tube.
- 26 Install the fuel pressure sensor on low pressure side.
- 27 Install the oil pump tappet.
- 28 Install the high pressure fuel pump.
- 29 Install the oil-air separator subassembly.
- 30 Install the turbocharger water pipe subassembly.
- 31 Install the heat shield.
- 32 Install the resonator assembly.
- 33 Install a resonator.
- 34 Install the engine trim cover assembly.
- 35 Fill with the engine coolant.
- 36 Connect the negative cable of the battery, start the vehicle and connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle level. If there is a drop in the level, replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the upper scribe line of the expansion kettle, and tighten the lid of the expansion kettle.
- 37 Close the engine compartment cover.

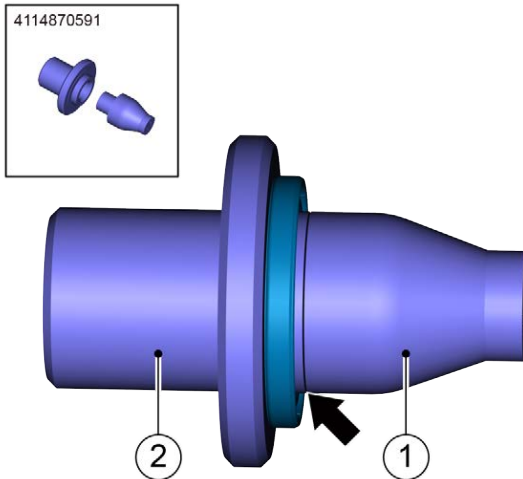
2.5.7.13 Replacement of Front Oil Seal for Crankshaft

Removal Procedure

- 1 Open the engine compartment hood.
 - 2 Remove the damping pulley, see [Replacement of Damping Pulley](#).
 - 3 Remove the front oil seal of the crankshaft with a special tool.
- Special tool: 4114870386



Installation Procedure

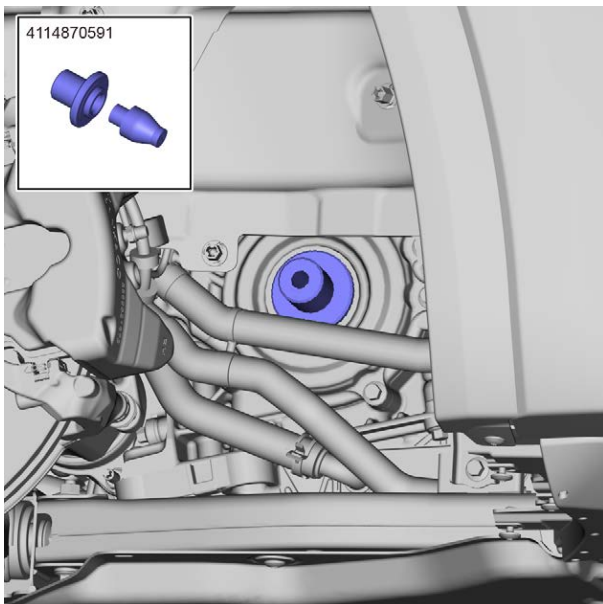


- 1 Install the front oil seal of the crankshaft to the special tool and remove the front end part 1 of the special tool.

Special tool: 4114870591

Caution

Ensure that the position of the rear end part 2 of the special tool needs to be higher than the front oil seal of the crankshaft.



- 2 Install the front oil seal of the crankshaft to the timing belt guard with a special tool.

Special tool: 4114870591

Oil seal pressing depth: 0.6 mm~ 1 mm

End parallelism: 0.25 mm

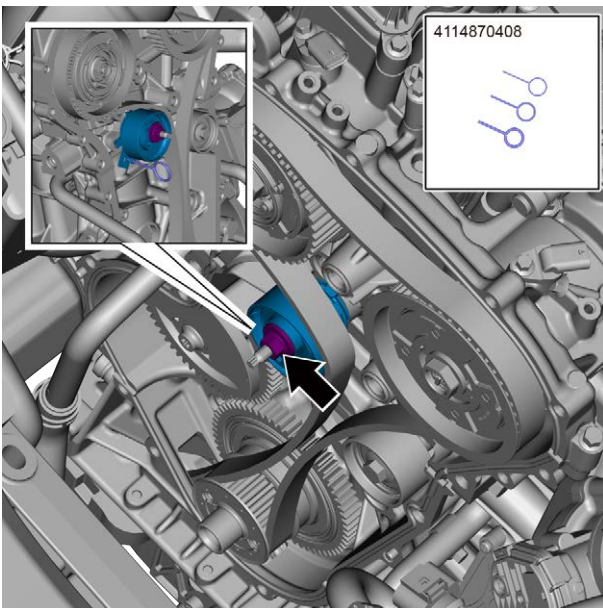
Caution

1. Before assembly, confirm that the installation journal and chamfer of the oil seal are clean and free of foreign objects. If any, it needs to be wiped away. Confirm that the installation journal and chamfer of the oil seal are free of visual defects such as bumps, scratches, indentations, rust, and excessive paint. If there are any defects, please replace the damping pulley with a new one.
 2. For installing the oil seal, it is permissible to apply P80 or other lubricating insert aids on the installation hole wall or outer ring of the oil seal.
 3. Hands should not touch the oil seal mounting groove during installation.
 4. Scrap the oil seal directly after landing.
 5. Do not allow contact with the inner ring and lip of the oil seal.
- 3 Install the damping pulley.
 - 4 Close the engine compartment cover.

2.5.7.14 Replacement of Timing Belt Tensioner

Removal Procedure

- 1 Open the engine compartment hood.
- 2 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 3 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 4 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 5 Take a jack to slightly lift the engine assembly.
- 6 Remove the right engine isolation pad assembly, see [Replacement of Right Engine Isolation Pad Assembly](#).
- 7 Remove the front right wheel, see [Replacement of Wheel Assembly](#).
- 8 Remove the front right wheel cover fender assembly, see [Replacement of Front Left Wheel Cover Feeder Assembly](#).
- 9 Remove the damping pulley, see [Replacement of Damping Pulley](#).
- 10 Remove the timing belt guard, see [Replacement of Timing Belt Guard](#).
- 11 Install the special tool locking locating pin set by turning it in the direction of the arrow on the surface of the timing belt tensioner.
Special tool positioning pin set: 4114870408
- 12 Take off the timing belt tensioner by removing the fixing nuts of the timing belt tensioner.



Installation Procedure

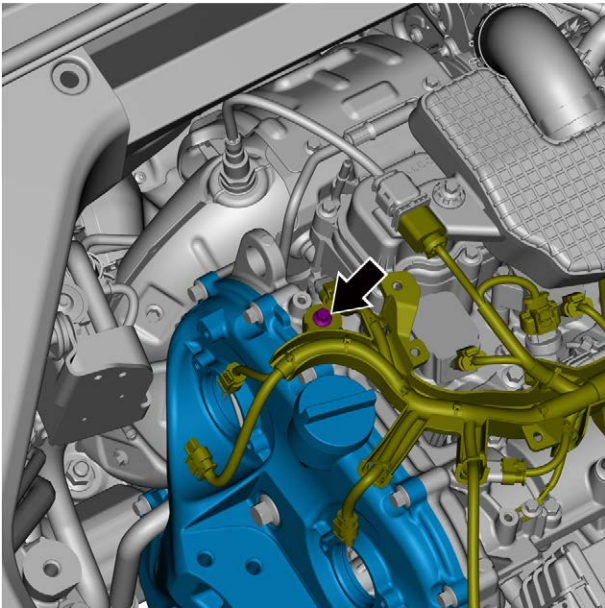
- 1 Perform [Timing Calibration](#).
- 2 Install the timing belt guard.
- 3 Install the damping pulley.
- 4 Install the front right wheel cover fender assembly.
- 5 Install front right wheel.
- 6 Install the right engine vibration isolation pad assembly.
- 7 Lower and take off the jack.

- 8 Install the bottom engine guard assembly.
- 9 lower the vehicle.
- 10 Install the engine trim cover assembly.
- 11 Close the engine compartment cover.

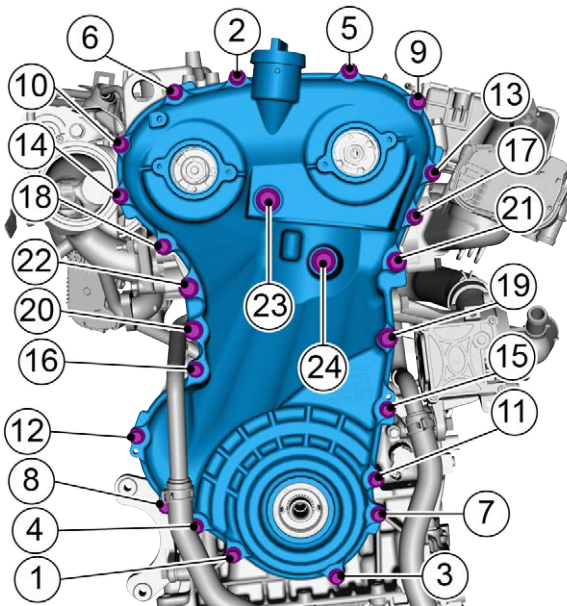
2.5.7.15 Replacement of Timing Belt Guard

Removal Procedure

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 4 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 5 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 6 Take a jack to slightly lift the engine assembly.
- 7 Remove the right engine isolation pad assembly, see [Replacement of Right Engine Isolation Pad Assembly](#).
- 8 Remove the front right wheel, see [Replacement of Wheel Assembly](#).
- 9 Remove the front right wheel cover fender assembly, see [Replacement of Front Left Wheel Cover Feeder Assembly](#).
- 10 Remove the damping pulley, see [Replacement of Damping Pulley](#).
- 11 Remove the front oil seal for crankshaft, see [Replacement of Front Oil Seal for Crankshaft](#).
- 12 Remove the VVT solenoid coil (exhaust side), see [Replacement of VVT Solenoid Coil \(exhaust side\)](#).
- 13 Remove the VVT solenoid coil (intake side), see [Replacement of VVT Solenoid Coil \(intake side\)](#).



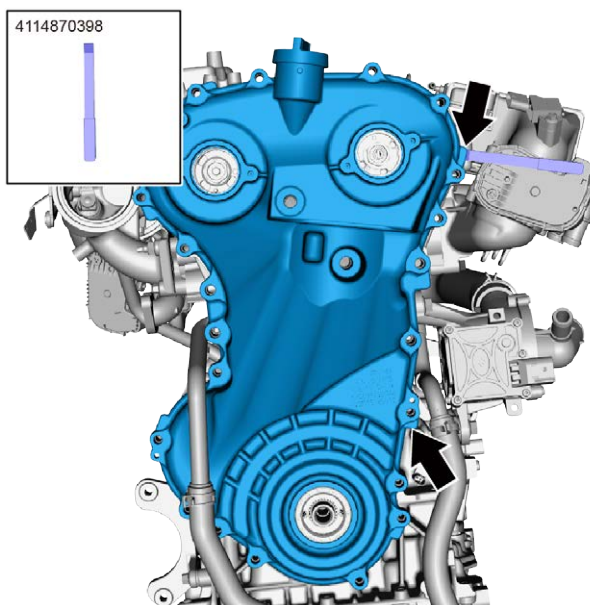
- 14 Remove the fixing bolts of the engine wiring harness, and set them aside.



- 15 Remove the fixing bolts of the timing belt guard in the order shown in the figure.

Caution

The specifications of Bolts 1-8 in the figure are M8 × 30. The specifications of Bolts 23 and 24 in the figure are M12 × 70. The specifications of Bolts 19-22 in the figure are M10 × 35. The positions of the bolts cannot be interchanged.



- 16 Remove the timing belt guard with a special tool.
Special tool: 4114870398

Installation Procedure

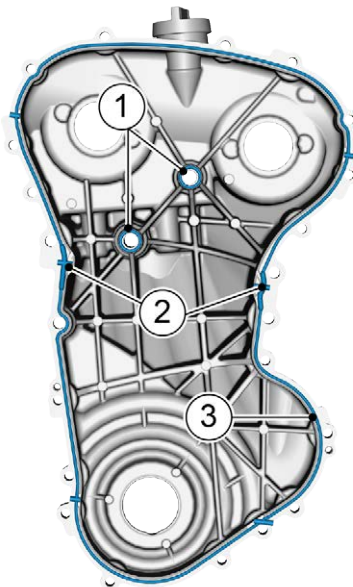
- 1 If the disassembled damping pulley needs to be assembled for the second time, it is necessary to clean up the residual adhesive on the joint surface (cylinder block side and shield side), then use a dust-free cloth moistened with mechanical cleaning agent to clean the mounting surfaces of the timing belt guard, crankcase, cylinder block, cylinder head, and camshaft bearing cover, and use the Dainese pen 32# to test. After passing the test, take a dust-free cloth to wipe clean. After the mechanical cleaning agent completely evaporates, spray Loctite 1455 onto a clean dust-free cloth, wipe the timing belt guard, crankcase, cylinder block, cylinder head and camshaft bearing guard on the bonding surface.

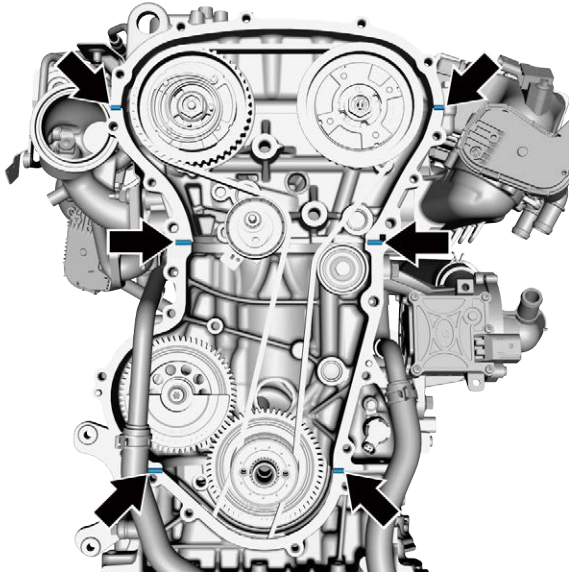
Caution

1. Control the amount of residual Loctite 1455 surface adhesive on the bonding surface, wipe the bonding surface on the surface of the wet, but did not shrink into water droplets.
 2. After the Loctite 1455 surface adhesive on the bonding surface dries, a second wipe of the Loctite 1455 surface adhesive is not allowed.
- 2 Apply flat sealant (Loctite 5970) on the timing belt guard.

Caution

1. Before assembling the timing belt guard, cut off any excess adhesive.
2. The diameter of the colloid at Mark 1 is 2.5 to 4 mm.
3. The diameter of the colloid at Mark 2 is 2.5 to 4 mm.
4. The diameter of the colloid at Mark 3 is 4.5 to 6 mm.
5. The starting position of the adhesive line is within 10 mm, with a diameter of 2.5-6 mm.
6. Before assembling the timing belt guard, cut off any excess adhesive.

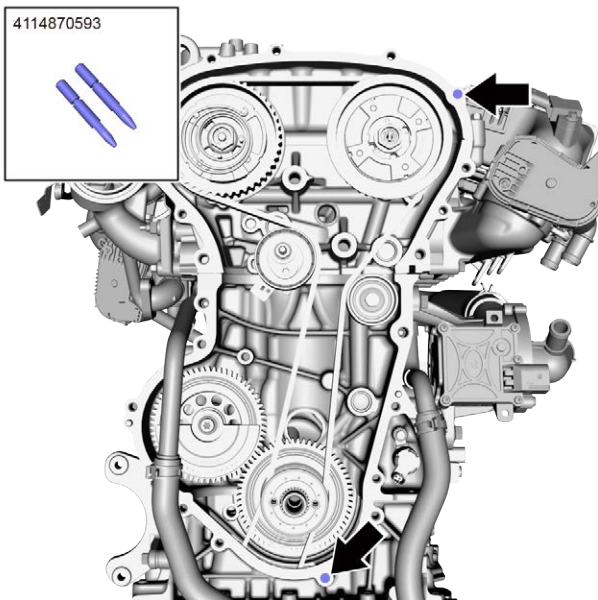




3 Apply flat sealant (Loctite 5970) on the cylinder block.

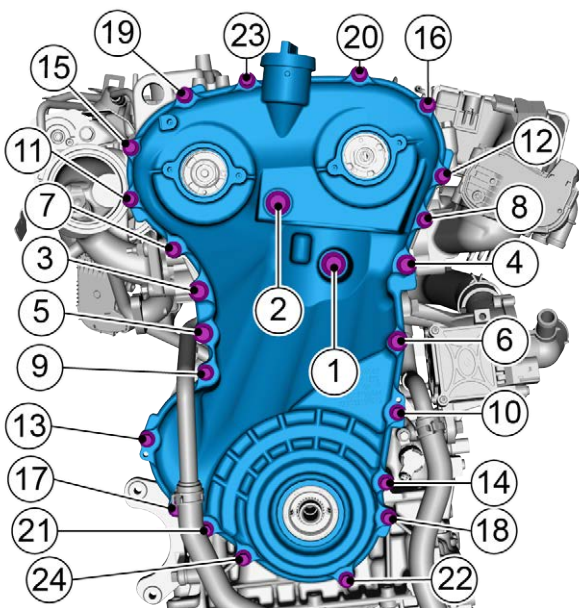
Caution

1. Before assembling the timing belt guard, cut off any excess adhesive.
2. The diameter of the colloid is 4 to 6 mm.



4 Install a special tool for the guide pin.

Special tool: 4114870593



5 Pre-tighten and then tighten in the sequence shown.

Torque of Bolt M8x30: 23 N·m

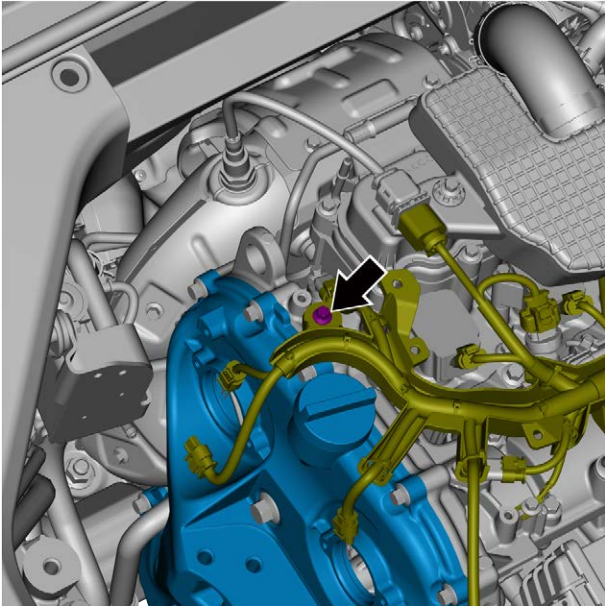
Torque of Bolt M10x35: 50 N·m

Torque of Bolt M12x70: 110 N·m

Caution

1. After applying adhesive to the cylinder block components, final tightening needs to be completed within 10 min. If this time is exceeded, remove the sealant and start again.

2. The specification of Bolts 7-24 in the figure is M8x30. The specification of Bolts 3~6 in the figure is M10x35. The specification of Bolts 1-2 in the figure is M12x70. The positions of the bolts cannot be interchanged.



- 6 Install the engine wiring harness and tighten the fixing bolts of the engine wiring harness.

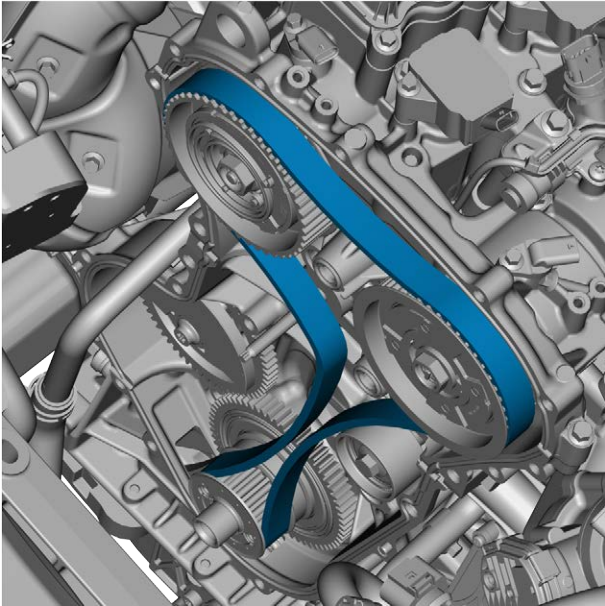
Torque: 10 N·m

- 7 Install the VVT solenoid coil (intake side).
- 8 Install the VVT solenoid coil (exhaust side).
- 9 Install the front oil seal of the crankshaft.
- 10 Install the damping pulley.
- 11 Install the front right wheel cover fender assembly.
- 12 Install front right wheel.
- 13 Install the right engine vibration isolation pad assembly.
- 14 Lower and take off the jack.
- 15 Install the bottom engine guard assembly.
- 16 lower the vehicle.
- 17 Install the engine trim cover assembly.
- 18 Connect the battery cables.
- 19 Close the engine compartment cover.

2.5.7.16 Replacement of Timing Belt

Removal Procedure

- 1 Open the engine compartment hood.
- 2 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 3 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 4 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 5 Take a jack to slightly lift the engine assembly.
- 6 Remove the right engine isolation pad assembly, see [Replacement of Right Engine Isolation Pad Assembly](#).
- 7 Remove the front right wheel, see [Replacement of Wheel Assembly](#).



- 8 Remove the front right wheel cover fender assembly, see [Replacement of Front Left Wheel Cover Feeder Assembly](#).
- 9 Remove the damping pulley, see [Replacement of Damping Pulley](#).
- 10 Remove the timing belt guard, see [Replacement of Timing Belt Guard](#).
- 11 Remove the timing belt tensioner, see [Replacement of Timing Belt Tensioner](#).
- 12 Remove the timing belt.

Installation Procedure

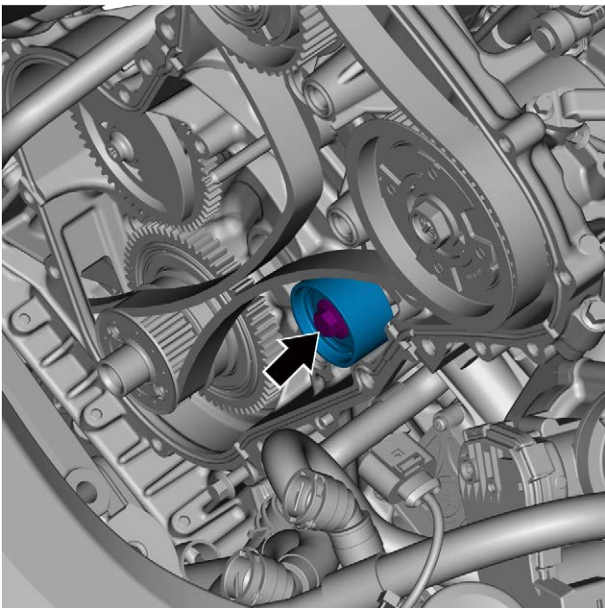
- 1 Perform [Timing Calibration](#).
- 2 Install the timing belt guard.
- 3 Install the damping pulley.
- 4 Install the front right wheel cover fender assembly.
- 5 Install front right wheel.
- 6 Install the right engine vibration isolation pad assembly.
- 7 Lower and take off the jack.
- 8 Install the bottom engine guard assembly.
- 9 lower the vehicle.
- 10 Install the engine trim cover assembly.
- 11 Close the engine compartment cover.

2.5.7.17 Replacement of Timing Idler

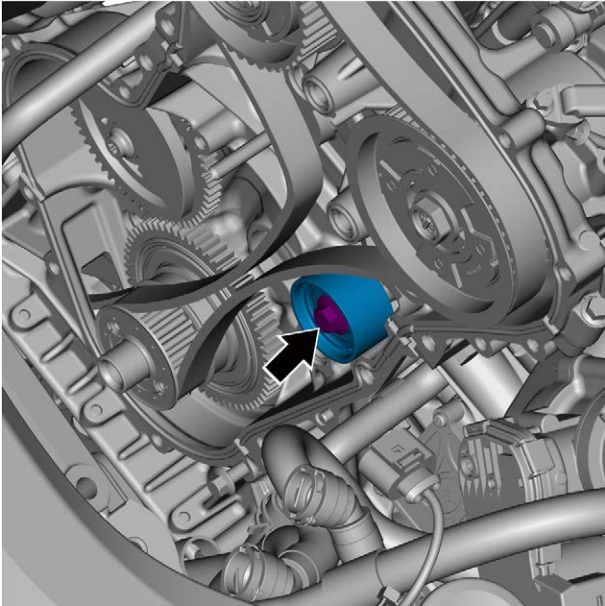
Removal Procedure

- 1 Open the engine compartment hood.
- 2 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).

- 3 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 4 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 5 Take a jack to slightly lift the engine assembly.
- 6 Remove the right engine isolation pad assembly, see [Replacement of Right Engine Isolation Pad Assembly](#).
- 7 Remove the front right wheel, see [Replacement of Wheel Assembly](#).
- 8 Remove the front right wheel cover fender assembly, see [Replacement of Front Left Wheel Cover Feeder Assembly](#).
- 9 Remove the damping pulley, see [Replacement of Damping Pulley](#).
- 10 Remove the timing belt guard, see [Replacement of Timing Belt Guard](#).
- 11 Remove the timing belt tensioner, see [Replacement of Timing Belt Tensioner](#).
- 12 Take off the timing idler by removing the fixing bolts of the timing idler.



Installation Procedure



- 1 Install the timing idler, and tighten the fixing bolts of the timing idler.

Torque: 25 N·m

- 2 Perform [Timing Calibration](#).
- 3 Install the timing belt guard.
- 4 Install the damping pulley.
- 5 Install the front right wheel cover fender.
- 6 Install front right wheel.
- 7 Install the right engine vibration isolation pad assembly.
- 8 Lower and take off the jack.
- 9 Install the bottom engine guard assembly.
- 10 lower the vehicle.
- 11 Install the engine trim cover assembly.
- 12 Close the engine compartment cover.

2.5.7.18 Replacement of Crankshaft Timing Pulley Assembly

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

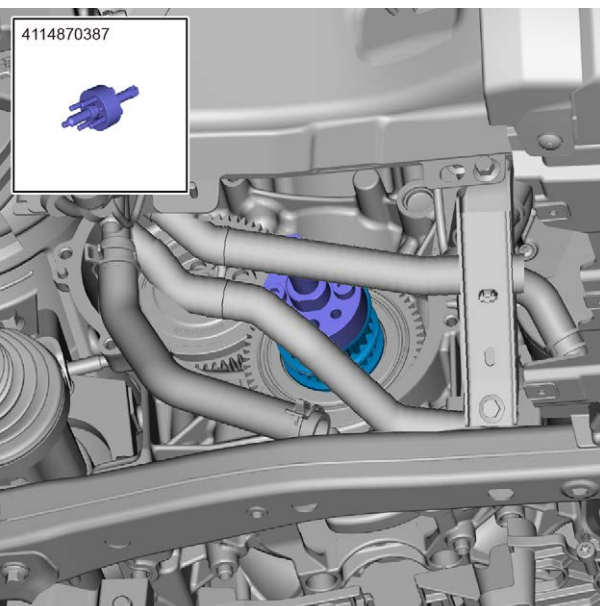
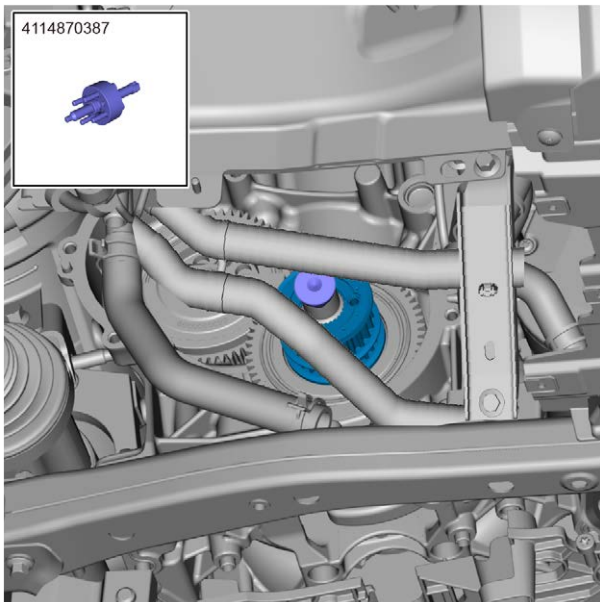
- 1 Open the engine compartment hood.
- 2 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 3 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 4 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 5 Take a jack to slightly lift the engine assembly.
- 6 Remove the right engine isolation pad assembly, see [Replacement of Right Engine Isolation Pad Assembly](#).

- 7 Remove the front right wheel, see [Replacement of Wheel Assembly](#).
- 8 Remove the front right wheel cover fender assembly, see [Replacement of Front Left Wheel Cover Feeder Assembly](#).
- 9 Remove the damping pulley, see [Replacement of Damping Pulley](#).
- 10 Remove the timing belt guard, see [Replacement of Timing Belt Guard](#).
- 11 Remove the timing belt tensioner, see [Replacement of Timing Belt Tensioner](#).
- 12 Remove the timing belt, see [Replacement of Timing Belt](#).
- 13 Remove the fuel pump, see [Replacement of Fuel Pump](#).
- 14 Install a special tool.

Special tool: 4114870387

Caution

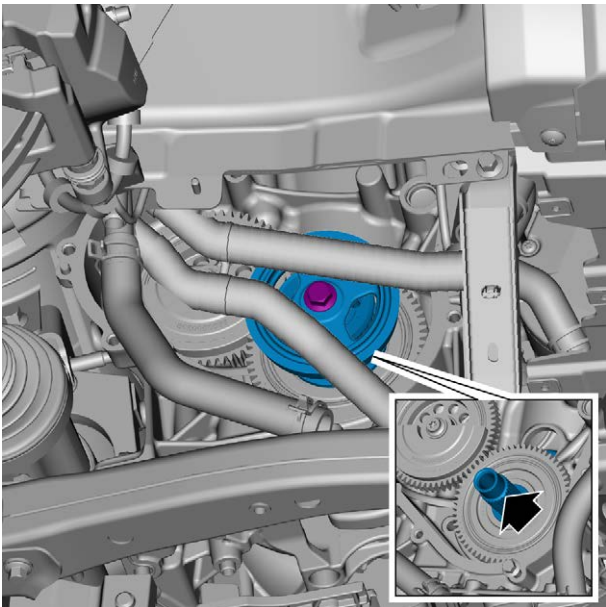
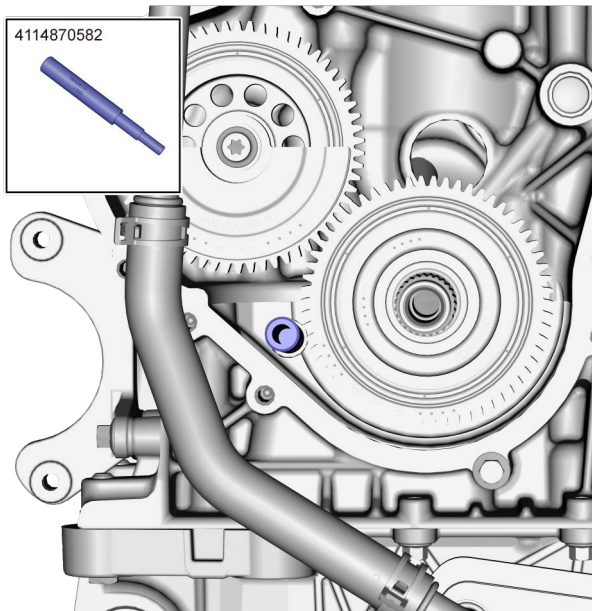
This special tool is used to protect the crankshaft.



- 15 Remove the crankshaft timing pulley assembly with a special tool.

Special tool: 4114870387

Installation Procedure



- 1 Install the crankshaft zero position fixture to ensure that the crankshaft disk is at zero position.

Special tool: 4114870582

Caution

1. Insert the zero reference hole of the crankcase for positioning, ensuring that the fixture head is in contact with the small flat surface of the crankshaft first balance block.

2. Rotate the crankshaft counterclockwise, if it fails to rotate, it indicates that the crankshaft is in the zero position.

- 2 Slide the crankshaft timing pulley assembly on the crankshaft and use a dampening pulley to slowly press it into the threaded hole at the front end of the crankshaft assembly until the crankshaft timing pulley assembly fits against the front face of the crankshaft gear.

Torque: 35N·m

- 3 Install the oil pump.
- 4 Perform [Timing Calibration](#).
- 5 Install the timing belt guard.
- 6 Install the damping pulley.
- 7 Install the front right wheel cover fender assembly.
- 8 Install front right wheel.
- 9 Install the right engine vibration isolation pad assembly.
- 10 Lower and take off the jack.
- 11 Install the bottom engine guard assembly.
- 12 lower the vehicle.

- 13 Install the engine trim cover assembly.
- 14 Close the engine compartment cover.

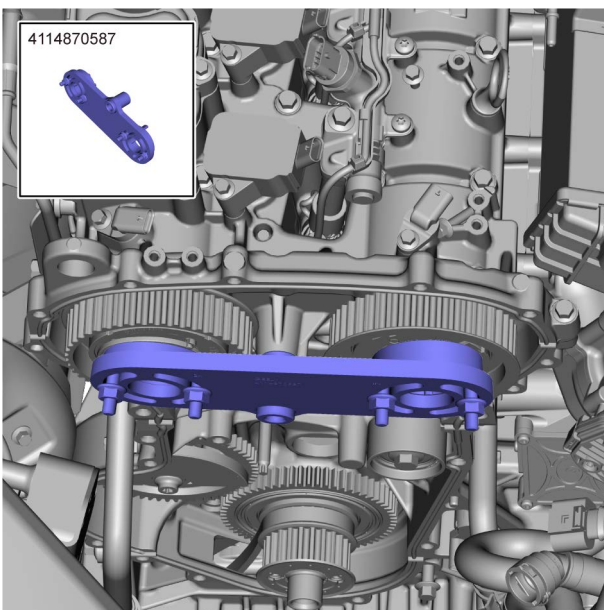
2.5.7.19 Replacement of Intake/Exhaust Center Oil Control Valve

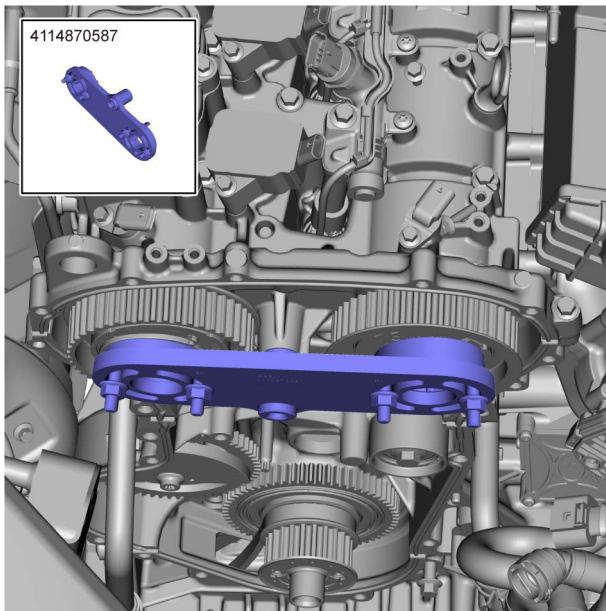
Removal Procedure

- 1 Open the engine compartment hood.
- 2 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 3 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 4 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 5 Take a jack to slightly lift the engine assembly.
- 6 Remove the right engine isolation pad assembly, see [Replacement of Right Engine Isolation Pad Assembly](#).
- 7 Remove the front right wheel, see [Replacement of Wheel Assembly](#).
- 8 Remove the front right wheel cover fender assembly, see [Replacement of Front Left Wheel Cover Feeder Assembly](#).
- 9 Remove the damping pulley, see [Replacement of Damping Pulley](#).
- 10 Remove the timing belt guard, see [Replacement of Timing Belt Guard](#).
- 11 Remove the timing belt tensioner, see [Replacement of Timing Belt Tensioner](#).
- 12 Remove the timing belt, see [Replacement of Timing Belt](#).
- 13 Install and tighten the four fixing nuts of the VVT fixing tool and remove the intake/exhaust center oil control valve.

Special Tool for VVT Fixation: 4114870587

Torque: 30 N·m +30°





Installation Procedure

- 1 Install and pre-tighten the intake/exhaust center oil control valve.

Caution

1. Intake/exhaust center oil control valve can be used only with 3 times in total.
2. The center oil control valves on the intake/exhaust sides are different, so be careful not to install them upside down. .
3. The center oil control valve, exhaust VVT assembly, and intake VVT component must be parts provided by the same supplier, and the mixing from different suppliers is prohibited.

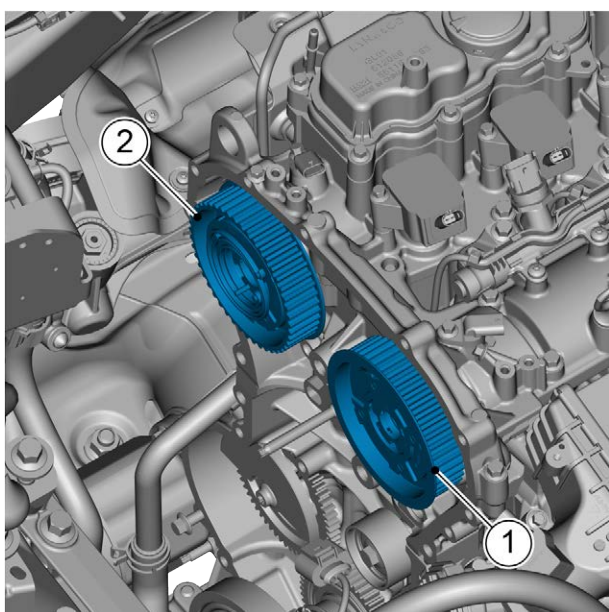
- 2 Perform [Timing Calibration](#).
- 3 Install the timing belt guard.
- 4 Install the damping pulley.
- 5 Install the front right wheel cover fender assembly.
- 6 Install front right wheel.
- 7 Install the right engine vibration isolation pad assembly.
- 8 Lower and take off the jack.
- 9 Install the bottom engine guard assembly.
- 10 lower the vehicle.
- 11 Install the engine trim cover assembly.
- 12 Close the engine compartment cover.

2.5.7.20 Replacement of Intake/exhaust VVT

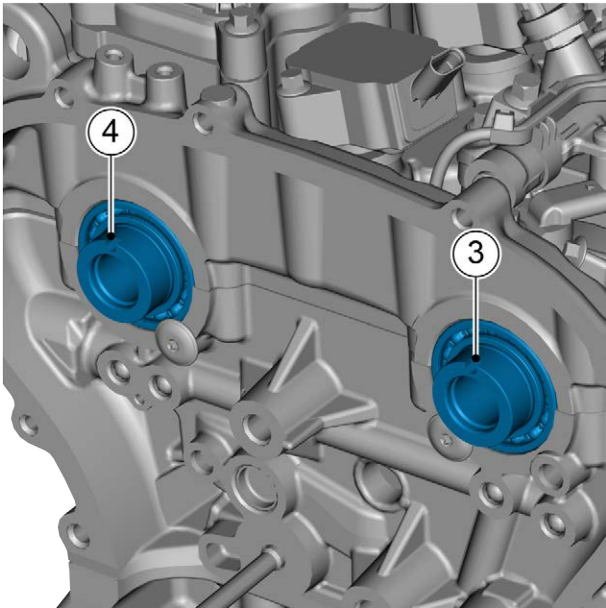
Removal Procedure

- 1 Open the engine compartment hood.
- 2 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 3 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 4 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 5 Take a jack to slightly lift the engine assembly.
- 6 Remove the right engine isolation pad assembly, see [Replacement of Right Engine Isolation Pad Assembly](#).
- 7 Remove the front right wheel, see [Replacement of Wheel Assembly](#).

- 8 Remove the front right wheel cover fender assembly, see [Replacement of Front Left Wheel Cover Feeder Assembly](#).
- 9 Remove the damping pulley, see [Replacement of Damping Pulley](#).
- 10 Remove the timing belt guard, see [Replacement of Timing Belt Guard](#).
- 11 Remove the timing belt tensioner, see [Replacement of Timing Belt Tensioner](#).
- 12 Remove the timing belt, see [Replacement of Timing Belt](#).
- 13 Remove the intake/exhaust center oil control valves, see [Replacement of Intake/Exhaust Center Oil Control Valve](#).
- 14 Take off the intake VVT1 and the exhaust VVT2.



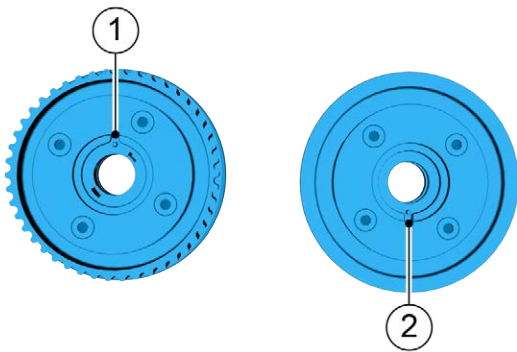
Installation Procedure



- 1 Assemble the intake VVT1 and exhaust VVT2 to the camshaft with the center oil control valves respectively (the VVT assembly can be rotated at a small angle relative to the camshaft), and then rotate both the intake VVT1 and the exhaust VVT2 clockwise until the pin of the VVT is in contact with the right side of Slots 3 and 4 of the camshaft.

Caution

The center oil control valve, exhaust VVT assembly, and intake VVT component must be parts provided by the same supplier, and the mixing from different suppliers is prohibited.



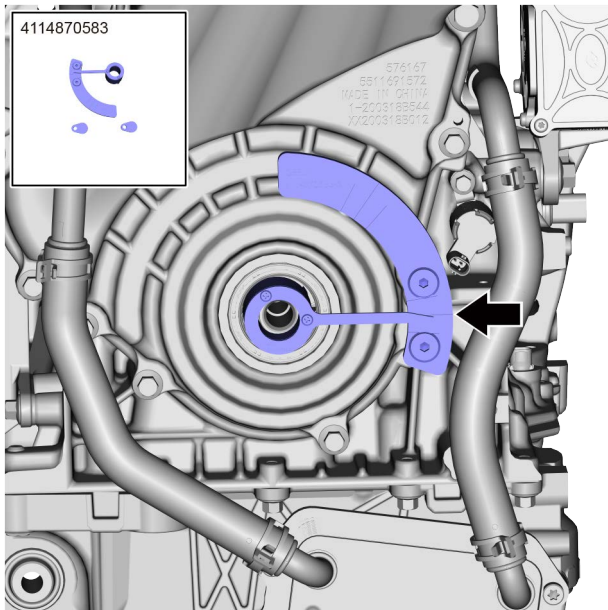
- 2 Install the intake/exhaust center oil control valve.
- 3 Perform [Timing Calibration](#).
- 4 Install the timing belt guard.
- 5 Install the damping pulley.
- 6 Install the front right wheel cover fender assembly.
- 7 Install front right wheel.
- 8 Install the right engine vibration isolation pad assembly.
- 9 Lower and take off the jack.
- 10 Install the bottom engine guard assembly.
- 11 lower the vehicle.
- 12 Install the engine trim cover assembly.
- 13 Close the engine compartment cover.

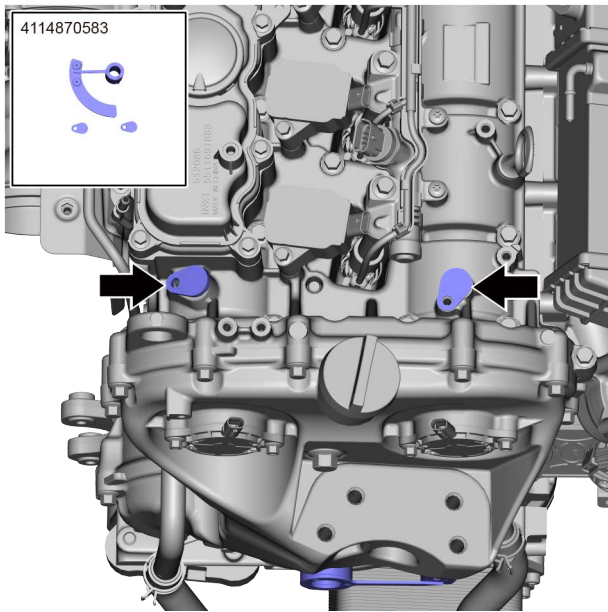
2.5.7.21 Timing Check

Check Procedure 1

- 1 Remove the damping pulley, see [Replacement of Damping Pulley](#).
- 2 Remove the exhaust camshaft position sensor, see [Replacement of Exhaust Camshaft Position Sensor](#).
- 3 Remove the intake camshaft position sensor, see [Replacement of Intake Camshaft Position Sensor](#).
- 4 Install the timing zero check tool and adjust the pointer to point at the scale.

Timing zero check tool: 4114870583





- 5 Install the timing zero check tool at the camshaft position sensor.

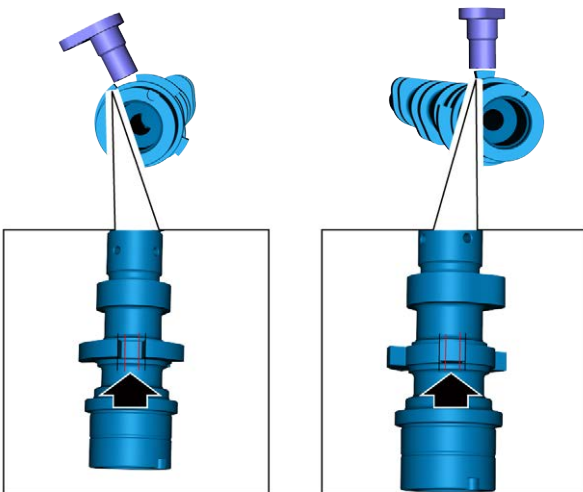
Timing zero check tool: 4114870583

- 6 Check the position of the intake/exhaust camshaft position sensor signal disk at zero point $+26.25^\circ$.

Timing zero check tool: 4114870583

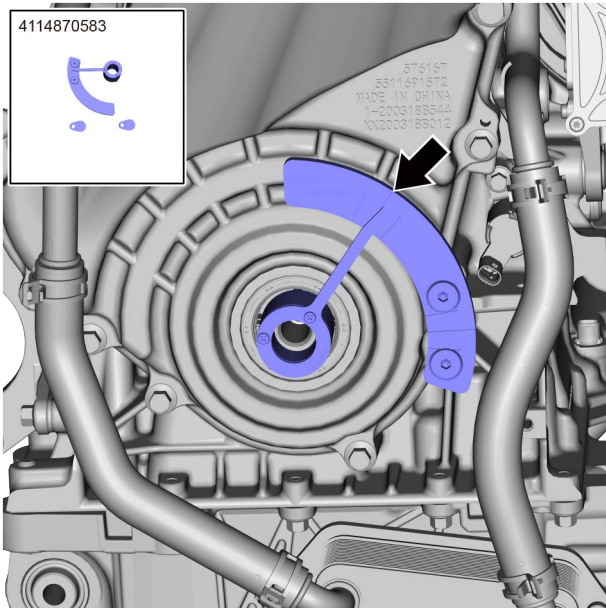
Caution

Ensure that the red scale line on the timing zero check tool is smaller than the range of the black lines formed at both ends of the camshaft concave and convex parts.



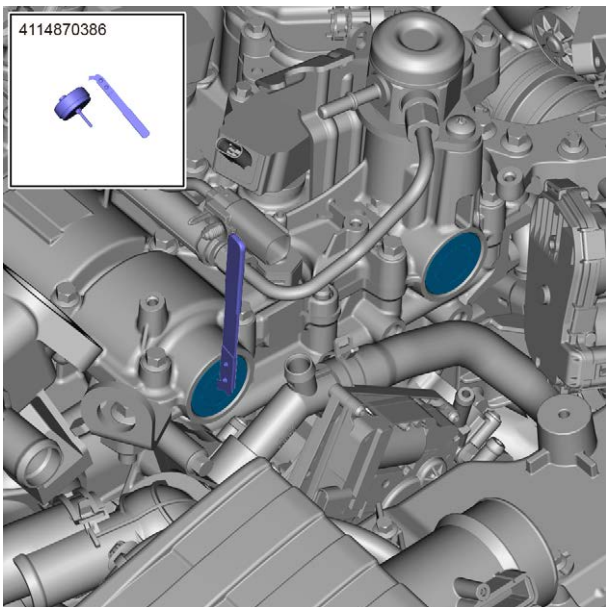
Check Procedure 2

- 1 Remove the damping pulley, see [Replacement of Damping Pulley](#).
- 2 Remove the turbocharger water pipe assembly, see [Replacement of Turbocharger Water Pipe Assembly](#).



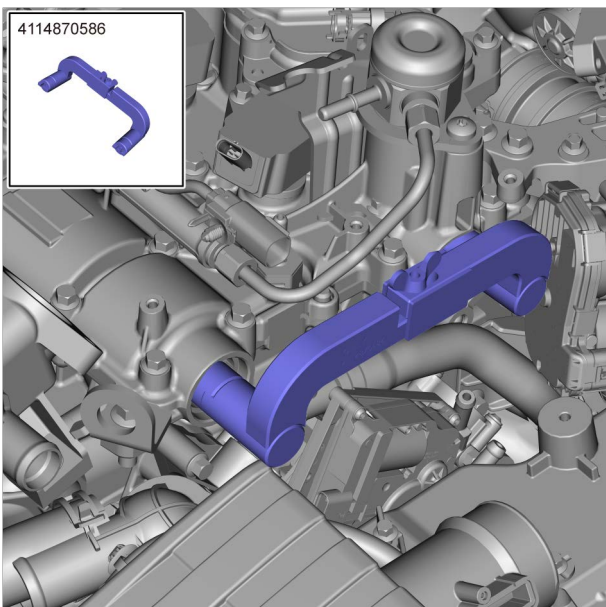
- 3 Install the timing zero check tool and adjust the pointer to point at the scale.

Timing zero check tool: 4114870583



- 4 Remove the camshaft plug cover with a special tool.

Special tool: 4114870386



- 5 Install the camshaft positioning fixture and check that the camshaft is in the zero position.





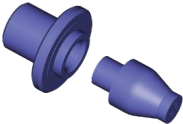
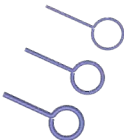
Camshaft Positioning Fixture: 4114870586





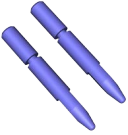

Caution


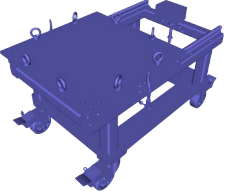
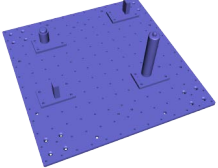
When the camshaft is in the zero position, the camshaft notch face up and both tail grooves are horizontal.

2.5.8 Specialized tools and equipment

2.5.8.1 Special tools

Serial No.:	Illustration	Tool No.	Name
1		4114870587	VVT fixing tool
2		4114870582	Zero point positioning tool for crankshaft
3		4114870386	Removal tool for crankshaft oil seal
4		4114870416	Fixing tool with wheels
5		4114870591	Installation tool for crankshaft oil seal
6		4114870408	Locating pin set

Serial No.:	Illustration	Tool No.	Name
7		4114870387	Removal tool for crankshaft pulley
8		4114870398	Pry bar
9		4114870395	Installation tool for camshaft plug cover
10		4114870586	Camshaft positioning tool
11		4114870593	Guide pin
12		4114870584	Crankshaft rotation tool

Serial No.:	Illustration	Tool No.	Name
13		4114870583	Formal inspection tool
14		4114870610	Powertrain positioning and placement bracket
15		4114870619	Engine pillar

2.6 Intake system (DHE15-ESZ)

2.6.1 Specification

2.6.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Fixing screw connecting air flow meter to air filter assembly	PF4×14	1.3-1.7
Fixing clamp connecting air filter corrugate pipe to air filter assembly	-	4.0-5.0
Fixing bolt between air filter intake pipe assembly and front end module assembly	M6×35	8.5-11.5
Fixing screws between upper and lower air filter housings	ST5×25	1.5-1.9
Fixing hoop for engine bypass pipe	-	3-4
Fixing bolt between resonator assembly and bracket	M6×30	8.5-11.5
Fixing bolts for resonator and oil-air separator	M6×30	8.5-11.5
Fixing bolt between resonator and low-pressure side fuel pressure sensor bracket	M6×14	8.5-11.5
Fixing bolt between resonator and water-cooled intercooler subassembly	M8×20	20-28
Fixing bolt between intake manifold and cylinder block	M7×30	14-21
Fixing bolt between intake pipe and camshaft bearing cover	M8×30	20-28

2.6.2 Instructions and operations

2.6.2.1 Intake Manifold

The intake manifold is installed on the engine, and primarily used to evenly distribute intake air to each intake port, which is important for optimizing engine efficiency and performance. The manifold pressure sensor is located on the intake manifold and is used to monitor the pressure of the intake air inside the intake manifold.

The intake manifold is the intake line from the rear of the throttle unit the front of the cylinder head intake duct. Its function is to distribute air to the intake tracts of each cylinder.

The intake manifold distributes fresh air evenly, sufficiently and stably to each cylinder of the engine, ensuring the crank gas with redistribution and even intake.

The throttle unit regulates the amount of air entering the engine. The throttle unit is controlled by the engine control module (ECM).

The Intake system of this model is equipped with a throttle unit to control the air intake of the engine, which can correct the control parameters of the engine at the right time to ensure that the engine works in the best condition, and is equipped with ETCS to realize excellent throttle controls.

2.6.2.2 Air pressure and temperature sensor 1

The air pressure and temperature sensor 1 is used to monitor the intake pressure in the intake manifold and feed the result back to the engine control module. The engine control module calculates the density of the air in the intake manifold and determines the mass flow rate of the engine's air.

2.6.2.3 Air Flow Meter

Air flow Mmeter: it is used to measure the amount of air absorbed by the engine and feed the result back to the engine control module. The engine control module calculates the density of the air in the intake pipe and determines the engine's air mass flow rate.

2.6.3 System working principles

2.6.3.1 System working principles

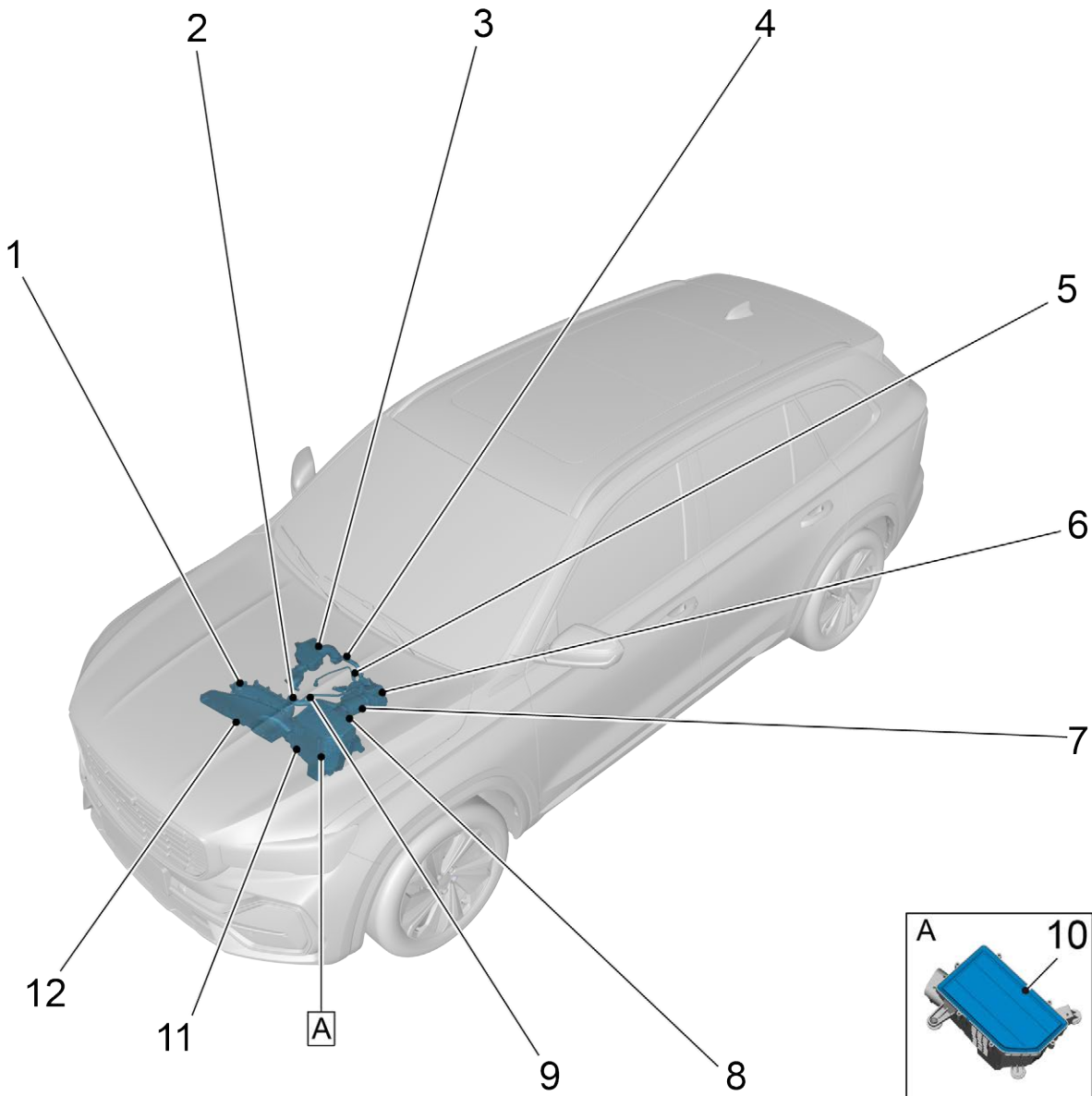
The function of the intake system is to allow air to enter the engine. Oxygen in the air is essential for engine combustion. The Intake system draws in air through a long plastic tube. This plastic tube passes through the air filter housing and the air filter. The air filter prevents dirt and particles from entering the engine, thus preventing engine damage. After the air passes through the air filter, it enters the turbocharger subassembly. The air flow meter is located in the air duct between the air filter and the turbocharger subassembly. The air flow meter is a combination sensor that measures the flow rate of air into the engine and the intake air temperature. The measured data is sent to the engine control module (ECM). Depending on different torque requirements, the air either passes straight through with no turbocharging effect, or enters the turbocharger bypass valve to enable the turbocharger subassembly. If the turbocharger subassembly is enabled, the turbocharger subassembly turbine is driven by the exhaust air and begins to rotate. Then, the incoming air will be compressed. The air continues to flow to the intercooler. As the air is compressed in the turbocharger subassembly, heat is generated and the intercooler is used to transfer the heat from the air. Once the air has been cooled by the intercooler, the density of the air entering the engine increases. The outside air is fed into the intercooler from the engine cooling fan by means of the stamping effect. The intercooler uses the outside air to cool the incoming air. After the cooled air passes through the intercooler, it continues to flow through the throttle unit and enters the intake manifold. The air pressure and temperature sensor 2 measures the temperature and pressure of the air in the intake tube between the intercooler and the throttle unit. The engine control module (ECM) regulates the turbo based on signals provided by manifold air temperature and pressure sensors T-MAPS. The engine control module controls the throttle unit. Throttle unit regulates the amount of air entering the intake manifold and the engine. The engine in the throttle unit regulates the opening angle of the throttle plate. The throttle unit contains two potentiometers that measure the throttle position. The greater the opening angle, the more air enters the engine. When the engine is idling, the throttle unit opens at a smaller angle but remains open until the engine is completely shut down. After passing through the throttle unit, the air enters the intake manifold, which distributes the incoming air evenly to each cylinder. Another sensor is used to measure the air in this intake manifold, namely the manifold absolute pressure sensor, which measures the air pressure. The measured data is sent to the engine control module. When the intake valves are opened, air enters the cylinders, which then mixes with fuel and burns.

The manifold pressure sensor chip provides a "load signal" to the controller based on the difference between the atmospheric pressure and the intake manifold pressure. The controller provides 5V and feedbacks 0-5V to the controller depending on the intake pressure, thus measuring the absolute pressure of the intake manifold and providing engine load information. This sensor is an absolute pressure sensor, and the output value of the product is roughly 2.1 V under standard atmospheric pressure.

The opening size of the throttle unit is calculated by the ECM according to the input signal of the accelerator pedal sensor controlled by the driver, as well as the input signals of various other sensors, to calculate the engine output power required by the vehicle at that moment and in that state and control the fuel supply (injection) amount of the engine accordingly. and to correct the control parameters according to the feedback signal to ensure that the engine operates in the optimal control state. The throttle unit adds components such as drive motor and gear drive mechanism as well as throttle position sensor with enhanced functionality and reliability.

2.6.4 Part position

2.6.4.1 Part position

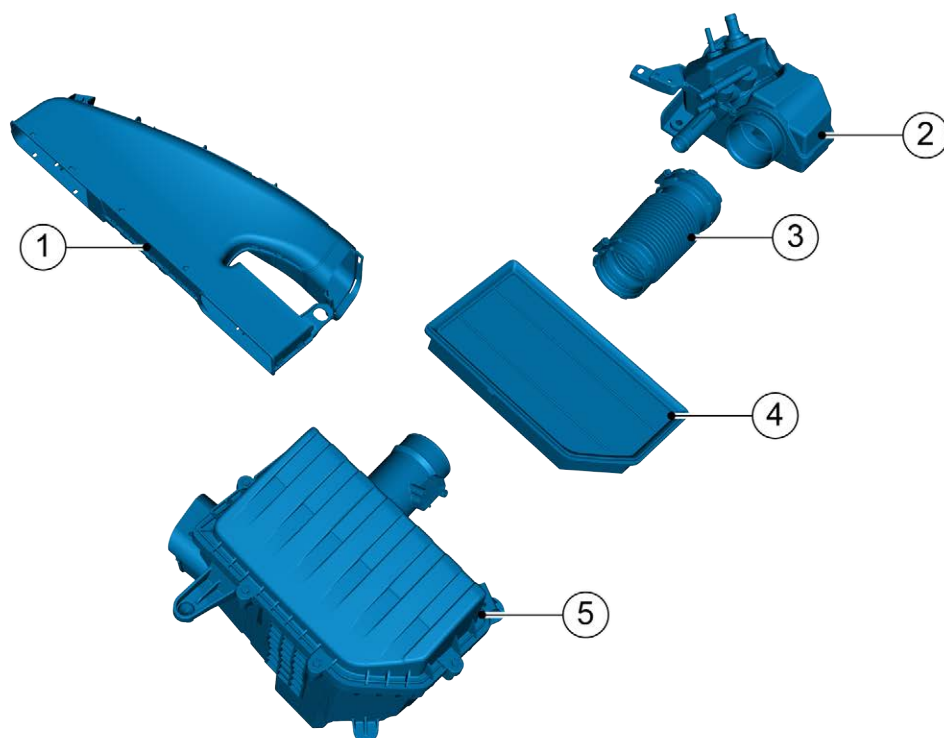


LEGEND

- | | |
|----------------------------|-------------------------------------|
| 1. Intake Manifold | 7. Air filter Bellows |
| 2. Engine bypass pipe | 8. Air Flow Meter |
| 3. Resonator | 9. Intake manifold detachment pipe |
| 4. Crankcase vent pipe | 10. Air filter element |
| 5. Crankcase air vent hose | 11. Air filter assembly |
| 6. Resonator assembly | 12. Air filter intake tube assembly |

2.6.5 Breakdown drawing

2.6.5.1 Breakdown drawing



- | | | | |
|----|---------------------------------|----|---------------------|
| 1. | Air filter intake tube assembly | 4. | Air filter element |
| 2. | Resonator assembly | 5. | Air filter assembly |
| 3. | Air filter Bellows | | |

2.6.6 Diagnostic information and procedure

2.6.6.1 Diagnosis description

See Description and Operation and System Operating Principles before diagnosing a fault in the Intake system. Understanding and familiarizing yourself with the operating principles of the Intake system before beginning system diagnostics will determine the correct troubleshooting steps to take in the event of a malfunction, and more importantly, this will determine if the condition described by the customer is normal operation. Any troubleshooting of the Intake system should begin with a visual inspection that guides the serviceman to the next logical step in the troubleshooting process. Understanding and using the diagnostic process correctly will shorten the diagnostic time and avoid misdiagnosis of the faulty part.

2.6.6.2 Visual check

- Check for aftermarket retrofitting devices that may affect the operation of the intake system to ensure that they cannot affect the proper functioning of the intake system.
- Inspect easily accessible or visible system components for obvious blockages or external leaks.
- Check the harness and harness connector to ensure that there is no sign of loosening, damage, poor contact, aging, etc.

2.6.7 Removal and Installation

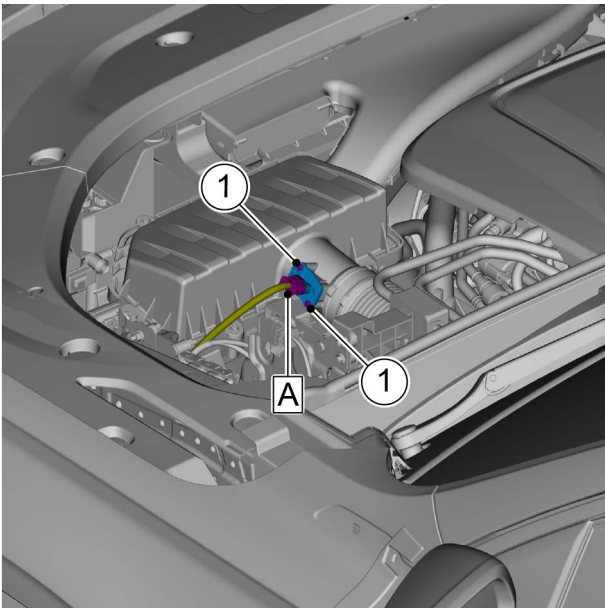
2.6.7.1 Replacement of Air Flow Meter

Removal Procedure

Warning !

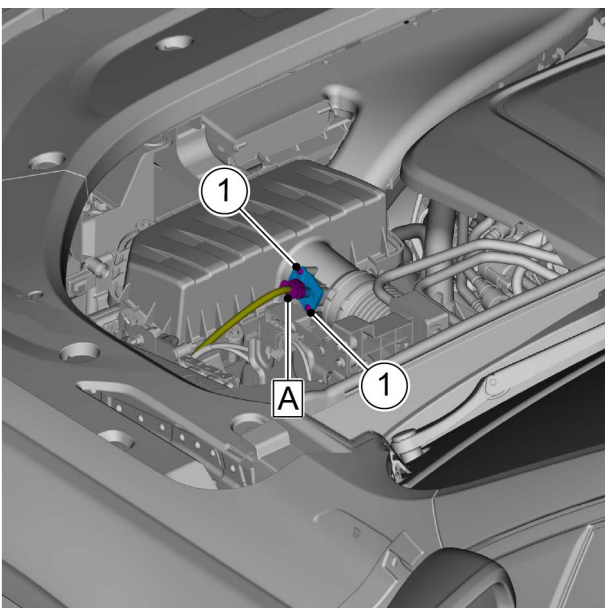
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Disconnect the harness connector A of the air flow meter.
- 4 Remove the two fixing screws 1 of the air flow meter and take off the air flow meter.



Installation Procedure

- 1 Install the air flow meter, and tighten the two fixing screws 1 of the air flow meter.
Torque: 1.5N·m
- 2 Connect the harness connector A of the air flow meter.



- 3 Connect the negative cable of battery.
- 4 Close the engine compartment cover.

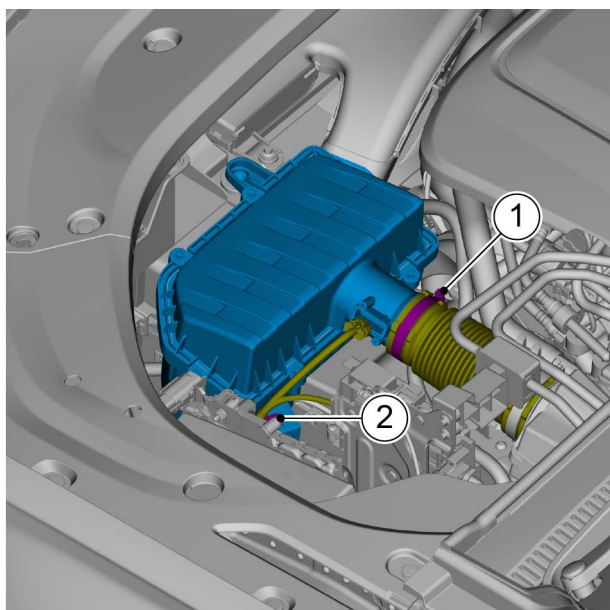
2.6.7.2 Replacement of Air Filter Assembly

Removal Procedure

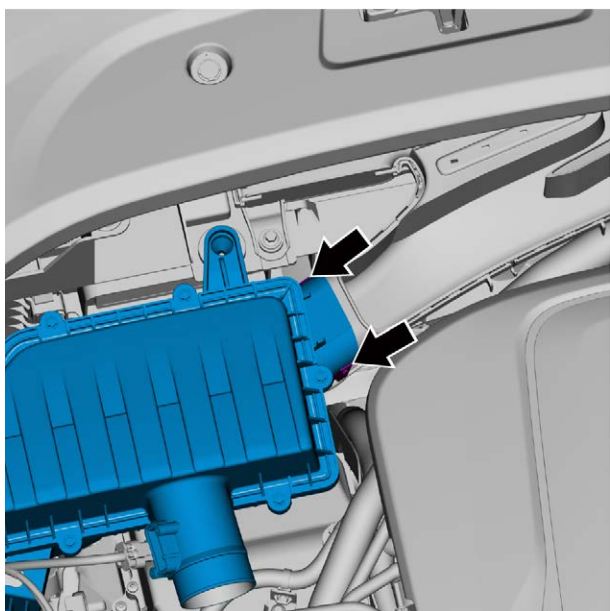
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
 - 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
 - 3 Remove the air flow meter, see [Replacement of Air Flow Meter](#).
-

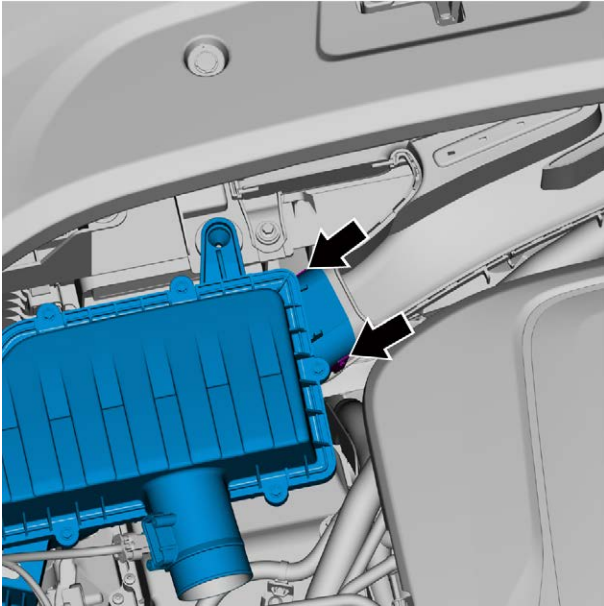


- 4 Loosen the fixing clamp 1 of the air filter bellows and disconnect the air filter bellows from the air filter assembly.
- 5 Remove the fixing clip 2 of the engine harness.

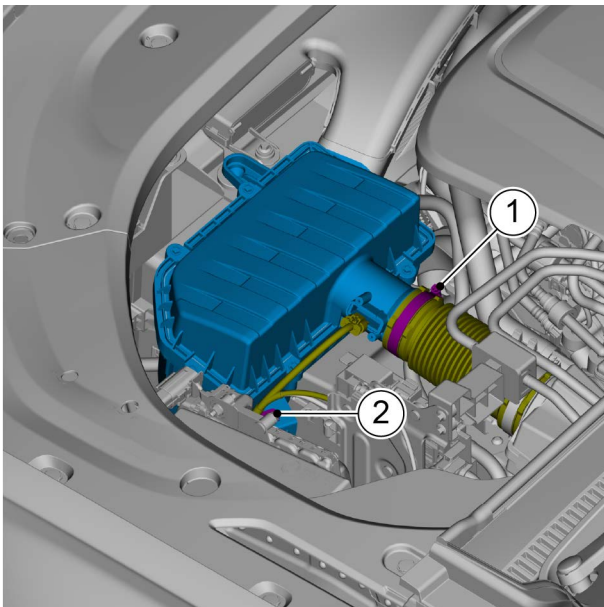


- 6 Disengage the two fixing clips connecting the air filter assembly and air filter intake pipe assembly, and take off the air filter assembly.

Installation Procedure



- 1 Install the air filter assembly, and connect the 2 fixing clips that connect the air filter assembly to the air filter intake pipe assembly.



- 2 Install the engine harness fixing clip 2.
- 3 Connect the air filter bellows to the air filter assembly and tighten the fixing clamp 1 of the air filter bellows.
Torque: 4.5 N·m

- 4 Install the air flow meter.
- 5 Connect the negative cable of battery.
- 6 Close the engine compartment cover.

2.6.7.3 Replacement of Air Filter Intake Pipe Assembly

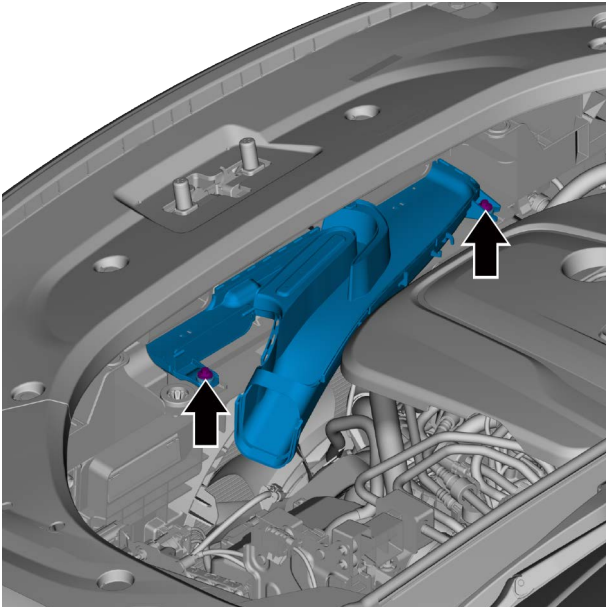
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

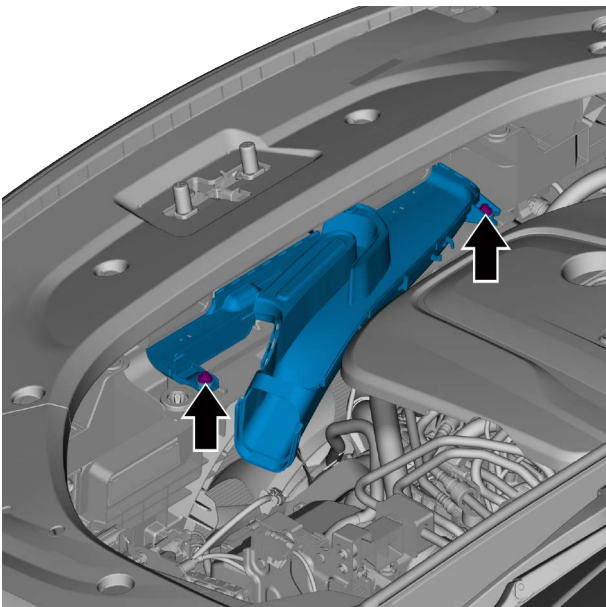
- 1 Open the engine compartment hood.

- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the air flow meter, see [Replacement of Air Flow Meter](#).
- 4 Remove the air filter assembly, see [Replacement of Air Filter Assembly](#).
- 5 Remove the air filter intake pipe assembly by removing the two fixing bolts of the air filter intake pipe assembly.



Installation Procedure

- 1 Install the air filter intake pipe assembly and tighten the two fixing bolts of the air filter intake pipe assembly.
Torque: 10N·m

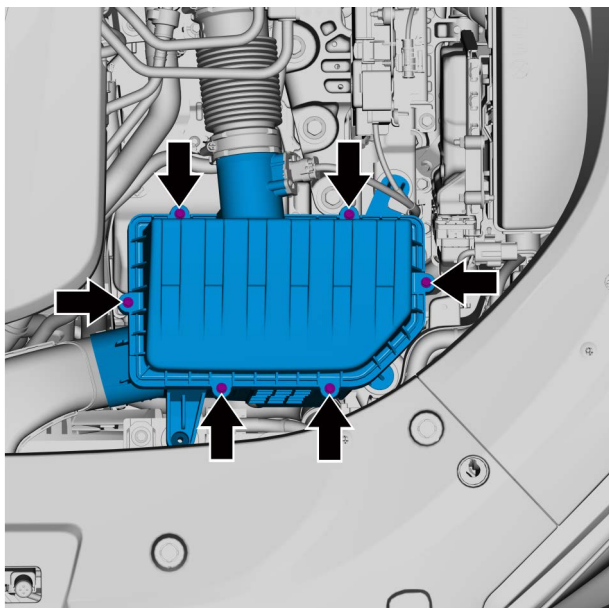


- 2 Install the air filter assembly.
- 3 Install the air flow meter.
- 4 Connect the negative cable of battery.
- 5 Close the engine compartment cover.

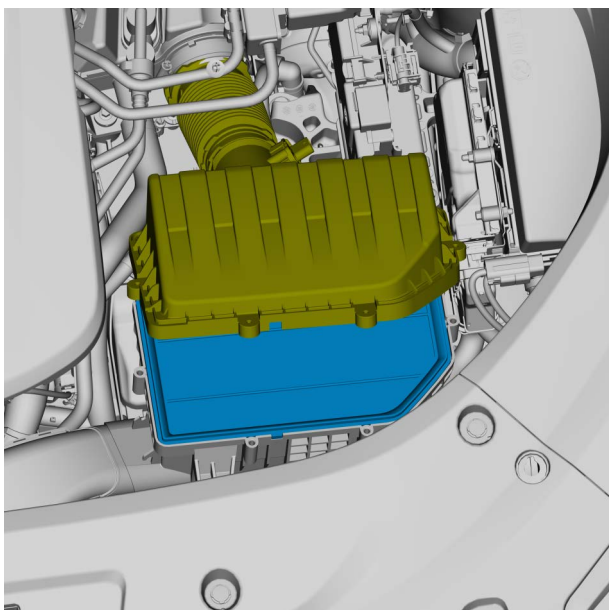
2.6.7.4 Replacement of Air Filter Element

Removal Procedure

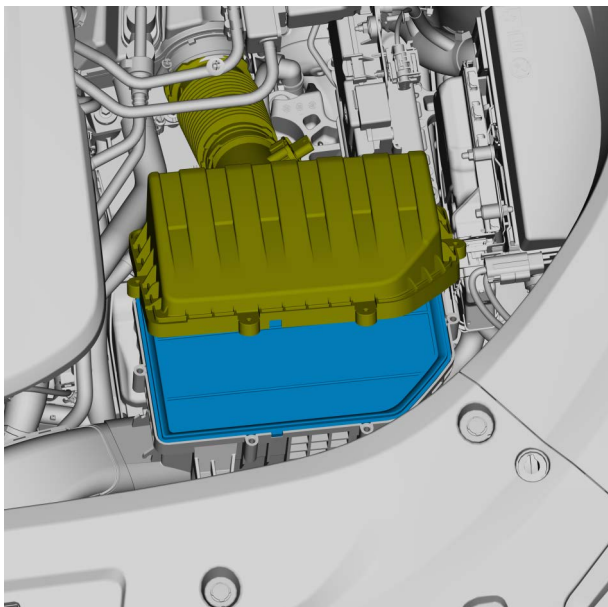
- 1 Open the engine compartment hood.
- 2 Remove the six fixing screws of the upper housing of the air filter.



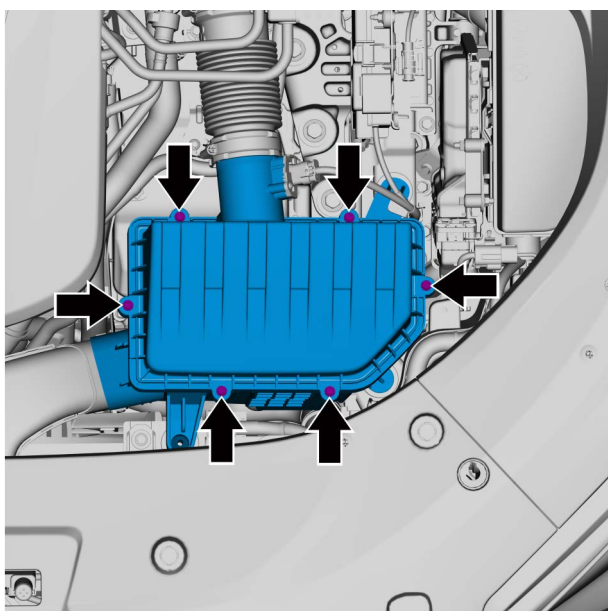
- 3 Remove the air filter element by lifting the upper air filter housing to the proper position.



Installation Procedure



1 Install the air filter element.



2 Install the upper housing of the air filter and tighten the six set screws of the upper housing of the air filter.

Torque: 1.7 N·m

3 Close the engine compartment cover.

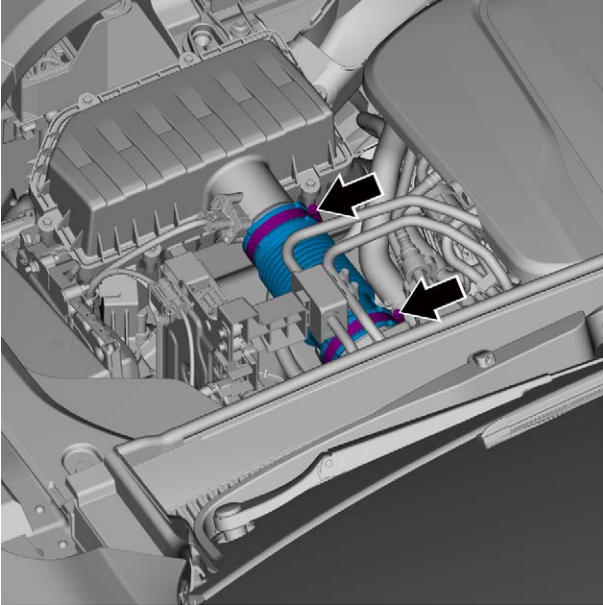
2.6.7.5 Replacement of Air Filter Bellows

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#).

- 1 Open the engine compartment hood.
- 2 Loosen the fixing clamps of the air filter bellows and remove the air filter bellows.

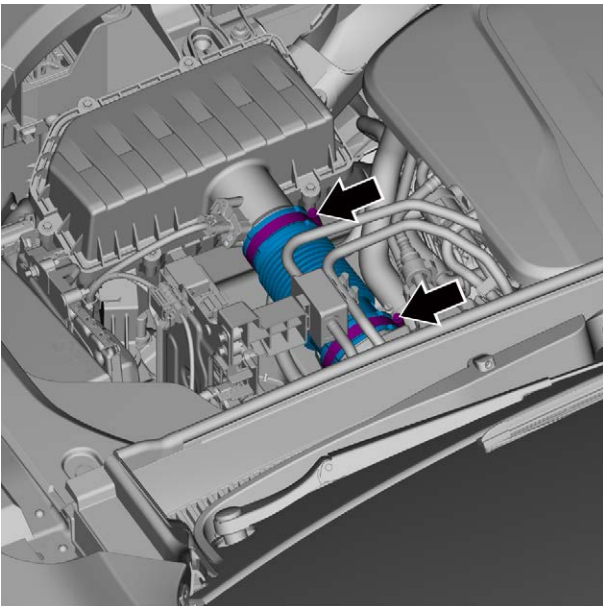
**Installation Procedure**

- 1 Install the air filter bellows and tighten the fixing clamps of the air filter bellows.

Torque: 4.5 N·m

Caution

Pipe orifices should be aligned with the markings for connecting.



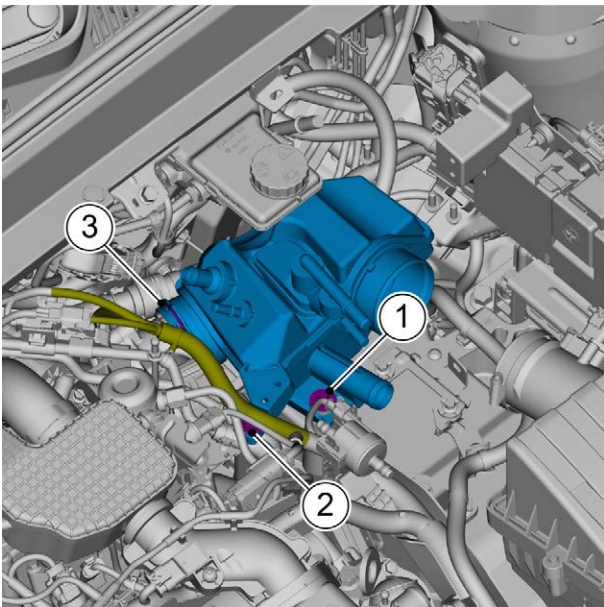
- 2 Close the engine compartment cover.

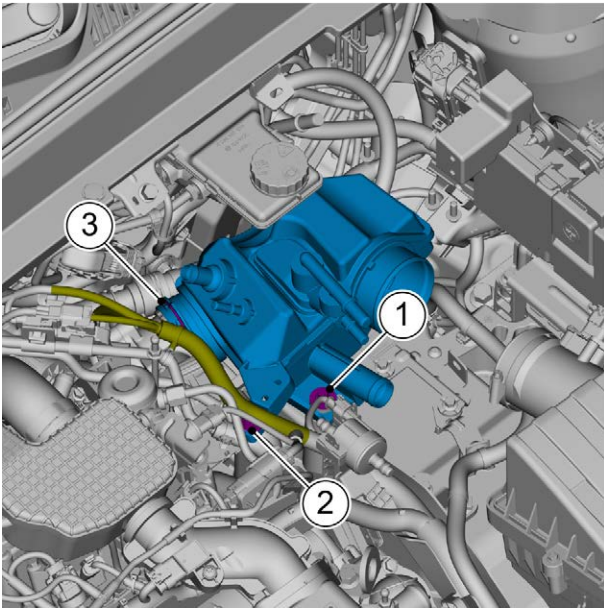
2.6.7.6 Replacement of Resonator Assembly**Removal Procedure**

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 4 Remove the carbon canister solenoid valve with line, see [Replacement of Carbon Canister Solenoid Valve with Line](#).
- 5 Remove the air filter bellows, see [Replacement of Air Filter Bellows](#).
- 6 Remove the engine bypass pipe, see [Replacement of Engine Bypass Pipe](#).
- 7 Remove the intake manifold detachment pipe, see [Replacement of Intake Manifold Detachment Pipe](#).
- 8 Remove the crankcase air vent tube, see [Replacement of Crankcase Air Vent Tube](#).
- 9 Remove the crankcase vent line, see [Replacement of Crankcase Vent Line](#).
- 10 Remove the fixing bolts 1 of the resonator assembly.
- 11 Remove the fixing clips 2 of the resonator assembly.
- 12 Unlock the quick insertion elastic circlips 3 and remove the resonator assembly.

**Installation Procedure**



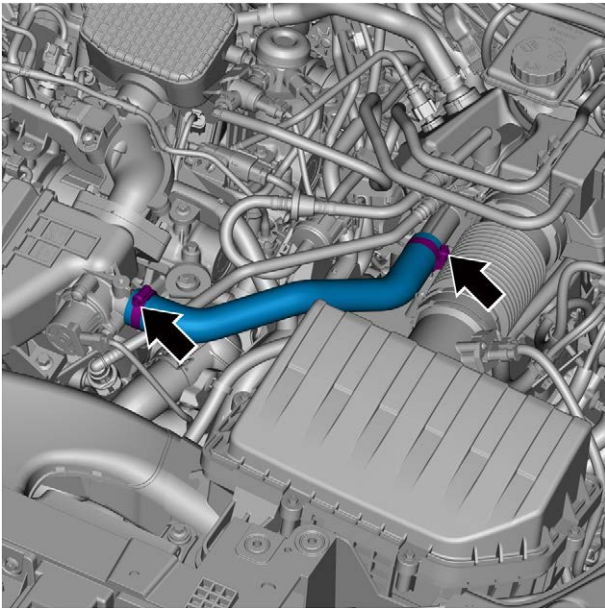
- 1 Install the resonator assembly.
- 2 Install quick-insertion elastic circlip 3.
- 3 Install the fixing clips 3 of the resonator assembly.
- 4 Install the fixing bolts 2 of the resonator assembly.

Torque: 10N·m

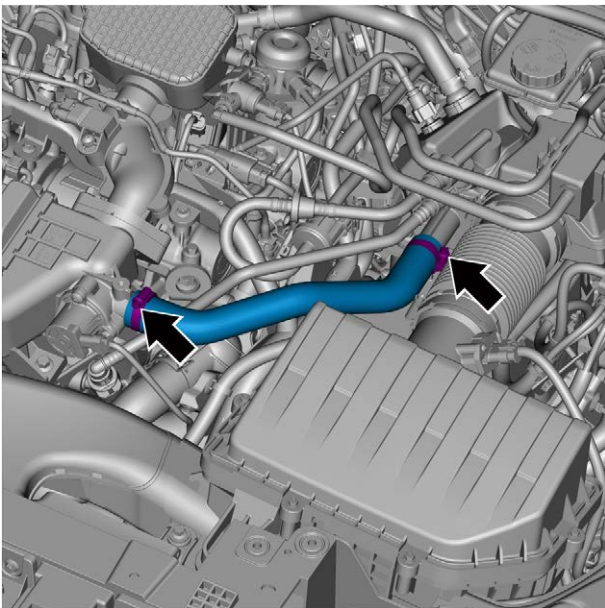
- 5 Install the crankcase vent tube.
- 6 Install the crankcase air vent line
- 7 Install the intake manifold detachment tube.
- 8 Install the engine bypass pipe.
- 9 Install the air filter bellows.
- 10 Install the carbon canister solenoid valve with line.
- 11 Install the engine trim cover assembly.
- 12 Connect the negative cable of battery.
- 13 Close the engine compartment cover.

2.6.7.7 Replacement of Engine Bypass Pipe

Removal Procedure



- 1 Open the engine compartment hood.
- 2 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 3 Loosen the two fixing clamps of the engine bypass pipe and remove the engine bypass pipe.



Installation Procedure

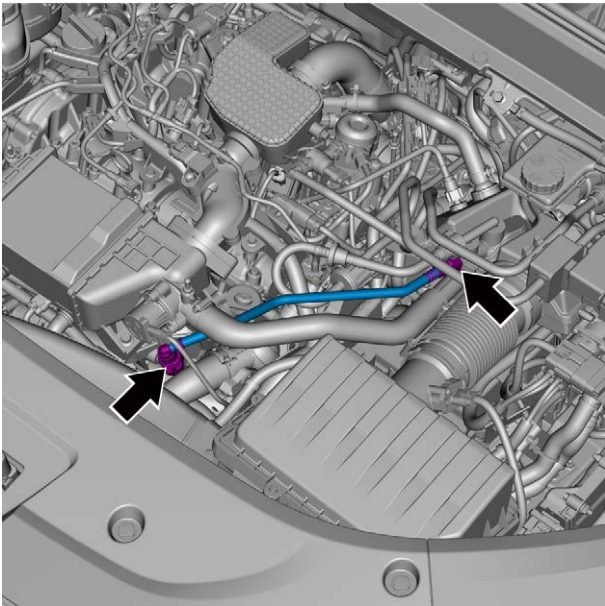
- 1 Install the engine bypass pipe and tighten the two fixing clamps of the engine bypass pipe.
Torque: 3.5 N·m

- 2 Install the engine trim cover assembly.
- 3 Close the engine compartment cover.

2.6.7.8 Replacement of Intake Manifold Detachment Pipe

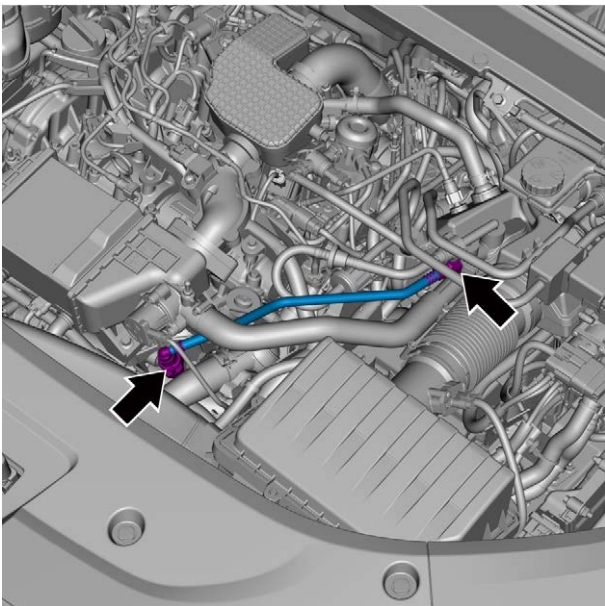
Removal Procedure

- 1 Open the engine compartment hood.
- 2 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 3 Remove the quick connector of the intake manifold detachment pipe and take off the engine bypass pipe.



Installation Procedure

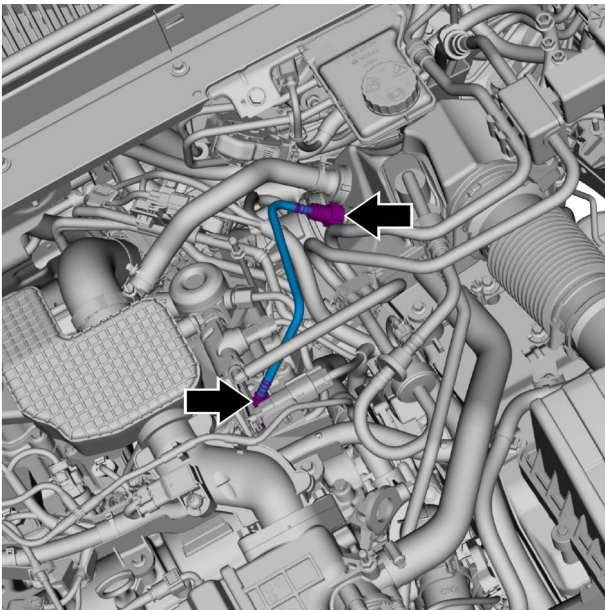
- 1 Connect the engine bypass pipe and install the quick connector of the intake manifold detachment pipe.



- 2 Install the engine trim cover assembly.
- 3 Close the engine compartment cover.

2.6.7.9 Replacement of Crankcase Air Vent Tube

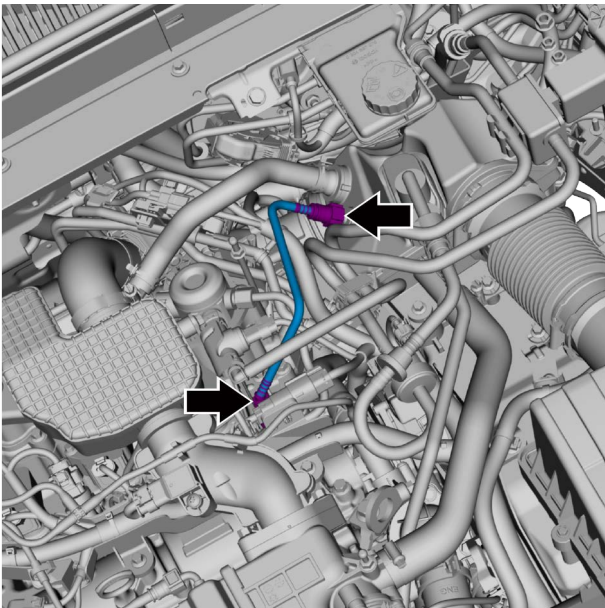
Removal Procedure



- 1 Open the engine compartment hood.
- 2 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 3 Remove the quick connector of the crankcase air vent tube and remove the crankcase air vent tube.

Installation Procedure

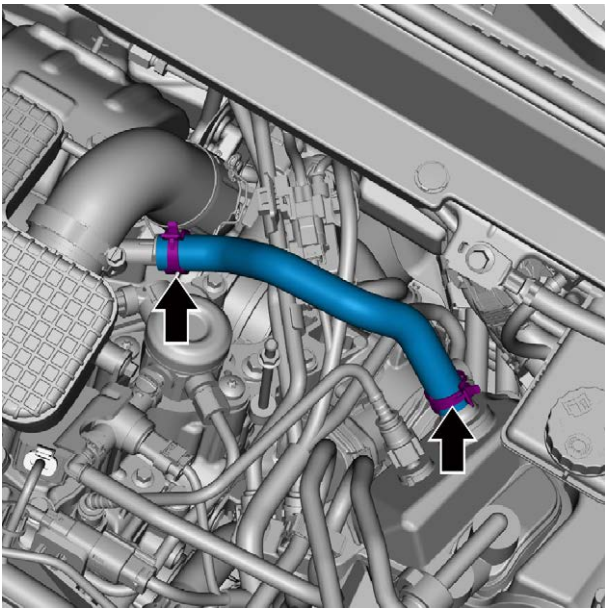
- 1 Install the crankcase air vent tube.
- 2 Install the quick connector of the crankcase air vent tube.



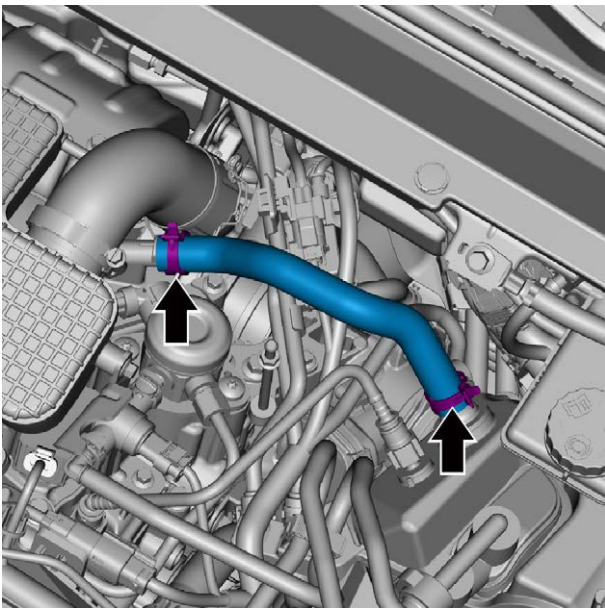
- 3 Install the engine trim cover assembly.
- 4 Close the engine compartment cover.

2.6.7.10 Replacement of Crankcase Air Vent Tube

Removal Procedure



- 1 Open the engine compartment hood.
- 2 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 3 Take off the crankcase vent tube by removing the fixing clamps of the crankcase vent tube.



Installation Procedure

- 1 Install the crankcase vent tube.
- 2 Install the fixing clamps of the crankcase ventilation pipe.

- 3 Install the engine trim cover assembly.
- 4 Close the engine compartment cover.

2.6.7.11 Replacement of Resonator

Removal Procedure

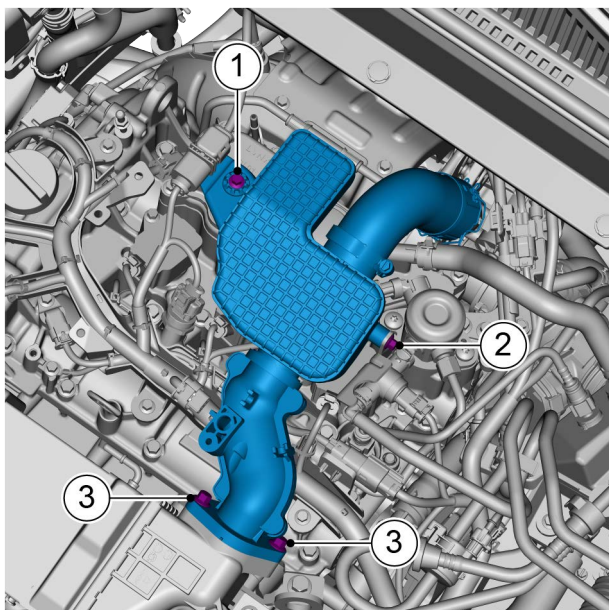
Warning !

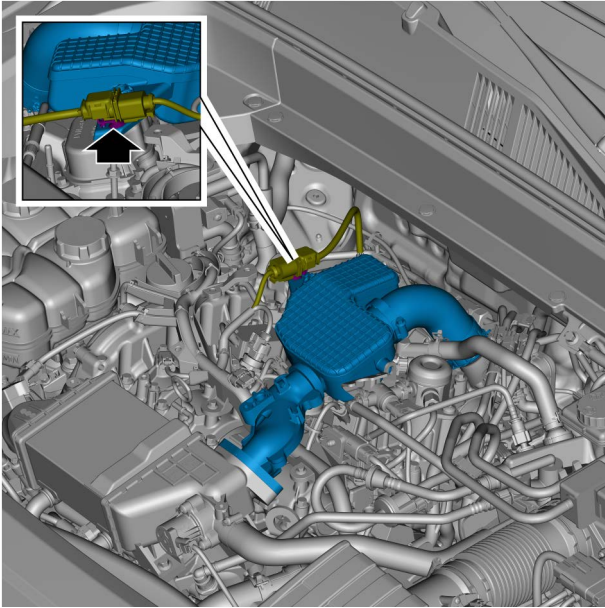
Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#).

Warning !

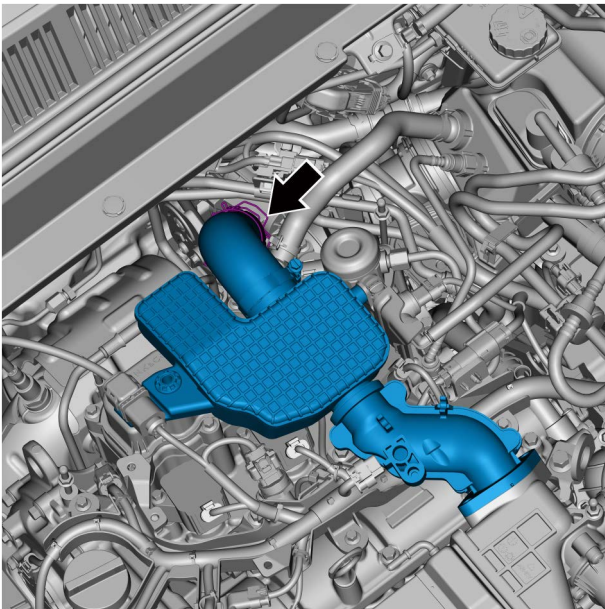
See "WARNING ABOUT COOLING SYSTEM MAINTENANCE" in ["WARNINGS AND PRECAUTIONS"](#).

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 4 Remove the degassing hose, see [Replacement of Degassing Hose](#).
- 5 Remove the temperature sensor, see [Replacement of Temperature Sensor](#).
- 6 Remove the fixing bolts 1 of the resonator.
- 7 Remove the fixing bolts 2 of the resonator.
- 8 Remove the two fixing bolts 3 of the resonator.



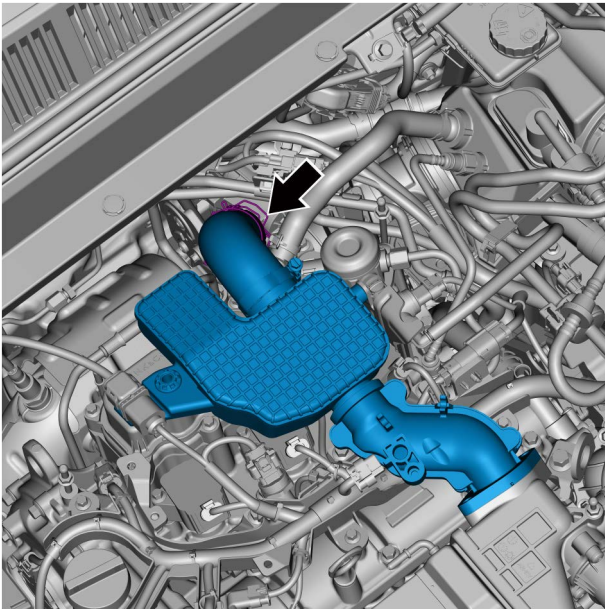


9 Remove the fixing clips of the engine harness.

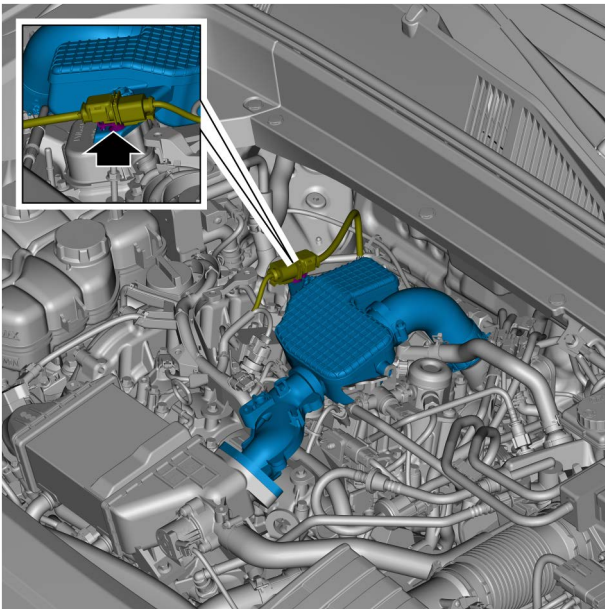


10 Remove the quick-insertion elastic spring circlips and take off the resonator.

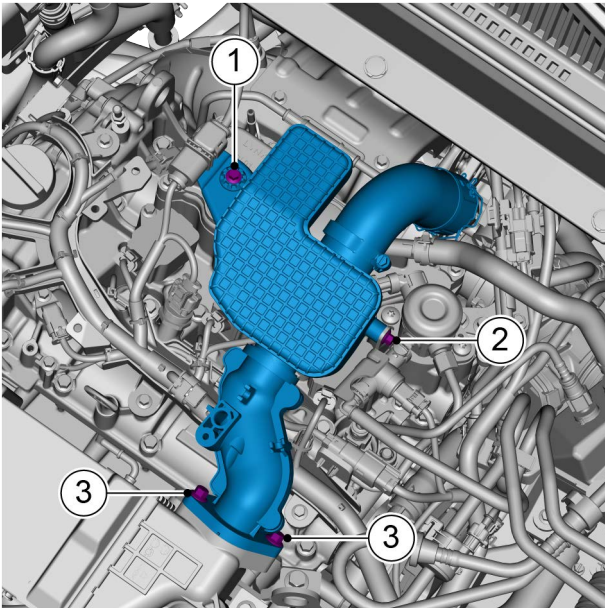
Installation Procedure



- 1 Install the resonator and reset the quick-insertion elastic spring.



- 2 Install the fixing clips of the engine harness.



- 3 Install and tighten the two fixing bolts 3 of the resonator.
Torque of Bolt 3: 24 N·m
- 4 Install and tighten the fixing bolts 2 of the resonator.
Torque of Bolt 2: 10 N·m
- 5 Install and tighten the fixing bolts 1 of the resonator.
Bolt 1 torque: 10 N·m

- 6 Install the temperature sensor.
- 7 Install the degassing hose.
- 8 Install the engine trim cover assembly.
- 9 Connect the negative cable of battery.
- 10 Close the engine compartment cover.

2.6.7.12 Replacement of Intake Manifold

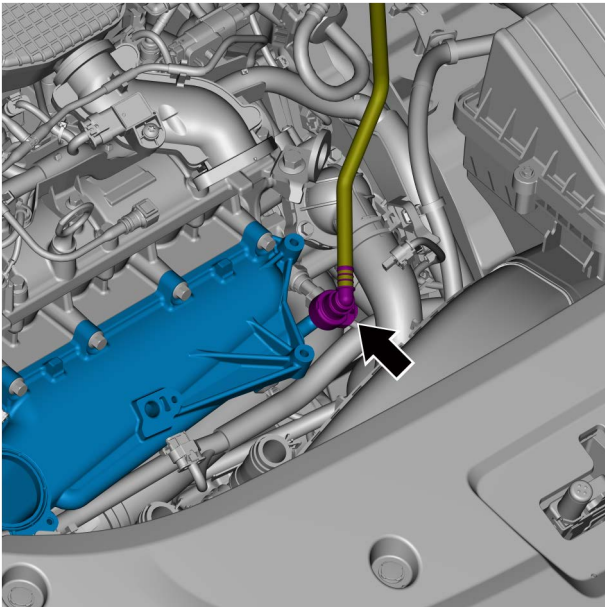
Removal Procedure

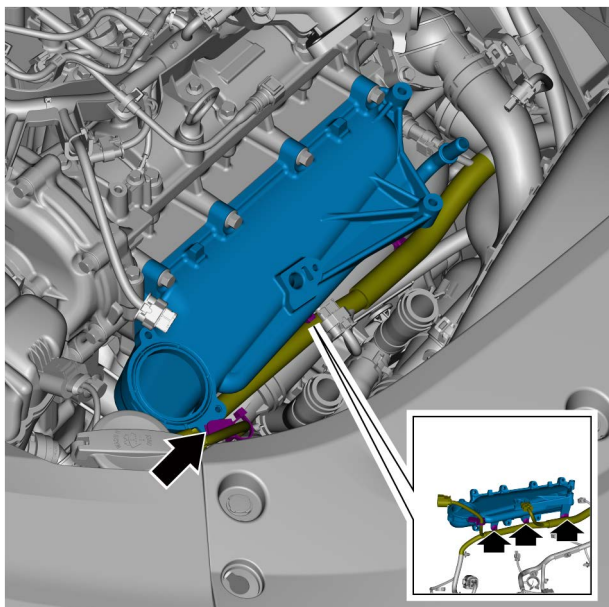
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 4 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 5 Drain the engine coolant, see [Draining and Filling of Engine Coolant](#).
- 6 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 7 Remove the intake air pressure and temperature sensor (water-cooled intercooler subassembly), see [Replacement of Intake Pressure and Temperature Sensor \(water-cooled intercooler subassembly\)](#).

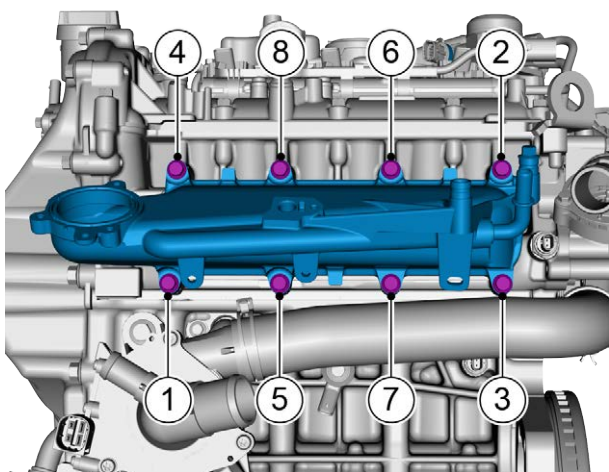
- 8 Remove the electric motor coolant valve, see [Replacement of Electric Motor Coolant Valve](#).
- 9 Remove the water-cooled intercooler subassembly, see [Replacement of Water-cooled Intercooler Subassembly](#).
- 10 Remove the air pressure and temperature sensor 1, see [Replacement of Air Pressure and Temperature Sensor 1](#).
- 11 Remove the throttle unit, see [Replacement of Throttle Unit](#).
- 12 Disconnect the quick connector of the intake manifold detachment tube, and move it aside.



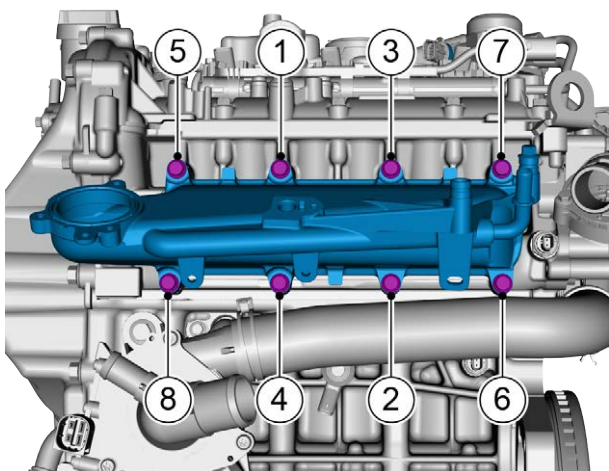


- 13 Remove the four harness clips from the engine and move it aside.

- 14 Remove the intake manifold by removing the eight fixing bolts of the intake manifold in the order shown.



Installation Procedure

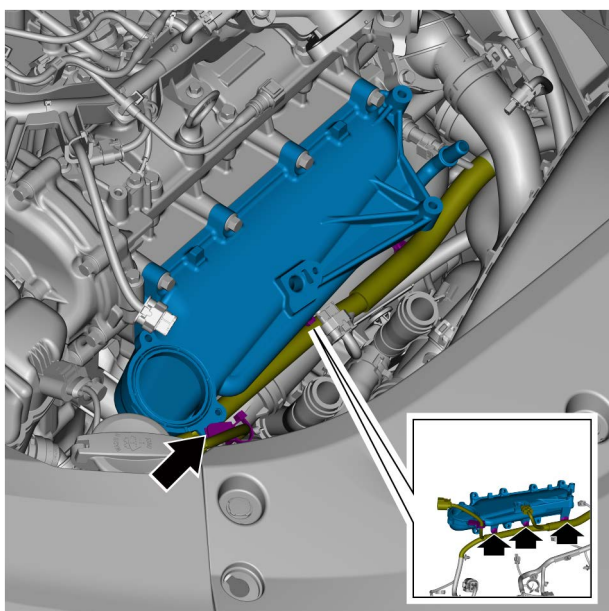


- 1 Install and pre-tighten the eight fixing bolts of the intake manifold, and tighten the eight fixing bolts of the intake manifold in the order shown.

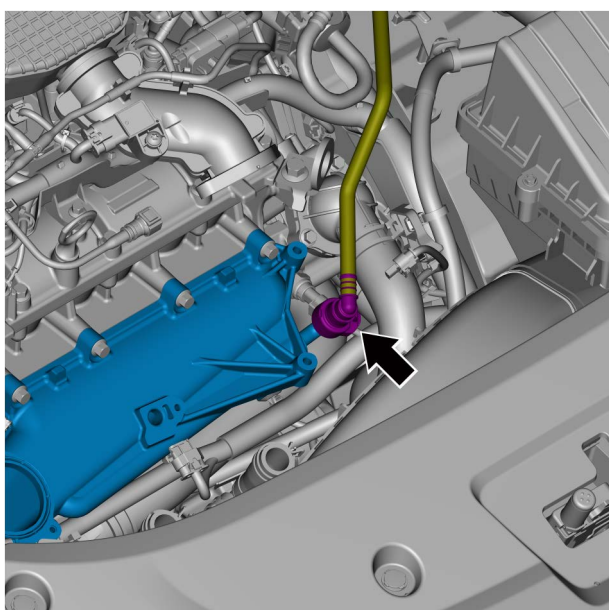
Torque: 17N·m

Caution

A new intake manifold gasket is required to replace.



- 2 Install the four harness clips of the engine.



- 3 Install the quick connector of the intake manifold detachment tube.

- 4 Install the throttle unit.
- 5 Install the air pressure and temperature sensor 1.
- 6 Install the water-cooled intercooler subassembly.
- 7 Install the electric motor coolant valve.
- 8 Install the intake pressure and temperature sensor (water-cooled intercooler subassembly).
- 9 Install the engine trim cover assembly.
- 10 Fill with the engine coolant.
- 11 Install the bottom engine guard assembly.
- 12 lower the vehicle.
- 13 Connect the negative cable of battery.
- 14 Start the vehicle to connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the liquid level of the expansion kettle. If the liquid level has dropped, you need to replenish the coolant in time. Until after the main circulation is opened, replenish the coolant to the upper scribe line of the expansion kettle, and tighten the lid of the expansion kettle.
- 15 Close the engine compartment cover.

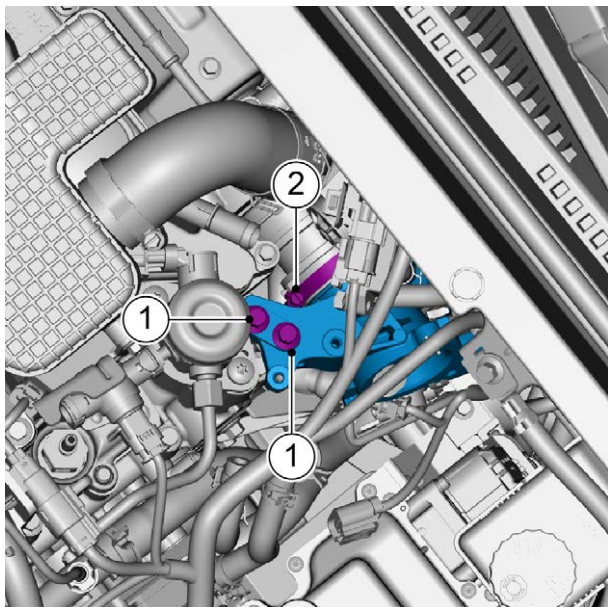
2.6.7.13 Replacement of Intake Pipe

Removal Procedure

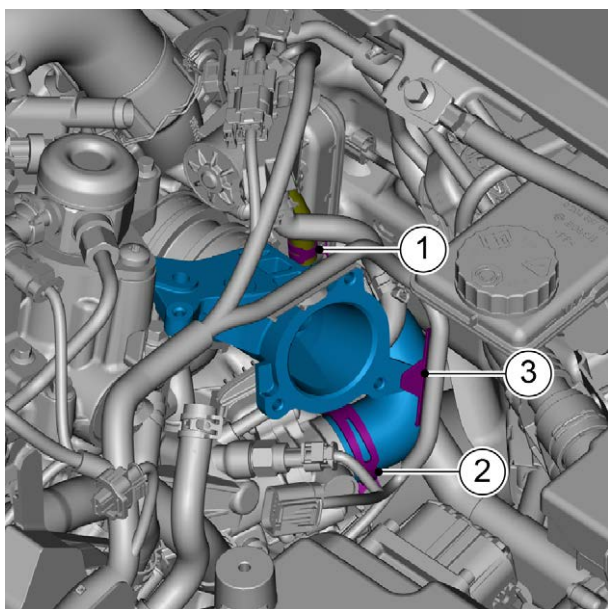
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 4 Remove the resonator assembly, see [Replacement of Resonator Assembly](#).
- 5 Remove the turbocharger water pipe subassembly, see [Replacement of Turbocharger Water Pipe Subassembly](#).
- 6 Remove the pressure regulating valve, , see [Replacement of Pressure Regulating Valve](#).

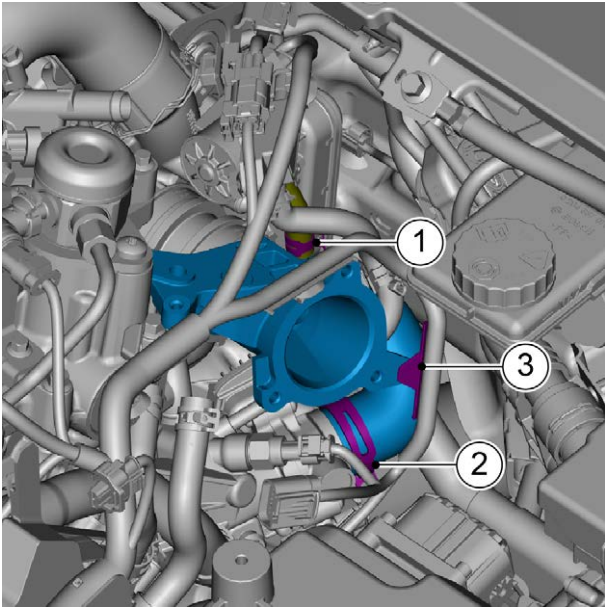


- 7 Remove the two fixing bolts 1 of the intake pipe.
- 8 Unscrew the worm clamp 2 of the low pressure sealing sleeve.



- 9 Remove the fixing clamp 1 of the low pressure end hose of the EGR differential pressure sensor and disengage the low pressure end hose of the EGR differential pressure sensor from the intake pipe. .
- 10 Remove the fixing clamp 2 of the EGR hose, and disengage the EGR hose from the EGR valve.
- 11 Remove the fixing clips 3 of the engine wiring harness and take off the intake pipe.

Installation Procedure



- 1 Install the intake pipe and the fixing clips 3 of the engine wiring harness.
- 2 Connect the EGR hose to the EGR valve and install the fixing clamp 2 of the EGR hose.

Caution

1. Make sure the marked ends are aligned.

2. Before installation, apply an appropriate amount of P80-like insertion aid to the pipe opening, and prohibit the use of motor oil and other oil substances as insertion aids.

- 3 Connect the low pressure end hose of the EGR differential pressure sensor to the intake pipe, and install the fixing clamp 1 of the low pressure end hose of the EGR differential pressure sensor.

Caution

1. Make sure the marked ends are aligned.

2. Before installation, apply an appropriate amount of P80-like insertion aid to the pipe opening, and prohibit the use of motor oil and other oil substances as insertion aids.

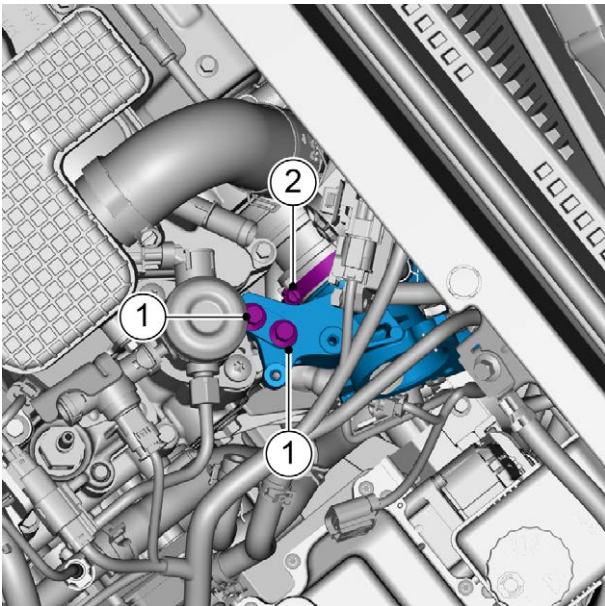
- 4 Tighten the worm clamp 2 of the low pressure sealing sleeve.

Torque: 3.5N·m

Caution

1. Before installation, apply an appropriate amount of P80-like insertion aid to the pipe opening, and prohibit the use of motor oil and other oil substances as insertion aids.

- 5 Install and tighten the two fixing bolts 1 of the intake pipe.
Torque: 24N·m



- 6 Install the pressure regulating valve.
- 7 Install the turbocharger water pipe subassembly.
- 8 Install the resonator assembly.
- 9 Install the engine trim cover assembly.
- 10 Connect the negative cable of battery.
- 11 Close the engine compartment cover.

2.7 Exhaust system (DHE15-ESZ)

2.7.1 Specification

2.7.1.1 Fastener specification

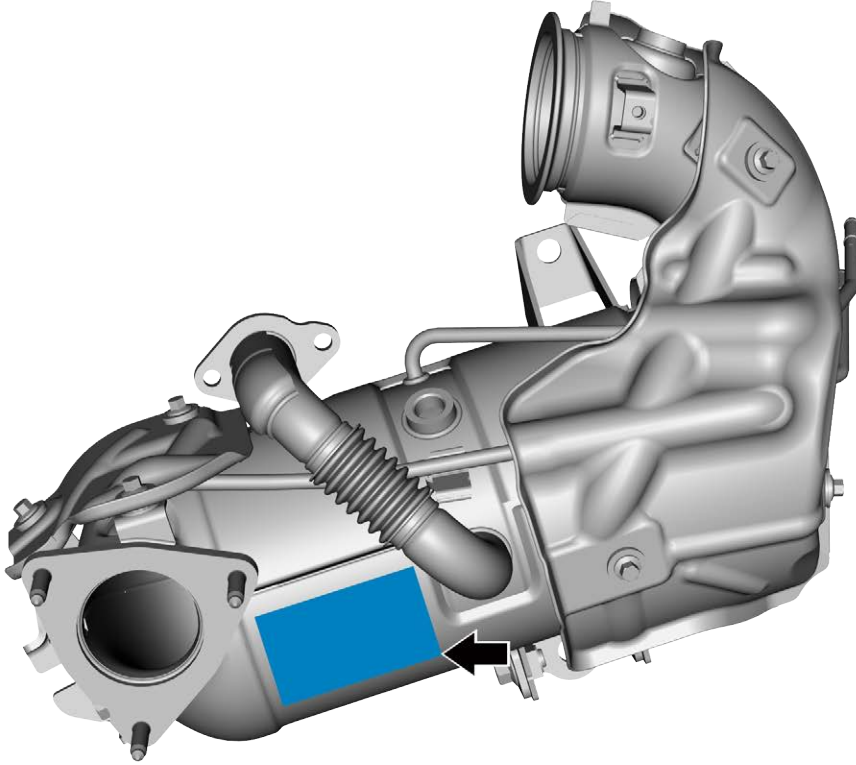
Fastener part	Model	Torque range (N·m)
Fixing nut between DC bus assembly and front channel heat shield (2)	M6	8.5-11.5
Fixing bolt between front access heat shield (2) and lower guard board mounting bracket	M8×25	20-28
Fixing nut between front channel heat shield (2) and right mounting bracket	M6	8.5-11.5
Fixing nut between front channel heat shield (2) and left mounting bracket	M6	8.5-11.5
Fixing bolt between front channel heat shield (1) and hybrid power battery assembly	M10×55	50-70
Fixing bolt between front channel heat shield (1) and front channel heat shield (2)	M6×16×19.3	8.5-11.5
Fixing bolts between rear channel heat shield and vehicle body	M8×25	20-28
Plastic nuts between rear channel heat shield and vehicle body	T5×11	2.2-2.8
Fixing bolts between rear muffler heat shield and rear bumper	M6×20	5-7
Fixing bolt between turbocharger and cylinder block	M8×32.5	21-25
Fixing nut between turbocharger and cylinder block	M8	21-25
Fixing bolt between turbocharger and turbocharger bracket	M8×45	20-28
Worm clamp for low pressure sealing sleeve	-	3-4
Fixing bolt between turbocharger heat shield and cylinder block	M6×20	8.5-11.5
Fixing nut between front exhaust pipe and GPF post catalytic converter	M8×9.4	20-28
Heat resistant nut between GPF post catalytic converter and exhaust gas circulation cooler	M8	26-30

Fastener part	Model	Torque range (N·m)
Fixing bolt between GPF post catalytic converter and engine	M10×25×30.65M	34-46
Fixing bolt between rubber lifting lug of exhaust pipe muffler assembly and vehicle body	M10×35	41-55
Fixing nut between exhaust pipe muffler assembly and front exhaust pipe	M8×9.4	20-28

2.7.1.2 Specification for Key Emission Parts

Name of Parts	Model	Emission level	Useful service life
Engine assembly	DHE15-ESZ	State VI	< 15 years or < 350,000 km
GPF catalytic converter	JL+PTP	State VI	5 years or 150,000 kilometers
Lambda probe (upstream oxygen sensor)	LSU 5.2	State VI	15 years or 250,000 kilometers
Lambda probe (downstream oxygen sensor)	LSF4 TSP	State VI	15 years or 250,000 kilometers

2.7.1.3 Decal Location of GPF Post Catalytic Converter



2.7.1.4 Decal Information Description of GPF Post Catalytic Converter



- 1. Environmental protection catalog number
- 2. Company Logo
- 3. Packaging company
- 4. Coating manufacturer
- 5. Carrier manufacturer
- 6. Airflow direction

- 7. Assembly manufacturer
- 8. Part No.
- 9. Internal code of manufacturer
- 10. Supplier code
- 11. Batch number
- 12. Country of origin

2.7.2 Instructions and operations

2.7.2.1 GPF Post Catalytic Converter

The GPF post-catalytic converter contains two parts, including a three-way catalytic converter and the GPF - the front part is a three-way catalytic converter, which is mainly used to reduce harmful gases and hydrocarbons in the exhaust gas. Catalytic converter - The active substances in the front part include platinum, palladium and rhodium. The converter reacts carbon monoxide (CO) and unburned hydrocarbons (HC) with oxygen to produce carbon dioxide (CO₂) and water (H₂O), and nitrogen oxides (NO_x) react with carbon monoxide (CO) and hydrocarbons (HC) to produce nitrogen (N₂), carbon dioxide (CO₂) and water (H₂O). The rear is the coated GPF, which mainly traps particulate matter in the exhaust gas and burns it to generate CO₂ under regenerative conditions, while the coated GPF also serves as part of the three-way catalytic converter to further purify gaseous pollutants. Oxygen front sensors and Lambda probe (downstream oxygen sensor) are located before and after the three-way catalytic converter respectively to measure the oxygen content in pre- and post-catalytic converter. That inside the stainless steel housing is a ceramic carrier arranged in a honeycomb pattern in the direction of the exhaust. The ceramic carrier is surrounded by a liner, the main function of which is to hold the ceramic carrier in place to prevent any contact or collision with the inner shell. The catalyst material is coated on the pore walls of the ceramic carrier.

2.7.2.2 Turbocharger subassembly

Turbocharger subassembly

The turbocharger subassembly is mainly used to increase the intake pressure. The turbocharger subassembly bypass valve is located on the turbocharger subassembly and is used to measure the intake pressure. The exhaust drives the impeller in the turbocharger subassembly to rotate at high speed, increasing the intake pressure and forcing more air into the combustion chamber.

The turbine control valve (exhaust gas bypass valve) is mainly used to control the underpressure of the turbocharger subassembly. The turbine control valve (exhaust gas bypass valve) has two pipes, one connecting to the vacuum pump (which generates the underpressure), and the other connecting to the exhaust valve. The turbine control valve (exhaust gas bypass valve) is controlled by the engine control module (ECM).

Particle Trap (GPF)

The State VI emission regulations impose stricter requirements for particulate emissions from gasoline vehicles, with a 33% decrease in the particulate mass (PM) limit compared to

the State V regulations, and new requirements for the particulate number (PN) are added in limit. For this reason, a particle trap (GPF) has been added to the vehicle exhaust system. The GPF is a wall-flow type particle trap with a number of parallel orifices in the filter body, with two adjacent orifices, one open only at the inlet and the other only at the outlet. Exhaust flows from the open inlet channel, and is discharged through the porous wall of the GPF carrier to the adjacent channel, while particles are retained in the pore, thus realizing the trapping effect. Although the GPF can effectively trap particles in the exhaust, with the increase of the trapped particles, the back pressure of the exhaust will also increase, which affects the power and economy of the vehicle. Therefore, when the particles in the GPF accumulate to a certain extent, the particles in the GPF are oxidized and burned by adjusting the engine operating conditions (e.g., fuel cut-off, delayed ignition angle, etc.), i.e., regeneration of the GPF, and the particles in the GPF are removed. The virtuous cycle of "capture-regeneration-capture" is finally realized.

Differential Pressure Sensor

The differential pressure sensor is to detect the pressure change of the GPF, because the collected particles will be temporarily stored inside the GPF, with the increasing particles will affect the exhaust efficiency. If these particulate matter are not disposed of at the appropriate time, it may affect vehicle performance or even damage the GPF. Installing a sensor can detect the pressure difference between the intake and exhaust of GPF, so the pressure sensor is also known as the particulate filter pressure sensor.

2.7.3 System working principles

2.7.3.1 System working principles

The GPF post-catalytic converter contains two parts, including the three-way catalytic converter and the GPF - the front part is a three-way catalytic converter, which is mainly used to reduce harmful gases and hydrocarbons in the exhaust gas. Catalytic converter - The active substances in the front part include platinum, palladium and rhodium. The converter reacts carbon monoxide (CO) and unburned hydrocarbons (HC) with oxygen to produce carbon dioxide (CO₂) and water (H₂O), and nitrogen oxides (NO_x) react with carbon monoxide (CO) and hydrocarbons (HC) to produce nitrogen (N₂), carbon dioxide (CO₂) and water (H₂O). The rear is the coated GPF, which mainly traps particulate matter in the exhaust gas and burns it to generate CO₂ under regenerative conditions, while the coated GPF also serves as part of the three-way catalytic converter to further purify gaseous pollutants. Oxygen front sensors and Lambda probe (downstream oxygen sensor) are located before and after the three-way catalytic converter to measure the oxygen content in front and rear of the catalytic converter. Inside the stainless steel housing is a ceramic carrier arranged in a honeycomb pattern in the direction of the exhaust. The ceramic carrier is surrounded by a liner, the main function of which is to hold the ceramic carrier in place to prevent any contact or collision with the inner shell. The catalyst material is applied to the pore walls of the ceramic carrier. The DHE15-ESZ engine utilizes an exhaust turbocharger subassembly. With turbocharging the engine fuel economy and power are dramatically improved due to the increased intake efficiency.

The basic structure of the turbocharger subassembly is:

Compressor: compressing air to increase intake air density.

Turbine: utilizing exhaust energy to drive the compressor to do work on the intake air.

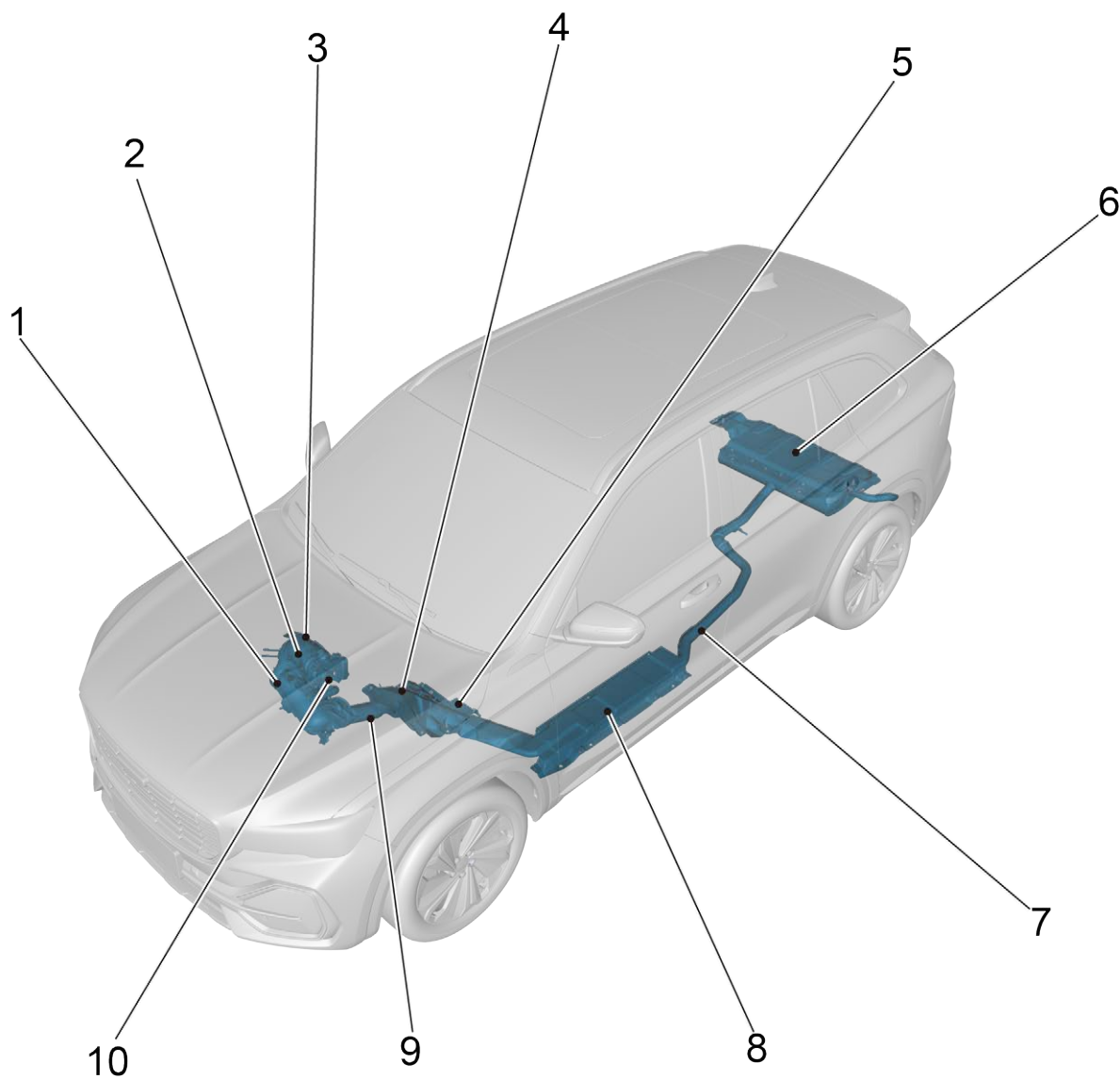
Intermediate body: support, lubrication, sealing and cooling.

Operating principle of turbocharger subassembly

The turbocharger subassembly is actually a kind of air compressor that increases the intake density of the engine by compressing air. It utilizes the exhaust gas discharged from the engine to push the turbine, and meanwhile, the turbine drives the coaxial pressure wheel, so that the pressure wheel compresses the fresh air introduced from the air filter pipeline and pressurizes it into the cylinder. When the engine speed increases, the exhaust gas flow and turbine speed is also synchronized to increase, the pressure wheel will compress more air into the cylinder, so that the engine can burn more fuel, and ultimately increase the output power of the engine.

2.7.4 Part position

2.7.4.1 Exhaust system Parts Location Diagram



1. GPF Post Catalytic Converter

2. Turbocharger subassembly

3. Heat shield

4. Front channel heat shield (2)

5. Front channel heat shield (1)

6. Rear muffler heat shield

7. Exhaust muffler assembly

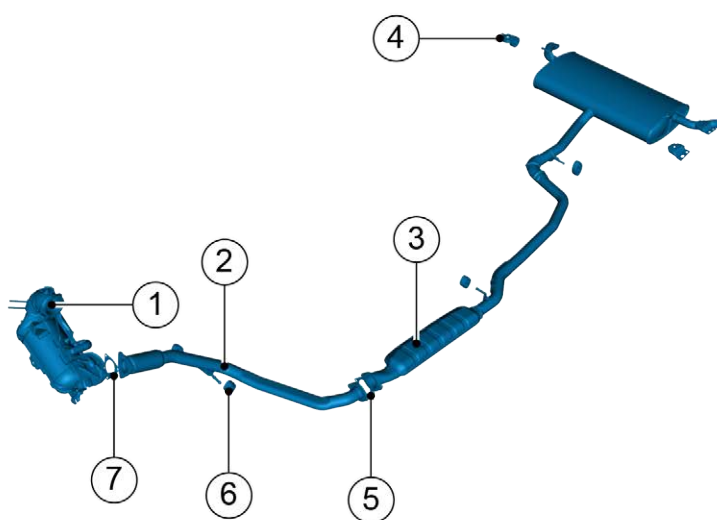
8. Rear channel heat shield

9. Front exhaust pipe

10. Turbocharger heat shield

2.7.5 Breakdown drawing

2.7.5.1 Breakdown drawing



- | | | | |
|----|------------------------------|----|----------------|
| 1. | GPF Post Catalytic Converter | 5. | Sealing gasket |
| 2. | Front exhaust pipe | 6. | Rubber lugs |
| 3. | Exhaust muffler assembly | 7. | Sealing washer |
| 4. | Rubber lugs | | |

2.7.6 Diagnostic Information and Procedures

2.7.6.1 Diagnosis description

See Description and Operation and System Operating Principles before diagnosing a fault in the exhaust system. Understanding and familiarizing yourself with the operating principles of the exhaust system before beginning system diagnostics will determine the correct troubleshooting steps to take in the event of a malfunction, and more importantly, this will help if the condition described by the customer is normal operation. Any troubleshooting of the exhaust system should begin with a visual inspection that guides the serviceman to the next logical step in the troubleshooting process. Understanding and using the diagnostic process correctly will shorten the diagnostic time and avoid mis-diagnosis of the faulty part.

2.7.6.2 Visual check

- Check for aftermarket retrofitting devices that may affect the operation of the exhaust system to ensure that they cannot affect the proper functioning of the exhaust system.
- Inspect easily accessible or visible system components for obvious blockages or external leaks.
- Check if the exhaust gas color in the exhaust pipe is normal.

2.7.6.3 Exhaust System Blockage

When there is any engine power loss, poor fuel economy or poor acceleration performance, check whether there is a "exhaust system blockage" fault. Using an exhaust back pressure gauge to monitor whether the system back pressure exceeds 48 kPa to confirm the fault, Possible causes include as follows:

- Damaged exhaust pipe.
- Debris in exhaust pipe.
- Internal muffler or resonator failure.
- Internal rust in the exhaust pipe blocking the exhaust port.
- Excessive accumulation of GPF particles and failure to regenerate faults in time.

2.7.6.4 Exhaust System Leakage

If the engine makes a "hissing" or popping sound when running, check for the "exhaust system Leakage" fault, as shown in the table below:

Fault suspects	Repair solution
Misalignment or incorrectly installed exhaust system parts	-Position and tighten the exhaust system components to the specified torque. -Make sure the exhaust hanger is in the correct position and is not loose.
Exhaust leakage exists at the following connections: -Turbocharger subassembly to GPF post-catalytic converter.	Tighten relevant parts to the specified torque.
Leakage seals or gaskets: -Turbocharger subassembly and assembly -Turbocharger subassembly and assembly to GPF post catalytic converter - GPF post catalytic converter and front exhaust pipe - Front exhaust pipe and exhaust muffler assembly	Replace leaking seals or gaskets.
Irregular mating surfaces at flange connection	Repair or replace related parts if necessary.
Leakage at welded joint of exhaust system parts	Replace leaking parts.

2.7.6.5 Exhaust System Noise

When the engine is running with loud or abnormal exhaust sound, it is necessary to check for the presence of the "exhaust system noise" malfunction, as shown in the table below:

Faults	Repair solution
Popping or hissing sound	Exhaust system is leaking, see Exhaust System Blockage .
High exhaust noise	1. Compare with vehicles known to be in good condition.
	2. Check for damaged or faulty muffler assembly. Replace any defective muffler assembly.
	3. Replace the turbocharger subassembly, the GPF post catalytic converter, and the muffler.
External or vibration noise	1. Check for bent or loose hooks, loose heat shields or fasteners.
	2. Check for interference from the exhaust pipe.
Internal noise	1. Tap these parts with a rubber mallet to confirm the noise.
	2. Replace the defective turbocharger subassembly, GPF post catalytic converter, exhaust muffler assembly or front exhaust pipe.

2.7.6.6 Precaution for Repair of Exhaust System

Warning !

See "Warning about Maintenance of Exhaust System" in "WARNING AND PRECAUTION".

Warning !

A broken GPF post-catalytic converter must be replaced. Using the exhaust system with the removed GPF post-catalytic converter is not permitted, as serious air contamination may occur.

Caution

The GPF post-catalytic converter may be damaged or fail in case of the following:

- Operating beyond the limit of the closed-loop mixture control system.
- A large amount of engine oil is burned in engine.
- Excessive exhaust gas temperature at the three-way catalytic cleaner.

Caution

-Leaded gasoline cannot be used in any vehicle with a GPF post-catalytic converter. Lead can contaminate the GPF post-catalytic converter.

- Do not drop the GPF post-catalytic converter as this may damage the ceramic carrier.
- Do not allow water, engine oil or fuel to enter the converter as this may contaminate the ceramic carrier.
- Do not start the vehicle with engine misfires or disconnected spark plug leads.

2.7.7 Removal and Installation

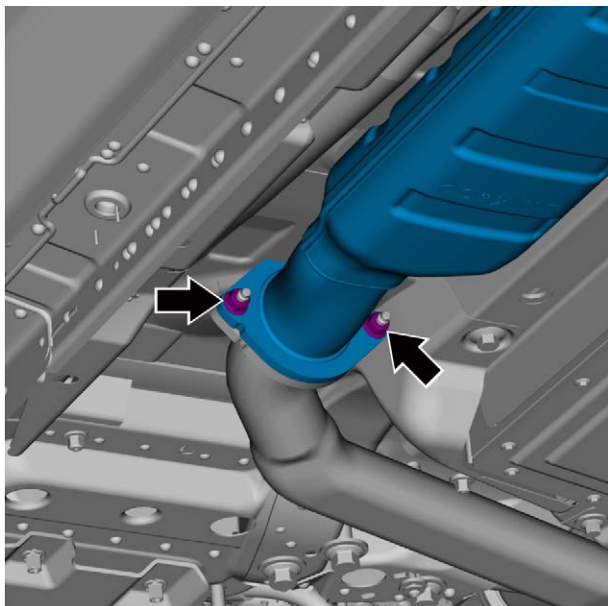
2.7.7.1 Replacement of Exhaust Pipe Muffler Assembly

Removal Procedure

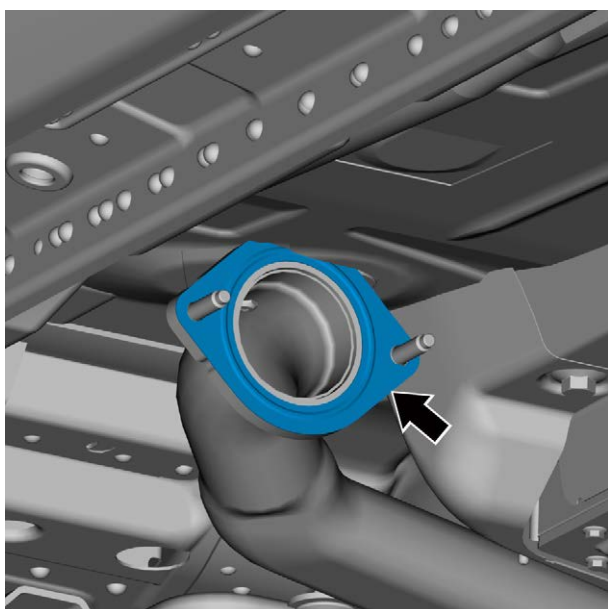
Warning !

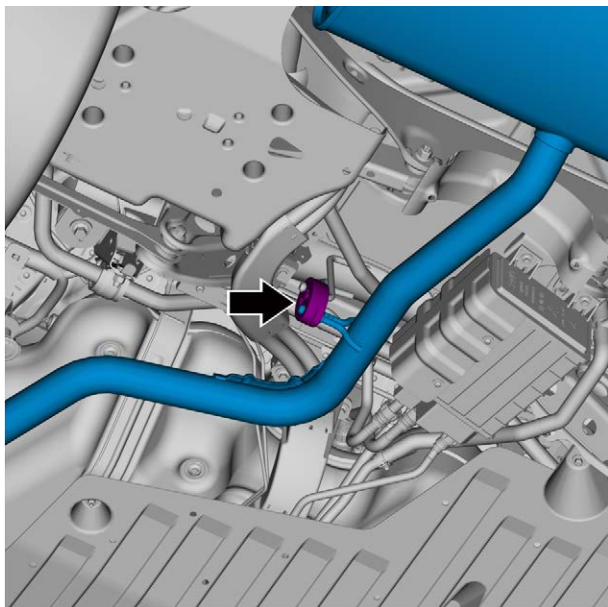
See "Warning about Exhaust System Maintenance" in "[Warning and Precaution](#)".

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the two fixing nuts between exhaust pipe muffler assembly and front exhaust pipe.

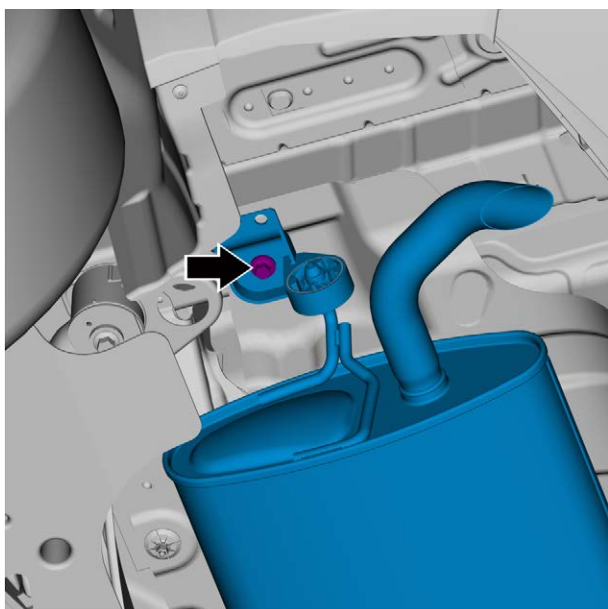


- 3 Remove the exhaust pipe gasket.





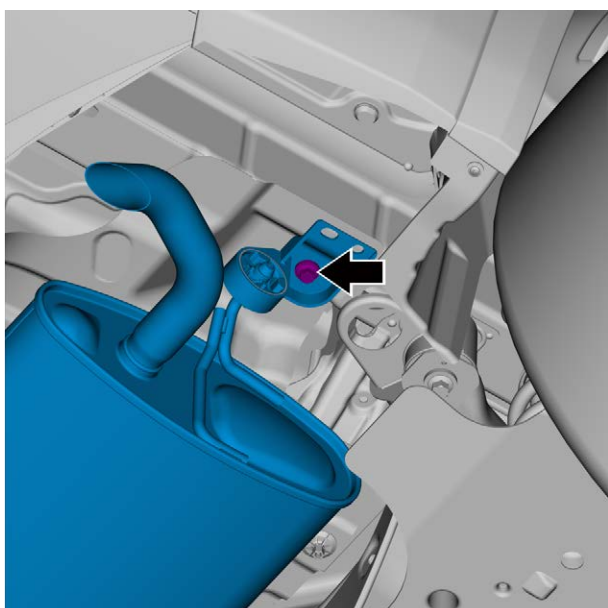
- 4 Disconnect the rubber lifting lug from the exhaust pipe muffler assembly.



- 5 Remove the fixing bolts of the left rubber lifting lug.

Caution

Pay attention to the sliding of the exhaust pipe muffler assembly.



- 6 Remove the fixing bolts of the right rubber lug and take off the exhaust pipe muffler assembly.

Caution

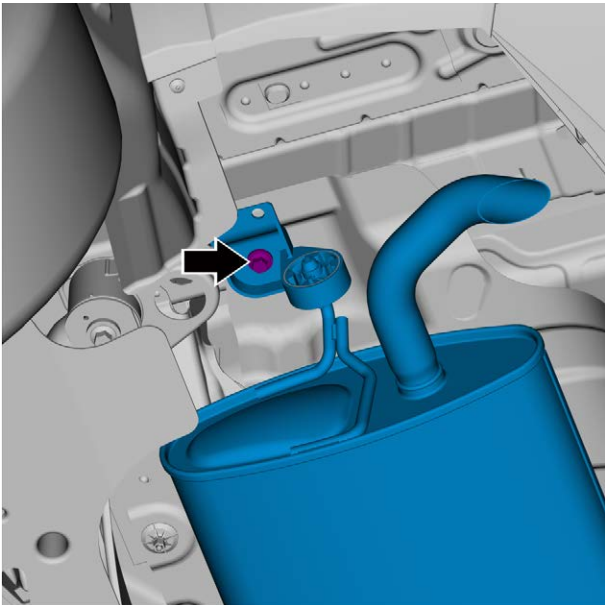
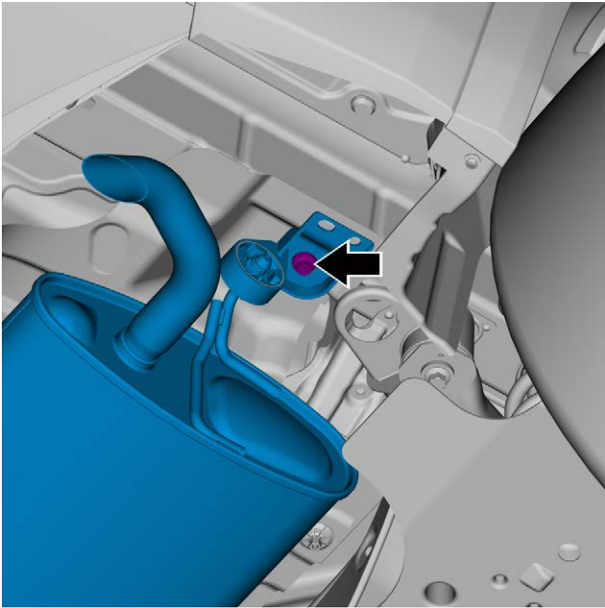
Requires 2 people to assist in removal.

Installation Procedure

- 1 Install the exhaust pipe muffler assembly and tighten the fixing bolt of the right rubber lifting lug.

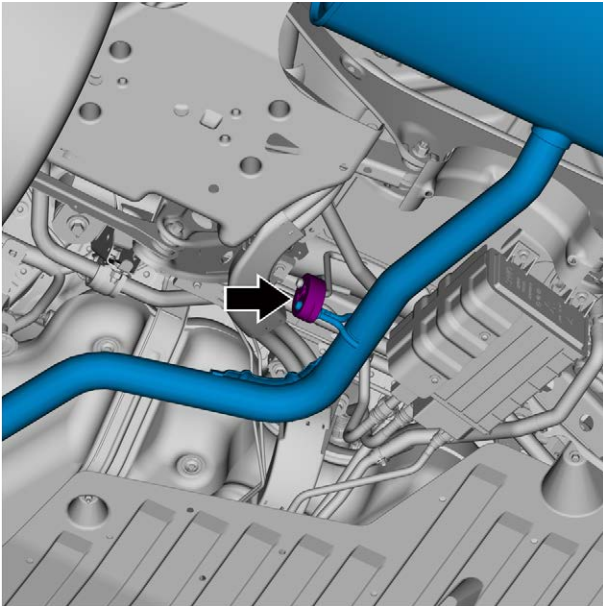
Caution

Two people are required to assist in installation and pay attention to slipping.

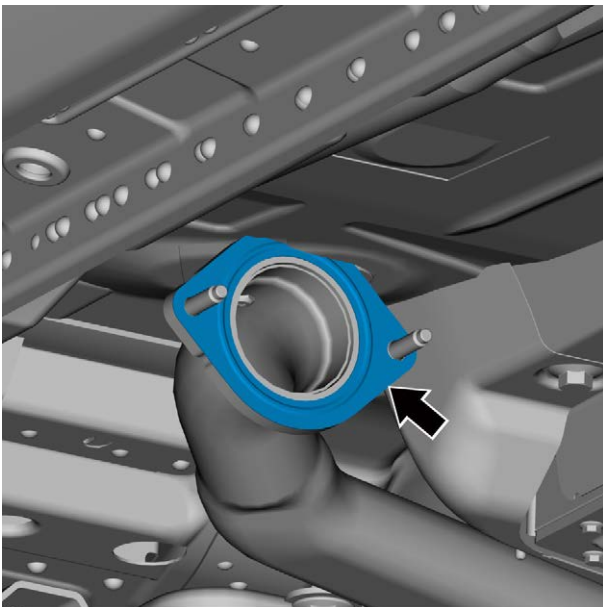


- 2 Install and tighten the fixing bolts of the left rubber lifting lug.

Torque: 48 N·m



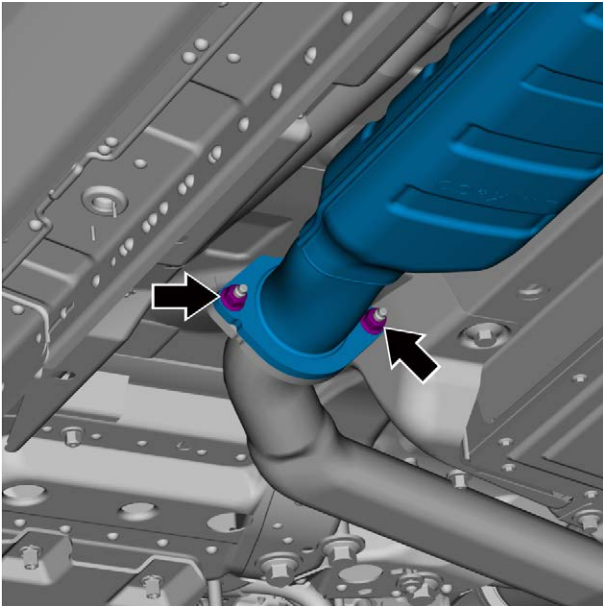
- 3 Connect the rubber lifting lugs to the exhaust pipe muffer assembly.



- 4 Install the exhaust pipe gasket.

Caution

A new exhaust pipe gasket need to be replaced.



- 5 Install and tighten the two fixing nuts that connect the exhaust pipe muffler assembly to the front exhaust pipe.
Torque: 24 N·m

- 6 lower the vehicle.

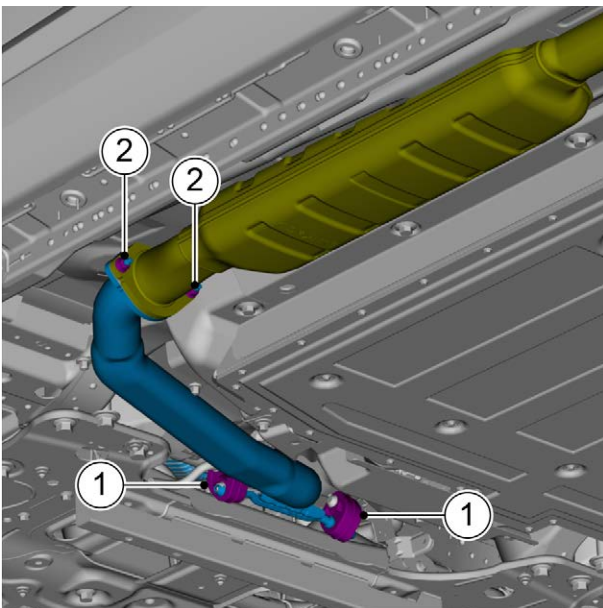
2.7.7.2 Replacement of Front Exhaust Pipe

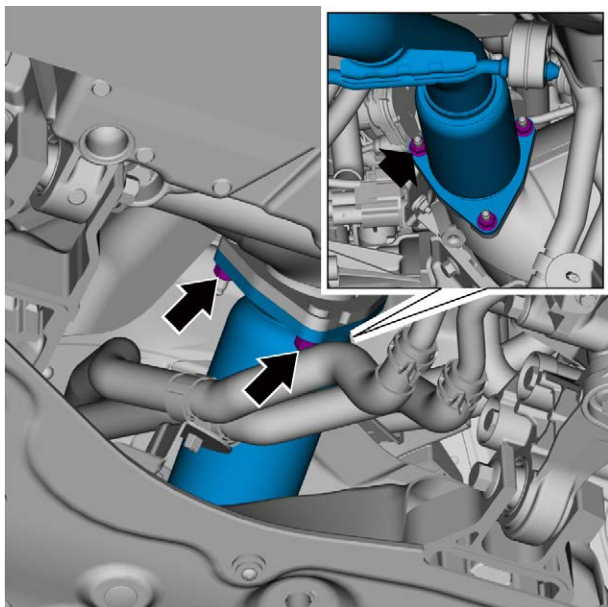
Removal Procedure

Warning !

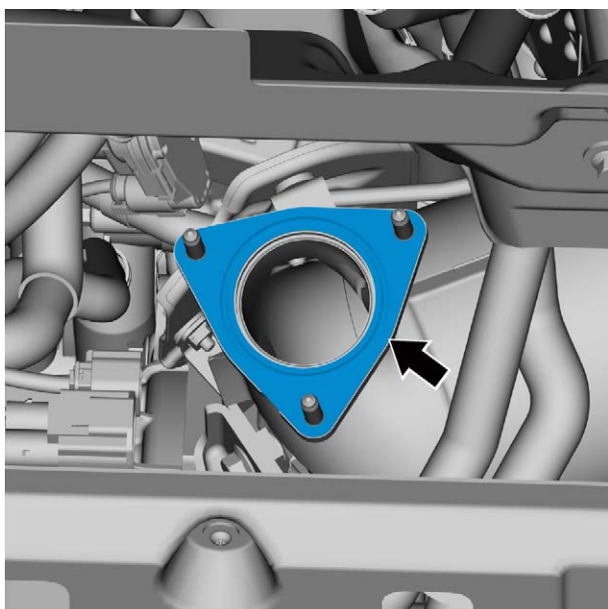
See "Warning about Exhaust System Maintenance" in "[Warning and Precaution](#)".

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 3 Disconnect the rubber lifting lug 1 from the front exhaust pipe.
- 4 Disconnect the front exhaust pipe from the exhaust pipe muffler assembly by removing the two fixing nuts 2 that connect the front exhaust pipe to the exhaust pipe muffler assembly.



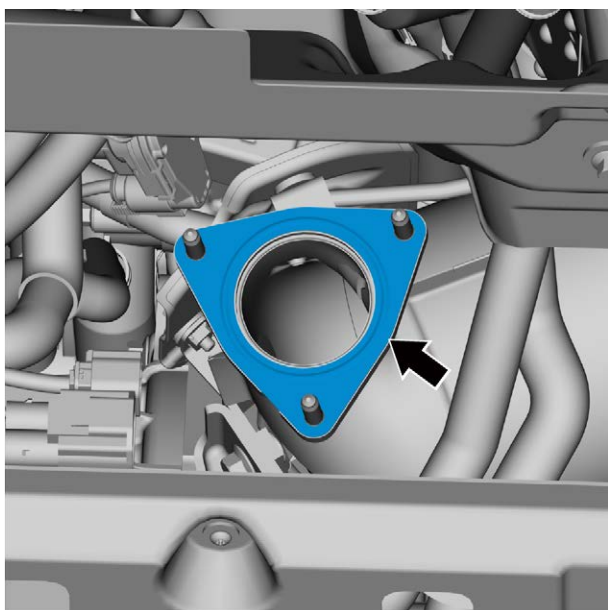


- 5 Remove the three fixing nuts connecting the front exhaust pipe to the GPF post catalytic converter and take off the front exhaust pipe.



- 6 Remove the exhaust pipe gasket.

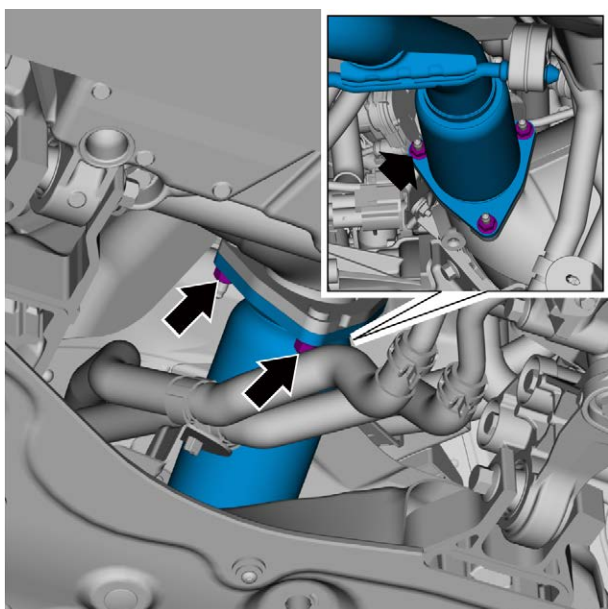
Installation Procedure



- 1 Install the exhaust pipe gasket.

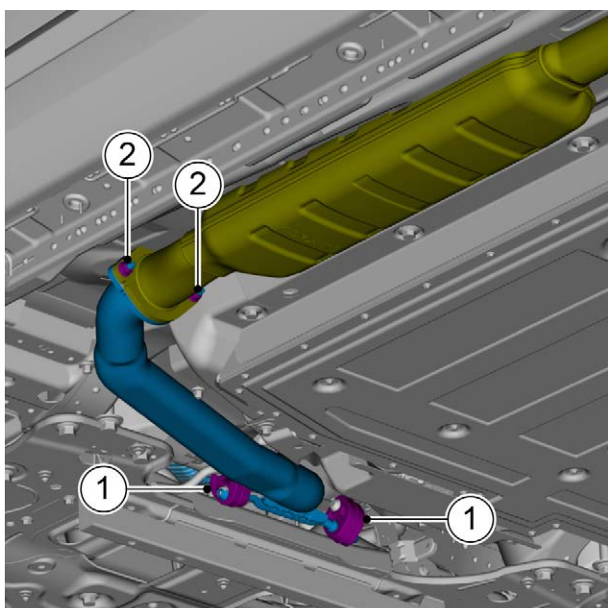
Caution

Replace the exhaust pipe gasket with a new one.



- 2 Install the front exhaust pipe and tighten the three fixing nuts connecting the front exhaust pipe to the GPF post catalytic converter.

Torque: 24 N·m



- 3 Connect the front exhaust pipe to the exhaust muffler assembly and tighten the two fixing nuts 2 that connect the front exhaust pipe to the exhaust muffler assembly.

Torque: 24 N·m

- 4 Connect the rubber lifting lugs 1 to the front exhaust pipe.

- 5 Install the bottom engine guard assembly.
- 6 lower the vehicle.

2.7.7.3 Replacement GPF Post Catalytic Converter

Removal Procedure

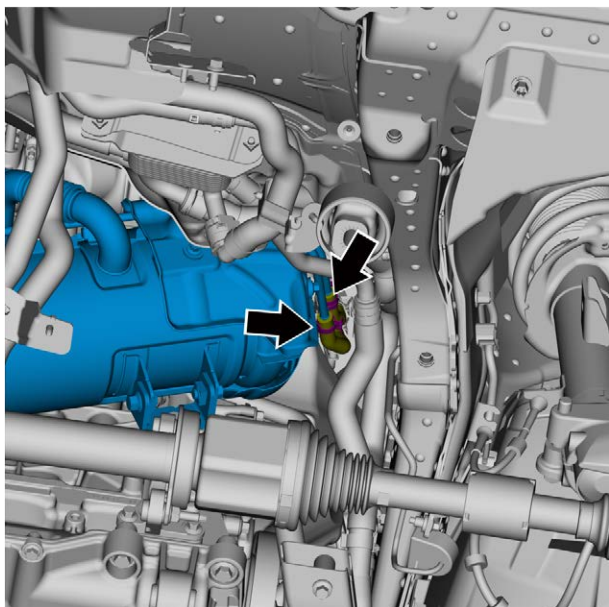
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

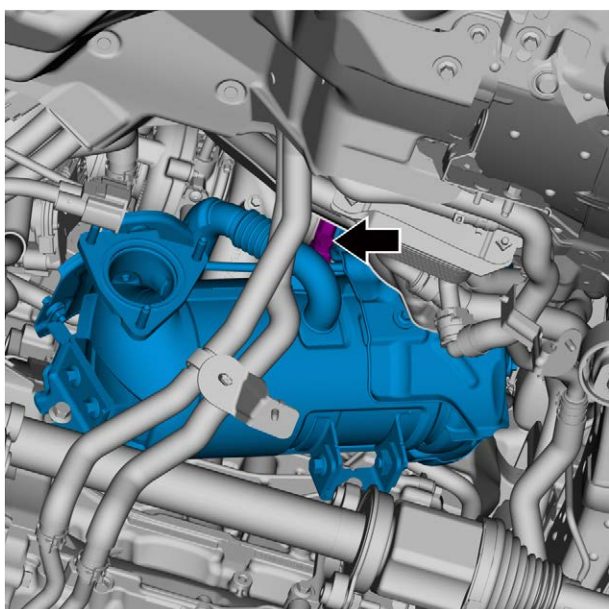
Warning !

See "Warning about Exhaust System Maintenance" in "[Warning and Precaution](#)".

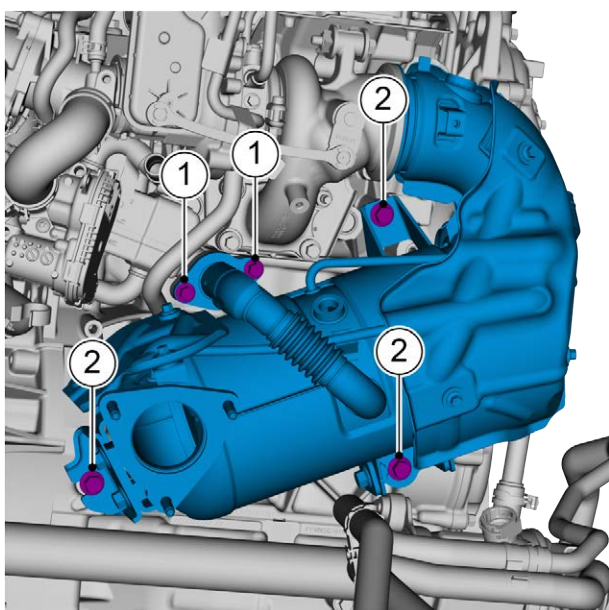
- 1 Open the engine compartment hood.
- 2 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 3 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 4 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 5 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 6 Remove the front exhaust pipe, see [Replacement of Front Exhaust Pipe](#).
- 7 Remove the front subframe, see [Replacement of Front Subframe](#).
- 8 Remove the lower bracket of the rear left suspension, see [Replacement of Lower Bracket of Rear Left Suspension](#).
- 9 Remove the lower bracket of the rear right suspension, see [Replacement of Rear Right Suspension](#).
- 10 Remove the heat shield, see [Replacement of Heat Shield](#).
- 11 Remove the Lambda probe (upstream oxygen sensor), see [Replacement of Lambda Probe \(upstream oxygen sensor\)](#).
- 12 Remove the Lambda probe (downstream oxygen sensor), see [Replacement of Lambda Probe \(downstream oxygen sensor\)](#).



- 13 Remove the two fixing clamps connecting the GPF pressure sensor to the rubber hose.
- 14 Disconnect the GPF pressure sensor connecting the rubber hose of GPF pressure sensor to the GPF post catalytic converter.



- 15 Loosen the fixing bolts of the front exhaust pipe clamp and disconnect the GPF post catalytic converter from the turbocharger subassembly.



- 16 Remove the two heat-resistant nuts 1 from the GPF post catalytic converter..
- 17 Remove the three fixing bolts of the GPF post catalytic converter, and take off the GPF Post Catalytic Converter.

Installation Procedure

- 1 Install the GPF post catalytic converter and tighten the three fixing bolts 2 of the GPF post catalytic converter.

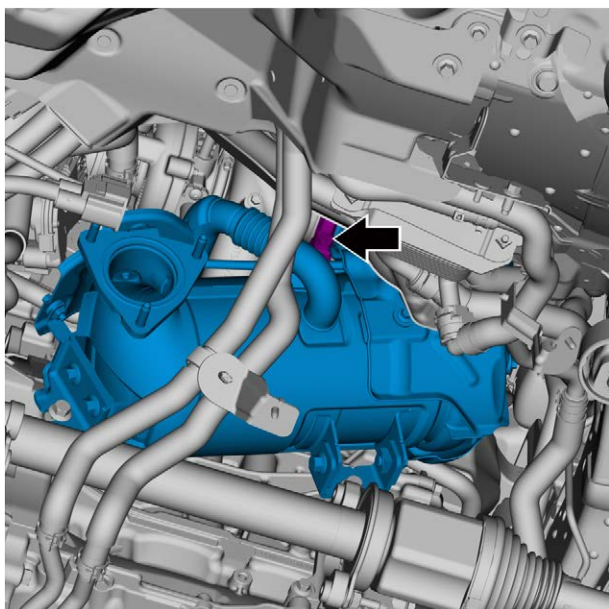
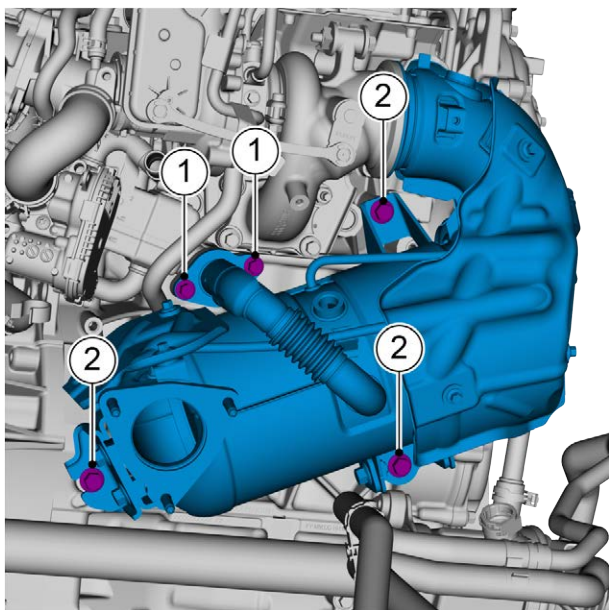
Torque: 40 N·m

- 2 Install and tighten the two heat-resistant nuts 1 of the GPF post catalytic converter.

Torque: 28N·m

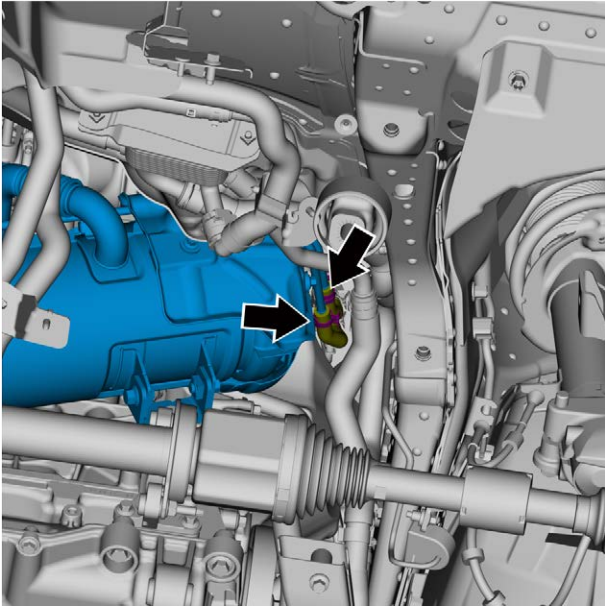
Caution

Replace the exhaust pipe gasket with a new one.



- 3 Connect the GPF post catalytic converter to the turbocharger subassembly, and install and tighten the fixing bolts of the front exhaust pipe clamp.

Torque: 15 N·m



- 4 Connect the GPF pressure sensor to the rubber hose and the GPF post catalytic converter.
- 5 Install the two fixing clamps connecting the GPF pressure sensor to the rubber hose.

- 6 Install the Lambda probe (downstream oxygen sensor).
- 7 Install the Lambda probe (upstream oxygen sensor).
- 8 Install the heat shield.
- 9 Install the rear right suspension vibration isolation pad.
- 10 Install the rear left suspension vibration isolation pad.
- 11 Install the front subframe.
- 12 Install the front exhaust pipe.
- 13 Install the bottom engine guard assembly.
- 14 lower the vehicle.
- 15 Connect the negative cable of the battery, start the vehicle and connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle level. If there is a drop in the level, replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the upper scribe line of the expansion kettle, and tighten the lid of the expansion kettle.
- 16 Install the engine trim cover assembly.
- 17 Close the engine compartment cover.

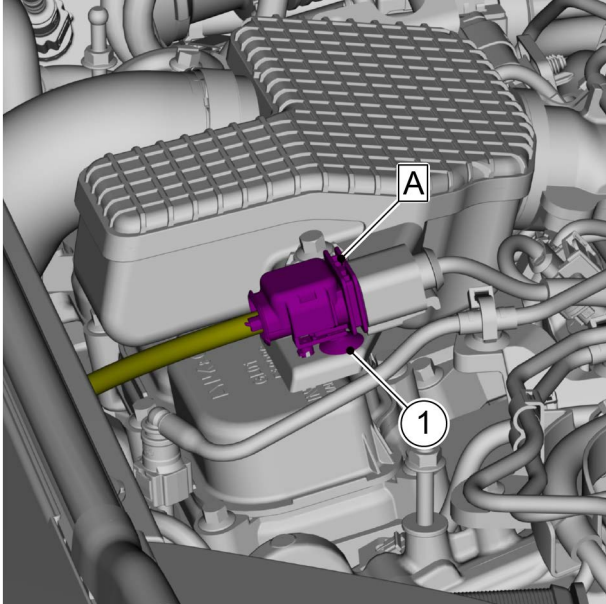
2.7.7.4 Replacement of heat shield

Removal Procedure

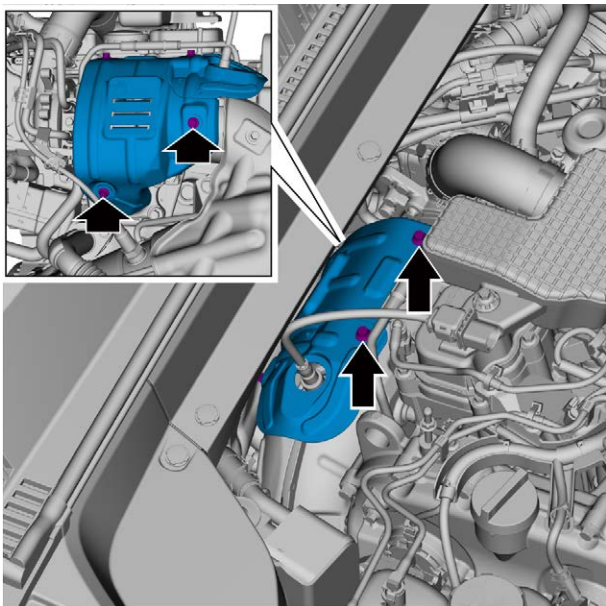
Warning !

Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#).

- 1 Open the engine compartment hood.

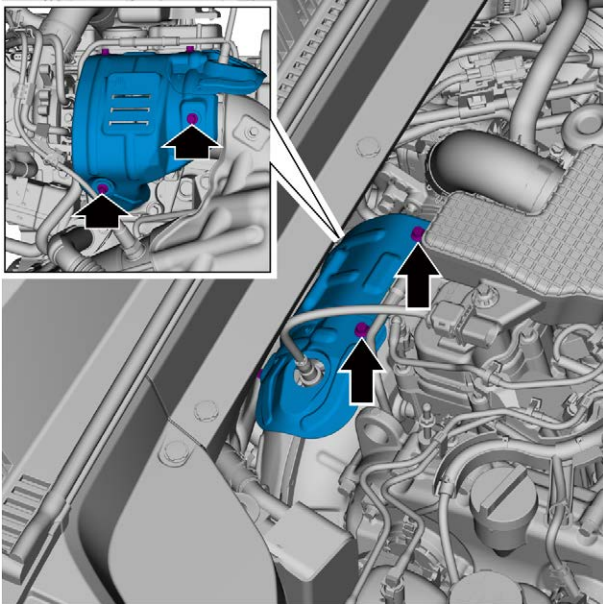


- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 4 Disconnect the upstream oxygen sensor wiring harness A.
- 5 Remove the wiring harness clip 1 of the upstream oxygen sensor.



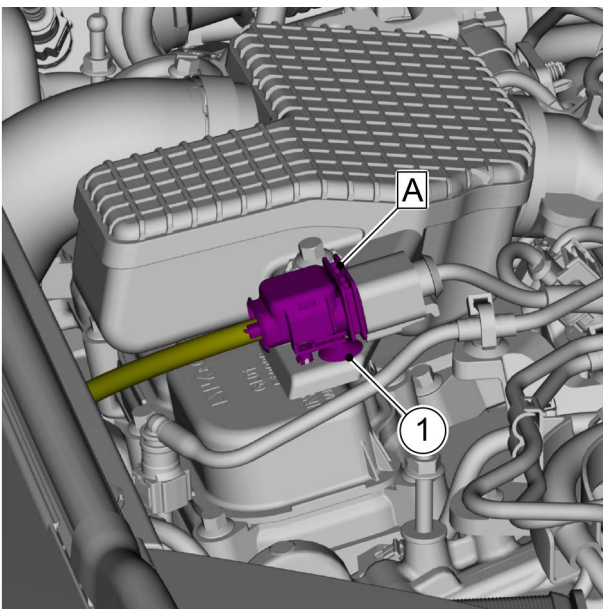
- 6 Take off the heat shield by removing the four fixing bolts of the heat shield.

Installation Procedure



- 1 Install the heat shield and tighten the four fixing bolts of the heat shield.

Torque: 10N·m



- 2 Connect the wiring harness clip 1 of the upstream oxygen sensor.
- 3 Connect the wiring harness A of the upstream oxygen sensor..

- 4 Connect the negative cable of battery.
- 5 Install the engine trim cover assembly.
- 6 Close the engine compartment cover.

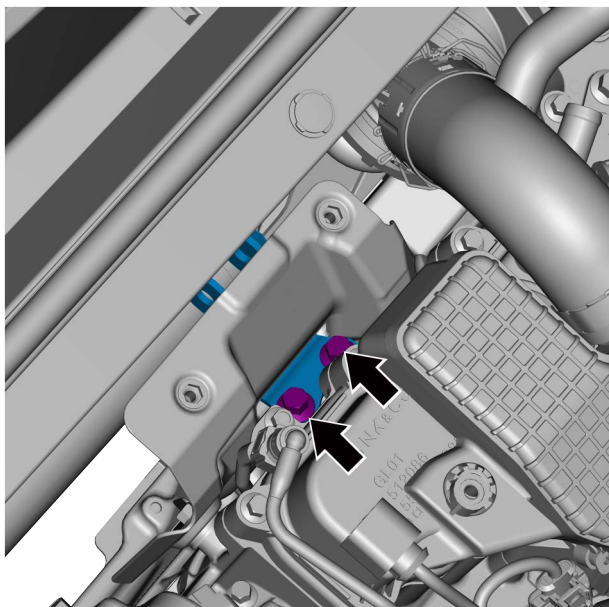
2.7.7.5 Replacement of Turbocharger Heat Shield

Removal Procedure

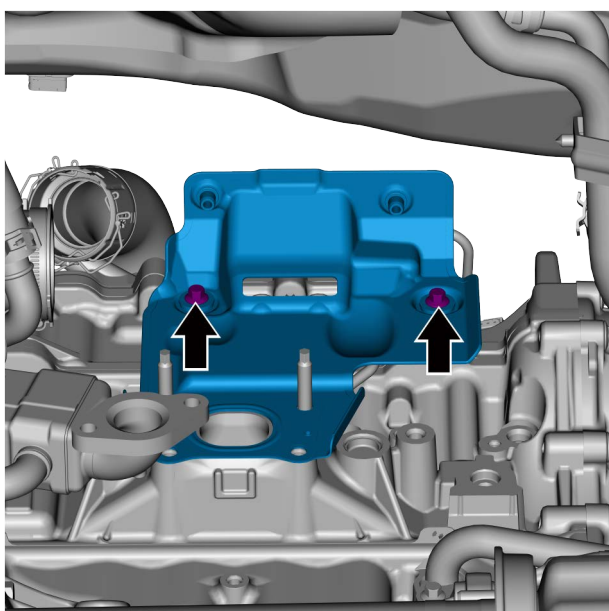
Warning !

See "Warning about Exhaust System Maintenance" in "[Warning and Precaution](#)".

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the turbocharger subassembly, see [Replacement of Turbocharger Subassembly](#).

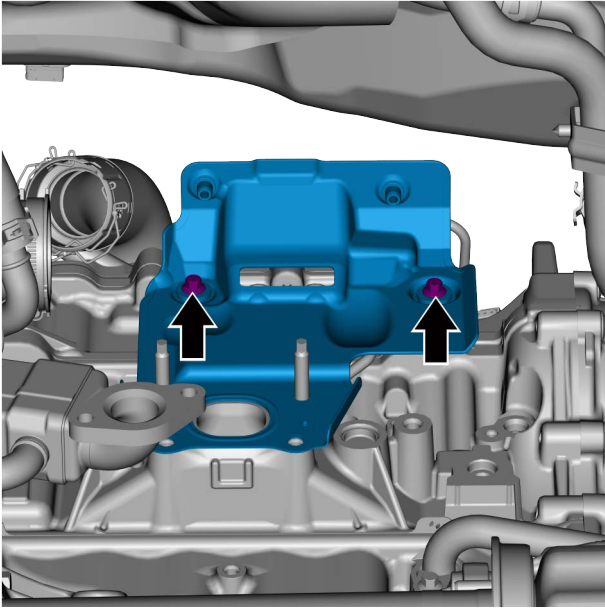


- 3 Remove the two fixing bolts of the turbocharger bracket and take off the turbocharger bracket.



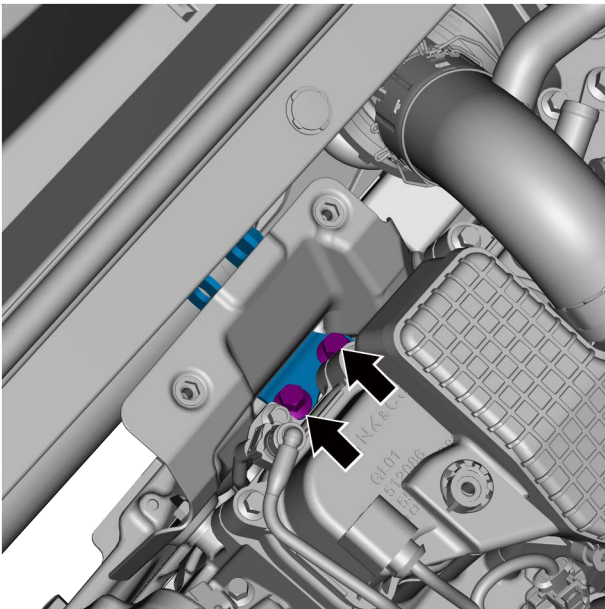
- 4 Remove the two fixing bolts of the turbocharger heat shield and remove the turbocharger heat shield.

Installation Procedure



- 1 Install the turbocharger heat shield, and tighten the two fixing bolts of the turbocharger heat shield.

Torque: 10N·m



- 2 Install the turbocharger bracket, and tighten the two fixing bolts of the turbocharger bracket.

Torque: 24N·m

- 3 Install the turbocharger subassembly.
- 4 lower the vehicle.

2.7.7.6 Replacement of Turbocharger Subassembly

Removal Procedure

Warning !

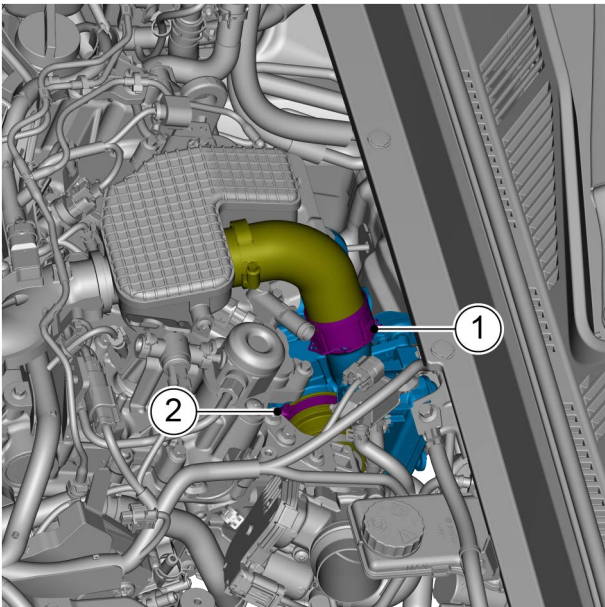
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

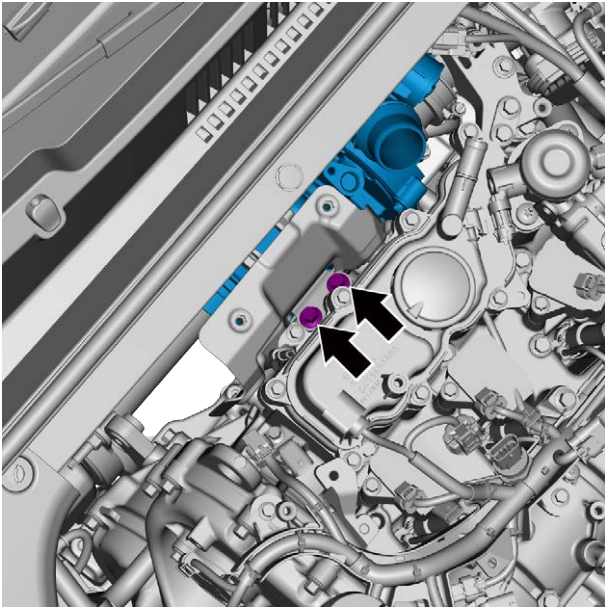
Warning !

See "Warning about Exhaust System Maintenance" in "[Warning and Precaution](#)".

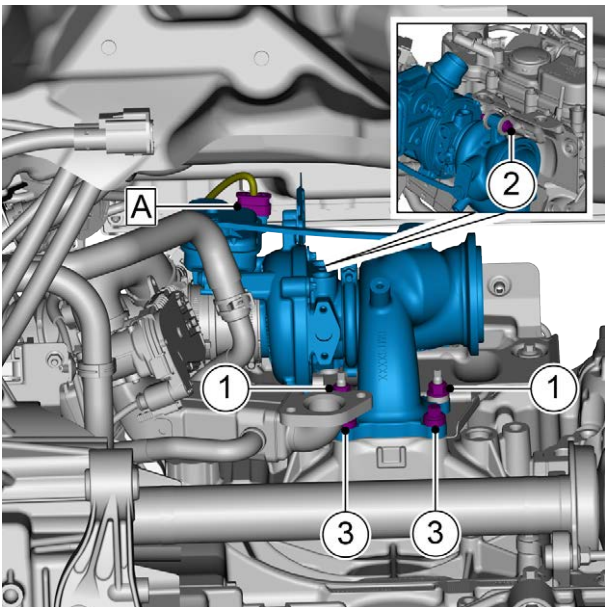
- 1 Open the engine compartment hood.

- 2 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 3 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 4 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 5 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 6 Remove the front exhaust pipe, see [Replacement of Front Exhaust Pipe](#).
- 7 Remove the heat shield, see [Replacement of Heat Shield](#).
- 8 Remove the GPF post catalytic converter, see [Replacement of GPF Post Catalytic Converter](#).
- 9 Remove the turbocharger return pipe, see [Replacement of Turbocharger Return Pipe](#).
- 10 Remove the turbocharger oil inlet pipe subassembly, see [Replacement of Turbocharger Oil Inlet Pipe Subassembly](#).
- 11 Remove the turbocharger water pipe subassembly, see [Replacement of Turbocharger Water Pipe Subassembly](#).
- 12 Unlock the quick-insertion elastic circlip 1 of the resonator and disconnect the resonator from the turbocharger subassembly.
- 13 Loosen the worm clamp 2 of the low pressure sealing sleeve and disconnect the low pressure sealing sleeve from the turbocharger subassembly.





14 Loosen the two fixing bolts of the turbocharger bracket.



15 Disconnect the harness connector A of the turbine control valve.

16 Remove the two fixing nuts 1 of the turbocharger subassembly.

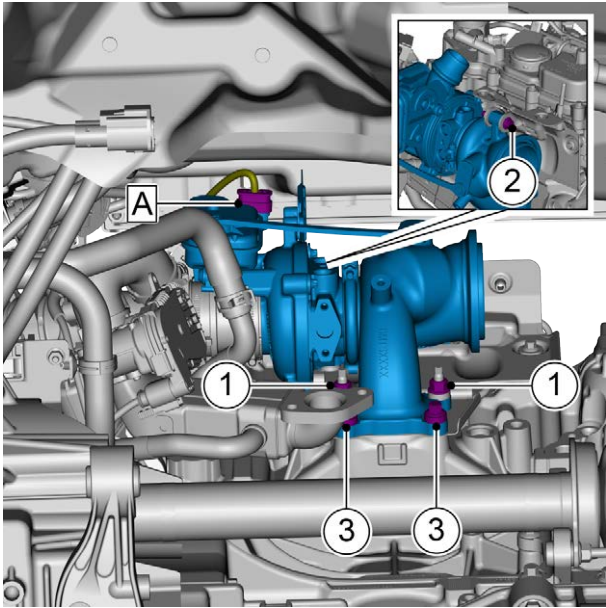
17 Remove the fixing bolts 2 of the turbocharger subassembly.

18 Take off the turbocharger subassembly by removing the two fixing bolts 3 of the turbocharger subassembly.

Caution

The turbocharger fixing bolts 3 need to be replaced after removal.

Installation Procedure



- 1 Install the turbocharger and tighten the two fixing bolts 3 and fixing nuts 1 of the turbocharger.

Bolt torque: 23 N·m

Nut torque: 23N·m

Caution

1. All removed seals such as exhaust pipe gasket, inlet/return pipe gasket, and turbocharger water pipe sealing ring need to be replaced with new ones.

2. Tighten the fixing bolts 3 and fixing nuts 1 sequentially or crosswise, and retighten them once sequentially or crosswise.

- 2 Install and tighten the fixing bolts 2 of the turbocharger subassembly.

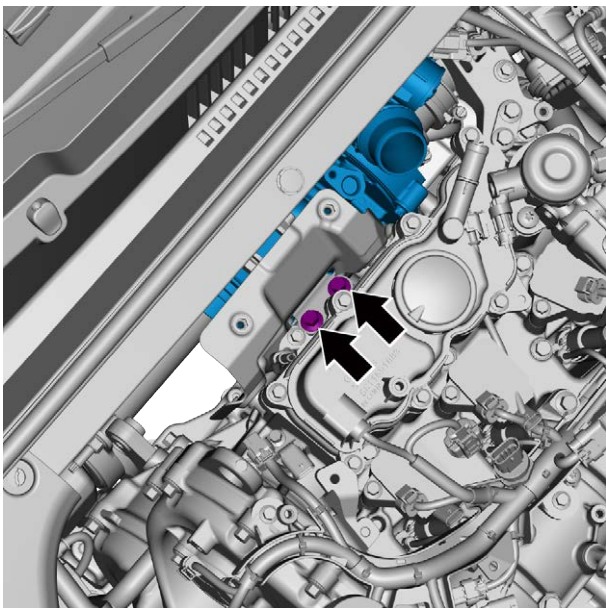
Torque: 24N·m

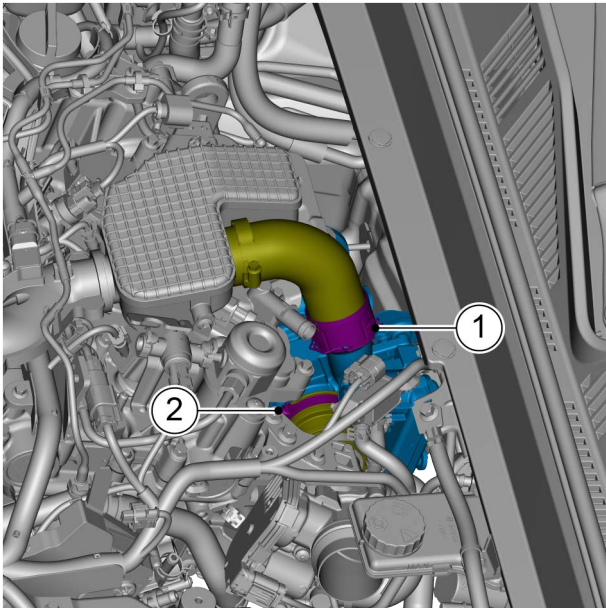
The exposed threaded parts of the bolts shall be treated by spraying the thread loosening agent, and WD-40 universal lubricating rust inhibitor should be used.

- 3 Connect the harness connector A of the turbine control valve.

- 4 Install and tighten the two fixing bolts of the turbocharger bracket.

Torque: 24N·m





- 5 Connect the low pressure sealing sleeve to the turbocharger subassembly, and install and tighten the worm clamp 2 of the low pressure sealing sleeve.

Torque: 3.5N·m

Caution

Apply an appropriate amount of a similar P80 insertion agent to the inside of the low pressure sealing sleeve before installation.

- 6 Connect the resonator to the turbocharger subassembly and install the resonator's quick-insertion elastic circlip 1.

- 7 Install the turbocharger water pipe subassembly.
- 8 Install the turbocharger oil inlet pipe subassembly.
- 9 Install the turbocharger oil return line.
- 10 Install the GPF rear catalytic converter.
- 11 Install the heat shield.
- 12 Install the front exhaust pipe.
- 13 Install the bottom engine guard assembly.
- 14 lower the vehicle.
- 15 Connect the negative cable of battery.
- 16 Install the engine trim cover assembly.
- 17 Close the engine compartment cover.

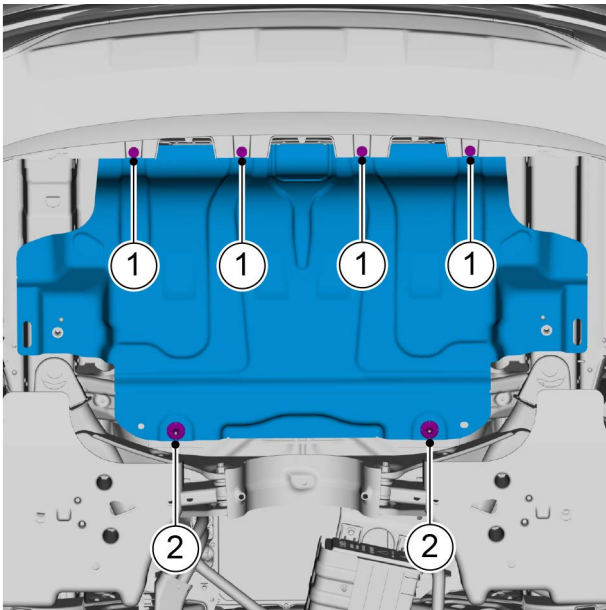
2.7.7.7 Replacement of Rear Muffler Heat Shield

Removal Procedure

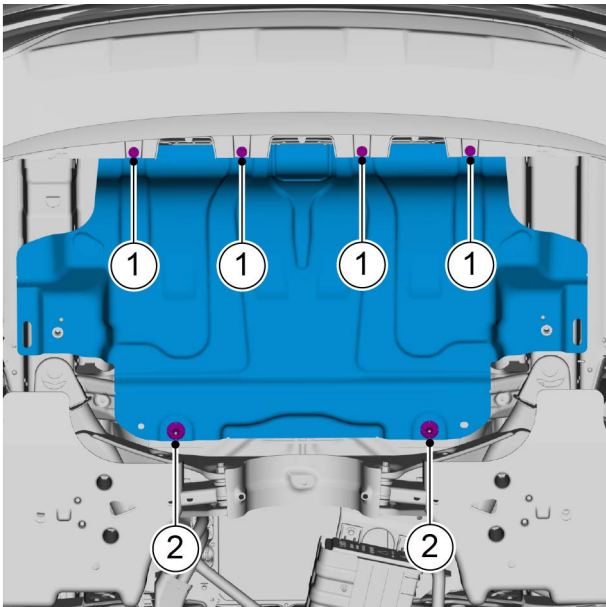
Warning !

See "Warning about Exhaust System Maintenance" in "[Warning and Precaution](#)".

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the exhaust pipe muffler assembly, see [Replacement of Exhaust Pipe Muffler Assembly](#).



- 3 Remove the two plastic fixing nuts 1 of the rear muffler heat shield.
- 4 Remove the four fixing bolts 2 of the rear muffler heat shield, and take off the rear muffler heat shield.



Installation Procedure

- 1 Install the rear muffler heat shield, install and tighten the four fixing bolts 2 of the rear muffler heat shield.
Torque: 6N·m
- 2 Install and tighten the two plastic fixing nuts 1 of the rear muffler heat shield.
Torque: Push firmly to the end

- 3 Install the exhaust pipe muffler assembly.
- 4 lower the vehicle.

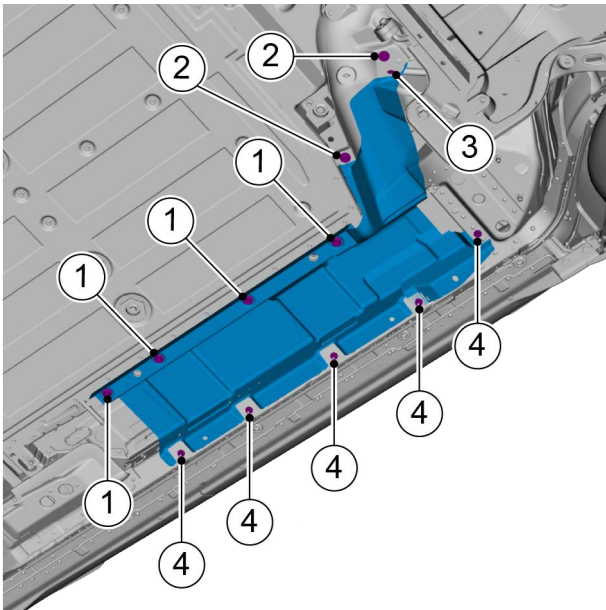
2.7.7.8 Replacement of Rear Channel Heat Shield Assembly

Removal Procedure

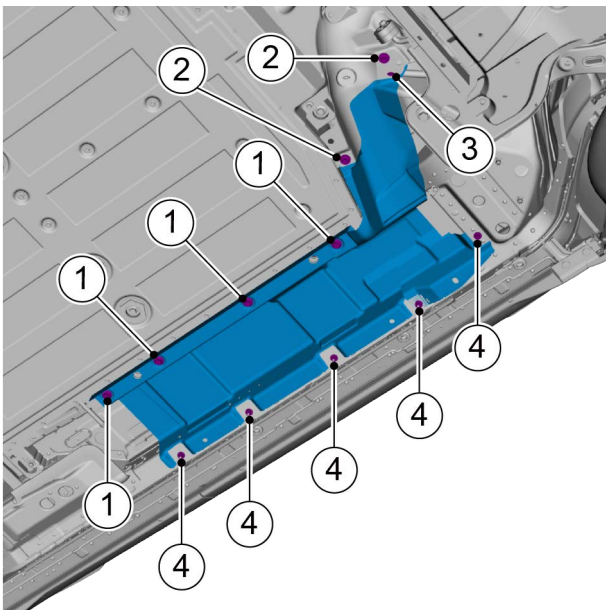
Warning !

See "Warning about Exhaust System Maintenance" in "[Warning and Precaution](#)".

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the exhaust pipe muffler assembly, see [Replacement of Exhaust Pipe Muffler Assembly](#).



- 3 Remove the front exhaust pipe, see [Replacement of Front Exhaust Pipe](#).
- 4 Remove the four fixing bolts 1 of the rear channel heat shield.
- 5 Remove the five plastic nuts 4 of the rear channel panel.
- 6 Remove harness clip 3.
- 7 Remove the fixing bolts 2 of the rear channel heat shield and take off the rear channel heat shield.



Installation Procedure

- 1 Install the rear channel panel, and install and tighten the fixing bolts 2 of the rear channel panel.
Torque: 24 N·m
- 2 Install the harness clip 3.
- 3 Install the five plastic nuts 4 for the rear channel heat shield.
Torque: 2 N·m
- 4 Install the four fixing bolts 1 of the rear channel heat shield.
Torque: 60 N·m
- 5 Install the front exhaust pipe.
- 6 Install the exhaust pipe muffler assembly.
- 7 lower the vehicle.

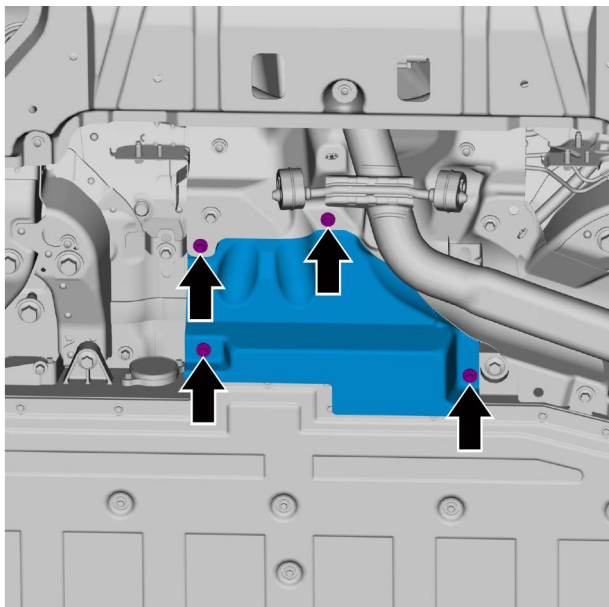
2.7.7.9 Replacement of Front Channel Heat Shield (1)

Removal Procedure

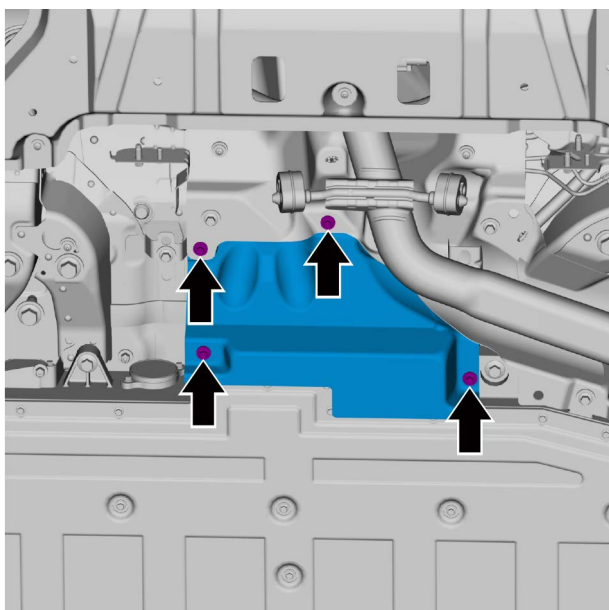
Warning !

See "Warning about Exhaust System Maintenance" in "[Warning and Precaution](#)".

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the four fixing bolts of the front channel heat shield (1) and take off the front channel heat shield (1).

**Installation Procedure**

- 1 Install the front channel heat shield (1) and tighten the four fixing bolts of the front channel heat shield (1).
Torque: 10 N·m



- 2 lower the vehicle.

2.7.7.10 Replacement of Front Channel Heat Shield (2)**Removal Procedure**

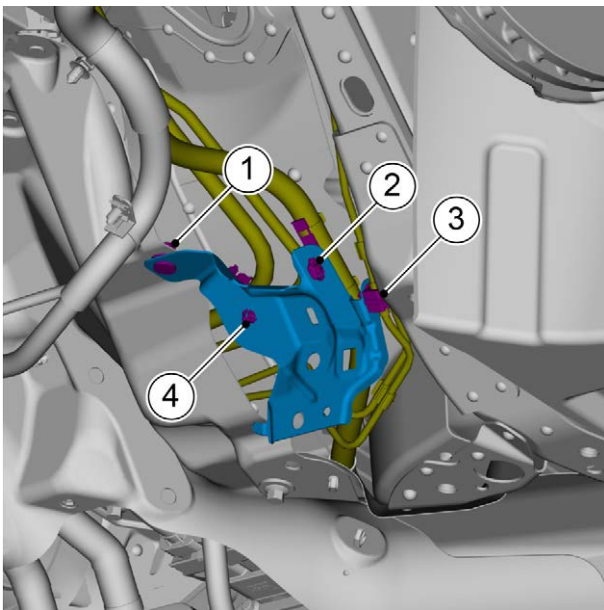
Warning !

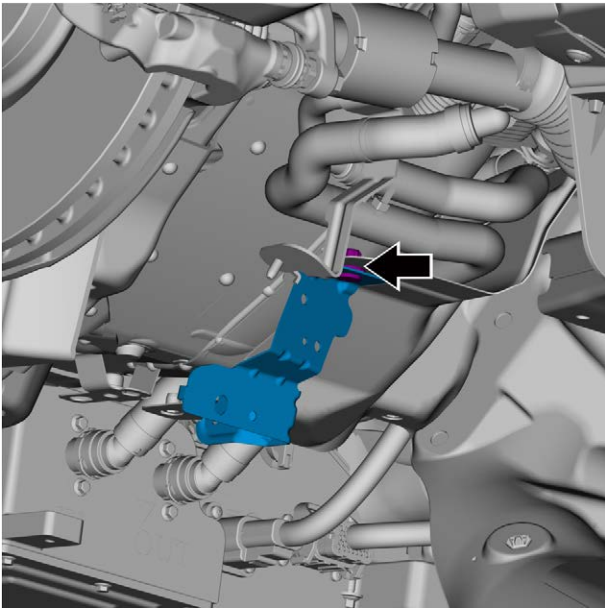
See "Warning about Exhaust System Maintenance" in "[Warning and Precaution](#)".

Warning !

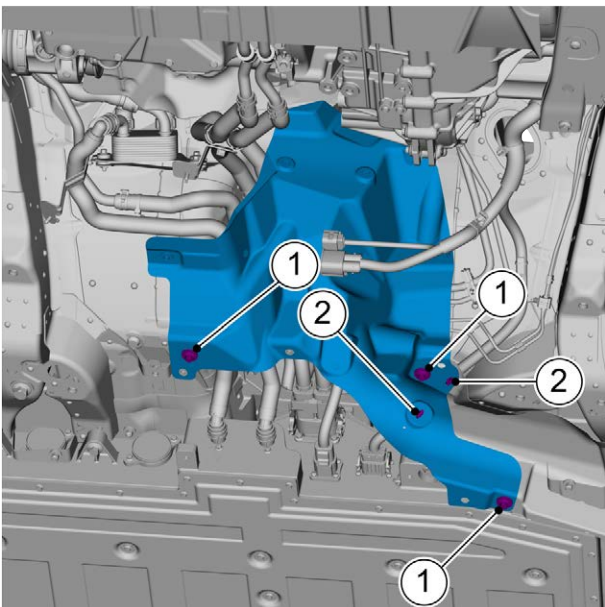
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 3 Remove the front exhaust pipe, see [Replacement of Front Exhaust Pipe](#).
- 4 Remove the front channel heat shield (1), see [Replacement of Front Channel Heat Shield \(1\)](#).
- 5 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 6 Remove the front subframe, see [Replacement of Front Subframe](#).
- 7 Install the fixing clips 2 connecting the left mounting bracket to the front channel heat shield (2).
- 8 Install the fixing clips 3 connecting the left mounting bracket to the front channel heat shield (2).
- 9 Install the fixing clips 4 connecting the left mounting bracket to the front channel heat shield (2).
- 10 Remove the left mounting bracket of the front channel heat shield (2) by removing one fixing nut connecting the front channel heat shield (2) to the left mounting bracket.

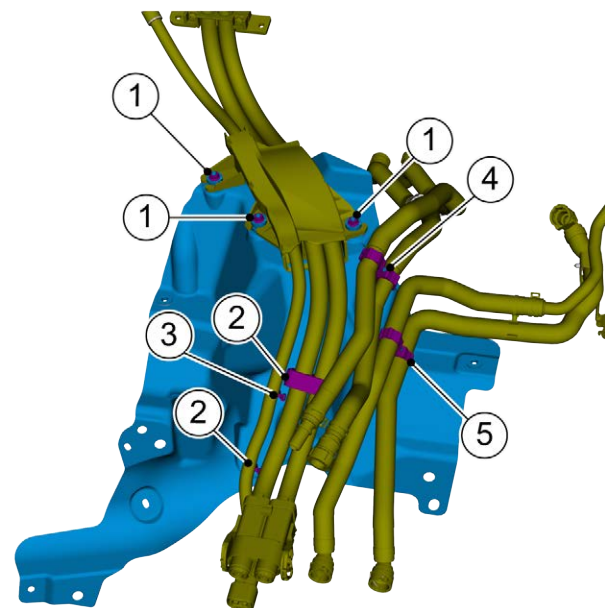




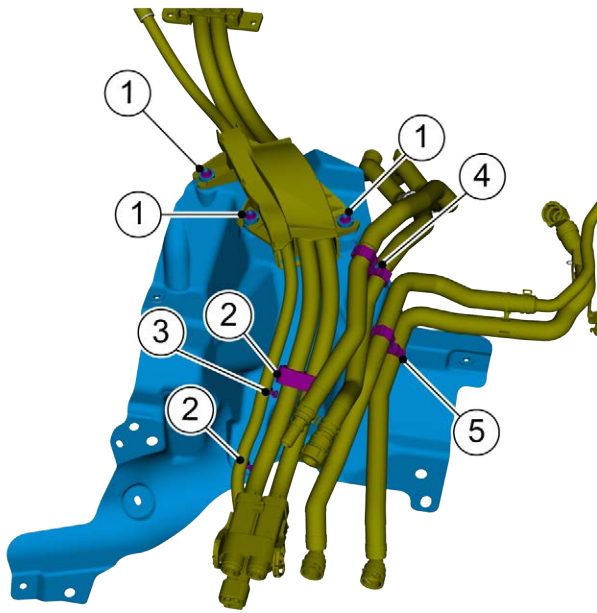
- 11 Remove the right mounting bracket of the front channel heat shield (2) by removing one fixing nut connecting the front channel heat shield (2) to the right mounting bracket.



- 12 Disengage the fixing clips 2 connecting the high voltage battery pack harness to the front channel heat shield (2).
- 13 Remove the three fixing bolts 1 of the front channel heat shield (2).

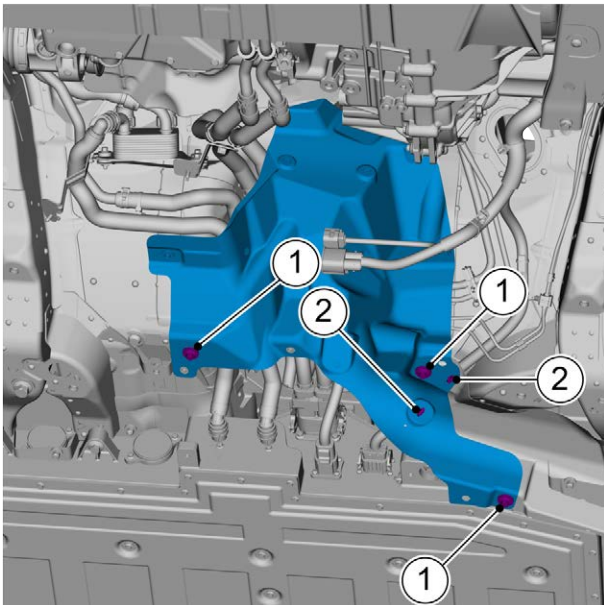


- 14 Disengage the fixing clips 4 connecting the water pipe to the front channel heat shield (2).
- 15 Disengage the fixing clips 5 connecting the water pipe to the front channel heat shield (2).
- 16 Disengage the fixing clips 2 and 3 connecting the DC bus assembly to the front channel heat shield (2).
- 17 Remove the three fixing nuts 1 connecting the DC bus assembly to the front channel heat shield (2) and take off the front channel heat shield (2).

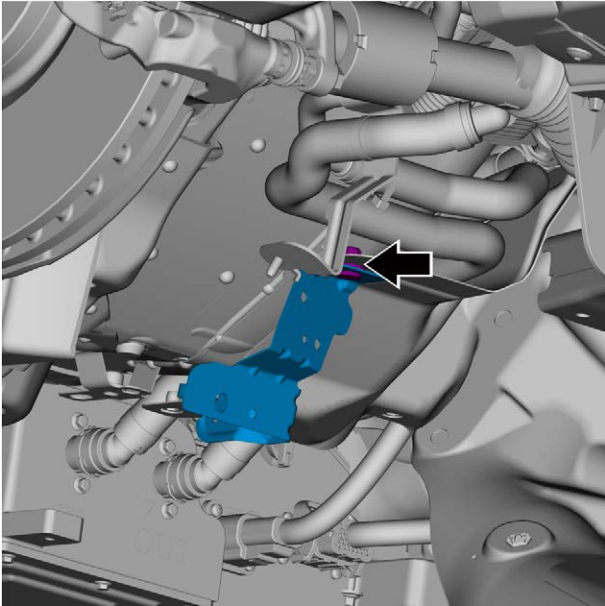


Installation Procedure

- 1 Install the front channel heat shield (2) and tighten the three fixing nuts 1 connecting the DC bus assembly to the front channel heat shield (2).
Torque: 10 N·m
- 2 Install the fixing clips 2 and 3 connecting the DC bus assembly to the front channel heat shield (2).
- 3 Install the fixing clips 5 connecting the water pipe and the front channel heat shield (2).
- 4 Install the fixing clips 4 connecting the water pipe and the front channel heat shield (2).

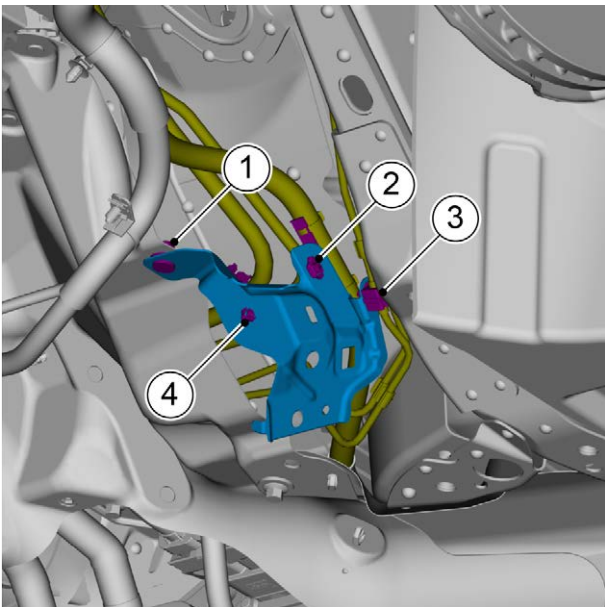


- 5 Install the front channel heat shield (2) and tighten the three fixing bolts 1 of the front channel heat shield (2).
Torque: 24 N·m
- 6 Install the fixing clips 2 connecting the high voltage battery pack harness to the front channel heat shield (2).



- 7 Install the right mounting bracket of the front channel heat shield (2) and tighten the fixing nuts.

Torque: 10 N·m



- 8 Install the left mounting bracket of the front channel heat shield (2) and tighten the fixing nuts 1.
Torque: 10 N·m
- 9 Install the fixing clips 4 connecting the front channel heat shield (2) to the left mounting bracket.
- 10 Install the fixing clips 3 connecting the front channel heat shield (2) to the left mounting bracket.
- 11 Install the fixing clips 2 connecting the front channel heat shield (2) to the left mounting bracket.

- 12 Install the front subframe.
- 13 Install the bottom engine guard assembly.
- 14 Install the front channel heat shield of the battery pack.
- 15 Install the front exhaust pipe
- 16 Lower the vehicle.
- 17 Connect the negative cable of the battery.

2.8 Cooling system (DHE15-ESZ)

2.8.1 Specification

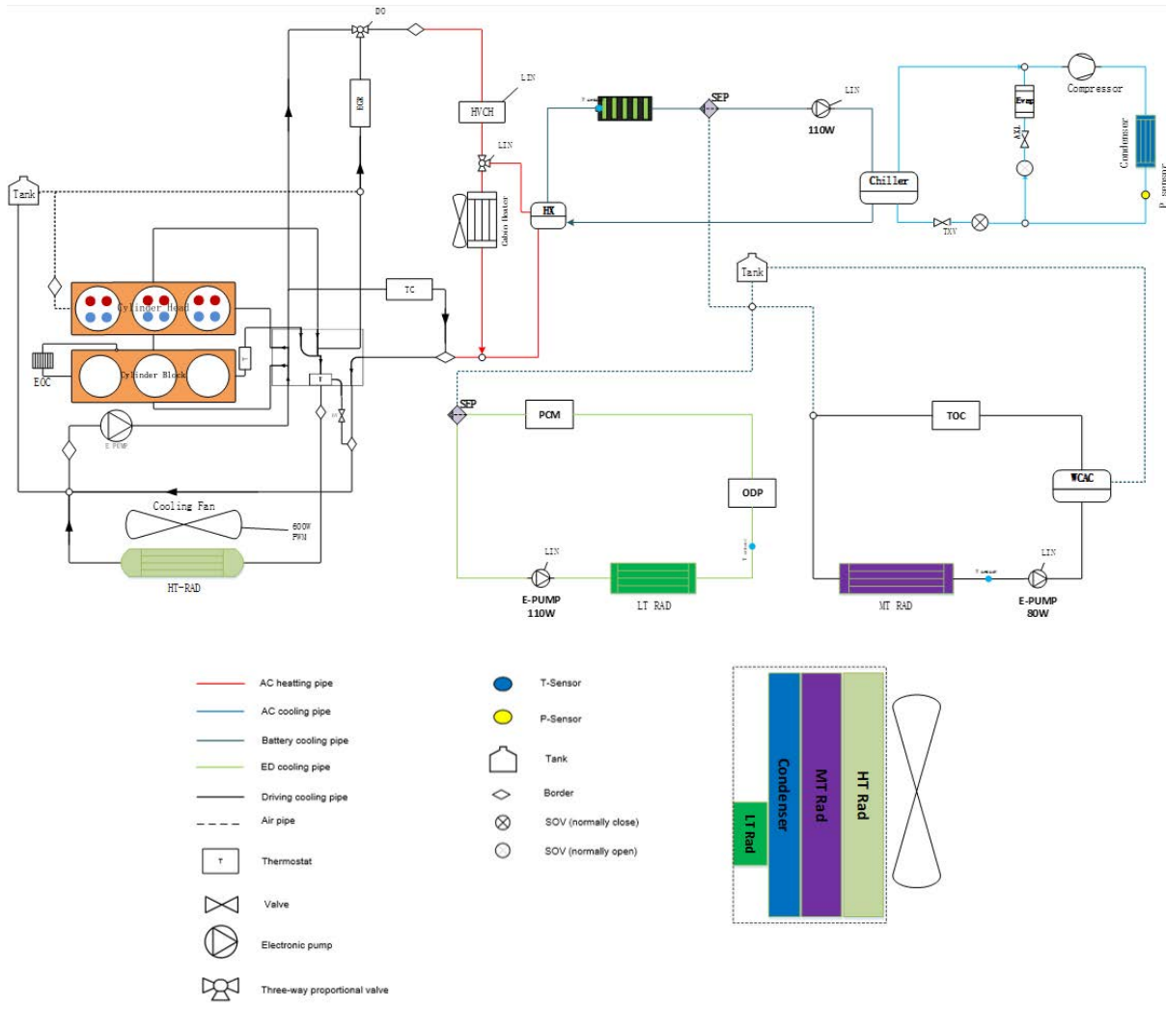
2.8.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Fixing bolt of engine cooling pump	M10×35	45-55
Fixing bolt for EGR cooler	M8×20	21-25
Fixing bolt between turbocharger water pipe assembly and turbocharger	M6×10	8.5-11.5
Fixing bolt between radiator and bumper beam	M8×50	20-28
Fixing bolt between water-cooled intercooler subassembly and engine	M8×25	21-25
Fixing bolt between water-cooled intercooler subassembly and throttle valve	M6×60	8.5-11.5
Fixing bolt between exhaust gas circulation cooler and cylinder block	M8×20	21-25
Fixing bolt of turbocharger water pipe assembly	M6×12	8.5-11.5
Fixing bolt between GPF post catalytic converter and exhaust gas circulation cooler	M10×25×30.65	37-43
Fixing bolt between thermostat housing subassembly and cylinder block	M7×45	13.5-18.5
	M7×65	13.5-18.5
Fixing bolt for thermostat cover and thermostat housing subassembly	M6	8.5-11.5

2.8.1.2 Cooling System Specifications

Application:	Specification
Cooling mode	Stratified cooling
Engine coolant specifications	Ethylene glycol type coolant certified by Geely
Coolant capacity	8.5 L
Thermostat type	Wax thermostat
Water pump type	Electronic water pump
Blade diameter	Φ51
Thermostat opening temperature	90 °C initial opening, full opening lift ≥ 8mm @ 105 °C

2.8.1.3 Schematic Diagram of Cooling System



2.8.2 Instructions and operations

2.8.2.1 Instructions and operations

The main function of the engine cooling system is to avoid engine overheating and keep the temperature in the normal range. The system also cools engine oil, transmission fluid and heats the main unit of the air conditioning.

The engine coolant temperature sensor measures the temperature of the coolant, and the engine control module (ECM) uses the resulting information to control several functions such as fan speed. When the engine overheats, the driver will see an alert message on the combination instrument.

The cooling system includes a low-temperature radiator expansion kettle that prevents any excessive pressure in the closed system due to thermal expansion.

The electronic water pump is controlled by the engine control module (ECM). In order to cool the engine oil and transmission fluid, the coolant flows through the oil cooler and transmission oil cooler.

When the engine is working and because the mixture burns in the cylinder combustion chamber to produce high temperature, the heat is transferred through the cylinder block. If it is not cooled down, the engine will not be able to work. So there is an engine coolant channel installed in the cylinder block, and the heat is exchanged with the outside world through the circulation of the engine coolant. This keeps the operating temperature of the engine within a certain range so that the engine can work effectively under all operating conditions.

When the engine is cold, the cooling system controls the amount of engine coolant circulation through a thermostat, which allows the engine to warm up quickly. The cooling system includes a radiator, a low temperature radiator expansion kettle, an engine cooling fan, a thermostat and its housing, an electronic coolant pump. The electronic coolant pump is controlled by the ECM and operates at different speeds according to the signals from the ECM. Only if the above normally perform their respective functions, the cooling system can work normally.

When the engine coolant reaches the operating temperature of the thermostat, the thermostat opens. Then, the engine coolant returns to the radiator and is cooled. The cooling system directs some of the engine coolant to the heater core through water hoses. Used for heating and defrosting, the low-temperature radiator expansion kettle is connected to the radiator and is used to recover the engine coolant that is discharged as a result of heating and expansion, the low-temperature radiator expansion kettle serves to maintain the correct engine coolant level. The low temperature radiator expansion

kettle is a transparent plastic canister similar to a front windshield washer canister. The low temperature radiator expansion kettle is connected to the engine through a water hose. As the vehicle is driven, the engine coolant gradually increases in temperature and expands. Some of the engine coolant flows from the engine into the low-temperature radiator expansion kettle as it expands. Air trapped in the engine is also exhausted into the cold radiator expansion kettle. When the engine is turned off, the engine coolant automatically cools and contracts, and the previously discharged engine coolant is sucked back into the engine. This keeps the coolant in the cooling system at a proper level and improves cooling efficiency.

When the cooling system is cold, the engine coolant level should be maintained between the MIN (minimum) and MAX (maximum) marks on the low-temperature radiator expansion kettle. The engine cooling fan is mounted at the rear of the radiator in the engine compartment, and it increases the amount of airflow to the radiator and air-conditioning condenser, which helps to speed up the cooling of the vehicle when it is idling or driving at low speeds.

Warning !

Even when the engine is not running, the engine cooling fan under the engine compartment can activate and injure someone. Keep hands, clothing and tools away from the motorized fan under the engine compartment.

Warning !

As long as there is pressure in the cooling system, the solution temperature will be much higher than the boiling temperature even if the solution in the radiator is not boiling. If the pressure cap is opened before the engine is not cooled and the pressure is still high, the engine coolant will boil immediately and may produce explosive force, spraying onto the engine, fenders, and the person who opened the radiator pressure cap.

2.8.3 System working principles

2.8.3.1 System working principles

The engine can be cooled by coolant. The electronic water pump circulates coolant through the engine by causing coolant to flow within the cooling system between the radiator and the engine. The coolant flow controls and maintains the engine temperature within the permissible temperature range. The coolant flow also heats the air supplied to the passenger compartment by the main unit of the air conditioning, if required. The cooling system is primarily connected to rubber hoses. The electric water pump is controlled by the engine control module (ECM). When the coolant temperature reaches a specified value, the thermostat opens. The coolant is also circulated in the radiator when cooling of the coolant is required. The coolant is delivered from the engine to the radiator for cooling. As the coolant passes through the radiator, it is cooled by the airflow through the radiator. The electric engine cooling fan provides additional airflow through the cooling assembly, including the radiator and condenser. The engine cooling fan sends a pulse width modulation signal to the engine control module (ECM), which is controlled by the engine control module. The engine cooling fan speed is determined based on the cooling demand, with the greater the cooling demand, the higher the fan speed. Radiator racks are mounted around the cooling assembly to direct airflow into the cooling assembly. If the coolant temperature is not high enough, the thermostat closes and the coolant therefore cannot flow through the radiator.

If the engine is unable to reach its ideal operating temperature for a long time, this can increase wear and tear on the body. Because of the low temperature, the gas mixture does not burn sufficiently in the combustion chamber and serious carbon deposits can form. So that the engine in the low temperature requires its operating temperature as much as possible in a short period of time to reach the normal operating temperature, the engine is required to produce as little heat as possible with the outside world to occur heat exchange. Then, the thermostat controls the circulation of engine coolant within the engine body, carrying the heat generated around the cylinder wall to other parts of the engine, causing its temperature to rise rapidly. The water pump circulates the coolant in the engine cylinder body, and then the engine coolant circulates within the water jacket, water pipe, turbocharger sub assembly, and cylinder head of the engine body. This state is called a "small cycle"..

When the engine reaches the normal operating temperature: with the engine running, the engine coolant inside the body warms up rapidly. When it reaches the opening temperature of the thermostat, the engine coolant is extracted by the water

pump to the water jacket, water pipe, turbocharger subassembly, cylinder head and radiator in the engine body. This state is called "major circulation".

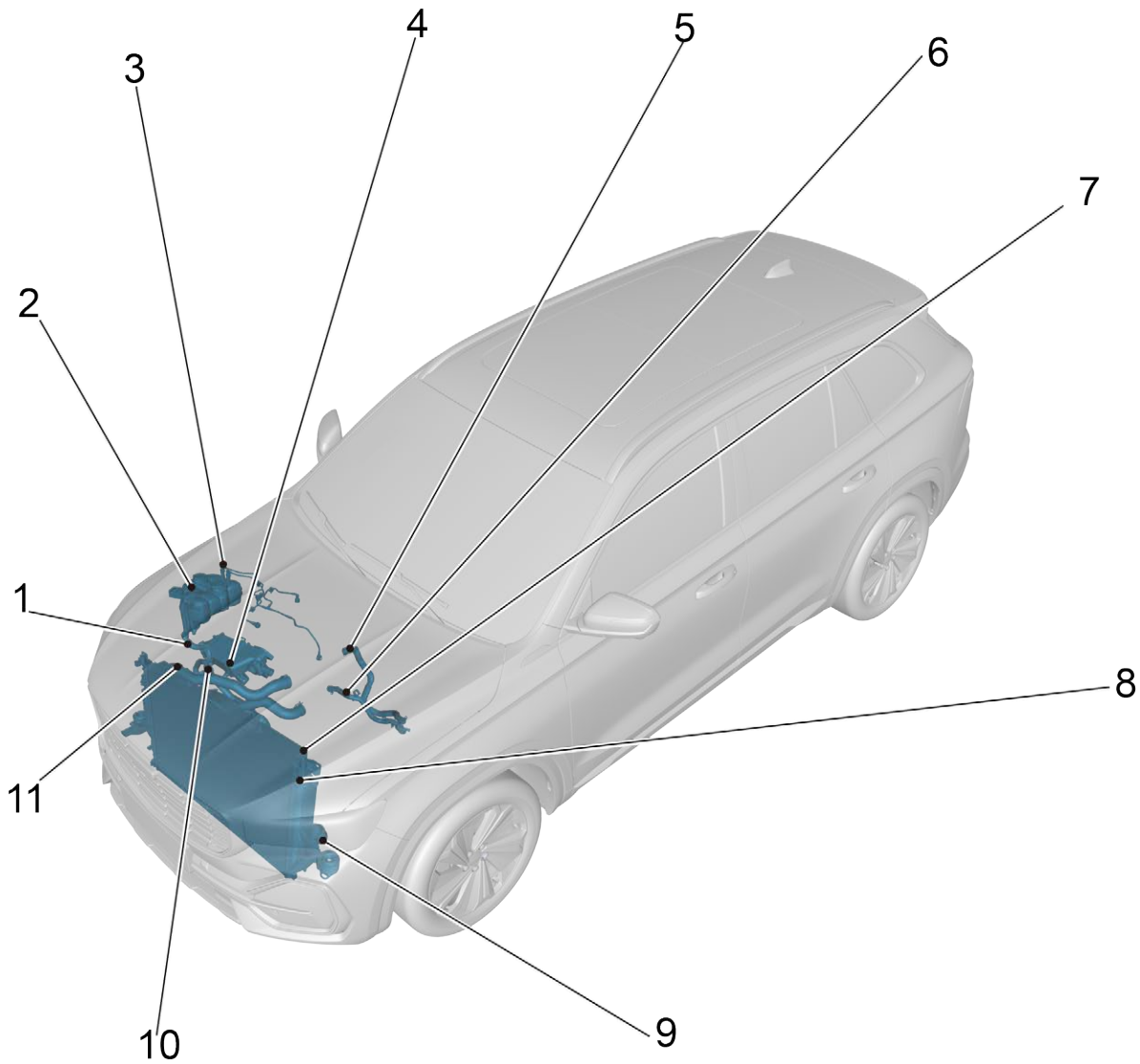
Thermostat: The role of a thermostat is to control the flow of engine coolant in the cooling system. The thermostat prevents the engine coolant from flowing from the engine to the radiator, allowing the engine to warm up quickly and regulating the engine coolant temperature. When the engine coolant temperature is low, the thermostat remains in the closed position, preventing the engine coolant from circulating through the radiator. Then, only the engine coolant is allowed to circulate through the heater core, thus warming up the engine quickly and evenly. When the engine has warmed up, the thermostat opens. Allowing the engine coolant to flow through the radiator and dissipate heat through the radiator. The opening and closing of the thermostat allows enough engine coolant to enter the radiator to keep the engine within the normal operating temperature range. The wax inside the thermostat is encapsulated in a metal housing. The thermostat wax expands with heat and contracts with cold. As the vehicle is driven and the engine warms up, the engine coolant temperature rises. When the engine coolant reaches a specified temperature, the thermostat opens the valve, which allows the engine coolant to flow through the engine cooling system and cool the engine.

Description of engine cooling fan: The electric engine cooling fan is primarily used to provide additional airflow through the radiator and condenser. The engine cooling fan sends a signal to the engine control module (ECM) and is controlled by the engine control module. The speed of the engine cooling fan is determined by the cooling requirements. The engine cooling fan is directly connected to the engine control module (ECM).

2.8.4 Part position

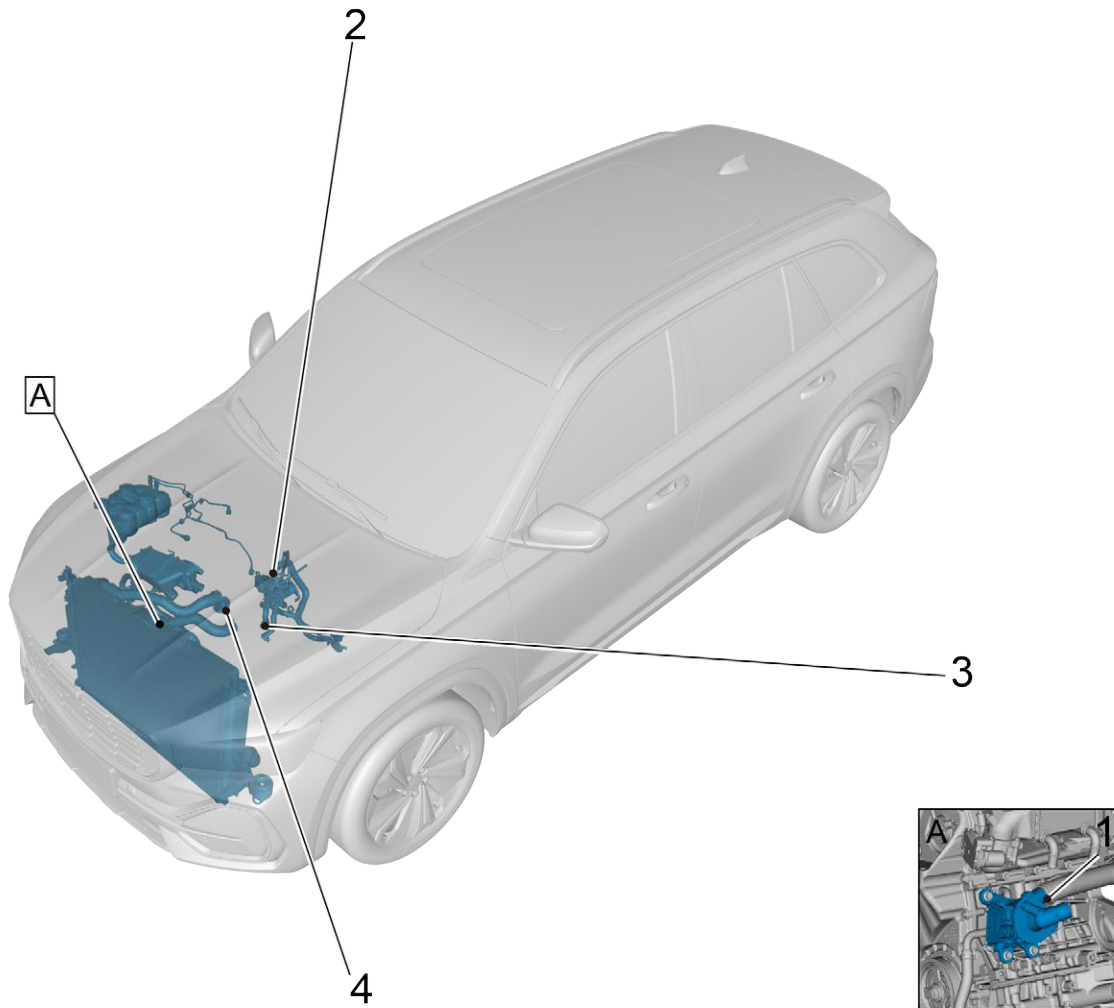
2.8.4.1 Location of Cooling System Components

Component Location Diagram (1)



- | | | | |
|----|---|-----|------------------------|
| 1. | Expansion tank outlet hose | 7. | Engine cooling fan |
| 2. | Low temperature radiator expansion kettle | 8. | Radiator |
| 3. | Engine to expansion kettle degassing hose | 9. | Radiator outlet pipe |
| 4. | Water-cooled intercooler | 10. | Intercooler inlet pipe |
| 5. | Exhaust gas recirculation outlet pipe | 11. | Radiator inlet pipe |
| 6. | Thermostat outlet pipe | | |

Component Location Diagram (2)

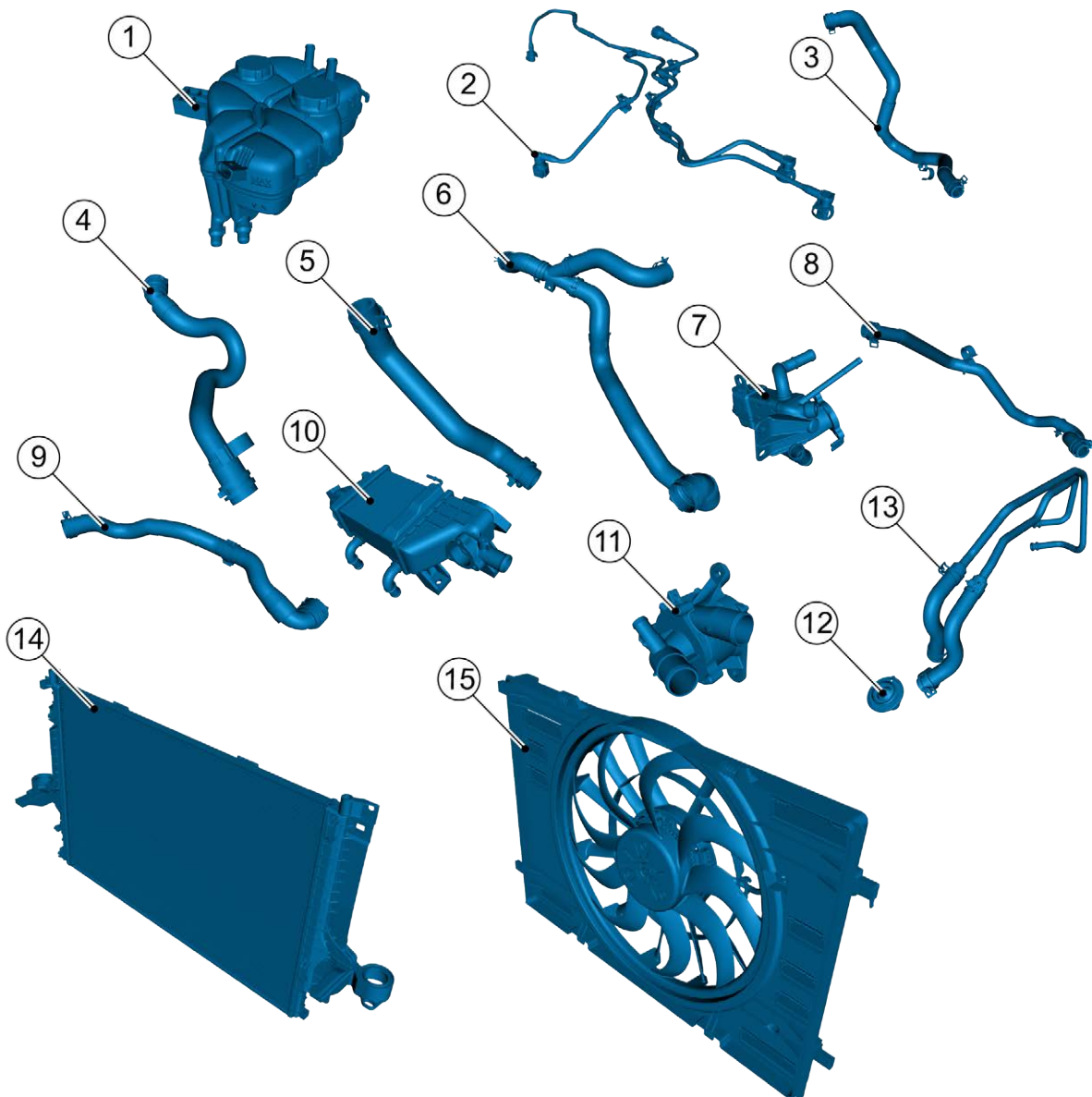


- 1. Engine cooling pump
- 2. EGR cooler

- 3. Turbocharger water pipe assembly
- 4. Thermostat

2.8.5 Breakdown drawing

2.8.5.1 Breakdown drawing



- | | | | |
|----|---|-----|--------------------------------------|
| 1. | Low temperature radiator expansion kettle | 9. | Radiator inlet pipe |
| 2. | Degassing hose | 10. | Water-cooled intercooler subassembly |
| 3. | Exhaust gas circulation outlet pipe | 11. | Engine cooling pump |
| 4. | Expansion tank outlet pipe | 12. | Thermostat |
| 5. | Intercooler inlet pipe | 13. | Turbocharger water pipe subassembly |
| 6. | Radiator outlet pipe | 14. | Radiator |
| 7. | Exhaust gas circulation cooler | 15. | Engine cooling fan |
| 8. | Thermostat outlet pipe | | |

2.8.6 Diagnostic Information and Procedures

2.8.6.1 Diagnosis description

See Description and Operation and System Operating Principles before diagnosing a fault in the cooling system. Understanding and familiarizing yourself with the operating principles of the cooling system before beginning system diagnosis will determine the correct troubleshooting steps to take in the event of a malfunction, and more importantly, this will determine if the condition described by the customer is normal operation. More importantly, this helps to determine whether the situation described by the customer belongs to normal operation. Understanding and correctly using the diagnostic process can shorten diagnostic time and avoid misjudgment of the faulty location.

2.8.6.2 Visual check

- Inspect for aftermarket retrofitting devices that may affect the operation of the engine cooling fan control device.
- Inspect easily accessible or visible system components for obvious blockages or external leaks.
- Check that the fuel in the fuel tank is the recommended fuel and that it is adequately filled.

2.8.6.3 Engine Coolant Loss Too Fast

Diagnostic Steps

Warning !

If the pressure cap is opened to perform maintenance on the cooling system while the engine is not cooled and the pressure is still high, the engine coolant will boil immediately and could spray onto the operator and cause severe burns.

Step 1	Check whether the radiator is leaking
--------	---------------------------------------

Yes

Replace the damaged radiator.

No

Step 2	Check for leaks at the following locations, such as low-temperature radiator expansion kettle, water pipe.
--------	--

Yes

If necessary, replace the following components, such as low-temperature radiator, expansion kettle, and water pipe.

No

Step 3	Check for loose or damaged radiator water pipes fittings?
--------	---

Yes

Reinstall the water pipe, replace the water pipe or clamp.

No

Step 4	Check the water pipe sealing ring for leakage.
--------	--

Yes

Replace the water pipe seal.

No

Step 5 Check if the cylinder head for proper torque.

Yes

Tighten the cylinder head bolts to a specified torque and replace the cylinder head gasket if necessary.

No

Step 6 Check for leaks at the following locations:

- A. Intake manifold,
- B. Cylinder head gasket,
- C. Cylinder block screw plug,
- D. Radiator vent plug,
- E. Turbocharger subassembly.

Yes

Repair or replace parts as necessary to troubleshoot leaks.

No

Step 7 Confirm that the fault has been resolved.

2.8.7 Removal and Installation

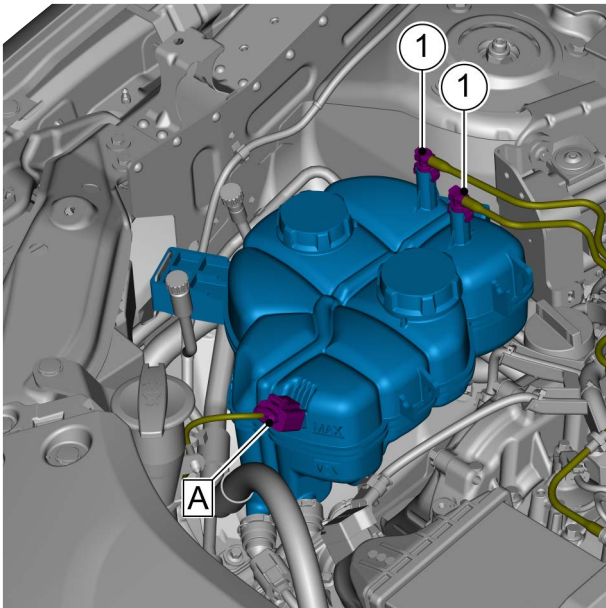
2.8.7.1 Replacement of Low Temperature Radiator Expansion Kettle

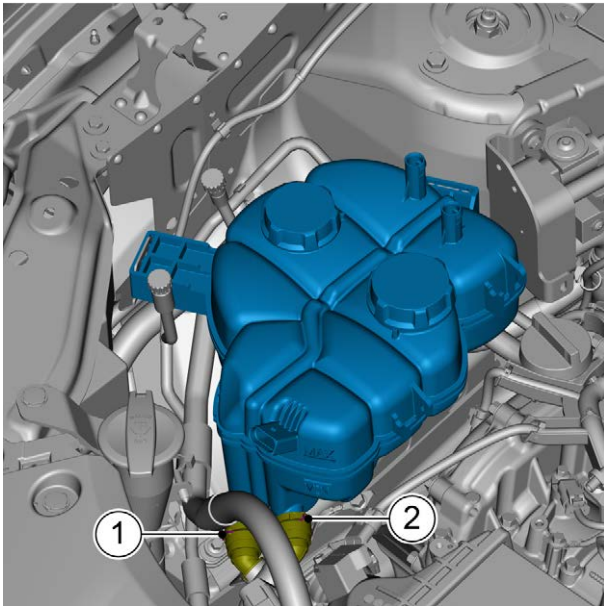
Removal Procedure

Warning !

See "WARNING ABOUT COOLING SYSTEM MAINTENANCE" in "[WARNINGS AND PRECAUTIONS](#)".

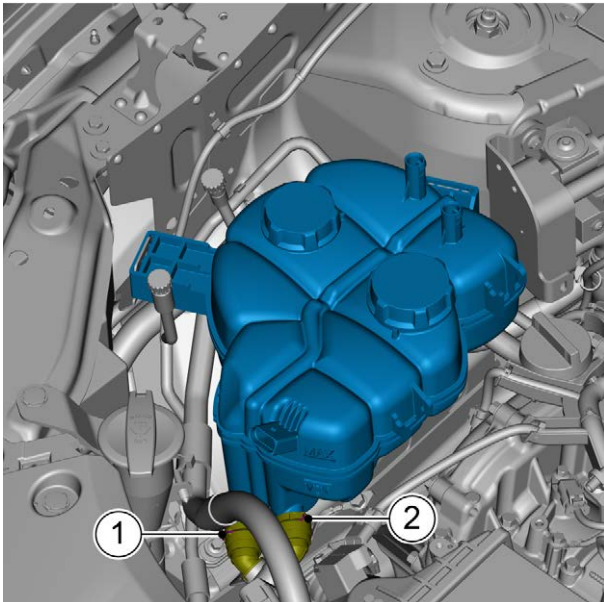
- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 4 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 5 Drain the engine coolant, see [Draining and Filling of Engine Coolant](#).
- 6 Remove the right engine compartment trim panel, see [Replacement of Left Engine Compartment Trim Panel](#).
- 7 Disconnect the harness connector A of the expansion tank level sensor.
- 8 Disconnect the quick connector 1 between the degassing hose and the low temperature radiator expansion kettle.



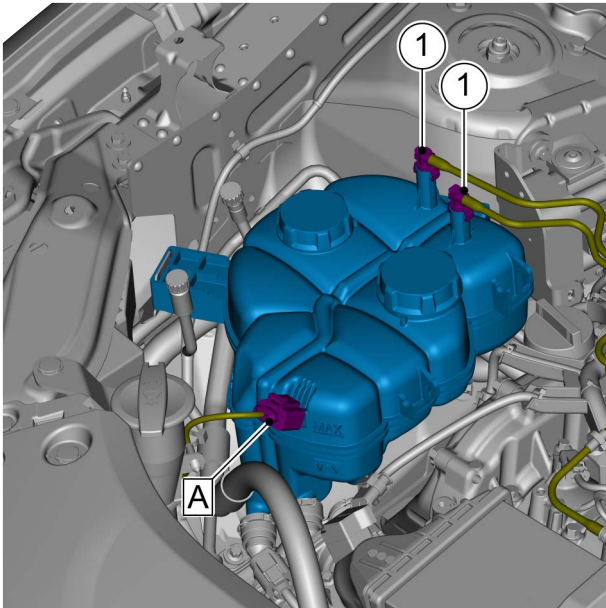


- 9 Remove the quick-insertion circlip 1 of the expansion tank outlet pipe and disconnect the expansion tank outlet pipe from the low-temperature radiator expansion kettle.
- 10 Remove the quick-insertion circlip 2 of the battery water pump inlet pipe, and disconnect the connection between the battery water pump inlet pipe and the low temperature radiator expansion kettle.
- 11 Remove the low temperature radiator expansion kettle.

Installation Procedure



- 1 Install the expansion kettle.
- 2 Connect the battery water pump inlet pipe to the low-temperature radiator expansion kettle, and install the quick-insertion circlip 2 of the battery water pump inlet pipe.
- 3 Connect the water outlet pipe of the expansion tank to the low-temperature radiator expansion kettle, and install the quick-insertion elastic circlip 1 of the water outlet pipe of the expansion tank.



- 4 Install the quick connector 1 between the degassing hose and the low-temperature radiator expansion kettle.
- 5 Connect the harness connector A of the expansion tank liquid level sensor.

- 6 Install the right engine compartment trim panel.
- 7 Fill with the engine coolant.
- 8 Install the bottom engine guard assembly.
- 9 lower the vehicle.
- 10 Connect the negative cable of the battery, start the vehicle and connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle level. If there is a drop in the level, replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the upper scribe line of the expansion kettle, and tighten the lid of the expansion kettle.
- 11 Close the engine compartment cover.

2.8.7.2 Replacement of Degassing Hose

Removal Procedure

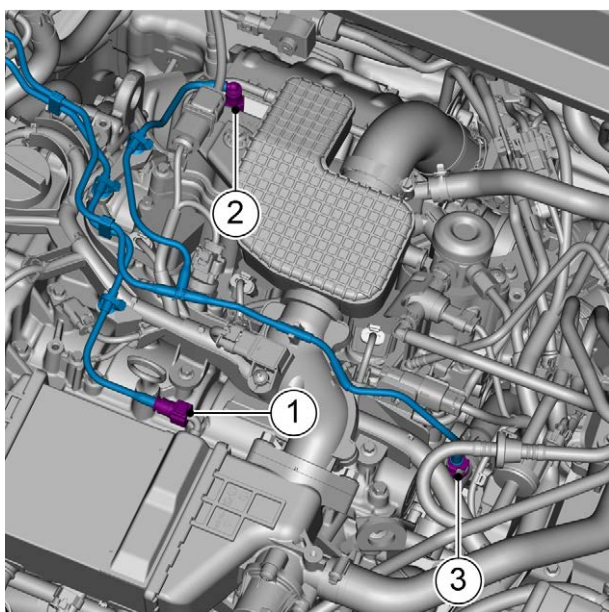
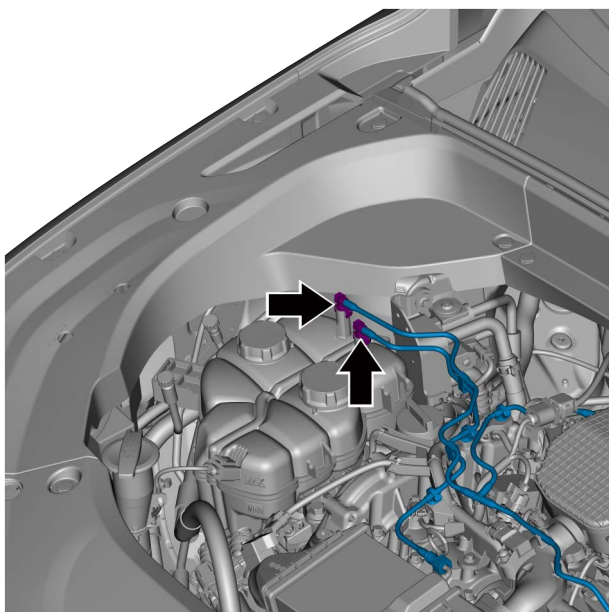
Warning !

Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#).

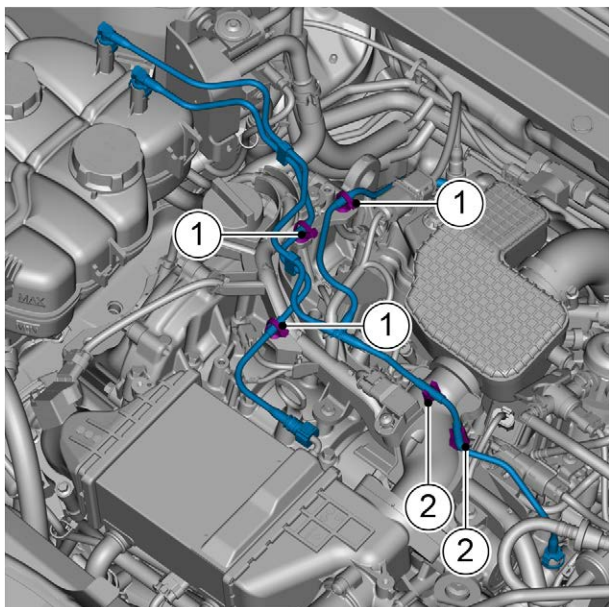
Warning !

See "WARNING ABOUT COOLING SYSTEM MAINTENANCE" in ["WARNINGS AND PRECAUTIONS"](#).

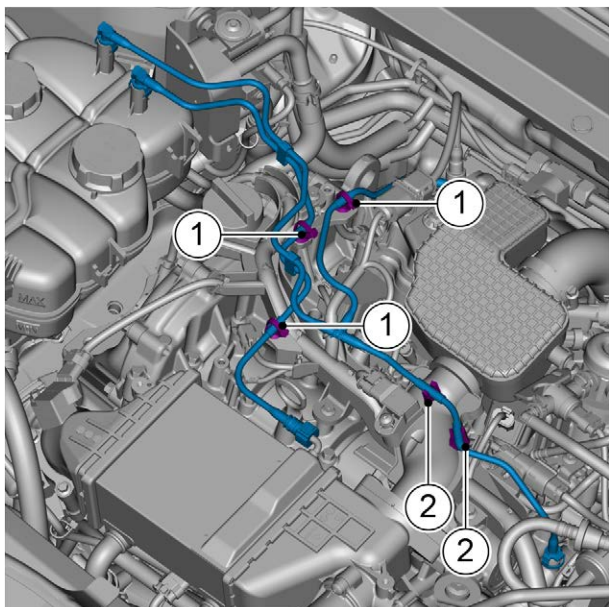
- 1 Open the engine compartment hood.
- 2 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 3 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).



- 4 Drain the engine coolant, see [Draining and Filling of Engine Coolant](#).
- 5 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 6 Remove the two quick connectors of the degassing hose to the low temperature radiator expansion kettle.
- 7 Remove the quick connector 1 between the degassing hose and the water-cooled intercooler subassembly.
- 8 Remove the quick connector 2 of the degassing hose.
- 9 Remove the quick connector 3 between the degassing hose and the thermostat housing subassembly.

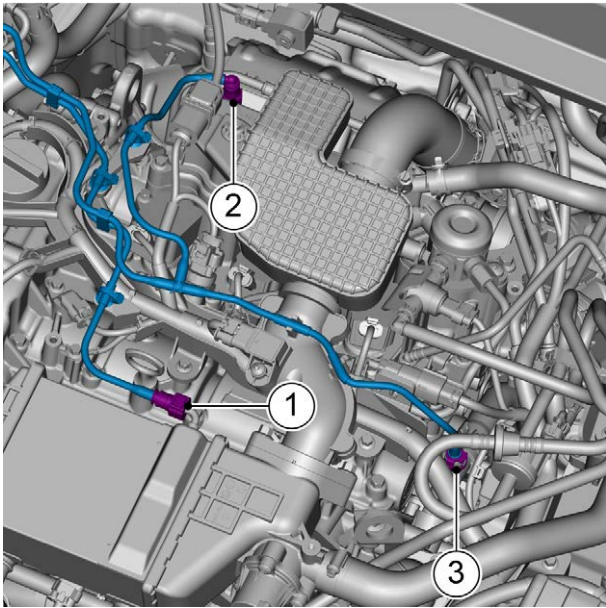


- 10 Remove the three fixing clips 1 of the degassing hose.
- 11 Remove the two fixing points 2 of the degassing hose.
- 12 Take off the degassing hose.

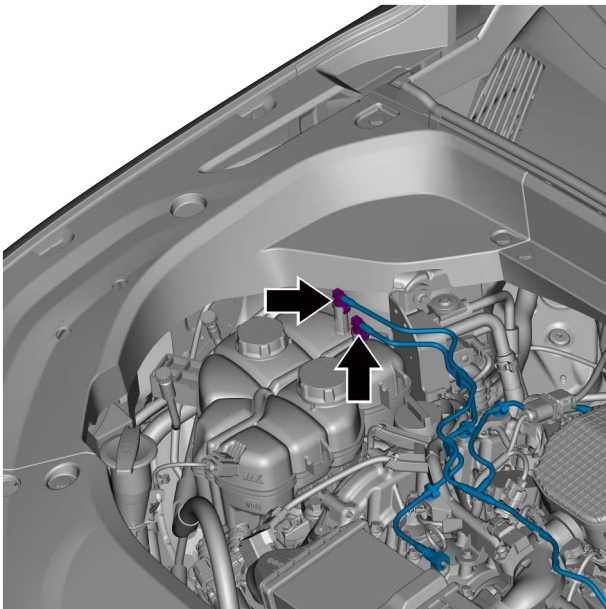


Installation Procedure

- 1 Install the degassing hose to the fixing point 2.
- 2 Install the three fixing clips 1 of the degassing hose.



- 3 Install the quick connector 3 between the degassing hose and the thermostat housing subassembly.
- 4 Install the quick connector 2 connecting the degassing hose to the engine.
- 5 Install the quick connector 1 between the degassing hose and the water-cooled intercooler subassembly.



- 6 Connect the quick connector between the degassing hose and the low temperature radiator expansion kettle.

- 7 Install the engine trim cover assembly.
- 8 Fill with the engine coolant.
- 9 Install the bottom engine guard assembly.
- 10 lower the vehicle.
- 11 Start the vehicle to connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the liquid level of the expansion kettle. If the liquid level has dropped, you need to replenish the coolant in time. Until after the main circulation is opened, replenish the coolant to the upper scribe line of the expansion kettle, and tighten the lid of the expansion kettle.
- 12 Close the engine compartment cover.

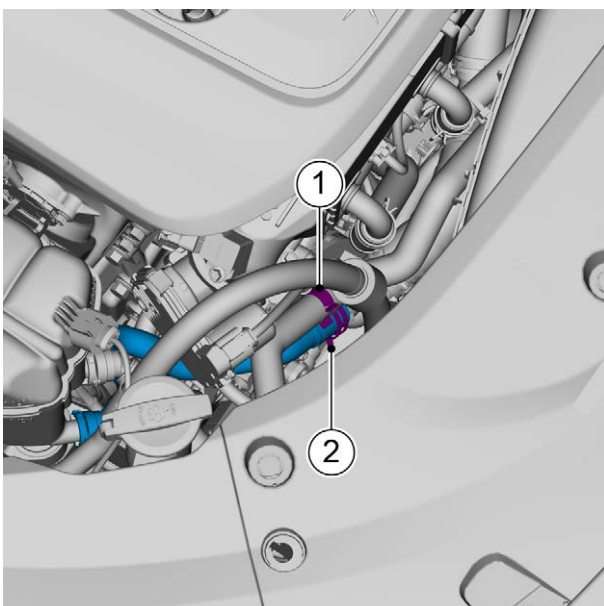
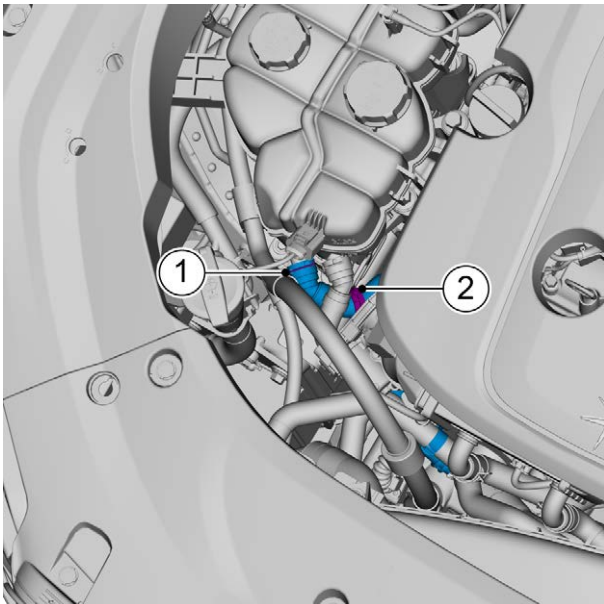
2.8.7.3 Replacement of Expansion Tank Outlet Pipe

Removal Procedure

Warning !

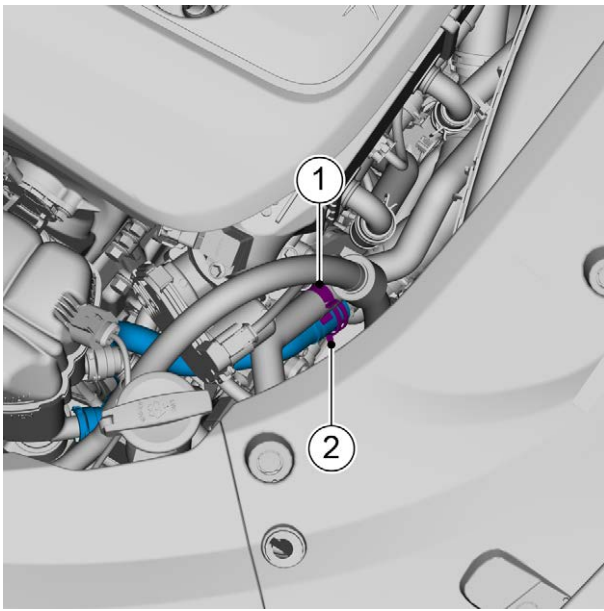
See "WARNING ABOUT COOLING SYSTEM MAINTENANCE" in "[WARNINGS AND PRECAUTIONS](#)".

- 1 Open the engine compartment hood.
- 2 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 3 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 4 Drain the engine coolant, see [Draining and Filling of Engine Coolant](#).
- 5 Remove the quick-insertion circlip 1 of the expansion tank outlet pipe and disconnect the expansion tank outlet pipe from the low-temperature radiator expansion kettle.
- 6 Disconnect the harness clip 2 of the engine grounding wire.



- 7 Disconnect the fixing clip 1 of the expansion tank outlet pipe.
- 8 Remove the fixing clips 2 of the expansion tank outlet pipe, and take off the expansion tank outlet pipe.

Installation Procedure

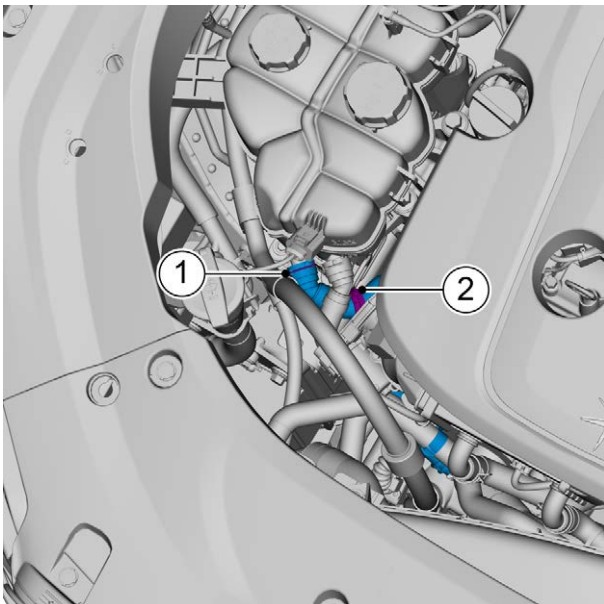


- 1 Connect the expansion tank outlet pipe, and install the fixing clips 2 of the expansion tank outlet pipe.

Caution

Pipe orifices should be aligned with the markings for connecting.

- 2 Install the fixing clips 1 of the expansion tank outlet pipe.



- 3 Install the harness clip 2 of the engine grounding wire.
- 4 Connect the water outlet pipe of the expansion tank to the low-temperature radiator expansion kettle, and install the quick-insertion elastic circlip 1 of the water outlet pipe of the expansion tank.

- 5 Fill with the engine coolant.
- 6 Install the bottom engine guard assembly.
- 7 lower the vehicle.
- 8 Start the vehicle to connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the liquid level of the expansion kettle. If the liquid level has dropped, you need to replenish the coolant in time. Until after the main circulation is opened, replenish the coolant to the upper scribe line of the expansion kettle, and tighten the lid of the expansion kettle.
- 9 Close the engine compartment cover.

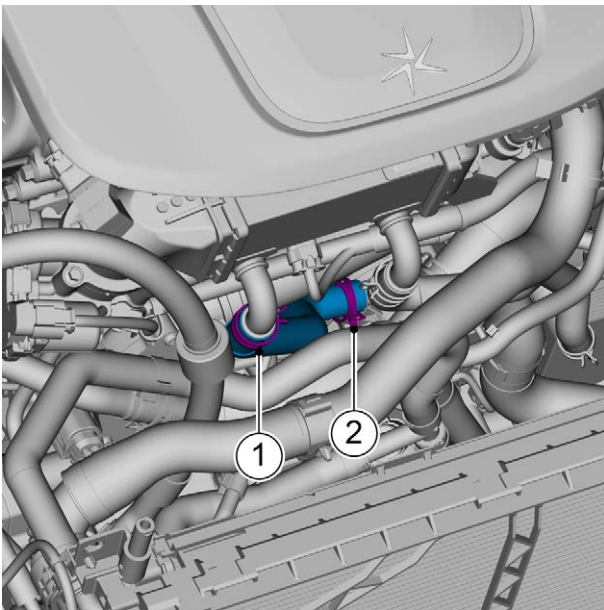
2.8.7.4 Replacement of Intercooler Inlet Hose

Removal Procedure

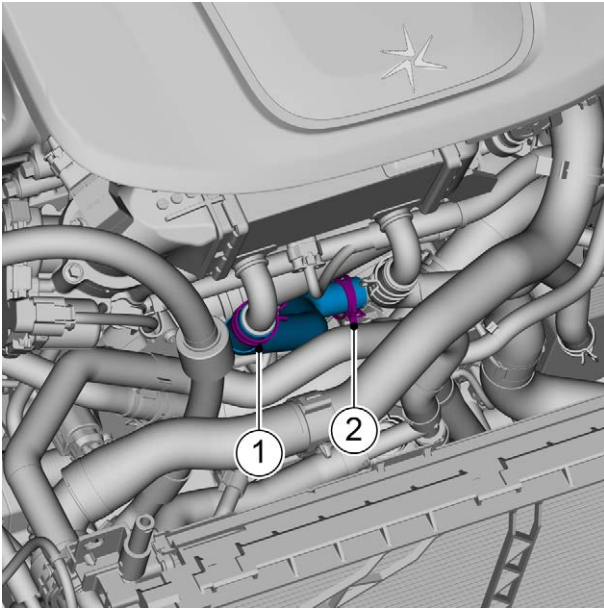
Warning !

See "WARNING ABOUT COOLING SYSTEM MAINTENANCE" in "[WARNINGS AND PRECAUTIONS](#)".

- 1 Open the engine compartment hood.
- 2 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 3 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 4 Drain the engine coolant, see [Draining and Filling of Engine Coolant](#).
- 5 Remove the air filter intake pipe assembly. refer to [Replacement of air filter intake pipe assembly](#).
- 6 Remove the engine cooling fan, see [Replacement of Engine Cooling Fan](#).
- 7 Disconnect the intercooler inlet pipe from the water-cooled intercooler subassembly by removing the fixing clamp 1 of the intercooler inlet pipe.
- 8 Disconnect the intercooler inlet pipe from the battery coolant pump by removing the fixing clamp 2 of the intercooler inlet pipe.
- 9 Remove the intercooler inlet pipe.



Installation Procedure



- 1 Install the intercooler inlet pipe.
- 2 Connect the intercooler inlet pipe to the battery coolant pump and install the fixing clamp 2 of the intercooler inlet pipe.

Caution

Pipe orifices should be aligned with the markings for connecting.

- 3 Connect the intercooler inlet pipe to the water-cooled intercooler subassembly and install the fixing clamp 1 of the intercooler inlet pipe.

Caution

Pipe orifices should be aligned with the markings for connecting.

- 4 Install the engine cooling fan.
- 5 Install the air filter intake pipe assembly.
- 6 Fill with the engine coolant.
- 7 Install the bottom engine guard assembly.
- 8 lower the vehicle.
- 9 Start the vehicle to connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the liquid level of the expansion kettle. If the liquid level has dropped, you need to replenish the coolant in time. Until after the main circulation is opened, replenish the coolant to the upper scribe line of the expansion kettle, and tighten the lid of the expansion kettle.
- 10 Close the engine compartment cover.

2.8.7.5 Replacement of Radiator Outlet Pipe

Removal Procedure

Warning !

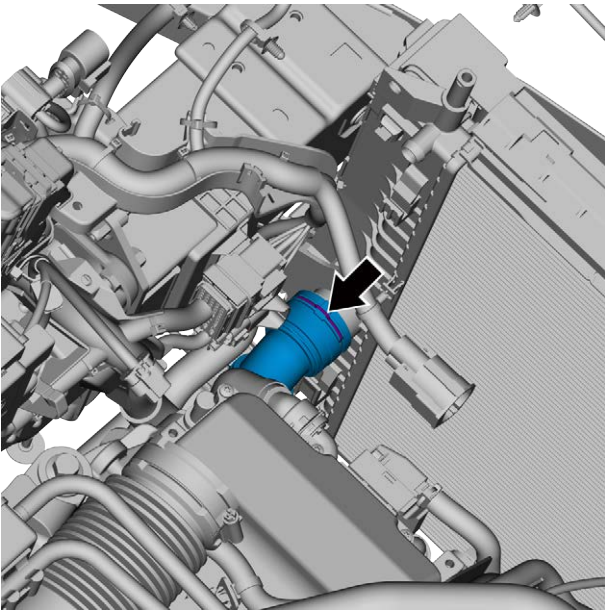
See "WARNING ABOUT COOLING SYSTEM MAINTENANCE" in "[WARNINGS AND PRECAUTIONS](#)".

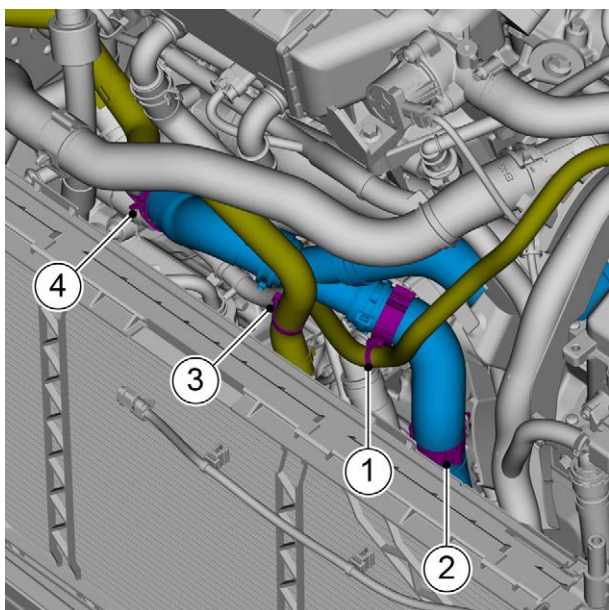
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

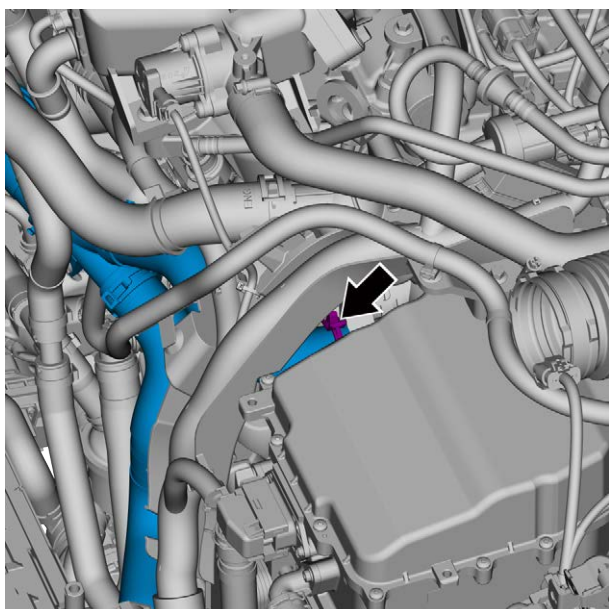
- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

- 3 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 4 Remove the air filter assembly, see [Replacement of Air Filter Assembly](#).
- 5 Remove the air filter intake pipe assembly. refer to [Replacement of air filter intake pipe assembly](#).
- 6 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 7 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 8 Drain the engine coolant, see [Draining and Filling of Engine Coolant](#).
- 9 Remove the engine cooling fan, see [Replacement of Engine Cooling Fan](#).
- 10 Remove the transmission oil cooler inlet pipe (front end), see [Replacement of Transmission Oil Cooler inlet pipe \(front end\)](#).
- 11 Remove the quick-insertion circlip of the radiator outlet pipe, and disconnect the radiator outlet pipe from the radiator.



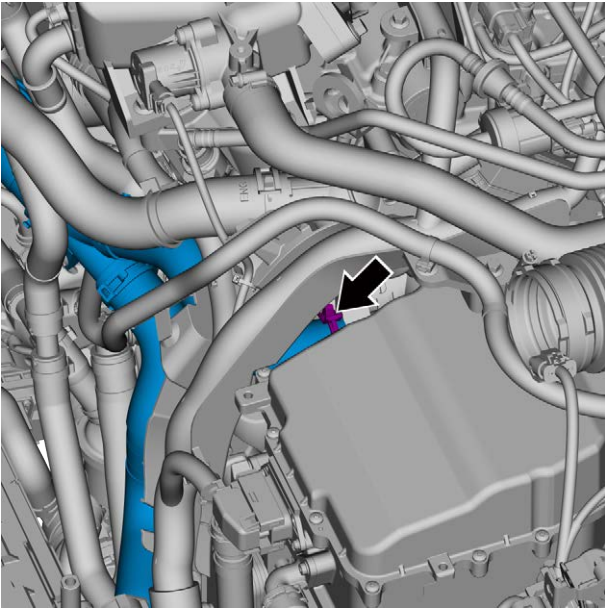


- 12 Disengage the fixing clips 1 of the DC bus assembly.
- 13 Remove the fixing clip 2 of the radiator inlet pipe (2).
- 14 Remove the fixing clips 3 of the radiator outlet pipe.
- 15 Remove the fixing clamp 4 of the radiator outlet pipe and disconnect the connection between the radiator outlet pipe and the engine cooling pump.



- 16 Remove the fixing clamp of the radiator outlet pipe, and disconnect the radiator outlet pipe from the thermostat housing subassembly.
- 17 Remove the radiator outlet pipe.

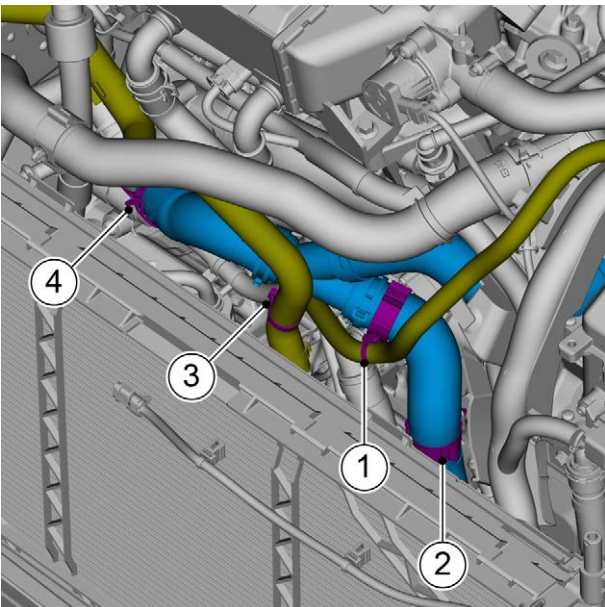
Installation Procedure



- 1 Install the radiator outlet pipe.
- 2 Connect the radiator outlet pipe to the thermostat housing subassembly, and install the fixing clips of the radiator outlet pipe.

Caution

Pipe orifices should be aligned with the markings for connecting.

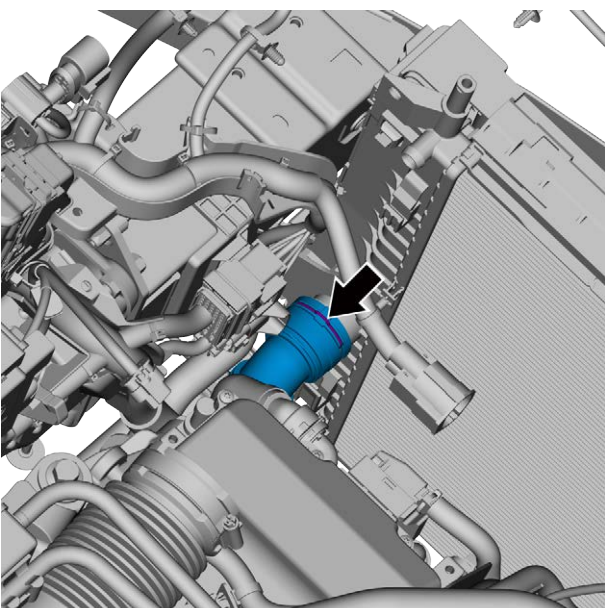


- 3 Connect the radiator outlet pipe to the engine cooling pump, and install the fixing clamp 4 of the radiator outlet pipe.

Caution

Pipe orifices should be aligned with the markings for connecting.

- 4 Install the fixing clips 3 of the radiator outlet pipe.
- 5 Install the fixing clip 2 of the radiator inlet pipe (2).
- 6 Install and remove the fixing clips 1 of the DC bus assembly.



- 7 Connect the radiator outlet pipe to the radiator, and install the quick-insertion circlip of the radiator outlet pipe.

- 8 Install the transmission oil cooler inlet pipe (front end).
- 9 Install the engine cooling fan.
- 10 Fill with the engine coolant.
- 11 Install the bottom engine guard assembly.
- 12 lower the vehicle.
- 13 Install the air filter intake pipe assembly.
- 14 Install the air filter assembly.
- 15 Install the engine trim cover assembly.
- 16 Connect the negative cable of the battery, start the vehicle and connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle level. If there is a drop in the level, replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the upper scribe line of the expansion kettle, and tighten the lid of the expansion kettle.
- 17 Close the engine compartment cover.

2.8.7.6 Replacement of Radiator Inlet Hose

Removal Procedure

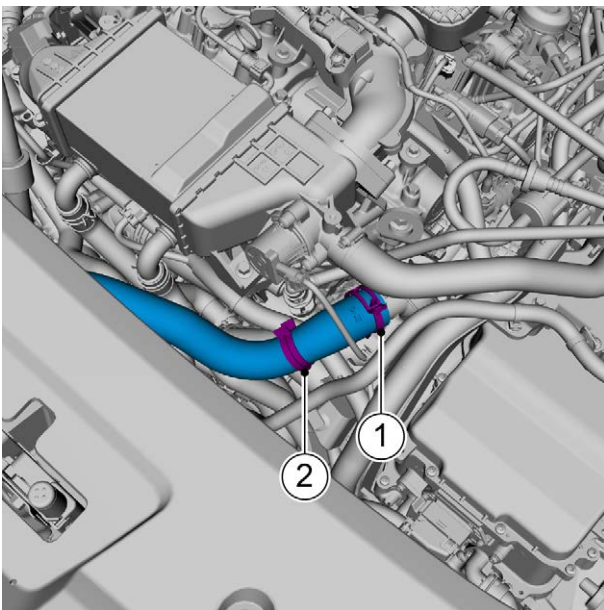
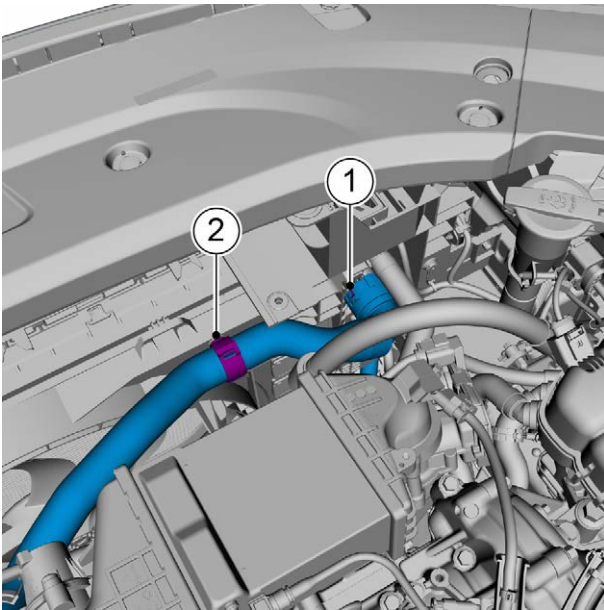
Warning !

See "WARNING ABOUT COOLING SYSTEM MAINTENANCE" in "[WARNINGS AND PRECAUTIONS](#)".

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

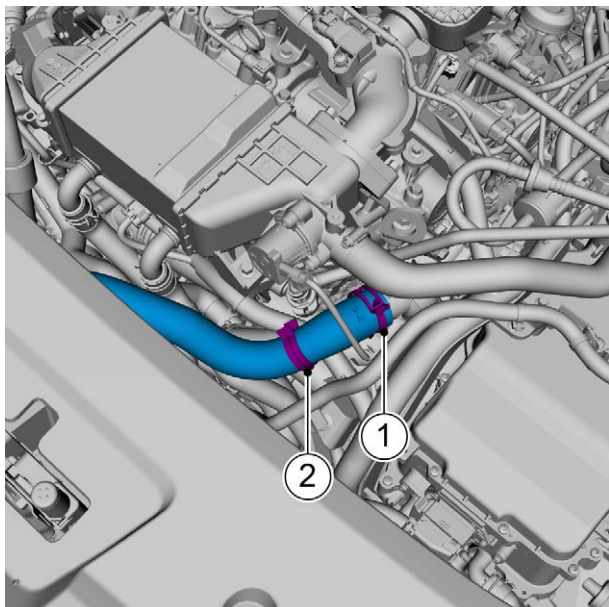
- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 4 Remove the air filter assembly, see [Replacement of Air Filter Assembly](#).
- 5 Remove the air filter intake pipe assembly. refer to [Replacement of air filter intake pipe assembly](#).
- 6 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 7 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).



- 8 Drain the engine coolant, see [Draining and Filling of Engine Coolant](#).
- 9 Disconnect the radiator inlet pipe from the radiator by removing the quick-insert circlip 1 of the radiator inlet pipe.
- 10 Remove the fixing clip 2 of the radiator inlet pipe.

- 11 Remove the fixing clamp 1 of the radiator inlet pipe, and disconnect the connection between the radiator inlet pipe and the engine.
- 12 Disconnect the harness clips 2 from the engine wiring harness.
- 13 Remove the radiator inlet pipe.

Installation Procedure

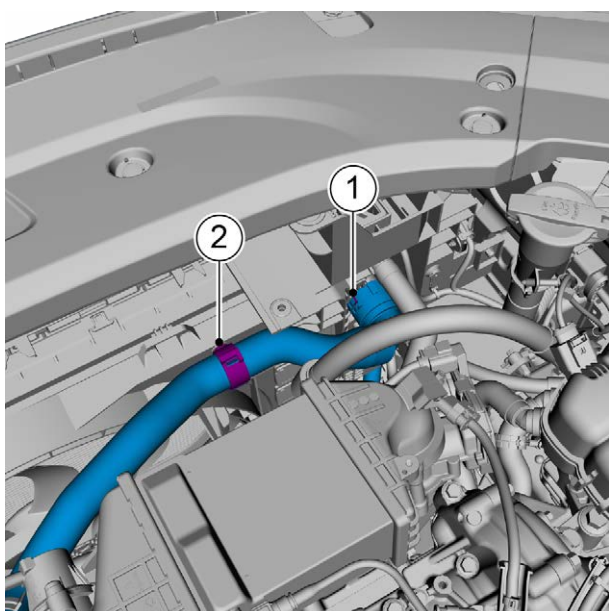


- 1 Install the radiator inlet pipe.

Caution

Pipe orifices should be aligned with the markings for connecting.

- 2 Install the harness clip 2 of the engine harness.
- 3 Connect the radiator inlet pipe to the engine, and install the fixing clips 1 of the radiator inlet pipe.



- 4 Install the fixing clip 2 of the radiator inlet pipe.
- 5 Connect the radiator inlet pipe to the radiator and install the quick-insertion circlip 1 of the radiator inlet pipe.

- 6 Fill with the engine coolant.
- 7 Install the bottom engine guard assembly.
- 8 lower the vehicle.
- 9 Install the air filter intake pipe assembly.
- 10 Install the air filter assembly.
- 11 Install the engine trim cover assembly.

- 12 Connect the negative cable of the battery, start the vehicle and connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle level. If there is a drop in the level, replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the upper scribe line of the expansion kettle, and tighten the lid of the expansion kettle.
- 13 Close the engine compartment cover.

2.8.7.7 Replacement of Exhaust Gas Circulation Outlet Pipe

Removal Procedure

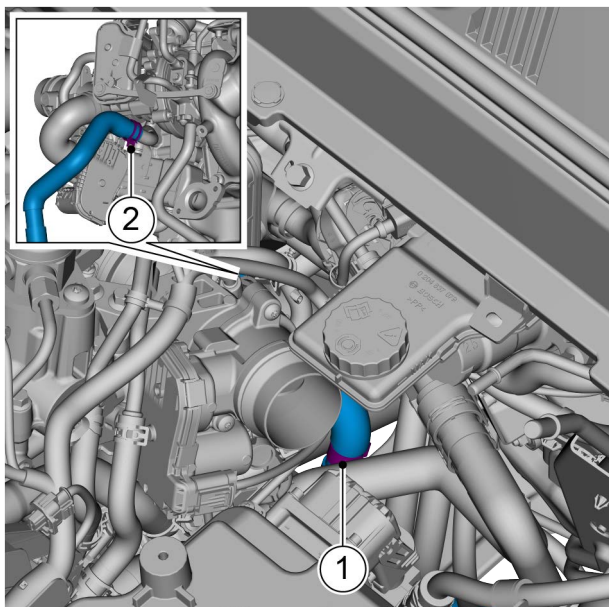
Warning !

See "WARNING ABOUT COOLING SYSTEM MAINTENANCE" in "[WARNINGS AND PRECAUTIONS](#)".

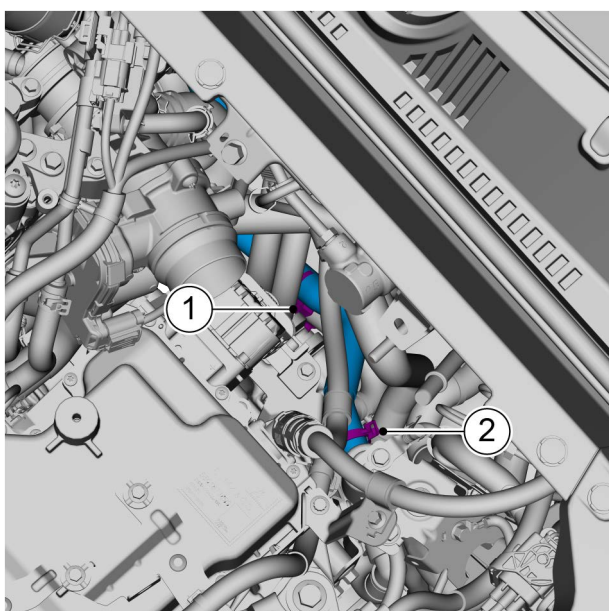
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the engine trim cover assembly, refer to [Replacement of engine trim cover assembly](#).
- 4 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 5 Drain the engine coolant, see [Draining and Filling of Engine Coolant](#).
- 6 Remove the resonator assembly, see [Replacement of Resonator Assembly](#).

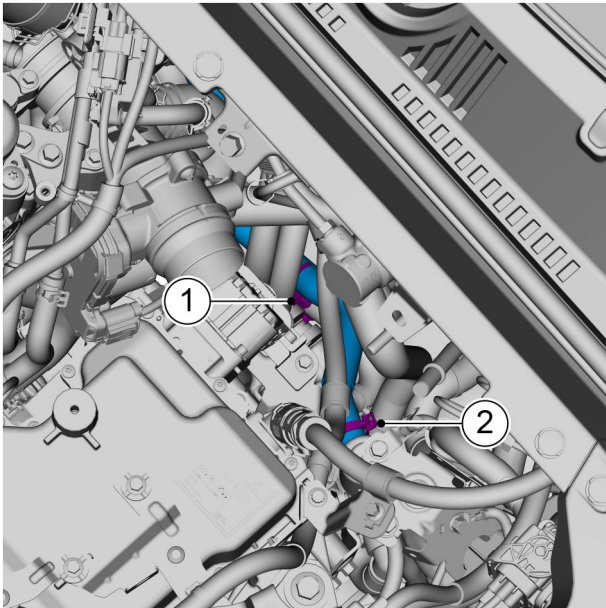


- 7 Disengage the fixing clip 1 of the transmission oil cooler inlet pipe assembly.
- 8 Disconnect the exhaust gas circulation outlet pipe from the engine by removing the fixing clamp 2 of the exhaust gas circulation outlet pipe.



- 9 Disengage the fixing clip 1 of the exhaust gas circulation outlet pipe.
- 10 Remove the fixing clamp 2 of the exhaust gas circulation outlet pipe and disconnect the exhaust gas circulation outlet pipe from the Three-way solenoid valve (1).
- 11 Remove the exhaust gas circulation outlet pipe.

Installation Procedure

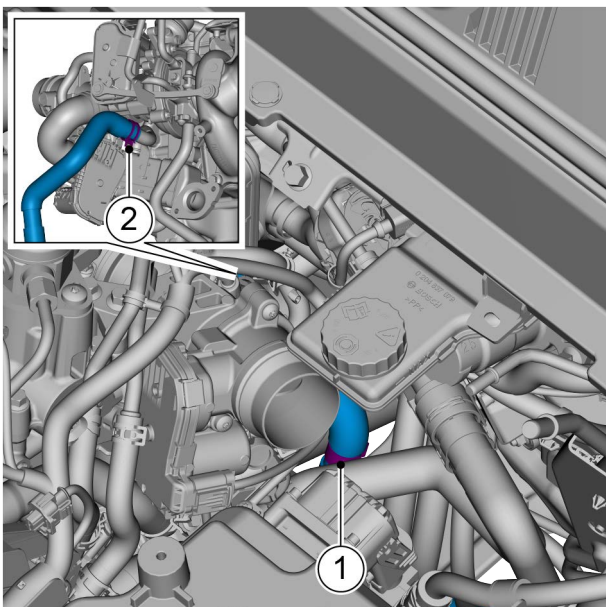


- 1 Installation Exhaust gas circulation outlet pipe.
- 2 Connect the exhaust gas circulation outlet pipe to the Three-way solenoid valve (1) and install the fixing clamp 2 for the exhaust gas circulation outlet pipe.

Caution

Pipe orifices should be aligned with the markings for connecting.

- 3 Install the fixing clip 1 of the exhaust gas circulation outlet pipe.



- 4 Connect the exhaust gas circulation outlet pipe to the engine and install the fixing clamp 2 of the exhaust gas circulation outlet pipe.
- 5 Install the fixing clip 1 of the transmission oil cooler inlet pipe assembly.

- 6 Install the resonator assembly.
- 7 Fill with the engine coolant.
- 8 Install the bottom engine guard assembly.
- 9 Install the engine trim cover assembly.
- 10 Connect the negative cable of the battery, start the vehicle and connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle level. If there is a drop in the level, replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the upper scribe line of the expansion kettle, and tighten the lid of the expansion kettle.
- 11 Close the engine compartment cover.

2.8.7.8 Replacement of Thermostat Outlet Pipe

Removal Procedure

Warning !

See "WARNING ABOUT COOLING SYSTEM MAINTENANCE" in "[WARNINGS AND PRECAUTIONS](#)".

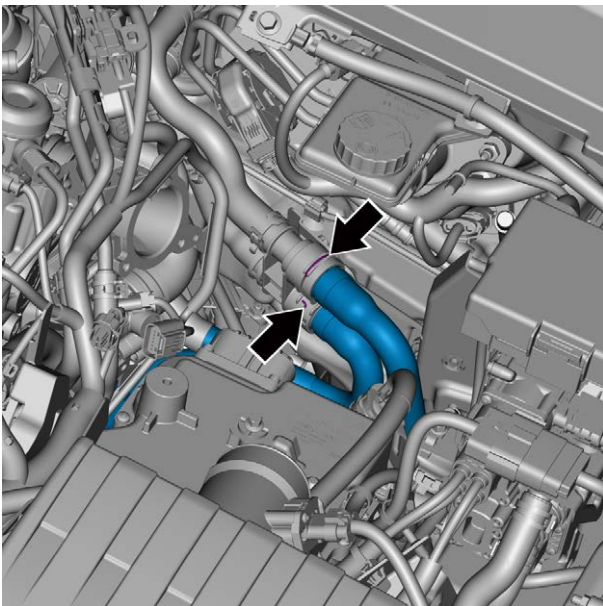
Warning !

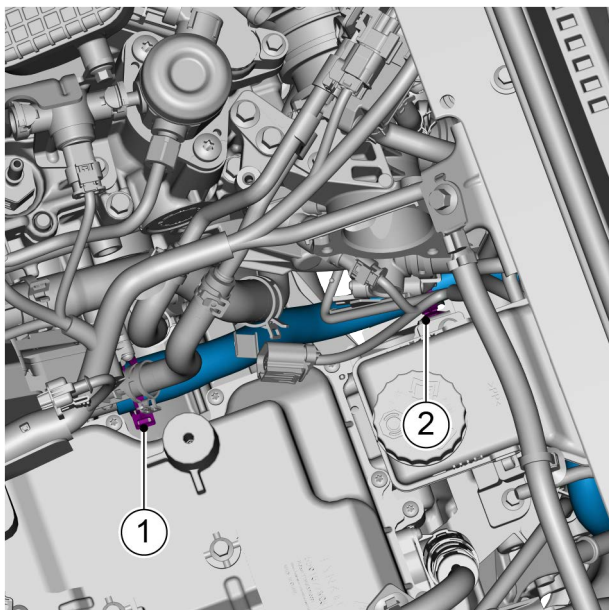
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 4 Remove the resonator assembly, see [Replacement of Resonator Assembly](#).
- 5 Remove the pressure regulating valve, , see [Replacement of Pressure Regulating Valve](#).
- 6 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 7 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 8 Drain the engine coolant, see [Draining and Filling of Engine Coolant](#).
- 9 Unlock the quick-insertion elastic circlip and disconnect the thermostat outlet pipe from the electric heater outlet pipe.

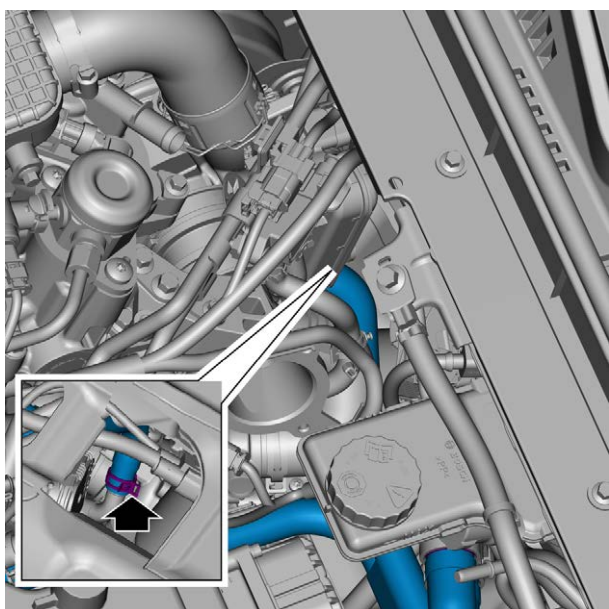
Caution

1. After disconnecting the pipeline, promptly perform pipe wrapping to prevent foreign objects from entering the pipeline.
2. Before the water pipe is disconnected, please place a container on the bottom of the vehicle to catch the antifreeze to avoid contaminating the ground.



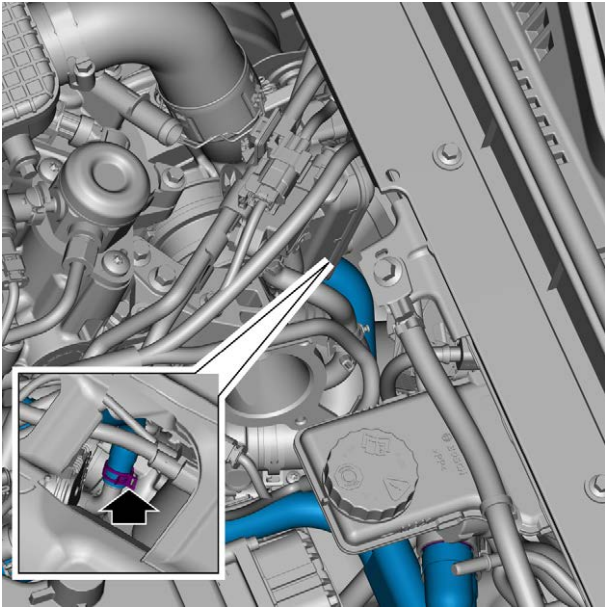


- 10 Remove the fixing clamp 1 of the thermostat outlet pipe and disconnect the thermostat outlet pipe from the engine.
- 11 Remove the fixing clips 2 of the thermostat outlet pipe.



- 12 Remove the fixing clamp of the thermostat outlet pipe and take off the thermostat outlet pipe.

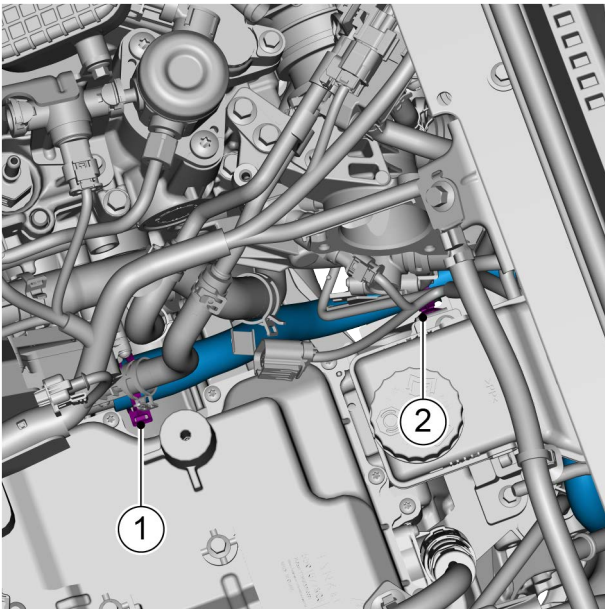
Installation Procedure



- 1 Connect the thermostat outlet pipe, and install the fixing clamp of the thermostat outlet pipe.

Caution

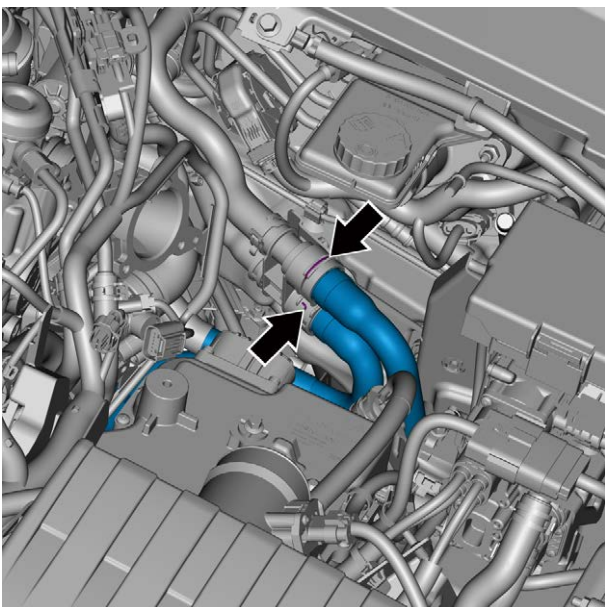
Pipe orifices should be aligned with the markings for connecting.



- 2 Install the fixing clips 2 of the thermostat outlet pipe.
- 3 Connect the thermostat outlet pipe to the engine, and install the fixing clamp 1 of the thermostat outlet pipe.

Caution

Pipe orifices should be aligned with the markings for connecting.



- 4 Connect the thermostat outlet pipe with the electric heating outlet pipe, and install the quick-insertion elastic clamp.

- 5 Fill with the engine coolant.
- 6 Install the bottom engine guard assembly.
- 7 lower the vehicle.
- 8 Install the pressure regulating valve.
- 9 Install the resonator assembly.
- 10 Install the engine trim cover assembly.
- 11 Connect the negative cable of the battery, start the vehicle and connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle level. If there is a drop in the level, replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the upper scribe line of the expansion kettle, and tighten the lid of the expansion kettle.
- 12 Close the engine compartment cover.

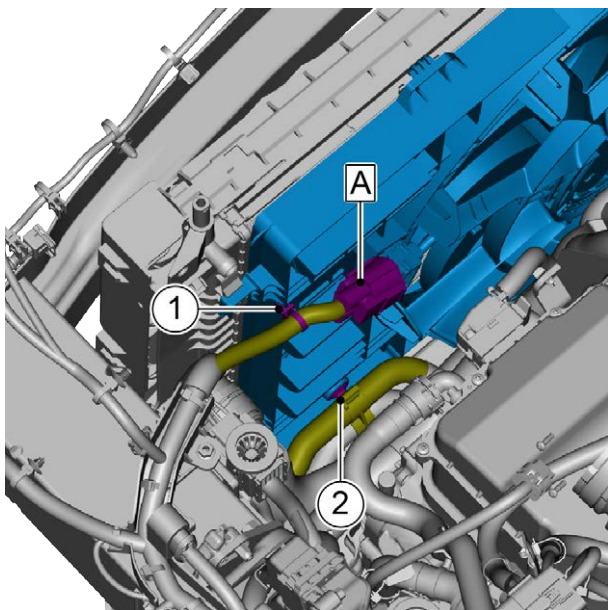
2.8.7.9 Replacement of Engine Cooling Fan

Removal Procedure

Warning !

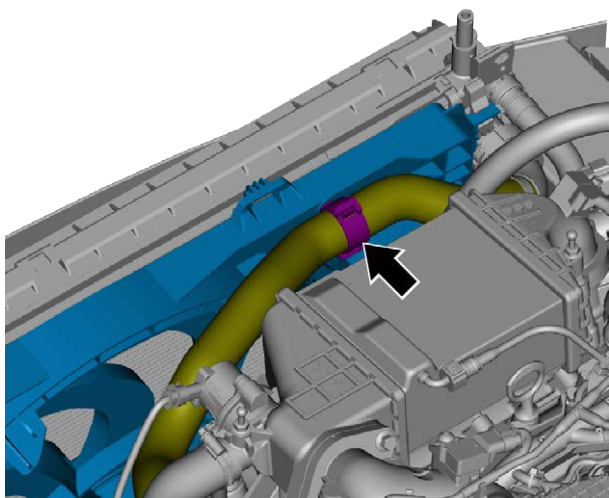
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the air filter assembly, see [Replacement of Air Filter Assembly](#).
- 4 Remove the air filter intake pipe assembly. refer to [Replacement of air filter intake pipe assembly](#).
- 5 Remove the left/right engine compartment trim panel, see [Replacement of Left Engine Compartment Trim Panel](#).
- 6 Remove the engine compartment trim panel, refer to [Replacement of engine compartment trim panel](#).
- 7 Remove the front bumper assembly, see [Replacement of Front Bumper Assembly](#).
- 8 Remove the left/right headlight unit, see [Replacement of Headlight Unit \(front left\)](#).
- 9 Remove the engine hood latch, refer to [Replacement of engine hood latch](#).
- 10 Remove the horn (treble), see [Replacement of Horn \(treble\)](#).

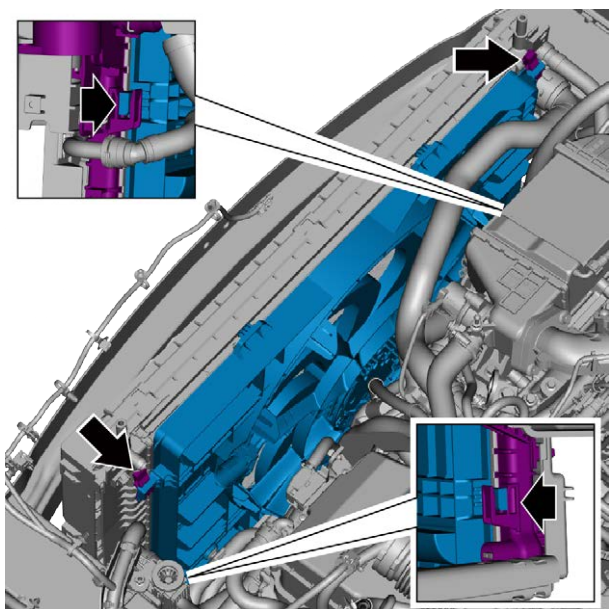


- 11 Remove the horn (bass), see [Replacement of Horn \(bass\)](#).
- 12 Remove the front end module assembly, refer to [Replacement of front end module assembly](#).
- 13 Disconnect the harness connector A of the engine cooling fan, and remove the fixing clips 1 of the front compartment wiring harness assembly.
- 14 Remove the fixing clips 2 of the radiator outlet pipe (2).

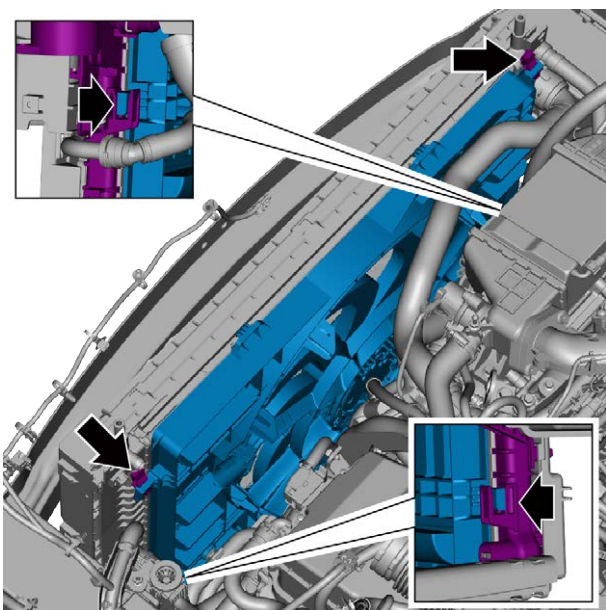
- 15 Remove the fixing clips of the radiator inlet pipe.



- 16 Disconnect the fixing clips of the engine cooling fan, and remove the engine cooling fan.



Installation Procedure

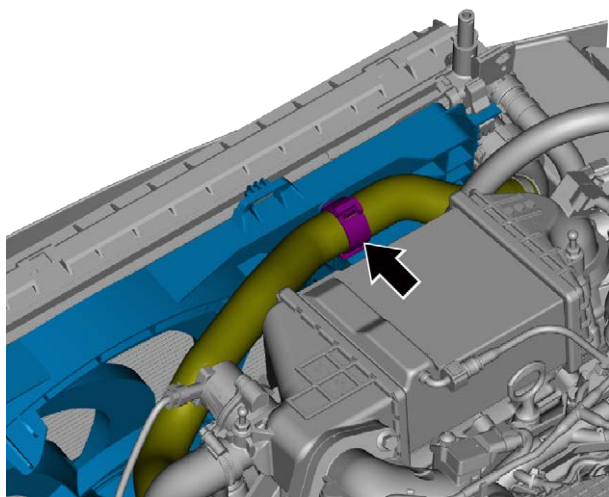


- 1 Install the engine cooling fan.

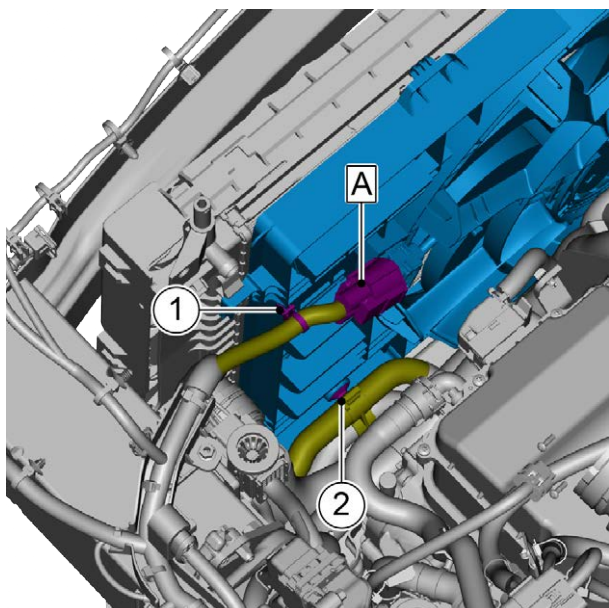
Caution

After installation is complete, make sure the engine cooling fan is in place.

- 2 Install the fixing clips of the radiator inlet pipe.



- 3 Install the fixing clips 2 of the radiator outlet pipe.
- 4 Connect the connector A of the engine cooling fan, and install the fixing clips 1 of the front compartment wiring harness assembly.



- 5 Install the front end module assembly.
- 6 Install the bass horn assembly.
- 7 Install the treble horn assembly.
- 8 Install the engine hood latch.
- 9 Install the front combination light assembly.
- 10 Install the front bumper assembly.
- 11 Install the engine compartment trim panel.
- 12 Install the left and right compartment trim panels.
- 13 Install the air filter intake pipe assembly.
- 14 Install the air filter assembly.
- 15 Connect the negative cable of the battery, and perform a motion test on the engine cooling fan with a diagnostic gauge.
- 16 Close the engine compartment cover.

2.8.7.10 Cleaning of Cooling System

Cleaning Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine hood.
- 2 Disconnect the negative cable of the battery, see [Disconnection Procedure of Battery Cable](#).
- 3 Flush the cooling module with clean water from the front grille to the cooling module at a flushing pressure of ≤ 0.2 mPa and a flushing angle of $\leq 30^\circ$ (perpendicular to the radiator surface).

Caution

Avoid the wiring harness connectors as much as possible during the flushing process.

- 4 Connect the negative cable of battery.

Caution

Wait for all the water on the radiator surface to dry in air before connecting the negative electrode of the battery.

- 5 Close the engine hood.

2.8.7.11 Radiator Replacement

Removal Procedure

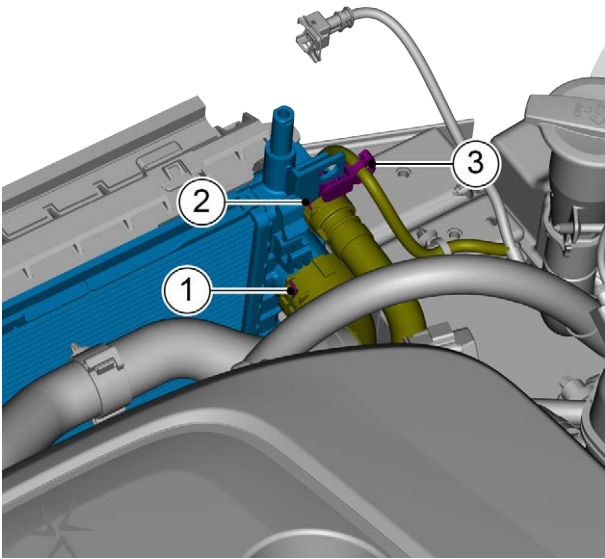
Warning !

Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#).

Warning !

See "WARNING ABOUT COOLING SYSTEM MAINTENANCE" in ["WARNINGS AND PRECAUTIONS"](#).

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Drain the engine coolant, see [Draining and Filling of Engine Coolant](#).
- 4 Remove the air filter assembly, see [Replacement of Air Filter Assembly](#).
- 5 Remove the air filter intake pipe assembly. refer to [Replacement of air filter intake pipe assembly](#).
- 6 Remove the engine compartment trim panel, refer to [Replacement of engine compartment trim panel](#).
- 7 Remove the front bumper assembly, see [Replacement of Front Bumper Assembly](#).
- 8 Remove the radiator cover, refer to [Replacement of radiator cover](#).
- 9 Remove the radiator (front), see [Replacement of Radiator \(front\)](#).
- 10 Remove the headlight unit, see [Replacement of Headlight Unit \(front left\)](#).
- 11 Remove the engine hood latch, refer to [Replacement of engine hood latch](#).
- 12 Remove the horn (treble), see [Replacement of Horn \(treble\)](#).
- 13 Remove the horn (bass), see [Replacement of Horn \(bass\)](#).
- 14 Remove the front end module assembly, refer to [Replacement of front end module assembly](#).
- 15 Remove the engine cooling fan, see [Replacement of Engine Cooling Fan](#).

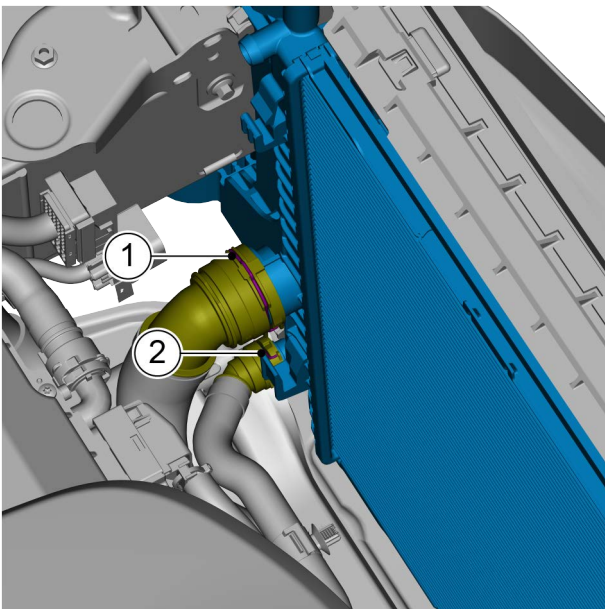


16 Disconnect the radiator inlet pipe from the radiator by removing the quick-insert circlip 1 of the radiator inlet pipe.

Left

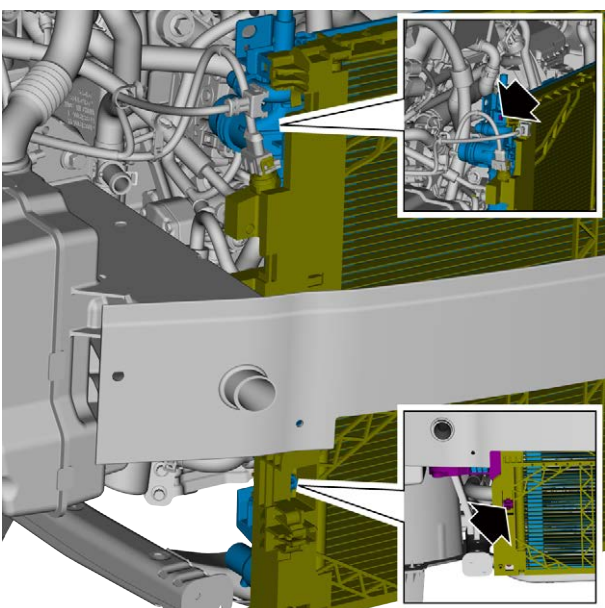
17 Disconnect the radiator inlet pipe (2) from the radiator (rear) by removing the quick-insertion circlip 2 of the radiator inlet pipe (2).

18 Remove the harness clip 3 of the chassis harness.

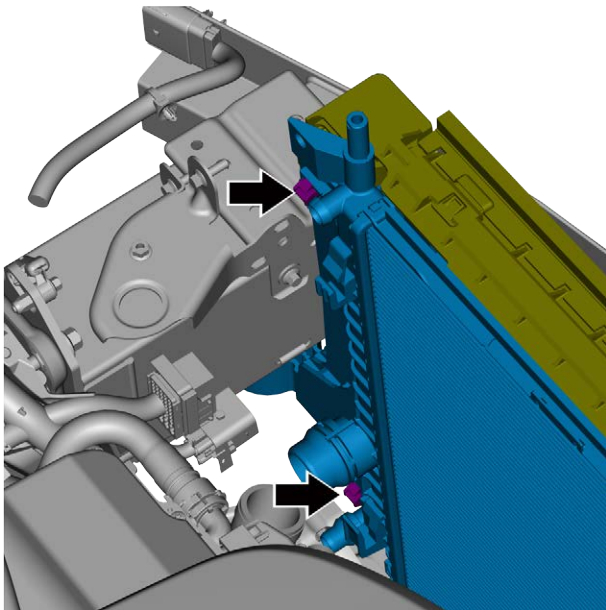


19 Remove the quick-insertion circlip 1 from the radiator outlet pipe and disconnect the radiator outlet pipe from the radiator.

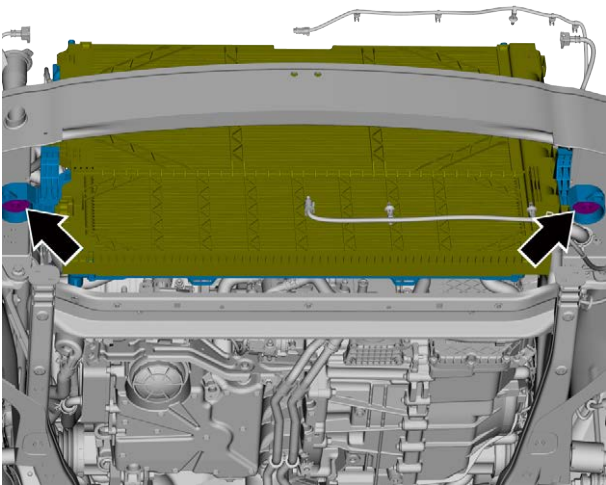
20 Remove the quick-insertion circlip 2 from the radiator outlet pipe (2) and disconnect the radiator outlet pipe (2) from the low temperature radiator.



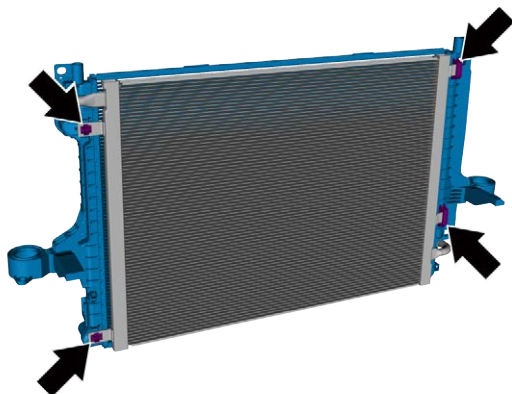
21 Disengage the two fixing clips of the right condenser frame.



- 22 Disengage the two fixing clips of the left condenser frame and move the condenser frame and condenser assembly aside and secure them.



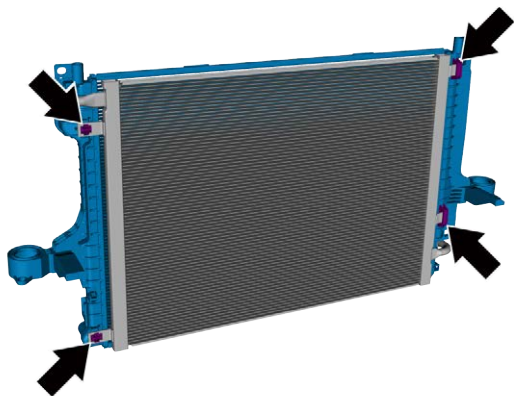
- 23 Remove the radiator and low temperature radiator by removing the two fixing bolts of the radiator.



- 24 Remove the four fixing points of the radiator and separate the radiator from the low temperature radiator.

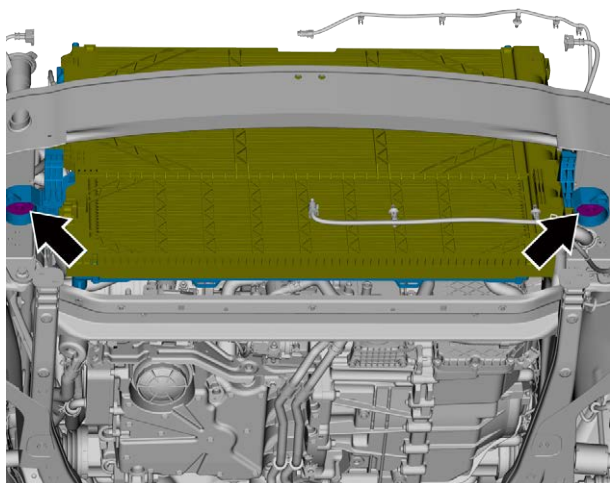
Installation Procedure

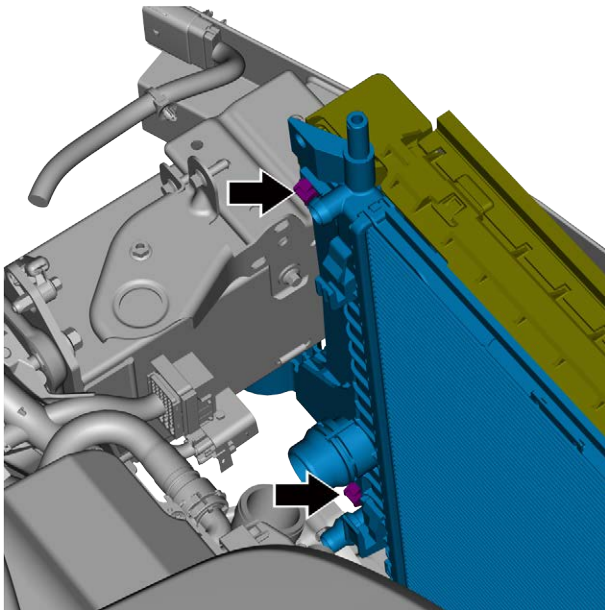
- 1 Install the radiator and low temperature radiator through four fixing points.



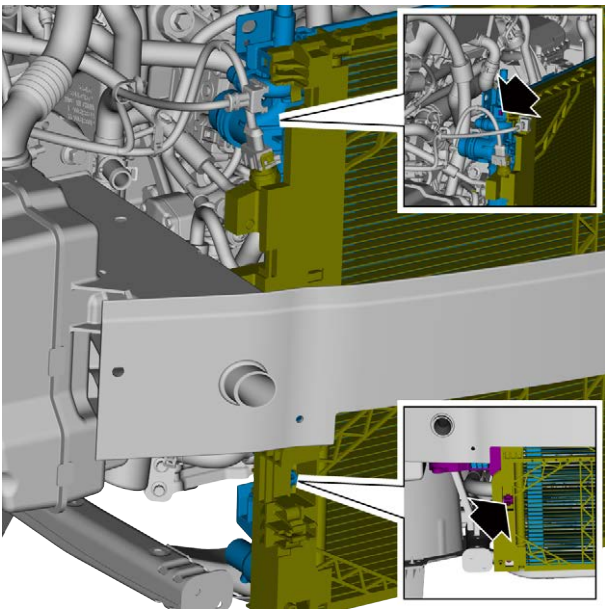
- 2 Install the radiator and the low temperature radiator, and tighten the two fixing bolts of the radiator.

Torque: 24N·m

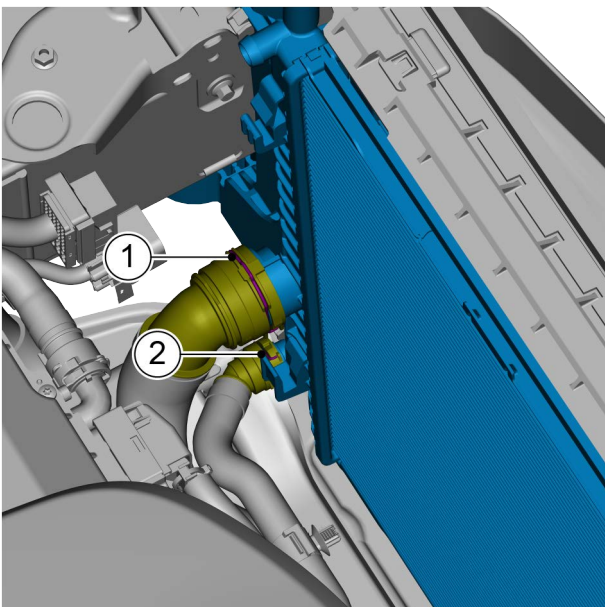




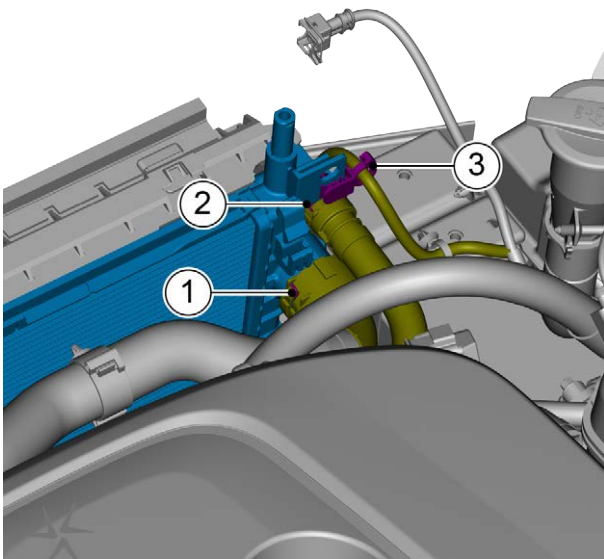
- 3 Install the condenser frame and condenser assembly.
- 4 Install the two fixing clips of the left condenser frame.



- 5 Install the two fixing clips of the right condenser frame.



- 6 Connect the radiator water outlet pipe (2) to the low temperature radiator, and install the quick-insertion elastic circlip 2.
- 7 Connect the radiator water outlet pipe to the radiator, and install the quick-insertion circlip 1.



- 8 Install the fixing clips 3 of the bottom plate wiring harness.
- 9 Connect the radiator water inlet pipe (2) to the radiator, and install the quick-insertion circlip 2 of the radiator water inlet pipe (2).
- 10 Connect the radiator inlet pipe to the radiator and install the quick-insertion circlip 1 of the radiator inlet pipe.

- 11 Install the engine cooling fan.
- 12 Install the front end module assembly.
- 13 Install the woofer.
- 14 Install the tweeter.
- 15 Install the engine hood latch.
- 16 Install the headlight unit.
- 17 Install the radiator (front).
- 18 Install the radiator cover.
- 19 Install the front bumper assembly.
- 20 Install the engine compartment trim panel.
- 21 Install the air filter intake pipe assembly.
- 22 Install the air filter assembly.
- 23 Fill with the engine coolant.
- 24 Connect the negative cable of the battery, start the vehicle and connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle level. If there is a drop in the level, replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the upper scribe line of the expansion kettle, and tighten the lid of the expansion kettle.
- 25 Close the engine compartment cover.

2.8.7.12 Replacement of Water-cooled Intercooler Subassembly

Removal Procedure

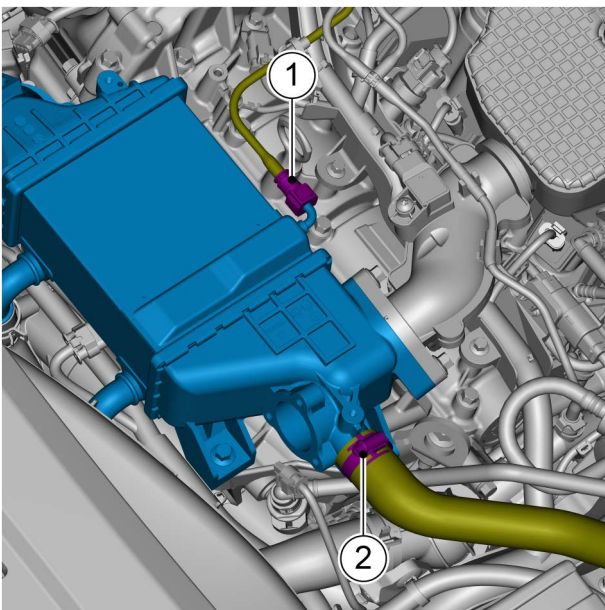
Warning !

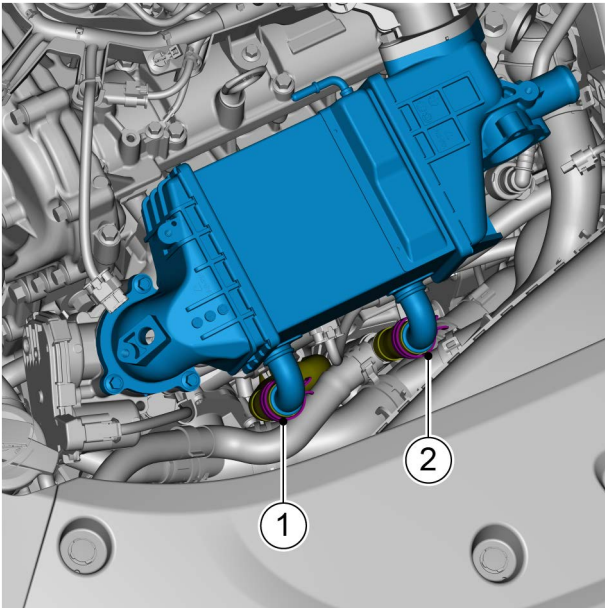
Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#).

Warning !

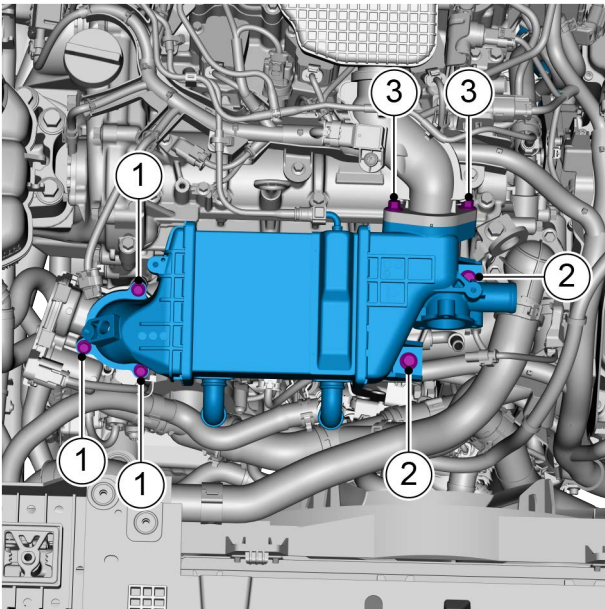
See "WARNING ABOUT COOLING SYSTEM MAINTENANCE" in ["WARNINGS AND PRECAUTIONS"](#).

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 4 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 5 Drain the electric system coolant, see [Draining and Filling Procedure of Electric System Coolant](#).
- 6 Drain the engine coolant, see [Draining and Filling of Engine Coolant](#).
- 7 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 8 Remove the intake air pressure and temperature sensor (water-cooled intercooler subassembly), see [Replacement of Intake Pressure and Temperature Sensor \(water-cooled intercooler subassembly\)](#).
- 9 Remove the electric motor coolant valve, see [Replacement of Electric Motor Coolant Valve](#).
- 10 Disconnect the quick connector 1 between the degassing hose and the water-cooled intercooler subassembly, and move aside.
- 11 Disconnect the fixing clamp 2 of the engine bypass pipe, and move aside.



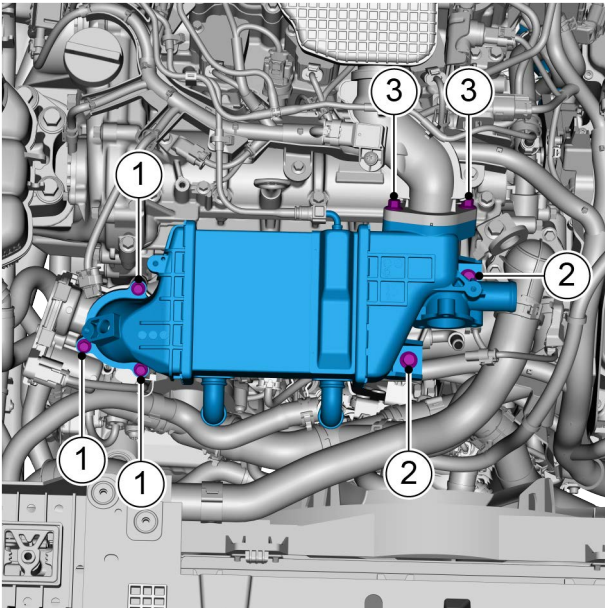


- 12 Disconnect the intercooler inlet pipe from the water-cooled intercooler subassembly by removing the fixing clamp 1 of the intercooler inlet pipe.
- 13 Remove the fixing clamp 2 of the transmission oil cooler inlet pipe assembly, and disconnect the transmission oil cooler inlet pipe assembly from the water-cooled intercooler subassembly.



- 14 Remove the three fixing bolts 1 of the water-cooled intercooler subassembly.
- 15 Remove the two fixing bolts 2 of the water-cooled intercooler subassembly.
- 16 Remove the water-cooled intercooler subassembly by removing the two fixing bolts 3 of the water-cooled intercooler subassembly.

Installation Procedure



- 1 Install the water-cooled intercooler subassembly by tightening the three fixing bolts 1 of the water-cooled intercooler subassembly in priority, and then tightening the two fixing bolts 2 of the water-cooled intercooler subassembly, and finally re-tightening them once in sequence after tightening them all.

Bolt 1 torque: 10 N·m

Torque of Bolt 2: 23 N·m

Caution

Before assembly, make sure that the throttle body sealing gasket on the intake manifold and water-cooled intercooler subassembly is in place, and check that the gasket is free from scratches, oil and dirt.

- 2 Install and tighten the two fixing bolts 3 of the water-cooled intercooler subassembly.

Torque of Bolt 3: 24 N·m

- 3 Connect the transmission oil cooler inlet pipe assembly to the water-cooled intercooler subassembly and install the fixing clamp 2 of the transmission oil cooler inlet pipe assembly.

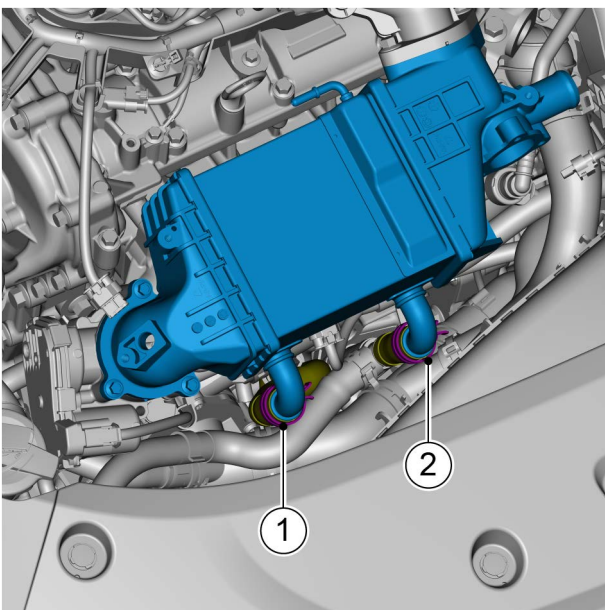
Caution

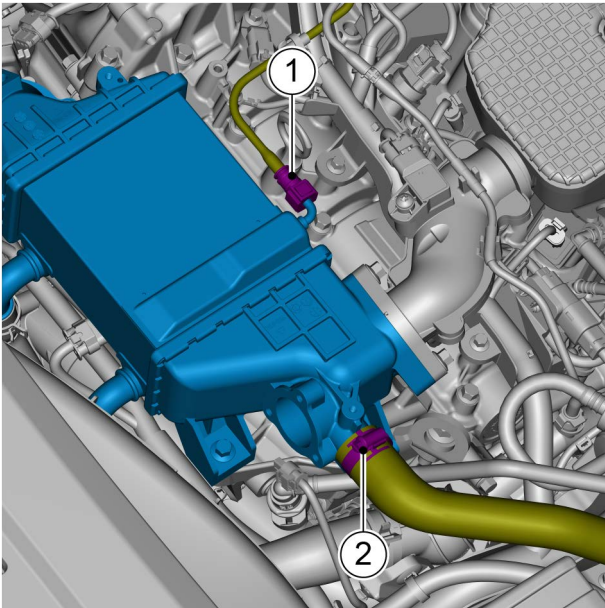
Pipe orifices should be aligned with the markings for connecting.

- 4 Connect the intercooler inlet pipe to the water-cooled intercooler subassembly and install the fixing clamp 1 of the intercooler inlet pipe.

Caution

Pipe orifices should be aligned with the markings for connecting.





- 5 Install the fixing clamps 2 of the engine bypass pipe.
- 6 Install the quick connector 1 between the degassing hose and the water-cooled intercooler subassembly.
- 7 Install the electric motor coolant valve.
- 8 Install the intake pressure and temperature sensor (water-cooled intercooler subassembly).
- 9 Install the engine trim cover assembly.
- 10 Fill with the engine coolant.
- 11 Electric system coolant.
- 12 Install the bottom engine guard assembly.
- 13 lower the vehicle.
- 14 Connect the negative cable of the battery, start the vehicle and connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle level. If there is a drop in the level, replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the upper scribe line of the expansion kettle, and tighten the lid of the expansion kettle.
- 15 Close the engine compartment cover.

2.8.7.13 Replacement of Engine Cooling Pump

Removal Procedure

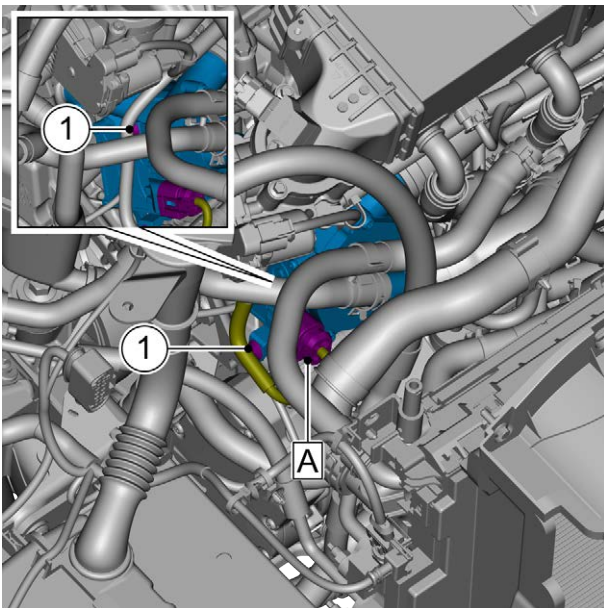
Warning !

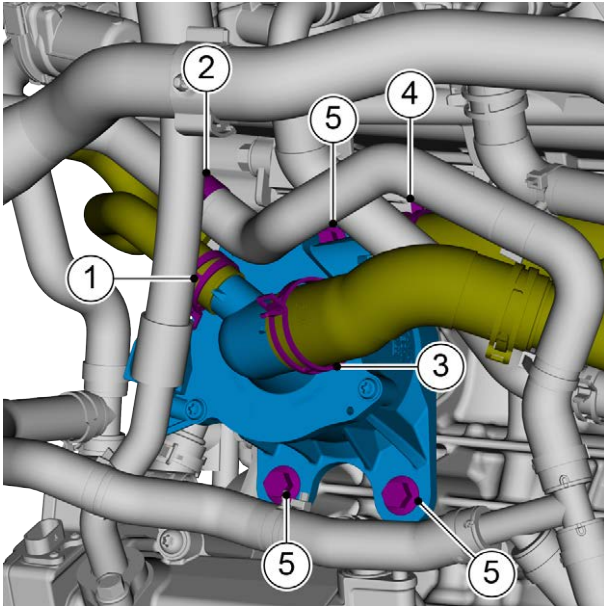
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

Warning !

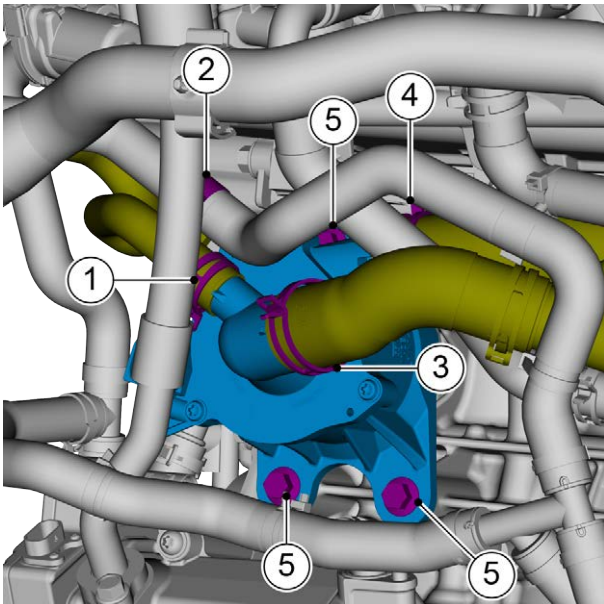
See "WARNING ABOUT COOLING SYSTEM MAINTENANCE" in "[WARNINGS AND PRECAUTIONS](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 4 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 5 Drain the engine coolant, see [Draining and Filling of Engine Coolant](#).
- 6 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 7 Remove the air filter assembly, see [Replacement of Air Filter Assembly](#).
- 8 Remove the air filter intake pipe assembly. refer to [Replacement of air filter intake pipe assembly](#).
- 9 Remove the engine cooling fan, see [Replacement of Engine Cooling Fan](#).
- 10 Remove the two harness clips 1 of the engine cooling pump harness.
- 11 Disconnect the harness connector A of the engine cooling pump.





- 12 Remove the fixing clamp 1 of the expansion tank outlet pipe, remove the fixed clamp 2 of the expansion tank outlet pipe, and disconnect the connection between the expansion tank outlet pipe and the engine cooling pump.
- 13 Remove the fixing clamp 3 of the radiator outlet pipe and disconnect the connection between the radiator outlet pipe and the engine cooling pump.
- 14 Remove the fixing clamp 4 of the rubber connecting pipe and disconnect the connection between the rubber connecting pipe and the engine cooling pump.
- 15 Remove the engine cooling pump by removing the three fixing bolts 5 of the engine cooling pump.



Installation Procedure

- 1 Install the engine cooling pump and tighten the three fixing bolts of the engine cooling pump in the order of 5, 6, and 7 in the figure.

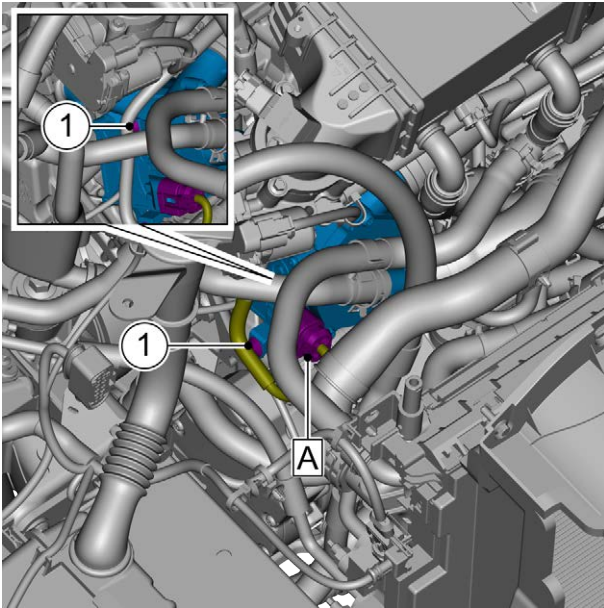
Torque: 50N·m

Caution

1. During the storage and assembly process of the engine cooling pump, anti-static protection measures must be taken and contact with connector pins is prohibited.

2. Avoid connectors with live plug-in parts.

- 2 Connect the rubber tubing to the engine cooling pump, and install the fixing clamp 4 of the rubber tubing.
- 3 Connect the radiator outlet pipe to the engine cooling pump, and install the fixing clamp 3 of the radiator outlet pipe.
- 4 Connect the expansion tank outlet pipe to the engine cooling pump, and install the fixing clips 2 of the expansion tank outlet pipe.
- 5 Install the fixing clamp 1 of the expansion tank outlet pipe.



- 6 Connect the harness connector A of the engine cooling pump.
- 7 Install the two harness clips 1 of the engine cooling pump harness.

- 8 Install the engine cooling fan.
- 9 Install the air filter intake pipe assembly.
- 10 Install the air filter assembly.
- 11 Install the engine trim cover assembly.
- 12 Fill with the engine coolant.
- 13 Install the bottom engine guard assembly.
- 14 lower the vehicle.
- 15 Connect the negative cable of the battery, start the vehicle and connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle level. If there is a drop in the level, replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the upper scribe line of the expansion kettle, and tighten the lid of the expansion kettle.
- 16 Close the engine compartment cover.

2.8.7.14 Replacement of Exhaust Gas Circulation Cooler

Removal Procedure

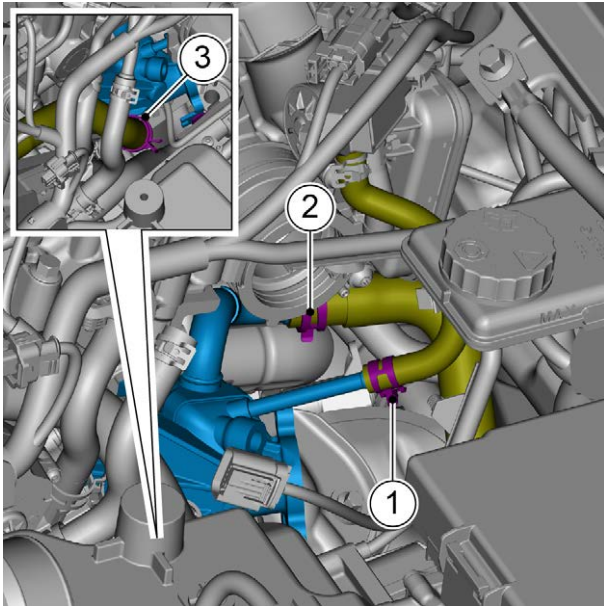
Warning !

Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#).

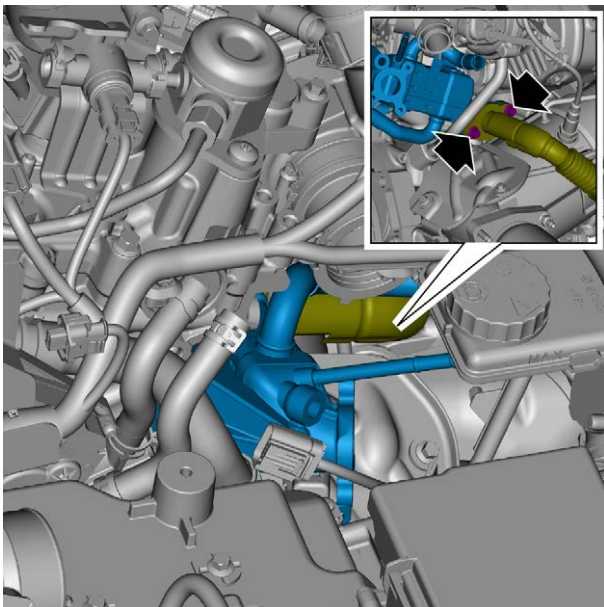
Warning !

See "WARNING ABOUT COOLING SYSTEM MAINTENANCE" in ["WARNINGS AND PRECAUTIONS"](#).

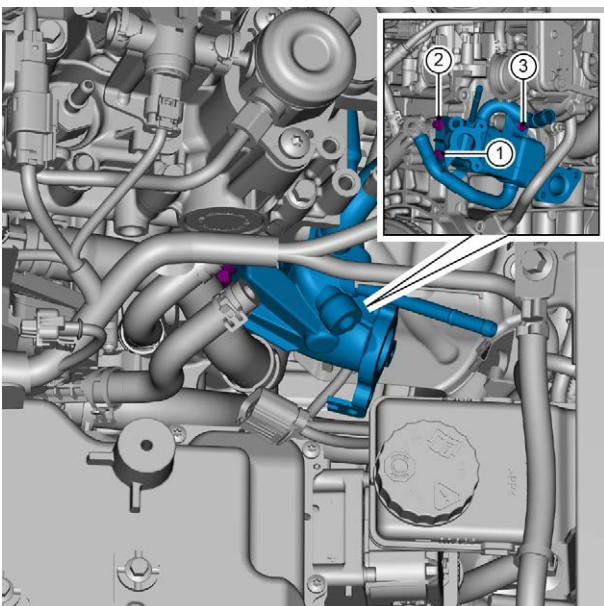
- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 4 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 5 Drain the engine coolant, see [Draining and Filling of Engine Coolant](#).
- 6 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 7 Remove the resonator assembly, see [Replacement of Resonator Assembly](#).
- 8 Remove the pressure regulating valve, , see [Replacement of Pressure Regulating Valve](#).
- 9 Remove the turbocharger water pipe subassembly, see [Replacement of Turbocharger Water Pipe Subassembly](#).
- 11 Remove the intake tube, see [Replacement of Intake Tube](#).
- 12 Remove EGR valve, see [Replacement of EGR Valve](#).
- 13 Remove the EGR temperature sensor, see [Replacement of EGR Temperature Sensor](#).



- 14 Remove the fixing clamp 1 of the high pressure end hose of the EGR differential pressure sensor, and disconnect the connection between the high pressure end hose of the EGR differential pressure sensor and the exhaust gas circulation cooler.
- 15 Disconnect the exhaust gas circulation outlet pipe from the exhaust gas circulation cooler by removing the fixing clamp 2 of the exhaust gas circulation outlet pipe.
- 16 Remove the fixing clamp 3 of the exhaust gas circulation cooler inlet hose, and disconnect the connection between the exhaust gas circulation cooler inlet hose and the exhaust gas circulation cooler.

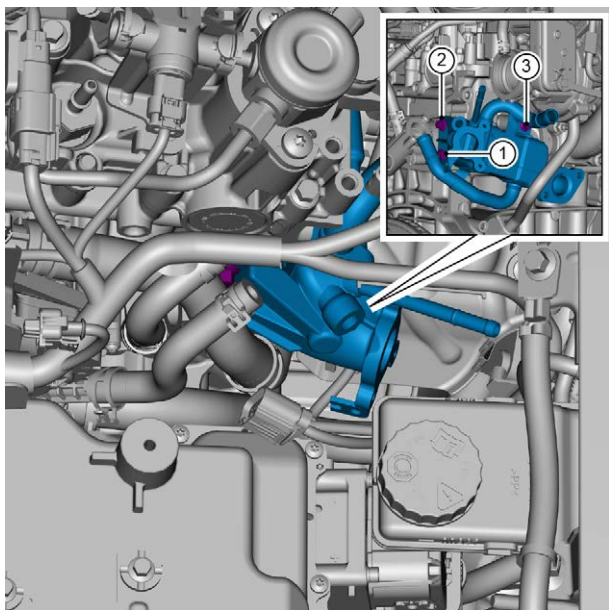


- 17 Remove the two fixing bolts of the exhaust gas circulation cooler, and disconnect the connection between the GPF post-catalytic converter and the exhaust gas circulation cooler.



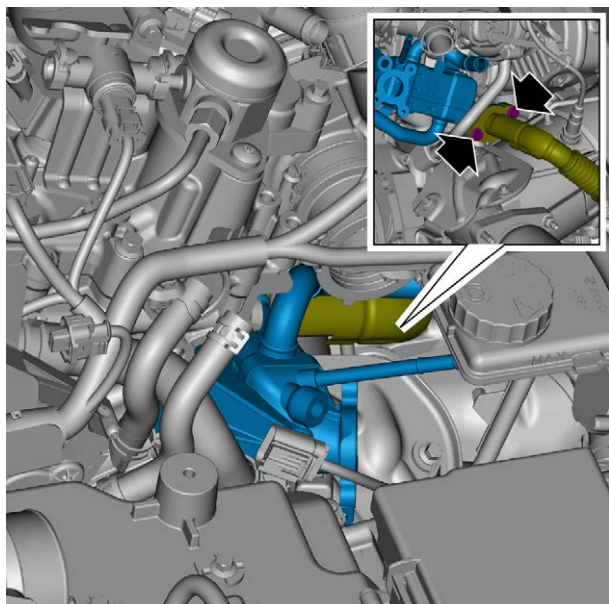
- 18 Remove the exhaust gas circulation cooler by removing the three fixing bolts of the exhaust gas circulation cooler in the order shown in the diagram.

Installation Procedure



- 1 Install the exhaust gas circulation cooler, and pre-tighten and then tighten the three fixing bolts of the exhaust gas circulation cooler in the order shown in the diagram.

Torque: 23N·m

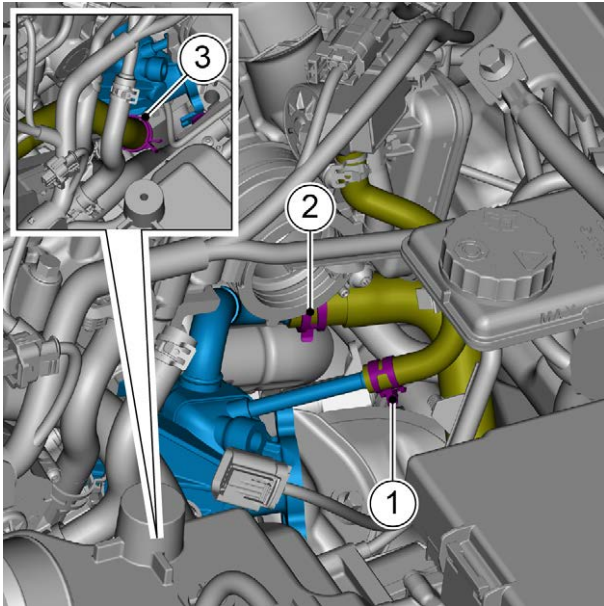


- 2 Connect the GPF post catalytic converter to the exhaust gas circulation cooler, and install the two fixing bolts of the exhaust gas circulation cooler.

Torque: 40N·m

Caution

New bolts and exhaust gaskets are replaced in requirement after removal.



- 3 Connect the exhaust gas circulation cooler inlet hose to the exhaust gas circulation cooler, and install the fixing clamp 3 of the exhaust gas circulation cooler inlet hose.
- 4 Connect the exhaust gas circulation outlet pipe to the exhaust gas circulation cooler and install the fixing clamp 2 of the exhaust gas circulation outlet pipe.
- 5 Connect the high pressure end hose of the EGR differential pressure sensor to the exhaust gas cycle cooler, and install the fixing clamp 1 of the high pressure end hose of the EGR differential pressure sensor.

- 6 Install the EGR temperature sensor.
- 7 Install the EGR valve.
- 8 Install the intake pipe
- 9 Install the turbocharger water pipe subassembly.
- 10 Install the pressure regulating valve.
- 11 Install the resonator assembly.
- 12 Install the engine trim cover assembly.
- 13 Fill with the engine coolant.
- 14 Install the bottom engine guard assembly.
- 15 lower the vehicle.
- 16 Connect the negative cable of the battery, start the vehicle and connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle level. If there is a drop in the level, replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the upper scribe line of the expansion kettle, and tighten the lid of the expansion kettle.
- 17 Close the engine compartment cover.

2.8.7.15 Replacement of Turbocharger Water Pipe Subassembly

Removal Procedure

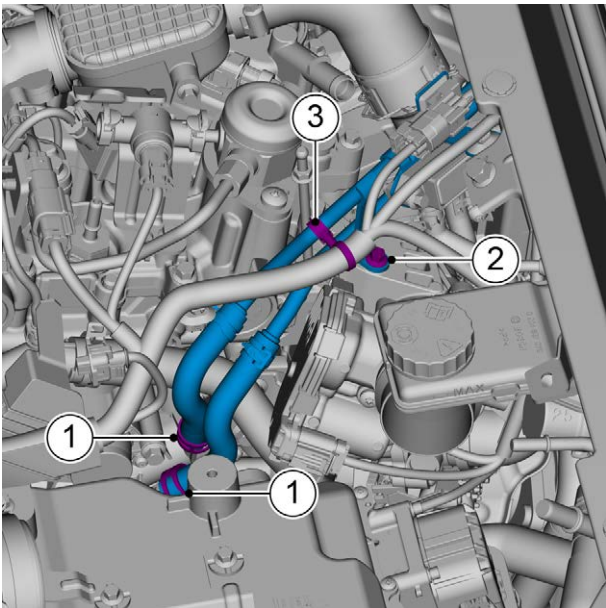
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

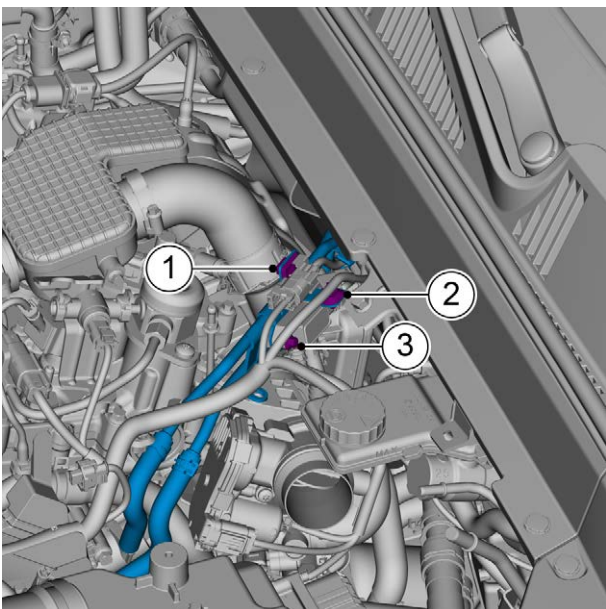
Warning !

See "WARNING ABOUT COOLING SYSTEM MAINTENANCE" in "[WARNINGS AND PRECAUTIONS](#)".

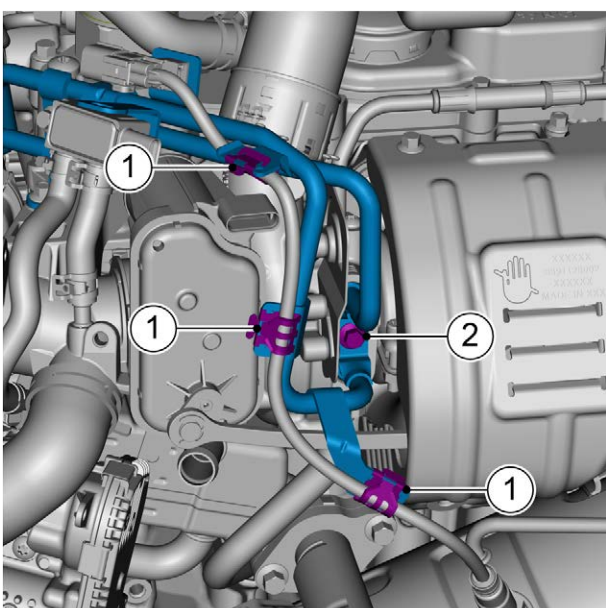
- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 4 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 5 Drain the engine coolant, see [Draining and Filling of Engine Coolant](#).
- 6 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 7 Remove the carbon canister solenoid valve with line, see [Replacement of Carbon Canister Solenoid Valve with Line](#).
- 8 Remove the air filter bellows, see [Replacement of Air Filter Bellows](#).
- 9 Remove the engine bypass pipe, see [Replacement of Engine Bypass Pipe](#).
- 10 Remove the intake manifold detachment pipe, see [Replacement of Intake Manifold Detachment Pipe](#).
- 11 Remove the crankcase air vent tube, see [Replacement of Crankcase Air Vent Tube](#).
- 12 Remove the crankcase vent line, see [Replacement of Crankcase Vent Line](#).
- 13 Remove the resonator assembly, see [Replacement of Resonator Assembly](#).



- 14 Disconnect the thermostat housing subassembly from the turbocharger water pipe subassembly by removing the two fixing clamps 1 of the turbocharger water pipe subassembly.
- 15 Remove the fixing bolt 2 of the turbocharger water pipe subassembly.
- 16 Disengage the fixing clips 3 of the engine wiring harness.

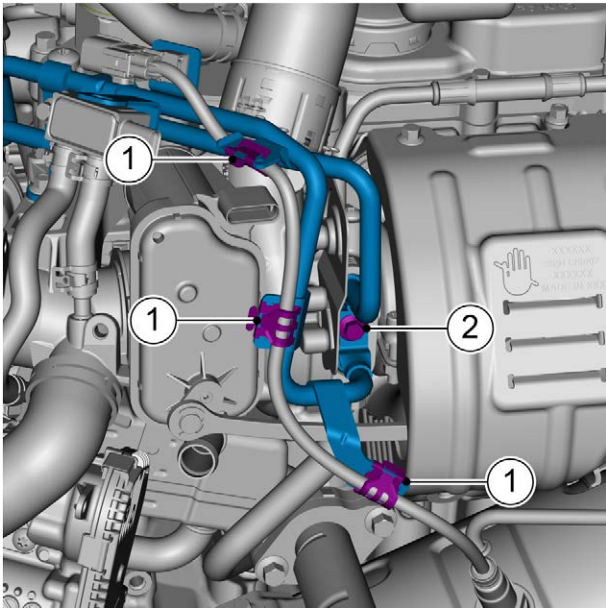


- 17 Remove the fixing clips 1 of the Lambda probe (downstream oxygen sensor).
- 18 Remove the fixing clip 2 of the engine harness.
- 19 Remove the fixing bolt 3 of the EGR differential pressure sensor, and disconnect the EGR differential pressure sensor from the turbocharger water pipe subassembly.



- 20 Remove the three fixing clips 1 of the Lambda probe (downstream oxygen sensor) harness.
- 21 Remove the fixing bolts 2 of the turbocharger water pipe subassembly, and take off the turbocharger water pipe subassembly.

Installation Procedure

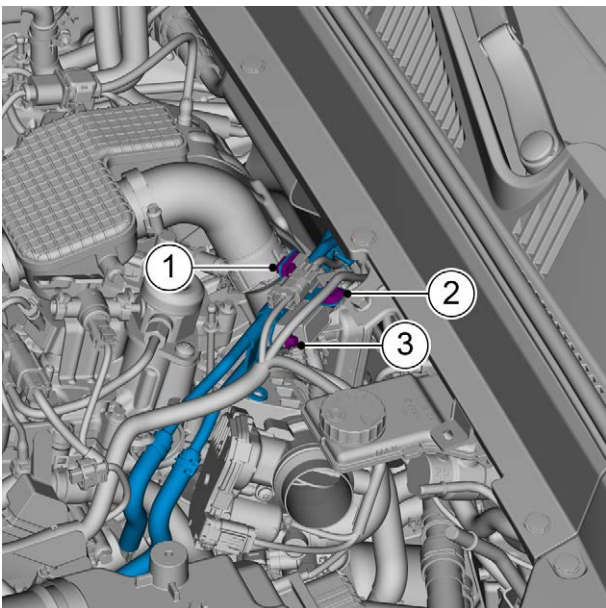


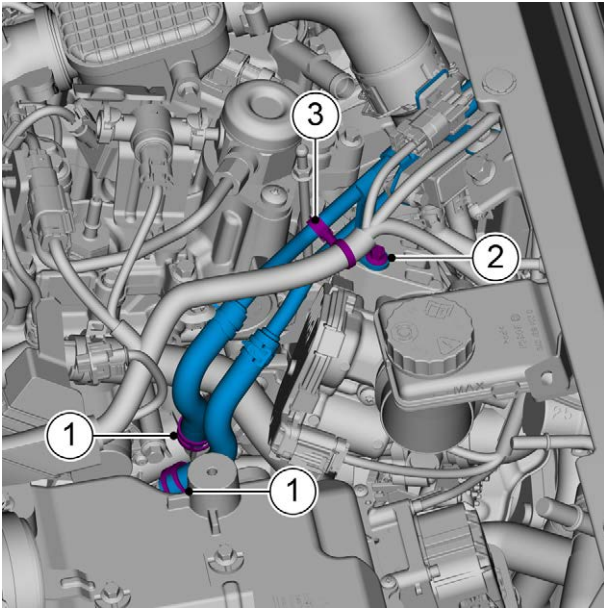
- 1 Install the turbocharger water pipe subassembly, and tighten the fixing bolts 2 of the turbocharger water pipe subassembly.

Torque: 10N·m

Caution

1. Replace the O-ring with a new one.
 2. After the O-ring is assembled and before the water pipe assembly is inserted into the turbocharger, apply an appropriate amount of a P80-like insertion aid to the O-ring seal. Prohibit the use of motor oil and other oil substances as aids to insertion.
 3. Before assembling the turbocharger water pipe subassembly, pre-tighten the bolts to secure the turbocharger water pipe subassembly.
- 2 Install the three fixing clips 1 of the Lambda probe (downstream oxygen sensor) harness.
 - 3 Connect the EGR differential pressure sensor to the turbocharger water pipe subassembly, and install and tighten the fixing bolt 3 of the EGR differential pressure sensor.
- Torque: 10N·m
- 4 Install the engine harness fixing clip 2.
 - 5 Install the fixing clips 1 of the Lambda probe (downstream oxygen sensor) wiring harness.





- 6 Install the fixing clips 3 of the engine harness.
- 7 Install and tighten the fixing bolts 2 of the turbocharger water pipe subassembly.
Torque: 10N·m
- 8 Connect the thermostat housing subassembly to the turbocharger water tube subassembly, and install the two fixing clips 1 of the turbocharger water tube subassembly.

Caution

Pipe orifices should be aligned with the markings for connecting.

- 9 Install the resonator assembly.
- 10 Install the crankcase vent tube.
- 11 Install the crankcase air vent tube.
- 12 Install the intake manifold detachment tube.
- 13 Install the engine bypass pipe.
- 14 Install the air filter bellows.
- 15 Install the carbon canister solenoid valve with line.
- 16 Install the engine trim cover assembly.
- 17 Fill with the engine coolant.
- 18 Install the bottom engine guard assembly.
- 19 lower the vehicle.
- 20 Connect the negative cable of the battery, start the vehicle and connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle level. If there is a drop in the level, replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the upper scribe line of the expansion kettle, and tighten the lid of the expansion kettle.
- 21 Close the engine compartment cover.

2.8.7.16 Replacement of Thermostat

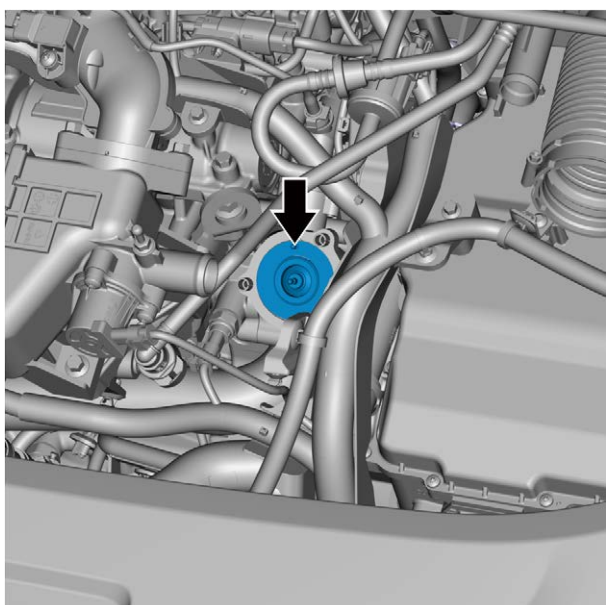
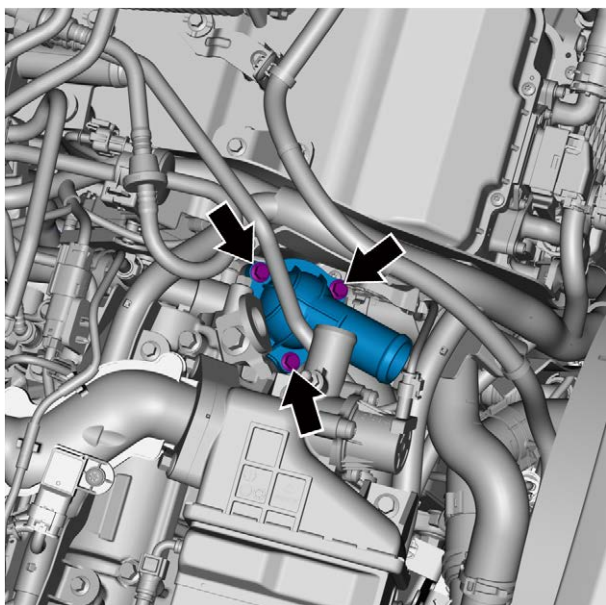
Removal Procedure

Warning !

See "WARNING ABOUT ENGINE COOLANT" in "[WARNING AND PRECAUTION](#)"

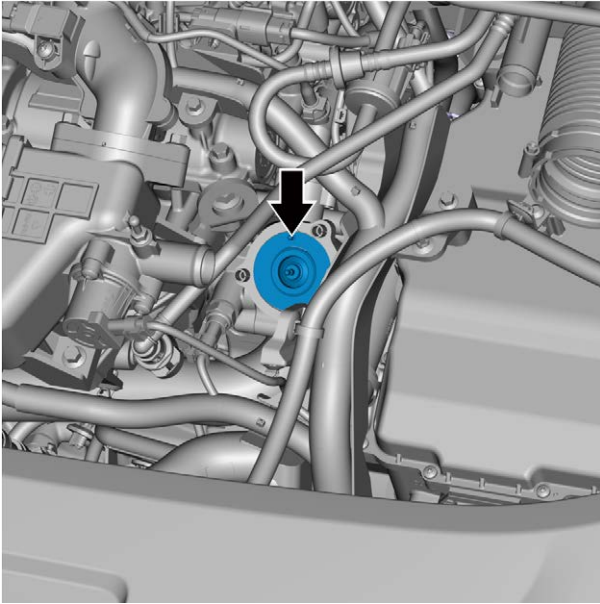
- 1 Drain the engine coolant, see [Draining and Filling of Engine Coolant](#).

- 2 Remove the air filter inlet pipe, see [Replacement of Air Filter Inlet Pipe](#).
- 3 Remove the air filter assembly, see [Replacement of Air Filter Assembly](#).
- 4 Remove the engine bypass pipe, see [Replacement of Engine Bypass Pipe](#).
- 5 Remove the thermostat cover plate by removing the three fixing bolts of the thermostat cover plate.



- 6 Take off the thermostat.

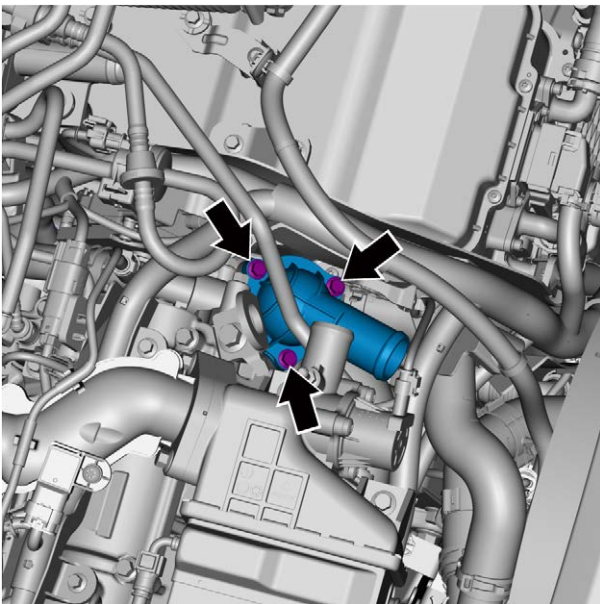
Installation Procedure



- 1 Install the thermostat.

Caution

Make sure the bleeder valve is up.



- 2 Install the thermostat cover, and tighten the three fixing bolts of the thermostat cover.

Torque: 10N·m

- 3 Install the engine bypass pipe.
- 4 Install the air filter assembly.
- 5 Install the air filter intake pipe.
- 6 Fill the engine coolant, start the vehicle to connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle liquid level. If there is a drop in the liquid level, it is necessary to replenish the coolant in time. Until the main cycle is opened, replenish the coolant to the expansion kettle on the mark, and tighten the expansion kettle cover.

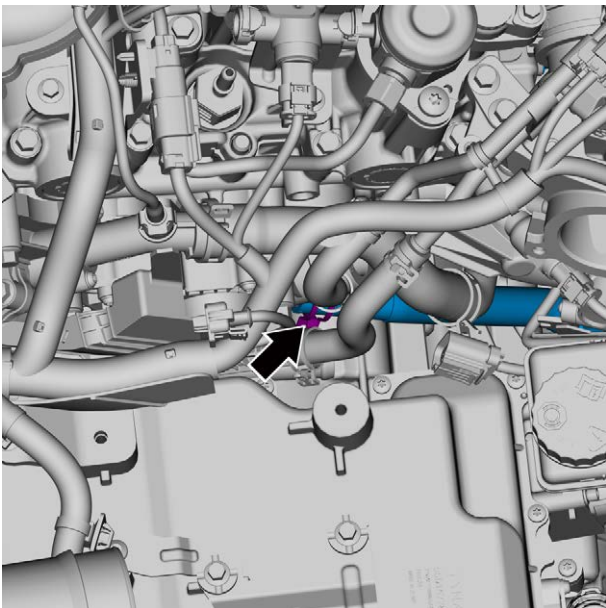
2.8.7.17 Replacement of Thermostat Outlet Pipe

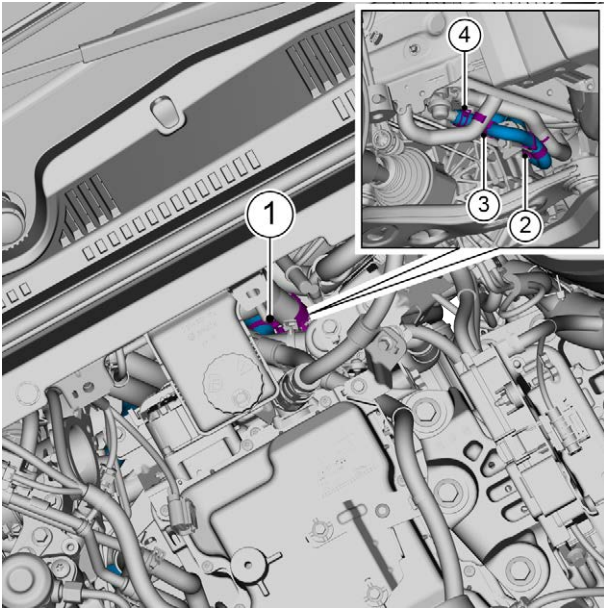
Removal Procedure

Warning !

See "WARNING ABOUT COOLING SYSTEM MAINTENANCE" in "[WARNINGS AND PRECAUTIONS](#)".

- 1 Open the engine compartment hood.
- 2 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 3 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 4 Drain the engine coolant, see [Draining and Filling of Engine Coolant](#).
- 5 Remove the resonator assembly, see [Replacement of Resonator Assembly](#).
- 6 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 7 Remove the pressure regulating valve, , see [Replacement of Pressure Regulating Valve](#).
- 8 Remove the transmission oil cooler inlet pipe (rear end), see [Replacement of Transmission Oil Cooler Inlet Pipe \(rear end\)](#).
- 9 Remove the fixing clamp of the thermostat outlet pipe and disengage the thermostat outlet pipe from the engine.





- 10 Disengage the fixing clip 1 of the exhaust gas circulation outlet pipe.
- 11 Remove the fixing clip 2 of the thermostat outlet pipe.
- 12 Disengage the fixing clip 3 of the thermostat outlet pipe.
- 13 Remove the fixing clamp 4 of the thermostat outlet pipe and disengage the thermostat outlet pipe from the three-way solenoid valve (1).
- 14 Remove the thermostat outlet pipe

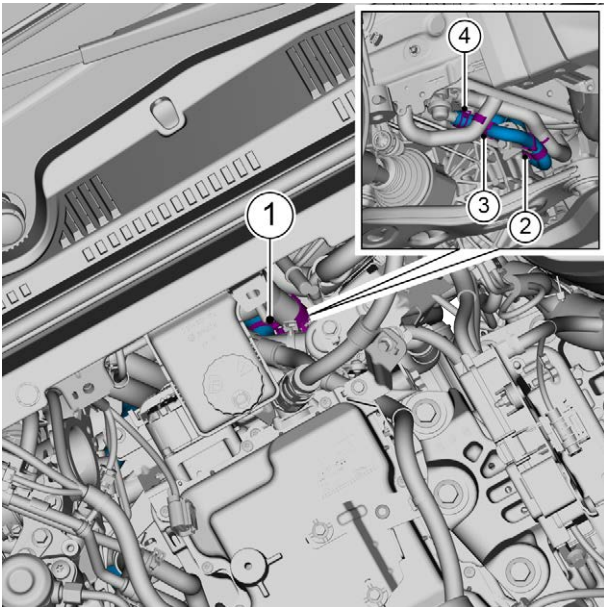
Installation Procedure

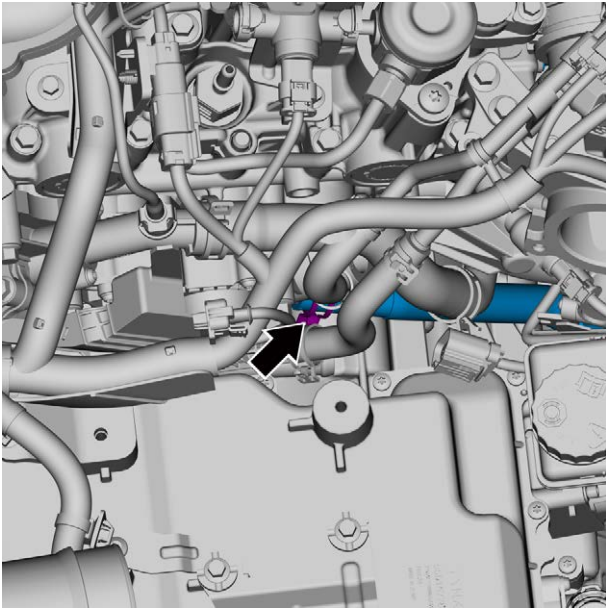
- 1 Install the thermostat outlet pipe.
- 2 Connect the thermostat outlet pipe to the three-way solenoid valve (1) and install the fixing clamp 4 of the thermostat outlet pipe.

Caution

Pipe orifices should be aligned with the markings for connecting.

- 3 Install the fixing clip 3 of the thermostat outlet pipe.
- 4 Install the fixing clip 2 of the thermostat outlet pipe.
- 5 Install the fixing clip 1 of the exhaust gas circulation outlet pipe.





- 6 Connect the thermostat outlet pipe to the engine and install the fixing clamp for the thermostat outlet pipe.

- 7 Install the transmission oil cooler inlet pipe (rear end).
- 8 Install the pressure regulating valve.
- 9 Install the engine trim cover assembly.
- 10 Install the resonator assembly.
- 11 Fill the engine coolant, start the vehicle to connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle liquid level. If there is a drop in the liquid level, it is necessary to replenish the coolant in time. Until the main cycle is opened, replenish the coolant to the expansion kettle on the mark, and tighten the expansion kettle cover.
- 12 Install the bottom engine guard assembly.
- 13 lower the vehicle.
- 14 Close the engine compartment cover.

2.8.7.18 Replacement of Thermostat Housing Subassembly

Removal Procedure

Warning !

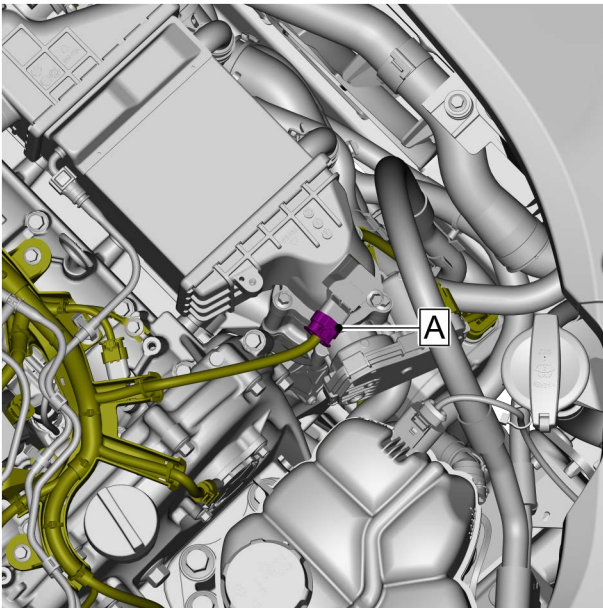
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

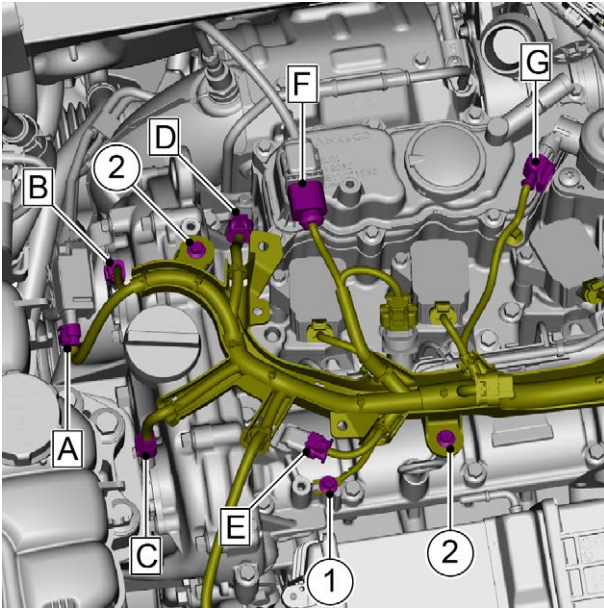
Warning !

See "WARNING ABOUT COOLING SYSTEM MAINTENANCE" in "[WARNINGS AND PRECAUTIONS](#)".

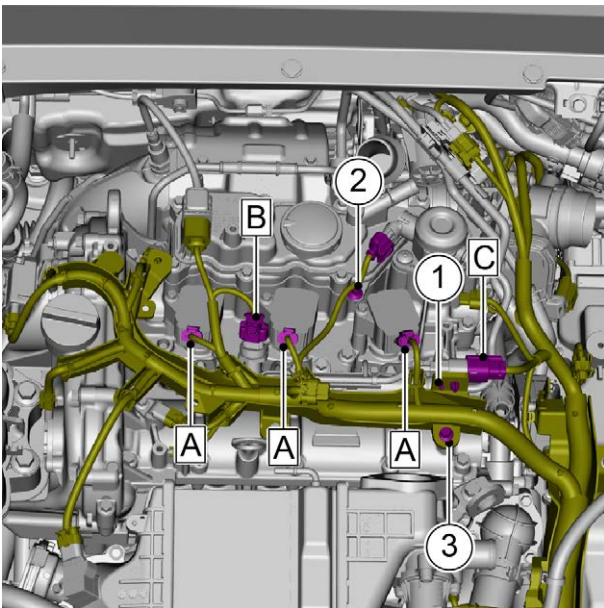
- 1 Open the engine compartment hood.

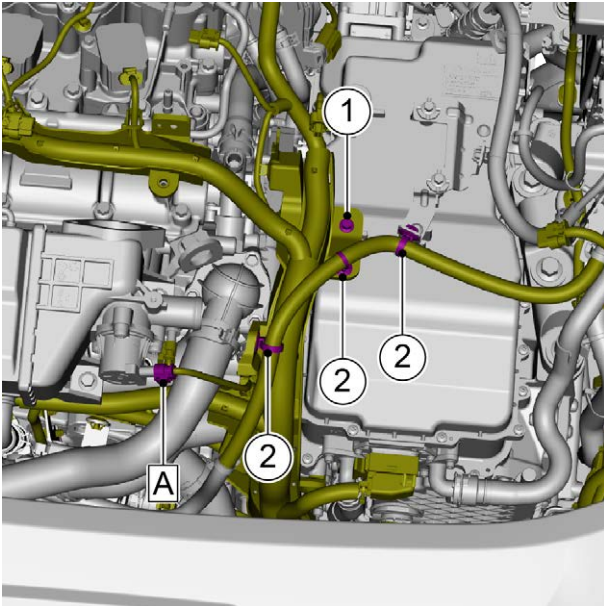
- 2 Release the fuel pressure, see [Fuel Pressure Release Procedure](#).
- 3 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 4 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 5 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 6 Drain the engine coolant, see [Draining and Filling of Engine Coolant](#).
- 7 Remove the resonator assembly, see [Replacement of Resonator Assembly](#).
- 8 Remove the resonator, see [Replacement of Resonator](#).
- 9 Remove the air filter assembly, see [Replacement of Air Filter Assembly](#).
- 10 Remove the air filter intake pipe assembly. refer to [Replacement of air filter intake pipe assembly](#).
- 11 Disconnect the harness connector A of the intake pressure and temperature sensor (water-cooled intercooler subassembly).



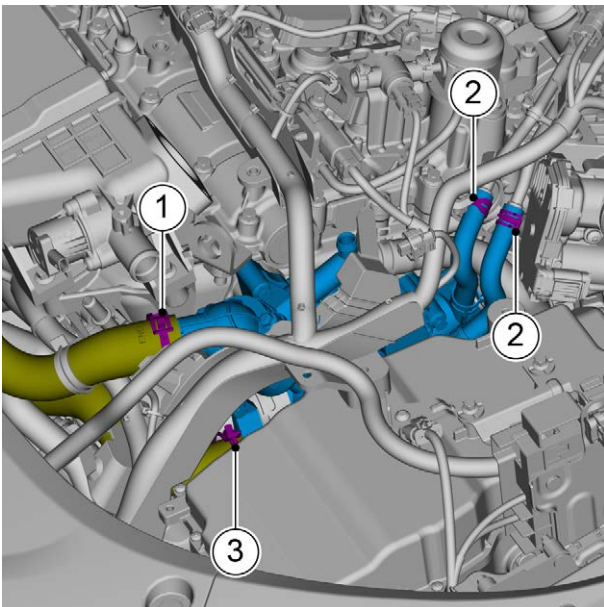


- 12 Disconnect the harness connector A of the differential filter pressure sensor.
- 13 Disconnect the harness connector B of the VVT solenoid coil (exhaust side).
- 14 Disconnect the harness connector C of the VVT solenoid coil (intake side).
- 15 Disconnect the harness connector D of the exhaust camshaft position sensor.
- 16 Disconnect the harness connector E of the intake camshaft position sensor.
- 17 Disconnect harness connector F of the Lambda probe (upstream oxygen sensor).
- 18 Disconnect the harness connector G of the high pressure fuel pump.
- 19 Remove the fixing bolt 1 of the engine wiring harness grounding.
- 20 Remove the two fixing bolts 2 of the engine wiring harness
- 21 Disconnect the harness connector A from the ignition coil.
- 22 Disconnect the harness connector B of the fuel pressure sensor.
- 23 Disconnect the harness connector C of the fuel rail injector subassembly.
- 24 Remove the harness clip 1 of the fuel rail injector subassembly.
- 25 Remove the fixing clip 2 of the engine harness.
- 26 Remove the fixing bolt 3 of the engine wiring harness.





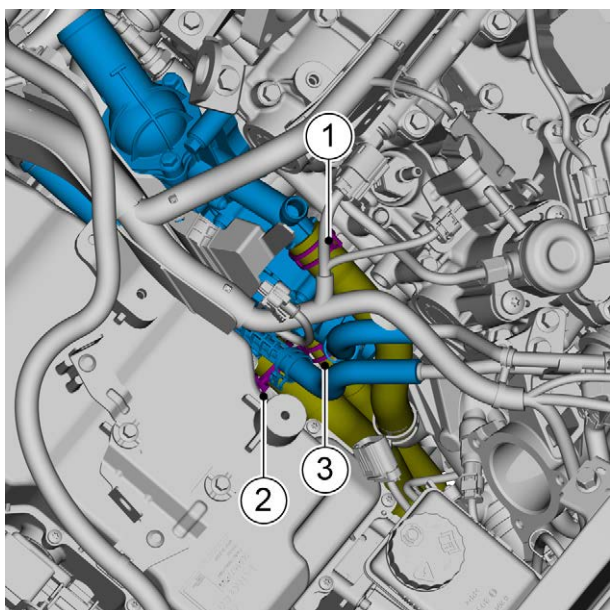
- 27 Disconnect the harness connector A of the electric motor coolant valve.
- 28 Remove the fixing bolt 1 of the engine wiring harness.
- 29 Remove the three harness fixing clips 2 and set the engine harness aside.



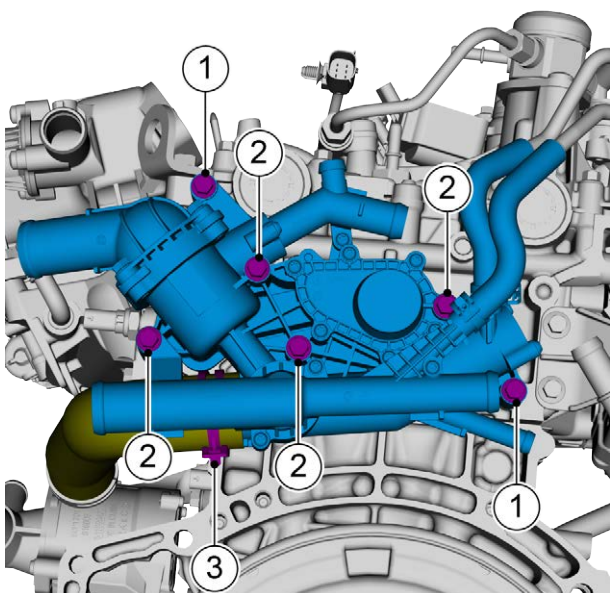
- 30 Remove the fixing clamp 1 of the radiator inlet pipe, and disconnect the radiator inlet pipe from the thermostat housing subassembly.
- 31 Remove the fixing clamp 2 of the turbocharger water pipe subassembly, and disconnect the turbocharger water pipe subassembly from the thermostat housing subassembly.
- 32 Remove the fixing clamp 3 of the radiator outlet pipe assembly, and disconnect the radiator outlet pipe assembly from the thermostat housing subassembly.

1

- 33 Remove the pressure regulating valve, , see [Replacement of Pressure Regulating Valve](#).

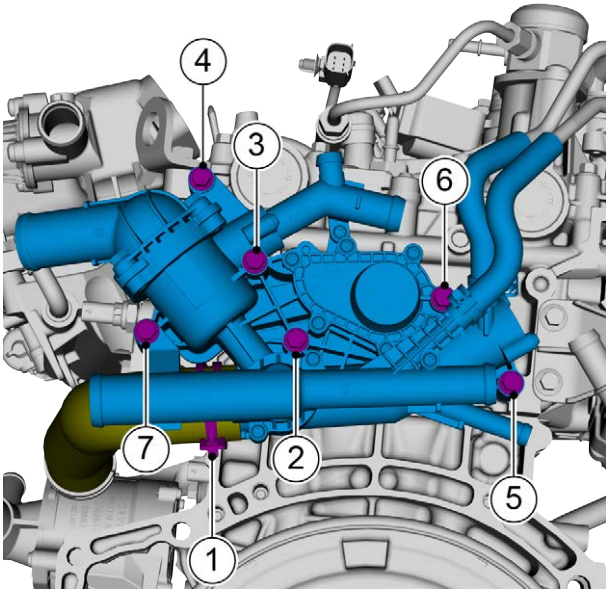


- 34 Remove the fixing clamp 1 of the exhaust gas circulation cooler inlet hose, and disconnect the exhaust gas circulation cooler inlet hose from the thermostat housing subassembly.
- 35 Remove the fixing clamps 2 of the transmission oil cooler inlet pipe assembly and disconnect the transmission oil cooler inlet pipe assembly from the thermostat housing subassembly.
- 36 Remove the fixing clamp 3 of the thermostat outlet pipe and disconnect the thermostat outlet pipe from the thermostat housing subassembly.



- 37 Remove the two fixing bolts 1 of the thermostat housing subassembly.
- 38 Remove the four fixing bolts 2 of the thermostat housing subassembly.
- 39 Remove the fixing clamp 3 of the rubber receiver, and disconnect the rubber receiver from the thermostat housing subassembly.
- 40 Remove the thermostat housing subassembly.

Installation Procedure



- 1 Install the thermostat housing subassembly.

Caution

Before assembly, check O-rings for damage. If any, replace them before assembly.

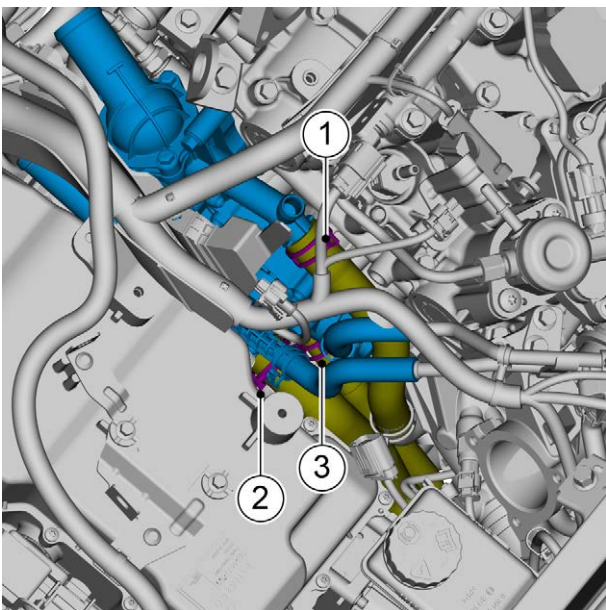
The fixing bolts need to be used along when the thermostat housing subassembly is installed.

- 2 Connect the rubber receiver to the thermostat housing subassembly, and install the fixing clamp 1 of the rubber receiver.
- 3 Pre-tighten then tighten the six fixing bolts of the thermostat housing subassembly in the order shown.
Torque: 16 N·m

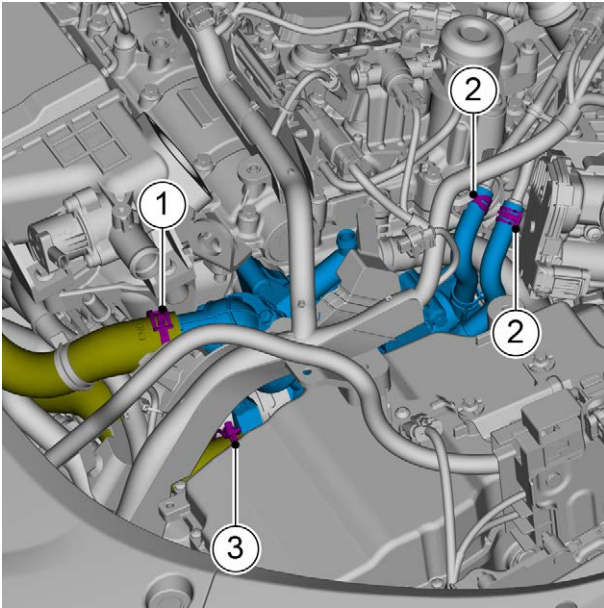
Caution

In the figure, Bolts 3 to 6 have specifications M6×30, and Bolts 2 and 7 have specifications M6×18×21.3M, and different bolts are not interchangeable in different positions.

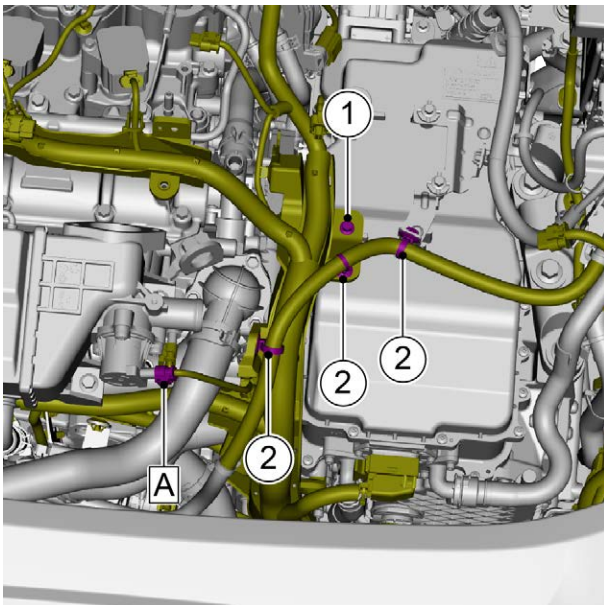
- 4 Connect the thermostat outlet pipe to the thermostat housing subassembly and install the fixing clamp 3 of the thermostat outlet pipe.
- 5 Connect the transmission oil cooler inlet pipe assembly to the thermostat housing subassembly and install the fixing clamp 2 of the transmission oil cooler inlet pipe assembly.
- 6 Connect the exhaust gas circulation cooler inlet hose to the thermostat housing subassembly, and install the fixing clamp 1 of the exhaust gas circulation cooler inlet hose.



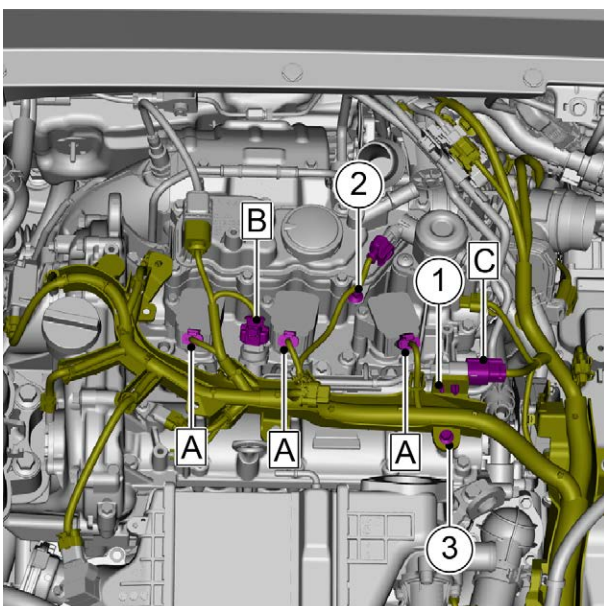
- 7 Install the pressure regulating valve.



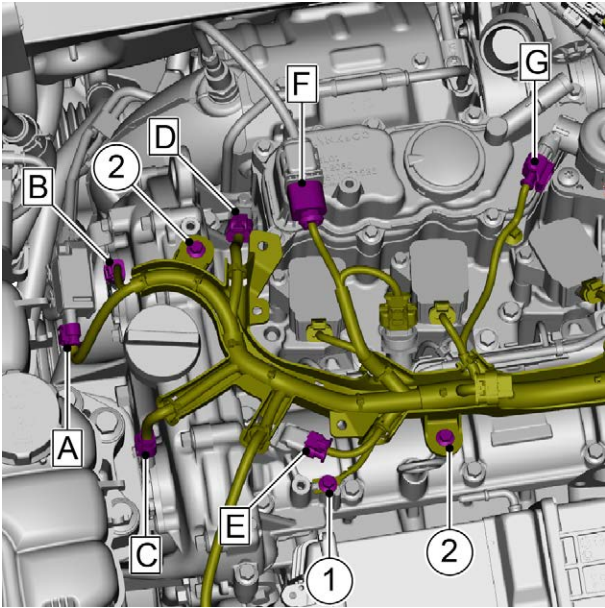
- 8 Connect the radiator outlet pipe assembly to the thermostat housing subassembly, and install the fixing clamp 3 of the radiator outlet pipe assembly.
- 9 Connect the turbocharger water pipe subassembly to the thermostat housing subassembly, and install the fixing clips 2 of the turbocharger water pipe subassembly.
- 10 Connect the radiator water pipe to the thermostat housing subassembly, and install the fixing clamp 1 of the radiator water pipe.



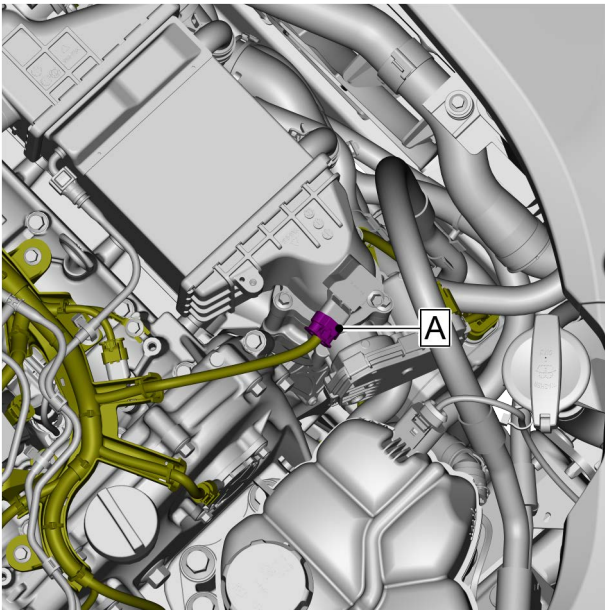
- 11 Install the engine harness, and then the three harness fixing clips 2.
- 12 Install and tighten the engine harness fixing bolts 1.
Torque: 10N·m
- 13 Connect the harness connector A of the electric motor coolant valve.



- 14 Install and tighten the engine harness fixing bolts 3.
Torque: 10N·m
- 15 Install the engine harness fixing clip 2.
- 16 Install the harness clip 1 of the fuel rail injector subassembly.
- 17 Connect the harness connector C of the fuel rail injector subassembly.
- 18 Connect the harness connector B of the fuel pressure sensor.
- 19 Connect the ignition coil harness connector A.



- 20 Install the two fixing bolts 2 of the engine harness.
- 21 Install the fixing bolt 1 of the engine harness grounding.
- 22 Connect the harness connector G of the high pressure fuel pump.
- 23 Connect the harness connector F of the Lambda probe (upstream oxygen sensor).
- 24 Connect the harness connector E of the intake camshaft position sensor.
- 25 Connect the harness connector D of the exhaust camshaft position sensor.
- 26 Connect the harness connector C of the VVT solenoid coil (intake side).
- 27 Connect the harness connector B of the VVT solenoid coil (exhaust side).
- 28 Connect the harness connector A of the differential filter pressure sensor.
- 29 Connect the harness connector A of the intake pressure and temperature sensor (water cooled intercooler subassembly).



- 30 Install the air filter intake pipe assembly.
- 31 Install the air filter assembly.
- 32 Install a resonator.
- 33 Install a resonator.
- 34 Fill with the engine coolant.
- 35 Install the bottom engine guard assembly.
- 36 Install the engine trim cover assembly.

- 37 Connect the negative cable of the battery, start the vehicle and connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle level. If there is a drop in the level, replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the upper scribe line of the expansion kettle, and tighten the lid of the expansion kettle.
- 38 Close the engine compartment cover.

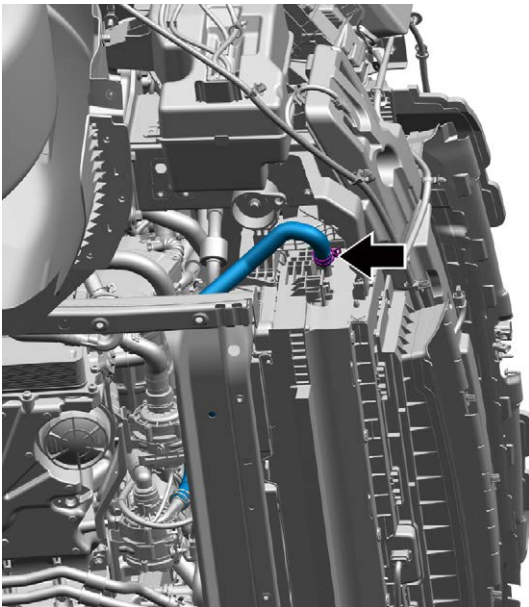
2.8.7.19 Replacement of Low Temperature Radiator Water Inlet Hose

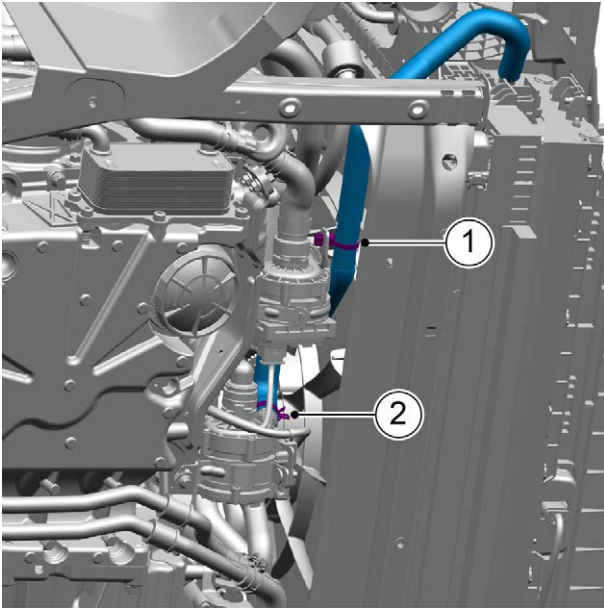
Removal Procedure

Warning !

See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

- 1 Open the engine hood.
- 2 Remove the front bumper assembly, refer to [Replacement of front bumper assembly](#).
- 3 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 4 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 5 Drain the electric system coolant, see [Draining and Filling Procedure of Electric System Coolant \(DHT Pro\)](#).
- 6 Remove the fixing clamp of the low-temperature radiator inlet hose, and disconnect the low temperature radiator inlet hose from the low-temperature radiator.





- 7 Remove the quick-insertion circlip 1 of the water pump outlet pipe, and disconnect the low temperature radiator inlet hose from the electronic powertrain coolant pump.
- 8 Remove the fixing clamp 2 of the low-temperature radiator inlet hose, and disconnect the low temperature radiator inlet hose from the electronic water pump.

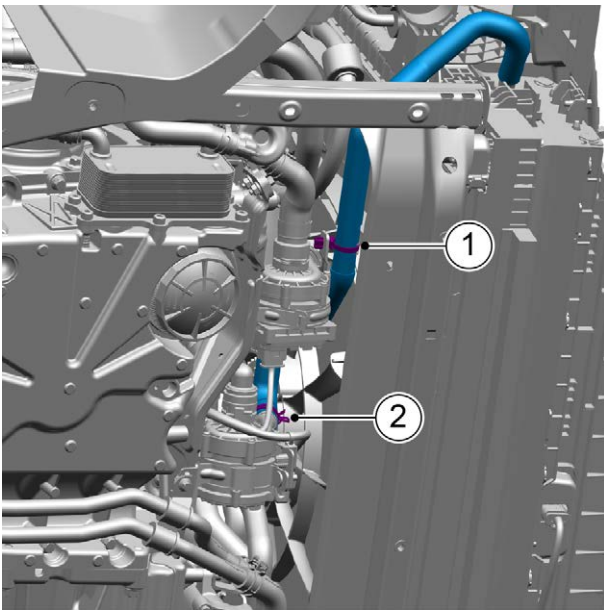
- 9 Remove the low temperature radiator water inlet hose

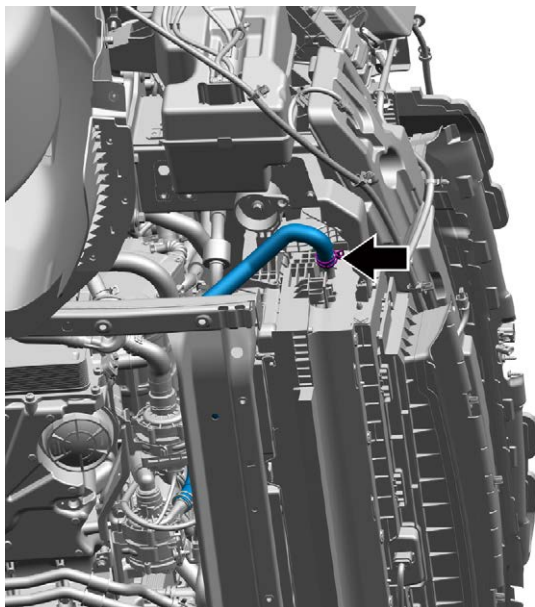
Installation Procedure

- 1 Connect the low-temperature radiator inlet hose to the electronic water pump, and install the fixing clamp 2 of the low-temperature radiator inlet hose.
- 2 Connect the low-temperature radiator inlet hose to the electronic powertrain coolant pump, and install the quick-insertion circlip 1 of the water pump outlet pipe.

Caution

Pipe orifices should be aligned with the markings for connecting.





- 3 Connect the low temperature radiator inlet hose to the low-temperature radiator, and install the fixing clamp of the low-temperature radiator inlet hose.

Caution

Pipe orifices should be aligned with the markings for connecting.

- 4 Fill the electric system coolant, start the vehicle to connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle liquid level. If the liquid level has dropped, it is necessary to replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the expansion kettle on the scribe line, and screw the lid of the expansion kettle cover tightly.
- 5 Install the bottom engine guard assembly.
- 6 lower the vehicle.

2.9 Lubrication system (DHE15-ESZ)

2.9.1 Specification

2.9.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Fixing bolt between oil sump and cylinder block	M7×20	14-20
	M7×90	14-20
	M10×40	41-55
Fixing bolt connecting oil sump to transmission	M10×40	41-55
Fixing bolt of battery water pump bracket	M8×20	20-28
Fixing screw between turbocharger return pipe and turbocharger subassembly	M6×16	8.5-11.5
Fixing screw between turbocharger oil inlet pipe and turbocharger subassembly	M6×16	1~5 (pre-tightening)
		8.5-11.5
Fixing bolt between oil cooler and engine oil sump subassembly	M7×20	14-20
Oil drain plug	M18×1.5	33-37
Oil filter subassembly	-	First rotation 25~30°, then reverse rotation 30°, final 25~30°
Fixing bolt between oil pump assembly and crankcase	M7×35	14-20

2.9.1.2 Engine oil specification

Engine oil capacity and quality	
Oil filling volume (L)	Dry type: 5.8 L
	Wet type: 5 L
Engine oil specification	VCC RBS0-2AE 0W20

2.9.1.3 Oil pressure gauge

High pressure mode

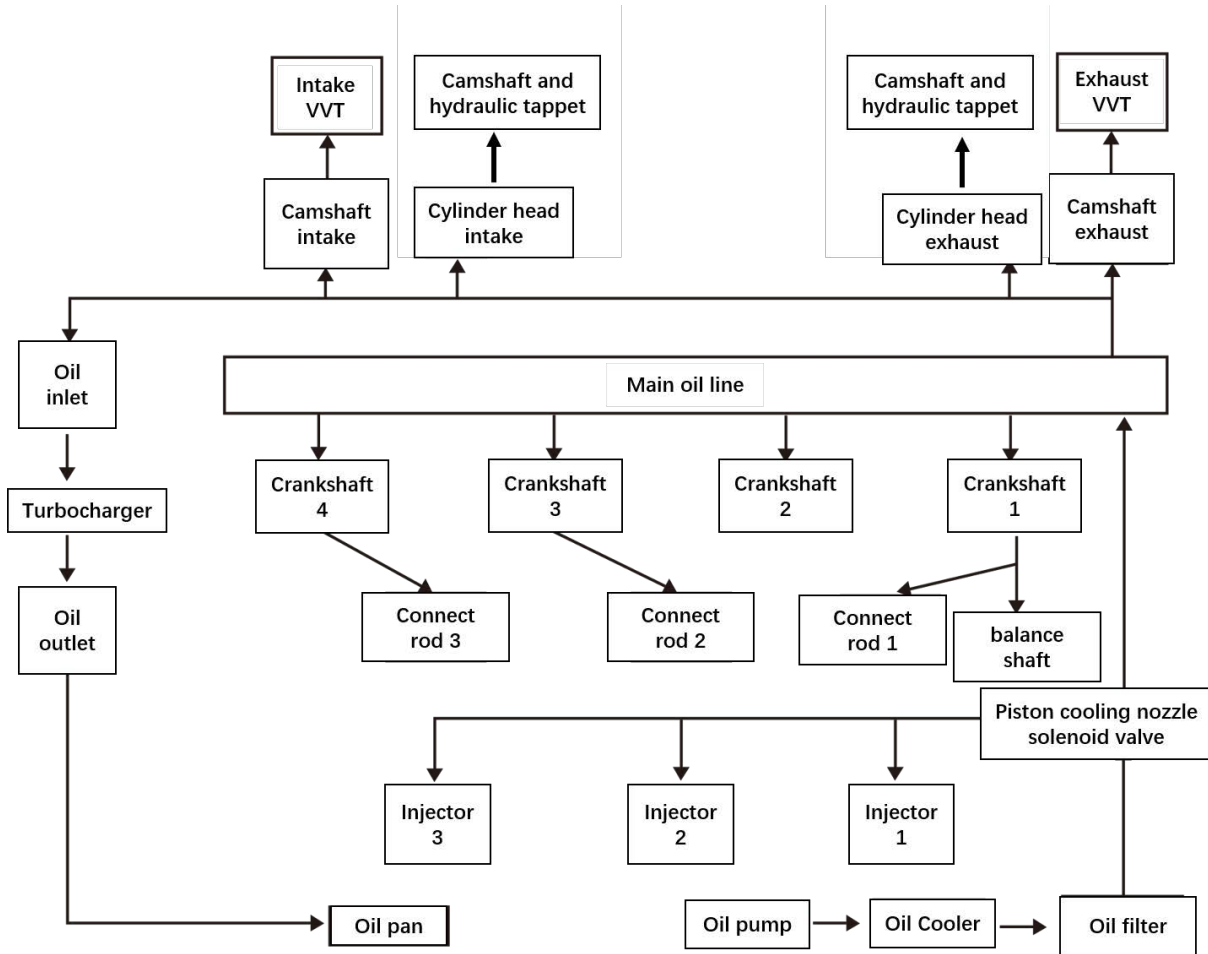
Speed (r/min)	Torque (N·m)	Oil temperature (°C)	Oil pressure (kPa)
850	30.6	88.9	179
850	25.5	88.9	182.6
850	25.5	91.8	179.2
1001	31.1	90.1	221
1000	33.4	89.9	219.5
1500	54.4	90.3	348.5
1500	54.4	90.4	348.3
2000	33.3	90.7	448.3

Speed (r/min)	Torque (N·m)	Oil temperature (°C)	Oil pressure (kPa)
2000	33.4	90.7	448.2
2500	93.9	88.9	456.3
2500	94	88.8	456.3
3000	77.5	89.4	459.1
3000	77.7	89.3	459
3500	54.9	89.4	455.6
3500	54.9	89.4	455.8
4000	54.4	89.8	455.8
4000	54.4	89.8	455.8
4500	23.1	90	455.5
4500	23.1	89.8	455.5
5000	22.5	90.7	449.9
5000	22.6	91.4	450.1
5500	23.4	90.7	448.6
5500	23.3	90.7	448.6

Low Pressure Mode

Speed (r/min)	Torque (N·m)	Oil temperature (°C)	Oil pressure (kPa)
850	17.1	90.1	183.6
850	17.1	90.3	183.5
1000	5.8	90.3	205.6
1000	23.2	90.3	204.7
1000	23.2	90.2	204.7
1000	23.2	90.3	204.7
1500	63.2	90.8	209
1500	63.6	90.7	209
2000	65.8	89.8	211.7
2000	65.9	89.1	211.7
2500	66.5	89.8	213.4
2500	66.3	89.9	213.5
3000	63.8	90.5	214.4
3000	64.1	90.6	214.3
3500	63.1	90.9	214.8
3500	63.1	90.9	214.8

2.9.1.4 Schematic Diagram of Lubrication System



2.9.2 Instructions and operations

2.9.2.1 Instructions and operations

Engine Oil Sump Subassembly

The oil sump is mainly used to collect engine oil. There is an oil drain plug on the oil sump. The drain plug is located at the bottom of the oil sump and is used to drain engine oil.

The engine oil sump subassembly is mounted at the bottom of the crankcase. The oil pump draws engine oil from the oil sump and after passing through the oil filter subassembly, engine oil passes through two oil passages to lubricate the cylinder block and the cylinder head, respectively. In one of the passages, engine oil passes through the engine oil channel in the crankshaft to the crankshaft connecting rods, and then to the pistons and the cylinders, and finally returns to the oil sump. In addition, part of the oil passes through specific oil passages. In one oil passage, engine oil passes through engine oil in the crankshaft to the crankshaft connecting rods, then to the pistons and cylinders, and back to the oil sump. In the other, a portion of it passes through specific oil passages to the turbocharger subassembly for lubrication by the turbocharger subassembly and back to the oil sump. In the second oil passage, engine oil passes through the engine oil passage to the camshaft, and engine oil passes through the internal oil passage of the camshaft, lubricates the valve assembly, and finally returns to the oil sump.

Oil Pump

This engine uses a variable displacement oil pump. The oil pump draws engine oil from the sump and then delivers engine oil to various parts of the engine under pressure. The oil pump draws engine oil from the sump and then delivers it to various parts of the engine. The oil pump inlet is fitted with a screen-collector, and a clogged collector screen will damage the oil pump. The oil pump will not be able to pump oil properly and the lubrication system will not be able to build up a normal lubricant pressure, this condition will cause damage to the mechanical parts of the engine. The oil pump is driven directly by the crankshaft gear. So as long as the crankshaft rotates, the oil pump will also be involved in the work. When the engine speed is high, the output pressure of the oil pump will exceed the demand of the engine's lubrication system, so a safety valve is set on the oil pump assembly. When the output pressure exceeds the specified pressure, the safety valve opens, and the excess oil flows back to the sump through the safety valve, and the safety valve stays closed during normal oil supply.

Oil pressure sensor

An oil pressure sensor is fitted at the front of the engine. This sensor is a combined oil pressure and temperature sensor for

which the engine control module provides a 5 V operating voltage. The sensor generates a pulse width modulated signal for diagnosis, temperature and pressure measurement.

The engine oil pressure and temperature sensor component is a combination of two sensors. The engine control module (ECM) supplies 5 V to this sensor and the sensor feeds back a pulse width modulated signal.

Oil filter subassembly

The oil filter subassembly is located under the engine on the front left side. The oil filter subassembly is primarily used to clean engine oil. The engine oil flows from the oil sump to the oil filter subassembly. The engine oil passes through the oil filter subassembly and removes contaminants from the engine. The filtered engine oil flows back to the oil sump.

Oil Cooler

The oil cooler is mounted on the oil sump. The oil cooler is mainly used to cool the engine oil. The engine oil and the coolant in the oil cooler are separate. There are many radiator cores inside the oil cooler to improve the cooling effect.

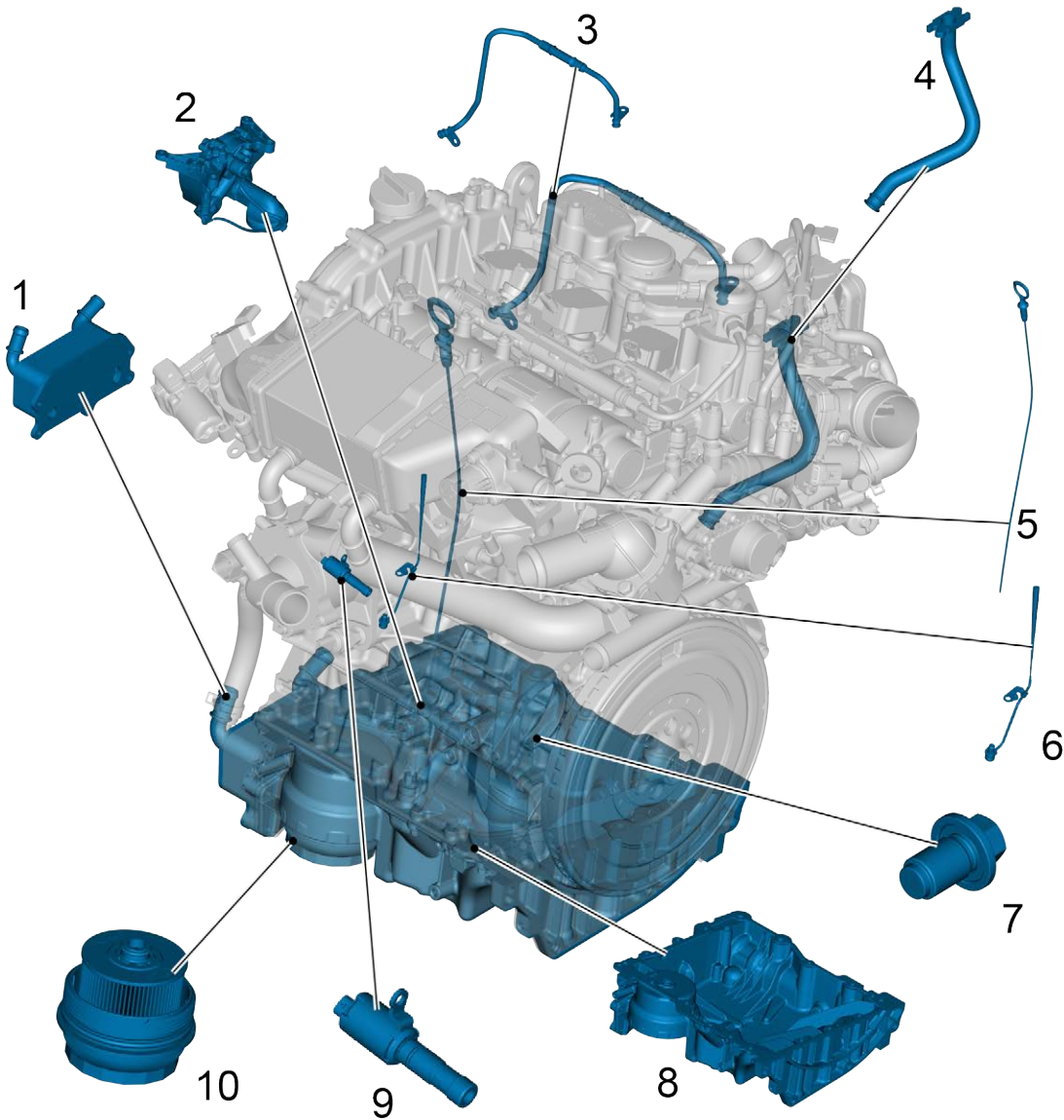
2.9.3 System working principles

2.9.3.1 System working principles

The oil cooler and oil filter subassembly modules are integrated into the engine oil sump sub-assembly. After engine oil is cooled through the oil cooler assembly, it flows upward through the oil filter sub-assembly cartridge by the upper oil passages of the oil filter sub-assembly seat. The engine oil flows upward through the oil passages and passes through the front of the cylinder block. These front oil passages supply engine oil to each cylinder head oil passage, main shaft passage, and balance shaft. Each cylinder head oil passage feeds engine oil to the oil control valve, hydraulic tappet, and cam bearing. The engine oil passes through the oil control valve cartridge, the oil control valve oil chamber, and reaches the VVT. The oil control valve is used to control the intake and exhaust VVTs. The engine control module (ECM) controls the oil control valve. The engine oil passes through the intake camshaft bearing cap oil passage to the oil holes drilled in the camshaft journals, and flows to the intake front of the camshaft mounting surface. The engine oil then flows to the corresponding oil passage in the VVT. The oil control valve directs the engine oil to flow to the corresponding oil passages in the system, allowing pressurized engine oil to act on the intake and exhaust internal vanes. The engine oil acts on the vanes to rotate the intake camshaft relative to the sprocket. At idle speed, the internal locking pin locks the inner rotor to the outer housing of the intake and exhaust VVTs, holding the intake and exhaust VVTs in their original or default positions during startup. The oil control valve directs the engine oil pressure to release the locking pins, allowing the intake and exhaust VVTs to operate. A second branch circuit leads to the main oil passage bearing holes and the engine oil diverts to the turbocharger, right balance journal. The engine oil flows back to the sump through a return passage cast into the cylinder head and cylinder block outer wall.

2.9.4 Part position

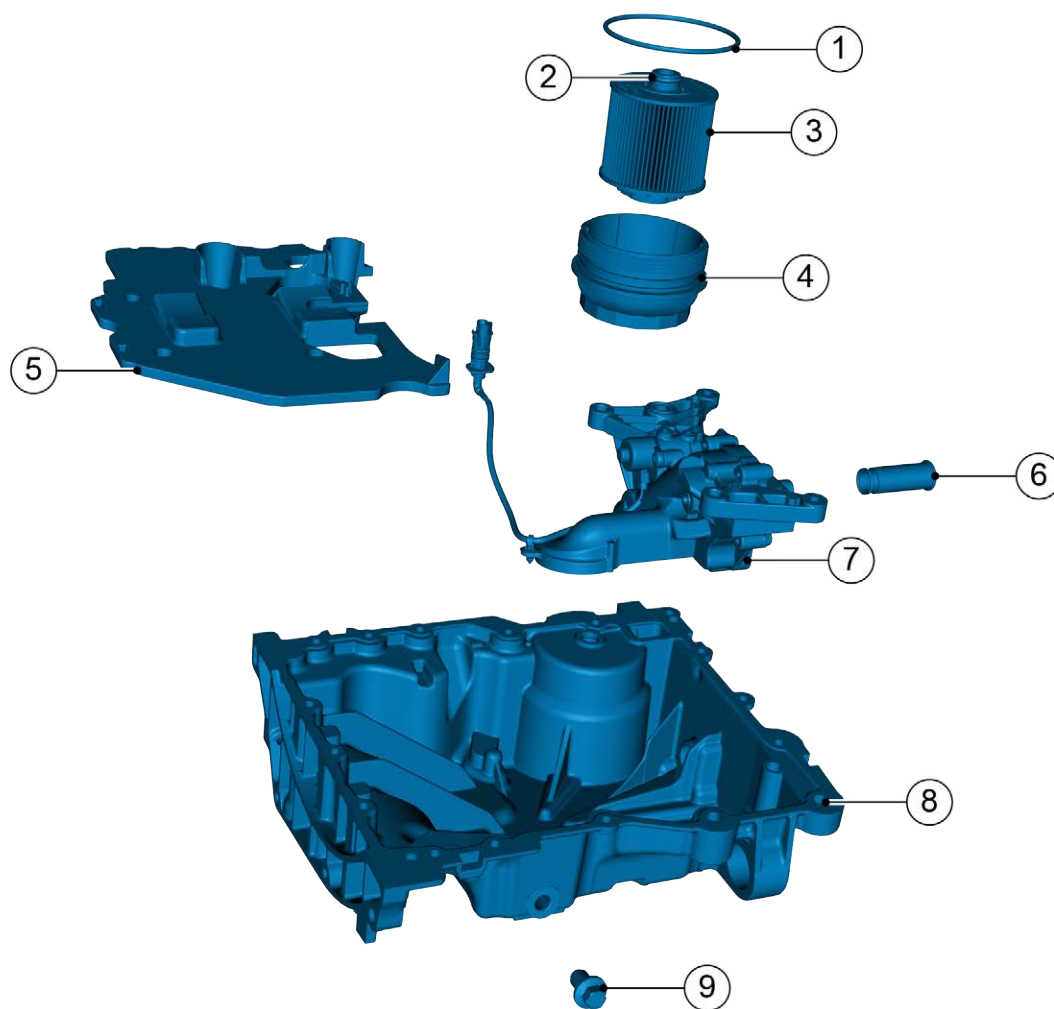
2.9.4.1 Location of Lubrication System Component



- | | | | |
|----|---|-----|-------------------------------|
| 1. | Engine oil cooler | 6. | Piston cooling nozzle |
| 2. | Oil Pump | 7. | Oil drain plug |
| 3. | Turbocharger oil inlet pipe subassembly | 8. | Engine Oil Sump Subassembly |
| 4. | Turbocharger oil return pipe | 9. | Piston cooling solenoid valve |
| 5. | Oil dipstick | 10. | Oil filter subassembly |

2.9.5 Breakdown drawing

2.9.5.1 Breakdown drawing



- | | |
|---------------------------|--------------------------------|
| 1. Sealing ring | 6. Oil pipe |
| 2. Oil filter check valve | 7. Oil Pump |
| 3. Oil filter subassembly | 8. Engine Oil Sump Subassembly |
| 4. Oil filter housing | 9. Oil drain plug |
| 5. Oil baffle assembly | |

2.9.6 Diagnostic information and procedure

2.9.6.1 Diagnosis description

See Description and Operation and System Operating Principles before diagnosing a fault in the lubrication system. Understanding and familiarizing yourself with the operating principles of the lubrication system before beginning system diagnosis will determine the correct troubleshooting steps to take in the event of a malfunction, and more importantly, this will determine if the condition described by the customer is normal operation. Any troubleshooting of the lubrication system should begin with a routine inspection that guides the serviceman to take the next logical step in the troubleshooting process. Understanding and using the diagnostic process correctly will shorten the diagnostic time and avoid mis-diagnosis of the faulty location.

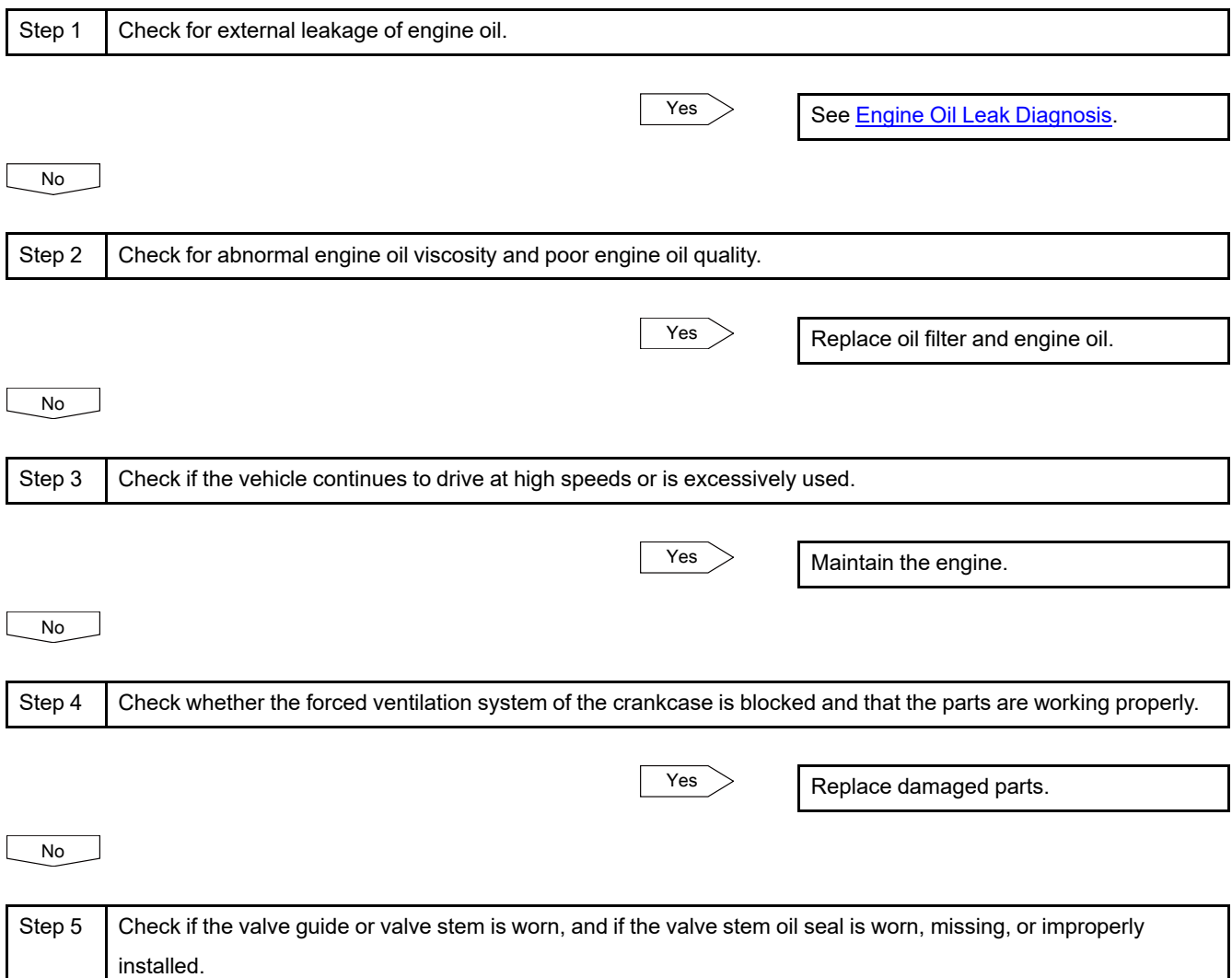
2.9.6.2 Routine inspection

- Check for aftermarket retrofitting devices that may affect the operation of the lubrication system to ensure that they cannot affect the proper functioning of the lubrication system.
- Inspect easily accessible or visible system components for obvious blockages or leaks. If there is a leak, first verify that it is an engine oil leak.
- Check oil filters for dirt or clogging, and replace as necessary.

2.9.6.3 Diagnosis of Abnormal Engine Oil Consumption

The diagnostic program for abnormal engine oil consumption must be performed when the oil consumption of the engine exceeds the acceptable range.

Diagnostic Steps



Yes

Repair defective parts.

No

Step 6 Check for improper installation of piston and piston ring in cylinder.

Yes

Repair defective parts.

No

Step 7 Check whether the piston rings are properly sealed and whether there are fractures or wear on the piston rings. If necessary, address the faulty area.

Next Step

Step 8 Confirm that the fault has been resolved.

2.9.6.4 Engine oil Pressure Diagnosis and Testing

Diagnostic Steps

Step 1 Check if the viscosity of the engine oil is abnormal and if inferior engine oil has been used.

Next Step

Step 2 Park the vehicle on a level surface, run the engine for a few minutes, wait long enough (2-3 min) for the engine oil to return, and measure if the engine oil level is too low.

Next Step

Step 3 If necessary, add the recommended grade of engine oil until the engine oil level reaches the fill scale on the dipstick.

Next Step

Step 4 Allow the engine to run for a short period of 10~15 s to confirm that there is no indication of low pressure or no engine oil pressure on the vehicle indicator.

Next Step

Step 5 Listen for any valve system noise or cylinder knocking.

Next Step

Step 6 Check for the following conditions:

- A. Engine oil is foam like.
- B. Idle speed is too low.
- C. Engine oil filter is clogged.
- D. Engine oil is diluted with water or engine coolant.
- E. Oil filter is faulty.
- F. Engine oil viscosity not suitable for the expected temperature.

Yes

See the User Manual for the recommended grade and viscosity of engine oil from Geely Auto based on local temperatures.

No

Step 7 Operate the start switch to set the power mode to OFF and remove the oil pressure sensor.

Next Step

Step 8 Install the engine oil pressure testing tool to the oil pressure sensor location.

Next Step

Step 9 Start the engine and measure the engine oil pressure.

Next Step

Step 10 Compare the reading to the pressure value in the oil pump specification and if the engine oil pressure is below the specified value, check the engine for one or more of the following conditions:

- A. Oil filter seat bolts are loose.
- B. O-ring or seal of oil filter seat is missing or damaged.
- C. Oil pump is worn or dirty.
- D. bolts from oil pump to cylinder block are loose.
- E. Oil pump filter screen is loose, clogged or damaged.
- F. O-ring seal of oil pump filter screen is missing or damaged.
- G. Suction pipe of oil pump filter screen is damaged or leaking.
- H. Engine oil line orifice plugs are missing or improperly installed.
- I. Bearing clearance in the following parts exceeds the acceptable tolerances range. Repair or replace related parts as necessary.
 - 1. Connecting rod
 - 2. Crankshaft
 - 3. Camshaft
 - 4. Intermediate drive shaft sprocket of camshaft
- J. Engine oil passage is cracked, porous or clogged.
- K. Valve tappet is broken.

Next Step

Step 11	End of test.
---------	--------------

2.9.6.5 Engine Oil Leakage Diagnosis

Once the vehicle is found to have any engine oil leakage, it must be checked for the following conditions:

Diagnostic Steps

Step 1	Check if the engine oil level is too high.
--------	--

Yes

Drain the engine oil to the specified level.
--

No

Step 2	Check the engine ventilation system for blockage or malfunction.
--------	--

Yes

Repair defective parts.

No

Step 3	Check for improperly tightened or damaged fasteners.
--------	--

Yes

Replace damaged parts and retighten to the specified torque.
--

No

Step 4 | Check for cracks or pores in related parts.

Yes

Repair defective parts.

No

Step 5 | Check for worn sealing surfaces and improper or incorrect sealing gasket installation.

Yes

Repair defective parts.

Next Step

Step 6 | Confirm that the fault has been resolved.

2.9.7 Removal and Installation

2.9.7.1 Replacement of Turbocharger Oil Return Pipe

Removal Procedure

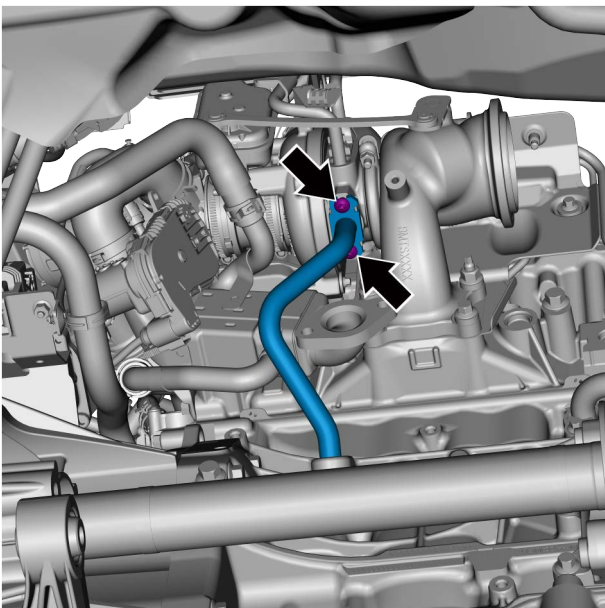
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

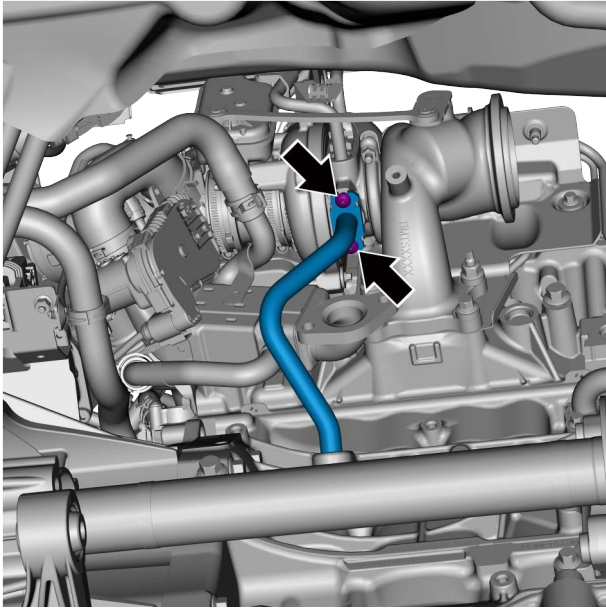
Warning !

See "Warning about Exhaust System Maintenance" in "[Warning and Precaution](#)".

- 1 Open the engine compartment hood.
- 2 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 3 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 4 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 5 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 6 Remove the front exhaust pipe, see [Replacement of Front Exhaust Pipe](#).
- 7 Remove the heat shield, see [Replacement of Heat Shield](#).
- 8 Remove the GPF post catalytic converter, see [Replacement of GPF Post Catalytic Converter](#).
- 9 Remove 2 fixing screws of turbocharger return pipe.
- 10 Remove the turbocharger return pipe.



Installation Procedure



- 1 Install the turbocharger oil return line.

Caution

1. Replace the oil turn pipe gasket and sealing ring with a new one.
 2. Lubricate sealing ring and cylinder block bore with silicone oil or similar lubricant.
- 2 Install and tighten the two fixing screws of the turbocharger return line.
- Torque: 10N·m

- 3 Install the GPF rear catalytic converter.
- 4 Install the heat shield.
- 5 Install the front exhaust pipe.
- 6 Install the bottom engine guard assembly.
- 7 lower the vehicle.
- 8 Connect the negative cable of battery.
- 9 Install the engine trim cover assembly.
- 10 Close the engine compartment cover.

2.9.7.2 Replacement of the Turbocharger Oil Inlet Pipe Subassembly

Removal Procedure

Warning !

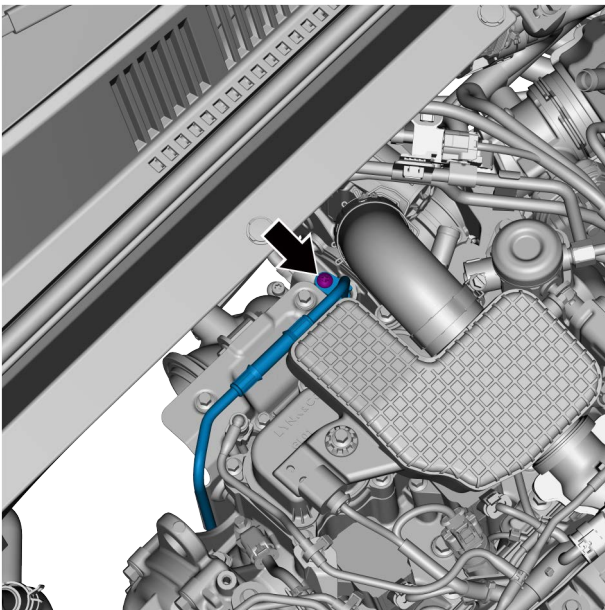
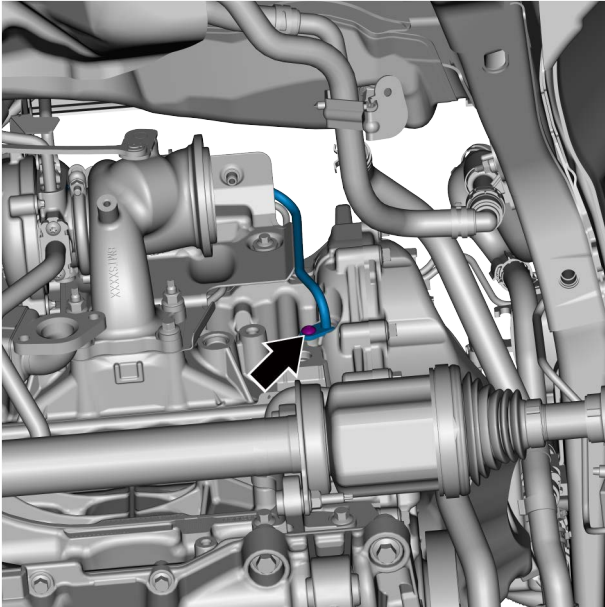
Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#).

Warning !

See "Warning about Exhaust System Maintenance" in ["Warning and Precaution"](#).

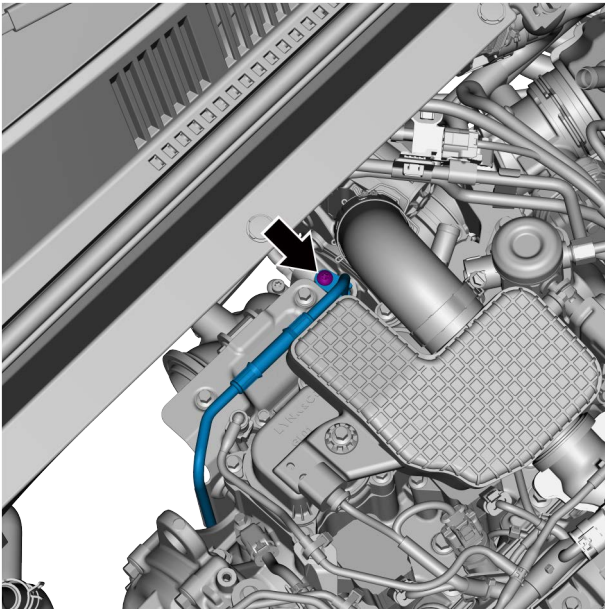
- 1 Open the engine compartment hood.
- 2 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 3 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 4 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 5 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).

- 6 Remove the front exhaust pipe, see [Replacement of Front Exhaust Pipe](#).
- 7 Remove the heat shield, see [Replacement of Heat Shield](#).
- 8 Remove the GPF post catalytic converter, see [Replacement of GPF Post Catalytic Converter](#).
- 9 Remove the fixing screws of the turbocharger oil inlet tube subassembly.



- 10 Remove the fixing screws of the turbocharger oil inlet pipe subassembly and take off the turbocharger oil inlet pipe subassembly.

Installation Procedure



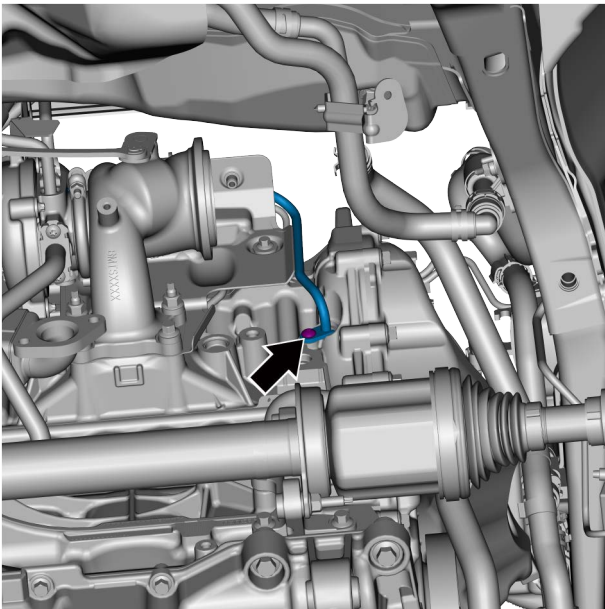
- 1 Install the turbocharger inlet pipe subassembly, pre-tighten then tighten the fixing screws of the turbocharger inlet pipe subassembly fixing screws.

Pre-tightening torque: 3 N·m

Tightening torque: 10 N·m

Caution

1. Replace the oil turn pipe sealing ring with a new one.
2. Apply P80 or other lubricating agents similar to P80 insertion aid to both sealing rings before installation.
3. During installation, take care that the sealing rings do not have cut edges.



- 2 Pre-tighten and then tighten the fixing screw of the turbocharger oil inlet pipe subassembly.

Pre-tightening torque: 3 N·m

Tightening torque: 10 N·m

- 3 Install the GPF rear catalytic converter.
- 4 Install the heat shield.
- 5 Install the front exhaust pipe.
- 6 Install the bottom engine guard assembly.
- 7 lower the vehicle.
- 8 Connect the negative cable of battery.
- 9 Install the engine trim cover assembly.
- 10 Close the engine compartment cover.

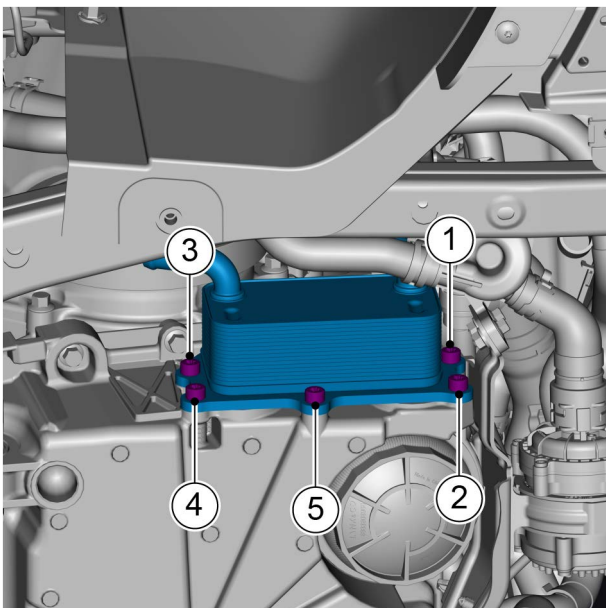
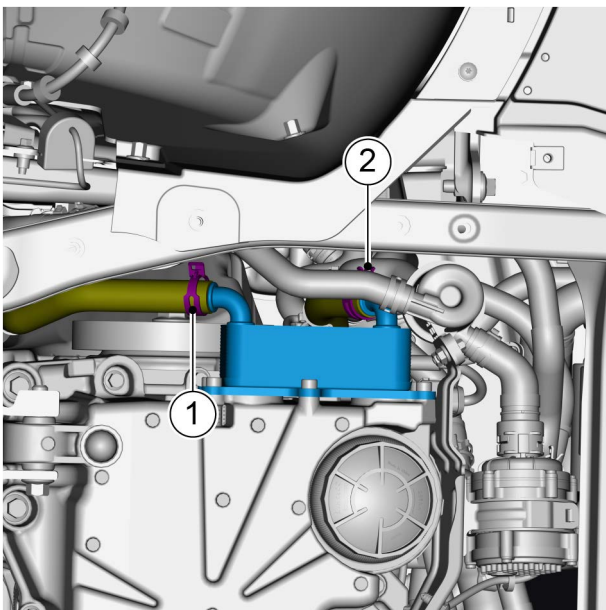
2.9.7.3 Replacement of Engine Oil Cooler

Removal Procedure

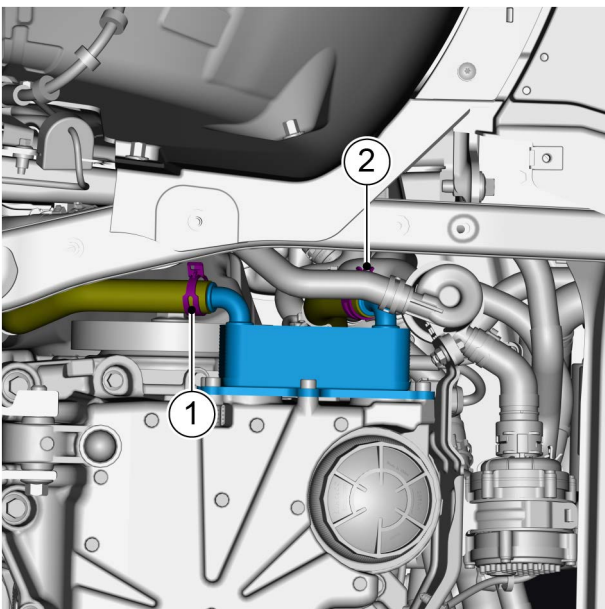
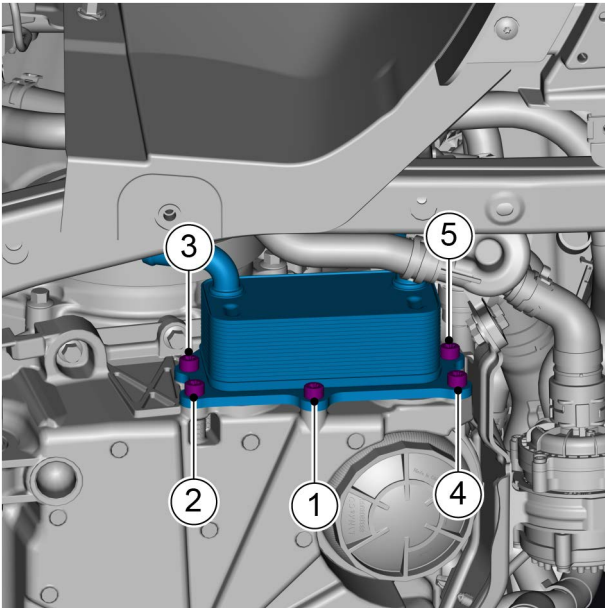
Warning !

See "WARNING ABOUT COOLING SYSTEM MAINTENANCE" in "[WARNINGS AND PRECAUTIONS](#)".

- 1 Open the engine compartment hood.
- 2 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 3 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 4 Drain the engine coolant, see [Draining and Filling of Engine Coolant](#).
- 5 Drain the engine oil.
- 6 Remove the fixing clamp 1 of the radiator inlet pipe, and disconnect the connection between the engine oil cooler inlet pipe and the engine oil cooler.
- 7 Remove the fixing clamp 2 of the engine oil cooler outlet pipe, and disconnect the engine oil cooler outlet pipe from the engine oil cooler.
- 8 Remove the five fixing bolts of the engine oil cooler in the order shown in the diagram, and take off the engine oil cooler and sealing ring.



Installation Procedure



- 1 Install the engine oil cooler and tighten the five fixing bolts of the engine oil cooler in the order of in the figure.

Torque: 17 N·m

Caution

1. Before installing the engine oil cooler, make sure there is no damage to the sealing rings, and pre-install the sealing rings into the oil sump sealing ring groove.

2. Do not reuse any sealing ring after removal.

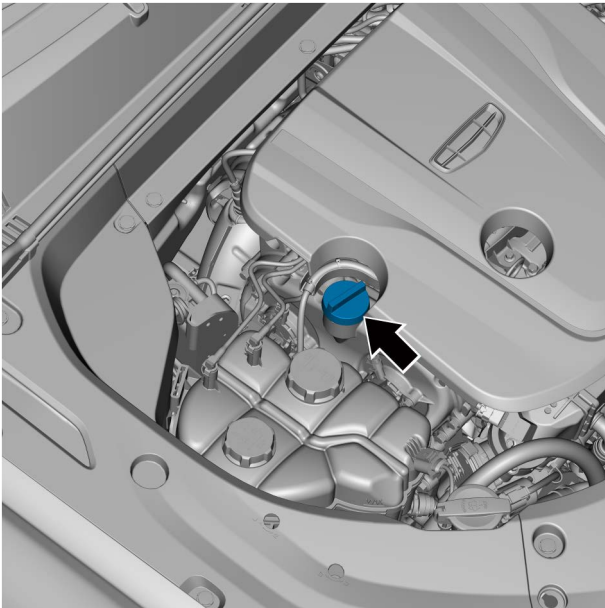
- 2 Connect the engine oil cooler outlet pipe to the engine oil cooler, and install the fixing clamp 2 of the engine oil cooler outlet pipe.
- 3 Connect the engine oil cooler inlet pipe to the engine oil cooler, and install the fixing clamp 1 of the engine oil cooler inlet pipe.

- 4 Fill in engine oil.
- 5 Fill in coolant.
- 6 Install the bottom engine guard assembly.
- 7 lower the vehicle.
- 8 Start the vehicle to connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the liquid level of the expansion kettle. If the liquid level has dropped, you need to replenish the coolant in time. Until after the main circulation is opened, replenish the coolant to the upper scribe line of the expansion kettle, and tighten the lid of the expansion kettle.
- 9 Close the engine compartment cover.

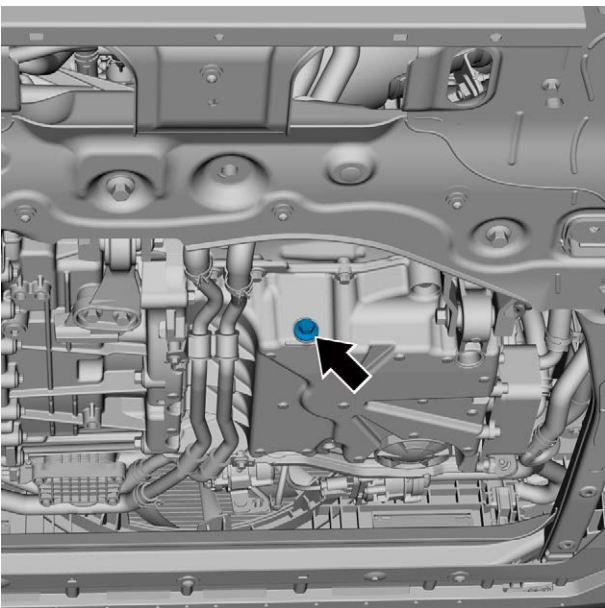
2.9.7.4 Replacement of Oil Drain Screw Plug

Removal Procedure

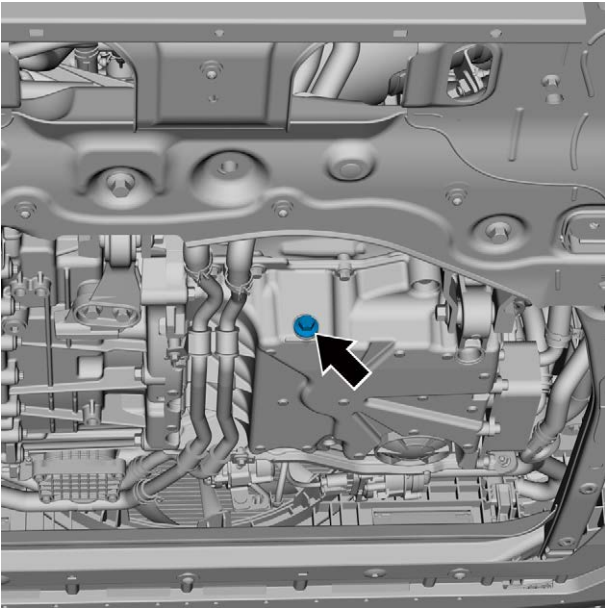
- 1 Open the engine compartment hood.
- 2 Open the oil filler cap.



- 3 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 4 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 5 Remove the oil drain plug screw and sealing washer.
- 6 Drain the engine oil.



Installation Procedure

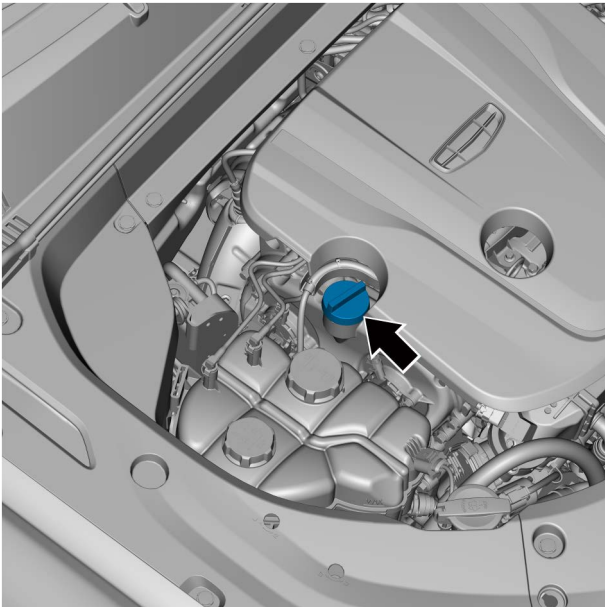


- 1 Install an oil drain screw plug and a new sealing washer.

Caution

The oil drain plug screw is not obviously damaged and does not need to be replaced, the sealing washer is a disposable part that must be replaced.

Torque: 35 N·m



- 2 Fill in engine oil.
- 3 Install an oil filler cap.

- 4 Start the vehicle and idle it for 3 minutes, then turn off the engine and wait for 10 minutes to adjust the oil level from the dipstick so that the oil level is at the middle level.

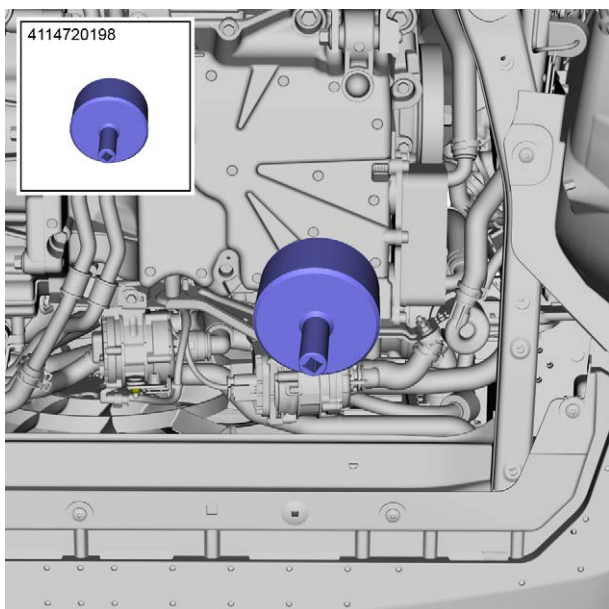
Caution

The oil level check requires the vehicle to be parked in a horizontal position.

- 5 Install the bottom engine guard assembly.
- 6 lower the vehicle.
- 7 Close the engine compartment cover.

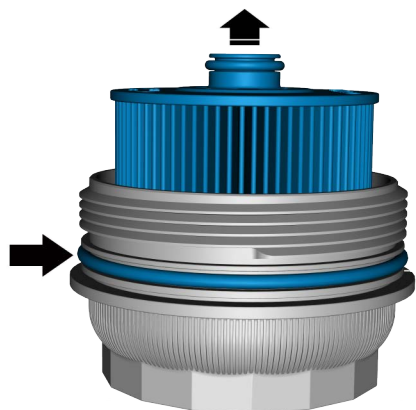
2.9.7.5 Replacement of Oil Filter Subassembly

Removal Procedure

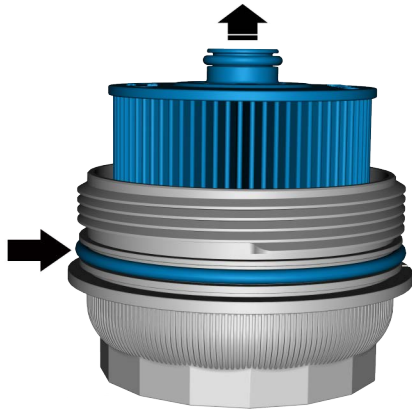


- 1 Open the engine compartment hood.
- 2 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 3 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 4 Drain the engine oil.
- 5 Remove the oil filter subassembly housing with a special tool.
Special tool for disassembly and assembly of oil filter subassembly: 4114720198

- 6 Remove the oil filter subassembly.
- 7 Remove and discard the sealing ring.



Installation Procedure



- 1 Install a new sealing ring.

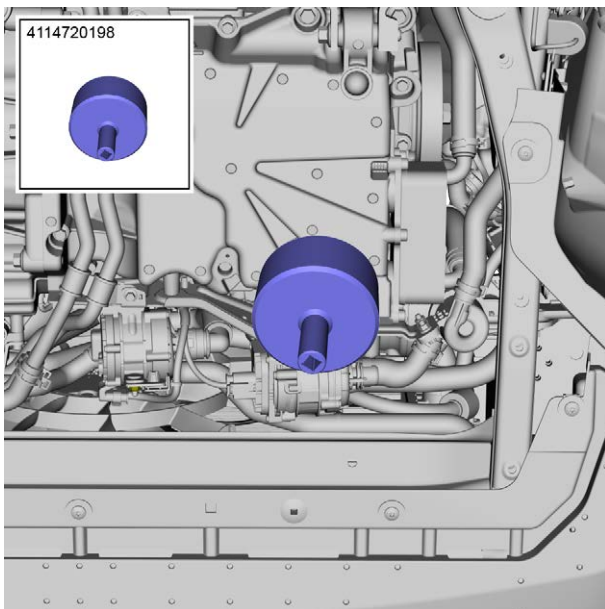
Caution

Use silicone or white oil seal rings.

- 2 Install a new oil filter subassembly into the oil filter subassembly housing.

Caution

Verify that the oil filter check valve is installed correctly.



- 3 Install and tighten the oil filter subassembly housing with a special tool.

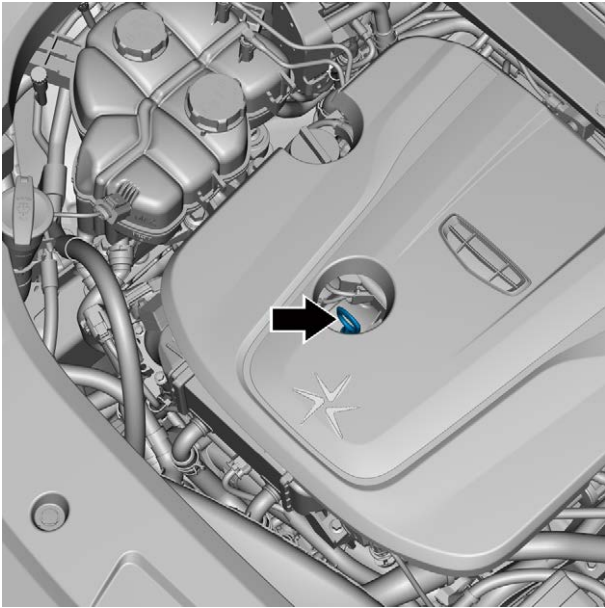
Special tool for disassembly and assembly of oil filter subassembly: 4114720198

Torque: first tighten to 25~30 N·m, then rotate in reverse by 30°, and finally tighten to 25~30 N·m.

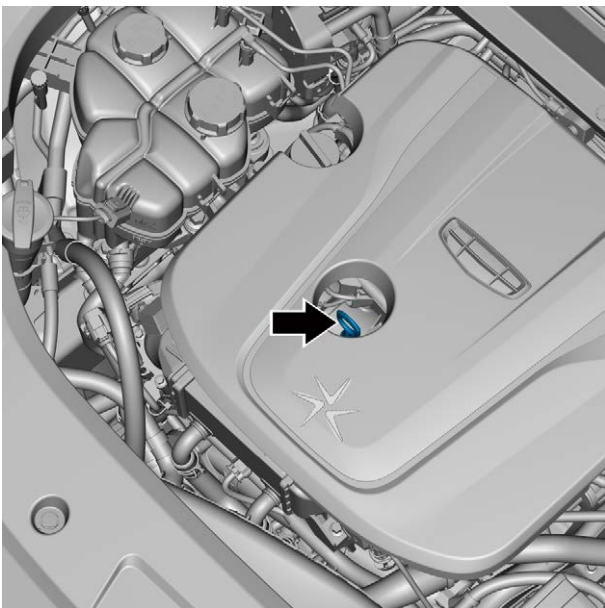
- 4 Fill in engine oil.
- 5 Install the bottom engine guard assembly.
- 6 lower the vehicle.
- 7 Close the engine compartment cover.

2.9.7.6 Replacement of Oil Dipstick

Removal Procedure



- 1 Open the engine compartment hood.
- 2 Remove the oil dipstick.



Installation Procedure

- 1 Install an oil dipstick.

Caution

Do not pull out the dipstick during engine startup.

- 2 Close the engine compartment cover.

2.9.7.7 Replacement of Engine Oil Sump Subassembly

Removal Procedure

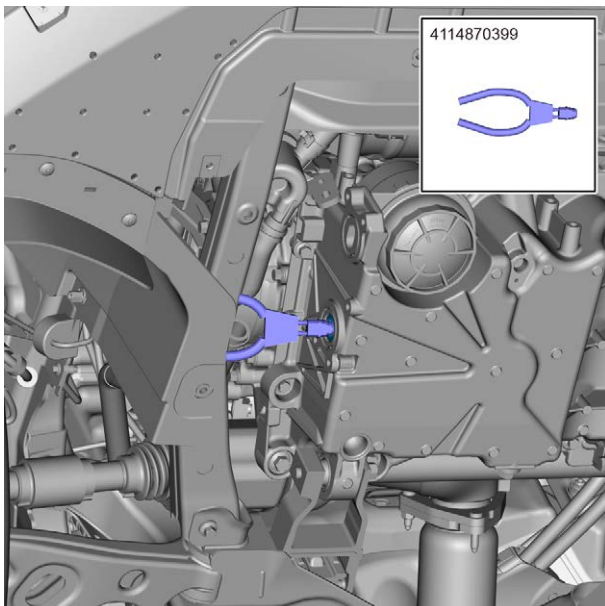
Warning !

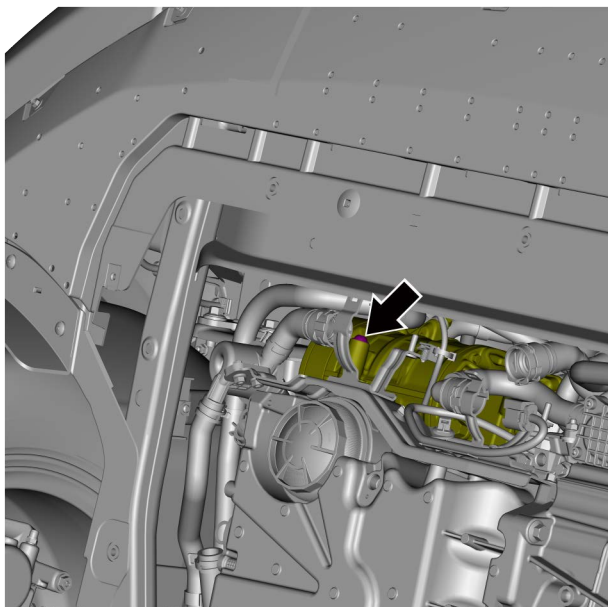
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

Warning !

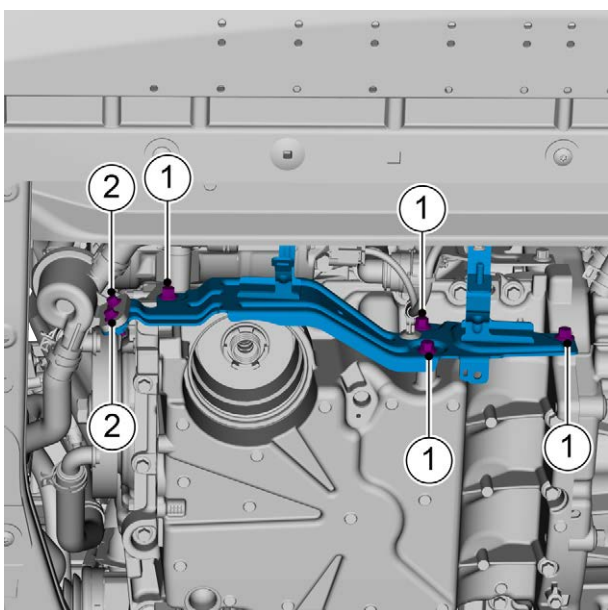
See "WARNING ABOUT COOLING SYSTEM MAINTENANCE" in "[WARNINGS AND PRECAUTIONS](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 4 Drain the engine oil, see [Draining and Filling Procedure of Engine Oil](#).
- 5 Remove the oil cooler, see [Replacement of Oil Cooler](#).
- 6 Remove the electronic powertrain coolant pump, see [Replacement of Electronic Powertrain Coolant Pump](#).
- 7 Remove the electronic water pump (3), see [Replacement of Electronic Water Pump \(3\)](#).
- 8 Remove the coolant inlet/outlet metal pipe, see [Replacement of Coolant Inlet/Outlet Metal Pipe](#).
- 9 Remove the oil pipe with a special tool.
Oil pipe removal tool: 4114870399

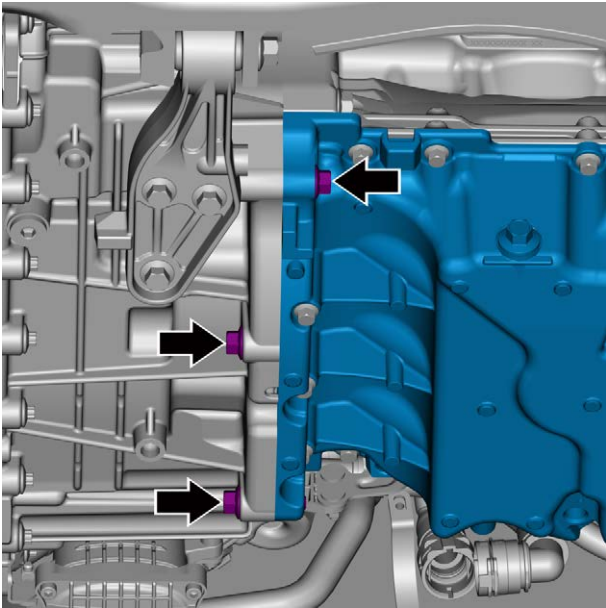




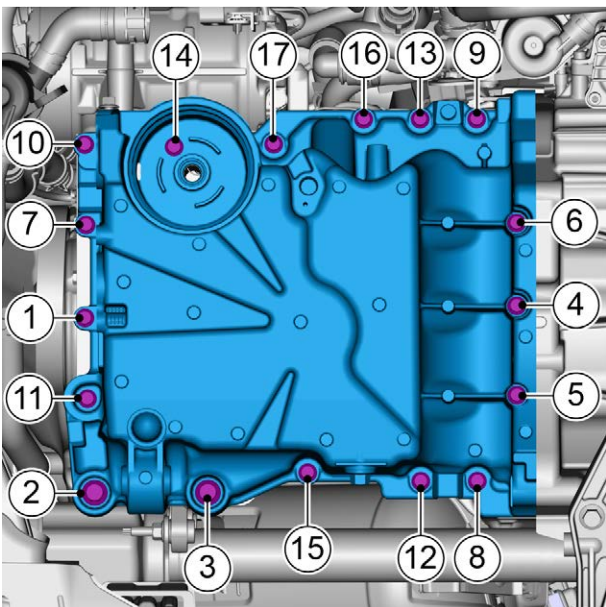
- 10 Remove the fixing screws of the air conditioning (A/C) compressor module.



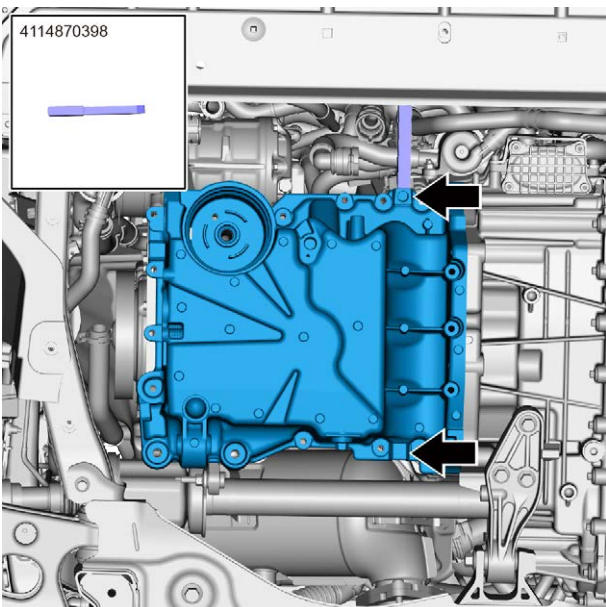
- 11 Remove the oil filter subassembly, see [Replacement of Oil Filter Subassembly](#).
- 12 Remove the rear right suspension vibration isolator pad, see [Replacement of Rear Right Suspension Vibration Isolation Pad](#).
- 13 Remove the four fixing bolts of the battery water pump bracket, and take off the battery water pump bracket.
- 14 Remove the two fixing bolts 2 of the water pump inlet pipe.



- 15 Remove the three fixing bolts connecting the transmission and the oil sump.



- 16 Remove the 17 fixing bolts from the engine oil sump subassembly in the order shown in the diagram.

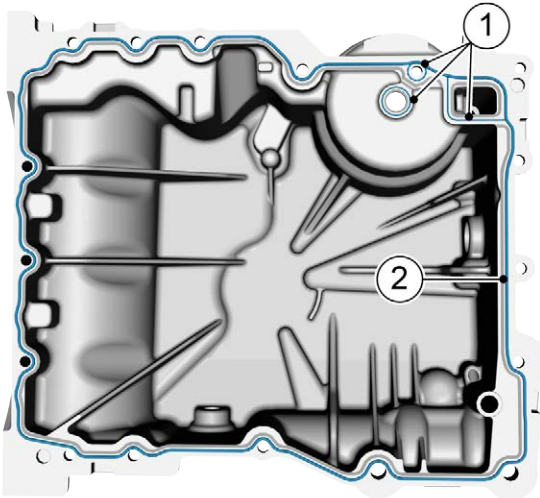


- 17 Pry off the engine oil sump subassembly with a special tool.

Profession tool: 4114870398

Installation Procedure

- 1 Apply flat sealing silicone (Loctite 5970) to the installation surface of the engine oil sump subassembly as shown in the diagram.



Caution

1. The oil sump needs to be assembled within 10 minutes after applying glue. If it exceeds the installation time, you need to clean the glue line and reapply glue to assemble.
2. Inspect the crankcase and oil sump sealing surfaces, and wipe the surfaces with alcohol to ensure that they are free of oil stain and grease.
3. The width of the adhesive line 2 is controlled at 2 ± 0.5 mm, the width of the adhesive line 1 is controlled at 1 ± 0.5 mm, and the distance from the contour of the glue line to the chamfered corner of the glue storage is controlled at 1 ± 0.5 mm.

- 2 Assemble the seventeen bolts of the engine oil sump subassembly to the engine oil sump subassembly at the positions shown in the illustration and pre-tighten then tighten in the order shown in the illustration.

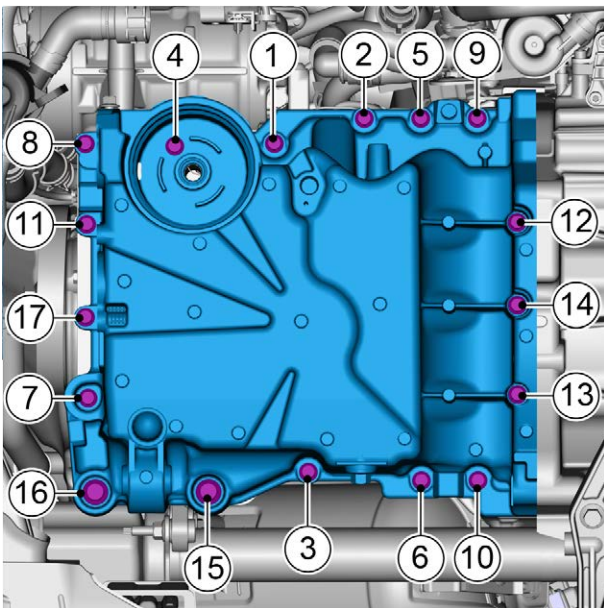
Bolt M7×20 Torque: 17 N·m

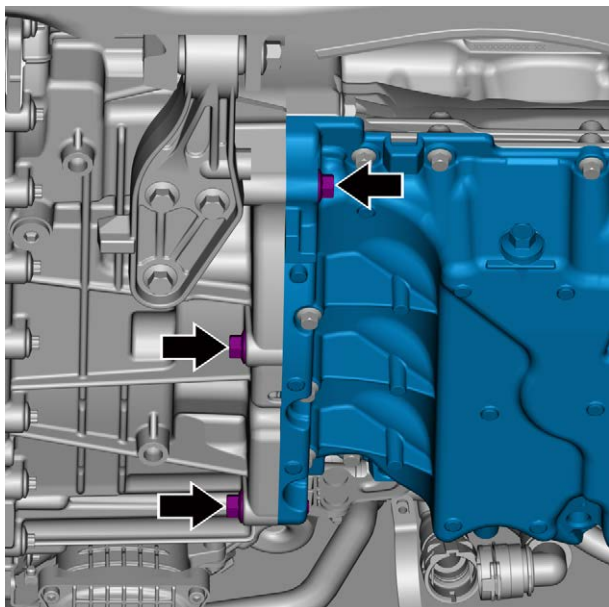
Bolt M7×90 Torque: 17 N·m

Bolt M10×40 Torque: 48 N·m

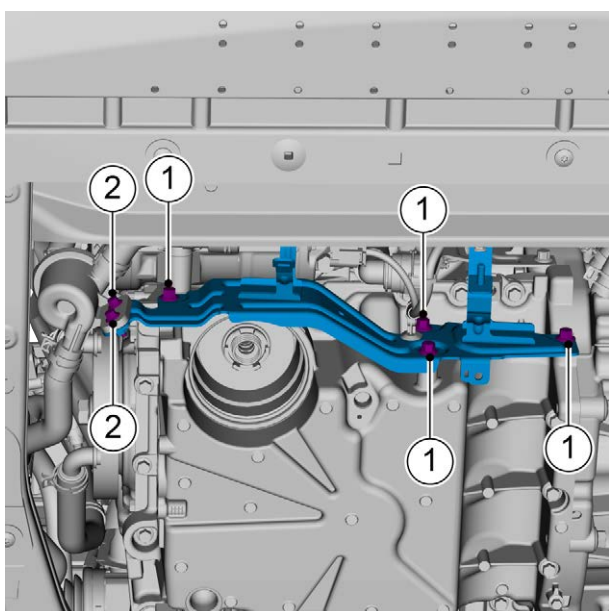
Caution

The number of bolts M7×20 in the figure is 11, the number of bolts M7×90 is 3, and the number of bolts M10×40 is 2. The different bolts in different positions are not interchangeable.



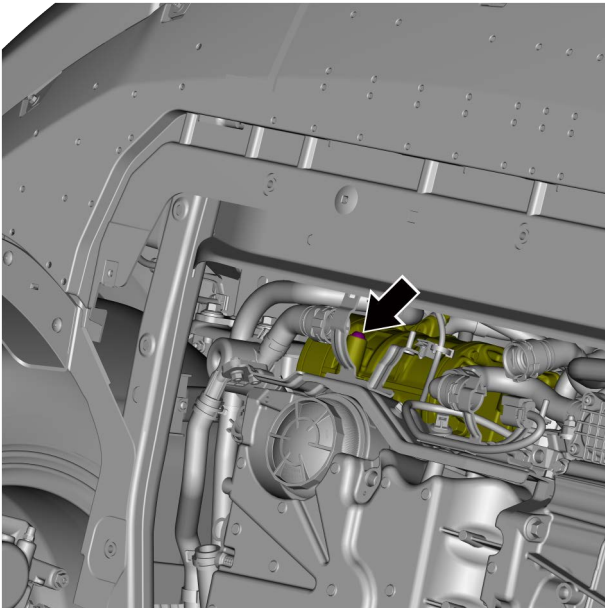


- 3 Install and tighten the three fixing bolts connecting the engine oil sump subassembly to the transmission.
Torque: 48 N·m

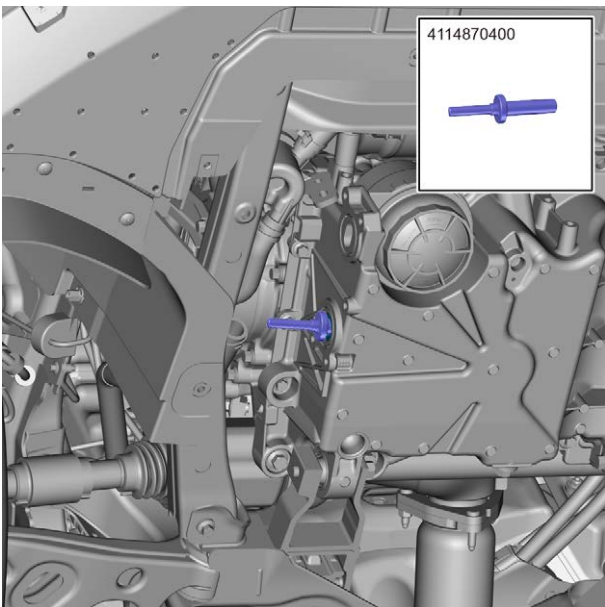


- 4 Install and tighten the two fixing bolts 2 of the water pump inlet pipe.
Torque: 10N·m
- 5 Install the battery water pump bracket, and tighten the four fixing bolts 1 of the battery water pump bracket.
Torque: 24N·m

- 6 Install the rear right suspension vibration isolation pad.
- 7 Install the oil filter subassembly.



- 8 Install the fixing screws of the A/C compressor module.
Torque: 24N·m



- 9 Install the oil pipe with a the special tool.
Oil pipe installation tool: 4114870400

Caution

Visually check the integrity of the sealing rings before assembly, and lubricate the sealing rings with P80 or other lubricating aids.

- 10 Install the coolant inlet and outlet metal pipes.
- 11 Install the electronic coolant pump (3).
- 12 Install the electronic powertrain coolant pump.
- 13 Install the oil cooler.
- 14 Fill in engine oil.
- 15 Install the engine trim cover assembly.
- 16 Connect the negative cable of battery.
- 17 Close the engine compartment cover.

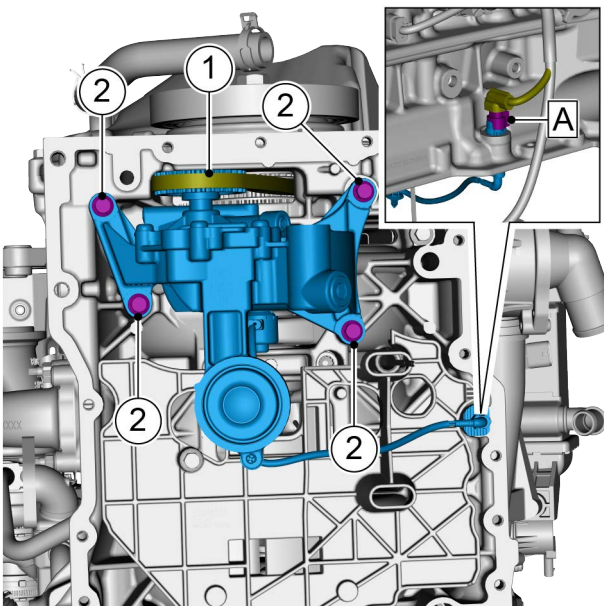
2.9.7.8 Replacement of Oil Pump

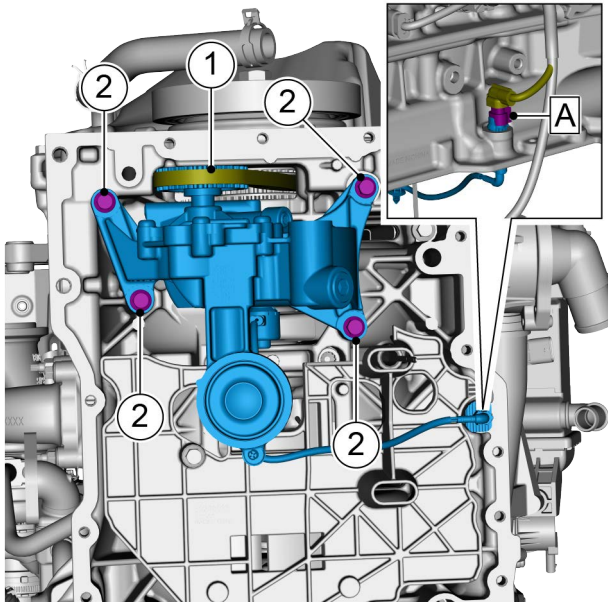
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 4 Remove the right engine suspension isolation pad assembly, see [Replacement of Right Engine Suspension Isolation Pad Assembly](#).
- 5 Drain the engine oil, see [Draining and Filling Procedure of Engine Oil](#).
- 6 Remove the oil cooler, see [Replacement of Oil Cooler](#).
- 7 Remove the oil filter subassembly, see [Replacement of Oil Filter Subassembly](#).
- 8 Remove the engine oil sump subassembly, see [engine oil sump subassembly replacement](#).
- 9 Disconnect the harness connector A of the engine oil pump solenoid.
- 10 Disconnect the oil pump drive belt 1 from the oil pump.
- 11 Remove the four fixing bolts 2 of the oil pump and take off the oil pump.

**Installation Procedure**



- 1 Install the oil pump and tighten the four fixing bolts 2 of the oil pump after pre-tightening in the order shown.

Torque: 17 N·m

- 2 Connect the oil pump drive belt 1 to the oil pump.

Caution

Ensure that the oil pump drive belt end face of the oil pump is within the oil pump pulley end face.

- 3 Connect the harness connector A of the engine oil pump solenoid.





Caution

Lubricate the harness connector of the oil pump with a similar P80 insertion aid before assembly.

- 4 Installation the engine oil sump subassembly.
- 5 Install the oil filter subassembly.
- 6 Install the oil cooler.
- 7 Fill in engine oil.
- 8 Install the rear right engine suspension vibration isolation pad assembly.
- 9 Install the engine trim cover assembly.
- 10 Connect the negative cable of battery.
- 11 Close the engine compartment cover.

2.9.8 Specialized tools and equipment

2.9.8.1 Special tools

Serial No.:	Illustration	Tool No.	Name
1		4114870398	Sealing surface pry bar
2		4114870399	Special tool for removing oil pipe (oil pump to oil cooler)
3		4114870400	Special tool for installing oil pipe (oil pump to oil cooler)
4		4114720198	Special tool for oil filter removal

2.10 Ignition system (DHE15-ESZ)

2.10.1 Specification

2.10.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Ignition coil fixing bolt	M6×40	8.5-11.5
Spark plug	M12×1.25	20-25

2.10.1.2 Ignition System Specifications

Application:	Specification
Ignition sequence	1-3-2
Ignition type	SP
Spark plug manufacturer	Shanghai Special Ceramics Co. Ltd.
Spark plug gap	0.6 ~ 0.7 mm

2.10.2 Instructions and operations

2.10.2.1 Instructions and operations

Spark Plug

The spark plug is mounted below the ignition coil. The spark plug is mainly used to ignite the oil and gas mixture in the combustion chamber. The spark plug is connected to the ignition coil, which generates a high voltage. As a result, an electric spark is generated between the positive and negative terminals of the spark plug. The ignition timing is controlled by the Engine Control Module (ECM).

Ignition Coil

The ignition coil is mounted on top of the DHE15-ESZ engine. The ignition coil supplies high voltage to the spark plug. The ignition coil has an integrated voltage amplifier. The Engine Control Module (ECM) controls the ignition coil to ensure that the spark plugs produce sparks at the correct time. The ignition coil is directly connected to ECM and the spark plug. The engine utilizes a single-cylinder independent ignition system that transmits the ignition voltage directly from the ignition coil to the spark plug. The components of the ignition system are mainly composed of ECM, ignition coil, spark plug, speed sensor, camshaft position sensor and knock sensor. This independent ignition method, also known as direct ignition, has a separate ignition coil for each cylinder for ignition. When the sensor gives the ignition position before the top dead center of a certain cylinder to the ECM, the ECM triggers this ignition coil to start ignition. Due to the single-cylinder independent ignition system, the ECM can control the optimal ignition timing according to the various engine load conditions, so that the engine output power, acceleration, economy and exhaust gas emissions are optimized, and the voltage of the ignition system does not decrease with the increase in speed. Since there are no mechanical components, there are no mechanical errors (malfunctions).

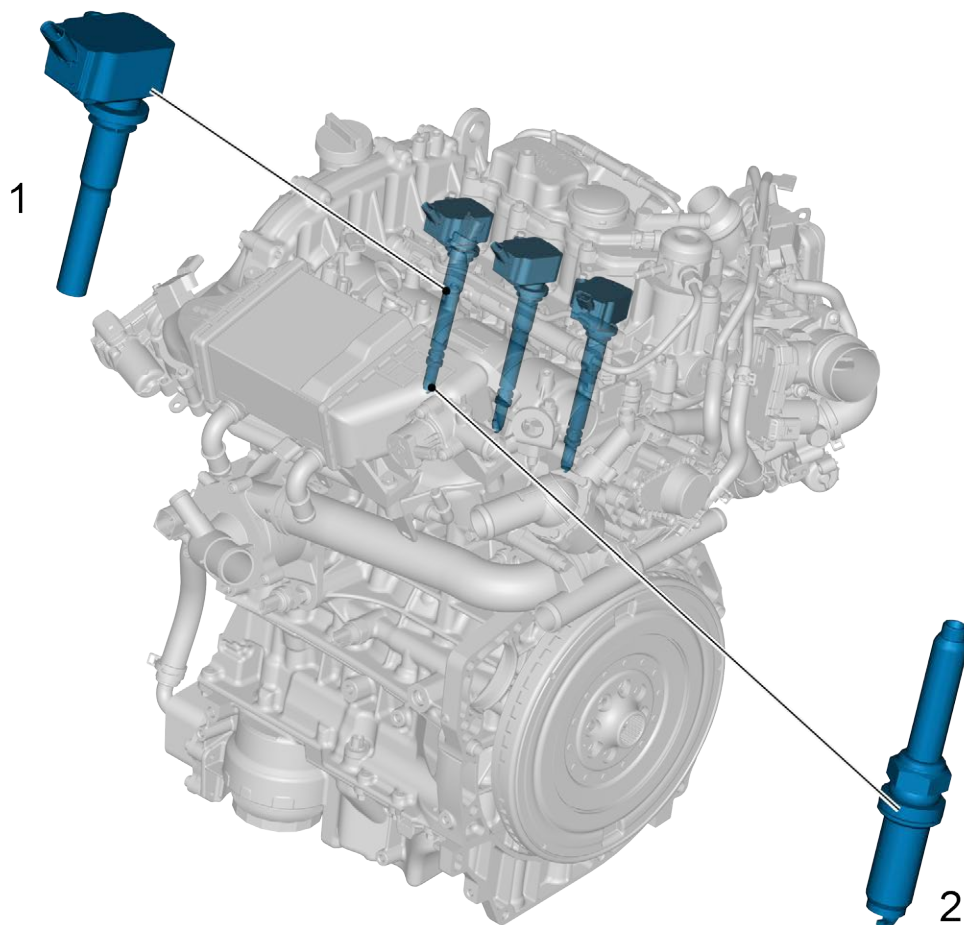
2.10.3 System working principles

2.10.3.1 System working principles

Start the vehicle, the ECM control the operation of the ER04 main relay, then the battery voltage passes through the ER04 main relay and EF71A ignition coil fuse to reach the ignition coil, to provide working power to the ignition coil. The crankshaft position sensor is a magnetic induction speed sensor. When the engine rotates, the signal disk of the crankshaft position sensor also begins to rotate, so the sensor also produces a corresponding alternating signal, which is transmitted to the ECM. According to the signal, the ECM calculates the current crankshaft rotation angle to determine the benchmark for the piston to reach the top dead center, which directly affects the accuracy of ignition advance angle control. So the sensor signal is a crucial input signal in the ignition system, and when the ECM cannot receive this signal, the ignition system cannot function. The ECM harness connector receives the signal input from the crankshaft position sensor, calculates the ignition advance angle, and then controls the ignition of each cylinder through the ECM.

2.10.4 Part position

2.10.4.1 Location of Ignition System Component



1. Ignition coil

2. Spark plug

2.10.5 Diagnostic information and procedure

2.10.5.1 Diagnosis description

Before diagnosing a malfunction in the ignition system, see Description and Operation and How the System Works. Understanding and familiarizing yourself with the operating principles of the ignition system before beginning system diagnosis will help determine the proper troubleshooting steps to take in the event of a malfunction, and more importantly, this will help determine if the condition described by the customer is normal operation. Any troubleshooting of the ignition system should begin with a visual inspection, which guides the service technician to the next logical step in the troubleshooting process. Understanding and using the diagnostic process correctly will shorten the diagnostic time and avoid misjudgment of the faulty location.

2.10.5.2 Routine inspection

- Check for aftermarket retrofitting devices that may affect the operation of the ignition system to ensure that these devices cannot interfere with the proper functioning of the ignition system.
- Inspect easily accessible or visible system components for obvious blockages or leaks. If there is a leak, first verify that it is an engine oil leak.

2.10.5.3 Spark Plug Inspection and Diagnosis

Diagnostic Steps

Step 1	Remove the spark plug. See Replacement of Spark Plug .
--------	--

Next Step

Step 2	Check for bent or broken spark plug terminal connecting rod, test for loose spark plug terminal connecting rod by twisting and pulling the terminal post.
--------	---

Yes

Step 3	Check the spark plug insulator for sparking or showing signs of leakage, which is caused by discharge between the two ends of the spark plug insulator between the spark plug terminal rod and the grounding point.
--------	---

Check for the following conditions:

- A. Check the ignition coil for damage.
- B. Check if the spark plug groove area of the cylinder head is damp and free of engine oil, engine coolant or water. Complete moisture in the spark plug bushing can cause an arc discharge.

Next Step

Step 4	Check the spark plug insulator for cracks, which can cause a discharge.
--------	---

Next Step

Step 5	Check the spark plug center electrode for signs of abnormal discharge, measure the gap between the spark plug center electrode and the side electrodes.
--------	---

- A. Check whether the spark plug torque is correct. The tightening torque of the spark plug is 22.5 ± 2.5 N·m (16.6 ± 1.8 lb ft), insufficient torque spark plug will not work properly, too much tightening torque of the spark plug may cause the insulator B to crack.
- B. Check for any signs of leakage near the center electrode of the spark plug.
- C. Check the side electrodes for breakage and wear.
- D. Check if the center electrode is broken, worn or loose by shaking the spark plug. If you hear a clicking sound, it means that it is damaged internally, and a loose center electrode will reduce the strength of the spark.
- E. Check if the electrodes are too dirty.

Next Step

Step 6	Check the spark plug installation area of the cylinder head for debris that could damage the spark plug during installation.
--------	--

2.10.5.4 Spark Plugs in Use of Common Faults

Serious erosion of spark plug: spark plug tip scarring, destruction or electrode melting, ablation are indicative of spark plug has been destroyed, should be replaced. When replacing, the symptoms of erosion and color changes should be examined in order to analyze the cause of the malfunction. See [Replacement of Spark Plug](#).

1. A melted electrode with a white insulator indicates a high temperature in the combustion chamber. This may be due to excessive carbon accumulation in the combustion chamber, overheating of the exhaust valves caused by too small a valve clearance, poor operation of the cooling device, or failure to tighten the spark plug to the specified torque.
2. Rounded electrodes and scarred insulators indicate premature ignition of the engine, which may be caused by premature ignition time or low octane gasoline and high spark plug calorific value.
3. The top of the insulator is broken. Knocking combustion is the main cause of insulator rupture, and premature ignition, low gasoline octane, and high temperatures in the combustion chamber may lead to engine knocking combustion.
4. There is a gray-black streak on the top of the insulator. This streak indicates that the spark plug has leaked air and should be replaced with a new one.

Spark plugs have deposits: the tip of the spark plug insulator and the electrode will sometimes be stuck between the deposits, serious cases will cause the engine can not work, such as cleaning the spark plug can be temporarily remedied.

In order to maintain good performance, the source of the fault must be identified.

Oily deposits. Oily deposits on the spark plug indicate that lubricating oil has entered the combustion chamber. If it is only an individual spark plug, the valve stem oil seal may be damaged. If the spark plugs of all cylinders are adhering to such deposits, indicating that the cylinder oil, the air filter and venting device should be checked for blockage.

Black sediment. Spark plug electrode and internal black deposits, indicating that the mixture is too thick, which can increase the engine running speed, and continue for a few minutes to burn off to stay on the electrode a layer of black soot layer.

1. The center electrode of the spark plug for normal fuel is gray or yellow.
2. The center electrode of the spark plug with excessive fuel is severely corroded.
3. Spark plugs with incorrect heating values or due to engine fuel system failure have very heavy carbon deposition on the spark plug center electrode and center pole insulating magnet.

2.10.6 Removal and Installation

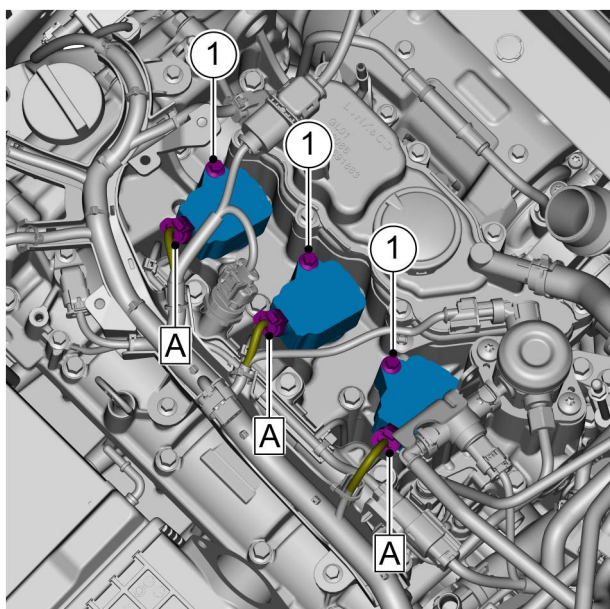
2.10.6.1 Replacement of Ignition Coil

Removal Procedure

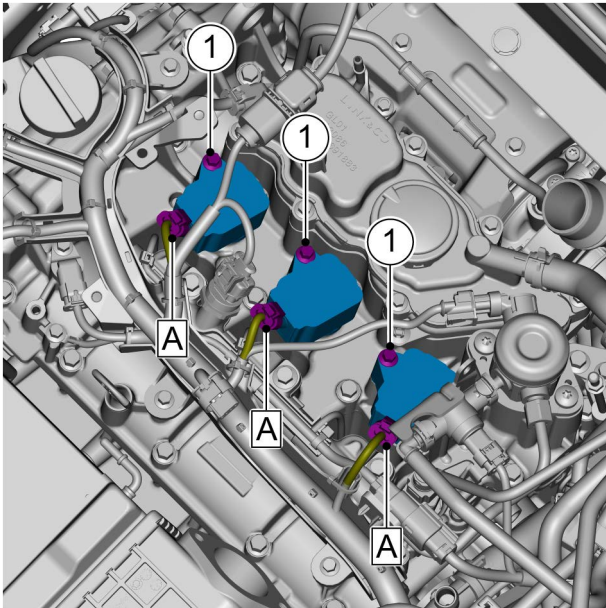
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 4 Remove the resonator, see [Replacement of Resonator](#).
- 5 Disconnect the harness connector A from the ignition coil.
- 6 Remove the three fixing bolts 1 of the ignition coil and take off the three ignition coils.



Installation Procedure



- 1 Install each of the three ignition coils into the ignition coil mounting holes on the cylinder head cover.
- 2 Install and tighten the three fixing bolts 1 of the ignition coil.

Torque: 10 N·m (metric)

Caution

1. It is prohibited to touch the part pins.
 2. Electrical plugging or unplugging of part connectors is not permitted during energizing operations such as cold or hot test.
 3. Avoid dropping parts or subjecting them to shocks. Dropped parts must be scrapped.
- 3 Connect the ignition coil harness connector A.
 - 4 Install a resonator.
 - 5 Install the engine trim cover assembly.
 - 6 Connect the negative cable of battery.
 - 7 Close the engine compartment cover.

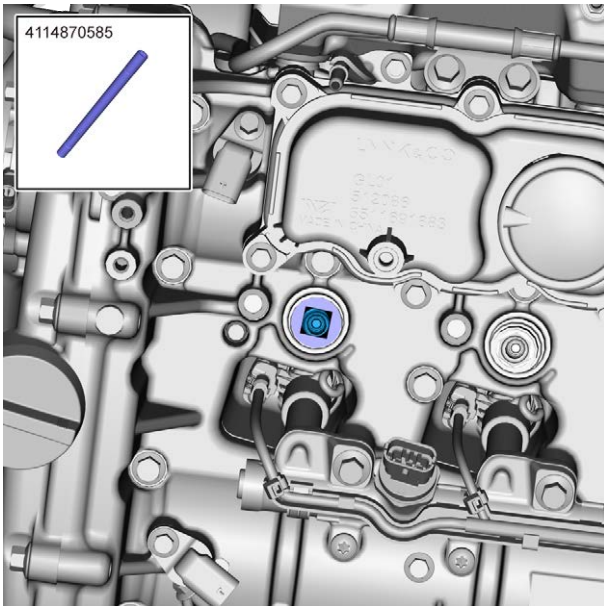
2.10.6.2 Replacement of Spark Plug

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 4 Remove the resonator, see [Replacement of Resonator](#).



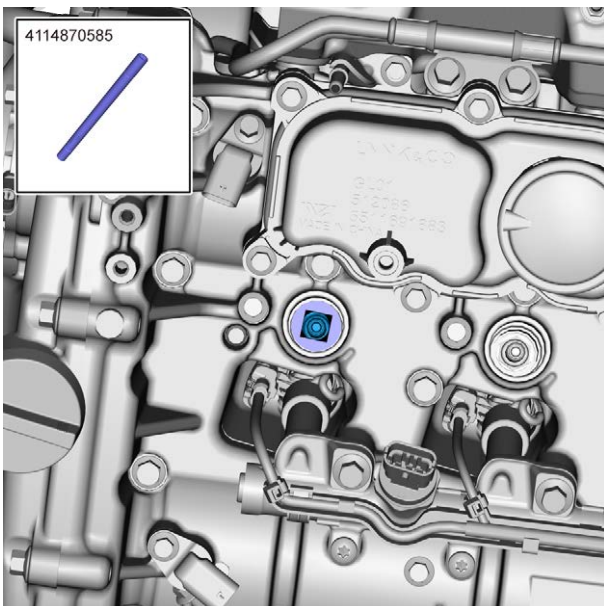
5 Remove the ignition coil. See [Replacement of Ignition Coil](#).

6 Remove the spark plug with the special tool.

Special tool: 4114870585

Caution

When removing the spark plug, it is strictly prohibited to tilt the tool to cause damage to the spark plug.



Installation Procedure

1 Perform the spark plug electrode gap detection.

Standard value: 0.6 to 0.7 mm

2 Install the spark plug by fully inserting the spark plug into the special tool, then install the spark plug in the cylinder head hole and tighten the spark plug.

Torque: 22.5N·m

Special tool: 4114870585

Caution

1. Spark plugs are vulnerable parts that must be scrapped after a fall or collision.

2. The axis of the spark plug mounting hole has a 9° angle to the cylinder bore to avoid lateral force on the spark plug when tightening.

3. Insert a sleeve into the spark plug hole so that the sleeve is completely set into the hexagonal flange surface of the spark plug. During disassembly, avoid tilting the extension rod and damaging the spark plug.

3 Installation of ignition coil.

4 Install a resonator.


5 Install the engine trim cover assembly.

6 Connect the negative cable of battery.

7 Close the engine compartment cover.

2.10.7 Specialized tools and equipment

2.10.7.1 Special tools

Serial No.:	Illustration	Tool No.	Name
1		4114870585	Spark plug removal tool

2.11 Charging system (DHE15-ESZ)

2.11.1 Specification

2.11.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Fastening nut for positive battery cable and fuse box	M6	8.5-11.5
Fixing nut for battery monitoring sensor	M6	4-6
Fastening nut for battery monitoring sensor and grounding wire	M8×8	20-28
Rear battery bracket and body	M8×16	20-28

2.11.2 Instructions and operations

2.11.2.1 Battery Instruction and Operation

This vehicle is equipped with a maintenance-free battery, the difference with the traditional batteries is that there is no vent hole plug on the battery cover. Except for the small vent holes on both sides of the battery, the battery is completely sealed.

Ventilation holes can discharge a small amount of gas generated by the battery, the internal electrolyte chemical reaction of the battery will produce a small amount of gas. If not set up venting holes, the pressure inside the battery with the increase in gas increases constantly. When the bearing limit of the battery casing is exceeded, it will make the casing crack. Compared with conventional batteries, this kind of battery has the following advantages:

- No need to add water during the service life of the battery.
- Overcharge protection.
- Not as prone to leakage as conventional batteries.
- Less weight, smaller volume, and greater capacity.

The battery has three main functions in the overall electrical system:

- Powering electrical appliances when the vehicle is not started.
- May act as a voltage regulator for the electrical system.
- The battery is able to provide power for a certain period of time when the power generated by the DCDC cannot meet the requirements of the electrical system.

2.11.2.2 Description and Operation of Charging System

The charging system mainly consists of battery, DCDC, CEM and related circuits.

Charging procedure:

1. When removing the battery from the vehicle for charging, install an adapter connector tool assembly. Ensure that all charger wiring is clean and secure. For best results, charge the battery when the electrolyte and electrode are at room temperature. If the battery temperature is too low, it may not charge for several hours after starting the charger.
2. Charge the battery until the charger indicates that the battery is fully charged or the detected battery voltage is close to the full charge level. The battery should be checked every half hour of charging.
3. A load test should be performed on the battery after charging. Battery discharge current and parasitic load

testing. Charging a fully discharged battery (outside the vehicle): the following procedure must be strictly followed, otherwise an intact battery may be replaced by mistake.

The following procedure must be followed to charge a fully discharged battery:

1. Measure the voltage at the battery terminals with an accurate voltmeter. If the reading is less than 10 V, the charging current will be very low and a certain amount of time must elapse before the battery can be charged with more than a few milliampere of current.
2. Set the battery charger on a higher setting.
3. Continue battery charging for more than 4 h at a voltage of 16 V or less:
 - If there is still no charging current when the above time is reached, the battery should be replaced.
 - If the charging current is measured during the charging time, the battery is intact and charging can be continued to an intact state.

2.11.3 System working principles

2.11.3.1 System working principles

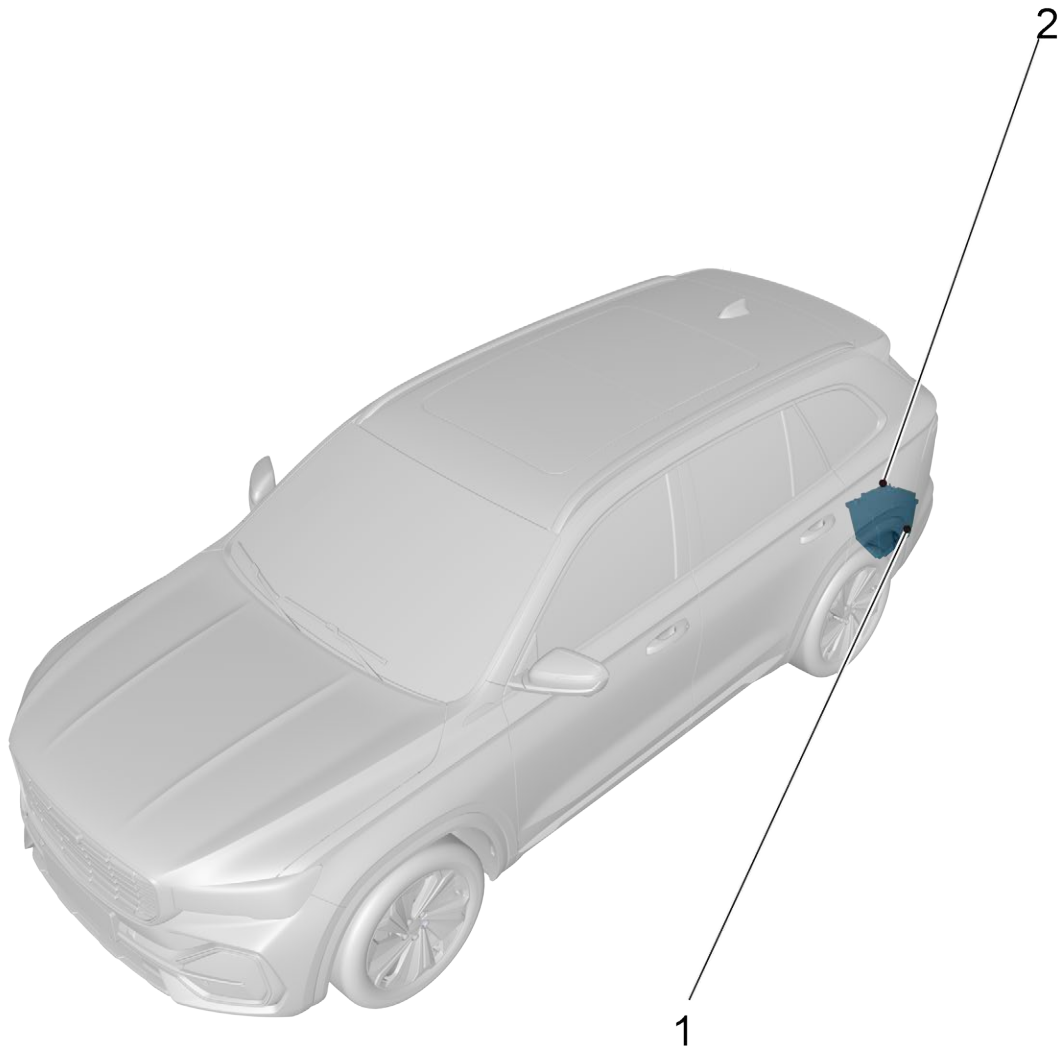
After the main relay of the battery is closed, the ECM will automatically control the charging and discharging of the high-voltage battery according to the SOC status of the high-voltage battery, power demand, and system efficiency, which can be divided into the following scenarios:

- a. In-situ idle charging: when the SOC of the high-voltage battery is lower than a certain threshold (around 36%), the ECM requests the PCM to control the speed of the P1 motor, meanwhile controls the charging power to the battery by adjusting the output torque of the engine, and control the engine to turn off the engine and stop charging the high-voltage battery when the SOC of the battery has risen to a certain threshold (depending on different driving modes).
- b. Charging during driving: The ECM dynamically calculates the target SOC of the battery, and generates power through P1 to meet the driving power demand of P2 while charging the battery in series connection, and adjusts the engine operating point to charge the battery through P2 in parallel connection.
- c. Braking energy recovery: During throttle release coasting or braking, the ECM receives the motor recovery torque demand from the VDDM, and then requests the PCM to output negative torque to charge the battery through the P2 motor to meet the vehicle deceleration demand.

The PCM is requested to control the P1 motor as a starter to start the engine. After the engine is started, the P1 motor generates power to charge the high-voltage battery DC, meanwhile supplies power to the low-voltage system through the DCDC, and stops charging the battery when the SOC of the high-voltage battery rises to the target SOC (which is related to factors such as driving mode and vehicle speed).

2.11.4 Part position

2.11.4.1 Part position



1. Battery

2. Battery monitoring sensor

2.11.5 Diagnostic information and procedure

2.11.5.1 Diagnosis description

Before diagnosing a malfunction in the charging system, see Description and Operation and How the System Works. Understanding and familiarizing yourself with the operating principles of the charging system before beginning system diagnosis will help determine the proper troubleshooting steps to take in the event of a malfunction, and more importantly, this will help determine if the condition described by the customer is normal operation. Any troubleshooting of the charging system should begin with a routine diagnosis, which guides the service technician to take the next logical step in the troubleshooting process. Understanding and using the diagnostic process correctly will shorten the diagnostic time and avoid misjudgment of the faulty location.

2.11.5.2 Parasitic Load Test of Battery Discharge Current

If the battery produces a sustained power loss, the following test procedure should be performed to check for parasitic current generation in the battery.

Caution

Before performing this procedure, check if the vehicle has any aftermarket add-on devices, such as DVD, audio amplifier, rear back box subwoofer, or other non-original accessories. And if so, disconnect these systems before performing this test procedure.

Warning !

See "WARNING ABOUT BATTERY DISCONNECTION" in "WARNING AND PRECAUTION".

Step 1	Disconnect the negative cable of battery, refer to Procedures for disconnecting and connecting battery cable .
--------	--

Next Step

Step 2	Connect one end of the digital multimeter to the negative battery cable and the other end to the negative terminal of the battery.
--------	--

Next Step

Step 3	Select the "Current Test" maximum range setting of the digital multimeter.
--------	--

Next Step

Step 4	Open the front left door and observe the reading on the multimeter display screen.
--------	--

Caution

Do not do anything else at this time or the multimeter may be damaged.

Next Step

Step 5	If there is no display on the multimeter, check if the multimeter is damaged. If there is a display, close the front left door, depress the engine compartment switch and press the door lock button on the remote control.
--------	---

Next Step

Step 6	Wait for more than 10 min, observe the multimeter reading, (if the multimeter display reading is not normal, you can turn down the multimeter gear), then the multimeter display should be below 30 mA. If it is higher than 30 mA, there may be parasitic current generation.
--------	--

Caution

When you can't confirm whether the parasitic current of the system is normal or not, you can find a trouble-free vehicle to do a comparison test so as to confirm the fault.

2.11.6 Removal and Installation

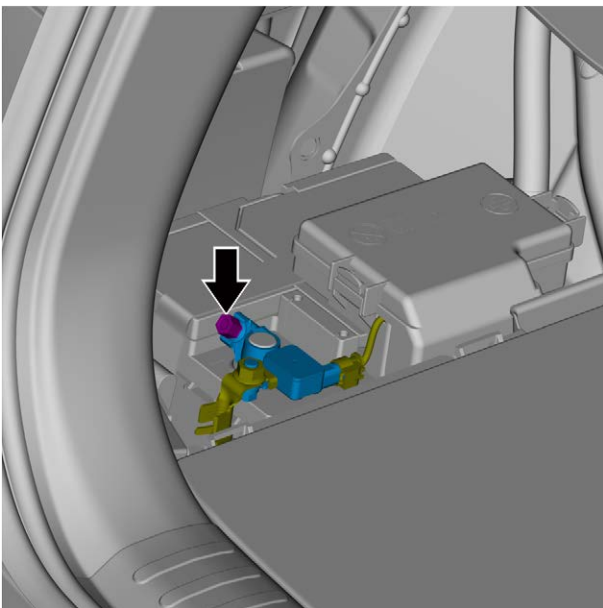
2.11.6.1 Disconnection Procedure for Battery Cable

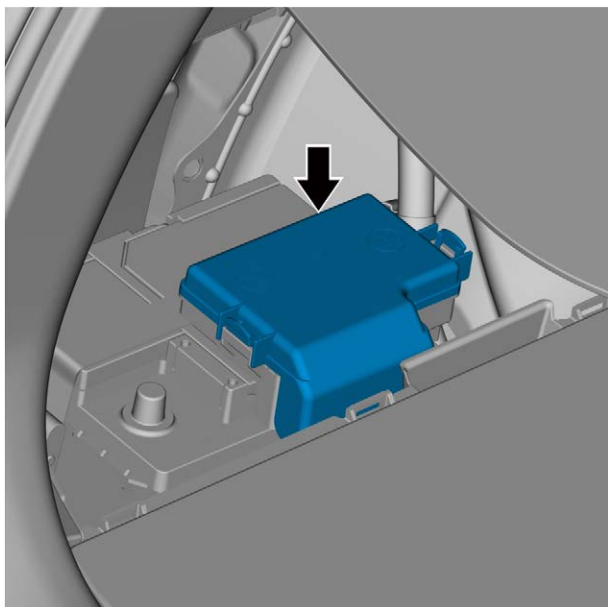
Disconnection Procedure

Warning !

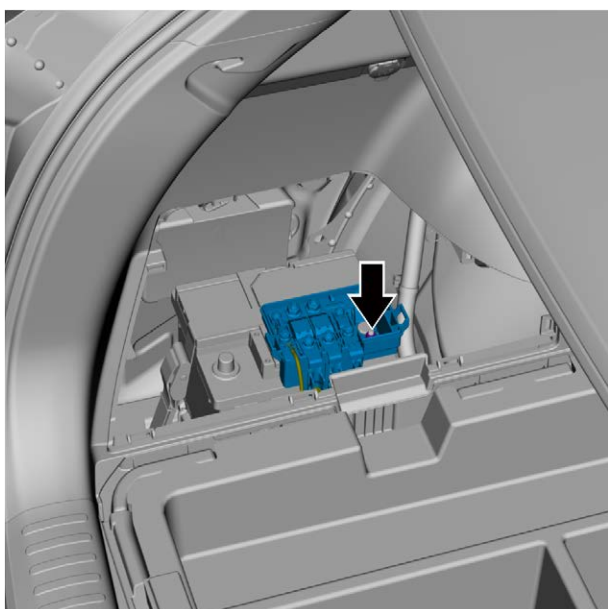
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the back door.
- 2 Remove the left luggage compartment trim panel access covers, refer to [Replacement of left luggage compartment trim panel access cover](#).
- 3 Loosen the battery monitoring sensor fixing nuts and disconnect the negative battery cable.



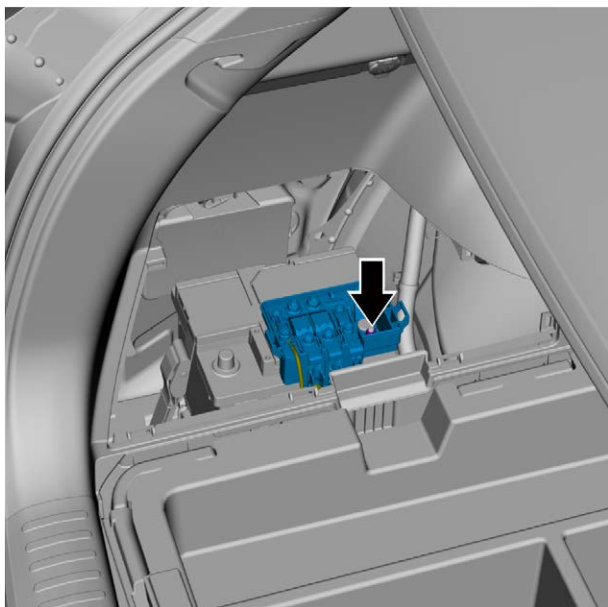


- 4 Disassemble and remove the positive battery shield.

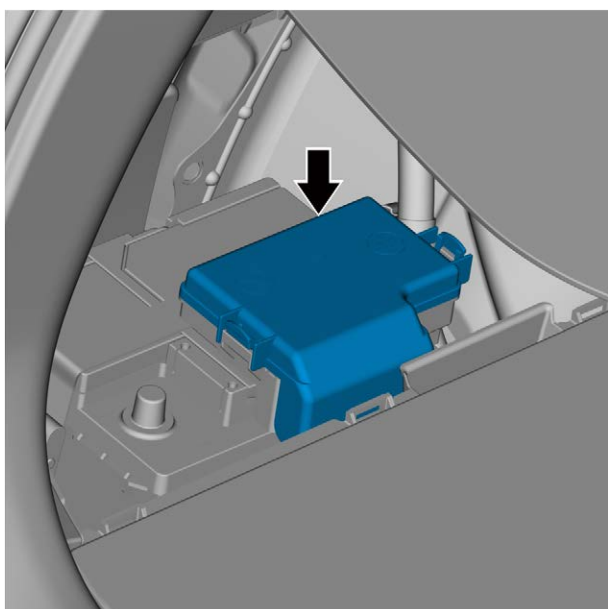


- 5 Loosen the fixing nuts of the positive battery cable, disconnect the positive battery cable and set the relay box aside.

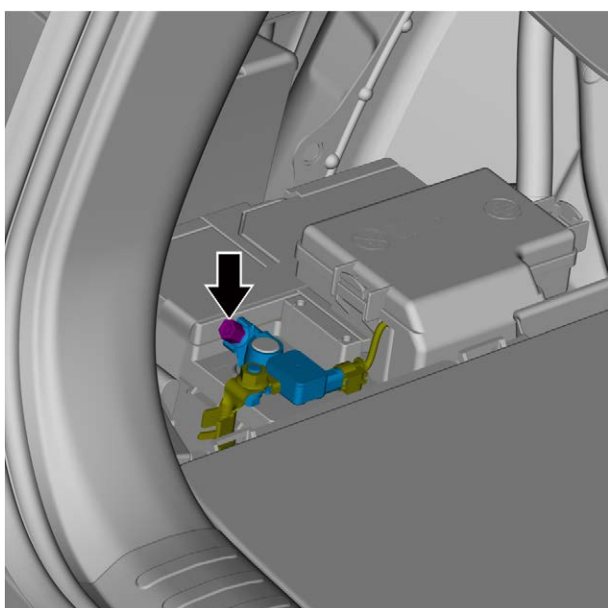
Connection Procedure



- 1 Install the relay box while connecting the positive battery cable, and tighten the positive battery cable fixing nuts.
Torque: 6N·m



- 2 Install the positive electrode shroud of the battery.



- 3 Install the negative battery cable and tighten the fixing nuts for the battery monitoring sensor.
Torque: 5N·m

- 4 Install the left luggage compartment trim panel access cover.
- 5 Close the back door.

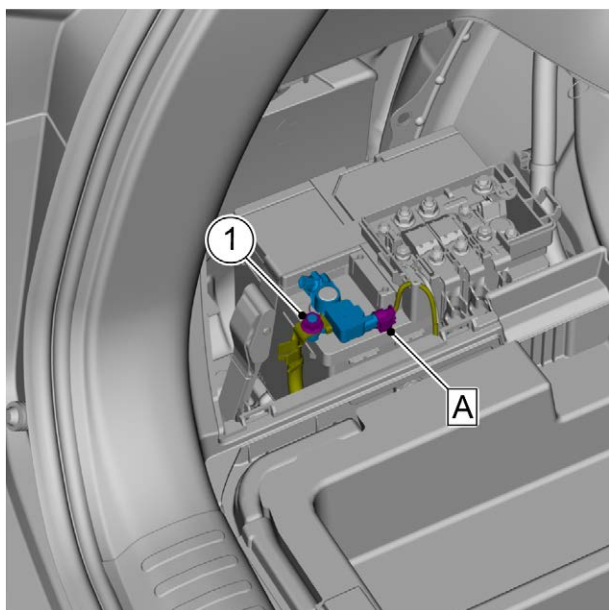
2.11.6.2 Replacement of Battery Monitoring Sensor

Removal Procedure

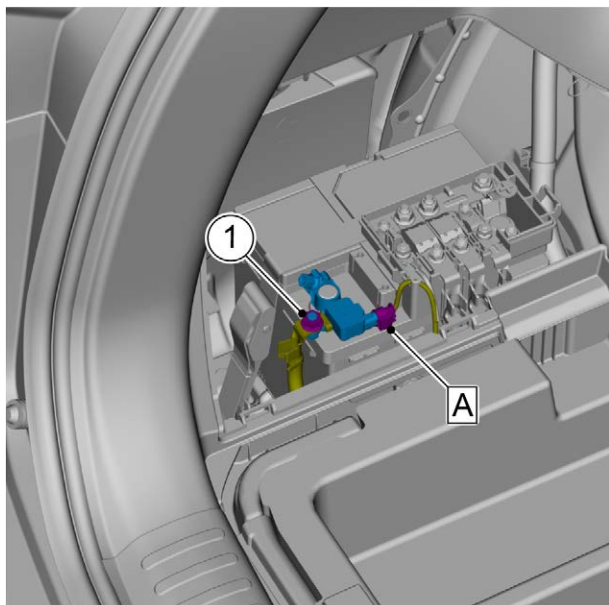
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the back door.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Disconnect the battery monitoring sensor harness connector A.
- 4 Remove the battery monitoring sensor fixing nuts 1 and take off the battery monitoring sensor.



Installation Procedure



- 1 Install the battery monitoring sensor, and fasten the battery monitoring sensor fixing nuts 1.
Torque: 24N·m
- 2 Connect the battery monitoring sensor harness connector A.

- 3 Connect the negative cable of battery.
- 4 Use the GLDS diagnostic program. On the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software flash operation.
- 5 Close the back door.

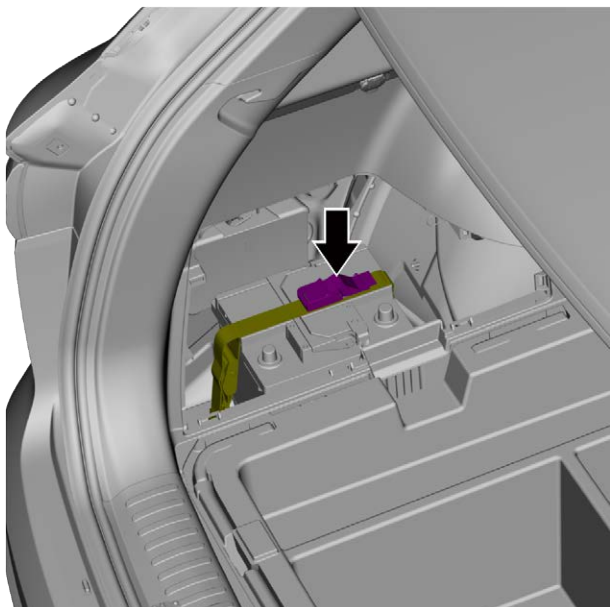
2.11.6.3 Replacement of Battery

Removal Procedure

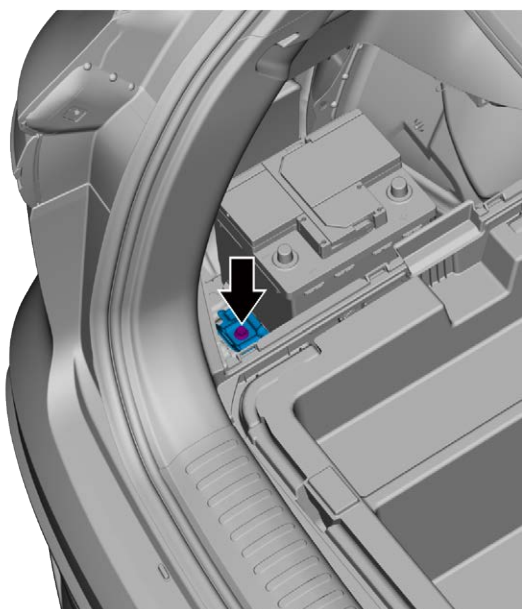
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

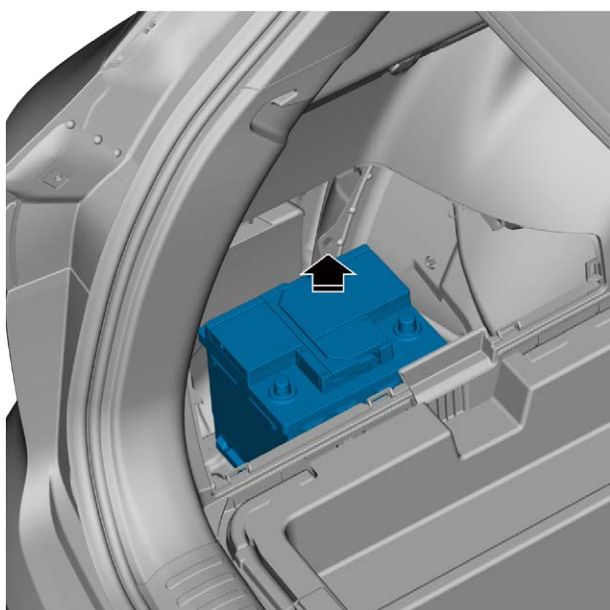
- 1 Open the back door.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).



3 Remove the battery fixing strap buckle.



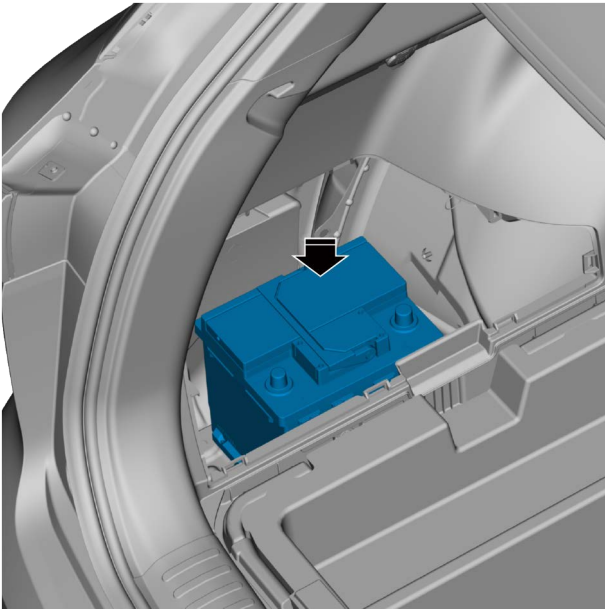
4 Remove the fixing bolts from the rear bracket of the battery.



5 Take off the battery.

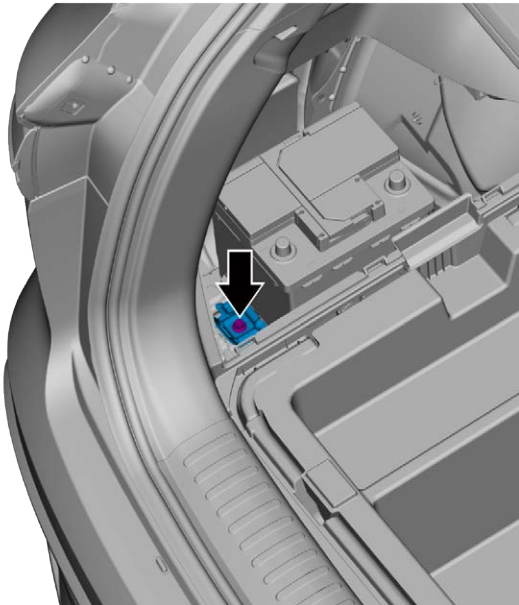
Installation Procedure

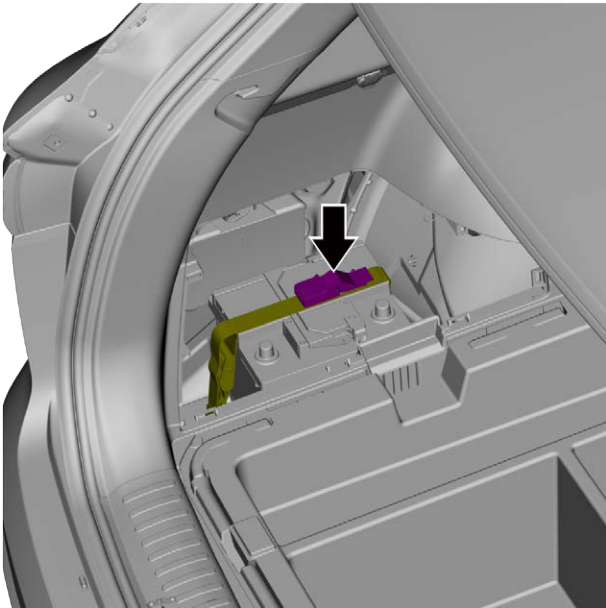
- 1 Install the battery.



- 2 Install and tighten the fixing bolts on the rear bracket of the battery.

Torque: 24N·m





3 Install the battery fixing strap buckle.

5 Connect the negative cable of battery.

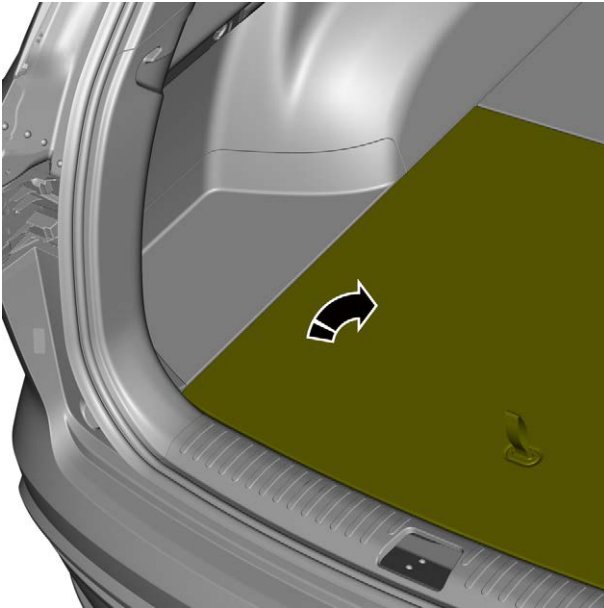
6 Use the GLDS diagnostic program. On the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software flash operation.

7 Close the back door.

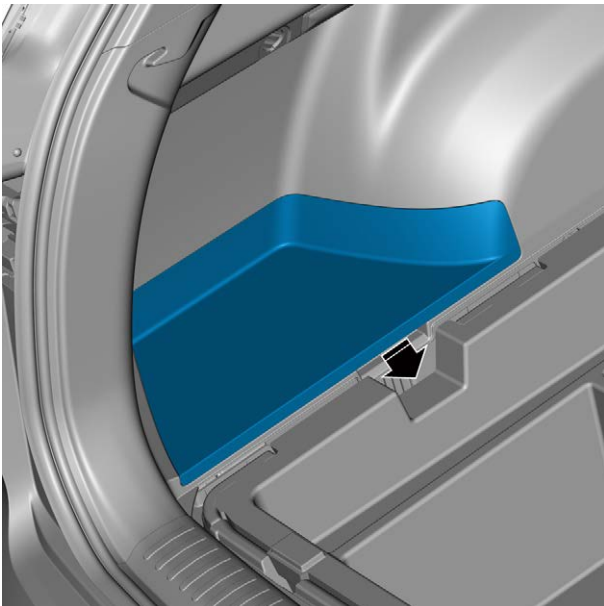
2.11.6.4 Replacement of Repair Cover for Left Luggage Compartment Trim Panel

Disconnection Procedure

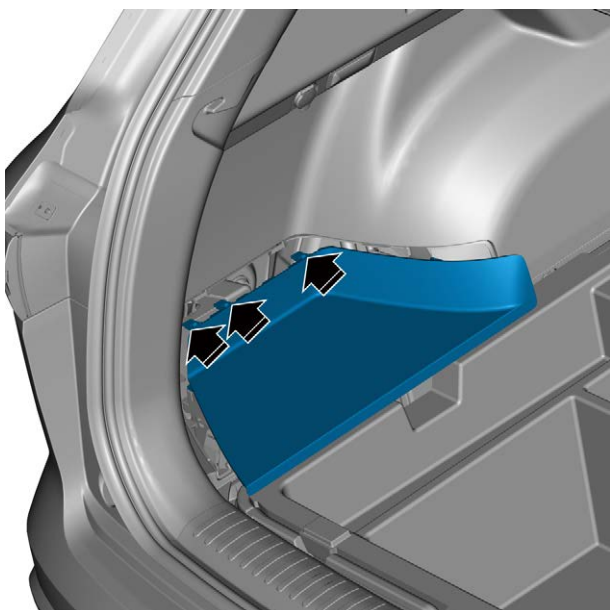
- 1 Open the back door.
- 2 Lift off the luggage compartment cover.



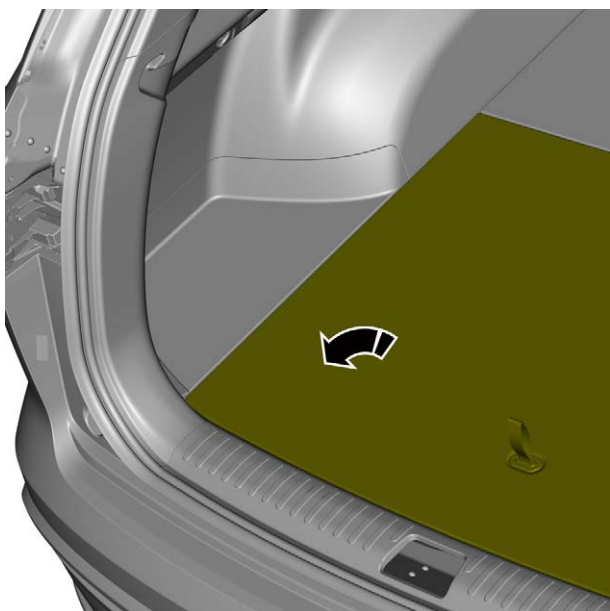
- 3 Remove the left luggage compartment trim panel repair cover by holding down the lower end of the removal opening with one hand and pulling the left luggage compartment trim panel repair cover towards the inside of the vehicle with the other hand.



Connection Procedure



- 1 Place the left luggage compartment trim panel repair cover parallel to the front three mounting holes and push the left luggage compartment trim panel repair cover into place.



- 2 Reset the luggage compartment cover.

- 3 Close the back door.

Hybrid Powertrain

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3.1 Warnings and Cautions

3.1.1 Warnings and Cautions

3.1.1.1 Warnings and Cautions

Warning about Battery Disconnection

Warning !

The hybrid vehicle contains a sealed set of high-voltage lithium-ion power battery. If the power battery is improperly exposed, there is a risk of violent combustion and electric shock, which could result in serious injury or death and environmental contamination.

Warning about High Pressure Safety Precaution

Warning !

The rated voltage of the vehicle's high voltage power battery is 352 V. Do not touch high voltage parts with bare hands without disconnecting the high voltage power. The high-voltage parts of this vehicle include motor controller, high-voltage distribution device, high-voltage cables, power battery, electric compressor, etc.

After the vehicle has been running for some time, the surface temperature of the high-voltage parts is high relatively. If the air conditioner is used to cool the vehicle, the surface of the electric A/C compressor and the surface temperature of the radiator are high relatively. In these cases, please do not touch the above parts with bare hands. It is strictly prohibited to privately disassemble the high-voltage electrical parts in the vehicle, unplug and disconnect the high-voltage connectors and cables in the vehicle., otherwise it may cause serious electric shock injury and vehicle damage. The high voltage cables in the vehicle are wrapped with orange bellows, please pay attention to identify them.

Precautions for Storage of Power Battery

Warning !

In order to avoid damage to power batteries during storage of power battery project, please observe the following points:

- Power battery or battery module should not be placed upside down or tilted during transportation and maintenance, otherwise this may cause damage to the power battery.
- The power battery pack should be stored in a warehouse where the temperature is within the range of $-25^{\circ}\text{C} \sim +55^{\circ}\text{C}$, the maximum relative humidity of the air does not exceed 90% (relative to the temperature at $20^{\circ}\text{C} \pm 5^{\circ}\text{C} / 23^{\circ}\text{C} \pm 2^{\circ}\text{C}$) and there is no corrosive gas.
- During the storage period of the power battery pack, the remaining power should be kept within the range of 40%~60%.
- The power battery pack should not be placed upside down or laid down, and mechanical shock or heavy pressure should be avoided.

Warning about Vehicle in the Event of Collision

Warning !

Check the vehicle's high voltage parts and wiring harnesses for damage or exposure (the location of the parts can be determined from the high voltage parts layout diagram). To avoid personal injury, do not touch the high-voltage wiring harness, connectors and other high-voltage parts (motor controller, power battery, etc.). It is prohibited to touch damaged or exposed wiring harnesses to avoid the risk of high-voltage electric shock. In particular, if the vehicle floorboard scrapes against the ground, the high-voltage wire harnesses distributed on the floorboard should be carefully inspected for breakage. If it is necessary to contact any high voltage cables or components, wear insulated protective clothing (including insulated gloves, insulated shoes, insulated clothing) with a voltage resistance of 1,000 V or more.

If the extent of damage to the vehicle cannot be estimated, do not touch it. Stay away from the vehicle and immediately contact a professional technician at an authorized dealer to inspect and repair it. Be sure to inform emergency personnel responding to the accident immediately that the vehicle is a hybrid one and that no one else should approach, touch or move it.

It is strictly prohibited to privately disassemble the high-voltage wiring harness and high-voltage parts in the front compartment, and the surface of the high-voltage wiring harness is orange in color.

Leakage or damage to the power battery electrolyte may cause a fire. If it happens, contact an authorized vehicle dealer immediately. Do not touch the leaking electrolyte with your hands. If your skin or eyes come into contact with the electrolyte inadvertently, flush them immediately with plenty of water and seek medical attention immediately to avoid injury.

If the vehicle smokes or catches fire, leave the vehicle immediately and extinguish the fire with carbon dioxide, a large amount of sand and a large amount of water. Otherwise serious injury or death may result.

If a trailer is required, be sure to raise the front wheels off the ground. If the front wheels are on the ground during towing, the drive motor may generate electricity, damaging the vehicle's high-voltage components or even causing a fire.

If the vehicle needs to be repaired or painted after an impact, it must be handled by an authorized dealer and

must not be disassembled privately. Remove the power battery, high voltage wiring harness, motor controller and other high voltage parts before painting. Because the power battery is exposed to higher temperatures in the spraying operation room, it may affect the life of the power battery. In addition, the power battery on the vehicle, if not removed, may pose a safety hazard to maintenance personnel who are not professionally trained in hybrid vehicle maintenance.

After a vehicle breakdown or accident, immediately place a reflective tripod approximately 100 m behind the vehicle. On a highway, put it approximately 150 m behind the vehicle to warn passing vehicles or pedestrians to avoid them.

Handling of Power Battery Electrolyte when It Comes into Contact with the Human Body

When the electrolyte adheres to the human body:

- If the electrolyte adheres to the skin, rinse immediately with plenty of water.
- If the electrolyte gets into your eyes, please call out for help, do not rub the eyes. Flush with plenty of water immediately, and then seek medical attention immediately.

If you accidentally drink electrolyte:

- Please do not force vomiting.
- Give the injured person plenty of drinking water to dilute the electrolyte.
- Do not give water to the injured person when he/she is unconscious.
- In case of spontaneous vomiting, avoid choking the injured person's respiratory tract due to the obstruction of vomits.
- Please transfer the injured person to a nearby hospital for medical treatment. In case of inhalation of vapors from the electrolyte:
- Please move the injured person to a safe place, let him/her inhale oxygen and send him/her to a nearby hospital for medical treatment as soon as possible.

3.1.1.2 Precautions for Operating High-pressure Systems

Caution

- Be very careful when overhauling a high pressure system that has water in it!
- Do not operate it with water. Ensure that internal and external surfaces are clean and dry to ensure safety.
- All orange-colored wires may carry high pressure, which can be life-threatening!
- Water spray hoses and high-pressure cleaning devices must not be aimed directly at high-pressure components!
- Oil, grease, cleaning agents, etc. must not be used on high-voltage connectors!
- When carrying out maintenance in the vicinity of high-voltage conductive parts, the high-voltage system must first be de-energized!
- The high-voltage system must be de-energized before welding, machining with cutting tools or working with sharp tools!
- All dismantled high-voltage connectors must be protected against water and dirt!
- Damaged leads must be replaced!
- Suitable and approved measuring instruments must be used!
- The service personnel must use professional equipment and tools to operate high-voltage components.
- Service personnel are not permitted to wear metal jewelry, necklaces, watches, etc.
- The service personnel must wear and use the necessary safety devices, e.g. insulated gloves.
- Before use, insulated gloves must be checked for damage, holes or cracks, etc., and should be intact.
- In maintenance operation, ensure that at least two people are present; one person to operate, and the other to maintain a certain distance to observe in order to prevent the occurrence of safety accidents when no one first aid, and meanwhile play a safety reminder role.

3.1.1.3 Qualification of Inspection Personnel

- Should have obtained low voltage electrician license or above operation qualification.
- Should have attended high-voltage safety training and mastered relevant knowledge.
- Familiar with the main high-voltage components of new energy vehicles.
- Familiar with the structure of the high voltage system, the dangers of the high voltage system and the treatment methods.

Caution

- The high-voltage system can only be overhauled when it has been de-energized!

3.1.1.4 Personnel Protection and Environmental Requirements

Tools for Personnel Protection

For servicing vehicles, the following tools are used as needed: insulating tools, insulating hooks, insulating gauges, multimeter, micro-resistance testers, CO2 or dry powder fire extinguishers, insulating gloves, insulating shoes, goggles, anti-static clothing, insulating mats, warning signs, warning tape, etc.

Tool samples	Name of tool
	Insulated tools
	Insulated hook
	Insulation meter
	Multimeter
	Micro-resistance tester
	CO2 or dry powder fire extinguisher
	Insulating gloves
	Insulating shoes
	Goggles
	Anti-static clothing
	Insulated mats
	Warning sign
	Warning tape

Personnel Protection



1. Check the expiration date of the insulating gloves before use, and make sure that there are no damages, holes or cracks, etc., to ensure that they have the safety protection functions and that the voltage resistance level is greater than the maximum voltage of the system.
2. Check the insulating gloves, insulating rubber shoes and other protective devices before use. Do not operate with water, to ensure that the internal and external surfaces are clean and dry;
3. Operators keep watches, keys, necklaces, rings and other metal objects properly to prevent any accidental contact with the electrified part.

Operating Environment Requirements



1. Take safe and effective isolation measures and set up obvious high-voltage warning signs before operation to warn relevant personnel and avoid safety accidents.
2. During operation, vehicle key and manual maintenance switch are kept by maintenance personnel.

3.2 Power battery

3.2.1 Specification

3.2.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Fixing bolts between battery grounding cable and hybrid power battery assembly	M8×20	20-28
Center channel line bracket and framework	M8×20	20-28
Fixing bolt between front channel heat shield (1) and hybrid power battery assembly	M10	50-70

3.2.1.2 Power Battery Specifications

Application:	Unit	JL6482DCPHEV02	JL6482DCPHEV03
Type	-	Lithium ion battery	Ternary lithium ion battery
Rated voltage	V	352	352
Capacity	Ah	113	112.5
Nominal voltage of energy storage device monobloc	V	3.67	3.67
Mass of energy storage unit	kg	1.80±0.03	1.76±0.1
Number of energy storage device units	-	96	96
Total storage capacity of energy storage device	kWh	39.81	39.63
Total mass of energy storage device	kg	255	249
Peak charging power	kWh	134@10s , 35%SOC , 25°C	100@10s , 35%SOC , 25°C
Peak discharge power	kWh	174.8@10s , 50%SOC , 25°C	197@10s , 50%SOC , 25°C
Self-discharge rate	%/m	322	322
Charging temperature	°C	-20 to 55°C	-20 to 55°C
Discharge temperature	°C	-30 to 55°C	-30 to 55°C
Storage temperature	°C	-30 to 55°C	-30 to 55°C
Battery pack charging temperature range	°C	-20 to 55°C	-20 to 55°C
Battery pack discharge temperature range	°C	-30 to 55°C	-30 to 55°C

3.2.2 Instructions and operations

3.2.2.1 Instructions and operations

System Overview

The power battery is mounted on the lower part of the vehicle body. The components include each module assembly, CSC acquisition system, Battery Management System (BMS), and Battery Disconnect Unit (BDU).

The power battery should recover and distribute the power according to the commands of the vehicle control system through the CAN interface and based on the information provided by the BECM. The BECM is responsible for the charging and discharging power limit values during driving, and for the voltage and current limit values during charging. These limits should ensure the long-term use of the battery while meeting the battery's lifetime requirements.

The BMS within the power battery assembly manages the power battery to realize the power and safety requirements of the vehicle. The BECM shall be able to maintain the battery cell temperature at the proper value to extend the battery service life. Potentially hazardous faults or conditions shall be recognized by the system and actions taken to prevent the fault from occurrence to ensure that the battery is not damaged.

Functional Description

The power battery provides electrical power to the entire vehicle, providing the energy and power required for the vehicle to operate as intended by the driver, as well as providing the energy and power for the proper operation of other high voltage accessories;

It has high-voltage power safety management functions, including collision power failure, high-voltage system circuit insulation and high-voltage interlock detection and processing.

The high-voltage circuit has corresponding devices to protect against overcurrent and other faults.

It provides CAN communication function and CAN network management function.

BMS has battery pack voltage, current, temperature and other parameters monitoring; temperature, over-current, over-charging, over-discharging protection; accurate SOC calculation; battery equalization management; pre-charging management; leakage detection and protection; fault diagnosis and fault code recording, software online upgrade and parameter calibration; thermal management system, CAN communication function, and others.

The power battery package should have effective thermal management functions to ensure that the battery operates in a reasonable temperature interval, and the use of the battery in this interval will not affect the service life of the battery.

3.2.3 System working principles

3.2.3.1 System working principles

Battery Cell

It is the smallest energy storage unit and a basic electrochemical energy storage device, which consists of positive electrode, negative electrode, electrolyte, isolation film, exhaust valve and shell, also known as a battery cell.

Battery Module

It is an intermediate energy storage unit, placed in a mechanical and electrical unit, consisting of a number of monomers connected by circuits and circuit devices (monitoring and protection circuits, electrical and communication interfaces), also known as a module.

Battery Pack

It is a power system, consisting of several battery modules, circuit devices (protection circuits, battery management systems, electrical and communication interfaces) and thermal management devices, etc., which are used to provide energy for power-using devices.

Nominal Voltage

It is a potential difference between the positive and negative terminals of a battery at 25°C, 90% RH, 50% SOC.

Capacity

It is the amount of power that a fully charged battery can provide under specified conditions, which is usually expressed in Ah.

Energy Capacity

It is the amount of power that a fully charged battery can provide under specified conditions, which is usually expressed in Wh or kWh.

Nominal Capacity

At the beginning of life (BOL), it is the minimum capacity that can be provided by a fully charged battery discharged at a 1C multiplication rate (C-rate) under specified conditions.

CSC Acquisition System

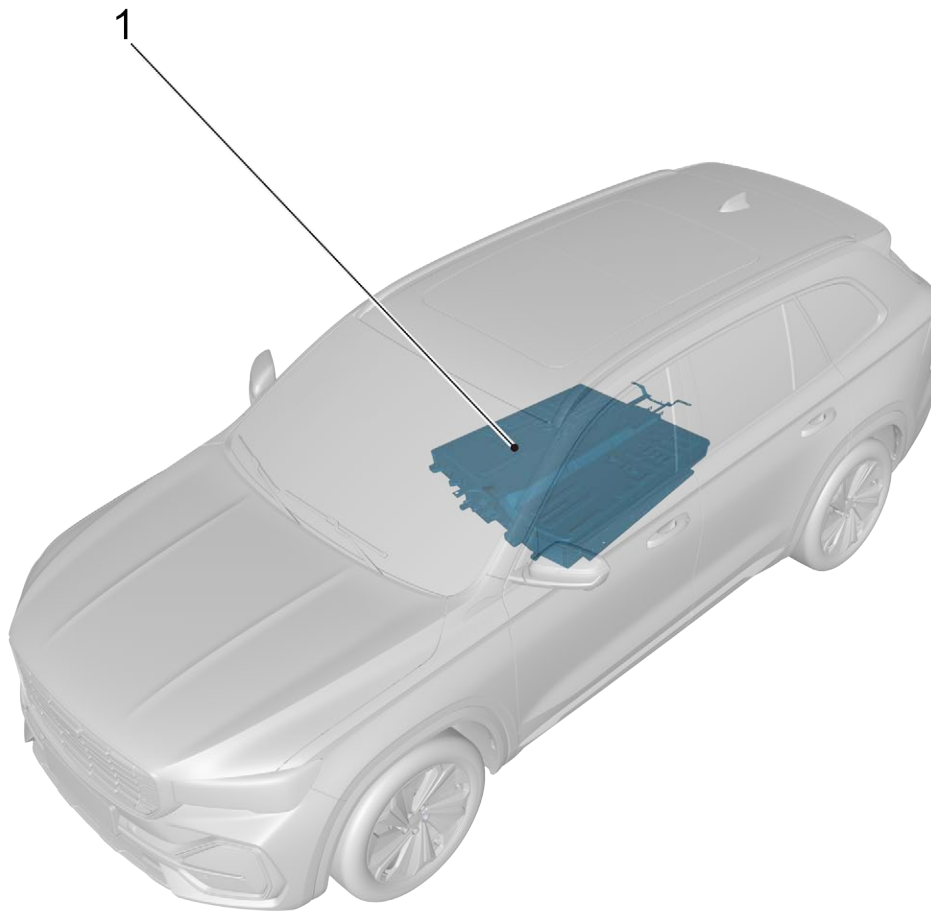
Each battery cell has multiple CSC acquisition systems to monitor the voltage and temperature information of each individual cell or battery pack, and the CSC acquisition systems report the relevant information to the Battery Management Unit (BMU) and perform individual voltage equalization according to the instructions of the BMU.

Battery Management System (BMS)

The BMS controller system has a master-slave structure, which can effectively manage the charging and discharging process of the battery pack and provide comprehensive battery information detection and fault protection functions. The system provides real-time detection functions of battery status (including cell voltage, ambient temperature voltage, total voltage, total current, etc.), real-time estimation of SOC/SOH/SOP, insulation detection, high-voltage interlock insulation detection, collision disconnection, braking energy recovery, battery equalization, thermal management contactor control and diagnostics, UDS-based troubleshooting and storage and on-line code updating, input voltage detection, appointment charging, RTC timing detection of lead-acid battery voltage, sleep and wake-up, etc. It supports AC charging that meets the technical requirements of the national standard.

3.2.4 Part position

3.2.4.1 Part position



1. Hybrid power battery assembly

3.2.5 Diagnostic information and procedure

3.2.5.1 Diagnosis description

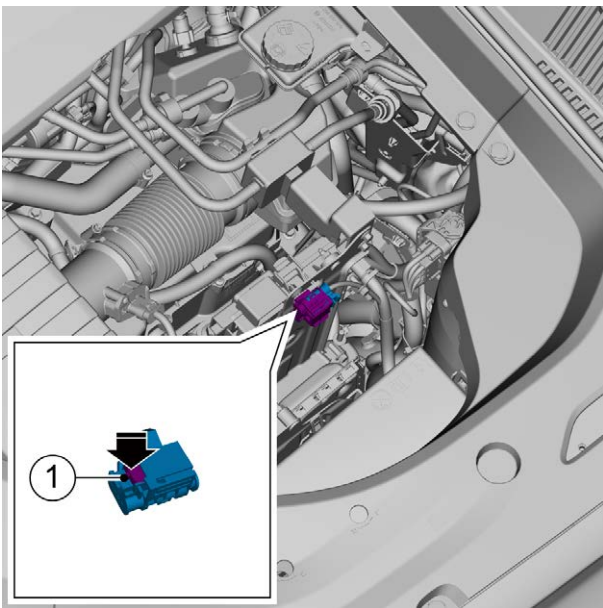
See Power battery System Operating Principles before diagnosing power battery faults. Understanding and familiarizing yourself with the operating principles of the power battery before beginning system diagnosis will determine the correct troubleshooting steps to take in the event of a malfunction. And more importantly, this will determine if the condition described by the customer is normal operation. Any troubleshooting of the power battery should start with a [routine check](#) that guides the serviceman to take the next logical step in the troubleshooting process. Understanding and using the diagnostic process correctly will reduce the diagnostic time and avoid mis-diagnosis of the faulty part.

3.2.5.2 Routine inspection

- Check for aftermarket retrofitting devices that may affect the proper operation of the power battery and ensure that they cannot affect the power battery;
- Inspect easily accessible or visible system components to ensure that any component is not visibly damaged or in a condition that could cause a malfunction.
- Check the harness and harness connector to ensure that there is no sign of loosening, damage, poor contact, aging, etc.

3.2.5.3 Normal Power Outage Process of High Voltage System

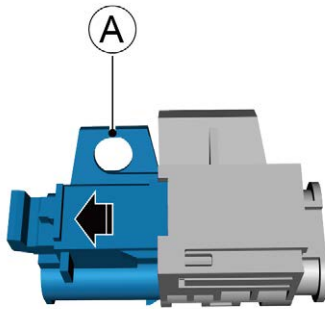
Step 1	Power outage process:
--------	-----------------------



- Operate the start button to turn off the power and keep the smart key out of the sensing range while the vehicle is in a non-charging state.
- Disconnect the low voltage service switch in the front compartment.
 - Pull out the latch 1 and press down to disconnect the plug.
- Wait for 5 minutes before disconnecting the negative cable of the battery, see [Battery Cable Disconnection Procedure](#).

Next Step

Step 2	Strictly prevent heavy electrification.
--------	---



- A. Pull out the plug and lock in Position A.
- B. The smart key and the mechanical lock key are kept by a dedicated supervisor to ensure that no one will be powered on again during the maintenance process.

Next Step

Step 3	Power test.
--------	-------------

- A. Wait for more than 5 minutes after power outage, and measure the voltage of the high-voltage system (e.g., the port connected to the electric compressor) with a multimeter voltage gear to ensure that the voltage is 60 V DC and within 30 V AC before proceeding with the subsequent maintenance of high-voltage components.

Next Step

Step 4	Block the high voltage port:
--------	------------------------------

- A. After removing the high-voltage harness on the high-voltage component, promptly seal the plug and socket with insulating tape to prevent any terminal contamination or foreign objects from entering.

Next Step

Step 5	Perform related repair works of the high voltage system.
--------	--

3.2.5.4 Normal Power-up Process of High Voltage System

After completing the maintenance of the high-voltage system and replacement of high-voltage components in electric vehicles, and before installing the MSD and applying the vehicle on the high-voltage, it is necessary to carry out a high-voltage safety test on the vehicle, which is carried out according to the following steps:

Step 1	Confirm the high voltage system integrity.
--------	--

- A. Confirm that the high-voltage components are correctly and reliably installed according to the design status, and that the high-voltage wiring harness and connectors are correctly connected and locked in place according to the design status.

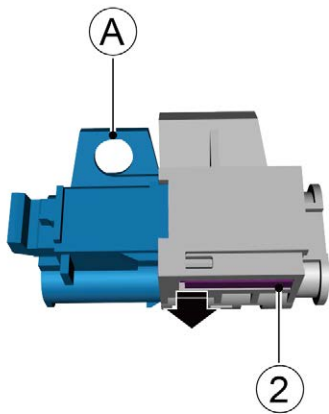
Next Step

Step 2	Potential equalization test.
--------	------------------------------

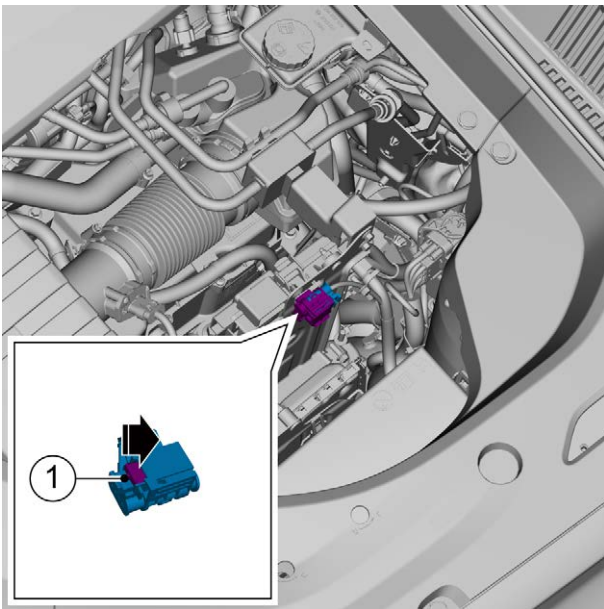
- A. Perform an insulation resistance test on high voltage system components.
- B. Test the insulation resistance of the vehicle's high voltage positive and negative terminals to the vehicle body, with the insulation test tool having a test voltage of not less than 500 V. Requirements are shown as follows:
 - 1. If the high voltage components are only repaired and not replaced, the test results are not less than the insulation characteristics of the vehicle before the failure.
 - 2. If a high-voltage component is replaced, it is necessary to combine the insulation characteristics of the component itself for overall evaluation, but not lower than 500 Ω/V .

Next Step

Step 3	Reset the low voltage service switch.
--------	---------------------------------------



- A. Remove the mechanical lock at A.
- B. Partially pull the latch 2 in the direction of the arrow and connect the low voltage service switch plug.
- C. Return latch 1.



Next Step

Step 4 | Connect the negative cable of the battery and check for trouble codes with a diagnostic tester.

- A. Connect the diagnostic instrument to the diagnostic interface.
- B. Operate the start switch to set the power mode to ON.
- C. Clear the fault code.
- D. Start the engine and run it at idle speed to warm it up for 5 min at least.
- E. Read a fault code of the entire vehicle again to confirm whether a fault code is output.

Yes

Carry out diagnosis according to the fault code output.

Next Step

Step 5	Vehicle at high voltage.
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3.2.6 Removal and Installation

3.2.6.1 Replacement of Hybrid Power Battery Assembly

Removal Procedure

Warning !

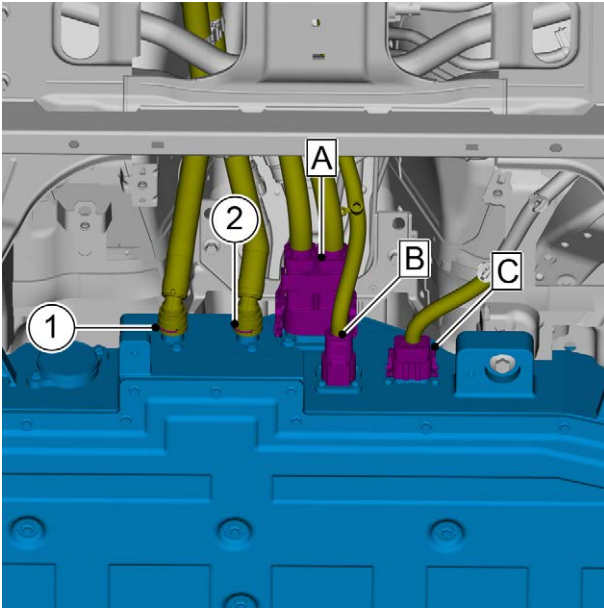
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

Warning !

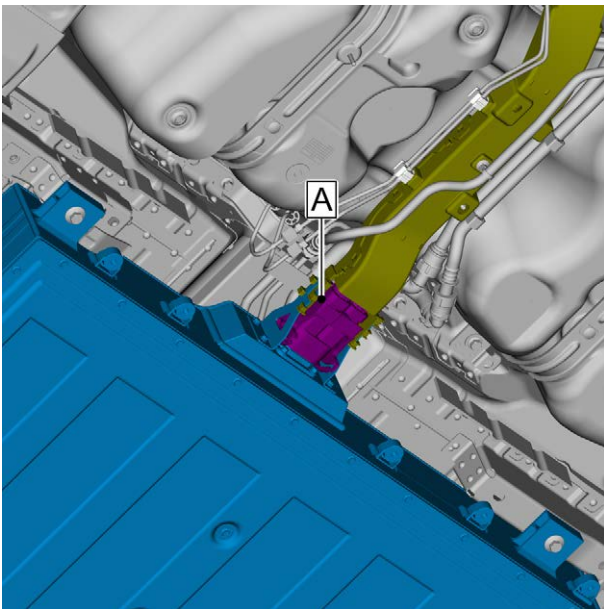
See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

See "WARNINGS ON HIGH VOLTAGE SAFETY PRECAUTIONS" in "[WARNING AND PRECAUTION](#)"

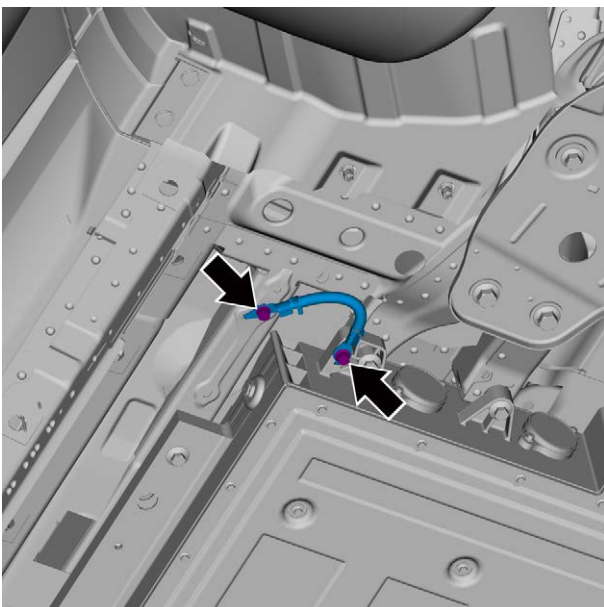
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Perform the normal power outage process for the high voltage system, see [Normal Power Outage Process for High Voltage System](#).
- 3 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 4 Drain the electric system coolant, see [Draining and Filling Procedure of Electric System Coolant \(DHT Pro\)](#).
- 5 Remove the lower right fuel tank shield, see [Replacement of Lower Right Fuel Tank Shield](#).
- 6 Remove the front exhaust pipe, see [Replacement of Front Exhaust Pipe](#).
- 7 Remove the exhaust pipe muffler assembly, see [Replacement of Exhaust Pipe Muffler Assembly](#).
- 8 Remove the rear channel heat shield, see [Replacement of Rear Channel Heat Shield](#).
- 9 Remove the front channel heat shield (2), see [Replacement of Front Channel Heat Shield \(2\)](#).



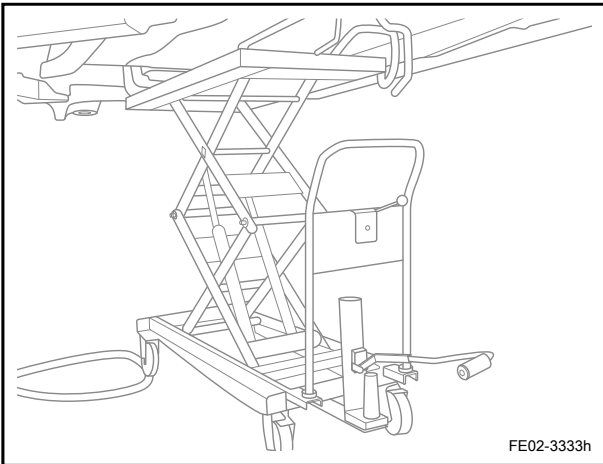
- 10 Disconnect the battery inlet pipe from the hybrid power battery assembly by removing the quick-insertion circlip 1 of the battery inlet pipe.
- 11 Disconnect the battery outlet pipe from the hybrid power battery assembly by removing the quick-insertion circlip 2 of the battery outlet pipe.
- 12 Disconnect the harness connector A of the DC bus assembly.
- 13 Disconnect the harness connector B of the DC bus assembly.
- 14 Disconnect the harness connector C of the hybrid power battery assembly.



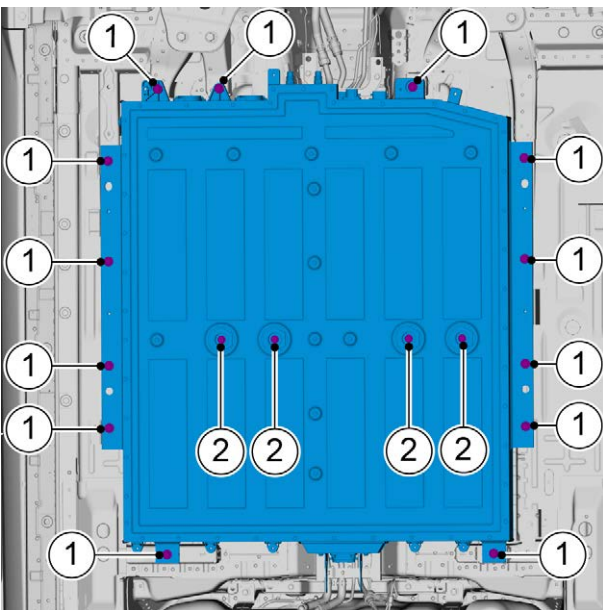
- 15 Disconnect the harness connector A of the hybrid power battery assembly.



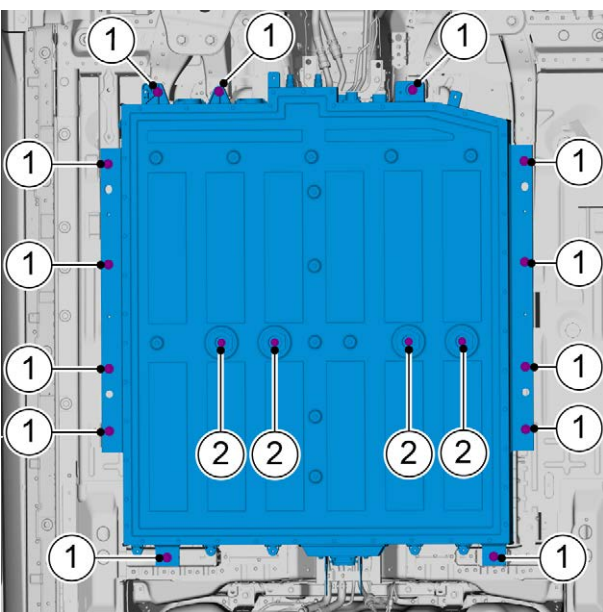
- 16 Take off the battery grounding wire by removing the two fixing bolts of the battery grounding wire.



- 17 Place the platform cart and use the platform cart to support the hybrid power battery assembly.



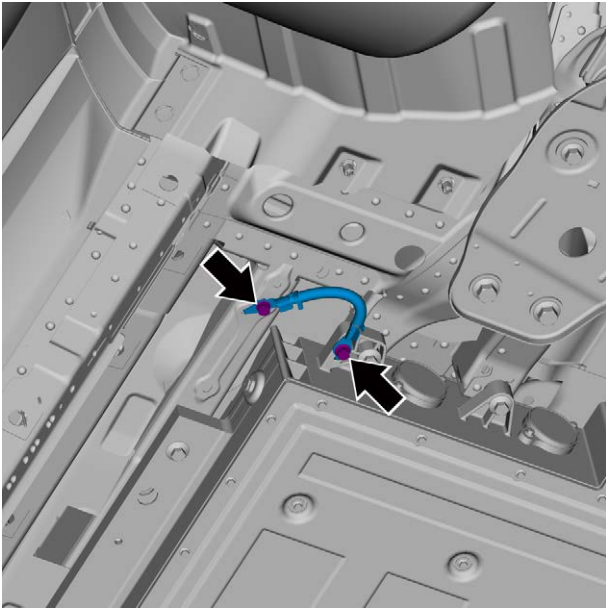
- 18 Remove the four fixing bolts 2 of the hybrid power battery assembly.
- 19 Remove the thirteen fixing bolts 1 of the hybrid power battery assembly.
- 20 Lower the platform cart to remove the hybrid power battery assembly.



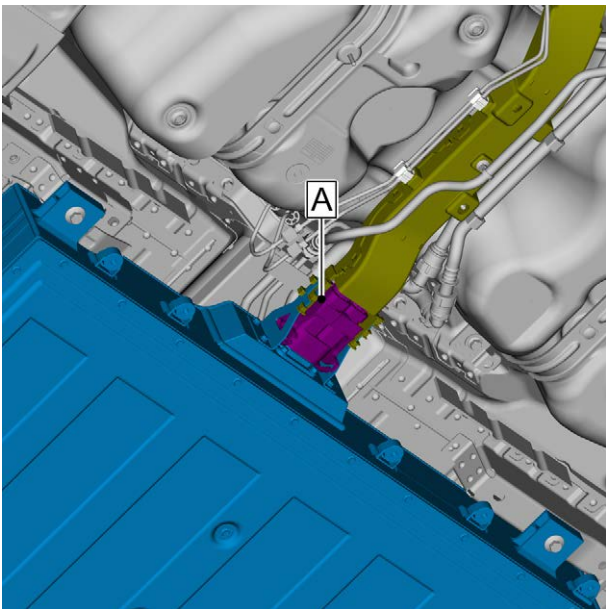
Installation Procedure

- 1 Lift the hybrid power battery assembly to the mounting position.
- 2 Install and tighten the thirteen fixing bolts 1 of the hybrid power battery assembly.
Torque: 60 N·m
- 3 Install and tighten the four fixing bolts 2 of the hybrid power battery assembly.
Torque: 60 N·m

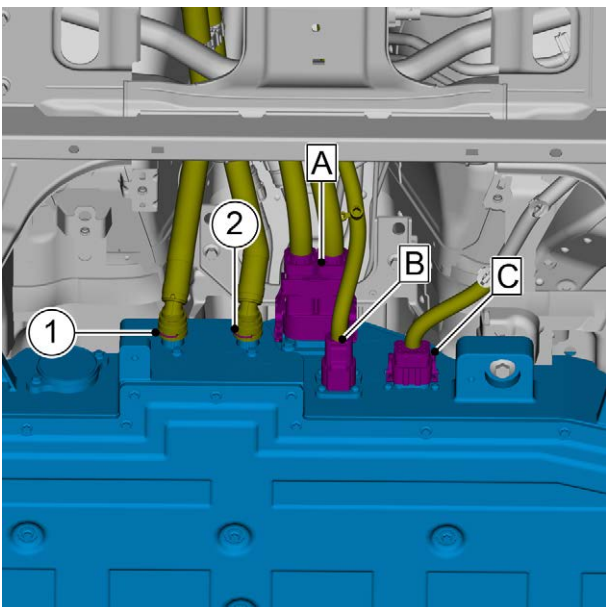
- 4 Remove the platform cart.



- 5 Install the battery grounding wire.
- 6 Install and tighten the two fixing bolts of the battery grounding wire.
Torque: 24 N·m



- 7 Connect the harness connector A of the hybrid power battery assembly.



- 8 Connect the harness connector C of the hybrid power battery assembly.
- 9 Connect the harness connector B of the DC bus assembly
- 10 Connect the DC bus assembly harness connector A.
- 11 Connect the battery outlet pipe to the hybrid power battery assembly, and install the quick-insertion circlip 2 of the battery outlet pipe.
- 12 Connect the battery inlet hose to the hybrid power battery assembly, and install the quick-insertion circlip 1 of the battery inlet pipe.

- 13 Install the front channel heat shield (2).
- 14 Install the rear channel heat shield.
- 15 Install the exhaust pipe muffler assembly.
- 16 Install the front exhaust pipe.
- 17 Install the lower right fuel tank guard.
- 18 Fill with the electric system coolant.
- 19 lower the vehicle.
- 20 Carry out the normal power-on process of the high voltage system, see [Normal Power-on Process of High Voltage System](#).
- 21 Connect the negative cable of the battery, start the vehicle and connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle level. If there is a drop in the level, replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the upper scribe line of the expansion kettle, and tighten the lid of the expansion kettle.
- 22 Use the GLDS diagnostic program. On the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software flash operation.

3.2.6.2 Replacement of Center Channel Line Bracket

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

Warning !

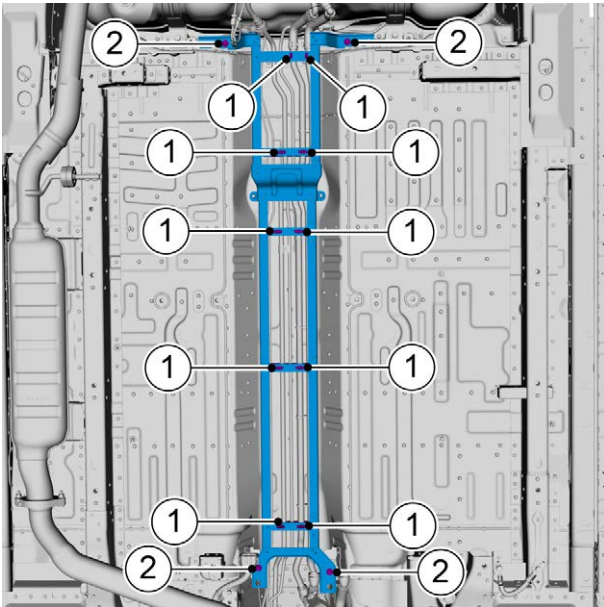
See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

Warning !

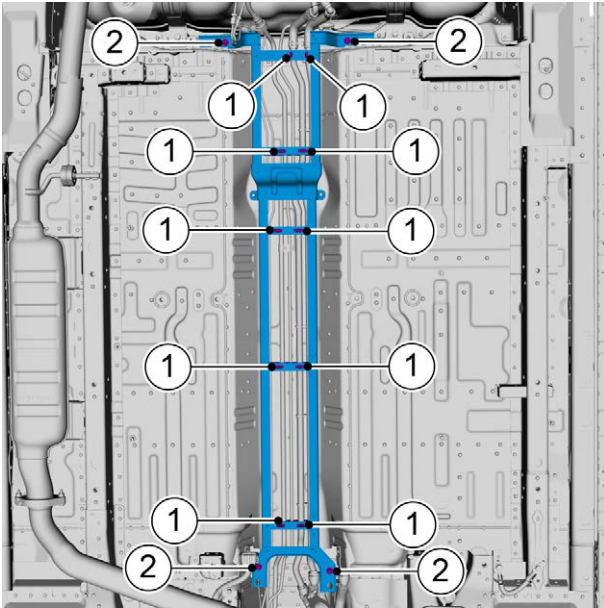
See "WARNINGS ON HIGH VOLTAGE SAFETY PRECAUTIONS" in "[WARNING AND PRECAUTION](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Perform the normal power outage process for the high voltage system, see [Normal Power Outage Process for High Voltage System](#).

- 3 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 4 Drain the electric system coolant, see [Draining and Filling Procedure of Electric System Coolant \(DHT Pro\)](#).
- 5 Remove the lower right fuel tank shield, see [Replacement of Lower Right Fuel Tank Shield](#).
- 6 Remove the front exhaust pipe, see [Replacement of Front Exhaust Pipe](#).
- 7 Remove the exhaust pipe muffler assembly, see [Replacement of Exhaust Pipe Muffler Assembly](#).
- 8 Remove the rear channel heat shield, see [Replacement of Rear Channel Heat Shield](#).
- 9 Remove the front channel heat shield (2), see [Replacement of Front Channel Heat Shield \(2\)](#).
- 10 Remove the hybrid power battery assembly, see [Replacement of Hybrid Power Battery Assembly](#).
- 11 Remove the ten fixing clips 1 of the center channel line bracket.
- 12 Remove the four fixing bolts 2 of the center channel line bracket.
- 13 Install the center channel line bracket.



Installation Procedure



- 1 Install the center access line bracket.
- 2 Install and tighten the four fixing bolts 2 of the center channel line bracket.
Torque: 24 N·m
- 3 Install the ten fixing clips 1 of the center channel line bracket.

- 4 Install the hybrid power battery assembly.
- 5 Install the front channel heat shield (2).
- 6 Install the rear channel heat shield.
- 7 Install the exhaust pipe muffler assembly.
- 8 Install the front exhaust pipe.
- 9 Install the lower right fuel tank guard.
- 10 Fill with the electric system coolant.
- 11 lower the vehicle.
- 12 Carry out the normal power-on process of the high voltage system, see [Normal Power-on Process of High Voltage System](#).
- 13 Connect the negative cable of the battery, start the vehicle and connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle level. If there is a drop in the level, replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the upper scribe line of the expansion kettle, and tighten the lid of the expansion kettle.

3.3 Power battery cooling system

3.3.1 Specification

3.3.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Fixing nuts between coolant pump and bracket in electronic power transmission system	M6×7.3	8.5-11.5
Two fixing bolts between battery cooler and bracket	M6×20	8.5-11.5
Fixing nuts between water pump inlet pipe (3) and body	M6×7.3	8.5-11.5
Fixing bolts between water pump inlet pipe (2) and water pump bracket	M6×16×19.3	8.5-11.5
Fixing bolts between coolant inlet/outlet metal pipe and engine	M6×16	8.5-11.5

3.3.2 Instructions and operations

3.3.2.1 Instructions and operations

System description

The hybrid power battery assembly on the vehicle is always charging and discharging constantly, and heat will be generated in the process. If this heat cannot be emitted in time, it will keep accumulating. When the temperature of the hybrid power battery assembly is too high, it not only affects the performance of the battery due to aging, but also increases the resistance of the relevant conductors, resulting in more energy loss.

System composition

The battery cooling system of this vehicle consists of the following components:

- Low temperature radiator expansion kettle
- Hybrid power battery assembly
- Electronic water pump
- Battery cooler
- Related water pipe

Function description

The hybrid power battery assembly has a high working current and produces a large amount of heat. Meanwhile, the battery pack is in a relatively closed environment, which will lead to a rise in the temperature of the battery. Through the circulation of coolant to reduce the working temperature of the hybrid power battery assembly, this ensures that the battery can work normally and efficiently.

The role of the hybrid power battery assembly cooling system is to dissipate the heat for the hybrid power battery assembly through the coolant circulation, and to heat the hybrid power battery assembly through the heat exchanger management module and the whole vehicle pipeline at the appropriate time.

3.3.3 System working principles

3.3.3.1 System working principles

The main needs of the vehicle to the battery pack are directly reflected by the power demand. Therefore, in actual use, in order to meet the requirements of vehicle starting, driveability (acceleration and deceleration, etc.), fuel economy, comfort (NVH), maintenance cost (battery life) and other aspects of the battery pack should try to be in a high-capacity state. Therefore, the temperature of the power battery should be kept in the range of 25°C~30°C as much as possible during vehicle use.

According to the battery management system (BMS) requirements for the use of power, when the battery temperature exceeds 50 °C, it can increase the engine standby time, reduce the power of the battery, to prevent overuse of the battery, resulting in thermal runaway of the battery, triggering the BMS under the strong power protection action, and finally lead to the vehicle stalling and parking. When the temperature is lower than -5°C, and when starting the engine, it is necessary to apply to the BMS, and the number of consecutive applications shall not exceed 3 times. In other cases, the battery is used in accordance with the maximum capacity provided by the BMS, and shall not be used with excessive power. The battery pack dissipates heat through the high voltage battery cooler.

Low temperature radiator expansion kettle

The Low temperature radiator expansion kettle assembly is a transparent plastic tank similar to a windshield cleaner tank. The low-temperature radiator expansion kettle assembly is integrated into the low-temperature radiator expansion kettle, and the low-temperature radiator expansion kettle assembly is connected to the air-liquid separator via a water pipe.

After the vehicle is started, as the temperature of the coolant gradually rises, part of the coolant flows into the expansion tank assembly from the liquid-air separator as a result of expansion, and the air trapped in the cooling line is also discharged into the expansion tank assembly.

After the vehicle stops, the coolant automatically cools and contracts, and the previously discharged coolant is sucked back into the cooling lines, so that the coolant in the radiator is always kept at the proper level, thus improving the cooling efficiency.

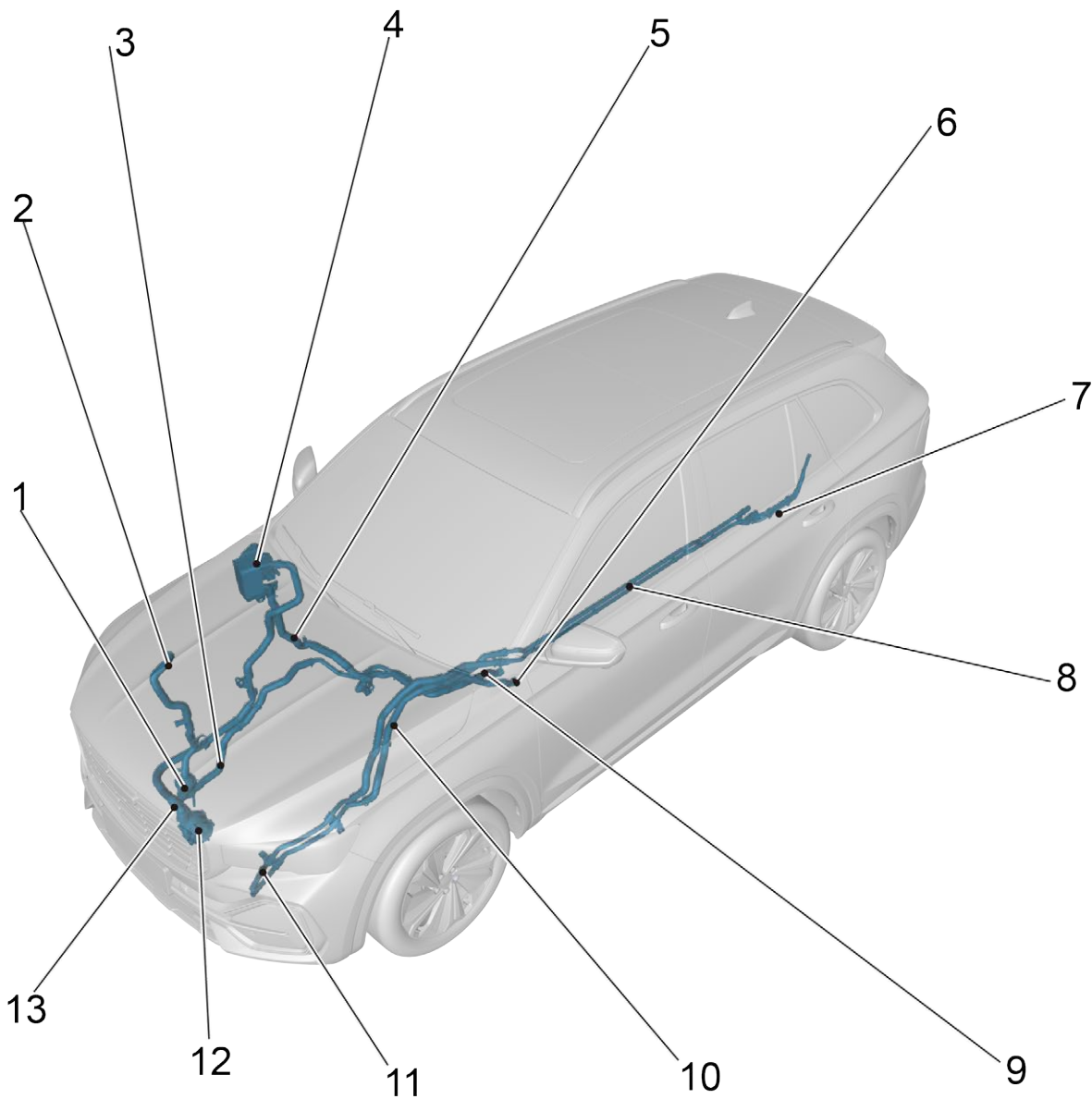
When the cooling system is cold, the coolant level should be maintained between the Min (minimum) and Max (maximum) marks on the expansion tank assembly.

Battery cooler

The battery cooler (Chiller) is a key component of the power battery cooling system and is responsible for maintaining the power battery at an appropriate operating temperature to optimize the discharge performance of the power battery. The battery cooler (Chiller) mainly consists of heat exchanger, expansion valve (TXV) with solenoid valve, line interface and bracket. The heat exchanger is mainly used for the heat exchange between the power battery coolant and the refrigerant of the refrigeration system, transferring the heat from the power battery coolant to the refrigerant.

3.3.4 Part position

3.3.4.1 Part position



- | | | | |
|----|---|-----|--|
| 1. | Water pump inlet pipe (2) | 8. | Lower floor inlet/outlet pipe |
| 2. | Water pump inlet pipe (1) | 9. | Battery inlet pipe |
| 3. | Water pump inlet pipe (3) | 10. | Front connection pipe of lower floor inlet/outlet pipe |
| 4. | Battery cooler | 11. | Coolant inlet/outlet metal pipe |
| 5. | Water inlet valve hose | 12. | Electronic Drivetrain Coolant Pump |
| 6. | Battery outlet pipe | 13. | Water pump outlet pipe |
| 7. | Rear connection pipe of lower floor inlet/outlet water pipe | | |

3.3.5 Removal and Installation

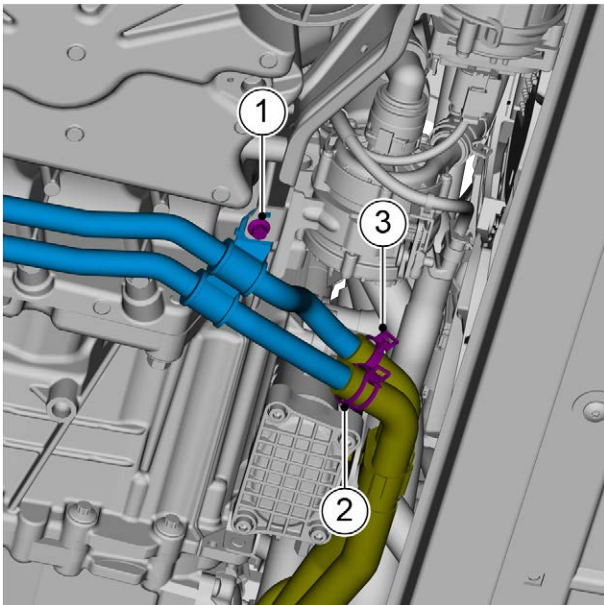
3.3.5.1 Replacement of Coolant Inlet/Outlet Metal Pipe

Removal Procedure

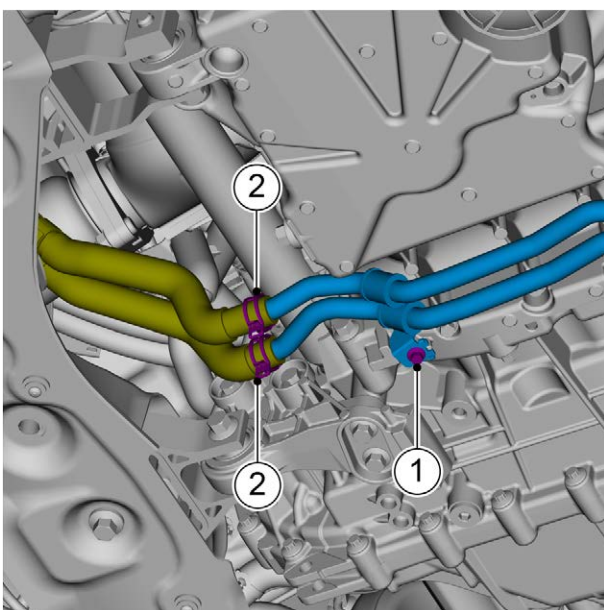
Warning !

See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

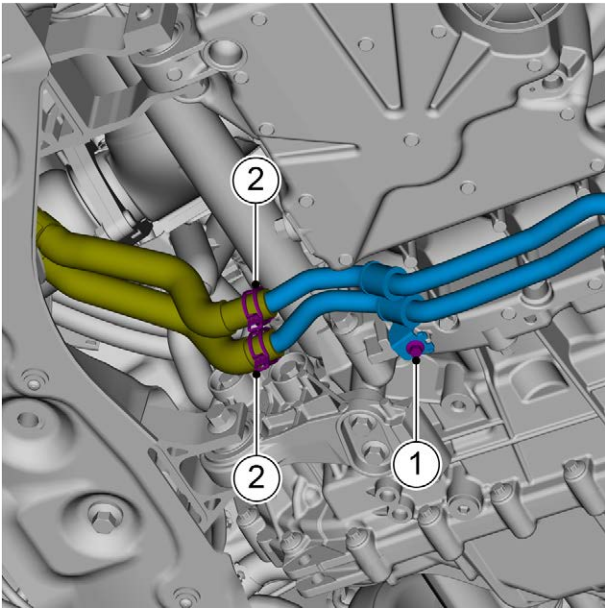
- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 3 Drain the electric system coolant, see [Draining and Filling Procedure of Electric System Coolant \(DHT Pro\)](#).
- 4 Remove the fixing bolt 1 of the coolant inlet/outlet metal pipe.
- 5 Remove the fixing clamp 2 of the drive motor outlet pipe (2) and disconnect the coolant inlet/outlet metal pipe from the drive motor outlet pipe (2).
- 6 Disconnect the coolant inlet/outlet metal pipes from the transmission inlet pipe by removing the fixing clamp 3 of the transmission inlet pipe.



- 7 Remove the fixing bolt 1 of the coolant inlet/outlet metal pipe.
- 8 Remove the front connecting pipe fixing clamp 2 of the lower floor inlet/outlet pipe, and disconnect the front connecting pipe of the lower floor inlet/outlet pipe from the coolant inlet/outlet metal pipe.
- 9 Remove the coolant inlet/outlet metal pipe.



Installation Procedure



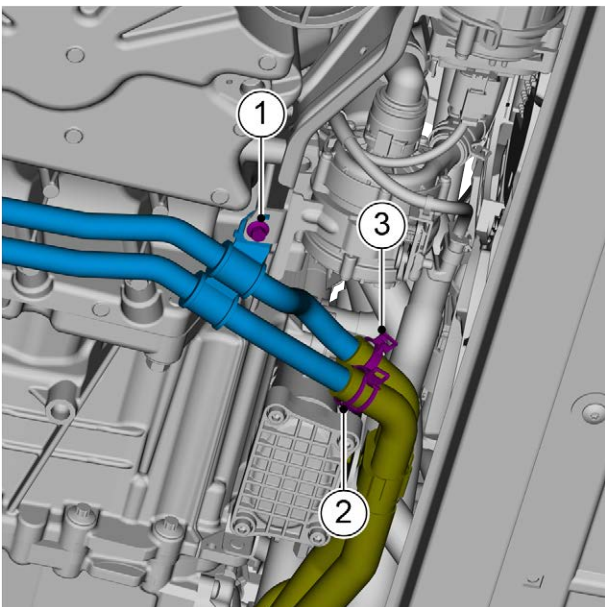
- 1 Install the coolant inlet and outlet metal pipes.
- 2 Connect the lower floor inlet/outlet pipe with the coolant inlet/outlet metal pipe, and install the fixing clamp 2 of the lower floor inlet/outlet pipe.

Caution

Pipe orifices should be aligned with the markings for connecting.

- 3 Install and tighten the fixing bolts 1 of the coolant inlet and outlet metal pipes.

Torque: 10 N·m



- 4 Connect the coolant inlet/outlet metal pipes to the transmission inlet pipe, and install the fixing clamp 3 of the transmission inlet pipe.

Caution

Pipe orifices should be aligned with the markings for connecting.

- 5 Connect the coolant inlet/outlet metal pipe to the drive motor outlet pipe (2) and install the fixing clamp 2 of the drive motor outlet pipe (2).

Caution

Pipe orifices should be aligned with the markings for connecting.

- 6 Install and tighten the fixing bolts 1 of the coolant inlet and outlet metal pipes.

Torque: 10 N·m

- 7 Fill the power battery coolant, start the vehicle and connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the liquid level in the expansion kettle. If there is a drop in the level, it is necessary to replenish coolant in time. Until the main circulation is opened, replenish coolant to the upper scribe line of the expansion kettle, and tighten the lid of the expansion kettle.

- 8 Install the bottom engine guard assembly.

- 9 Lower the vehicle.

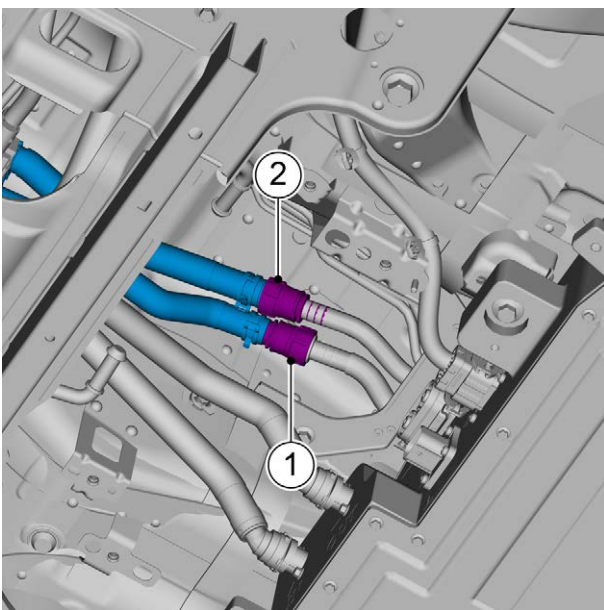
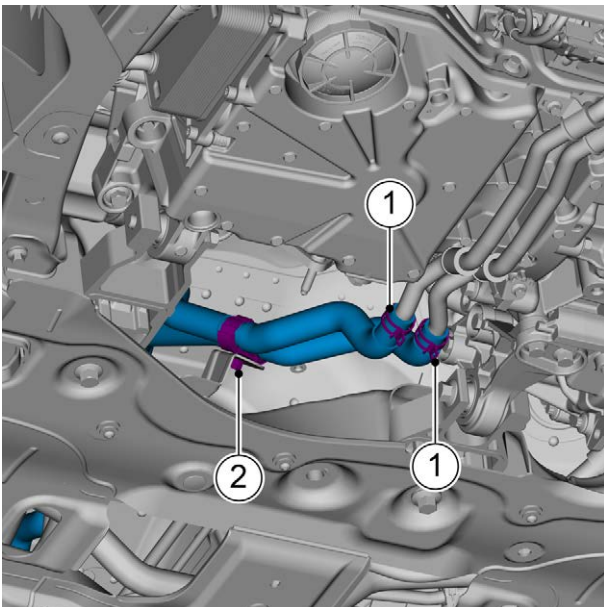
3.3.5.2 Replacement of Front Connection Pipe of Lower floor Inlet/Outlet Pipe

Removal Procedure

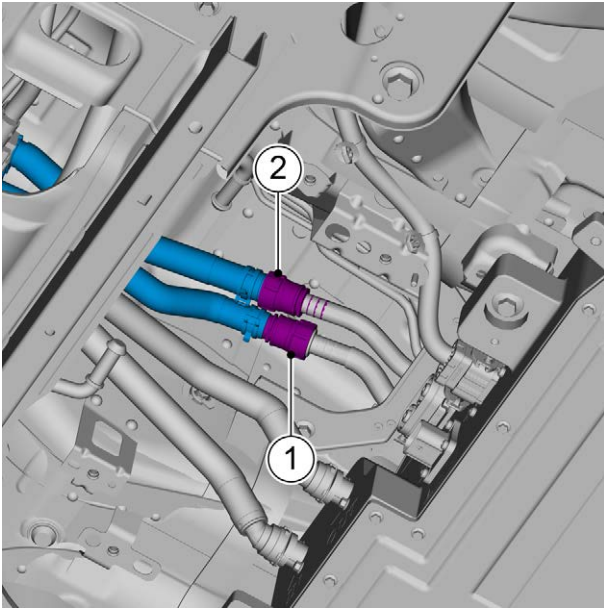
Warning !

See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

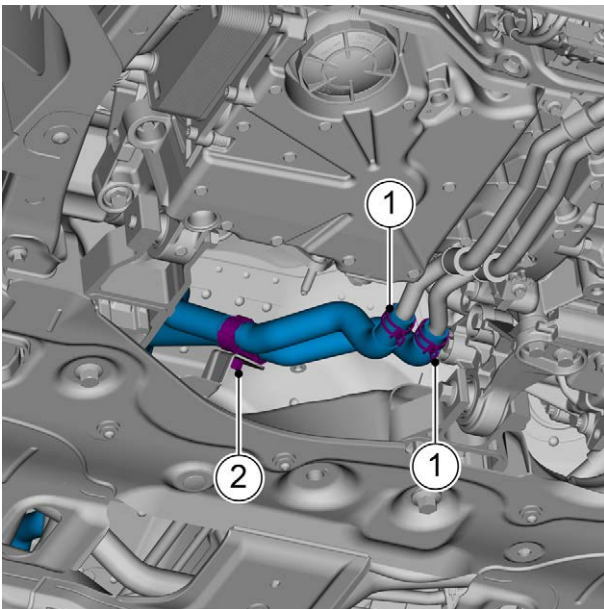
- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 3 Drain the electric system coolant, see [Draining and Filling Procedure of Electric System Coolant \(DHT Pro\)](#).
- 4 Remove the front exhaust pipe, see [Replacement of Front Exhaust Pipe](#).
- 5 Remove the front channel heat shield (2), see [Replacement of Front Channel Heat Shield \(2\)](#).
- 6 Remove the two fixing clamps 1 of the front connection tube of the lower floor inlet/outlet pipe, and disconnect the front connection tube of the lower floor inlet/outlet pipe from the coolant inlet/outlet metal pipe.
- 7 Remove the fixing clips 2 of the front connecting pipe of the lower floor inlet/outlet pipe.
- 8 Remove the quick connector 1 of the front connecting pipe of the lower floor inlet/outlet pipe.
- 9 Remove the quick connector 2 of the lower floor inlet/outlet pipe.
- 10 Remove the front connection tube of the lower floor inlet/outlet pipe.



Installation Procedure



- 1 Connect the front connection tube of the lower floor inlet/outlet pipe.
- 2 Install the quick connector 2 of the lower floor inlet/outlet pipe.
- 3 Install quick connector 1 of the front connection tube of the lower floor inlet/outlet pipe.



- 4 Install the fixing clips 2 of the front connection tube of the lower floor inlet/outlet pipe.
- 5 Connect the front connection tube of the lower floor inlet/outlet pipe to the coolant inlet/outlet metal pipe, and install the two fixed clamps 1 of the front connection tube of the lower floor inlet/outlet pipe.

Caution

Pipe orifices should be aligned with the markings for connecting.

- 6 Install the front channel heat shield (2).
- 7 Install the front exhaust pipe.
- 8 Fill the electric system coolant, start the vehicle to connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle liquid level. If the liquid level has dropped, it is necessary to replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the expansion kettle on the scribe line, and screw the lid of the expansion kettle cover tightly.
- 9 Install the bottom engine guard assembly.
- 10 lower the vehicle.

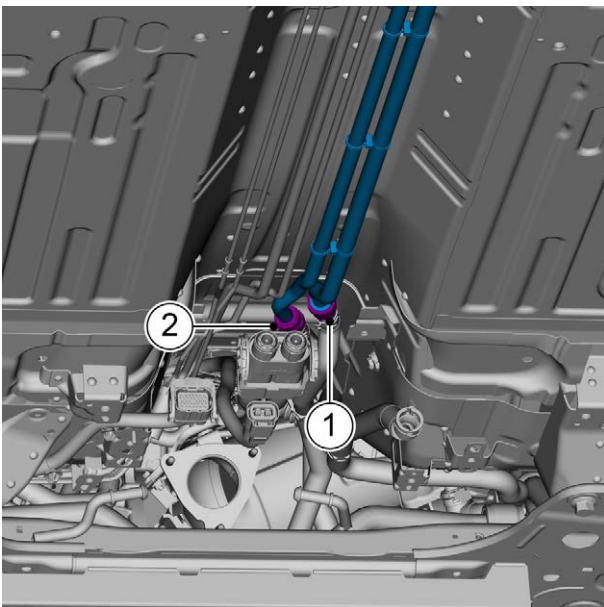
3.3.5.3 Replacement of Lower Floor Inlet/Outlet Pipe

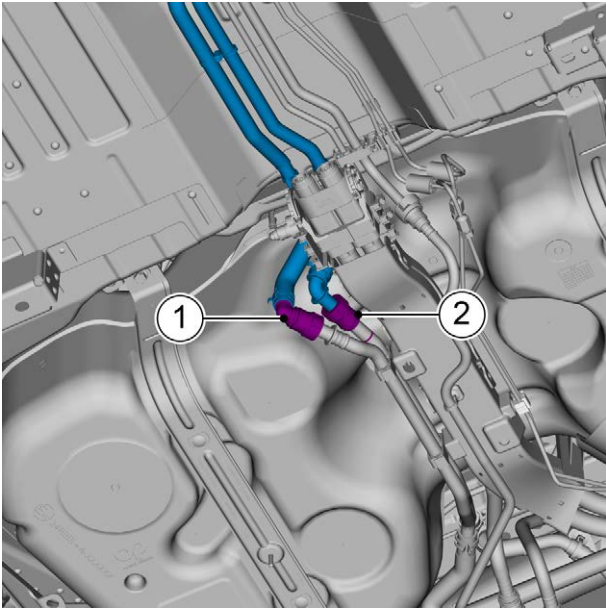
Removal Procedure

Warning !

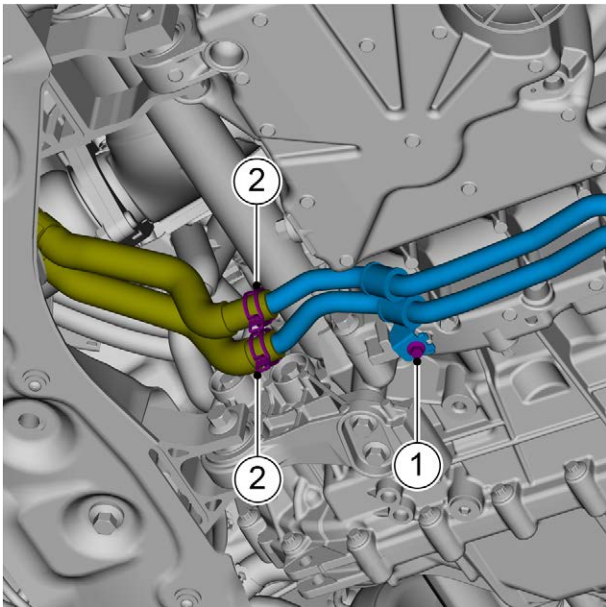
See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 3 Drain the electric system coolant, see [Draining and Filling Procedure of Electric System Coolant \(DHT Pro\)](#).
- 4 Remove the front exhaust pipe, see [Replacement of Front Exhaust Pipe](#).
- 5 Remove the front channel heat shield (2), see [Replacement of Front Channel Heat Shield \(2\)](#).
- 6 Remove the rear channel heat shield, see [Replacement of Rear Channel Heat Shield](#).
- 7 Remove the hybrid power battery assembly, see [Replacement of Hybrid Power Battery Assembly](#).
- 8 Remove the center access line bracket, see [Replacement of Center Channel Line Bracket](#).
- 9 Remove the quick connector 1 of the front connecting pipe of the lower floor inlet/outlet pipe.
- 10 Remove the quick connector 2 of the lower floor inlet/outlet pipe.
- 11 Disconnect the front connection tube of the lower floor inlet/outlet pipe from the lower floor inlet/outlet pipe.





- 12 Remove the quick connector 1 of the lower floor inlet/outlet pipe.
- 13 Remove the quick connector 2 from the rear connection tube of the lower floor inlet/outlet pipe.
- 14 Disconnect the lower floor inlet/outlet pipe from the rear connection tube of the lower floor inlet/outlet pipe.
- 15 Remove the lower floor inlet/outlet pipe.



Installation Procedure

- 1 Install the coolant inlet and outlet metal pipes.
- 2 Connect the lower floor inlet/outlet pipes to the rear connection tube of the lower floor inlet/outlet pipe.
- 3 Install the quick connector 2 of the rear connection tube of the lower floor inlet/outlet pipe.

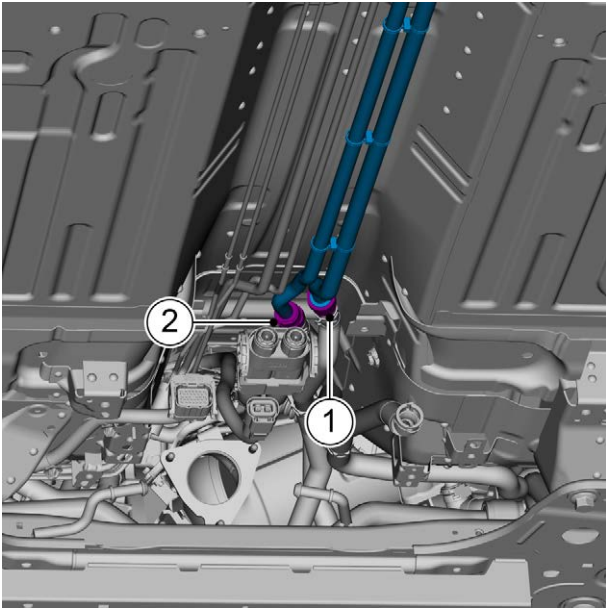
Caution

Pipe orifices should be aligned with the markings for connecting.

- 4 Install the quick connector 1 of the lower floor inlet/outlet pipe.

Caution

Pipe orifices should be aligned with the markings for connecting.



- 5 Connect the front connection tube of the lower floor inlet/outlet to the lower floor inlet/outlet tube.
- 6 Install the quick connector 2 of the lower floor inlet/outlet pipe.
- 7 Install quick connector 1 of the front connection tube of the lower floor inlet/outlet pipe.

- 8 Install the center access line bracket.
- 9 Install the hybrid power battery assembly.
- 10 Install the rear channel heat shield.
- 11 Install the front channel heat shield (2).
- 12 Install the front exhaust pipe.
- 13 Fill the electric system coolant, start the vehicle to connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle liquid level. If the liquid level has dropped, it is necessary to replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the expansion kettle on the scribe line, and screw the lid of the expansion kettle cover tightly.
- 14 Install the bottom engine guard assembly.
- 15 Lower the vehicle.

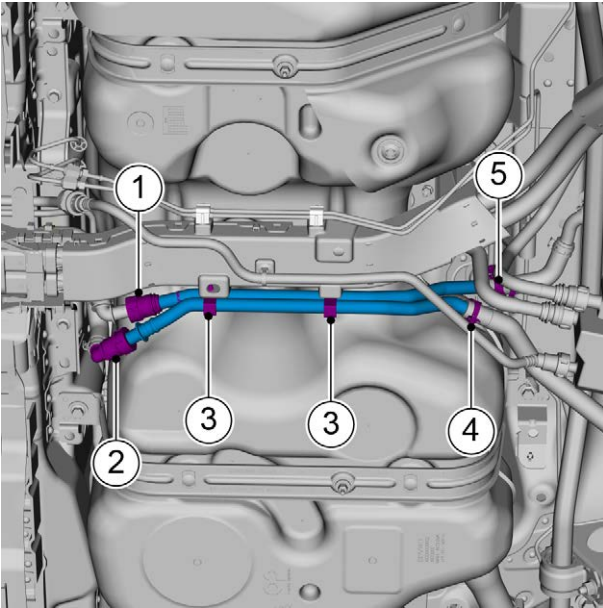
3.3.5.4 Replacement of Rear Connection Tube of Lower Floor Inlet/Outlet Pipe

Removal Procedure

Warning !

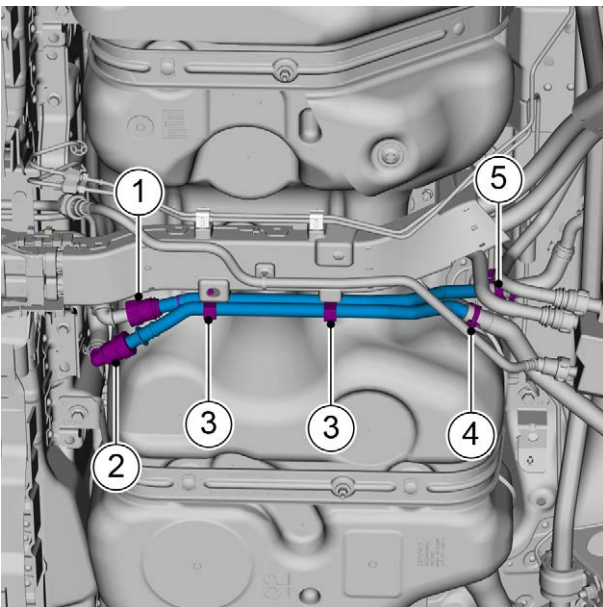
See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 3 Drain the electric system coolant, see [Draining and Filling Procedure of Electric System Coolant \(DHT Pro\)](#).



- 4 Remove the lower right fuel tank shield, see [Replacement of Lower Right Fuel Tank Shield](#).
- 5 Remove the quick connector 1 of the rear connection tube of the lower floor inlet/outlet pipe.
- 6 Remove the quick connector 2 of the lower floor inlet/outlet pipe.
- 7 Disconnect the rear connection tube of the lower floor inlet/outlet pipe from the lower floor inlet/outlet pipe.
- 8 Remove the two fixing clips 3 of the rear connection tube of the lower floor inlet/outlet pipe.
- 9 Remove the fixing clamp 4 of the drive motor inlet pipe, and disconnect the rear connection tube of the lower floor inlet/outlet pipe from the drive motor inlet pipe.
- 10 Remove the fixing clamp 5 of the drive motor outlet hose (1), and disconnect the rear connection tube of the lower floor inlet/outlet pipe from the drive motor outlet hose (1).
- 11 Remove the rear connection tube of the lower floor inlet/outlet pipe.

Installation Procedure



- 1 Install the lower floor inlet and outlet tube, and connect the pipes.
- 2 Connect the rear connection tube of the lower floor inlet/outlet pipe to the drive motor outlet pipe (1) and install the fixing clamp 5 of the drive motor outlet pipe (1).

Caution

Pipe orifices should be aligned with the markings for connecting.

- 3 Connect the rear connection tube of the lower floor inlet/outlet pipe with the drive motor inlet pipe, and install the fixing clamp 4 of the drive motor inlet pipe.

Caution

Pipe orifices should be aligned with the markings for connecting.

- 4 Install the two fixing clips 3 of the rear connection tube of the lower floor inlet/outlet pipe.
- 5 Connect the rear connection tube of the lower floor inlet/outlet pipe with the lower floor inlet/outlet pipe.
- 6 Install the quick connector 2 of the lower floor inlet/outlet pipe.
- 7 Install the quick connector 1 of the rear connection tube of the lower floor inlet/outlet pipe.

- 8 Install the lower right fuel tank guard.
- 9 Fill the electric system coolant, start the vehicle to connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle liquid level. If the liquid level has dropped, it is necessary to replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the expansion kettle on the scribe line, and screw the lid of the expansion kettle cover tightly.
- 10 Install the bottom engine guard assembly.
- 11 lower the vehicle.

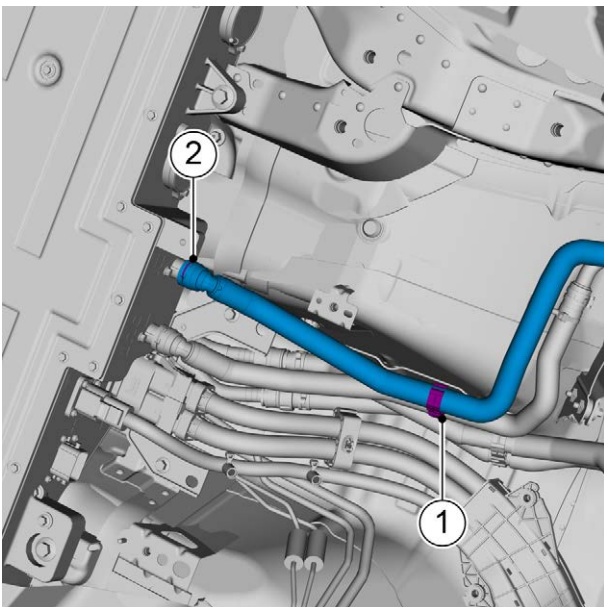
3.3.5.5 Replacement of Battery Inlet Pipe

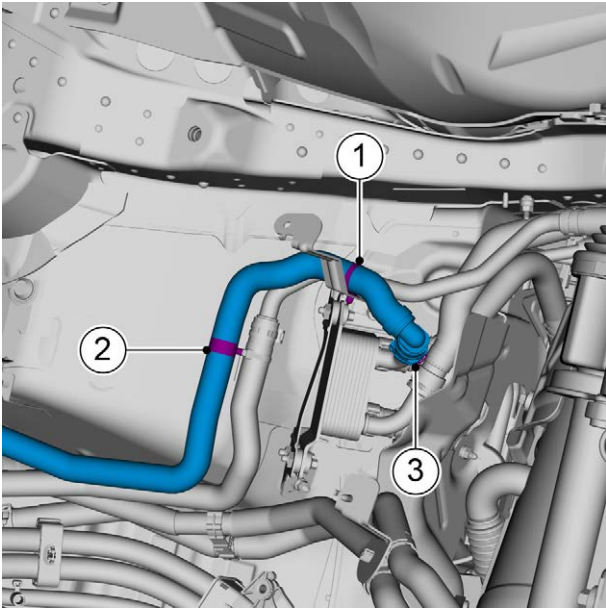
Removal Procedure

Warning !

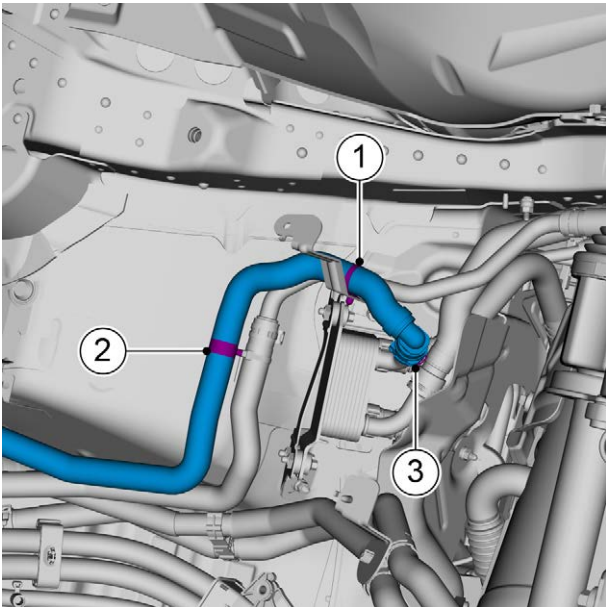
See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 3 Drain the electric system coolant, see [Draining and Filling Procedure of Electric System Coolant \(DHT Pro\)](#).
- 4 Remove the front exhaust pipe, see [Replacement of Front Exhaust Pipe](#).
- 5 Remove the front channel heat shield (2), see [Replacement of Front Channel Heat Shield \(2\)](#).
- 6 Disengage the fixing clips 1 of the battery outlet pipe.
- 7 Disconnect the battery inlet pipe from the hybrid power battery assembly by removing the quick-insertion circlip 2 of the battery inlet pipe.



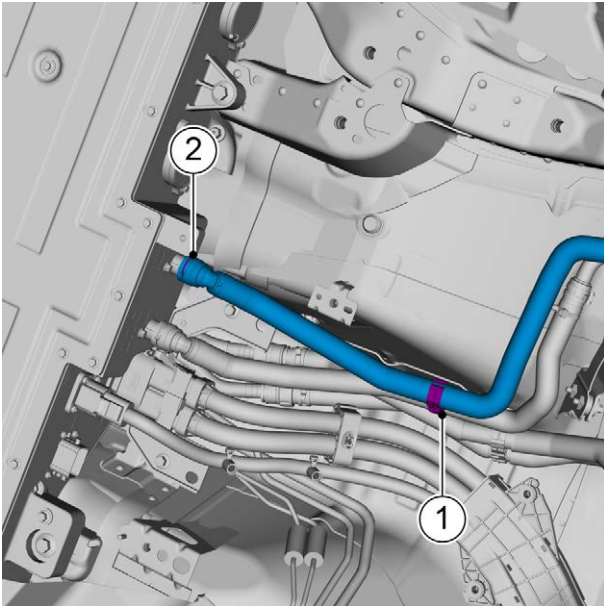


- 8 Remove the fixing clips 1 of the battery inlet pipe.
- 9 Disengage the fixing clips 2 of the battery outlet pipe.
- 10 Remove the quick-insertion circlip 3 of the battery inlet pipe, and disconnect the battery inlet pipe from the heat exchanger.
- 11 Remove the battery inlet pipe.



Installation Procedure

- 1 Install the battery inlet pipe.
- 2 Connect the battery inlet pipe to the heat exchanger and install the quick-insertion circlip 3 of the battery inlet pipe.
- 3 Install the fixing clips 2 of the battery outlet pipe.
- 4 Install the fixing clips 1 of the battery inlet pipe.



- 5 Connect the battery inlet hose to the hybrid power battery assembly, and install the quick-insertion circlip 2 of the battery inlet pipe.
- 6 Install the fixing clips 1 of the battery outlet pipe.

- 7 Install the front channel heat shield (2).
- 8 Install the front exhaust pipe.
- 9 Fill the electric system coolant, start the vehicle to connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle liquid level. If the liquid level has dropped, it is necessary to replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the expansion kettle on the scribe line, and screw the lid of the expansion kettle cover tightly.
- 10 Install the bottom engine guard assembly.
- 11 lower the vehicle.

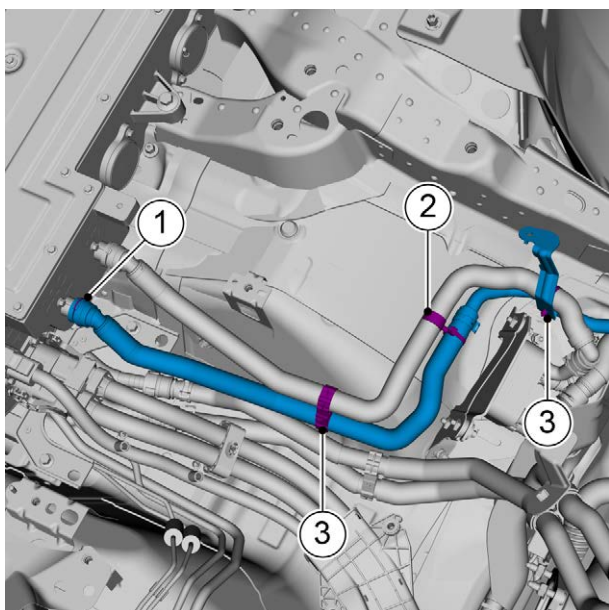
3.3.5.6 Replacement of Battery Outlet Pipe

Removal Procedure

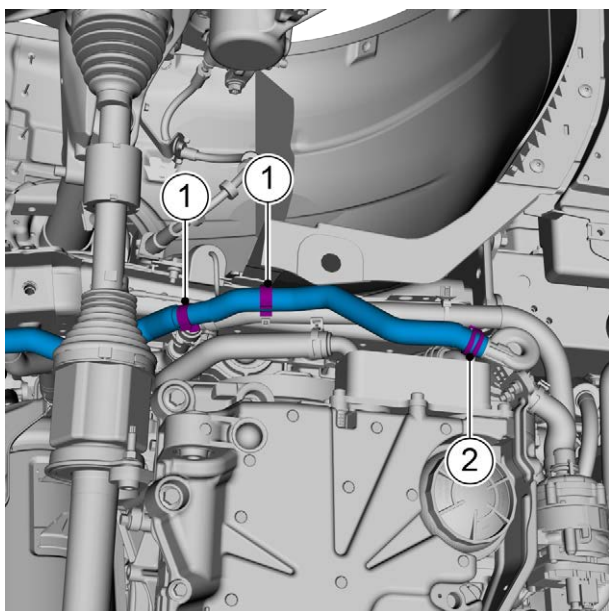
Warning !

See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 3 Drain the electric system coolant, see [Draining and Filling Procedure of Electric System Coolant \(DHT Pro\)](#).
- 4 Remove the front exhaust pipe, see [Replacement of Front Exhaust Pipe](#).
- 5 Remove the front channel heat shield (2), see [Replacement of Front Channel Heat Shield \(2\)](#).

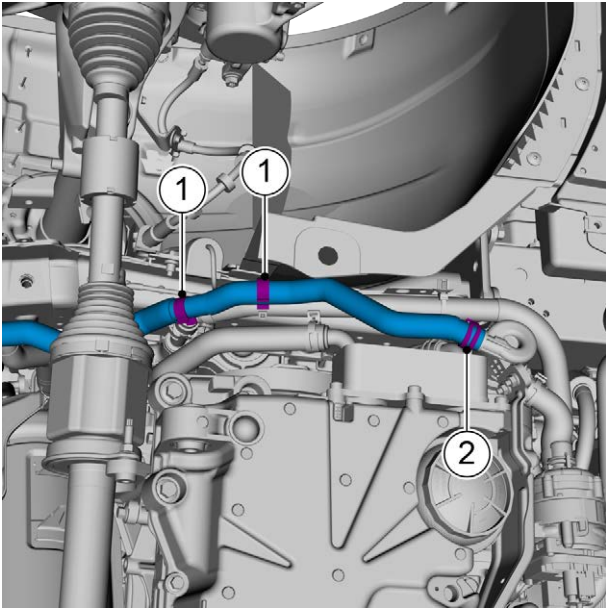


- 6 Disconnect the battery outlet pipe from the hybrid power battery assembly by removing the quick-insertion circlip 1 of the battery outlet pipe.
- 7 Disengage the fixing clips 2 of the battery outlet pipe.
- 8 Remove the two fixing clips 3 of the battery inlet pipe.



- 9 Disconnect the two fixing clips 1 of the water pump output pipe.
- 10 Remove the fixing clamp 2 of the battery outlet pipe and disconnect the battery outlet pipe from the battery water pump inlet pipe.
- 11 Remove the battery outlet pipe.

Installation Procedure

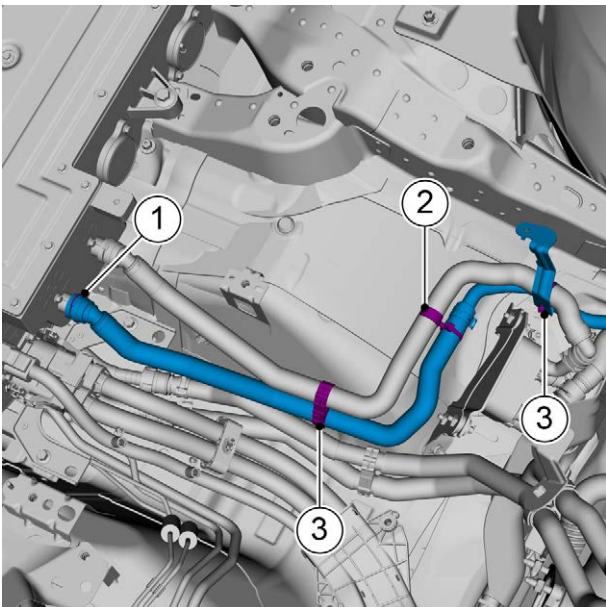


- 1 Install the battery outlet pipe.
- 2 Connect the battery outlet pipe to the water pump inlet pipe (2), and install the fixing clamp 2 of the battery outlet pipe.

Caution

Pipe orifices should be aligned with the markings for connecting.

- 3 Install the two fixing clips 1 of the water pump outlet pipe.



- 4 Install the two fixing clips 3 of the battery inlet pipe.
- 5 Install the fixing clips 2 of the disengaged battery outlet pipe.
- 6 Connect the battery outlet pipe to the hybrid power battery assembly, and install the quick-insertion circlip 1 of the battery outlet pipe.

- 7 Install the front channel heat shield (2).
- 8 Install the front exhaust pipe.
- 9 Fill the electric system coolant, start the vehicle to connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle liquid level. If the liquid level has dropped, it is necessary to replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the expansion kettle on the scribe line, and screw the lid of the expansion kettle cover tightly.
- 10 Install the bottom engine guard assembly.
- 11 lower the vehicle.

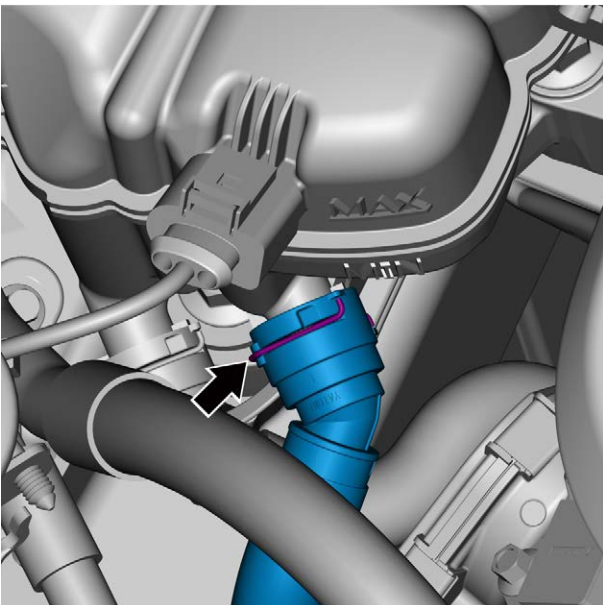
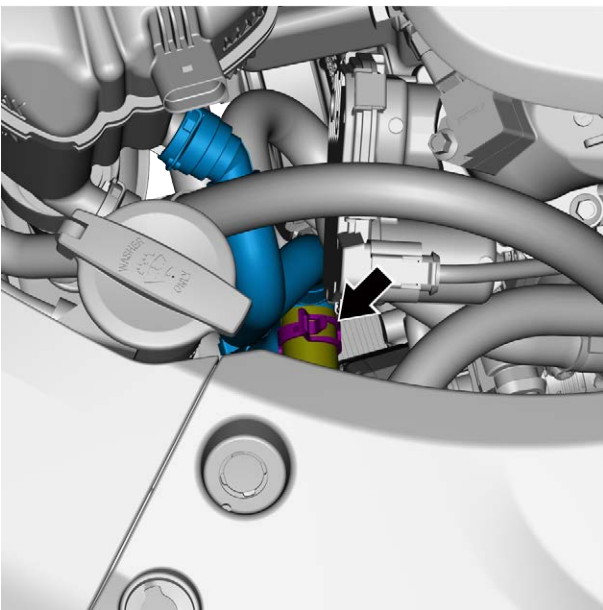
3.3.5.7 Replacement of water pump inlet pipe (1)

Removal Procedure

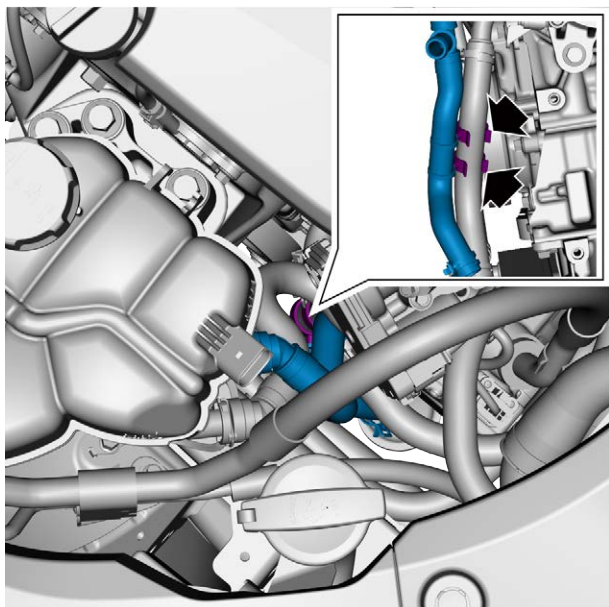
Warning !

See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

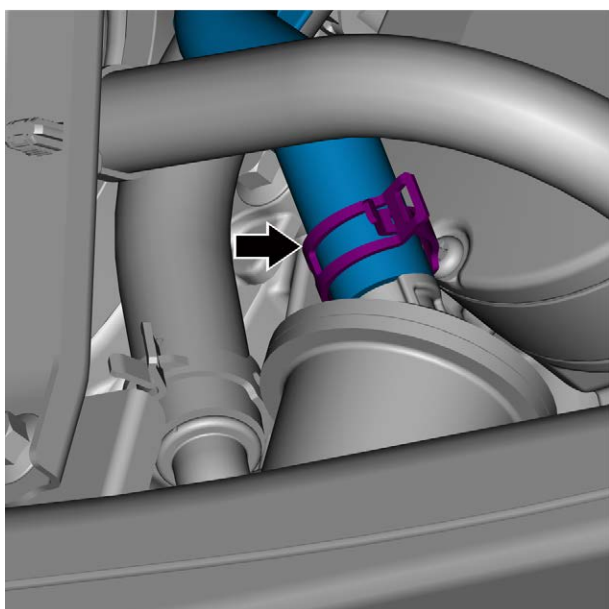
- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 3 Drain the electric system coolant, see [Draining and Filling Procedure of Electric System Coolant \(DHT Pro\)](#).
- 4 Remove the fixing clamp of the radiator inlet pipe (2) and disconnect the radiator inlet pipe (2) from the water pump inlet pipe (1).



- 5 Remove the quick-insertion circlips of the water pump inlet pipe (1), and disconnect the connection between the water pump inlet pipe (1) and the low temperature radiator expansion kettle.

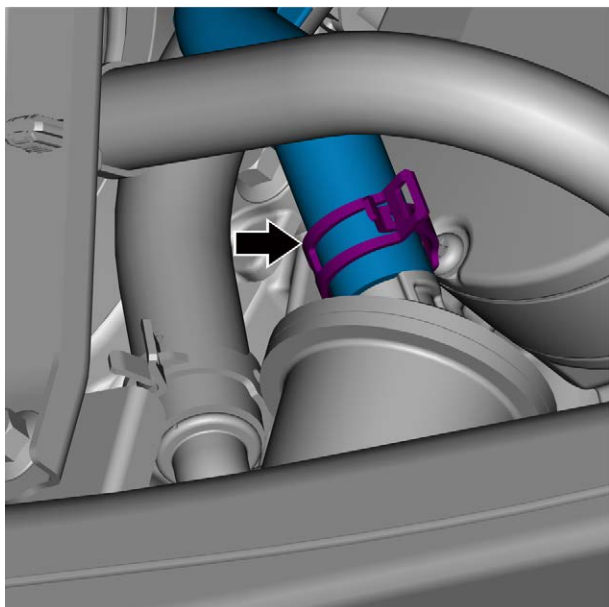


- 6 Disconnect the two fixing clips of the water pump inlet pipe (1).



- 7 Remove the fixing clamp of the water pump inlet pipe (1) and disconnect the water pump inlet pipe (1) from the water pump inlet pipe (2).
- 8 Remove the water pump inlet pipe (1).

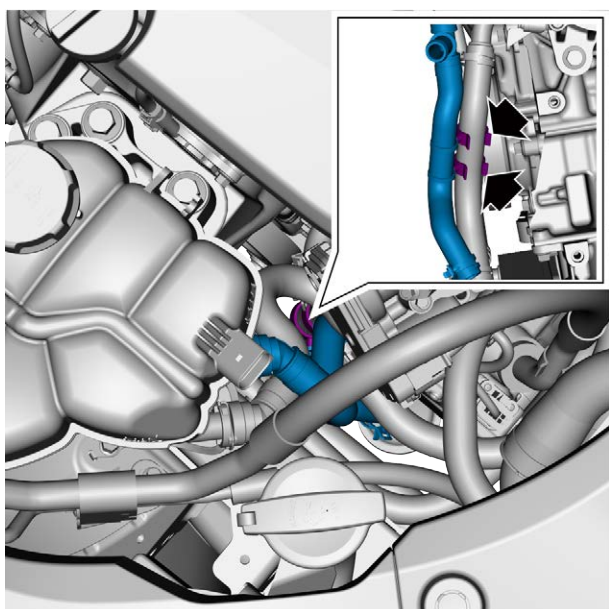
Installation Procedure



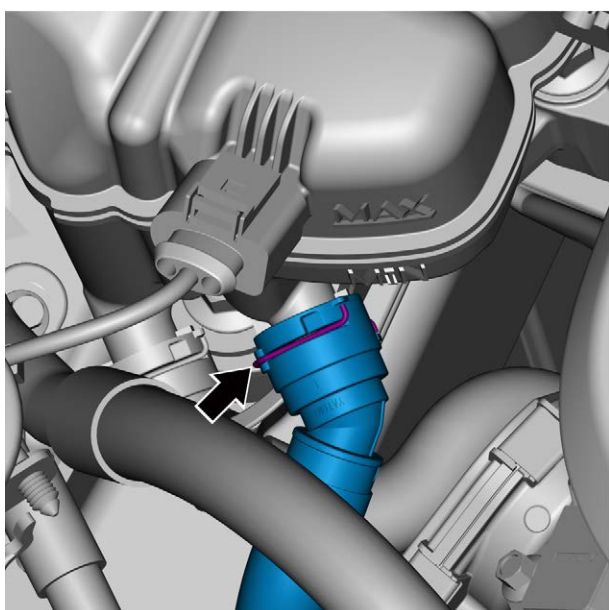
- 1 Install the water pump inlet pipe (1).
- 2 Connect the water pump inlet pipe (1) to the water pump inlet pipe (2) and install the fixing clamps of the water pump inlet pipe (1).

Caution

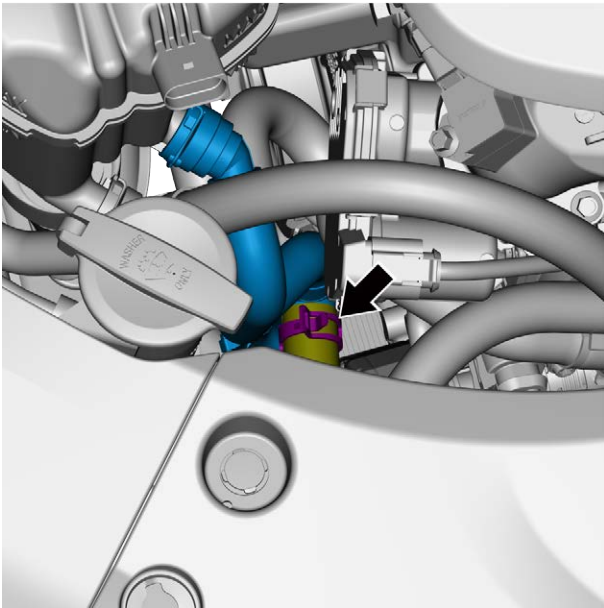
Pipe orifices should be aligned with the markings for connecting.



- 3 Install the two fixing clips of the water pump inlet pipe (1).



- 4 Connect the water pump inlet pipe (1) to the low-temperature radiator expansion kettle, and install the quick-insertion circlip of the water pump inlet pipe (1).



- 5 Connect the radiator inlet pipe (2) to the water pump inlet pipe (1) and install the fixing clamp of the radiator inlet hose (2).

Caution

Pipe orifices should be aligned with the markings for connecting.

- 6 Fill the power battery coolant, start the vehicle and connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the liquid level in the expansion kettle. If there is a drop in the level, it is necessary to replenish coolant in time. Until the main circulation is opened, replenish coolant to the upper scribe line of the expansion kettle, and tighten the lid of the expansion kettle.
- 7 Install the bottom engine guard assembly.
- 8 Lower the vehicle.

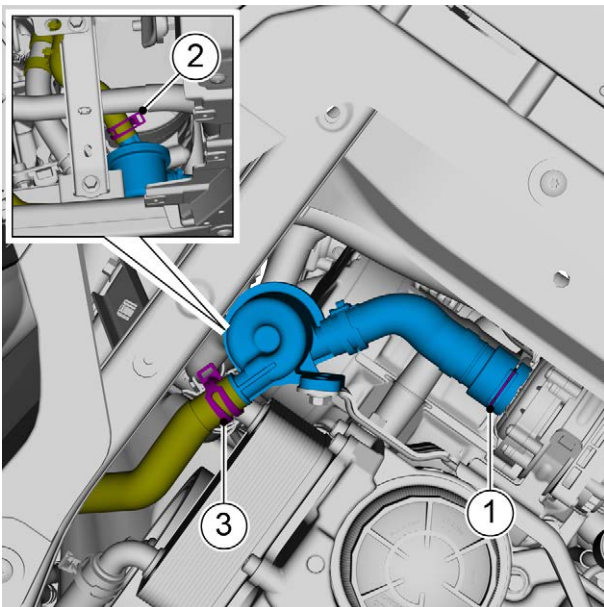
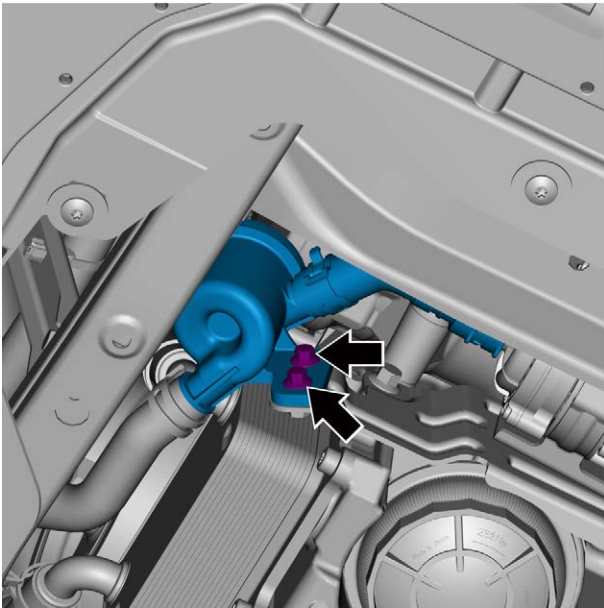
3.3.5.8 Replacement of water pump inlet pipe (2)

Removal Procedure

Warning !

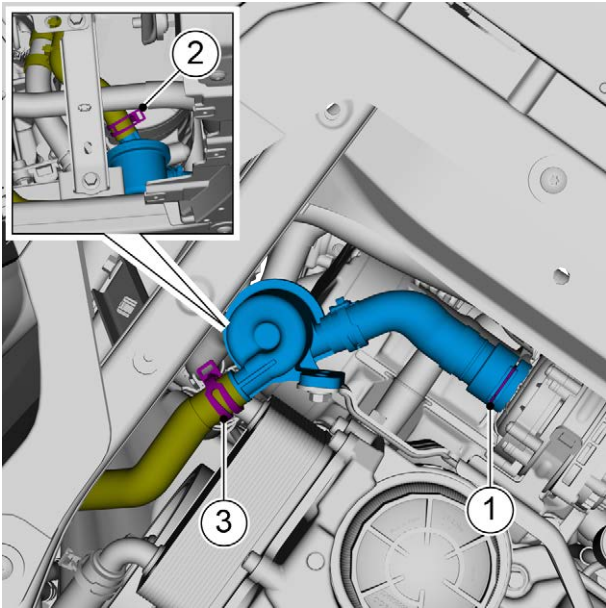
See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 3 For the electric system coolant draining and filling procedure, see [Draining and Filling Procedure of Electric System Coolant \(DHT Pro\)](#).



- 4 Remove the two fixing bolts of the water pump inlet pipe (2).
- 5 Remove the quick-insertion circlips 2 of the water pump inlet pipe (2) and disconnect the water pump inlet pipe (2) from the electronic powertrain coolant pump.
- 6 Remove the fixing clamp 2 of the water pump inlet pipe (1) and disconnect the water pump inlet pipe (1) from the water pump inlet pipe (2).
- 7 Disconnect the water pump inlet pipe (2) from the battery outlet pipe by removing the fixing clamp 3 of the battery outlet pipe.
- 8 Remove the water pump inlet pipe (2).

Installation Procedure



- 1 Install the water pump inlet pipe (2).
- 2 Connect the water pump inlet pipe (2) to the battery outlet pipe, and install the fixing clamp 3 of the battery outlet pipe.

Caution

Pipe orifices should be aligned with the markings for connecting.

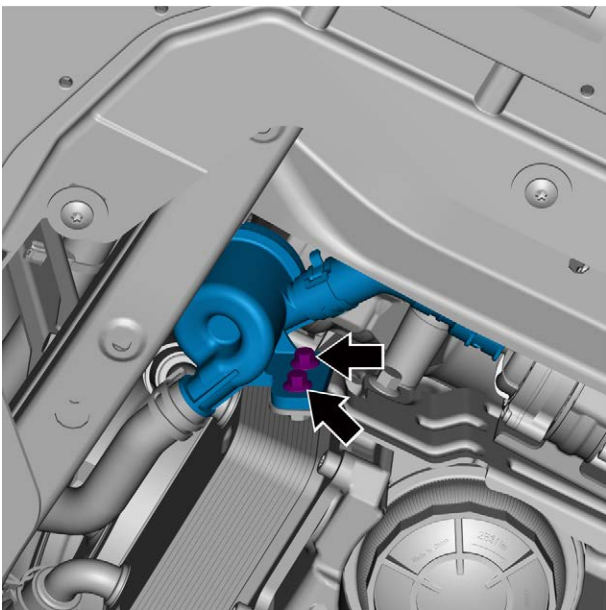
- 3 Connect the water pump inlet pipe (1) to the water pump inlet pipe (2), and install the fixing clamp 2 of the water pump inlet pipe (1).

Caution

Pipe orifices should be aligned with the markings for connecting.

- 4 Connect the water pump outlet pipe to the electronic powertrain coolant pump, and install the quick-insertion circlip 1 of the water pump outlet pipe.
- 5 Install and tighten the two fixing bolts of the water pump inlet pipe (2).

Torque: 10N·m



- 6 Fill the electric system coolant, start the vehicle to connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle liquid level. If the liquid level has dropped, it is necessary to replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the expansion kettle on the scribe line, and screw the lid of the expansion kettle cover tightly.
- 7 Install the bottom engine guard assembly.
- 8 Lower the vehicle.

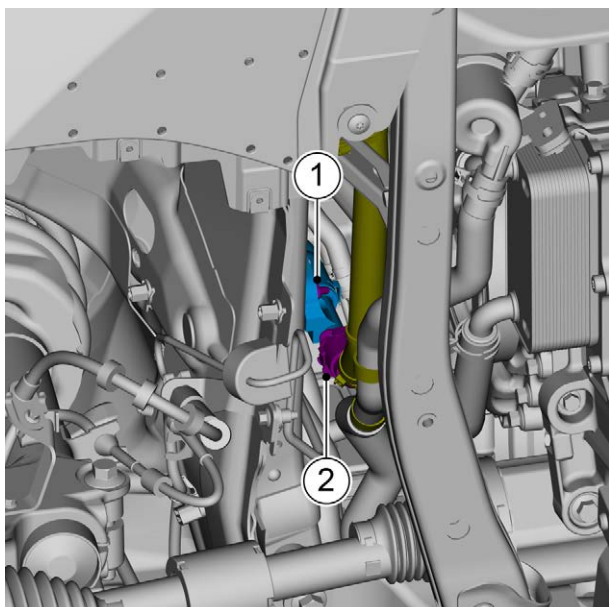
3.3.5.9 Replacement of water pump inlet pipe (3)

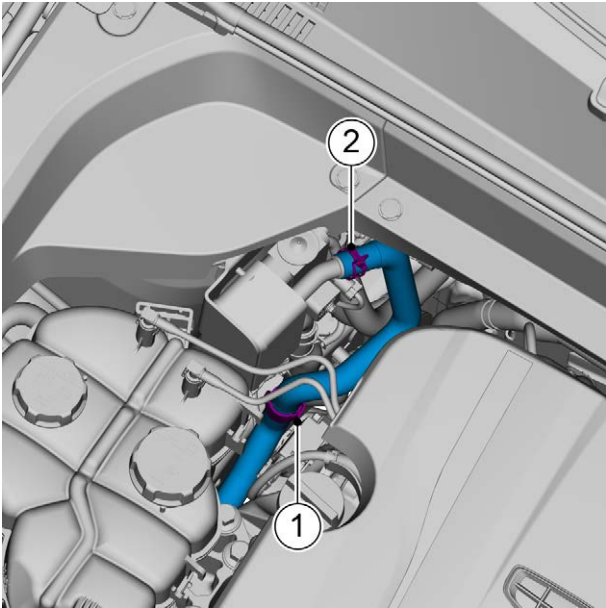
Removal Procedure

Warning !

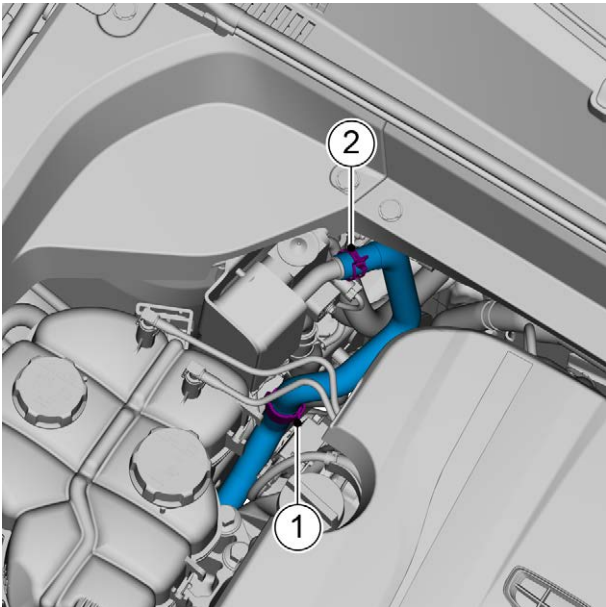
See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 3 Remove the front right wheel cover fender assembly, see [Replacement of Front Right Wheel Cover Feeder Assembly](#).
- 4 For the electric system coolant draining and filling procedure, see [Draining and Filling Procedure of Electric System Coolant \(DHT Pro\)](#).
- 5 Remove the fixing nuts 1 of the water pump inlet pipe (3).
- 6 Remove the quick connector 2 of the water pump outlet pipe and disconnect the water pump outlet pipe from the water pump inlet pipe.





- 7 Disengage the fixing clips 1 of the water inlet valve hose.
- 8 Remove the fixing clamp 2 of the water pump inlet pipe (3) and disconnect the water pump inlet pipe (3) from the battery cooler.
- 9 Remove the water pump inlet pipe (3).



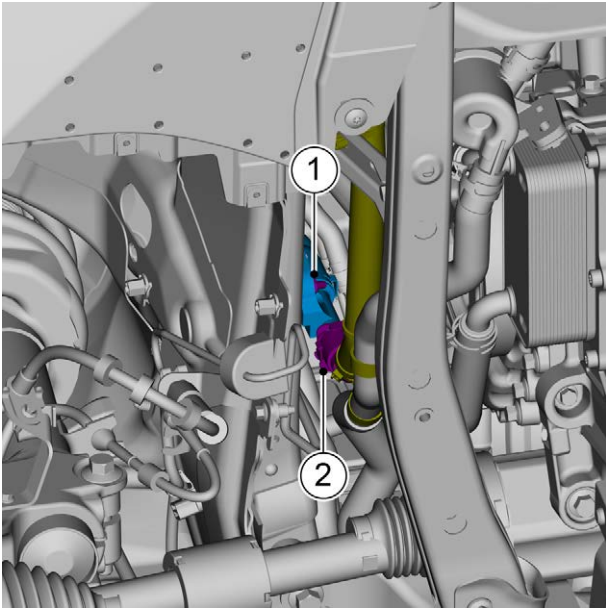
Installation Procedure

- 1 Install the water pump inlet pipe (3).
- 2 Connect the water pump inlet pipe (3) to the battery cooler, and install the fixing clamp 2 of the water pump inlet pipe (3).

Caution

Pipe orifices should be aligned with the markings for connecting.

- 3 Install the fixing clips 1 of the water inlet valve hose.



- 4 Connect the water pump outlet pipe to the water pump inlet pipe (3) and install the quick connector 2 of the water pump outlet hose.
- 5 Install and tighten the fixing bolts 1 of the water pump inlet pipe (3).
Torque: 10 N·m

- 6 Fill the electric system coolant, start the vehicle to connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle liquid level. If the liquid level has dropped, it is necessary to replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the expansion kettle on the scribe line, and screw the lid of the expansion kettle cover tightly.
- 7 Install the front right wheel cover fender assembly.
- 8 Install the bottom engine guard assembly.
- 9 lower the vehicle.

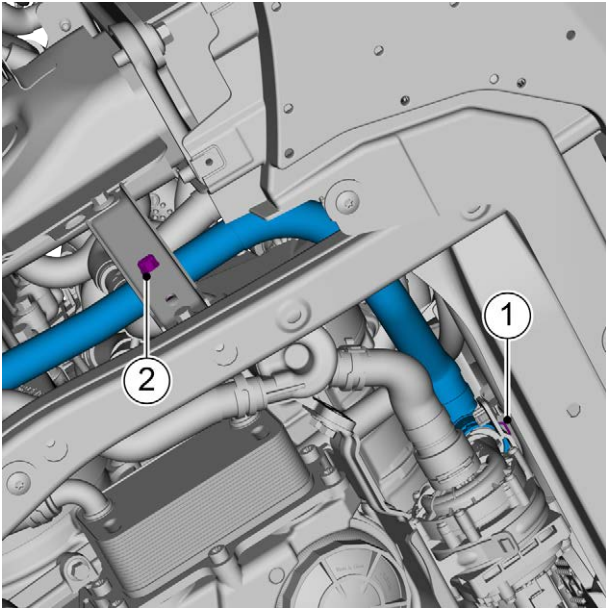
3.3.5.10 Replacement of Water Pump Outlet Pipe

Removal Procedure

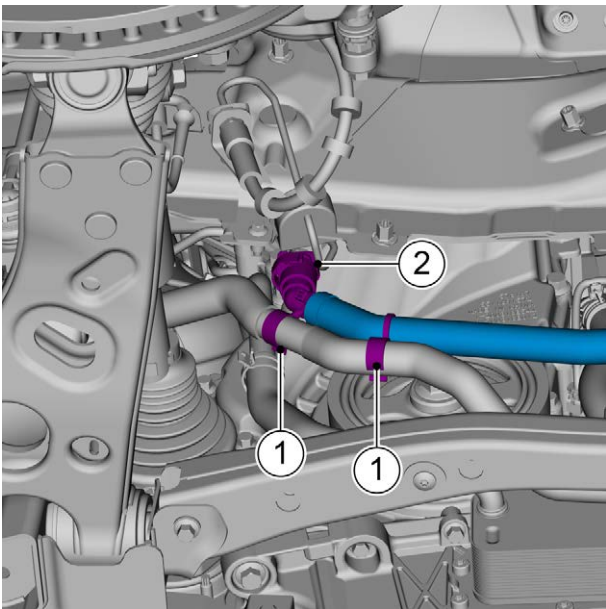
Warning !

See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 3 Drain the electric system coolant, see [Draining and Filling Procedure of Electric System Coolant \(DHT Pro\)](#).
- 4 Remove the front right wheel cover fender assembly, see [Replacement of Front Right Wheel Cover Feeder Assembly](#).

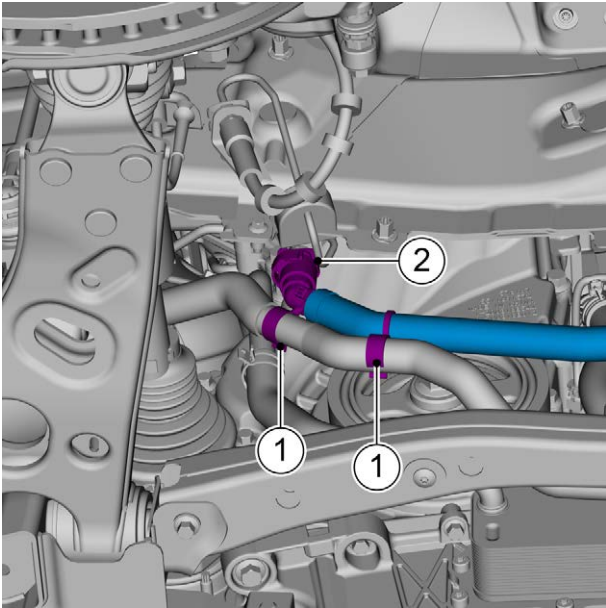


- 5 Disconnect the water inlet valve hose from the electronic water pump by removing the fixing clips 1 of the water pump outlet hose.
- 6 Remove the fixing clips 2 of the water pump outlet pipe.

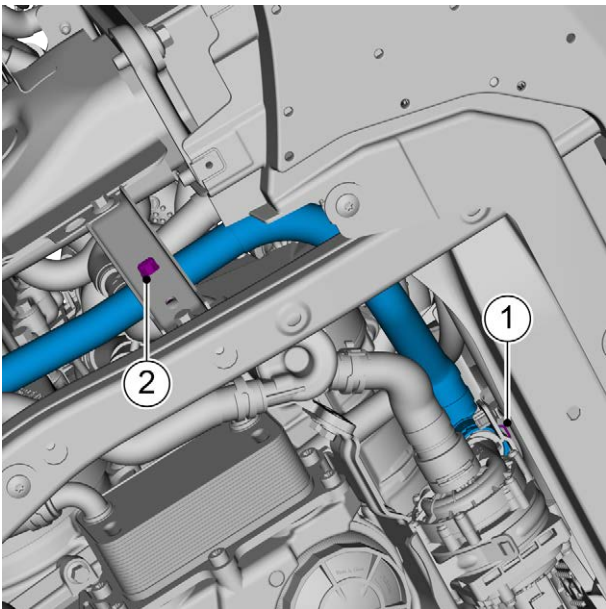


- 6 Disengage the fixing clips 1 of the water pump outlet pipe.
- 7 Remove the quick connector 2 of the water pump outlet pipe and disconnect the water pump outlet pipe from the water pump inlet pipe.
- 8 Remove the water pump outlet hose.

Installation Procedure



- 1 Install the water pump outlet pipe.
- 2 Connect the water pump outlet pipe to the water pump inlet pipe (3) and install the quick connector 2 of the water pump outlet hose.
- 3 Install the fixing clips 1 of the water pump outlet pipe.



- 4 Install the fixing clips 2 of the water pump outlet pipe.
- 5 Connect the water inlet valve hose to the electronic water pump and install the fixing clamp 1 of the water pump outlet hose.

Caution

Pipe orifices should be aligned with the markings for connecting.

- 6 Install the front right wheel cover fender assembly.
- 7 Fill the electric system coolant, start the vehicle to connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle liquid level. If the liquid level has dropped, it is necessary to replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the expansion kettle on the scribe line, and screw the lid of the expansion kettle cover tightly.
- 8 Install the bottom engine guard assembly.
- 9 lower the vehicle.

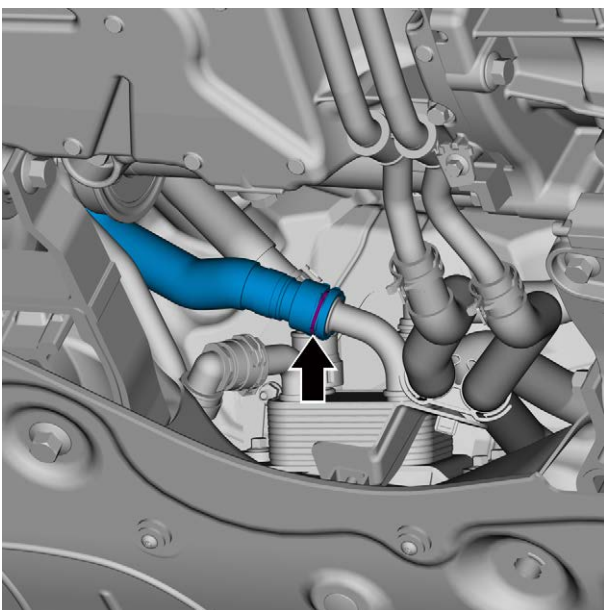
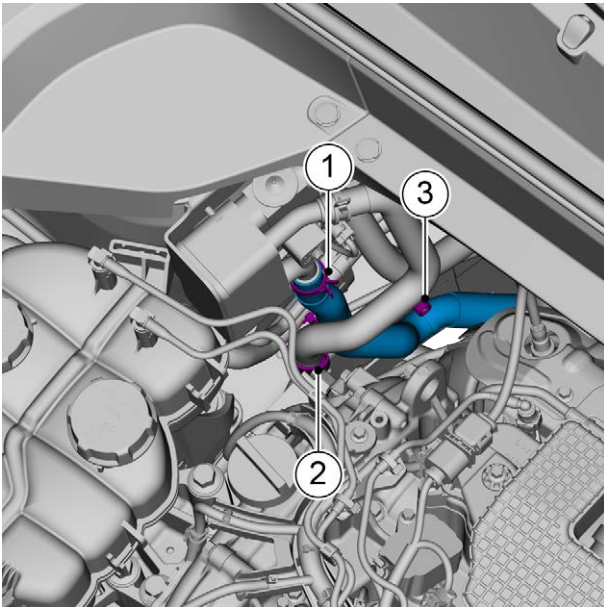
3.3.5.11 Replacement of Water Inlet Valve Hose

Removal Procedure

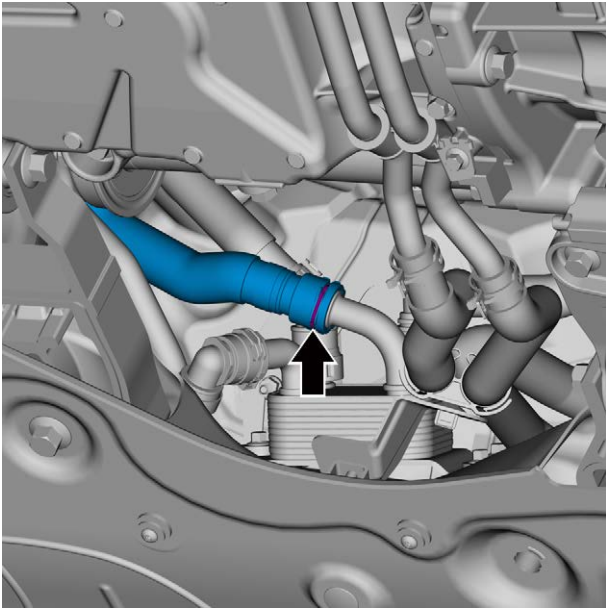
Warning !

See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

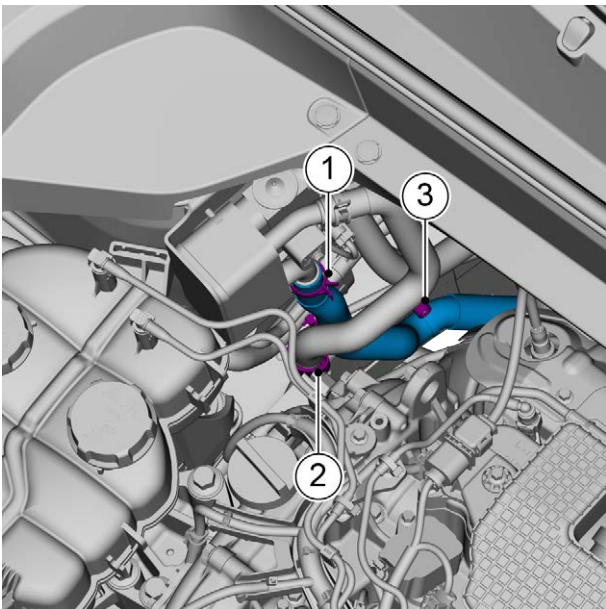
- 1 Remove the engine trim cover assembly, refer to [Replacement of engine trim cover assembly](#).
- 2 Remove the heat shield, see [Replacement of Heat Shield](#).
- 3 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 4 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 5 Drain the electric system coolant, see [Draining and Filling Procedure of Electric System Coolant \(DHT Pro\)](#).
- 6 Remove the fixing clamp 1 of the water inlet valve hose, and disconnect the water inlet valve hose from the battery cooler.
- 7 Disengage the fixing clips 2 and 3 of the water inlet valve hose.
- 8 Remove the quick-insertion circlip of the water inlet valve hose, and disconnect the water inlet valve hose from the heat exchanger.
- 9 Remove the water inlet valve hose.



Installation Procedure



- 1 Install the water inlet valve hose.
- 2 Connect the water inlet valve hose to the heat exchanger, and install the quick-insertion circlip of the water inlet valve hose.



- 3 Install the fixing clips 2 and 3 of the water inlet valve hose.
- 4 Connect the water inlet valve hose to the battery cooler, and install the fixing clamp 1 of the water inlet valve hose.

Caution

Pipe orifices should be aligned with the markings for connecting.

- 5 Fill the electric system coolant, start the vehicle to connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle liquid level. If the liquid level has dropped, it is necessary to replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the expansion kettle on the scribe line, and screw the lid of the expansion kettle cover tightly.
- 6 Install the bottom engine guard assembly.
- 7 lower the vehicle.
- 8 Install the heat shield.
- 9 Install the engine trim cover assembly.

3.3.5.12 Replacement of Battery Cooler

Removal Procedure

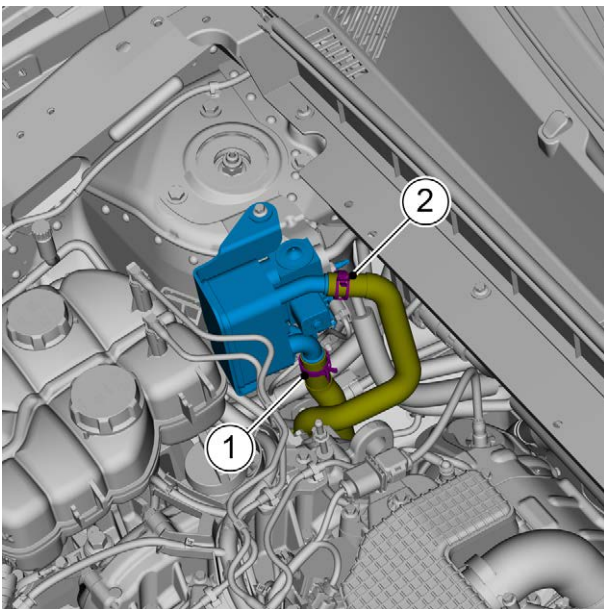
Warning !

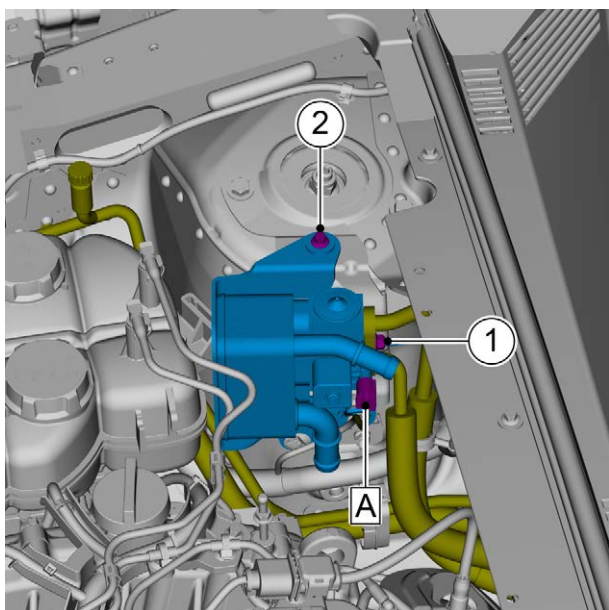
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

Warning !

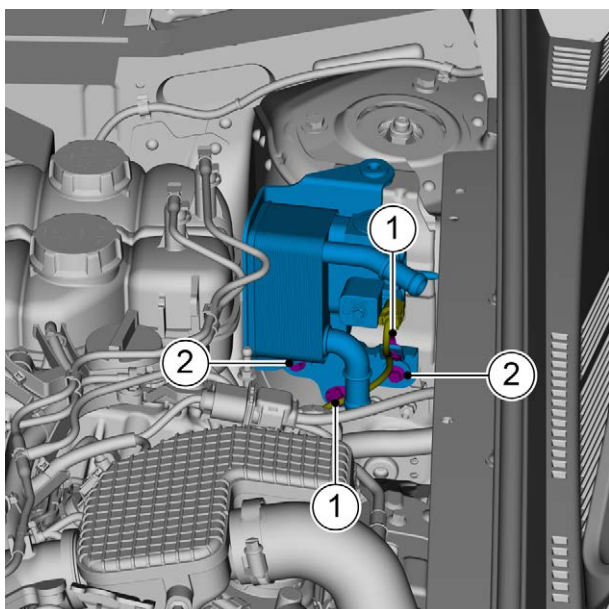
See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 3 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 4 Drain the electric system coolant, see [Draining and Filling Procedure of Electric System Coolant \(DHT Pro\)](#).
- 5 Recover the A/C refrigerant, see [A/C Refrigerant Discharge and Filling](#).
- 6 Remove the left engine compartment trim panel, refer to [Replacement of left engine compartment trim panel](#).
- 7 Remove the engine trim cover assembly, refer to [Replacement of engine trim cover assembly](#).
- 8 Remove the fixing clamp 1 of the water inlet valve hose, and disconnect the water inlet valve hose from the battery cooler.
- 9 Remove the fixing clamp 2 of the water pump inlet pipe (3) and disconnect the water pump inlet pipe (3) from the battery cooler.



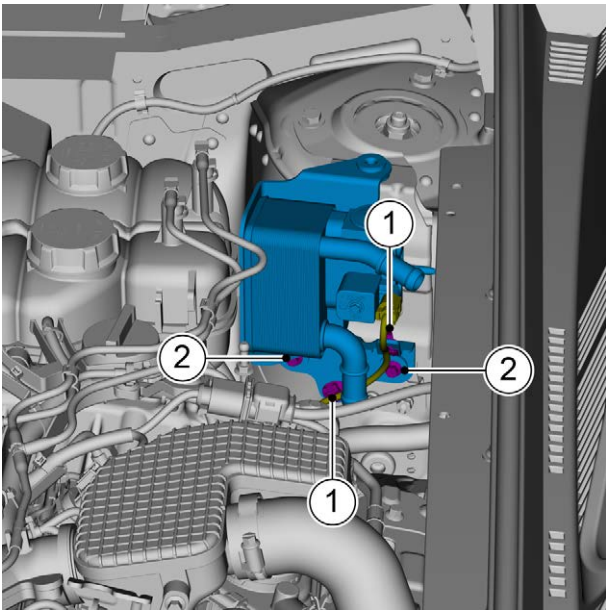


- 10 Disconnect the harness connector A of the battery heat exchanger refrigerant valve. .
- 11 Remove the fixing nuts 1 of the air conditioner high/low pressure hose assembly, and disconnect the air conditioner high/low pressure hose assembly from the battery cooler.
- 12 Remove the fixing bolts 2 of the battery cooler.

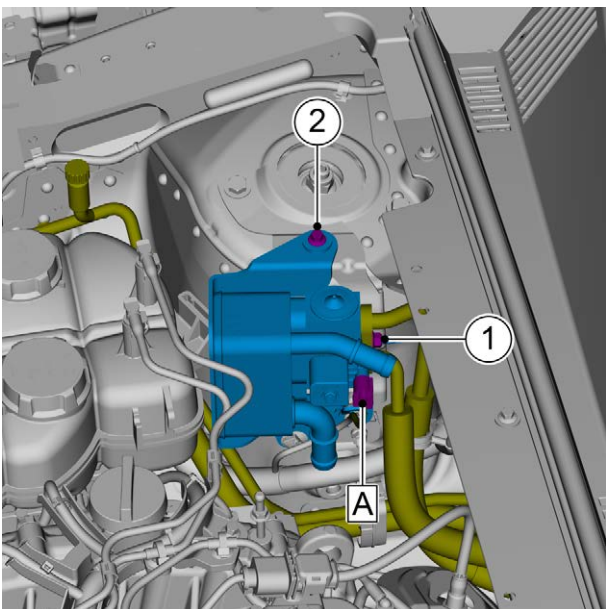


- 13 Remove the two harness clips 1 of the base plate harness.
- 14 Remove the two fixing bolts 2 of the battery cooler.
- 15 Remove the battery cooler.

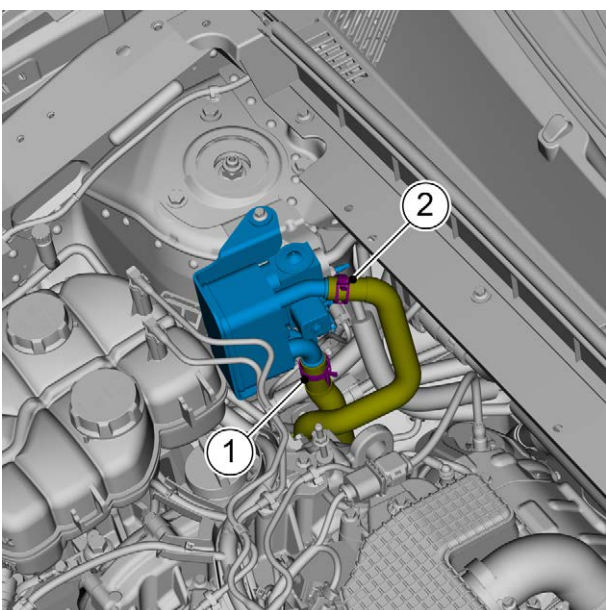
Installation Procedure



- 1 Install the battery cooler.
- 2 Install and tighten the two fixing bolts 2 of the battery cooler.
Torque: 10 N·m
- 3 Install the two harness clips 1 for the base plate harness.



- 4 Install and tighten the fixing bolts 2 of the battery cooler.
Torque: 10 N·m
- 5 Connect the air conditioning high/low pressure pipe assembly with the battery cooler, install and tighten the fixing nut 1 of the air conditioner high/low pressure pipe assembly.
- 6 Connect the harness connector A of the battery heat exchanger refrigerant valve. .



- 7 Connect the water pump inlet pipe (3) to the battery cooler, and install the fixing clamp 2 of the water pump inlet pipe (3).
- 8 Connect the water inlet valve hose to the battery cooler, and install the fixing clamp 1 of the water inlet valve hose.

Caution

Pipe orifices should be aligned with the markings for connecting.

- 9 Install the engine trim cover assembly.
- 10 Install the left engine compartment trim panel.
- 11 Fill with the air conditioning refrigerant.
- 12 Fill with the electric system coolant.
- 13 Install the bottom engine guard assembly.
- 14 lower the vehicle.
- 15 Connect the negative cable of the battery, start the vehicle and connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle level. If there is a drop in the level, replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the upper scribe line of the expansion kettle, and tighten the lid of the expansion kettle.

3.3.5.13 Replacement of Electronic Powertrain Coolant Pump

Removal Procedure

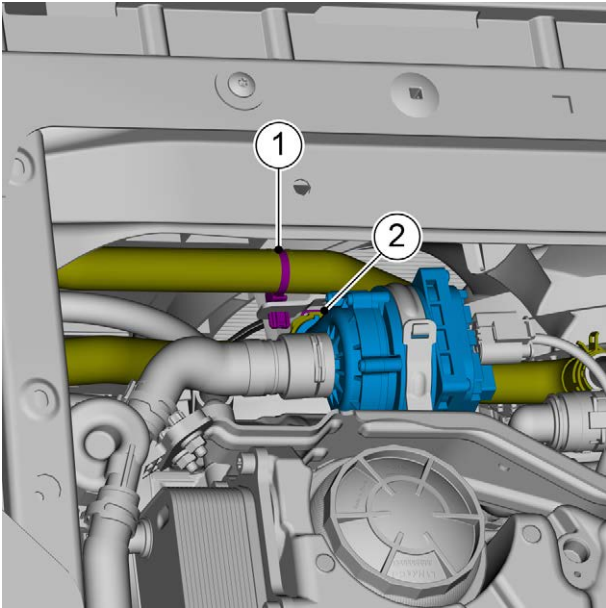
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

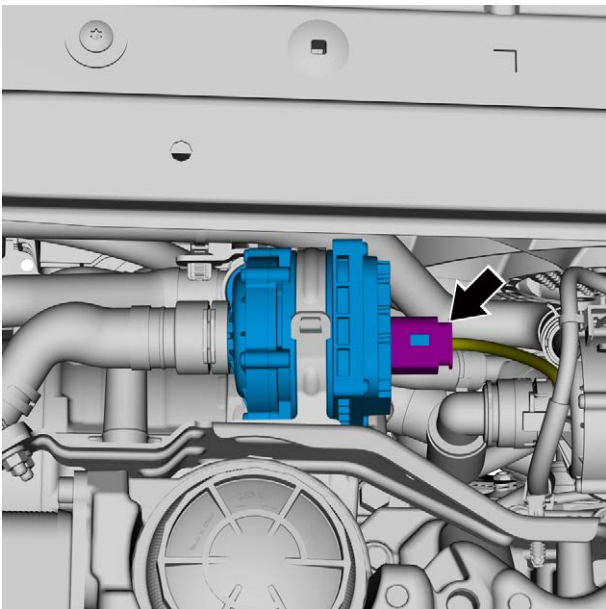
Warning !

See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

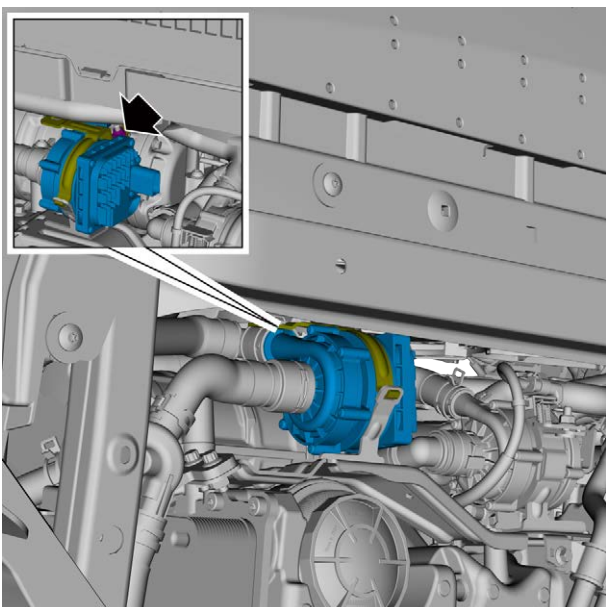
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 3 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 4 Drain the electric system coolant, see [Draining and Filling Procedure of Electric System Coolant \(DHT Pro\)](#).



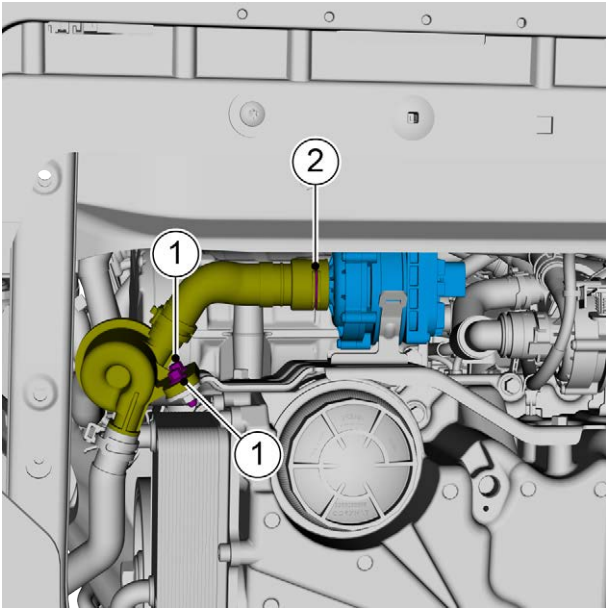
- 5 Remove the fixing clips 1 of the drive motor radiator inlet pipe.
- 6 Disconnect the water pump outlet pipe from the electronic powertrain coolant pump by removing the quick-insertion circlip 2 of the water pump outlet pipe.



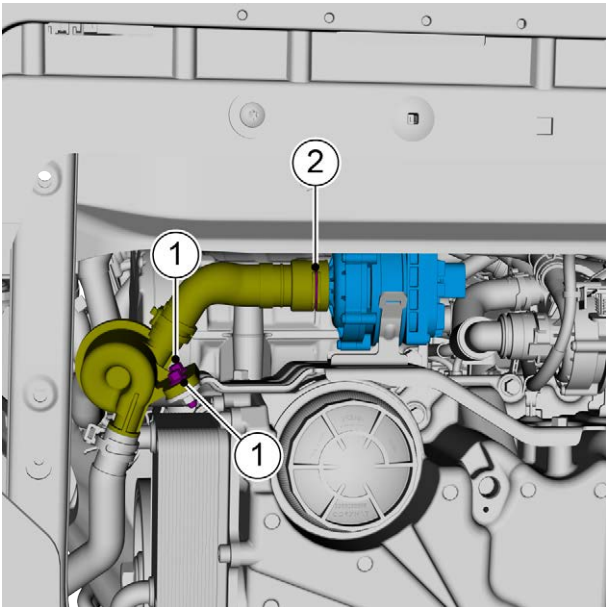
- 7 Disconnect the harness connector of the electronic powertrain coolant pump.



- 8 Remove the fixing nut of the electric powertrain coolant pump.



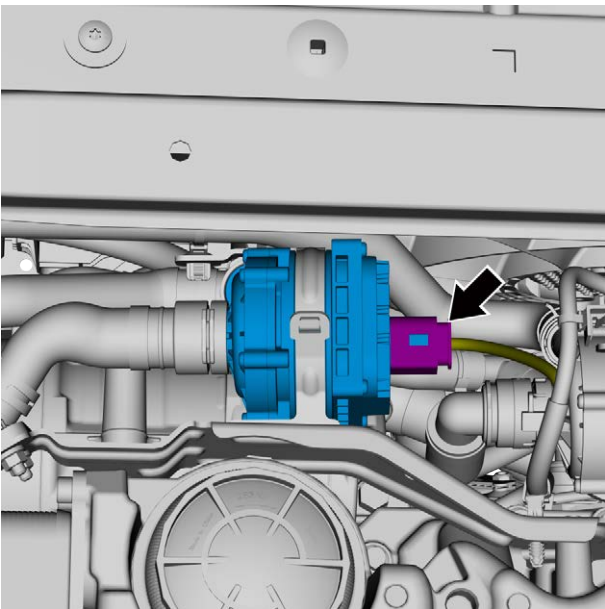
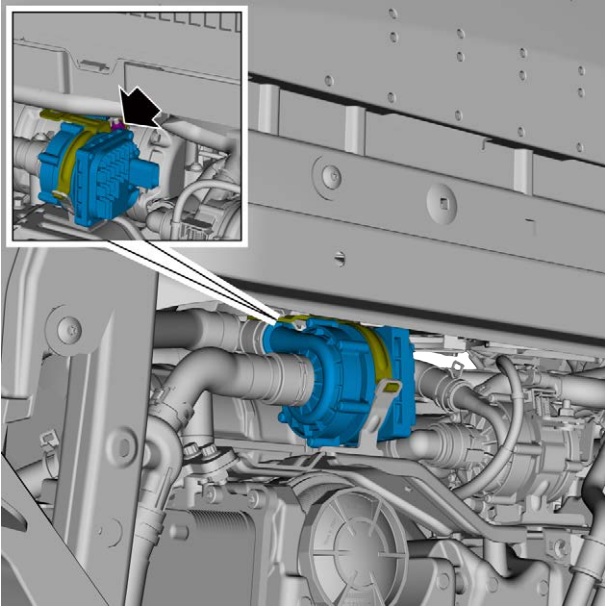
- 9 Remove the two fixing bolts 1 of the battery water pump inlet pipe (2).
- 10 Remove the quick-insertion circlips 2 of the battery water pump inlet pipe (2) and disconnect the battery water pump inlet pipe (2) from the electronic powertrain coolant pump.
- 11 Remove the electronic powertrain coolant pump.



Installation Procedure

- 1 Install the electronic powertrain coolant pump.
- 2 Connect the battery water pump inlet pipe (2) to the electronic powertrain coolant pump, and install the quick-insertion circlip 2 of the battery water inlet pipe (2).
- 3 Install and tighten the two fixing bolts 1 of the battery water pump inlet pipe (2).

Torque: 10 N·m



- 4 Install and tighten the fixing nuts of the electronic powertrain coolant pump.

Torque: 10 N·m

- 5 Connect the water pump outlet pipe to the electronic powertrain coolant pump, and install the quick-insertion circlip 2 of the water pump outlet pipe.
- 6 Install the fixing clips 1 of the drive motor radiator inlet pipe.

- 7 Fill with the electric system coolant.
- 8 Install the bottom engine guard assembly.
- 9 lower the vehicle.
- 10 Connect the negative cable of the battery, start the vehicle and connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle level. If there is a drop in the level, replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the upper scribe line of the expansion kettle, and tighten the lid of the expansion kettle.

3.4 High voltage distribution system

3.4.1 Specification

3.4.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Fixing bolt between DC direct charging socket harness assembly and bracket	M8×25	25-35
	M6×20	8.5-11.5
Fixing nut between DC direct charging socket harness assembly and rear subframe	M6×7.8	8.5-11.5
Fixing nut between DC bus assembly and high voltage protection bracket	M6×6	8.5-11.5
Fixing bolt between DC bus assembly and high voltage protection bracket	M6×16×19.3	8.5-11.5
Fixing bolt between AC charging socket harness assembly and bracket	M6×12	8.5-11.5
Fixing nut between AC charging socket wiring harness assembly and body	M6	8.5-11.5
Fixing bolt between AC charging socket harness assembly to rear subframe	M6×20	8.5-11.5
Fixing bolt between heater harness and bracket	M6×16×19.3	8.5-11.5

3.4.2 Instructions and operations

3.4.2.1 Instructions and operations

Function description

The hybrid vehicle has a high voltage distribution system. The high-voltage distribution system consists of power batteries to provide electrical power to the motor controller (with internal integrated high-voltage distribution and DC/DC converter), drive motor, electric compressor, PTC heater and other high-voltage electrical components. All these high-voltage electrical components are connected by the high-voltage distribution system to deliver electrical energy.

The high voltage (HV) distribution system mainly consists of the following components: DC bus assembly, electric compressor wiring harness, etc.

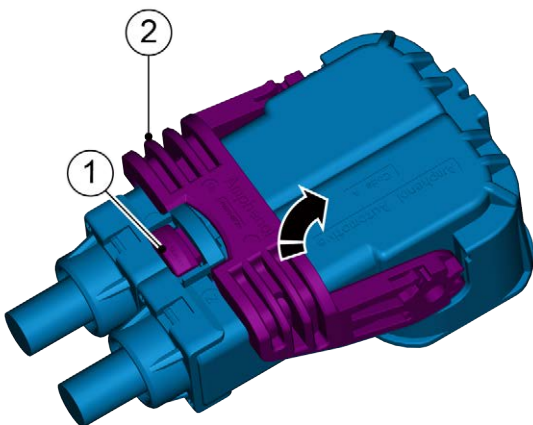
All high voltage cables are orange in color. Do not touch these cables and parts when the vehicle is powered up. After the high voltage cable connector is unplugged, wrap it immediately with insulating tape.

Introduction to Low Voltage Manual Service Device

The low-voltage manual service device (MSD) is a low-voltage signal connection one, connected in series in the interlock circuit. By manually triggering the whole vehicle system to disconnect the high-voltage system signals, the high-voltage process is executed by the BMS (BECM).

Type of High Voltage Wiring Harness Connector

1. Type I of high voltage connectors:

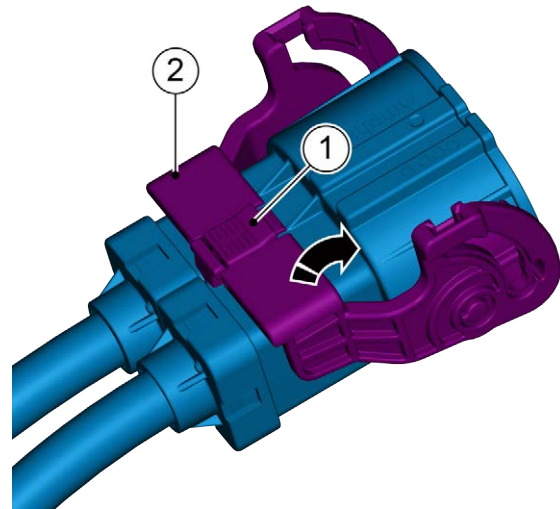


1. Lightly press the assist handle latch 1 by hand or with a screwdriver

2. Then slowly raise the assist handle 2 upwards and the connector will slowly withdraw.

3. When the assist handle changes from horizontal position to vertical position, the connectors are all in the unplugged state.

4. Type II of high voltage connectors:

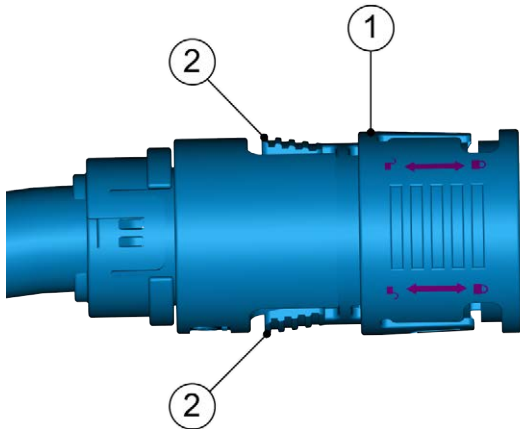


1. Push the assist handle latch 1 by hand

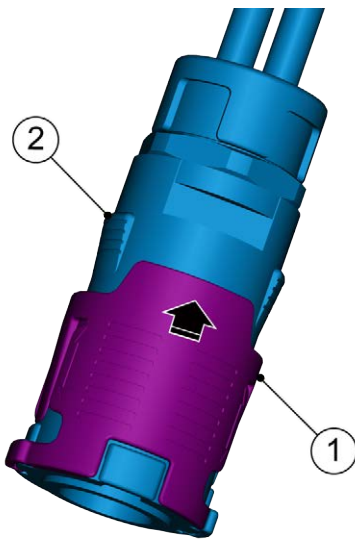
2. Then slowly raise the assist handle 2 upwards and the connector will slowly withdraw.

3. When the assist handle changes from horizontal position to vertical position, the connectors are all in the unplugged state.

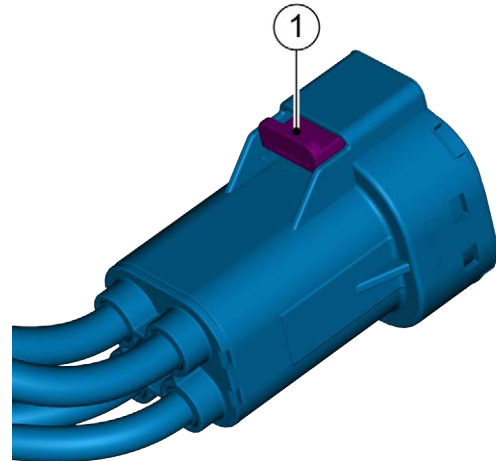
4. Type III of high voltage connectors:



1. Push the latch 1 as indicated by the arrow;
2. After pressing the latch 2, pull the connector outward until it is pulled out.
3. Type IV high voltage connectors:



1. Push the latch 1 as indicated by the arrow;
2. After pressing the latch 2, pull the connector outward until it is pulled out.
3. Category V high voltage connector:

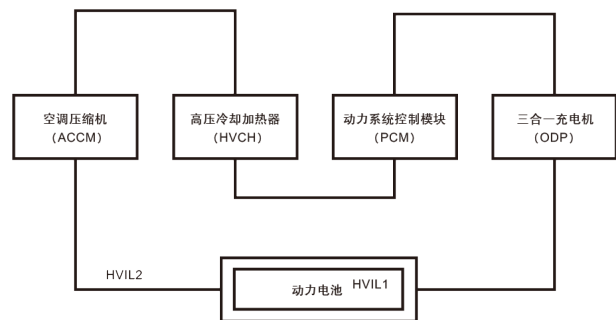


1. Press the latch 1 by hand or with a screwdriver until the high voltage connector is unplugged.

High-voltage Interlock and Insulation Detection

Each high-voltage connector is connected to a high-voltage interlock (HVIL) circuit, and high-voltage parts such as CIDD and battery pack have cover opening monitoring functions.

After the high voltage is energized, the BMS will perform insulation detection in a cyclic manner. When the insulation resistance value is found to be lower than the required resistance value, the high voltage power-off strategy will be implemented.

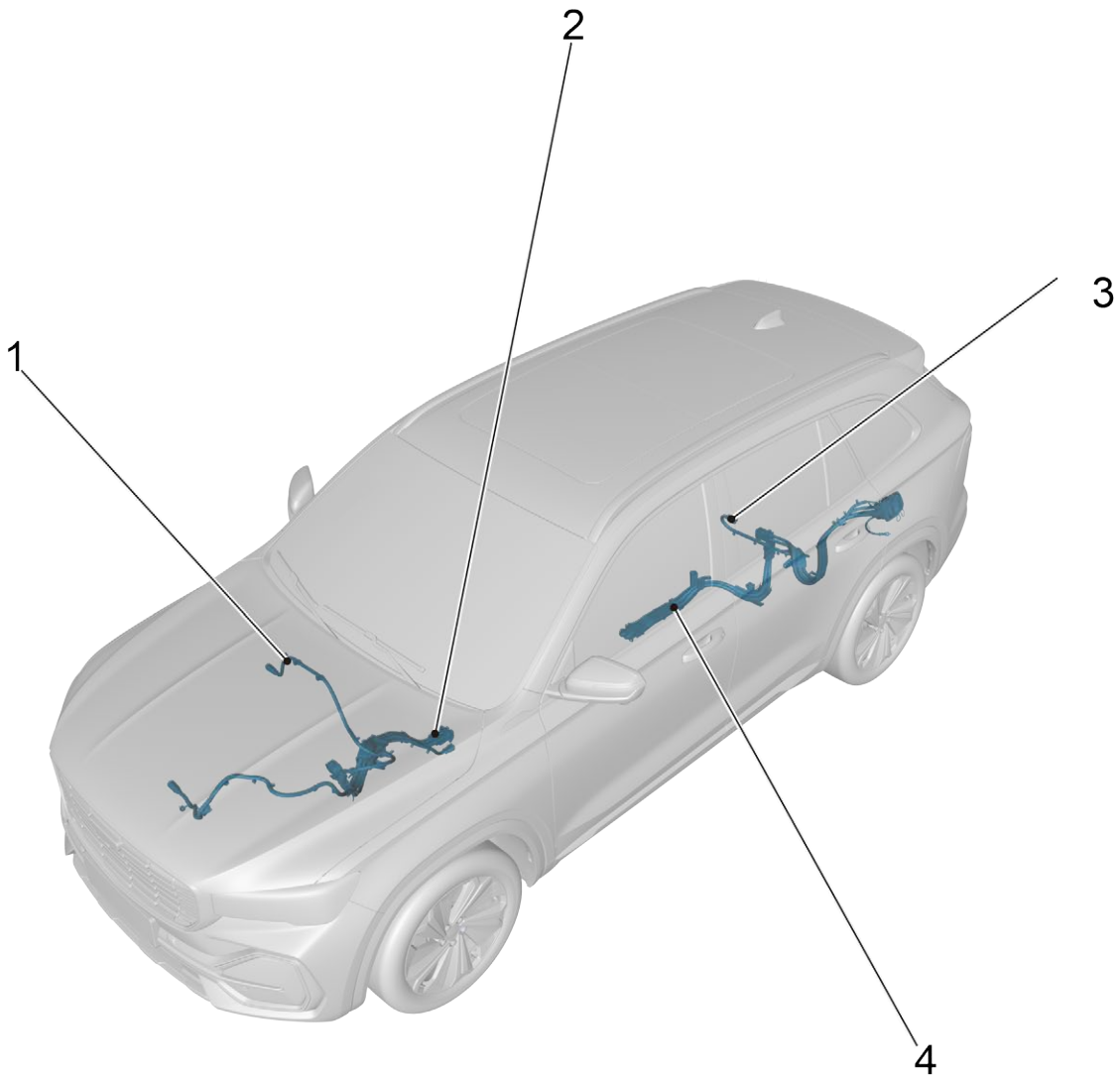


HVL1: Internal interlock circuit of battery.

HVL2: External high-voltage electrical appliance interlock circuit of battery, the diagram only illustrates the parts associated in HVL2, connected in series in the interlock circuit, without limiting the order in the circuit.

3.4.3 Part position

3.4.3.1 Part position



1. Heater harness
3. AC charging socket and harness assembly

2. DC bus assembly
4. DC charging socket and harness assembly

3.4.4 Diagnostic information and procedure

3.4.4.1 Diagnosis description

See Description and Operation and System Operating Principles before diagnosing a fault in the high voltage distribution system. Understanding and familiarizing yourself with the system functions and operating contents before beginning system diagnosis will determine the correct troubleshooting steps to take in the event of a malfunction, and more importantly, this will determine if the condition described by the customer is normal operation.

3.4.4.2 Routine inspection

- Check for aftermarket retrofitting devices to ensure that they cannot affect the proper functioning of the high-voltage distribution system.
- Check system components that are easily accessible or visible to ensure that there is no obvious damage or potential malfunction.
- Inspect the inside of the PEU to ensure that there are no foreign objects such as water or dust inside the PEU.
- Check the PEU high voltage harness and harness connectors to ensure that the harness and its connectors are not loose and that there are no signs of rust or corrosion inside.

3.4.5 Removal and Installation

3.4.5.1 Replacement of Heater Harness

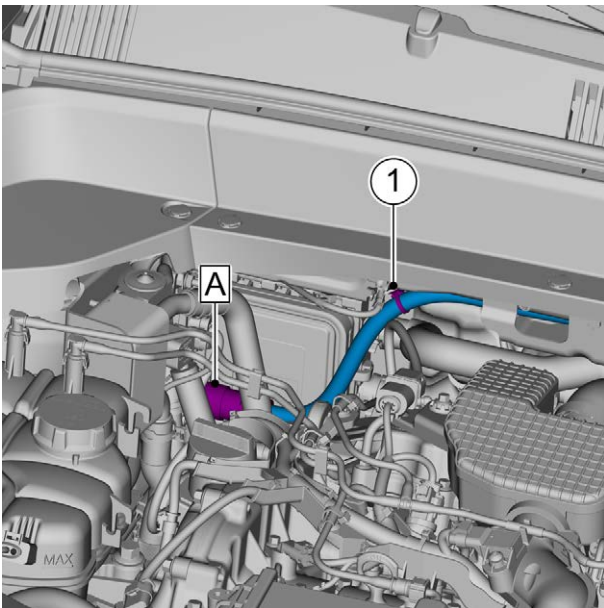
Removal Procedure

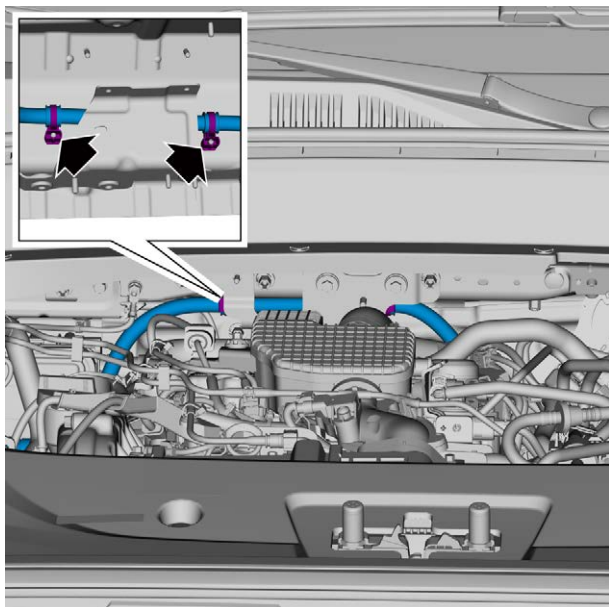
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

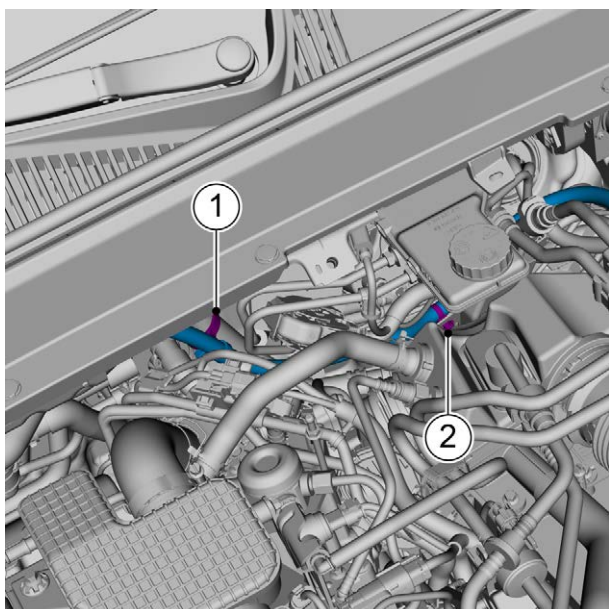
See "WARNINGS ON HIGH VOLTAGE SAFETY PRECAUTIONS" in "[WARNING AND PRECAUTION](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the engine trim cover assembly, refer to [Replacement of engine trim cover assembly](#).
- 3 Remove the heat shield, see [Replacement of Heat Shield](#).
- 4 Perform the normal power outage process for the high voltage system, see [Normal Power Outage Process for High Voltage System](#).
- 5 Disconnect the harness connector (heater end) A of the heater harness.
- 6 Remove the harness clip 1 of the heater harness.



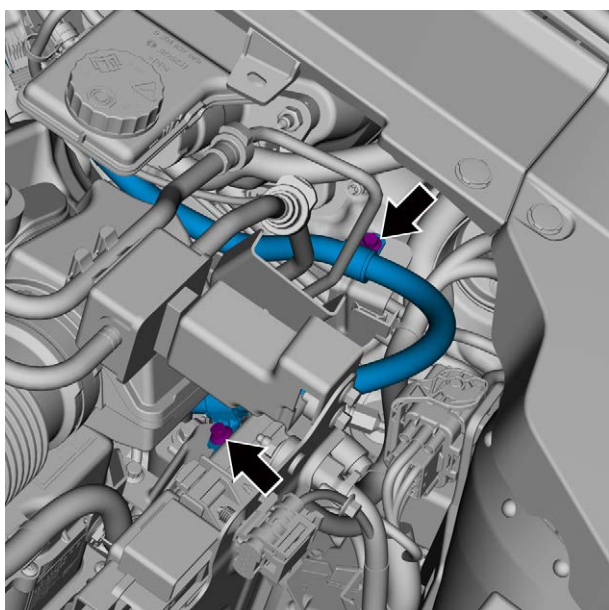


- 7 Remove the two harness clips of the heater harness.

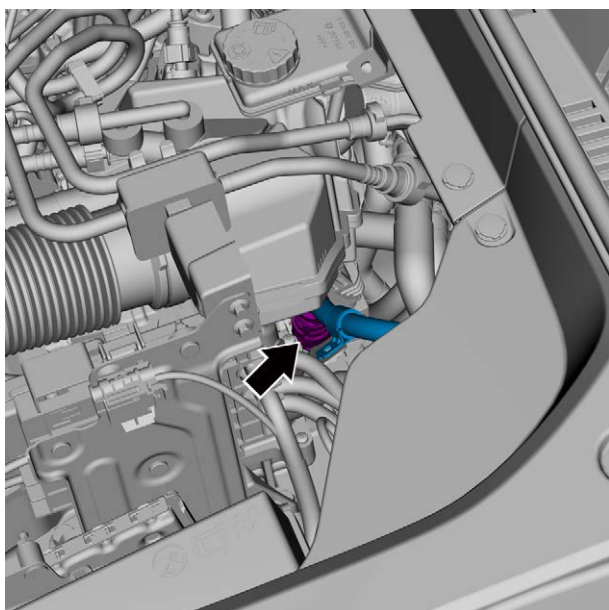


- 8 Disengage the harness clip 1 of the heater harness.

- 9 Remove the harness clip 2 of the heater harness.



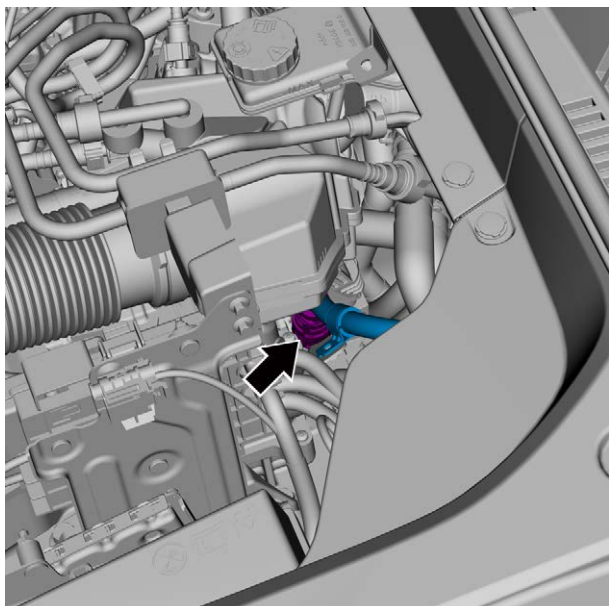
- 10 Remove the two fixing bolts of the heater harness.

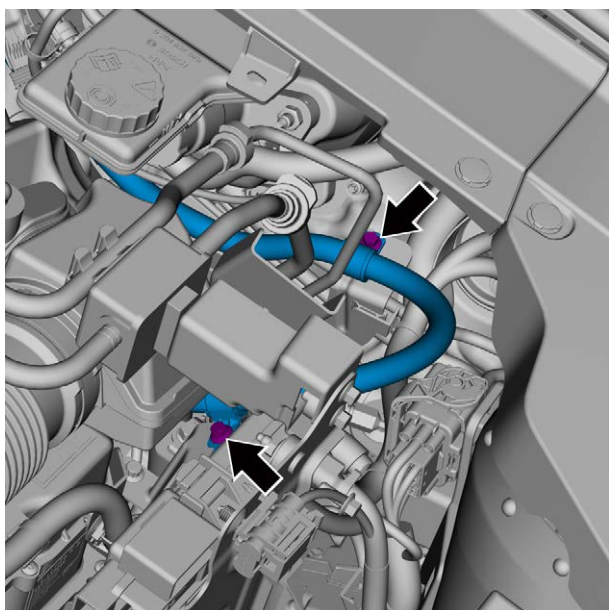


- 11 Disconnect the harness connector (power control module end) from the heater harness.
- 12 Take off the heater harness.

Installation Procedure

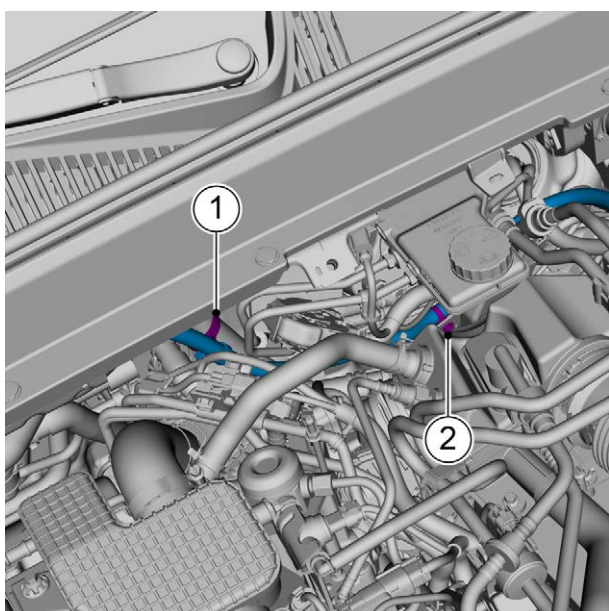
- 1 Install the heater harness.
- 2 Connect the harness connector (power control module end) of the heater harness.





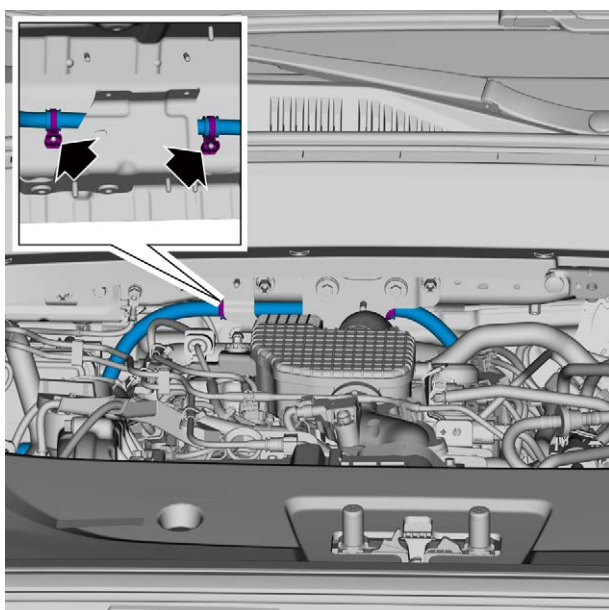
- 3 Install and tighten the two fixing bolts of the heater harness.

Torque: 10N·m

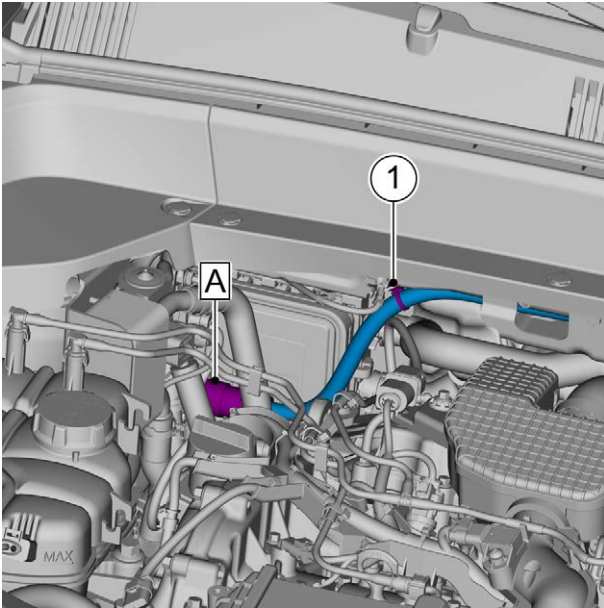


- 4 Install the harness clip 2 of the heater harness.

- 5 Install the harness clip 1 of the heater harness.



- 6 Install the two harness clips of the heater harness.



- 7 Install the harness clip 1 of the heater harness.
- 8 Connect the harness connector (heater end) A of the heater harness.

- 9 Carry out the normal power-on process of the high voltage system, see [Normal Power-on Process of High Voltage System](#).
- 10 Install the heat shield.
- 11 Install the engine trim cover assembly.
- 12 Connect the negative cable of battery.

3.4.5.2 Replacement of DC Bus Assembly

Removal Procedure

Warning !

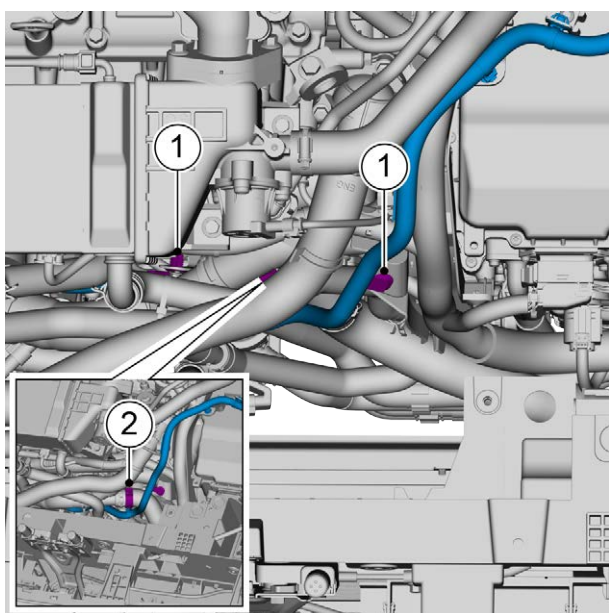
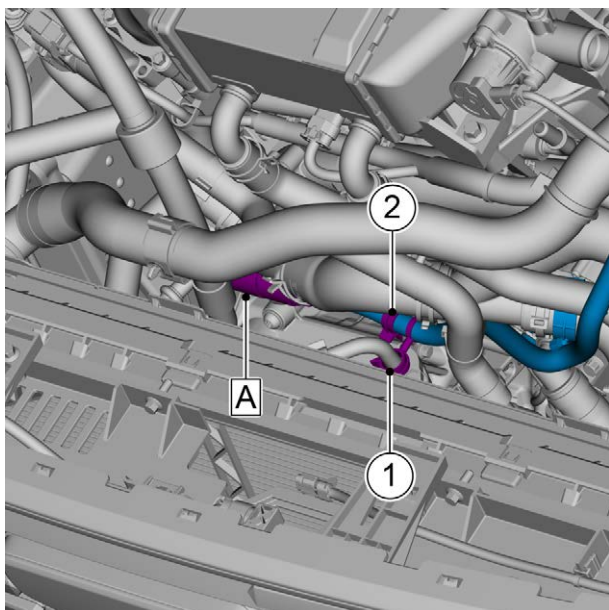
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

Warning !

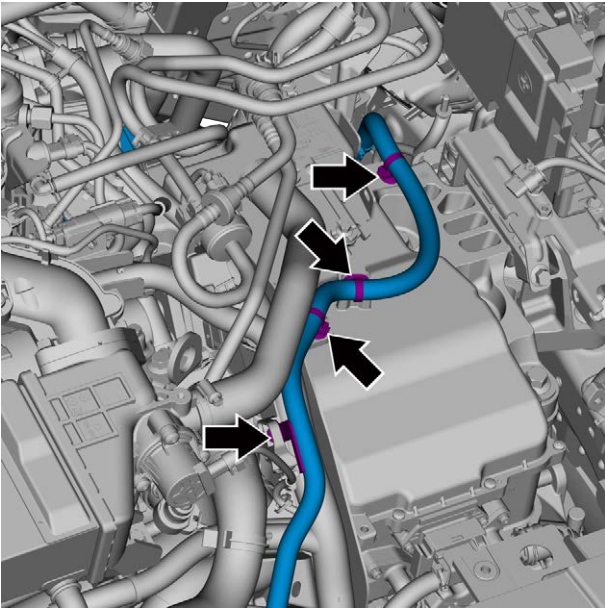
See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

See "WARNINGS ON HIGH VOLTAGE SAFETY PRECAUTIONS" in "[WARNING AND PRECAUTION](#)"

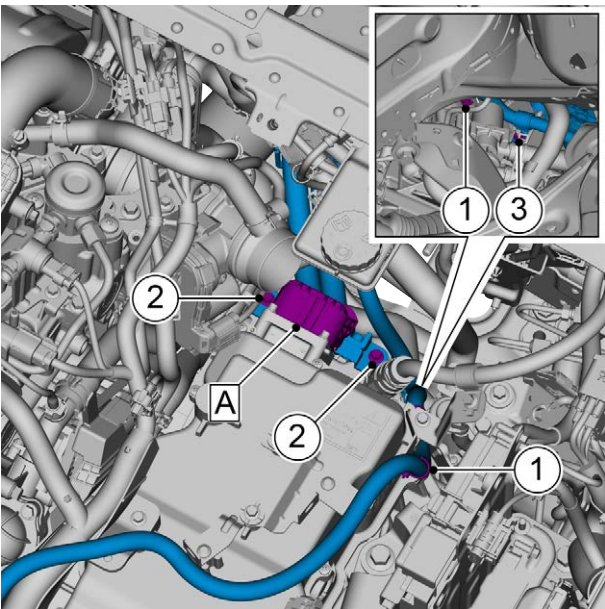
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Perform the normal power outage process for the high voltage system, see [Normal Power Outage Process for High Voltage System](#).
- 3 Remove the air filter assembly, see [Replacement of Air Filter Assembly](#).
- 4 Remove the air filter intake pipe assembly. refer to [Replacement of air filter intake pipe assembly](#).



- 5 Remove the resonance box assembly, see [Replacement of Resonance Box Assembly](#).
- 6 Remove the engine cooling fan, see [Replacement of Engine Cooling Fan](#).
- 7 Disconnect the harness connector (electric compressor end) A of the DC bus assembly.
- 8 Disengage the wiring harness clips 1 of the DC bus assembly.
- 9 Disconnect the harness clips 2 from the engine wiring harness.
- 10 Remove the two harness clips 1 of the DC bus assembly.
- 11 Disengage the wiring harness clips 2 of the DC bus assembly.

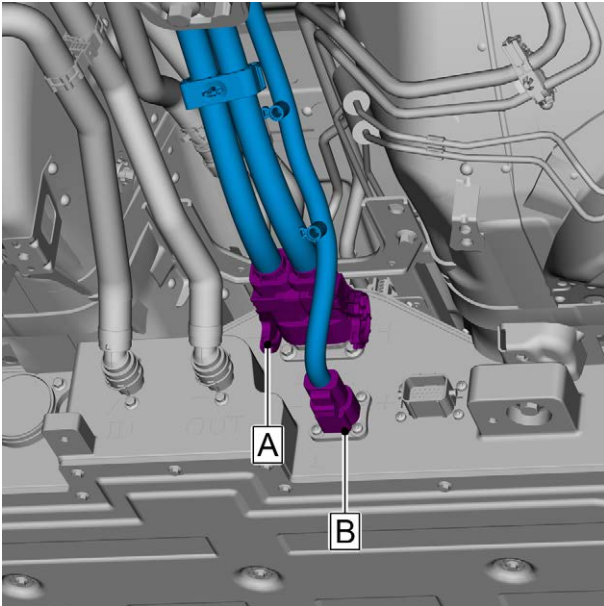


- 12 Remove the four harness clips of the DC bus assembly.

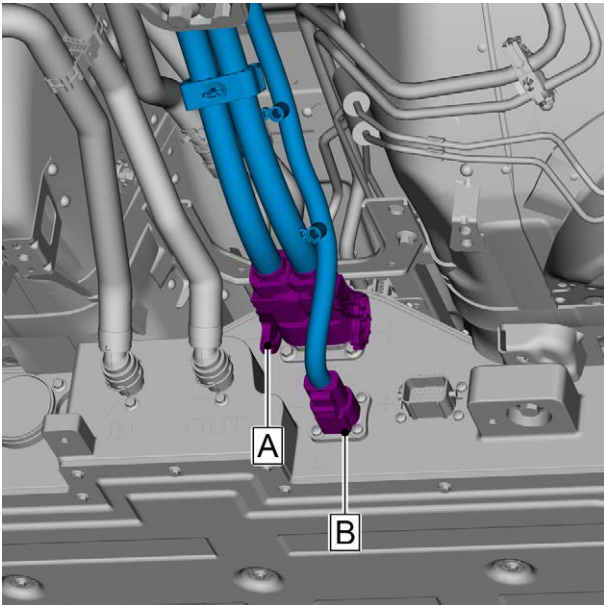


- 13 Disconnect the harness connector A of the DC bus assembly.
- 14 Remove the two harness clips 1 of the DC bus assembly.
- 15 Remove the two fixing bolts 2 of the DC bus assembly.
- 16 Remove the fixing nuts 3 of the DC busbar assembly.

- 17 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 18 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 19 Remove the front channel heat shield (2), see [Replacement of Front Channel Heat Shield \(2\)](#).

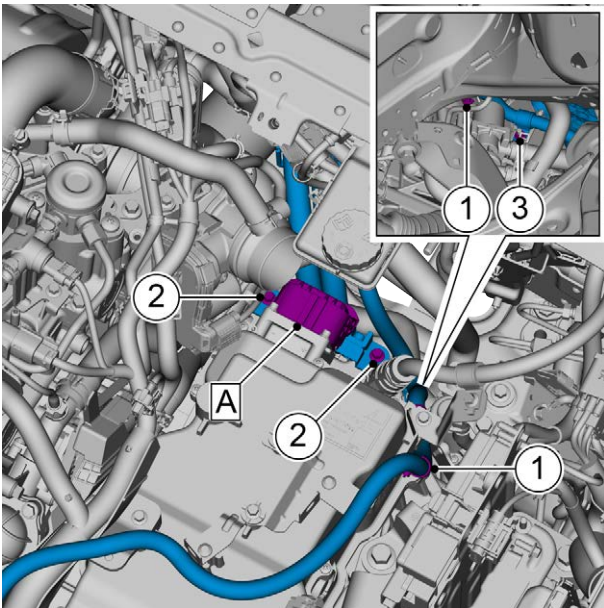


- 20 Disconnect the harness connector A of the DC bus assembly.
- 21 Disconnect the harness connector B of the DC bus assembly.
- 22 Take off the DC bus assembly.

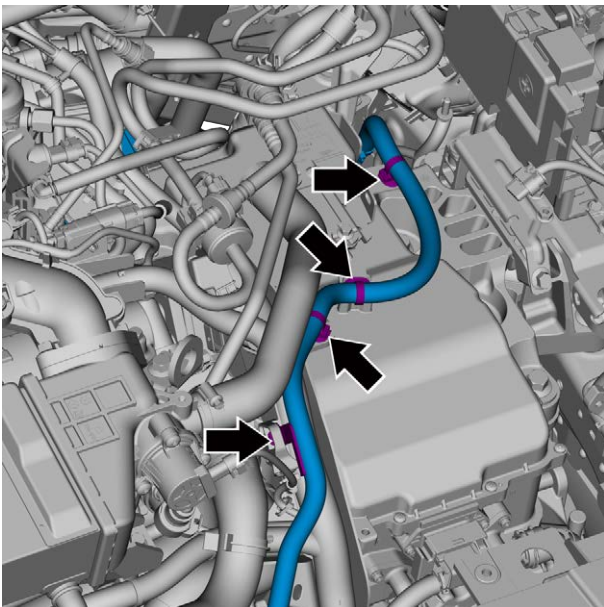


Installation Procedure

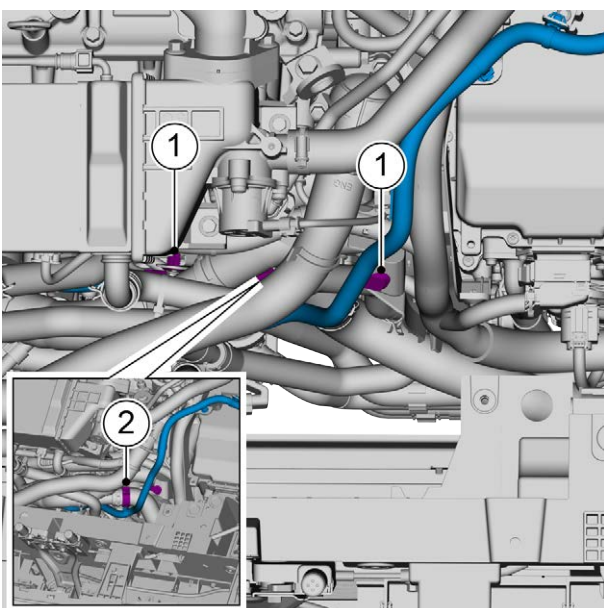
- 1 Install the DC bus assembly.
 - 2 Connect the harness connector B of the DC bus assembly
 - 3 Connect the DC bus assembly harness connector A.
-
- 4 Install the front channel heat shield (2).
 - 5 Install the bottom engine guard assembly.
 - 6 lower the vehicle.



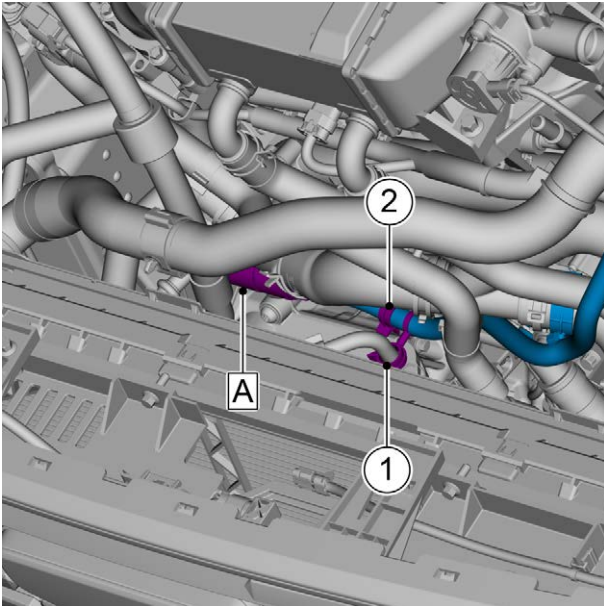
- 7 Install and tighten the fixing nuts 3 of the DC bus assembly.
Torque: 10 N·m
- 8 Install and tighten the two fixing bolts 2 of the DC bus assembly.
Torque: 10 N·m
- 9 Install the two harness clips 1 of the DC bus assembly.
- 10 Connect the DC bus assembly harness connector A.



- 11 Install the four harness snaps of the DC bus assembly.



- 12 Install the harness snap 2 of the DC bus assembly.
- 13 Install the two harness clips 1 of the DC bus assembly.



- 14 Install the harness clip 2 of the engine harness.
- 15 Install the harness snap 1 of the DC bus assembly.
- 16 Connect the harness connector (electric compressor end) A of the DC bus assembly.

- 17 Install the engine cooling fan.
- 18 Install the resonance box assembly.
- 19 Install the air filter intake pipe assembly.
- 20 Install the air filter assembly.
- 21 Perform the normal power-on process for the high voltage system, see [Normal Power-on/off Process of High Voltage System](#).
- 22 Connect the negative cable of battery.

3.4.5.3 Replacement of AC Charging Socket and Wiring Harness Assembly

Removal Procedure

Warning !

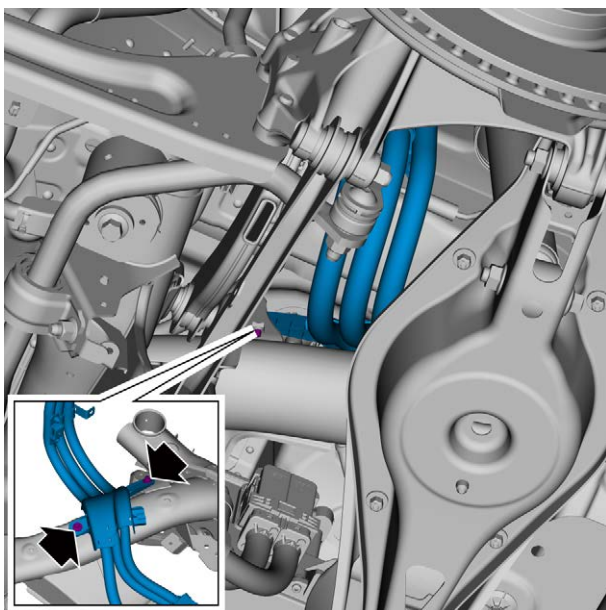
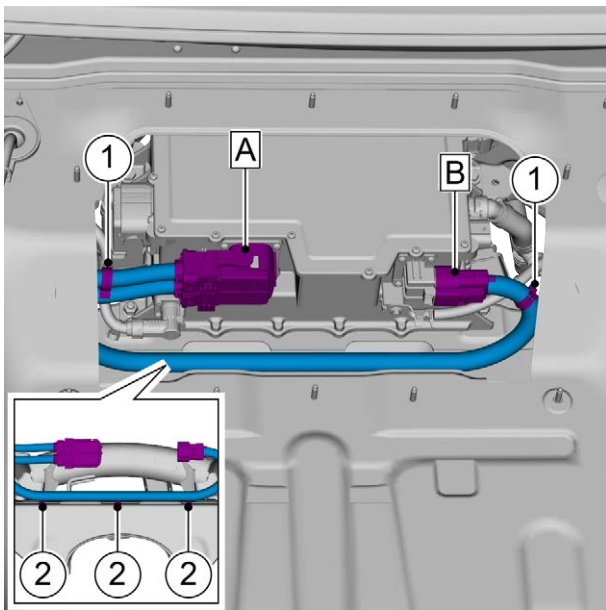
Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#).

Warning !

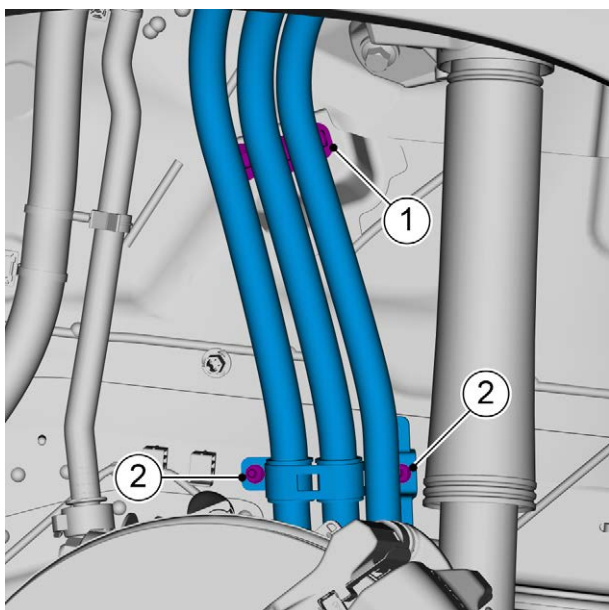
See "WARNINGS ABOUT VEHICLE LIFT" in ["WARNINGS AND PRECAUTIONS"](#)

See "WARNINGS ON HIGH VOLTAGE SAFETY PRECAUTIONS" in ["WARNING AND PRECAUTION"](#)

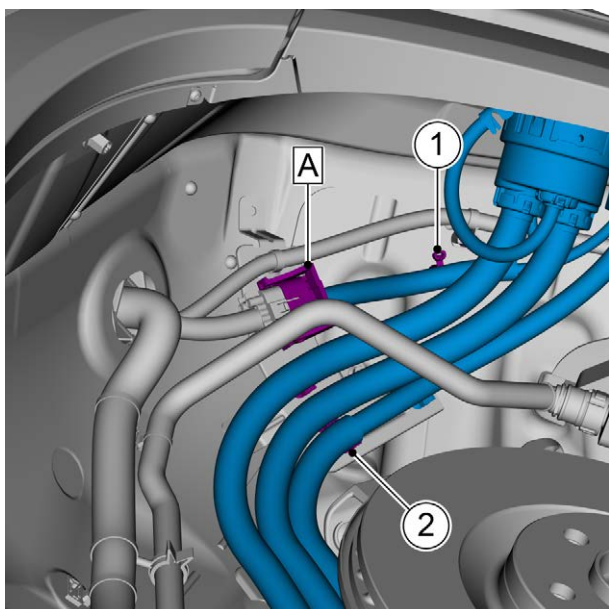
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Perform the normal power outage process for the high voltage system, see [Normal Power Outage Process for High Voltage System](#).



- 3 Lift the vehicle, see [Vehicle Lifting](#).
- 4 Remove the rear left wheel cover fender assembly, see [Replacement of Rear Left Wheel Cover Fender Assembly](#).
- 5 Remove the DC socket cover in the electric vehicle, see [Replacement of DC Socket Cover in Electric Vehicle](#).
- 6 Remove the rear left suspension guard, see [Replacement of Rear Left Suspension Guard](#).
- 7 Remove the battery access cover, see [Replacement of Battery Access Cover](#).
- 8 Disconnect the harness connector A and B of the on-board charger module.
- 9 Disconnect the two harness clips 1 between the AC charging socket and the harness assembly.
- 10 Remove the three harness clips 2 between the AC charging socket and the harness assembly.
- 11 Remove the two fixing bolts between the AC charging socket and the harness assembly.

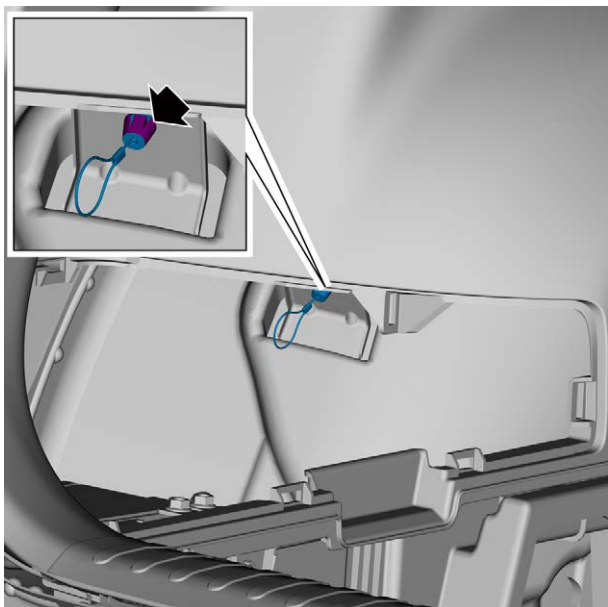


- 12 Remove the harness clips 1 between the AC charging socket to the harness assembly.
- 13 Remove the two fixing nuts 2 between the AC charging socket and harness assembly.

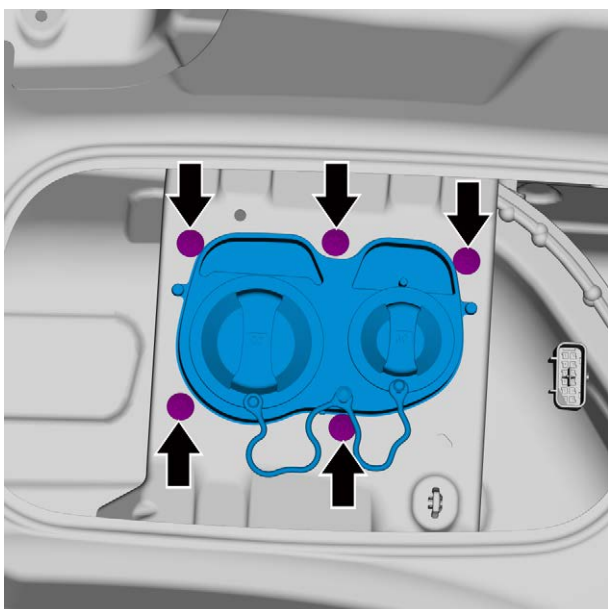


- 14 Remove the harness clips 1 between the AC charging socket to the harness assembly.
- 15 Remove the harness clips 2 between the AC charging socket to the harness assembly.
- 16 Disconnect the harness connector A between the AC charging socket and the harness assembly.

- 17 Remove the left luggage compartment trim panel access covers, refer to [Replacement of left luggage compartment trim panel access cover](#).

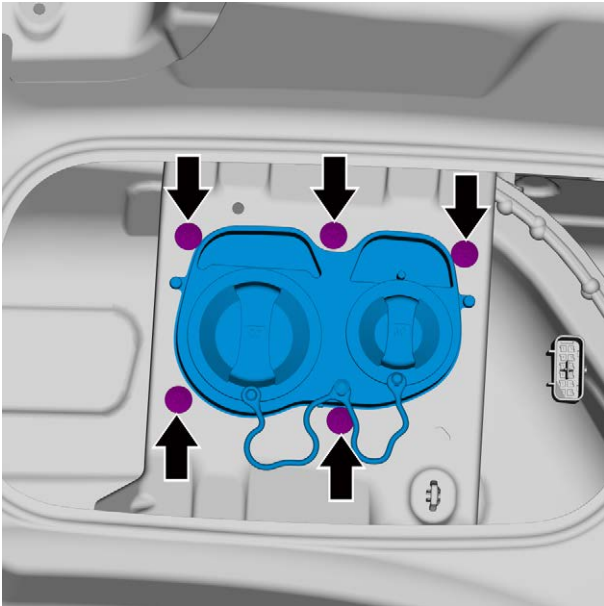


- 18 Remove the inhaul cable section between the AC charging socket and the harness assembly.

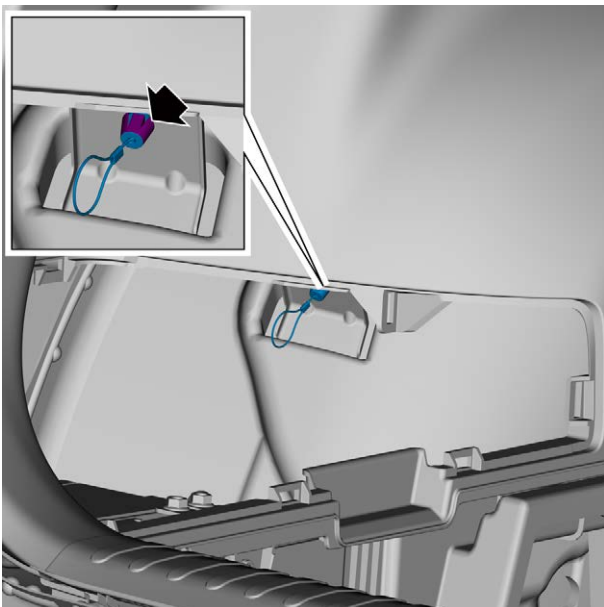


- 19 Remove the five fixing bolts between the AC charging socket and the harness assembly, and take off the AC charging socket and the harness assembly.

Installation Procedure

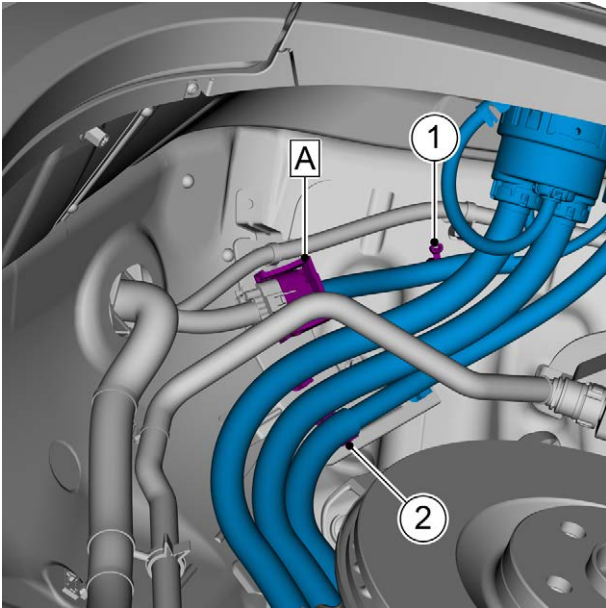


- 1 Install the AC charging socket and the harness assembly.
- 2 Install and tighten the five fixing bolts between the AC charging socket and the harness assembly.
Torque: 10N·m

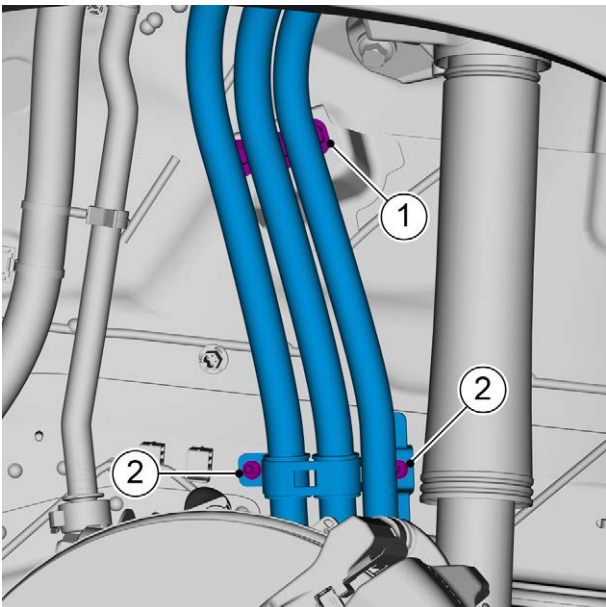


- 3 Install the inhaul cable portion between the AC charging socket and the harness assembly.

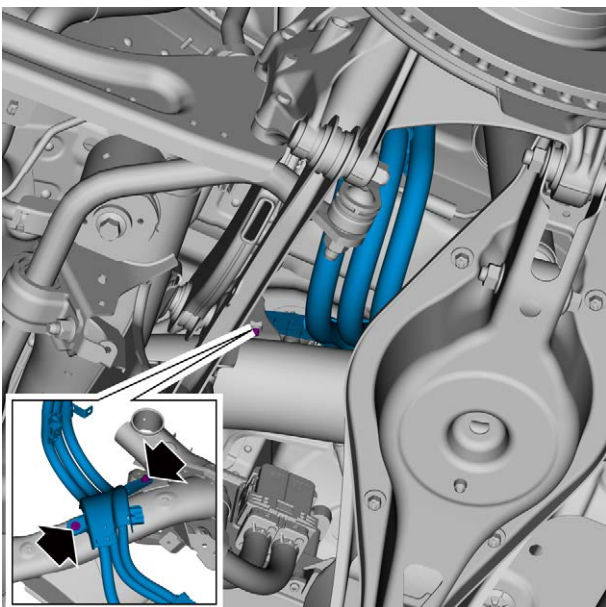
- 4 Install the left luggage compartment trim panel access cover.



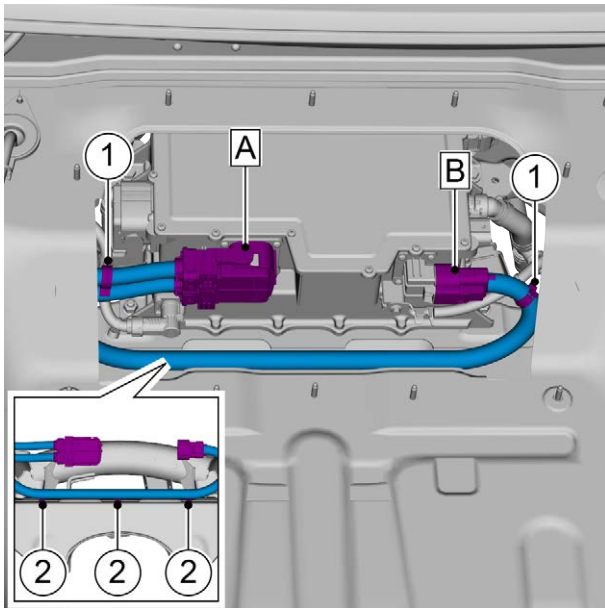
- 5 Connect the harness connector A between the AC charging socket and the harness assembly.
- 6 Install the harness clip 2 between the AC charging socket and the harness assembly.
- 7 Install the harness clip 1 between the AC charging socket and the harness assembly.



- 8 Install and tighten the two fixing nuts 2 between the AC charging socket and the harness assembly.
Torque: 10N·m
- 9 Install the harness clip 1 between the AC charging socket and the harness assembly.



- 10 Install and tighten the two fixing bolts between the AC charging socket and the harness assembly.
Torque: 10N·m



- 11 Install the three harness clips 2 between the AC charging socket and the harness assembly.
- 12 Install the two harness clips 1 between the AC charging socket and the harness assembly.
- 13 Connect the harness connectors A and B of the on-board charger module.
- 14 Install the battery access cover.
- 15 Install the rear left suspension guard.
- 16 Install the electric vehicle DC socket cover.
- 17 Install the rear left wheel cover fender assembly.
- 18 lower the vehicle.
- 19 Perform the high voltage system power-on procedure, see [High Voltage System Power-on Procedure](#).
- 20 Connect the negative cable of battery.

3.4.5.4 Replacement of DC Charging Socket and Harness Assembly

Removal Procedure

Warning !

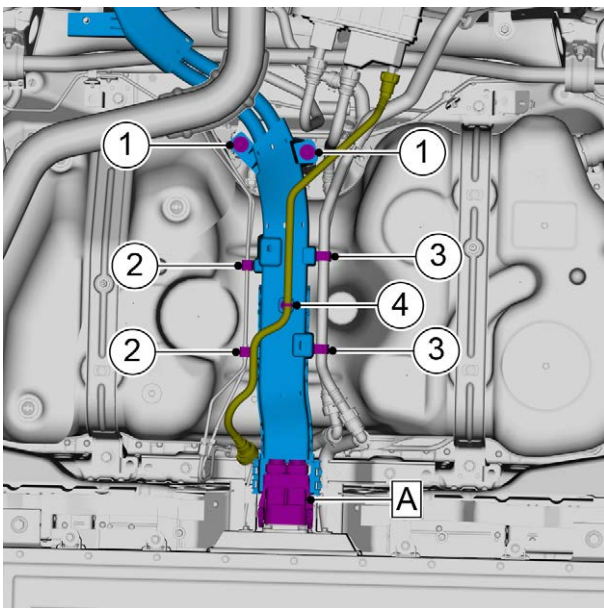
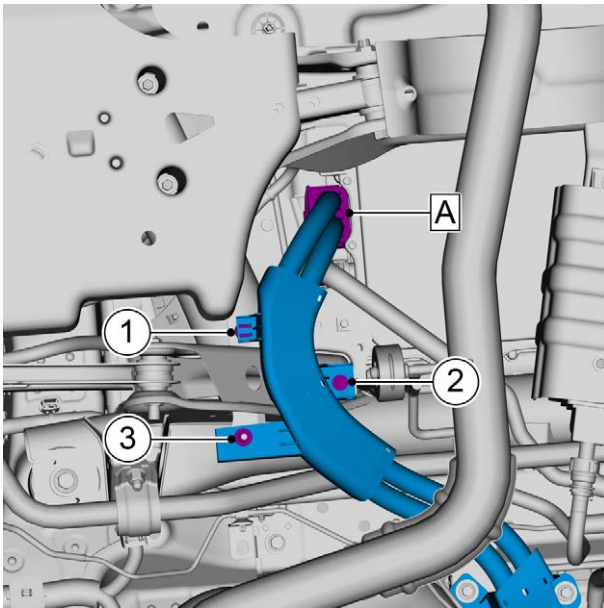
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

Warning !

See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

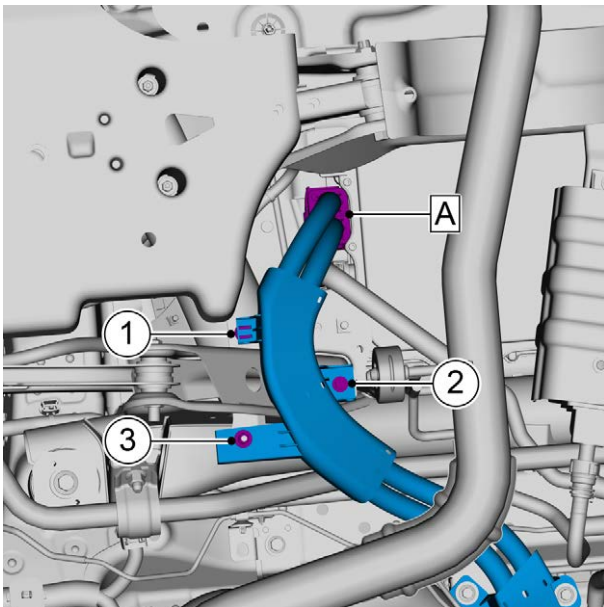
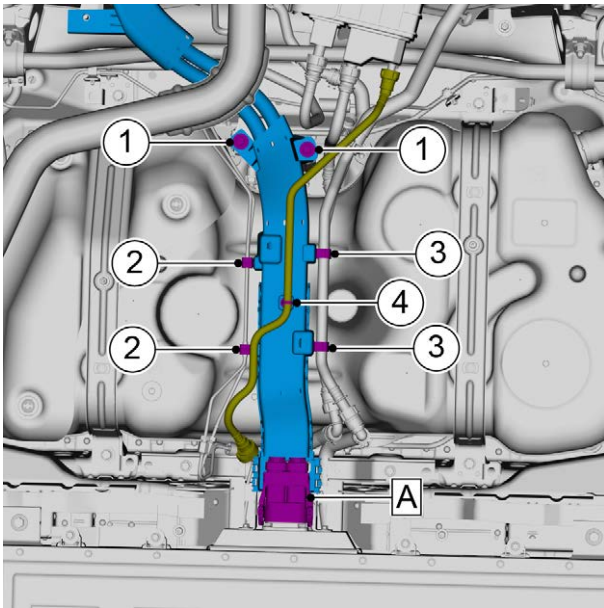
See "WARNINGS ON HIGH VOLTAGE SAFETY PRECAUTIONS" in "[WARNING AND PRECAUTION](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Perform the normal power outage process for the high voltage system, see [Normal Power Outage Process for High Voltage System](#).
- 3 Lift the vehicle, see [Vehicle Lifting](#).



- 4 Remove the right bottom guard of the fuel tank, see [Replacement of Right Bottom Guard of Fuel Tank](#).
- 5 Disconnect the harness connector (on-board charger end) A of the DC charging socket and harness assembly.
- 6 Remove the harness clip 1 between the DC charging socket and the harness assembly.
- 7 Remove the fixing bolts 2 of the DC charging socket and harness assembly.
- 8 Remove the fixing nut 3 of the DC charging socket and harness assembly.
- 9 Remove the fixing bolts 1 of the DC charging socket and harness assembly.
- 10 Remove the two fixing clips 2 of the brake pipe.
- 11 Remove the two fixing clips 3 of the rear connection tube of the lower floor inlet/outlet pipe.
- 12 Remove the fixing clips 4 of the carbon canister desorption tube.
- 13 Disconnect the harness connector (hybrid power battery assembly end) A of the DC charging socket and harness assembly.
- 14 Remove the DC charging socket and harness assembly.

Installation Procedure



- 1 Install the DC charging socket and wiring harness assembly.
- 2 Connect the harness connector (hybrid power battery assembly) of the DC charging socket and harness assembly.
- 3 Install the fixing clips 4 of the carbon canister desorption tube.
- 4 Install the two fixing clips 3 of the rear connection tube of the lower floor inlet/outlet pipe.
- 5 Install the two fixing clips 2 of the brake pipe.
- 6 Install and tighten the fixing bolts 1 of the DC charging socket and harness assembly.
Torque: 30N·m
- 7 Install and tighten the fixing nuts 3 of the DC charging socket harness assembly.
Torque: 10N·m
- 8 Install and tighten the fixing bolts 2 of the DC charging socket and harness assembly.
Torque: 10N·m
- 9 Install the harness clips 1 of the DC charging socket and harness assembly.
- 10 Connect the harness connector (on-board charger end) A of the DC charging socket and harness assembly.
- 11 Install the right bottom guard of the fuel tank.
- 12 lower the vehicle.
- 13 Perform the high voltage system power-on procedure, see [High Voltage System Power-on Procedure](#).
- 14 Connect the negative cable of battery.

3.5 Charging system

3.5.1 Specification

3.5.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Fixing bolts between on-board charger module and rear subframe	M8×25	20-28
Fixing nuts between on-board charger module and rear subframe	M8	20-28
Fixing bolts between on-board charger grounding wire and on-board charger module	M6×16	8.5-11.5

3.5.1.2 Specification for On-board Charger Module

Item	Unit	Parameter
Model	-	VAILD62442
Charging mode	-	First constant current charging then constant voltage charging
Rated input voltage	V	220
Input current	A	32
Frequency	Hz	40-70
Output voltage	V	250-500
Output current	A	22
Power	kW	6.6

3.5.2 Description and Operation

3.5.2.1 Description and Operation

1. Overview

The charging system can be functionally divided into three items, including slow charging, low voltage charging and energy recovery.

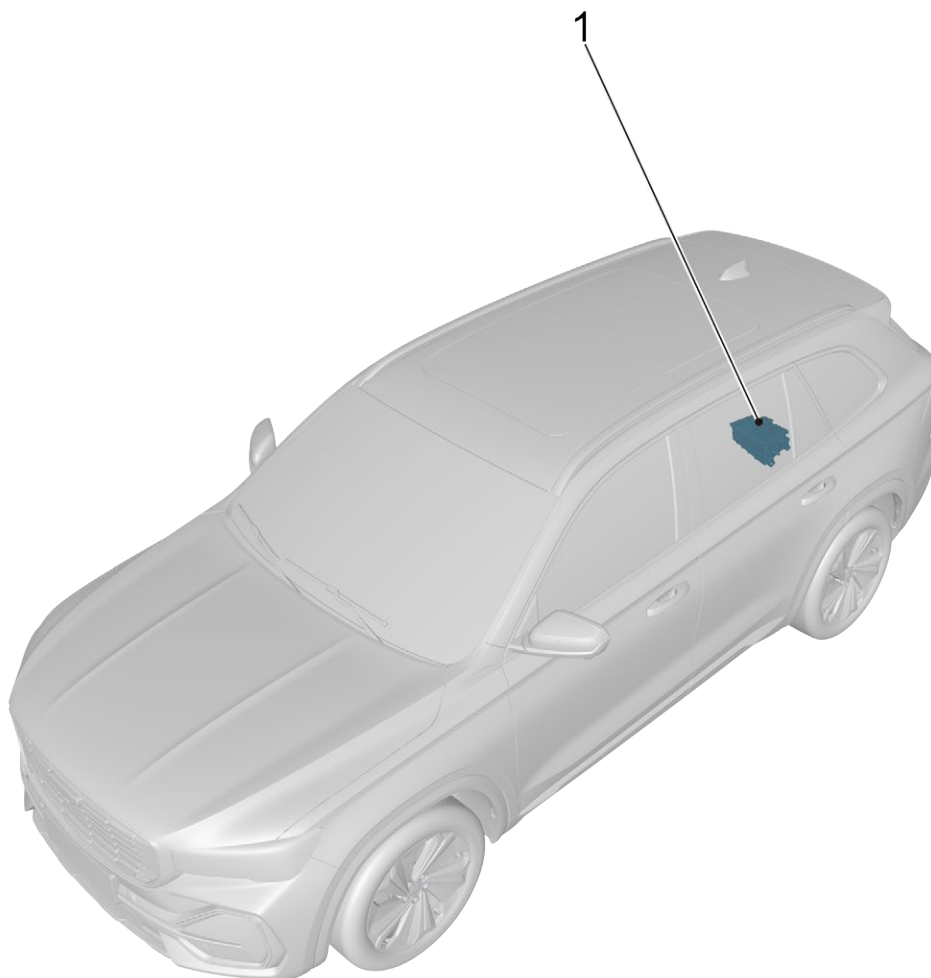
The AC charging port is installed on the rear left side of the body. When charging, connect the AC charging plug and start charging after the correct connection. The charging port is connected to form a detection circuit. Therefore when there is a connection fault, the system can detect the fault.

2. Charging Port Cover

The charging port cover is located on the rear left side of the vehicle.

3.5.3 Part position

3.5.3.1 Location Diagram of Charging System Components



1. On-board charger module

3.5.4 Removal and Installation

3.5.4.1 Replacement of On-board Charger Module

Removal Procedure

Warning !

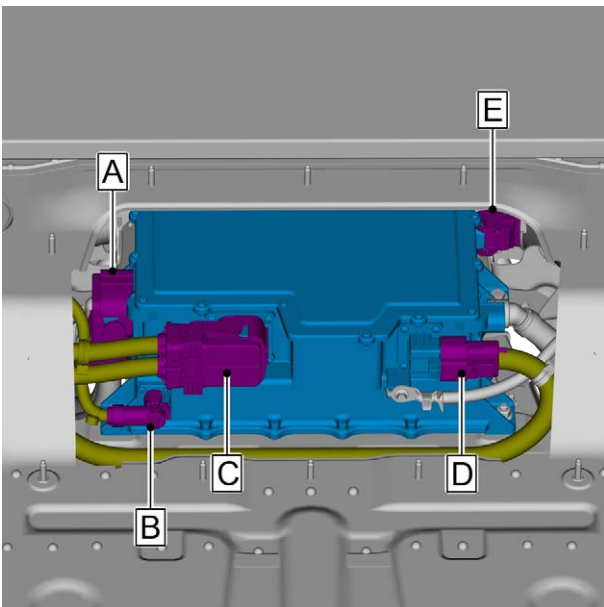
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

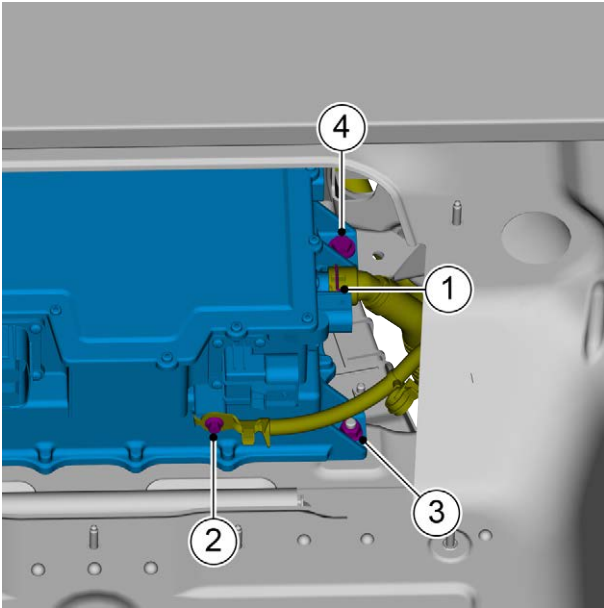
Warning !

See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

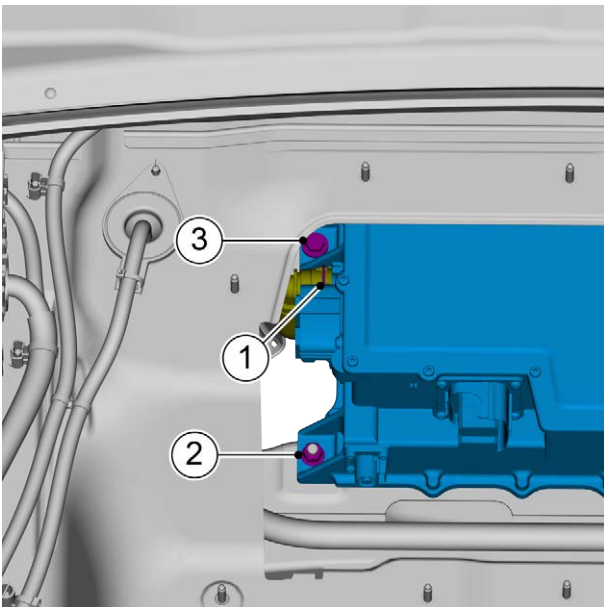
See "WARNINGS ON HIGH VOLTAGE SAFETY PRECAUTIONS" in "[WARNING AND PRECAUTION](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Perform the normal power outage process for the high voltage system, see [Normal Power Outage Process for High Voltage System](#).
- 3 Remove the battery access cover, see [Replacement of Battery Access Cover](#).
- 4 Disconnect the harness connector A of the on-board charger module.
- 5 Disconnect the harness connector B of the on-board charger module.
- 6 Disconnect the harness connector C of the on-board charger module.
- 7 Disconnect the harness connector D of the on-board charger module.
- 8 Disconnect the harness connector E of the on-board charger module.



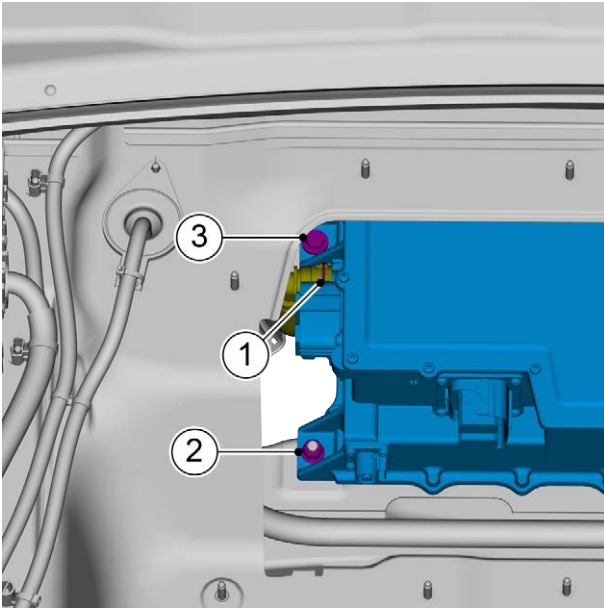


- 9 Disconnect the drive motor inlet pipe from the on-board charger module by removing the quick-insertion circlip 1 of the drive motor inlet pipe.
- 10 Remove the fixing bolts 2 of the grounding wire.
- 11 Remove the fixing nuts 3 of the on-board charger module.
- 12 Remove the fixing bolts 4 of the on-board charger module.

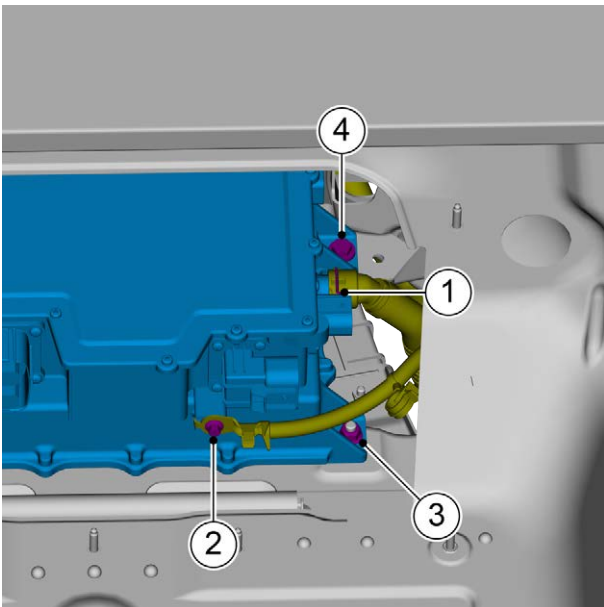


- 13 Remove the quick-insertion circlip 1 of the drive motor outlet pipe (1), and disconnecting the drive motor outlet pipe (1) from the on-board charger module.
- 14 Remove the fixing nuts 2 of the on-board charger module.
- 15 Remove the fixing bolts 3 of the on-board charger module.
- 16 Take off the on-board charger module.

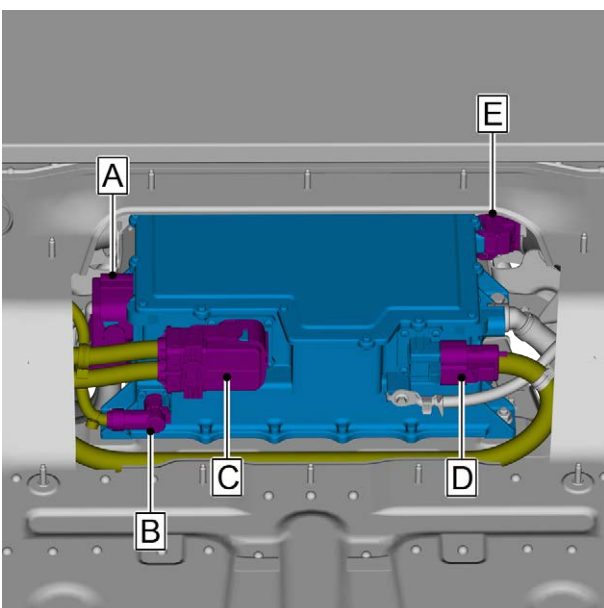
Installation Procedure



- 1 Install the on-board charger module.
- 2 Install and tighten the fixing bolts 3 of the on-board charger module.
Torque: 24N·m
- 3 Install and tighten the fixing nuts 2 of the on-board charger module.
Torque: 24N·m
- 4 Connect the drive motor outlet pipe (1) to the on-board charger module, and install the quick-insertion circlip 1 of the drive motor outlet pipe (1).



- 5 Install and tighten the fixing bolts 4 of the on-board charger module.
Torque: 24N·m
- 6 Install and tighten the fixing nuts 3 of the on-board charger module.
Torque: 24N·m
- 7 Install and tighten the fixing bolts 2 of the charger grounding wire.
Torque: 10N·m
- 8 Connect the drive motor inlet pipe to the on-board charger module, and install the quick-insertion circlip 1 of the drive motor inlet pipe.



- 9 Connect the harness connector E of the on-board charger module.
- 10 Connect the harness connector D of the on-board charger module.
- 11 Connect the harness connector C of the on-board charger module.
- 12 Connect the harness connector B of the on-board charger module.
- 13 Connect the harness connector A of the on-board charger module.

- 14 Install the battery access cover.
- 15 Carry out the normal power-on process of the high voltage system, see [Normal Power-on Process of High Voltage System](#).
- 16 Connect the negative cable of battery.

3.6 Motor Control System

3.6.1 Specification

3.6.1.1 Specification

Item	Unit	JL6482DCPHEV02	JL6482DCPHEV03
Model	-	TZ270WY000	TZ270WY000
Type	-	Permanent magnet synchronous motor	Permanent magnet synchronous motor
Rated power	kw	50	50
Peak power	kw	107	107
Rated torque	N•m	160	160
Peak torque	N•m	338	338
Rated speed	r/min	3000	3000
Peak speed	t/min	7000	7000
Drive motor layout type	-	Horizontal/Front	Horizontal/Front
Drive motor cooling method	-	Oil-cooled	Oil-cooled
Drive motor working system	-	S9	S9

3.6.2 Instructions and operations

3.6.2.1 Instructions and operations

The PCM contains a motor controller (Investor) and a transmission controller (TCM) with the following advantages:

- High integration: Inverter + TCU.
- Double-sided water cooling technology with a power density up to 30 kW/L.
- Adopting a customized IGBT module with the highest system efficiency ($\geq 99.2\%$).
- A new generation of six-core processor, which can run at 300 MHz, supports fixed-point and floating-point operations.

Realize the following functions with the help of hydraulic system by controlling the opening and closing of solenoid valve, opening degree, etc:

- Realize the transmission clutch engagement and disengagement control;
- Realize transmission automatic gear selection, mode switching and other functions;

At present, PCM has dual motor control function: P1 motor and P2 motor.

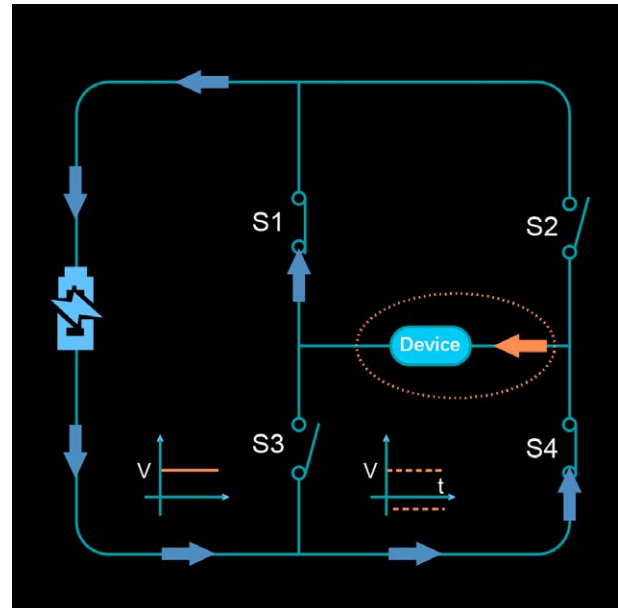
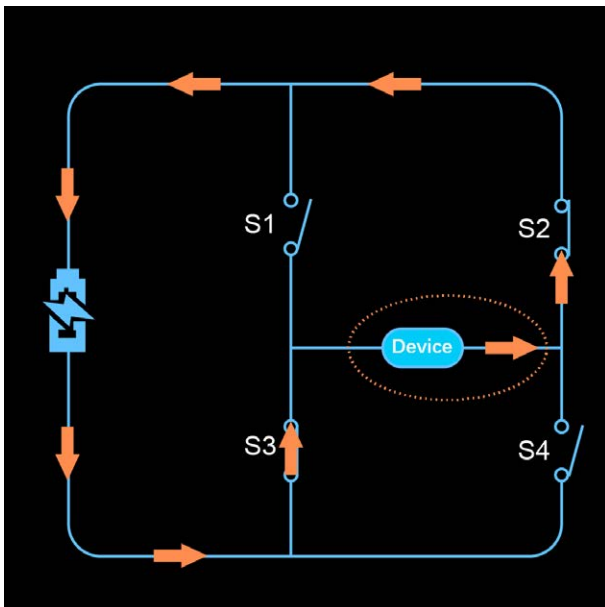
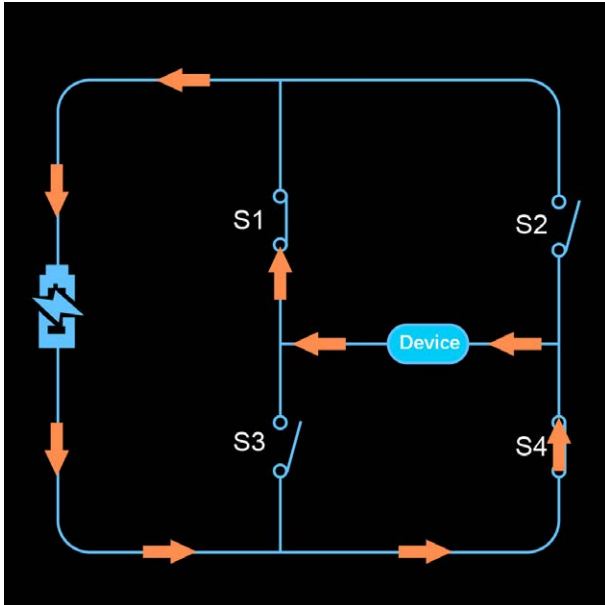
P1 motor is mainly used for starting and stopping the engine, and the engine drives the motor to carry out power generation;

P2 motor is mainly used for driving, used to provide power output for the whole vehicle.

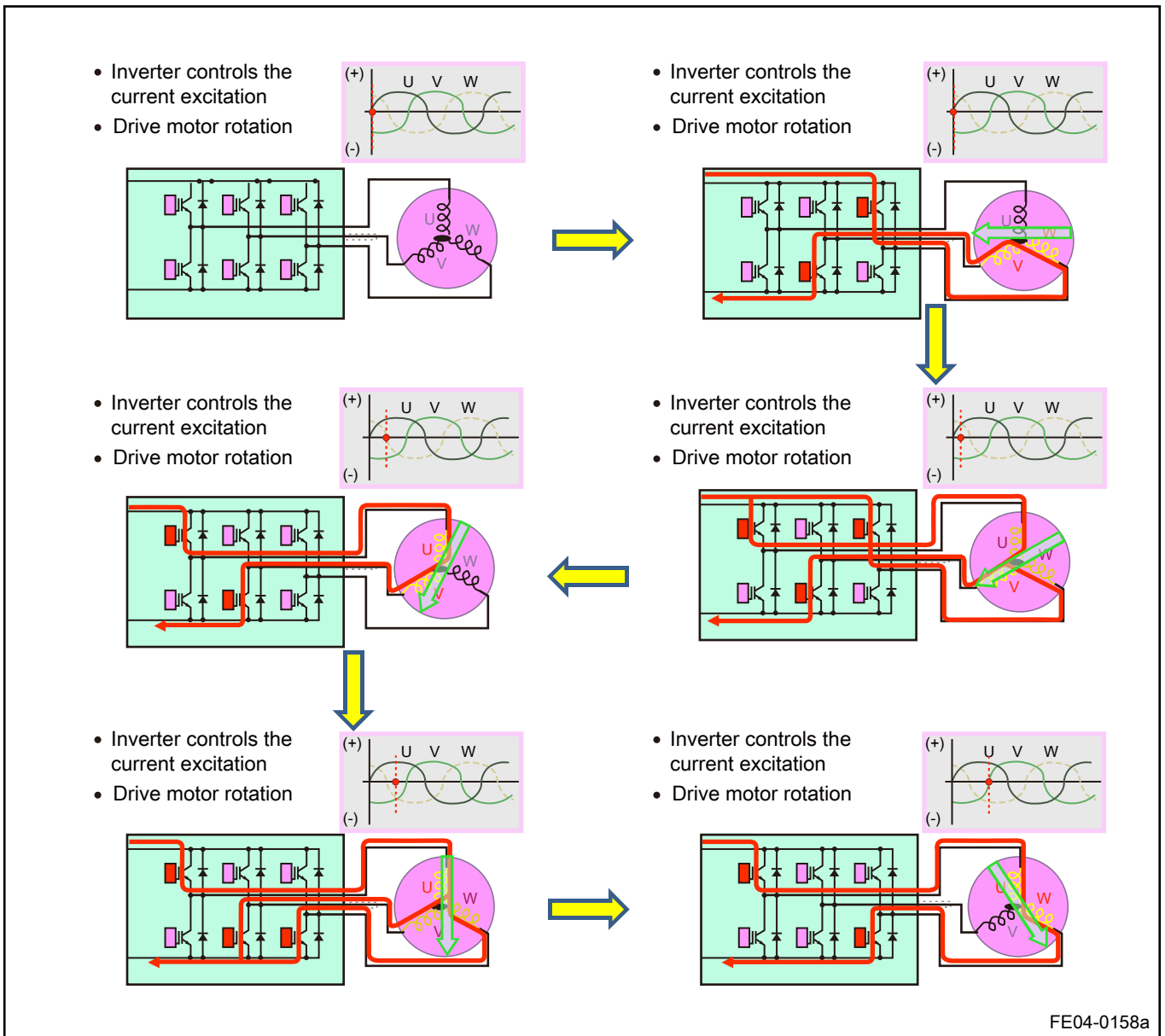
3.6.3 System working principles

3.6.3.1 System working principles

The principle for controller's direct current (DC) converted to alternating current (AC) is shown in the following figure. By controlling the opening and closing of the four switches, you can realize the battery's DC power in the end of the electrical appliances converted to AC power.

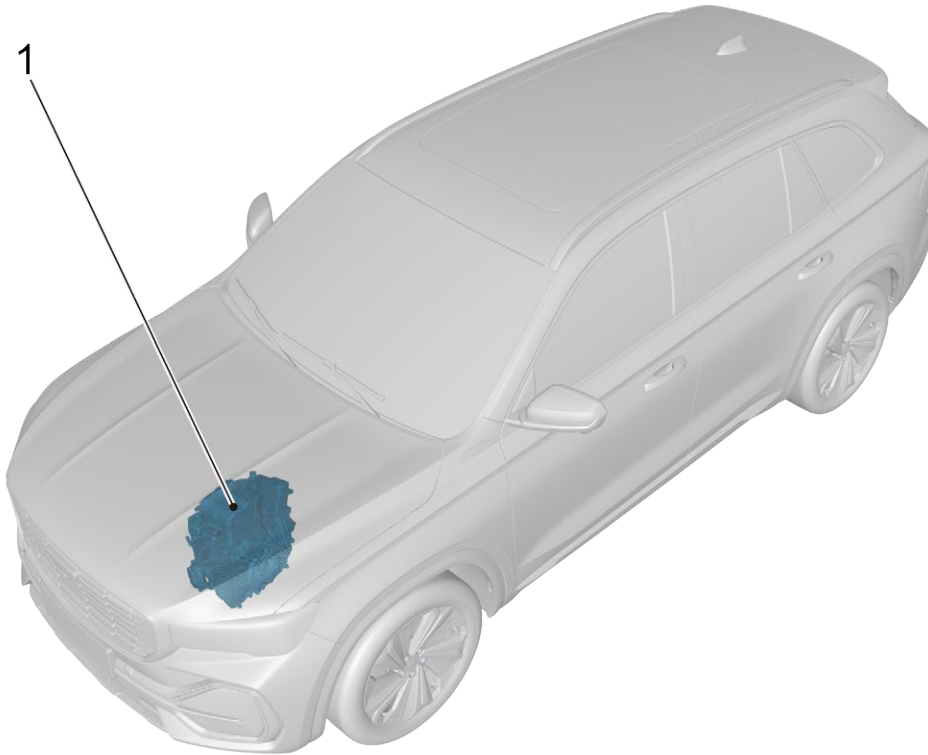


The power control module (IGBT) in the motor controller can convert the DC power from the battery pack into three-phase AC power for the motor by controlling the different combinations of opening and closing of the switches of the upper and lower bridge arms of the three IGBTs (U, V, W). Meanwhile, it controls the current magnitude and direction to control the torque and speed of the motor.



3.6.4 Part position

3.6.4.1 Part position



1. Hybrid special transmission assembly

3.6.5 Removal and Installation

3.6.5.1 Replacement of Power Control Module

Removal Procedure

See [Replacement of Hybrid Special Transmission Assembly](#).

3.7 Motor Control Cooling System

3.7.1 Specification

3.7.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Fixing nuts between electronic water pump (3) and water pump bracket	M6×7.3	8.5-11.5
Fixing nuts between electronic water pump (2) and water pump bracket	M6×7.3	8.5-11.5
Fixing bolts between three-way solenoid valve (1) and hybrid special transmission assembly	M8×20	20-28
Fixing bolts between water pump inlet pipe (4) and bracket	M6×20	8.5-11.5

3.7.2 Instructions and operations

3.7.2.1 Instructions and operations

The on-board charger not only controls the high voltage three-phase power supply from the drive motor, but also converts the high voltage DC power from the power battery into the low voltage DC power to charge the lead-acid battery. In this process, heat is generated, which needs to be dissipated through the coolant circulation to the electronic power devices to ensure that the on-board charger is working at the right temperature.

The high-speed rotation of the drive motor rotor will produce high temperatures, heat transfers through the body. If not cooled down, the drive motor can not work properly. So the drive motor body is set up with a coolant channel to carry out heat exchange with the outside through the coolant circulation. . This keeps the operating temperature of the drive motor within a certain range and prevents the drive motor from overheating.

The control cooling system of this vehicle consists of the following components:

- On-board charger
- Low temperature radiator
- Engine cooling fan
- Driving motor
- Electronic water pump
- Low temperature radiator expansion kettle
- Related piping

3.7.3 System working principles

3.7.3.1 System working principles

Electronic water pump

The electronic water pump is driven by a low voltage circuit to provide pressure for the circulation of coolant in a motor controller. The motor controller adjusts the water pump speed according to the water temperature change, gives the target speed (duty cycle) signal, and receives the actual speed (frequency) signal of the cooling water pump.

Low temperature radiator expansion kettle

The low temperature radiator expansion kettle is a transparent plastic tank similar to a windshield cleaner tank. The low-temperature radiator expansion kettle is connected to the air-liquid separator through a water pipe.

As the coolant gets warmer, it expands. Some of the coolant flows from the radiator and drive motor into the low-temperature radiator expansion kettle as it expands. Air trapped in the radiator and fluid passages is also discharged into the low-temperature radiator expansion kettle.

After the vehicle stops, the coolant automatically cools and contracts, and the previously discharged coolant is sucked back into the radiator. Thus, the coolant in the radiator is kept at a proper level and the cooling efficiency is improved.

When the cooling system is cold, the coolant level should be maintained between the Min (minimum) and Max (maximum) marks on the low-temperature radiator expansion tank.

Coolant

The coolant used in this vehicle is a ethylene glycol type of coolant conforming to Geely certification, with a freezing point $\leq -40^{\circ}\text{C}$. The use of ordinary water is prohibited. The coolant filling volume is 8.5 L for the engine circuit and 9.3 L for the battery circuit.

Warning !

The coolant used in the cooling system is made of the same material as the warm air coolant used in the air conditioning system.

Engine cooling fan

Installed at the rear of the radiator in the engine compartment, the engine cooling fan assembly increases the amount of ventilation to the radiator and air conditioning condenser, which helps to speed up the cooling rate when the vehicle is running at low speeds.

Warning !

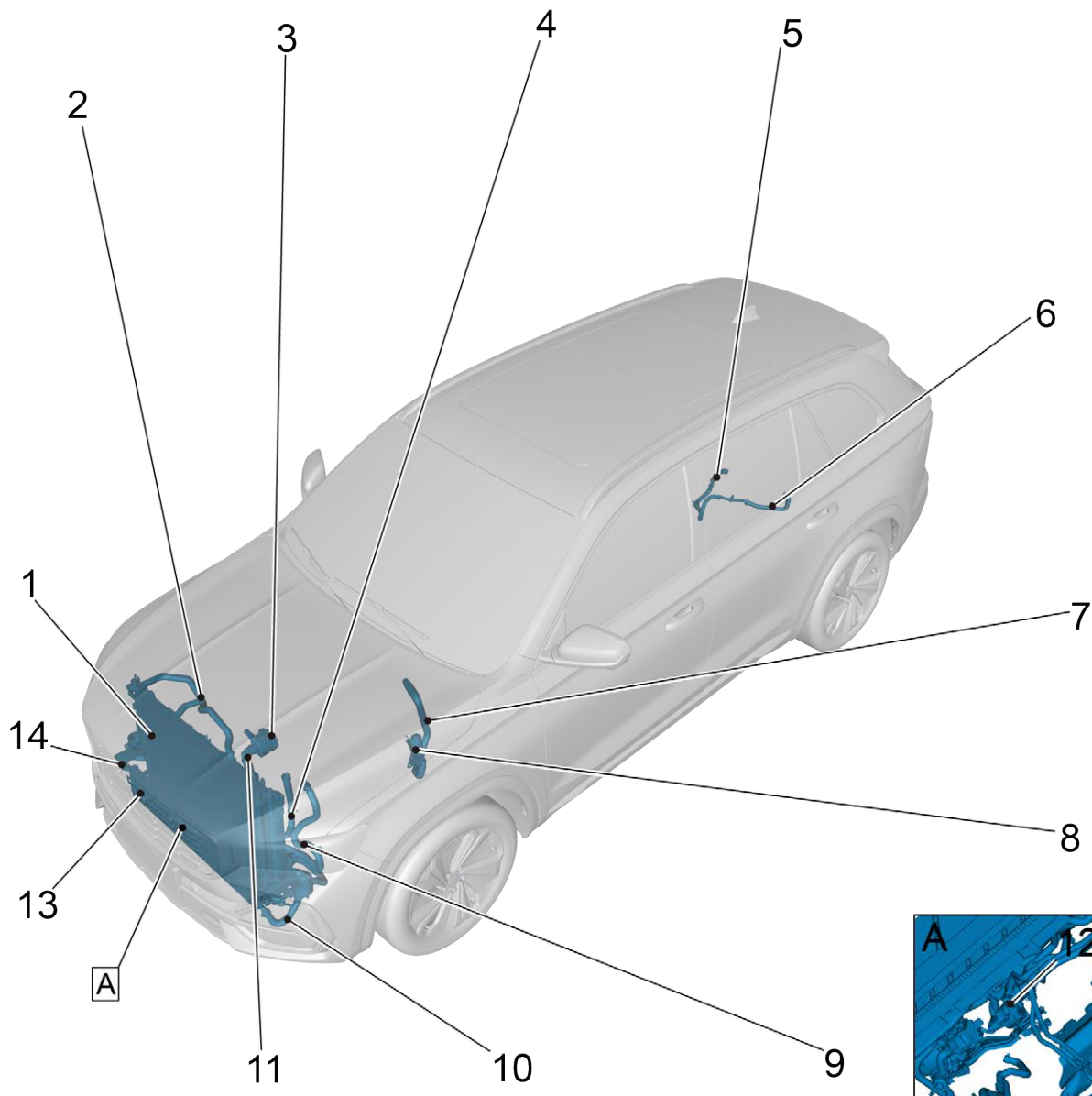
Even when the vehicle is running, the engine cooling fan under the compartment can activate and injure someone. Keep hands, clothing and tools away from the electric fan under the compartment.

If the fan blades are bent or damaged in any way, do not repair or reuse the damaged parts. The bent or damaged fan blades must be replaced.

Damaged fan blades do not ensure proper balance and can fail and fly off during continuous use, which is very dangerous.

3.7.4 Part position

3.7.4.1 Part position



- | | |
|--------------------------------|-------------------------------------|
| 1. Radiator (rear) | 8. Three-way solenoid valve (1) |
| 2. Radiator inlet pipe (2) | 9. Transmission inlet pipe |
| 3. Battery coolant pump | 10. Drive motor outlet pipe (2) |
| 4. Water pump inlet pipe (4) | 11. Radiator outlet pipe (2) |
| 5. Drive motor outlet pipe (1) | 12. Electronic water pump (3) |
| 6. Drive motor inlet pipe | 13. Radiator (front) |
| 7. Heater inlet pipe | 14. Drive motor radiator inlet pipe |

3.7.5 Removal and Installation

3.7.5.1 Replacement of Radiator (front)

Removal Procedure

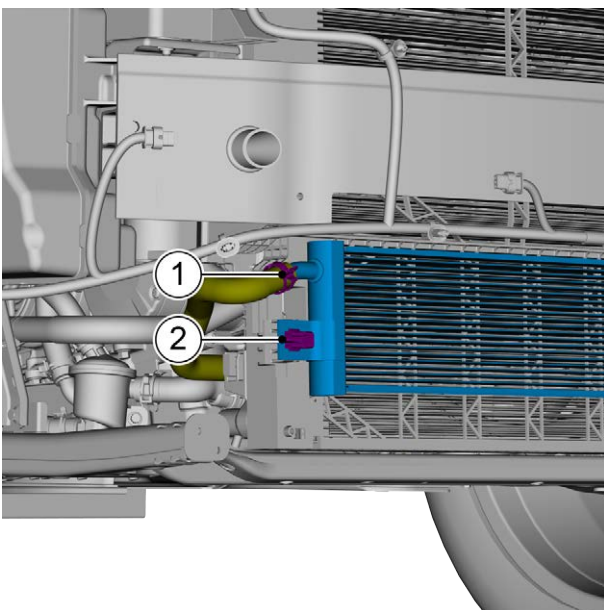
Warning !

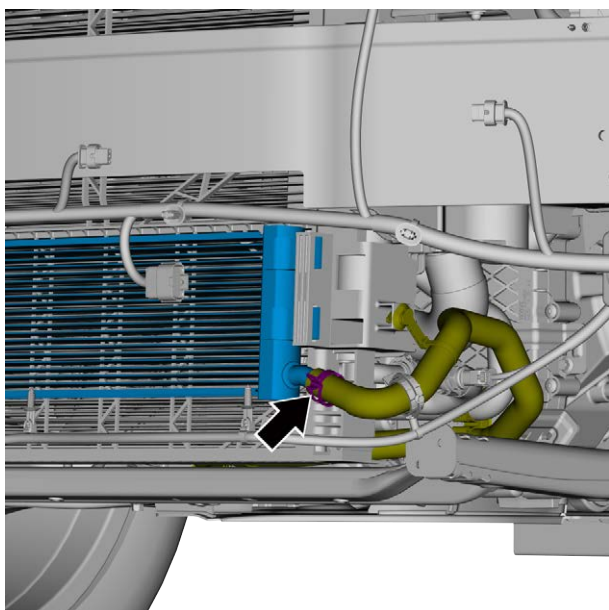
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

Warning !

See "WARNING ABOUT COOLING SYSTEM MAINTENANCE" in "[WARNINGS AND PRECAUTIONS](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Drain the electric system coolant, see [Draining and Filling Procedure of Electric System Coolant \(DHT Pro\)](#).
- 4 Remove the air filter assembly, see [Replacement of Air Filter Assembly](#).
- 5 Remove the air filter intake pipe assembly. refer to [Replacement of air filter intake pipe assembly](#).
- 6 Remove the engine compartment trim panel, refer to [Replacement of engine compartment trim panel](#).
- 7 Remove the front bumper assembly, see [Replacement of Front Bumper Assembly](#).
- 8 Remove the radiator cover, refer to [Replacement of radiator cover](#).
- 9 Remove the fixing clamp 1 of the drive motor radiator inlet pipe, and disconnect the drive motor radiator inlet pipe from the radiator (front).
- 10 Disengage the two fixing points 2 of the condenser frame.

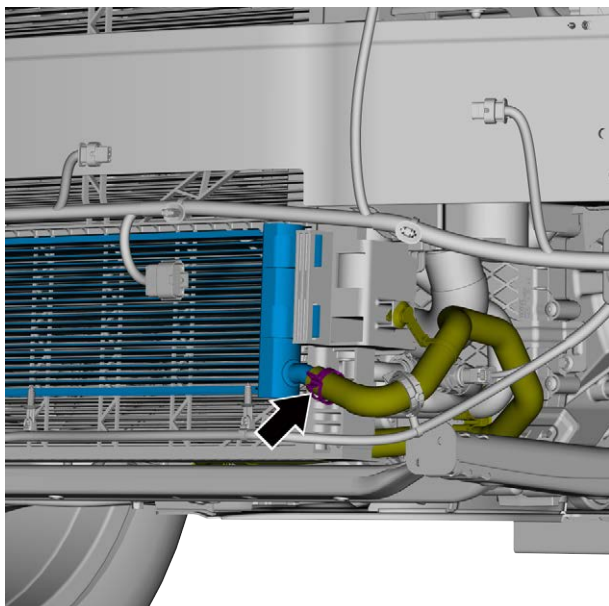


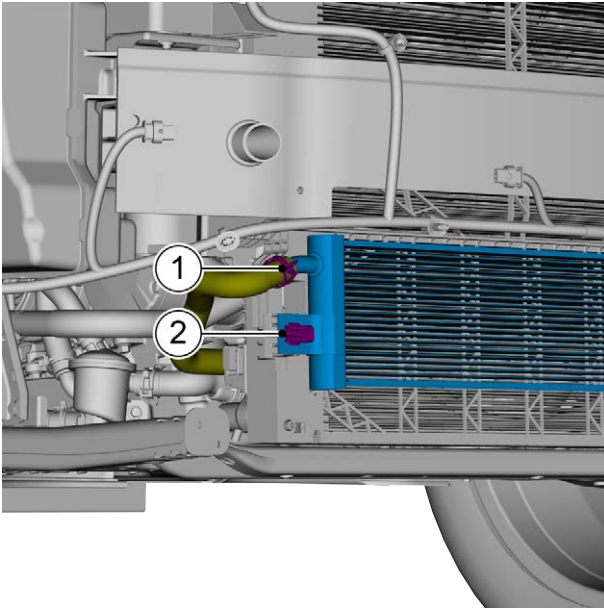


- 11 Remove the fixing clamp of the drive motor outlet pipe (2) and disconnect the drive motor outlet pipe (2) from the radiator (front).
- 12 Remove the radiator (front).

Installation Procedure

- 1 Install the radiator (front).
- 2 Connect the drive motor outlet pipe (2) to the radiator (front), and install the fixing clamp for the drive motor outlet pipe (2).





- 3 Install the condenser frame to the fixing point 2.
- 4 Connect the drive motor radiator inlet pipe to the radiator (front), and install the fixing clamp 1 of the drive motor radiator inlet pipe.
- 5 Install the radiator cover.
- 6 Install the front bumper assembly.
- 7 Install the engine compartment trim panel.
- 8 Install the air filter intake pipe assembly.
- 9 Install the air filter assembly.
- 10 Fill in the electric system coolant.
- 11 Connect the negative cable of the battery, start the vehicle and connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle level. If there is a drop in the level, replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the upper scribe line of the expansion kettle, and tighten the lid of the expansion kettle.
- 12 Close the engine compartment cover.

3.7.5.2 Replacement of Radiator (rear)

Removal Procedure

See [Replacement of Radiator](#).

3.7.5.3 Replacement of water pump inlet pipe (4)

Removal Procedure

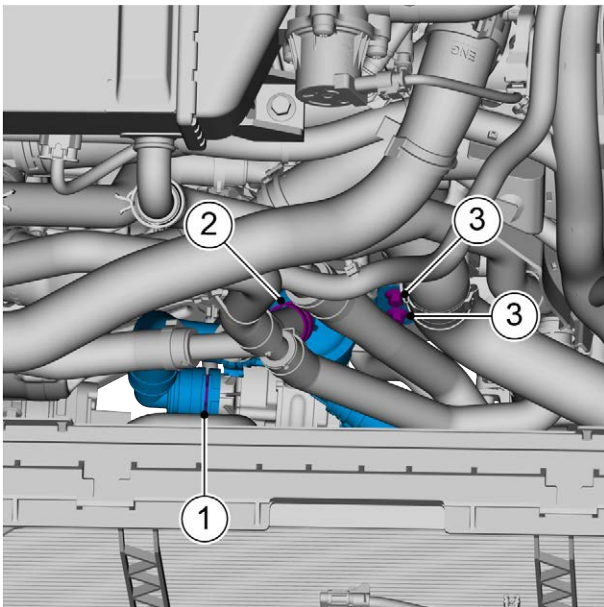
Warning !

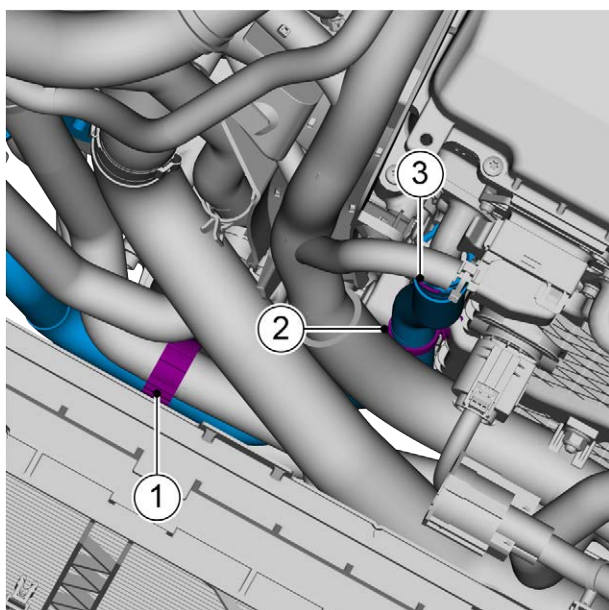
Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#).

Warning !

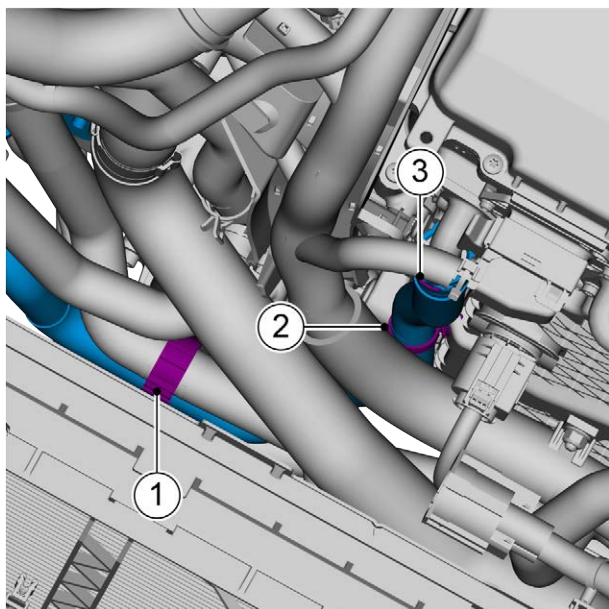
See "WARNINGS ABOUT VEHICLE LIFT" in ["WARNINGS AND PRECAUTIONS"](#)

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 3 Drain the electric system coolant, see [Draining and Filling Procedure of Electric System Coolant](#).
- 4 Remove the engine cooling fan, see [Replacement of Engine Cooling Fan](#).
- 5 Remove the quick-insertion clip 1 of the water pump inlet pipe (4), and disconnect the water pump inlet pipe (4) from the electronic water pump (low-temperature radiator).
- 6 Remove the fixing clamp 2 of the water pump inlet pipe (4), and disconnect the water pump inlet pipe (4) from the radiator inlet pipe (2).
- 7 Remove the two fixing bolts 3 of the water pump inlet pipe (4).



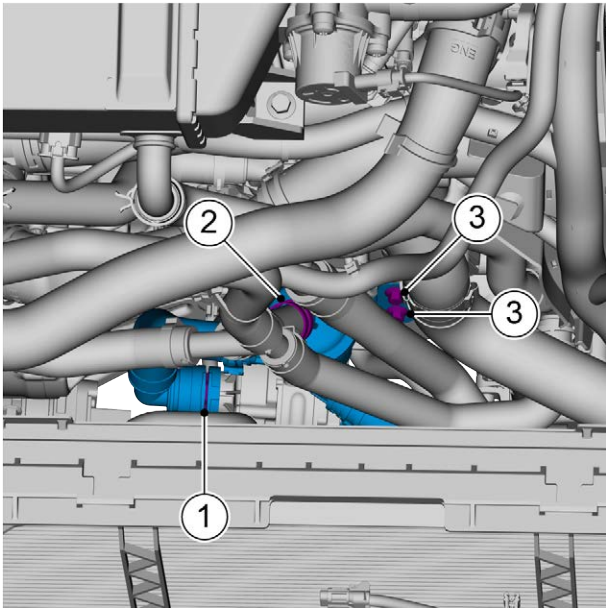


- 8 Disengage the fixing clips 1 of the radiator outlet pipe (2).
- 9 Remove the fixing clips 2 of the water pump inlet pipe.
- 10 Remove the quick-insertion circlip 3 of the water pump inlet pipe (4), and disconnect the water pump inlet pipe (4) from the power control module.
- 11 Remove the water pump inlet pipe (4).



Installation Procedure

- 1 Install the water pump inlet pipe (4).
- 2 Connect the water pump inlet pipe (4) to the power control module, and install the quick-insertion clip 3 of the water pump inlet pipe (4).
- 3 Install the fixing clips 2 of the water pump inlet pipe (4).
- 4 Install the fixing clips 1 of the radiator outlet pipe (2).



- 5 Install and tighten the two fixing bolts 3 of the water pump inlet pipe (4).

Torque: 10N·m

- 6 Connect the water pump inlet pipe (4) to the radiator inlet pipe (2), and install the fixing clamp 2 of the water pump inlet pipe (4).

Caution

Pipe orifices should be aligned with the markings for connecting.

- 7 Connect the water pump inlet pipe (4) to the electronic water pump (low-temperature radiator), and install the quick-insertion circlip 1 of the water pump inlet pipe (4).

- 8 Install the engine cooling fan.
- 9 Fill the electric system coolant, start the vehicle to connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle liquid level. If the liquid level has dropped, it is necessary to replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the expansion kettle on the scribe line, and screw the lid of the expansion kettle cover tightly.
- 10 Install the bottom engine guard assembly.
- 11 Connect the negative cable of battery.

3.7.5.4 Replacement of Radiator Inlet Pipe (2)

Removal Procedure

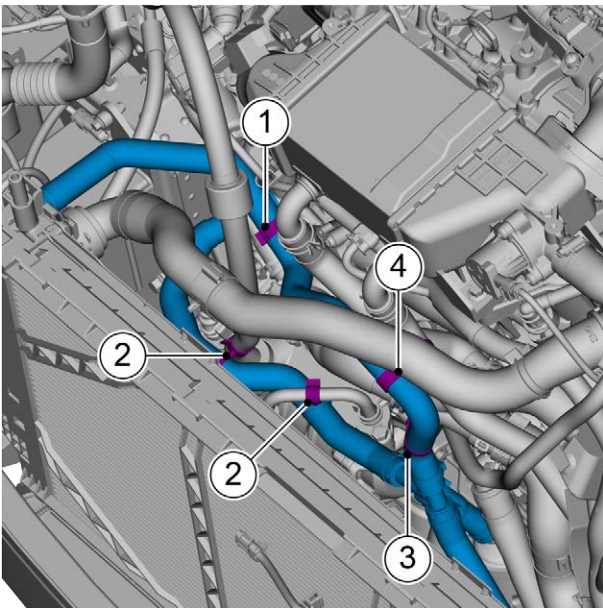
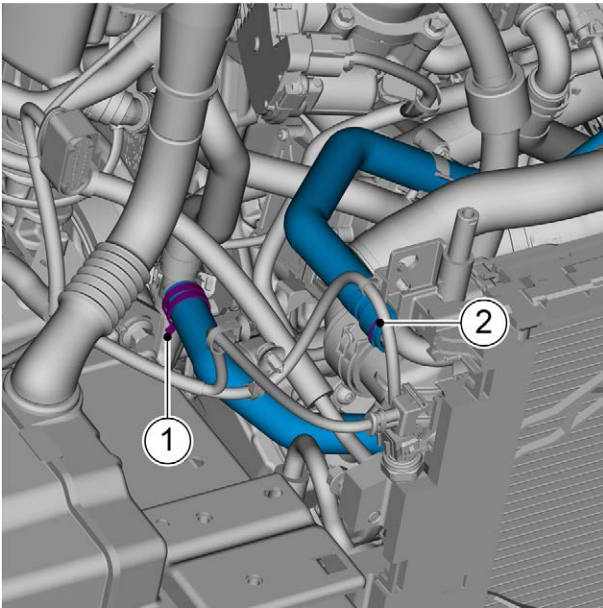
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

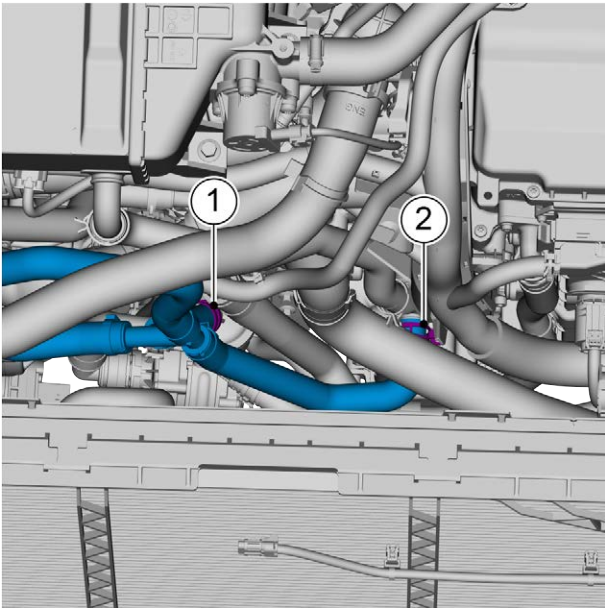
Warning !

See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)".

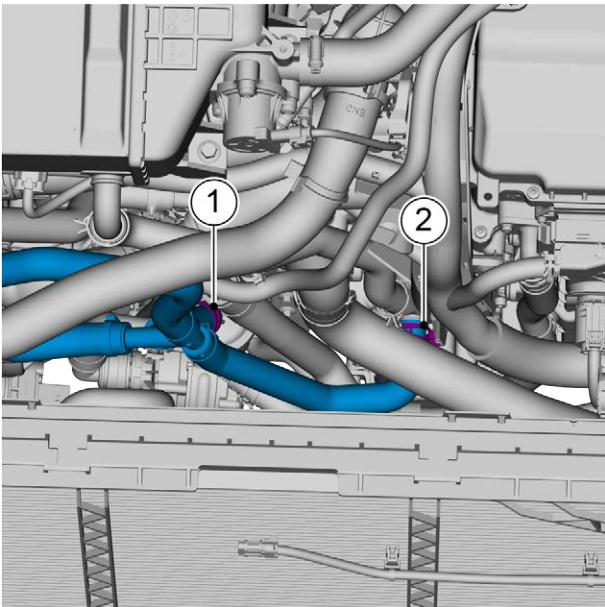
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 3 Drain the electric system coolant, see [Draining and Filling Procedure of Electric System Coolant](#).



- 4 Remove the engine cooling fan, see [Replacement of Engine Cooling Fan](#).
- 5 Remove the fixing clamp 1 of the radiator inlet pipe (2), and disconnect the radiator inlet pipe (2) from the battery water pump inlet pipe (expansion water bottle).
- 6 Disconnect the radiator inlet pipe (2) from the radiator by removing the quick-insert circlip 2 of the radiator inlet pipe (2).
- 7 Disconnect the fixing clip 1 of the expansion tank outlet pipe.
- 8 Disengage the two fixing clips 2 of the radiator inlet pipe (2).
- 9 Disconnect the fixing clips 3 of the transmission oil cooler inlet pipe (front end).
- 10 Remove the fixing clip 4 of the radiator inlet pipe (2).



- 11 Remove the fixing clamp 1 of the radiator inlet pipe (2), and disengage the radiator inlet pipe (2) from the water pump inlet pipe (4).
- 12 Remove the fixing clamp 2 of the radiator inlet pipe (2) and disconnect the radiator inlet pipe (2) from the hybrid special transmission assembly.
- 13 Remove the radiator inlet pipe (2).



Installation Procedure

- 1 Install the radiator inlet pipe (2) .
- 2 Connect the radiator inlet pipe (2) to the hybrid special transmission assembly, and install the fixing clamp 2 of the radiator inlet pipe (2).

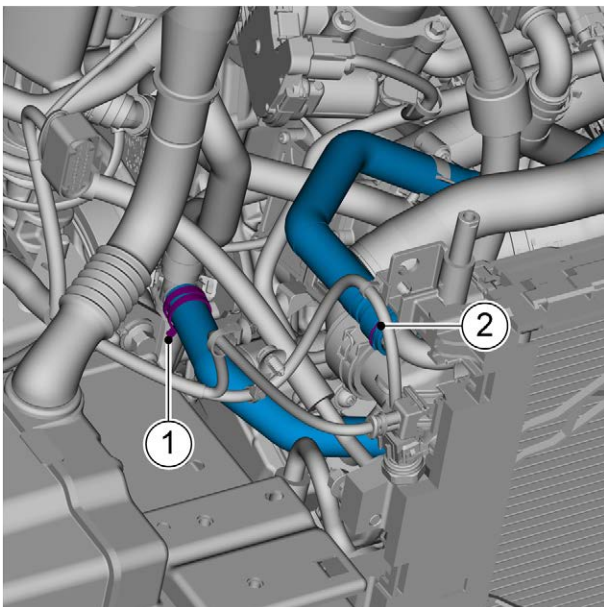
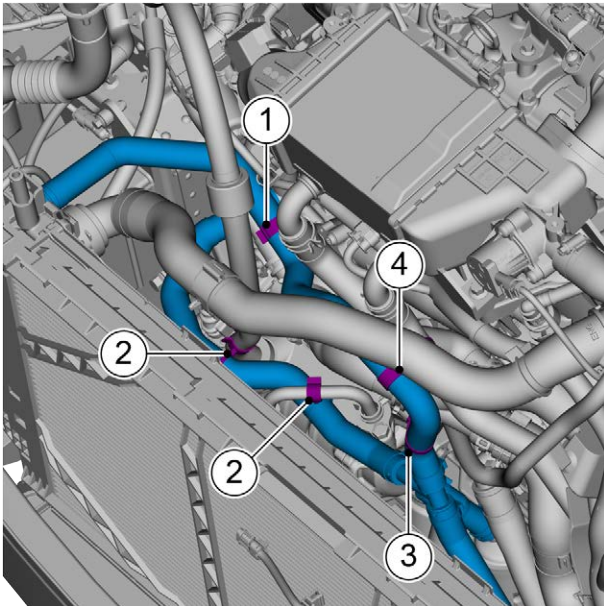
Caution

Pipe orifices should be aligned with the markings for connecting.

- 3 Connect the radiator inlet pipe (2) to the water pump inlet pipe (4), and install the fixing clips 1 of the radiator inlet pipe (2).

Caution

Pipe orifices should be aligned with the markings for connecting.



- 4 Install the fixing clip 4 of the radiator inlet pipe (2).
 - 5 Install the fixing clips 3 of the transmission oil cooler inlet pipe (front end).
 - 6 Install the two fixing clips 2 of the radiator inlet pipe (2).
 - 7 Install the fixing clips 1 of the expansion tank outlet pipe.
-
- 8 Connect the radiator inlet pipe (2) to the radiator and install the quick-insert circlip 2 of the radiator inlet pipe (2).
 - 9 Connect the radiator inlet pipe (2) to the battery water pump inlet pipe (expansion kettle), and install the fixing clamp 1 of the radiator inlet pipe (2).

Caution

Pipe orifices should be aligned with the markings for connecting.

- 10 Install the engine cooling fan.
- 11 Fill the electric system coolant, start the vehicle to connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle liquid level. If the liquid level has dropped, it is necessary to replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the expansion kettle on the scribe line, and screw the lid of the expansion kettle cover tightly.
- 12 Install the bottom engine guard assembly.
- 13 Connect the negative cable of battery.

3.7.5.5 Replacement of Radiator Outlet Pipe (2)

Removal Procedure

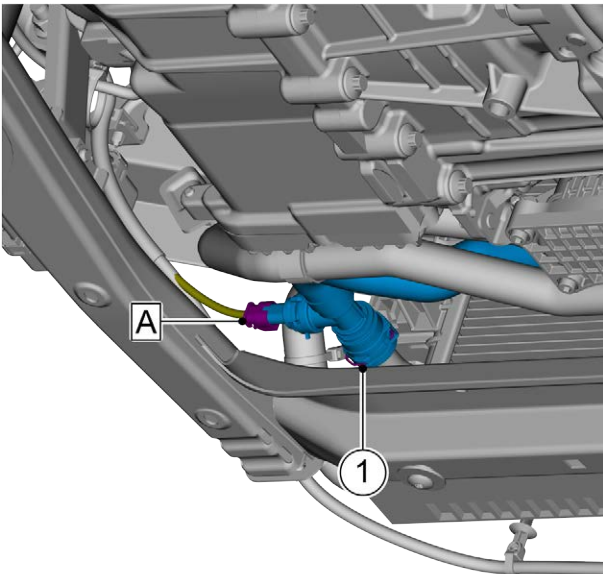
Warning !

Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#).

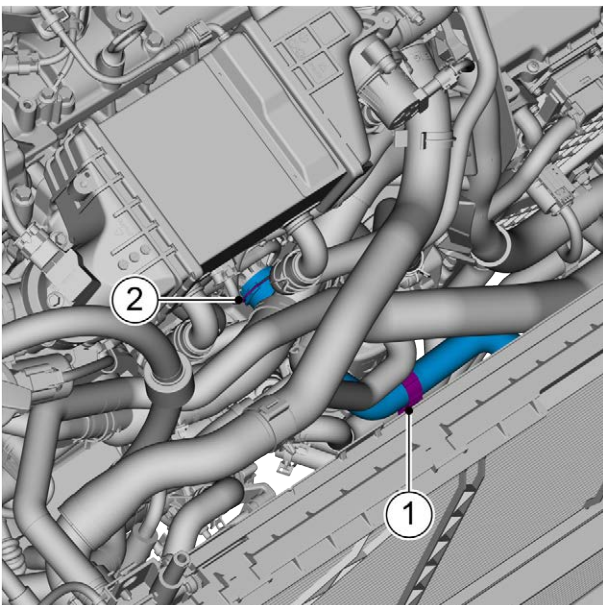
Warning !

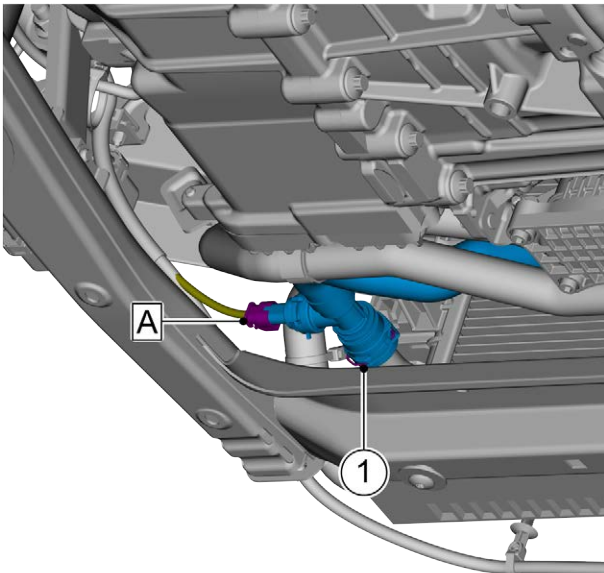
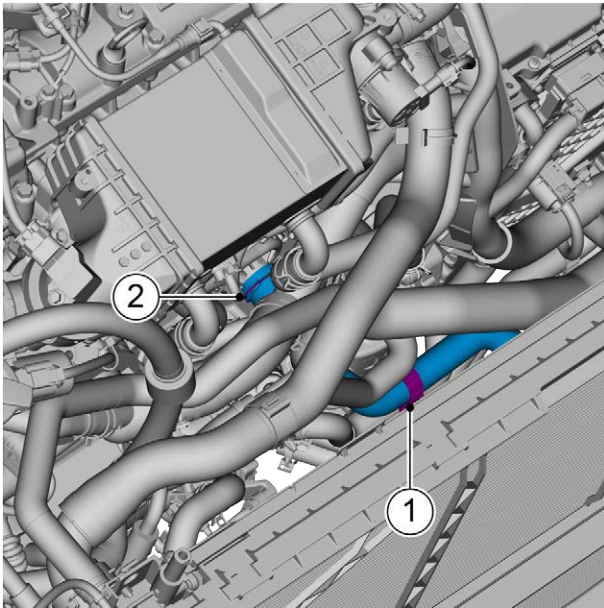
See "WARNINGS ABOUT VEHICLE LIFT" in ["WARNINGS AND PRECAUTIONS"](#)

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 3 Drain the electric system coolant, see [Draining and Filling Procedure of Electric System Coolant \(DHT Pro\)](#).
- 4 Remove the quick-insertion circlip 1 from the radiator outlet pipe (2) and disconnect the radiator outlet pipe (2) from the low temperature radiator.
- 5 Disconnect the harness connector A of the high-pressure coolant heater fluid temperature sensor.



- 6 Remove the fixing clip 1 of the radiator outlet pipe (2).
- 7 Disconnect the radiator outlet pipe (2) from the battery coolant pump by removing the quick-insertion circlip 2 of the radiator outlet pipe (2).
- 8 Remove the radiator outlet pipe (2).





Installation Procedure

- 1 Install the radiator outlet pipe (2).
- 2 Connect the radiator outlet hose (2) to the battery coolant pump, and install the quick-insert circlip 2 of the radiator outlet hose (2).
- 3 Install the fixing clips 1 of the radiator outlet pipe (2).
- 4 Connect the harness connector A of the high pressure coolant heater fluid temperature sensor.
- 5 Connect the radiator outlet pipe (2) to the low-temperature radiator, and install the quick-insert circlip 1 of the radiator outlet pipe (2).
- 6 Fill the electric system coolant, start the vehicle to connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle liquid level. If the liquid level has dropped, it is necessary to replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the expansion kettle on the scribe line, and screw the lid of the expansion kettle cover tightly.
- 7 Install the bottom engine guard assembly.
- 8 Connect the negative cable of battery.

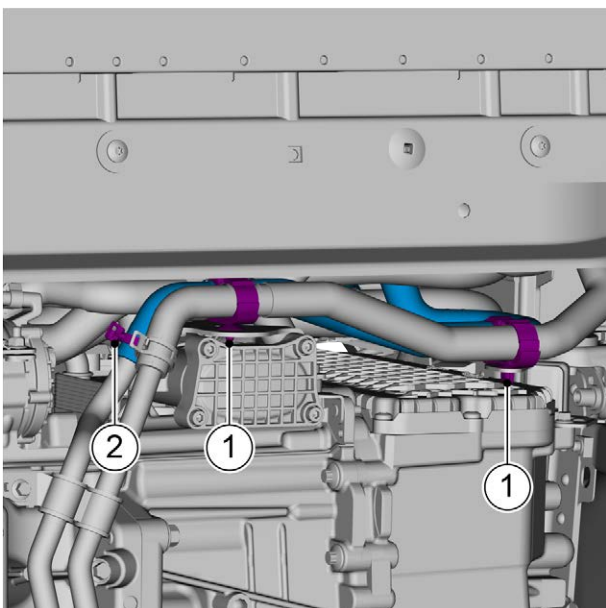
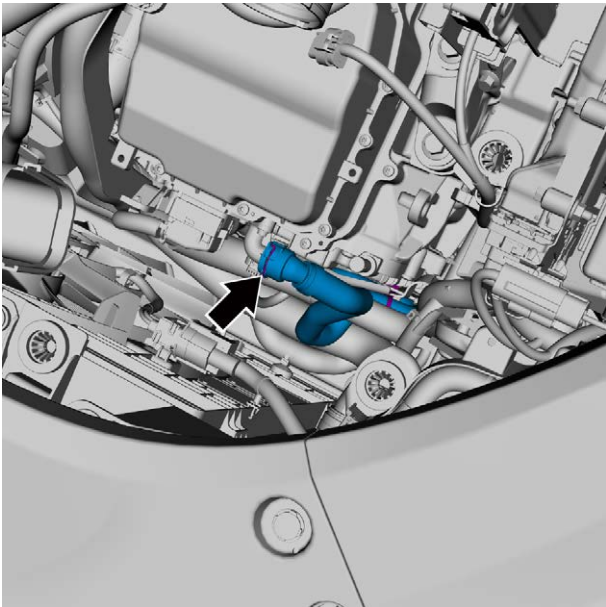
3.7.5.6 Replacement of Transmission Inlet Pipe

Removal Procedure

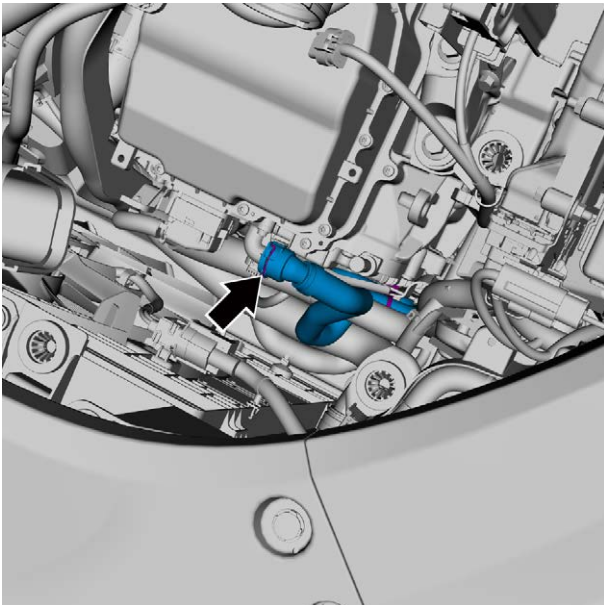
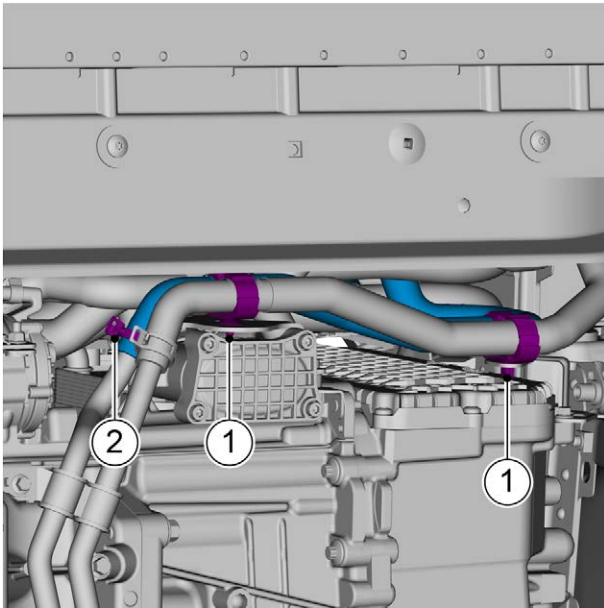
Warning !

See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

- 1 Remove the resonator assembly, see [Replacement of Resonator Assembly](#).
- 2 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 3 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 4 Drain the electric system coolant, see [Draining and Filling Procedure of Electric System Coolant](#).
- 5 Remove the left front wheel arch splash guard assembly, refer to [Replacement of left front wheel arch splash guard assembly](#).
- 6 Disconnect the transmission inlet pipe from the air conditioning heater outlet pipe by removing the quick-insertion circlip of the transmission inlet pipe.



- 7 Disconnect the two fixing clips 1 of the drive motor outlet pipe (2).
- 8 Remove the fixing clamp 2 of the transmission inlet pipe and disconnect the transmission inlet pipe from the coolant inlet/outlet metal pipe.
- 9 Remove the transmission inlet pipe.



Installation Procedure

- 1 Install the transmission inlet pipe.
- 2 Connect the transmission inlet pipe to the coolant inlet/outlet metal pipe and install the fixing clamps 2 of the transmission inlet pipe.

Caution

Pipe orifices should be aligned with the markings for connecting.

- 3 Install the two fixing clips 1 of the drive motor outlet pipe (2).
- 4 Connect the transmission inlet pipe to the air conditioning heater outlet pipe and install the quick-insertion circlip of the transmission inlet pipe.

- 5 Install the left front wheel arch splash guard assembly.
- 6 Fill the electric system coolant, start the vehicle to connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle liquid level. If the liquid level has dropped, it is necessary to replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the expansion kettle on the scribe line, and screw the lid of the expansion kettle cover tightly.
- 7 Install the bottom engine guard assembly.
- 8 Lower the vehicle.
- 9 Install the resonator assembly.

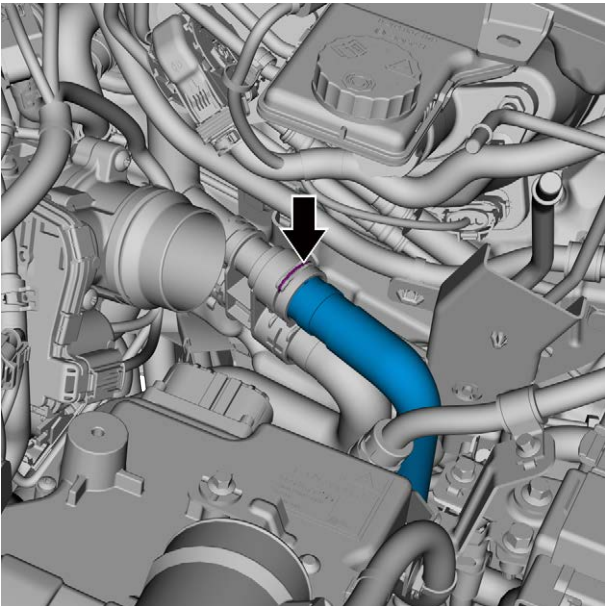
3.7.5.7 Replacement of Heater Inlet Hose

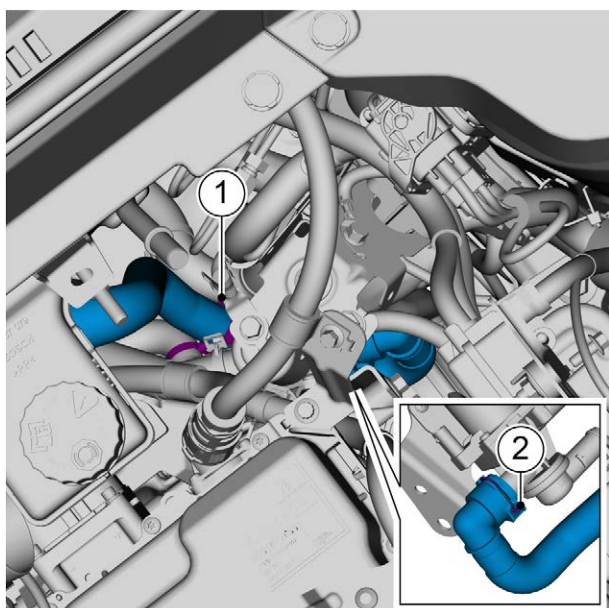
Removal Procedure

Warning !

See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

- 1 Remove the resonator assembly, see [Replacement of Resonator Assembly](#).
- 2 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 3 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 4 Drain the electric system coolant, see [Draining and Filling Procedure of Electric System Coolant](#).
- 5 Remove the left front wheel arch splash guard assembly, refer to [Replacement of left front wheel arch splash guard assembly](#).
- 6 Remove the quick-insertion circlip of the heater inlet pipe and disconnect the heater inlet pipe from the air conditioning heater outlet pipe.

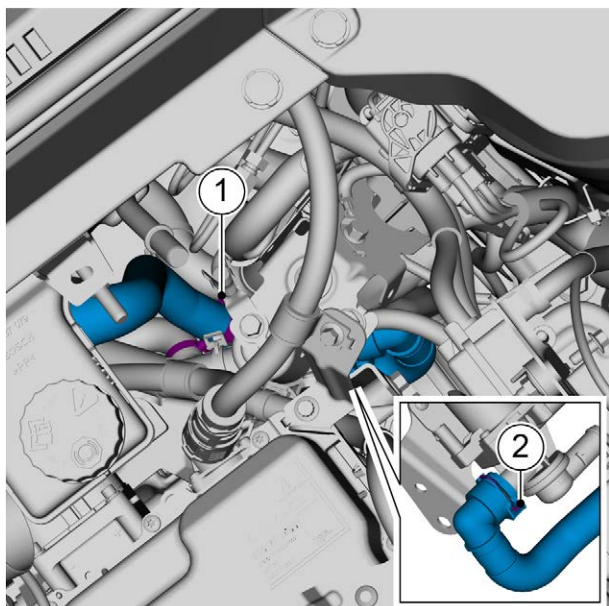


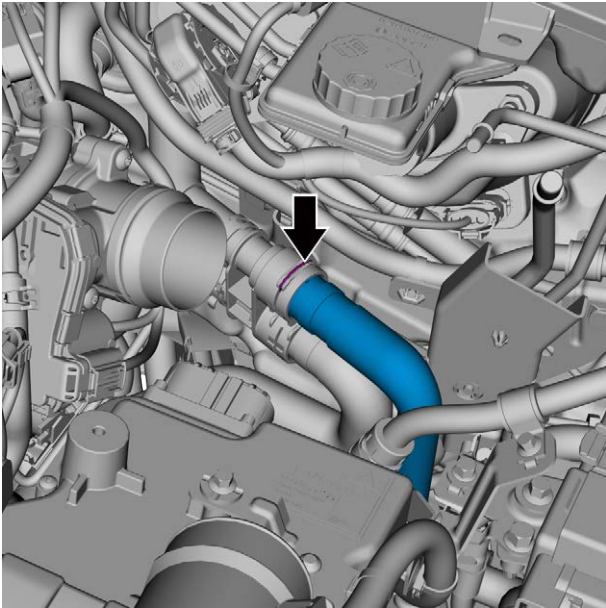


- 7 Remove the fixing clips 1 of the heater inlet pipe.
- 8 Remove the quick-insertion circlip 2 of the heater inlet pipe, and disconnect the heater inlet pipe from the electronic water pump (low-temperature radiator).
- 9 Remove the heater inlet pipe.

Installation Procedure

- 1 Install the heater inlet pipe.
- 2 Connect the heater inlet pipe to the electronic water pump (low-temperature radiator) and install the quick-insertion circlip 2 of the heater inlet pipe.
- 3 Install the fixing clips 1 of the heater inlet pipe.





- 4 Connect the heater inlet pipe to the air conditioning heater outlet pipe and install the quick-insertion circlip of the heater inlet pipe.

- 5 Install the left front wheel arch splash guard assembly.
- 6 Fill the electric system coolant, start the vehicle to connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle liquid level. If the liquid level has dropped, it is necessary to replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the expansion kettle on the scribe line, and screw the lid of the expansion kettle cover tightly.
- 7 Install the bottom engine guard assembly.
- 8 lower the vehicle.
- 9 Install the resonator assembly.

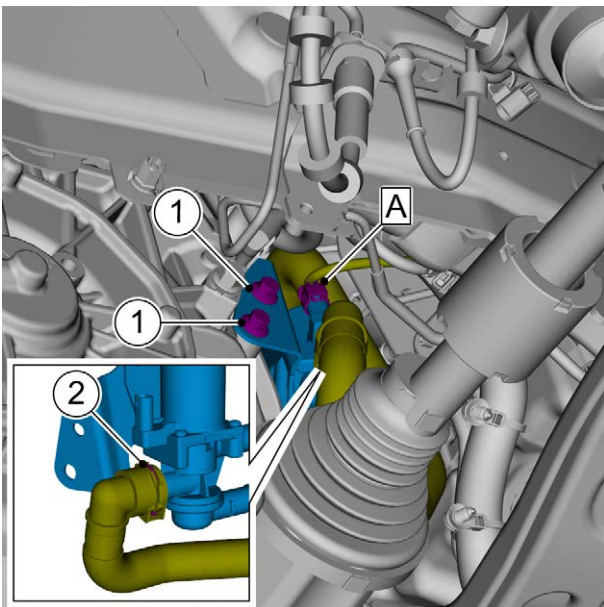
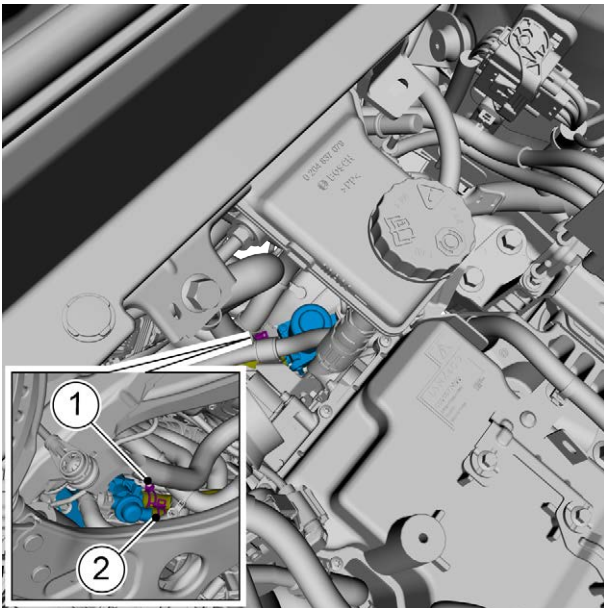
3.7.5.8 Replacement of Three-way Solenoid Valve (1)

Removal Procedure

Warning !

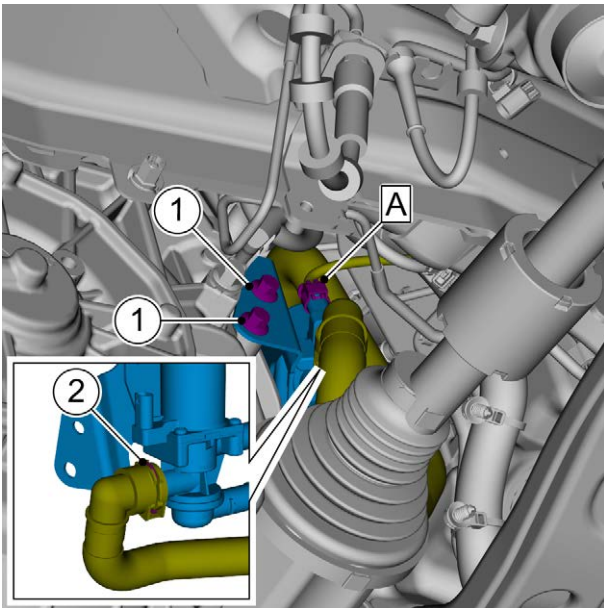
See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

- 1 Remove the resonator assembly, see [Replacement of Resonator Assembly](#).
- 2 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 3 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 4 Drain the electric system coolant, see [Draining and Filling Procedure of Electric System Coolant](#).

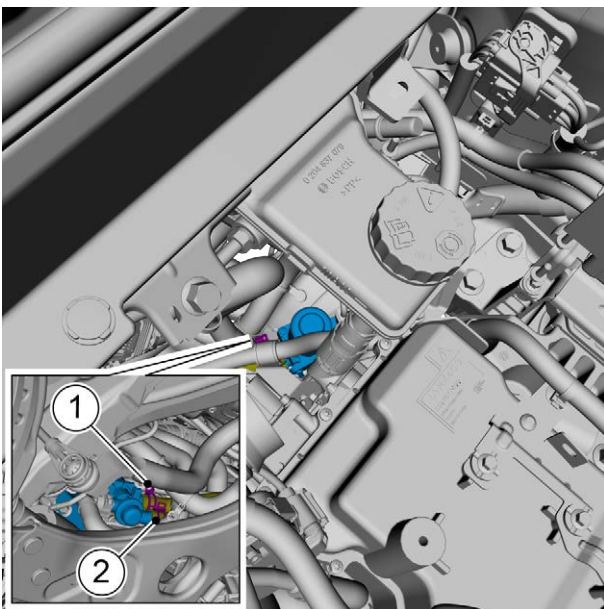


- 5 Remove the left front wheel arch splash guard assembly, refer to [Replacement of left front wheel arch splash guard assembly](#).
- 6 Remove the fixing clamp 1 of the exhaust gas circulation outlet pipe and disconnect the three-way solenoid valve (1) from the exhaust gas circulation outlet pipe.
- 7 Disconnect the three-way solenoid valve (1) from the thermostat outlet pipe by removing the fixing clamp 2 of the thermostat outlet pipe.
- 8 Disconnect the harness connector A of the three-way solenoid valve (1).
- 9 Remove the two fixing bolts 1 of the three-way solenoid valve (1).
- 10 Disconnect the heater inlet pipe from the three-way solenoid valve (1) by removing the quick-insertion clamp 2 of the heater inlet pipe.
- 11 Take off the three-way solenoid valve (1).

Installation Procedure



- 1 Install the three-way solenoid valve (1).
- 2 Connect the heater inlet pipe to the three-way solenoid valve (1) and install the quick-insertion clamp 2 of the heater inlet pipe.
- 3 Install and tighten the two fixing bolts 1 of the three-way solenoid valve (1).
Torque: 24N·m
- 4 Connect the harness connector A of the three-way solenoid valve (1).



- 5 Connect the three-way solenoid valve (1) to the thermostat outlet pipe and install the fixing clamp 2 of the thermostat outlet pipe.
- 6 Connect the three-way solenoid valve (1) to the exhaust gas circulation outlet pipe and install the fixing clamp 1 of the exhaust gas circulation outlet pipe.

- 7 Install the left front wheel arch splash guard assembly.
- 8 Fill with the electric system coolant.
- 9 Install the bottom engine guard assembly.
- 10 lower the vehicle.
- 11 Install the resonator assembly.

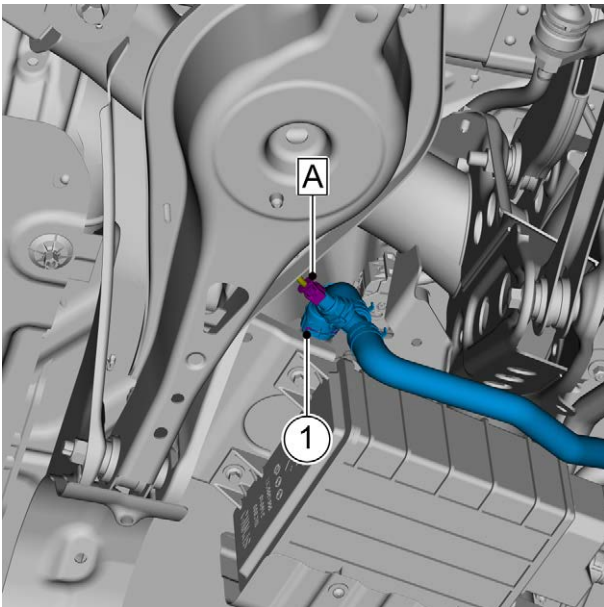
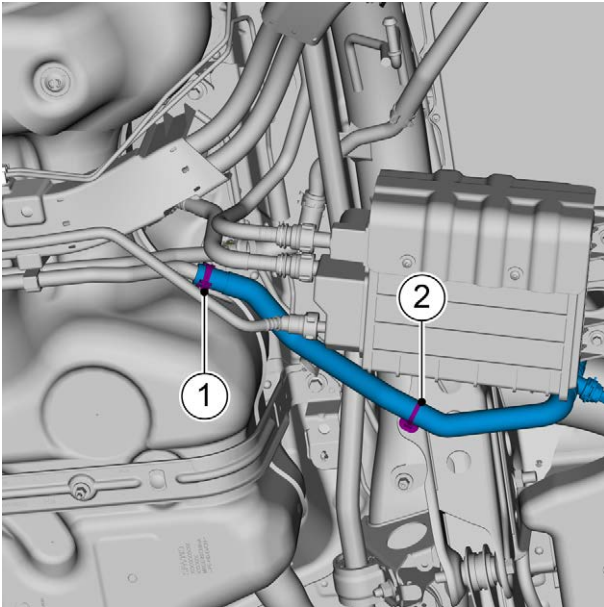
3.7.5.9 Replacement of Drive Motor Inlet Pipe

Removal Procedure

Warning !

See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

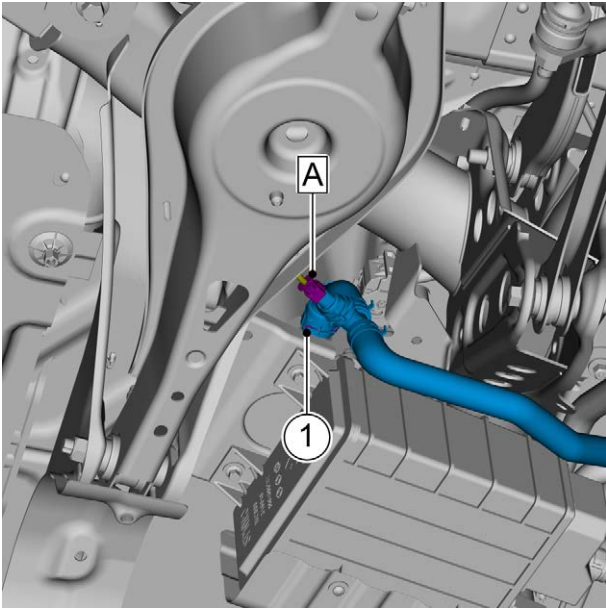
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).



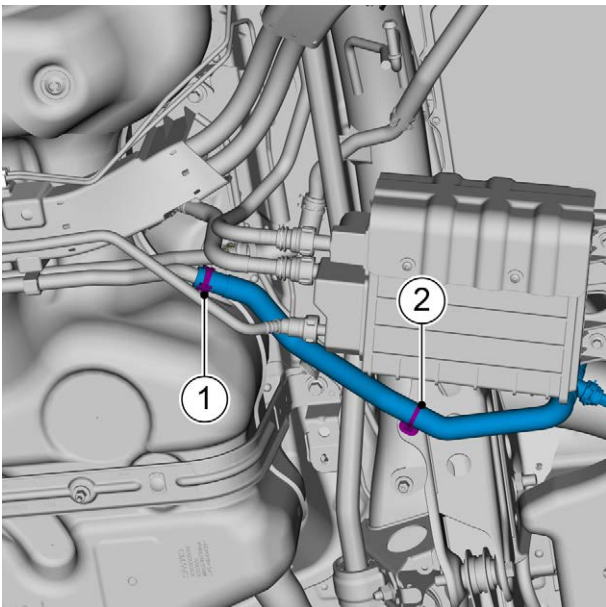
- 2 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 3 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 4 Drain the electric system coolant, see [Draining and Filling Procedure of Electric System Coolant \(DHT Pro\)](#).
- 5 Remove the right bottom guard of the fuel tank, see [Replacement of Right Bottom Guard of Fuel Tank](#).
- 6 Remove the fixing clamp 1 of the drive motor inlet pipe and disconnect the drive motor inlet pipe from the rear connection tube of the lower floor inlet/outlet pipe.
- 7 Remove the fixing clamp 2 of the drive motor inlet pipe.

- 8 Disconnect the harness connector A of the DC/DC coolant temperature sensor.
- 9 Disconnect the drive motor inlet pipe from the on-board charger module by removing the quick-insertion circlip 1 of the drive motor inlet pipe.
- 10 Remove the drive motor inlet pipe.

Installation Procedure



- 1 Install the drive motor intake pipe.
- 2 Connect the drive motor inlet pipe to the on-board charger module, and install the quick-insertion circlip 1 of the drive motor inlet pipe.
- 3 Connect the harness connector A of the DC/DC coolant temperature sensor.



- 4 Install the fixing clips 2 of the drive motor inlet pipe.
- 5 Connect the drive motor inlet pipe to the rear connection tube of the lower floor inlet/outlet pipe, and install the fixing clamp 1 of the drive motor inlet pipe.

- 6 Install the right bottom guard of the fuel tank.
- 7 Fill with the electric system coolant.
- 8 Install the bottom engine guard assembly.
- 9 lower the vehicle.
- 10 Connect the negative cable of the battery, start the vehicle and connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle level. If there is a drop in the level, replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the upper scribe line of the expansion kettle, and tighten the lid of the expansion kettle.

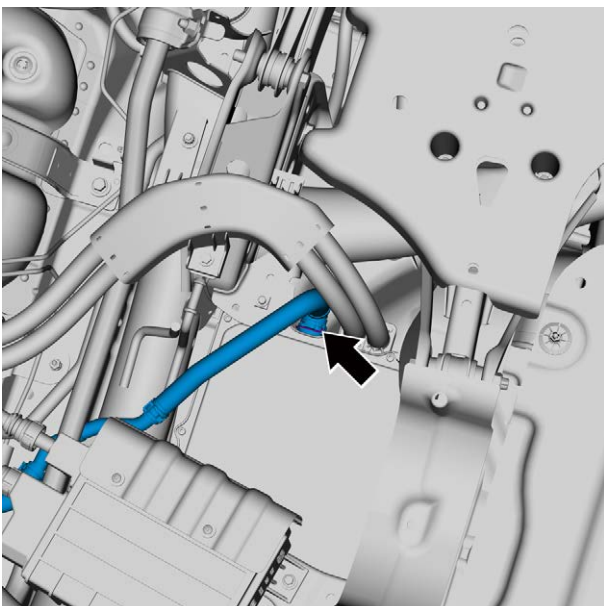
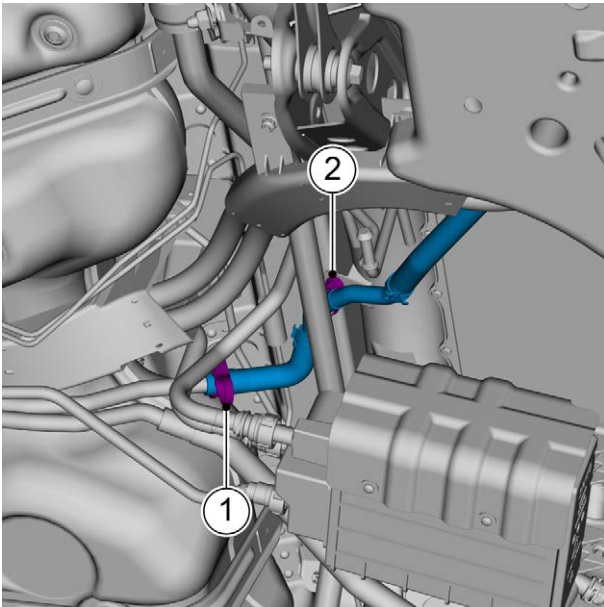
3.7.5.10 Replacement of Drive Motor Outlet Pipe (1)

Removal Procedure

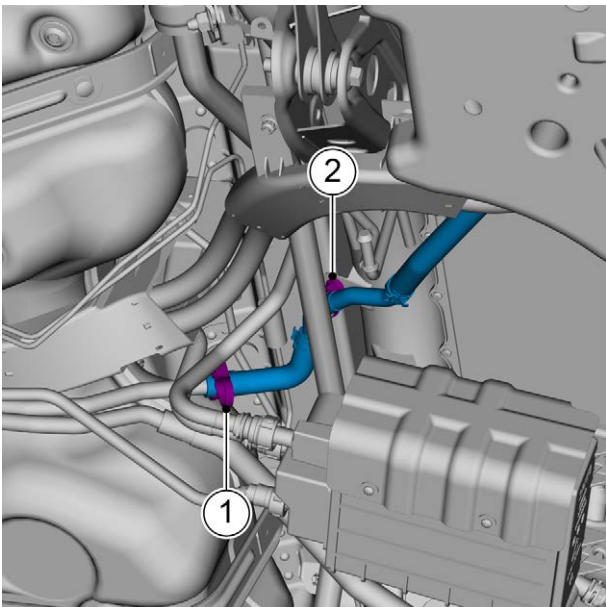
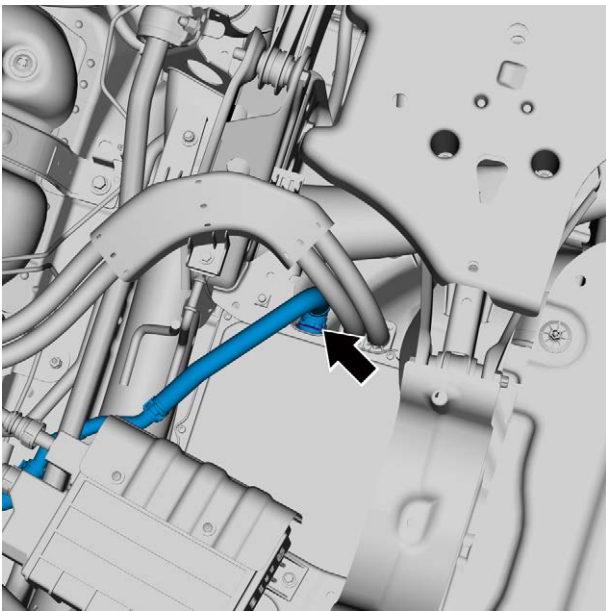
Warning !

See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 3 Drain the electric system coolant, see [Draining and Filling Procedure of Electric System Coolant \(DHT Pro\)](#).
- 4 Remove the lower right fuel tank shield, see [Replacement of Lower Right Fuel Tank Shield](#).
- 5 Remove the fixing clamp 1 of the drive motor outlet pipe (1), and disconnect the drive motor outlet pipe (1) from the rear connection tube of the lower floor inlet/outlet pipe.
- 6 Remove the fixing clips 2 of the drive motor outlet pipe (1).
- 7 Remove the quick-insertion circlip of the drive motor outlet pipe (1) and disconnect the drive motor outlet pipe (1) from the on-board charger module.
- 8 Remove the drive motor outlet pipe (1).



Installation Procedure



- 1 Install the drive motor outlet pipe (1).
- 2 Connect the drive motor outlet pipe (1) to the on-board charger module, and install the quick-insertion circlip of the drive motor outlet pipe (1).

- 3 Install the fixing clip 2 of the drive motor outlet pipe (1).
- 4 Connect the drive motor outlet pipe (1) to the rear connection tube of the lower floor inlet/outlet pipe, and install the fixing clamp 1 for the drive motor outlet pipe (1).

Caution

Pipe orifices should be aligned with the markings for connecting.

- 5 Install the lower right fuel tank guard.
- 6 Fill the electric system coolant, start the vehicle to connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle liquid level. If the liquid level has dropped, it is necessary to replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the expansion kettle on the scribe line, and screw the lid of the expansion kettle cover tightly.
- 7 Install the bottom engine guard assembly.
- 8 Lower the vehicle.

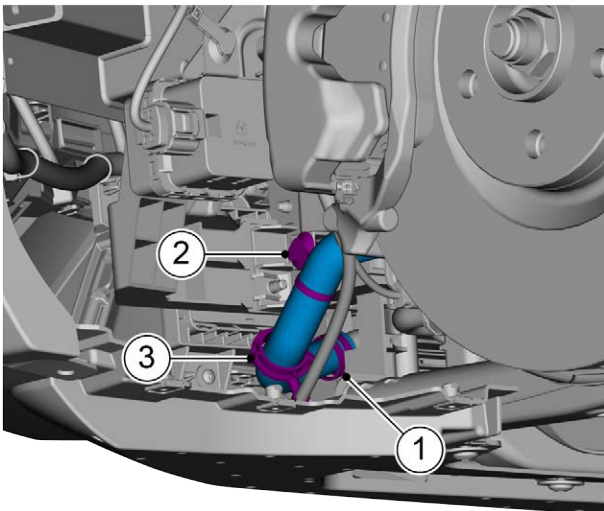
3.7.5.11 Replacement of Drive Motor Outlet Pipe (2)

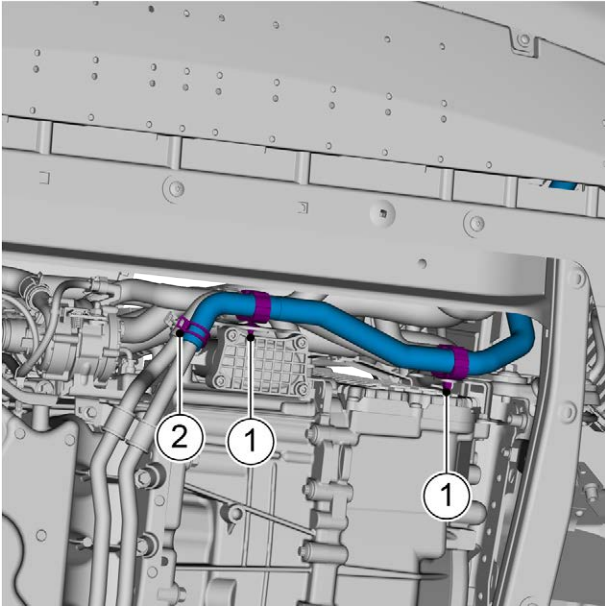
Removal Procedure

Warning !

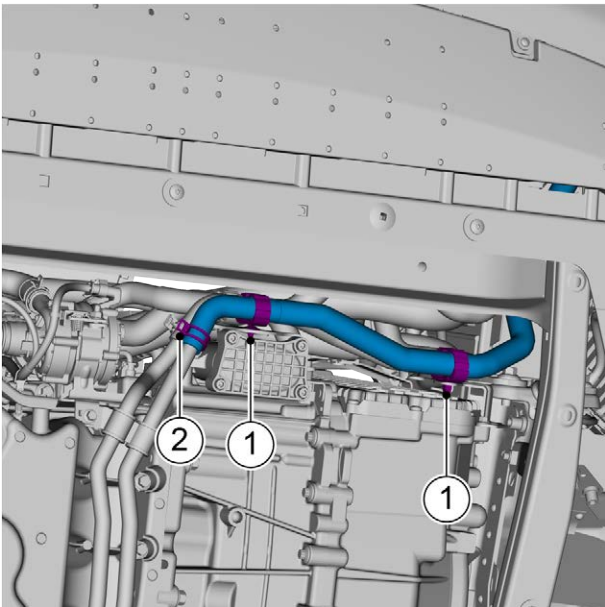
See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 3 For the electric system coolant draining and filling procedure, see [Draining and Filling Procedure of Electric System Coolant](#).
- 4 Remove the left front wheel arch splash guard assembly, refer to [Replacement of left front wheel arch splash guard assembly](#).
- 5 Remove the fixing clamp 1 of the drive motor outlet pipe (2), and disconnect the drive motor outlet pipe (2) from the low temperature radiator.
- 6 Remove the fixing clips 2 of the drive motor outlet pipe (2).
- 7 Disengage the harness clips 3 of the front compartment harness.





- 8 Remove the two fixing clips 1 of the drive motor outlet pipe (2).
- 9 Remove the fixing clamp 2 of the drive motor outlet pipe (2), and disconnect the drive motor outlet pipe (2) from the coolant inlet/outlet metal pipe.
- 10 Remove the drive motor outlet pipe (2).



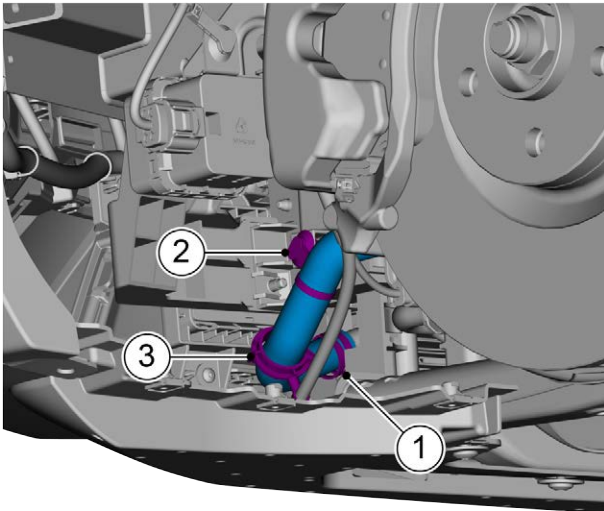
Installation Procedure

- 1 Install the drive motor outlet pipe (2).
- 2 Connect the drive motor outlet pipe (2) to the coolant inlet/outlet metal pipe, and install the fixing clamps 2 of the drive motor outlet pipe (2).

Caution

Pipe orifices should be aligned with the markings for connecting.

- 3 Install the two fixing clips 1 of the drive motor outlet pipe (2).



- 4 Install the harness clip 3 for the front compartment harness.
- 5 Install the fixing clip 2 of the drive motor outlet pipe (2).
- 6 Connect the drive motor outlet pipe (2) to the low-temperature radiator, and install the fixing clamp 1 of the drive motor outlet pipe (2).

Caution

Pipe orifices should be aligned with the markings for connecting.

- 7 Install the left front wheel arch splash guard assembly.
- 8 Fill the electric system coolant, start the vehicle to connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle liquid level. If the liquid level has dropped, it is necessary to replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the expansion kettle on the scribe line, and screw the lid of the expansion kettle cover tightly.
- 9 Install the bottom engine guard assembly.
- 10 Lower the vehicle.

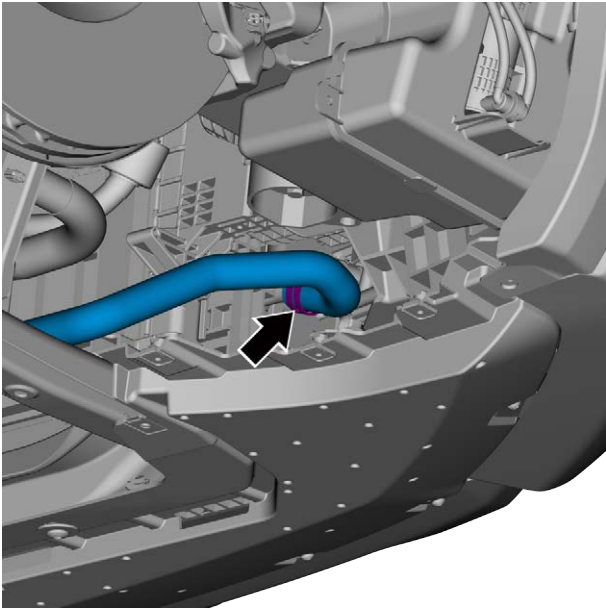
3.7.5.12 Replacement of Drive Motor Radiator Inlet Pipe

Removal Procedure

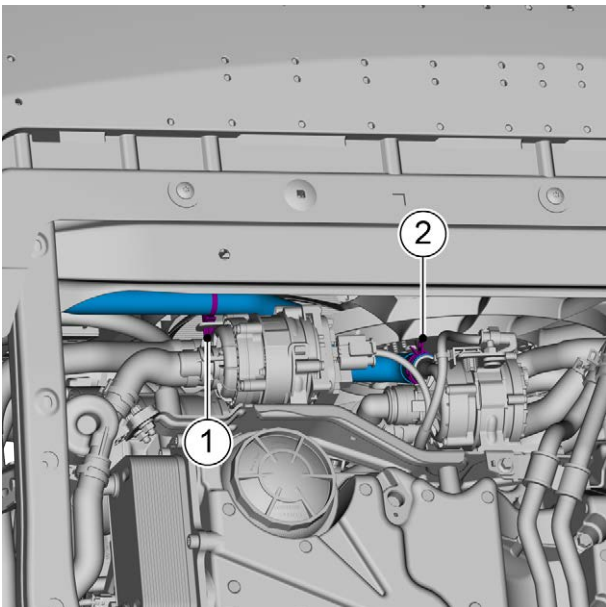
Warning !

See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 3 For the electric system coolant draining and filling procedure, see [Draining and Filling Procedure of Electric System Coolant](#).
- 4 Remove the front right wheel cover fender assembly, see [Replacement of Front Right Wheel Cover Feeder Assembly](#).

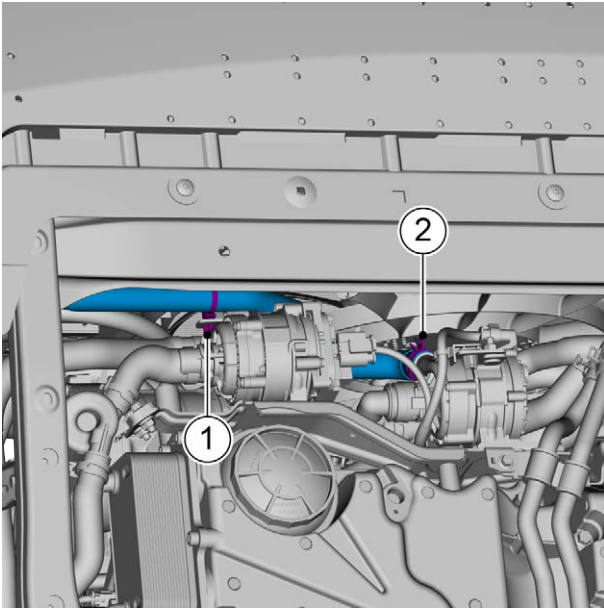


- 5 Remove the fixing clamp of the drive motor radiator inlet pipe, and disconnect the drive motor radiator inlet pipe from the low-temperature radiator.



- 6 Remove the fixing clips 1 of the drive motor radiator inlet pipe.
- 7 Remove the fixed clamp 2 of the drive motor radiator inlet pipe, and disconnect the drive motor radiator inlet pipe from the electronic water pump (3).
- 8 Remove the drive motor radiator inlet pipe.

Installation Procedure

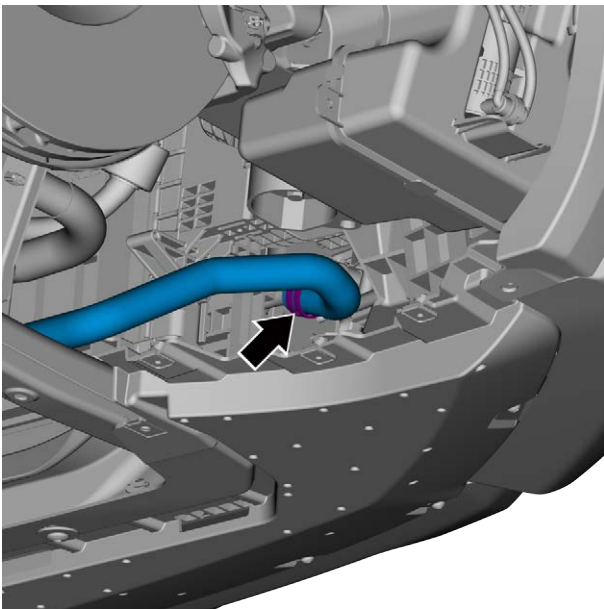


- 1 Install the drive motor radiator inlet pipe.
- 2 Connect the drive motor radiator inlet pipe to the electronic water pump (3), and install the fixing clamp 2 of the drive motor radiator inlet pipe.

Caution

Pipe orifices should be aligned with the markings for connecting.

- 3 Install the fixing clips 1 of the drive motor radiator inlet pipe.



- 4 Connect the drive motor radiator inlet pipe to the low-temperature radiator, and install the fixing clamp of the drive motor radiator inlet pipe.

Caution

Pipe orifices should be aligned with the markings for connecting.

- 5 Install the front right wheel cover fender assembly.
- 6 Fill the power battery coolant, start the vehicle and connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the liquid level in the expansion kettle. If there is a drop in the level, it is necessary to replenish coolant in time. Until the main circulation is opened, replenish coolant to the upper scribe line of the expansion kettle, and tighten the lid of the expansion kettle.
- 7 Install the bottom engine guard assembly.
- 8 lower the vehicle.

3.7.5.13 Replacement of Battery Coolant Pump

Removal Procedure

Warning !

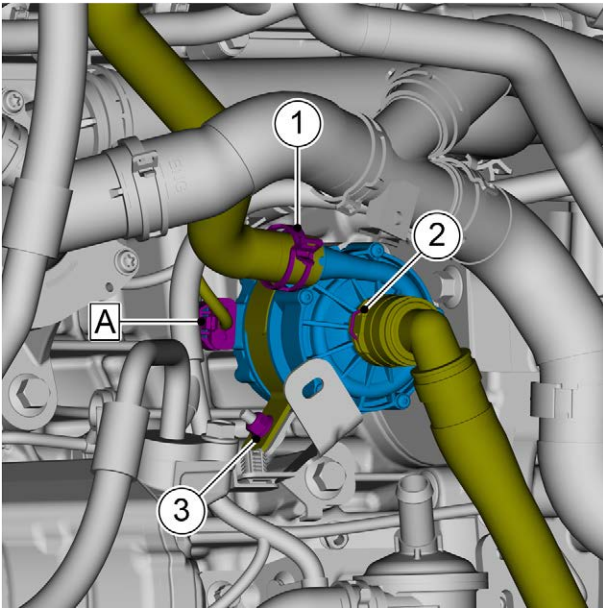
Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#).

Warning !

See "WARNINGS ABOUT VEHICLE LIFT" in ["WARNINGS AND PRECAUTIONS"](#)

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 3 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 4 Drain the electric system coolant, see [Draining and Filling Procedure of Electric System Coolant](#).
- 5 Remove the radiator inlet pipe (2), see [Replacement of Radiator Inlet Pipe \(2\)](#).
- 6 Remove the two fixing clips of the DC bus assembly.





- 7 Disconnect the harness connector A of the battery coolant pump.
- 8 Remove the fixing clamp 1 of the battery coolant pump and disconnect the battery coolant pump from the intercooler inlet pipe.
- 9 Disconnect the battery coolant pump from the radiator outlet pipe (2) by removing the quick-insertion circlip 2 of the battery coolant pump.
- 10 Remove the fixing nut 3 of the electronic water pump mounting/fixing bracket.
- 11 Remove the battery coolant pump.

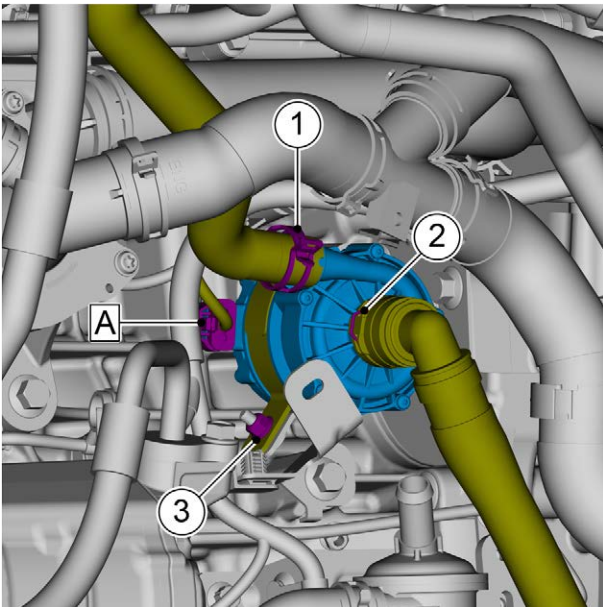
Installation Procedure

- 1 Install the battery coolant pump.
- 2 Install and tighten the fixing nut 3 of the electronic coolant pump mounting/fixing bracket.
Torque: 10N·m
- 3 Connect the battery coolant pump to the radiator outlet pipe (2) and install the quick-insertion circlip 2 of the battery coolant pump.
- 4 Connect the battery coolant pump to the intercooler inlet pipe, and install the fixing clamp 1 of the battery coolant pump

Caution

Pipe orifices should be aligned with the markings for connecting.

- 5 Connect the harness connector A of the battery coolant pump.





- 6 Install the two fixing clips of the DC bus assembly.

- 7 Install the radiator inlet pipe (2) .
- 8 Fill the electric system coolant, start the vehicle to connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the expansion kettle liquid level. If the liquid level has dropped, it is necessary to replenish the coolant in time. Until the main circulation is opened, replenish the coolant to the expansion kettle on the scribe line, and screw the lid of the expansion kettle cover tightly.
- 9 Install the bottom engine guard assembly.
- 10 lower the vehicle.
- 11 Connect the negative cable of battery.

3.7.5.14 Replacement of Electronic Water Pump (on-board charger module and PCM)

Removal Procedure

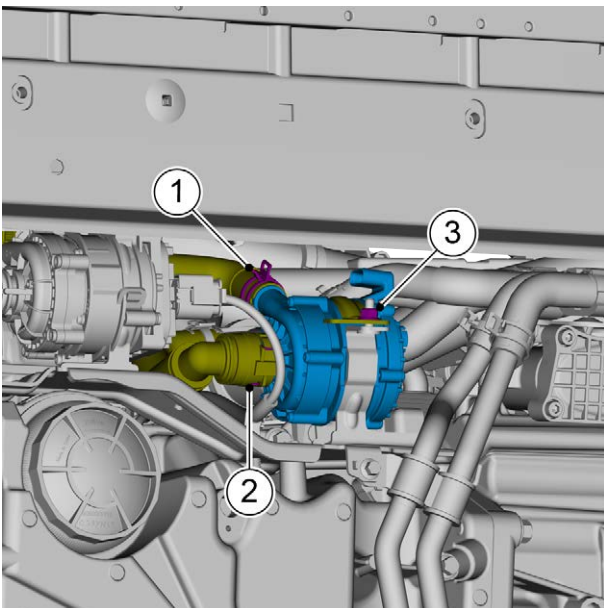
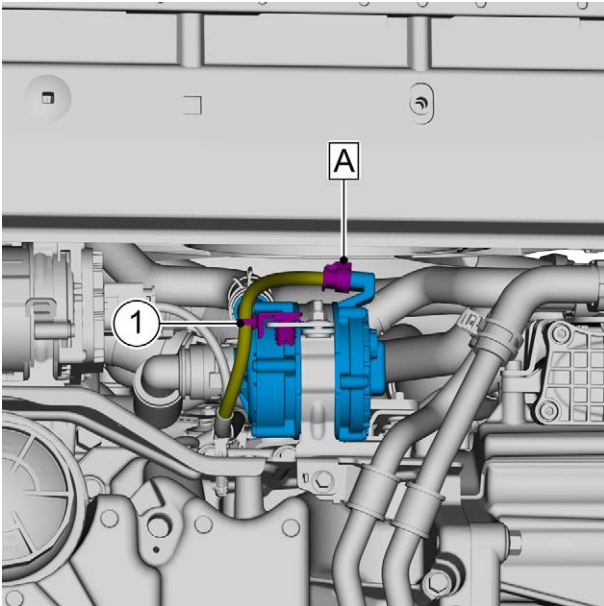
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

Warning !

See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

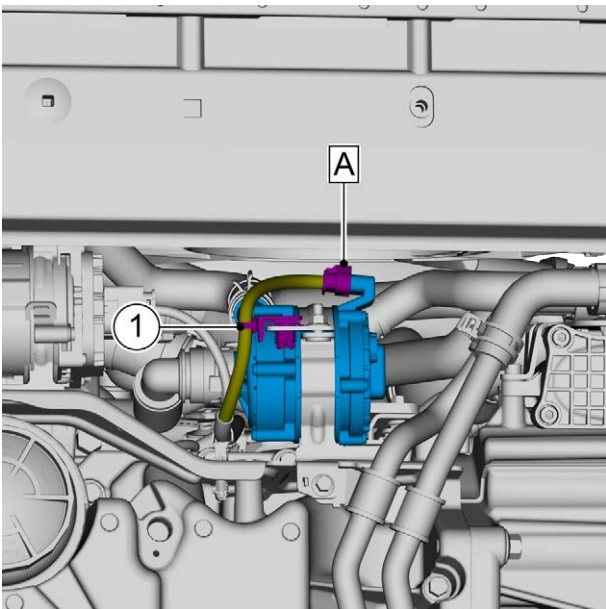
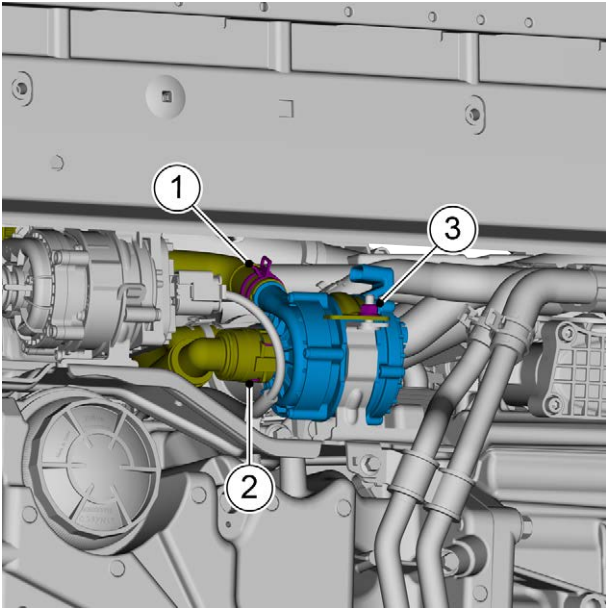
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).



- 3 Drain the electric system coolant, see [Draining and Filling Procedure of Electric System Coolant \(DHT Pro\)](#).
- 4 Disconnect the harness connector A of the electronic water pump (on-board charger module and PCM).
- 5 Remove the harness clip 1 of the engine wiring harness.

- 6 Remove the fixing clamp 1 of the drive motor radiator inlet pipe, and disconnect the drive motor radiator inlet pipe from the electronic water pump (on-board charger module and PCM).
- 7 Remove the quick-insertion circlip 2 of the water pump inlet pipe (4) and disconnect the water pump inlet pipe (4) from the electronic water pump (on-board charger module and PCM).
- 8 Remove the fixing nuts 3 of the water pump bracket and disengage the water pump bracket.
- 9 Take off the electronic water pump (on-board charger module and PCM).

Installation Procedure



- 1 Install the electronic water pump (on-board charger module and PCM).
- 2 Install and tighten the fixing nut 3 of the water pump bracket.
Torque: 10N·m
- 3 Connect the water pump inlet pipe (4) to the electronic water pump (on-board charger module and PCM), and install the quick-insertion circlip 2 of the water pump inlet pipe (4).
- 4 Connect the drive motor radiator inlet pipe to the electronic water pump (on-board charger module and PCM) and install the fixing clamp 1 of the drive motor radiator inlet pipe.
- 5 Install the harness clip 1 of the engine harness.
- 6 Connect the harness connector A of the electronic water pump (on-board charger module and PCM).

- 7 Fill with the electric system coolant.
- 8 Install the bottom engine guard assembly.
- 9 Connect the negative cable of battery.

Speed transmission

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4.1 Warnings and Cautions

4.1.1 Warnings and Cautions

4.1.1.1 Warnings and Cautions

Warning about High Voltage Power during Removal and Installation of Transmission Parts

Warning !

1. Operators for removing and installing transmission parts must have an electrician's license;
2. All part replacement operations must be disconnected from the power and operators must wear insulated gloves.

Warning about High Temperatures in Transmission

Warning !

After the transmission is separated from the powertrain, the temperature of the transmission surface and fluid is high. Direct contact with hot surfaces should be avoided, and protection should be provided when draining the fluid.

Warning about Goggles and Gloves

Warning !

Always wear goggles and gloves for removing exhaust system parts, otherwise rust and sharp edges falling from worn exhaust system parts can cause serious personal injury.

Warning about Road Test

Warning !

Road test the vehicle in a safe manner and obey all traffic laws. Do not attempt any operation that could jeopardize vehicle control. Failure to comply with the above safety instructions could result in serious personal injury and damage to the vehicle.

Engine Lifting Precautions

Caution

When lifting or supporting the engine for any reason, do not support the jack under the oil sump, any sheet metal parts, or the crankshaft pulley. Lifting the engine in an incorrect manner can result in damage to components.

Fastener Precautions

Caution

Use the correct fastener in the correct location. Replacement fasteners must be of the correct part number. Fasteners requiring replacement or requiring the use of thread locking adhesive or sealant are specifically noted in the service procedures. Paint, lubricants, or corrosion inhibitors must not be applied to fasteners or fastener attachment surfaces unless otherwise indicated. These coatings affect the torque and clamping force of the fastener and can damage the fastener. When installing fasteners, be sure to use the correct tightening sequence and torque to avoid damage to the parts and the system.

Sealant Precautions

Caution

Do not allow room-temperature hardening sealants to enter blind threaded holes. If room-temperature hardening sealant enters a blind threaded hole, the fastener will hydraulically lock up during fastening. Hydraulic locking of fasteners can cause damage to the fastener and/or other components. It also prevents the fastener from being tightened with the correct clamping force. Incorrect clamping force prevents the component from sealing properly, which can lead to leakage. Failure to properly tighten fasteners can cause components to loosen or separate, which can lead to severe engine damage.

4.2 Automatic transmission 3DHT

4.2.1 Specification

4.2.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Fixing bolts between hybrid special transmission assembly and engine	M10×40	41-55
	M10×70	41-55
Fixing bolt between water pump bracket assembly and hybrid special transmission assembly	M8×20	20-28
Fixing bolt between high-pressure protection bracket and hybrid special transmission assembly	M6×20×23.3	8.5-11.5
	M6×16×19.3	
Fixing bolt between water pipe bracket and hybrid special transmission assembly	M6×20	8.5-11.5
Fixing bolt between oil sump and housing	M6×16×19.3	8.5-11.5
Fixing nut of engine wiring harness	M6	8.5-11.5
Fixing bolt between transmission oil cooler and hybrid special transmission assembly	M6x16	Pre-tightening 2~4
		Final tightening 9~11
Fixing bolt between low pressure filter and transmission oil cooler	M6×16	9-11
Hexagon socket fixing screw between electronic gear selector module and auxiliary dashboard body assembly	M5×25	5-7
Fixing bolt of between electronic water pump inlet pipe and battery water pump bracket	M6×16	8.5-11.5
Oil filler bolt for hydrostatic clutch release actuator	-	1.3-1.7
Fixing bolt for transmission control module	M6x22	7-9
Fixing bolt for transmission oil temperature sensor	M6x16	9-11
Fixing bolt for transmission wiring harness	M6x20/16	17-23
	M8x20	17-23
	M6x22	Pre-tightening 2~4
		Final tightening 9~11
Fixing bolt for oil sump	M6	9-11
Fixing bolt for oil cooler	M6	9-11

4.2.1.2 Maintenance Data

Item	Unit	Parameter
Transmission mode	-	3DHTP535G
Form	-	Automatic
Peak power of drive motor	kW	100
Rated power of drive motor	kW	50
Peak torque of drive motor	N·m	338
Rated torque of drive motor	N·m	160
Peak speed of drive motor	r/min	7000
Rated speed of drive motor	r/min	3000
Main reducer reduction ratio	-	3.19
Number of gears	-	3
Transmission gear ratio	-	I:2.890,II:1.546,III:0.915/R:2.890
Maximum input torque	N·m	338
Clutch operation mode	-	Hydraulic
Shift mode	-	AT
Speed ratio range	-	I:9.221/II:4.933/III:2.920/R:9.221
Transmission fluid grade	-	Chinese name: 壳牌新能源汽车变速器油 English name: Shell E-Fluids E6 i DHTF
Transmission fluid filling capacity	L	4.7±0.2

4.2.2 Instructions and operations

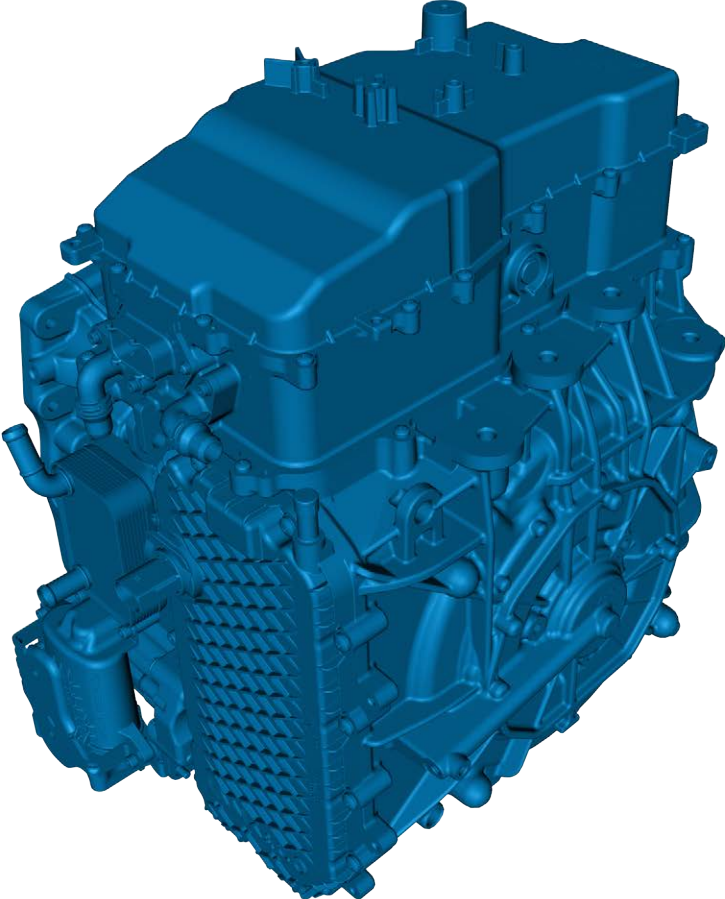
4.2.2.1 Instructions and operations

The 3DHT transmission is a high-torque hybrid special automatic transmission assembly, which successfully realizes the miniaturization, lightweight and low-power consumption of automatic transmission by adopting highly efficient and integrated key components such as dual motors (P1 power generation, P2 drive), electronic duplex pumps, dual clutch system, hydraulic module, dual planetary row structure, PCM and so on.

It has the following features:

1. Adopting a clutch system with high precision torque model and temperature model, it has high torque accuracy and efficiency.
2. The 3DHT transmission has a dual-motor system, which can realize different working modes such as series, parallel, pure electric, and energy recovery.
3. The axle gear system is a double planetary gear structure, which can provide three gears, which can make the engine run better in the high efficiency zone. The application of column bearings and ball bearings realizes low power loss. The axle gears are designed with high overlap, providing excellent NVH performance.

3DHT has various driving modes, including sport mode, economy mode and normal mode. The driver judges the driving conditions and switches to different driving modes, and the PCM will judge the driver's current needs based on the signals transmitted from the accelerator pedal and vehicle speed so as to meet the customer's needs in driving the vehicle.



4.2.3 System working principles

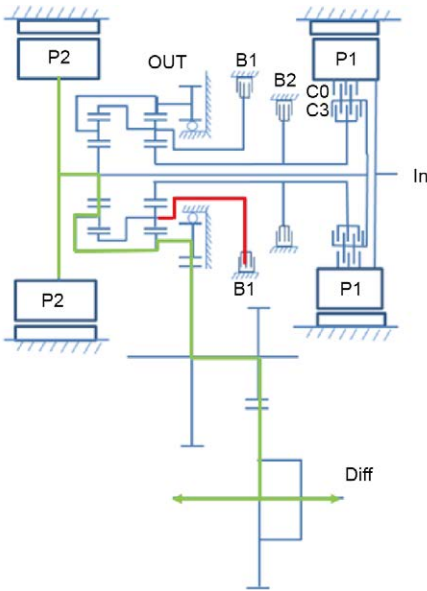
4.2.3.1 System working principles

Transmission System

The transmission system consists of the input shaft 1, input shaft 2, front planetary mechanism, rear planetary mechanism, front planetary mechanism ring, output shaft assembly and differential assembly.

First gear: B1 brake binding

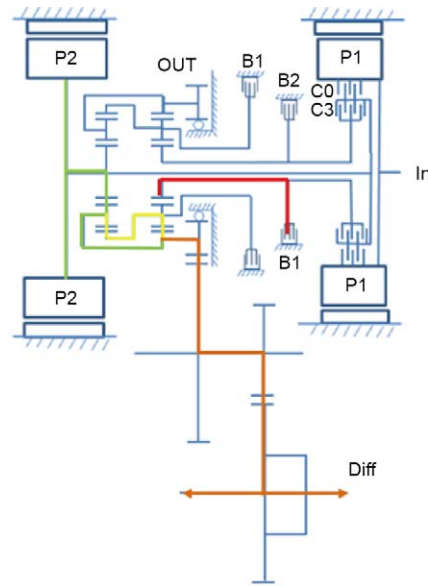
P2 motor/engine → Input shaft 1 → Rear planetary mechanism planetary carrier bracket → Front planetary mechanism gear ring → Output gear ring (green path), the red path in the diagram indicates that the front planetary mechanism planetary carrier is locked.



Second gear: B1 brake released, B2 brake engaged

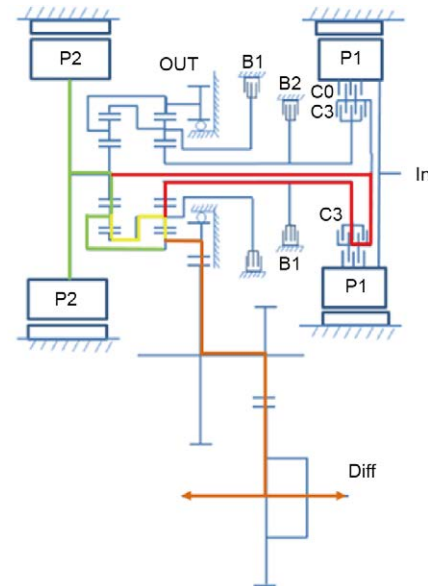
1. P2 motor/engine → input shaft 1 → rear planetary mechanism planetary carrier bracket → front planetary mechanism gear ring → output gear ring (green path).
2. P2 motor/engine → input shaft 1 → rear planetary mechanism planetary wheel → front planetary mechanism gear ring → output gear ring (yellow path).

The red path in the diagram indicates that the input shaft 2 is locked, and the orange path indicates that the two paths are combined to output power.



Third gear: B1 and B2 brake released, C3 clutch combined

Input shaft 1 → On the basis of second gear, add the path: P2 motor/engine → Input shaft 2 → Rear planetary row sun wheel → Output toothed ring (red path).



Hydraulic System Actuator

The hydraulic system actuator consists of the C0 and C3 clutches and the B1 and B2 brakes. By combining and disengaging the clutches and brakes, the power transmission of different paths is accomplished, and the switching between different gears is realized.

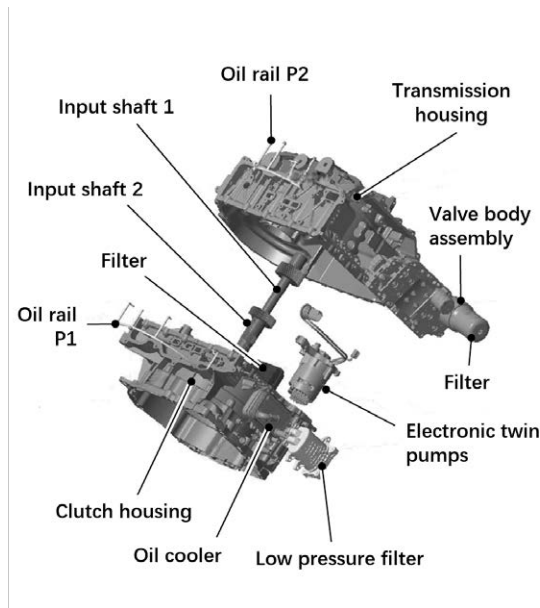
Hydraulic Valve Assembly

DHT Pro's valve assembly mainly controls the hydraulic oil pressure and flow distribution through the switching solenoid valve, pressure regulating solenoid valve, and mechanical valve, and realizes the clutch and brake engagement and disengagement, cooling and lubrication of axle and gear parts,

cooling and lubrication of clutches and brakes, and cooling and lubrication of motors.

Cooling and Lubrication System

The transmission generates heat during operation., The P1 motor, P2 motor, brake, clutch, and axle gears need to be cooled by the cooling system. The cooling and lubrication system includes a suction filter, an electronic duplex pump, an oil cooler, a low-pressure filter press, a valve assembly, P1 and 2 oil rails, a transmission case (oil passages), a clutch case (oil passages), input shaft 1 (lubricating oil holes), and input shaft 2 (lubricating oil holes).



Cooling Oil Circuit

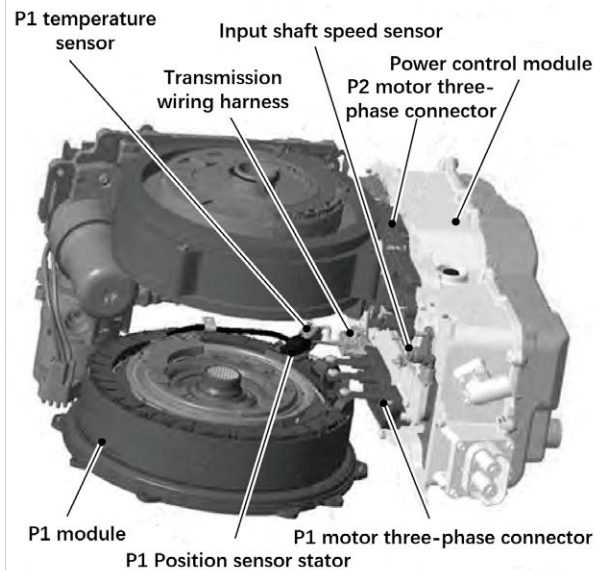
1. P1 motor lubricating oil circuit: the transmission lubricating oil is filtered by the internal suction filter and then transported through the clutch housing by the electronic duplex pump to the oil cooler and low pressure filter press for cooling and secondary filtration. After cooling and filtering, it is connected with the lubricating oil channel of the clutch housing and the lubricating oil rail of the P1 motor to lubricate and cool the P1 motor.
2. P2 motor lubricating oil circuit: transmission lubricating oil is filtered by the internal suction filter and then transported to oil cooler and low pressure filter press for cooling and secondary filtration through electronic duplex pump through clutch housing. After cooling and filtering, it is connected to transmission housing oil circuit through valve assembly inlet and outlet ports, and lubricating oil reaches to the P2 lubricating oil circuit through housing oil circuit to cool and lubricate the P2 motor.
3. Clutch and brake lubricating oil circuit: the transmission lubricating oil is filtered by the internal suction filter and then

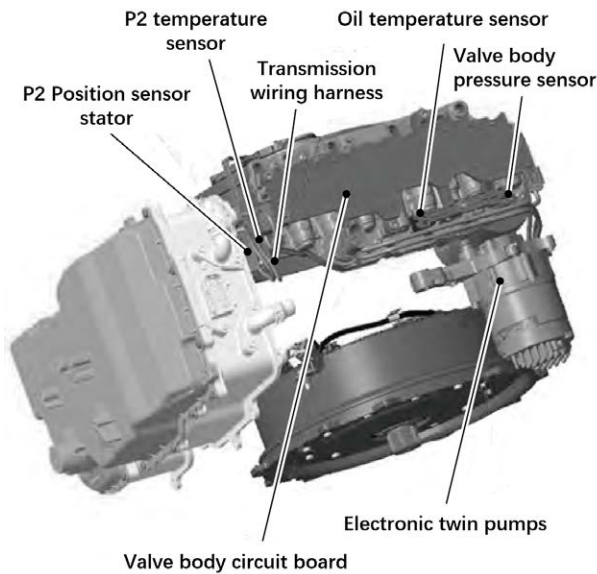
transported to the oil cooler and low-pressure pressurized filter for cooling and secondary filtration through the clutch housing by the electronic duplex pump, After cooling and filtration, the lubricating oil is finally connected to the transmission housing oil circuit through the inlet/outlet port of the valve assembly, and the lubricating oil reaches the clutch oil circuit through the housing oil circuit to provide lubricating cooling for the clutch and the brake.

4. Shaft gear lubricating oil circuit: the transmission lubricating oil is filtered by the internal suction filter and then transported to the low-pressure filter press of the oil cooler for cooling and secondary filtration through the electronic duplex pump through the clutch housing. After cooling and filtering, it is connected with the transmission housing oil passage through the inlet and outlet of the valve assembly, and the lubricating oil enters into the internal shaft gears via the transmission housing oil passage, and then provides cooling and lubrication to the bearings through the oil holes on the shaft gears.

Electrical Control System

The electronic control system includes PCM, transmission out-of-case harness, transmission variable-case harness, P1 temperature sensor, P2 temperature sensor, valve body circuit board, P1 three-phase connector, P2 three-phase connector, output shaft speed sensor, valve body pressure sensor, transmission fluid temperature sensor, P1 position sensor, P2 position sensor control system, as well as the electronic duplex pumps, P1 module, P2 motor electronic control execution components.





Electronic control principle

1. Processing sensor feedback signal function: several sensors are installed in the DHT Pro transmission, including the P1 temperature sensor, P2 temperature sensor, output shaft speed sensor, valve body pressure sensor, transmission oil temperature sensor, P1 position sensor and P2 position sensor. The signals returned from these sensors need to be processed before the controller can recognize them, so the controller's primary function is to process the feedback signals from the sensors.
2. Control the transmission clutch, brake engagement and disengagement to achieve transmission gear shifting and mode switching function: through the collection of various sensor signals, and through CAN communication on the vehicle's operating conditions to judge, combined with the shift law of the control program. In the need to carry out the shift operation, the PCM sends out commands, through the control of the solenoid valve opening and closing and open, to achieve the clutch C3 and C0 and brake engagement and disengagement, to complete the gear shift, mode switching.
3. Control the P1 motor to realize engine start-stop and power generation functions: It receives commands from ECM through CAN communication to realize engine start-stop and power generation functions.
4. Control the P2 motor to realize driving, which is used to provide power output for the whole vehicle: Accept ECM instructions through CAN communication, collect throttle opening signals, and drive P2 to meet the power demands of the whole vehicle.

5. Realize lubrication and cooling control: PCM adjusts the rate of the transmission cooling and lubrication flow in real time according to the relevant sensor signal feedback and combining with the actual operating conditions so as to meet the transmission working requirements.

6. Realizing the data exchange with the whole vehicle: PCM is equipped with CAN bus to realize the data communication between PCM and the whole vehicle, obtaining data such as engine speed, vehicle speed, throttle opening, etc., and understanding the working condition of the whole vehicle and the driver's intention, so as to realize the overall matching between the transmission and the whole vehicle.

4.2.3.2 Parts Information

Electronic Gear Selector Module



An electronic gear selector module has a safer and faster electronic control mode, eliminating the traditional mechanical gear shift mode and replacing all with electronic signals. The electronic gear selector module sends the gear signals to the hybrid special transmission assembly, thus realizing the switching of gears.

Transmission oil cooler



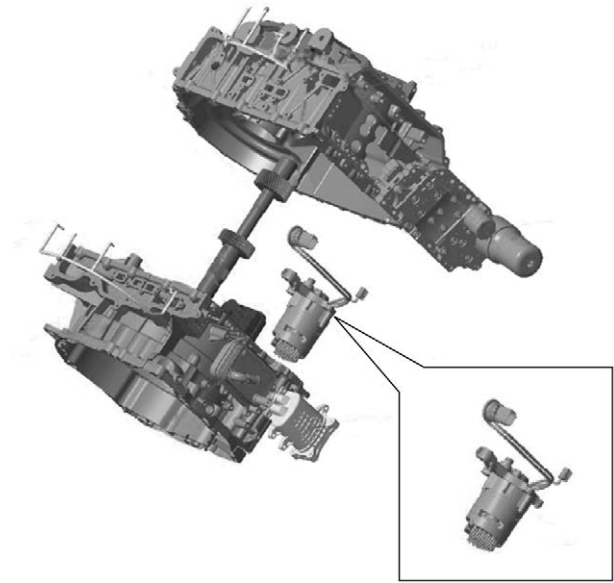
The transmission oil cooler is located in front of the transmission and connected to the radiator assembly outlet pipe. The transmission lubricant is cooled by an electronic duplex pump through the clutch housing to the oil cooler, thus improving the service life of the transmission.

Low pressure filter



The low-pressure filter press has a low-pressure filter press element inside, and the transmission lubricant is filtered by the internal suction filter and then transferred to the low-pressure filter press for secondary filtration by the electronic duplex pump through the clutch housing.

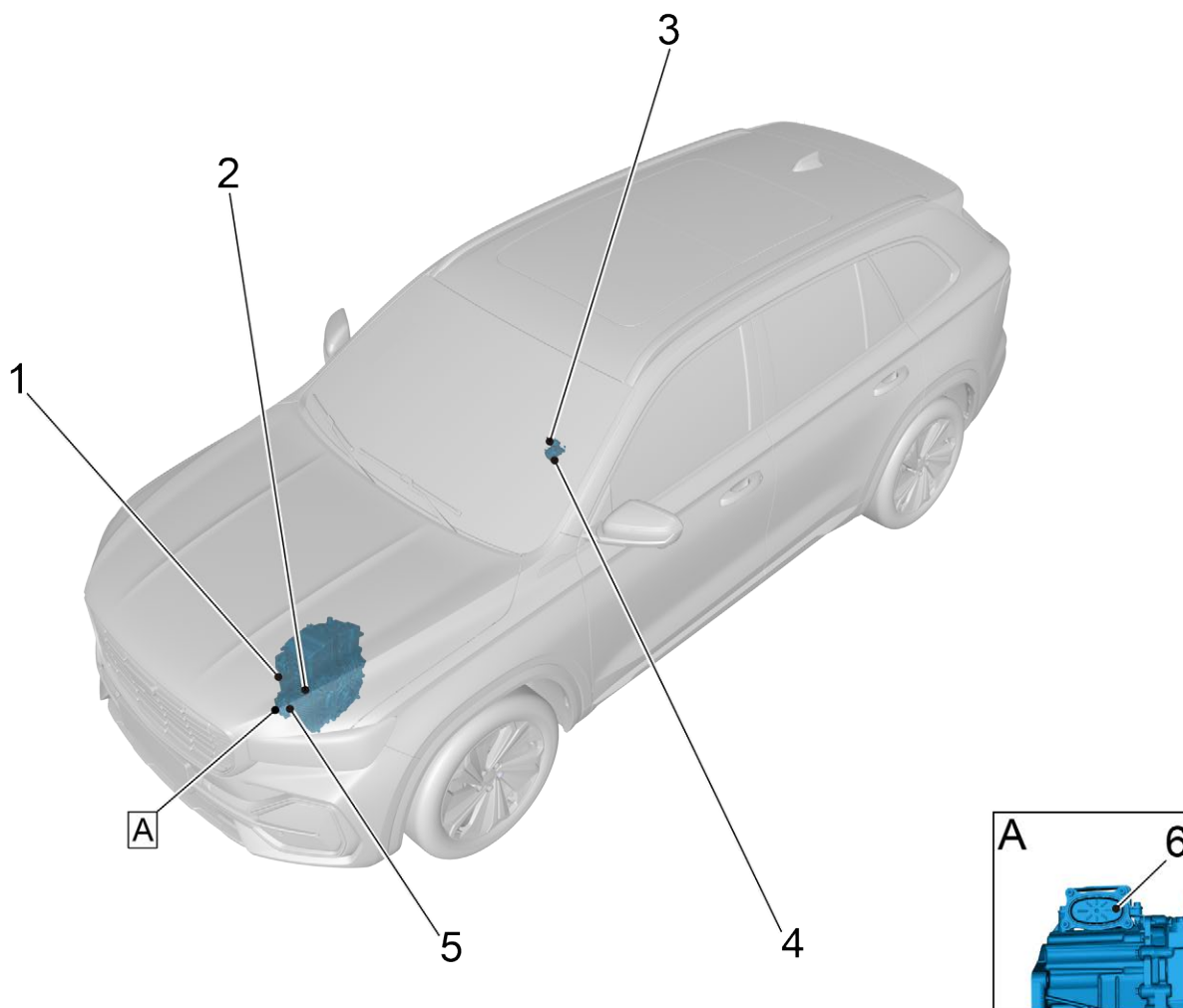
Electric Oil Pump (electronic duplex pump) in Transmission



The electric oil pump (electronic duplex pump) in transmission is integrated inside the hybrid transmission assembly to provide power source for the internal fluid lubrication of transmission assembly, cooling and clutch and brake piston operation. It is powered and grounded by the engine wiring harness sub-assembly, and the PCM inside the transmission assembly is connected to the electric oil pump (electronic duplex pump) in transmission through the valve circuit board to control its work.

4.2.4 Part position

4.2.4.1 Part position



- 1. Transmission oil cooler
- 2. Oil sump
- 3. Shifter handle

- 4. Automatic transmission shift lever
- 5. Low pressure filter
- 6. Low pressure filter element

4.2.5 Diagnostic information and procedure

4.2.5.1 Diagnosis description

See Description, Operation and System Operating Principles before diagnosing a fault in the hybrid special transmission assembly. Understanding and familiarizing yourself with the operating principles of the hybrid special transmission assembly before beginning system diagnostics will determine the correct troubleshooting steps to take in the event of a malfunction. And more importantly, this will determine if the condition described by the customer is normal operation. Any troubleshooting of the hybrid special transmission assembly should begin with a visual inspection that guides the serviceman to the next logical step in the troubleshooting process. Understanding and using the diagnostic process correctly will shorten the diagnostic time and avoid mis-diagnosis of the faulty location.

Introduction to Diagnostics:

- The mechanical failure of a hybrid special transmission assembly consists of any of the following symptoms:
 - Producing noise or vibration
 - Automatic transmission oil leakage
 - Vehicle will not move forward or reverse
- The causes of the above mechanical failures come from:
 - Assembly errors
 - Transmission fluid is low relatively
 - Failure of a component of automatic transmission
- The following are the causes that produce control system malfunctions:
 - Failure of ECM
 - Faulty switches
 - Faulty wiring harness and wiring harness connector

4.2.5.2 Visual check

- Inspect aftermarket retrofit devices that may affect the hybrid special transmission assembly to ensure that they cannot affect the operation of the hybrid special transmission assembly.
- Check system components that are easily accessible or can be seen to find out if there is any obvious damage of the component or there is a situation that may cause a fault.
- Check the harness and harness connector to ensure that there is no sign of loosening, damage, poor contact, aging, etc.
- Check the transmission fluid to ensure that the recommended transmission fluid is being used, added well without contaminated or leaking.

4.2.5.3 DTC Failure Protection

Different symptoms and protection modes may occur for different types of faults and vehicle operating conditions, and the vehicle will return to normal after the fault is removed.

4.2.5.4 Diagnostic System

1. Note

When troubleshooting a vehicle equipped with Multi-Channel Communication On-Board Diagnostics (OBD), the vehicle must be connected to an intelligent tester. Various data outputs from the control module can then be read.

The OBD specification requires the on-board computer to illuminate the malfunction lamp on the instrument panel when it detects a malfunction in a component in the system and record the corresponding DTC in the control module memory. If the fault does not occur repeatedly in 3 consecutive cycles, the fault lamp automatically turns off, but the DTC remains be recorded in the control module memory.

Connecting the diagnostic instrument cable to the diagnostic Interface will enable the diagnostic instrument by operating the start switch to bring the power mode to ON. If the combination instrument indicates that a communication error has occurred, the problem occurs either on the vehicle or on the diagnostic instrument.

Caution

If communication is normal when the diagnostic instrument is connected to another vehicle, check the diagnostic interface on the original vehicle.

When communication still cannot be established when the diagnostic instrument is connected to another vehicle, the problem may be with the diagnostic instrument. Consult the service department listed in the User Manual of Diagnostic Instrument.

4.2.5.5 Diagnostic Code Reading and Clearing

1. Read DTC

- a. Connect the diagnostic instrument to the diagnostic interface.
- b. Operate the start switch to set the power mode to ON.
- c. Follow the prompts on the diagnostic instrument screen to read the DTC value.

2. Clear DTC

- a. Connect the fault diagnosis instrument to the fault diagnosis interface.
- b. Operate the start switch to set the power mode to ON.
- c. Follow the prompts on the diagnostic instrument screen to delete the DTC.

4.2.6 Removal and Installation

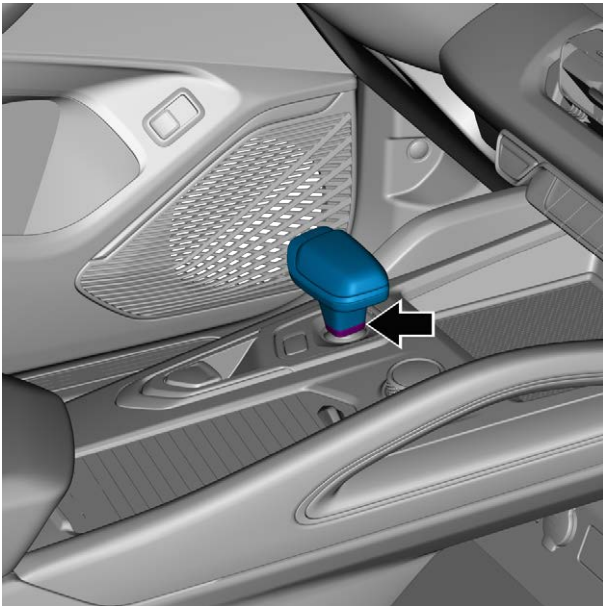
4.2.6.1 Replacement of Shifter Handle

Removal Procedure

- 1 Remove the shifter handle by turning the locking ring clockwise (counterclockwise).

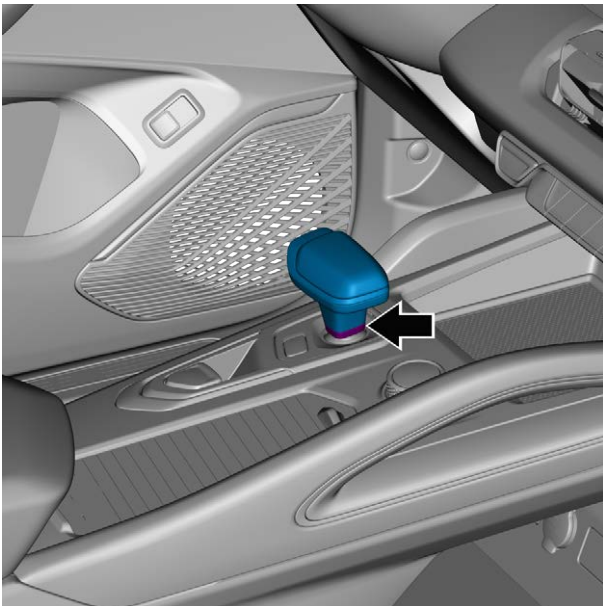
Caution

If the locking ring cannot be loosened even with a clockwise (counterclockwise) unlocking torque of 2 N·m, rotate the locking ring in the opposite direction and remove the shifter handle;



Installation Procedure

- 1 Install the shifter handle and rotate the locking ring in the reverse direction (opposite to the direction of removal).



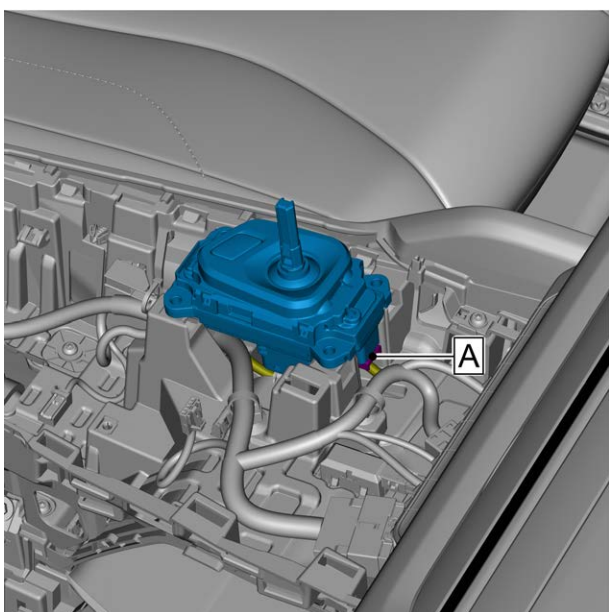
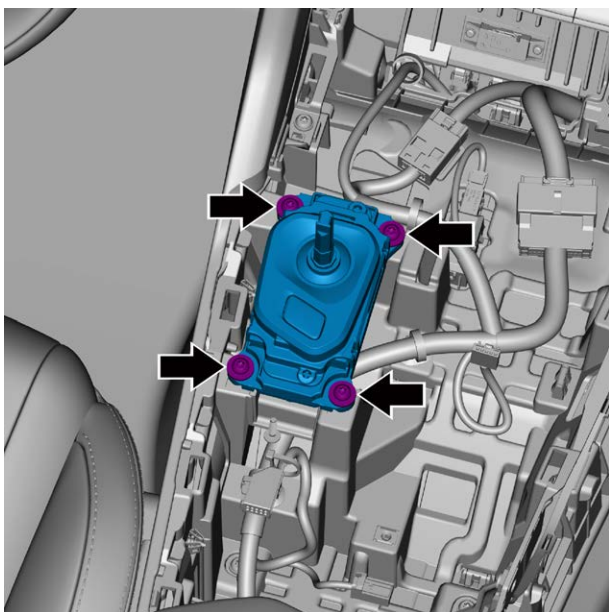
4.2.6.2 Replacement of Electronic Gear Selector Module

Removal Procedure

Warning !

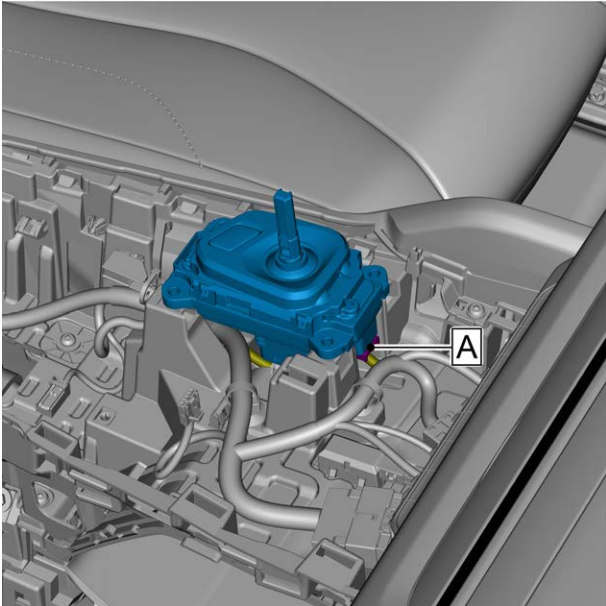
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

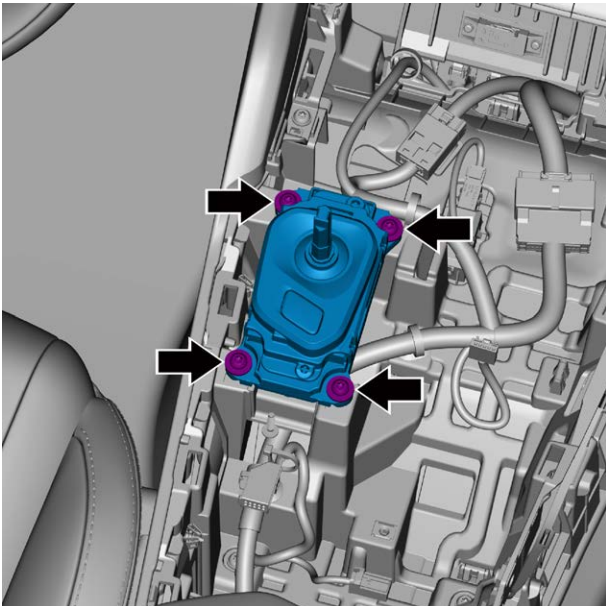


- 2 Remove the shifter handle for replacement, see [Replacement of Shifter Handle](#).
- 3 Remove the gear shift panel assembly, refer to [Replacement of gear shift panel assembly](#).
- 4 Remove the four hexagon socket fixing screws from electronic gear selector module.
- 5 Disconnect the harness connector A of the electronic gear selector module and remove the electronic gear selector module.

Installation Procedure



- 1 Connect the harness connector A of the electronic gear selector module after installing the electronic gear selector module.



- 2 Install and tighten the four hexagon socket fixing screws of the electronic gear selector module.
Torque: 6 N·m

- 3 Install the gear shift panel assembly.
- 4 Replace the installed shifter handle.
- 5 Connect the negative cable of battery.
- 6 Use the GLDS diagnostic program. On the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software flash operation.

4.2.6.3 Replacement of Vent Valve

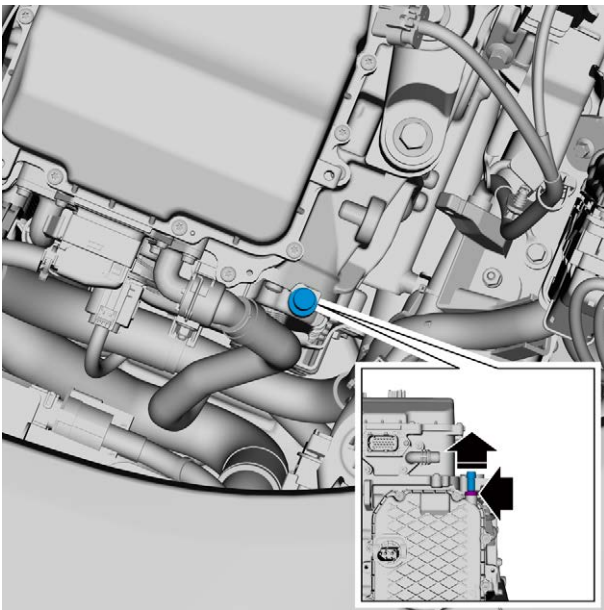
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#).

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the air filter assembly, see [Replacement of Air Filter Assembly](#).
- 4 Remove the vent valve.

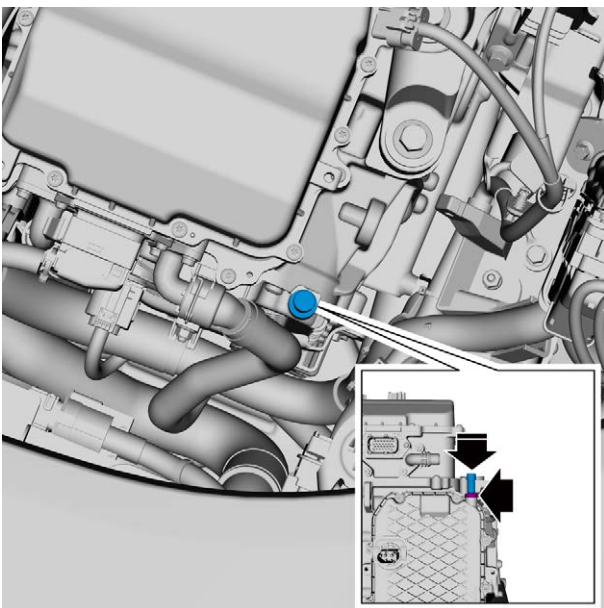
Before removing the vent valve, make the red marking as a grip point and pull out the vent valve in the direction of the arrow.

**Installation Procedure**

- 1 Install the vent valve.

Caution

- The vent valve is a disposable and vulnerable component and needs to be replaced with a new one each time it is removed.
- Ensure that the centerline of the vent hose is perpendicular to the mating end of the housing during installation, and slowly insert it into the housing until it clicks into place.



- 2 Install the air filter assembly.

- 3 Connect the negative cable of battery.
- 4 Close the engine compartment cover.

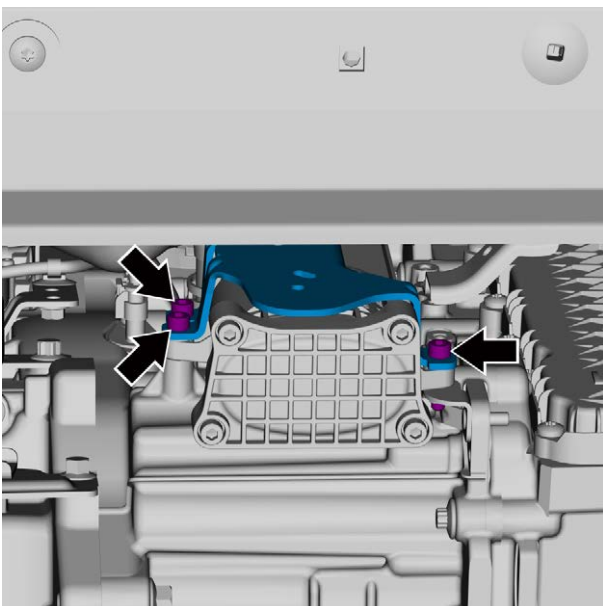
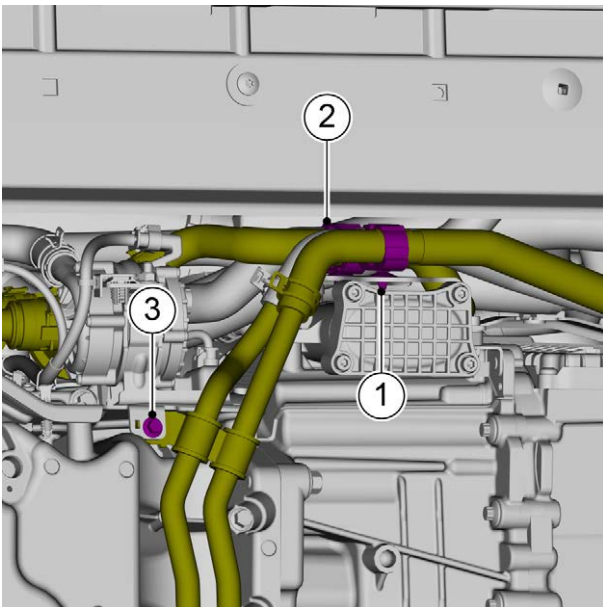
4.2.6.4 Replacement of Low Pressure Filter Press

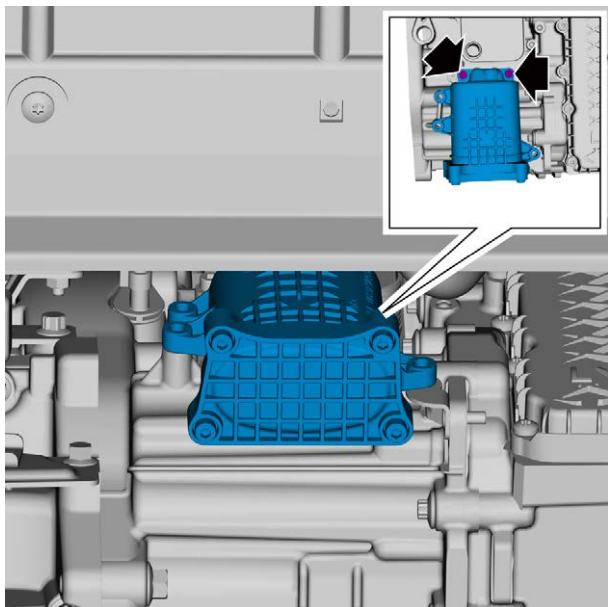
Removal Procedure

Caution

The transmission assembly needs to be refilled with oil (200 ml) after the low pressure filter press is replaced as the low pressure filter is replaced with oil stored inside (about 200 ml).

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 3 Remove the fixing clip 1 of the low-temperature radiator outlet pipe.
- 4 Remove the fixing clip 2 of the radiator outlet pipe (2).
- 5 Remove the fixing bolts 3 of the coolant inlet/outlet metal pipe, and take off the water pipe.
- 6 Remove the three fixing bolts of the bracket.





- 7 Remove the two fixing bolts of the low pressure filter press.
- 8 Take off the low pressure filter press.

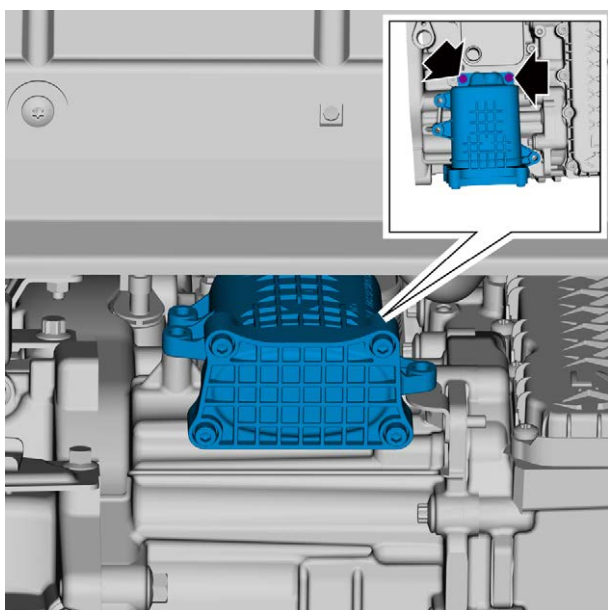
Caution

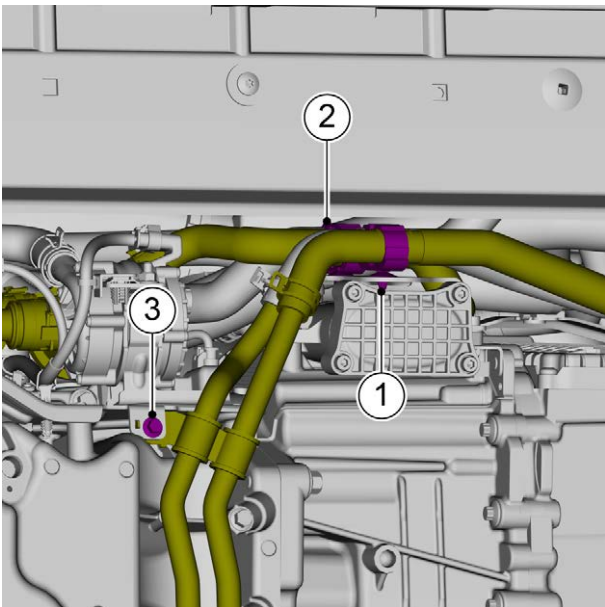
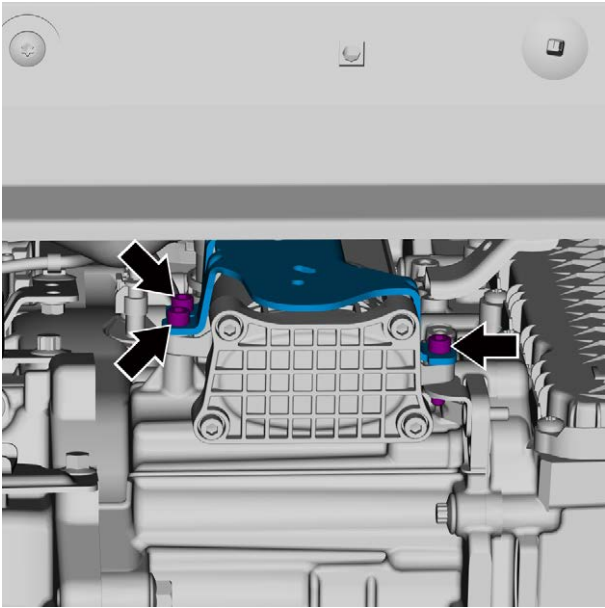
When removing the low pressure filter press, transmission fluid may flow out at this time and will need to be collected with a container prepared in advance.

Installation Procedure

- 1 Install the low pressure filter press.
- 2 Install and tighten the two fixing bolts of the low pressure filter press.

Torque: 10 N·m





- 3 Install and tighten the three fixing bolts of the bracket.
Torque: 10N·m

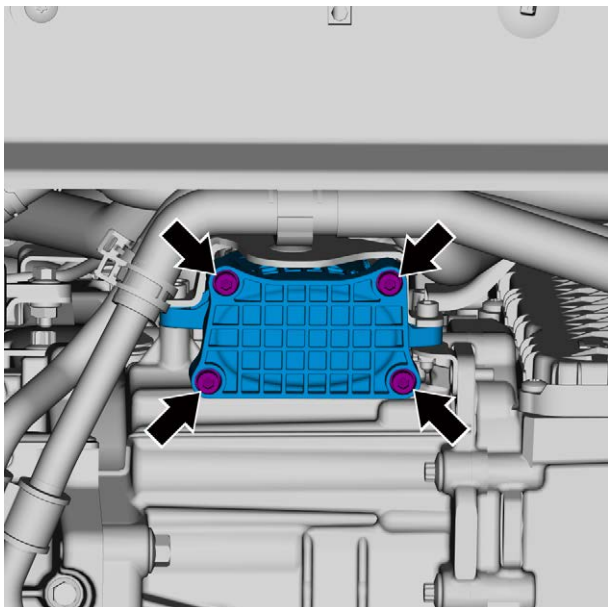
- 4 Install and tighten the fixing bolts 3 of the coolant inlet and outlet metal pipes.
- 5 Install the fixing clips 2 of the radiator outlet pipe (2).
- 6 Install the fixing clip 1 of the low temperature radiator outlet pipe.

- 7 Check the transmission fluid level, see [Transmission Fluid Draining and Filling Procedure](#).
- 8 Install the bottom engine guard assembly.
- 9 lower the vehicle.

4.2.6.5 Replacement of Low Pressure Filter Element

Drain Procedure

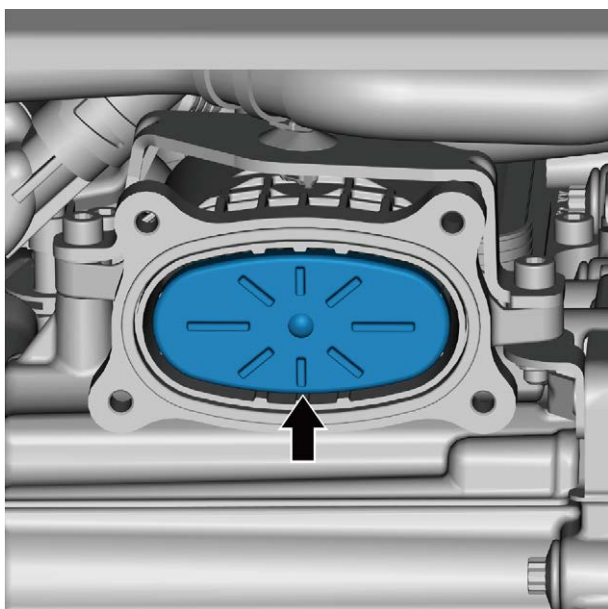
- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).



- 3 Take off the low pressure filter bottom housing by removing the four fixing bolts from the low pressure filter bottom housing.

Caution

Place a drip pan to prevent transmission spillage.



- 4 Remove the low pressure filter press element.

Caution

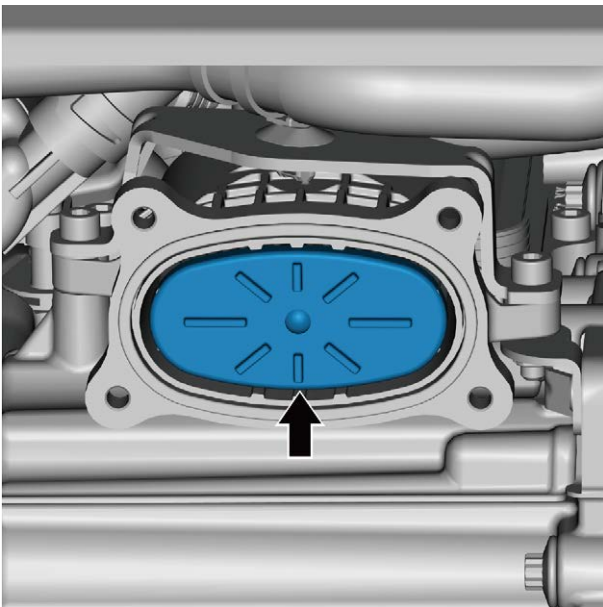
Using a pair of flat nose pliers to grip the small tab on the bottom of the filter element and carefully pull it down.

Filling Procedure



1 **Caution**

Clean the inside of the low-pressure filter press and install the low-pressure filter press 1. Replace the new low-pressure filter press 1 and the sealing ring 2.

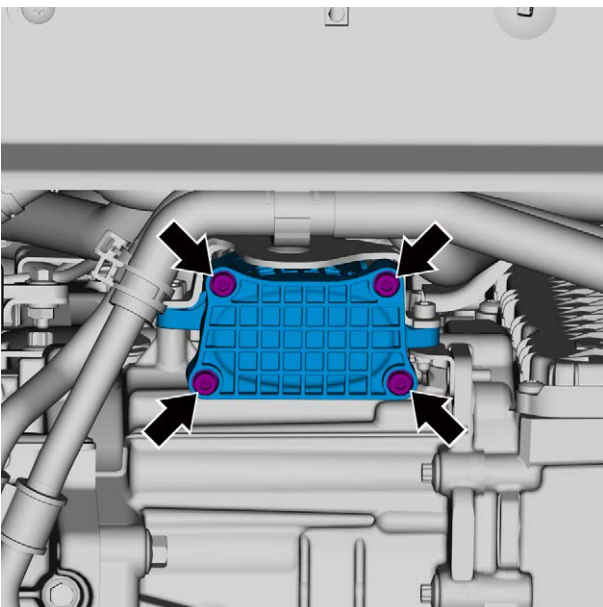


2 Install a new low pressure filter upwards.

Caution

Pay attention to the direction of the filter element.

Install a new sealing ring, and apply some lubricating oil.



3 Install the bottom shell of the low pressure filter press and four fixing bolts.

Torque: 14 N·m

- 4 Check the transmission fluid level, see [Transmission Fluid Draining and Filling Procedure](#).
- 5 Install the bottom engine guard assembly.
- 6 lower the vehicle.

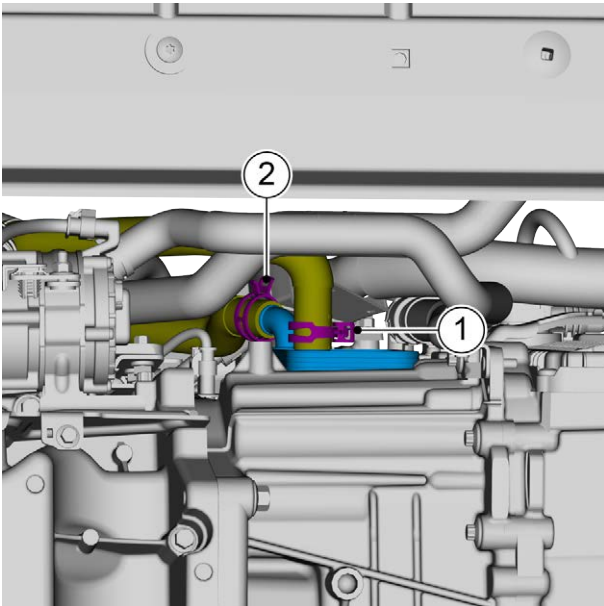
4.2.6.6 Replacement of Transmission Oil Cooler

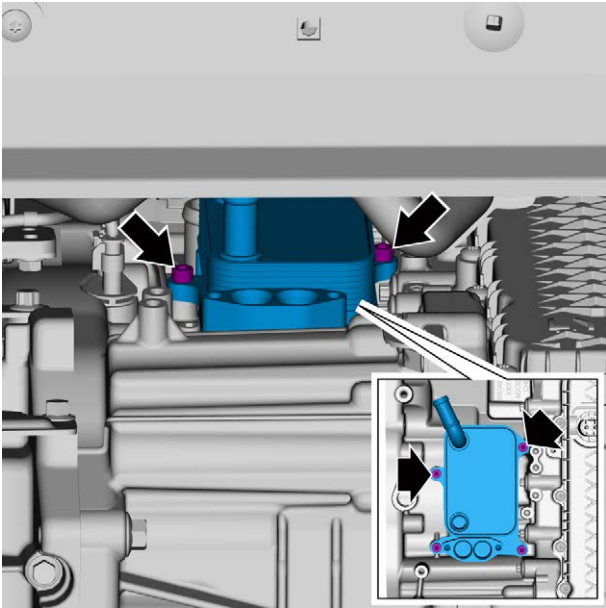
Removal Procedure

Warning !

See "WARNING ABOUT COOLING SYSTEM MAINTENANCE" in "[WARNINGS AND PRECAUTIONS](#)".

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 3 Drain the engine coolant, see [Draining and Filling of Engine Coolant](#).
- 4 Remove the air filter assembly, see [Replacement of Air Filter Assembly](#).
- 5 Remove the low pressure filter press, see [Replacement of Lower Pressure Filter Press](#).
- 6 Remove the radiator outlet pipe, see [Replacement of Radiator Outlet Pipe](#).
- 7 Remove the fixing clamp 1 of the radiator inlet pipe (2) and disconnect the radiator inlet pipe (2) from the transmission oil cooler.
- 8 Disconnect the transmission oil cooler inlet pipe (front end) from the transmission oil cooler by removing the fixing clamp 2 of the transmission oil cooler inlet pipe (front end).

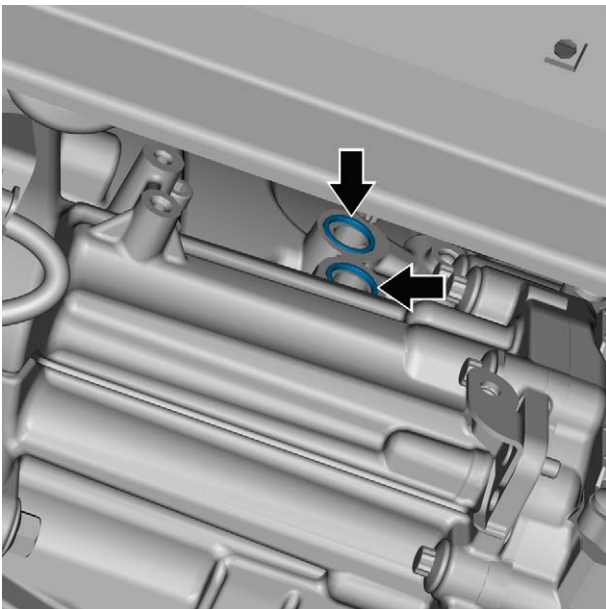




- 9 Take off the transmission oil cooler by removing the four fixing bolts of the transmission oil cooler.

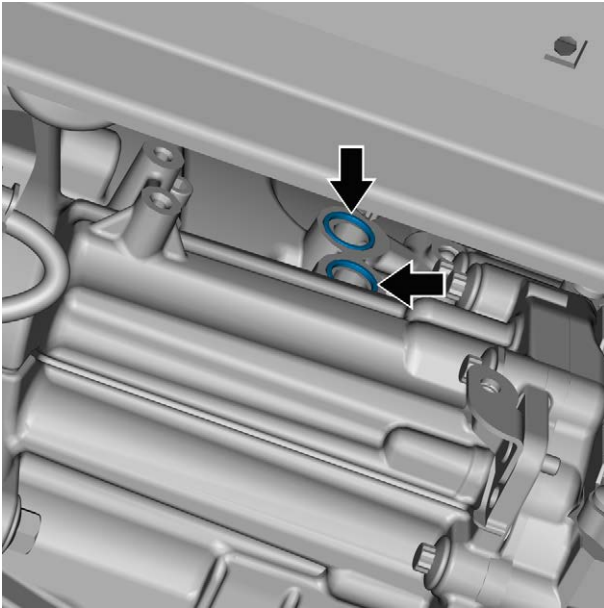
Caution

When removing the transmission oil cooler, transmission fluid may flow out at this time and will need to be collected with a container prepared in advance.



- 10 Remove the two O-rings of the transmission oil cooler.

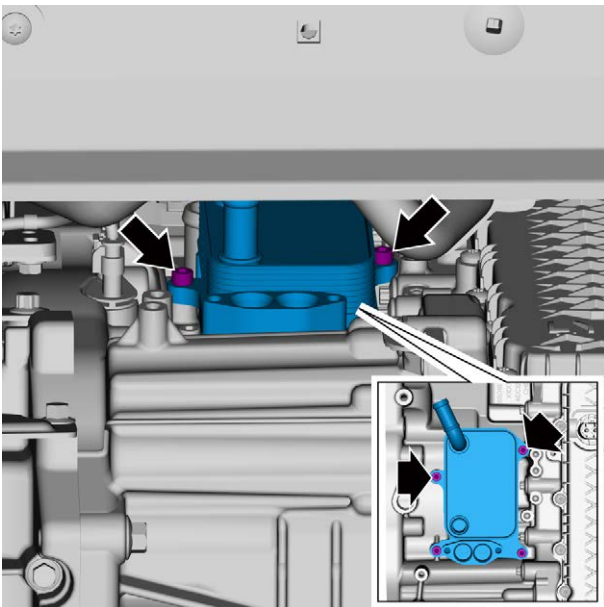
Installation Procedure



- 1 Install the two O-rings of the transmission oil cooler.

Caution

The transmission oil cooler O-ring is a disposable and easily worn part, and must be replaced with a new one.

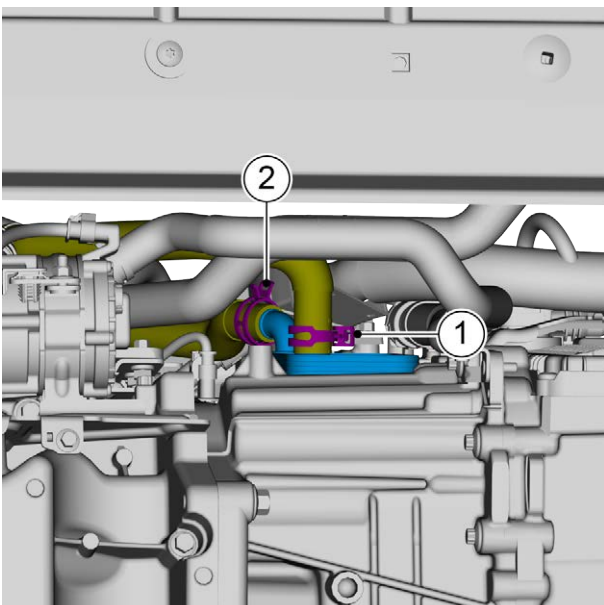


- 2 Install and tighten the four fixing bolts of the transmission oil cooler.

Torque: 10 N·m

Caution

The fixing bolts of the transmission oil cooler need to be pre tightened crosswise before tightening.



- 3 Connect the transmission oil cooler inlet pipe (front) to the transmission oil cooler, and install the fixing clamp 2 of the transmission oil cooler inlet pipe (front end).
- 4 Connect the radiator inlet hose (2) to the transmission oil cooler, and install the fixing clamp 1 of the radiator inlet pipe (2).

- 5 Install the radiator outlet pipe.
- 6 Install the low pressure filter press.
- 7 Install the air filter assembly.
- 8 Fill with the engine coolant.
- 9 Install the bottom engine guard assembly.
- 10 lower the vehicle.

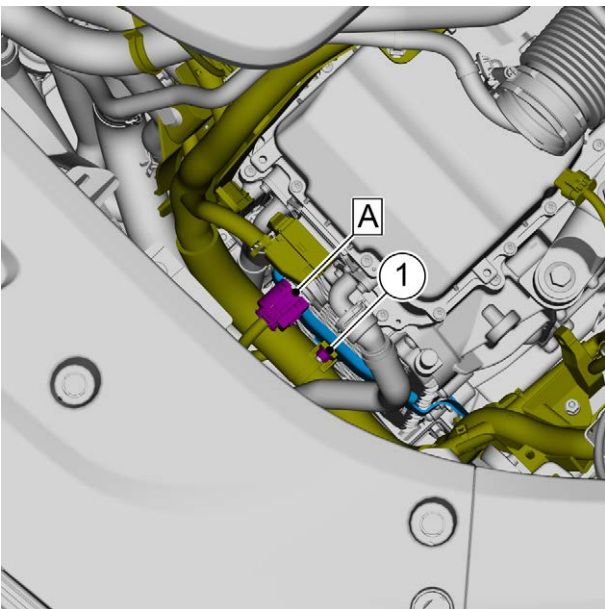
4.2.6.7 Replacement of Oil Sump

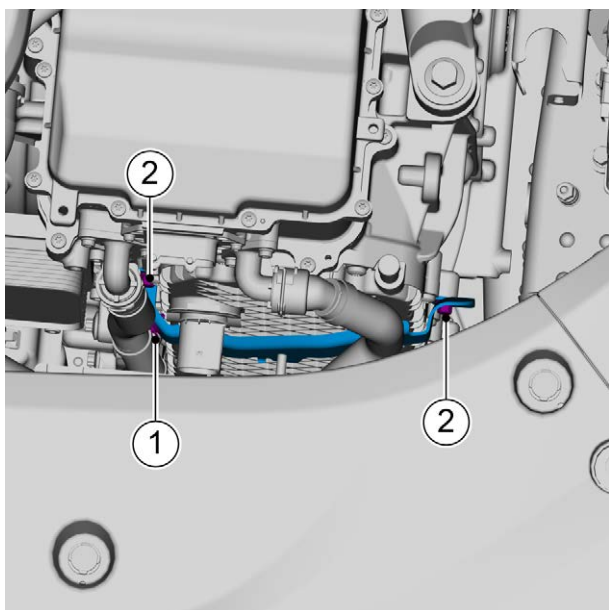
Removal Procedure

Warning !

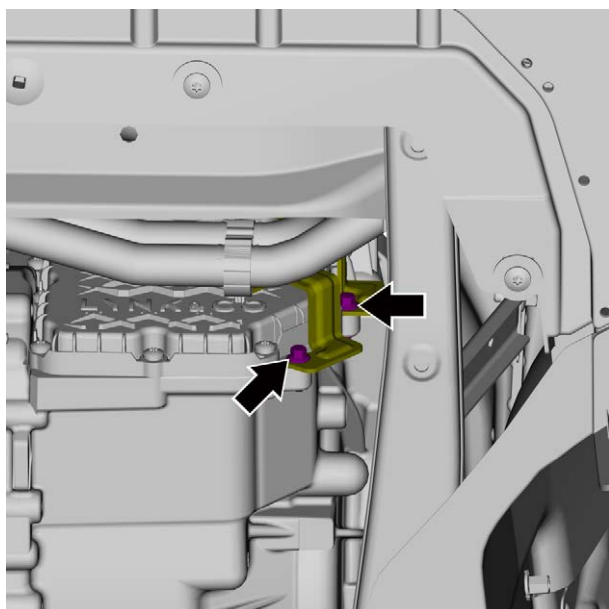
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 3 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 4 Drain the transmission fluid, see [Transmission Fluid Draining and Filling Procedure \(DHT Pro\)](#).
- 5 Remove the air filter assembly, see [Replacement of Air Filter Assembly](#).
- 6 Disconnect the harness connector A of the transmission.
- 7 Remove the fixing nuts 1 of the engine harness.

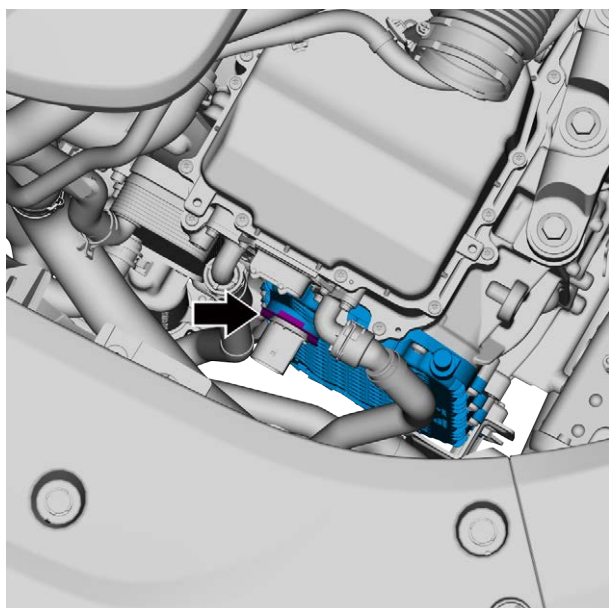




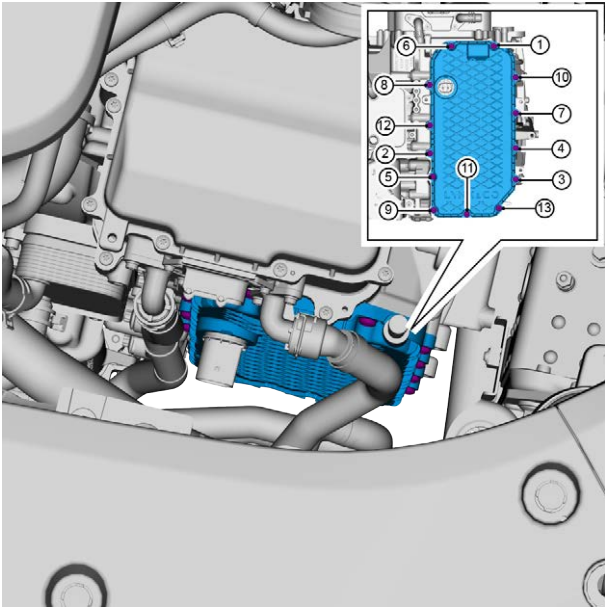
- 8 Remove the fixing clips 1 of the electronic water pump inlet pipe.
- 9 Remove the two fixing bolts 2 of the front compartment harness bracket.



- 10 Remove the two fixing bolts from the water pipe bracket and set the water pipe bracket aside.



- 11 Remove the C-type spring card.

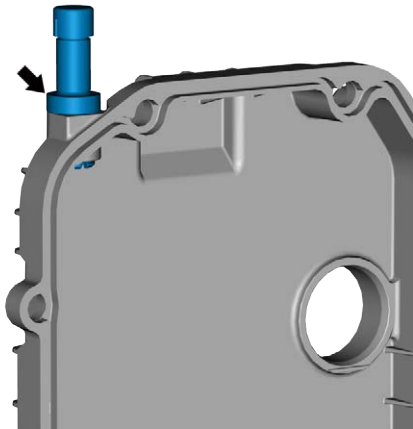


- 12 Take off the transmission engine oil sump subassembly by removing the thirteen fixing bolts of the oil sump.

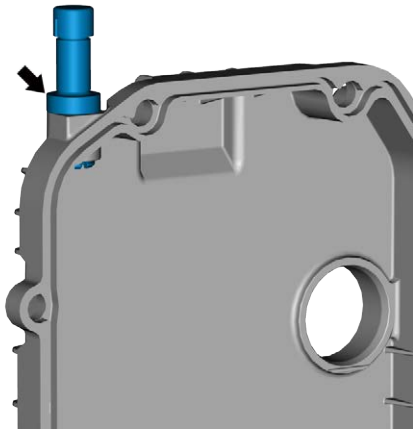
Caution

The fixing bolts of the oil sump need to be removed in order.

- 13 Remove the vent valve.



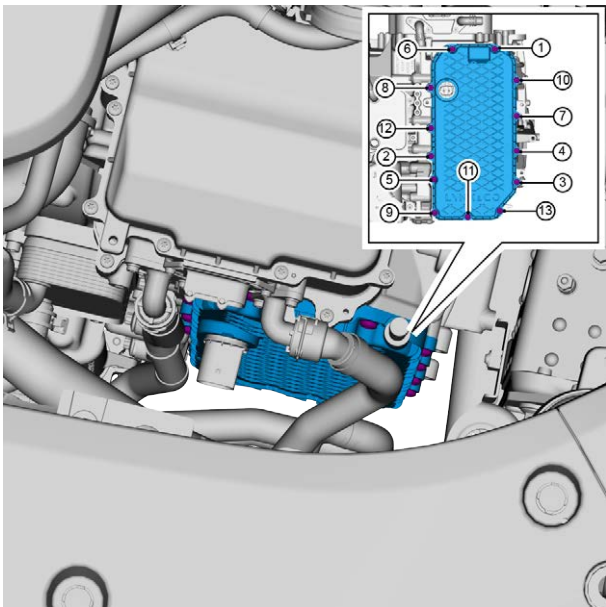
Installation Procedure



- 1 Install the vent valve.

Caution

The vent valve is a disposable and vulnerable component and needs to be replaced with a new one.

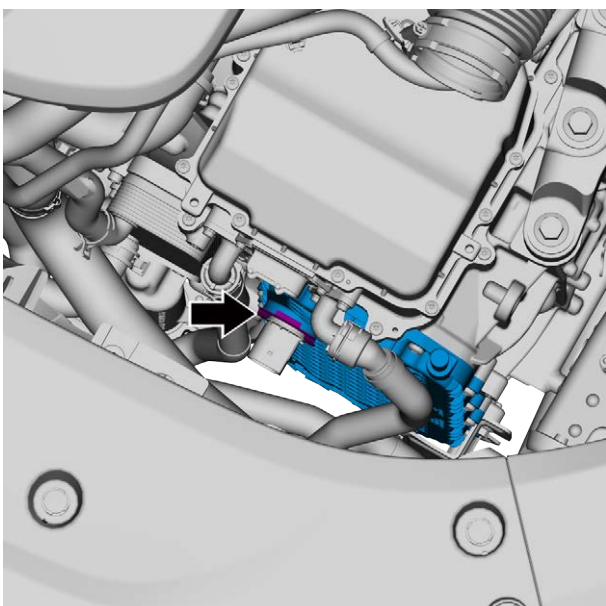


- 2 Install the transmission engine oil sump subassembly and tighten the thirteen fixing bolts of the oil sump.

Torque: 10N·m

Caution

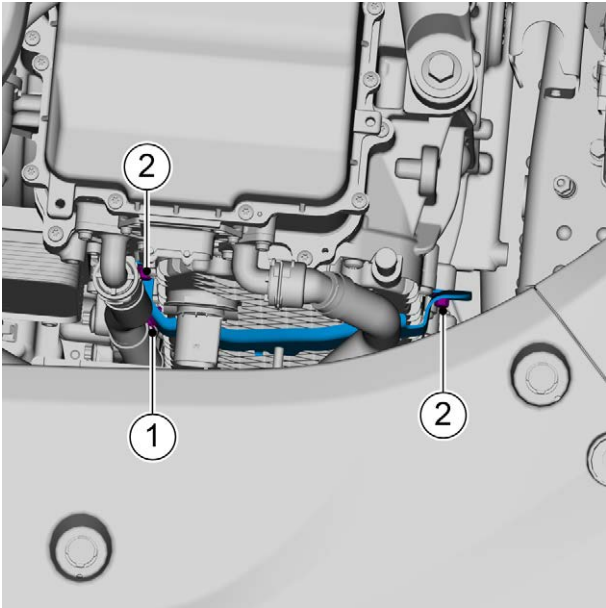
The fixing bolts of the oil sump need to be pre-tightened and then tightened in sequence.



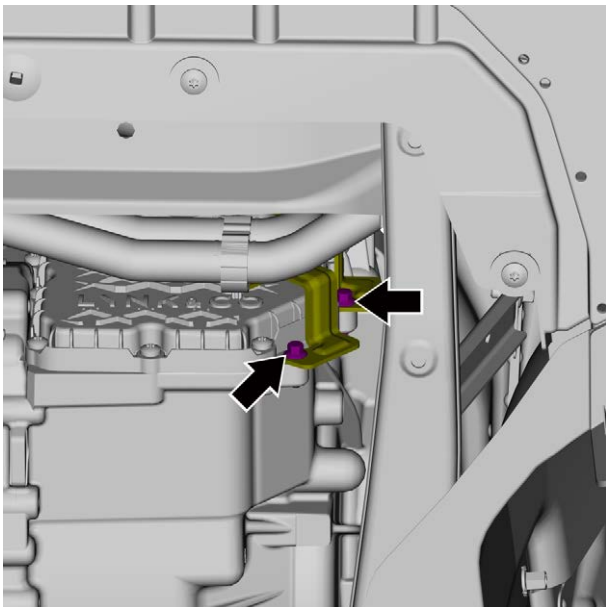
- 3 Install the C-type spring card.

Caution

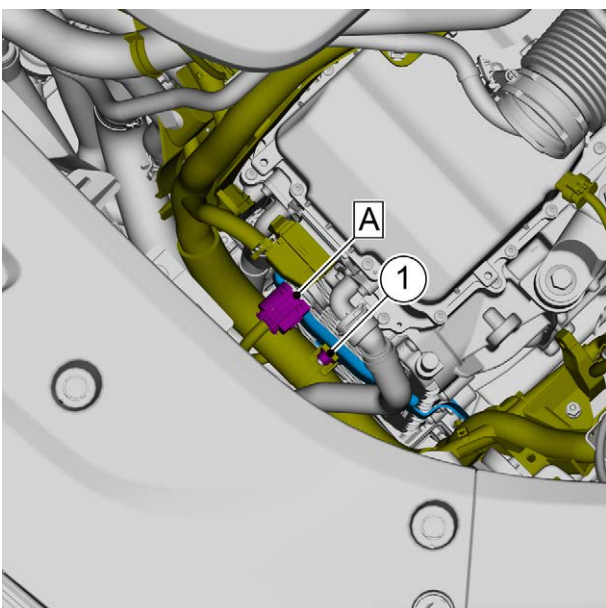
The C-type spring card needs to be snug against the limit boss.



- 4 Install and tighten the two fixing bolts 2 of the front compartment harness bracket.
Torque: 10 N·m
- 5 Install the fixing clips 1 of the electronic water pump inlet pipe.



- 6 Install the water pipe bracket and tighten the two fixing bolts of the water pipe bracket.
Torque: 10N·m



- 7 Install and tighten the fixing nut 1 of the engine wiring harness.
Torque: 10N·m
- 8 Connect the transmission harness connector A.

- 9 Install the air filter assembly.
- 10 Fill in transmission fluid.
- 11 Install the bottom engine guard assembly.
- 12 lower the vehicle.
- 13 Connect the negative cable of battery.

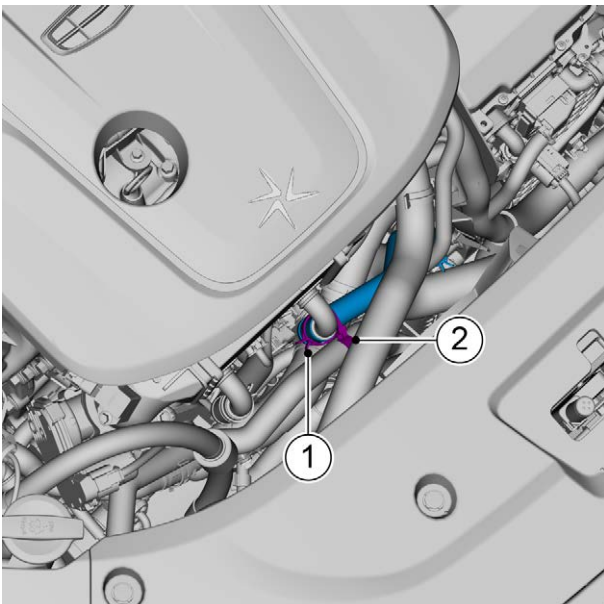
4.2.6.8 Replacement of Transmission Oil Cooler Inlet Pipe (front end)

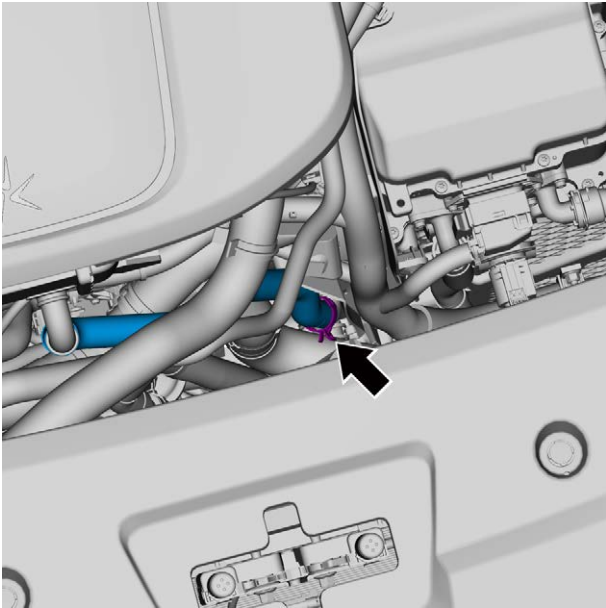
Removal Procedure

Warning !

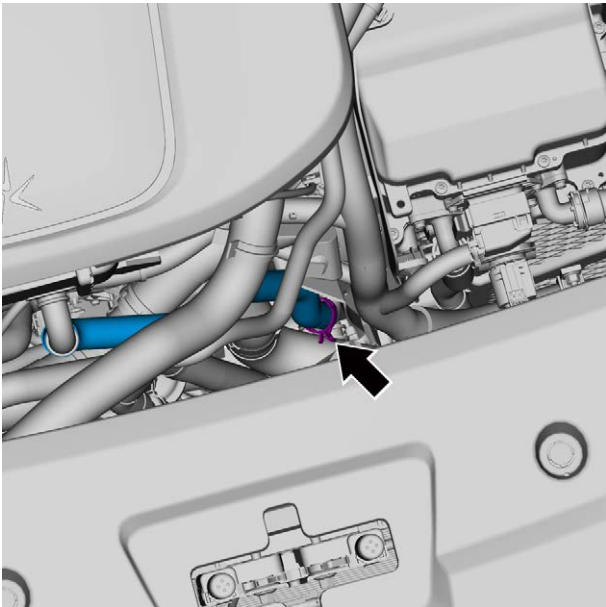
See "WARNING ABOUT COOLING SYSTEM MAINTENANCE" in "[WARNINGS AND PRECAUTIONS](#)".

- 1 Open the engine compartment hood.
- 2 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 3 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 4 Drain the engine coolant, see [Draining and Filling of Engine Coolant](#).
- 5 Remove the air filter assembly, see [Replacement of Air Filter Assembly](#).
- 6 Remove the air filter intake pipe assembly. refer to [Replacement of air filter intake pipe assembly](#).
- 7 Disconnect the transmission oil cooler inlet pipe (front end) from the transmission oil cooler by removing the fixing clamp 1 of the transmission oil cooler inlet pipe (front end).
- 8 Disconnect the fixing clips 2 of the transmission oil cooler inlet pipe (front end).





- 9 Remove the fixing clamp of the transmission oil cooler inlet pipe (front end) and disconnect the transmission oil cooler inlet pipe (front end) from the hybrid special transmission assembly.
- 10 Remove the transmission oil cooler inlet pipe (front end).



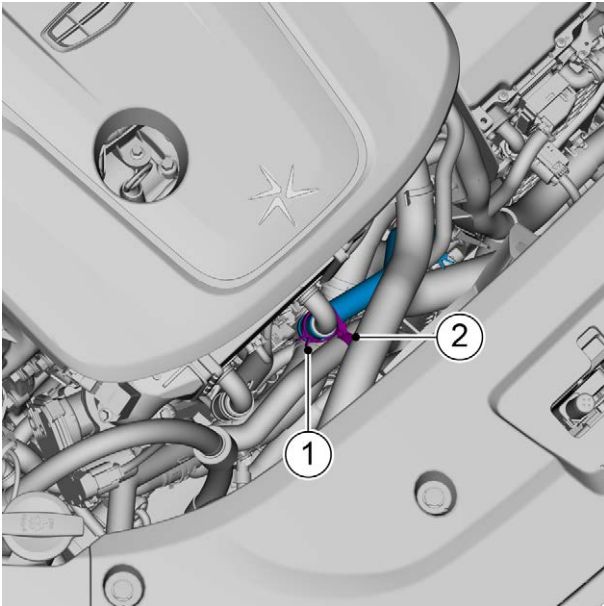
Installation Procedure

- 1 Install the transmission oil cooler inlet pipe (front end).

Caution

Pipe orifices should be aligned with the markings for connecting.

- 2 Connect the transmission oil cooler inlet pipe (front end) to the hybrid special transmission assembly, and install the fixing clamps of the transmission oil cooler inlet pipe (front end).



- 3 Install the fixing clips 2 of the transmission oil cooler inlet pipe (front end).
- 4 Connect transmission oil cooler inlet pipe (front end) to the intercooler water cooler, and install the fixing clamp 1 of the transmission oil cooler inlet pipe (front end).

Caution

Pipe orifices should be aligned with the markings for connecting.

- 5 Install the air filter intake pipe assembly.
- 6 Install the air filter assembly.
- 7 Fill with the engine coolant.
- 8 Install the bottom engine guard assembly.
- 9 lower the vehicle.
- 10 Start the vehicle to connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the liquid level of the expansion kettle. If the liquid level has dropped, you need to replenish the coolant in time. Until after the main circulation is opened, replenish the coolant to the upper scribe line of the expansion kettle, and tighten the lid of the expansion kettle.
- 11 Close the engine compartment cover.

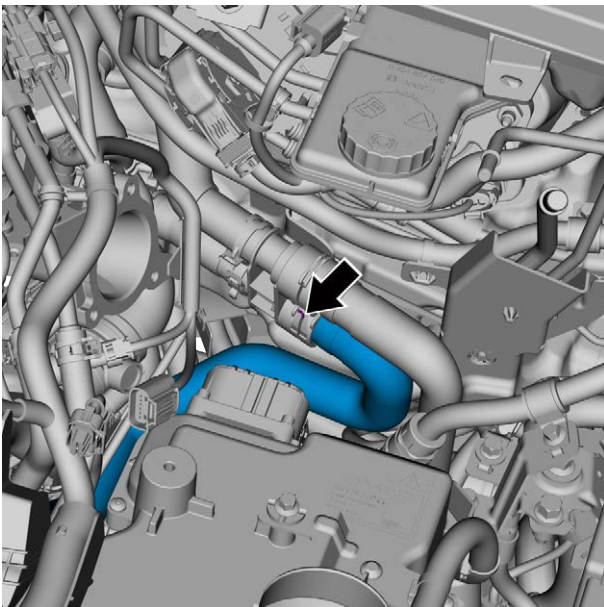
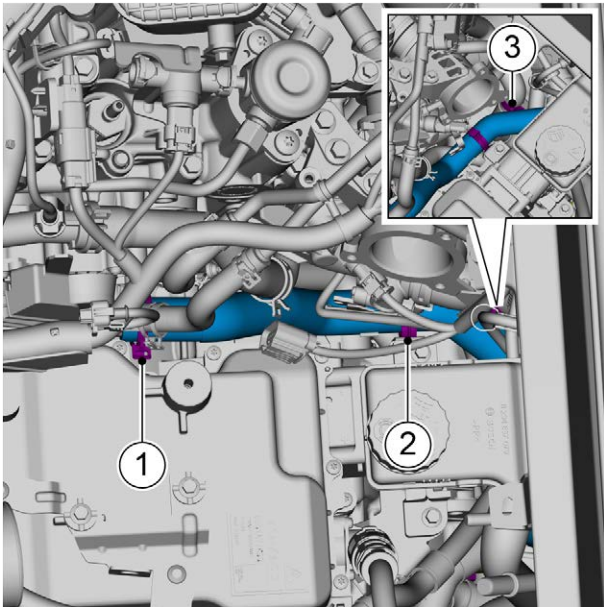
4.2.6.9 Replacement of Transmission Oil Cooler Inlet Pipe (rear end)

Removal Procedure

Warning !

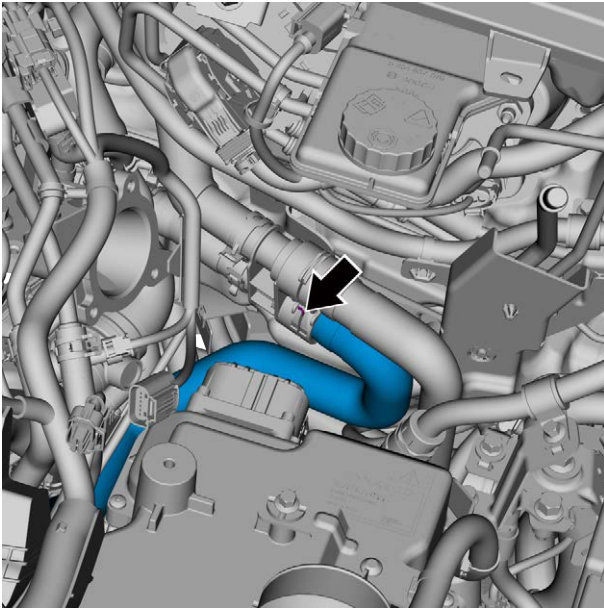
See "WARNING ABOUT COOLING SYSTEM MAINTENANCE" in "[WARNINGS AND PRECAUTIONS](#)".

- 1 Open the engine compartment hood.
- 2 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 3 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 4 Drain the engine coolant, see [Draining and Filling of Engine Coolant](#).

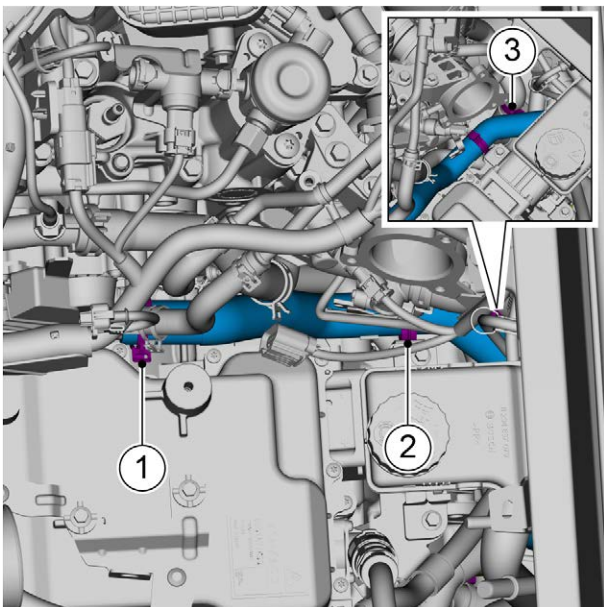


- 5 Remove the resonator assembly, see [Replacement of Resonator Assembly](#).
- 6 Remove the engine trim cover assembly, see [Replacement of Engine Trim Cover Assembly](#).
- 7 Remove the pressure regulating valve, , see [Replacement of Pressure Regulating Valve](#).
- 8 Disconnect the transmission oil cooler inlet pipe (front end) from the engine by removing the fixing clamp 1 of the transmission oil cooler inlet pipe (rear end).
- 9 Remove the fixing clips 2 of the transmission oil cooler inlet pipe (rear end).
- 10 Disconnect the fixing clips 3 of the transmission oil cooler inlet pipe (rear end).
- 11 Disconnect the transmission oil cooler inlet pipe (rear end) from the air conditioning and heating air outlet pipe by removing the quick-insertion circlip of the transmission oil cooler inlet pipe (rear end).
- 12 Remove the transmission oil cooler inlet pipe (rear end).

Installation Procedure



- 1 Install the transmission oil cooler inlet pipe (rear end).
- 2 Connect transmission oil cooler inlet pipe (rear end) to the air conditioning and heating air outlet pipe, and install the quick-insertion circlip 1 of the transmission oil cooler inlet pipe (rear end).



- 3 Install the fixing clip 3 of the transmission oil cooler inlet pipe (rear end).
- 4 Install the fixing clip 2 of the transmission oil cooler inlet pipe (rear end).
- 5 Connect the transmission oil cooler inlet pipe (front end) to the engine, and install the fixing clamp 1 of the transmission oil cooler inlet pipe (rear end).

Caution

Pipe orifices should be aligned with the markings for connecting.

- 6 Install the pressure regulating valve.
- 7 Install the engine trim cover assembly.
- 8 Install the resonator assembly.
- 9 Fill with the engine coolant.
- 10 Install the bottom engine guard assembly.
- 11 lower the vehicle.

- 12 Start the vehicle to connect the diagnostic instrument to monitor the water temperature and electronic coolant pump speed, and observe the liquid level of the expansion kettle. If the liquid level has dropped, you need to replenish the coolant in time. Until after the main circulation is opened, replenish the coolant to the upper scribe line of the expansion kettle, and tighten the lid of the expansion kettle.
- 13 Close the engine compartment cover.

4.2.6.10 Replacement of Hybrid Special Transmission Assembly

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

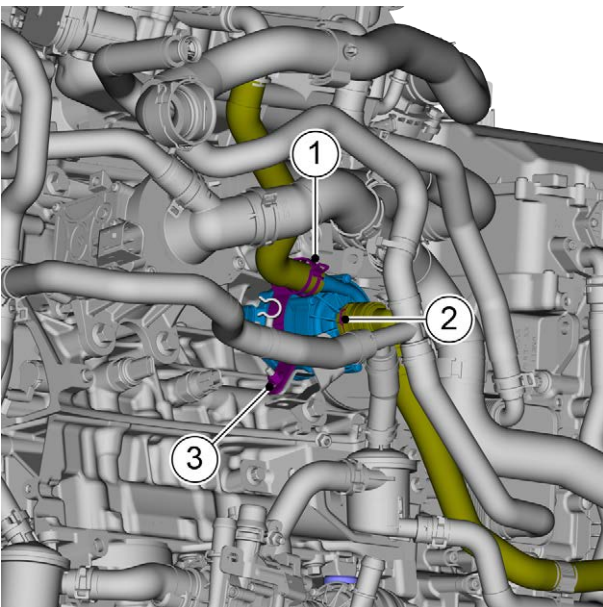
Warning !

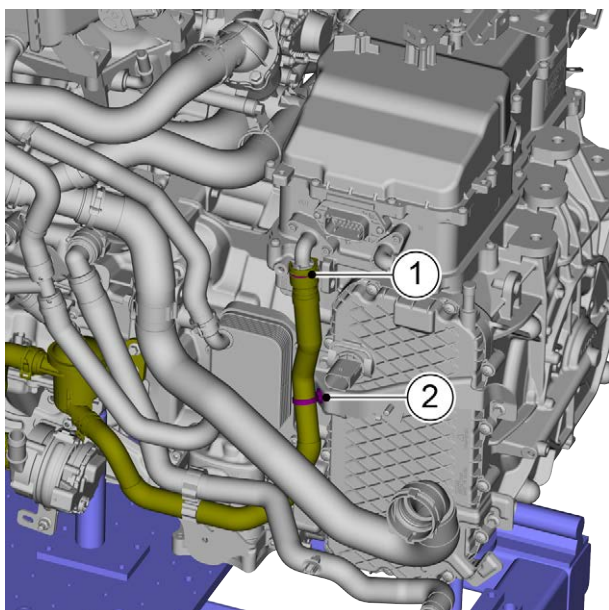
See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

Warning !

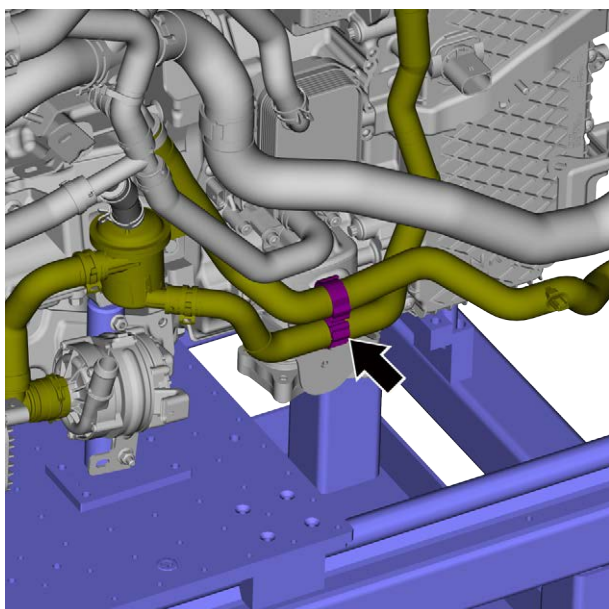
See "WARNINGS ON HIGH VOLTAGE SAFETY PRECAUTIONS" in "[WARNING AND PRECAUTION](#)"

- 1 Remove the powertrain, see [Replacement of Powertrain](#).
- 2 Disconnect the intercooler inlet pipe from the battery coolant pump by removing the fixing clamp 1 of the intercooler inlet pipe.
- 3 Disconnect the radiator outlet pipe (2) from the battery coolant pump by removing the quick-insertion circlip 2 of the radiator outlet pipe (2).
- 4 Remove the fixing nut 3 of the electronic water pump mounting fixing bracket and take off the battery coolant pump.





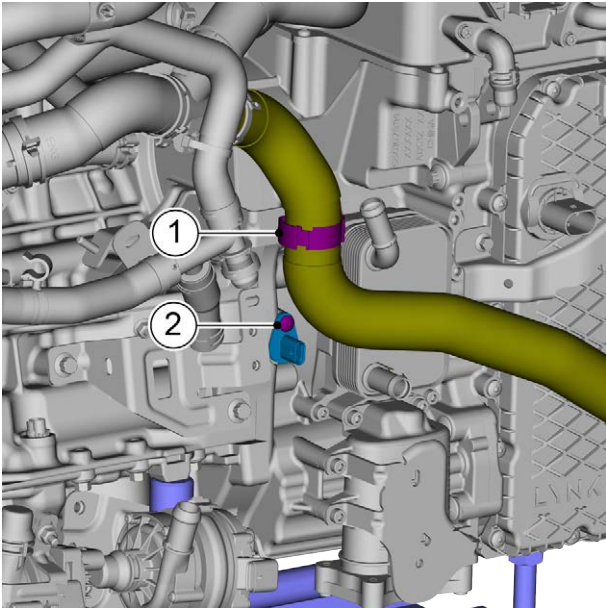
- 5 Remove the quick-insertion circlip 1 of the electronic water pump inlet pipe and disconnect the electronic water inlet pipe from the hybrid special transmission assembly.
- 6 Remove the fixing clips 2 of the electronic water pump inlet pipe.



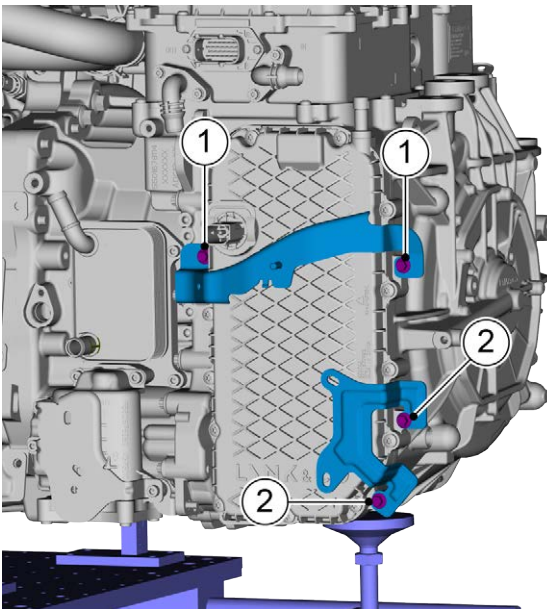
- 7 Remove the fixing clips of the electronic water pump inlet hose and the radiator outlet pipe (2), and set them aside.



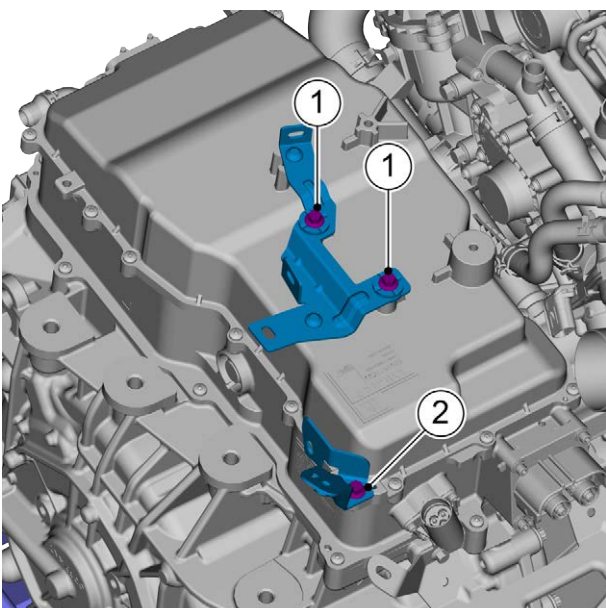
- 8 Remove the fixing clamp 1 of the transmission oil cooler inlet pipe and disconnect the transmission oil cooler inlet pipe assembly from the hybrid special transmission assembly.
- 9 Remove the fixing clamp 2 of the radiator inlet pipe (2) and disconnect the radiator inlet pipe (2) from the hybrid special transmission assembly.



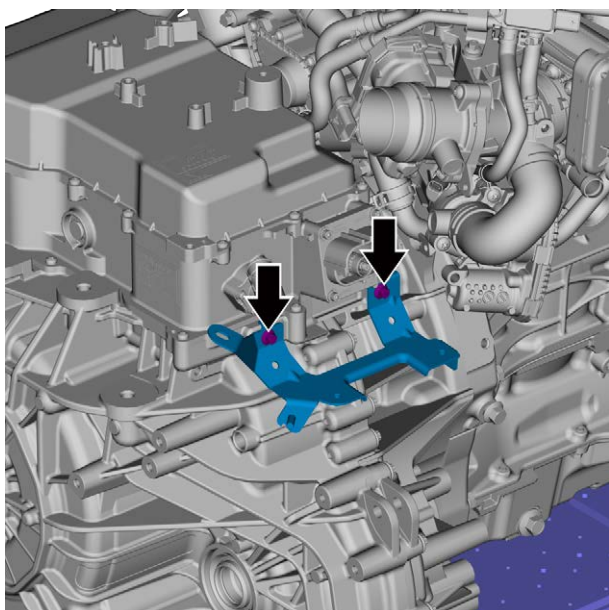
- 10 Remove the fixing clips 1 of the radiator outlet pipe, and set the radiator outlet pipe aside.
- 11 Remove the fixing bolt 2 of the crankshaft position sensor and take off the crankshaft position sensor.



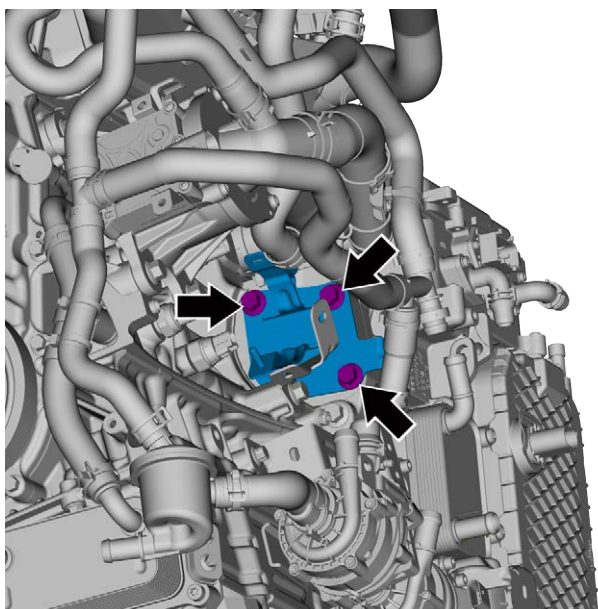
- 12 Remove the two fixing bolts 1 of the front compartment harness bracket, and take off the front compartment harness bracket.
- 13 Remove the two fixing bolts 2 of the water pipe bracket, and take off the water pipe bracket.



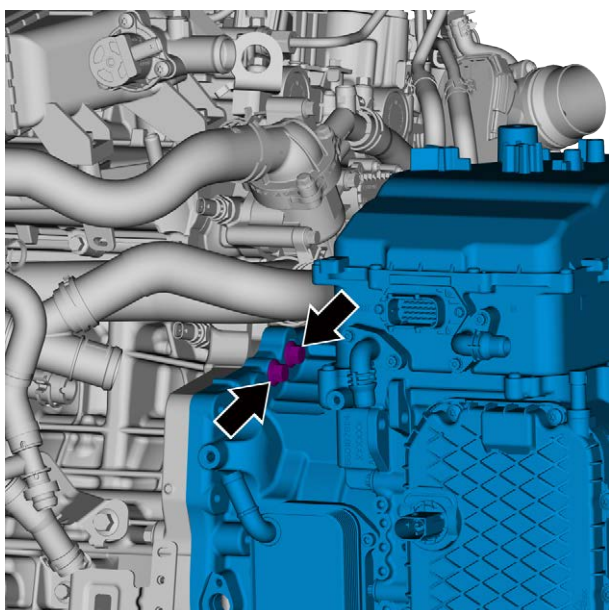
- 14 Remove the two fixing bolts 1 of the high pressure protection bracket, and take off the high pressure protection bracket.
- 15 Remove the fixing bolt 2 of the high voltage harness bracket, and take off the high voltage harness bracket.



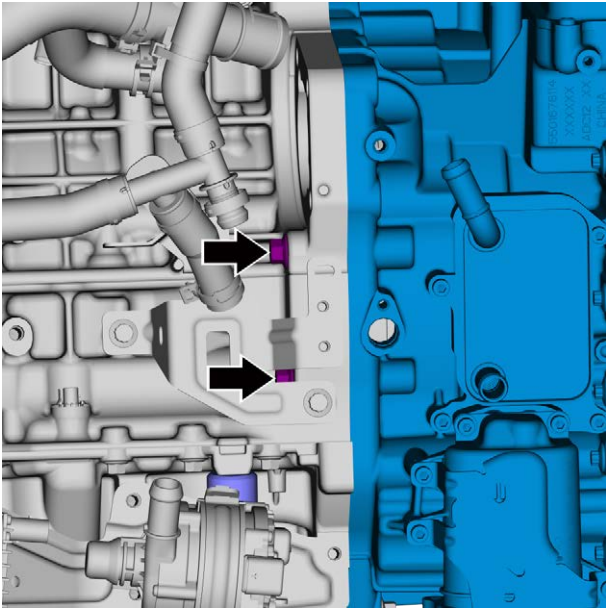
- 16 Remove the two fixing bolts of the high-pressure guard bracket and take off the high-pressure guard bracket.



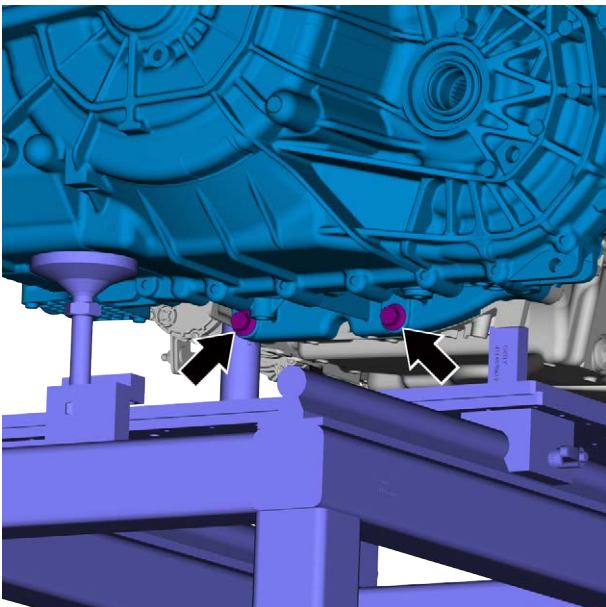
- 17 Remove the three fixing bolts of the water pump bracket assembly and take off the water pump bracket assembly.



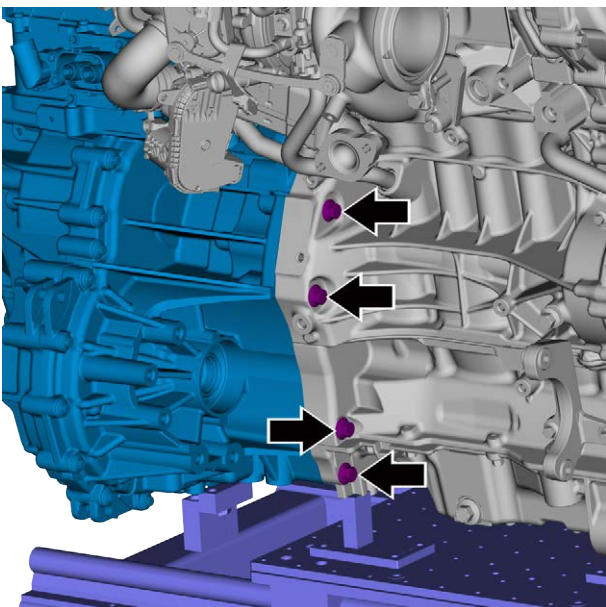
- 18 Remove the two fixing bolts between the hybrid special transmission assembly and the upper part of the engine.



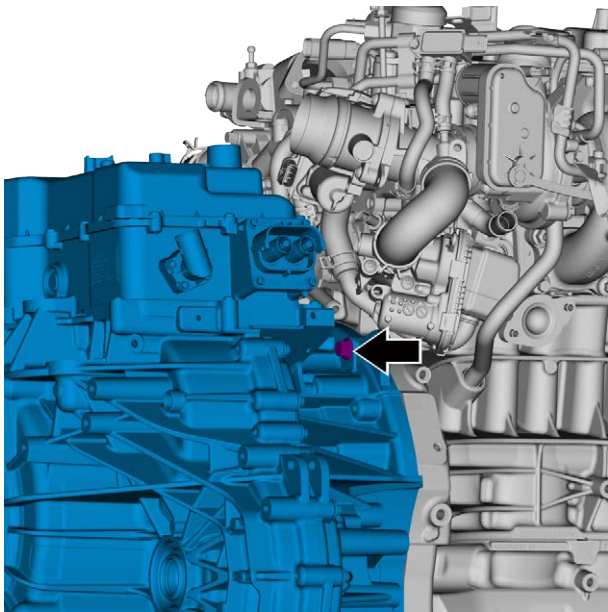
- 19 Remove the two fixing bolts between the hybrid special transmission assembly and the side of the engine.



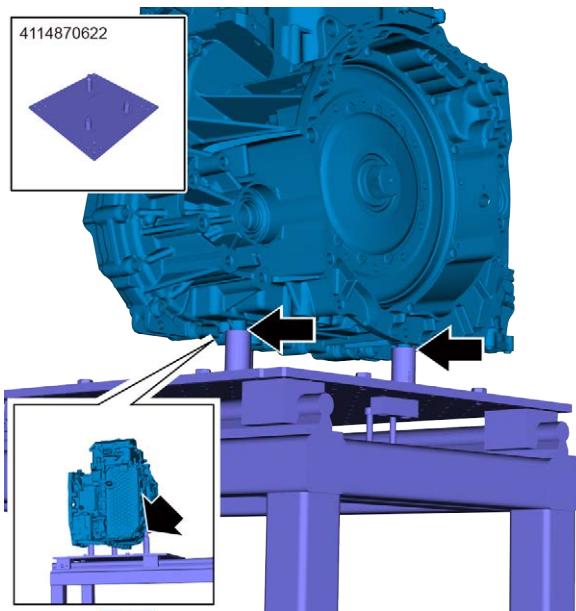
- 20 Remove the two fixing bolts between the hybrid special transmission assembly and the lower part of the engine.



- 21 Remove the four fixing bolts 1 between the hybrid special transmission assembly and the side of the engine.

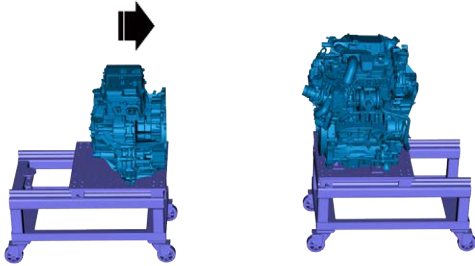


- 22 Remove the fixing bolts between the hybrid special transmission assembly and the upper part of the engine.



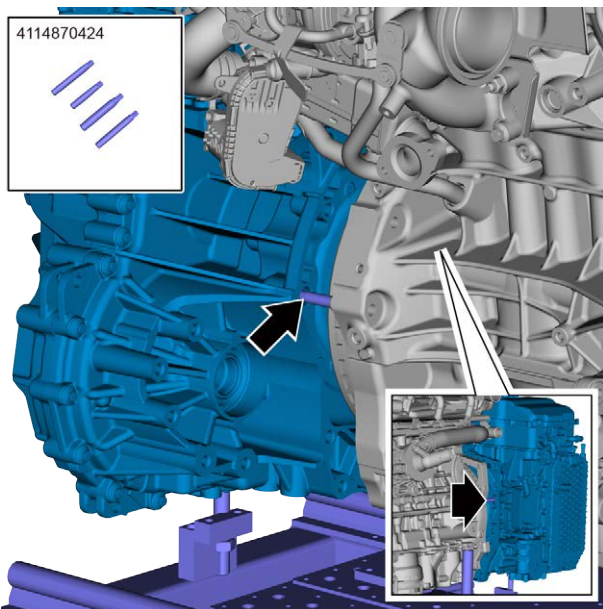
- 23 Take off the hybrid special transmission assembly.
Transmission positioning column: 4114870622

Installation Procedure



Caution

During the assembly of the engine and transformer, the placement bracket of the engine part is fixed in place and moves towards the engine part from the placement bracket of the transmission part.

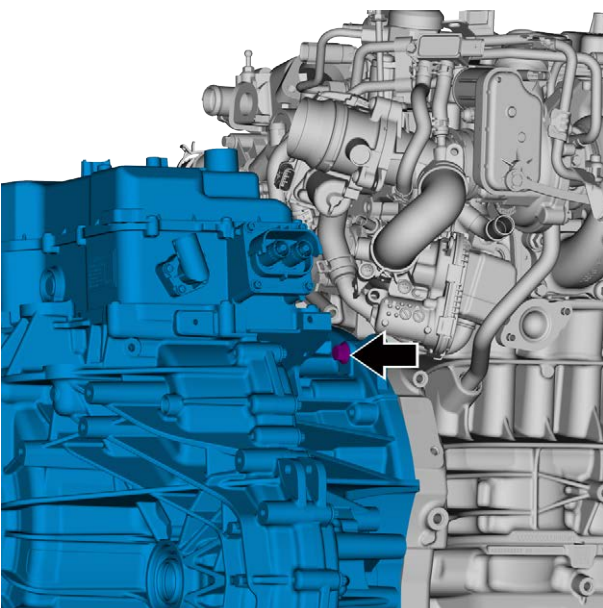


- 1 Install the guide pins for the engine transmission assembly, and merge the hybrid special transmission assembly with the engine.

Guide pin for engine transmission assembly: 4114870424

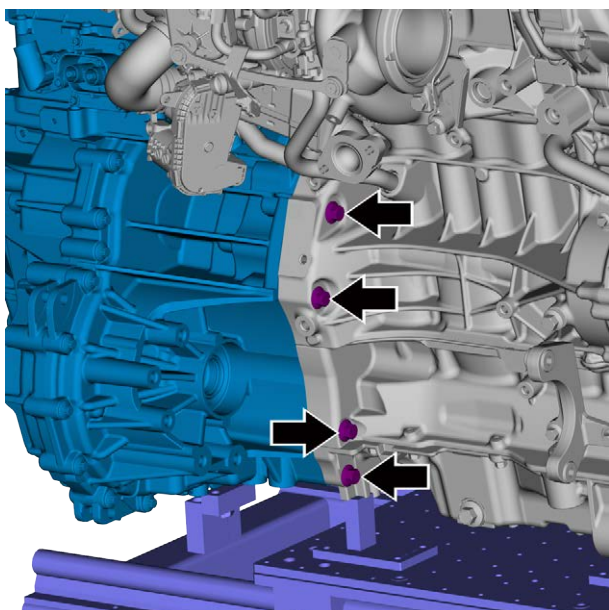
Caution

Slightly adjust the crankshaft to successfully merge the hybrid special transmission assembly with the engine.



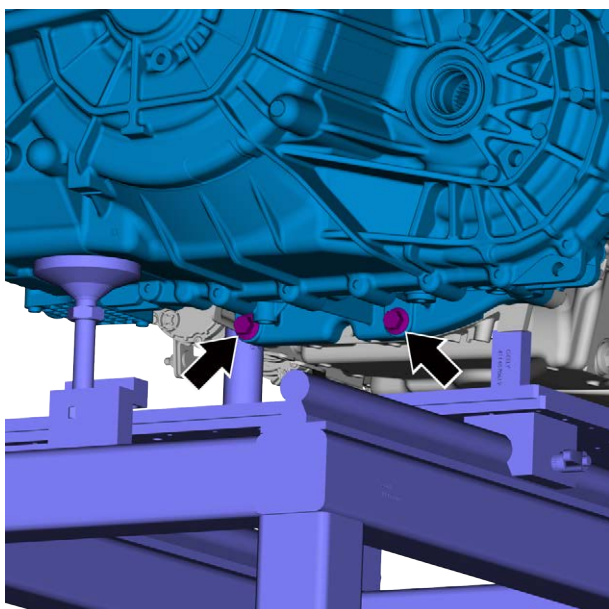
- 2 Install and tighten the fixing bolts between the hybrid special transmission assembly and the upper part of the engine.

Torque: 48 N·m



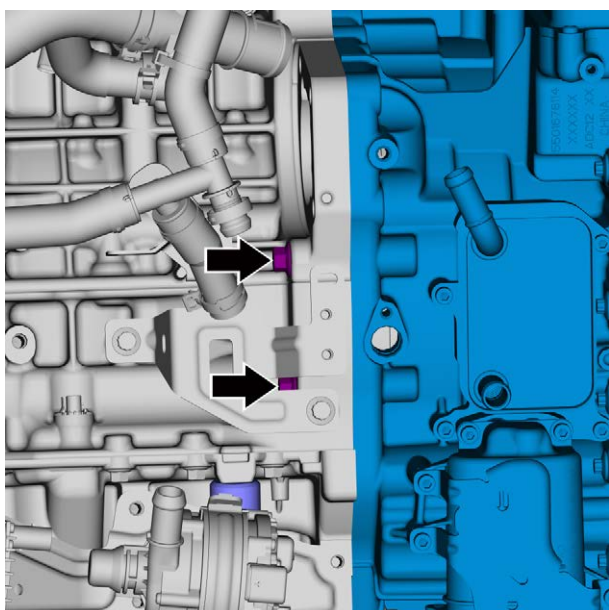
- 3 Install and tighten the four fixing bolts 1 between the hybrid special transmission assembly and the engine side.

Torque: 48 N·m



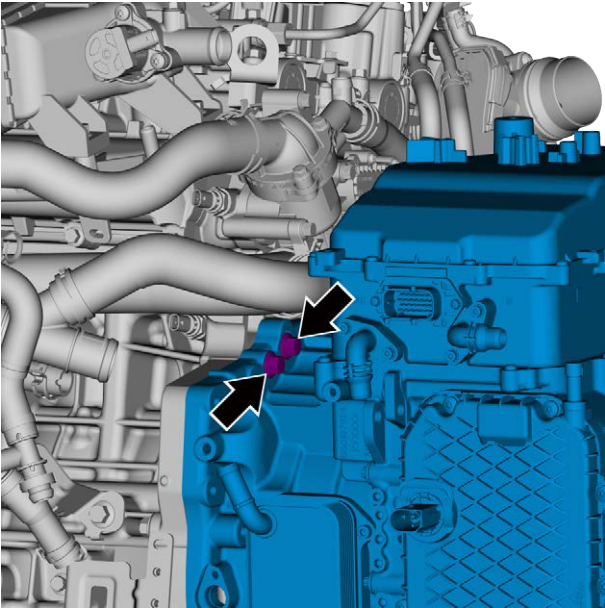
- 4 Install and tighten the two fixing bolts between the hybrid special transmission assembly to the lower part of the engine.

Torque: 48 N·m



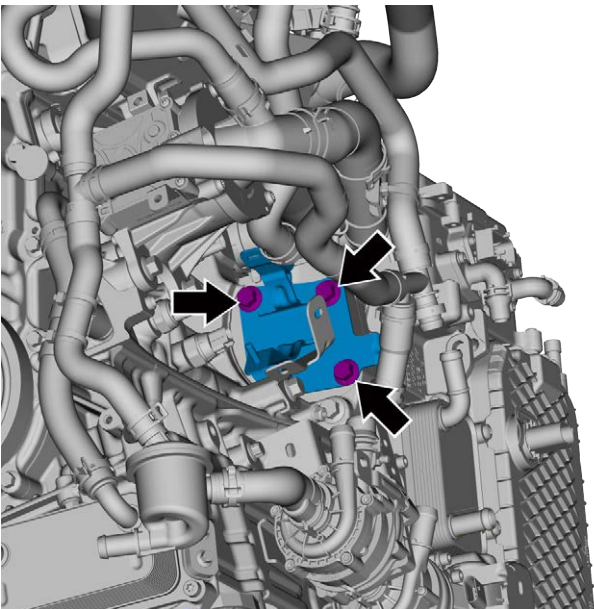
- 5 Install and tighten the two fixing bolts between the hybrid special transmission assembly and the engine side.

Torque: 48 N·m



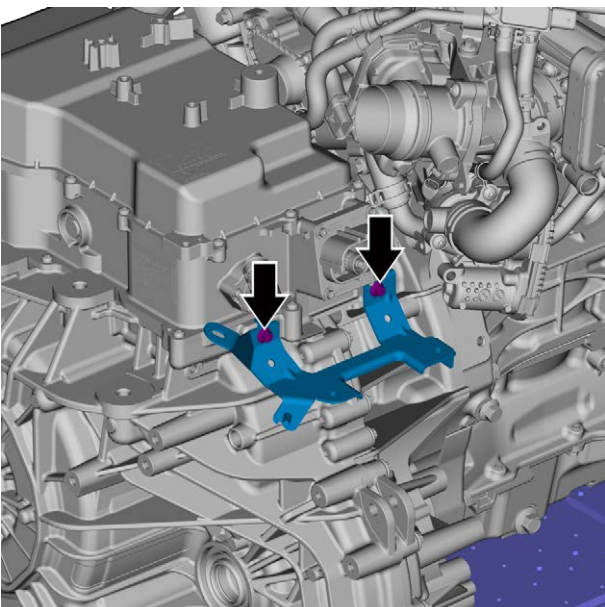
- 6 Install and tighten the two fixing bolts between the hybrid special transmission assembly and the upper part of the engine.

Torque: 48 N·m



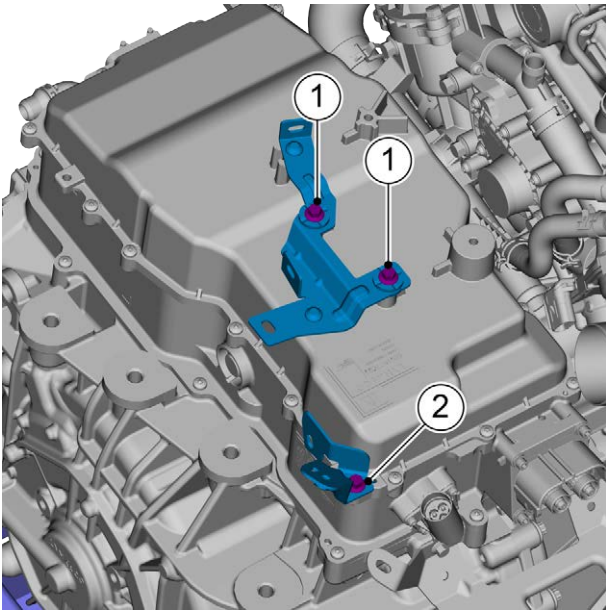
- 7 Install the water pump bracket assembly.
- 8 Install and tighten the three fixing bolts of the water pump bracket subassembly.

Torque: 24 N·m

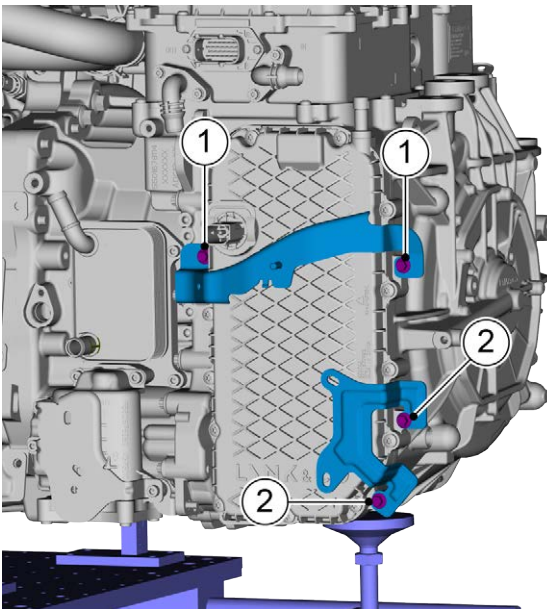


- 9 Install the high pressure protection bracket.
- 10 Install and tighten the two fixing bolts of the high pressure guard bracket.

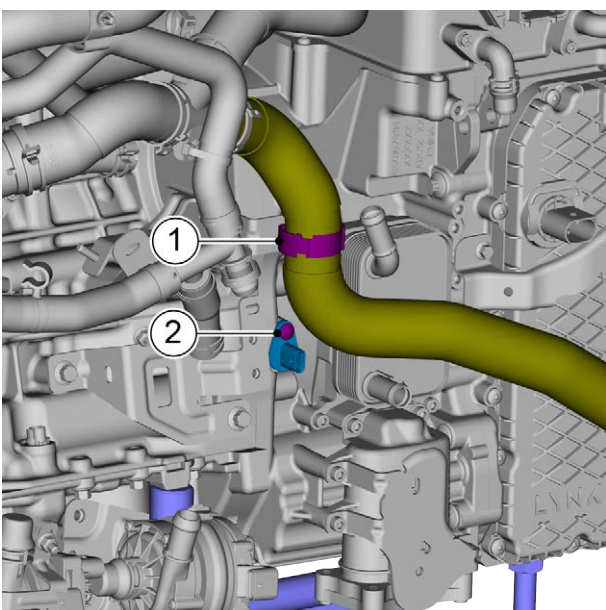
Torque: 10 N·m



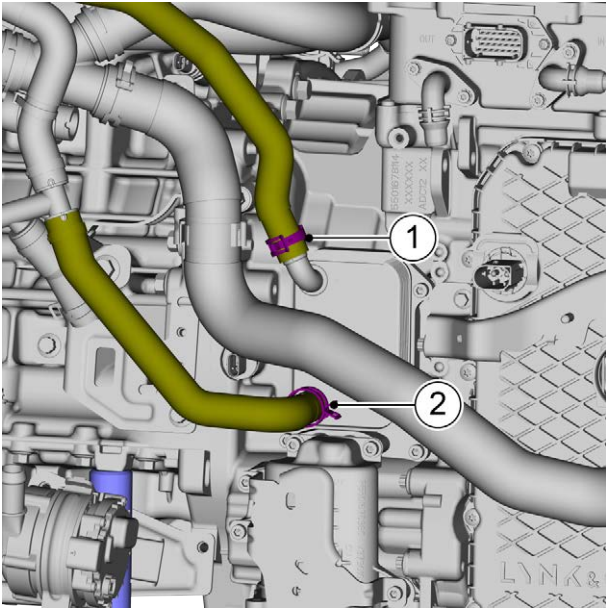
- 11 Install the high pressure harness bracket.
- 12 Install and tighten the fixing bolt 2 of the high pressure harness bracket.
Torque: 10 N·m
- 13 Install the high pressure protection bracket.
- 14 Install and tighten the two fixing bolts 1 of the high pressure protection bracket.
Torque: 10 N·m



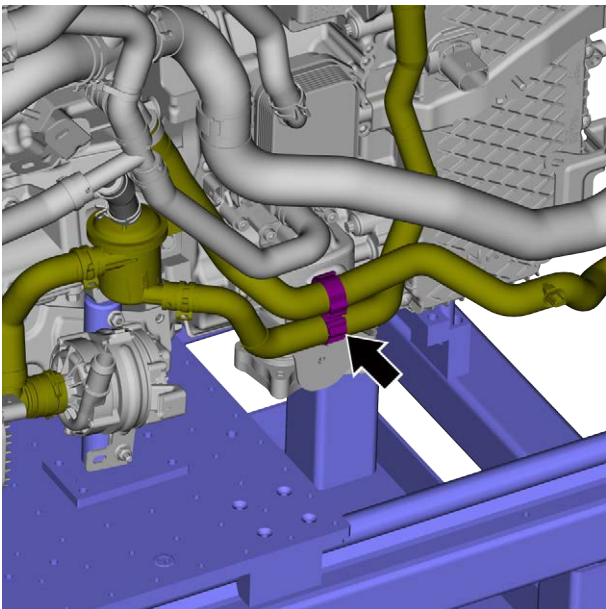
- 15 Install the water pipe bracket.
- 16 Install and tighten the two fixing bolts 2 of the water pipe bracket.
Torque: 10 N·m
- 17 Install the front compartment harness bracket.
- 18 Install and tighten the two fixing bolts 1 of the front compartment harness bracket.
Torque: 10 N·m



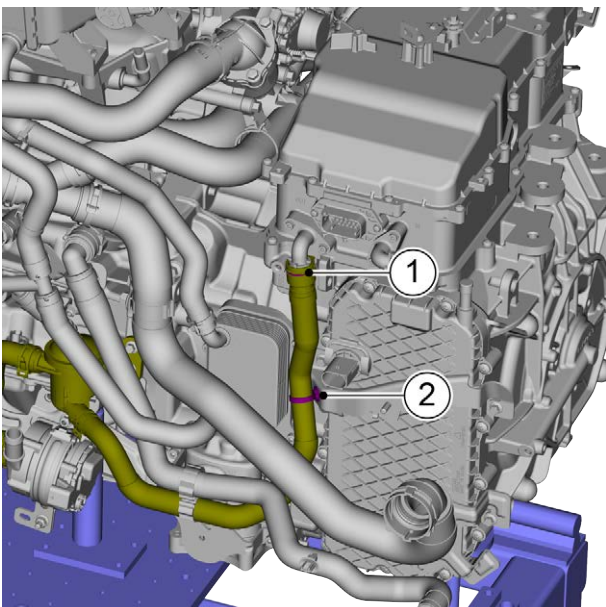
- 19 Install the crankshaft position sensor.
- 20 Install and tighten the fixing bolts 2 of the crankshaft position sensor.
Torque: 10 N·m
- 21 Connect the radiator outlet pipe and install the fixing clips 1 of the radiator outlet pipe.



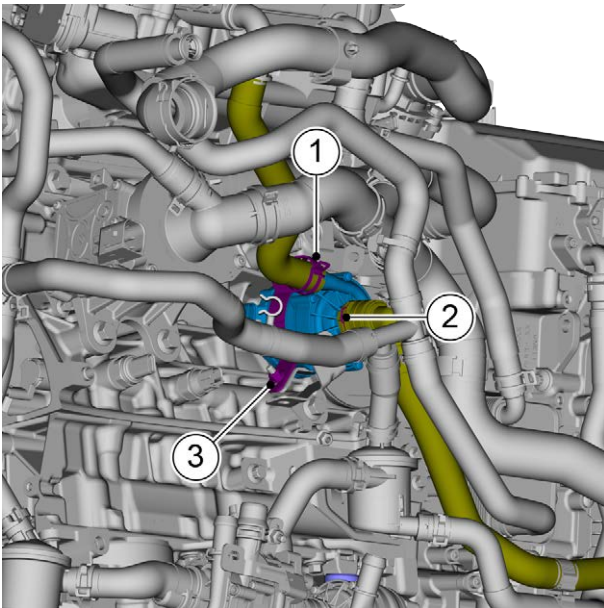
- 22 Connect the warm radiator inlet hose to the hybrid special transmission assembly, and install the fixing clamp 2 of the radiator inlet pipe (2).
- 23 Connect the transmission oil cooler inlet pipe assembly with the hybrid special transmission assembly, and install the fixing clamp 1 of the transmission oil cooler inlet pipe assembly.



- 24 Install the fixing clips between the electronic water pump inlet pipe and the radiator outlet pipe (2).



- 25 Install the fixing clips 2 of the electronic water pump inlet pipe.
- 26 Connect the electronic water pump inlet pipe to the hybrid special transmission assembly, and install the quick-insertion circlip 1 of the electronic water pump inlet pipe.


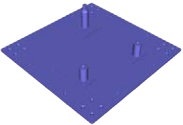


- 27 Install the battery coolant pump.
- 28 Install and tighten the fixing nuts 3 of the electronic water pump mounting fixing bracket
- 29 Connect the radiator outlet hose (2) to the battery coolant pump, and install the quick-insertion circlip 2 of the radiator outlet hose (2).
- 30 Connect the intercooler inlet pipe to the battery coolant pump and install the fixing clamp 1 of the intercooler inlet pipe.

- 31 Install the powertrain.
- 32 Use the GLDS diagnostic program. On the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software flash operation.

4.2.7 Specialized tools and equipment

4.2.7.1 Special tools

Serial No.:	Illustration	Tool No.	Name
1		4114870424	Special tool for engine transformer assembly guide pin
2		4114870622	Transmission positioning column

Suspension system

5.1 Warnings and Cautions	5-3	5.3 Rear suspension	5-40
5.1.1 Warnings and Cautions	5-3	5.3.1 Specification.....	5-40
5.1.1.1 Warnings and Cautions	5-3	5.3.1.1 Fastener specification.....	5-40
5.2 Front Suspension	5-4	5.3.2 Description and Operation	5-42
5.2.1 Specification.....	5-4	5.3.2.1 Instructions and operations	5-42
5.2.1.1 Fastener specification.....	5-4	5.3.3 System working principles	5-43
5.2.2 Description and Operation	5-6	5.3.3.1 System working principles	5-43
5.2.2.1 Instructions and operations	5-6	5.3.4 Part position	5-44
5.2.3 System working principles	5-7	5.3.4.1 Part position	5-44
5.2.3.1 Operating principle of suspension system components	5-7	5.3.5 Diagnostic Information and Procedures	5-45
5.2.4 Part position	5-9	5.3.5.1 Diagnosis description	5-45
5.2.4.1 Part position	5-9	5.3.5.2 Routine inspection	5-45
5.2.5 Diagnostic Information and Procedures	5-10	5.3.5.3 Rear shock absorber inspection	5-45
5.2.5.1 Diagnosis description	5-10	5.3.5.4 Excessive Friction Check	5-47
5.2.5.2 Routine inspection	5-10	5.3.5.5 Ride smoothness diagnosis (too soft or too hard).....	5-48
5.2.5.3 Check of front shock absorber assembly	5-10	5.3.5.6 Body leaning or swaying while turning	5-48
5.2.5.4 Ball pin and steering knuckle inspection	5-12	5.3.5.7 Noise Diagnosis	5-48
5.2.5.5 Inspection of ball studs.....	5-13	5.3.5.8 Abnormal tail height	5-49
5.2.5.6 Excessive Friction Check	5-13	5.3.6 Removal and Installation	5-50
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5.1 Warnings and Cautions

5.1.1 Warnings and Cautions

5.1.1.1 Warnings and Cautions

Warning regarding driving of another technician

Warning !

When one technician is checking the faulty parts reported for repair, the vehicle should be driven by another technician. Otherwise, it may lead to personal injury.

Warning about Battery Disconnection

Warning !

Before maintaining any electrical components, the ignition lock must be in the OFF or LOCK position, and all electrical loads must be "OFF" unless otherwise stated in the operating procedures. If tools or equipment are easily accessible to exposed live electrical terminals, it is required to disconnect the battery negative cable. Violating these safety instructions may result in personal injury or damage to the vehicle or vehicle components.

Warning about Road Test

Warning !

Road test the vehicle in a safe manner and obey all traffic laws. Do not attempt any operation that could jeopardize vehicle control. Failure to comply with the above safety instructions could result in serious personal injury and damage to the vehicle.

Engine Lifting Precautions

Warning !

When lifting or supporting the engine for any reason, do not support the jack under the oil pan, any sheet metal parts or the crankshaft pulley. Lifting the engine in an improper manner can result in damage to vehicle components.

5.2 Front Suspension

5.2.1 Specification

5.2.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Fixing bolt connecting the upper support of the left front shock absorber and the vehicle body	M8	31-37
Fixing nut connecting the front stabilizer bar linkage and front steering knuckle assembly	M10×11.4	59-81
Fixing bolt connecting propeller shaft intermediate bracket and body	M8×25	20-28
Fixing bolt connecting front suspension lower U-beam and support beam	M8×16	20-28
Fixing bolt connecting front suspension lower U-beam and subframe	M8×65	25 N·m+140°
Fixing nut connecting front shock absorber upper support and shock absorber	M12×1.25×16	49-67
Fixing bolt connecting front stabilizer bar and left subframe	M8×65	20-28
Fixing nut connecting front stabilizer bar connecting rod and front stabilizer bar assembly	M10×11.4	59-81
Fixing bolt connecting front wheel brake guard and front knuckle assembly	M6×12	8.5-11.5
Fixing bolt connecting drive hub assembly and front steering knuckle assembly	M12×55	90 N·m+90°
Fixing bolt connecting front steering knuckle assembly and front shock absorber assembly	M12×75	90 N·m+90°
Fixing bolt connecting front steering knuckle assembly and lower arm ball head pin	M12×65	90 N·m+75°
Fixing bolt connecting front suspension left lower arm assembly rear point and front subframe	M14×80	140 N·m+90°

Fastener part	Model	Torque range (N·m)
Fixing bolt connecting front suspension left lower arm assembly front point and front subframe	M14×105	140 N·m+90°
Fixing bolt connecting front stabilizer bar and subframe	M8×65	20-28

5.2.2 Description and Operation

5.2.2.1 Instructions and operations

The vehicle's front suspension system serves to maximize friction between the tires and the road surface, provide good steering handling and stability, and ensure passenger comfort. It reduces the disturbance to the frame and bodywork caused by wheel bumping up and down along the road surface by absorbing the energy of vertically accelerating wheel.

The front suspension is mainly divided into load-carrying and kinematic parts, which can withstand vertical and torsional forces. The shock absorber can accelerate the attenuation of vibration; the coil spring bears and transmits the vertical load and reduces the impact of the road surface.

The front suspension used in this vehicle is MacPherson type independent suspension, including the following components: spring, shock absorber, stabilizer bar, front lower arm, front subframe.

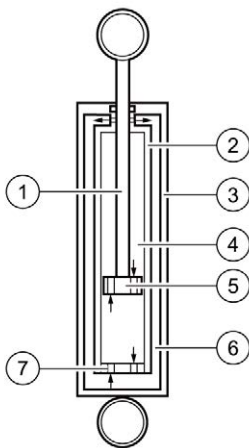
5.2.3 System working principles

5.2.3.1 Operating principle of suspension system components

Springs:

The stiffness of the springs affects how the sprung mass responds when the car is being driven. Cars with low spring stiffness completely eliminate bumps and provide an extremely smooth ride, but at the same time are prone to dive and squat during braking and acceleration, and tend to pitch and roll in corners. Cars with excessive spring stiffness are slightly less smooth over bumpy roads, but have very little body movement, which means that the vehicle can be driven in a quicker manner, even when cornering. So while springs themselves may seem simple, designing and implementing them in a car and balancing passenger comfort with the car's handling performance, springs alone cannot provide an extremely smooth ride. This is because springs are excellent at absorbing energy, but slightly less so at dissipating it. For this reason, suspension systems require the use of a component called shock absorber. Without the use of a damping structure, the spring will spring open at an uncontrollable rate and release the energy it absorbed from the bumps and continue to spring up at its own frequency until all the energy initially applied to it has been dissipated. The suspension itself, built on springs, causes the car to travel in a bouncy and uncontrolled manner depending on the terrain.

Shock absorber



1. Piston push rod
2. Inner barrel
3. Outer barrel

4. Hydraulic chamber
5. Piston and valve
6. Liquid storage space
7. Inner barrel bottom valve

It controls unwanted spring motion through a process called damping. The shock absorber slows and dampens the magnitude of vibratory motion by converting the kinetic energy of the suspension motion into heat energy that can be dissipated through the hydraulic fluid. The shock absorber has an upper support attached to the frame (i.e., the spring loaded mass) and a lower support near wheel attached to the axle (i.e., the unsprung mass). One of the most common types of shock absorbers in the double barrel design is where the upper support is attached to a piston rod, which is attached to a piston that sits in a barrel filled with hydraulic fluid. The inner barrel is called the pressure barrel and the outer barrel is called the oil reservoir. The reservoir barrel stores the excess hydraulic fluid. When the wheel encounters a bumpy road and causes the spring to compress and stretch, the energy of the spring is transferred through the upper support to the shock absorber and down through the piston rod to the piston. The piston is perforated with holes that allow hydraulic fluid to leak out through these small holes as the piston moves up and down inside the pressure barrel. Because these holes are so tiny, only a very small amount of hydraulic fluid can pass through even under great pressure. This slows down the movement of the piston, which in turn slows down the movement of the spring. The operation of the shock absorber consists of two cycles - the compression cycle and the tension cycle. The compression cycle compresses the hydraulic fluid below the piston as it moves downward; the tension cycle refers to the hydraulic fluid above the piston as it moves upward to the top of the pressure barrel. For a typical automobile, the resistance of its tension cycle is greater than that of its compression cycle. Also note that the compression cycle controls the motion of the unsprung mass of the vehicle, while the tension cycle controls the motion of the relatively heavier sprung mass. All modern shock absorbers have speed sensing function- the faster the suspension is moving, the more resistance the shock absorber provides. This allows the shock absorber to adjust to the road conditions and control all the unwanted movements that can occur in a moving vehicle, including bouncing, sideways roll, braking dive and acceleration squat.

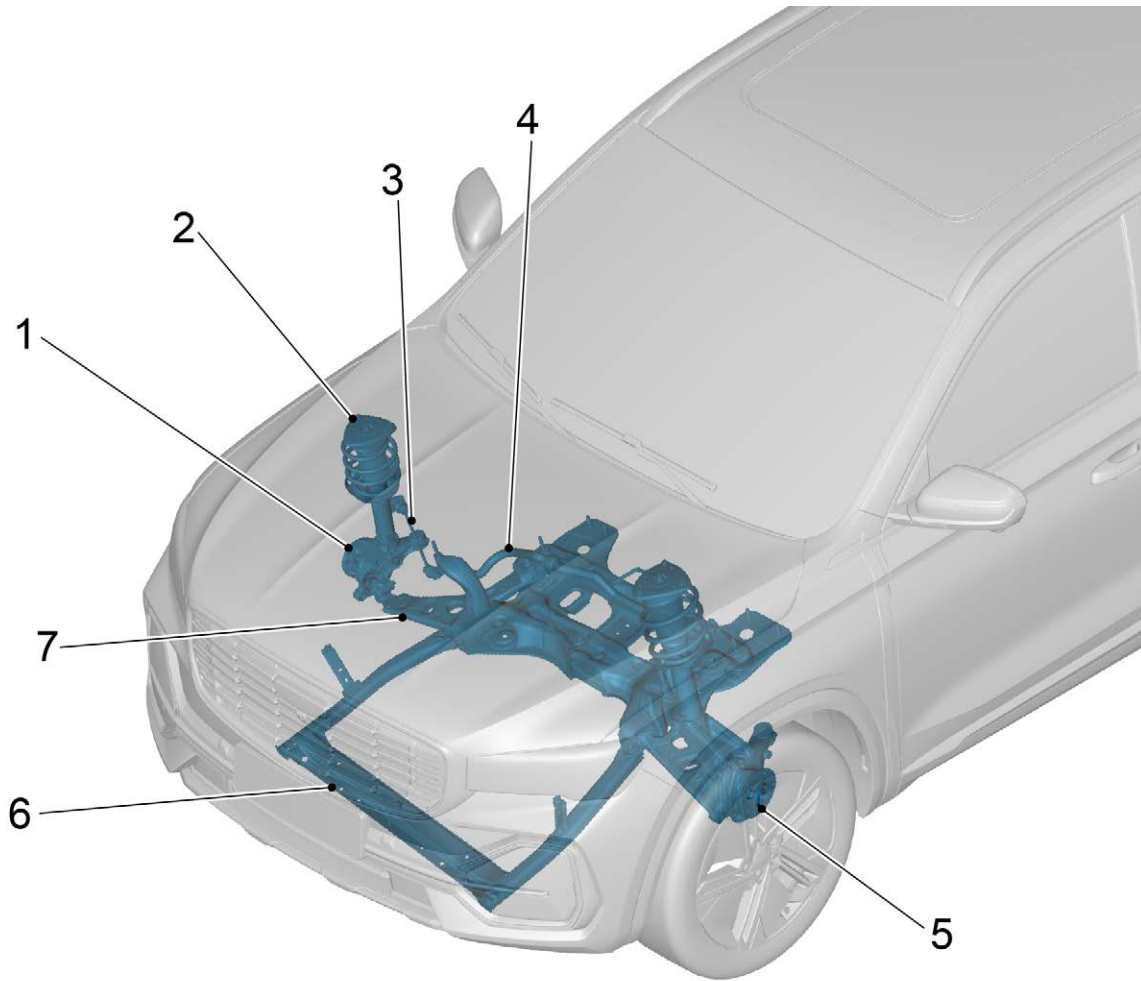
Stabilizer bar:

Used in conjunction with a shock absorber in order to provide additional stability to a moving vehicle. The stabilizer bar is a metal rod that spans the entire axle and effectively connects the two sides of the suspension together. When the

suspension on one wheel moves up and down, the stabilizer bar transmits the movement to the other wheel. This provides a smoother ride and reduces vehicle lean. In particular, it counteracts the tendency of the car on the suspension to roll over when cornering.

5.2.4 Part position

5.2.4.1 Part position



- | | | | |
|----|-------------------------------------|----|-------------------------------------|
| 1. | Front Steering Knuckle | 5. | Front Wheel Hub Bearing |
| 2. | Front Shock Absorber Assembly | 6. | Front Suspension Lower U-beam |
| 3. | Front Stabilizer Bar Connecting Rod | 7. | Front Suspension Lower Arm Assembly |
| 4. | Front Stabilizer Bar | | |

5.2.5 Diagnostic Information and Procedures

5.2.5.1 Diagnosis description

See [Description and Operation](#) and [Operating Principle of Suspension System Components](#) before diagnosing a malfunction in the front suspension. Understanding and familiarizing yourself with the operation principle of the front suspension before beginning system diagnostics will help determine the proper troubleshooting steps to take in the event of a malfunction, and more importantly, this will help determine if the condition described by the customer is normal operation. Any troubleshooting of the front suspension should start with a [routine inspection](#) that guides the mechanic to the next logical step in the troubleshooting process. Understanding and using the diagnostic process correctly will reduce diagnostic time and avoid misdiagnosis of the faulty area.

5.2.5.2 Routine inspection

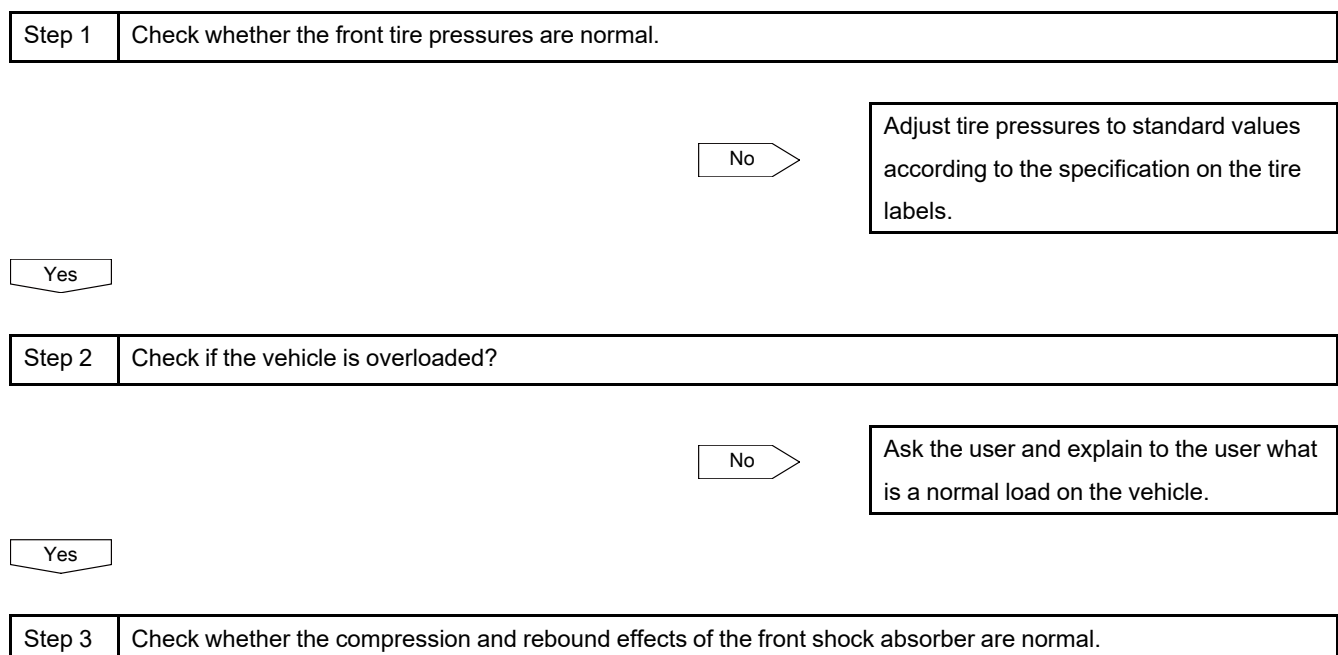
- Confirm trouble symptom

The most difficult situation in troubleshooting is when there are no symptoms, in which case the fault described by the user must be thoroughly analyzed. Then simulate the same or similar conditions and environments as the customer's vehicle when the malfunction occurs. Regardless of how experienced and skilled the maintenance personnel are, if troubleshooting is performed without confirming the symptoms of the malfunction, something important will be overlooked in the repair and a wrong guess will be made in some places. This will make troubleshooting impossible.

- Inspect easily accessible or visible system components for obvious damage or conditions that could cause a malfunction, and if so, repair or replace the component.
- Check the harness and harness connector to ensure that there is no sign of loosening, damage, poor contact, aging, etc.
- Connector joints and vibrating pivot points are the main areas that should be thoroughly checked, and the vibration method is recommended in cases where a malfunction may be caused by vibration.
 - Gently vibrate the sensor parts that may be faulty with your finger and check for malfunction.
 - Gently shake the connector in both vertical and horizontal directions.
 - Gently shake the harness in both vertical and horizontal directions.

5.2.5.3 Check of front shock absorber assembly

The Front Shock Absorber Is Too Soft



a. Quickly press and release the corner of the front shock absorber bumper closest to the front shock absorber being inspected, and compare the compression and rebound effects with those of a normal comparable vehicle.

No

Replace the front shock absorber, see [Replacement of Left Front Shock Absorber](#).

Yes

Step 4 The system is normal.

Front shock absorber is noisy

Step 1 Check if the front shock absorber is installed properly and check if the front shock absorber parts are working properly? (There can be no abnormalities such as looseness).

No

Replace the front shock absorber, see [Replacement of Left Front Shock Absorber](#).

Yes

Step 2 Check whether the compression and rebound effects of the front shock absorber are normal.

a. Quickly press and release the corner of the front shock absorber bumper closest to the front shock absorber being inspected, and compare the compression and rebound effects with those of a normal comparable vehicle.

No

Replace the front shock absorber, see [Replacement of Left Front Shock Absorber](#).

Yes

Step 3 The system is normal.

Front shock absorber oil is leaking

Step 1	Check if the front shock absorber is installed properly and if the front shock absorber components are working properly? (There must not be any abnormalities such as looseness).
--------	---

Next Step

Step 2	Check the sealing condition of the front shock absorber when it is fully extended, and whether the dust cover is broken or not.
--------	---

No

Replace the front shock absorber, see [Replacement of Left Front Shock Absorber](#).

Yes

Step 3	Check if there is too much oil on the front shock absorber?
--------	---

No

Replace the front shock absorber, see [Replacement of Left Front Shock Absorber](#).

Yes

Step 4	The system is normal.
--------	-----------------------

5.2.5.4 Ball pin and steering knuckle inspection

Warning !

See "Warnings and Precautions" under "Warnings about Vehicle Lift".

Step 1	Raise the front end of the vehicle so that the front suspension is free hanging.
--------	--

Next Step

Step 2	Grasp the top and bottom of the front tires and wrench the top of the wheel inward and outward.
--------	---

Next Step

Step 3	Note if there is any clearance and if the steering knuckle is moving horizontally relative to the control arm?
--------	--

Next Step

Step 4	The ball head must be replaced if any of the following conditions occur.
--------	--

- a. Ball joint is loose.
- b. The ball seal is broken.
- c. The ball stud is disconnected from the steering knuckle.
- d. Ball stud is loose on the steering knuckle.
- e. Ball stud twists in seat when pressed with finger.

No

Replace the steering gear left outer tie rod, see [Replacement of Steering Gear Left Outer Tie Rod](#).

Next Step

Step 5 Tie parts are normal.

5.2.5.5 Inspection of ball studs

Each time the ball joints are inspected, it must be checked that the ball studs are tightly seated in the steering knuckle bosses.

To check the ball studs for wear:

- a. Shake the wheel and feel the movement of the bolt head or slotted nut in the steering knuckle boss.
- b. Check the tightening torque of the slotted nut, a loose nut indicates that the ball stud is under stress or has a hole in the steering knuckle boss.

Worn or damaged ball joints or steering knuckles must be replaced if any of the above conditions exist. See [Replacement of Front Suspension Left Lower Swing Arm Assembly](#).

5.2.5.6 Excessive Friction Check

Check for excessive front suspension friction by following the procedure below:

Step 1 Raise the front bumper to elevate the vehicle as high as possible.

Next Step

Step 2 Slowly lower the bumper and allow the vehicle to return to its normal cocking height.

Next Step

Step 3 Measure the distance from the ground to the center of the bumper.

Next Step

Step 4 Press down on the bumper and then slowly release it to allow the vehicle to return to its normal cocking height.

Next Step

Step 5 Measure the distance from the ground to the center of the bumper.

Next Step

Step 6 The difference between the two measurements should be <12.7 mm (0.5 in), if the distance exceeds this limit, check the control arms, front shock absorber and ball head for damage or wear.

5.2.5.7 Ride smoothness diagnosis (too soft or too hard)

Too soft

Step 1	Check front shock absorber for wear, replace front shock absorber if necessary.
--------	---

Next Step

Step 2	Check if the front coil spring is broken or loose, replace the front coil spring if necessary.
--------	--

Too hard

Step 1	Check that the front shock absorber is installed correctly and that the front shock absorber does not match the model, replace the front shock absorber if necessary.
--------	---

Next Step

Step 2	Check if the front coil springs are correct, replace the front coil springs if necessary.
--------	---

5.2.5.8 Body leaning or swaying while turning

Step 1	Check if the front stabilizer bar connecting rod is loose, retighten the front stabilizer bar connecting rod and front strut assembly connecting nut according to the specified torque.
--------	---

Next Step

Step 2	Check the front shock absorber and front bolt spring seat for wear and tear, replace the front shock absorber if necessary, and retighten the fixing nut on the front shock absorber.
--------	---

Next Step

Step 3	Check for overloading of the vehicle and provide a reasonable explanation to the user.
--------	--

Next Step

Step 4	Check if the front coil spring is broken or loose, replace if necessary.
--------	--

5.2.5.9 Noise Diagnosis

Step 1	Check each ball head for insufficient lubrication.
--------	--

Yes

Replace the ball head.

No

Step 2	Check if the steering knuckle washer is installed, or is it in place, which causes damage to the swing arm ball head dust cover and produces a ball head rattle.
--------	--

Yes

Reinstall the steering knuckle gasket and replace the ball head.

No

Step 3 Check front suspension components for wear?

Yes

Replace damaged front suspension components.

No

Step 4 Check for loose front stabilizer bar connecting rod?

Yes

Tighten the fixing nut of the front stabilizer bar connecting rod.

No

Step 5 Check that the front shock absorber or front strut coil spring seat vibration isolation pads are intact, installed in place, damaged, etc.?

Yes

Replace damaged parts.

No

Step 6 Check the front strut coil spring installation for misalignment?

Yes

Install a new front coil spring.

No

Step 7 Check for excessive wear on the front stabilizer bar retaining bushings?

Yes

Re-replace the front stabilizer bar retaining bushings. See [Replacement of Front Stabilizer Bar Assembly](#).

No

Step 8 Find a vehicle of the same model and make a comprehensive assessment of whether the noise is a normal operating noise.

No

Step 9 Tie parts are normal.

5.2.5.10 Cocking height is not normal

Step 1	Check for broken or loose coil springs in the front strut assembly and replace if necessary.
--------	--

Next Step

Step 2	Check if the vehicle is overloaded and explain the hazards of overloading the vehicle to the user if necessary.
--------	---

Next Step

Step 3	Check if the coil springs in the front strut assembly are incorrect or too soft, replace with genuine Geely coil springs.
--------	---

5.2.6 Removal and Installation

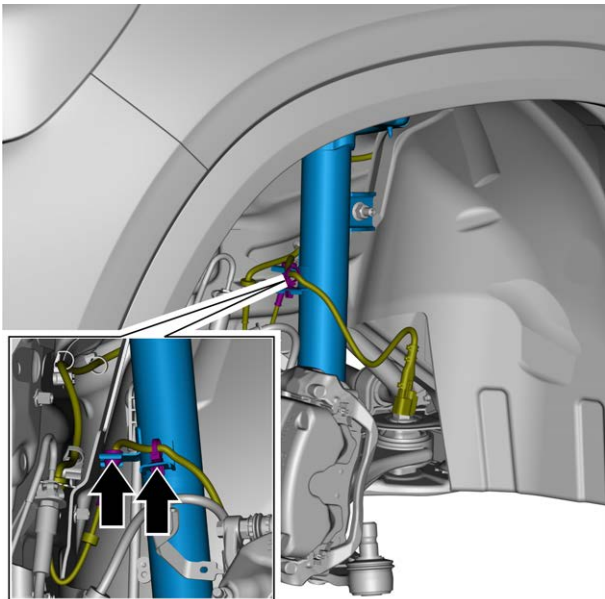
5.2.6.1 Replacement of Left Front Shock Absorber

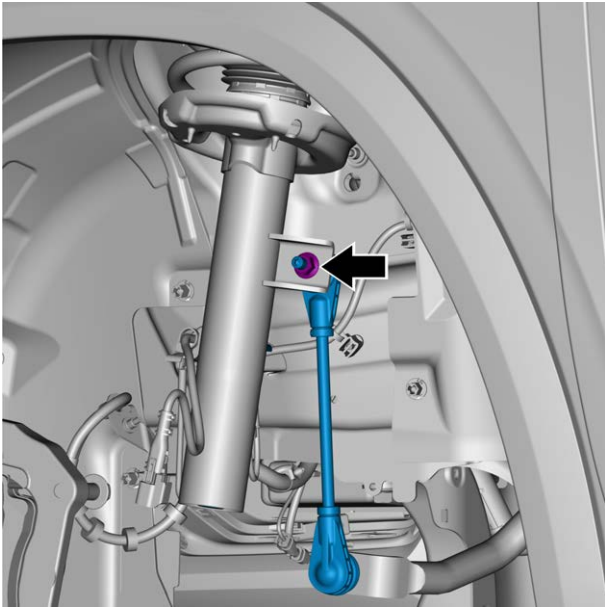
Removal Procedure

Caution

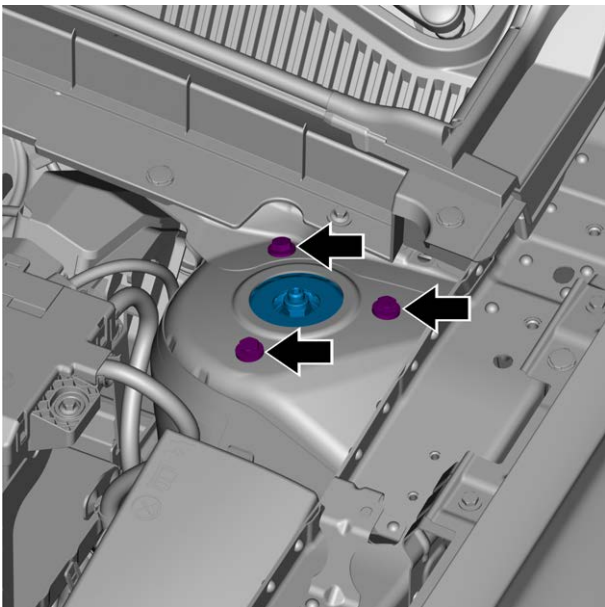
The left and right front shock absorber assemblies are removed in a similar manner.

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove wheel, see [Replacement of Wheel Assembly](#).
- 3 Remove the left front caliper assembly, see [Replacement of Left Front Caliper Assembly](#).
- 4 Remove the left front brake disc, see [Replacement of Left Front Brake Disc](#).
- 5 Remove the front left constant velocity drive shaft, see [Replacement of Front Left Constant Velocity Drive Shaft](#).
- 6 Remove the left front steering knuckle assembly, see [Replacement of Left Front Steering Knuckle Assembly](#).
- 7 Remove the left cabin trim panel, see [Replacement of Left Cabin Trim Panel](#)
- 8 Remove the wheel speed sensor (left front) retaining clip.





- 9 Remove and discard the front stabilizer bar connecting rod fixing nut and disconnect the front stabilizer bar connecting rod from the front shock absorber assembly.



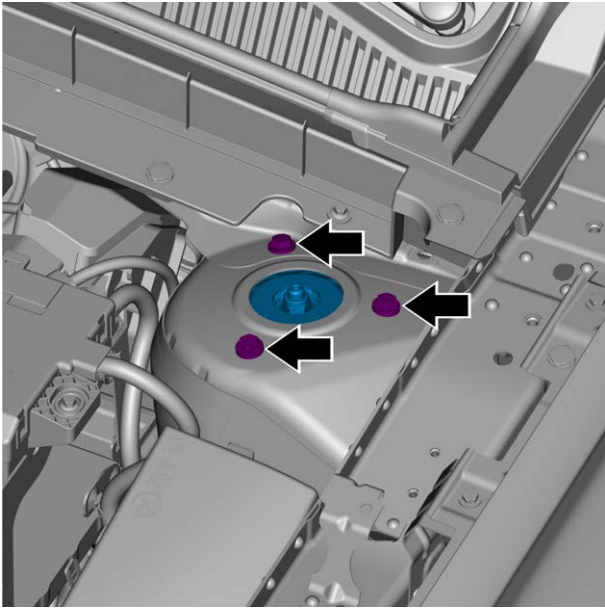
- 10 Remove the 3 fixing bolts from the upper part of the front shock absorber assembly to the vehicle body.

Caution

Two people are required to work together when disassembling and removing the front shock absorber assembly to prevent maintenance accidents.

- 11 Remove the front shock absorber assembly.

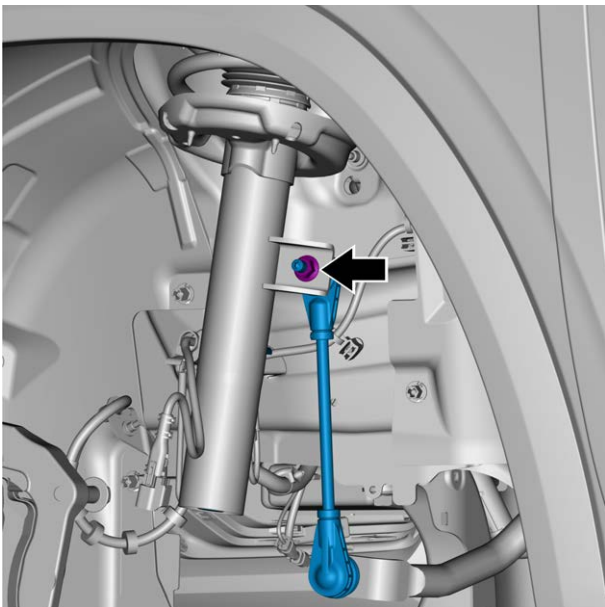
Installation Procedure



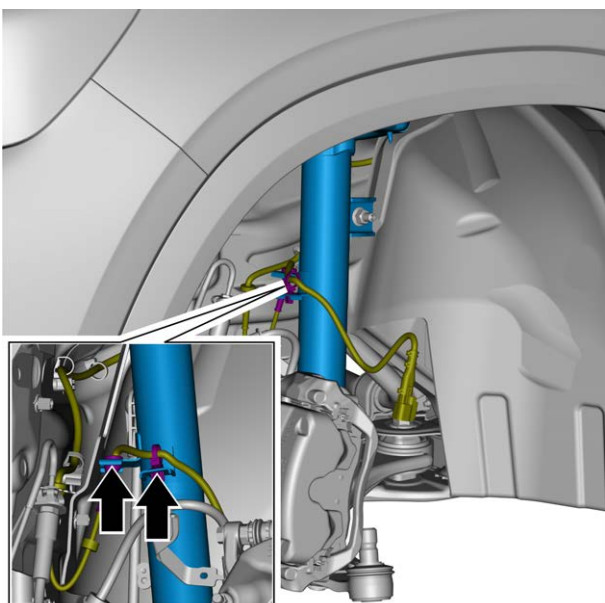
- 1 Install the front shock absorber assembly into the body holes on the front cabin side and tighten the 3 fixing bolts.
Torque: 34N·m

Caution

Be sure to handle carefully so as not to damage or scratch the coating when moving the front suspension coil spring. Damage to the coating can cause early failure.



- 2 Install the left stabilizer bar connecting rod and install and tighten the new fixing nut.
Torque: 70N·m



- 3 Install the wheel speed sensor (left front) harness retaining clip.

- 4 Install the left front steering knuckle assembly.
- 5 Install the left equal drive shaft.
- 6 Install the left brake disk.
- 7 Install the left caliper assembly.
- 8 Install the left cabin trim panel.
- 9 Install the wheel.
- 10 Lower the vehicle.
- 11 Perform a vehicle four-wheel alignment.

5.2.6.2 Disassembly of the left front shock absorber

Removal Procedure

Caution

The left and right front shock absorber assemblies are disassembled in a similar manner.

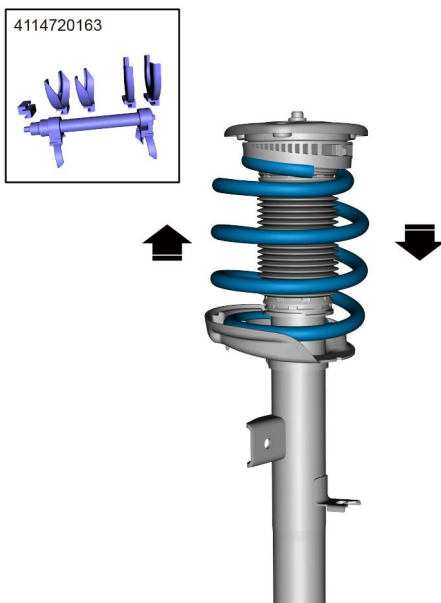
- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove wheel, see [Replacement of Wheel Assembly](#).
- 3 Remove the front shock absorber, see [Replacement of Left Front Shock Absorber](#).
- 4 Secure the front shock absorber assembly to the vise.
- 5 Compress the coil springs using the spring compression tool until the coil springs and spring compression tool are free to move.

Special tool: 4114720163

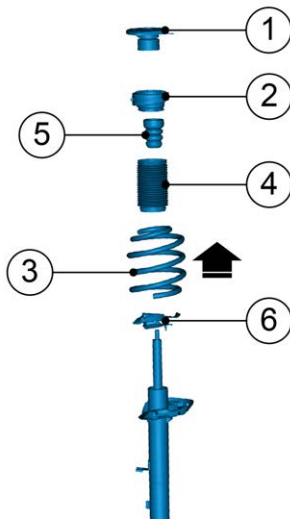
Caution

Do not use a pneumatic wrench as it will damage the compression tool.

Confirm that the spring fits tightly with the spring compression tool and keep an eye on the spring condition.

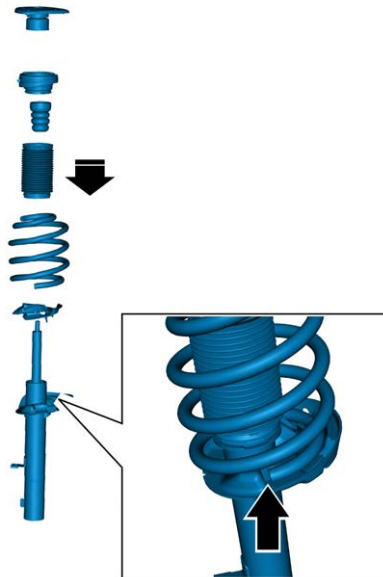
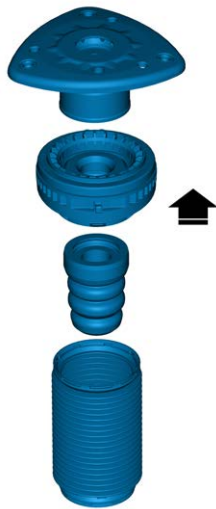


- 6 Secure the spring seat, remove and discard the lock nut.



- 7 Remove the front shock absorber upper support assembly 1, support bearing 2, front suspension coil spring 3, front suspension buffer guard 4, front suspension bump buffer 5, and front coil spring lower vibration isolation pad 6, in that order.

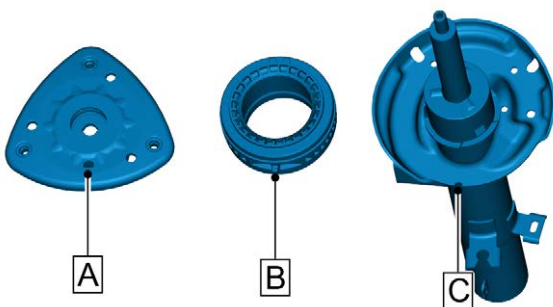
Installation Procedure



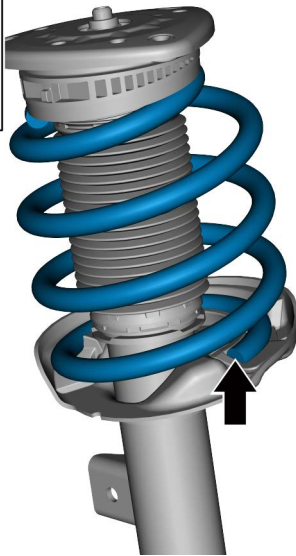
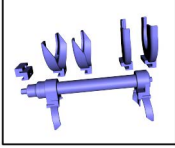
- 1 Snap the bearing into the outer ring of the cup of the upper support of the front shock absorber, and snap the upper end of the front suspension bump buffer (big head) into the inner ring of the cup, and then the upper end of the front suspension buffer guard (big head) into the outer inverted buckle of the support bearing.
- 2 Use a spring compression tool to compress the coil springs.
- 3 On the shock absorber, install the front suspension lower spring gasket, front suspension bump buffer, front suspension coil spring, support bearing and front suspension buffer guard, and upper connecting support assembly in sequence, and snap the small end of the front suspension buffer guard into the outer inverted buckle of the shock absorber.

Caution

Align notch locating marks A, B, and C when installing the upper attachment support, support bearing, and shock absorber.



4114720163



- 4 Make sure the lower end of the coil spring is installed in the groove of the spring pad.
Special tool: 4114720163



- 5 Secure the spring seat, install and tighten the new lock nut.

Torque: 58N·m

Caution

A hex wrench is required to "no-turn" the piston rod when tightening the nut.

- 6 Install the front shock absorber assembly.
- 7 Install the wheel.
- 8 Lower the vehicle.

5.2.6.3 Replacement of front stabilizer bar

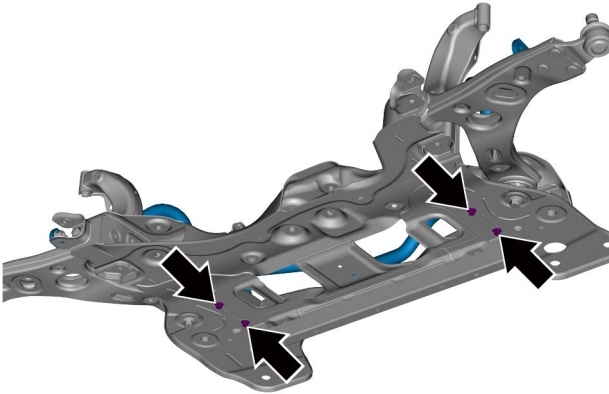
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Lift the vehicle, see [Vehicle Lifting and Raising](#).

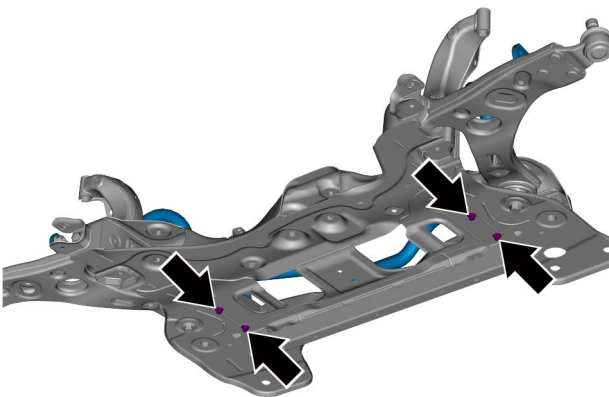
- 3 Remove wheel, see [Replacement of Wheel Assembly](#).
- 4 Remove the front subframe, see [Replacement of Front Subframe](#).
- 5 Remove and discard the 2 fixing bolts from the left and right sides of the front stabilizer bar to the front subframe.
- 6 Remove the front stabilizer bar.



Installation Procedure

- 1 Place the front stabilizer bar to the mounting position.
- 2 Install and tighten the front stabilizer bar to the front subframe with 2 new fixing bolts on each side of the front subframe, left and right.

Torque: 24N·m



- 3 Install the front subframe.
- 4 Install the wheel.
- 5 lower the vehicle.
- 6 Connect the negative cable of battery.
- 7 Perform a vehicle four-wheel alignment.

5.2.6.4 Replacement of Front Stabilizer Bar Connecting Rod

Removal Procedure

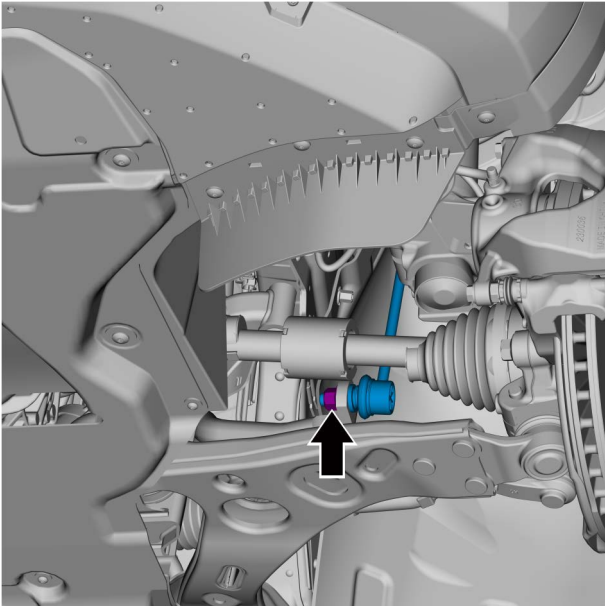
Caution

Remove and install the left and right front stabilizer bar connecting rods in a similar manner.

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove wheel, see [Replacement of Wheel Assembly](#).
- 3 Remove and discard the fixing nut of the front stabilizer bar and the front stabilizer bar connecting rod.

Caution

A hex head is required to hold the ball head pin during removal.

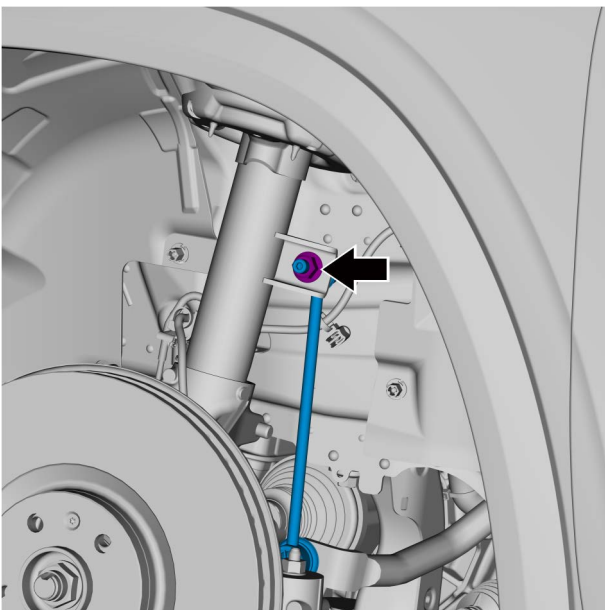


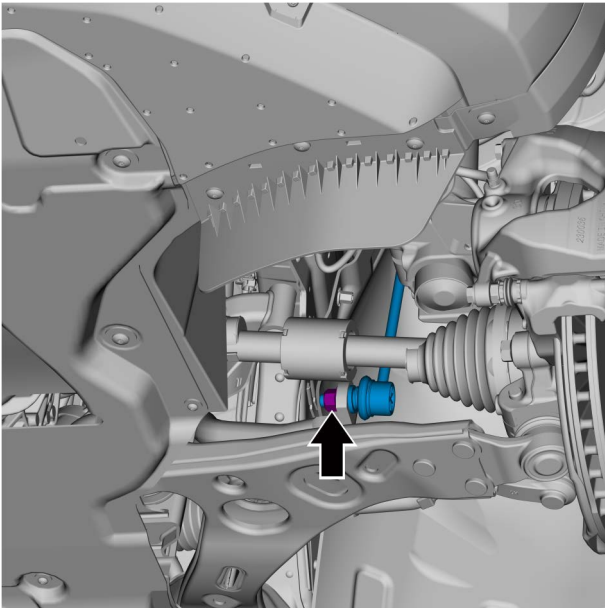
- 4 Remove and discard the fixing nut of the front stabilizer bar connecting rod to the left front shock absorber.

Caution

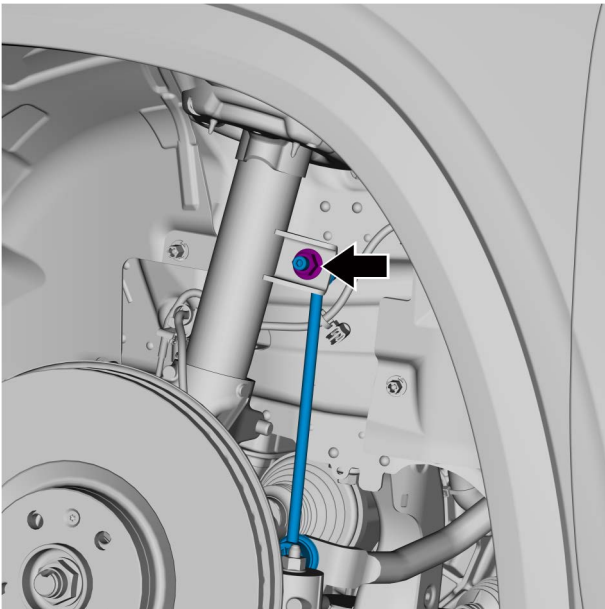
Use a hex head to hold the ball head pin during disassembly.

- 5 Remove the front stabilizer bar connecting rod.

**Installation Procedure**



- 1 Install the front stabilizer bar connecting rod to the front stabilizer bar and tighten the new fixing nut.
Torque: 70N·m



- 2 Install the front stabilizer bar connecting rod to the left front shock absorber and tighten the new fixing nut.
Torque: 70N·m

- 3 Install the wheel.
- 4 lower the vehicle.

5.2.6.5 Front Suspension Left Lower Arm Assembly

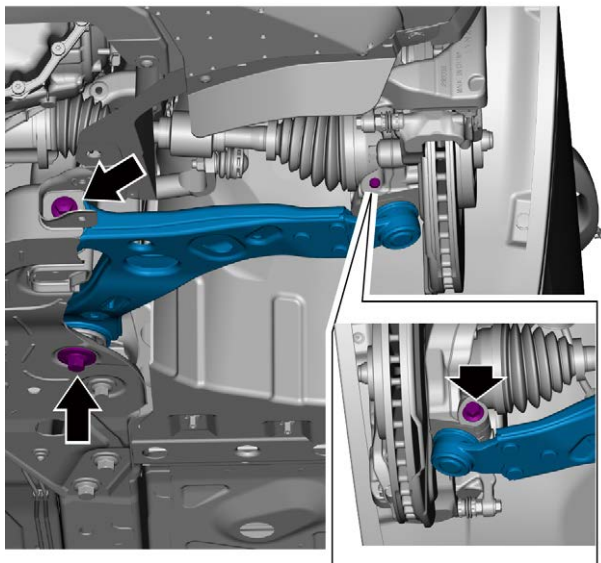
Removal Procedure

Caution

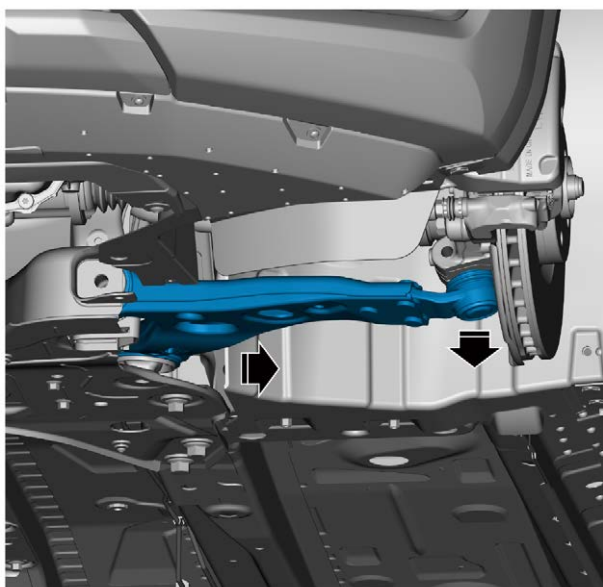
Remove and install the left and right front lower swing arm in a similar way.

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove wheel, see [Replacement of Wheel Assembly](#).
- 3 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).

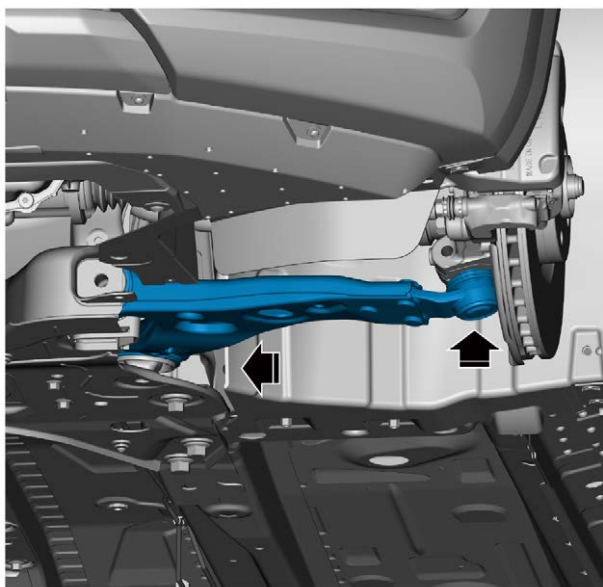
- 4 Remove the lower U-beam of the front suspension, see [Replacement of Lower U-beam of Front Suspension](#).
- 5 Remove and discard the 3 fixing bolts of the front suspension left lower swing arm assembly.



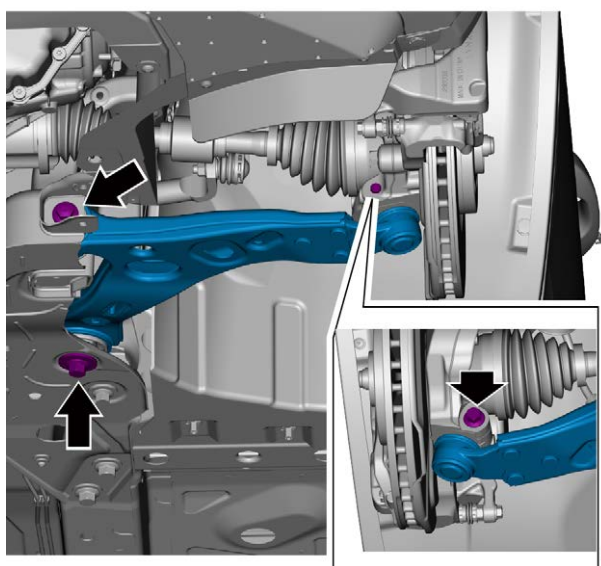
- 6 Remove the front suspension left lower swing arm assembly by disconnecting it downward from the front steering knuckle assembly.



Installation Procedure

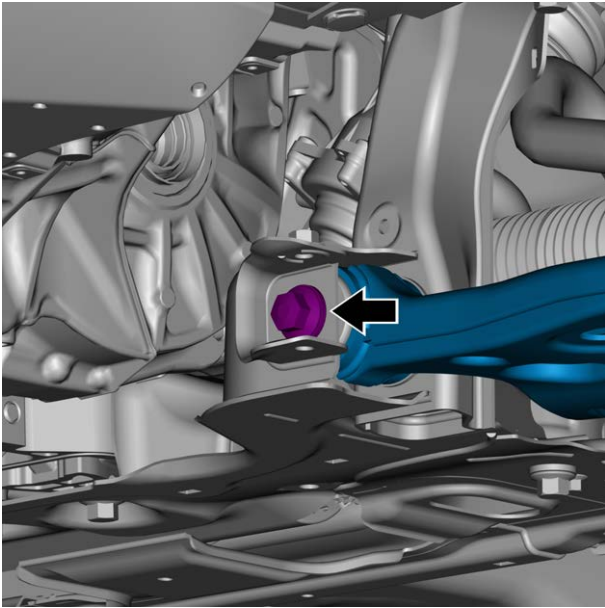


- 1 Install the front suspension left lower swing arm assembly.



- 2 Pre-tension the 3 new fixing bolts for the front suspension left lower swing arm assembly.

- 3 Install wheel, lower the vehicle.

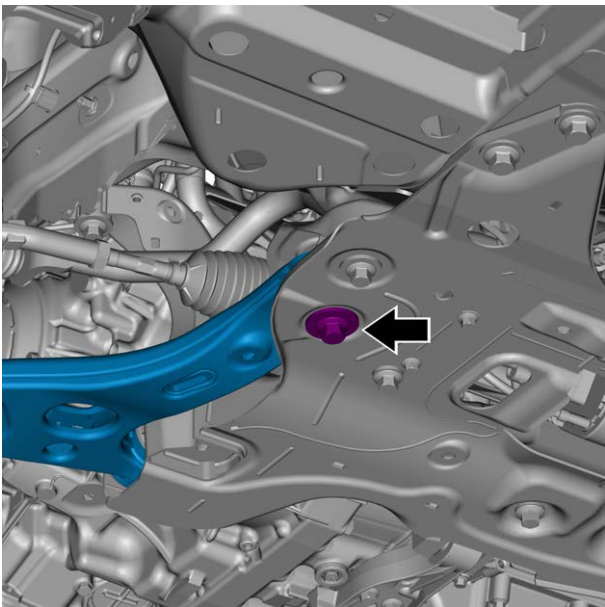


- 4 Tighten the fixing bolts connecting the front end of the front suspension left lower arm assembly to the subframe.

Torque: 140 N·m + 90°

Caution

Make sure the vehicle height is correct when tightening the bolt.



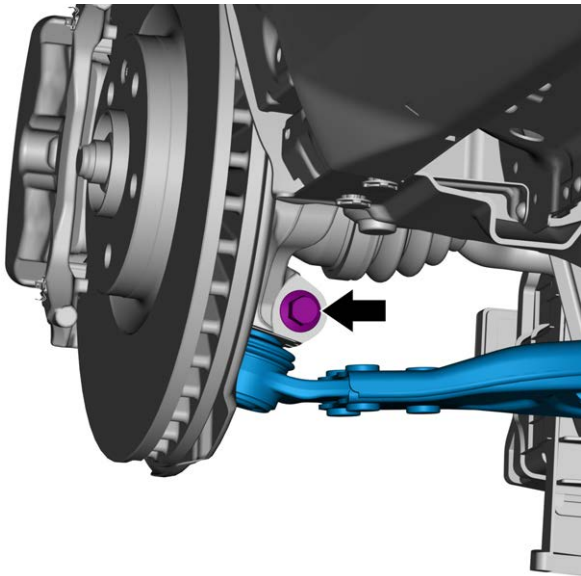
- 5 Tighten the fixing bolt that connects the rear end of the front suspension left lower swing arm assembly to the subframe.

Torque: 140 N·m + 90°

Caution

Make sure the vehicle height is correct when tightening the bolt.

- 6 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 7 Remove wheel, see [Replacement of Wheel Assembly](#).



- 8 Tighten the fixing bolt connecting the left lower swing arm assembly of the front suspension to the left front steering knuckle assembly.

Torque: 90 N·m + +75°

Caution

Make sure that the lower swing arm position is correct before tightening the bolts.

- 9 Install the lower U-shaped beam of the front suspension.
- 10 Install the bottom engine guard assembly.
- 11 Install the wheel.
- 12 lower the vehicle.
- 13 Perform a vehicle four-wheel alignment.

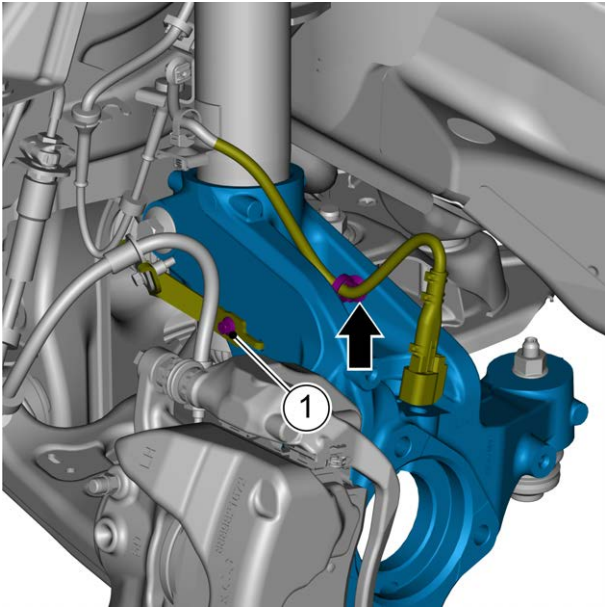
5.2.6.6 Replacement of left front steering knuckle assembly

Removal Procedure

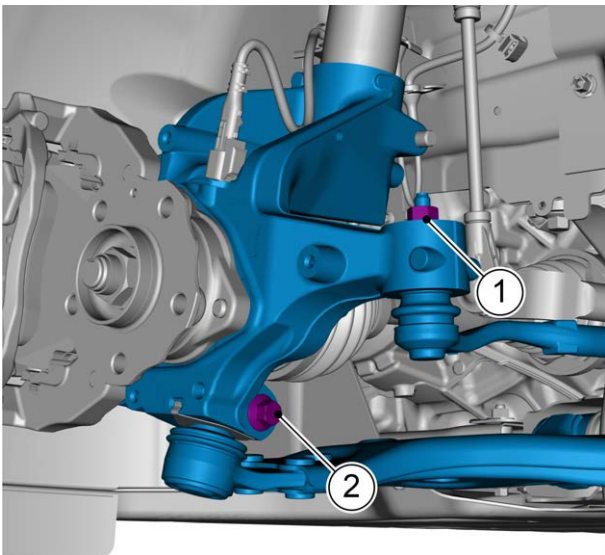
Caution

Remove and install the left and right front steering knuckle assemblies in a similar way.

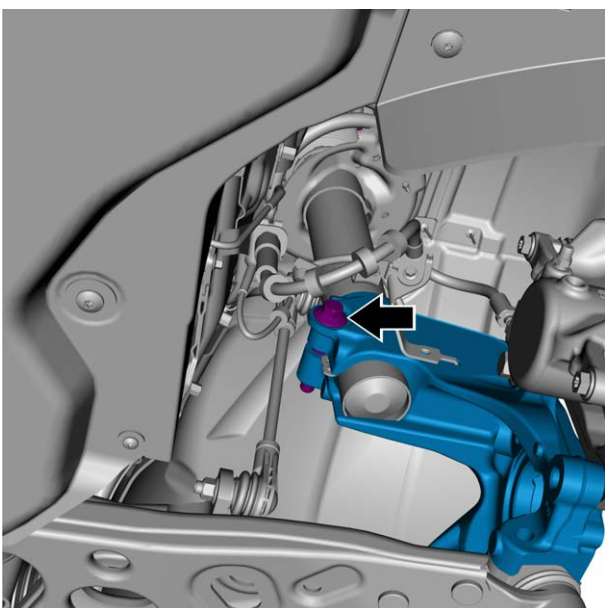
- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove wheel, see [Replacement of Wheel Assembly](#).
- 3 Remove the left front caliper assembly, see [Replacement of Left Front Caliper Assembly](#).
- 4 Remove the left front brake disc, see [Replacement of Left Front Brake Disc](#).
- 5 Remove the front left constant velocity drive shaft, see [Replacement of Front Left Constant Velocity Drive Shaft](#).
- 6 Remove the left front wheel brake guard. See [Replacement of Left Front Brake Guard](#).
- 7 Remove the left front drive hub assembly, see [Replacement of Left Front Drive Hub Assembly](#).
- 8 Remove the left front wheel beam sensor, see [Replacement of wheel speed sensor \(left front\)](#).



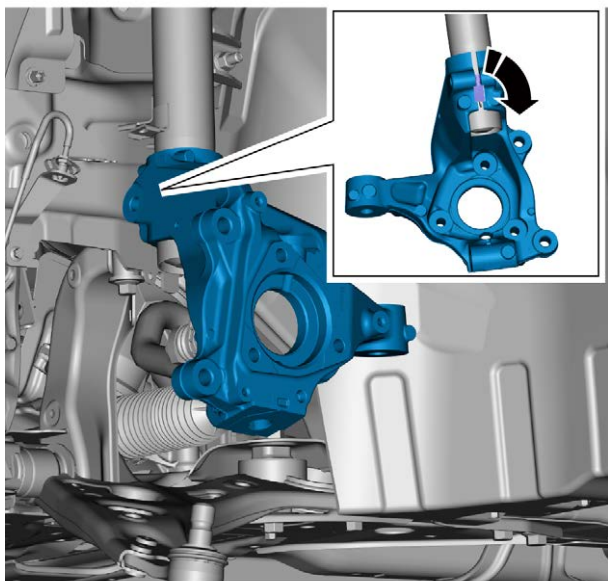
- 9 Remove the retaining clip on the wheel speed sensor (left front) wiring harness.
- 10 Remove left front brake hose bracket fixing bolt 1 and disconnect from left front steering knuckle.



- 11 Remove and discard fixing nut 1 and disconnect the left outer tie rod of steering gear from the left front steering knuckle assembly.
- 12 Remove and discard the fixing bolt 2 and disconnect the left front lower swing arm assembly from the left front steering knuckle assembly.

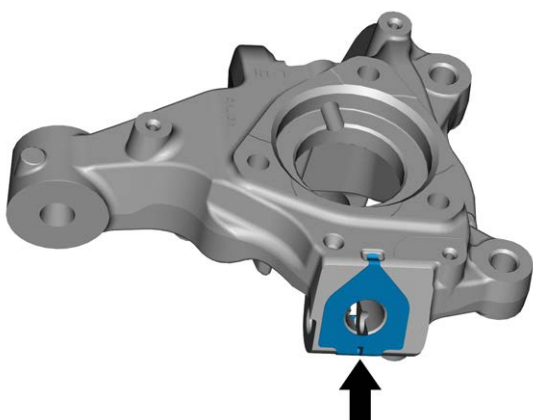


- 13 Remove and discard the fixing bolts connecting the left front steering knuckle assembly to the shock absorber, and take off the left front steering knuckle assembly



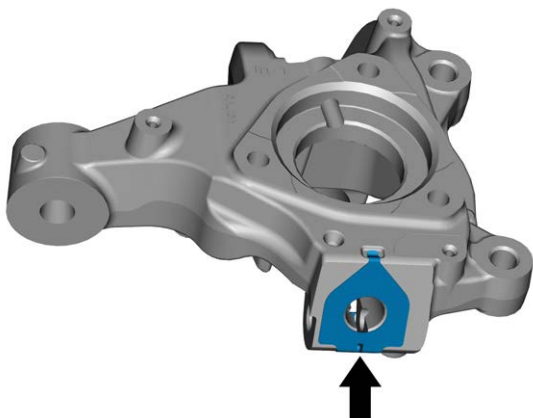
- 14 Insert a suitable tool and turn the tool with a wrench to loosen the steering knuckle from the front shock absorber assembly.

- 15 Remove the steering knuckle washer.

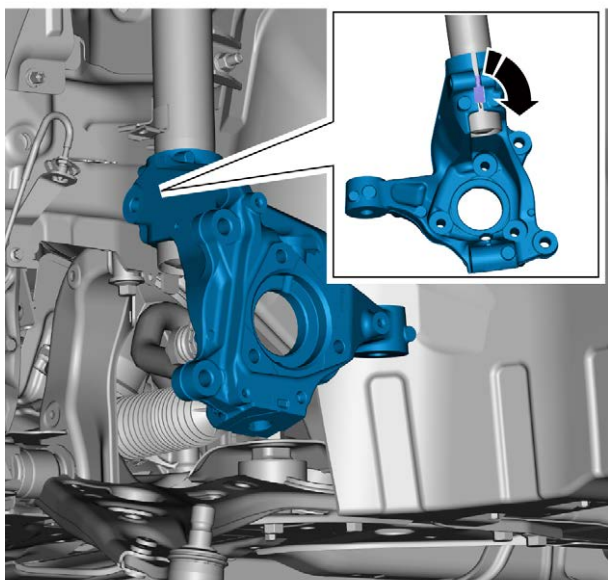


Installation Procedure

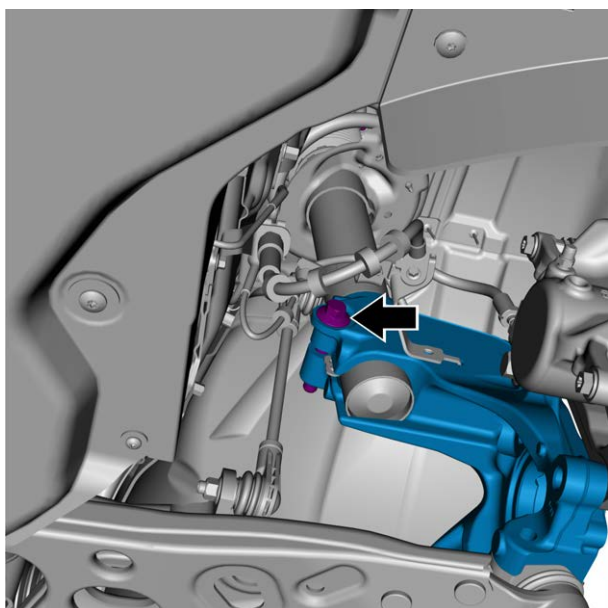
- 1 Install the steering knuckle washer.

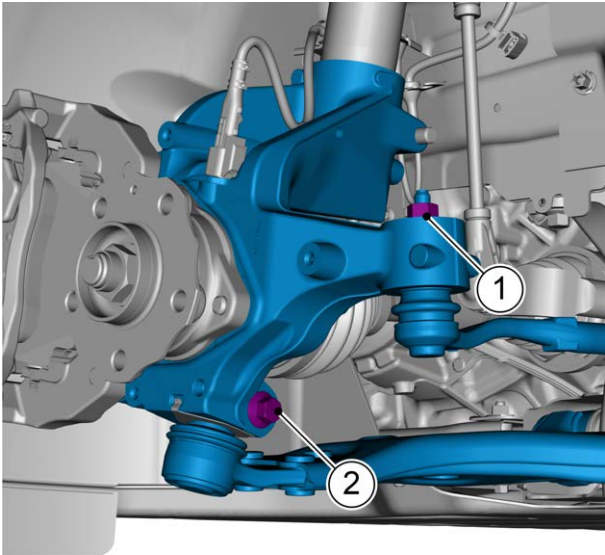


- 2 Insert a suitable tool, turn the tool with a wrench and install the steering knuckle to the front shock absorber assembler.

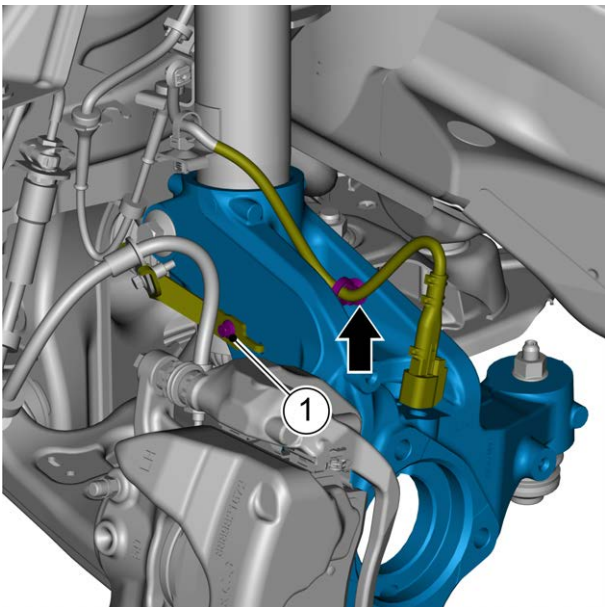


- 3 Install the left front steering knuckle assembly, install and tighten the new fixing bolts.
Torque: 90N·m+90°





- 4 Install the steering gear left outer tie rod and tighten the new fixing nut 1.
Torque: 30 N·m + 90°
- 5 Install the left front lower swing arm assembly and tighten the new fixing bolt 2.
Torque: 90 N·m + +75°



- 6 Install the left front brake hose bracket and tighten fixing bolt 1.
Torque: 7N·m
- 7 Install the left front wheel beam sensor harness retaining clip.

- 8 Install the left front wheel beam sensor.
- 9 Install the left front drive hub assembly.
- 10 Install the left front brake guard.
- 11 Install the front left constant velocity drive shaft.
- 12 Install the left front brake disk.
- 13 Install the left front brake caliper assembly.
- 14 Install the wheel.
- 15 lower the vehicle.
- 16 Perform a vehicle four-wheel alignment.

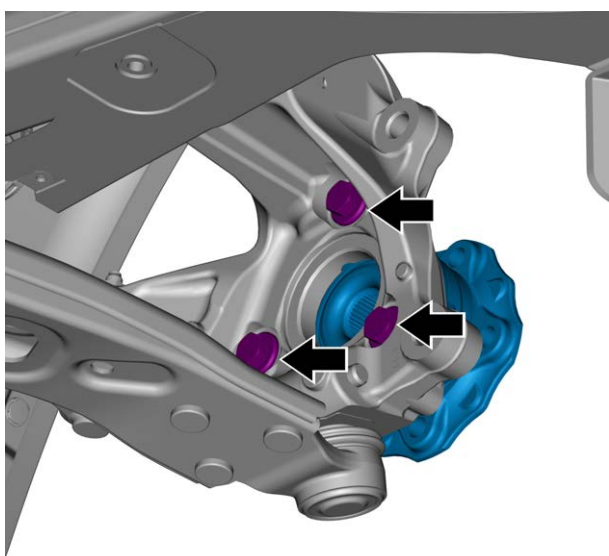
5.2.6.7 Replacement of left front drive hub assembly

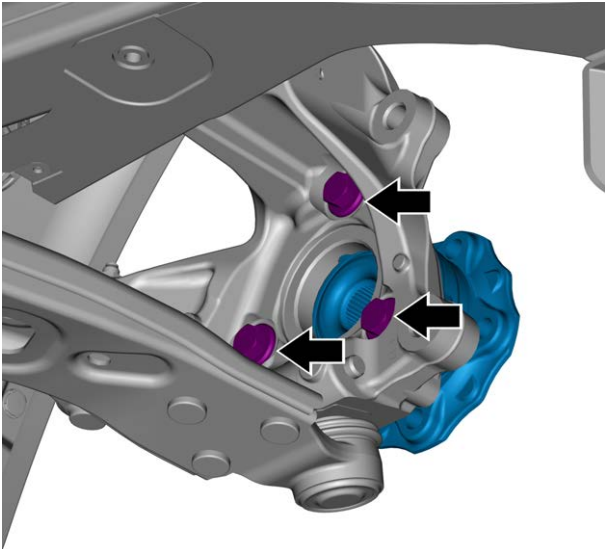
Removal Procedure

Caution

Remove and install the left and right front drive hub assemblies in a similar manner.

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove wheel, see [Replacement of Wheel Assembly](#).
- 3 Remove the left front caliper assembly, see [Replacement of Left Front Caliper Assembly](#).
- 4 Remove the left front brake disc, see [Replacement of Left Front Brake Disc](#).
- 5 Remove the front left constant velocity drive shaft, see [Replacement of Front Left Constant Velocity Drive Shaft](#).
- 6 Remove and discard the 3 fixing bolts connecting the front drive hub assembly to the left front steering knuckle assembly, and remove the front drive hub assembly.

**Installation Procedure**



- 1 Install the left front drive hub assembly into the left front steering knuckle assembly, install and tighten the 3 new fixing bolts.

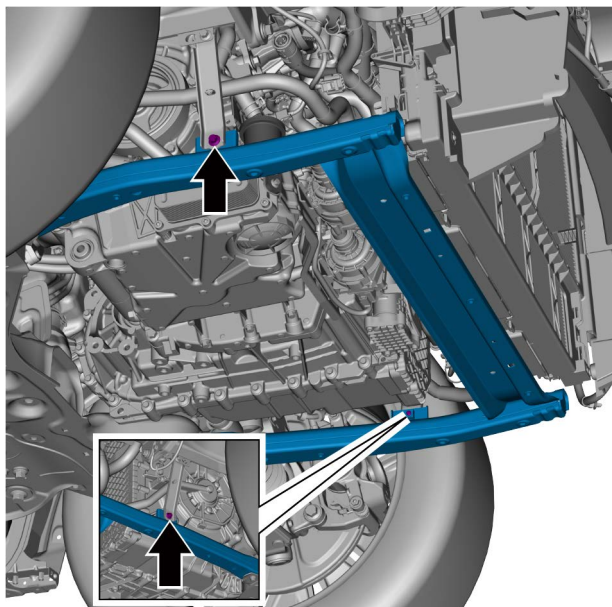
Torque: 90 N·m + 90°

- 2 Install the front left constant velocity drive shaft.
- 3 Install the left front brake disk.
- 4 Install the left front brake caliper assembly.
- 5 lower the vehicle.

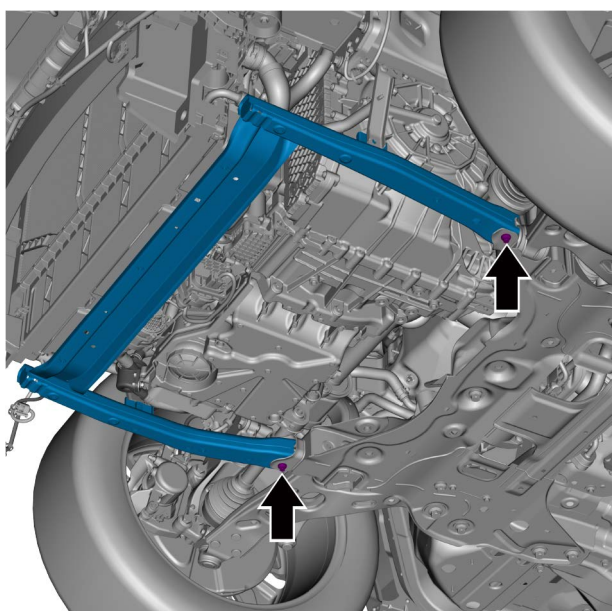
5.2.6.8 Replacement of Front Suspension Lower U-Beam

Removal Procedure

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 3 Remove the left and right side front wheel cover fender assemblies, see [Replacement of Left Front Wheel Cover Fender Assembly](#).
- 4 Remove the front bumper assembly, refer to [Replacement of front bumper assembly](#).

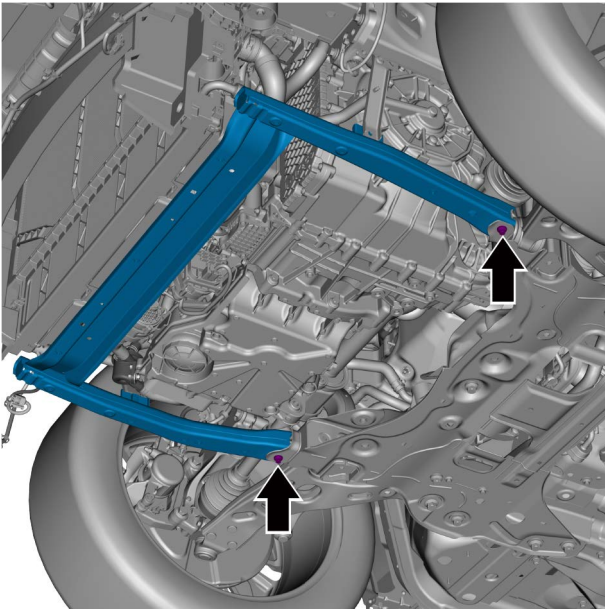


- 5 Remove the bolts securing the left and right sides of the front suspension lower U-beam to the front suspension lower U-beam support beam.

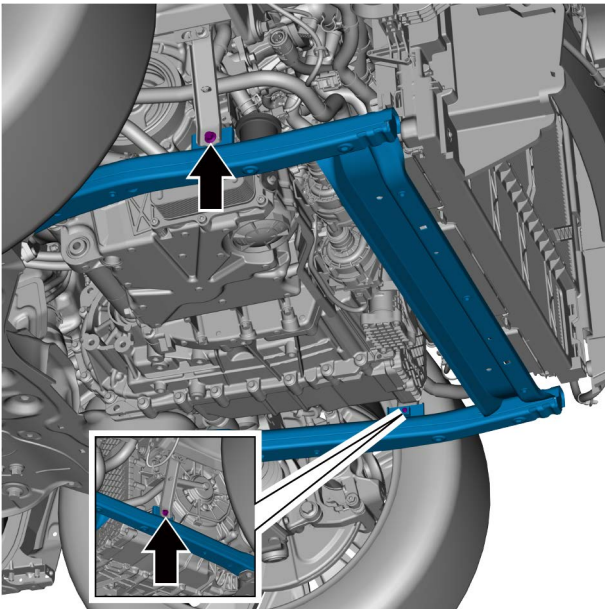


- 6 Remove the fixing bolts of the left and right sides of the front suspension lower U-beam to the subframe, and take down the front suspension lower U-beam.

Installation Procedure



- 1 Install the front suspension lower U-beam and tighten the fixing bolts on the left and right sides to the subframe.
Torque: 25 N·m + +140°

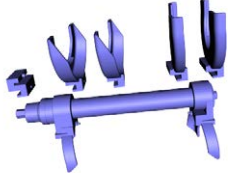
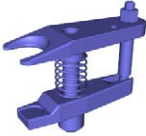


- 2 Install and tighten the fixing bolts on the left and right sides of the front suspension lower U-beam and the front suspension lower U-beam support beam.
Torque: 24N·m

- 3 Install the front bumper assembly.
- 4 Install the front wheel cover fender assembly on the left and right sides.
- 5 Install the bottom engine guard assembly.
- 6 lower the vehicle.

5.2.7 Specialized tools and equipment

5.2.7.1 Special tools

Serial No.:	Illustration	Tool No.	Name
1		4114720163	Shock absorber spring removal tool
2		4114720160	Ball Head Removal Tool

5.2.7.2 Equipment

Torque wrenches
Percentage gauges with magnetic holders
Tire pressure gauge
Alignment gauges

5.3 Rear suspension

5.3.1 Specification

5.3.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Fixing bolt connecting rear longitudinal arm mounting bracket and body	M10×35	50 N·m+60°
Fixing bolt connecting rear suspension longitudinal arm assembly and rear longitudinal arm mounting bracket	M14×85	140 N·m+60°
Fixing bolt connecting rear suspension arm assembly upper point and rear steering knuckle	M14×45	140 N·m+30°
Fixing bolt connecting rear suspension longitudinal arm assembly lower point and rear steering knuckle	M12×40	90 N·m+30°
Fixing bolt connecting rear subframe front beam bar assembly and rear subframe	M12×70	90 N·m+90°
Fixing bolt connecting rear subframe front beam rod assembly and rear steering knuckle	M12×75	95-125
Fixing bolt connecting rear upper cross arm assembly and rear subframe	M12×70	90 N·m+90°
Fixing bolt connecting rear upper cross arm assembly and rear steering knuckle	M12×75	95-125
Fixing nut connecting rear upper cross arm and steering knuckle	M12×15.3	95-125
Fixing bolt connecting Rear suspension lower arm assembly and rear subframe	M12×85	77-103
Fixing bolt connecting rear suspension lower arm assembly and rear steering knuckle	M12×70	90 N·m+90°
Fixing nut connecting rear stabilizer bar and rear subframe	M10×11.4	50-70
Fixing nut connecting rear stabilizer bar connecting rod and stabilizer bar	M12×13.8	85-115
Fixing bolt connecting rear stabilizer bar connecting rod and steering knuckle	M10×60	50-70
Fixing bolt connecting rear suspension arm assembly and rear shock absorber assembly	M12×70	90 N·m+90°

Fastener part	Model	Torque range (N·m)
Fixing bolt connecting rear shock absorber upper mounting bracket and body	M10×35	50 N·m+60°
Fixing bolt connecting rear wheel hub bearing to steering knuckle	M12×55	230-300
Fixing bolt connecting rear wheel hub bearing and rear drive shaft	M10×65	45 N·m+90°
Fixing bolt connecting rear caliper to steering knuckle	M12×50	95-125

5.3.2 Description and Operation

5.3.2.1 Instructions and operations

Rear suspension and front suspension together provide excellent stability, maneuverability and comfort of the car. Rear suspension has the main load-bearing and moving parts, which can withstand vertical and torsional forces, and enhance the anti-roll capacity of the rear suspension device and the anti-nodding capacity of the whole vehicle. The shock absorber accelerates the attenuation of vibration. Coil springs bear and transfer vertical loads to reduce the impact of the road surface.

The rear suspension of this model adopts multi-link independent suspension with lateral stabilizer bar, which mainly consists of the following components: rear longitudinal arm assembly, rear shock absorber assembly, rear suspension coil spring, rear subframe, rear suspension upper swing arm assembly, rear suspension lower swing arm assembly, rear stabilizer bar assembly, and rear subframe front beam bar assembly.

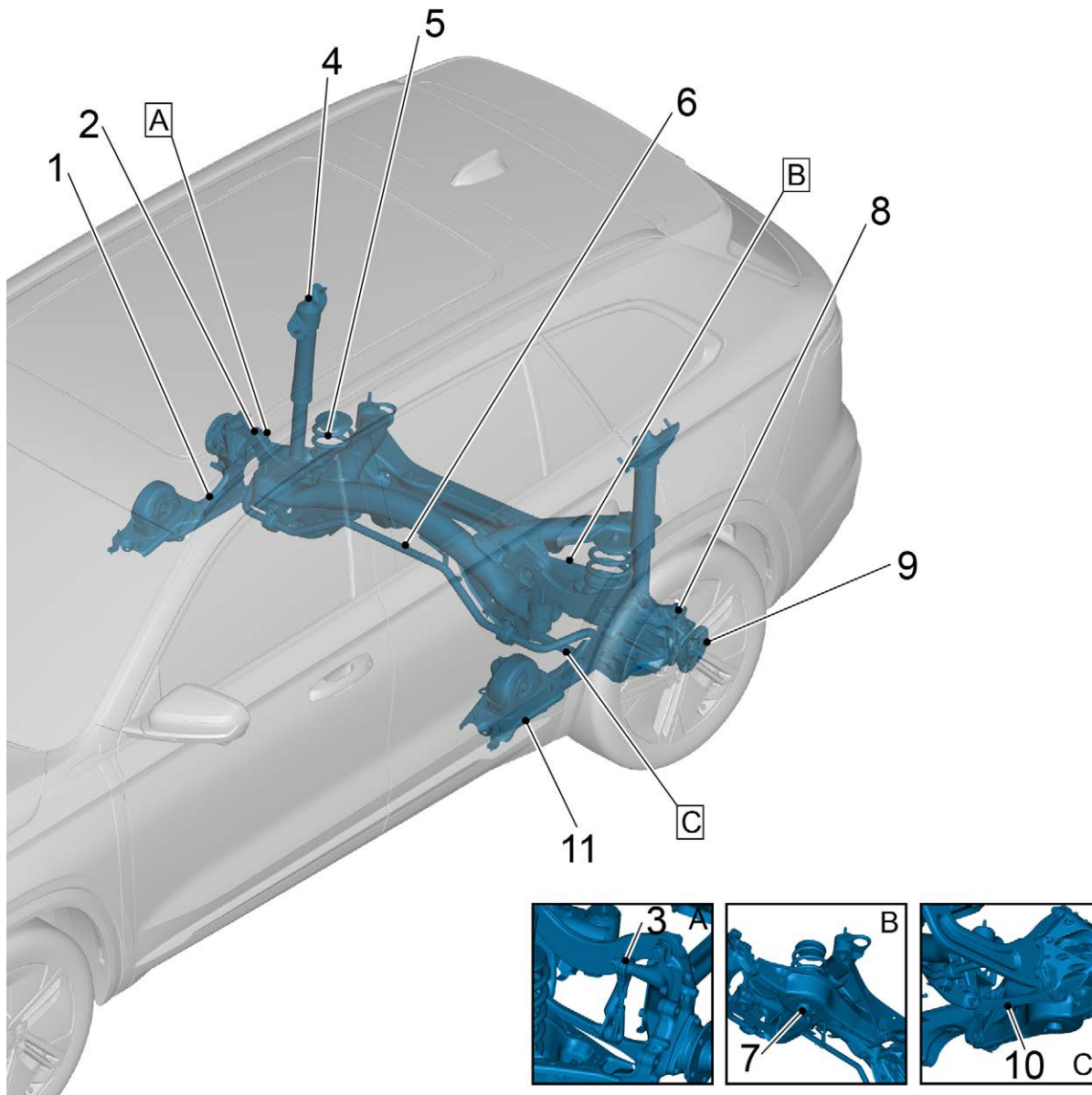
5.3.3 System working principles

5.3.3.1 System working principles

See [Operating principle of suspension system components](#).

5.3.4 Part position

5.3.4.1 Part position



- | | |
|---------------------------------------|--|
| 1. Rear Suspension Longitudinal Arms | 7. Rear Suspension Lower Arms |
| 2. Rear Suspension Upper Cross Arm | 8. Rear Suspension Steering Knuckle |
| 3. Rear stabilizer bar connecting rod | 9. Wheel hub with bearing |
| 4. Rear shock absorber | 10. Rear Subframe Front Beam Bars |
| 5. Rear Suspension Coil Spring | 11. Rear Suspension Longitudinal Arm Bracket |
| 6. Rear stabilizer bar | |

5.3.5 Diagnostic Information and Procedures

5.3.5.1 Diagnosis description

See [Description and Operation](#) and [Working Principle of System](#)s before diagnosing faults in the rear suspension. Understanding and familiarizing yourself with the operation principle of the rear suspension before beginning system diagnostics will help determine the correct troubleshooting steps to take in the event of a malfunction, and more importantly, this will help determine if the condition described by the customer is normal operation. Any troubleshooting of the rear suspension should start with a [Routine Inspection](#) that guides the mechanic to the next logical step in the troubleshooting process. Understanding and using the diagnostic process correctly will reduce diagnostic time and avoid misjudgment of the faulty area.

5.3.5.2 Routine inspection

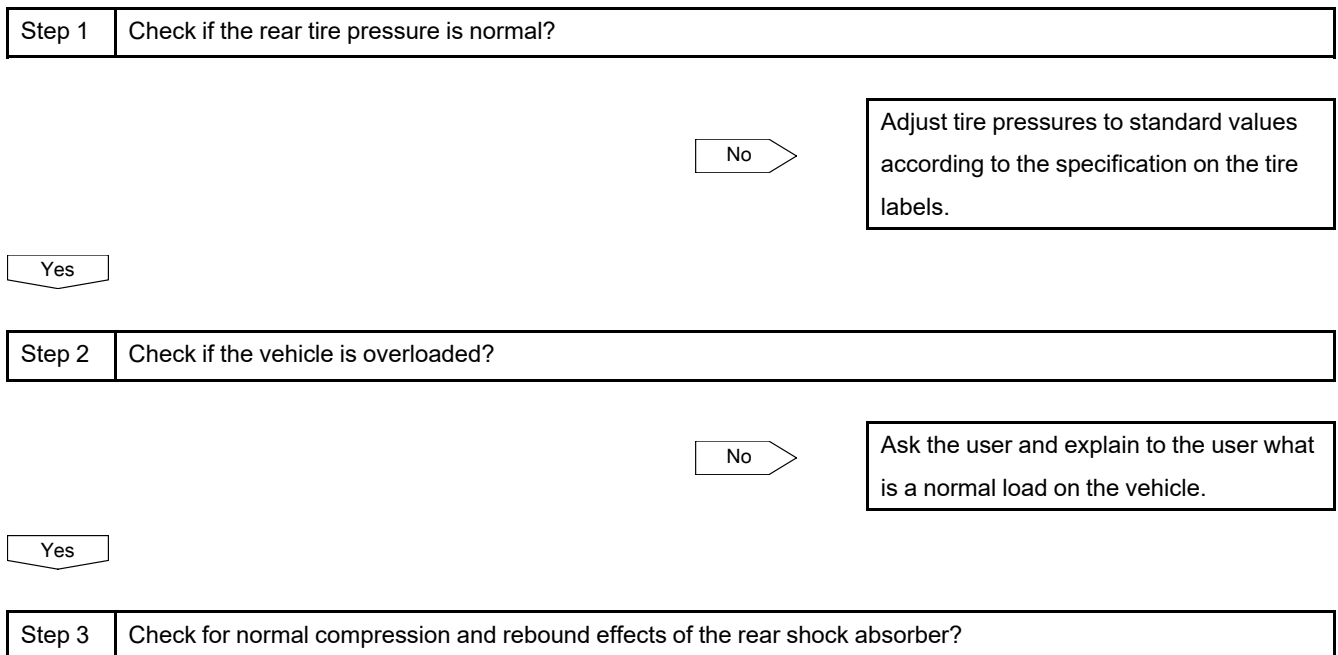
- Confirm trouble symptom

The most difficult situation in troubleshooting is when there are no symptoms, in which case the fault described by the user must be thoroughly analyzed. Then simulate the same or similar conditions and environments as the customer's vehicle when the malfunction occurs. Regardless of how experienced and skilled the maintenance personnel are, if troubleshooting is performed without confirming the symptoms of the malfunction, something important will be overlooked in the repair and a wrong guess will be made in some places. This will make troubleshooting impossible.

- Inspect easily accessible or visible system components for obvious damage or conditions that could cause a malfunction, and if so, repair or replace the component.
- Check the harness and harness connector to ensure that there is no sign of loosening, damage, poor contact, aging, etc.
- Connector joints and vibrating pivot points are the main areas that should be thoroughly checked, and the vibration method is recommended in cases where a malfunction may be caused by vibration.
 - Gently vibrate the sensor parts that may be faulty with your finger and check for malfunction.
 - Gently shake the connector in both vertical and horizontal directions.
 - Gently shake the harness in both vertical and horizontal directions.

5.3.5.3 Rear shock absorber inspection

Rear shock absorber too soft



- a. Quickly press and release the corner of the rear shock absorber bumper closest to the rear shock absorber being inspected to compare the compression and rebound effect with a normal comparable vehicle.

No

Replace the rear shock absorber, see [Replacement of Rear Shock Absorber Assembly](#).

Yes

Step 4 The system is normal.

Rear shock absorber is noisy

Step 1 Check whether the installation of the rear shock absorber is normal, and check whether the parts of the rear shock absorber work normally? (There must not be any abnormalities such as looseness).

No

Replace the rear shock absorber, see [Replacement of Rear Shock Absorber Assembly](#).

Yes

Step 2 Check for normal compression and rebound effects of the rear shock absorber?

- a. Quickly press and release the corner of the rear shock absorber bumper closest to the rear shock absorber being inspected to compare the compression and rebound effect with a normal comparable vehicle.

No

Replace the rear shock absorber, see [Replacement of Rear Shock Absorber Assembly](#).

Yes

Step 3 System is normal

Rear shock absorber oil leakage

Step 1 Check whether the installation of the rear shock absorber is normal, and check whether the parts of the rear shock absorber work normally? (There must not be any abnormalities such as looseness).

Next Step

Step 2	Check the sealing of the rear shock absorber when it is fully extended, and whether the dust cover is broken or not.
--------	--

Yes

Replace the rear shock absorber, see Replacement of Rear Shock Absorber Assembly .
--

No

Step 3	Check for excessive fluid on the rear shock absorber?
--------	---

Yes

Replace the rear shock absorber, see Replacement of Rear Shock Absorber Assembly .
--

No

Step 4	The system is normal.
--------	-----------------------

5.3.5.4 Excessive Friction Check

Check for excessive rear suspension friction by following the procedure below:

Step 1	Raise the rear bumper to elevate the vehicle as high as possible.
--------	---

Next Step

Step 2	Slowly lower the bumper and allow the vehicle to return to its normal cocking height.
--------	---

Next Step

Step 3	Measure the distance from the ground to the center of the bumper.
--------	---

Next Step

Step 4	Press down on the bumper and then slowly release it to allow the vehicle to return to its normal cocking height.
--------	--

Next Step

Step 5	Measure the distance from the ground to the center of the bumper.
--------	---

Next Step

Step 6	The difference between the two measurements should be <12.7 mm (0.5 in), if the distance exceeds this limit, check the coil spring, rear shock absorber, rubber bushings, and rear suspension assembly for damage or wear.
--------	--

5.3.5.5 Ride smoothness diagnosis (too soft or too hard)

Too soft

Step 1	Check the rear shock absorber assembly for wear and replace the rear shock absorber assembly if necessary.
--------	--

Next Step

Step 2	Check the rear suspension coil spring for breakage or slackness, replace the rear suspension coil spring if necessary.
--------	--

Too hard

Step 1	Check that the rear shock absorber assembly is correctly installed and that the rear shock absorber assembly does not match the model, replace the rear shock absorber assembler if necessary.
--------	--

Next Step

Step 2	Check the rear suspension coil springs for correctness and replace them if necessary.
--------	---

5.3.5.6 Body leaning or swaying while turning

Step 1	Inspect the rear shock absorber assembly and rear suspension bolt spring seats for wear, replace the rear shock absorber assembly if necessary, and retighten the fixing nuts on the rear shock absorber assembly.
--------	--

Next Step

Step 2	Check for overloading of the vehicle and provide a reasonable explanation to the user.
--------	--

Next Step

Step 3	Check if the rear suspension coil spring is broken or loose, and replace it if necessary.
--------	---

5.3.5.7 Noise Diagnosis

Step 1	Check the rear suspension components for wear?
--------	--

Yes

Replace damaged rear suspension components.

No

Step 2	Check if the rear stabilizer bar is loose?
--------	--

Yes

Tighten the rear stabilizer bar fixing nut.

No

Step 3	Check that the rear shock absorber assembly and rear coil spring washers are intact, installed in place, and that there is no damage, etc.?
--------	---

Yes

Replace damaged parts.

No

Step 4	Check if the rear suspension coil spring installation is misaligned?
--------	--

Yes

Reinstall the rear suspension coil spring.

No

Step 5	Find a vehicle of the same model and make a comprehensive assessment of whether the noise is a normal operating noise.
--------	--

Yes

Replace damaged parts.

No

Step 6	Tie parts are normal.
--------	-----------------------

5.3.5.8 Abnormal tail height

Step 1	Check if the rear suspension coil spring is broken or loose, and replace it if necessary.
--------	---

Next Step

Step 2	Check if the vehicle is overloaded and explain the hazards of overloading the vehicle to the user if necessary.
--------	---

Next Step

Step 3	Check the rear suspension coil springs for incorrect or excessive softness, replace with Genuine Geely coil springs.
--------	--

5.3.6 Removal and Installation

5.3.6.1 Replacement of Left Rear Shock Absorber

Removal Procedure

Caution

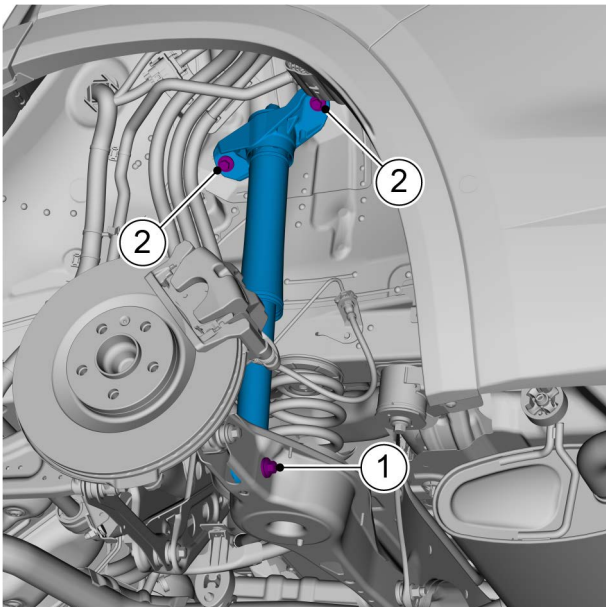
The left and right rear shock absorber assemblies are disassembled and assembled in a similar manner.

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove wheel, see [Replacement of Wheel Assembly](#).
- 3 Remove the rear left wheel cover fender assembly, see [Replacement of Rear Left Wheel Cover Fender Assembly](#).
- 4 Remove the rear left suspension guard, see [Replacement of Rear Left Suspension Guard](#).
- 5 Use a jack to support the rear lower swing arm.

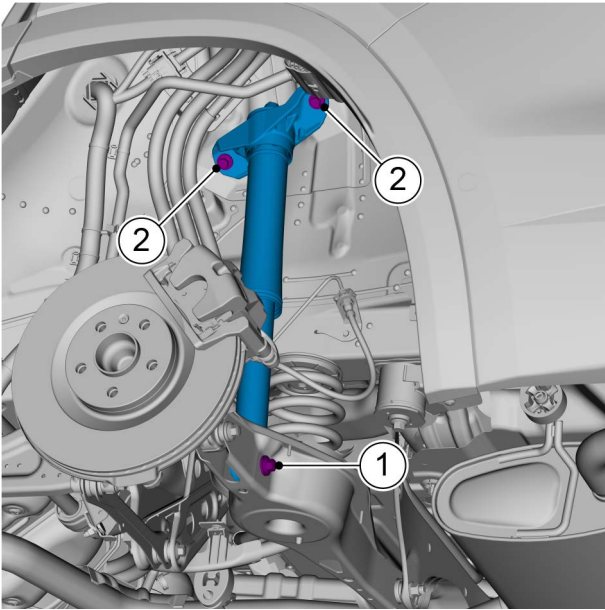
Caution

Use a jack to hold the rear lower swing arm slightly upward before removing the rear shock absorber assembly.

- 6 Remove and discard the fixing bolt 1 that connects the left rear suspension lower swing arm assembly to the rear shock absorber.
- 7 Remove and discard the 2 fixing bolts 2 that connect the top of the left rear shock absorber to the body.
- 8 Remove the left rear shock absorber.



Installation Procedure



- 1 Install and tighten the 2 fixing bolts 2 at the top of the new left rear shock absorber attached to the body.
Torque: 50 N·m + +60°
- 2 Install and tighten the fixing bolt 1 that connects the new left rear shock absorber to the rear suspension lower swing arm assembly.
Torque: 140N·m

- 3 Install the rear left wheel cover fender assembly.
- 4 Install the rear left suspension guard.
- 5 Install the wheel.
- 6 lower the vehicle.

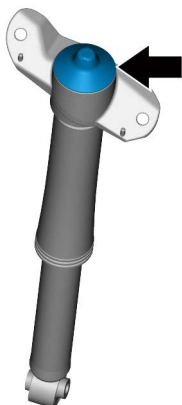
5.3.6.2 Disassembly of the left rear shock absorber

Removal Procedure

Caution

The left and right rear shock absorbers are removed in a similar manner.

- 1 To disassemble the rear shock absorber assembly, see Replacement of [Rear Shock Absorber Assembly](#).
- 2 Remove the left rear shock absorber upper support cover.

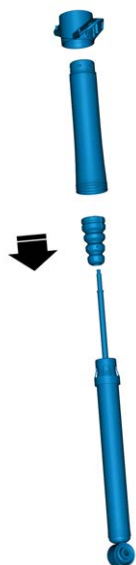


- 3 Remove and discard the lock nuts.



- 4 Remove the left rear shock absorber upper support assembly, left rear shock absorber buffer block and left rear shock absorber dust cover in turn.
- 5 Remove the left rear shock absorber.

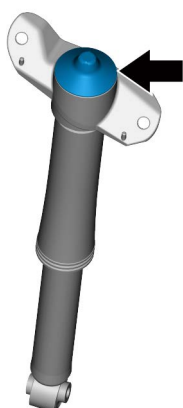
Installation Procedure



- 1 Install the left rear shock absorber dust cover, left rear shock absorber buffer block, and left rear shock absorber upper support assembly in sequence.



- 2 Install and tighten the new left rear shock absorber lock nut.
Torque: 25N·m



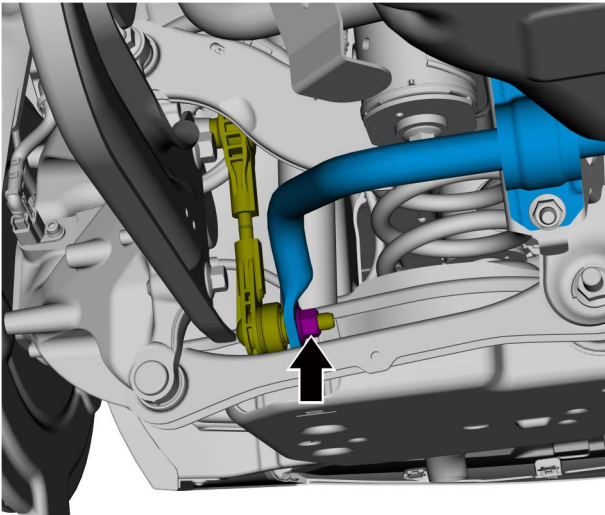
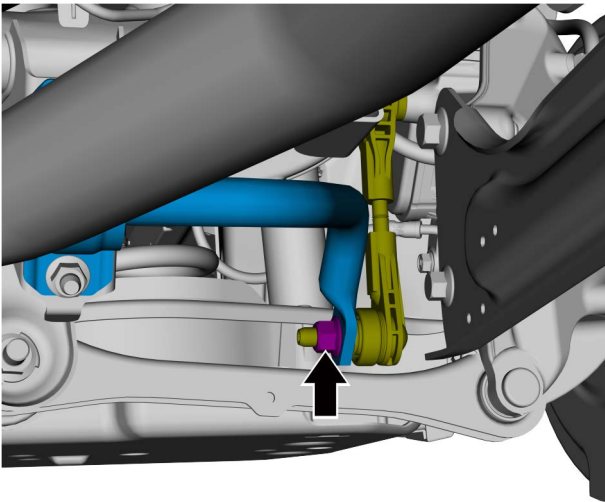
- 3 Install the cover of the upper support of the left rear shock absorber.

- 4 Install the left rear shock absorber.
- 5 Install the wheel.
- 6 Lower the vehicle.

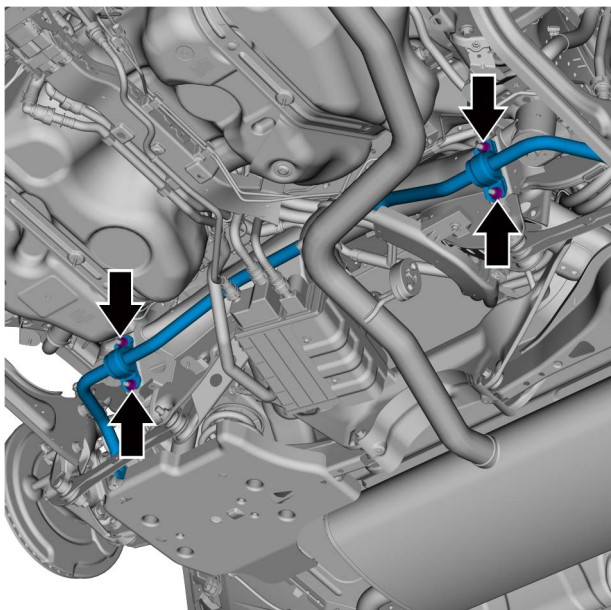
5.3.6.3 Replacement of Rear Suspension Stabilizer Bar

Removal Procedure

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the right side bottom guard of the fuel tank, see [Replacement of Fuel Tank Right Side Lower Guard](#).
- 3 Remove 1 fixing nut of the left rear stabilizer bar connecting rod and disengage the left rear stabilizer bar connecting rod.

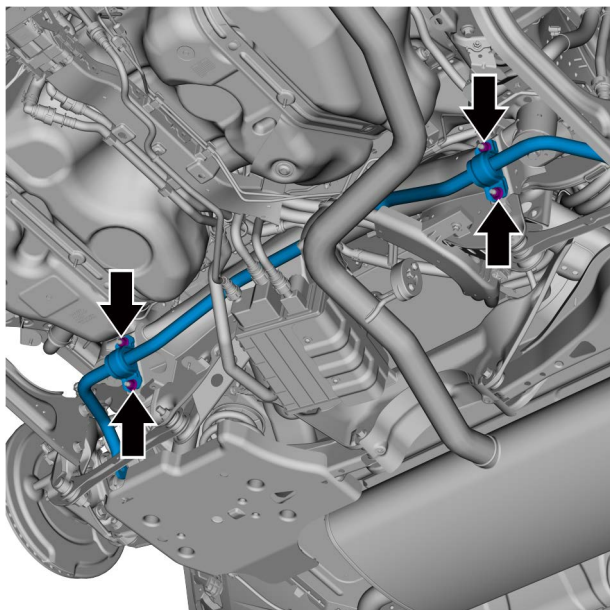


- 4 Disengage the right rear stabilizer bar connecting rod by removing 1 fixing nut on the right rear stabilizer bar connecting rod.



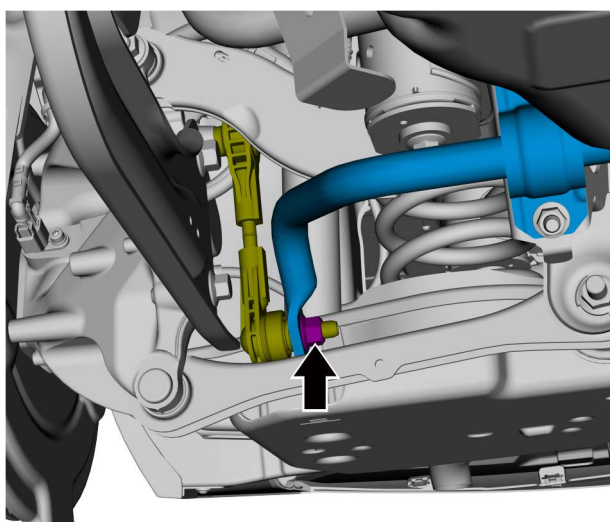
- 5 Remove and discard the 4 fixing nuts for the rear suspension stabilizer bar connected to the rear subframe.
- 6 Remove the rear suspension stabilizer bar assembly.

Installation Procedure



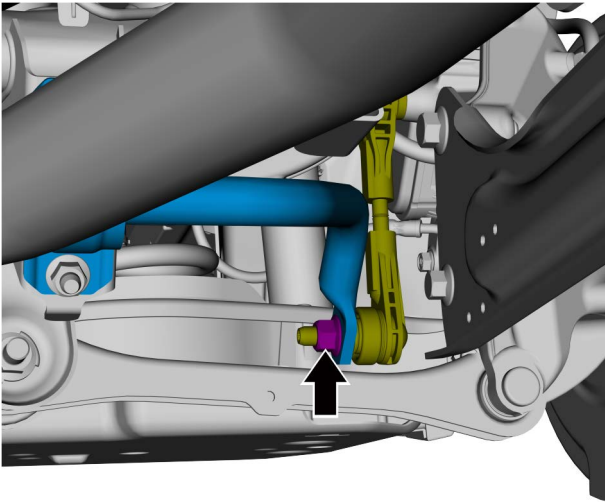
- 1 Install the rear suspension stabilizer bar and install and tighten 4 new retaining nuts.

Torque: 60N·m



- 2 Install the right rear stabilizer bar connecting rod and tighten 1 fixing nut.

Torque: 100N·m



- 3 Install the left rear stabilizer bar connecting rod and tighten 1 fixing nut.
Torque: 100N·m

- 4 Install the fuel tank right side lower guard.
- 5 lower the vehicle.

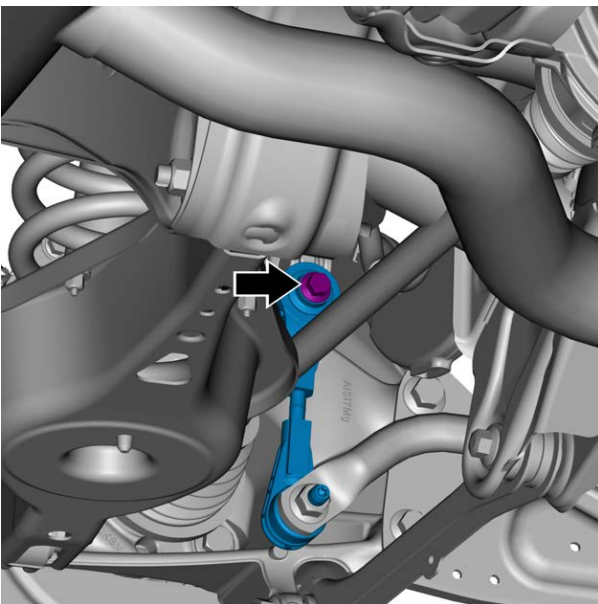
5.3.6.4 Replacement of left rear stabilizer bar connecting rod

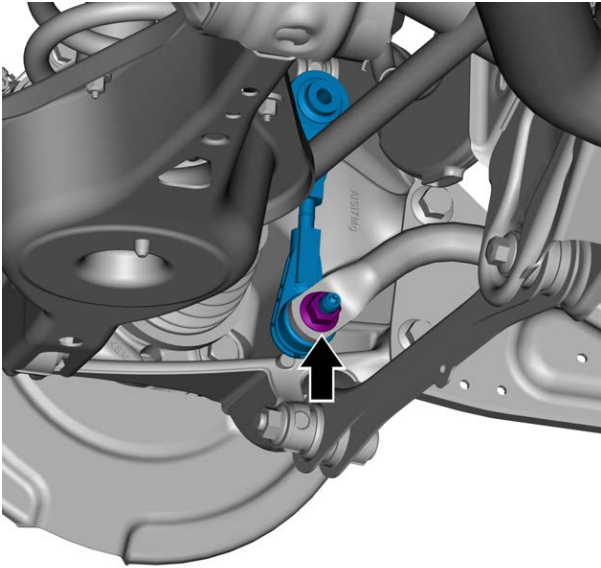
Removal Procedure

Caution

Remove and install the left and right rear stabilizer bar connecting rods in a similar manner.

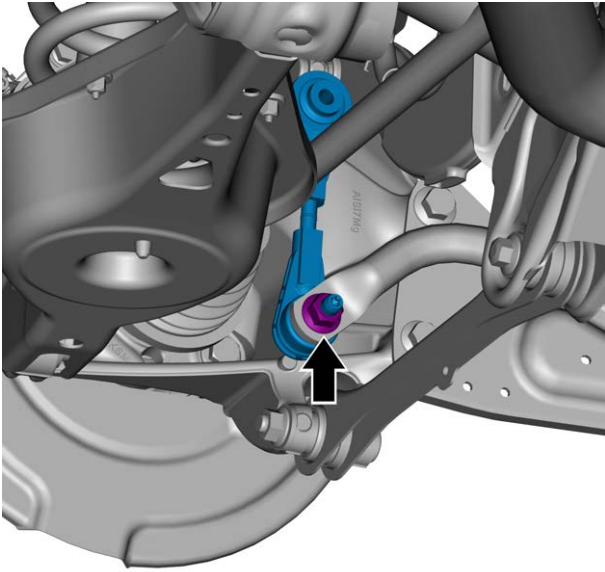
- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the rear left suspension guard, see [Replacement of Rear Left Suspension Guard](#).
- 3 Remove and discard the 1 fixing bolt that connects the rear stabilizer bar connecting rod to the left rear steering knuckle assembly.



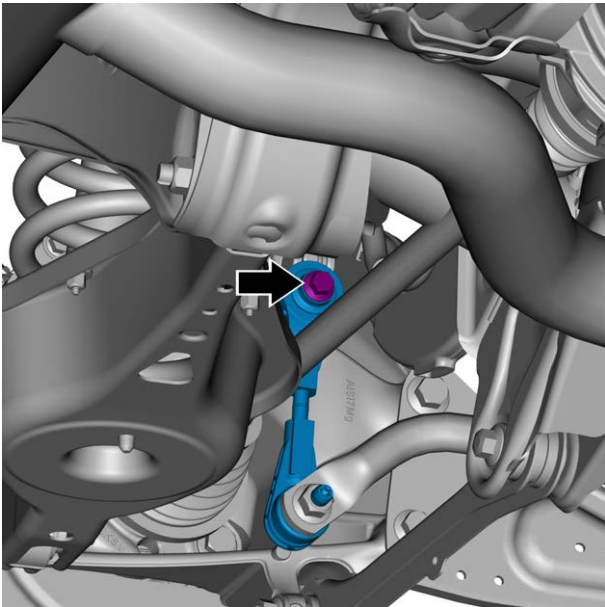


- 4 Remove and discard 1 fixing nut of the rear stabilizer bar connecting rod to the rear suspension stabilizer bar.
- 5 Remove the stabilizer bar connecting rod.

Installation Procedure



- 1 Install the stabilizer bar connecting rod and install and tighten 1 new fixing nut.
Torque: 100N·m



- 2 Install and tighten the new fixing bolt for the rear stabilizer bar connecting rod to the left rear knuckle assembly.
Torque: 60N·m

- 3 Install the rear left suspension guard.
- 4 lower the vehicle.

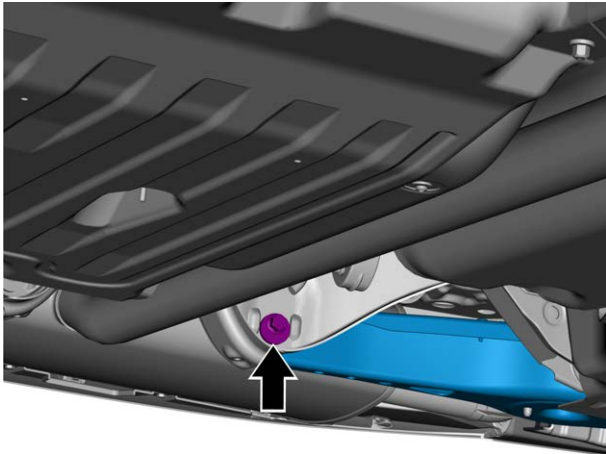
5.3.6.5 Replacement of Left Rear Suspension Lower Arm Assembly

Removal Procedure

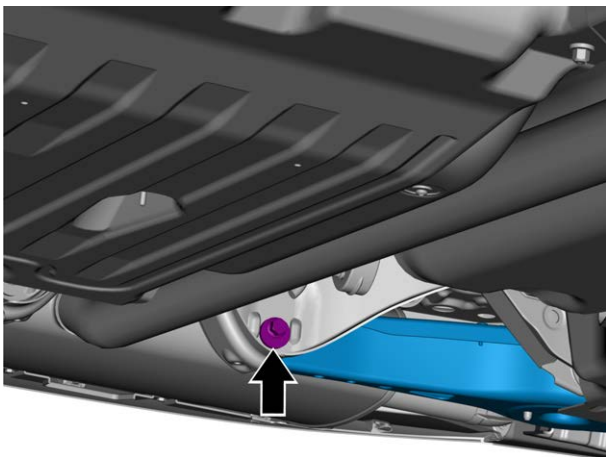
Caution

Remove and install the left and right rear suspension lower swing arm assemblies in a similar manner.

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove wheel, see [Replacement of Wheel Assembly](#).
- 3 Remove the rear left suspension guard, see [Replacement of Rear Left Suspension Guard](#).



- 4 Remove the left rear suspension coil spring, see [Replacement of Rear Suspension Coil Spring](#).
- 5 Remove and discard the fixing bolt that connects the left rear suspension lower swing arm assembly to the rear subframe, and remove the left rear suspension lower swing arm assembly.



Installation Procedure

- 1 Install the left rear suspension lower swing arm assembly, install and tighten the new fixing bolt.
Torque: 90N·m

- 2 Install the left rear suspension coil spring.
- 3 Install the rear left suspension guard.
- 4 Install the wheel.
- 5 lower the vehicle.
- 6 Perform a vehicle four-wheel alignment.

5.3.6.6 Replacement of Left Rear Steering Knuckle Assembly

Removal Procedure

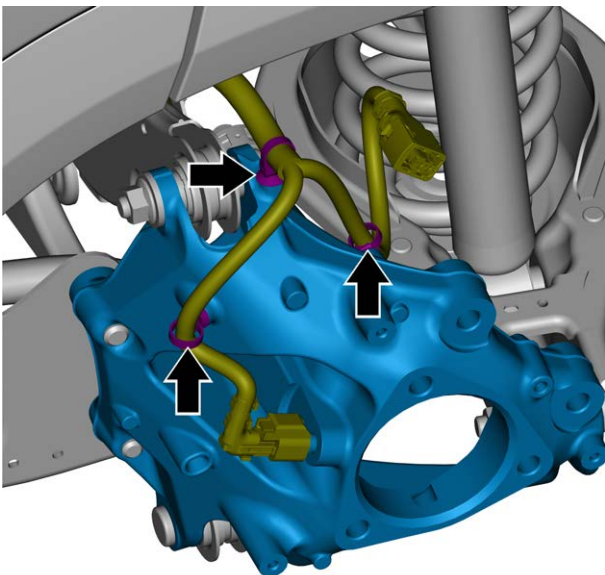
Caution

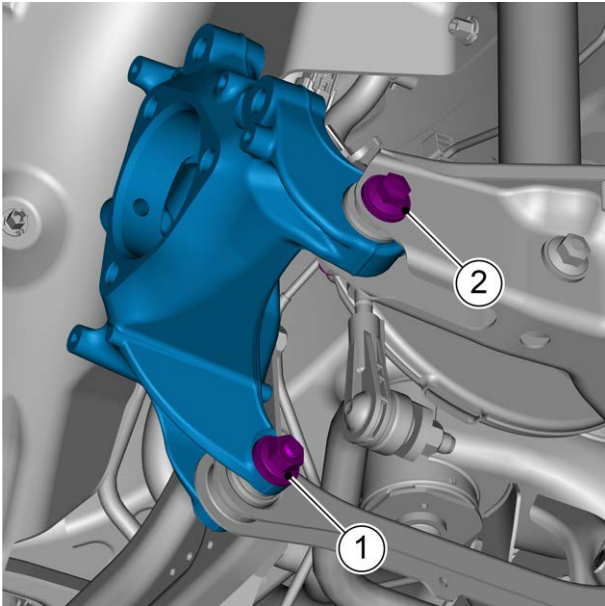
The left and right rear steering knuckle assemblies are removed and installed in a similar manner.

Caution

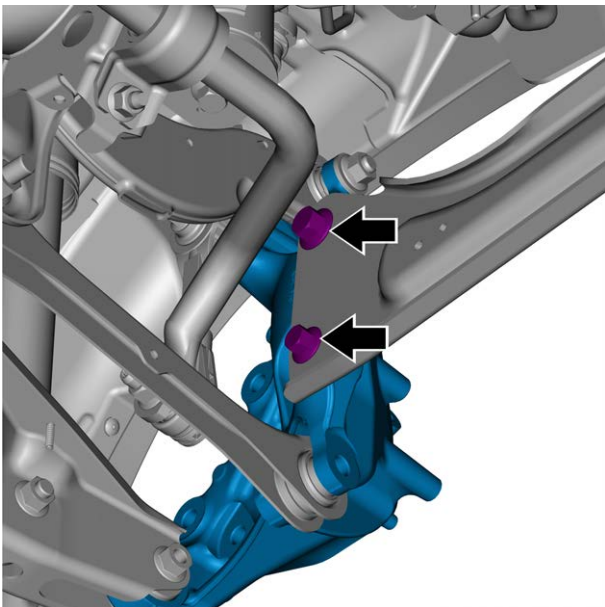
When removing the splined bolts connecting the rear steering knuckle to the upper cross arm assembly and the front beam bar assembly without special tools, operate carefully when striking the splined bolts with a hammer or the like to prevent damage to the rear steering knuckle or reaming problems.

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove wheel, see [Replacement of Wheel Assembly](#).
- 3 Remove the rear left suspension guard, see [Replacement of Rear Left Suspension Guard](#).
- 4 Remove the left rear caliper body with EPB assembly, see [Replacement of Left Rear Caliper Body with EPB Assembly](#).
- 5 Remove the left rear brake disk, see [Replacement of Left Rear Brake Disc](#).
- 6 Remove the left rear wheel brake guard, see [Replacement of the left rear wheel brake guard](#).
- 7 Remove wheel speed sensor (left rear), see [Replacement of wheel speed sensor \(left rear\)](#).
- 8 Remove the left rear wheel hub bearing assembly, see [Replacement of Left Rear Wheel Hub Bearing Assembly](#).
- 9 Remove the left rear stabilizer bar connecting rod, see [Replacement of Left Rear Stabilizer Bar Connecting Rod](#).
- 10 Disengage the wiring harness retaining clip.

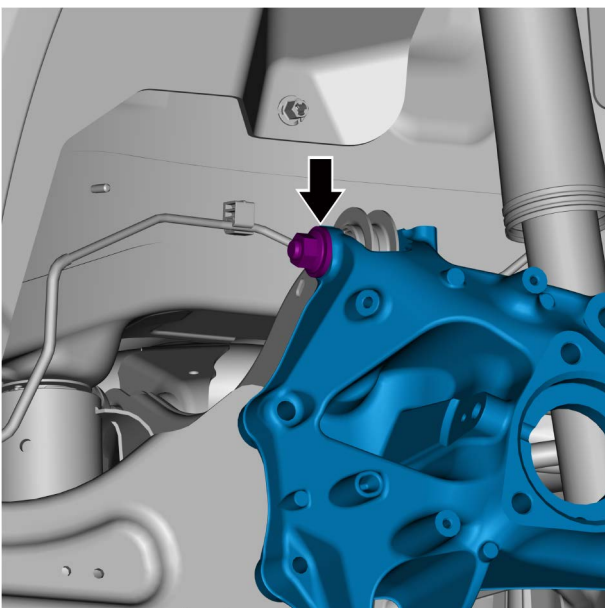




- 11 Remove and discard the fixing bolt 1 that connects the left rear subframe front beam rod assembly to the steering knuckle.
- 12 Remove and discard fixing bolt 2 of the left rear suspension lower swing arm assembly attached to the left rear steering knuckle assembly.

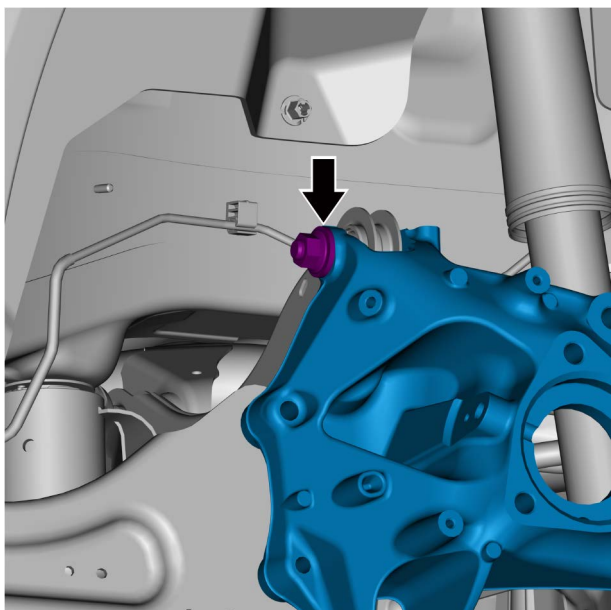


- 13 Remove and discard the fixing bolt that connects the left rear suspension longitudinal arm assembly to the left rear steering knuckle assembly.



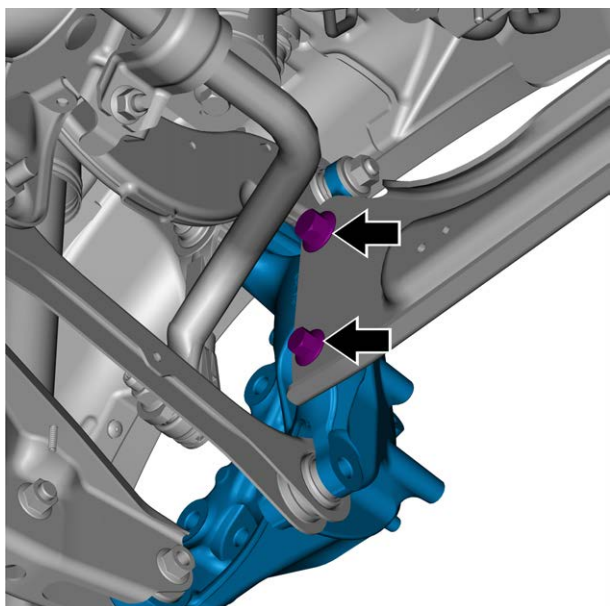
- 14 Remove and discard the fixing bolt that connects the left rear upper cross arm assembly to the steering knuckle and remove the left rear steering knuckle assembly.

Installation Procedure



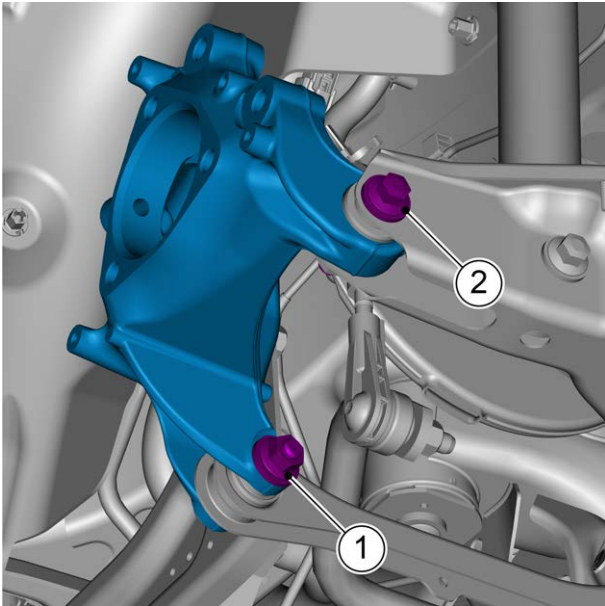
- 1 Install the left rear upper cross arm assembly to the steering knuckle connection, install and tighten the new fixing bolt.

Torque: 110N·m

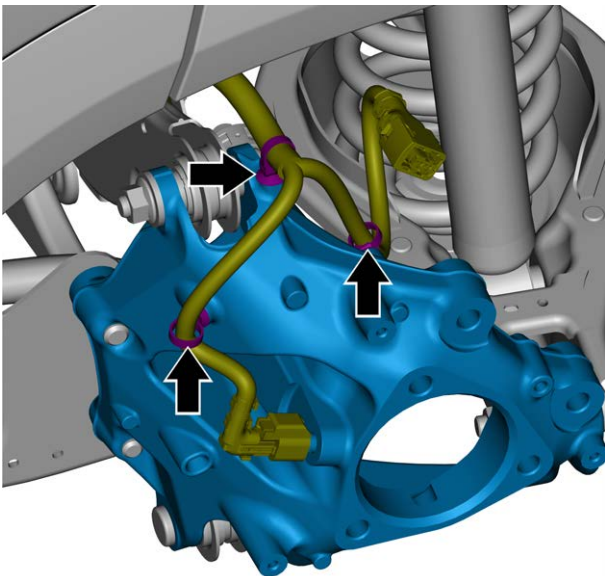


- 2 Install and tighten the fixing bolts connecting the new left rear suspension longitudinal arm assembly to the left rear steering knuckle assembly.

Torque: 90 N·m + +30°



- 3 Install the left rear subframe front beam bar assembly to connect with the left rear steering knuckle assembly, and install and tighten the new fixing bolt 1.
Torque: 110N·m
- 4 Install the left rear suspension lower swing arm assembly to connect to the left rear steering knuckle assembly, install and tighten the new fixing bolt 2
Torque: 90N·m



- 5 Install the wiring harness retaining clip.

- 6 Install the left rear stabilizer bar connecting rod
- 7 Install the left rear hub bearing assembly.
- 8 Install wheel speed sensor (left rear).
- 9 Install the left rear brake guard.
- 10 Install the left rear brake disk.
- 11 Install the left rear brake caliper body with EPB assembly.
- 12 Install the rear left suspension guard.
- 13 Install the wheel.
- 14 lower the vehicle.
- 15 Perform a vehicle four-wheel alignment.

5.3.6.7 Replacement of Left Rear Hub Bearing Assembly

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#).

Caution

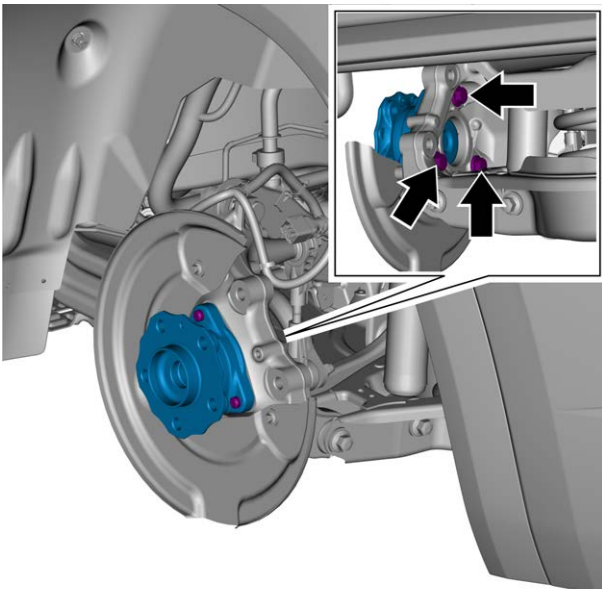
Remove the left and right rear hub bearings in a similar manner.

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 3 Remove wheel, see [Replacement of Wheel Assembly](#).
- 4 Remove the left rear caliper body with EPB assembly, see [Replacement of Left Rear Caliper Body with EPB Assembly](#).

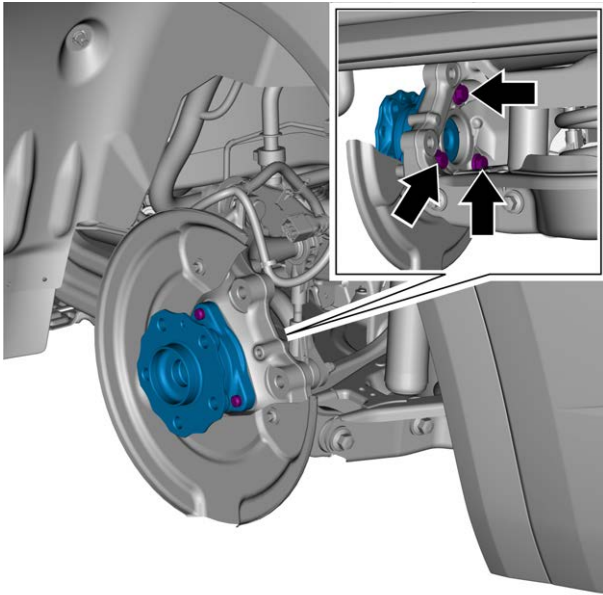
Caution

To remove the caliper, it is not necessary to remove the caliper brake hose. The caliper should be suspended by a piece of wire to avoid damage to the brake hose.

- 5 Remove the left rear brake disk. See [Replacement of Left Rear Brake Disc](#).
- 6 Remove the rear left suspension guard, see [Replacement of Rear Left Suspension Guard](#).
- 7 Remove and discard the 3 fixing bolts connecting the left rear wheel hub bearing to the steering knuckle.
- 8 Remove the rear left wheel hub bearing.



Installation Procedure



- 1 Install the left rear wheel hub bearing.
- 2 Install and tighten the 3 fixing bolts that connect the new left rear wheel bearing to the left rear steering knuckle assembly.

Torque: 90 N·m + 90°

- 3 Install the rear left suspension guard.
- 4 Install the left rear brake disk.
- 5 Install the left rear brake caliper body with EPB assembly.
- 6 Install the wheel.
- 7 lower the vehicle.
- 8 Connect the negative cable of battery.

5.3.6.8 Replacement of the left rear subframe front beam bar assembly

Removal Procedure

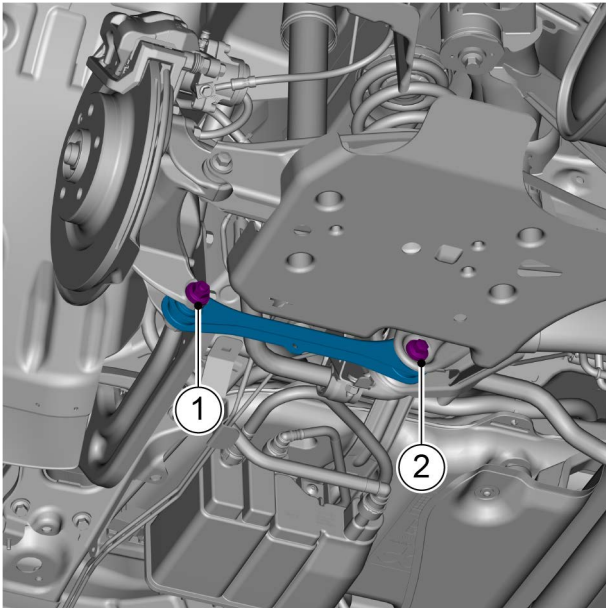
Caution

Remove and install the left and right rear subframe front beam bar assemblies in a similar manner.

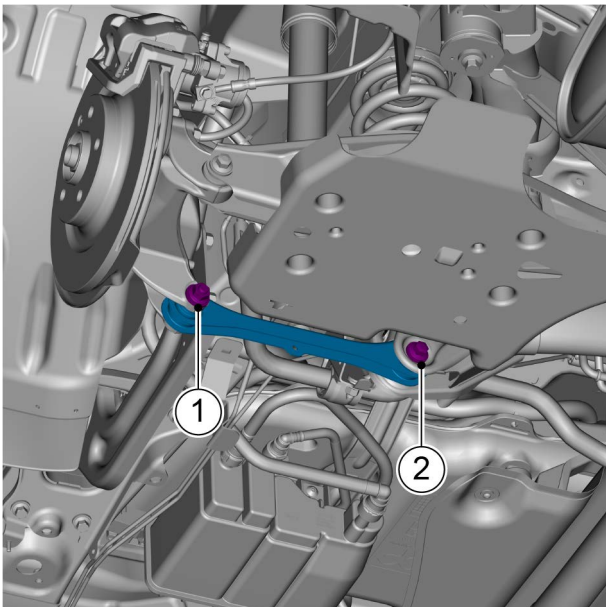
Caution

When removing the splined bolts of the rear steering knuckle to the front beam bar assembly without a special tool, be cautious when striking the splined bolts with a hammer or the like to prevent damage to the rear steering knuckle or reaming problems.

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).



- 2 Remove and discard the fixing bolt 1 that connects the left rear subframe front beam rod assembly to the steering knuckle.
- 3 Remove and discard the fixing bolt 2 securing the left rear subframe front beam bar assembly to the subframe.
- 4 Remove the left rear subframe front beam rod assembly.



Installation Procedure

- 1 Place the left rear subframe front beam bar assembly in the mounting position and pre-tighten the new fixing bolts 1 and 2.
- 2 Tighten fixing bolt 1 and fixing bolt 2.
Bolt 1 torque: 110 N·m
Torque of bolt 2: 90 N·m+90°

- 3 lower the vehicle.

5.3.6.9 Replacement of Left Rear Upper Cross Arm Assembly

Removal Procedure

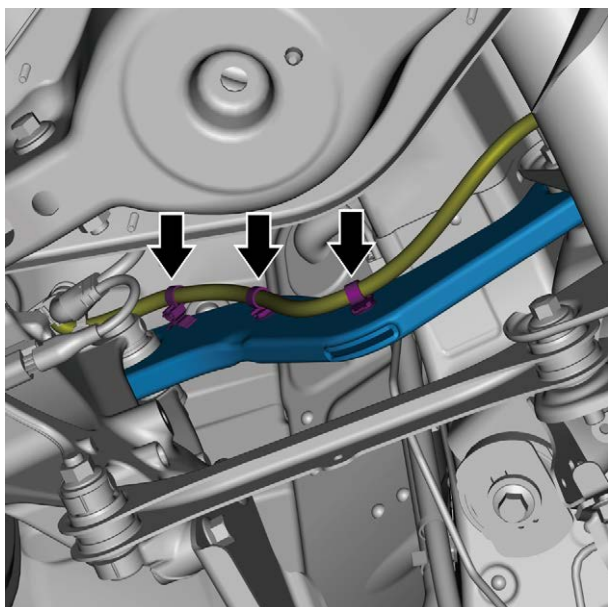
Caution

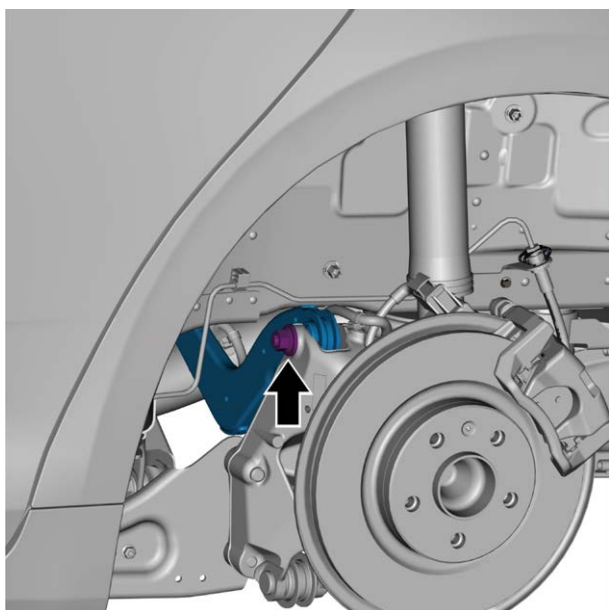
Remove and install the left and right rear upper cross arm assemblies in a similar manner.

Caution

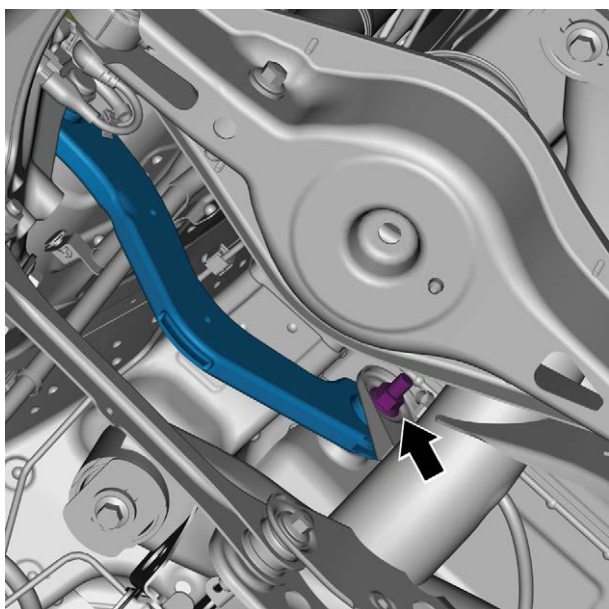
When removing the splined bolts of the rear steering knuckle to the upper cross arm assembly without a special tool, be cautious when striking the splined bolts with a hammer, etc. to prevent damage to the rear steering knuckle or reaming problems.

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove wheel, see [Replacement of Wheel Assembly](#).
- 3 Disengage the wheel speed sensor (left rear) harness retaining clips from the left rear upper cross arm.



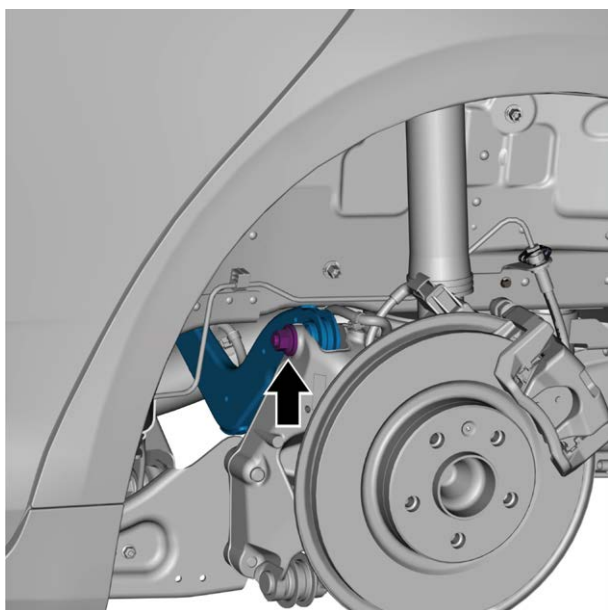


- 4 Remove and discard the fixing bolts connecting the left rear upper cross arm to the rear steering knuckle.



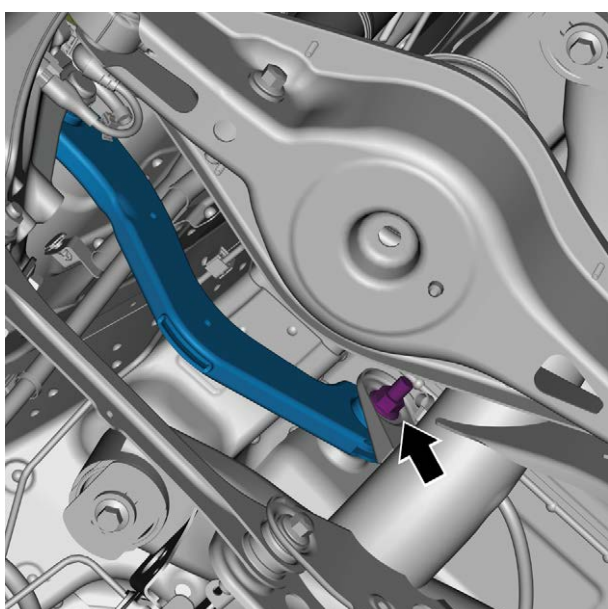
- 5 Remove and discard the fixing bolt that connects the left rear upper cross arm to the rear subframe and remove the left rear upper cross arm assembly.

Installation Procedure



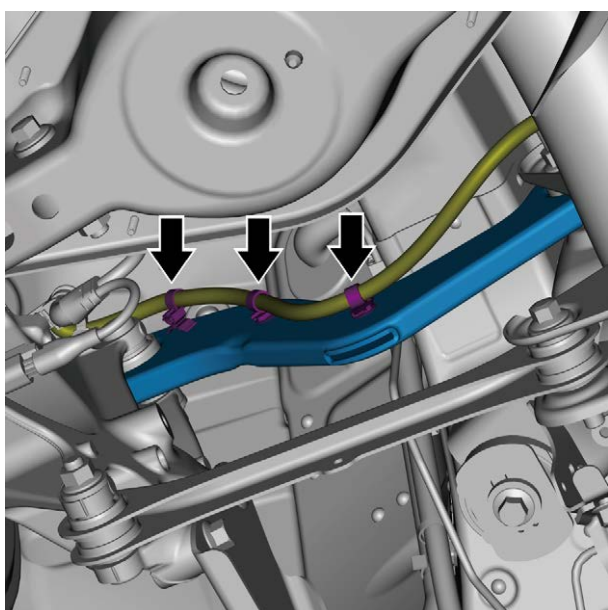
- 1 Place the left rear upper cross arm assembly in the mounting position and tighten the new fixing bolt that connects to the rear steering knuckle.

Torque: 110N·m



- 2 Tighten the new fixing bolts connecting the left rear upper cross arm assembly to the rear subframe.

Torque: 90N·m+90°



- 3 Secure the wheel speed sensor (left rear) harness retaining clip to the left rear upper cross arm assembly.

- 4 Install the wheel.
- 5 lower the vehicle.
- 6 Perform a vehicle four-wheel alignment.

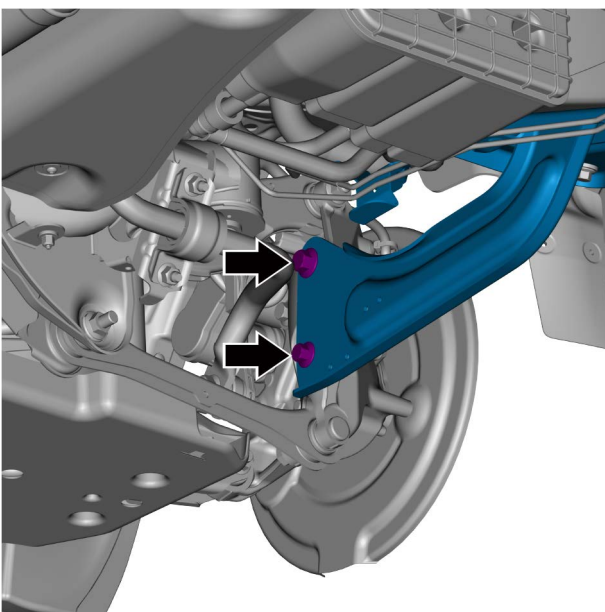
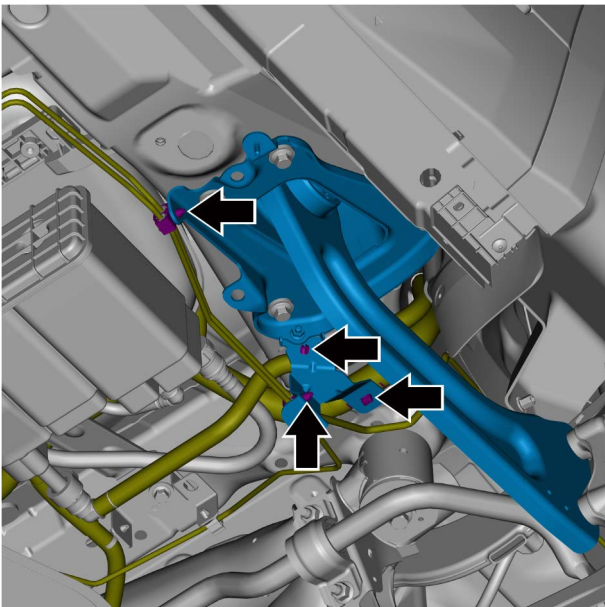
5.3.6.10 Replacement of Left Rear Suspension Longitudinal Arm Assembly

Removal Procedure

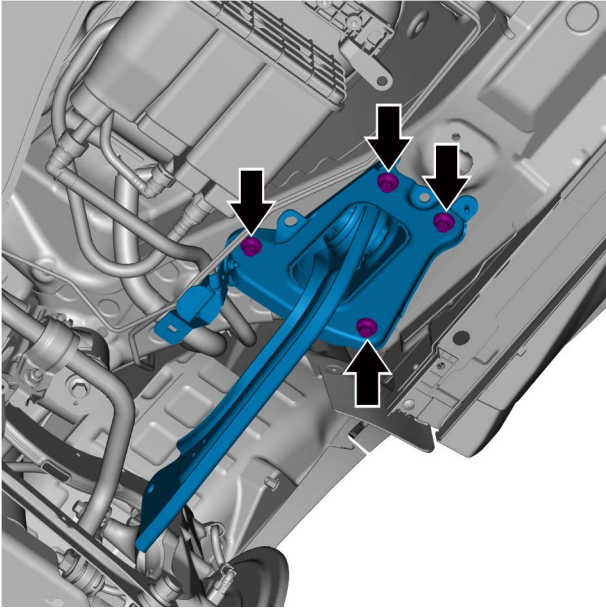
Caution

Remove and install the left and right rear suspension longitudinal arm assemblies in a similar manner.

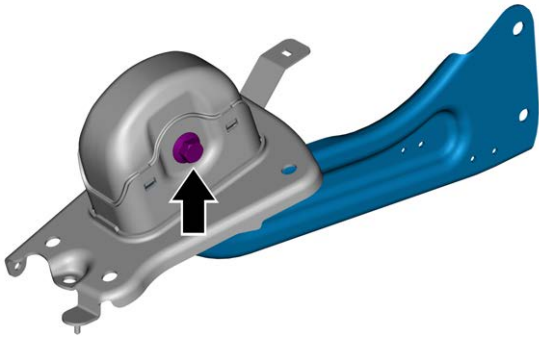
- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove wheel, see [Replacement of Wheel Assembly](#).
- 3 Disengage the clips securing the brake line and securing the wiring harness from the bracket.



- 4 Remove and discard the 2 fixing bolts connecting the left rear suspension longitudinal arm assembly to the left rear steering knuckle assembly.



- 5 Remove and discard the four fixing bolts that attach the left rear suspension longitudinal arm assembly to the vehicle body, and remove the left rear suspension longitudinal arm assembly.

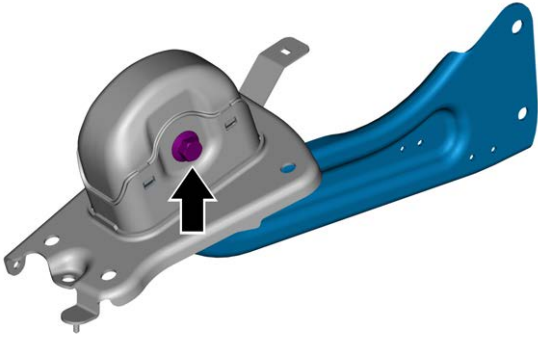


- 6 Remove and discard the fixing bolts connecting the left rear suspension longitudinal arm assembly to the left rear longitudinal arm mounting bracket, and remove the left rear suspension longitudinal arm assembly.

Installation Procedure

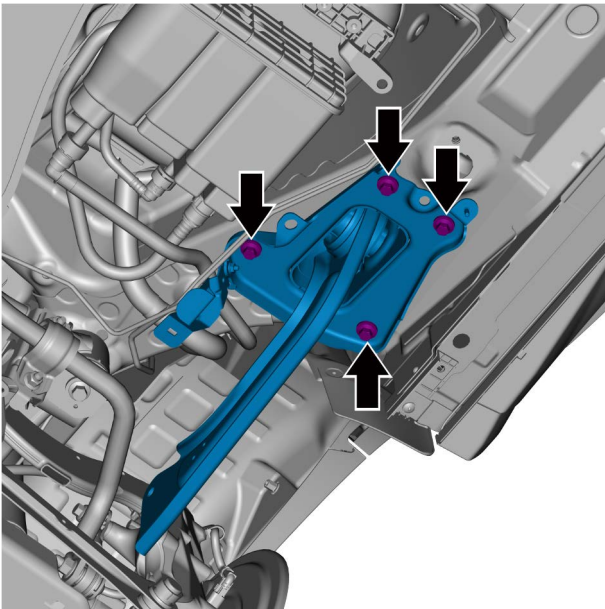
- 1 Place the left rear longitudinal arm assembly inside the left rear longitudinal arm mounting bracket and tighten the new fixing bolts.

Torque: 140 N·m + +60°



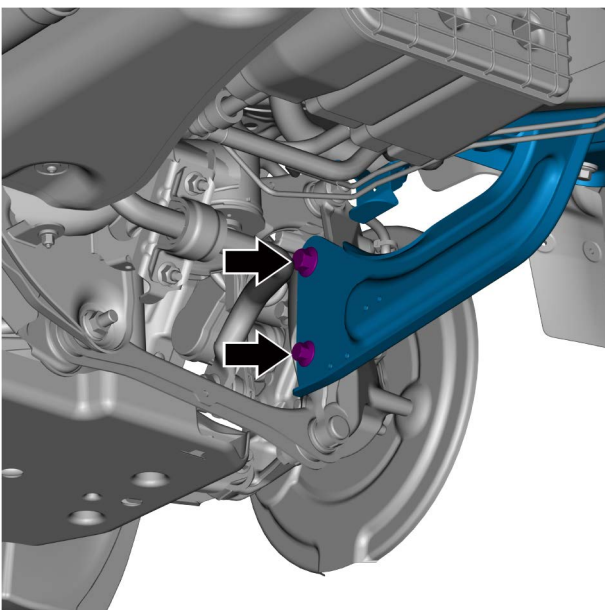
- 2 Install the left rear suspension longitudinal arm assembly and tighten the 4 new fixing bolts attached to the body.

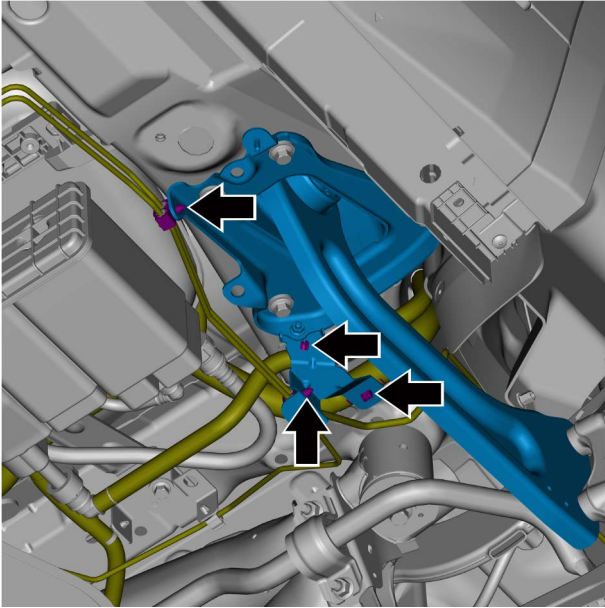
Torque: 50 N·m + +60°



- 3 Tighten the 2 new fixing bolts connecting the left rear suspension longitudinal arm assembly to the left rear steering knuckle assembly.

Torque: 90 N·m + +30°





- 4 Install the clips securing the brake lines and securing the wiring harness to the bracket.

- 5 Install the wheel.
- 6 lower the vehicle.

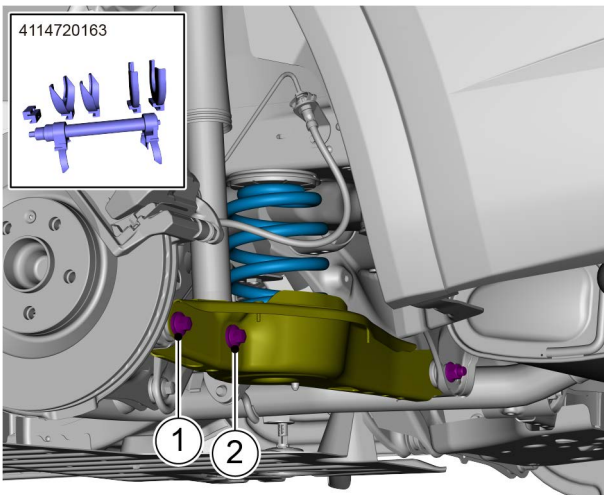
5.3.6.11 Replacement of rear suspension coil spring

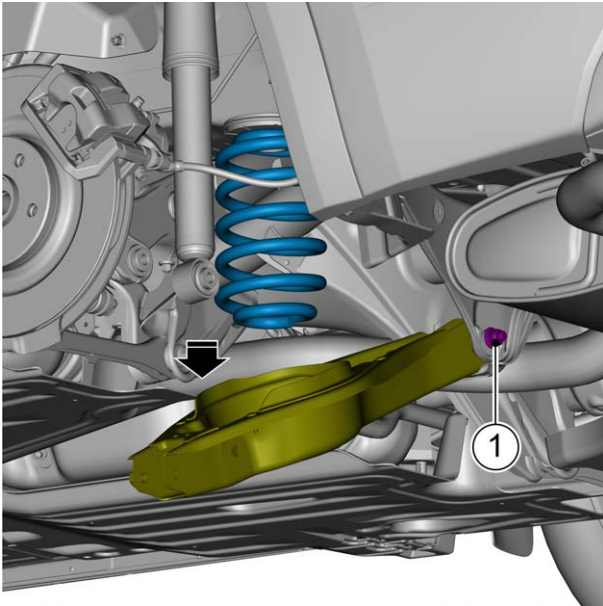
Removal Procedure

Caution

Remove and install the left and right rear suspension coil springs in a similar manner.

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the left rear wheels, refer to [Replacement of wheel assembly](#).
- 3 Remove the rear left suspension guard, see [Replacement of Rear Left Suspension Guard](#).
- 4 Compress the coil spring using a spring compression tool until the coil spring is free to move.
Special tool: 4114720163
- 5 Remove and discard the fixing bolt 1 that connects the rear suspension lower swing arm assembly to the rear steering knuckle assembly.
- 6 Remove and discard the fixing bolt 2 that connects the rear shock absorber assembly to the rear suspension lower swing arm assembly.





- 7 Loosen the adjusting bolt 1 that connects the rear suspension lower swing arm assembly to the rear subframe.
- 8 Remove the rear suspension coil spring.

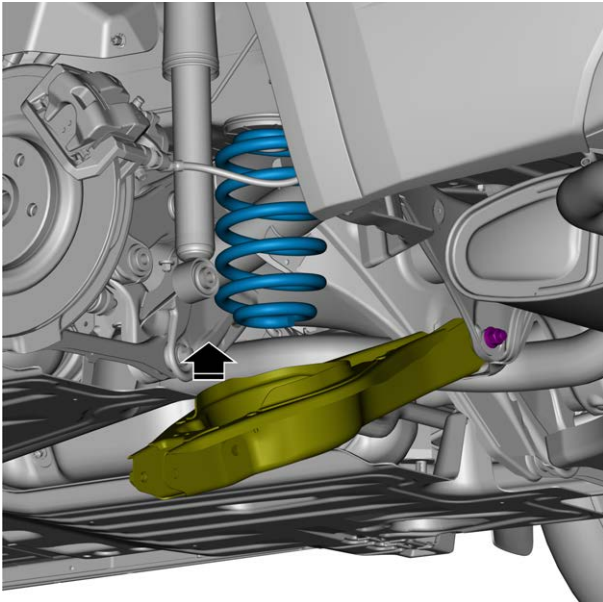
Installation Procedure

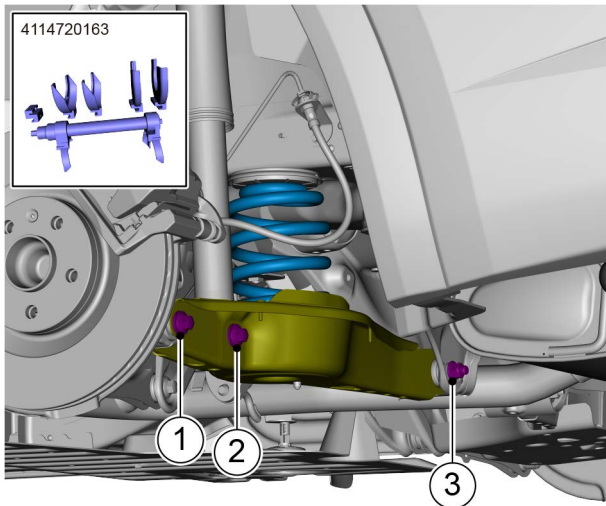
- 1 Install the rear suspension coil springs.

Caution

The upper end of the coil spring should be accurately positioned in the locating holes on the body, and the lower end should be placed on the buffer gasket.

- 2 Lift the rear suspension lower swing arm assembly upward.

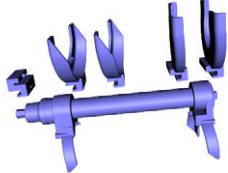




- 3 Compress the coil springs to the proper position using a spring compression tool.
Special tool: 4114720163
- 4 Install the new fixing bolt 2 of the rear shock absorber assembly connected to the rear suspension lower swing arm assembly.
Torque: 140N·m
- 5 Install new fixing bolt 1 for rear suspension lower swing arm assembly to rear steering knuckle assembly connection.
Torque: 250N·m
- 6 Install the adjusting bolt 3 that connects the rear suspension lower swing arm assembly to the rear subframe.
Torque: 90N·m
- 7 Install the rear left suspension guard.
- 8 Install the left rear wheel.
- 9 lower the vehicle.
- 10 Perform a vehicle four-wheel alignment.

5.3.7 Specialized tools and equipment

5.3.7.1 Special tools

Serial No.:	Illustration	Tool No.	Name
1		4114720163	Shock absorber spring removal tool

5.3.7.2 Equipment

Torque wrenches
Percentage gauges with magnetic holders
Tire pressure gauge
Alignment gauges

5.4 Wheel and tires

5.4.1 Specification

5.4.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Wheel Bolt	M14x1.5x45	125-155

5.4.1.2 Tire specification

Traveling Tire Model

Specification	Type and parameter
Cold pressure (front/rear)	250/250 kPa
Rim	19×8J aluminum alloy rim
	20×8J aluminum alloy rim
Tire specification	235/50R19
	245/45R20

Inflation pressure conversion table					
kPa	psi	kPa	psi	kPa	psi
140	20	185	27	235	34
145	21	190	28	240	35
155	22	200	29	250	36
160	23	205	30	275	37
165	24	215	31	310	38
170	25	220	32	345	39
180	26	230	34	380	40

5.4.1.3 Front Suspension Positioning Specifications

Caution

The following parameters refer to the technical parameters of the whole vehicle in the state of readiness

Wheel positioning (unloaded)	Maximum front wheel angle (inside/outside)	36.4°±2.0°/30.5°±2.0°
	Front wheel camber	-45'±39' (difference between left and right ≤39')
	Kingpin inclination angle	13.8°±0.5° (left-right difference≤0.5°)
	Kingpin caster angle	4.7°±0.5° (left-right difference≤0.5°)
	Front wheel front beam	6.6'±3' (left-right difference≤6')

5.4.1.4 Rear Suspension Positioning Specifications

Caution

The following parameters refer to the technical parameters of the entire vehicle in the fully loaded state.

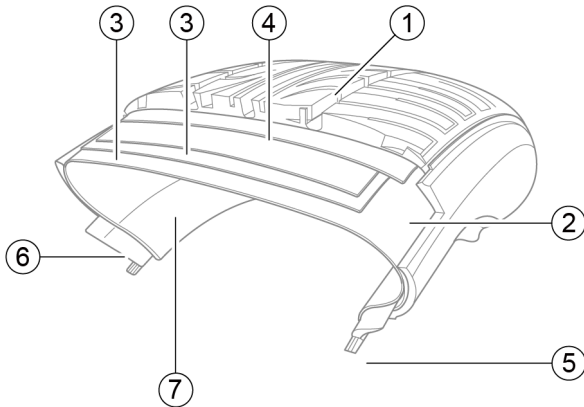
Wheel positioning (unloaded)	Rear wheel camber	-36'±43.8' (left-right difference≤43.8')
------------------------------	-------------------	--

	Rear wheel front beam	6'±3' (left-right difference≤6')
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5.4.2 Description and Operation

5.4.2.1 Description and Operation

The structure of the tire



1. Tread

a. The part of the tire in contact with the road surface, through friction to make the car with drive, braking and other properties, should have good wear resistance, puncture resistance, impact resistance, heat dissipation and other properties.

2. Tire body

a. The cord fabric layer in the tire, the main force parts of the tire, has impact resistance and good resistance to flexing in driving.

3. Belt ply

a. The steel cord fabric between tread and tire body, protects the tire body, inhibits tread deformation, maintains the ground surface of the tread, and improves abrasion resistance and driving stability.

4. Crown belt layer

a. The special cord fabric layer above the belt ply inhibits the movement of the belt ply when the tire is running, prevents the belt ply from detaching at high speed, and maintains the stability of the tire size at high speed.

5. Tire bead

a. The rubber-hanging steel wire is wound according to a certain shape (quadrangle or hexagon), which plays the role of fixing the tire on the rim.

6. Triangle rubber strip

a. Filling material on top of the steel wire bead in the tire, preventing the bead from dispersing, slowing down the impact of the bead, protecting the bead, and preventing the air from entering the tire when it is being molded.

7. Pneumatic sealing layer

a. Part to maintain air tightness of tire without tire tube, made of special rubber and can perform the function of a tire tube.

Tire sidewall marking meaning

Tire sidewall marking meaning: Example: 235/50R19 99V

- 235-Nominal section width (unit: mm)
- 50 - Flatness (aspect ratio: %)
- R-Radial construction
- 19-Nominal rim diameter (unit: in)
- 99-Load index
- V-Speed class (240 km/h)

Corresponding table of common speed ratings:

Speed class	Maximum speed (km/h)
S	180
T	190
H	210
V	240
W	270
Y	300
ZR	Above 240

Tire air pressure instructions

Tire air pressure has a decisive influence on the wear and tear and failure damage aspects of tires, therefore, it is necessary to maintain the standard air pressure and check the air pressure regularly for safe driving.

- The load capacity of a tire corresponds to its inflation pressure, and the reasonable air pressure of a tire must be determined according to the load of the vehicle. Climate and seasonal changes should not be used as a reason for tire pressure adjustment.
- In the early stages of using a new tire, the tire's outer edge dimensions will change due to the heat generated by the flexing motion, causing the tire's air pressure to decrease, so the air pressure should be checked and adjusted after 24 hours of use or 2,000-3,000 km of driving.
- When driving at high speeds for long periods of time, the tire pressure should be increased by 10-15%.

Dangers of insufficient air pressure

Insufficient air pressure will lead to increased deformation of the tire sidewalls and increased heat generation, greatly reducing the life of the tire, and will bring the following problems as well as safety hazards:

- a. Excessive wear on the tire shoulder.

- b. Increase the likelihood of drumming on impact.
- c. Decreased adhesion between tire components leading to delamination.
- d. Severe lack of air pressure resulting in sidewall crush damage.
- e. Excessive tire runout causes abnormal wear between the bead section and the rim, damaging the rim.
- f. Increased rolling resistance and higher fuel consumption.

Dangers of excessive air pressure

Excessive air pressure will lead to a decrease in the grounded area of the tire tread, an increase in the rigidity of the carcass, a decrease in cushioning, and will bring about the following problems as well as safety hazards:

- a. Excessive wear in the center of the tread.
- b. Increase the risk of rupture or blowout when the tire is impacted by external forces.
- c. Reduced grounding area leads to reduced maneuverability, and is prone to ditching, skidding and other dangers.
- d. Reduced ride comfort.
- e. Poor driving smoothness and long-term driving with excessive air pressure are easy to cause damage to the vehicle chassis.

Uneven tire pressure on the same suspension can lead to

- a. Uneven braking force from side to side.
- b. Steering misalignment.
- c. Reduced maneuverability.
- d. Bias when boosting.
- e. Vehicle run-deviation while driving.

5.4.3 System working principles

5.4.3.1 Wheel Positioning

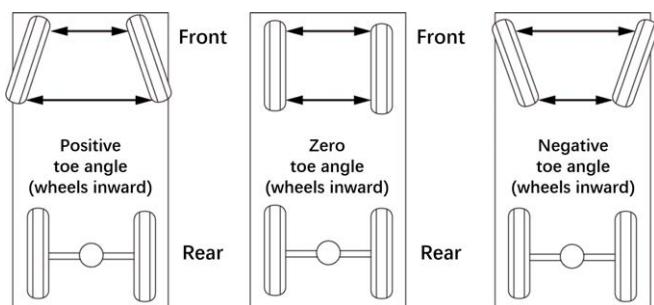
By turning the steering wheel, the driver can make the vehicle move in the desired direction. However, if the driver has to operate the steering wheel constantly to keep the vehicle moving in a straight line when driving on a straight road, or has to use a lot of force to steer the vehicle when turning a corner, the driver has to expend a lot of physical strength and suffer a lot of mental stress. In order to solve this problem, and also to prevent premature tire wear, wheel is mounted on the body (or chassis) at a certain angle according to certain requirements. These angles are summarized as "wheel positioning". Positioning is a comprehensive term that refers to the angular relationship between the front and rear axles, wheel, steering components and suspension components.

Steering is easy when the wheel is correctly positioned. When driving in a straight line, the driver only needs to make a slight adjustment to the steering wheel to keep it in the forward position, and only a small amount of effort is required when turning. In other words, steering is easy when all of the angular relationships that make up the "wheel positioning" are correctly adjusted. However, if even one of them is not adjusted correctly, the following problems may occur: difficult steering, poor steering stability, poor steering return, and shortened tire life.

The vehicle's positioning angles include: front beam, tire camber, kingpin caster angle, kingpin inclination angle, steering angle, inclusion angle, propulsion angle, tire grinding radius, etc. The above angles and dimensions depend on the type of vehicle used. The above angles and dimensions depend on the suspension system used in the vehicle, the tire drive system (front-powered front-wheel drive or front-powered rear-wheel drive, two-wheel drive or four-wheel drive), and the steering system (manual steering or power steering). Adjusting these elements optimizes driving performance and steering stability. It also extends the life of the components.

Usually the only angle recommended for adjustment during maintenance is the front beam value.

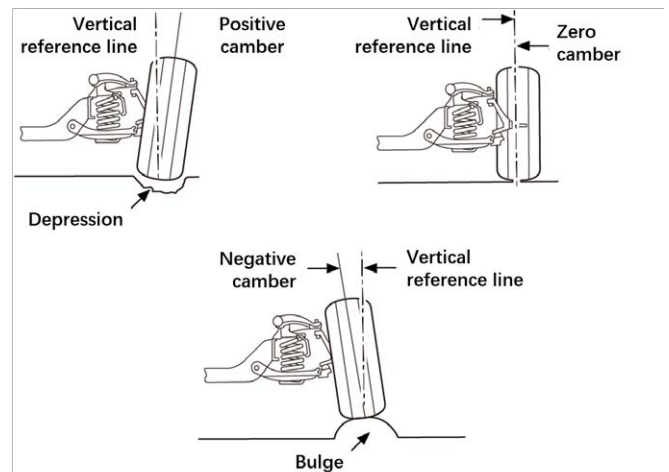
1. Front Beam



Front beam is used to measure how far the wheel turns forward or deviates from the centerline of the vehicle. Another understanding of front beam can be described as the distance between the front of two wheel compared to the distance between the rear of the same two wheels. If the wheels are perfectly parallel to each other, the two measurements should be equal and the front beam angle should be zero degrees. If the front of wheel is tilted inward toward the centerline, the front beam angle is said to be positive. When wheel is tilted outward, the front beam angle is said to be negative. Positive and negative front beam angles are also commonly referred to as front wheel front beam and front wheel rear beam.

The function of the front beam is to compensate for the tire due to camber and road resistance caused by the tendency to roll inward or outward, to ensure that the vehicle's straight into the nature.

2. Camber



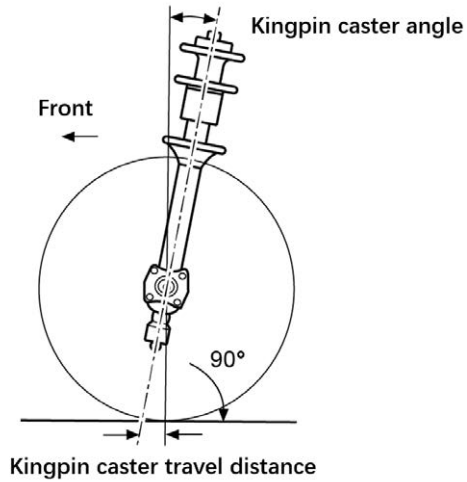
Camber is the angle of inclination of a tire relative to a vertical reference line. When the top of an wheel is tilted outward, it can be said that the camber is positive at this time. When the top of an wheel is tilted inward, the camber is said to be negative. Camber settings can affect vehicle directional control and tire wear.

Various suspension and steering devices are designed to minimize tire tread wear and transfer traction by keeping the wheel perpendicular to the ground and in a straight line when the vehicle is on.

Improper camber settings can cause excessive or uneven tire wear. Excessive positive camber will cause wear on the outside of the tire tread, and when the load on the outside of the tread is higher than on the inside, it will cause this uneven wear.

Excessive negative camber will cause wear on the inside of the tire tread, and uneven wear will be caused when the load on the inside of the tread is higher than that on the outside.

3. Kingpin caster angle



Kingpin caster angle is the kingpin axis forward or backward tilt angle. Kingpin caster angle is measured from the side view, the angle between the steering axis to the vertical line and get. Tilting backward from the vertical line is called positive kingpin caster angle, and tilting forward to the side is called negative kingpin caster angle. The centerline of the steering axis has an intersection point with the ground, and the tire has a center point of contact with the road, and the distance between these two points is called the main pin rear camber distance. Kingpin caster angle produces stability in straight-line driving: if the vehicle has positive kingpin caster angle, the left journal will have a tendency to sink when the wheel is turned to the left. (This is due to the fact that the journal rotates along the steering axis, which is inclined.) However, since the journal is fixed to the wheel assembly, and since the ground also makes it impossible to move it downward, the journal does not actually move downward, but rather the left steering knuckle is forced upward. This causes the body to rise slightly, and when the steering is complete and the steering wheel is released, the weight of the raised body forces the steering knuckle downward again, thus returning the journal to its original forward travel position.

5.4.4 Diagnostic Information and Procedures

5.4.4.1 Diagnosis description

See [Description and Operation](#) and [Wheel Positioning](#) before diagnosing wheel and tire failures. Understanding and familiarizing yourself with the operation principles of the wheel and tires before beginning system diagnostics will help determine the correct troubleshooting procedure in the event of a malfunction, and more importantly, this will help determine if the condition described by the customer is normal operation. Any troubleshooting of the wheel and tires should start with a [visual inspection](#) that guides the service technician to the next logical step in the troubleshooting process. Understanding and using the diagnostic process correctly will reduce diagnostic time and avoid misjudgment of the location of the fault.

5.4.4.2 Visual check

- Inspect after-sales retrofit devices that may affect the operation of the wheel and tires to ensure that they cannot affect the wheel and tires.
- Inspect easily accessible or visible system components for visible damage or the presence of conditions that could cause a malfunction, and if so, repair the malfunctioning component.
- Check for the following conditions:
 - Obvious tire and wheel runout.
 - Obvious drive axle runout.
 - Incorrect tire air pressure.
 - Incorrect cocking height.
 - Bent or damaged wheel.
 - Debris on tires or wheel.
 - Abnormal or excessive tire wear.
 - Defects in the tire including tread deformation, separation or bulging slight tire sidewall indentation due to collision damage are normal and do not affect ride quality.

If any of these phenomena exist, clean, repair or replace the appropriate part.

5.4.4.3 Initial inspection before tire alignment

Caution

Before aligning the tires, the following inspection steps must be performed, otherwise new faults may occur due to inaccurate alignment.

Step 1	Check for abnormal tire inflation pressure and abnormal tire wear?
--------	--

Yes

Adjust the tire inflation pressure to the specified value and check for normal tire wear. Replace the tires if necessary.

No

Step 2	Check if the wheel bearing is loose?
--------	--------------------------------------

Yes

Replace the wheel bearing (drive hub assembly) if necessary. See, [Replacement of Left Rear Wheel Hub Bearing Assembly](#). See, [Replacement of Left Front Drive Hub Assembly](#).

No

Step 3 | Inspect the front suspension left lower swing arm assembly ball head to the steering gear left outer tie rod ball head and the front suspension right lower swing arm assembly ball head to the steering gear right outer tie rod ball head for looseness?

Yes

Tighten the nuts and replace the front suspension left lower swing arm assembly and front suspension right lower swing arm assembly if necessary. See [Replacement of Front Suspension Left Lower Swing Arm Assembly](#). Or replace steering gear left outer tie rod, steering gear right outer tie rod. See [Replacement of Steering Gear Left Outer Tie Rod](#).

No

Step 4 | Check for abnormal wheel and tire runout?

Yes

Measure and correct the amount of tire runout.

No

Step 5 | Check for abnormal vehicle cocking height?

Yes

Correct the vehicle cocking before adjusting the front beam.

No

Step 6 | Check for incorrect installation of the front shock absorber assembly?

Yes

Replace the front shock absorber assembly. See [Replacement of Front Shock Absorber Assembly](#).

No

Step 7 | Check if the left rear suspension lower swing arm assembly and right rear suspension lower swing arm assembly are loose?

Yes

Tighten the left rear lower suspension arm assembly and right rear lower suspension arm assembly attachment bolts, and replace the lower suspension arm assembly if necessary.

No

Step 8 Check whether the vehicle's overall mass is normal and whether there is any overloading, etc.?

Yes

Restore the vehicle to its factory condition of overall mass.

No

Step 9 Perform the four-wheel alignment procedure. See [Front Suspension Alignment Specifications](#) and [Rear Suspension Alignment Specifications](#).

5.4.4.4 Wheel Bearing Diagnosis

Warning !

Please road test the vehicle under safe conditions and obey all traffic laws. Do not attempt any operation that could jeopardize vehicle control. Violation of the above safety instructions can result in a serious injury accident and damage to the vehicle.

Step 1 Road test the vehicle to confirm the fault phenomenon.

Tip: When the sealed wheel bearing is damaged, outside impurities will enter inside the bearing and damage the bearing. When the bearing is rotated by external force, it will emit a humming sound similar to that of an airplane taking off, so the noise will only appear when the vehicle is moving, and the noise will be stable and non-fluctuating, and will increase with the increasing speed of the vehicle.

Next Step

Warning !

To avoid vehicle damage, serious personal injury and even death, when the main components are removed from the vehicle, and the lifter is used for support, the jack should be used to support the vehicle part corresponding to the components to be removed.

Step 2 Confirm that the noise is coming from the wheel bearings. If you cannot determine if the noise is coming from the wheel bearings during the road test, lift the vehicle.

Next Step

Step 3	Check if wheel is bent?
--------	-------------------------

Yes

Replace Wheel, see [Replacement of Wheel Assembly](#).

No

Step 4	Check if wheel is unbalanced?
--------	-------------------------------

Yes

Re-do the dynamic balance on the wheel.

Warning !

When rotating the wheel by hand, the tire must be rotated with your hand holding it. If the position is not correct, it is likely to cause personal injury.

Next Step

Step 5	Rotate the tires and wheel assembly and listen for noise from the wheel bearings.
--------	---

Yes

Replace the wheel bearing (drive hub assembly) if necessary. See, [Replacement of Left Rear Wheel Hub Bearing Assembly](#). See, [Replacement of Left Front Drive Hub Assembly](#).

No

Step 6	Shake the wheel by hand to check if the wheel bearing is loose?
--------	---

Yes

Replace the wheel bearing (drive hub assembly) if necessary. See, [Replacement of Left Rear Wheel Hub Bearing Assembly](#). See, [Replacement of Left Front Drive Hub Assembly](#).

No

Step 7	Do a comprehensive comparison test with a normal vehicle of the same model to confirm whether the noise is a normal operating noise.
--------	--

5.4.4.5 Wheel Vibration Diagnosis

Tire dynamic balance

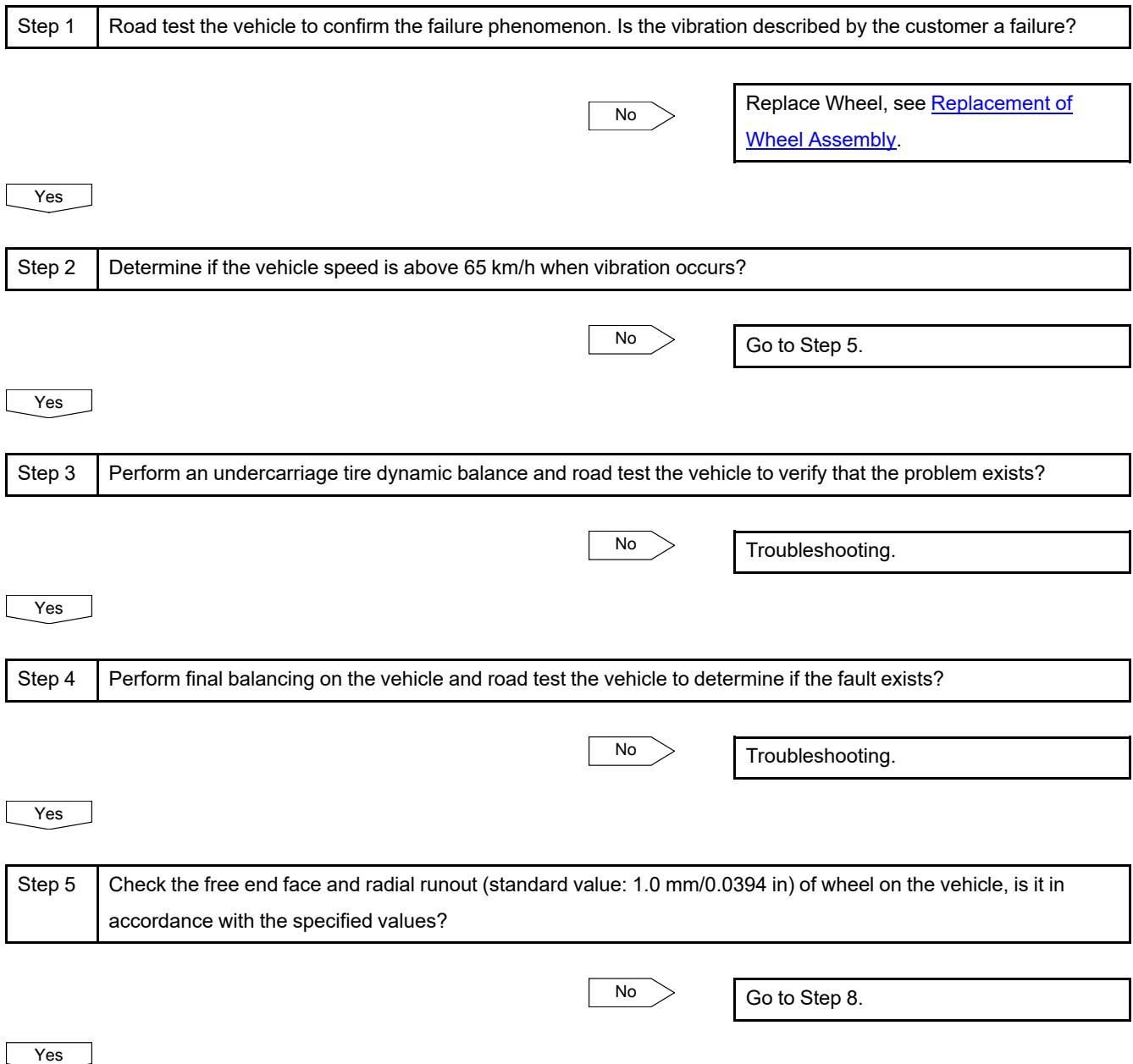
Tire dynamic balance is the easiest procedure to perform for checking, and should be performed first if the vehicle vibrates at high speeds. First perform a double-sided dynamic balance under the vehicle to correct imbalances in the tires and wheel assembly, and a final balance on the vehicle can correct imbalances in the brake disks or hubcaps. If the balancing operation fails to eliminate the vibration at high speeds, or if the vibration occurs at low speeds, the runout is the likely cause of the vibration.

Runout

The tire, the way the wheel or the way wheel is attached to the vehicle can cause the runout, to explore the possibility of generating wheel runout, see the wheel runout diagnostic procedure below.

Warning !

Please road test the vehicle under safe conditions and obey all traffic laws. Do not attempt any operation that could jeopardize vehicle control. Violation of the above safety instructions can result in a serious injury accident and damage to the vehicle.



Step 6	Is there any imbalance in the drivetrain of the inspection vehicle?
Thoroughly inspect the drive axle and equal velocity universal joints.	
No	
Replace damaged parts.	
Yes	
Step 7	Check wheel flange runout (standard value: 0.26 mm/0.0102 in), does the runout meet the specified value?
Replace the wheel bearing (drive hub assembly) if necessary. See, Replacement of Left Rear Wheel Hub Bearing Assembly . See, Replacement of Left Front Drive Hub Assembly .	
No	
Yes	
Step 8	Remove the wheel assembly, remove the tire from the assembly, and measure the runout of the wheel (standard value: 0.3mm /0.01 in), does it meet the specified value?
Replace Wheel, see Replacement of Wheel Assembly .	
No	
Yes	
Step 9	Replace the tire.
Next Step	
Step 10	Confirm troubleshooting.

5.4.4.6 Inspection of wheel runout

Measure the amount of wheel runout with a dial gauge, which can be measured both on and off the vehicle, but make sure that the mounting surface is correct, measurements can be made both with and without the tire, measure radial and end face runout on the inside and outside of the rim flange, fix the dial gauge next to the wheel and the tire assembly, slowly rotate the wheel for one revolution and record the dial gauge readings, and if the measured value is more than the following specifications and wheel balancing does not eliminate vibration, replace wheel.

Aluminum Wheel

Radial runout: 0.3 mm (0.01 in)

End face runout: 0.3 mm (0.01 in)

5.4.4.7 Diagnosis of abnormal wear on wheel

There are many reasons for abnormal and premature tire wear, including incorrect inflation pressure, failure to change positions regularly, poor driving habits or incorrect wheel alignment. If the wheel alignment needs to be readjusted due to tire wear, be sure to adjust the front beam as close to zero as possible, as long as the specifications allow.

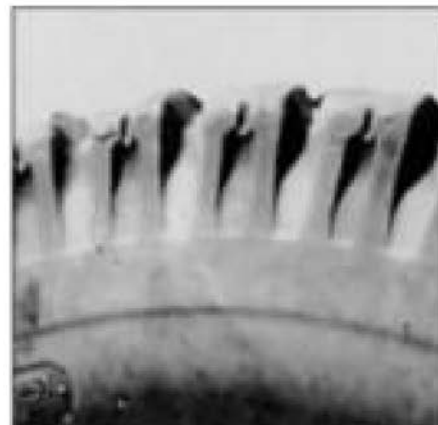
If any of the following conditions occur, perform a tire shift:

- a. Front tires wear is different from rear tires wear.
- b. The left front and right front tires are in different wear conditions.
- c. Left rear and right rear tires are in different wear conditions.

Check wheel alignment if the following occurs:

- a. The left front and right front tires wear differently.
- b. Uneven tread wear on any of the front tires.
- c. Feather scuffing on one side of the tread strips or blocks of the front tires.

Several typical tire wear conditions are shown below:

**Shoulder wear****Intermediate wear****Single-side wear****Feather wear****Annular groove wear****1. Center wear**

Cause:

Tire air pressure for a long time is high, tire tread is too wide, rim is too narrow, tire wear is mainly borne by the middle of the tread.

2. Tire shoulder wear

Cause:

Tire air pressure is low for a long time or the car is overloaded, the tire tread is too narrow, the rim is too wide, tire wear is mainly borne by the two sides of the tread.

3. unilateral wear:

Cause:

Front wheel front beams are out of specification, wheel camber is too large or too small, the car makes frequent sharp turns, and wheel has not been shifted for a long time.

4. tire sidewall area feather wear:

Cause:

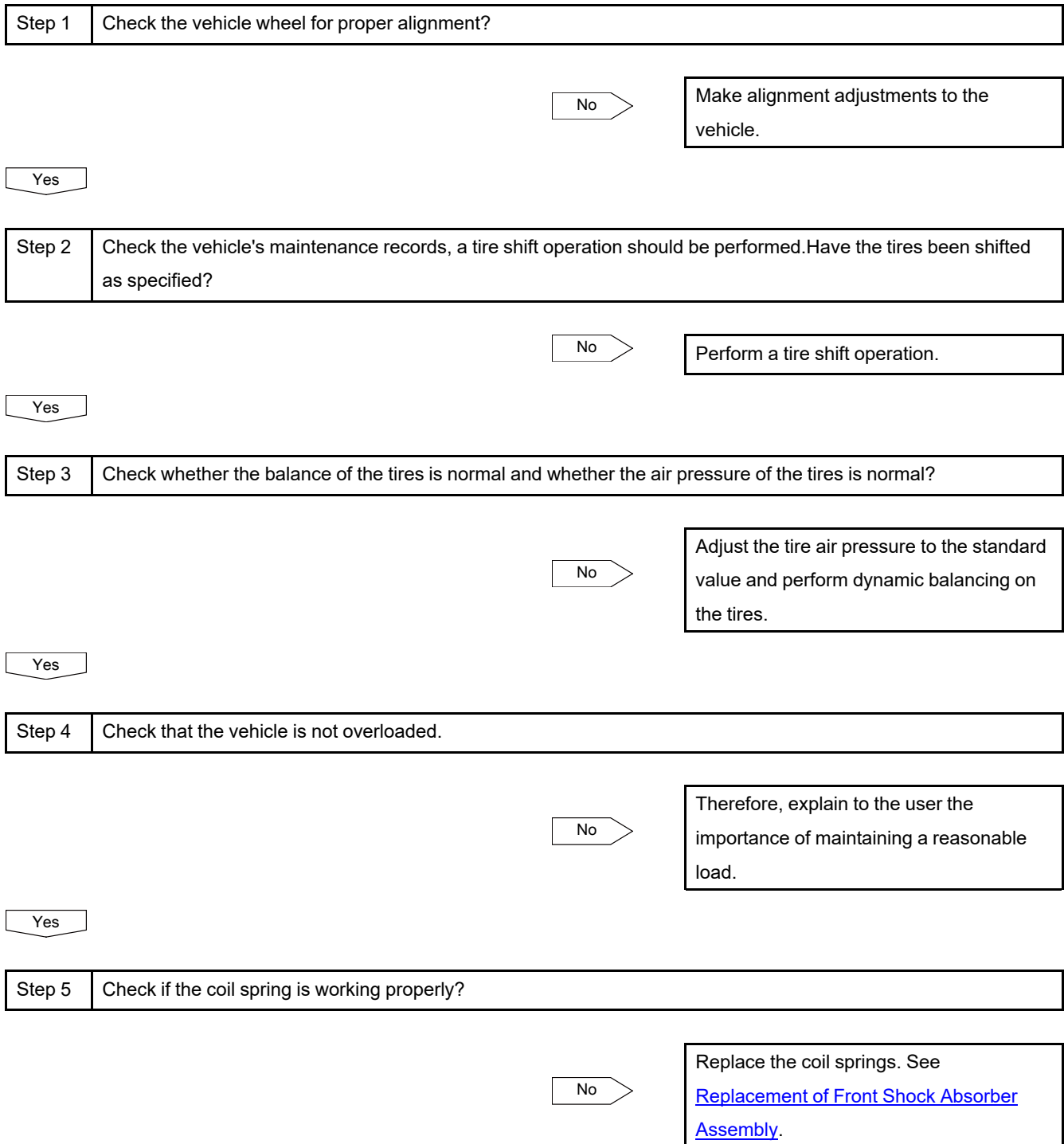
Low tire pressure, excessive load, loose wheel bearing wear, incorrect front wheel alignment parameters.

4. annular groove wear:

Cause:

Insufficient tire pressure, wheel imbalance, deformed rims, excessive front beam, loose steering rod connections, incorrect wheel alignment parameters.

5.4.4.8 Diagnosis of excessive tire wear



Yes

Step 6 Check front shock absorber assembly for proper operation?

No

Replace the defective part. See [Replacement of Front Shock Absorber Assembly](#).

Yes

Step 7 Check if the front suspension left lower swing arm assembly and front suspension right lower swing arm assembly are working properly? (There should be no bending, loosening, etc.)

No

Replace the front suspension left lower swing arm assembly and front suspension right lower swing arm assembly. See [Replacement of Front Suspension Left Lower Swing Arm Assembly](#).

Yes

Step 8 Check if the wheel bearing is working properly? (There must be no signs of failure such as wear, looseness, etc.)

No

Replace the wheel bearing (drive hub assembly) if necessary. See, [Replacement of Left Rear Wheel Hub Bearing Assembly](#). See, [Replacement of Left Front Drive Hub Assembly](#).

Yes

Step 9 Check if the front suspension left lower swing arm assembly ball head and steering gear left outer tie rod ball head and front suspension right lower swing arm assembly ball head and steering gear right outer tie rod ball head are working properly? (There should be no wear or looseness.)

No

Replace the front suspension left and right lower swing arm assemblies, see [Replacement of Front Suspension Left Lower Swing Arm Assembly](#). Tighten nuts and replace steering gear left outer tie rod and steering gear right outer tie rod if necessary, see [Replacement of steering gear left outer tie rod](#).

Yes

Step 10	Check for normal amount of runout on wheel. See wheel runout check.
---------	---

No

Reassemble tires and replace tires or wheel if necessary. see [Replacement of Wheel Assembly](#).

Yes

Step 11	Confirm that the fault has been resolved.
---------	---

5.4.4.9 Diagnosis of Side Swing of Vehicle While Driving

Step 1	Check whether the balance of the tires is normal and whether the air pressure of the tires is normal?
--------	---

No

Adjust the tire air pressure to the standard value and perform dynamic balancing on the tires.

Yes

Step 2	Check the vehicle wheel for proper alignment?
--------	---

No

Readjust the positioning of wheel.

Yes

Step 3	Check whether the wear of the tires is normal?
--------	--

No

Replace the tires. Note: The vehicle's wheel should be aligned immediately after replacing the tires.

Yes

Step 4	Check for normal wheel runout?
--------	--------------------------------

No

Measure the wheel flange runout and replace the wheel if necessary. See Replacement of Front Hub See Replacement of Rear Hub Unit

Yes

Step 5	Check that the steering cross tie rod ball heads are working properly? (There must be no signs of failure such as wear or looseness)
--------	--

No

Tighten the nuts and replace the steering cross tie rod ball head if necessary. See Replacement of steering cross tie rod and ball head

Yes

Step 6	Check the front suspension left lower arm assembly ball head and front suspension right lower arm assembly ball head for proper operation? (There can be no signs of failure such as wear or looseness)
--------	---

No

Tighten the nuts and replace the front suspension left lower swing arm assembly and front suspension right lower swing arm assembly if necessary.

Yes

Step 7	Check if the runout of the wheel is excessive?
--------	--

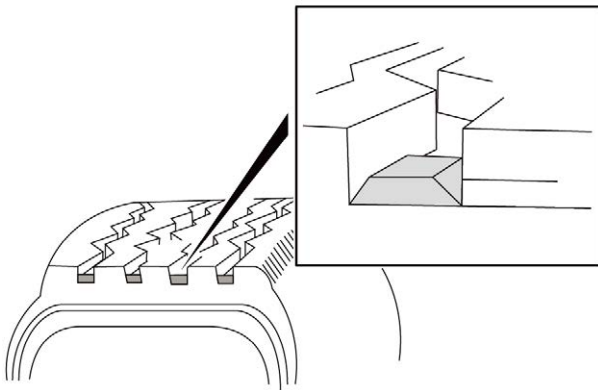
No

Measure the wheel runout, reassemble the wheel and tires, and replace damaged parts if necessary.

Yes

Step 8	Confirm that the fault has been resolved.
--------	---

5.4.4.10 Tire Wear Indicator Markings



5.4.4.11 Correction of radial tire runout

1. Definition of fault:

When the vehicle is traveling in a straight line at a certain speed, and no external force is applied to the steering wheel, the vehicle deviates from the original direction of travel to the left or right.

2. Benchmarks for determining vehicle runout:

(a) When a vehicle is traveling in a straight line at a certain speed, in order to maintain its original direction of travel, a force is applied to the steering wheel that prevents it from rotating in a clockwise or counterclockwise direction.

(b) When the vehicle is traveling in a straight line at a certain speed, after releasing the steering wheel, the vehicle deviates from the original direction of travel to the left or right {usually referred to as traveling 100 m (3940 in) deviating from the original direction of travel by more than 1 m (39.4 in)}.

Caution

Before performing runout correction, the vehicle should be checked for the following basic items

- a. Check front and rear wheel brakes for drag, etc.
- b. Check whether there is a big difference in tire wear on the same suspension.
- c. Check for excessive difference in tire air pressure in the same suspension.

If any of the above is abnormal, adjust to the normal state before road testing the vehicle to confirm that the malfunction is eliminated.

3. Correction procedure:

Road test the vehicle under safe conditions and obey all traffic laws. Do not attempt any operation that could jeopardize vehicle control. Violation of the above safety instructions can result in serious injury and damage to the vehicle!

Step 1 Road test the vehicle to determine if the vehicle is running out of alignment.

No

Explain to the customer the definition of runout and that depending on the road conditions, the vehicle may have the illusion of runout for a short period of time.

Yes

Step 2 Check tire air pressure for compliance.

No

Adjust the vehicle tires according to the vehicle tire air pressure standards.

Yes

Step 3 Check that the vehicle's front wheel front beam values are normal.

No

Readjust the vehicle's front wheel front beam values and make alignment adjustments if necessary, see [Front Wheel Front Beam Adjustment](#).

Yes

Step 4 Check that all of the vehicle's alignment parameters are within specification when compared to the values in the specification sheet.

No

Recheck all alignment parameters of the vehicle and make alignment adjustments if necessary.

Yes

Step 5 Check the vehicle's four-wheel tires.

- A. Check the amount of tire runout on all four wheels of the vehicle. See [Checking the amount of wheel runout](#).
- B. Confirm whether the check result is normal.

No

Replace the defective rim.

Yes

Step 6 Perform the front tire assembly left/right swap procedure.

- A. Swap the left front wheel assembly with the right front wheel assembly.
- B. Road test the vehicle.
- C. Verify that the vehicle running direction shifts with the tire swap.

No

Indicates that the runout side tire is defective, replace the defective tire (it is recommended that both front tires on both sides be replaced at the same time), see [Replacement of Wheel Assembly](#).

Yes

Step 7 Perform the front and rear tire assembly swap procedure.

- A. Align the front wheel assembly with the rear wheel assembly. See [Tire Swap](#).
- B. Road test the vehicle.
- C. Whether the vehicle is still deviating.

No

This indicates that there is a malfunction on both sides of the front tires, replace the front tire assemblies on both sides. See [Replacement of Wheel Assembly](#).

Yes

Step 8 Check the frame and suspension system components.

- A. Check the frame and suspension system components for bending, severe wear, etc.

No

Replace the vehicle's four-wheel tire assembly. See [Replacement of wheel assembly](#).

Yes

Step 9 Align the frame, replace damaged parts if necessary, and confirm troubleshooting.

5.4.5 Removal and Installation

5.4.5.1 Replacement of Wheel Assembly Replacement

Removal Procedure

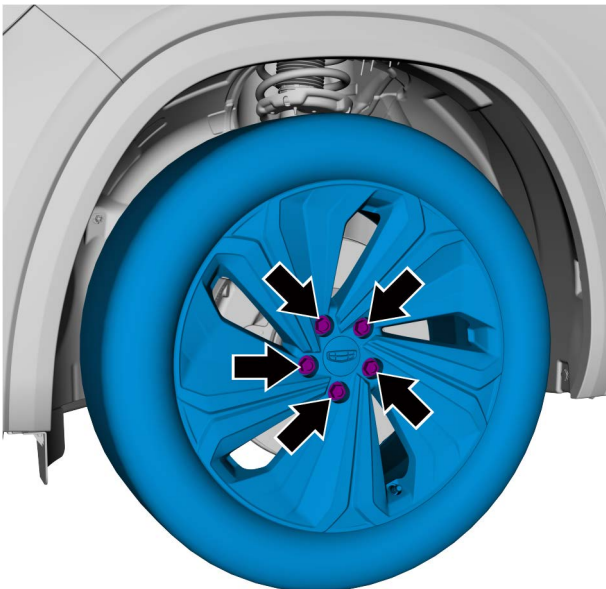
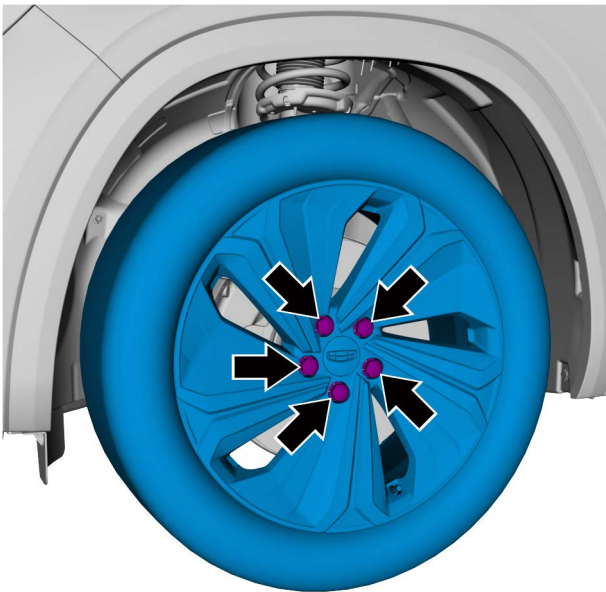
Caution

The disassembly procedure is similar for all four wheel assemblies.

- 1 Remove the wheel bolt trim cover with the special tool from the trunk inside the tools supplied with the vehicle.

Caution

1. Place the vehicle on level ground.
2. Set the vehicle steering wheel straight with the front wheels facing forward.



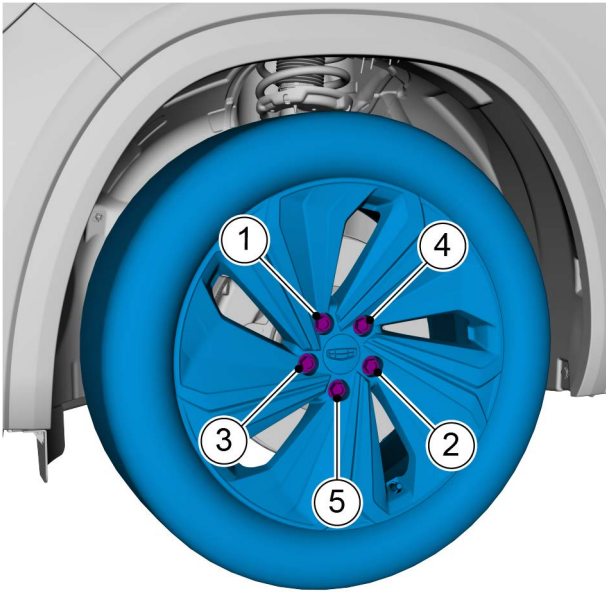
- 2 Cross pre-loosen the 5 wheel bolts securing the tire.

Caution

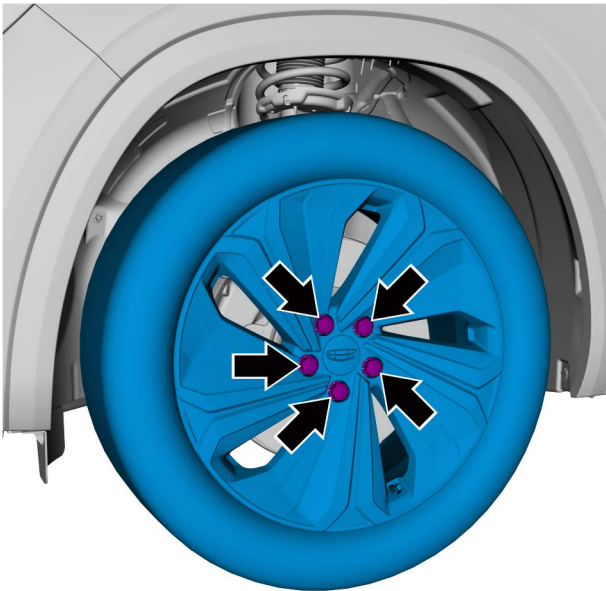
To keep the wheel balanced, mark the relative position of the wheel before removing the tires.

- 3 Lift the vehicle so that the tires are off the ground, see [Lifting and Raising the Vehicle](#).
- 4 Remove the wheel bolts.
- 5 Remove the wheel.

Installation Procedure



- 1 Tighten the wheel bolts in the order shown, pre-tightened.
- 2 Lower the vehicle.
- 3 Tighten the wheel bolts in the order shown.
Torque: 140N·m



- 4 Install the wheel bolt trim cover.

5.4.5.2 Front wheel front beam adjustment

- 1 Check the front beam settings at both ends.
Use equipment: wheel alignment system.

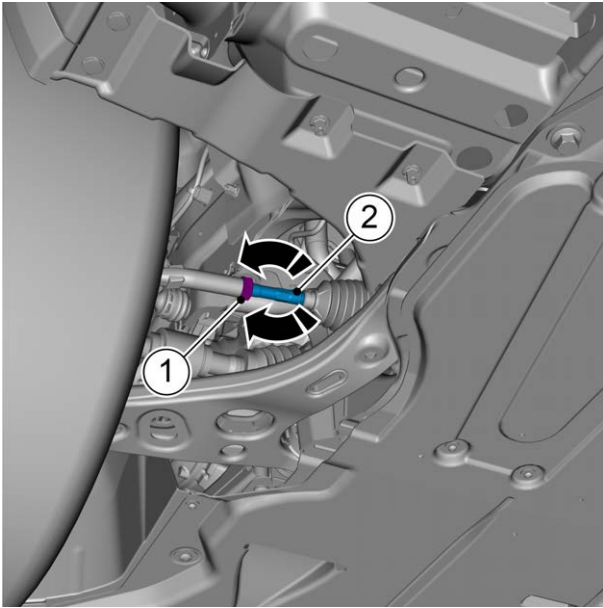
Caution

Make sure the vehicle is parked on a level surface before checking.

Ensure that the wheels are both facing forward in position.

Check that the air pressure in all four tires is consistent and at normal values before alignment.

Check that the ball heads of the components are normal.



- 2 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 3 Loosen the steering gear outer tie rod left and right end fixing nuts 1.

Caution

Remove and adjust the left and right ends the same way.

- 4 Adjust the front wheel front beam settings at both ends by turning the cross tie rods 2 clockwise or counterclockwise by the same amplitude of rotation, see Wheel and Tire Service Data for parameters.
- 5 Tighten the steering gear outer tie rod lock nut 1.

5.4.5.3 Rear wheel front beam adjustment

Caution

Remove and adjust the left and right ends the same way.

- 1 Check the front beam settings at both ends.
Use equipment: wheel alignment system.

Caution

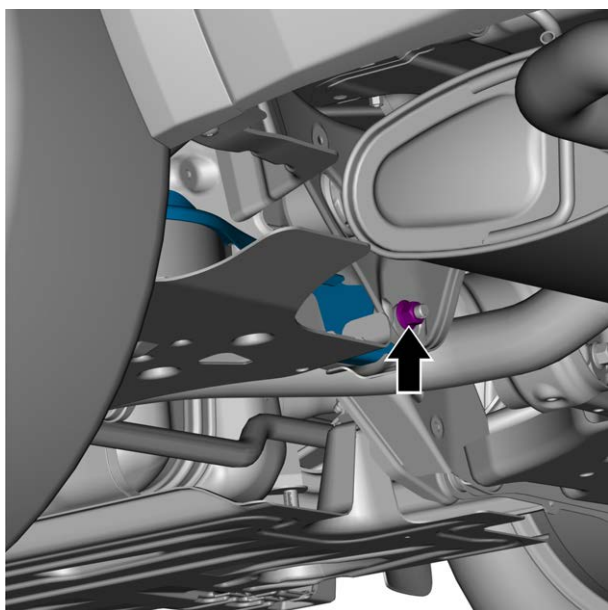
Make sure the vehicle is parked on a level surface before checking.

Ensure that the wheels are both facing forward in position.

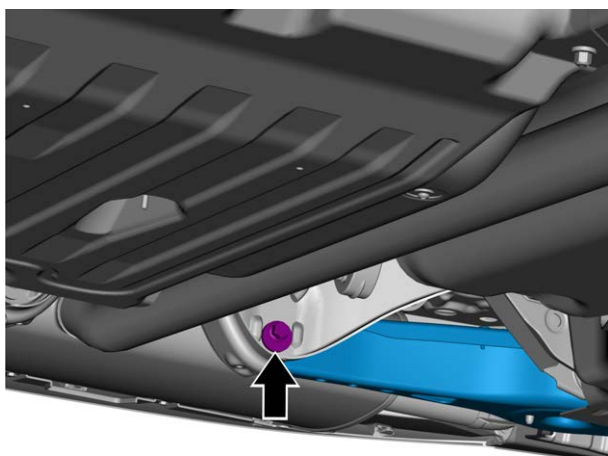
Check that the air pressure in all four tires is consistent and at normal values before alignment.

Check that the ball heads of the components are normal.

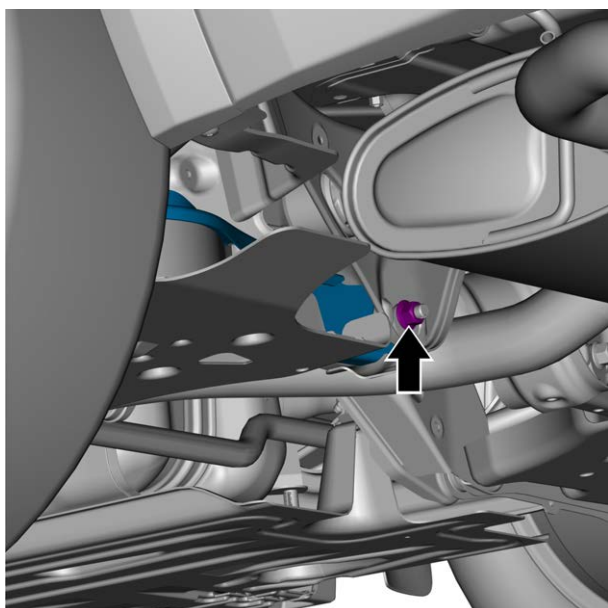
- 2 Lift the vehicle, see [Vehicle Lifting and Raising](#).



- 3 Loosen the front beam adjustment nut on the vehicle's left rear suspension lower swing arm assembly.



- 4 Adjust the rear wheel front beam setting by turning the adjusting bolt clockwise or counterclockwise, see Wheel and Tire Service Data for parameters.



- 5 Tighten the front beam adjusting nut of the left rear suspension lower swing arm assembly.
Torque: 90N·m

5.4.5.4 Rear suspension camber adjustment

- 1 Check the rear wheel front beam setting.

Use equipment: wheel alignment system.

Caution

Make sure the vehicle is parked on a level surface before checking.

Ensure that all four tire pressures are consistent and within standard values before making adjustments.

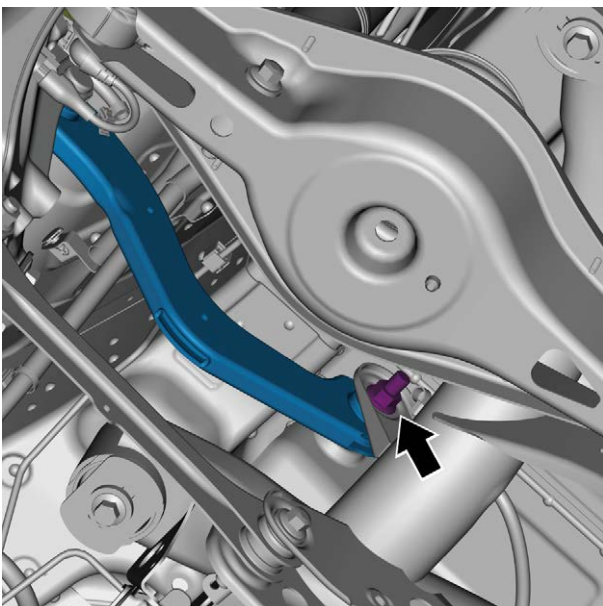
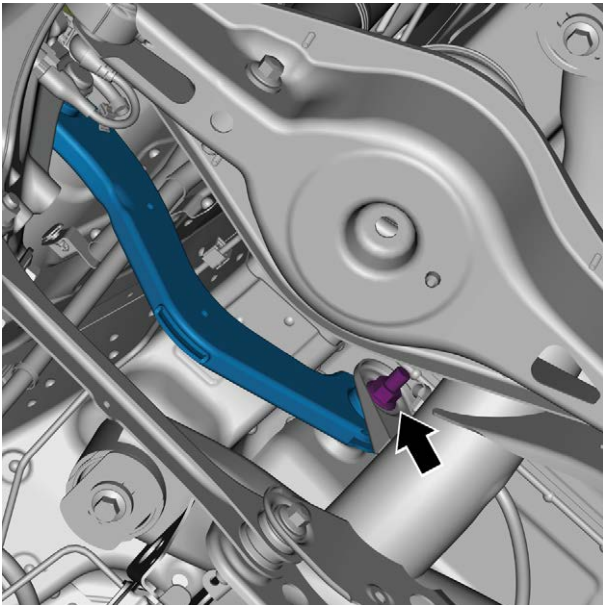
Check that the air pressure in all four tires is consistent and at normal values before alignment.

Check that the ball heads of the components are normal.

- 2 Loosen the fastening nuts connecting the rear upper cross arm to the rear subframe.

Caution

Remove and adjust the left and right ends the same way.



- 3 Rotate the upper cross arm and rear subframe fixing bolt until the rear suspension camber is at the normal value, see the [Rear Suspension Repair Data](#) for the parameters.
- 4 Tighten and lock the nuts.
Torque: 250N·m

Driveline/Shaft

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6.1 Warnings and Cautions

6.1.1 Warnings and Cautions

6.1.1.1 Warnings and Cautions

Warning about Assisted Driving

Caution

An assistant should drive the vehicle while the technician is checking the reported defective part, otherwise personal injury may result.

Warning about Battery Disconnection

Caution

Before servicing any electrical component, the power mode must be OFF and all electrical loads must be "OFF" unless otherwise stated in the operating procedures. Also disconnect the battery negative cable if tools or equipment are likely to come into contact with exposed energized electrical terminals. Violation of these safety instructions may result in personal injury or damage to the vehicle and vehicle components.

Warning about Road Test

Warning !

Carry out a vehicle road test in a safe manner and obey all traffic laws. Do not attempt any maneuver that could jeopardize the control of the vehicle. Violation of the above safety instructions could result in serious personal injury and damage to the vehicle.

Caution for Engine Lifting

Caution

When lifting or supporting the engine for any reason, do not support the jack under the engine and any sheet metal parts; lifting the engine incorrectly can result in damage to components.

6.2 Drive shaft system

6.2.1 Specification

6.2.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Fixing nut for left hub bearing and drive shaft	M22	230-310
Fixing nut of right wheel hub bearing and drive shaft	M22	230-310
Fixing nut for right front constant velocity drive shaft and engine bracket	M8	25-35

6.2.2 Description and Operation

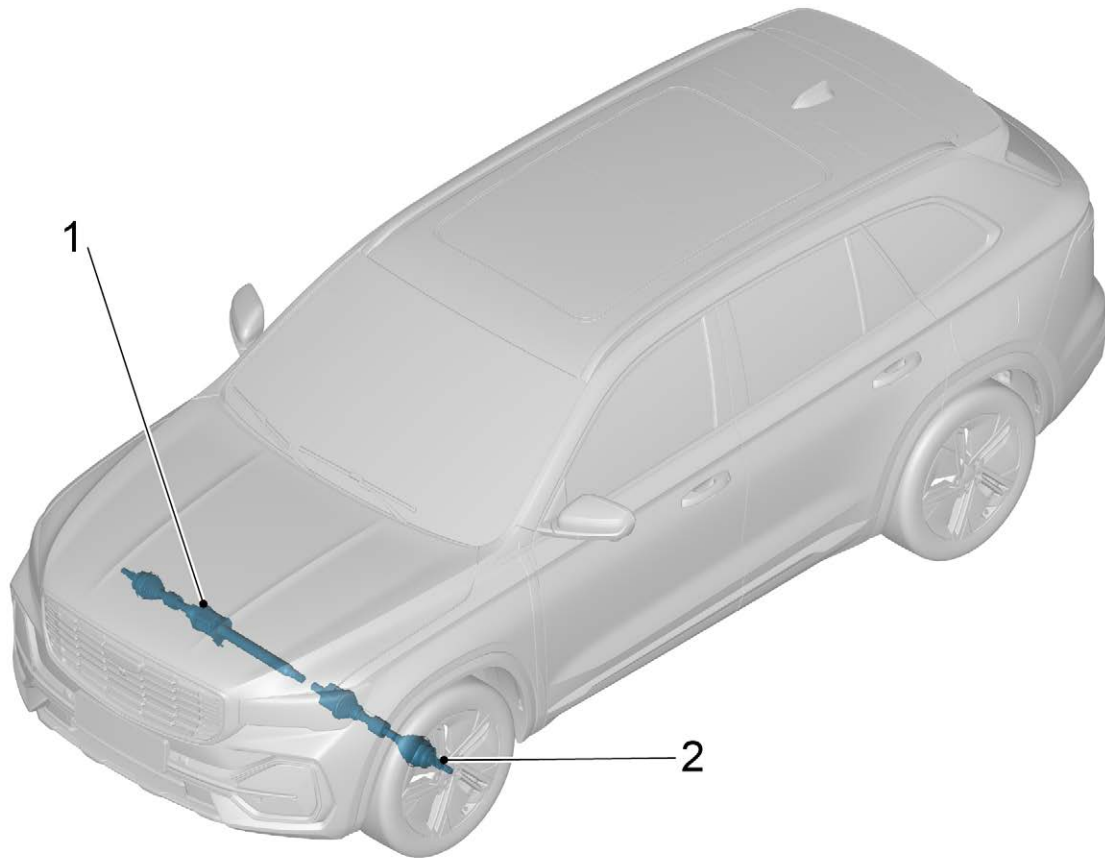
6.2.2.1 Description and Operation

The vehicle is equipped with one drive mode: FWD front wheel drive. The drive shaft system of a 2WD vehicle consists of a left front constant velocity drive shaft and a right front equal-velocity drive shaft.

The constant velocity drive shaft is the shaft that connects the differential to the drive wheels. The constant velocity drive shaft is the shaft that transmits torque between the transmission and the drive hub assembly, and each of its inner and outer ends has a universal joint connected to the reducer gear and the inner ring of the drive hub assembly via splines on the universal joints, respectively. The constant velocity drive shaft is used to transfer power between the differential and the drive wheel.

6.2.3 Part position

6.2.3.1 Part position

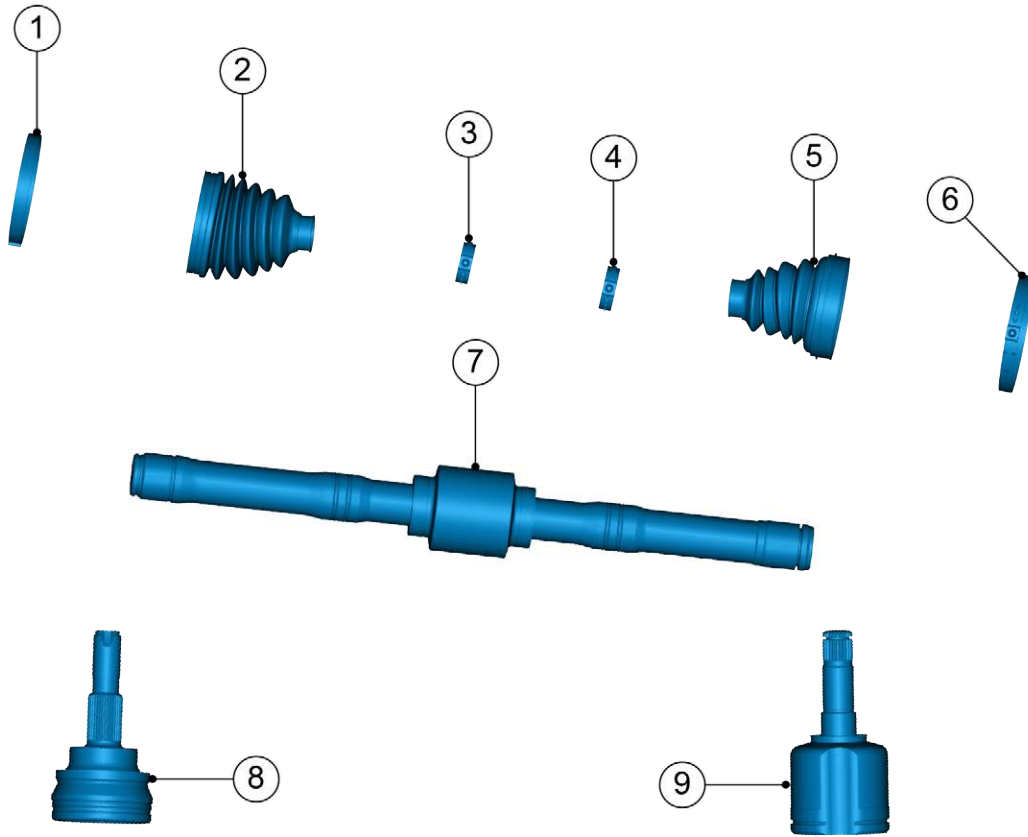


1. Right front constant velocity drive shaft

2. Left front constant velocity drive shaft

6.2.4 Breakdown drawing

6.2.4.1 Breakdown drawing



- 1. Large Clamp
- 2. Front Axle Outer Ball Cage Bushing
- 3. Small clamp
- 4. Small clamp
- 5. Front Axle Inner Ball Cage Bushing

- 6. Large Clamp
- 7. Drive shaft
- 8. Front Axle Outer Ball Cage
- 9. Front Axle Inner Ball Cage

6.2.5 Diagnostic information and procedure

6.2.5.1 Diagnosis description

See [Description and Operation](#) before diagnosing a failure in the drive shaft system. Understanding and familiarizing yourself with the operation principle of the drive shaft system before beginning system diagnostics will help determine the proper troubleshooting steps to take in the event of a malfunction, and more importantly, this will help determine if the condition described by the customer is normal operation. Any troubleshooting of the drive shaft system should begin with a [visual inspection](#) that guides the service technician to the next logical step in the troubleshooting process. Understanding and using the diagnostic process correctly will reduce diagnostic time and avoid misjudgment of the faulty area.

6.2.5.2 Visual check

- Inspect aftersales retrofit devices that may affect the operation of the drive shaft system to ensure that they cannot affect the drive shaft system.
- Inspect easily accessible or visible system components for visible damage or the presence of conditions that could cause a malfunction, and if so, repair the malfunctioning component.

6.2.5.3 Malfunction Symptom List

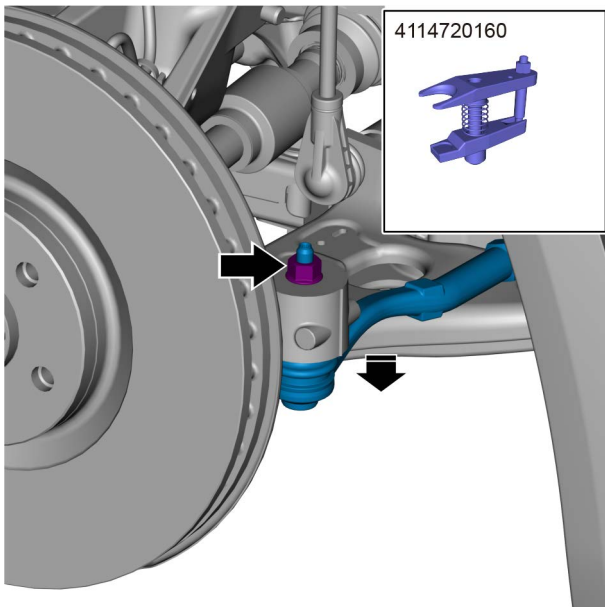
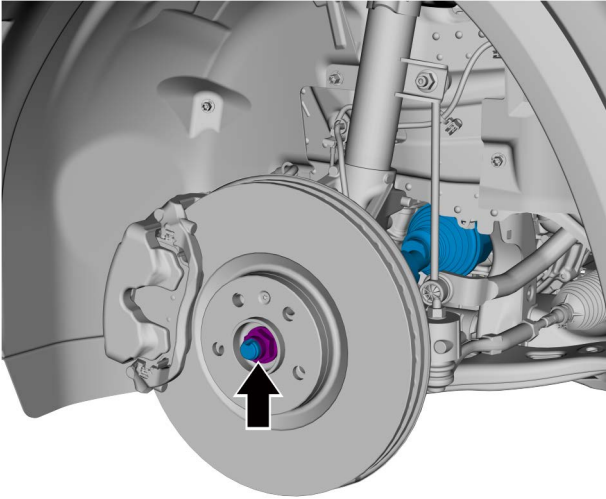
Symptoms	Suspected Parts	Replacement
Noise	1.Fixed ball-cage type constant velocity universal joint (worn) 2.Movable three-ball pin type constant velocity universal joint (worn) 3.Dust cover at both ends (whether the corrugation is squeezing and rubbing)	See Replacement of Left Front Constant Velocity Drive Shaft , replacement of right front constant velocity drive shaft .
Oil leakage	1. Fixed end dust cover (cracked) 2. Telescopic end dust cover (ruptured)	

6.2.6 Removal and Installation

6.2.6.1 Replacement of left front constant velocity drive shaft

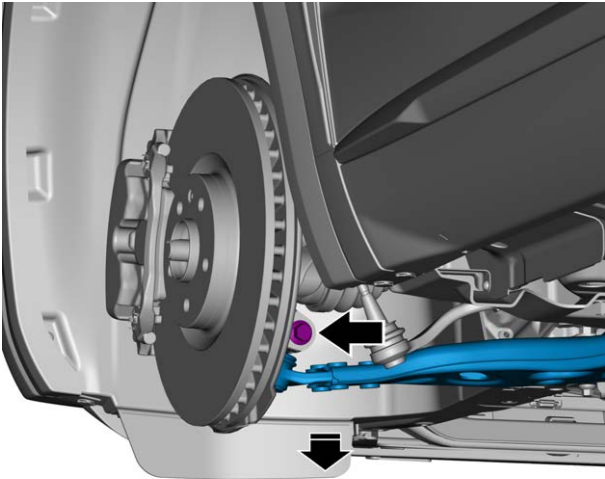
Removal Procedure

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove wheel, see [Replacement of Wheel Assembly](#).
- 3 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 4 Remove the fixing nut that connects the left front constant velocity drive shaft assembly to the left front drive hub assembly.

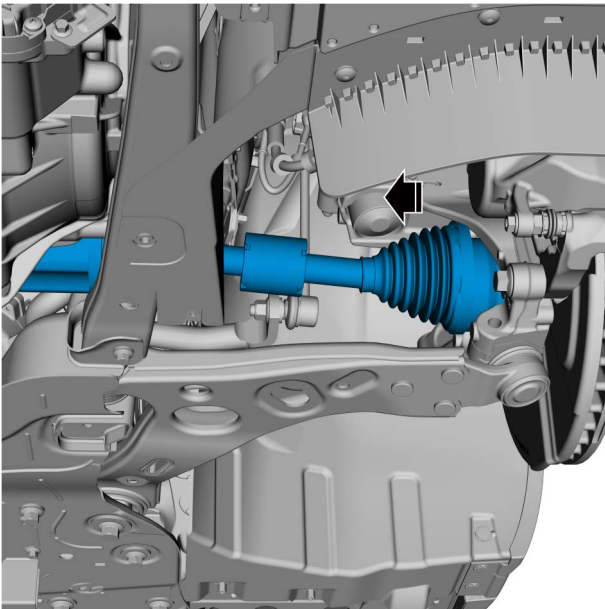


- 5 Remove the fixing nut of the steering gear left outer tie rod ball head and disengage the steering gear left outer tie rod ball head from the left front steering knuckle assembly.

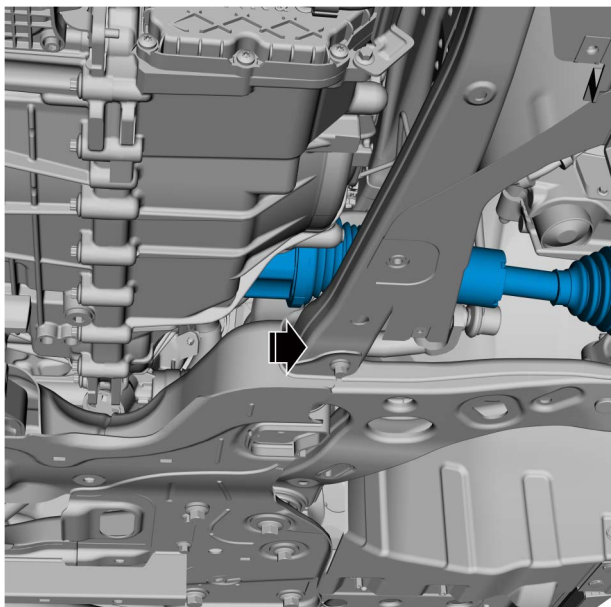
Special tool: 4114720160



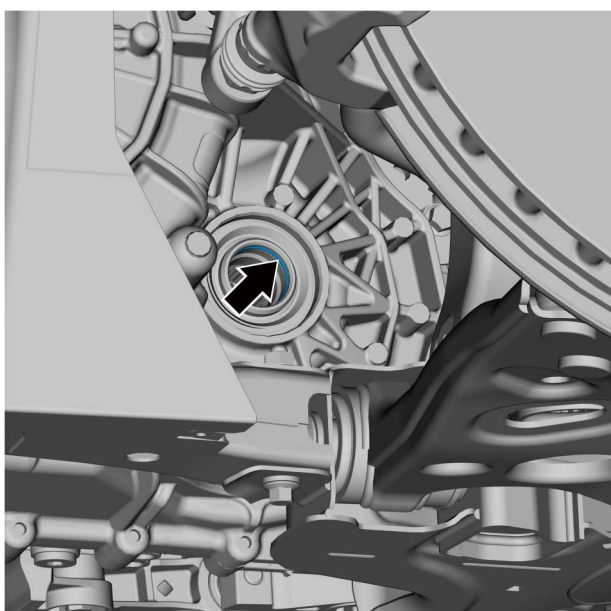
- 6 Disconnect the front suspension left lower swing arm assembly from the left front steering knuckle assembly by removing the front suspension left lower swing arm assembly fixing bolt.



- 7 Disconnect the left constant velocity drive shaft from the left front drive hub assembly.



- 8 Separate the constant velocity drive shaft from the transmission using a suitable tool, withdraw the constant velocity drive shaft outward and remove it.



- 9 Use the tool to pick out the O-ring slowly.

Caution

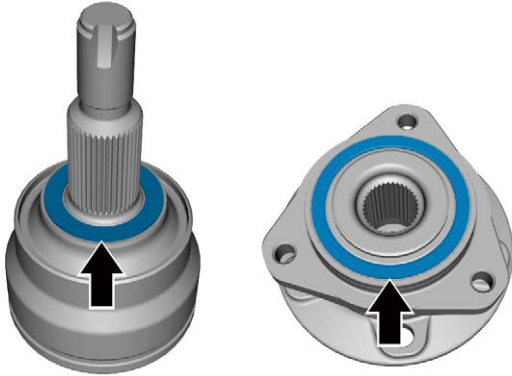
Do not scratch the inner wall of the half shaft gear.

Installation Procedure

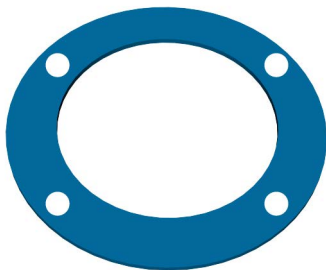
- 1 Check for dislodged composite gasket, if composite gasket is not dislodged and is securely affixed, it does not need to be replaced, otherwise composite gasket will need to be reinstalled.
- 2 Wipe clean the mating surface where the outer ball cage of the drive shaft mates with the hub bearing (make sure the surface is free of impurities and dry and free of moisture).

Caution

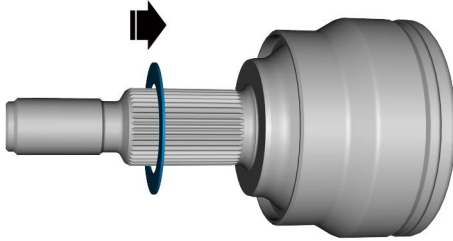
Ensure that the half shafts are parallel during disassembly and installation, and pay attention to the protection of the axle shafts, sheaths and other parts of the shaft to avoid bumps, scratches and secondary damage caused by the half shafts coming out.



- 3 Apply glue to the opposite side of the composite gasket (the side with the paint pen markings) as shown in the picture to the left.



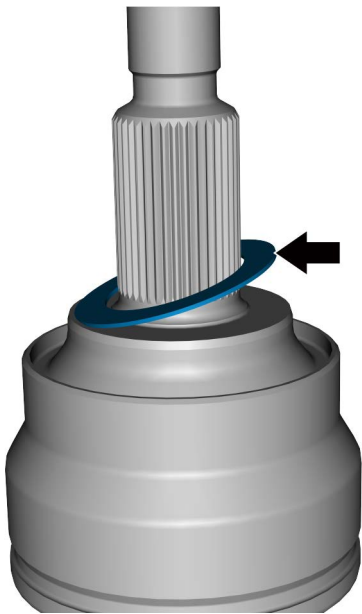
- 4 Push the adhesive side of the spacer concentrically down the spline to the drive shaft end face for adhesion.

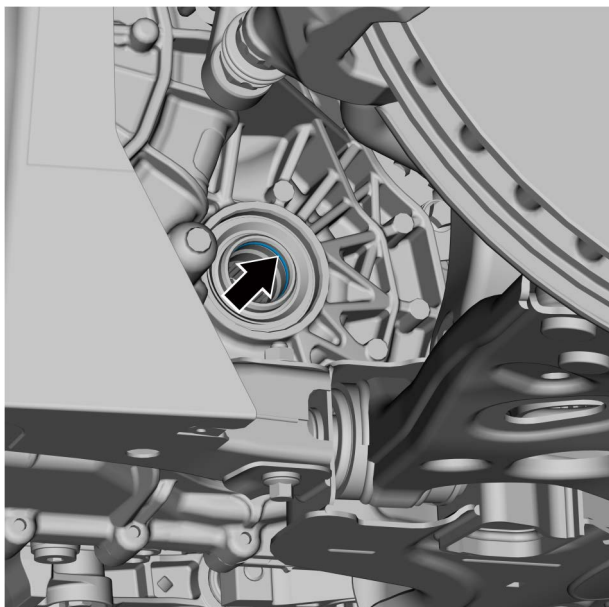


- 5 Hold it in a pressed condition for 5~10 seconds after pasting to make sure the gasket is firmly pasted.

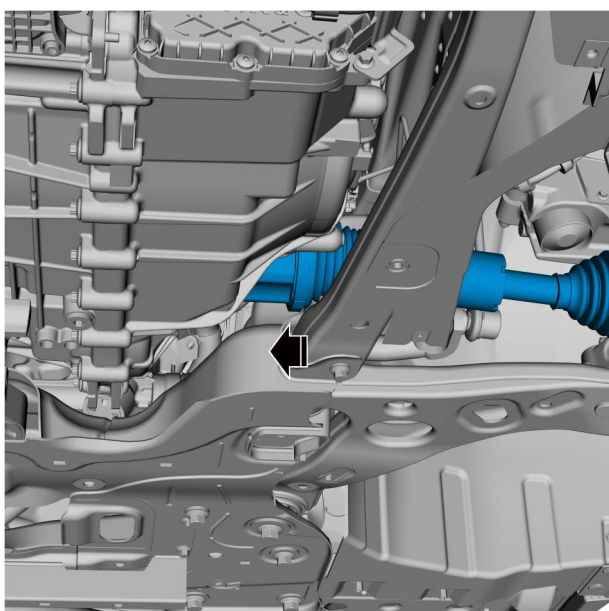
Caution

1. Do not interfere with the gasket with the end face step to avoid a warped condition after assembly (as shown).
2. Do not touch the adhesive surface with your hand, and push the horizontal spline shaft.
3. Take care to confirm the front and back sides of the gasket (front side: fiberglass side, back side: dark green fabric side).
4. Be sure to ensure that the gasket is secure and not loose or knocked before and during the half shaft recovery assembly.





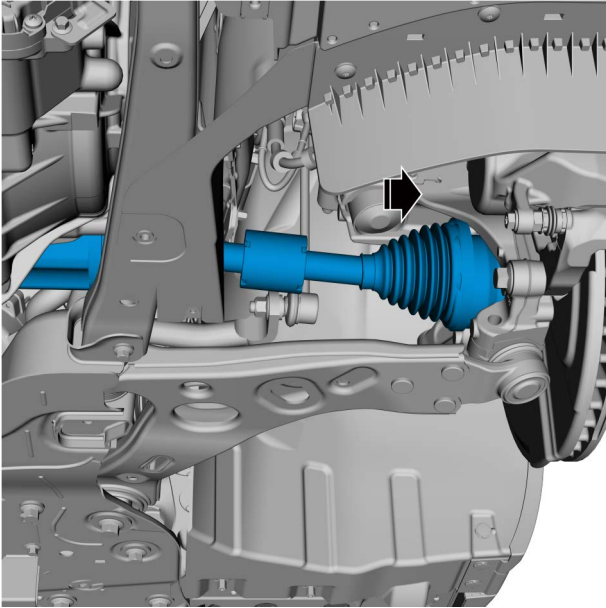
- 6 Install the new O-ring seal into the half shaft O-ring groove.



- 7 Install the left front constant velocity drive shaft to the transmission.

Caution

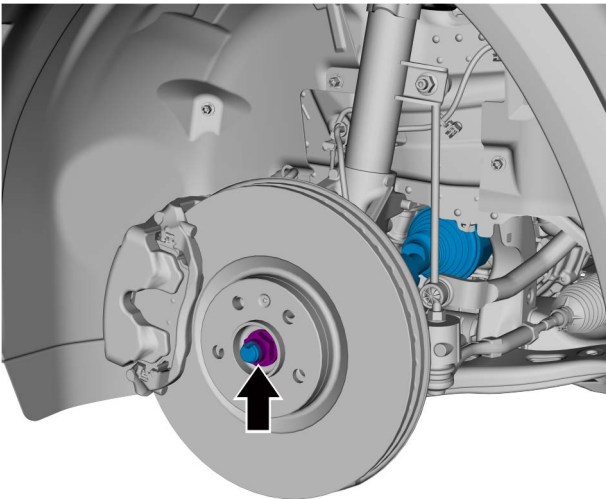
Do not damage the transmission oil seal.



- 8 Install the left front constant velocity drive shaft to the left front drive hub assembly.

Caution

Installation requires alignment of the spline to the spline groove.

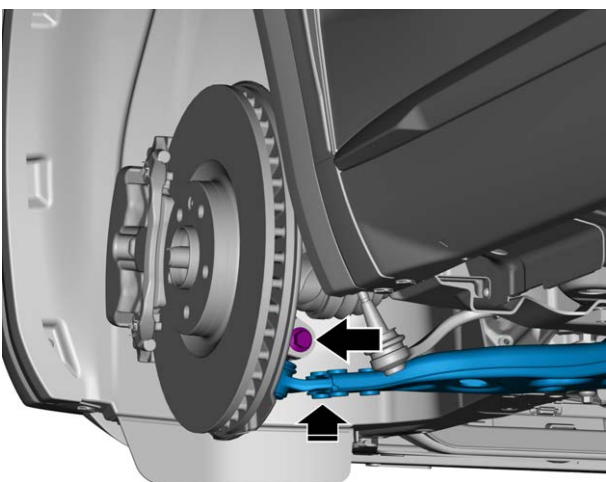


- 9 Tighten the fixing nut of the left front constant velocity drive shaft and the left front drive hub assembly.

Torque: 270N·m

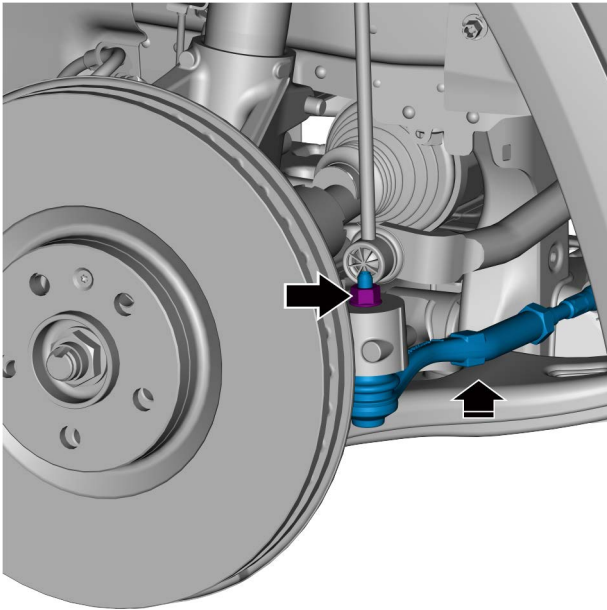
Caution

When installing the drive shaft left front drive hub assembly turning nut, an assistant is required to assist in applying the brake to prevent the left front drive hub assembly from turning.



- 10 Install the front suspension left lower control arm ball head onto the left front steering knuckle assembly and tighten the fixing bolt.

Torque: 250N·m



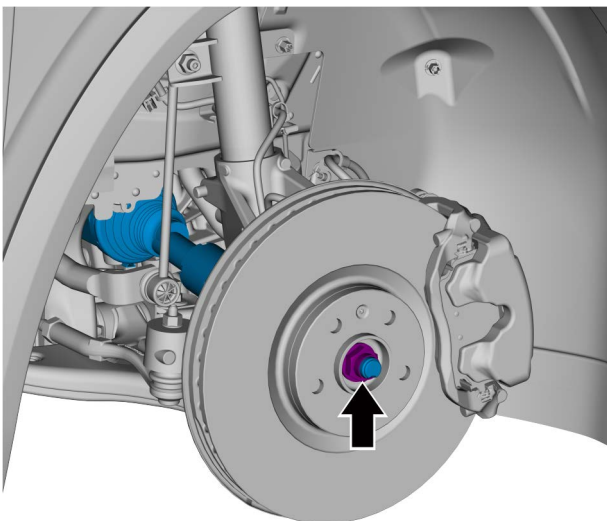
- 11 Install the steering cross tie bar with ball head on the left front steering knuckle assembly and tighten the fixing nut.
Torque: 120N·m

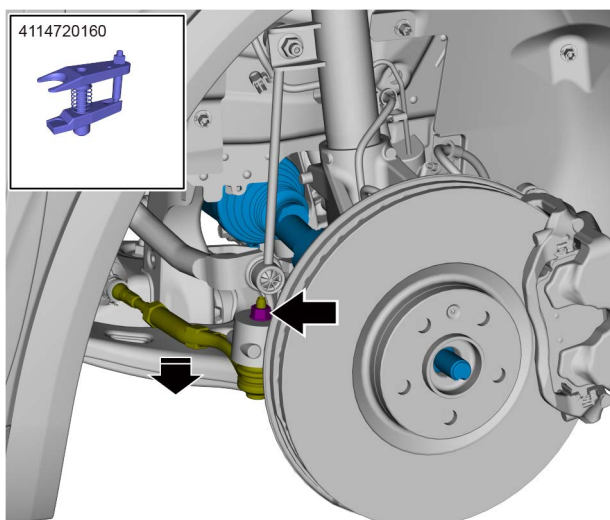
- 12 Install the bottom engine guard assembly.
- 13 Install the wheel.
- 14 Connect the negative cable of battery.

6.2.6.2 Replacement of the right front constant velocity drive shaft

Removal Procedure

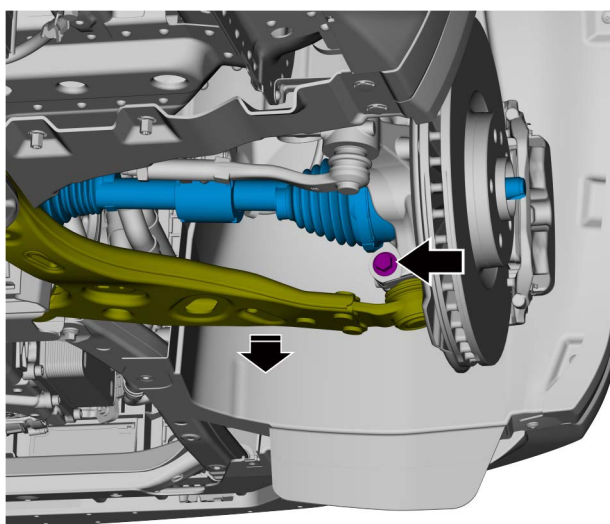
- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove wheel, see [Replacement of Wheel Assembly](#).
- 3 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 4 Remove the fixing nut that connects the right front constant velocity drive shaft assembly to the right front drive hub assembly.



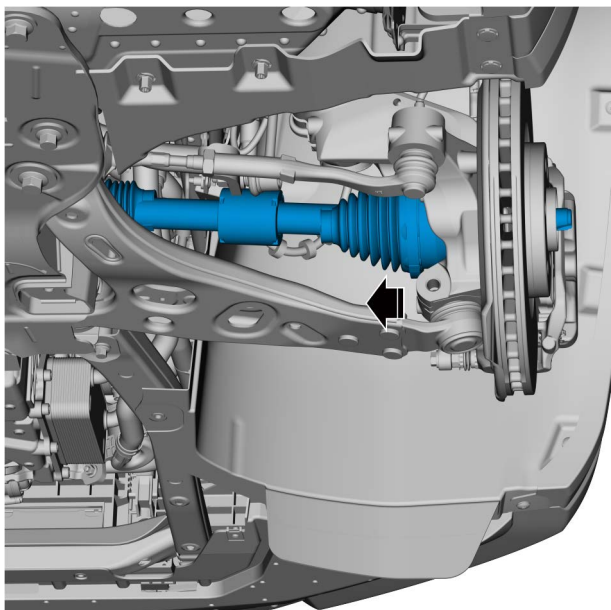


- 5 Remove the fixing nut of the steering right outer tie rod ball head, and disengage the steering gear right outer tie rod ball head from the right front steering knuckle assembly.

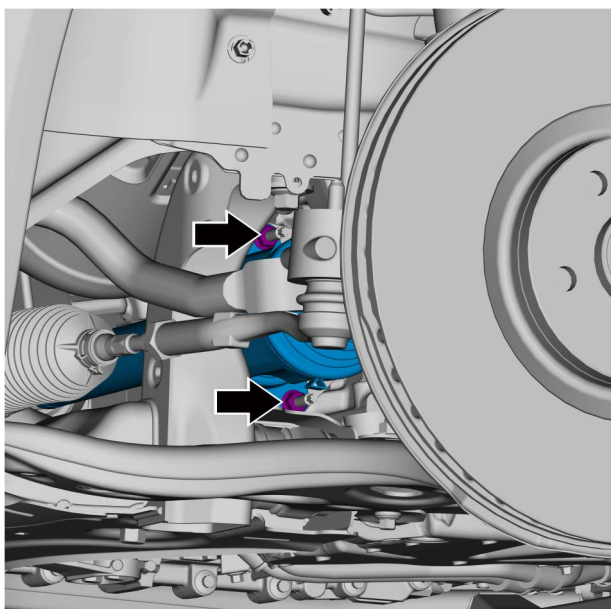
Special tool: 4114720160



- 6 Remove the fixing bolt of the front suspension right lower swing arm assembly and disconnect the front suspension right lower swing arm assembly from the right front steering knuckle assembly.



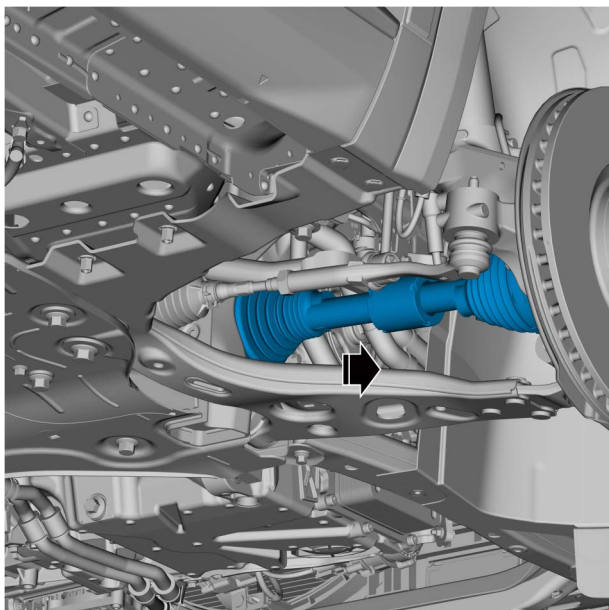
- 7 Disengage the right front constant velocity drive shaft from the right front drive hub assembly.



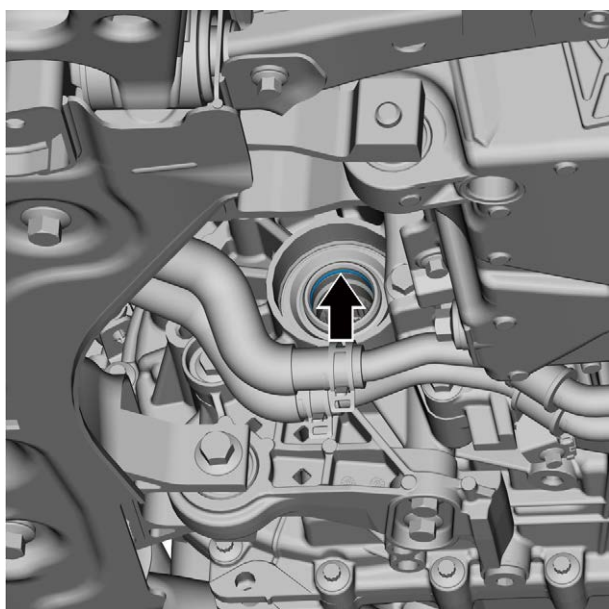
- 8 Remove the 2 fixing nuts that connect the right front constant velocity drive shaft assembly to the bracket.

Caution

Removal of the right front constant velocity drive shaft requires the assistance of another staff member. Pulling on the right front constant velocity drive shaft joint is prohibited.



- 9 Using a suitable tool to separate the right front constant velocity drive shaft from the transmission, withdraw the right front constant velocity drive shaft outward and remove.



- 10 Use the tool to pick out the O-ring slowly.

Caution

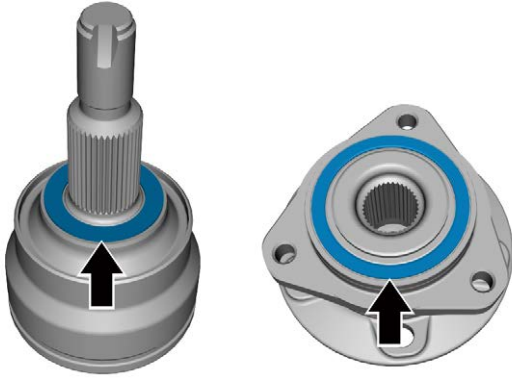
Do not scratch the inner wall of the half shaft gear.

Installation Procedure

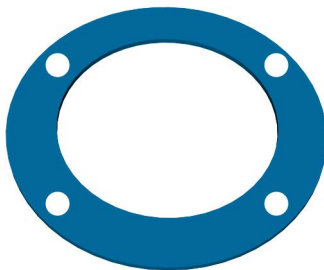
- 1 Check for dislodged composite gasket, if composite gasket is not dislodged and is securely affixed, it does not need to be replaced, otherwise composite gasket will need to be reinstalled.
- 2 Wipe clean the mating surface where the outer ball cage of the drive shaft mates with the hub bearing (make sure the surface is free of impurities and dry and free of moisture).

Caution

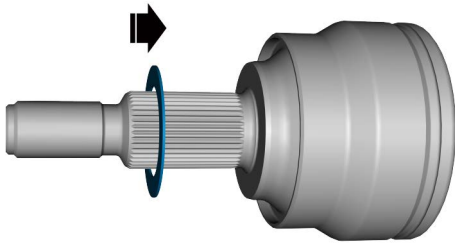
Ensure that the half shafts are parallel during disassembly and installation, and pay attention to the protection of the axle shafts, sheaths and other parts of the shaft to avoid bumps, scratches and secondary damage caused by the half shafts coming out.



- 3 Apply glue to the opposite side of the composite gasket (the side with the paint pen markings) as shown in the picture to the left.



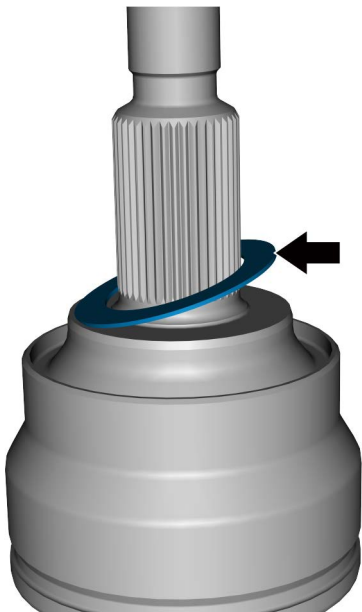
- 4 Push the adhesive side of the spacer concentrically down the spline to the drive shaft end face for adhesion.



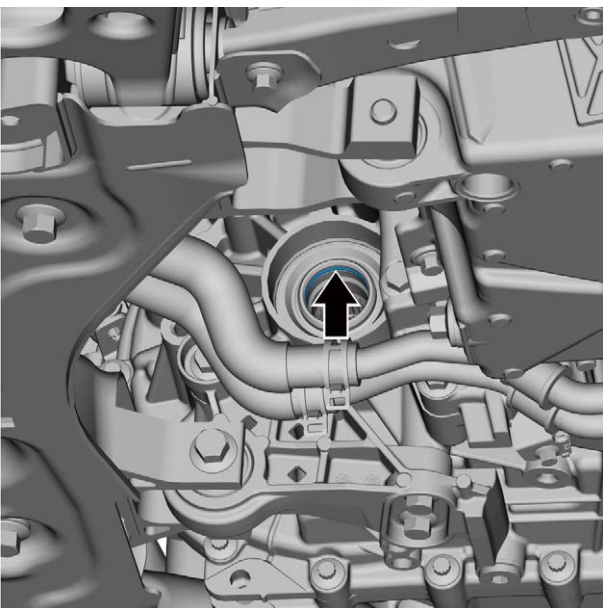
- 5 Hold it in a pressed condition for 5~10 seconds after pasting to make sure the gasket is firmly pasted.

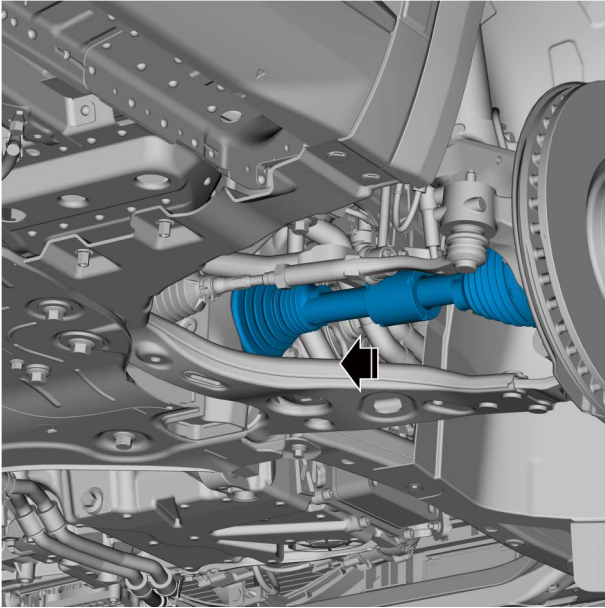
Caution

1. Do not interfere with the gasket with the end face step to avoid a warped condition after assembly (as shown).
2. Do not touch the adhesive surface with your hand, and push the horizontal spline shaft.
3. Take care to confirm the front and back sides of the gasket (front side: fiberglass side, back side: dark green fabric side).
4. Be sure to ensure that the gasket is secure and not loose or knocked before and during the half shaft recovery assembly.

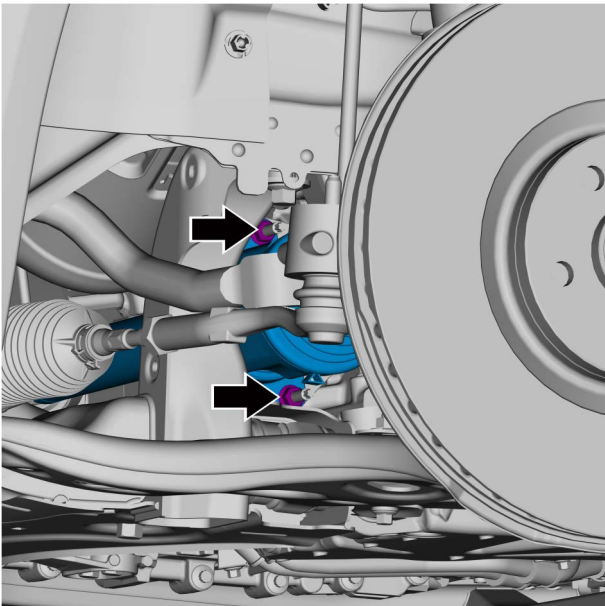


- 6 Install the new O-ring seal into the half shaft O-ring groove.

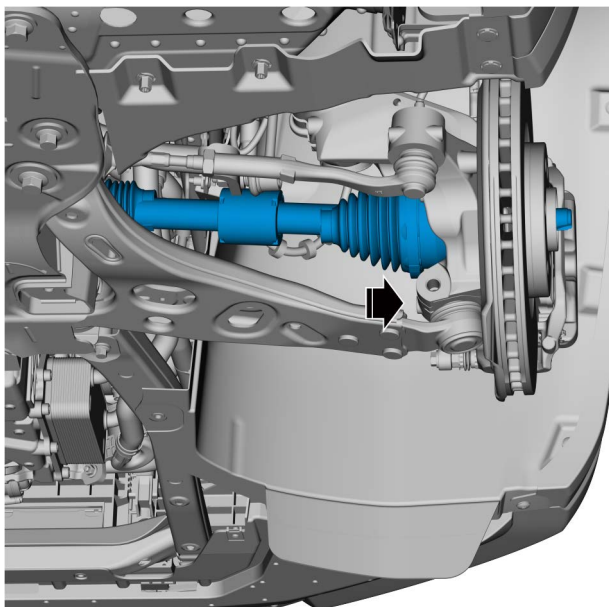




- 7 Install the right front constant velocity drive shaft to the transmission.



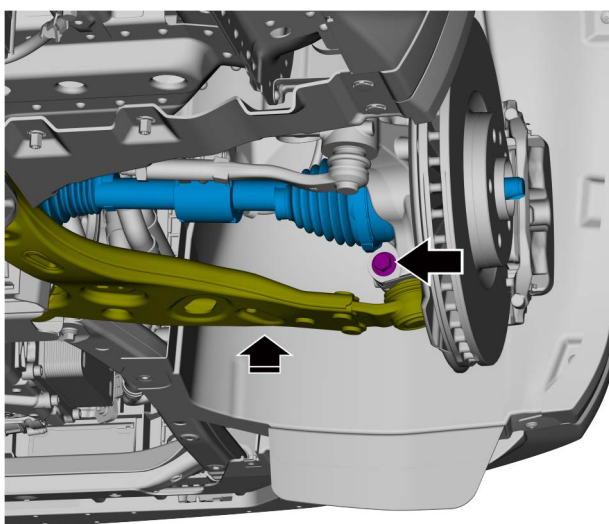
- 8 Install the 2 fixing nuts connecting the right front constant velocity drive shaft assembly and the bracket.
Torque: 30N·m



- 9 Install the right front constant velocity drive shaft to the right front drive hub assembly.

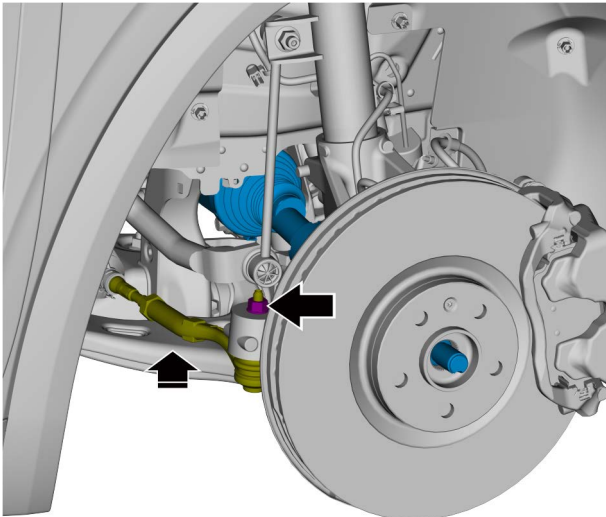
Caution

Installation requires alignment of the spline to the spline groove.



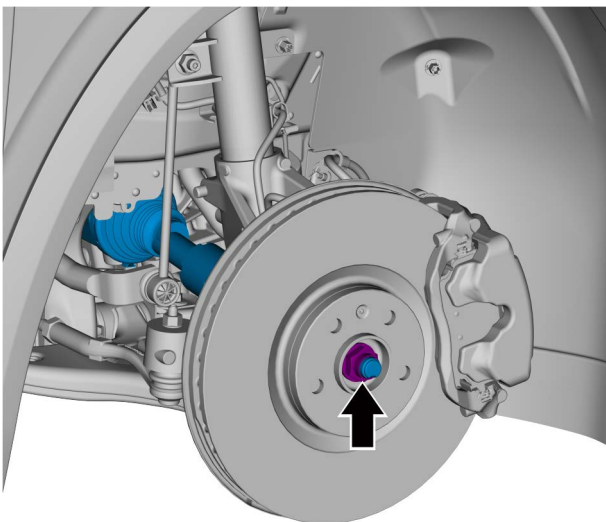
- 10 Install the front suspension right lower control arm on the right front steering knuckle assembly and tighten the fixing bolt.

Torque: 250N·m



- 11 Install the steering gear right outer tie rod ball head on the right front steering knuckle assembly and tighten the fixing nut.

Torque: 120N·m



- 12 Tighten the fixing nut connecting right front constant velocity drive shaft to the right front drive hub assembly.

Torque: 270N·m

Caution

When installing the constant velocity drive shaft right front drive hub assembly turning nut, an assistant is required to assist in applying the brakes to prevent the right front drive hub assembly from turning.

- 13 Install the bottom engine guard assembly.

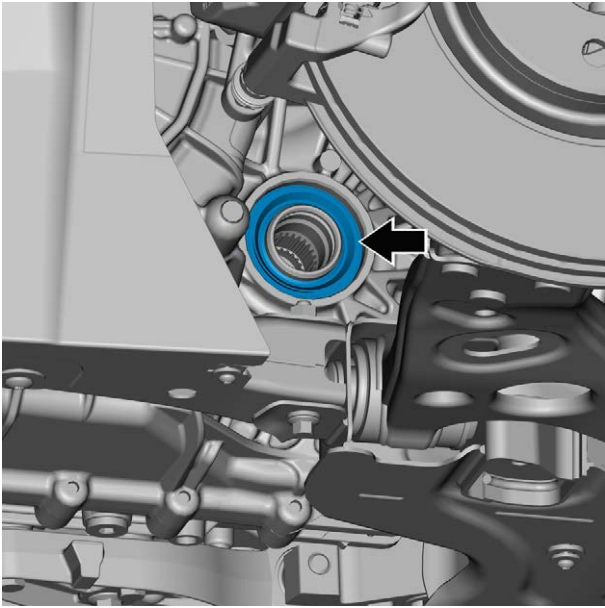
- 14 Install the wheel.

- 15 lower the vehicle.

6.2.6.3 Replacement of Left Differential Oil Cooler

Removal Procedure

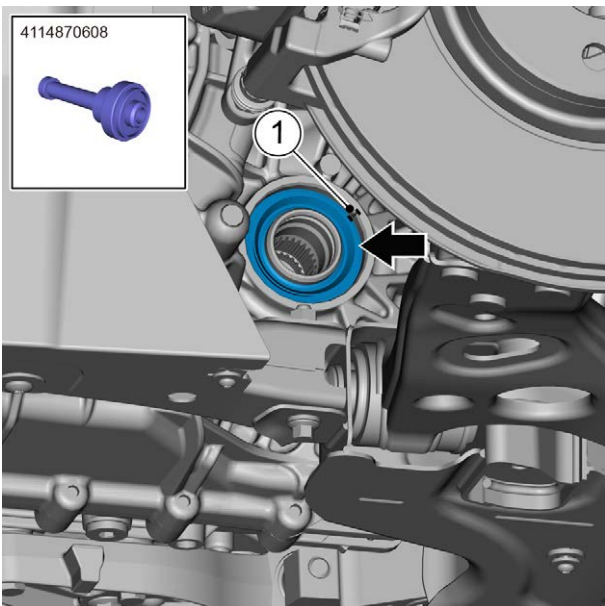
- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 3 Remove the front left wheel, see [Replacement of Wheel Assembly](#).
- 4 Drain the transmission fluid, see [Transmission Fluid Draining and Filling Procedure \(DHT Pro\)](#).



- 5 Remove the front left constant speed drive shaft, see [Replacement of Front Left Constant Speed Drive Shaft](#).
- 6 Remove the left differential oil seal.

Caution

Be careful not to damage the transmission case and differential case during destructive removal of the differential oil seal.



Installation Procedure

- 1 Slowly press the differential oil seal into the differential oil seal mounting holes in the housing using the special tooling.

Special tool: 4114870608

Caution

- Watch for pre-coated ester on sealing lips during assembly; do not wipe off pre-coated ester.
- The differential oil seal is assembled without oiling the differential oil seal outer ring.
- The axial 1 between the end face of the transmission differential oil seal and the datum plane of the oil seal mounting countersink on the housing needs to satisfy $7.5\text{mm} \pm 0.5\text{mm}$.

- 2 Install the front left constant velocity drive shaft.
- 3 Fill in transmission fluid.
- 4 Install the left front wheel.
- 5 Install the bottom engine guard assembly.
- 6 lower the vehicle.

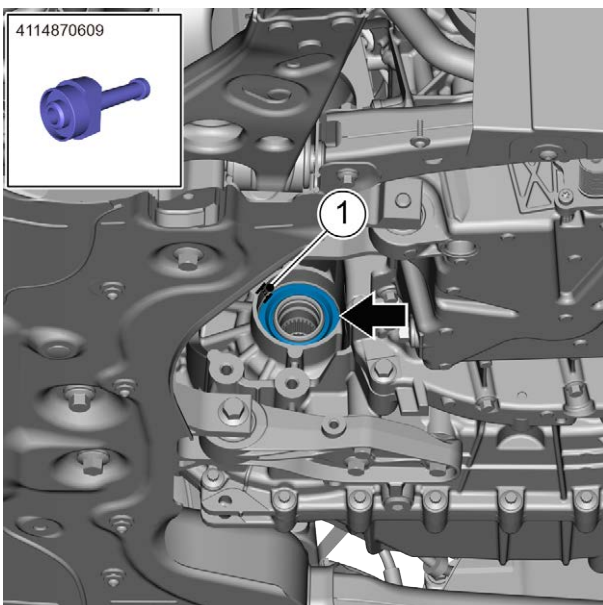
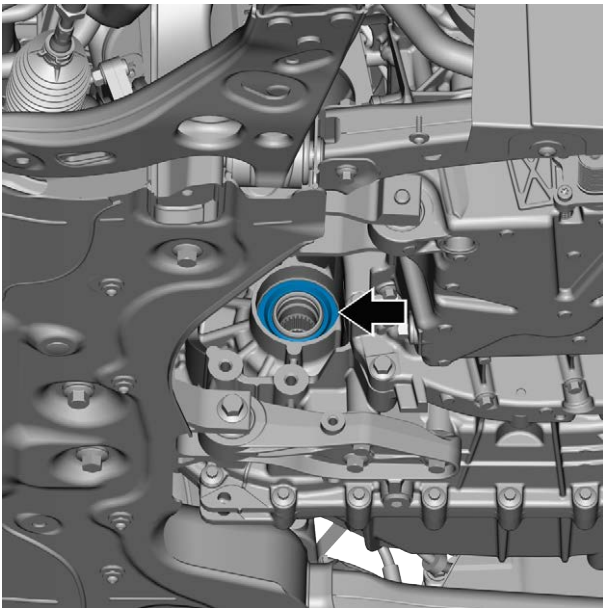
6.2.6.4 Replacement of Right Differential Oil Cooler

Removal Procedure

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 3 Remove the front right wheel, see [Replacement of Wheel Assembly](#).
- 4 Remove the front right constant speed drive shaft, see [Replacement of Front Right Constant Speed Drive Shaft](#).
- 5 Drain the transmission fluid, see [Transmission Fluid Draining and Filling Procedure \(DHT Pro\)](#).
- 6 Remove the right differential oil seal.

Caution

Be careful not to damage the transmission case and differential case during destructive removal of the differential oil seal.



Installation Procedure

- 1 Slowly press the differential oil seal into the right differential oil seal mounting hole in the housing with a special tool.

Special tool: 4114870609

Caution

- Watch for pre-coated ester on sealing lips during assembly; do not wipe off pre-coated ester.
- The differential oil seal is assembled without oiling the differential oil seal outer ring.
- The axial 1 between the end face of the transmission differential oil seal and the datum plane of the oil seal mounting countersink on the housing needs to satisfy $23\text{mm} \pm 0.5\text{mm}$.

- 2 Fill in transmission fluid.
- 3 Install the front right constant velocity drive shaft.

- 4 Install front right wheel.
- 5 Install the bottom engine guard assembly.
- 6 lower the vehicle.

Brake System

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7.1 Warnings and Cautions

7.1.1 Warnings and Cautions

7.1.1.1 Warnings and Cautions

Warning about handling VDDM Electronic Stability Control System components

Warning !

Some parts of the VDDM Electronic Stability Control System cannot be serviced individually. Attempts to remove or disconnect certain system components could result in personal injury or improper system operation; service only those parts that can be removed and installed with permission.

Warning about Brake Dust

Warning !

Avoid the following when servicing wheel brake components:

- a. Do not resharpen brake friction linings.
- b. Sandpaper must not be used to polish brake friction linings.
- c. Do not use any dry brush or compressed air to clean wheel brake components.

Some models or aftersales retrofit brake parts may contain fibers that can get mixed in with the dust. Inhalation of dust containing fibers can cause serious bodily injury. Use a damp cloth to clean any dust from the brake parts.

Warning about Brake Dust

Warning !

Brake fluid is composed of polyethylene glycol, which is highly hygroscopic and absorbs moisture. Do not use brake fluid that may be contaminated with water in an open container, as the use of unsuitable or contaminated brake fluid could result in system failure, loss of vehicle control and personal injury.

Warning about Brake Fluid Irritation

Warning !

Brake fluid is irritating to skin and eyes. The following measures should be taken in case of contact:

- a. Eye contact - Flush thoroughly with water.
- b. Skin contact - wash with soap and water.

Warning about Brake Line Replacement

Caution

When replacing the brake pipe, install and secure it carefully, making sure to use the correct fasteners. Otherwise damage to the brake pipe and the braking system may occur, resulting in personal injury.

Caution for Filling Brake System with Brake Fluid

Caution

When adding brake fluid to the brake master cylinder reservoir, use only brake fluid from a clean, sealed brake fluid container that complies with DOT 4. Failure to use the recommended brake fluid could result in contamination that could damage the rubber seals or rubber gaskets inside the hydraulic brake system components.

Caution for Brake Calipers

Caution

When removing the brake caliper, use a wire to hang up the caliper so as not to damage the brake pipe.

7.2 Front brake

7.2.1 Specification

7.2.1.1 Fastener specification

Fastener part	Model	Torque (N·m)
Brake disk to wheel hub bearing fixing screws	M6×16	8.5-11.5
Brake disk to drive hub assembly fixing screws	M6×16	8.5-11.5
Left front brake guard to left front steering knuckle assembly fixing bolt	M6×12	8.5-11.5
Left front brake caliper assembly to left front steering knuckle assembly fixing bolt	M14×50	170-230

7.2.1.2 Front Disk Brake Component Specifications

Application:	Part specification (mm)
Front Brake Disk Scrap Thickness	25
Thickness of front brake disk - new	28
Front Brake Lining Standard Thickness	12
Minimum thickness of front brake linings	3
Allowable end face runout of front brake disk	Old parts: end face runout ≥ 0.15 mm, then need to replace the brake disk (both sides); circumferential thickness difference ≥ 0.02 mm, replace the brake disk(both sides); new parts: face runout < 0.06 mm

7.2.2 Description and Operation

7.2.2.1 Instructions and operations

Components of the front disk brake system

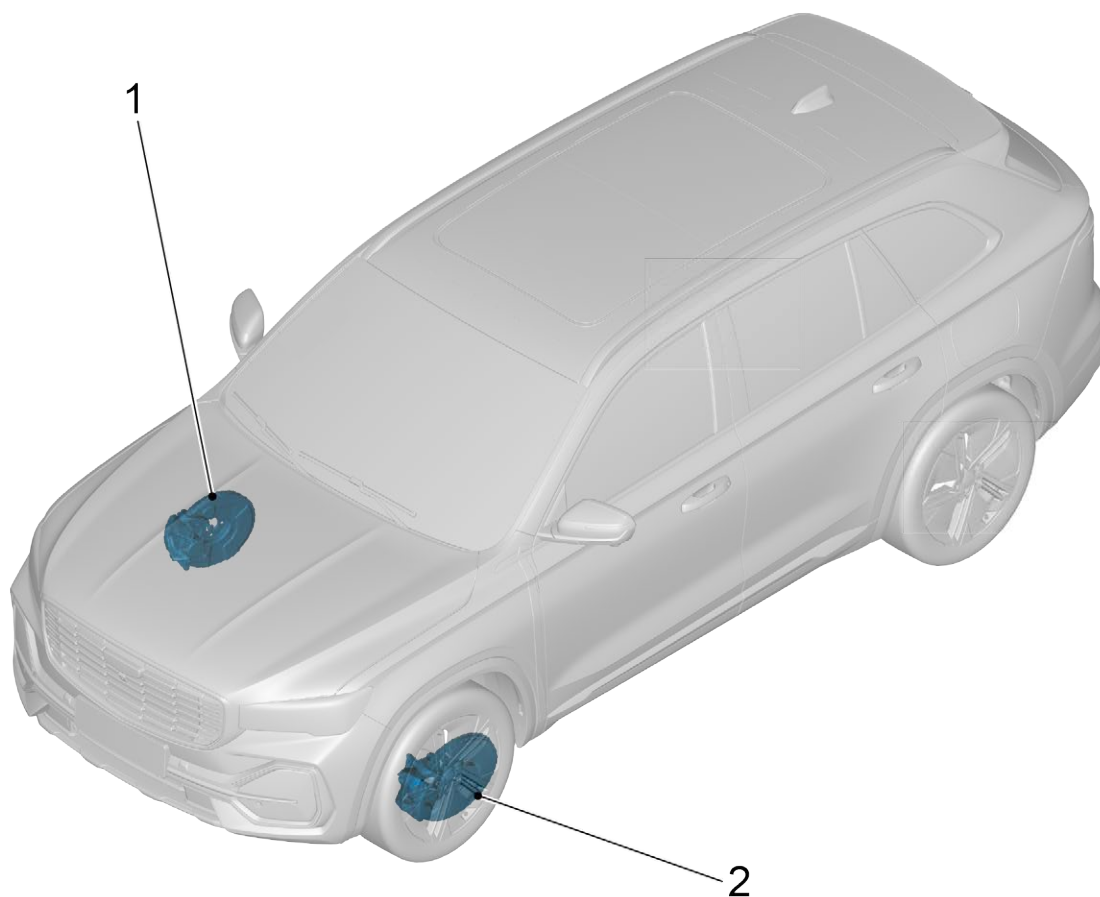
- Front brake with spring pad friction plate assembly: applies the mechanical output force from the hydraulic brake caliper to the friction surface of the brake disk.
- Front brake with spring pad friction plate assembly guide piece: located between the disk brake lining and the brake lining mounting bracket, it keeps the brake lining moving smoothly and eliminates noise.
- Brake Disk: Uses the mechanical output of the front brake with spring pad friction plate assembly on the friction surface of the brake disk to slow down the speed of the tires and the wheel assembly to apply the brakes to the vehicle.
- Brake Calipers: Receive fluid pressure from the brake master cylinder, convert the fluid pressure into mechanical output force acting on the inner brake lining; when the master cylinder is returned to the position, the brake caliper piston is automatically returned to the position.
- Brake caliper and front brake with spring pad friction plate assembly bracket: used to fix the front brake with spring pad friction plate assembly and brake caliper in place, and maintain the correct position with the hydraulic brake caliper, when the mechanical output force acts on the inner brake lining block, make the brake lining block sliding.
- Caliper Floating Pin: Used to mount the hydraulic brake caliper and fix the brake caliper in place, and maintain the correct mating position with the brake caliper bracket, so that the brake caliper slides relative to the brake lining block when a mechanical output force is applied.

Operation of the front disk brake system:

The mechanical output force from the hydraulic brake caliper piston acts on the inner brake lining, when the piston pushes outward on the inner brake lining, the brake caliper housing simultaneously pulls inward on the outer front brake with spring pad friction plate assembly so that the output force is evenly distributed, the front brake with spring pad friction plate assembly applies the output force to the friction surfaces on both sides of the brake disk to slow down the rotational speed of the tires and the wheel assembly. The proper functioning of the front brake with spring pad friction plate assembly and brake caliper floating pins is important for the even distribution of braking force.

7.2.3 Part position

7.2.3.1 Part position

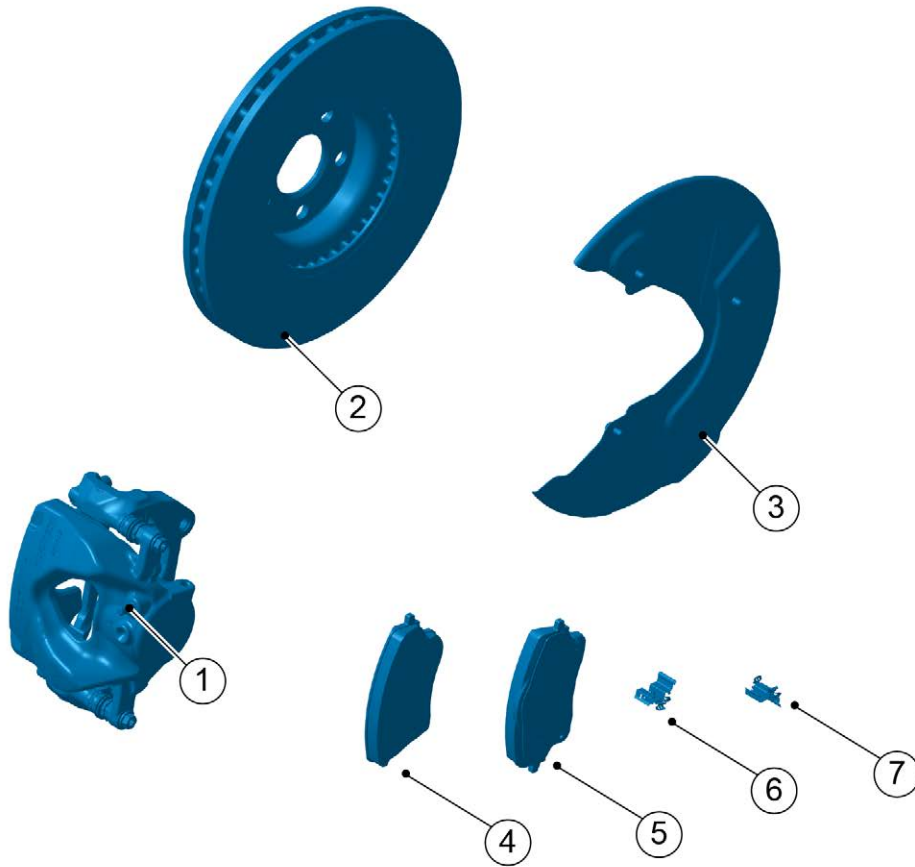


1. Right Front Brake Assembly

2. Left Front Brake Assembly

7.2.4 Breakdown drawing

7.2.4.1 Breakdown drawing



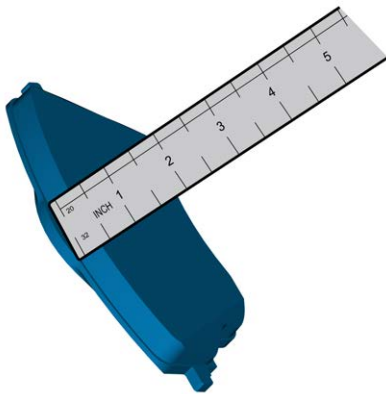
1. Front Brake Caliper Assembly
2. Front Brake Disk
3. Front Brake Guard
4. Front brake outer friction block

5. Front brake inner friction block
6. Return spring
7. Return spring

7.2.5 Diagnostic information and procedure

7.2.5.1 Brake Lining Inspection

1. Inspect the brake linings periodically, measure the friction material and replace the brake linings if they are out of specification.
2. If replacement is required, disk brake linings must be replaced as a set.
3. Check the friction surface of the disk brake linings for cracks, breaks or damage.



Front brake linings

Standard thickness: 12 mm

Minimum thickness: 2 mm

Rear brake linings

Standard thickness: 11 mm

Minimum thickness: 2 mm

7.2.5.2 Brake Caliper Inspection

1. Inspect the brake caliper housing for cracks, severe wear and damage and replace the brake caliper if any of these conditions occur.
2. Inspect the brake caliper piston dust cover seals for cracked, broken, chipped, deteriorated and not properly seated in the brake caliper body, if any of these conditions occurs, replace the brake caliper.
3. Check for brake fluid leakage around the brake caliper piston dust cover seal and on the disk brake linings and replace the brake caliper if there are signs of brake fluid leakage.
4. Check that the brake caliper piston enters the brake caliper cylinder smoothly and has complete travel, the movement of the brake caliper piston in the brake caliper cylinder should be smooth and even, if the brake caliper piston is stuck or has difficulty reaching the bottom, the brake caliper needs to be replaced.

7.2.5.3 Inspection of brake lining guide pieces

- Inspect the brake lining guide pieces for missing, severely corroded, bent mounting tabs.
- If any of these conditions are found, the disk brake lining guide pieces need to be replaced. Ensure that the brake linings slide smoothly on the disk brake lining guide pieces without blockage.

7.2.5.4 Inspection of the brake caliper floating pin

Check the brake caliper floating pin for the following conditions:

- stuck
- seized
- Cracked or broken bushings
- Missing bushing

If any of these conditions are found, the brake caliper and dust cover seals need to be replaced.

7.2.5.5 Brake Disk Surface and Wear Inspection

Clean the brake disk friction surface with industrial alcohol or a permitted brake cleaner equivalent.

Inspect the brake disk friction surface for the following conditions:

- Severe rust and/or pitting
- Minor surface rust
- Cracking and/or burnishing
- Severe discoloration and bluing
- Deep scratches on the brake disk friction surface

If one or more of the above conditions are present on the friction surface of the brake disk, the brake disk will require surface dressing or replacement.

If the problem of brake judder is caused by rusting of the brake disks due to prolonged parking of the vehicle, it can be solved by applying a brake disk treatment to the disk surface to bring the difference in thickness of the brake disk to within 0.008 mm.

Caution

After surface dressing or replacement of the brake disk, the brake linings should also be replaced.

7.2.5.6 Brake Disk Thickness Measurement

1. Clean the friction surface of the brake disk with industrial alcohol or similar brake cleaner.
2. Evenly select 6 measurement points on the end face of one side of the brake disk, and measure the thickness of the upper and lower end faces of the brake disk with an OD micrometer at 6 points, resulting in 6 circumferential thickness measurements, and the distance between the micrometer and the outer edge of the brake disk must be equal each time the measurement is made, and take the brake surface at a distance of 13 mm from the outer edge of the position.
3. 6 measured thickness minimum, if the brake disk thickness exceeds the end-of-life specifications, the brake disk needs to be replaced.
4. The maximum value of the six measured thicknesses minus the minimum value is the circumferential thickness difference of the brake disk. If the circumferential thickness difference of the brake disk is out of tolerance ($\geq 0.02\text{mm}$), replace the brake disks on both sides.

Caution

After surface dressing or replacement of the brake disk, the brake linings should also be replaced.

7.2.5.7 Measurement of end face runout after brake disk assembly

Caution

Rust or dirt should be removed from the brake disk, otherwise it may result in excessive runout of the end face after assembly of the brake disk.

1. Check that there is no torque degradation in the surrounding parts of the brake, control arm, shock absorber and stabilizer bar.

2. After cleaning the floating rust on the surface of the brake disk, the transmission is in N gear and rotate the brake disk by hand for 3-5 turns.
3. Place the measuring head of the dial gauge in contact with the friction surface of the brake disk at 90° and at a distance of about 13 mm from the outer edge of the brake disk.
4. Rotate the brake disk until the dial gauge reading is minimized, then zero the dial gauge.
5. Rotate the brake disk until the reading on the dial gauge reaches maximum.
6. Mark and record the amount of end face.
7. Compare the amount of rear end face runout of the assembled brake disk to the specification value.

7.2.6 Removal and Installation

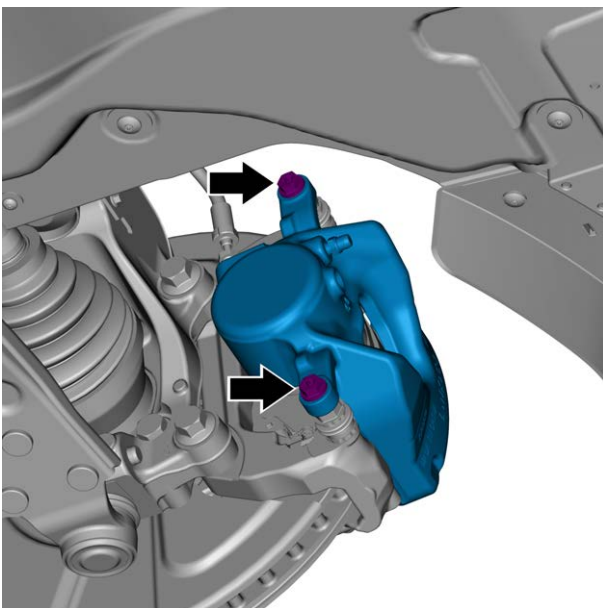
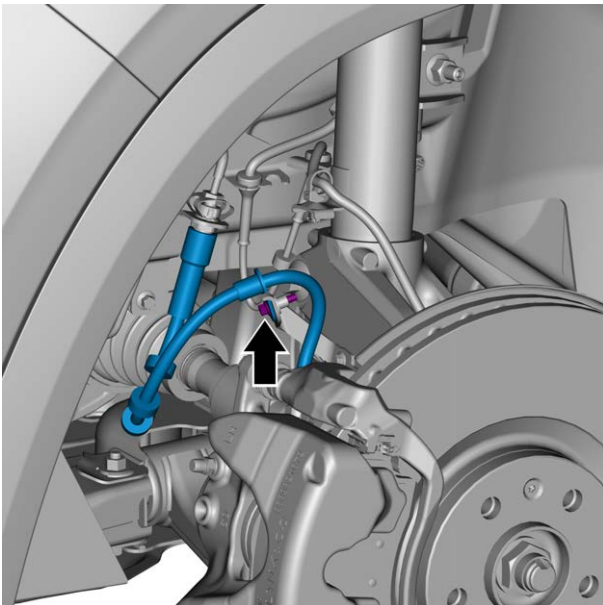
7.2.6.1 Left Front Brake Friction Plate Assembly Replacement

Removal Procedure

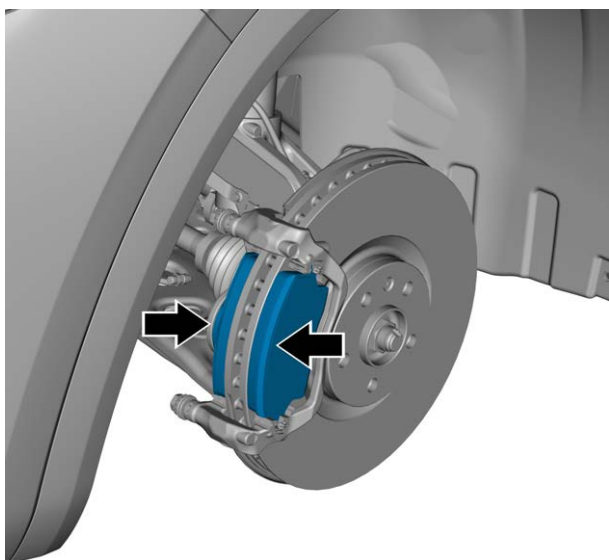
Caution

The left and right front brake friction plate assemblies are removed and installed in a similar manner.

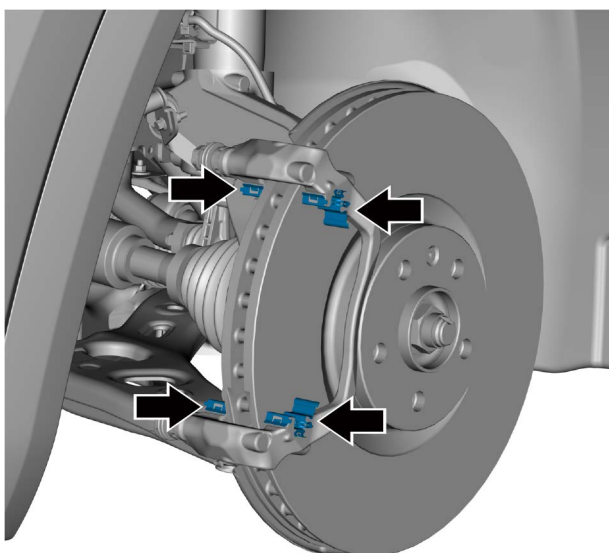
- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove wheel, see [Replacement of Wheel Assembly](#).
- 3 Remove the center connection point of the front brake hose. Failure to remove this point will result in deformation of the brake hose connection caliper joint.



- 4 Remove the 2 fixing bolts that hold the brake caliper in place, remove the left front brake caliper body and hang it safely in a suitable position while avoiding pulling on the brake hose.

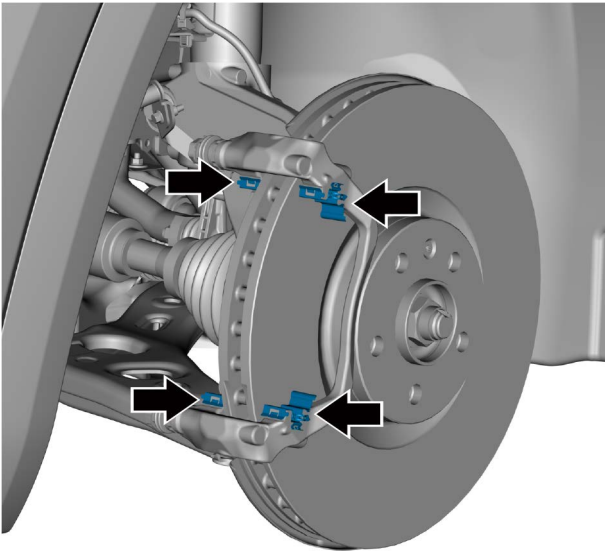


- 5 Remove the left front brake friction plate assembly from the front brake caliper bracket.



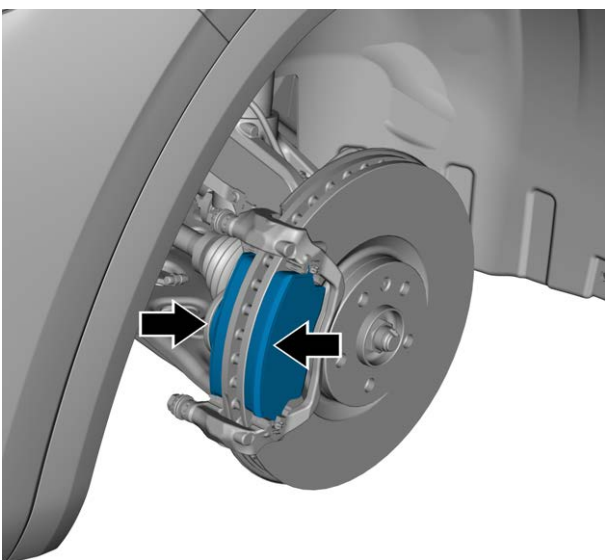
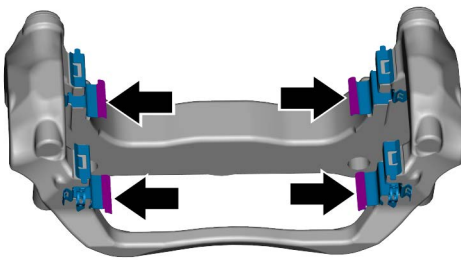
- 6 Remove the return spring.

Installation Procedure



- 1 Install the return spring.

- 2 Before installing the left front brake friction plate assembly, it is necessary to grease the spring pad support backing plate location.



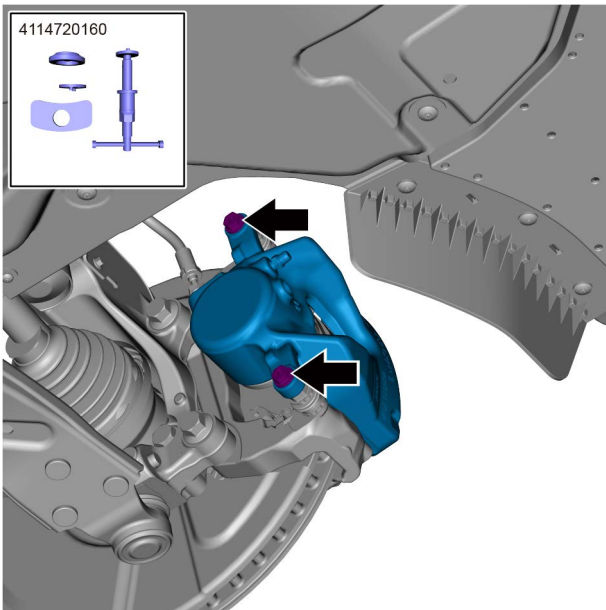
- 3 Install the left front brake friction plate assembly to the brake caliper bracket.

Caution

When installing the left front brake friction plate assembly, the lining block with wear-indicating metal is installed on the inner side.

If the friction plate muffler is rubberized, remove the plastic protective film.

Avoid plastic deformation of the spring pads during installation and avoid interference between the spring pads and the brake disk



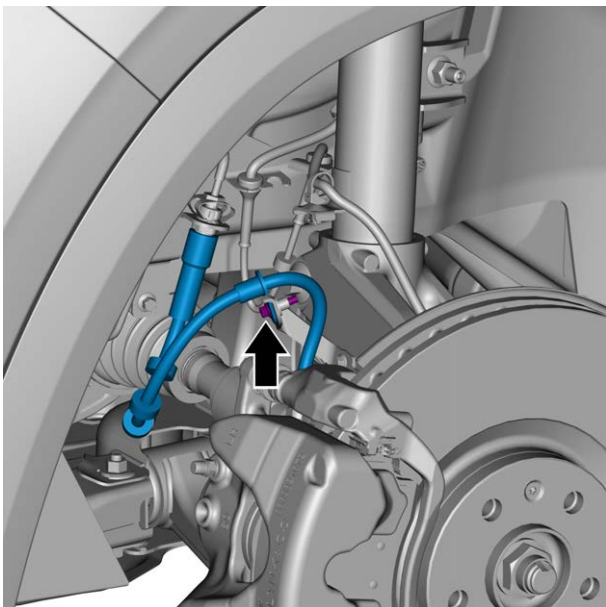
- 4 Use the piston reset tool to reset the brake caliper piston.
Special tool: 4114720160

Caution

Be careful not to damage the piston dust seal when pulling down on the brake caliper and installing the lower fixing bolt.

Avoid the piston dust cover being damaged, detached or caught between the piston and the friction plate during installation, if there is a slight curl of the dust cover, it should be turned back to return to its normal condition.

- 5 Install the brake caliper and tighten the bolts.
Torque: 34.5N·m



- 6 Tighten the front brake hose center connection point.
Torque: 7N·m

- 7 After installation, press the brake pedal several times.
- 8 Check the brake fluid level and keep the level at the MAX line.

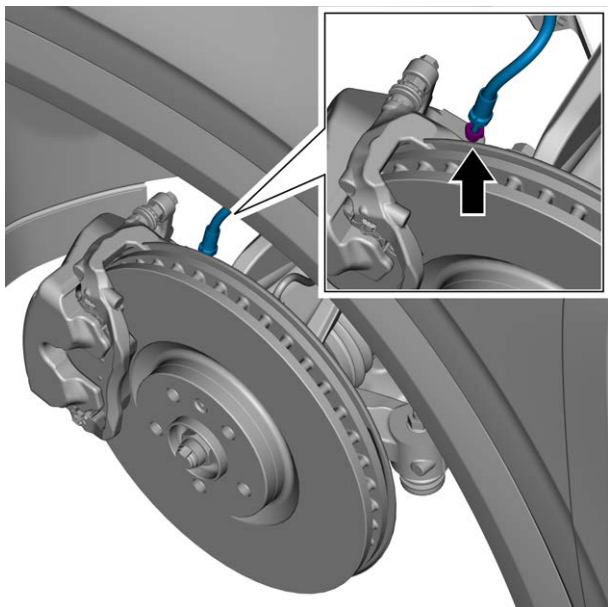
7.2.6.2 Left front brake caliper assembly replacement

Removal Procedure

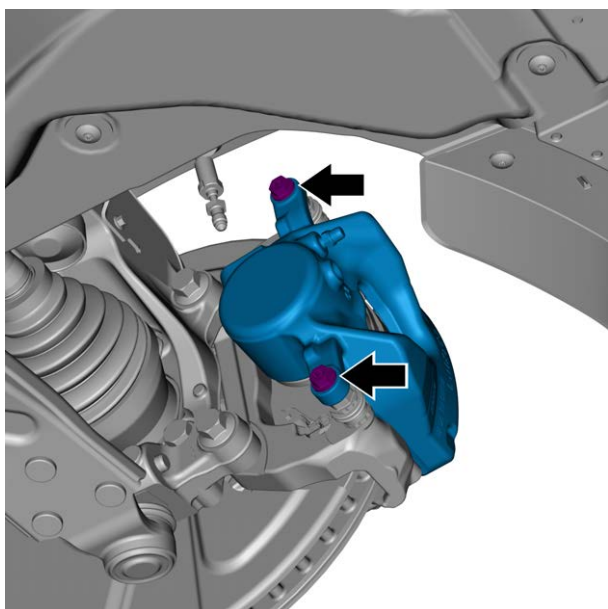
Caution

The left and right front brake caliper assemblies are removed and installed in a similar manner.

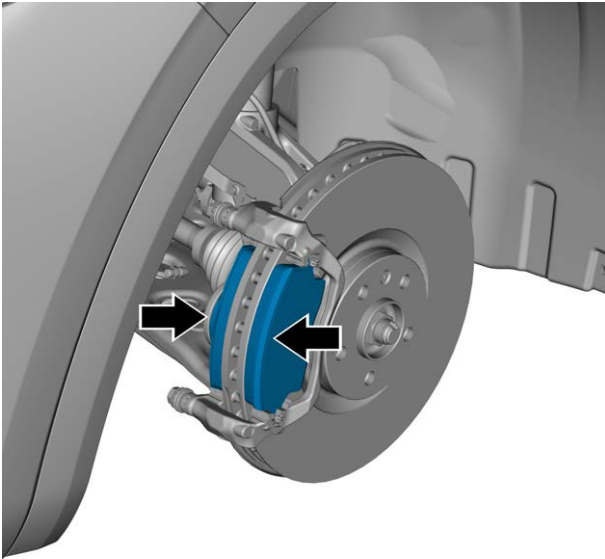
- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove wheel, see [Replacement of Wheel Assembly](#).
- 3 Drain brake fluid.



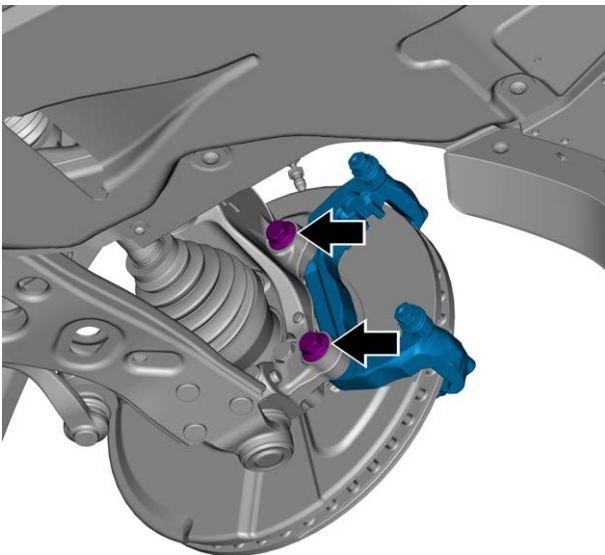
- 4 Remove the brake caliper brake hose inlet bolt and plug the brake caliper inlet and brake hose to prevent loss or contamination of brake fluid.



- 5 Remove the 2 fixing bolts from the brake caliper and remove the brake caliper.

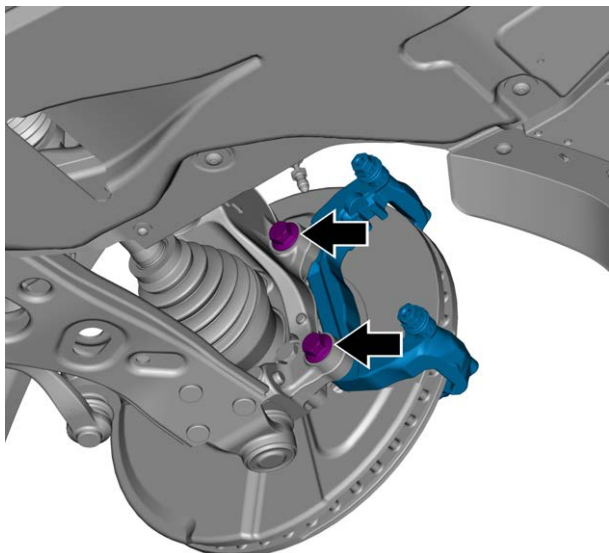


6 Remove brake friction plate assembly.



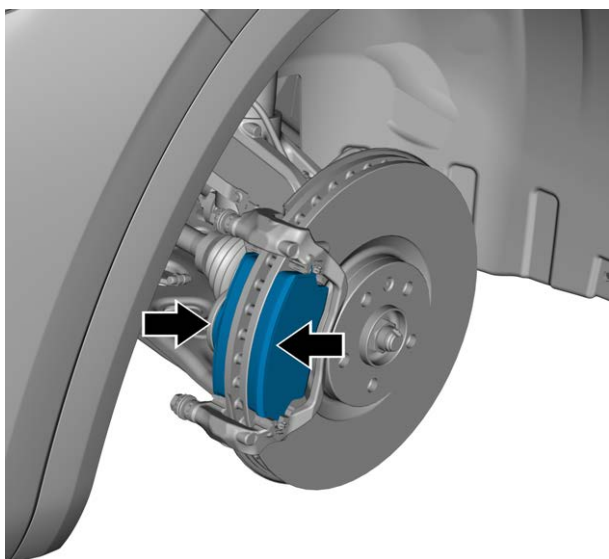
7 Remove the 2 fixing bolts of the brake caliper bracket and take out the brake caliper bracket.

Installation Procedure



- 1 Install the brake caliper bracket and tighten the 2 fixing bolts of the brake caliper bracket.

Torque: 200N·m

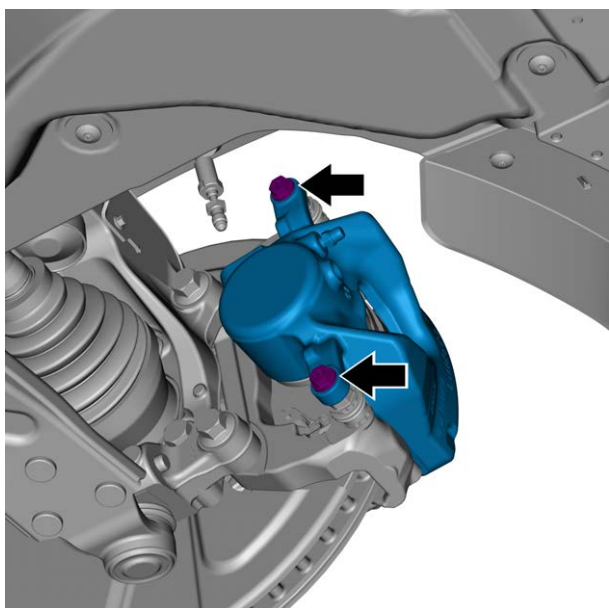


- 2 Install the brake friction plate assembly.

Caution

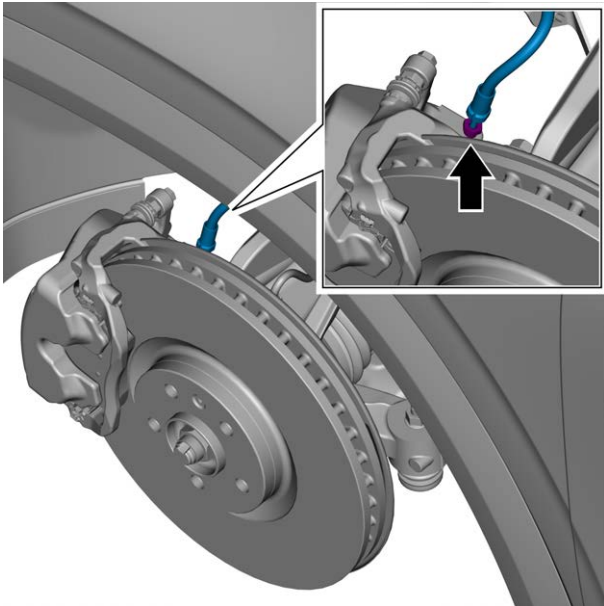
Install the brake linings with the wear tip metal installed on the inside.

Note: Before installing the brake linings, it is necessary to grease the spring pad support backing plate location.



- 3 Install and tighten the 2 fixing bolts of the brake caliper.

Torque: 34.5N·m



- 4 Install the left front brake hose fitting bolt.

Torque: 17N·m

Caution

When assembling the left front brake hose, the fitting is pre-tightened by hand, then hold the brake hose by hand and use an open-end wrench to apply tightening torque to prevent the brake hose from heeling over.

- 5 Install the front wheels.
- 6 Lower the vehicle.
- 7 Add clean brake fluid to the master cylinder reservoir to a position flush with the reservoir max line.
- 8 Drain air from the brake system, see [Brake Fluid Drain and Fill Procedure](#).
- 9 Check for brake fluid leaks.

7.2.6.3 Replacement of Left Front Brake Disk

Removal Procedure

Caution

The left and right front brake disks are removed and installed in a similar manner.

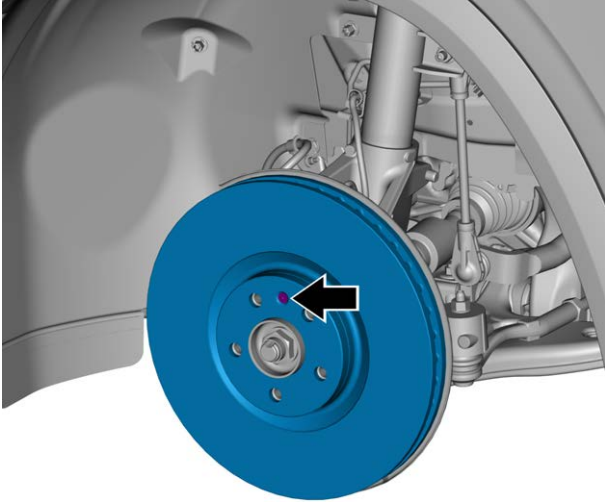
- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove wheel, see [Replacement of Wheel Assembly](#).
- 3 Remove the left front brake with spring pad friction plate assembly, see [Replacement of Front Brake with Spring Pad Friction Plate Assembly](#).

- 4 Remove front brake caliper assembly, see [Replacement of Left Front Caliper Assembly](#).

Caution

Remove the brake caliper, there is no need to remove the brake caliper brake hose, a wire should be used to suspend the brake caliper to avoid damage to the brake hose.

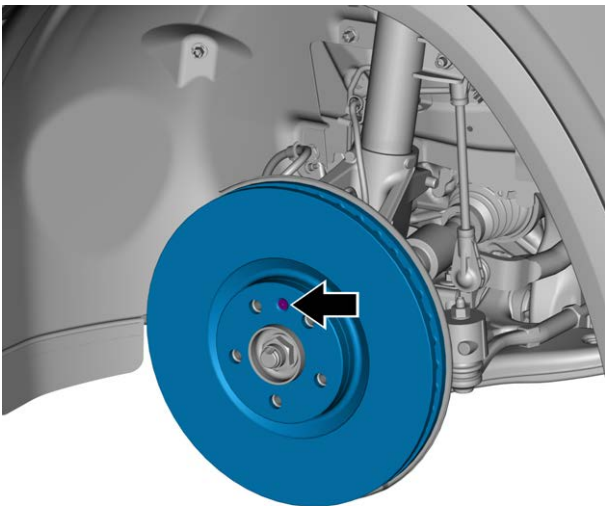
- 5 Remove the fixing bolts of the front brake disk and take off the left front brake disk.



Installation Procedure

- 1 Install the left front brake disk and tighten the fixing bolts of the left front brake disk.

Torque: 10N·m

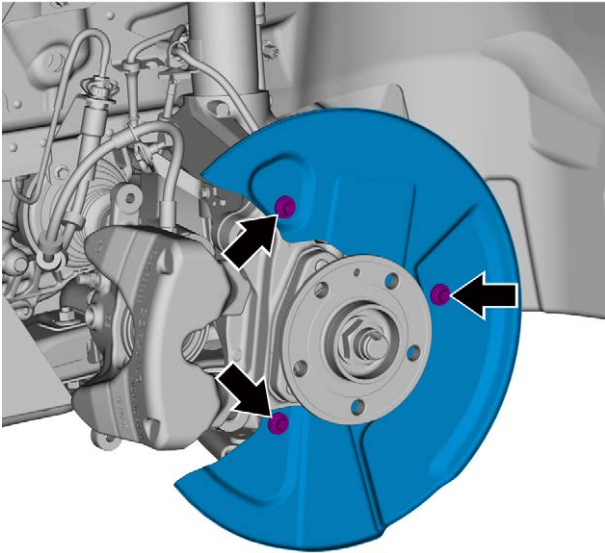


- 2 Install the front brake caliper assembly.
- 3 Install the brake friction plate assembly.
- 4 Install the front wheels.
- 5 Lower the vehicle.

7.2.6.4 Replacement of Left front brake guard

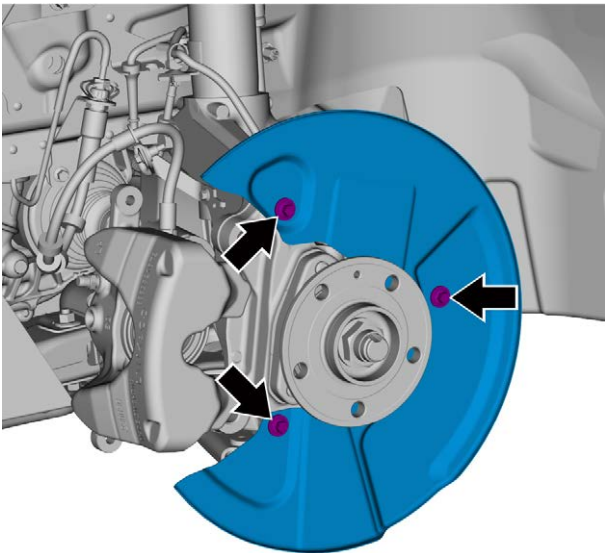
Removal Procedure

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove wheel, see [Replacement of Wheel Assembly](#).
- 3 Remove the left front caliper assembly, see [Replacement of Left Front Caliper Assembly](#).
- 4 Remove the left front brake disc, see [Replacement of Left Front Brake Disc](#).
- 5 Remove the brake guard by removing the 3 fixing bolts of the brake guard.



Installation Procedure

- 1 Install and tighten the brake guard 3 fixing bolts.
Torque: 10N·m



- 2 Install the front brake disk.
- 3 Install the brake friction plate assembly.
- 4 Install the front brake caliper assembly.

- 5 Install the front wheels.
- 6 Lower the vehicle.

7.3 Rear brake

7.3.1 Specification

7.3.1.1 Fastener specification

Fastener part	Model	Torque (N·m)
Fixing bolt connecting left rear fender to left rear steering knuckle assembly	M6×12	8.5-11.5
Fixing bolt connecting rear caliper to steering knuckle	M12×50	95-125
Fixing bolt connecting rear brake disk and rear wheel hub bearing	M6×16	8.5-11.5
Rear wheel brake dust cover and rear steering knuckle	M6×12	8.5-11.5

7.3.1.2 Rear Disk Brake Component Specifications

Application:	Part specification (mm)
Rear Brake Disk Scrap Thickness	9
Rear Brake Disk Thickness - New	12
Rear Brake Lining Standard Thickness	11
Minimum rear brake lining thickness	3
Allowable end face runout of rear brake disk	Old parts: end face runout ≥ 0.15 mm, then need to replace the brake disk (both sides); circumferential thickness difference ≥ 0.02 mm, replace the brake disk(both sides); new parts: face runout < 0.06 mm

7.3.2 Description and Operation

7.3.2.1 Instructions and operations

Components of the Rear Disk Brake System

– Brake with spring pad friction plate assembly: The brake with spring pad friction plate assembly applies the mechanical output force from the hydraulic brake caliper to the friction surface of the brake disk. The spring pads are located between the disk brake linings and the brake lining mounting bracket to keep the brake linings moving smoothly and eliminate noise.

– Brake Disk: The mechanical output force of the disk brake lining on the friction surface of the brake disk is used to slow down the speed of the tires and the wheel assembly to brake the vehicle.

– Brake caliper with EPB assembly: accepts the liquid pressure from the brake master cylinder, converts the liquid pressure into mechanical output force acting on the inner brake lining block; when the master cylinder returns to the position, the brake caliper piston automatically returns to the position, in which the brake caliper integrates the EPB motor of the electronic parking brake, which is able to realize the electronic parking by the parking brake switch control.

– Brake caliper and brake lining bracket: for fixing the disk brake lining and brake caliper in place, and keeping the correct fit position with the hydraulic brake caliper, making the brake lining slide when the mechanical output force acts on the brake lining.

– Caliper Floating Pin: Used to mount the hydraulic brake caliper and fix the brake caliper in place, and maintain the correct mating position with the brake caliper bracket, so that the brake caliper slides relative to the brake lining block when a mechanical output force is applied.

Operation of the rear disk brake system:

Mechanical output force from the hydraulic brake caliper piston acts on the inner brake lining, when the piston pushes outward on the inner brake lining, the brake caliper housing pulls inward on the outer brake lining at the same time so that the output force is evenly distributed, the brake lining acts on the friction surface on both sides of the brake disk to slow down the speed of the tires and the wheel assembly. The proper functioning of the brake lining guide pieces and brake caliper floating pins is important for the even distribution of braking force.

Operation of EPB release under power failure:

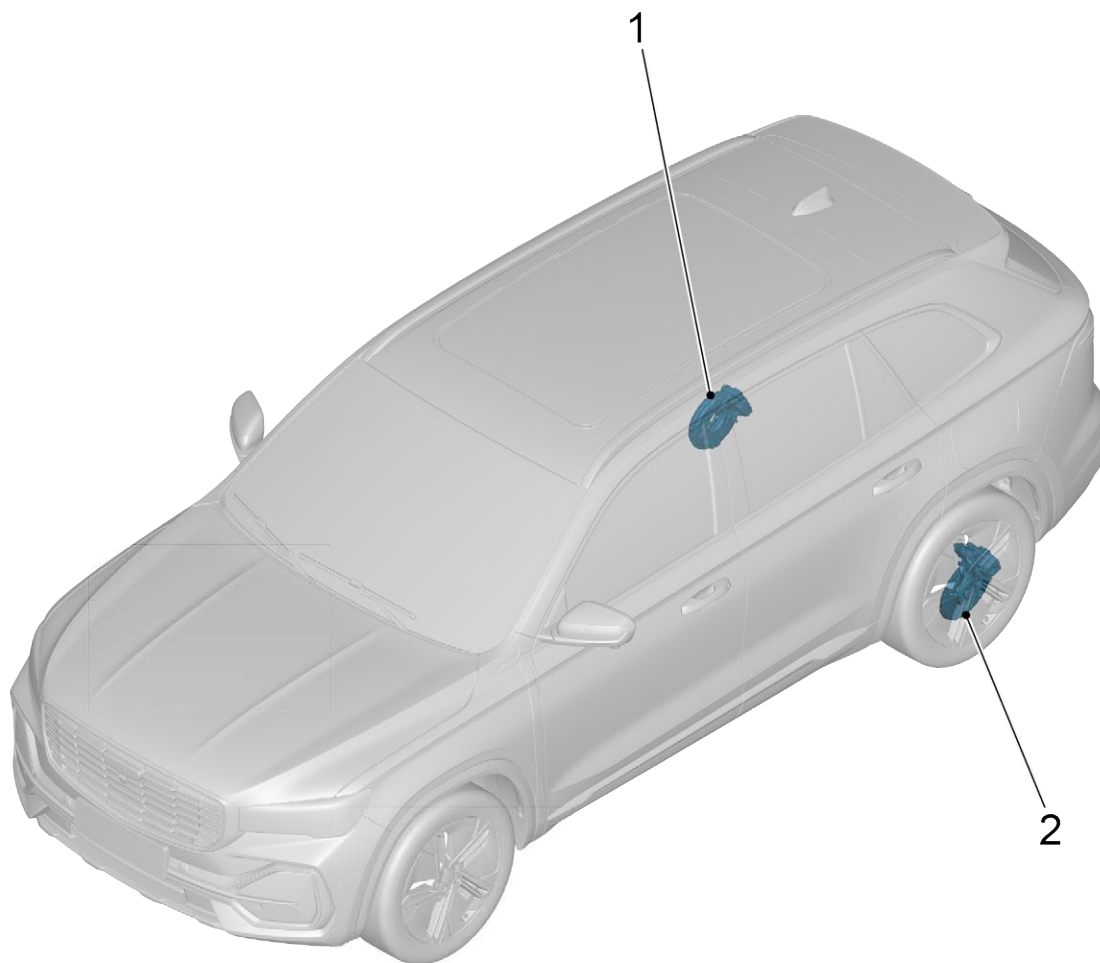
In the event of a power failure, the parking brake switch cannot control the parking brake release function, so how to release the EPB in the event of a power failure is as follows:

- a. Remove the EPB motor from the brake caliper.
- b. Open the rear cover plate of the EPB motor and use a special wrench to rotate the push rod inside the actuator motor to release the brake caliper.

- c. After completing the release operation and while in the energized state, perform a reset operation on the EPB brake caliper using a diagnostic instrument.

7.3.3 Part position

7.3.3.1 Part position

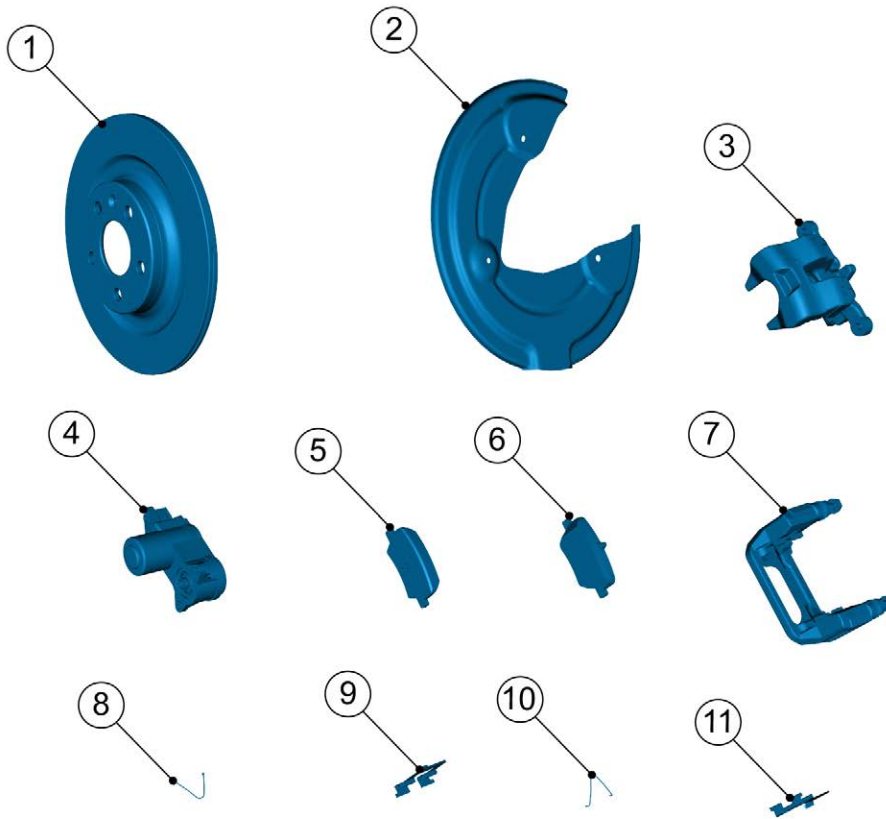


1. Right Front Brake Assembly
2. Right Rear Brake Assembly

3. Left Rear Brake Assembly
4. Left Front Brake Assembly

7.3.4 Breakdown drawing

7.3.4.1 Breakdown drawing



- | | |
|---|-------------------------------|
| 1. Rear brake disk | 7. Rear brake caliper bracket |
| 2. Rear wheel brake protective cover | 8. Figure-of-eight spring |
| 3. Left rear brake caliper housing | 9. Brake block circlip |
| 4. Brake caliper motor (parking brake) unit | 10. Figure-of-eight spring |
| 5. Rear brake outer friction block | 11. Brake block circlip |
| 6. Rear brake inner friction block | |

7.3.5 Diagnostic information and procedure

7.3.5.1 Brake Lining Inspection

For rear brake lining inspection, see [Front Brake Lining Inspection](#)

7.3.5.2 EPB release operation instructions

Warning !

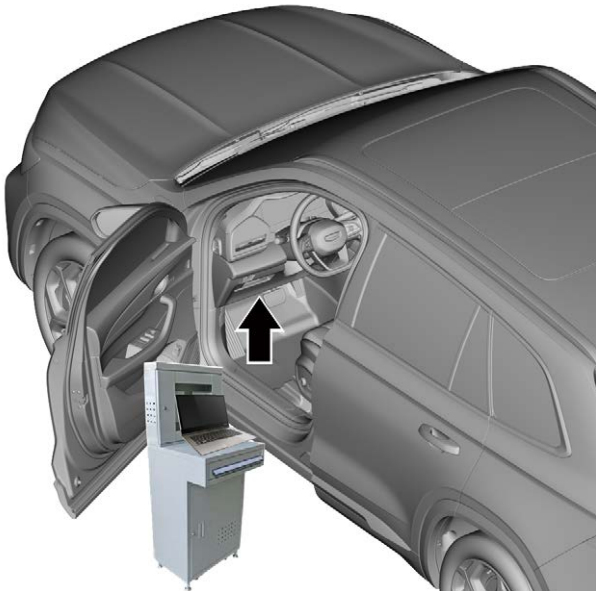
When releasing the EPB, the vehicle will lose the park function, to avoid vehicle damage, serious personal injury or death, do not perform this operation on roads with gradient.

When the EPB must be released after replacement of the brake system parts or under special circumstances, see the following 2 operation methods:

1. Manual Operation

- Release: Press and hold the EPB button all the way before the ignition is turned off, while turning off the ignition switch and releasing the EPB button.
- EPB reset: Pull up parking brake switch when the vehicle is stationary.

2. Operation using the diagnostic program



Release:

1. Connect the diagnostic instrument.
2. Operate start switch to bring the power mode to ON.
3. Operate the diagnostic instrument to enter the EPB system and release the parking brake.
4. Operate start switch to bring the power mode to OFF.

EPB reset:

1. Operate start switch to bring the power mode to ON.
2. Using a diagnostic tool, reset the replacement EPB and clear the fault codes at the same time.
3. Operate start switch to bring the power mode to OFF.

7.3.6 Removal and Installation

7.3.6.1 Replacement of left rear friction plate assembly

Removal Procedure

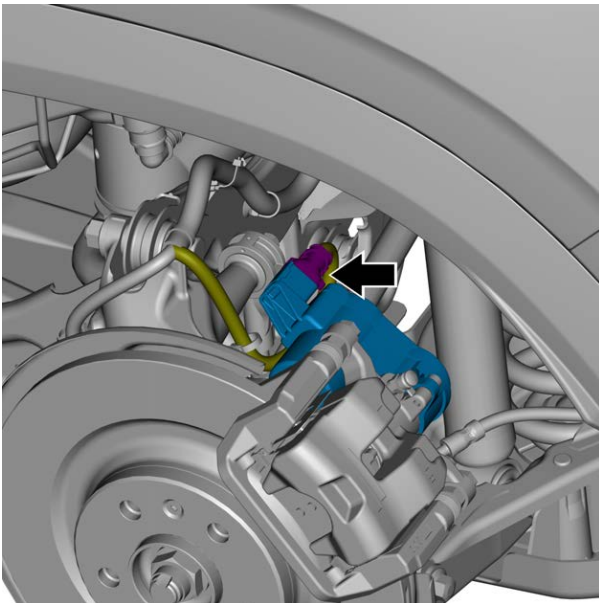
Warning !

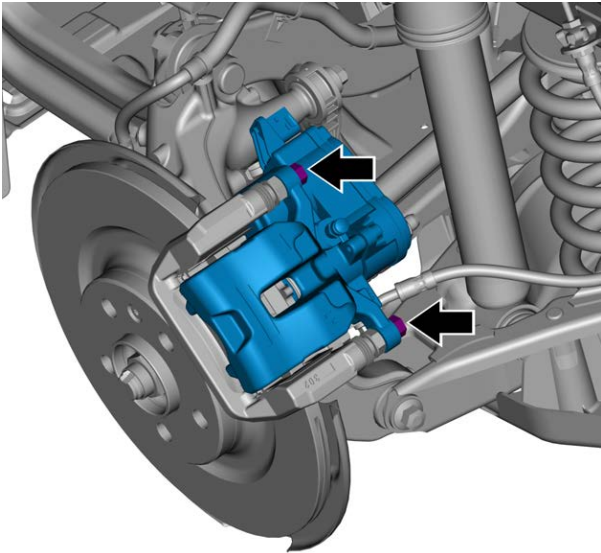
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

Caution

The left and right rear friction plate assemblies are removed and installed in a similar manner.

- 1 Release the brake caliper motor (parking brake), see [EPB release operation instructions](#).
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 4 Remove wheel, see [Replacement of Wheel Assembly](#).
- 5 Disconnect the connector of the brake caliper motor (parking brake) harness.

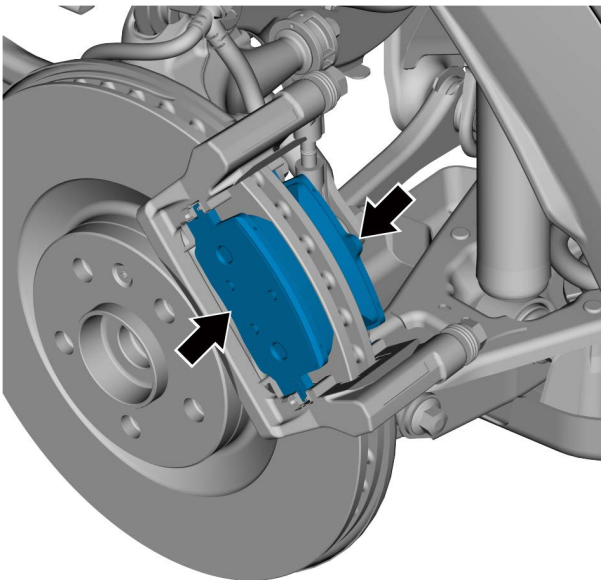




- 6 Remove the 2 fixing bolts from the brake caliper. Once the brake caliper body is removed, hang it securely in place and avoid pulling on the brake hose.

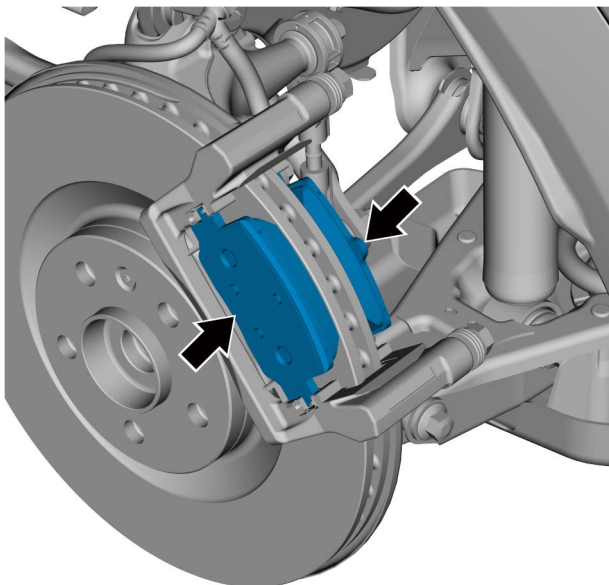
Caution

When removing the bolts, use an open-end wrench to secure the inner nut to prevent synchronized rotation.

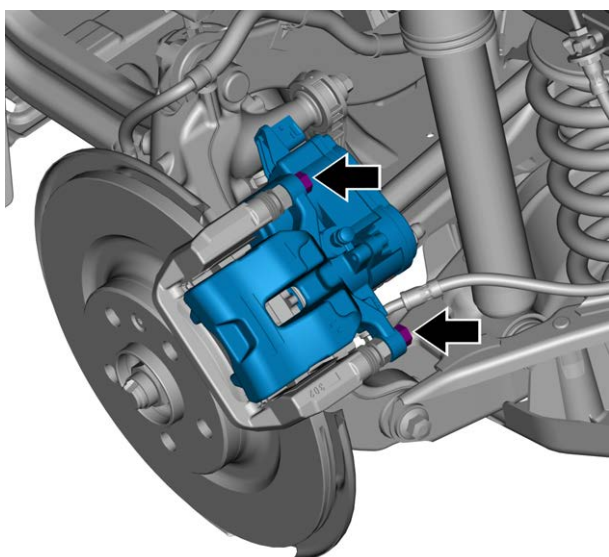


- 7 Remove the left rear friction plate assembly.

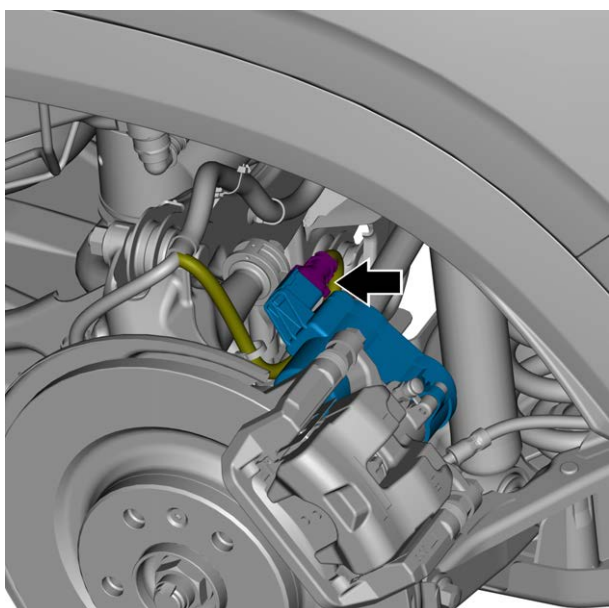
Installation Procedure



- 1 Install the left rear friction plate assembly to the brake caliper bracket.



- 2 Install the brake caliper and tighten the 2 fixing bolts.
Torque: 40N·m



- 3 Connect the harness connector of the brake caliper motor (parking brake).

- 4 Install the wheel.
- 5 Lower the vehicle.
- 6 Check that the brake fluid is at the MAX position. If it is not at that position, add brake fluid.
- 7 Connect the negative cable of battery.
- 8 Reset the brake caliper motor (parking brake).

7.3.6.2 Replacement of the left rear brake caliper body with EPB assembly

Removal Procedure

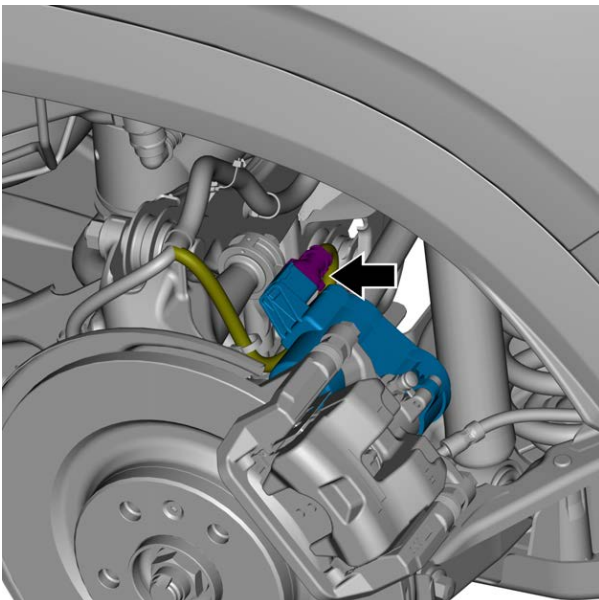
Warning !

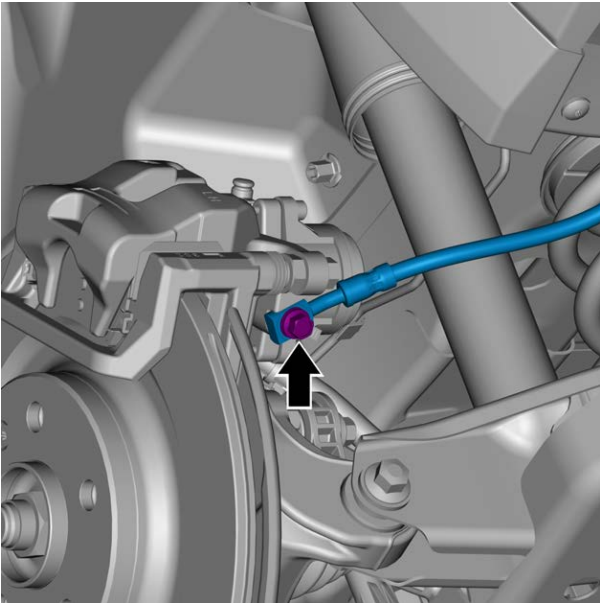
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

Caution

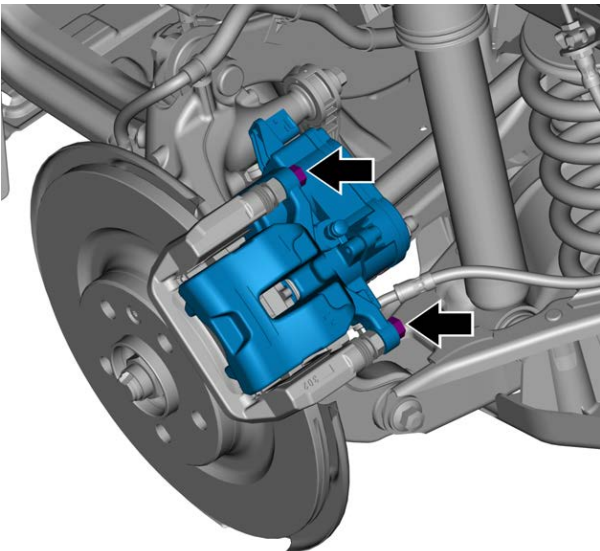
The left and right rear brake caliper body with EPB assemblies are removed and installed in a similar manner.

- 1 Release EPB motor, see [EPB Release Operating Instructions](#).
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 4 Remove wheel, see [Replacement of Wheel Assembly](#).
- 5 Disconnect the brake caliper motor (parking brake) harness connector.

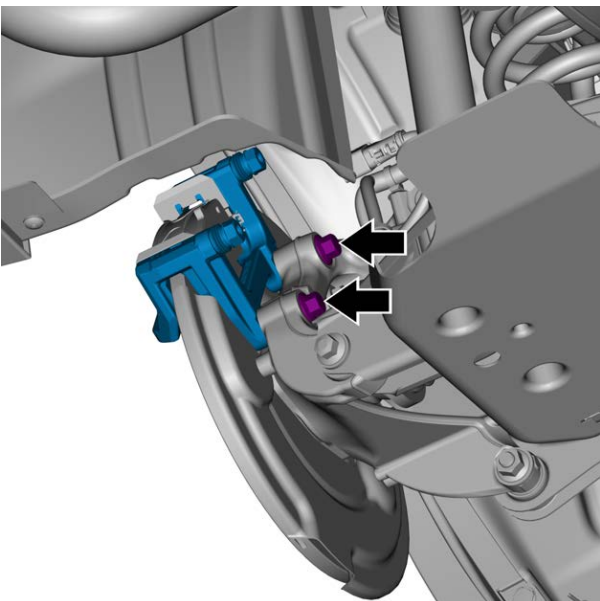




- 6 Remove the left rear brake caliper body with EPB assembly brake hose inlet bolt and plug the left rear brake caliper body with EPB assembly inlet and brake hose to prevent loss or contamination of brake fluid.

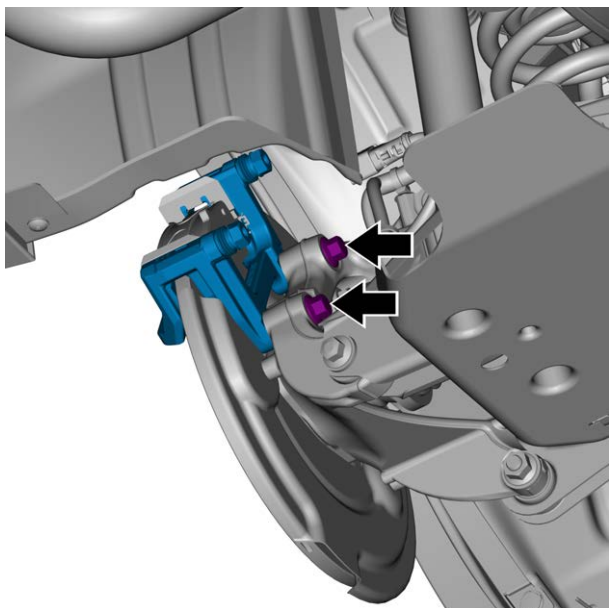


- 7 Remove the 2 fixing bolts of the left rear brake caliper body with EPB assembly and take off the left rear brake caliper body with EPB assembly.

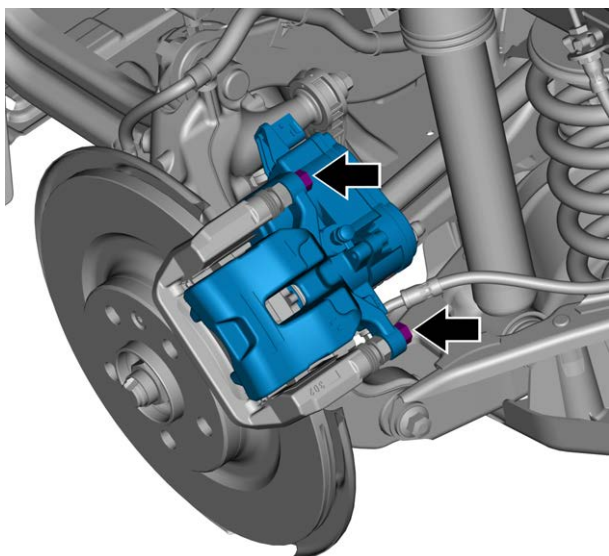


- 8 Remove the 2 fixing bolts of the brake caliper bracket and take out the rear brake caliper bracket.

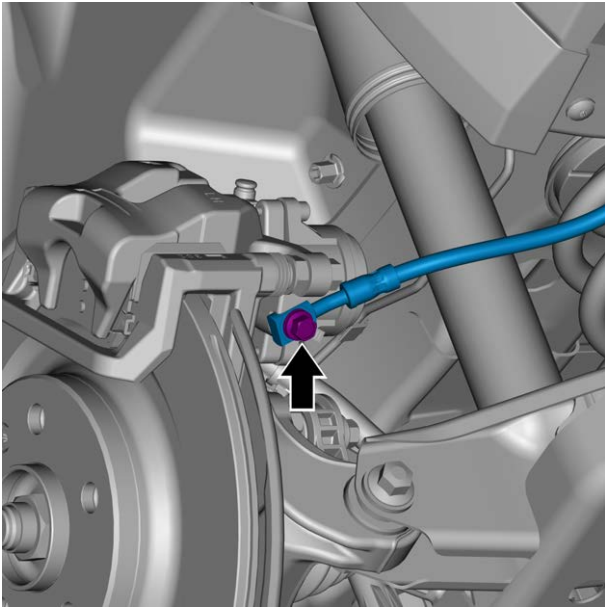
Installation Procedure



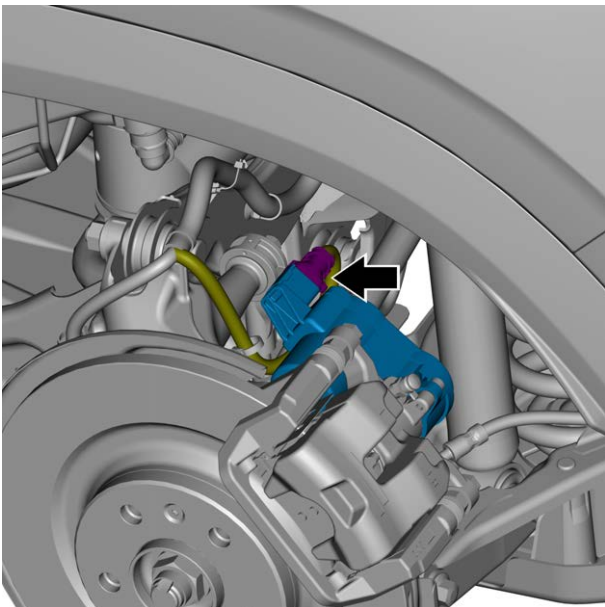
- 1 Install the rear brake caliper bracket and tighten the 2 fixing bolts.
Torque: 110N·m



- 2 Install the left rear brake caliper body with EPB assembly and tighten the 2 fixing bolts.
Torque: 40N·m



- 3 Install the left rear brake caliper body with EPB assembly oil inlet hose and tighten the oil inlet bolt.
Torque: 42N·m



- 4 Connect the harness connector of the brake caliper motor (parking brake).

- 5 Install the rear wheel.
- 6 Lower the vehicle.
- 7 Add clean brake fluid to the master cylinder reservoir to a position flush with the reservoir max line.
- 8 Drain air from the brake system, see [Brake Fluid Drain and Fill Procedure](#).
- 9 Connect the negative cable of battery.
- 10 Reset the EPB motor.

7.3.6.3 Replacement of left rear brake disk

Removal Procedure

Caution

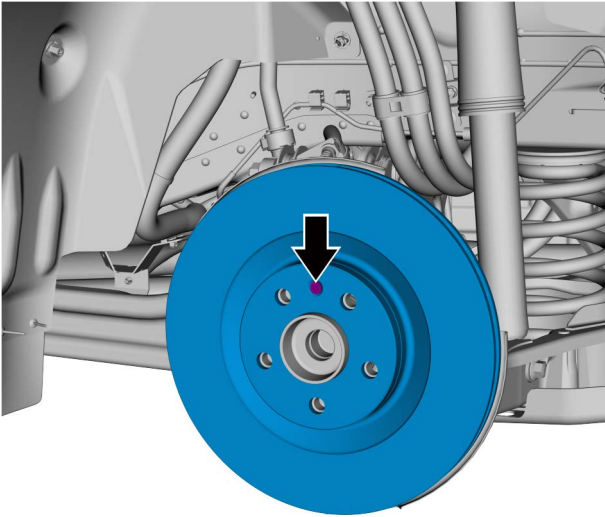
Remove and install the left and right rear brake disks in a similar manner.

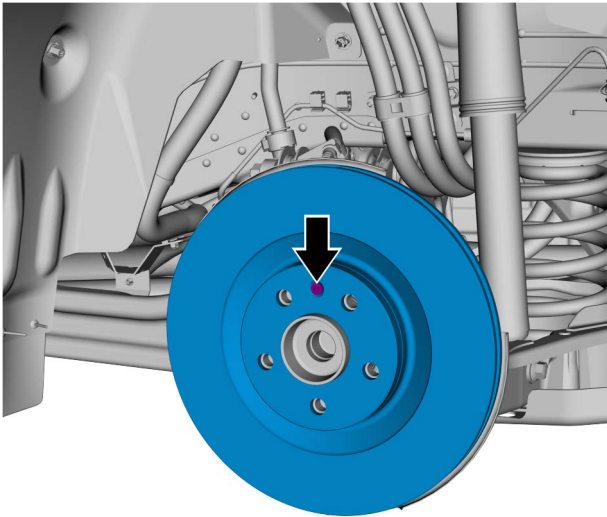
- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove wheel, see [Replacement of Wheel Assembly](#).
- 3 Remove the left rear caliper body with EPB assembly, see [Replacement of Left Rear Caliper Body with EPB Assembly](#).

Caution

To remove the brake caliper without removing the brake caliper brake hose, hang the brake caliper securely in place and avoid pulling on the brake hose.

- 4 Remove the fixing bolts of the left rear brake disk and take off the left rear brake disk.

**Installation Procedure**



- 1 Install the rear brake disk and tighten the 1 rear brake disk fastening screw.

Torque: 10N·m

- 2 Install the left rear brake caliper assembly.
- 3 Install the rear wheel.
- 4 Lower the vehicle.

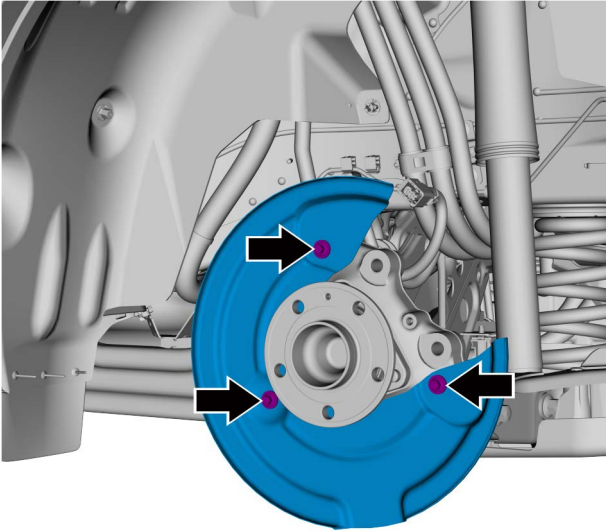
7.3.6.4 Replacement of Left Rear Wheel Brake Guard

Removal Procedure

Caution

The left and right rear brake guards are removed and installed in a similar manner.

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove wheel, see [Replacement of Wheel Assembly](#).
- 3 Remove the left rear caliper body with EPB assembly, see [Replacement of Left Rear Caliper Body with EPB Assembly](#).
- 4 Remove the left rear brake disk, see [Replacement of Left Rear Brake Disc](#).



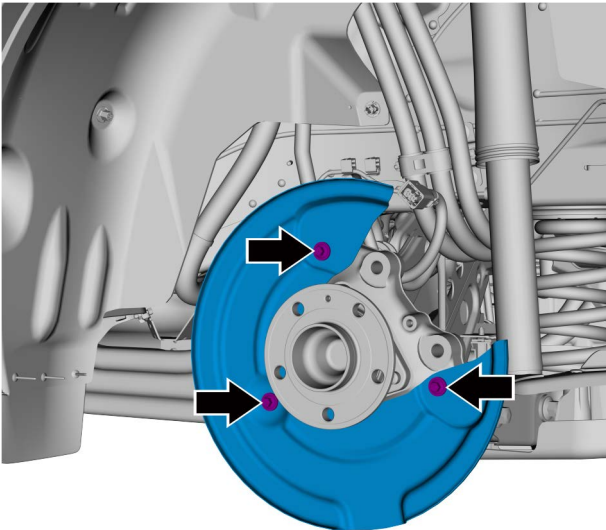
- 5 Remove the 3 fixing bolts of the left rear brake guard.

- 6 Remove the left rear brake dust cover.

Installation Procedure

- 1 Install the rear wheel brake dust cover and tighten the 3 fixing bolts.

Torque: 10N·m



- 2 Install the left rear brake disk.
- 3 Install the left brake caliper assembly.
- 4 Install the rear wheel.
- 5 Lower the vehicle.

7.4 Hydraulic Brake

7.4.1 Specification

7.4.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Front brake hose bracket mount to steering knuckle fixing bolt	M5×20	5.9-8.1
Front brake hose to hose bracket fixing bolt	M5×20	5.9-8.1
Brake pedal to body fixing nut	M8×8	20-28
Brake master cylinder No.1 brake hard pipe connector to master cylinder	M12	14-21
Brake master cylinder No.1 brake hard pipe connector to VDDM	M12	12-18
Brake master cylinder No.2 brake hard pipe connector to master cylinder	M12	14-21
Brake master cylinder No.2 brake hard pipe connector to VDDM	M12	12-18
Right front No.1 brake hard pipe connector to VDDM	M12	12-18
Left rear No.1 brake hard pipe connector to VDDM	M10	12-18
Left rear No.1 brake hard pipe connector to left center brake hard pipe	M10	12.8-19.2
Right Rear No.1 Brake Hard Pipe Connector to Right Center Brake Hard Pipe	M10	12.8-19.2
Left rear brake hard pipe connector to left center brake hard pipe	M10	12.8-19.2
Right rear brake hard pipe connector to right center brake hard pipe	M10	12.8-19.2
Right rear No.1 brake hard pipe connector to VDDM	M12	12-18
Left front brake hard pipe connector to VDDM	M10	12-18
Left front brake hard pipe connector to brake hose	M10	11.2-16.8
Right front brake hard pipe connector to brake hose	M10	11.2-16.8
Fixing bolt connecting the left front brake hose and the left front brake caliper assembly	M10	14-20

Fastener part	Model	Torque range (N·m)
Fixing bolt connecting the right front brake hose and the right front brake caliper assembly	M10	14-20
Left rear brake hard pipe connector to brake hose	M10	11.2-16.8
Right rear brake hard pipe connector to brake hose	M10	11.2-16.8
Fixing bolt of center channel pipeline bracket	M8x25	20-28
Fixing bolt connecting the left rear brake hose to left rear brake caliper body with EPB assembly	M10	38-46
Fixing bolt connecting the right rear brake hose to right rear brake caliper body with EPB assembly	M10	38-46

7.4.2 Instructions and operations

7.4.2.1 Instructions and operations

The hydraulic brake system consists of the following components:

Brake Pedal:

Receives, amplifies and transmits brake system input force from the driver.

Brake Pedal Actuator:

Transmits the amplified brake pedal input force to the vacuum booster.

Vacuum booster:

Brake system input force is amplified by the brake pedal and transmitted by the brake pedal actuator to the vacuum booster, where it is applied to the hydraulic brake master cylinder after being boosted by the vacuum booster. The vacuum booster utilizes a vacuum source for boosting, reducing the driver's maneuvering force applied to the brake pedal.

Vacuum Hose:

Used to deliver the vacuum source required by the vacuum booster.

Brake Master Cylinder Reservoir:

Contains the brake fluid inside for use in the hydraulic brake system.

Brake master cylinder:

Converts mechanical input force into hydraulic output pressure, which is distributed from the master cylinder to the two hydraulic oil circuits supplying the diagonal wheel brake lines.

Brake Hard Pipe and Brake Hose:

Transmit brake fluid flowing through the hydraulic brake system components.

Brake Sub Pump:

Converts hydraulic input pressure to mechanical output force.

System Operation

The mechanical force from the brake pedal is converted into hydraulic pressure by the master cylinder, and after adjustment by the hydraulic electronic control unit, it is delivered to the brake sub pump through the brake hard pipe and hose, and the brake sub pump then converts the hydraulic pressure into mechanical force, so that the brake linings press the brake disks to apply the brakes of the vehicle.

Brake System Fault Indicator Light

The combination instrument will illuminate the brake system malfunction indicator when the brake fluid level is too low, or when the brake system malfunctions, etc.

Brake Vacuum Check

1. Disconnect the vacuum pump outlet vacuum hose and connect a vacuum gauge.
2. Start the engine idling.

The hydraulic brake system adopts vacuum booster, when the brake pedal is pressed to push the brake master cylinder during operation, the pressure of the brake fluid in the master cylinder rises and enters the brake caliper of each wheel through the oil pipe to push the piston of the brake caliper outwardly, realizing the transmission of the force of the foot-applied brake to the wheel brake, and pushing the wheel brake to implement the braking.

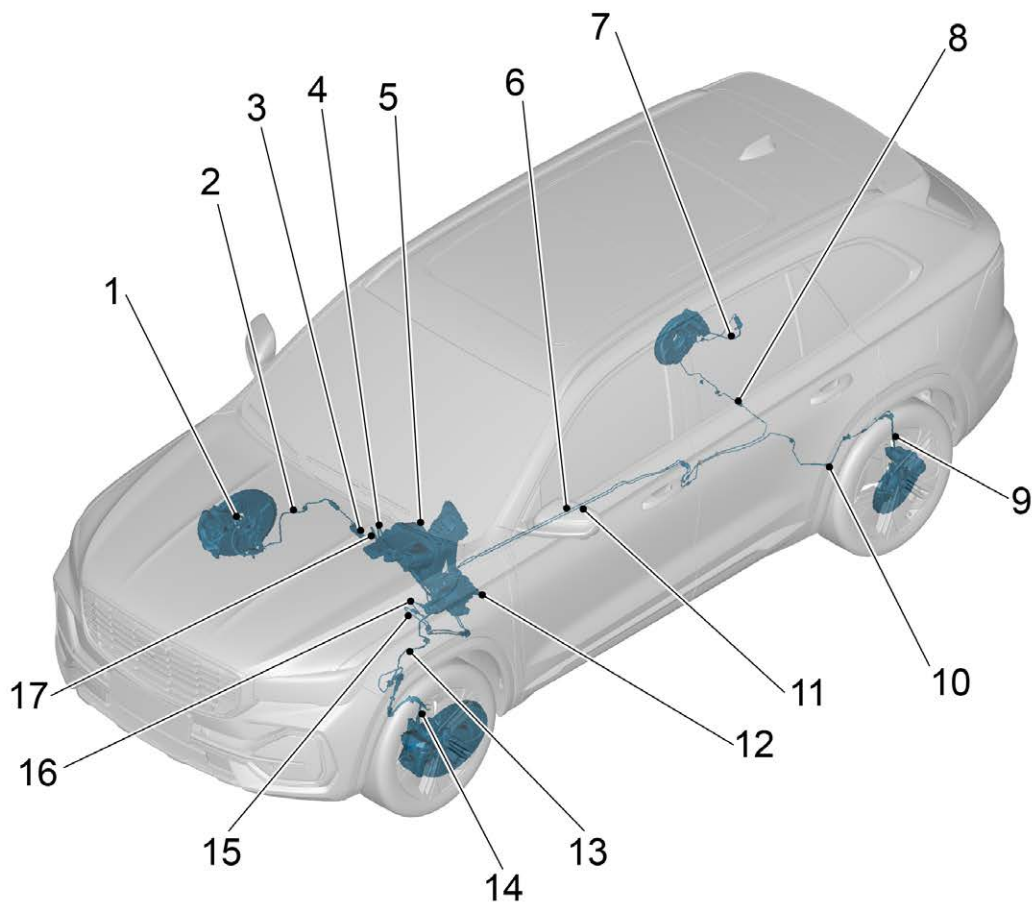
When the brake pedal is released, the piston of the master cylinder returns under the action of oil pressure and return spring, and the brake caliper and the wheel brake actuator return to the position, releasing the braking of the wheel.

Brake booster is mainly to provide auxiliary braking force to help the driver who cannot apply enough braking force during emergency braking, so as to maximize the braking performance of the vehicle.

The hydraulic brake system actuator section includes 12 dual-position solenoid valves, a motor, 2 pumps and 2 accumulators. The 12 dual-position solenoid valves include 2 high-pressure switching valves, 2 pilot valves, 4 inlet valves and 4 outlet valves.

7.4.3 Part position

7.4.3.1 Part position



- | | | | |
|----|--------------------------------------|-----|---------------------------------|
| 1. | Right front brake hose assembly | 10. | Left rear brake hard pipe |
| 2. | Right front brake hard pipe | 11. | Left center brake hard pipe |
| 3. | Right Front No.1 Brake Hard Pipe | 12. | Brake pedal assembly |
| 4. | Brake Master Cylinder No.1 Hard Pipe | 13. | Left Front Brake Hard Pipe |
| 5. | Brake Booster Module | 14. | Left front brake hose |
| 6. | Right center brake hard pipe | 15. | Left Rear No.1 Brake Hard Pipe |
| 7. | Right rear brake hose assembly | 16. | Right Rear No.1 Brake Hard Pipe |

- 8. Right Rear Brake Hard Pipe
- 9. Left Rear Brake Hose

- 17. Brake Master Cylinder No.2 Hard Pipe

7.4.4 Diagnostic information and procedure

7.4.4.1 Troubleshooting Precautions

- Be careful when replacing individual parts as it may affect the performance of the braking system and cause driving hazards, standard parts should be used.
- When servicing the brake system, it is very important to keep the components and the site clean.
- If a brake fluid leak is detected, the component must be disassembled and replaced with a new one if any abnormality is found.
- When disassembling the brake assembly, wrap the brake line connection area to prevent dirt, mud, and other contaminants from entering the line.
- Do not damage or deform the brake line when removing or installing the brake line.
- When installing the brake line or brake hose, make sure there is no twisting or bending.
- Brake hoses must be kept away from shock absorber oil, grease, etc.
- After installing the brake hard pipes and brake hoses, make sure they do not interfere with other components.
- Do not allow brake fluid to adhere to painted surfaces such as the bodywork, and if brake fluid leaks onto a painted surface, remove it immediately.

7.4.4.2 Malfunction Symptom List

Symptoms	Suspected parts	Handling measures
Brake warning light is always on; instrument text alerts brake fluid level is too low, check	1.Brake fluid	Check brake fluid.
	2.Brake fluid level sensing	Check brake fluid level sensing.
	3.Brake fluid level sensor wire	Check brake fluid level sensor harness connector and wiring.
	4.Gauge	Check gauges
Brake system is noisy	1. Brake linings (cracked, twisted, soiled, slick)	Check brake linings.
	2. Brake caliper bracket fixing bolt (loose)	Check brake caliper bracket fixing bolt.
	3. Brake caliper fixing bolt (loose)	Check the brake caliper fixing bolts.
	4. Brake disk (scarred)	Check the brake disk.
	5. Brake lining guide piece (loose)	Check brake lining guide piece.
	6. Brake caliper floating pin (worn)	Check brake caliper floating pin.
Brake deflection	1. Piston (fixed, stuck)	Check the brake caliper.
	2.Brake disk (scratches, oil stains)	Check the brake disk.
	3. Brake linings (cracked, twisted or oiled)	Check brake linings.
	4. Brake hard pipe, hose (twisted, deformed)	Check brake hard pipes, hoses.
Brake pedal too hard	1. Hydraulic brake booster system (vacuum leak, failure)	Check hydraulic vacuum booster.
	2. Brake hard pipe, hose (twisted, deformed)	Check brake hard pipes, hoses.
	3. Brake vacuum pipe (vacuum leak)	Check brake vacuum hose
Brake pedal too soft	1.Brake system brake fluid leakage	Check brake fluid leakage from brake system.
	2.Air in the brake system	Exhaust air to the brake system.

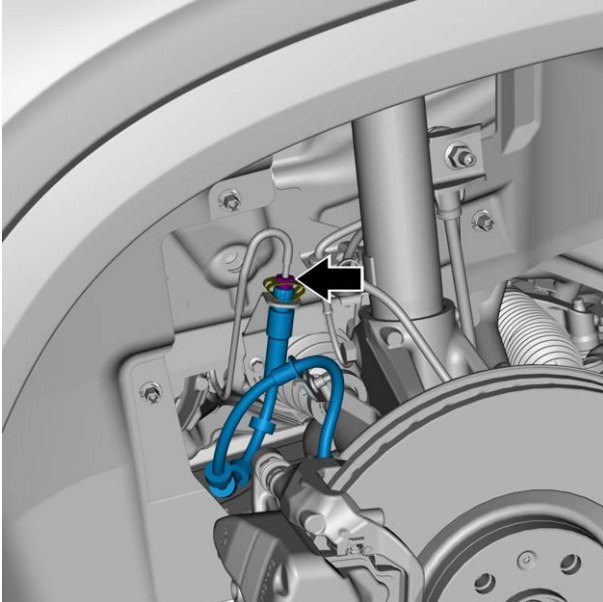
Symptoms	Suspected parts	Handling measures
	3. Brake linings (cracked, twisted, worn transition or oil stained)	Check brake linings.
	4. Brake master cylinder (internal leak)	Check the brake master cylinder.
Brake pedal too low	1.Brake system brake fluid leakage	Check the brake pedal.
	2.Air in the brake system	
	3. Brake master cylinder (internal leak)	
Insufficient braking force	1.Brake system brake fluid leakage	Check braking force.
	2.Air in the brake system	
	3. Brake master cylinder (internal leak)	
	4. Brake linings (cracked, twisted, worn transition or oil stained)	
	5. Brake disk (cracked, twisted, worn out or oiled)	
	6.Vacuum booster vacuum pipeline	
	7.Vacuum booster	

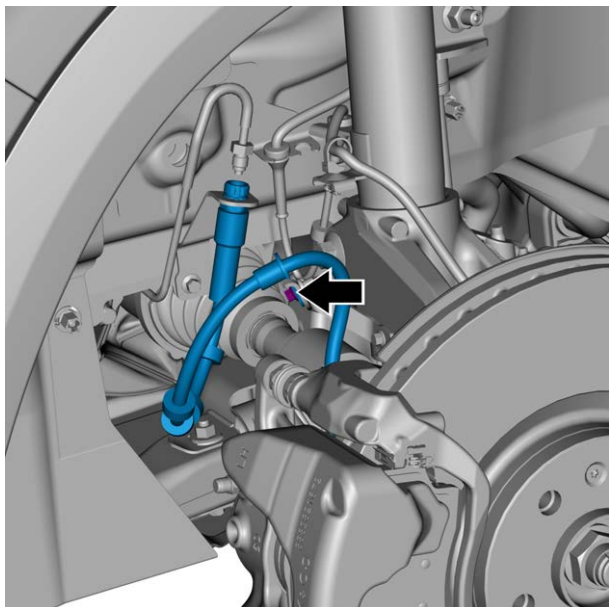
7.4.5 Removal and Installation

7.4.5.1 Replacement of Left Front Brake Hose

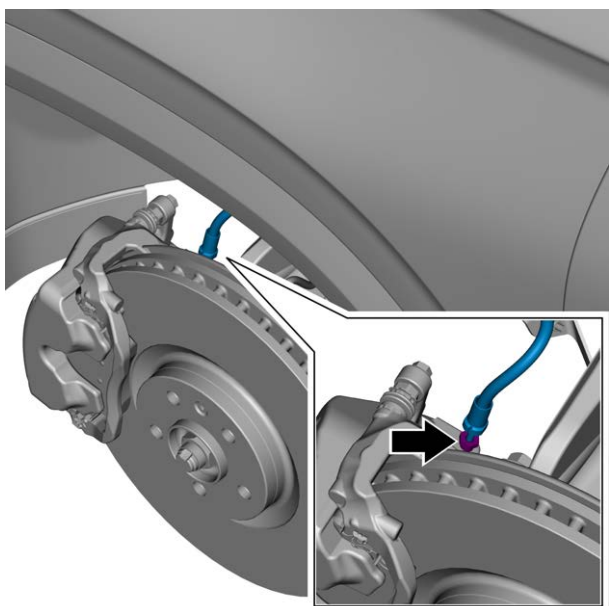
Removal Procedure

- 1 Drain brake fluid.
- 2 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 3 Remove wheel, see [Replacement of Wheel Assembly](#).
- 4 Remove the connecting nut of the left front brake hose to the brake hard pipe and pull out the spring stop tab.



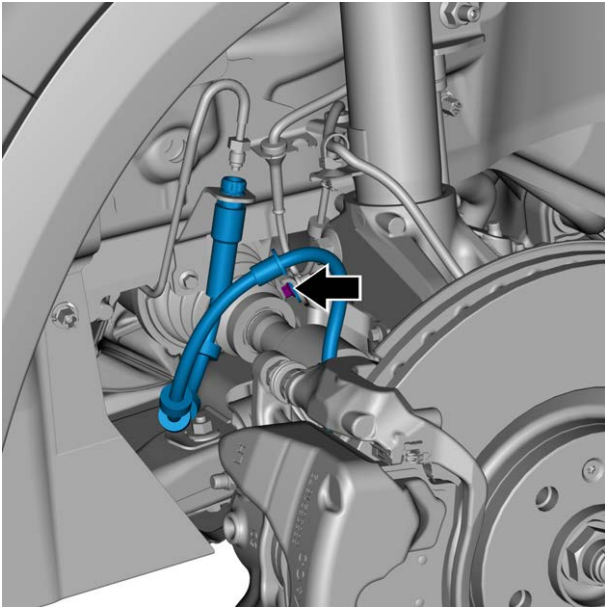


5 Remove the left front brake hose bracket fixing bolt.



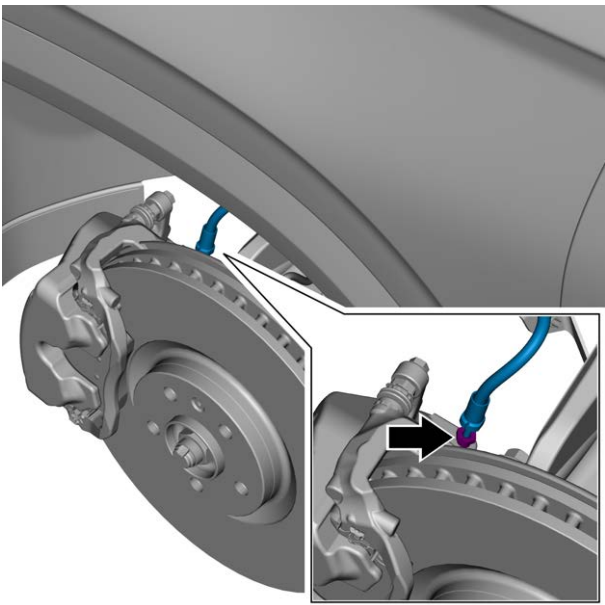
6 Remove the attachment bolt connecting left front brake hose to left front brake caliper assembly.

Installation Procedure



- 1 Install the left front brake hose bracket and tighten the bolts.

Torque: 7N·m

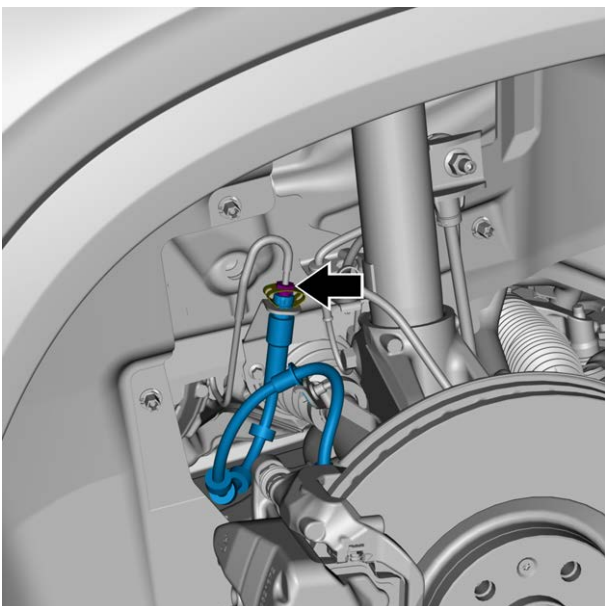


- 2 Install left front brake hose and tighten bolts.

Torque: 17N·m

Caution

When assembling the left front brake hose, the fitting is pre-tightened by hand, then hold the brake hose by hand and use an open-end wrench to apply tightening torque to prevent the brake hose from heeling over.



- 3 Connect the left front brake hose to the brake hard pipe and tighten the nut to snap in the spring stop tab.

Torque: 14N·m

- 4 Install the wheel.
- 5 Add clean brake fluid to the master cylinder reservoir to the reservoir jug max line position.
- 6 Drain air from the brake system, see [Brake Fluid Drain and Fill Procedure](#).
- 7 Check for brake fluid leaks.

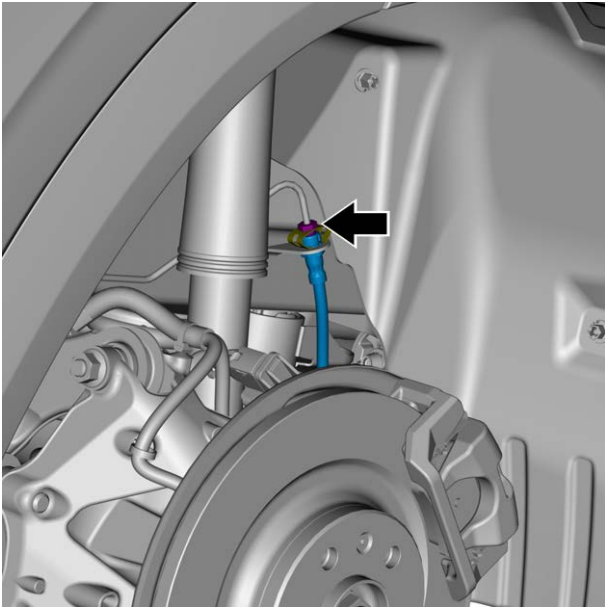
7.4.5.2 Replacement of left rear brake hose

Removal Procedure

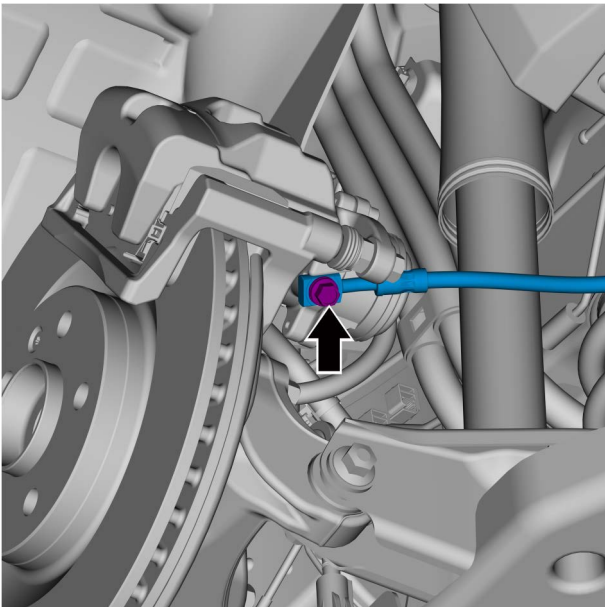
Caution

Remove and install the left and right rear brake hoses in a similar manner.

- 1 Drain brake fluid.
- 2 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 3 Remove wheel, see [Replacement of Wheel Assembly](#).

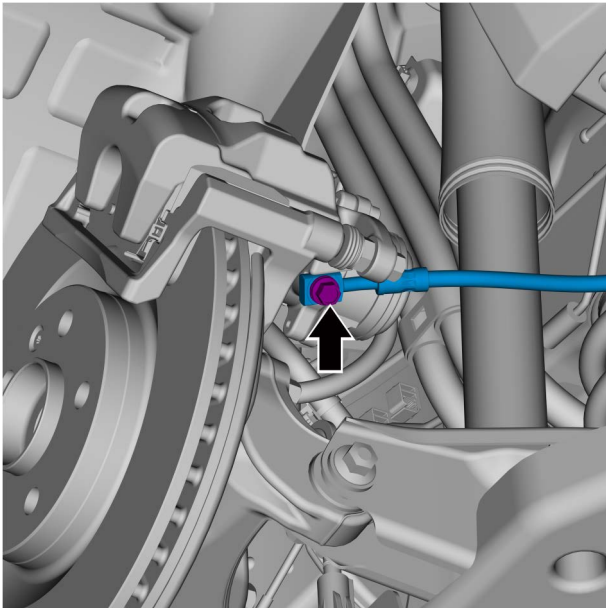


- 4 Remove the connection nut connecting the left rear brake hose to the brake hard pipe and pull out the spring stop tab.



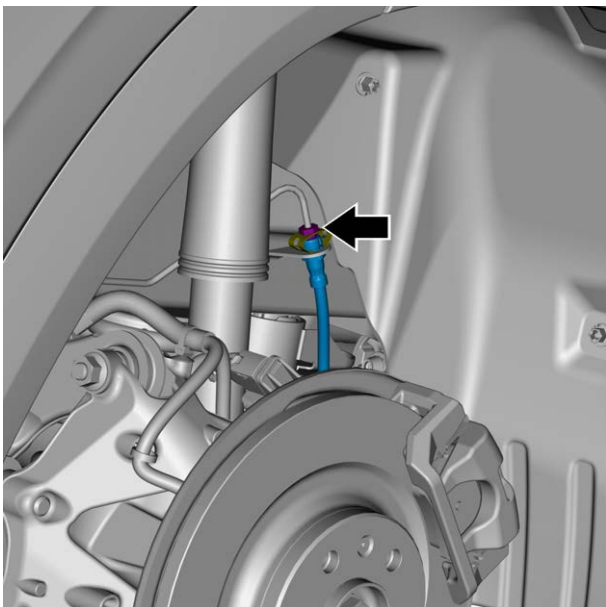
- 5 Remove the left rear brake hose hollow bolt and disconnect the brake hose from the left rear brake caliper body with EPB assembly and remove the left rear brake hose.

Installation Procedure



- 1 Install the left rear brake hose to the left rear brake caliper body with EPB assembly and tighten the brake hose hollow bolt.

Torque: 42N·m



- 2 Snap in the spring stop tabs, connect the left rear brake hose to the brake hard pipe, and tighten the nuts.

Torque: 14N·m

- 3 Install the wheel.
- 4 Add clean brake fluid to the master cylinder reservoir to the reservoir jug max line position.
- 5 Drain air from the brake system, see [Brake Fluid Drain and Fill Procedure](#).
- 6 Check for brake fluid leaks.

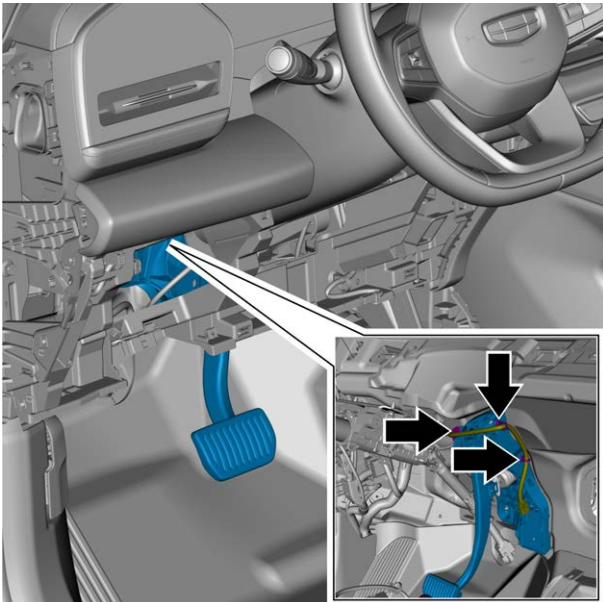
7.4.5.3 Replacement of Brake Pedal Assembly

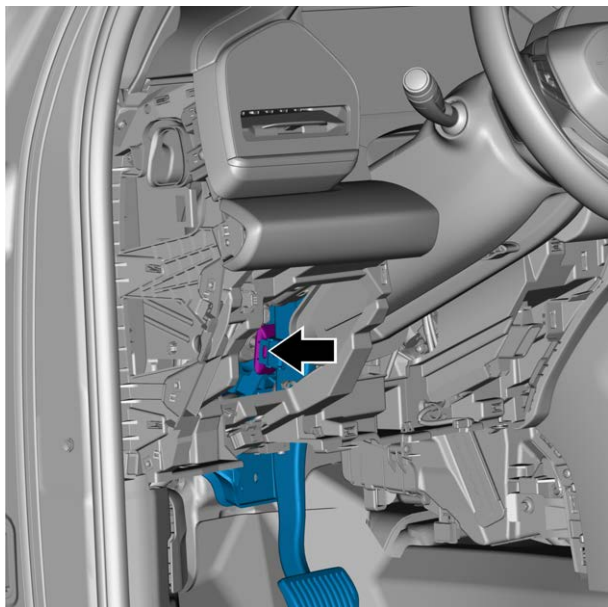
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the instrument panel lower left guard, see [Replacement of Instrument Panel Lower Left Guard Assembly](#).
- 3 Remove front blow foot left air duct, see [Replacement of Front Blow Foot Left Air Duct](#).
- 4 Remove accelerator pedal sensor, see [Replacement of Accelerator pedal sensor](#).
- 5 Remove brake light switch, see [Replacement of brake light switch](#).
- 6 Disconnect the harness retaining clip on the brake pedal assembly.



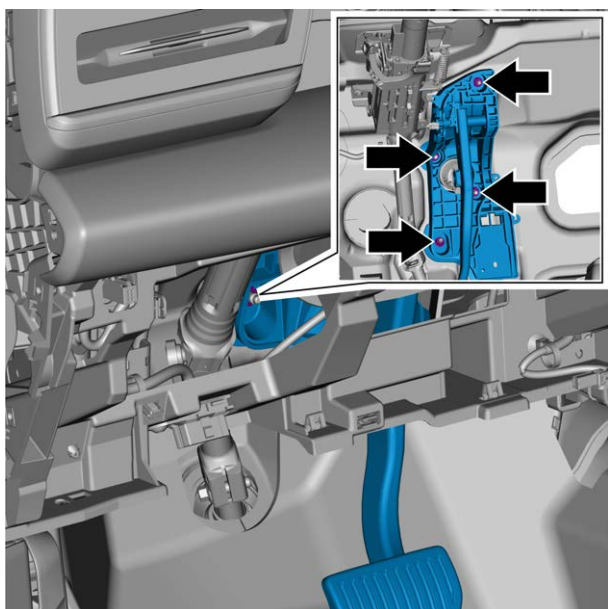


- 7 Disengage the vacuum booster with brake master cylinder assembly from the ball head push rod attached to the brake pedal assembly bracket.

Caution

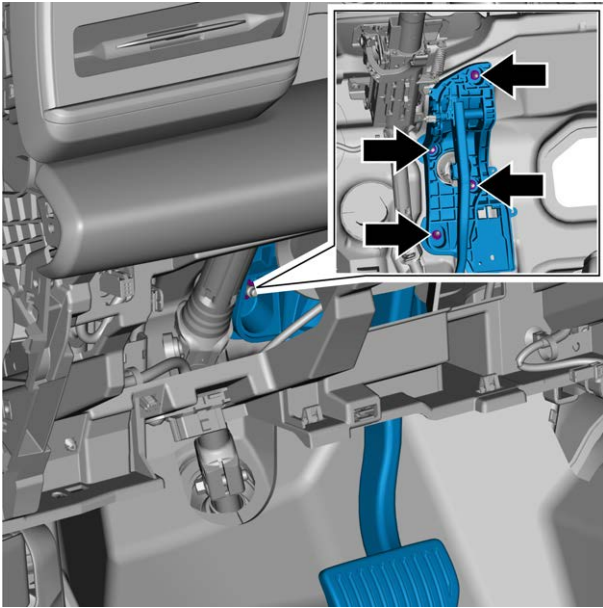
Each time you remove the ball head push rod, you need to replace the lining inside the pedal.

Each time the lining inside the pedal is replaced, grease needs to be applied to the lining



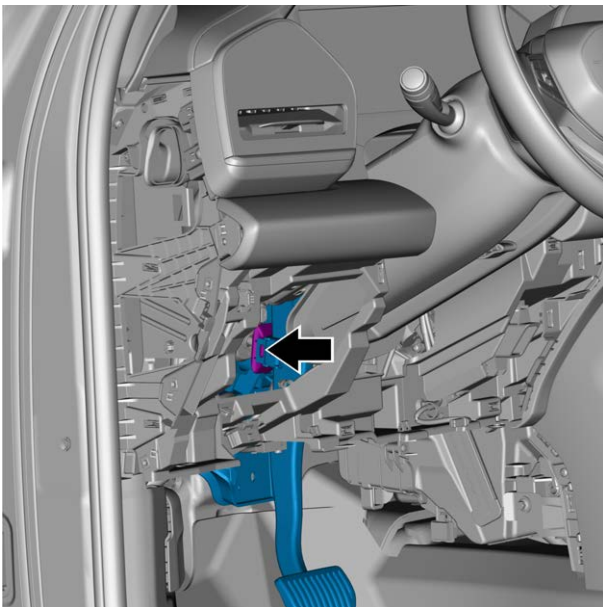
- 8 Remove the 4 fixing nuts connecting the brake pedal assembly to the body and take off the brake pedal assembly.

Installation Procedure

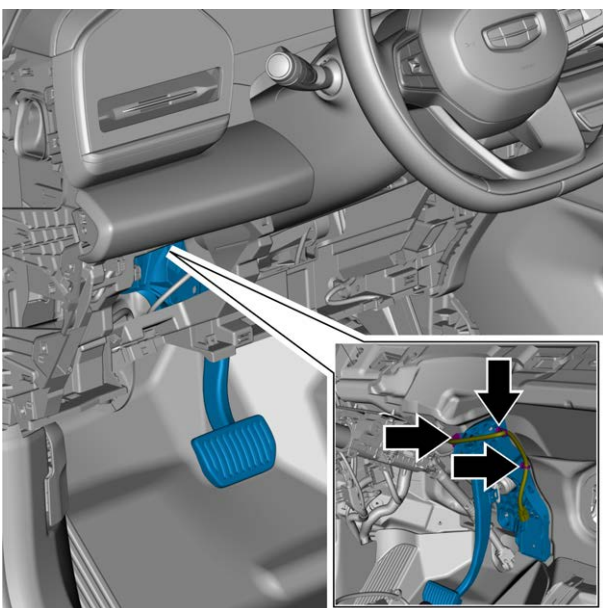


- 1 Install the 4 fixing nuts for the brake pedal to body connection.

Torque: 24N·m



- 2 Snap the vacuum booster ball head push rod into the brake pedal bracket.



- 3 Install to the harness retaining clip on the pedal assembly.

- 4 Install the brake light switch.
- 5 Install the accelerator pedal sensor.
- 6 Install the front blow foot left duct.
- 7 Install the instrument panel left lower guard.
- 8 Connect the negative cable of battery.

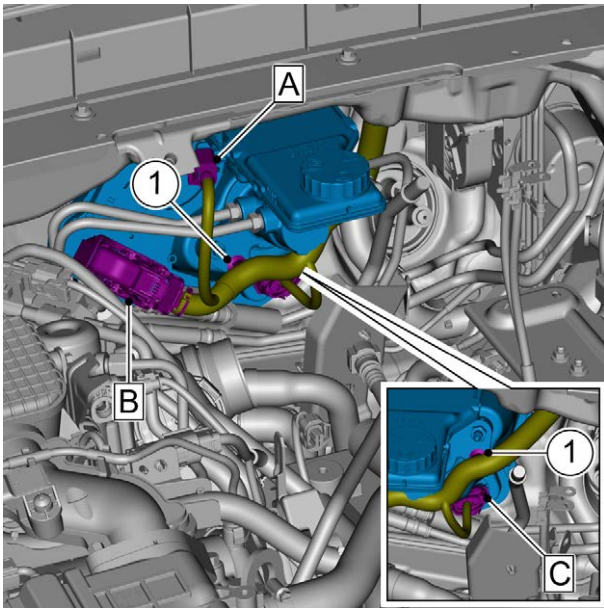
7.4.5.4 Replacement of brake booster module

Removal Procedure

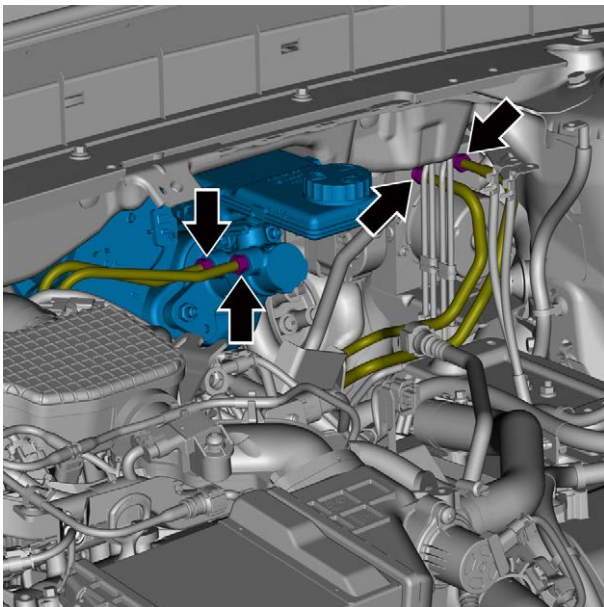
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

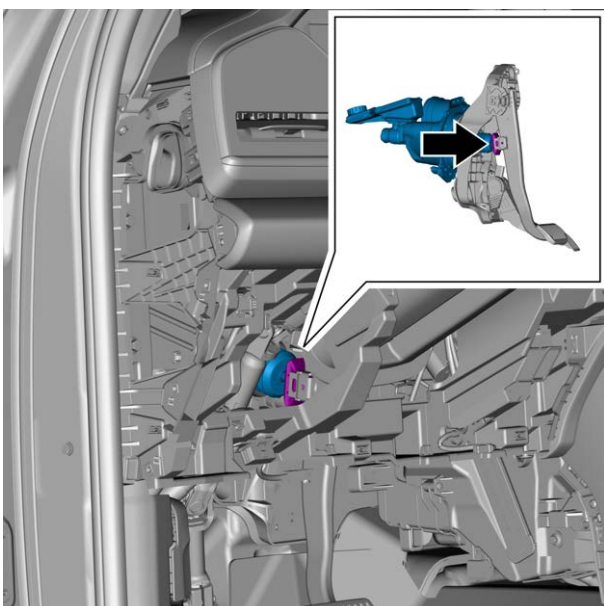
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the engine trim cover assembly, refer to [Replacement of engine trim cover assembly](#).
- 3 Remove the air filter assembly, see [Replacement of Air Filter Assembly](#).
- 4 Remove the resonator assembly, see [Replacement of Resonator Assembly](#).
- 5 Remove the left lower toe board assembly, refer to [Replacement of left lower toe board assembly](#).
- 6 Remove the instrument panel left lower shield assembly, refer to [Replacement of instrument panel left lower shield assembly](#).
- 7 Drain brake fluid.
- 8 Remove brake light switch, see [Replacement of brake light switch](#).



- 9 Disconnect harness connector A from brake fluid level sensor.
- 10 Disengage the brake booster module harness retaining clip 1.
- 11 Disconnect the harness connector B of the brake booster module.
- 12 Disconnect harness connector C of brake pedal travel sensor.



- 13 Remove the 2 brake hard pipe fixing bolts from the brake booster module.
- 14 Remove the 2 brake hard pipe fixing bolts on the vehicle's dynamic domain mainframe, and take off the 2 brake hard pipes.

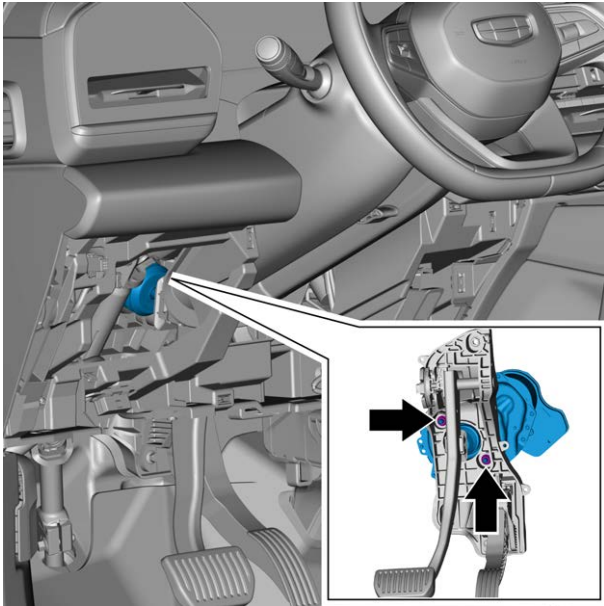


- 15 Disconnect the ball head push rod that connects the brake booster module to the brake pedal bracket.

Caution

Each time you remove the ball head push rod, you need to replace the lining inside the pedal.

Each time you replace the lining in the pedal, you will need to apply grease to the lining.



- 16 Remove the 2 fixing nuts that the vacuum booster with brake master cylinder assembly sharing with the brake pedal.
- 17 Pull out the brake booster module on the engine compartment side.

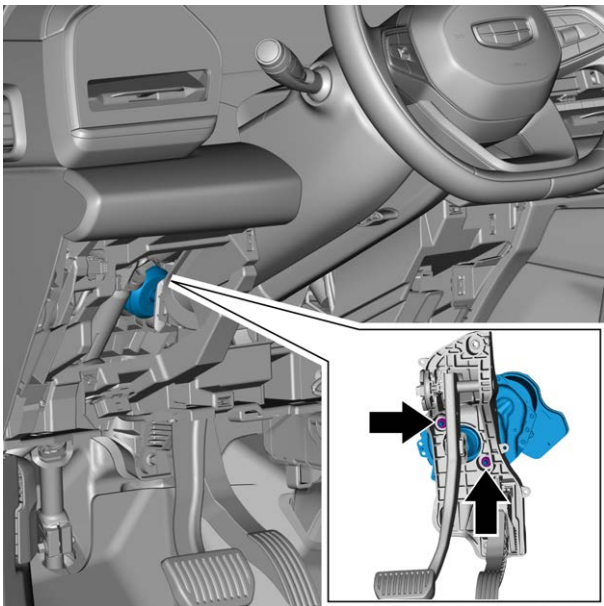
Installation Procedure

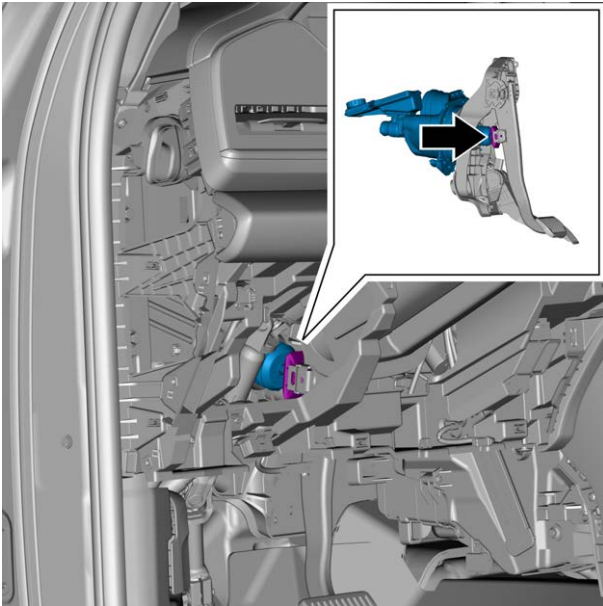
Caution

Pre-tighten the fittings by hand when installing the brake hard pipes, then use an open-end wrench to tighten the torque to prevent damage to the threads.

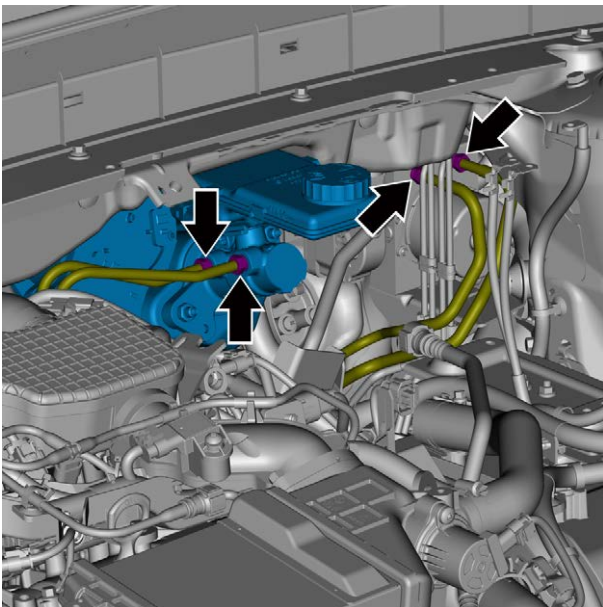
- 1 Install the 2 fixing nuts that the brake booster module sharing with the brake pedal.

Torque: 24N·m

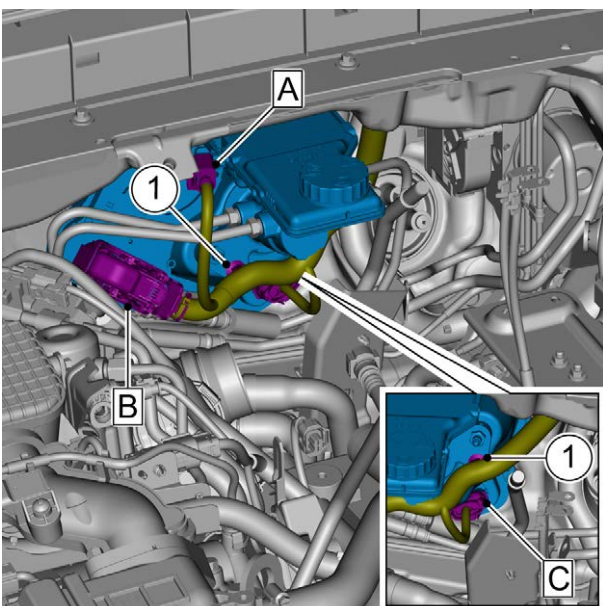




- 2 Snap the brake booster module ball head push rod into the brake pedal bracket.



- 3 Place the 2 brake hard pipes in the mounting position and tighten the brake hard pipe fixing bolts on the vehicle dynamic domain mainframe.
Torque: 15N·m
- 4 Tighten the brake hard pipe fixing bolts on the brake booster module.
Torque: 17.5N·m



- 5 Connect the brake fluid level sensor harness connector A.
- 6 Install the brake booster module harness retaining clip 1.
- 7 Connect the harness connector B of the brake booster module.
- 8 Connect the harness connector C of brake pedal travel sensor.

- 9 Install the brake light switch.
- 10 Install the resonator assembly.
- 11 Install the air filter assembly.
- 12 Install the engine trim cover assembly.
- 13 Install the left lower shield assembly of the instrument panel.
- 14 Install the left lower toe board assembly.
- 15 Add clean brake fluid to the brake booster module reservoir to a position flush with the reservoir max line.
- 16 Check for brake fluid leaks.
- 17 For brake system venting, see [Brake Fluid Drain and Fill procedure](#).
- 18 Connect the negative cable of battery.
- 19 The GLDS diagnostic program is required, under the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software brushing operation.
- 20 Close the engine compartment cover.
- 21 Perform brake booster air tightness check.

7.4.5.5 Replacement of left front brake hard pipe

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

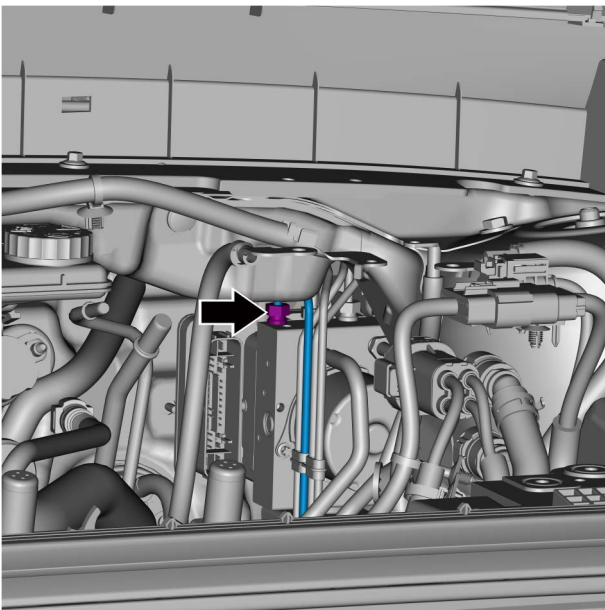
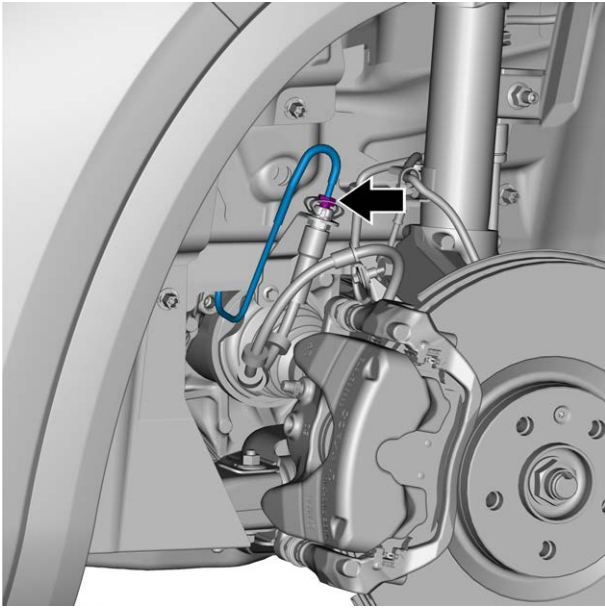
Warning !

Do not bend any brake pipe. Failure to do so may cause brake failure and result in an accident.

Caution

Do not spill brake fluid on the paintwork. Otherwise, it is likely to damage the paintwork.

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the air filter assembly, see [Replacement of Air Filter Assembly](#).
- 3 Remove the resonator assembly, see [Replacement of Resonator Assembly](#).
- 4 Drain brake fluid.

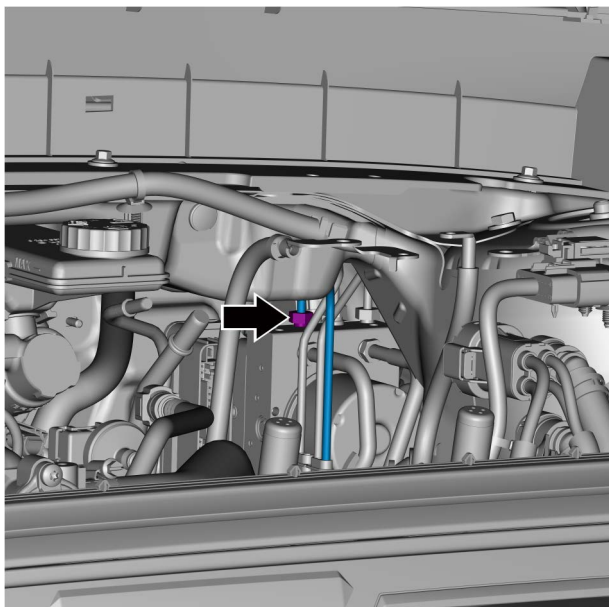


- 5 Remove the left front wheels, refer to [Replacement of wheel assembly](#).
- 6 Remove the connecting nut of the left front brake hose to the brake hard pipe and pull out the spring stop tab.

- 7 Remove the fitting nut of the right rear No. 1 brake hard pipe from the vehicle dynamics domain mainframe and wipe off any spilled brake fluid immediately.

Caution

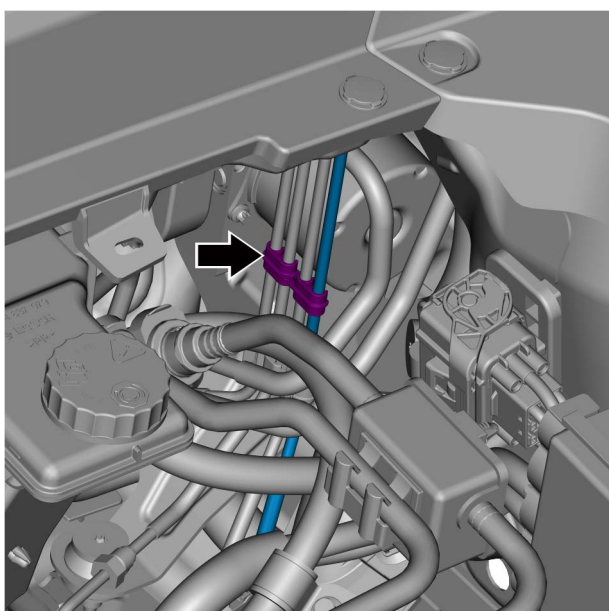
Plug the right rear No. 1 brake hard pipe and vehicle dynamic domain mainframe oil pipe port to prevent brake fluid loss and contamination.



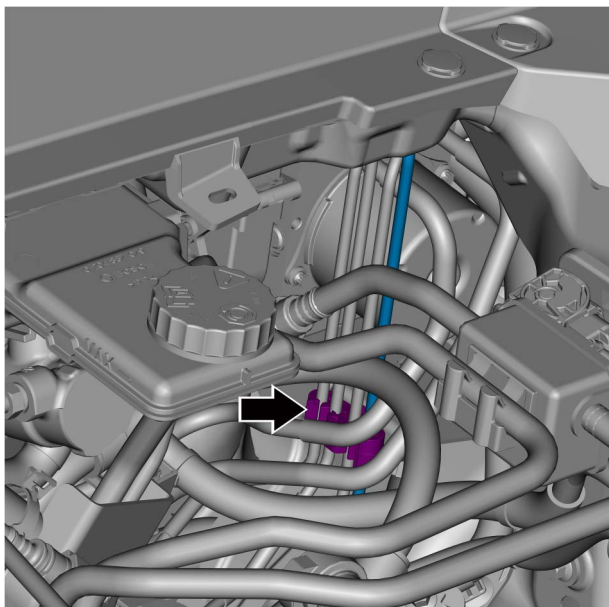
- 8 Remove the fitting nut of the left front brake hard pipe from the vehicle dynamic domain mainframe and wipe off any spilled brake fluid immediately.

Caution

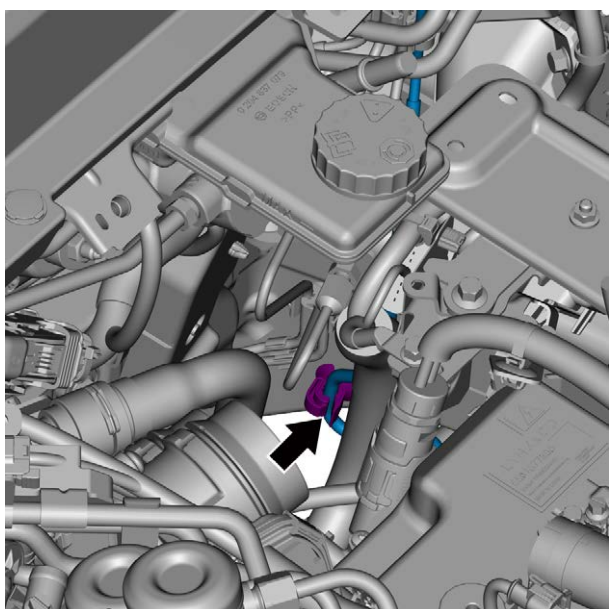
Plug the pipe opening connecting the left front brake hard pipe to the vehicle's dynamic domain mainframe to prevent brake fluid loss and contamination.



- 9 Remove the four-hole hose clamp.



- 10 Disconnect the left front brake hard pipe from the four-hole pipe clamp.



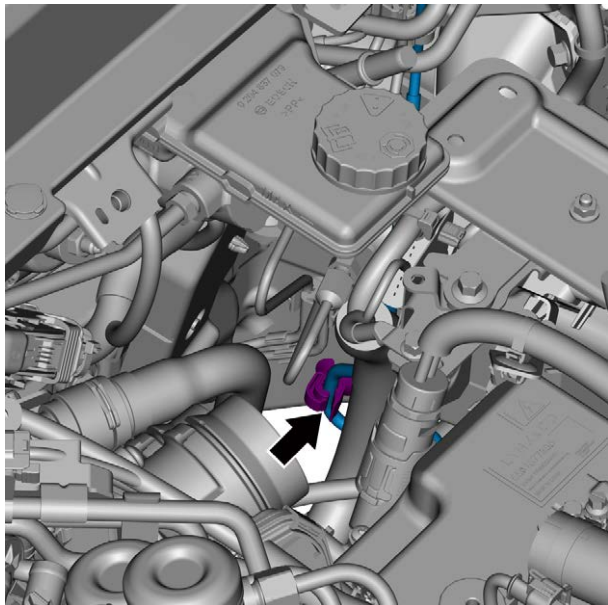
- 11 Remove the left front brake hard pipe by disconnecting it from the clamp.

Installation Procedure

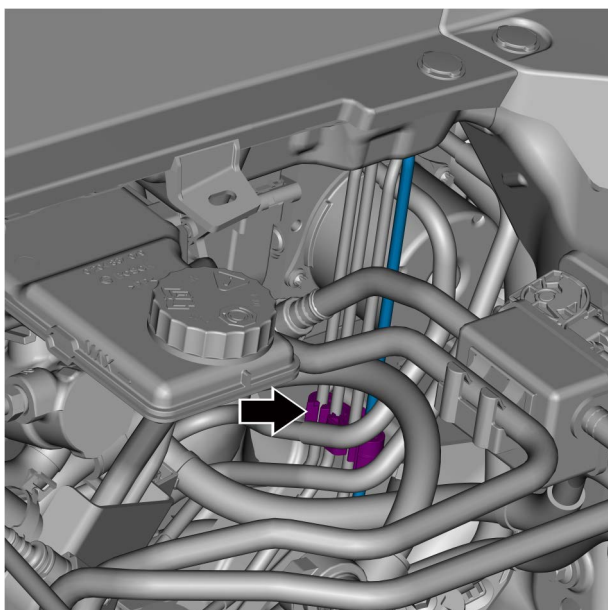
Caution

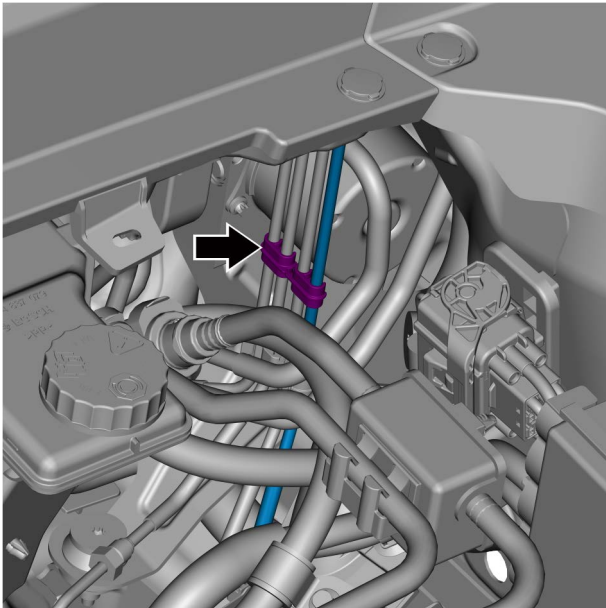
Pre-tighten the fittings by hand when installing the brake hard pipes, then use an open-end wrench to tighten the torque to prevent damage to the threads.

- 1 Install the left front brake hard pipe by snapping the left front brake hard pipe into the pipe clamp.

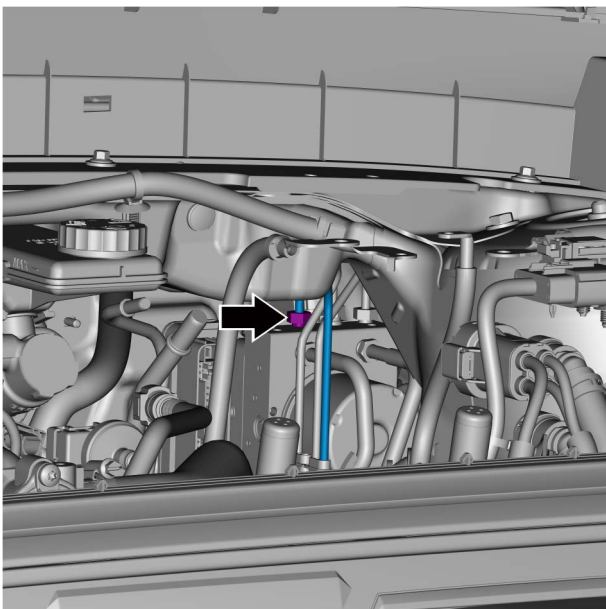


- 2 Snap the left front brake hard pipe into the four-hole hose clamp.

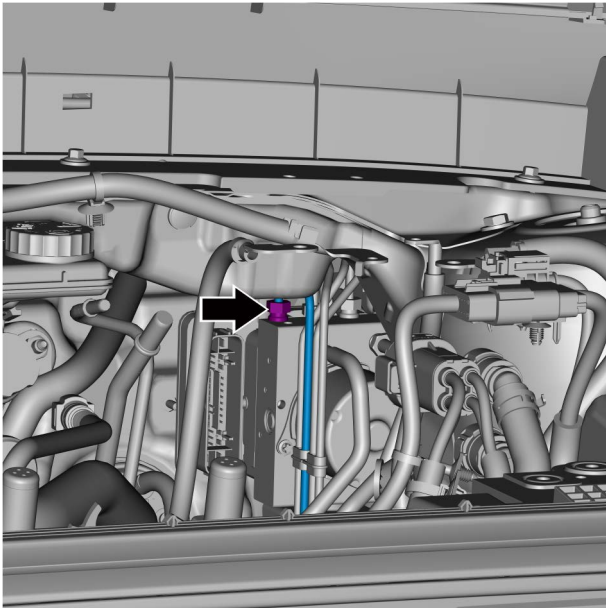




- 3 Install the four-hole hose clamp.

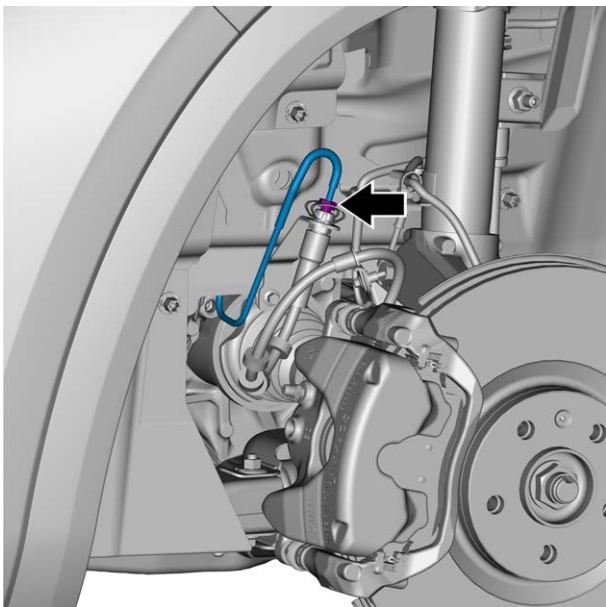


- 4 Install the brake hard pipe fixing nut that secures the left front brake hard pipe to the vehicle's dynamic domain mainframe.
Torque: 15N·m



- 5 Install the brake hard pipe fixing nut on the right rear No. 1 brake hard pipe secured to the vehicle's dynamic domain mainframe.

Torque: 15N·m



- 6 Snap in the spring stop tabs, connect the left front brake hose to the brake hard pipe, and tighten the nut.

Torque: 14N·m

- 7 Install the resonator assembly.
- 8 Install the air filter assembly.
- 9 Add clean brake fluid to the brake fluid reservoir to a position flush with the reservoir max line.
- 10 Check for brake fluid leaks.
- 11 For brake system venting, see [Brake Fluid Drain and Fill procedure](#).
- 12 Install the left front wheel.
- 13 Connect the negative cable of battery.
- 14 Close the engine compartment cover.

7.4.5.6 Replacement of Right Front Brake Hard Pipe

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#).

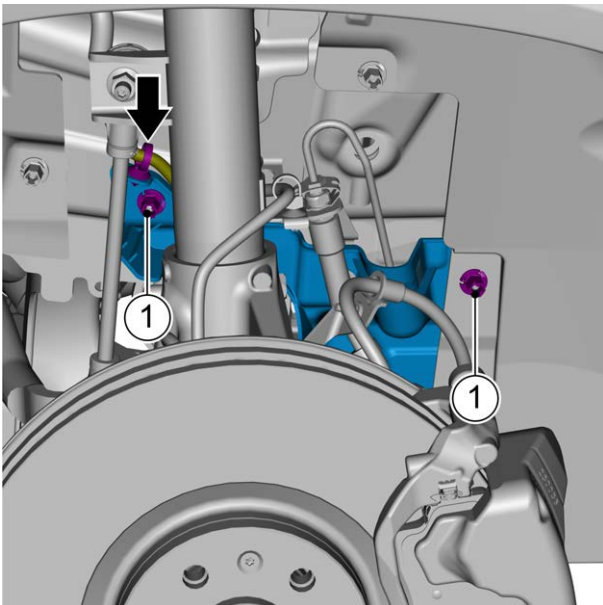
Warning !

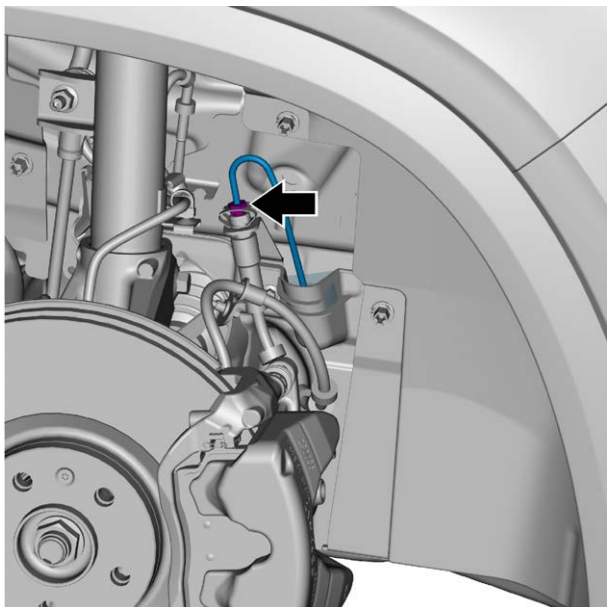
Do not bend any brake pipe. Failure to do so may cause brake failure and result in an accident.

Caution

Do not spill brake fluid on the paintwork. Otherwise, it is likely to damage the paintwork.

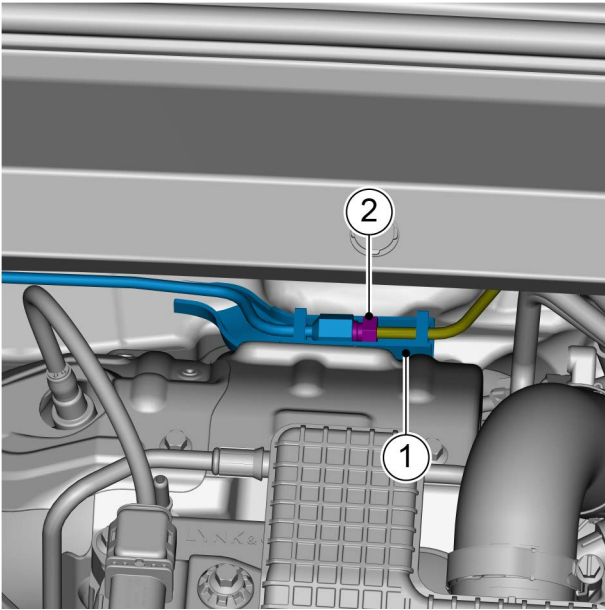
- 1 Remove the engine trim cover assembly, refer to [Replacement of engine trim cover assembly](#).
- 2 Remove the front right wheel, see [Replacement of Wheel Assembly](#).
- 3 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 4 Remove heater, see [Heater Replacement](#).
- 5 Disengage the wheel speed sensor (right front) harness retaining clip.
- 6 Remove the right front wheel cover splash guard by removing the 2 plastic fixing nuts 1.





- 7 Remove the connection nut connecting the right front brake hose to the brake hard pipe and pull out the spring stop tab.

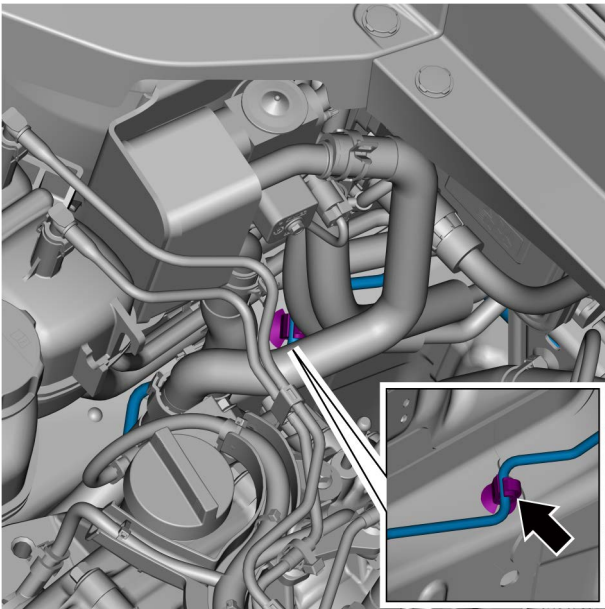
- 8 Drain brake fluid.



- 9 Remove the protective bracket 1 of the brake hard pipe.
- 10 Remove the fitting nut 2 of the right front brake hard pipe to the right front No. 1 brake hard pipe and wipe off any spilled brake fluid immediately.

Caution

Plug the pipe opening connecting the right front brake hard pipe to the right front No. 1 brake hard pipe to prevent brake fluid loss and contamination.



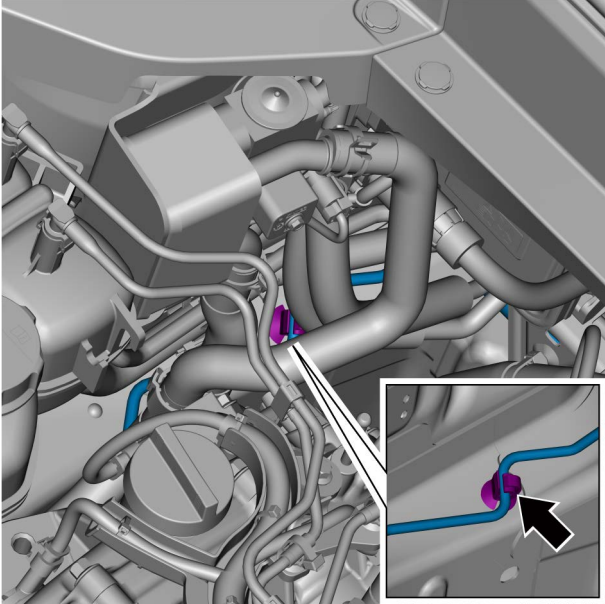
- 11 Remove the right front brake hard pipe by disconnecting the right front brake hard pipe from the single hole hose clamp.

Installation Procedure

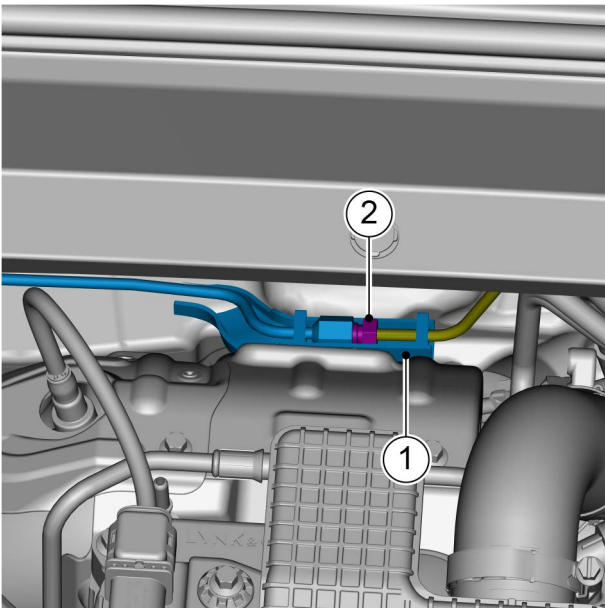
Caution

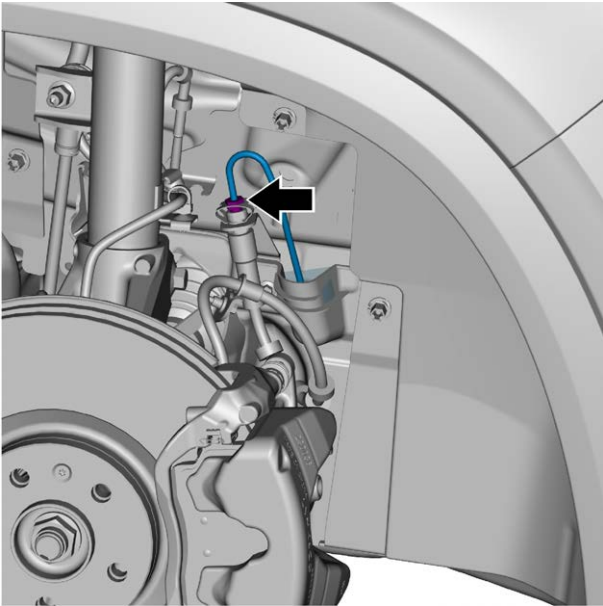
Pre-tighten the fittings by hand when installing the brake hard pipes, then use an open-end wrench to tighten the torque to prevent damage to the threads.

- 1 Install the right front brake hard pipe and snap the right front brake hard pipe into the single-hole hose clamp.

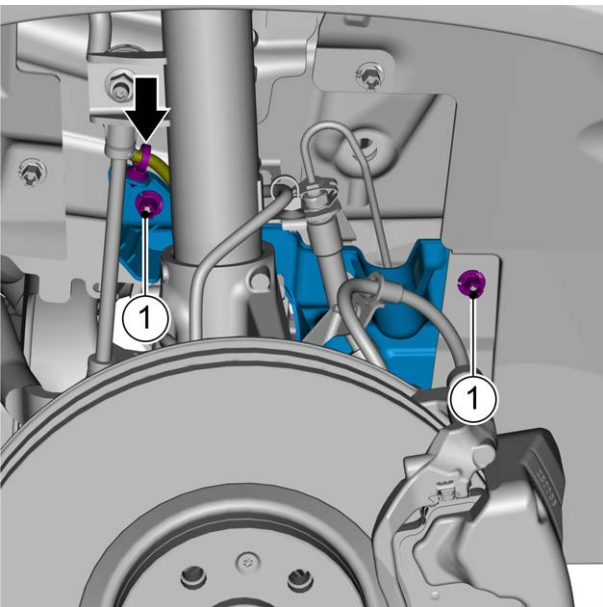


- 2 Install the fitting nut 2 of the right front brake hard pipe to the right front No. 1 brake hard pipe.
Torque: 16N·m
- 3 Install the brake hard pipe protection bracket 1.





- 4 Snap in the spring stop tab, connect the right front brake hose to the brake hard pipe and tighten the nut.
Torque: 14N·m



- 5 Install the right front wheel cover splash guard and tighten the 2 plastic fixing nuts 1.
- 6 Install wheel speed sensor (right front) wiring harness to retaining clip.

- 7 Install the heater.
- 8 Install the bottom engine guard assembly.
- 9 Add clean brake fluid to the brake fluid reservoir to a position flush with the reservoir max line.
- 10 Check for brake fluid leaks.
- 11 For brake system venting, see [Brake Fluid Drain and Fill procedure](#).
- 12 Install front right wheel.
- 13 Install the engine trim cover assembly.
- 14 Close the engine compartment cover.

7.4.5.7 Replacement of the left rear brake hard pipe

Removal Procedure

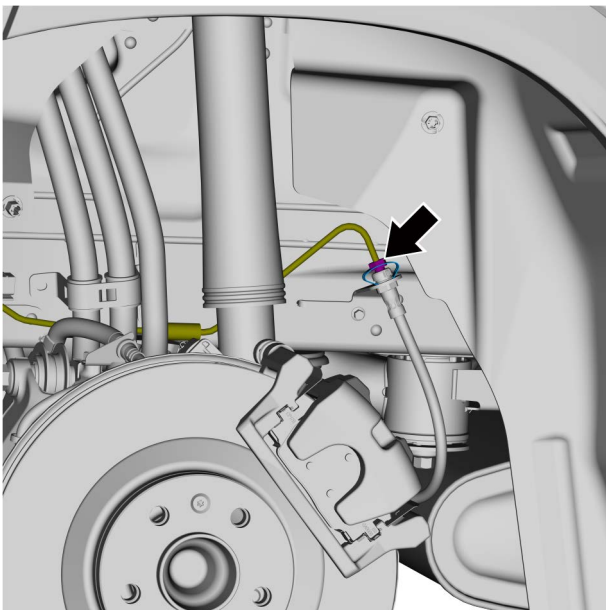
Warning !

Do not bend the brake pipe. Failure to do so may cause the brakes to fail, resulting in a serious accident.

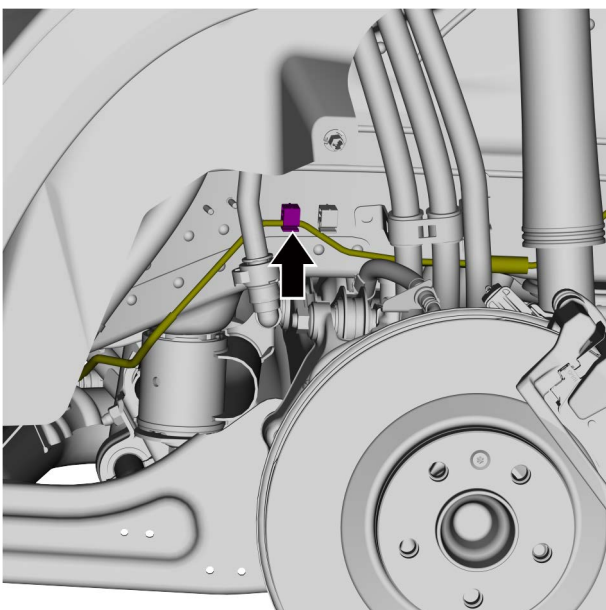
Caution

Do not spill brake fluid on the paintwork. Otherwise, it is likely to damage the paintwork.

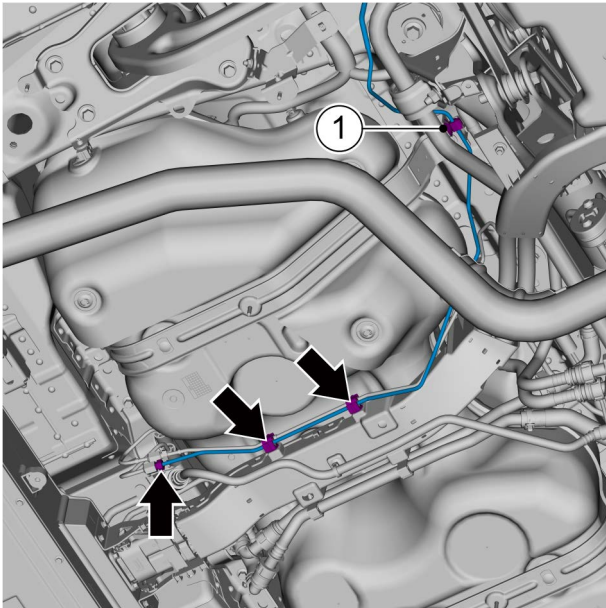
- 1 Remove the left rear wheels, refer to [Replacement of wheel assembly](#).
- 2 Remove the connection nut connecting the left rear brake hose to the brake hard pipe and pull out the spring stop tab.



- 3 Drain brake fluid.
- 4 Disconnect the hard pipe from the retaining clip of the left rear brake hard pipe.



- 5 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 6 Remove the right bottom guard of the fuel tank, see [Replacement of Right Bottom Guard of Fuel Tank](#).



- 7 Disconnect the connection fitting connecting left rear brake hard pipe from the left center brake hard pipe.

Caution

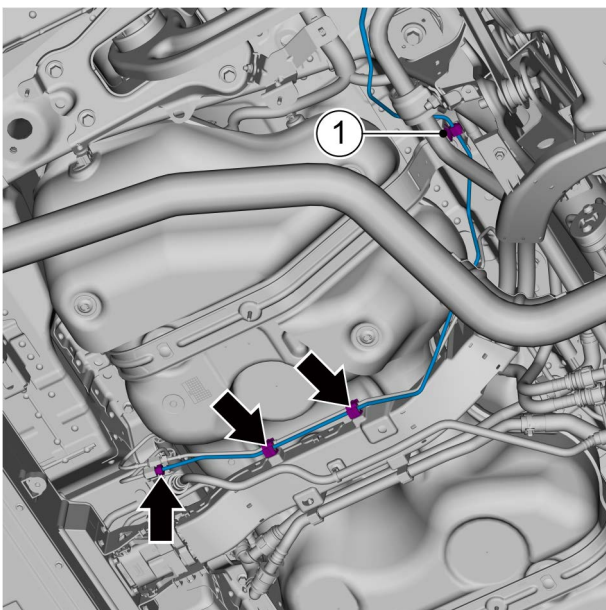
Plug the connection orifice between the left rear brake hard pipe and the left center brake hard pipe to prevent brake fluid loss and contamination.

- 8 Remove 1 retaining clip 1 of the left rear brake hard pipe.
- 9 Disconnect the left rear brake hard pipe from the two-hole hose clamp and remove the left rear brake hard pipe.

Installation Procedure

Caution

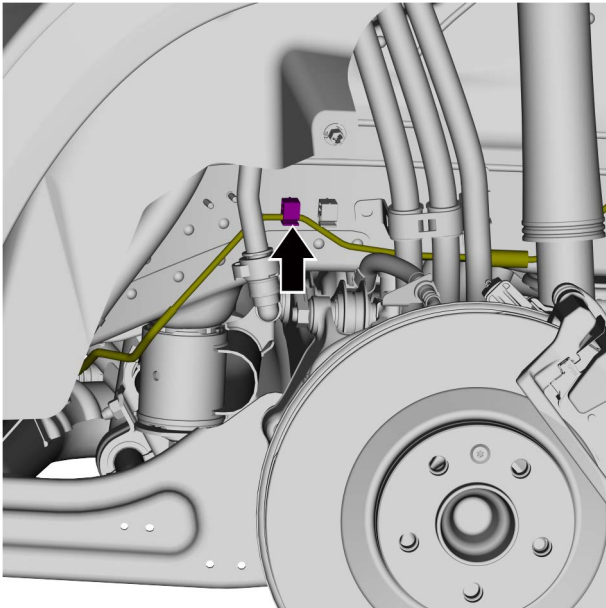
Pre-tighten the fittings by hand when installing the brake hard pipes, then use an open-end wrench to tighten the torque to prevent damage to the threads.



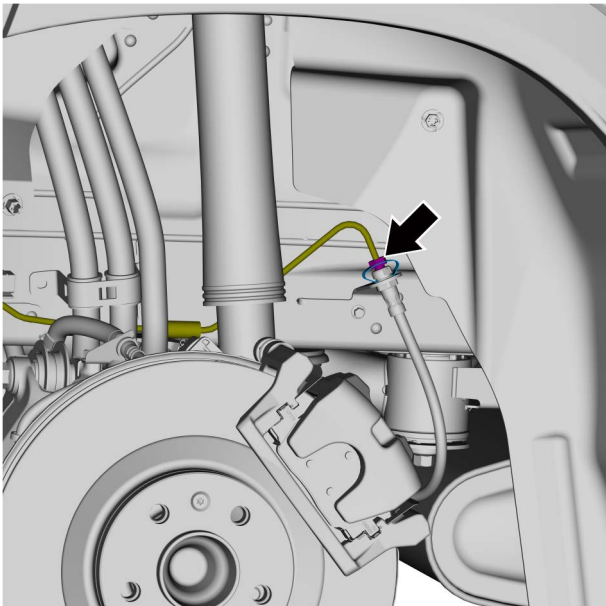
- 1 To install the left rear brake hard pipe, snap the left rear brake hard pipe into the two-hole hose clamp.
- 2 Install the 1 retaining clip 1 of the left rear brake hard pipe.
- 3 Connect the connection fitting connecting left rear brake hard pipe to the left center brake hard pipe.

Torque: 16N·m

- 4 Lower the vehicle.



- 5 Snap the left rear brake hard tube onto the retaining clip.



- 6 Snap in the spring stop tabs, connect the left rear brake hose to the brake hard pipe, and tighten the nuts.
Torque: 14N·m

- 7 Add clean brake fluid to the brake fluid reservoir to a position flush with the reservoir max line.
- 8 Check for brake fluid leaks.
- 9 For brake system venting, see [Brake Fluid Drain and Fill procedure](#).
- 10 Install the wheel.
- 11 Lift the vehicle and install the right side bottom guard of the gas tank.
- 12 Lower the vehicle.

7.4.5.8 Replacement of right rear brake hard pipe

Removal Procedure

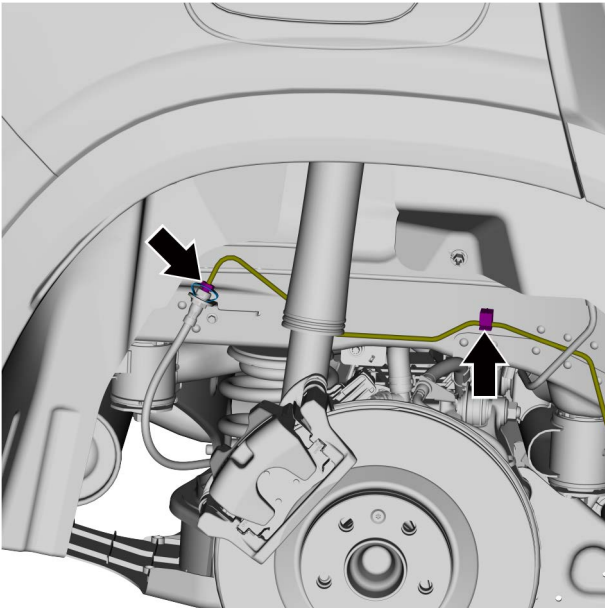
Warning !

Do not bend the brake pipe. Failure to do so may cause the brakes to fail, resulting in a serious accident.

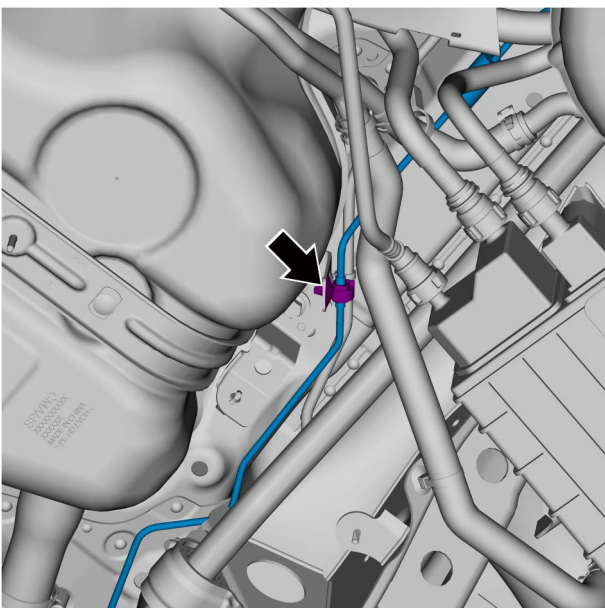
Caution

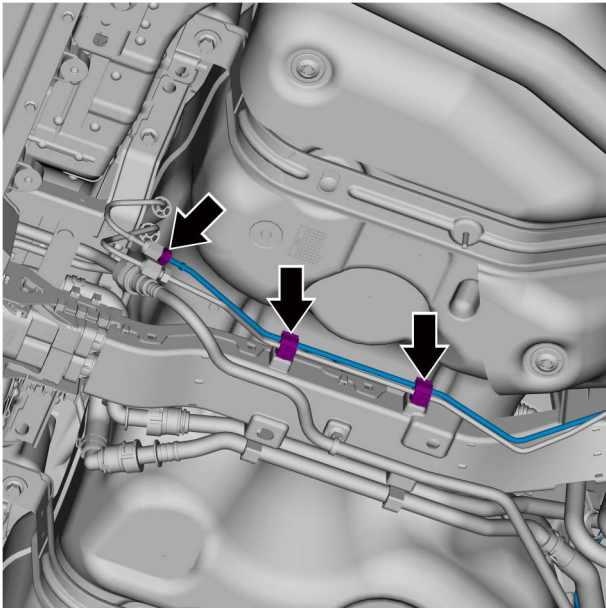
Do not spill brake fluid on the paintwork. Otherwise, it is likely to damage the paintwork.

- 1 Drain brake fluid.
- 2 Remove right rear wheel, see [Wheel Assembly Replacement](#).
- 3 Remove the connection nut connecting the left rear brake hose to the brake hard pipe and pull out the spring stop tab.
- 4 Disengage the retaining clip of the right rear brake hard pipe.



- 5 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 6 Remove the right bottom guard of the fuel tank, see [Replacement of Right Bottom Guard of Fuel Tank](#).
- 7 Remove the right rear brake hard pipe retaining clips.





- 8 Disconnect the right rear brake hard hose from the retaining snap.
- 9 Remove the connection nut connecting the right rear brake hard pipe to the right center brake hard pipe.

Caution

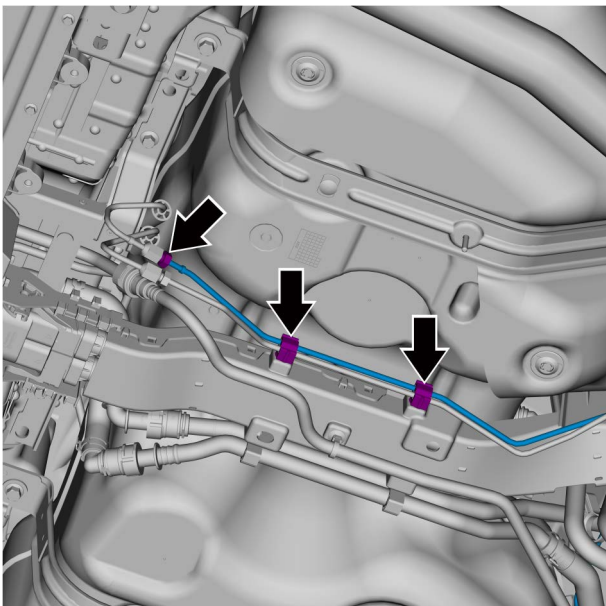
Plug the connection pipe opening between the right rear brake hard pipe and the right center brake hard pipe to prevent brake fluid loss and contamination.

Installation Procedure

Caution

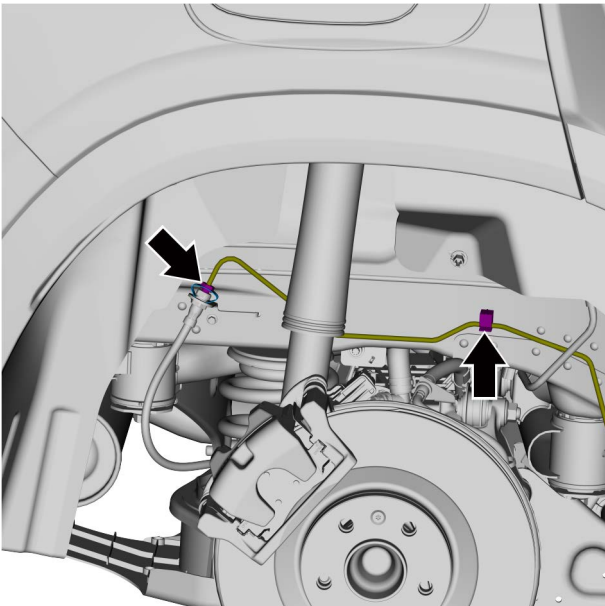
When assembling the right rear brake hard pipe, the joint is pre-tightened by hand, then hold the brake hard pipe by hand and use an open-end wrench to apply tightening torque to prevent deformation of the brake hard pipe.

- 1 Install the connecting nut of the right rear brake hard pipe to the right center brake hard pipe.
Torque: 16N·m
- 2 Install the right rear brake hard pipe into the retaining clip.





- 3 Install the right rear brake hard pipe retaining clips.



- 4 Install the brake hard pipe into the retaining clip.
- 5 Snap in the spring stop tab, connect the right rear brake hose to the brake hard pipe and tighten the nut.
Torque: 14N·m

- 6 Install the right bottom guard of the fuel tank.
- 7 Install the wheel.
- 8 lower the vehicle.
- 9 Add clean brake fluid into the brake fluid reservoir to the reservoir jug max line position.
- 10 Drain air from the brake system, see [Brake Fluid Drain and Fill Procedure](#).
- 11 Check for brake fluid leaks.

7.4.5.9 Replacement of left center brake hard pipe

Removal Procedure

Warning !

See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

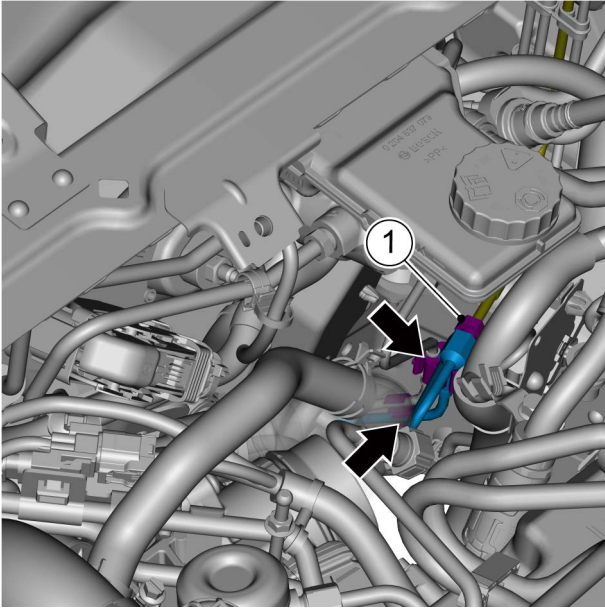
Warning !

Do not bend any brake pipe. Failure to do so may cause brake failure and result in an accident.

Caution

Do not spill brake fluid on the paintwork. Otherwise, it is likely to damage the paintwork.

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Drain brake fluid.
- 3 Remove the air filter assembly, see [Replacement of Air Filter Assembly](#).
- 4 Remove the resonator assembly, see [Replacement of Resonator Assembly](#).
- 5 Remove the front exhaust pipe, see [Replacement of Front Exhaust Pipe](#).
- 6 Remove the front access heat shield, see [Replacement of Front Access Heat Shield](#).
- 7 Remove the rear channel heat shield, see [Replacement of Rear Channel Heat Shield](#).
- 8 Remove the hybrid power battery assembly, see [Replacement of Hybrid Power Battery Assembly](#).
- 9 Remove the center channel line and harness bracket assembly, see [Replacement of Center Channel Line and Harness Bracket Assembly](#).

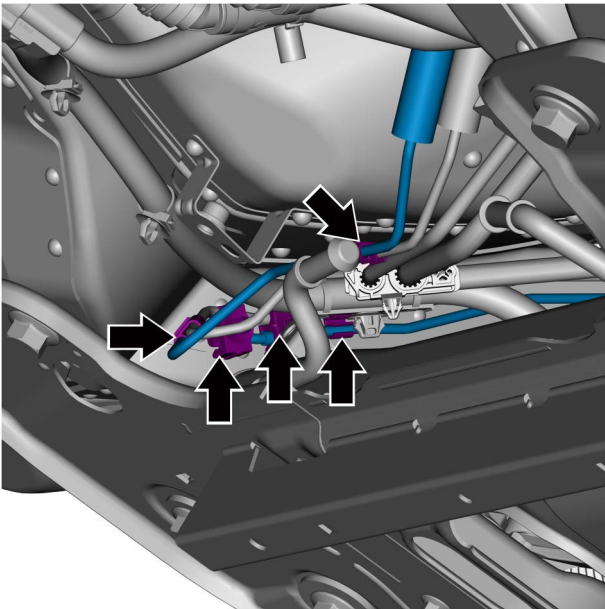


- 10 Remove the connection nut 1 connecting the left rear 1 brake hard pipe to the left center section brake hard pipe.

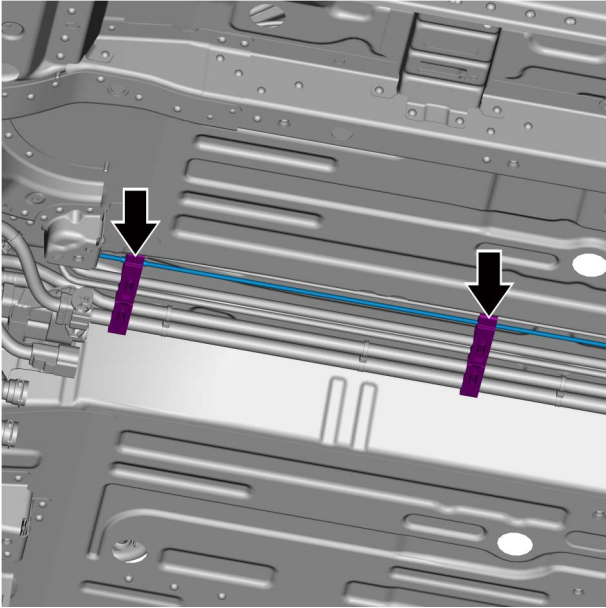
Caution

Plug the left rear No.1 brake hard pipe to the left center brake hard pipe connection orifice to prevent brake fluid loss and contamination.

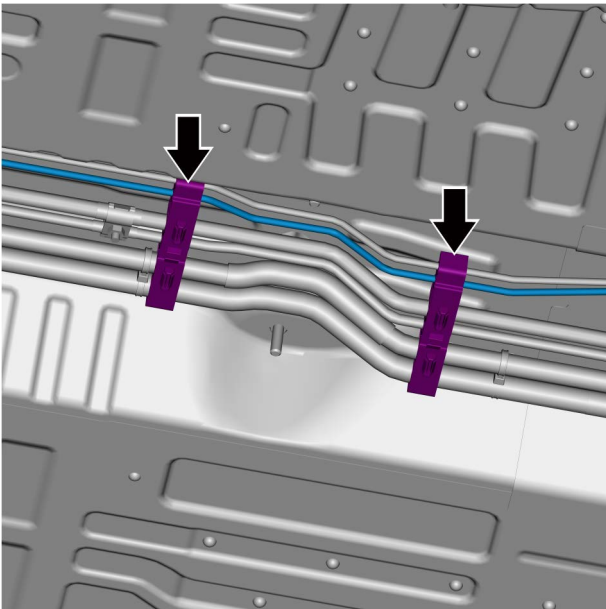
- 11 Disconnect the left center brake hard pipe from the pipe clamp.



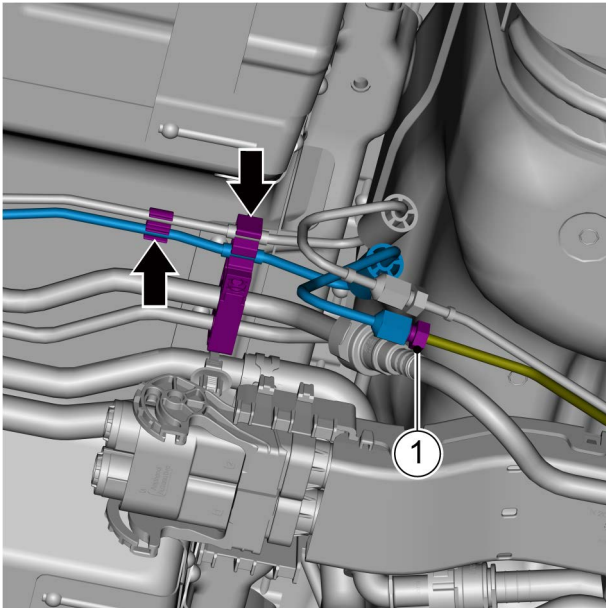
- 12 Remove the 5 clamps of the left center brake hard pipe.



13 Remove the 2 clamps of the left center brake hard pipe.



14 Remove the 2 clamps of the left center brake hard pipe.



- 15 Remove the 2 clamps of the left center brake hard pipe.
- 16 Remove the connection nut 1 connecting the left rear brake hard pipe to the left center brake hard pipe, and remove the left center brake hard pipe.

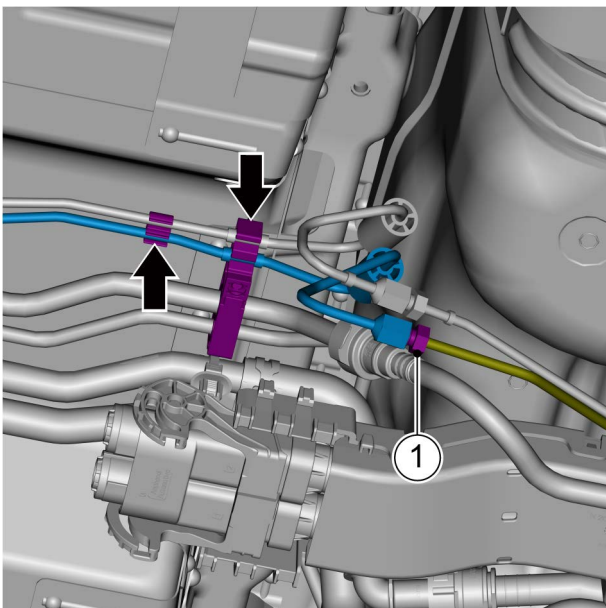
Caution

Plug the left rear brake hard pipe to left center brake hard pipe connection orifice to prevent brake fluid loss and contamination.

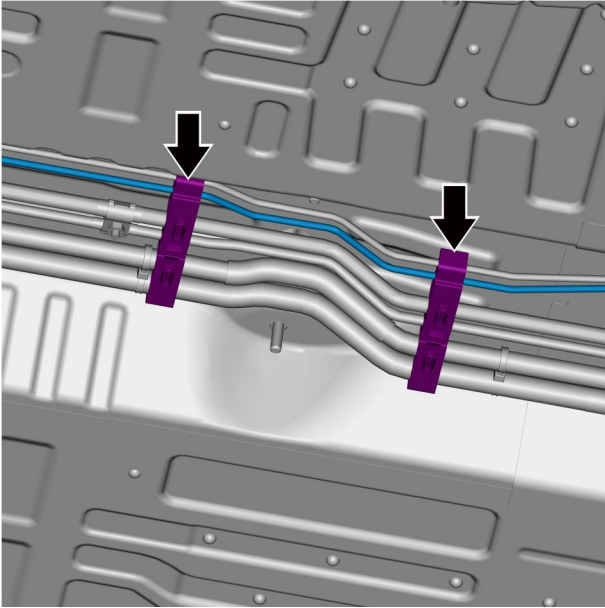
Installation Procedure

Caution

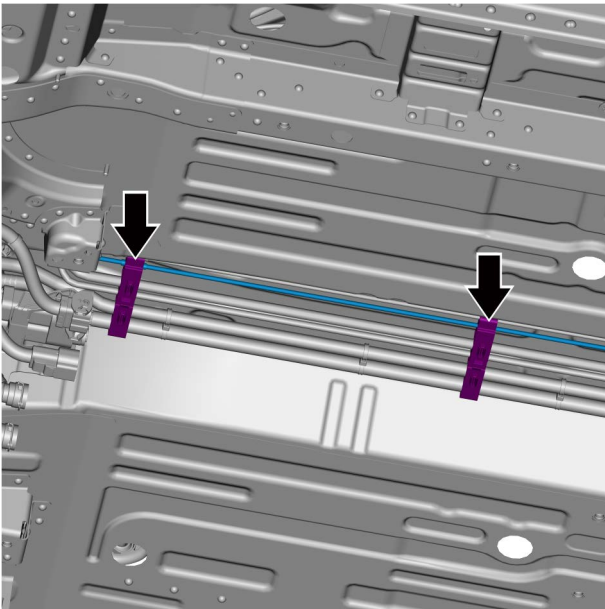
When assembling the left rear No. 1 brake hard pipe, pre-tighten the joint by hand and then use an open-end wrench to tighten the torque to prevent damage to the threads.



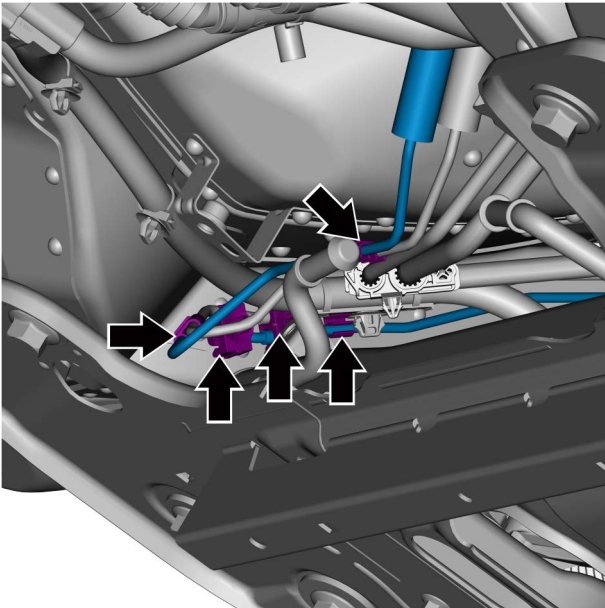
- 1 Install the left center section brake hard pipe by snapping the left center section brake hard pipe into the pipe clamps.
- 2 Connect the connecting nut connecting left rear brake hard pipe to the left center brake hard pipe and tighten.
Torque: 16N·m



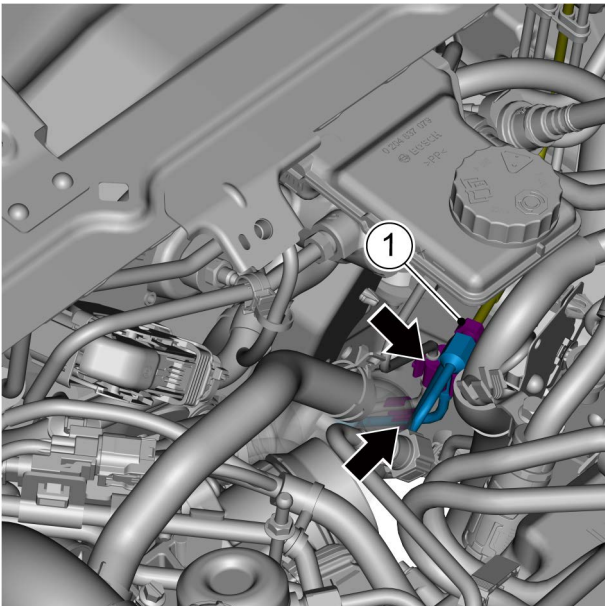
- 3 Install the 2 hose clamps for the left center section brake hard pipe.



- 4 Install the 2 hose clamps for the left center section brake hard pipe.



- 5 Install the 5 hose clamps for the left center section brake hard pipe.



- 6 Connect the connecting nut 1 connecting left rear No. 1 brake hard pipe to the left center brake hard pipe and tighten.
Torque: 16N·m
- 7 Snap the left center brake hard pipe into the clamps.

- 8 Add clean brake fluid to the master cylinder reservoir to the reservoir jug max line position.
- 9 Bleed air from the hydraulic brake system, see [Brake Fluid Bleeding and Filling Procedure](#).
- 10 Check for leaks.
- 11 Install the center channel line and harness bracket assembly.
- 12 Remove the hybrid power battery total.
- 13 Install the rear channel heat shield.
- 14 Install the front access heat shield.
- 15 Install the front exhaust pipe.
- 16 Install the resonator assembly.

- 17 Install the air filter assembly.
- 18 Connect the negative cable of battery.

7.4.5.10 Replacement of Right Center Brake Pipe

Removal Procedure

Warning !

See "WARNINGS ABOUT VEHICLE LIFT" in "[WARNINGS AND PRECAUTIONS](#)"

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

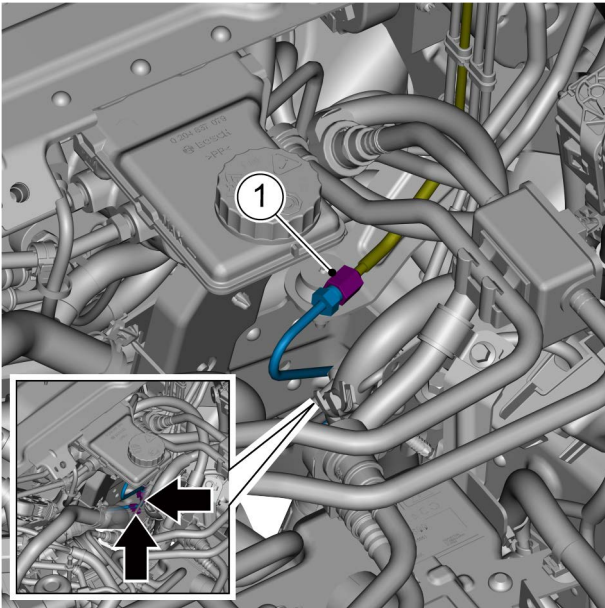
Warning !

Do not bend any brake pipe. Failure to do so may cause brake failure and result in an accident.

Caution

Do not spill brake fluid on the paintwork. Otherwise, it is likely to damage the paintwork.

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Drain brake fluid.
- 3 Remove the air filter assembly, see [Replacement of Air Filter Assembly](#).
- 4 Remove the resonator assembly, see [Replacement of Resonator Assembly](#).
- 5 Remove the front exhaust pipe, see [Replacement of Front Exhaust Pipe](#).
- 6 Remove the front access heat shield, see [Replacement of Front Access Heat Shield](#).
- 7 Remove the rear channel heat shield, see [Replacement of Rear Channel Heat Shield](#).
- 8 Remove the hybrid power battery assembly, see [Replacement of Hybrid Power Battery Assembly](#).
- 9 Remove the center channel line and harness bracket assembly, see [Replacement of Center Channel Line and Harness Bracket Assembly](#).

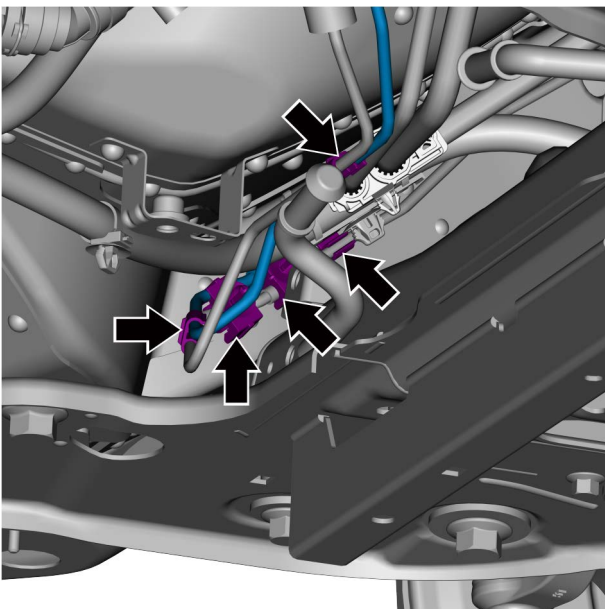


- 10 Remove the connection nut 1 connecting right rear No.1 brake hard pipe to the right center brake hard pipe.

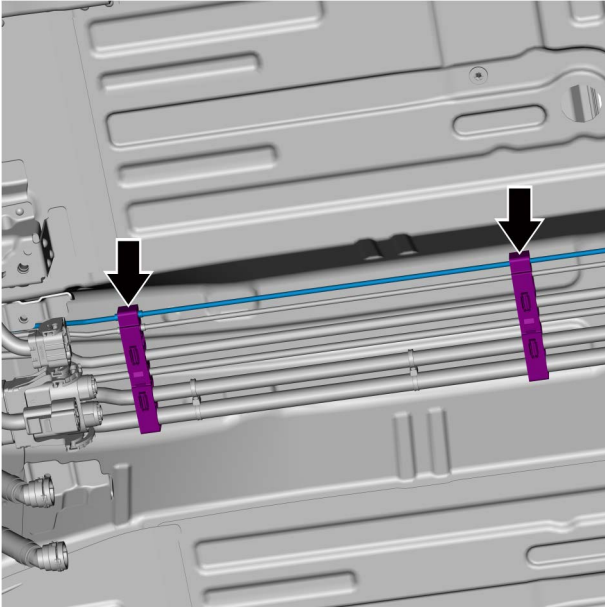
Caution

Plug the right rear No.1 brake hard pipe to right center brake hard pipe connection orifice to prevent brake fluid loss and contamination.

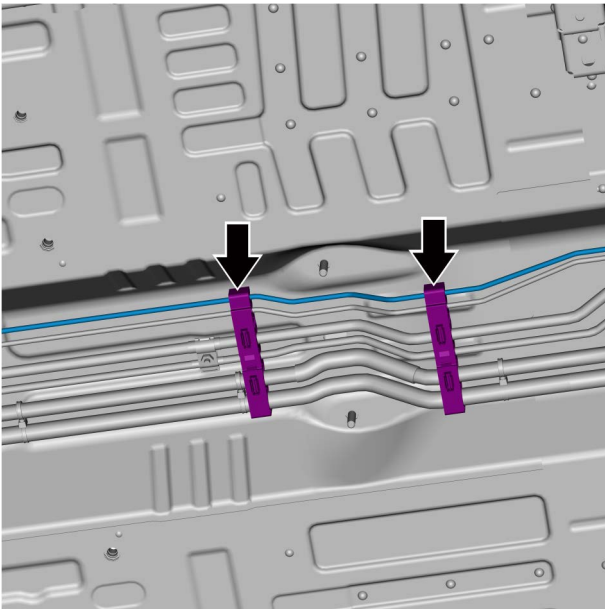
- 11 Disconnect the right center brake hard pipe from the pipe clamp.



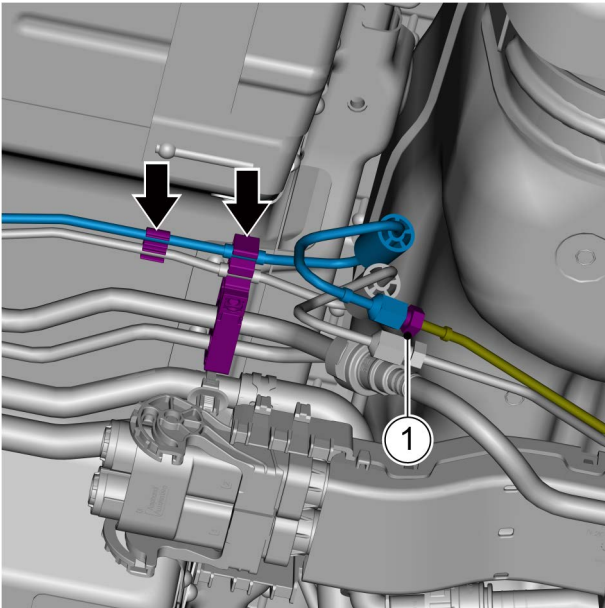
- 12 Remove the 5 hose clamps from the right center section brake hard pipe.



- 13 Remove the 2 hose clamps from the right center section brake hard pipe.



- 14 Remove the 2 hose clamps from the right center section brake hard pipe.



- 15 Remove the 2 hose clamps from the right center section brake hard pipe.
- 16 Remove the connection nut 1 connecting the right rear brake hard pipe to the right center brake hard pipe, and remove the right center brake hard pipe.

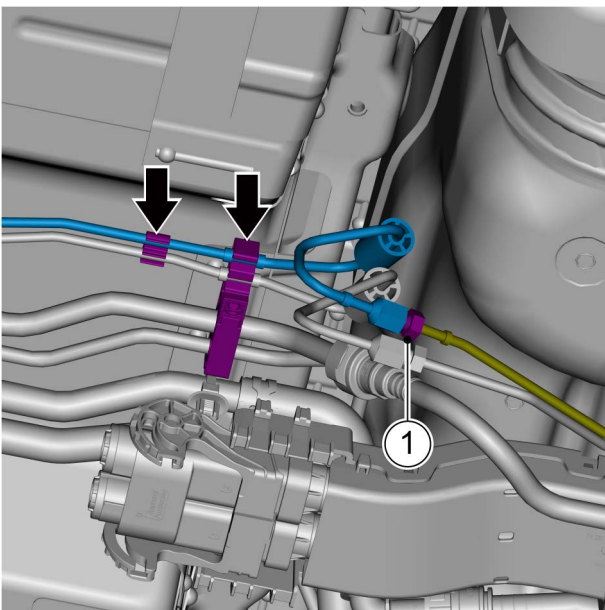
Caution

Plug the right rear brake hard pipe to right center section brake hard pipe connection orifice to prevent brake fluid loss and contamination.

Installation Procedure

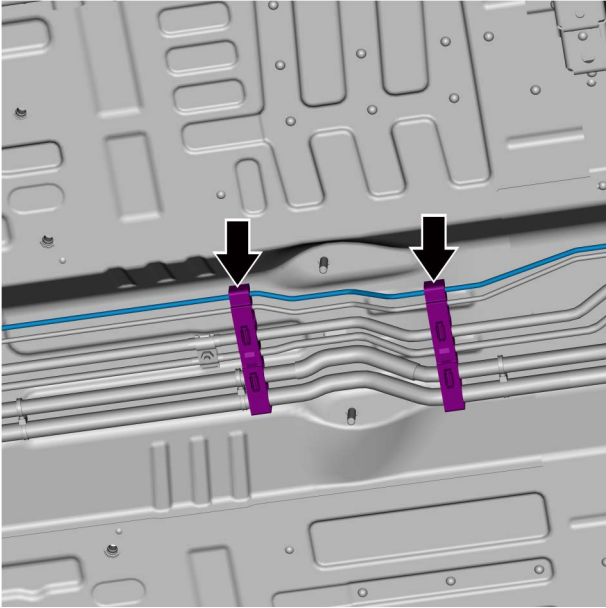
Caution

When assembling the right rear No.1 brake hard pipe, the fitting is pre-tightened by hand and then torqued with an open end wrench to prevent damage to the threads.

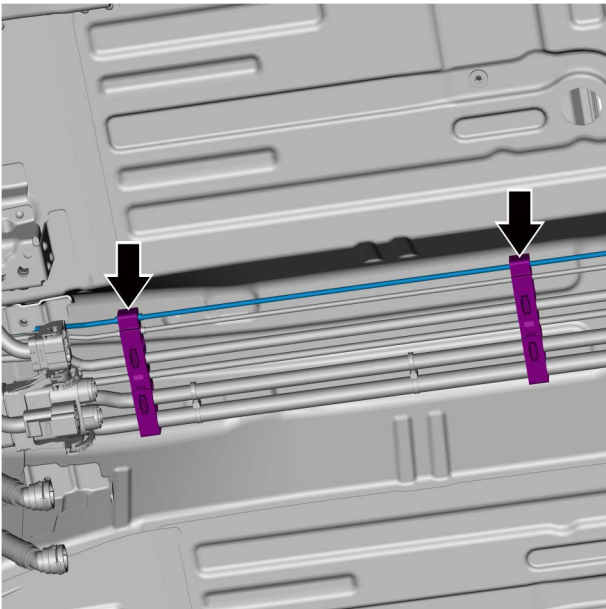


- 1 Install the right center brake hard pipe and snap the right center brake hard pipe into the pipe clamp.
- 2 Connect the right rear brake hard pipe to the right center brake hard pipe connecting nut and tighten.

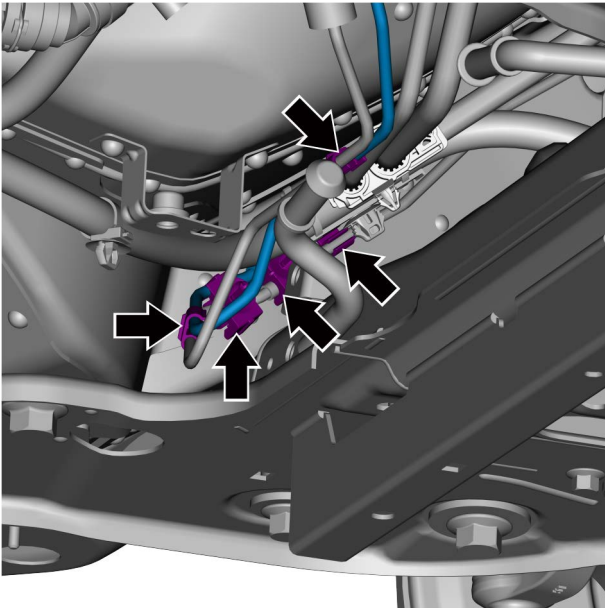
Torque: 16N·m



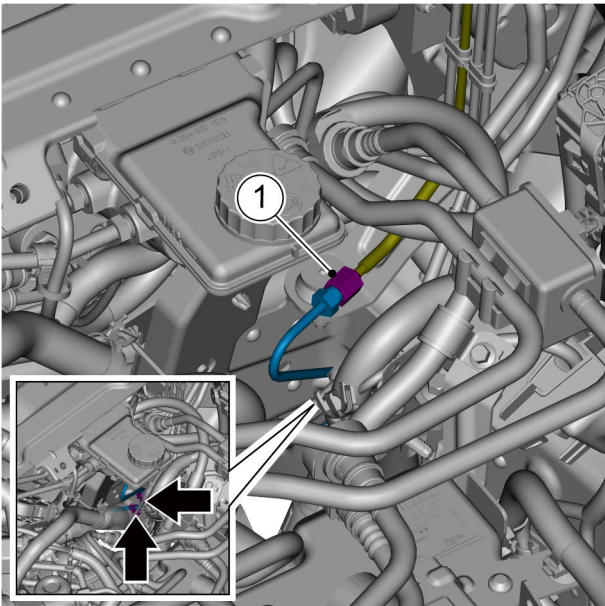
- 3 Install the 2 clamps on the right center brake hard pipe.



- 4 Install the 2 clamps on the right center brake hard pipe.



- 5 Install the 5 clamps on the right center brake hard pipe.



- 6 Connect the right rear No.1 brake hard pipe to the right center section brake hard pipe with the connecting nut 1 and tighten.

Torque: 16N·m

- 7 Snap the right center brake hard pipe into the clamp.

- 8 Add clean brake fluid to the master cylinder reservoir to the reservoir jug max line position.

- 9 Bleed air from the hydraulic brake system, see [Brake Fluid Bleeding and Filling Procedure](#).

- 10 Check for leaks.

- 11 Install the center channel line and harness bracket assembly.

- 12 Remove the hybrid power battery total.

- 13 Install the rear channel heat shield.

- 14 Install the front access heat shield.

- 15 Install the front exhaust pipe.

- 16 Install the resonator assembly.

- 17 Install the air filter assembly.
- 18 Connect the negative cable of battery.

7.4.5.11 Replacement of right front No. 1 brake hose

Removal Procedure

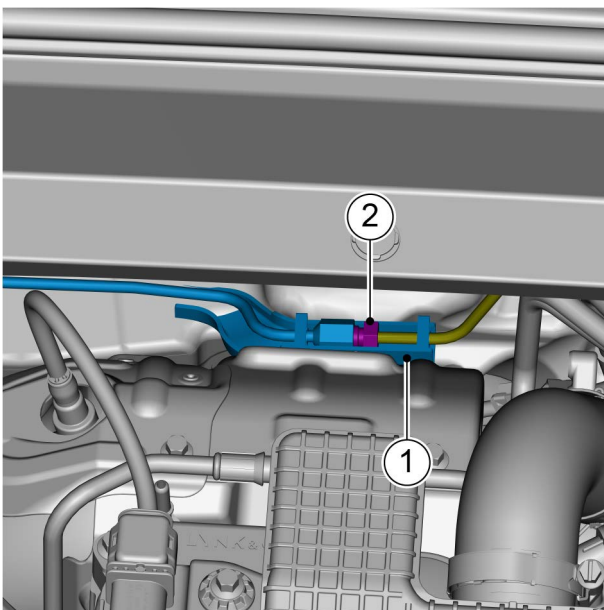
Warning !

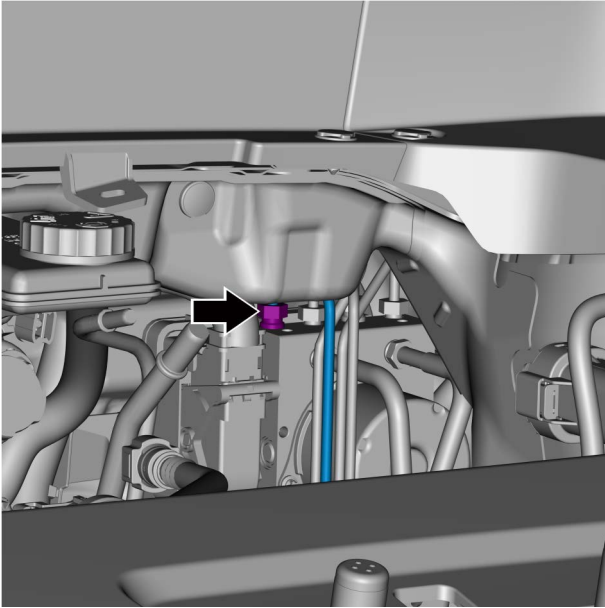
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Drain brake fluid.
- 3 Remove the air filter assembly, see [Replacement of Air Filter Assembly](#).
- 4 Remove the resonator assembly, see [Replacement of Resonator Assembly](#).
- 5 Remove the engine trim cover assembly, refer to [Replacement of engine trim cover assembly](#).
- 6 Remove wheel, see [Replacement of Wheel Assembly](#).
- 7 Remove the brake hard pipe protection bracket 1.
- 8 Remove the fitting nut 2 of the right front brake hard pipe to the right front No. 1 brake hard pipe and wipe off any spilled brake fluid immediately.

Caution

Plug the right front No.1 brake hard pipe and right front brake hard pipe connection orifice to prevent brake fluid loss and contamination.

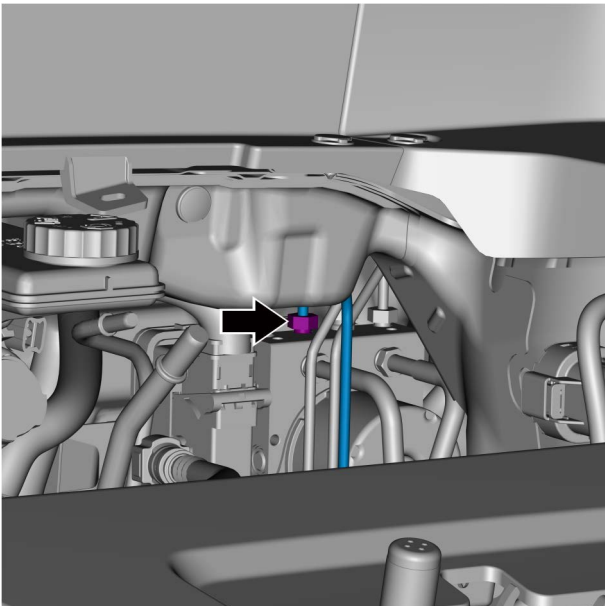




- 9 Remove the brake hard pipe fixing nut of the right rear No. 1 brake hard pipe fixed to the vehicle dynamic domain mainframe.

Caution

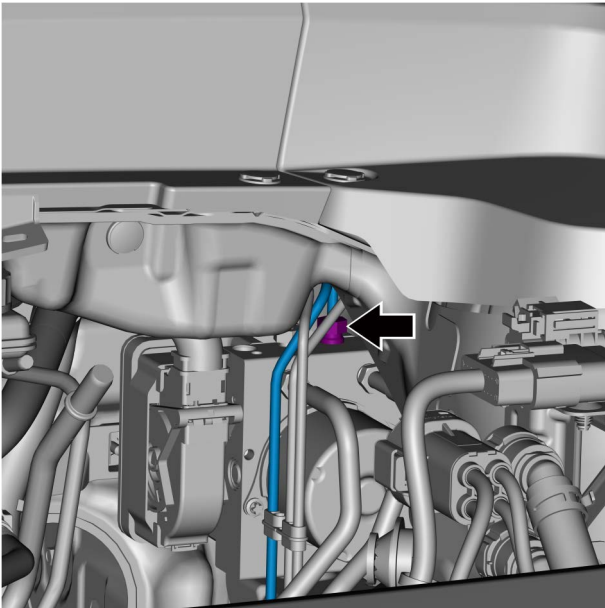
Plug the right rear No. 1 brake hard pipe and vehicle dynamic domain mainframe oil pipe port to prevent brake fluid loss and contamination.



- 10 Remove the fitting nut of the left front brake hard pipe from the vehicle dynamic domain mainframe and wipe off any spilled brake fluid immediately.

Caution

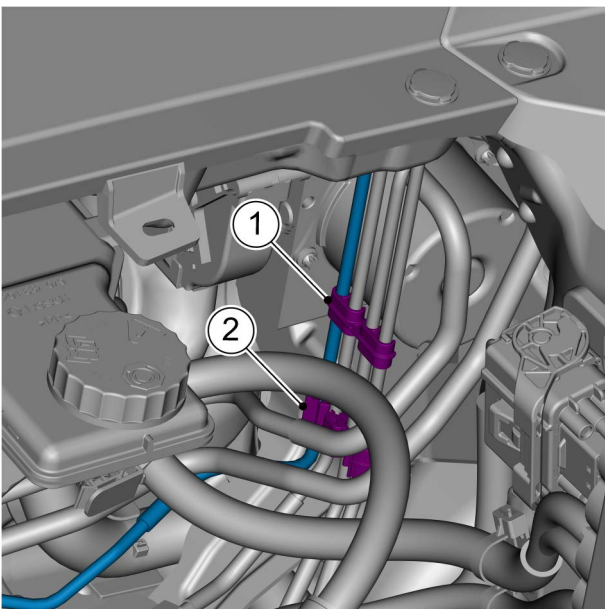
Plug the pipe opening connecting the left front brake hard pipe to the vehicle's dynamic domain mainframe to prevent brake fluid loss and contamination.



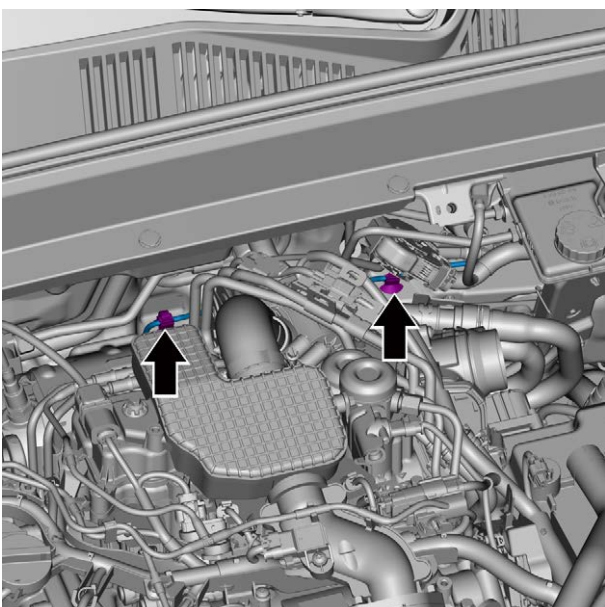
- 11 Remove the fitting nut of the right front No. 1 brake hose from the vehicle dynamics domain mainframe and wipe off any spilled brake fluid immediately.

Caution

Plug the right front No. 1 brake hard pipe to the vehicle dynamic domain mainframe fluid port to prevent brake fluid loss and contamination.



- 12 Remove the 4-hole hose clamp 1.
- 13 Disconnect the right front No.1 brake hard pipe from the 4-hole hose clamp 2.



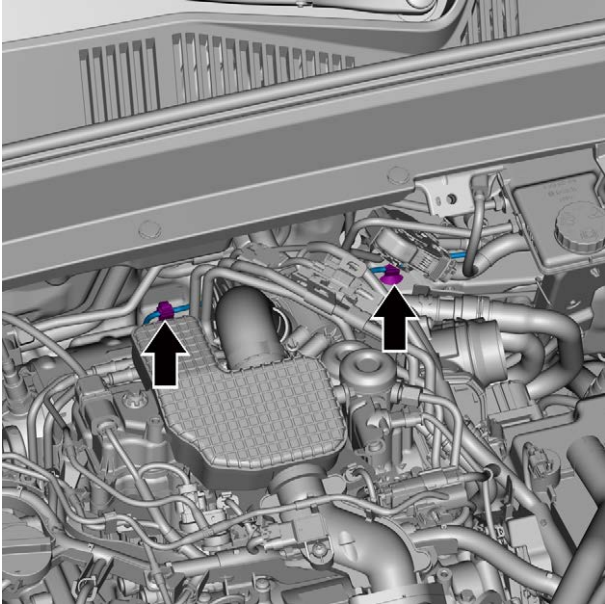
- 14 Remove the retaining clips of the right front No. 1 brake hard pipe.
- 15 Disconnect the right front 1 brake hard pipe from the pipe clamp and remove the right front 1 brake hard pipe.

Installation Procedure

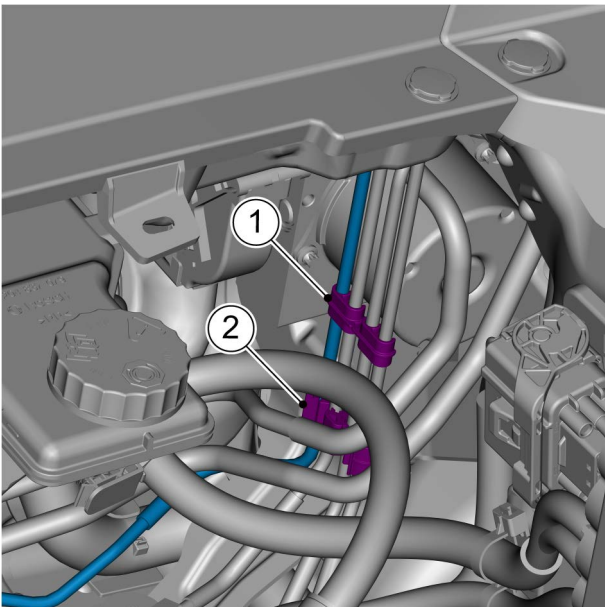
Caution

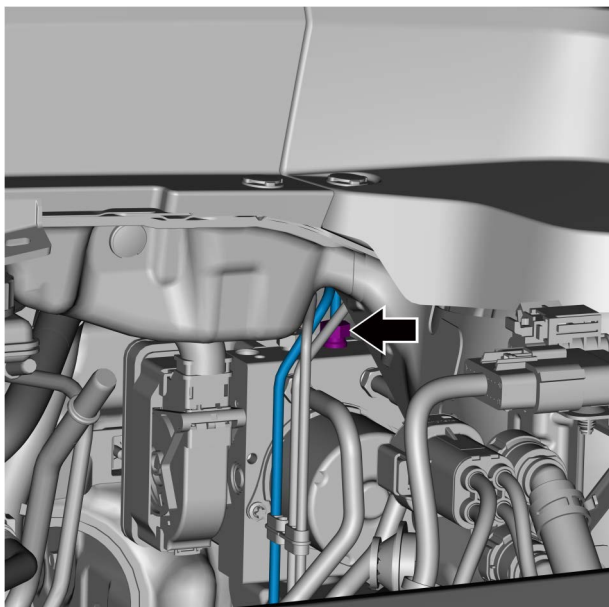
When assembling the right front No. 1 brake hard pipe, the joint is pre-tightened by hand and then torqued with an open-end wrench to prevent damage to the threads.

- 1 Install the right front No.1 brake hard pipe by snapping the right front No.1 brake hard pipe into the clamp.
- 2 Install the retaining clips for the right front No. 1 brake hard pipe.

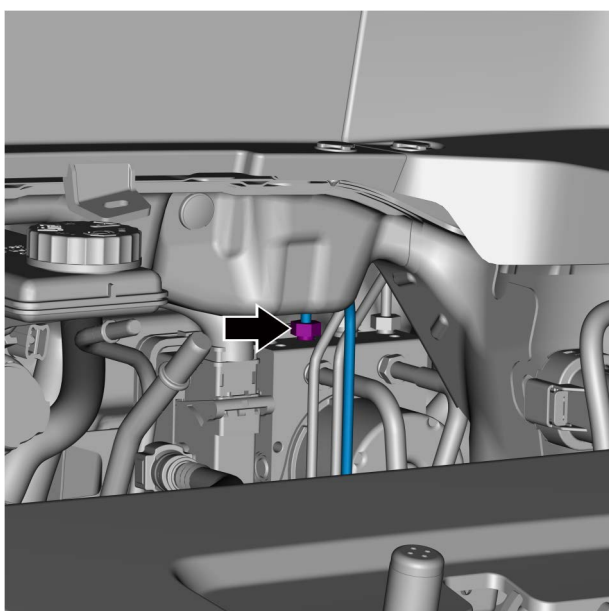


- 3 Install the right front 1 brake hard pipe to the 4-hole hose clamp 2.
- 4 Install the 4-hole hose clamp 1.

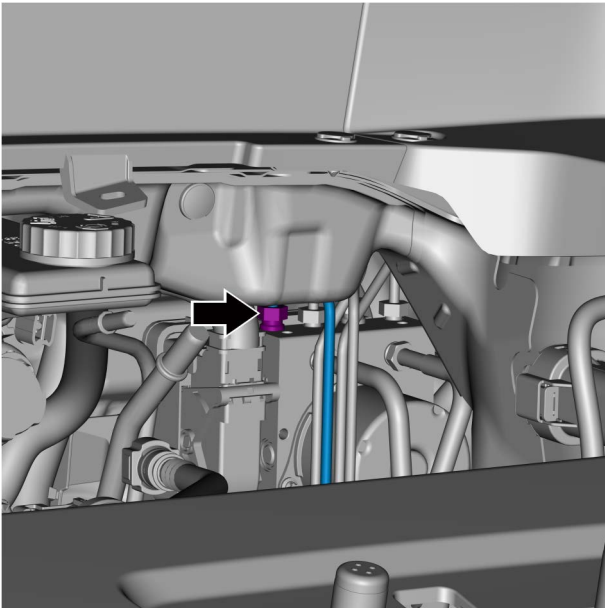




- 5 Install the fitting nut for the right front No.1 brake hard pipe located on the vehicle's dynamic domain mainframe.
Torque: 15N·m

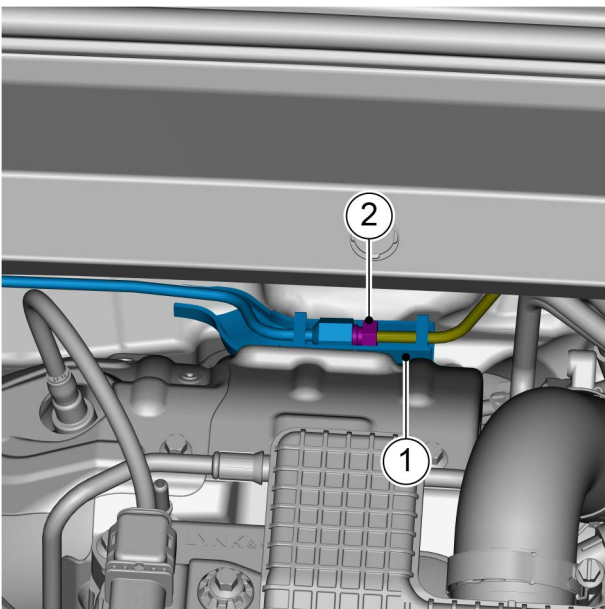


- 6 Install the fitting nut for the left front brake hard pipe located on the vehicle dynamics domain mainframe.
Torque: 15N·m



- 7 Install the brake hard pipe fixing nut on the right rear No.1 brake hard pipe secured to the vehicle's dynamic domain mainframe.

Torque: 15N·m



- 8 Install the connection nut 2 connecting right front No.1 brake hard pipe to the right front brake hard pipe.
- 9 Install the brake hard pipe protection bracket 1.

Torque: 16N·m

- 10 Add clean brake fluid to the master cylinder reservoir to the reservoir jug max line position.
- 11 Bleed air from the hydraulic brake system, see [Brake Fluid Bleeding and Filling Procedure](#).
- 12 Check for leaks.
- 13 Install the resonator assembly.
- 14 Install the air filter assembly.
- 15 Install the engine trim cover assembly.
- 16 Install the wheel.
- 17 Connect the negative cable of battery.

7.4.5.12 Replacement of left rear No.1 brake hard pipe

Removal Procedure

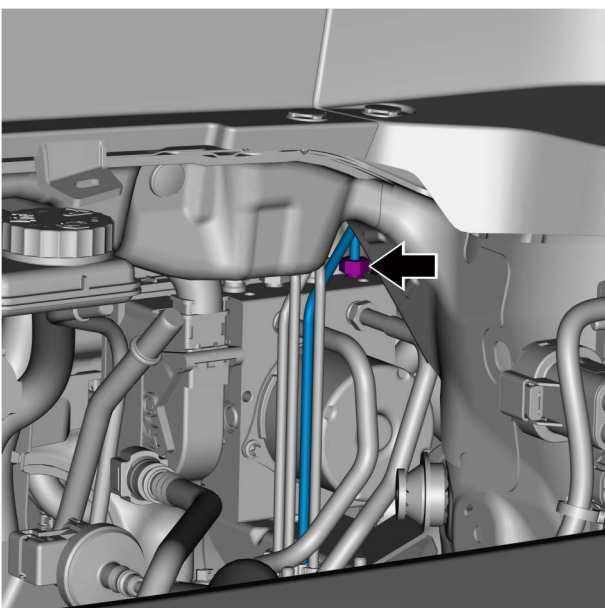
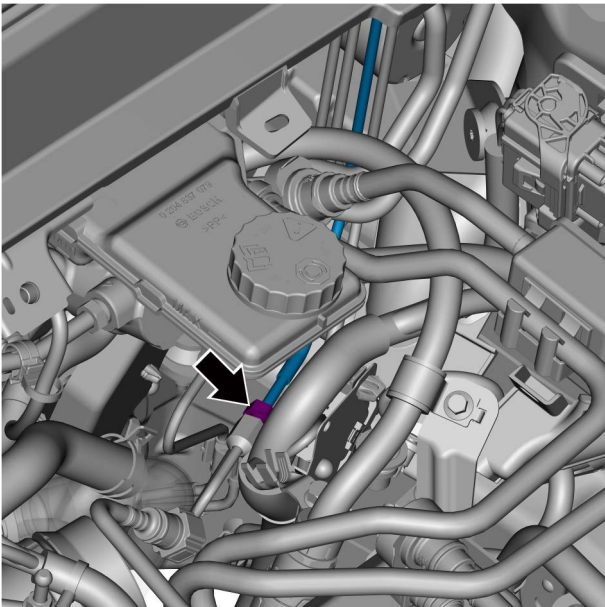
Warning !

Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the engine trim cover assembly, refer to [Replacement of engine trim cover assembly](#).
- 3 Drain brake fluid.
- 4 Remove the air filter assembly, see [Replacement of Air Filter Assembly](#).
- 5 Remove the resonator assembly, see [Replacement of Resonator Assembly](#).
- 6 Remove the connecting nut between the left rear 1 brake hard pipe and the left center brake hard pipe.

Caution

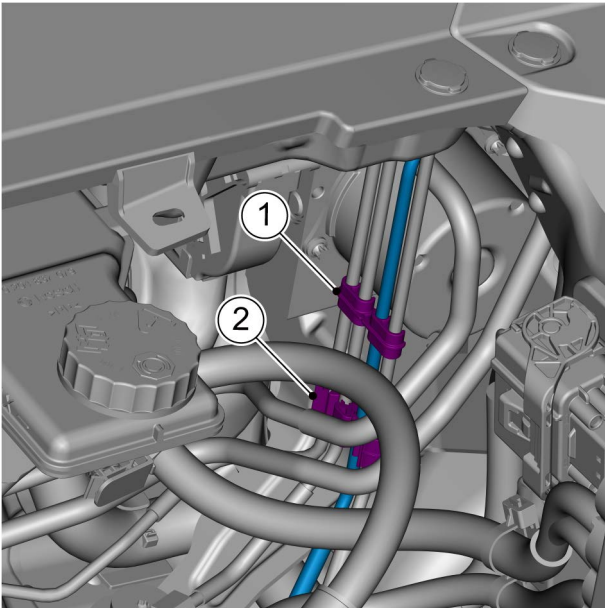
Plug the left rear No.1 brake hard pipe to the left center brake hard pipe connection orifice to prevent brake fluid loss and contamination.



- 7 Remove the brake hard pipe fixing nut that secures the left rear No. 1 brake hard pipe to the vehicle dynamic domain mainframe.

Caution

Plug the left rear No. 1 brake hard pipe and vehicle dynamic domain mainframe fluid line port to prevent brake fluid loss and contamination.



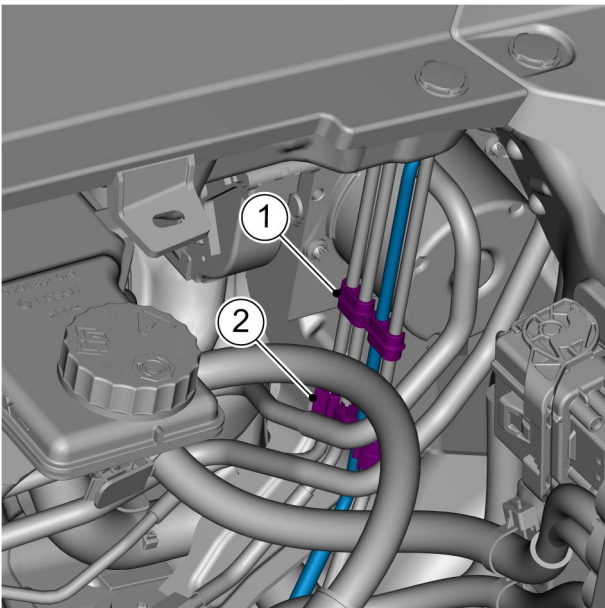
- 8 Remove the 4-hole hose clamp 1.
- 9 Disconnect the left rear No.1 brake hard pipe from the 4-hole hose clamp 2 and remove the left rear No.1 brake hard pipe.

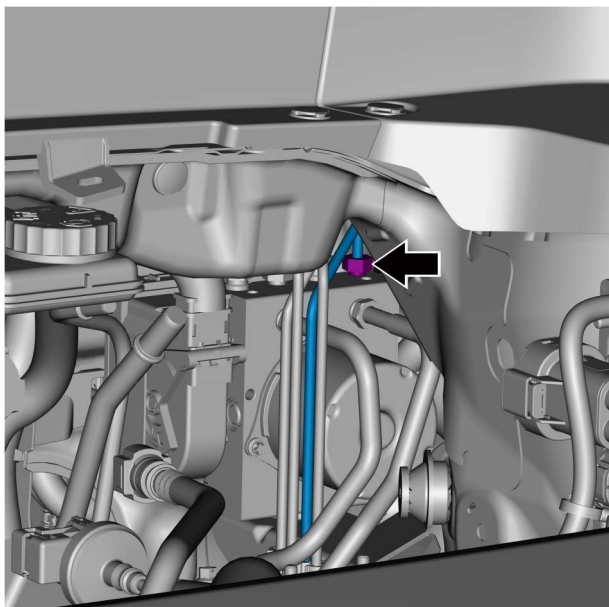
Installation Procedure

Caution

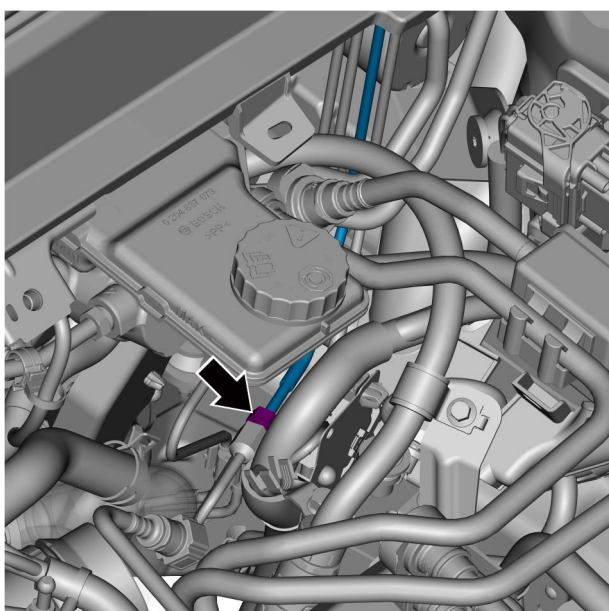
When assembling the left rear No. 1 brake hard pipe, pre-tighten the joint by hand and then use an open-end wrench to tighten the torque to prevent damage to the threads.

- 1 Install the left rear No. 1 brake hard pipe and snap the left rear No. 1 brake hard pipe into the 4-hole hose clamp 2.
- 2 Install the 4-hole hose clamp 1.

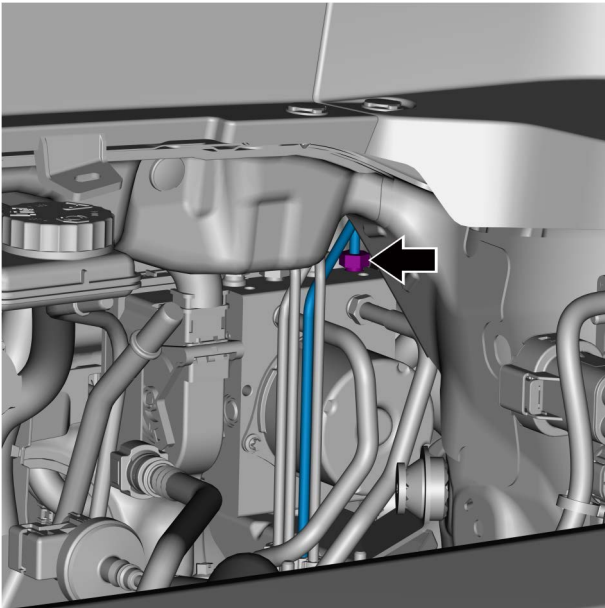




- 3 Pre-tighten the brake hard pipe fixing nut on the left rear No.1 brake hard pipe secured to the vehicle's dynamic domain mainframe.

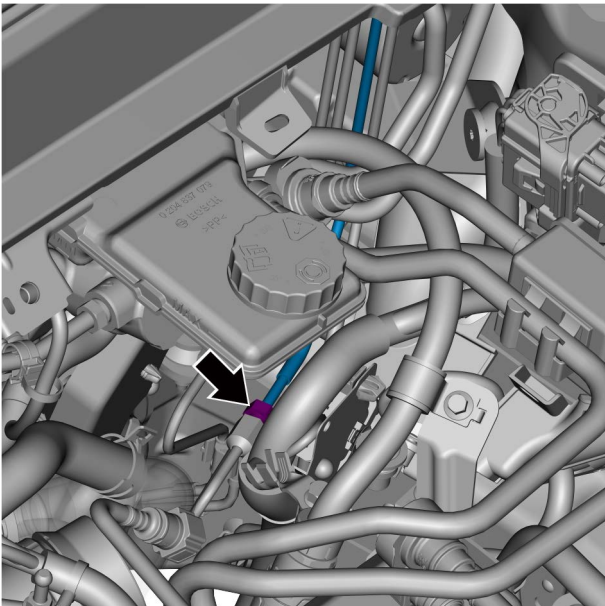


- 4 Pre-tighten the connection nut connecting the left rear No.1 brake hard pipe to the left center brake hard pipe.



- 5 Tighten the brake master cylinder No. 1 brake hard pipe fixing nut that secures the brake hard pipe to the vehicle dynamic domain mainframe.

Torque: 15N·m



- 6 Tighten the connection nut connecting left rear No. 1 brake hard pipe to the left center brake hard pipe.

Torque: 16N·m

- 7 Add clean brake fluid to the master cylinder reservoir to the reservoir jug max line position.
- 8 Bleed air from the hydraulic brake system, see [Brake Fluid Bleeding and Filling Procedure](#).
- 9 Check for leaks.
- 10 Install the resonator assembly.
- 11 Install the air filter assembly.
- 12 Connect the negative cable of battery.

7.4.5.13 Replacement of Right Rear No.1 Brake Hard Pipe

Removal Procedure

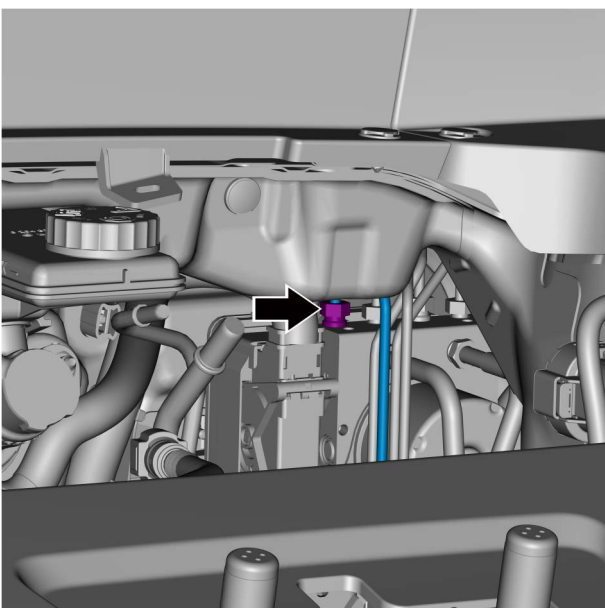
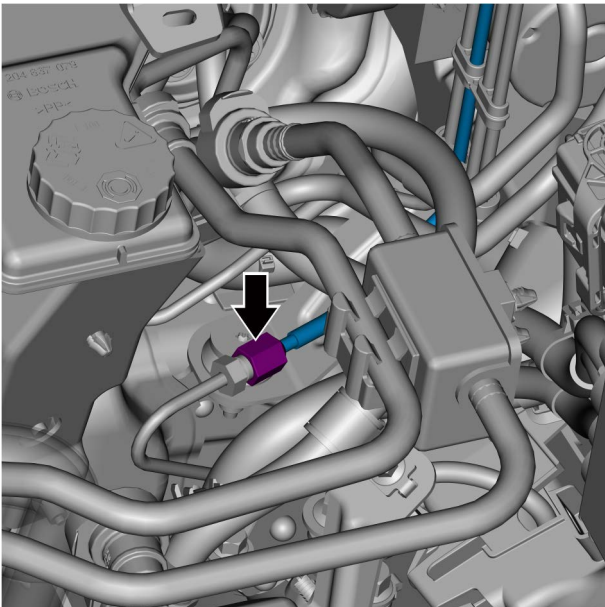
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the engine trim cover assembly, refer to [Replacement of engine trim cover assembly](#).
- 3 Drain brake fluid.
- 4 Remove the air filter assembly, see [Replacement of Air Filter Assembly](#).
- 5 Remove the resonator assembly, see [Replacement of Resonator Assembly](#).
- 6 Remove the connection nut connecting right rear No.1 brake hard pipe to right center brake hard pipe.

Caution

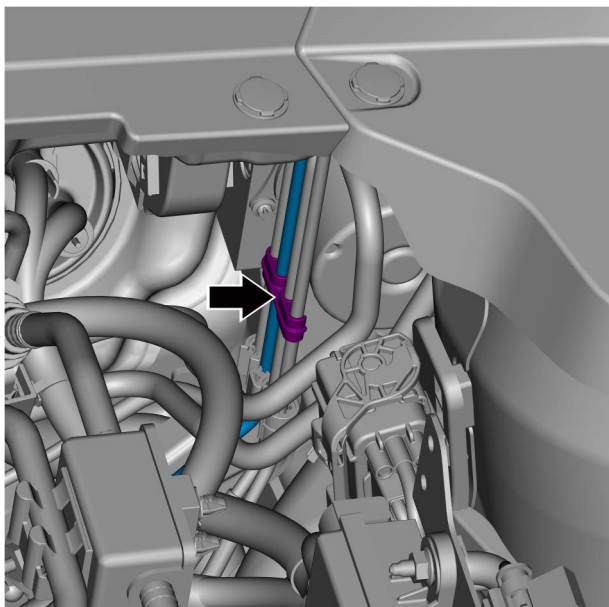
Plug the right rear No.1 brake hard pipe to right center brake hard pipe connection orifice to prevent brake fluid loss and contamination.



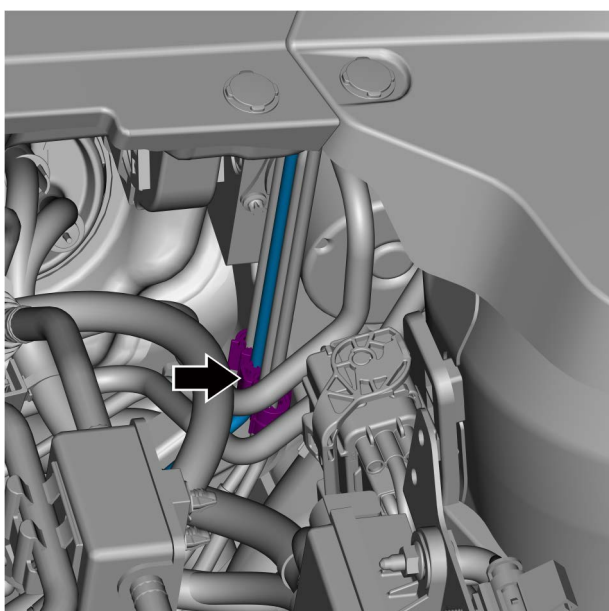
- 7 Remove the brake hard pipe fixing nut of the right rear No. 1 brake hard pipe fixed to the vehicle dynamic domain mainframe.

Caution

Plug the right rear No. 1 brake hard pipe and vehicle dynamic domain mainframe oil pipe port to prevent brake fluid loss and contamination.



8 Remove the 4-hole hose clamp.



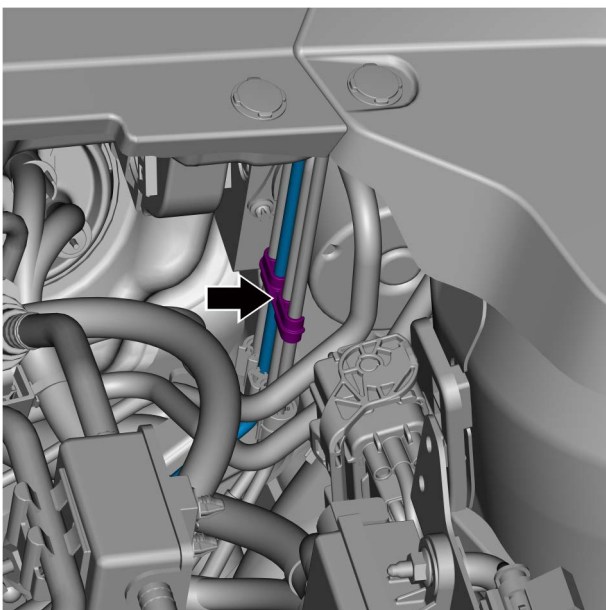
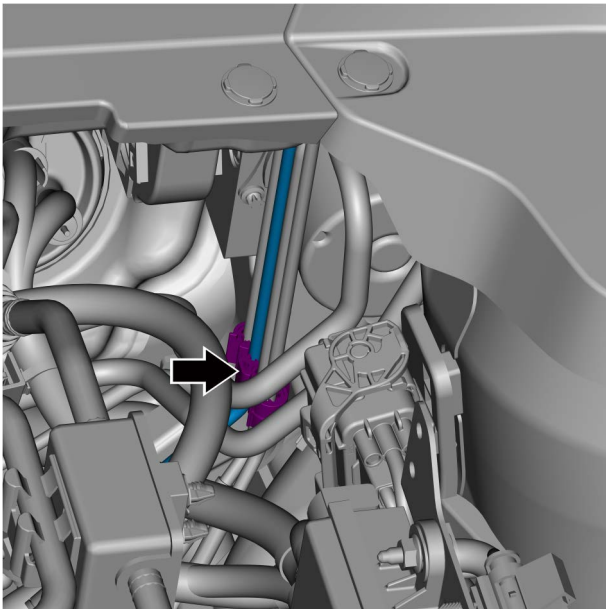
9 Disconnect the right rear No.1 brake hard pipe from the four-hole hose clamp and remove the right rear No.1 brake hard pipe.

Installation Procedure

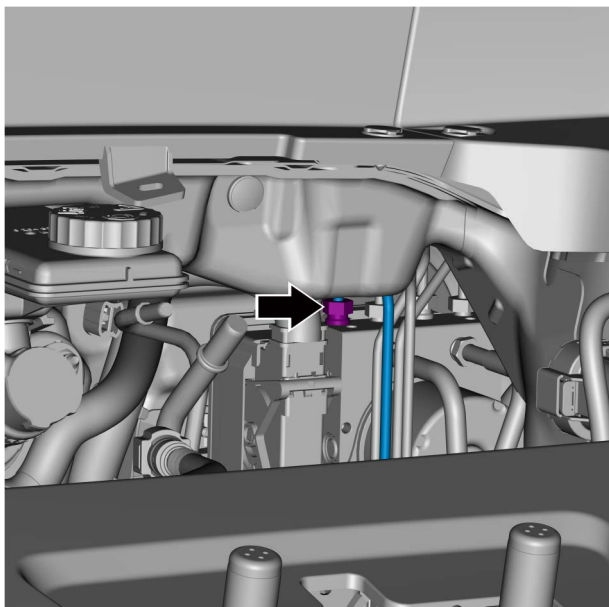
Caution

When assembling the right rear No.1 brake hard pipe, the fitting is pre-tightened by hand and then torqued with an open end wrench to prevent damage to the threads.

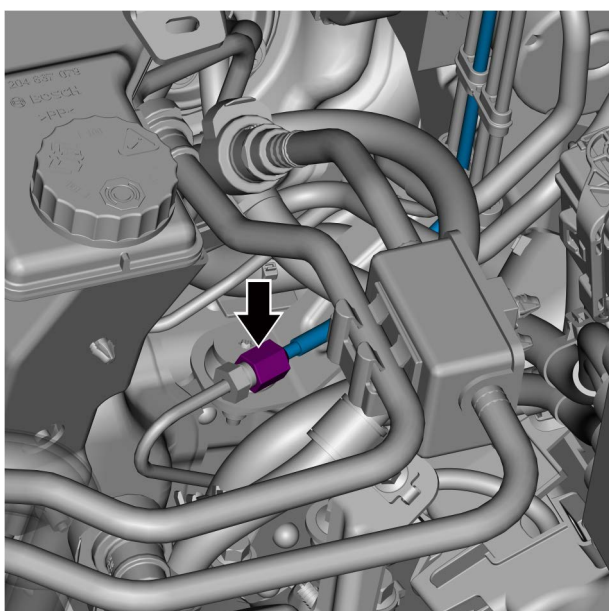
- 1 To install the right rear No. 1 brake hard pipe, snap the right rear No. 1 brake hard pipe into the four-hole hose clamp.



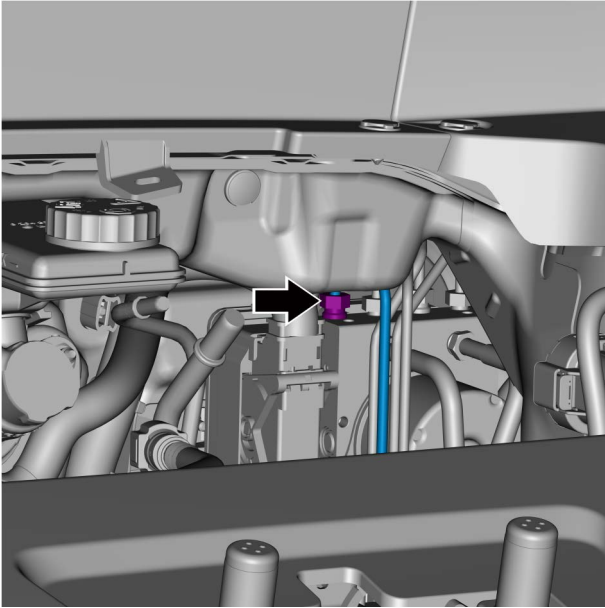
- 2 Install the four-hole hose clamp.



- 3 Pre-tighten the brake hard pipe fixing nut on the right rear No.1 brake hard pipe secured to the vehicle's dynamic domain mainframe.

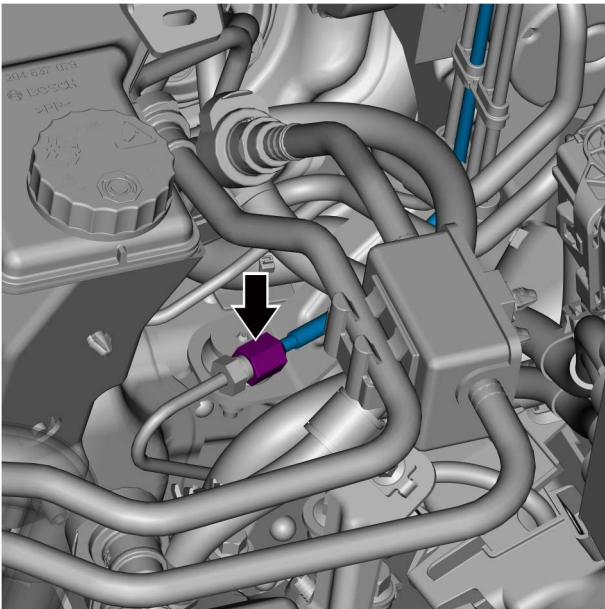


- 4 Pre-tighten the connection nut connecting right rear No. 1 brake hard pipe to the right center brake hard pipe.



- 5 Tighten the brake hard pipe fixing nut that secures the right rear No. 1 brake hard pipe to the vehicle's dynamic domain mainframe.

Torque: 15N·m



- 6 Tighten the connection nuts connecting the right rear 1 brake hard pipe to the right center brake hard pipe.

Torque: 16N·m

- 7 Add clean brake fluid to the master cylinder reservoir to the reservoir jug max line position.
- 8 Bleed air from the hydraulic brake system, see [Brake Fluid Bleeding and Filling Procedure](#).
- 9 Check for leaks.
- 10 Install the resonator assembly.
- 11 Install the air filter assembly.
- 12 Install the engine trim cover assembly.
- 13 Connect the negative cable of battery.

7.4.5.14 Replacement of Brake Master Cylinder No.1 Hard Pipe

Removal Procedure

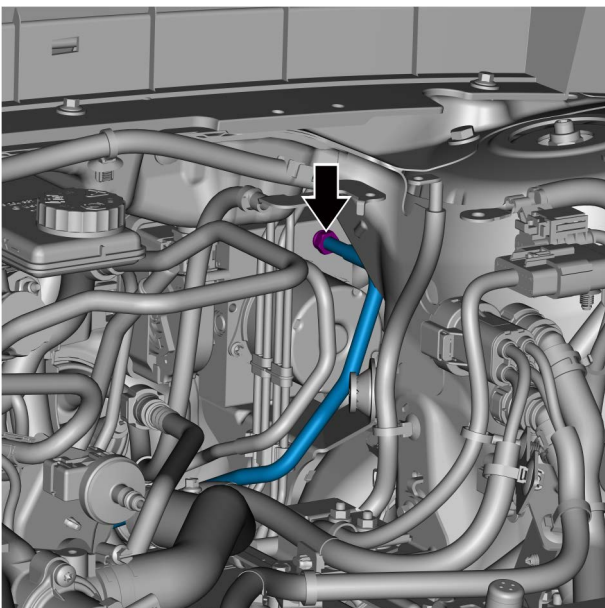
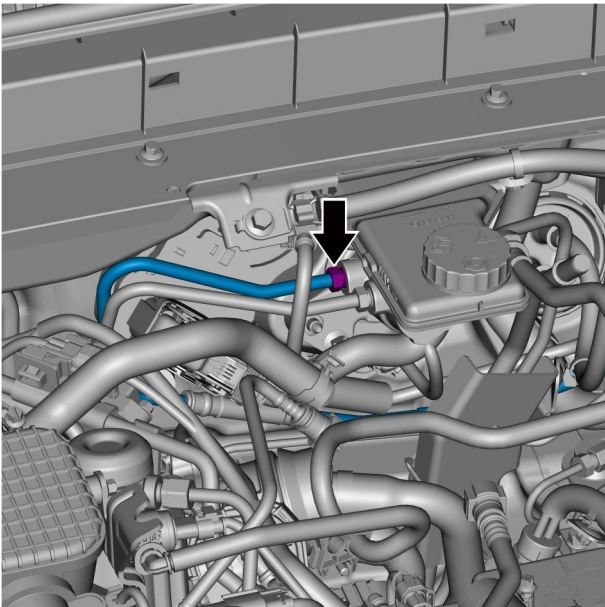
Warning !

Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the engine trim cover assembly, refer to [Replacement of engine trim cover assembly](#).
- 3 Drain brake fluid.
- 4 Remove the air filter assembly, see [Replacement of Air Filter Assembly](#).
- 5 Remove the resonator assembly, see [Replacement of Resonator Assembly](#).
- 6 Remove the connection nut connecting the brake master cylinder No. 1 brake hard pipe to the brake master cylinder.

Caution

Plug the brake master cylinder No. 1 hard pipe and the brake master cylinder fluid line port to prevent brake fluid loss and contamination.



- 7 Remove the brake master cylinder No.1 brake hard pipe fixing nut securing the brake hard pipe to the vehicle's dynamic domain mainframe and remove the brake master cylinder No.1 hard pipe.

Caution

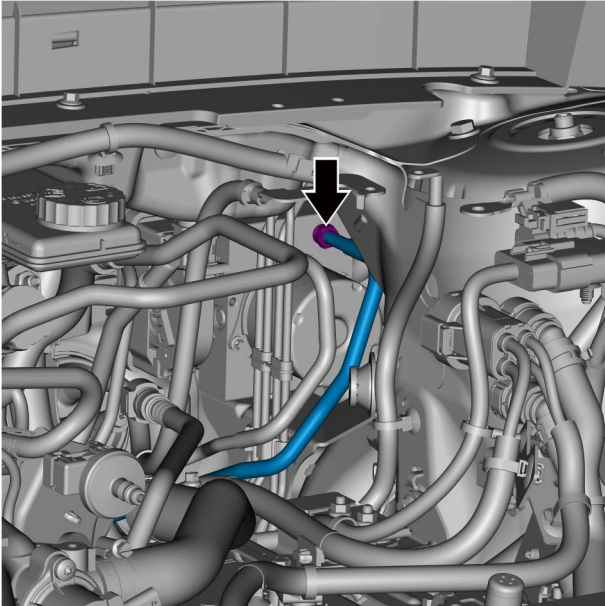
Plug the brake master cylinder No. 1 hard pipe and the vehicle dynamic domain mainframe fluid line port to prevent brake fluid loss and contamination.

Installation Procedure

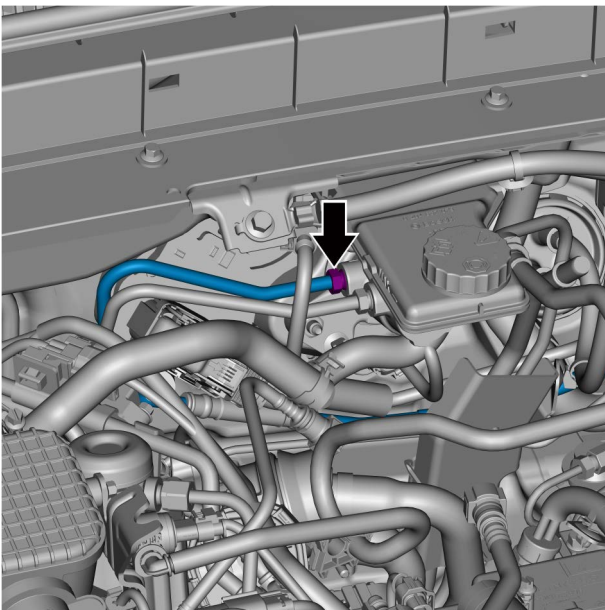
Caution

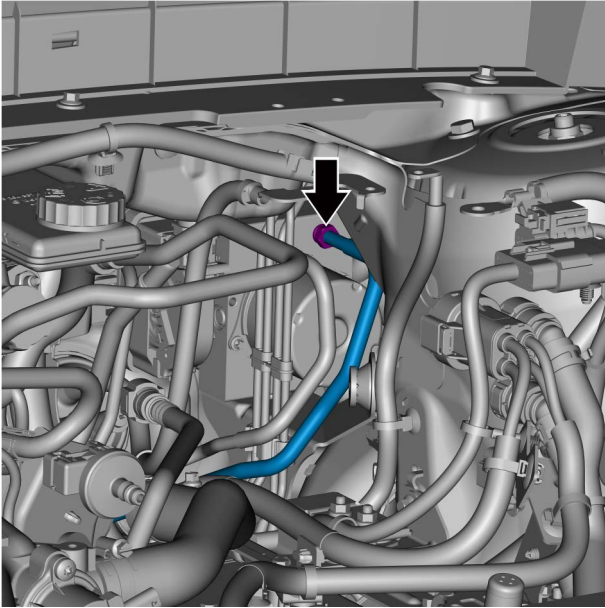
When assembling the brake master cylinder No. 1 hard pipe, the joint is pre-tightened by hand and then torqued with an open-end wrench to prevent damage to the threads.

- 1 Install the brake master cylinder No. 1 hard pipe and pretighten the brake hard pipe fixing nut of the brake master cylinder No. 1 brake hard pipe fixed to the vehicle dynamic domain mainframe.



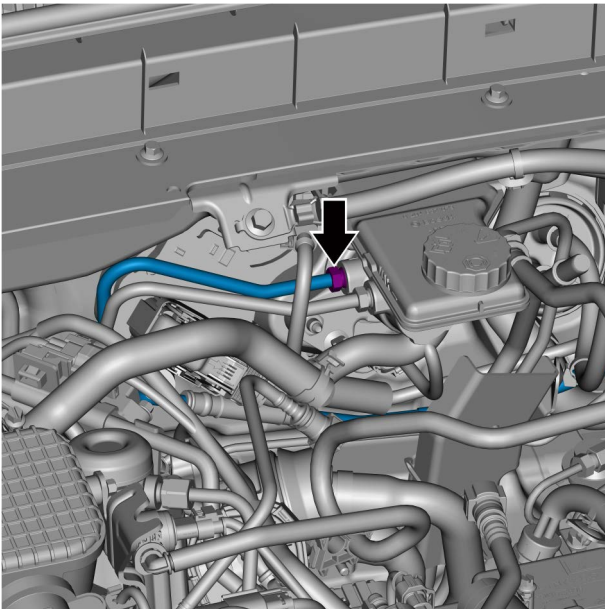
- 2 Pre-tighten the connection nut connecting brake master cylinder No. 1 brake hard pipe to the brake master cylinder.





- 3 Tighten the brake master cylinder No. 1 brake hard pipe fixing nut that secures the brake hard pipe to the vehicle dynamic domain mainframe.

Torque: 15N·m



- 4 Tighten the fixing nut connecting the brake master cylinder No. 1 hard pipe to the brake master cylinder.

Torque: 17.5N·m

- 5 Add clean brake fluid to the master cylinder reservoir to the reservoir jug max line position.
- 6 Bleed air from the hydraulic brake system, see [Brake Fluid Bleeding and Filling Procedure](#).
- 7 Check for leaks.
- 8 Install the resonator assembly.
- 9 Install the air filter assembly.
- 10 Install the engine trim cover assembly.
- 11 Connect the negative cable of battery.

7.4.5.15 Replacement of Brake Master Cylinder No.2 Hard Pipe

Removal Procedure

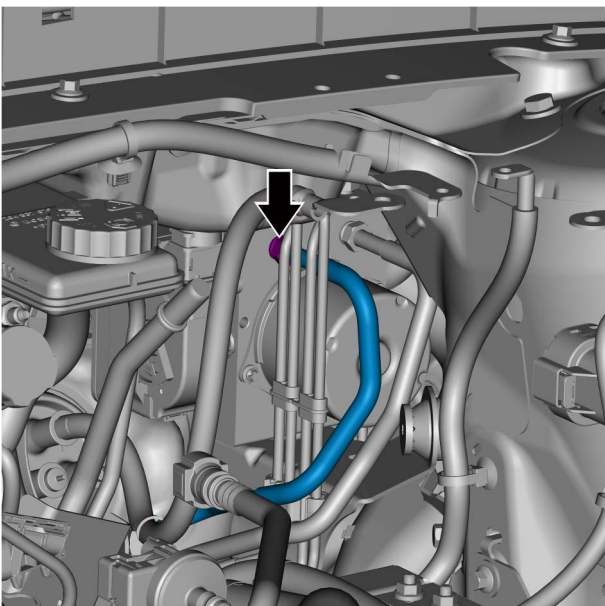
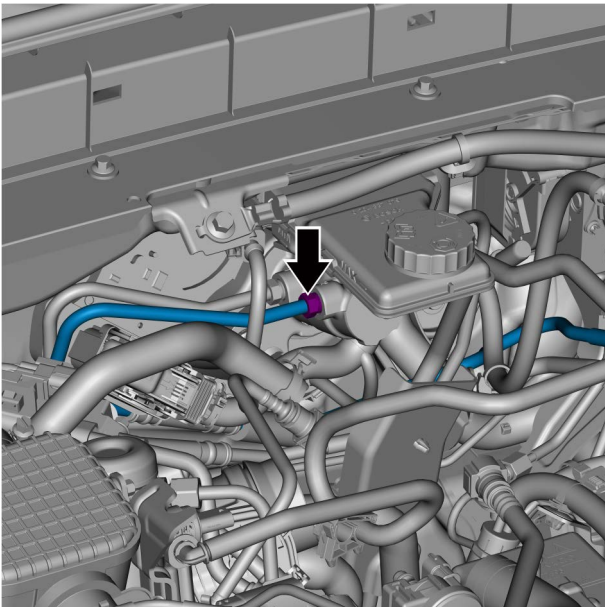
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the engine trim cover assembly, refer to [Replacement of engine trim cover assembly](#).
- 3 Drain brake fluid.
- 4 Remove the air filter assembly, see [Replacement of Air Filter Assembly](#).
- 5 Remove the resonator assembly, see [Replacement of Resonator Assembly](#).
- 6 Remove the connection nut connecting the brake master cylinder No. 2 brake hard pipe to the brake master cylinder.

Caution

Plug the brake master cylinder No. 2 hard pipe and the brake master cylinder fluid line port to prevent brake fluid loss and contamination.



- 7 Remove the brake master cylinder No.2 brake hard pipe fixing nut securing the brake hard pipe to the vehicle's dynamic domain mainframe and remove the brake master cylinder No.2 hard pipe.

Caution

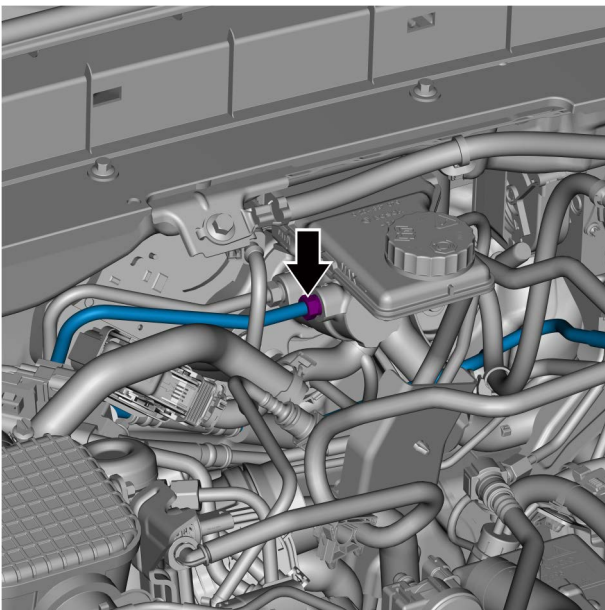
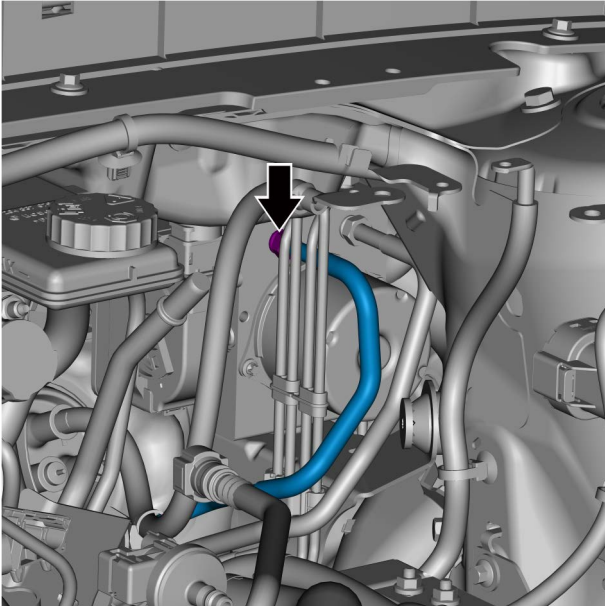
Plug the brake master cylinder No. 2 hard pipe and the vehicle dynamic domain mainframe fluid line port to prevent brake fluid loss and contamination.

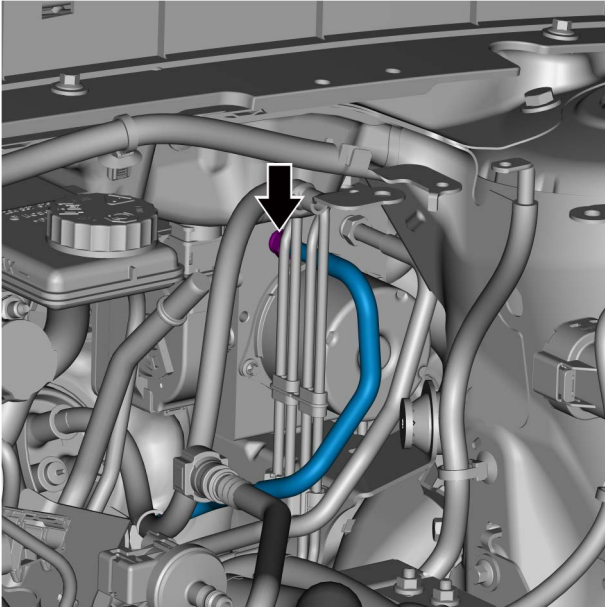
Installation Procedure

Caution

When assembling the brake master cylinder No. 2 hard pipe, the joint is pre-tightened by hand and then torqued with an open-end wrench to prevent damage to the threads.

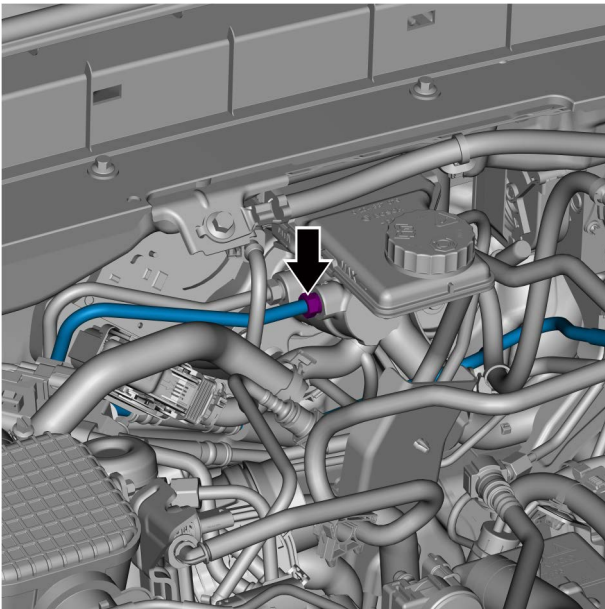
- 1 Install the brake master cylinder No. 2 hard pipe and pretighten the brake hard pipe fixing nut of the brake master cylinder No. 2 brake hard pipe fixed to the vehicle dynamic domain mainframe.
- 2 Pre-tighten the connection nut connecting brake master cylinder No. 2 brake hard pipe to the brake master cylinder.





- 3 Tighten the brake master cylinder No. 2 brake hard pipe fixing nut that secures the brake hard pipe to the vehicle dynamic domain mainframe.

Torque: 15N·m



- 4 Tighten the fixing nut connecting the brake master cylinder No. 2 hard pipe to the brake master cylinder.

Torque: 17.5N·m

- 5 Add clean brake fluid to the master cylinder reservoir to the reservoir jug max line position.
- 6 Bleed air from the hydraulic brake system, see [Brake Fluid Bleeding and Filling Procedure](#).
- 7 Check for leaks.
- 8 Install a resonator.
- 9 Install the air filter assembly.
- 10 Install the engine trim cover assembly.
- 11 Connect the negative cable of battery.

7.5 Parking system

7.5.1 Specification

7.5.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Brake caliper motor (parking brake) to brake caliper fixing bolt	M6x1.0	8-11
Parking brake switch fixing screw	PF5	1.3-1.7

7.5.2 Instructions and operations

7.5.2.1 Instructions and operations

This model's parking system uses Electronic Parking Brake (EPB) and Automatic Hold (AUTOHOLD).

Electronic Parking Brake (EPB)

Electronic Parking Brake (EPB) is mainly composed of parking brake switch, brake caliper motor and Vehicle Dynamic Domain Mainframe (VDDM), etc. Parking brake switch sends out a park or release signal to the Vehicle Dynamic Domain Mainframe (VDDM), which instructs the left and right rear brake caliper motors to perform the corresponding actions, realizing the park and release functions.

Automatic hold system (AUTOHOLD)

Automatic hold system (AUTOHOLD) is a kind of intelligent braking system, which realizes the control of the four wheel brakes through the extended function of VDDM, and has a certain linkage with the electronic parking brake system (EPB). When the vehicle is temporarily parked and needs to be restarted within a short period of time, the temporary parking in this case is accomplished by the brakes controlled by the VDDM. The Vehicle Dynamic Domain Mainframe (VDDM) measures the level of the body and the wheel torque through its sensors to make a determination of the vehicle's motion

7.5.2.2 Electronic Parking Brake Release

EPB Manual Release

When start switch is in the ON position or the engine is started, depress the brake pedal and press parking brake switch, EPB release is complete and the Electronic Parking Brake (EPB) status indicator goes out.

EPB automatic release

Start the engine, fasten the seat belt, the EPB has been pulled up, the gearshift lever is in the driving gear, lightly press the accelerator pedal sensor, the EPB will be released automatically and the Electronic Parking Brake (EPB) status indicator goes out.

EPB Manual Parking

Pull up parking brake switch when the vehicle is stationary, manual parking is completed, and the Electronic Parking Brake (EPB) status indicator lights up.

trend and applies an appropriate braking force to the wheels to keep the vehicle at a standstill. This braking effort is just enough to stop the vehicle from moving, and not too much, so that when the accelerator pedal is pressed forward again, there will not be too severe a forward movement. And when the temporary parking exceeds a certain time limit, the braking system switches to rear-wheel parking brake (EPB on), replacing the previous four-wheel hydraulic brake. When the vehicle is about to move forward, the system detects how hard the accelerator pedal is pressed to determine whether to release the brake.

With this feature, the driver does not need to operate the parking brake switch to park the vehicle, nor does he need to frequently operate the gearshift to switch back and forth between "P", "N" and "D". This simplifies the operation and improves driving comfort, and also reduces the potential safety hazards caused by the driver forgetting to operate the parking brake switch and accidentally "skidding" when the car is temporarily parked. However, in order to minimize wear and tear on the transmission system and to save fuel and protect the environment, try to shift the gearshift to "N" when parking the vehicle temporarily.

7.5.3 System working principles

7.5.3.1 System working principles

The electronic parking system is operated by first placing the power mode in the ON state, and by collecting the pedal signal and parking brake switch signal, etc., the EPB is controlled to work, thus controlling the parking rear wheel brake caliper piston to achieve the purpose of parking brake.

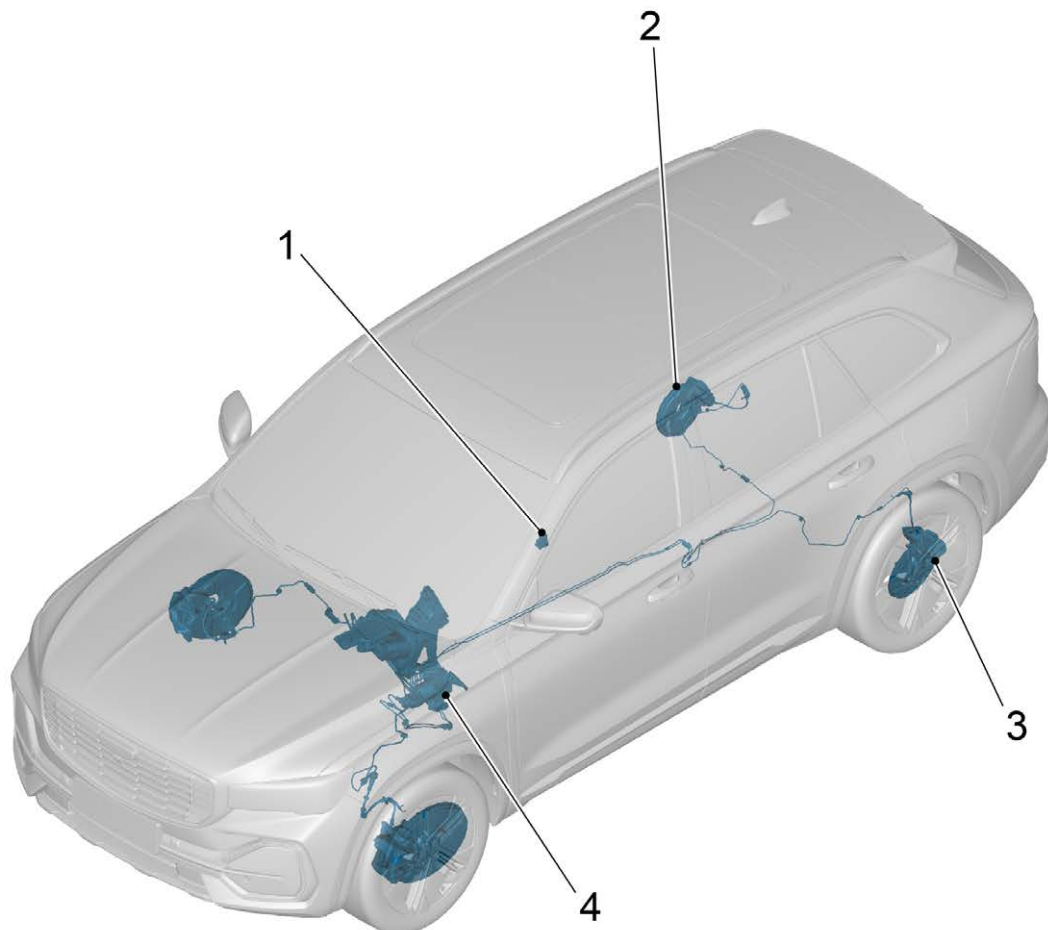
The electronic parking system has the following functions as described in the table below

Mode	Condition	Value	Note
Manual clamping	Parking brake switch status	Pull up parking brake switch manually, parking signal input	When the vehicle is stationary, the caliper clamping command is executed by manually pulling up parking brake switch and the system checks the parking brake switch pull-up signal.
	Vehicle status	Stationary	
	Road gradient	Gradient judgment of clamping force magnitude	
	Caliper status	Release and no mechanical failure	
Manual Release	Ignition switch status	ON	Vehicle stationary, depress manually parking brake switch, the system will check for the parking brake switch release signal and executes the caliper release command.
	Vehicle status	Stationary	
	Parking brake switch status	Press parking brake switch manually to release the parked vehicle.	
	Brake Status	Press brake pedal and brake signal is input	
	Caliper status	Park and no mechanical failure	
Automatic Holding	Ignition switch status	Turn ON to OFF	When the vehicle is stationary and the ignition power is turned from ON to OFF, the EPB is automatically clamped to apply the parking brake.
	Engine status	Run to OFF	
	Vehicle status	Stationary	
	Road gradient	Gradient judgment of clamping force magnitude	
	Caliper status	Release and no mechanical failure	
Gear shift P gear Lock	Ignition switch status	ON	The vehicle is driven to a standstill on a road with a certain gradient and shifted to P. The system executes the P-Lock function for caliper parking.
	Engine status	Running	
	Vehicle status	Stationary	
	Transmission gear	P Gear	
	Road gradient	Gradient judgment of clamping force magnitude	

Mode	Condition	Value	Note
	Caliper status	Release and no mechanical failure	
Automatic release	Ignition switch status	ON	By detecting signals such as accelerator pedal, engine speed, engine torque, gear, and gradient, it judges the driving intention and releases the EPB to assist the vehicle to drive away.
	Engine status	Running	
	Vehicle status	Stationary	
	Transmission gear	D or R gear	
	Accelerator pedal status	Specific by grade	
	Whether the driver is in the car	Main driver's door closed, seat belt fastened	
	Road gradient	Slope judgment release timing	
	Caliper status	Park and no mechanical failure	
Reclamping on slippery slopes	Vehicle status	Stationary	The system monitors the wheel speed pulse signal to determine if the vehicle is skidding. When the system detects the wheel speed pulse input, it automatically activates the skidding reclamping function and will reclamp with maximum clamping force.
	Caliper status	Park and no mechanical failure	
	Wheel speed sensor	Receive wheel speed pulse signal	
Emergency release	Ignition switch status	Turn ON/ACC to OFF	Press parking brake switch and turn ignition power ON/ACC to OFF, calipers will not clamp automatically.
	Vehicle status	Stationary	
	Parking brake switch status	Press parking brake switch manually to release the parked vehicle.	

7.5.4 Part position

7.5.4.1 Part position



- | | |
|--|---|
| 1. Electronic Parking Brake Button | 3. Left Rear Brake Caliper Body with EPB Assembly |
| 2. Right Rear Brake Caliper Body with EPB Assembly | 4. Vehicle Dynamic Domain Mainframe (VDDM) |

7.5.5 Diagnostic information and procedure

7.5.5.1 Diagnosis description

Fault codes can be read through the vehicle's data connector (DTC diagnostic interface), and by reading the data sheet displayed on the smart tester of Vehicle Dynamic Domain Mainframe (VDDM) block, the function of reading switch and sensor values can be performed without removing any parts. Reading the data sheet is the first step in troubleshooting and one way to reduce diagnostic time.

7.5.5.2 Routine inspection

- Confirm trouble symptom

The most difficult situation in troubleshooting is when there are no symptoms, in which case the fault described by the user must be thoroughly analyzed. Then simulate the same or similar conditions and environments as the customer's vehicle when the malfunction occurs. Regardless of how experienced and skilled the maintenance personnel are, if troubleshooting is performed without confirming the symptoms of the malfunction, something important will be overlooked in the repair and a wrong guess will be made in some places. This will make troubleshooting impossible.

- Inspect easily accessible or visible system components for obvious damage or conditions that could cause a malfunction, and if so, repair or replace the component.
- Check the harness and harness connector to ensure that there is no sign of loosening, damage, poor contact, aging, etc.
- Connector joints and vibrating pivot points are the main areas that should be thoroughly checked, and the vibration method is recommended in cases where a malfunction may be caused by vibration.
 - 1 Gently vibrate the sensor parts that may be faulty with your finger and check for malfunction.
 - 2 Gently shake the connector in both vertical and horizontal directions.
 - 3 Gently shake the harness in both vertical and horizontal directions.

7.5.6 Removal and Installation

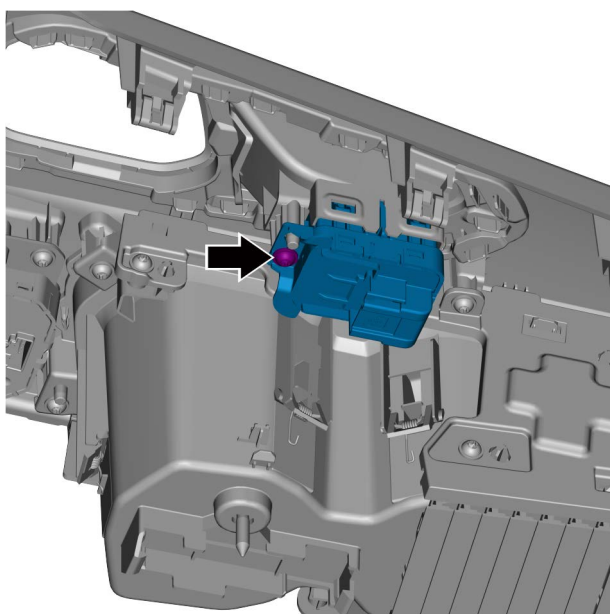
7.5.6.1 Electronic Parking Brake Button

Removal Procedure

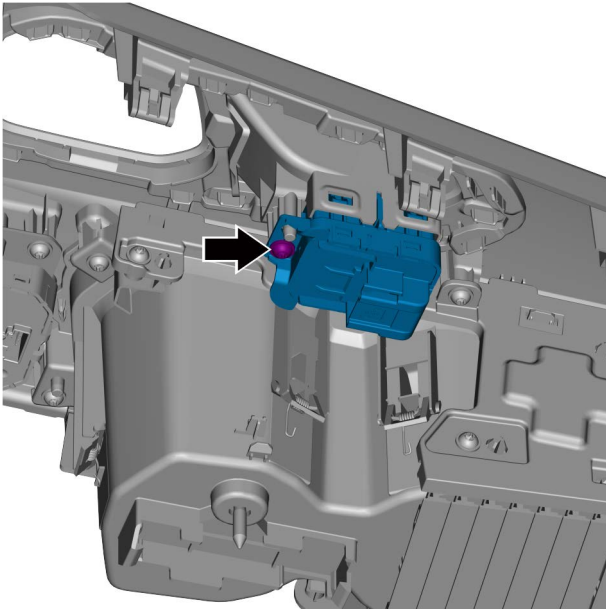
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the gear shift panel assembly, refer to [Replacement of gear shift panel assembly](#).
- 3 Remove the electronic parking brake button fixing screw.
- 4 Remove the electronic parking brake button from the shift panel assembly.



Installation Procedure



- 1 Install the electronic parking brake button to the shift panel assembly and tighten the fixing screws.
Torque: 1.5N·m

- 2 Install the gear shift panel assembly.
- 3 Connect the negative cable of battery.

7.5.6.2 Replacement of Left Rear Electronic Parking Brake Motor

Removal Procedure

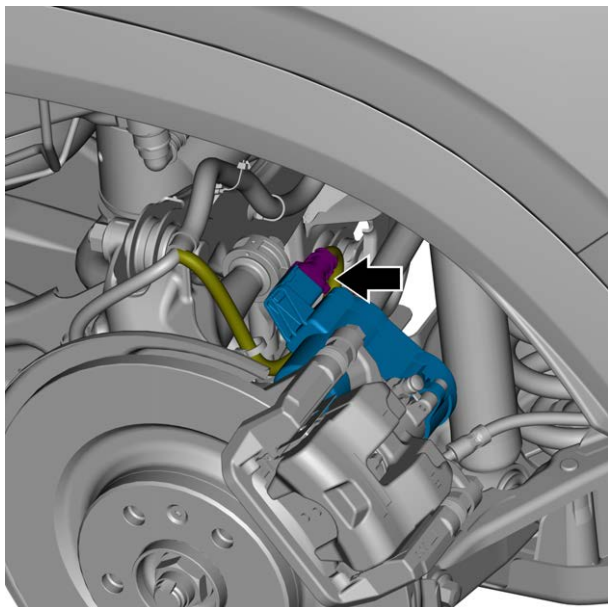
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

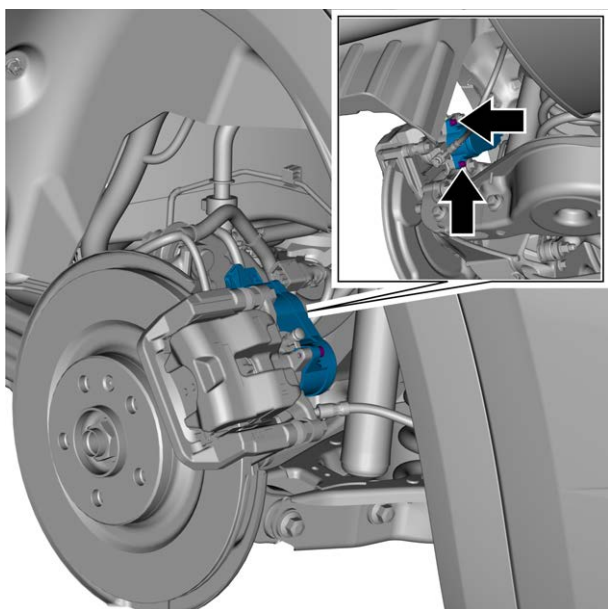
Caution

The removal and installation of the left and right rear brake caliper motors (parking brake) are similar.

- 1 Perform the rear brake with spring pad friction plate assembly replacement procedure using a diagnostic gauge.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 4 Remove wheel, see [Replacement of Wheel Assembly](#).

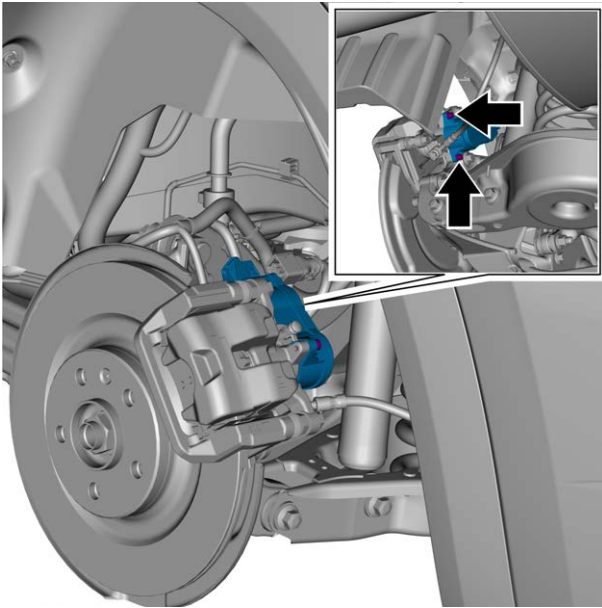


- 5 Disconnect the connector from the left rear electronic parking brake motor harness.

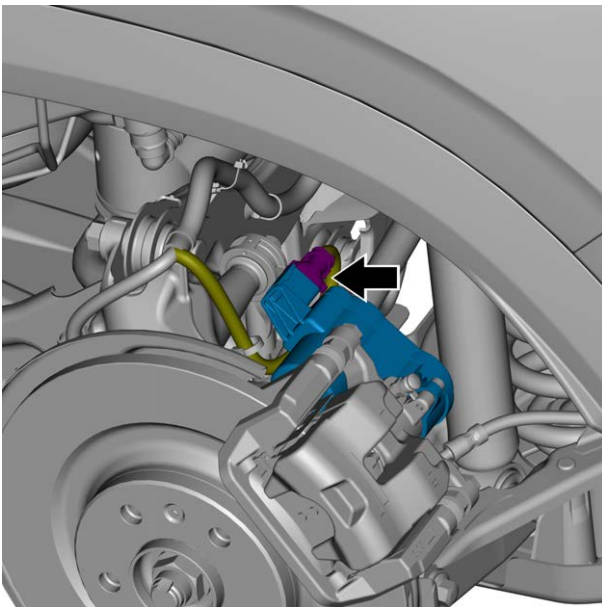


- 6 Remove the left rear electronic parking brake motor by removing the left rear electronic parking brake motor fixing bolt.

Installation Procedure



- 1 Install the left rear electronic parking brake motor and tighten the fixing bolts.
Torque: 9.5N·m



- 2 Install the left rear electronic parking brake motor harness connector.

- 3 Install the wheel.
- 4 lower the vehicle.
- 5 Connect the negative cable of battery.
- 6 Perform the rear brake friction plate assembly replacement procedure using a diagnostic instrument.

7.6 ABS/TCS/EBD/VDDM

7.6.1 Specification

7.6.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Fixing bolt connecting the VDDM controller unit and VDDM module bracket	M10×16	15.3-20.7
Fixing screw connecting the VDDM module bracket and body	M6×38.5	11-15
Fixing bolt connecting the front wheel speed sensor to left front steering knuckle assembly	M6×20	8.5-11.5
Fixing bolt connecting the rear wheel speed sensor to left rear steering knuckle assembly	M6×20	8.5-11.5

7.6.1.2 Wheel Speed Sensor Technical Specifications

Wheel speed sensor	Note
Sensor type	Active wheel speed sensor
Operating Frequency	1 Hz-2500 Hz
Operating temperature	-40°C to 115°C
Working voltage	4.5V-20V
Clearance value to signal disk	Front Axis: 0.2-1.565 mm (0.0079 in-0.0620 in)
	Rear Axis: 1-2.5 mm (0.0395 in-0.0975 in)

7.6.2 Instructions and operations

7.6.2.1 Instructions and operations

The braking system of this model adopts dual line hydraulic braking system and is equipped with brake anti-lock braking system (ABS), electronic brake force distribution system (EBD), brake assist system (BA), traction control system (TCS), vehicle dynamics domain mainframe (VDDM), hill assist (HAC), hill descent mitigation (HDC), emergency braking dual flashing (HAZ), and automatic hold system (AUTO-HOLD) to provide the driver with excellent braking, maneuverability, stability and safety in all cycling situations.

Anti-lock Braking System (ABS)

The main function of the anti-lock braking system (ABS) is to improve the braking performance of the whole vehicle, improve driving safety, and prevent the wheel from locking up (i.e., stopping rolling) during the braking process, so as to ensure that the driver can control the direction during braking and prevent the rear wheel from sliding sideways. Its working principle is: in emergency braking, when installed in each wheel on the wheel speed sensor found that a wheel hold dead, ABS computer immediately controls the corresponding solenoid valve, so that the wheel brake pump pressure relief, wheel to resume rotation, to prevent the purpose of wheel hold dead. The working process of ABS is actually a cyclic working process of "hold - release - hold - release", so that the vehicle is always in the gap rolling state of critical hold, effectively overcoming the phenomenon of vehicle deflection due to the hold of wheel in emergency braking, preventing the body from losing control and other situations.

Anti-lock braking system (ABS) consists of the following components:

1. Hydraulic Electronic Control Module (HECM)

Caution

There is a rubber vibration isolator between the mounting bolt of the hydraulic electronic control module and the bracket. The function of the rubber vibration isolator is to protect the hydraulic electronic control module from the impact of vehicle vibration. The hydraulic electronic control module cannot be decomposed and should be replaced as an assembly.

The HECM controls the system functions and detects malfunctions. When start switch is on and no ABS diagnostic codes are present, the system energizes the relays to provide battery positive voltage to the solenoids and pumps. The HECM continuously detects the status of wheel and controls the slip rate of wheel to remain within a certain range, thus maintaining vehicle stability. The hydraulic control lines are

configured in a diagonal split configuration so that fluid from the brake master cylinder flows one way to the left front and right rear wheels and the other way to the right front and left rear wheels. The diagonal split is isolated in terms of hydraulic control so that in the event of a leak or failure of one brake main line, continuous braking capability is assured on the other. The HECM includes the following major components:

- ABS control module
- ABS pump and its relay
- Inlet valves, each of which controls one wheel
- Discharge valves, each of which controls one wheel
- solenoid coil relay

2. Wheel Speed Sensor

The wheel speed sensor is a Hall-type speed sensor. As the wheel rotates, the ABS control module uses the wheel speed signal to calculate the speed of the wheel. The wheel speed sensor can be replaced individually, but the signal disk (ring) is located on the hub bearing and is replaced together with the hub bearing.

3. Brake light switch

The brake light is illuminated when the brake pedal is pressed, and a brake signal is sent to ABS control module.

4. ABS Warning Light

Located on combination instrument, it is illuminated to notify the driver of an ABS malfunction. The instrument panel combination instrument illuminates the ABS warning light when the following events occur:

- ABS control module detects a malfunction in the ABS system, combination instrument receives a request for illumination from ABS control module via the CAN bus, combination instrument performs a self-check test at the beginning of each ignition cycle, and the indicator light comes on for about 3s.
- Combination instrument performs a self-test at the beginning of each ignition cycle and the indicator light comes on for about 3s.
- Combination instrument detects loss of communication with ABS control module.

Electronic Brake force Distribution (EBD)

The Electronic Brake force Distribution (EBD) system is actually an auxiliary function of the ABS, which improves the effectiveness of the ABS. When braking, all four brake pumps of the vehicle will work, but due to the variation of road conditions and the shift of the vehicle's center of gravity when

decelerating, the grip between the four wheels and the ground will be different, as well as the vehicle's braking force will be different between the wheels in the unloaded and fully loaded conditions. Under these conditions, EBD automatically monitors the grip between each wheel and the ground, and then distributes the braking force of the front and rear wheels to maximize the efficiency of the braking system. With the assistance of the EBD system, the braking system maximizes its efficiency, shortens the braking distance significantly, maintains the vehicle's stability during braking, improves driving safety, and maintains the vehicle's stability during cornering braking, increasing the safety of cornering.

Brake Assist (BA)

The Brake Assist (BA) system judges the driver's braking action and increases the braking force and shortens the braking distance during emergency braking. It automatically judges whether it is emergency braking according to the strength and speed of the driver pressing the brake pedal, and then reasonably applies the appropriate auxiliary braking force to provide an effective, reliable and safe braking, avoiding the vehicle not being able to brake in time due to insufficient braking force applied to the brake pedal by the driver in an emergency braking situation.

Traction Control System (TCS)

The role of the traction control system (TCS) is to enable the car to obtain the best traction in various driving situations by detecting the speed of the four wheels and steering wheel angle sensor. When the car accelerates, if the difference between the speeds of the driving wheels and the non-driving wheels is detected to be too large, the traction control module will immediately determine that the driving force is too large, and instantly sends a signal to the engine ECM to reduce engine fuel supply and reduce the driving force, thereby reducing the slip rate of the driving wheels. The traction control module also understands the steering intention of the driver through steering wheel angle sensor, and then uses the left and right wheel speed sensors to detect the difference between the left and right wheel speeds, so as to determine whether the degree of steering of the automobile is in line with the intention of the driver. If understeering or oversteering of the automobile is detected, the traction control module immediately sends a command to reduce the driving force so as to realize the steering intention of the driver. The traction control system also prevents idling of the drive wheels when the vehicle is traveling on slippery surfaces such as snow and mud, so that the vehicle can start and accelerate smoothly. Especially on snowy or slushy roads, the traction control system can control the acceleration performance of the vehicle and prevent the

vehicle from moving sideways or tailgating due to the slipping of the drive wheels.

Vehicle Dynamic Domain System

The Vehicle Dynamic Domain System is a further extension of the functions of the Anti-lock Braking System (ABS) and the Traction Control System (TCS), to which are added the transverse sway rate sensor when the vehicle is steering, the lateral impact sensor and steering wheel angle sensor, etc. The control unit uses the signals from these sensors to judge the vehicle's operating status and then issue commands. VDDM is able to proactively detect and analyze the vehicle's driving conditions and correct driver errors in a timely manner. VDDM is particularly sensitive to vehicle oversteer to or understeer, and when the car is found to be turning on a slippery road or turning too fast leading to understeer or oversteer and then rear-end slipping, the sensor senses the slipping. Then the system will quickly apply braking force to single or multiple wheels, so that the wheel restores traction, adjusts the car's attitude when turning, and keeps the car on the original road, thus greatly improving the smoothness and safety of the car turning. The system will also work with the engine ECM, the electronic system determines that the drive wheels slip immediately and automatically reduce the throttle air intake, reduce engine speed to reduce the power output of the slipping drive wheels for braking, so that you can reduce slipping and maintain the most appropriate power output between the tires and the ground grip, at this time no matter how to give the oil, the drive wheels do not slip.

Hill Assist Control (HAC)

The Hill Descent Assist Control (HAC) function enables the driver to prevent the vehicle from skidding when starting uphill after releasing the brake pedal. HAC maintains the brake pressure applied by the driver, allowing up to 2 seconds for the driver to move his/her foot from the brake pedal to the accelerator pedal sensor, after which the brake pressure will be automatically released.

Hill Descent Control (HDC)

Without driver intervention, the vehicle is made to descend a steep hill at a constant speed by limiting engine torque and applying the brakes to the vehicle.

Emergency Braking Double Flash (HAZ)

When the vehicle brakes sharply, the brake lights and dual flashers begin to flash to warn vehicles behind of problems with vehicles in front of them and to prevent them from tailgating.

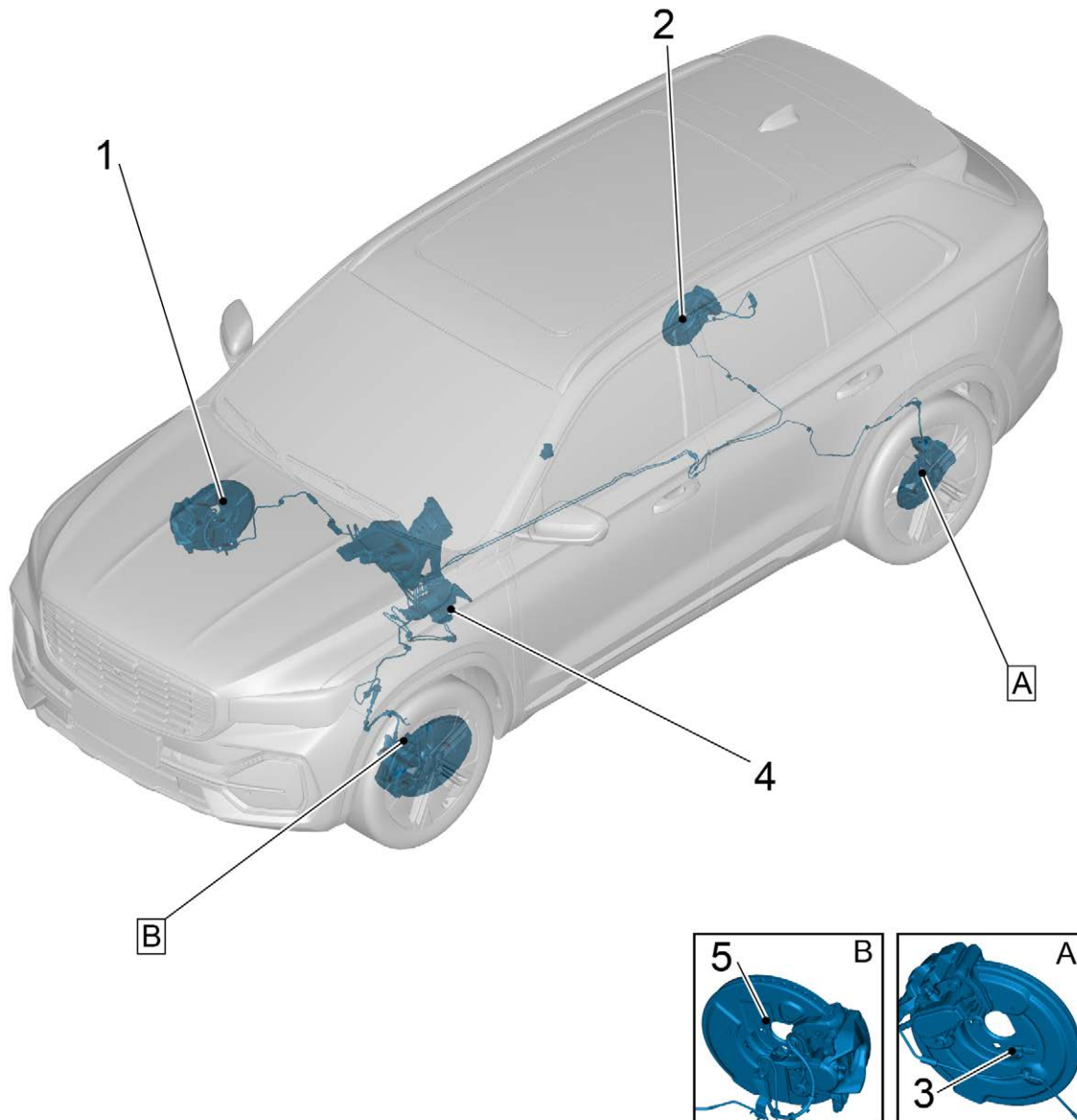
Automatic hold system (AUTOHOLD)

The Auto Hold System (AUTOHOLD) is an intelligent braking system that realizes the control of the four wheel brakes through the extended function of VDDM and has a certain linkage with the Electronic Parking Brake System (EPB). When the vehicle is temporarily parked and needs to be restarted within a short period of time, the temporary parking in this case is accomplished by the brakes controlled by the VDDM. The Vehicle Dynamic Domain Mainframe (VDDM) measures the level of the body and the wheel torque through its sensors to make a determination of the vehicle's motion trend and applies an appropriate braking force to the wheels to keep the vehicle at a standstill. This braking force is just enough to stop the vehicle from moving, and not too much, so that when the accelerator pedal is pressed forward again, there will not be too severe a forward movement. And when the temporary parking exceeds a certain time limit, the braking system switches to rear-wheel parking brake (EPB on), replacing the previous four-wheel hydraulic brake. When the vehicle is about to move forward, the system detects how hard the accelerator pedal is pressed to determine whether to release the brake.

With this feature, the driver does not need to operate the parking brake switch to park the vehicle, nor does he need to frequently operate the gearshift to switch back and forth between "P", "N" and "D". This simplifies the operation and improves driving comfort, and also reduces the potential safety hazards caused by the driver forgetting to operate the parking brake switch and accidentally "skidding" when the car is temporarily parked. However, in order to minimize wear and tear on the transmission system and to save fuel and protect the environment, try to shift the gearshift to "N" when parking the vehicle temporarily.

7.6.3 Part position

7.6.3.1 Part position



- | | | | |
|----|----------------------------------|----|---|
| 1. | Wheel speed sensor (right front) | 4. | Vehicle Dynamic Domain Mainframe (VDDM) |
| 2. | Wheel speed sensor (right rear) | 5. | Wheel speed sensor (left front) |
| 3. | Wheel speed sensor (left rear) | | |

7.6.4 Diagnostic information and procedure

7.6.4.1 Diagnosis description

Fault codes can be read through the vehicle's data connector (DTC Diagnostic Interface), and by reading the data sheet displayed on the smart tester, the function of reading switch and sensor values can be performed without removing any parts. Reading the data sheet is the first step in troubleshooting and one of the ways to reduce diagnostic time.

7.6.4.2 Routine inspection

- Confirm trouble symptom

The most difficult situation in troubleshooting is when there are no symptoms, in which case the fault described by the user must be thoroughly analyzed. Then simulate the same or similar conditions and environments as the customer's vehicle when the malfunction occurs. Regardless of how experienced and skilled the maintenance personnel are, if troubleshooting is performed without confirming the symptoms of the malfunction, something important will be overlooked in the repair and a wrong guess will be made in some places. This will make troubleshooting impossible.

- Inspect easily accessible or visible system components for obvious damage or conditions that could cause a malfunction, and if so, repair or replace the component.
- Connector joints and vibrating pivot points are the main areas that should be thoroughly checked, and the vibration method is recommended in cases where a malfunction may be caused by vibration.
 - Gently vibrate the sensor parts that may be faulty with your finger and check for malfunction.
 - Gently shake the connector in both vertical and horizontal directions.
 - Gently shake the harness in both vertical and horizontal directions.

7.6.5 Removal and Installation

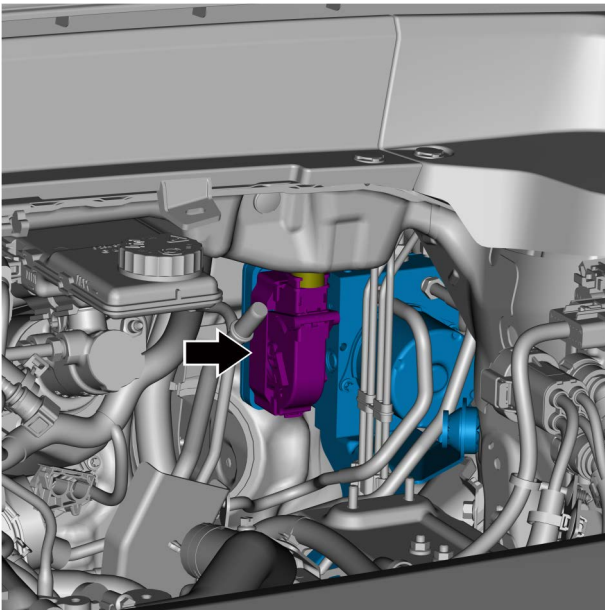
7.6.5.1 Replacement of Vehicle Dynamic Domain Mainframe

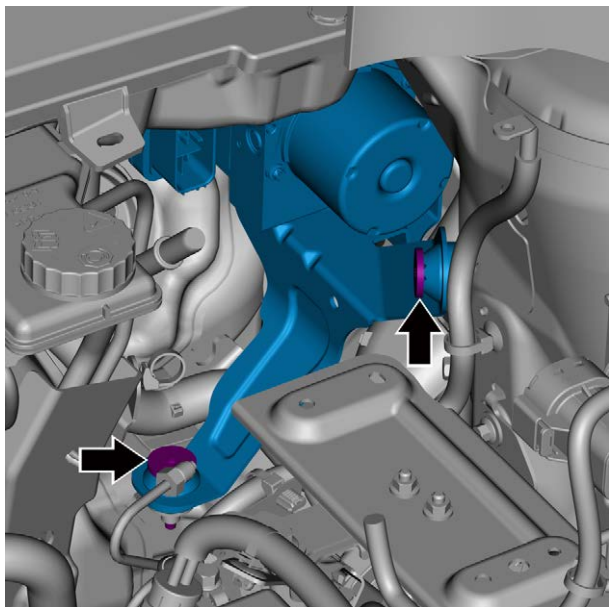
Removal Procedure

Warning !

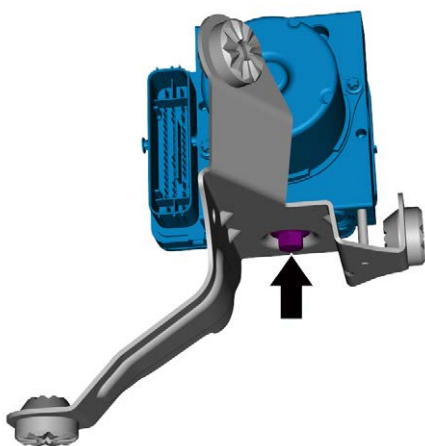
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the air filter assembly, see [Replacement of Air Filter Assembly](#).
- 4 Remove the resonator assembly, see [Replacement of Resonator Assembly](#).
- 5 Drain brake fluid.
- 6 Disconnect the wiring harness connector on the vehicle's dynamic domain mainframe by pressing the plug catch pin and pulling the locking clasp upward.
- 7 Remove right rear No.1 brake hard pipe, see [Replacement of Right Rear No.1 Brake Hard Pipe](#).
- 8 Remove the brake master cylinder No. 2 hard pipe, see [Replacement of Brake Master Cylinder No. 2 Hard Pipe](#).
- 9 Remove the brake master cylinder No. 1 hard pipe, see [Replacement of Brake Master Cylinder No. 1 Hard Pipe](#).
- 10 Remove left front brake hard pipe, see [Replacement of Left Front Brake Hard Pipe](#).
- 11 Remove the right front No.1 brake hard pipe, see [Replacement of Right Front No.1 Brake Hard Pipe](#).





- 12 Remove the left rear No.1 brake hard pipe, see [Replacement of Left rear No.1 brake hard pipe](#).
- 13 Remove the 2 fixing bolts of the vehicle dynamic domain mainframe bracket and take off the vehicle dynamic domain mainframe.



- 14 Remove the vehicle dynamic domain mainframe fixing bolts and detach the vehicle dynamic domain mainframe from its bracket.

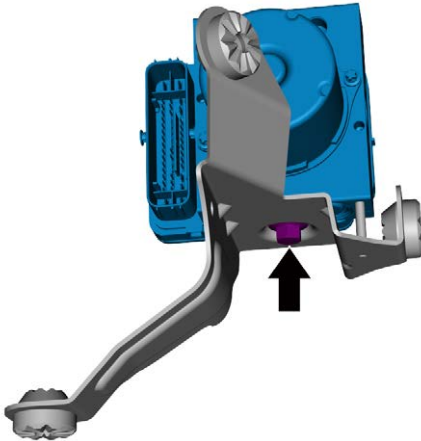
Installation Procedure

Caution

Pre-tighten the fittings by hand when installing the brake hard pipes, then use an open-end wrench to tighten the torque to prevent damage to the threads.

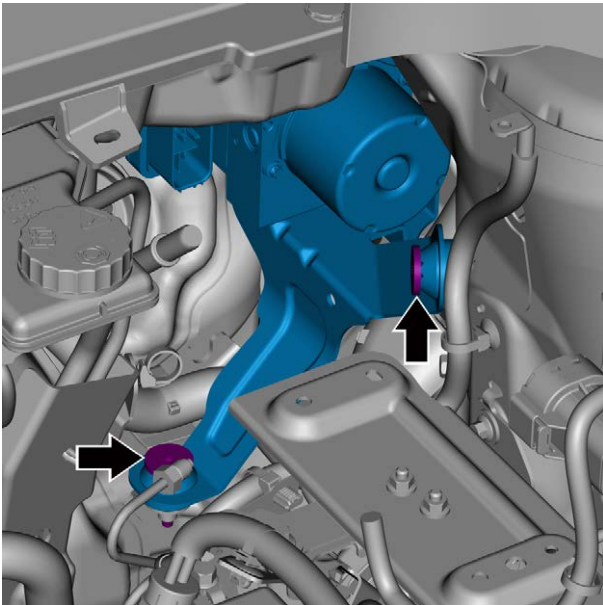
- 1 Install the vehicle dynamic domain mainframe to its bracket and tighten the fixing nut.

Torque: 18N·m

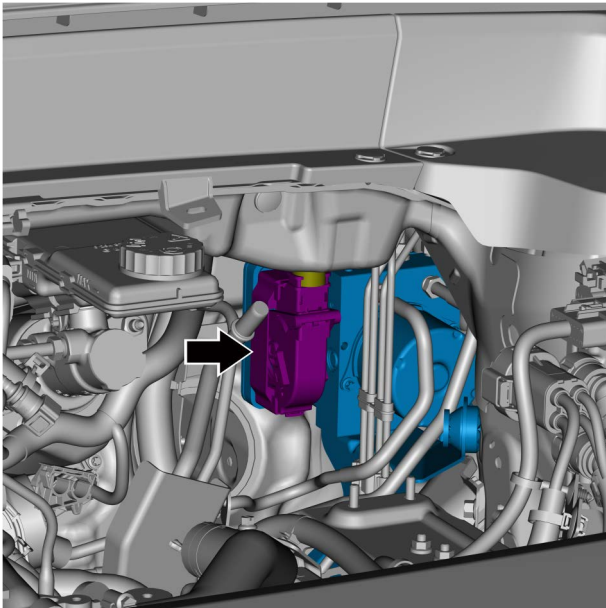


- 2 Install the vehicle dynamic domain mainframe and tighten the 2 fixing bolts.

Torque: 13N·m



- 3 Install the left rear No.1 brake hard pipe.
- 4 Install the right front No.1 brake hard pipe.
- 5 Install the left front brake hard pipe.
- 6 Install brake master cylinder No.1 hard pipe.
- 7 Install brake master cylinder No.2 hard pipe.
- 8 Install the right rear No.1 brake hard pipe.



- 9 Connect the wire harness connector on the vehicle's dynamic domain mainframe.

- 10 Add clean brake fluid to the master cylinder reservoir to a position flush with the reservoir max line.
- 11 Bleed air from the hydraulic brake system, see [Brake Fluid Bleeding and Filling Procedure](#).
- 12 Check for brake system leaks.
- 13 Install the resonator assembly.
- 14 Install the air filter assembly.
- 15 Connect the negative cable of battery.
- 16 Diagnostic program is required, under the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software brushing operation.
- 17 Close the engine compartment hood.

7.6.5.2 Replacement of wheel speed sensor (left front)

Removal Procedure

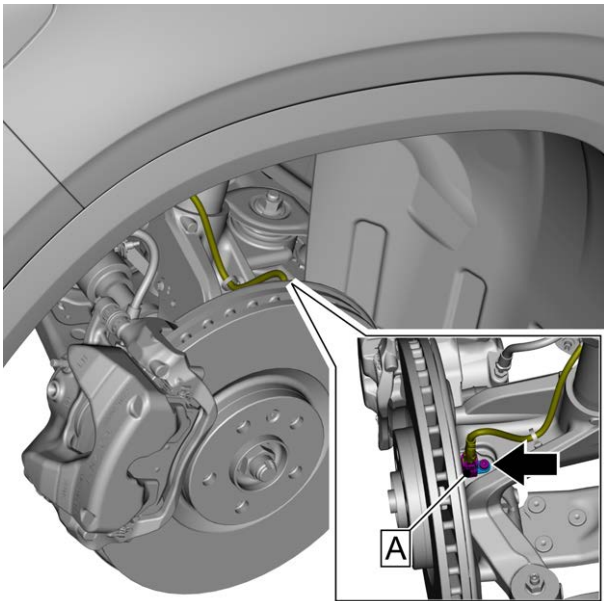
Warning !

Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#).

Caution

The removal and installation of the left and wheel speed sensor (right front) are similar.

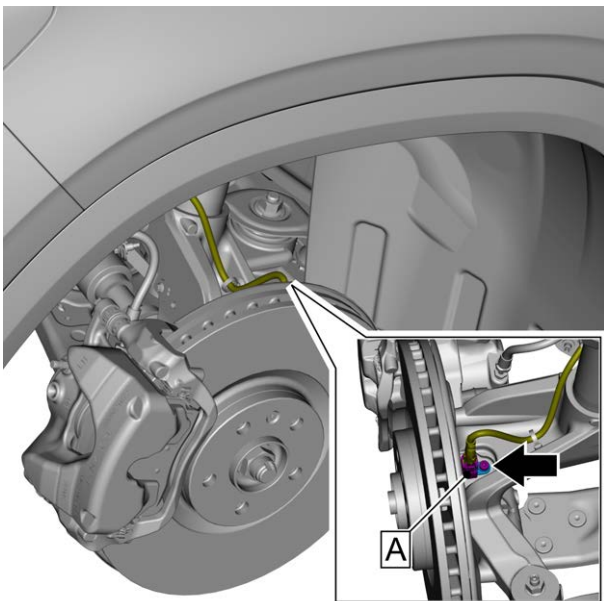
- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).



- 3 Remove wheel, see [Replacement of Wheel Assembly](#).
- 4 Disconnect the front wheel speed sensor harness connector A.
- 5 Remove the front wheel speed sensor fixing bolt and remove the wheel speed sensor (front left).

Installation Procedure

- 1 Install wheel speed sensor (left front) and tighten the fixing bolts.
Torque: 10N·m
- 2 Connect front wheel speed sensor harness connector A.



- 3 Install the front wheels.
- 4 Connect the negative cable of battery.
- 5 Close the engine compartment cover.

7.6.5.3 Replacement of wheel speed sensor (left rear)

Removal Procedure

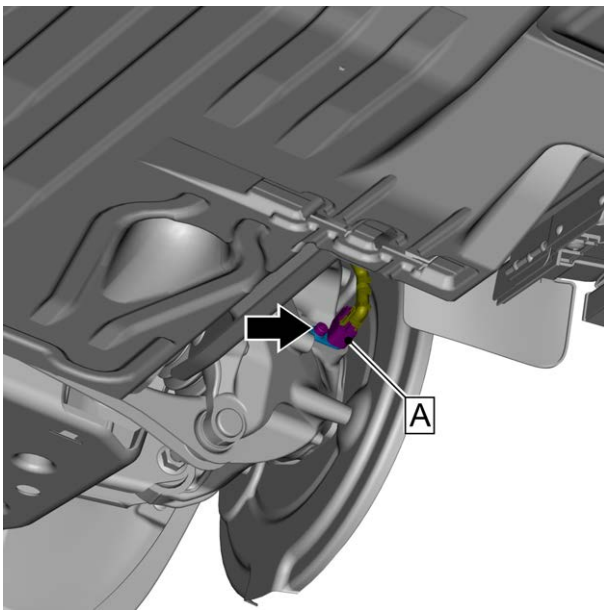
Warning !

Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#).

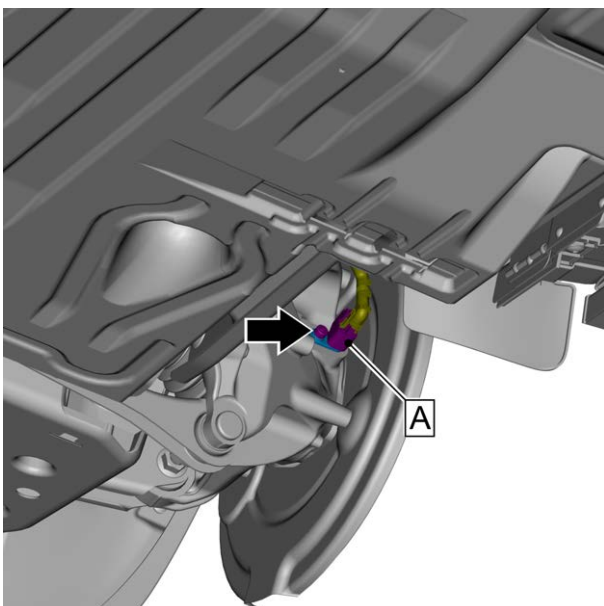
Caution

The removal and installation of the left and wheel speed sensor (right rear) are similar.

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove wheel, see [Replacement of Wheel Assembly](#).
- 4 Disconnect the wheel speed sensor (left rear) harness connector A.
- 5 Remove the wheel speed sensor (left rear) fixing bolt wheel speed sensor (left rear).

**Installation Procedure**

- 1 Install wheel speed sensor (left rear) and tighten the fixing bolts.
Torque: 10N·m
- 2 Connect wheel speed sensor (left rear) harness connector A.



- 3 Install the rear wheel.
- 4 Connect the negative cable of battery.
- 5 Close the engine compartment cover.

7.6.6 Specialized tools and equipment

7.6.6.1 Equipment

Torque wrenches
Troubleshooter

7.7 Tire Pressure Monitoring System (TPMS)

7.7.1 Specification

7.7.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Tire pressure sensor fixing screw	-	1.2-1.7

7.7.2 Instructions and operations

7.7.2.1 Instructions and operations

The Tire Pressure Monitoring System detects tire pressure via radio waves and sensing technology. The driver is reminded to check tire pressure by illuminating the Tire Pressure Monitoring System status indicator. Tire pressure checking should be performed once a month for each tire (including the spare tire) when the tire is cold and inflated to the pressure recommended on the tire pressure label.

If the Tire Pressure Monitoring System status indicator light is on constantly, an abnormality exists in one or more tire pressures. In this case, stop the vehicle as soon as possible, check the tire pressure and inflate the tires to the correct pressure value. The tire pressure label affixed to the vehicle already indicates the tire pressure when the vehicle is cold. The vehicle's Tire Pressure Monitoring System (TPMS) can alert you to abnormal tire pressures, but it is not a substitute for normal tire maintenance and regular tire inspections and shifts are required.

The TPMS system consists of the following components

- TPMS sensors (one per wheel) (spare tire not included)
- Tire Pressure Monitoring System Status Indicator
- RF receiver (integrated in TCAM)
- Central electronic module (CEM)

TPMS Sensor

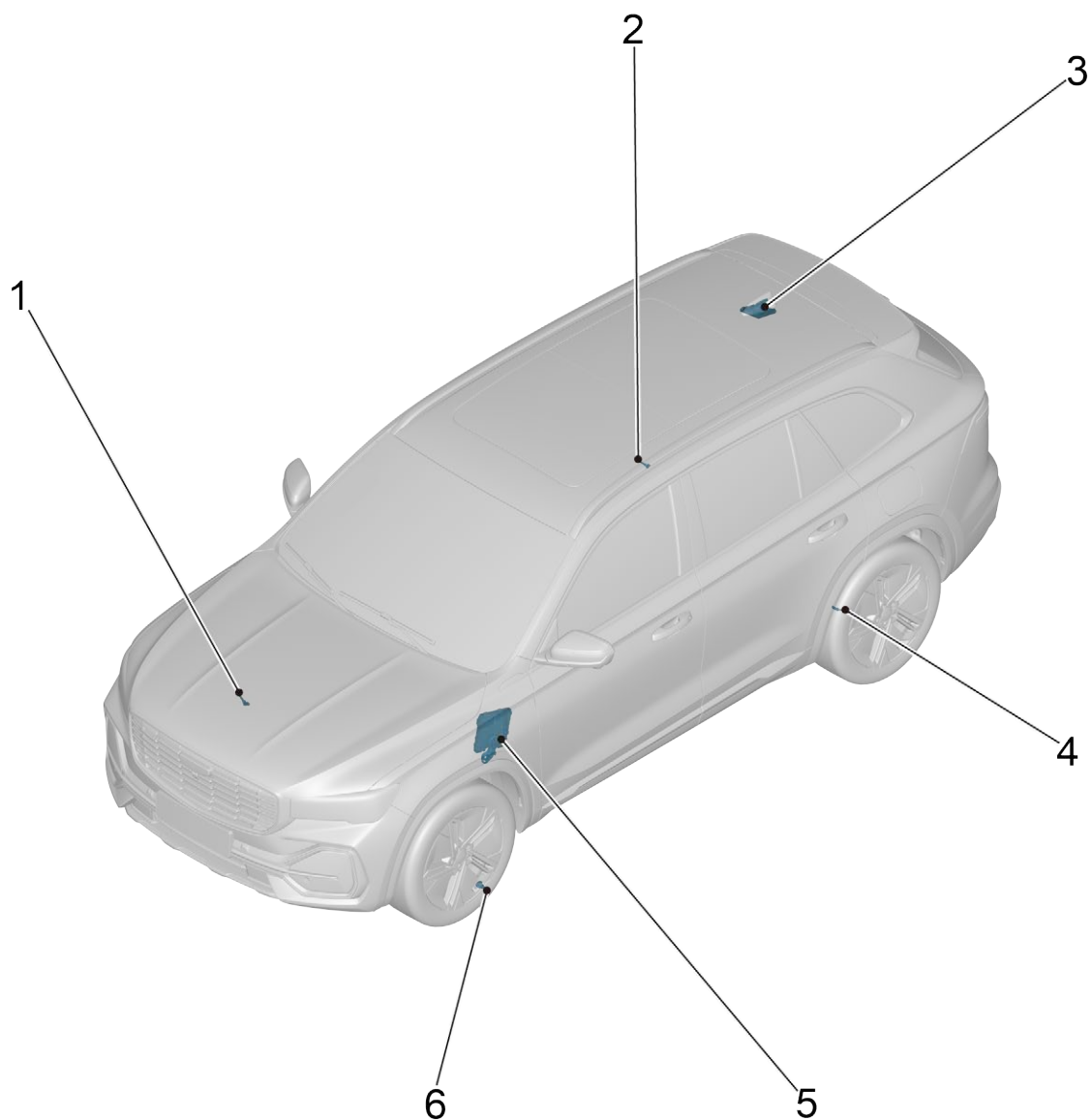
Each automobile tire is equipped with a TPMS sensor, which is mounted on the rim through the valve, and the TPMS sensor periodically sends information to the TCAM about tire alignment, pressure, and temperature parameters.

Tire Pressure Monitoring System Status Indicator

- High tire temperature, tire leakage, low sensor power alarm. When the alarm of high tire temperature, tire leakage, low sensor power is activated, the icons of corresponding tires start to flash, accompanied by sound alarm and text prompt interface.
- Low Tire Pressure Alarm - When the low tire pressure alarm is activated, the corresponding alarm tire starts to flash, the tire pressure monitoring system status indicator light continues to illuminate until the alarm is eliminated, accompanied by an audible alarm and a pop-up text prompting interface, and the low tire pressure alarm is lifted after the tire is coldly inflated to the standard tire pressure value.
- System Trouble Alarm - When the system trouble alarm is activated, the corresponding alarm tire starts flashing, the Tire Pressure Monitoring System status indicator flashes for 60 seconds and then stays on until the alarm is cleared, accompanied by an audible alarm and a pop-up text prompting interface.

7.7.3 Part position

7.7.3.1 Part position



- | | | | |
|----|---|----|--|
| 1. | Right Front Tire Pressure Monitoring Sensor | 4. | Left Rear Tire Pressure Monitoring Sensor |
| 2. | Right Rear Tire Pressure Monitoring Sensor | 5. | Central electronic module (CEM) |
| 3. | TCAM | 6. | Left Front Tire Pressure Monitoring Sensor |

7.7.4 Diagnostic information and procedure

7.7.4.1 Diagnosis description

See [Description and Operation](#) before diagnosing a TPMS fault. Understanding and familiarizing yourself with the operation principle of the TPMS before beginning system diagnostics will help determine the correct troubleshooting steps to take in the event of a malfunction, and more importantly, this will help determine if the condition described by the customer is normal operation. Any troubleshooting of a TPMS should start with a [visual inspection](#) that guides the maintenance personnel to the next logical step in troubleshooting. Understanding and using the diagnostic process correctly can reduce diagnostic time and avoid misjudgment of the faulty part.

7.7.4.2 Visual check

- Confirm customer's fault before repair.
- Check system components that are easily accessible or can be seen to find out if there is any obvious damage or there is a situation that may cause a fault.
 - Check for normal tire pressure.
 - There are no obvious signs of mechanical or electrical damage.

If so, repair or replace the part.

- Check the harness and harness connector to ensure that there is no sign of loosening, damage, poor contact, aging, etc.

Common Failures

Faults	Diagnostic method	Diagnostic results	Treatment
Damaged sensor module	Visual inspection	Visible scratches, cracked housings or gels on sensor modules	Replacement of sensor
Damaged valve stems	Visual inspection	Deformed, broken valve stems	Replacement of sensor
Damaged sealing gasket	Visual inspection	Cracked sealing gasket	Replacement of sensor
Tire pressure not displayed	Trigger sensor with hand tool	Sensors can be triggered normally	See if the vehicle has been retrofitted with a jamming device
		Sensor cannot be triggered	Replacement of sensor
	Visual inspection	Sensor installation error	Reinstall the sensor
Tire pressure false alarm	Check for abnormal tire air temperature and pressure according to alarm message	No abnormality in tire pressure and temperature, etc.	Replacement of sensor
Air leakage	Visual inspection	Damaged sealing gasket	Replacement of sensor
	Check mounting nut torque	Torque not up to standard	Reinstall the sensor

7.7.4.3 Sensor Learning

The c learning function automatically recognizes and confirms the vehicle's tire pressure sensor without external intervention.

1. The speed condition for the adaptive learning function to be activated is 30 km/h.
2. The adaptive learning function is activated when the vehicle has been stopped for more than 19 minutes with re-IGN-ON. When the car speed reaches 30 km/h, the auto positioning function and the adaptive learning function are activated together for 10 minutes until the four-wheel pressure is displayed on the instrument. The auto positioning function is a function where the CEM automatically determines the position of each sensor mounted in tire after the adaptive learning function is successfully activated, and records the position information into the CEM.

Sensor	Sensor Wheel Position
Sensor 1	Left Front
Sensor 2	Right front
Sensor 3	Right Rear
Sensor 4	Left Rear

7.7.5 Removal and Installation

7.7.5.1 TPMS control unit

Remove the TPMS control unit, see [Replacement of the central electronic module](#).

7.7.5.2 Tire pressure sensor replacement

Removal Procedure

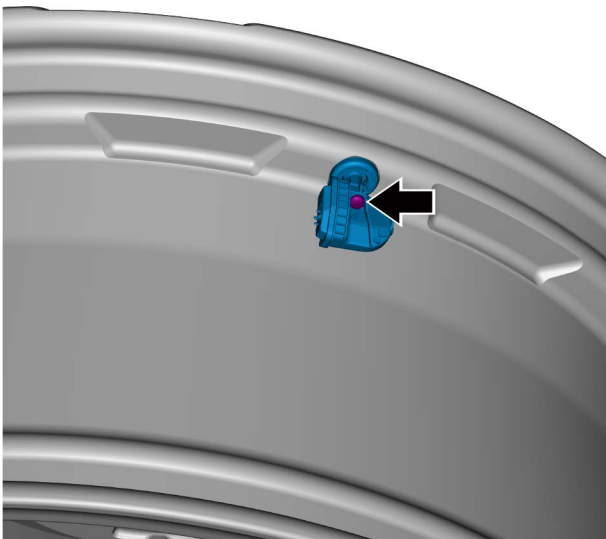
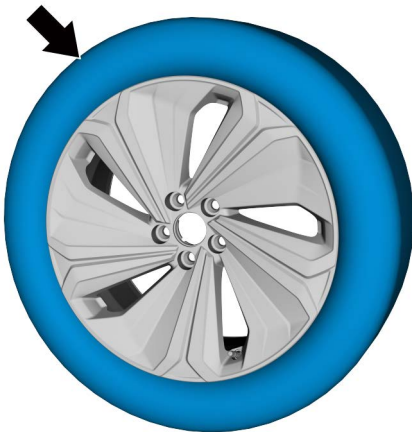
Caution

The front and rear tire pressure sensors are removed and installed in a similar manner.

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove wheel. see [Wheel Assembly Replacement](#).
- 3 Remove the tires.

Caution

When removing the tire, be careful not to knock the tire pressure sensor to avoid damage.



- 4 Remove the 1 fixing bolt of tire pressure sensor.
- 5 Remove tire pressure sensor.

Installation Procedure

- 1 Install tire pressure sensor.

Caution

- Clean the rim valve hole before installing tire pressure sensor, the contact surface between the rim valve hole and tire pressure sensor sealing gasket should be flat, and there should be no damage or burrs on the edges of the holes inside and outside the wheel hub on both sides, to ensure good sealing at the intersection of tire pressure sensor and the wheel hub hole.
- Apply lubricant to the tire pressure sensor.
- Valves that have been disassembled are not allowed to be used twice.

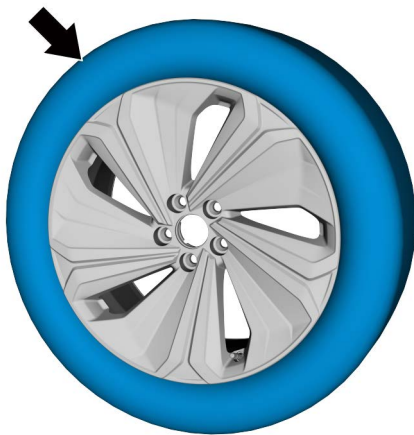
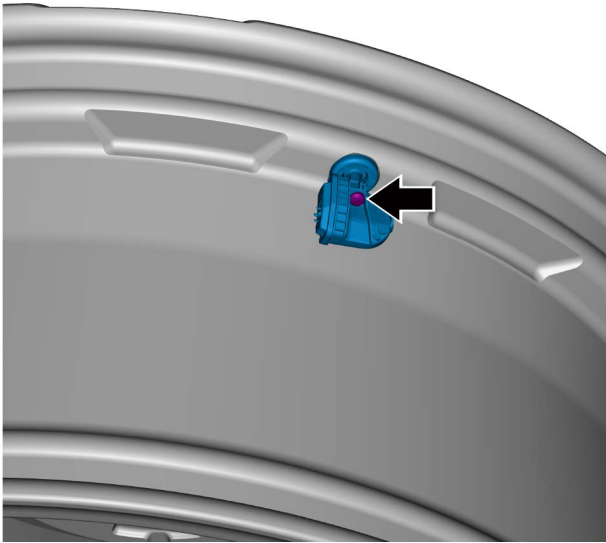
- 2 Tighten the 1 fixing bolt of tire pressure sensor.

Torque: 1.4N·m

- 3 Mount the tire.

Caution

- When mounting the tire, please be careful not to knock the tire pressure sensor to avoid damage.
- Installation test: The valve is mounted and dismounted from the rim to remove the tire 4 times in different directions such as 12 o'clock, 3 o'clock, 6 o'clock, and 9 o'clock of the wheel hub.
- Check the valve core locking status, inflate according to the tire pressure requirement, and test the valve and mounting tightness.



- 4 Install the wheel.
- 5 Connect the negative cable of battery.
- 6 Perform TPMS system matching, see [Sensor Learning](#).

7.7.6 Specialized tools and equipment

7.7.6.1 Equipment

Torque wrenches
Troubleshooter

Steering System

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8.1 Warnings and Cautions

8.1.1 Warnings and Cautions

8.1.1.1 Warnings and Cautions

Precautions for Electric power assisted steering gear with cross tie rod assembly system

Caution

When the ignition switch is in ON gear, there is a demand for steering assistance, and the electric power assisted steering gear with cross tie rod assembly system provides assistance, and the full driving hand sensing is continuous, smooth, and free of jerks, jams and other phenomena.

It is prohibited to skid the vehicle in the case of flameout, otherwise the steering is unassisted, which is easy to cause safety accidents. It is prohibited to adjust the height of the electric power assisted steering gear with cross tie rod assembly column during the driving of the vehicle.

The electric power assisted steering gear with cross tie rod assembly column with intermediate shaft is an assembly that is not allowed to be disassembled for repair, it is a whole assembly replacement.

Steering Wheel Precautions

Caution

Do not leave the steering wheel in the steering limit position for more than 5s, otherwise the motor may be damaged.

Precautions in electric power assist troubleshooting

Caution

Since the diagnostic trouble codes (DTC) are stored in the backup memory of the control module, be sure to clear the codes in the memory after repair.

Refer to the fault code diagnosis table, and note down the displayed fault codes to deal with the trouble.

8.2 Electric power assisted steering

8.2.1 Specification

8.2.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Fixing bolt of electric power assisted steering gear with cross tie rod assembly to subframe	M12×90	90 N·m+90°
Fixing bolt connecting steering gear heat shield to electric power assisted steering gear with cross tie rod assembly	M5×12	4.2-5.8
Fixing nut connecting steering gear left outer tie rod to left front steering knuckle assembly	M10	30 N·m+90°
Connection nut between steering gear left outer tie rod and inner cross tie rod assembly	M14	68-92
Connection between inner cross tie rod assembly and electric power assisted steering gear with cross tie rod assembly	M16	90-110
Fixing bolt connecting the mechanical steering column assembly to electric power assisted steering gear with cross tie rod assembly input shaft	M8×30	20-28
Fixing bolt connecting the mechanical steering column assembly to instrument panel cross member assembly	M8×14×18.35	20-28

8.2.2 Instructions and operations

8.2.2.1 Instructions and operations

Warning !

See "Warning about additional protection systems" in "Warnings and Precautions".

Caution

See "Warning about steering wheel in steering limit position" in "Warnings and Precautions".

Caution

Before disconnecting the steering column assembly from the steering gear with cross tie rod assembly, the wheel should remain in the forward direction with the steering column in the locked position. Do not move the front tires, wheel, and rotate the steering wheel after disconnecting the above components, as this could cause certain components to be misaligned during installation and cause airbag clock spring to be off-center, which could damage airbag clock spring.

Caution

The steering column not only has a steering function, but also has a safety protection function. To ensure the energy absorbing function of the steering column, be sure to use the specified screws, bolts and nuts and tighten them to the specified torque. The energy-absorbing column collapses in the event of a front-end collision, reducing the chance of injury to the driver.

Electric power assisted steering gear with cross tie rod assembly system:

Electric power assisted steering gear with cross tie rod assembly:

The electric power assisted steering gear with cross tie rod assembly bolts to the front subframe, and the electric power assisted steering gear with cross tie rod assembly utilizes an electronically-assisted rack-and-pinion steering gear. When the steering wheel is turned, the movement of the steering wheel is transmitted through the steering column assembly to the input shaft of the electric power assisted steering gear with cross tie rod assembly, which meshes with the rack and pinion through the gears on the input shaft and converts the left and right rotational movement of the steering wheel into the reciprocating linear movement of the rack and pinion, which moves the rack left and right. Transmitted to the inner and outer steering cross tie rod, and then to the steering knuckle, the steering knuckles twist and wheels rotate, so as to realize the vehicle steering. Electric power assisted steering gear with cross tie rod assembly system control module: collects the

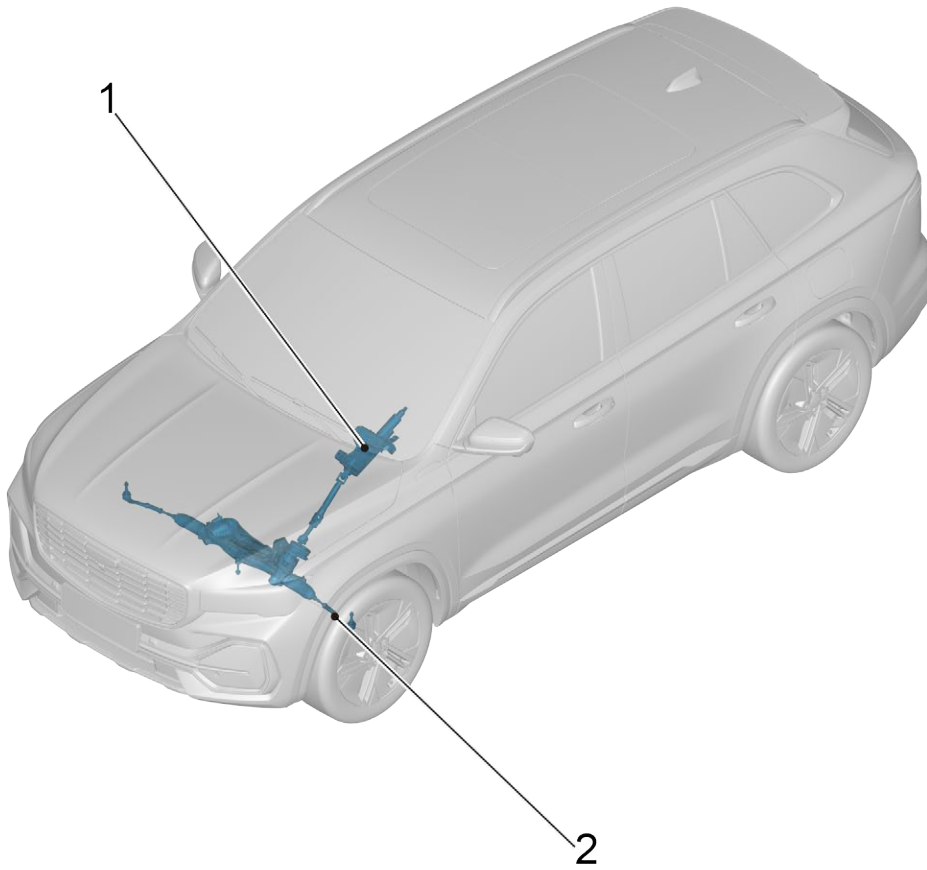
torque sensor, the vehicle speed, and the engine speed signals, determines the steering assistance size and direction, and drives motor steering assistance operation. The motor provides steering assist power as needed by the steering system. The torque sensor, detects the amplitude of the steering wheel torque and the direction of rotation.

8.2.2.2 System working principles

The electric steering system is a power steering system that uses an electric motor to directly provide assistance, and the amount of assistance is controlled by the electronic control unit. When the driver turns the steering wheel, the steering control unit generates auxiliary power according to the detected torque voltage signal, direction of rotation and vehicle speed signal, and the vehicle speed determines the motor's power-assisting effect, so as to ensure that the automobile is easy to drive at low speeds and stable and reliable at high speeds. The electric motor does not work when the car is not turning.

8.2.3 Part position

8.2.3.1 Part position

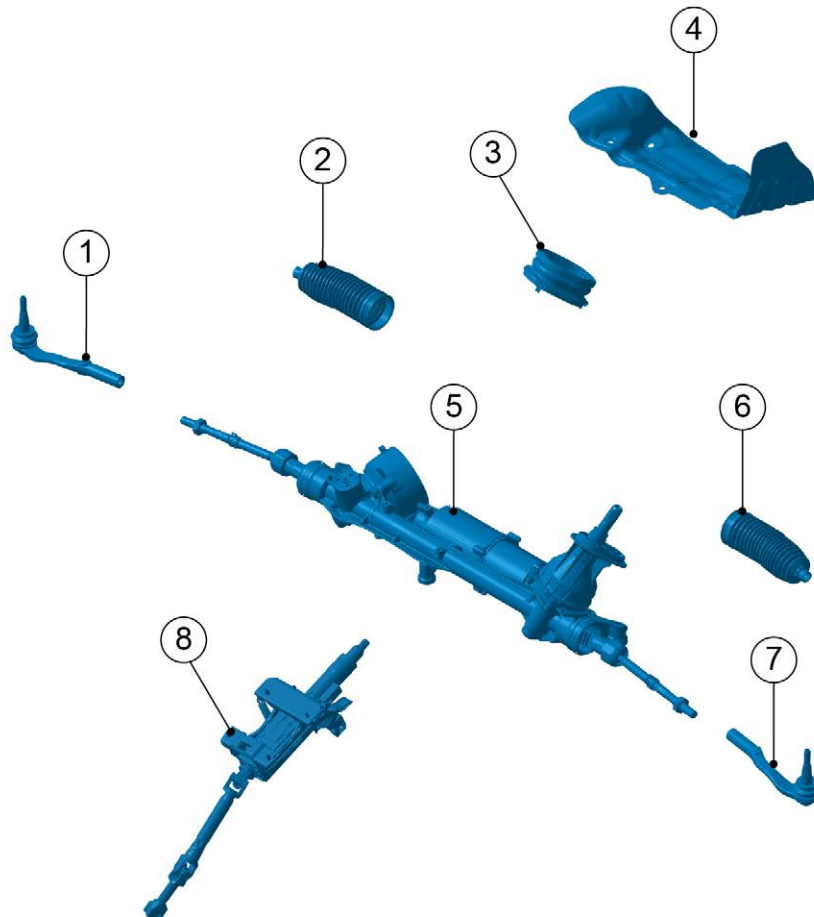


1. Electric power assisted steering

2. Mechanical Steering Column Assembly

8.2.4 Breakdown drawing

8.2.4.1 Breakdown drawing



- | | | | |
|----|-----------------------------------|----|--|
| 1. | Steering Gear Right Outer Tie Rod | 5. | Electric power assisted steering gear with cross tie rod assembly body |
| 2. | Steering Bellows Assembly | 6. | Steering Bellows Assembly |
| 3. | Steering Dust Cover | 7. | Steering Gear Left Outer Tie Rod |
| 4. | Steering Gear Heat Shield | 8. | Mechanical Steering Column Assembly |

8.2.5 Diagnostic information and procedure

8.2.5.1 Diagnosis description

Before diagnosing a malfunction in the electric power assisted steering gear with cross tie rod assembly system, see [Description and Operation](#) and [System Operating Principles](#). Understanding and familiarizing yourself with the operation of the electric power assisted steering gear with cross tie rod assembly system before you begin diagnosing the system will help you determine the proper troubleshooting procedure in the event of a malfunction, and more importantly, it will help you determine whether or not the condition described by the customer is normal operation. Any troubleshooting of the electric power assisted steering gear with cross tie rod assembly system should begin with a [visual inspection](#) that guides the service technician to the next logical step in the troubleshooting process. Understanding and properly using the diagnostic process will reduce diagnostic time and avoid misjudgment of the faulty area.

8.2.5.2 Visual check

- Confirm customer's fault before repair.
- Check system components that are easily accessible or can be seen to find out if there is any obvious damage or there is a situation that may cause a fault.
 - Check for normal tire pressure.
 - There are no obvious signs of mechanical or electrical damage.
 - Check for loose clamping bolts on the movable connector of the mechanical steering column assembly, loose fixing bolts on the mounting bracket of the mechanical steering column assembly, and verify that there are no signs of disassembly on the torque markings and bolt surfaces.

If so, repair or replace the part.

- Check the harness and harness connector to ensure that there is no sign of loosening, damage, poor contact, aging, etc.
- Verify that the EPS fuse is functioning properly.

8.2.5.3 Replacement of EPS parts

Serial No.:	Description	Note
1	Controller information reading: confirmation of controller version information, etc.	Diagnostic instrument operation
2	Perform PSCM software flashing, make sure the software flashing is successful.	Diagnostic instrument operation
3	End protection learning operation	End protection learning operation A. Make sure the four-wheel alignment is completed B. Start the engine, the engine is running C. Turn the steering wheel all the way left D. Turn the steering wheel all the way right E. Turn the steering wheel back to center
4	Read DTC and clear DTC	Diagnostic instrument operation
5	Performs straight-line self-learning to ensure good straight-line driving performance.	Straight-line self-learning operation steps A. Vehicle speed is greater than 35 km/h B. Hold the steering wheel and keep driving in a straight line for more than 1 minute.

8.2.6 Removal and Installation

8.2.6.1 Replacement of steering gear left outer tie rod

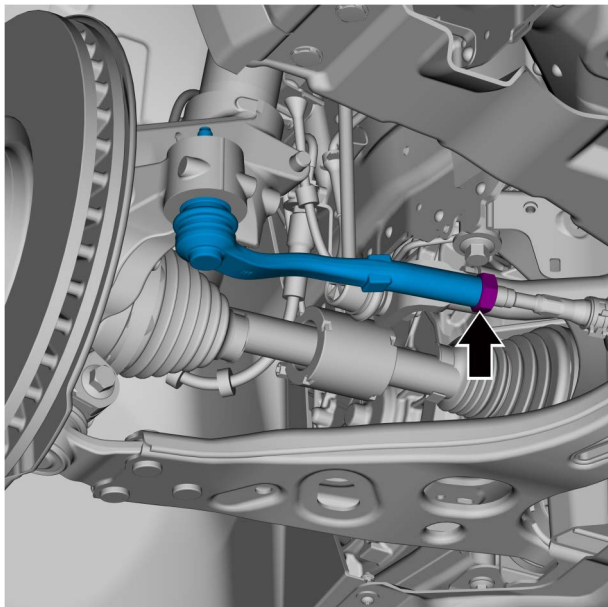
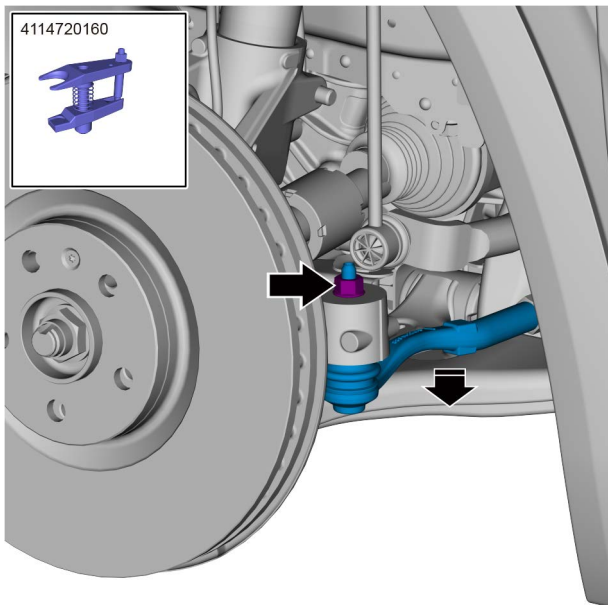
Removal Procedure

Caution

Remove and install the left and right steering gear outer tie rods in a similar manner.

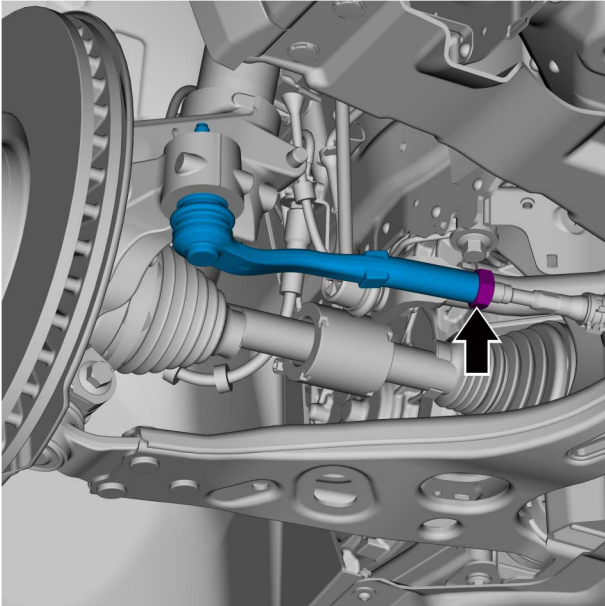
- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove wheel, see [Replacement of Wheel Assembly](#).
- 3 Remove and discard the steering gear left outer tie rod fixing nut and disengage the steering gear left outer tie rod from the left front steering knuckle assembly.

Special tool: 4114720160

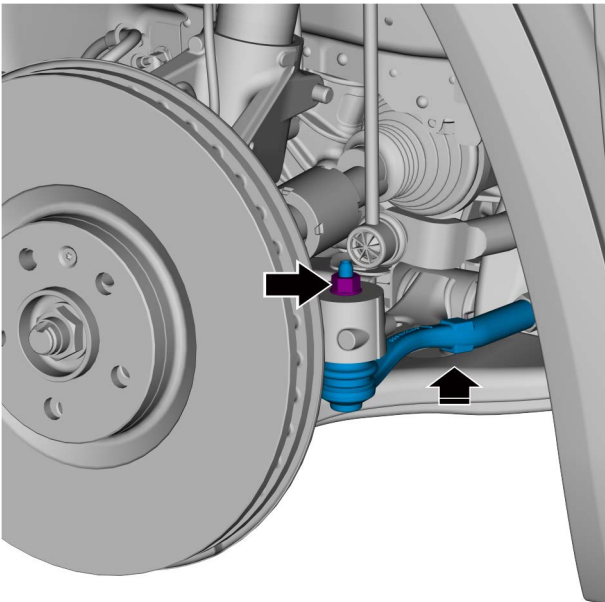


- 4 Loosen the steering gear left outer tie rod adjusting nut and screw out the steering gear left outer tie rod.

Installation Procedure



- 1 Install the steering gear left outer tie rod to the inner cross tie rod assembly and tighten the adjusting nut.
Torque: 80N·m



- 2 Install the steering gear left outer tie rod on the left front steering knuckle assembly and tighten the new fixing nut.
Torque: 30 N·m + 90°

- 3 Install the wheel.
- 4 lower the vehicle.
- 5 Perform a vehicle four-wheel alignment.

8.2.6.2 Replacement of Steering Gear Bellows Assembly

Removal Procedure

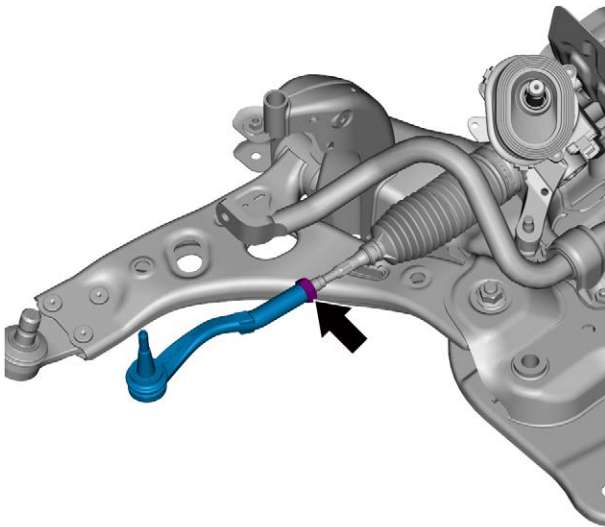
Caution

The left and right steering gear bellows assemblies are removed in a similar manner.

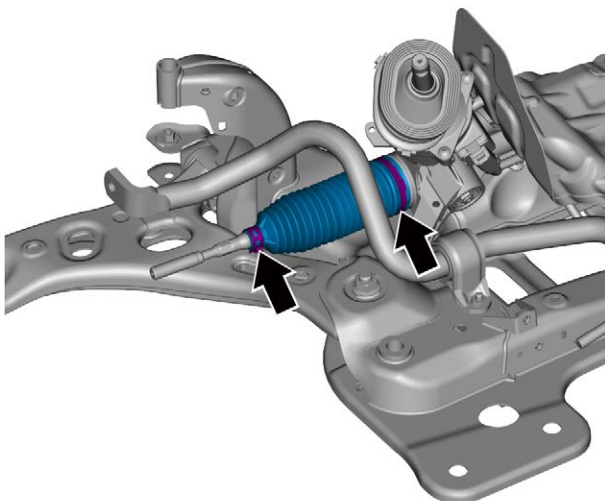
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

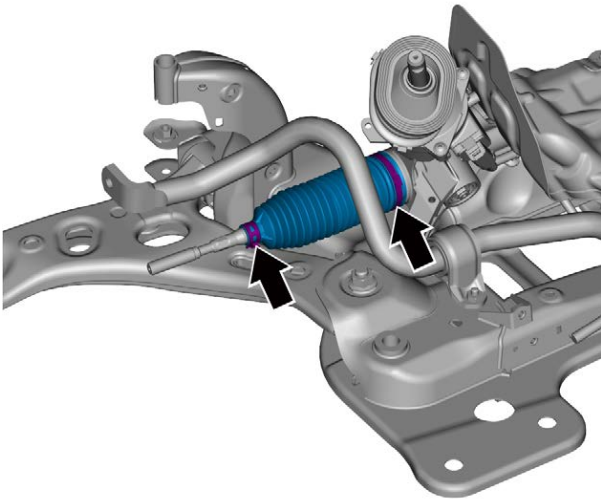
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the front subframe, see [Replacement of Front Subframe](#).
- 3 Loosen the steering gear left outer tie rod adjusting nut and screw out the steering gear left outer tie rod.



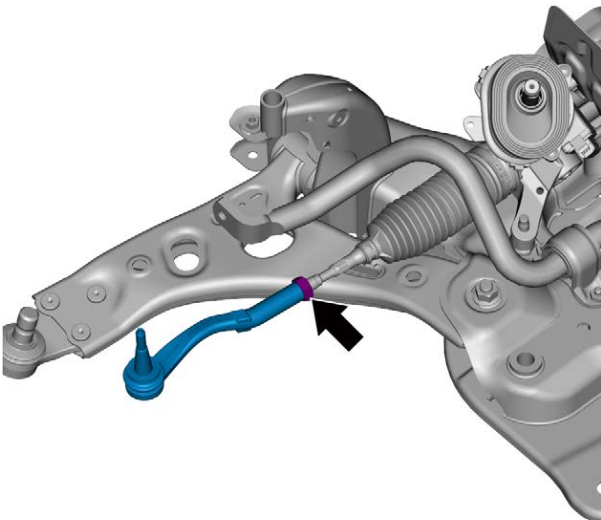
- 4 Remove steering gear bellows assembly retaining clamps.
- 5 Remove the steering gear bellows assembly.



Installation Procedure



- 1 Install the steering gear bellows assembly.
- 2 Install the steering gear bellows assembly retaining clamps.



- 3 Install the steering gear left outer tie rod to the inner cross tie rod assembly and tighten the adjusting nut.
Torque: 80N·m

- 4 Install the front subframe.
- 5 Connect the negative cable of battery.
- 6 Perform a vehicle four-wheel alignment.

8.2.6.3 Replacement of Inner Cross Tie Rod Assembly

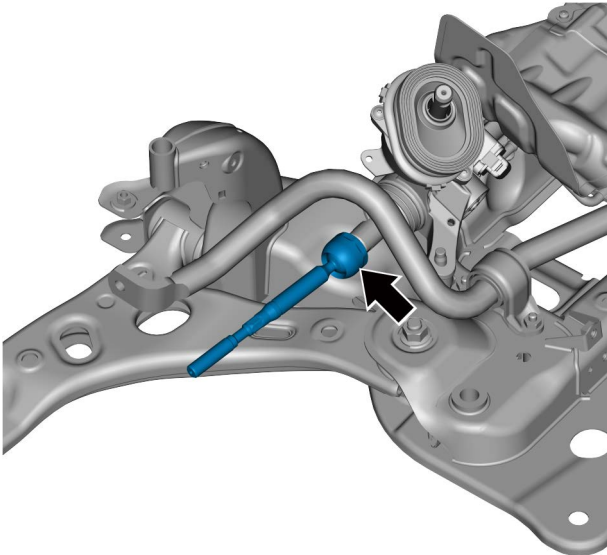
Removal Procedure

Caution

The left and right inner cross tie rod assemblies are removed and installed in a similar manner.

Warning !

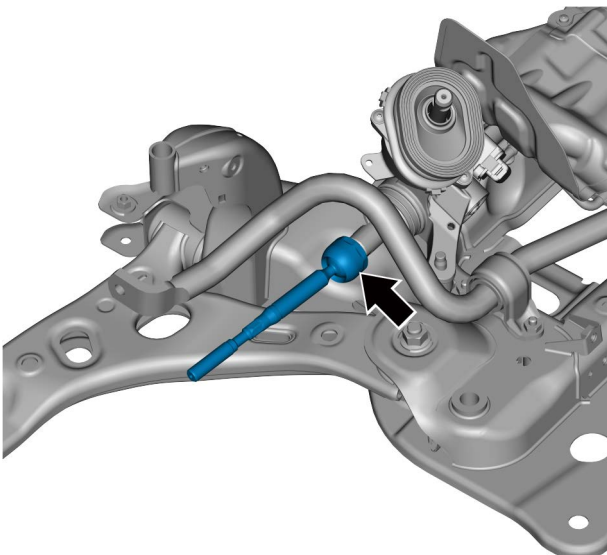
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".



- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the front subframe, see [Replacement of Front Subframe](#).
- 3 Remove the steering gear bellows assembly, see [Replacement of Steering Gear Bellows Assembly](#).
- 4 Remove the connection between the inner cross tie rod assembly and the electric power assisted steering gear with cross tie rod assembly, and remove the inner cross tie rod assembly.

Caution

When removing the inner cross tie rod assembly, use a suitable tool to secure the electric power assisted steering gear with cross tie rod assembly end to avoid damaging the steering gear.



Installation Procedure

- 1 Place the inner cross tie rod assembly in the mounting position and tighten the inner cross tie rod assembly.
Torque: 100N·m

- 2 Install the steering gear bellows assembly.
- 3 Install the front subframe.
- 4 Connect the negative cable of battery.
- 5 Perform a vehicle four-wheel alignment.

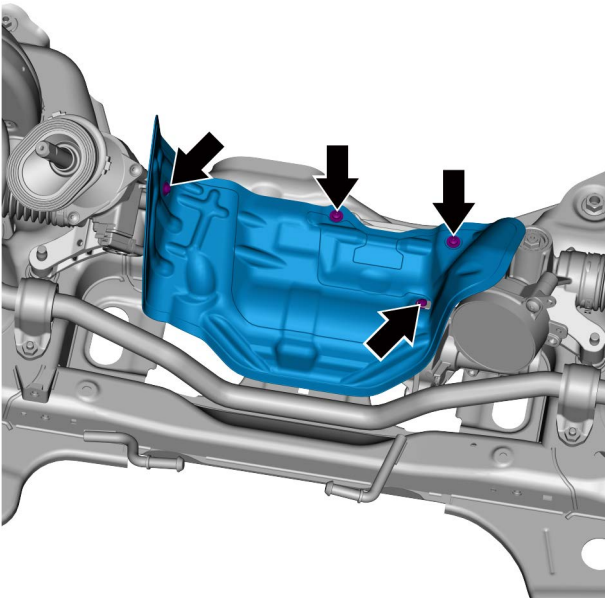
8.2.6.4 Replacement of the electric power assisted steering gear with cross tie rod assembly

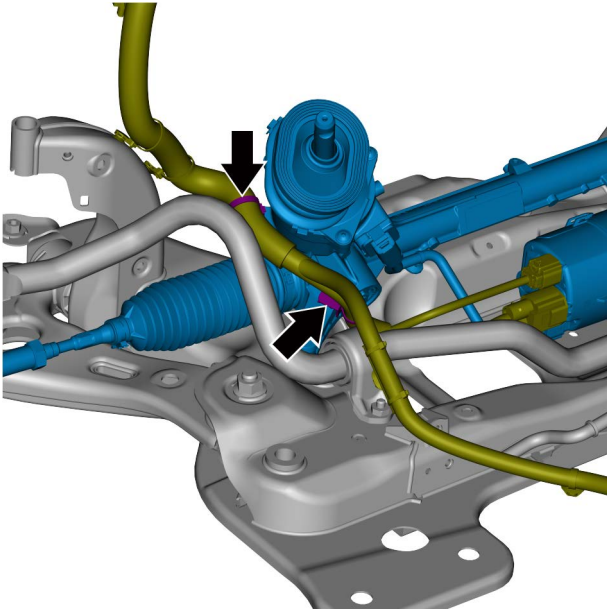
Removal Procedure

Warning !

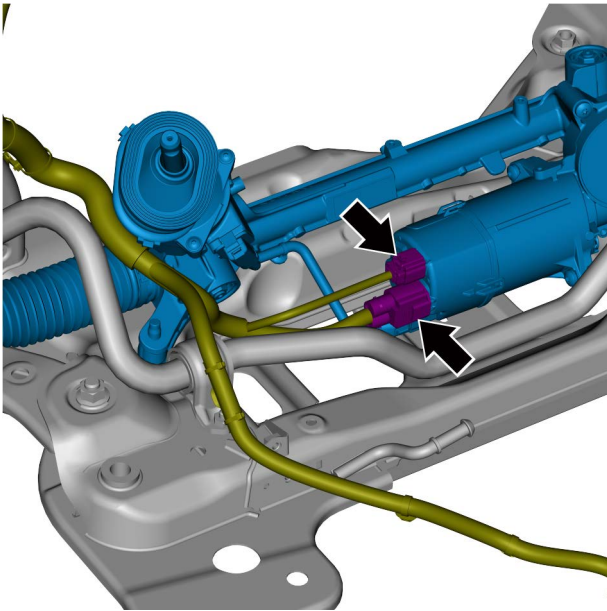
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 3 Remove wheel, see [Replacement of Wheel Assembly](#).
- 4 Remove the front subframe, see [Replacement of Front Subframe](#).
- 5 Remove the 4 fixing bolts of the steering gear heat shield.

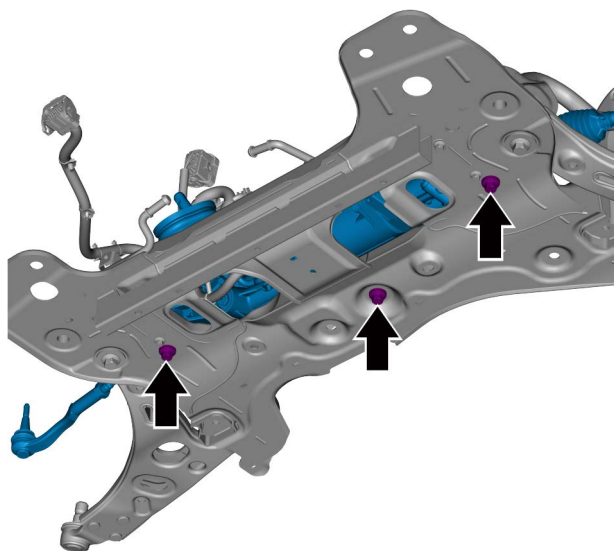




- 6 Disengage the electric power assisted steering gear with cross tie rod assembly harness retaining clips.

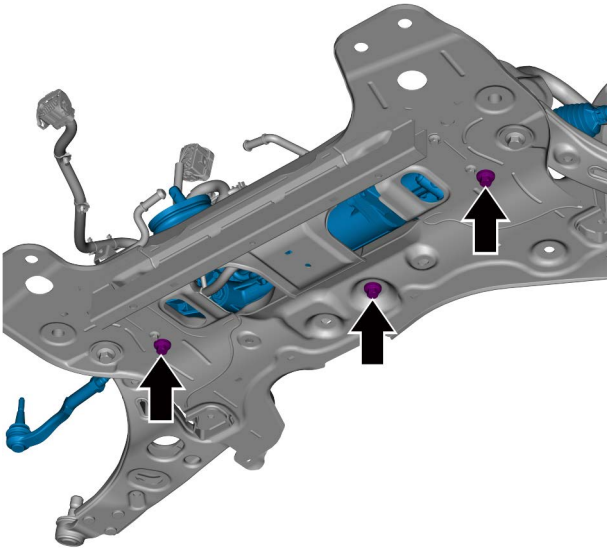


- 7 Disconnect the electric power assisted steering gear with cross tie rod assembly harness connector.



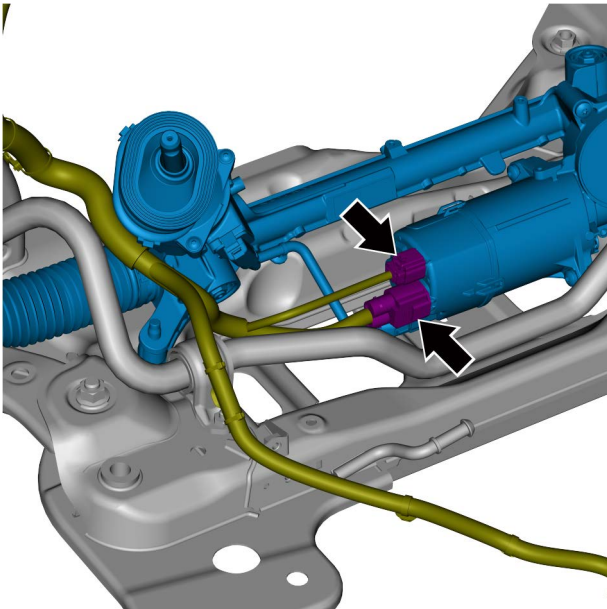
- 8 Remove and discard the 3 fixing bolts of the electric power assisted steering gear with cross tie rod assembly. Remove the electric power assisted steering gear with cross tie rod assembly.

Installation Procedure

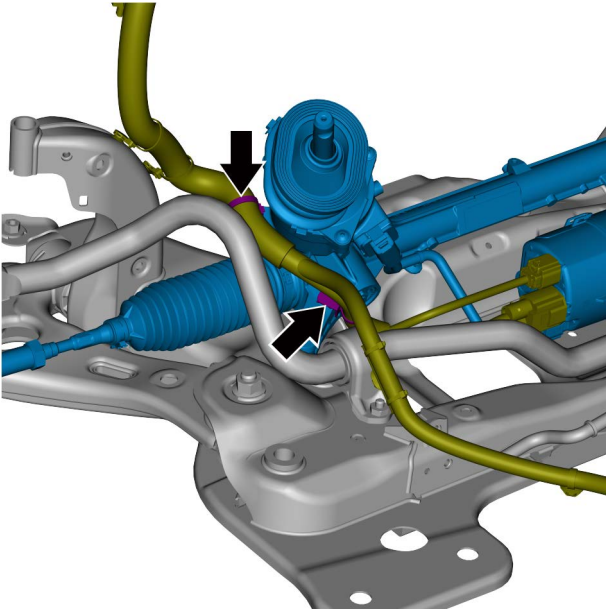


- 1 Install the electric power assisted steering gear with cross tie rod assembly on the front subframe and tighten the 3 new fixing bolts.

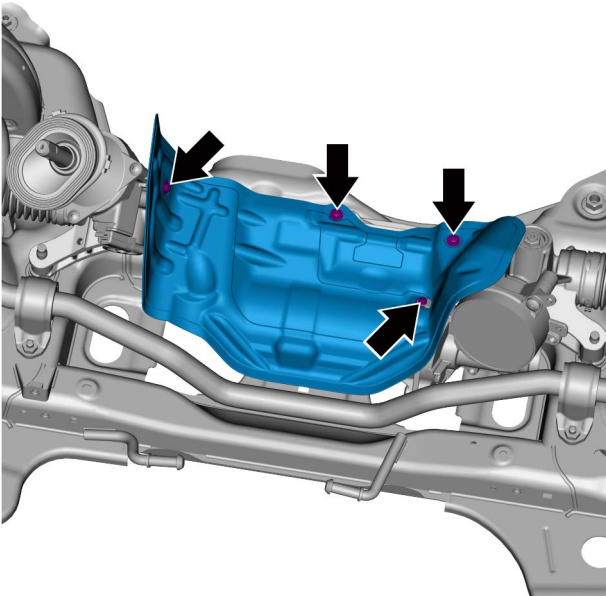
Torque: 90 N·m + 90°



- 2 Connect the electric power assisted steering gear with cross tie rod assembly harness connector.

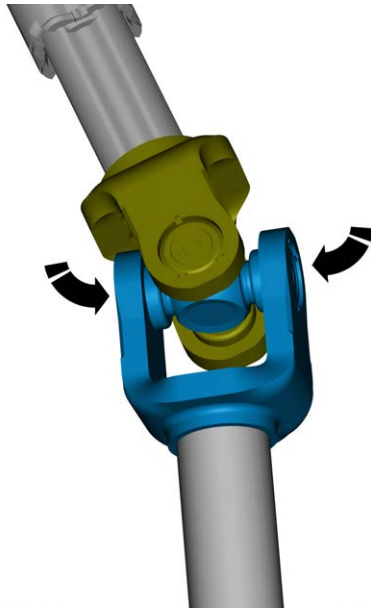


- 3 Install the electric power assisted steering gear with cross tie rod assembly harness retaining clips.



- 4 Install the 4 fixing bolts of the steering gear heat shield
Torque: 5N·m

- 5 Install the front subframe.
- 6 Install the wheel.
- 7 Connect the negative cable of battery.
- 8 Perform the EPS parts replacement operation procedure, refer to [Replacing EPS Parts Operation Guide](#).
- 9 The GLDS diagnostic program is required, under the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software brushing operation.
- 10 Perform a vehicle four-wheel alignment.



8.2.6.5 Inspection of intermediate shaft universal joints

- 1 Fix one end of the upper and lower intermediate shaft universal joints and twist the other end of the upper and lower intermediate shaft universal joints in clockwise and counterclockwise directions.
- 2 The maximum torsional clearance is 15°, if this is exceeded the mechanical steering column assembly needs to be replaced.

8.2.6.6 Replacement of Mechanical Steering Column Assembly

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

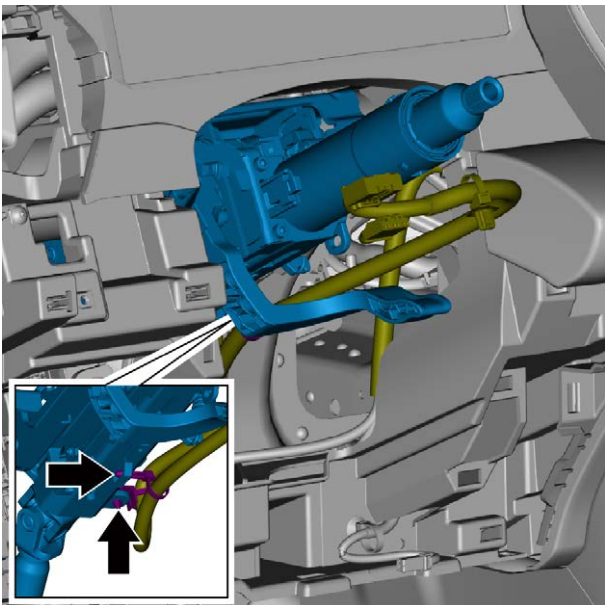
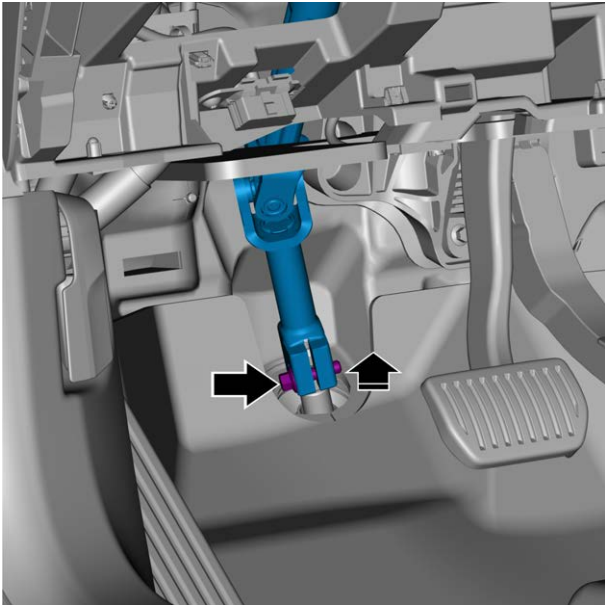
Caution

Wait at least 60s after disconnecting the battery cable to prevent the airbag and seat belt pretensioners from being activated.

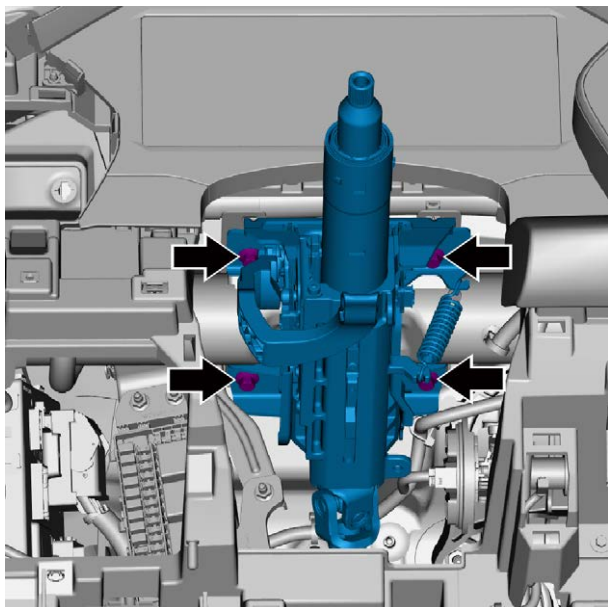
On a level surface, put steering wheel in the right direction.

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the steering column upper shroud assembly, see [Replacement of Steering Column Upper Shroud Assembly](#).
- 4 Remove the steering column lower shroud assembly, see [Replacement of Steering Column Lower Shroud](#).
- 5 Remove the front airbag (driver), refer to [Replacement of front airbag \(driver\)](#).
- 6 Remove the steering wheel assembly, refer to [Replacement of steering wheel assembly](#).

- 7 Remove the steering wheel module, refer to [Replacement of steering wheel module](#).
- 8 Remove the instrument panel lower left guard, see [Replacement of Instrument Panel Lower Left Guard Assembly](#).
- 9 Remove the left lower toe board assembly, refer to [Replacement of left lower toe board assembly](#).
- 10 Remove and discard the mechanical steering column assembly universal joint fixing bolts and disconnect the intermediate shaft assembly from the input shaft of the electric steering gear with cross tie rod assembly.

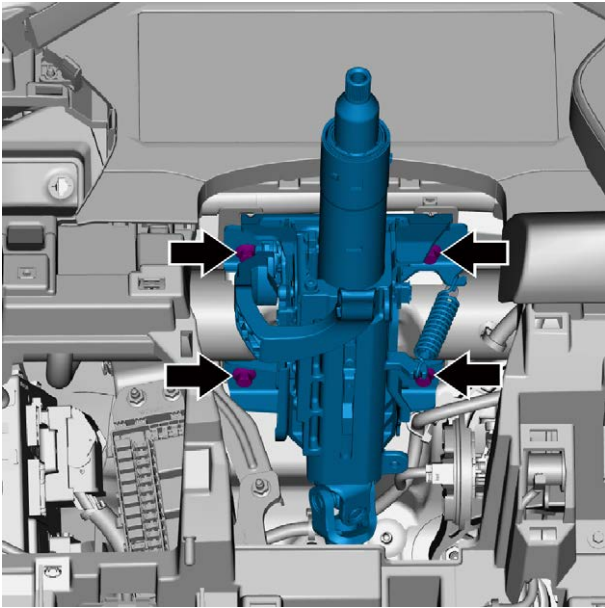


- 11 Disengage the harness clip on the mechanical steering column assembly.

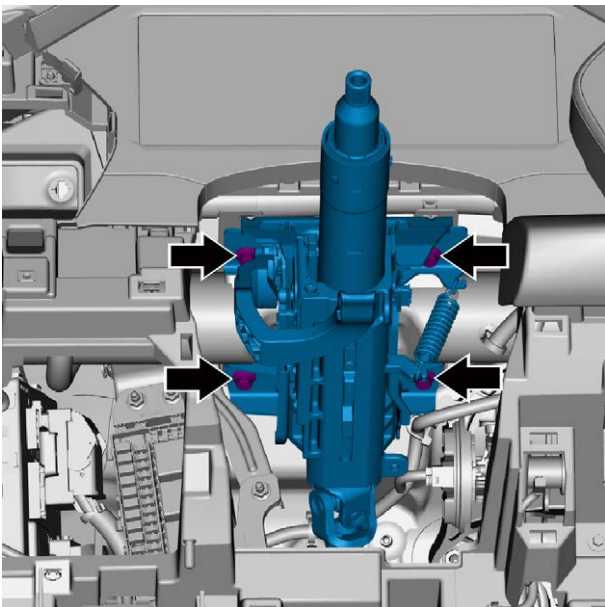


- 12 Remove the 4 fixing bolts attaching the mechanical steering column assembly to the instrument cross member.
- 13 Remove the mechanical steering column assembly.

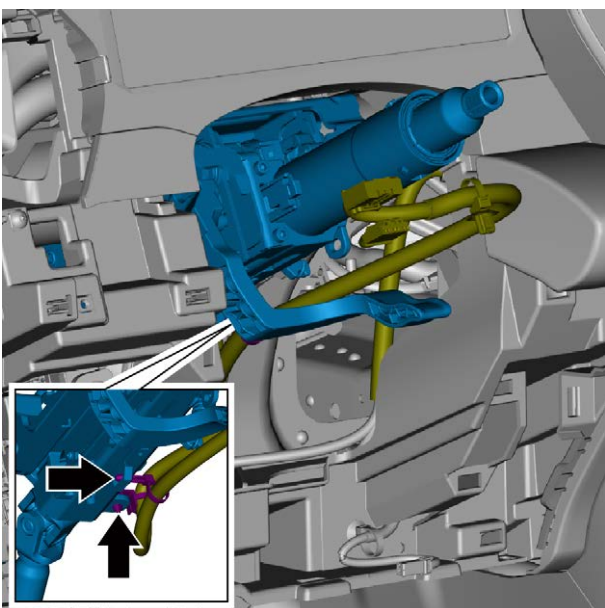
Installation Procedure



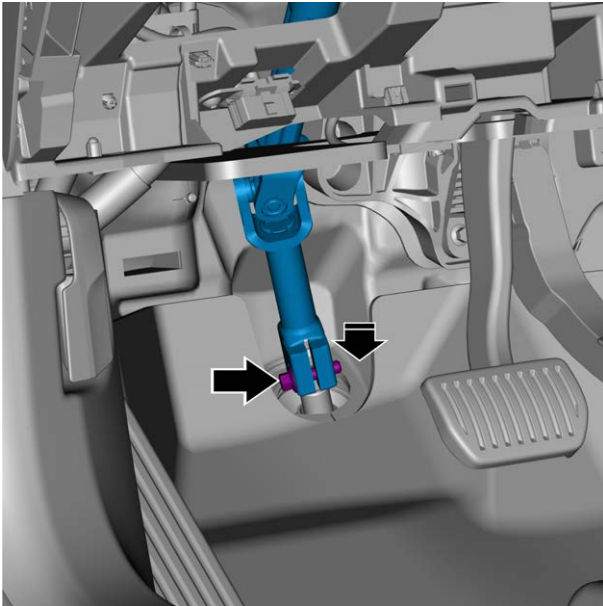
- 1 Install and pre-torque the 4 fixing bolts that connect the mechanical steering column assembly to the instrument cross member.



- 2 Tighten the 4 fixing bolts that connect the mechanical steering column assembly to the instrument cross member.
Torque: 24N·m



- 5 Install the mechanical steering column assembly's wiring harness clips.



- 6 Slide the mechanical steering column assembly with intermediate shaft assembly onto the electric power assisted steering gear with cross tie rod assembly input shaft, install and tighten the new fixing bolts.

Torque: 24N·m

- 7 Install the steering wheel module.
- 8 Install the steering wheel assembly.
- 9 Install the steering column upper and lower shrouds.
- 10 Install the driver airbag.
- 11 Install the instrument panel lower left shroud.
- 12 Install the left lower toe board assembly.
- 13 Connect the negative cable of battery.

8.2.6.7 Inspection of steering gear cross tie rod ball head

Inspection procedure

- 1 Lift the vehicle, see [Lifting and Raising the Vehicle](#)

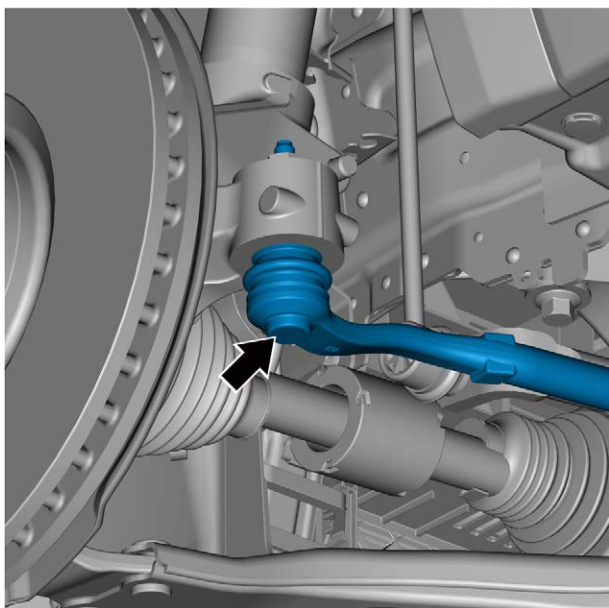
Caution

Make sure the steering wheel is unlocked before lifting the vehicle.

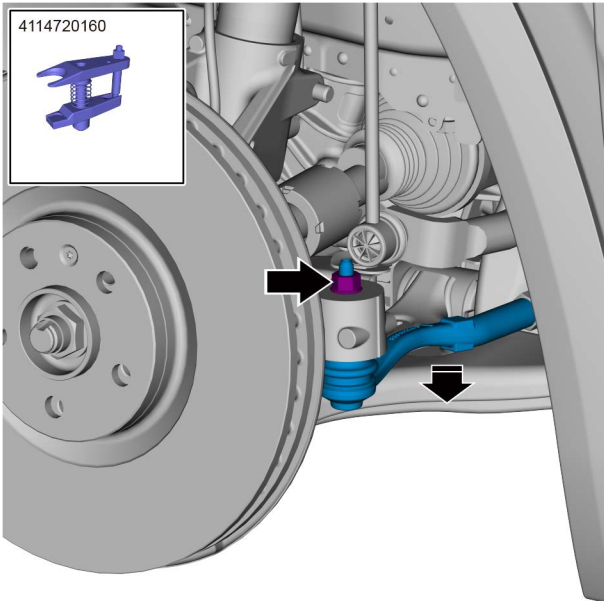
- 2 Hold both sides of the tires in your hands and rock the tires back and forth frequently to feel if there is a clearance between the vehicle's ball heads.



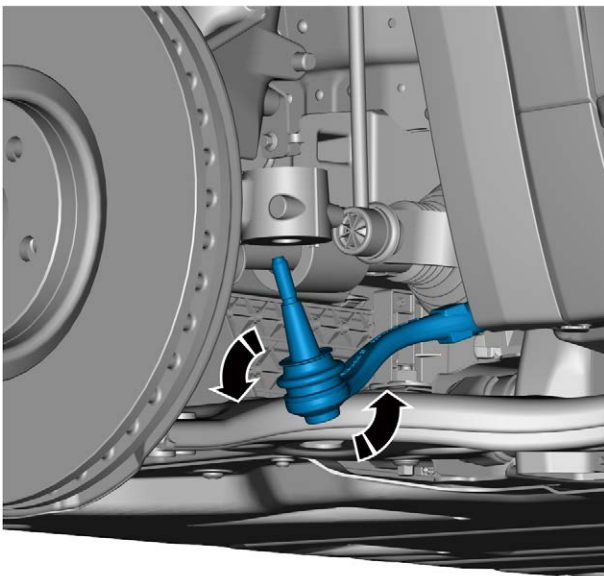
- 3 Wiggle the steering cross tie rod ball heads frequently by hand to feel if the lower ball heads are loose.



- 4 Disassemble wheel assembly, see [Replacement of Wheel Assembly](#).



- 5 Remove the 1 fixing nut that connects the steering gear left outer tie rod to the front steering knuckle.
- 6 Use the special tool to disengage the steering gear left outer tie rod ball head and steering knuckle.
Special tool: 4114720160



- 7 Frequently rotate and swing or pull and press the steering gear cross tie rod ball head by hand to feel whether it is loose or not.

- 8 Combine the above operations to determine if the steering gear cross tie rod ball head is loose.
- 9 Install the steering gear cross tie rod, see [Replacement of Steering Gear Left Outer Tie Rod](#)
- 11 lower the vehicle.

8.3 Steering Wheel

8.3.1 Specification

8.3.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Fixing bolt connecting the steering wheel assembly to mechanical steering column assembly	M12×30×36.07	50-70

8.3.2 Instructions and operations

8.3.2.1 Instructions and operations

Caution

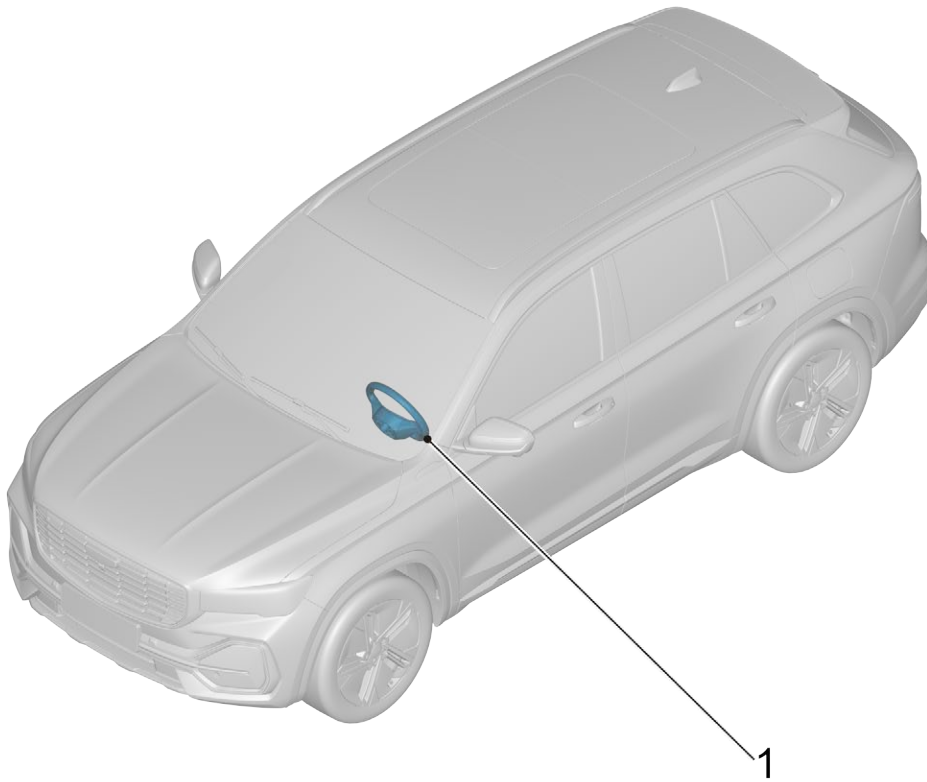
See "Warning about additional protection systems" in "Warnings and Precautions".

Caution

See "Warning about steering wheel in steering limit position" in "Warnings and Precautions".

8.3.3 Part position

8.3.3.1 Part position



1. Steering Wheel Assembly

8.3.4 Diagnostic information and procedure

8.3.4.1 Diagnosis description

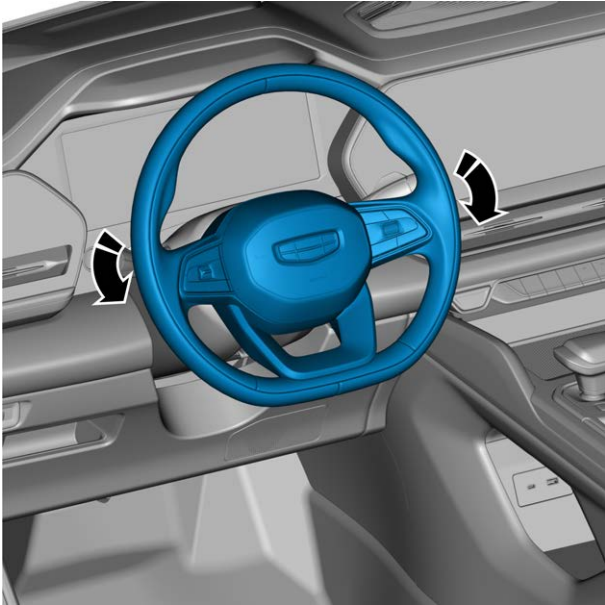
Before diagnosing a fault in the steering wheel assembly and mechanical steering column assembly, see [Description and Operation](#). Understanding and familiarizing yourself with the operation of the steering wheel assembly and mechanical steering column assembly before beginning system diagnostics will help determine the proper troubleshooting procedure in the event of a malfunction, and more importantly, it will help determine whether or not the condition described by the customer is a normal operation. Any troubleshooting of the steering wheel and steering column should start with a [routine inspection](#) that guides the mechanic to the next logical step in the troubleshooting process. Understanding and using the diagnostic process correctly will reduce diagnostic time and avoid misjudgment of the faulty area.

8.3.4.2 Routine inspection

- Confirm customer's fault before repair.
- Check system components that are easily accessible or can be seen to find out if there is any obvious damage or there is a situation that may cause a fault.
 - Check for normal tire pressure.
 - Whether there are obvious signs of mechanical damage.
 - Check for loose tightening bolts on the mechanical steering column assembly shaft movable coupling head, loose fixing bolts on the mechanical steering column assembly mounting bracket, and verify that the torque marking markings and bolt surfaces show signs of removal.

If so, repair or replace the part.

- Check the harness and harness connector to ensure that there is no sign of loosening, damage, poor contact, aging, etc.



8.3.5 Removal and Installation

8.3.5.1 Steering wheel assembly free clearance check

- 1 Park the vehicle with the tires facing straight ahead.

Caution

The free clearance on this vehicle cannot be adjusted, replace the power steering with cross tie rod assembly if the upper and lower intermediate shaft universal joints are normal.

- 2 Feel for clearance between the upper and lower shafts while turning, if there is clearance the steering column assembly must be replaced.

Maximum free rotation: 15°

8.3.5.2 Replacement of Steering Wheel Assembly

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the front airbag (driver), refer to [Replacement of front airbag \(driver\)](#).



- 3 Disconnect the harness connector from the steering wheel assembly.



- 4 Remove and discard the fixing bolts that secure the steering wheel assembly.

Caution

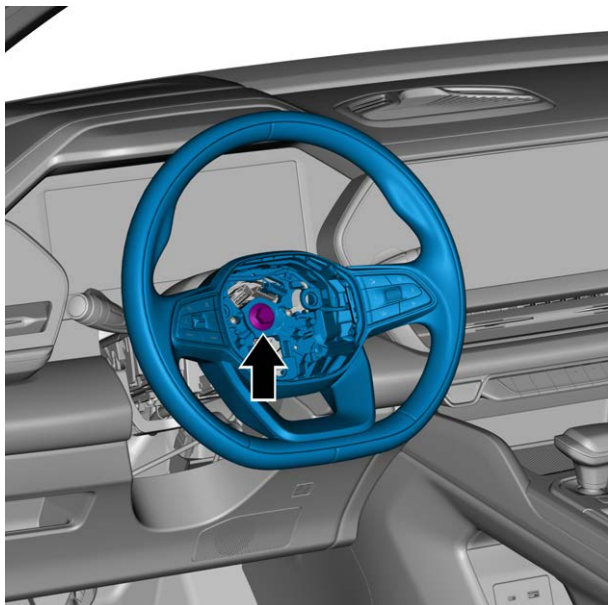
With wheel directly in front of the vehicle and mark the steering wheel assembly connection to the mechanical steering column assembly with a marker.

- 5 Remove the steering wheel.

Caution

Do not turn clock spring after steering wheel assembly removal to prevent damage to clock spring.

Installation Procedure



1 Install the steering wheel assembly so that the front wheels are in the front. Align the installation marks made with a marker before removing the steering wheel assembly.

2 Install and tighten the new steering wheel assembly fixing bolts.

Torque: 60N·m

3 Connect the harness connector on the steering wheel assembly.

4 Install front airbag (driver).

5 Connect the negative cable of battery.

Heating, ventilation and A/C system

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9.1 Warnings and Cautions

9.1.1 Warnings and Cautions

9.1.1.1 Warnings and Cautions

Warning !

Refrigerant related work should be carried out in a well ventilated environment and refrigerant vapors should not be inhaled. Inhalation of A/C refrigerant R-134a (tetrafluoroethane) and lubricant vapors or mists should also be avoided. Contact with them can irritate the eyes, nose and throat. Work should be done in a well-ventilated area. When removing R-134a from the A/C system, use service equipment certified to meet the requirements (R-134a regeneration equipment). In the event of an unintentional discharge from the system, the work area must be ventilated before repairs are continued. Additional information on health and safety can be obtained from refrigerant and lubricant manufacturers.

Warning !

The negative terminal of the battery must be disconnected before servicing the electrical system. Welding or steam cleaning operations are prohibited on or near vehicles with A/C lines or components.

Precautions concerning A/C refrigerant

Warning !

1. Skin contact may cause frostbite.
2. The instructions provided by the manufacturer must be observed. Wear appropriate goggles and protective gloves when performing work.

Handling of A/C refrigerant to be avoided

Warning !

1. Do not store refrigerant in sunlight or in areas with heat sources.
2. R-134a will become toxic gas when exposed to high temperatures from open flames.
3. When filling, do not turn the refrigerant bottle upside down and must keep the valve facing upwards to ensure that the refrigerant is filled as a gas.
4. Do not expose refrigerant bottles to frost or snow.
5. Do not drop refrigerant bottles.
6. Do not discharge refrigerants directly into the atmosphere under any circumstances.
7. Do not mix refrigerants, e.g. R134a (tetrafluoroethane) and R12 (difluorodichloromethane).

Precautions concerning A/C system lubricants

Warning !

Lubricants of the type and grade specified by the compressor manufacturer must be used; different types and grades of lubricants must never be mixed, or the compressor will be damaged. Lubricants are highly susceptible to water absorption, and the time that the lubricants are in contact with the air should be minimized.

Warning !

- Prohibit the use of water, corrosive solvents or flammable and explosive solvents to clean the A/C system, and recommend the use of cleaning agents such as R-141b and heptane.
- Strictly in accordance with the prescribed filling amount, note that the lubricant is an obstacle to heat exchange, overfilling will seriously reduce the effect of air conditioning; generally no need to refill the lubricant, the lubricant has been filled by the compressor manufacturer.
- Lubricant is very easy to absorb water, should minimize the lubricant and air contact time.
- Before refilling, the quality of the lubricant in the pipeline should be checked; if serious blackening or carbon particles precipitation phenomenon is found, the whole A/C system should be thoroughly cleaned and all lubricants should be replaced.
- The lubricant should be filled from the compressor exhaust port before pumping the vacuum.

9.2 A/C system

9.2.1 Specification

9.2.1.1 Maintenance Data

Parts	Item	Parameter
Electric compressor	Refrigerant filling capacity	650g
	Refrigerant type	R134a
	Compressor type	Scroll
	Compressor oil specification	FVC56EA

9.2.1.2 Fastener specification

Fastener part	Model	Torque range (N·m)
Center console switch module fixing screw	PF5×16	1.3-1.7
Condenser outlet tube assembly and condenser fixing nut	M8×8	20-28
A/C high pressure hose assembly and condenser fixing nut	M8×8	20-28
Radiator left lower air guide plate fixing screws	PF5×20	2.5-3.5
Radiator right lower air guide plate fixing screws	PF5×20	2.5-3.5
A/C low pressure hose assembly and A/C compressor module fixing bolt	M8×25	20-28
A/C high pressure hose assembly and A/C compressor module fixing screws	M8×25	20-28
A/C compressor module fixing bolt	M8	20-28
Blower motor resistors fixing screw	ST4.0x16	1.0-1.4
Blower motor fixing screw	ST4.0x16	1.0-1.4
Recirculation damper motor fixing screw	ST4.0x16	1.0-1.4
Air distribution damper motor fixing screw	ST4.0x16	1.0-1.4
Temperature control damper motor fixing screw	ST4.0x16	1.0-1.4
A/C main unit bracket fixing screws	ST4.0x16	1.0-1.4
Warm air core body water pipe bracket fixing screws	ST4.0x16	1.0-1.4
A/C high and low pressure hose assembly and expansion valve connection fixing nut	M6×7.3	8.5-11.5
Temperature control module fixing screw	PF5×16	1.3-1.7

Fastener part	Model	Torque range (N·m)
Expansion valve fixing screw	M5×40	3.5-5.5
A/C housing fixing screws	ST4.0×16	1.0-1.4
Front foot-blowing right air duct and A/C main unit fixing screws	ST4.8×16	1.3-1.7
Sub-instrument panel face-blowing air duct front section fixing screws	ST4.8×19	1.3-1.7
A/C high and low pressure hose and A/C low pressure hose fixing nut	M6×7.3	8.5-11.5
A/C high and low pressure hose and refrigerant solenoid valve fixing nut	M6×7.3	8.5-11.5
A/C high and low pressure hose and body fixing screws	M6×35	8.5-11.5
High pressure coolant heater assembly fixing bolt	M6×20	8.5-11.5
Left A/C air outlet panel assembly fixing screw	ST4.8×19	2.2-2.8
Instrument panel left side air outlet assembly fixing screws	PF5×16	1.3-1.7
Instrument panel right side air outlet assembly fixing screws	PF5×16	1.3-1.7
Fixing screw for air outlet assembly in the center of instrument panel	PF5×16	1.3-1.7
Sub-instrument rear air outlet assembly fixing screws	PF4×16	1.3-1.7
Fixing nut for battery circuit three-way valve	M6	8.5-11.5
Battery circuit three-way valve bracket fixing bolt	M6	6-9
Heater fixing bracket fixing bolt	M6	6-9
Heater hitch wire fixing nut	M6	8.5-11.5
Heat exchanger fixing bolt	M6	8.5-11.5
PTC bracket and PTC fixing screws	PF6	4.2-5.8
Heat exchanger bracket fixing bolt	M6	6.8-9.2

9.2.2 Instructions and operations

9.2.2.1 Instructions and operations

Compressor

The A/C compressor is connected to the drive motor controller via the compressor harness, which is powered by the power battery.

The compressor is turned off in the following cases:

1. Ambient temperature is too low.
2. Engine coolant temperature is too high.
3. Refrigerant pressure is above 2.8 MPa (406.09 psi) or below 0.196 Mpa (28.43 psi).

Caution

Do not hit, drop or invert compressor up and down. If compressor is hit or inverted up and down, rotate compressor clutch by hand 5-6 times to circulate lubricant deposited in the cylinder; otherwise, sudden rotation will cause valve damage and adversely affect durability.

Condenser, liquid storage dryer

The high-temperature, high-pressure refrigerant vapor from the A/C compressor flows into the condenser that is made of aluminum tubes capable of rapid heat transfer and cooling fins that condense the high-temperature, high-pressure refrigerant vapor into a medium-temperature, high-pressure liquid by dissipating heat. The liquid storage dryer is located at the side of the condenser and is welded with the condenser. The internal structure of the liquid storage drier is designed to ensure that the medium temperature and high pressure gas-liquid mixture refrigerant enters and what comes out of the liquid storage drier is medium temperature and high pressure liquid refrigerant.

Inside the liquid storage drier, there is a desiccant that adsorbs moisture from the cooling system, and the desiccant cannot be reused. The liquid storage drier core cannot be repaired but only replaced when leakage occurs due to the following reasons.

- a. Perforation
- b. Damage to sealing area
- c. Outside air has been entering the system for a considerable period of time

Sun sensor

The sun sensor is integrated with the rainwater and light sensor mounted on the upper side of the front windscreen. The sun sensor is a light energy sensor, which measures the

heat generated by the sunlight hitting the vehicle and provides additional compensation parameters for the temperature control module. The temperature control module automatically adjusts the airflow and cold/hot air mixing ratio in real time according to the state of light intensity outside the vehicle and the demand of A/C conditions inside the vehicle, so that all occupants can get the most comfortable feeling.

A/C temperature sensor, ambient temperature sensor (exterior rearview mirror)

Ambient temperature sensor (exterior rearview mirror), A/C temperature sensor affects the automatic control of the air temperature inside the vehicle: these sensors are temperature-sensitive thermal components, the resistance of the sensor and the temperature are inversely proportional to each other. The temperature control module sets the inner and outer circulation motors, cold and warm temperature air direction motors, and blower motor resistors to control the A/C temperature based on the resistance value information.

The A/C temperature sensor housing is connected to the air absorber through a hose pipe. The airflow out of the A/C main unit creates a slight vacuum at the end of the suction hose. This vacuum allows cabin air to flow through the A/C temperature sensor, improving the accuracy of the cabin temperature detected by the sensor.

The ambient temperature sensor (exterior rearview mirror) is located on the right side rearview mirror and is used by the temperature control module to obtain information about the ambient air temperature, and using this information temperature control module make the outside temperature shown on the instrument.

Indoor A/C Main Unit

The indoor A/C main unit is located in the dashboard and consists of blower motor, air distribution damper motor, temperature control damper motor, recirculation damper motor, blower motor resistors, A/C filters, heater cores, evaporators, expansion valves, as well as various air deflector dampers, and ventilation ducts.

1. Blower motor

Caution

The fan wheel of blower motor must not be used as a supporting surface when placing blower motor.

To prevent damage to the fan wheel blades, touching the fan wheel is prohibited.

The A/C blower module consists of the following components:

- Permanent magnet type motor
- Squirrel cage fan

The variation of the operating speed of the A/C blower module at different speeds depends on the blower motor control module controlled by the blower motor speed control unit.

Under most operating conditions, outside air enters the vehicle in the following manners:

- Blower motor works to draw in outside air
- Forward motion of the vehicle presses in outside air

Blower motor blows air along the following route:

- Through the evaporator core
- After the heater core
- Entry into the passenger compartment

2. Heater core

The heater core is the main component of the A/C heating system and is located in the A/C main unit. When the engine is running, engine coolant flows from the engine to the heater core, which radiates the heat of the coolant. When removing the heater core, it is necessary to drain the engine coolant, and when installing it, make sure that the heater core pipeline is assembled properly.

3. Evaporator and expansion valve

The evaporator is located on the right side of the interior of the A/C main unit. You need to finish draining the refrigerant before removing and disassembling the A/C main unit. The expansion valve is connected to the inlet and exhaust tubes of the evaporator at one end, and the other end is connected to the inlet and exhaust tubes of the A/C compressor. Within the liquid line, the expansion valve creates a restriction on the high-pressure liquid refrigerant so that the refrigerant flows to the evaporator as a low-pressure liquid.

The refrigerant is cooled and dehumidified before it enters the vehicle, the liquid refrigerant evaporates in the evaporator, by absorbing the heat from the evaporator airflow, the temperature inside the vehicle decreases, the liquid refrigerant is converted to gas state, and the moisture in the air condenses on the outer surface of the evaporator core to form water flowing out.

The evaporator is equipped with a temperature sensor, which measures the surface temperature of the heat sink on the evaporator, and if the temperature falls below the limit, the compressor stops continuing to work to prevent the evaporator from icing.

Refrigerant R-134a with lubricant

The refrigerant has the following roles in the A/C system:

1. - Absorbing heat

2. Carrying heat

3. Releasing heat

Vehicle uses R-134a refrigerant, which is non-toxic, flame retardant, transparent, colorless liquefied gas.

Before performing service operations that require opening cooling system lines or components, refer to the instructions for disposal of refrigerant lines and joints and for maintaining chemical stability. Depending on the model configuration of the compressor, use the specified grade of lubricant. The following items need to be noted:

- Refrigeration oil must be brand new, no used oil containing moisture/dirt/metal shavings;
- It is not allowed to add excessive lubricant to the system, otherwise the cooling capacity of the cooling system will be affected;
- Discharge refrigerant slowly when replacing the system so that the lubricant and refrigerant do not spray out together;
- New system replacement with new compressor does not need to be filled with lubricant, it has been charged by the compressor manufacturer.
- Before refilling, the quality of lubricant in the pipeline should be checked, if serious blackening or carbon particles precipitation phenomenon is found, the whole A/C system should be thoroughly cleaned and blown, the reservoir drier and all the lubricant should be replaced; it is prohibited to clean the A/C system with water, corrosive solvents or flammable and explosive solvents, and it is recommended to use cleaning agents such as heptane to clean and dry the cleaned A/C system thoroughly.

Be sure to follow the steps in the instructions for the following repairs:

- Refrigerant recovery and regeneration
- Adding lubricant
- Drain cooling system
- Refill the cooling system

Caution

Lubricants of the type and grade specified by the compressor manufacturer must be used; different types and grades of lubricants must never be mixed, or the compressor will be damaged. Lubricants are highly susceptible to water absorption, and the time that the lubricants are in contact with the air should be minimized.

When replacing the A/C system components, it is necessary to add or pour out a certain amount of lubricant of the same type appropriately, which can be performed according to the following recommended data in general:

A/C lubricant refill volume:

Item	Refill volume	Unit	Note
Sudden loss of refrigerant	10-20	ml	-
Condenser replacement	15	ml	-
Evaporator replacement	10	ml	-
Replacement of all lines	10	ml	-
Individual line replacement	0-5	ml	-

Item	Refill volume	Unit	Note
Refrigerant lubricant volume for the whole system	130	ml	-
Compressor Replacement	-40	ml	The compressor carries a large amount of lubricant (more than the amount of lubricant in the entire A/C system) when it is supplied from the manufacturer, so it is not necessary to replenish the lubricant after replacing the compressor, but rather, you will need to pour a certain amount of lubricant out of the new compressor before installing it.

A/C high-pressure hose, A/C low-pressure hose

Vehicles use A/C high-pressure hose and low-pressure hose (A/C hard tube or hose) to connect the A/C cooling system into a closed system, refrigerant and lubricant flow in this closed

system to complete the refrigerant work cycle process. The A/C hard tube consists of an aluminum tube and corresponding joints, and the A/C hose consists of a rubber hose and corresponding joints.

A/C pressure sensor

The A/C pressure sensor measures the A/C high pressure line pressure. When the A/C is cooling, based on the refrigerant pressure value in the line, it transmits the A/C system pressure signal and turns on or off engine cooling fan and compressor to realize the pressure protection of the A/C system.

Heater

The heater consists of a PTC heating device and a control unit, within a certain voltage range, the heating power varies with the current. The resistance value of the PTC is greatly affected by the temperature, so its heating power is greatly affected by the temperature change. Under the stable temperature of water inlet, the heating system can be provided with stable power by adjusting the gear.

Heat exchanger

The heat exchange process of the A/C system and battery cooling system used to control the entire vehicle and the heat exchange process of the cooling heating system and battery cooling system are for heating and cooling the power battery.

9.2.2.2 A/C Cooling System Inspection

General Inspection

The operating efficiency and service life of an A/C system depends on the chemical stability of the cooling system. When a cooling system is contaminated with foreign matter (e.g. dust, air or moisture), the contaminants can alter the stability of the refrigerant and refrigeration oil. And it also affects the relationship between pressure and temperature, reducing work efficiency and potentially leading to corrosion of system parts and abnormal component wear.

Have the A/C system checked as described below:

- Before opening the plug, clean the oil at and around the plug to reduce the possibility of oil entering the system.
- Immediately after the line is disconnected, seal both ends of the plug with caps, plugs, or tape to prevent the entry of oil, foreign matter, and moisture.
- Keep all tools clean and dry, including gauge assemblies and all replacement parts.
- Use clean, dry delivery devices and containers for refrigeration oil to ensure that the refrigeration oil is not contaminated.
- Operate the A/C system with the interior exposed to air for as short a time as possible.

- The interior of the A/C system must be re-emptied and refilled after exposure to air. All service parts are factory dried and sealed, and these sealed parts should only be opened when installation is about to take place. Before unsealing, all parts should be at room temperature to prevent moisture in the air from condensing on the parts and entering the interior of the system, and reseal all parts as soon as possible.

Caution

Do not store refrigerant in sunlight or in areas with heat sources.

Do not discharge refrigerant directly into the atmosphere under any circumstances.

Do not mix refrigerants, e.g. R-134a (tetrafluoroethane) with R-12 (dichlorodifluoromethane).

Refrigeration oil of the type and grade specified by the compressor manufacturer must be used. Refrigeration oils of different types and grades must never be mixed, otherwise the compressor will be damaged.

Refrigeration oil is very susceptible to water absorption, and contact time between refrigeration oil and air should be minimized.

Quick check of the refrigeration circuit

Caution

In some cases, refrigerant lines and A/C components may be extremely hot or cold. Use extreme caution when touching is required to inspect refrigerant lines or A/C components. Failure to follow this instruction can result in injury.

The A/C line from the compressor to the condenser should be hot.

The A/C line from the condenser to the expansion valve should be warm and not as hot as the A/C line described above.

Determine the temperature difference between the condenser cooling inlet air and cooling outlet air by measuring the temperature. Depending on the ambient temperature, the temperature difference should be greater than 20° C. If the temperature difference is less than 20°C, check for foreign objects or damage on the condenser heat sink and if the engine cooling fan is operating properly.

The A/C line between the expansion valve and the evaporator should be cold from the point of installation of the expansion valve. Depending on the climate, the surface of the A/C line may also freeze.

The A/C line between the evaporator and the compressor should be cold.

1. To test the evaporator core output line temperature, prepare the following while measuring:
 - Open all windows.
 - Set the air distribution to the face outlet position and open the outlet doors of all vents.
 - Turn on the external recirculation mode.
 - Select the lowest A/C blower module air speed setting.
 - Select the lowest temperature setting.
2. Connect the temperature sensor to the evaporator core output line, the temperature sensor must be mounted as close as possible to the evaporator core.

Caution

Temperature measurements should not be performed with a non-contact thermometer, as surface temperature radiation can cause incorrect measurements.

3. Turn on the A/C and after 3 min have passed, measure the surface temperature of the evaporator core output line.
4. If the measured temperature is 5-10°C, the A/C system is normal. If the temperature is too high, the A/C system is not cooling enough, carry out the next check. Frequent malfunctions of the cooling system and their causes:
 - Poor or no cooling

The A/C line or drying bottle is blocked or obstructed. You can find the location of the blockage or obstruction by comparing the temperature of the surfaces of the A/C line or drying bottle. The place where there is a temperature difference is the place where there is a blockage or obstruction.

- Sudden drop in cooling performance (cooling performance returns to normal after compressor stops for about 5min)

This is due to the presence of moisture in the system, causing the expansion valve to freeze. In order to ensure that moisture is completely removed from the refrigerant circuit, and to exhaust the air and moisture in the system, it is necessary to use the repeated evacuation method, i. e., after the first evacuation is completed, it is then continuously evacuated for more than 10min.

Cooling system pressure check

1. Park the vehicle indoors or in a sheltered place. Open the windows to ventilate the vehicle.

2. Install the A/C inspection and maintenance equipment, and connect the high and low pressure hoses of the equipment to the high and low pressure hose lines of the A/C system of the vehicle to be measured.
3. Allow the A/C system to run under cooling conditions for about 5~10min.
4. Measure the readings of the high and low pressure lines of the vehicle's A/C system.

The standard values for pressure are as follows:

	High Pressure	Low Pressure
Normal value	1.4~1.75 MPa	0.25~0.35 MPa

9.2.2.3 A/C Cooling System Leak Test

Cooling System Leak Test

When you suspect that your system is leaking refrigerant, you should test for refrigerant leaks. You should also perform a leak test when you perform a service that affects the lines or plugs. Leaks usually occur at refrigerant plugs or connections.

The causes of leaks usually include the following faults:

- Parts are not properly torqued for installation.
- Damaged seals.
- Leaking of refrigeration tube system components.
- The A/C system should be properly pressurized to check for leaks, at least 340 kPa. However, compressed air should not be charged into the system, otherwise moisture, dust or other impurities in the air will increase the burden on the desiccant or contaminate the system. There are several methods to check the leakage of cooling system.

Electronic leakage detection

1. Use an electronic leak detector to follow the entire piping of the cooling system for careful inspection.

Caution

Electronic leak detectors are sensitive to front windshield washer fluid, solvents and cleaners, and certain vehicle adhesives. Surfaces must be wiped clean to avoid inaccurate readings. Make sure all surfaces are dry to avoid damaging the electronic leak detector.

2. Move at a speed of 25~50 mm/s and test each joint for one full turn.
3. The tip of the probe is within 6 mm from the testing surface.
4. Prohibit blocking the air inlet.
5. If leakage is detected, the audible alarm will change from 1~2 beeps per second to a continuous alarm sound. Adjust

the balance control to keep the alarm at 1~2 beeps per second.

6. Even if one leak has been detected, all of the following must be tested:
- Evaporator and connecting line connections.
 - Condenser and connecting line connections.
 - Compressor and connecting line connections.
 - All plugs and connections.
 - Test high and low pressure service ports/service valves.
 - Brazing and soldering parts.

Fluorescent Dye Leak Detection

Some vehicles have marks of refrigerant oil and refrigerant at the A/C line joints, which may have been left there to facilitate installation of the A/C lines and to lubricate the A/C line spring lock connections. When a leak is suspected at the joint, wipe the parts clean and check leak with an R-134a electronic leak detector. The leak can be pinpointed by the soft yellowish green light of the tracer. Since there may be more than one leak, each part should usually be checked.

1. Charge 100g of fluorescent tracer into the A/C refrigerant system.
2. After running the A/C system for 15min, stop running the vehicle.
3. Use a UV lamp to inspect all parts of the A/C system to determine the leak.
4. If a leak is found, recover the refrigerant with the fluorescent tracer, repair or replace the leaking part, and recharge the refrigerant with the fluorescent tracer into the A/C system.
5. Use an oil-based solvent to remove any traces of fluorescent tracer from lines or parts.
6. Run the A/C system for a few minutes and use the UV light again to check all parts of the A/C system and confirm troubleshooting.

Vacuum Leak Detection

1. Recover the refrigerant and evacuate the system (about 30min).

If the A/C system is evacuated while it is charged with refrigerant, some of the refrigerant will remain in the refrigeration oil of the compressor. This remaining refrigerant will still evaporate and cause a slight increase in the reading on the pressure gauge during

the leak test (up to 2 divisions), but this increase in pressure does not mean that there is a leak in the A/C system.

2. Close the manual valves on the high and low pressure gauges on the refrigerant recovery filler.
3. Observe the low pressure gauge on the refrigerant recovery filler.
 - If the reading on the gauge increases by more than 2 kPa, there is a leak in the system. It will then be necessary to fill with refrigerant of approximately 300g and carry out a leak check. See: Fluorescent dye leak check.
 - If there are no leaks in the system, continue with the charging procedure.

9.2.2.4 A/C Refrigerant Recovery and Charging

The operating efficiency and service life of the A/C system depends on the chemical stability of the cooling system. When a cooling system is contaminated with foreign matter (e.g., dust, air, or moisture), the contaminants can alter the stability of the refrigerant and compressor oil. Also, it affects the relationship between pressure and temperature, reduces work efficiency, and can lead to internal corrosion and abnormal component wear. To ensure the chemical stability of the system do the following:

1. Before opening the joints, wipe off the oil at and around the joints to reduce the possibility of oil entering the system.
2. Immediately after disconnecting the joint, seal both ends of the joint with a cap, plug or tape to prevent the entry of oil, foreign matter and moisture.
3. Keep all tools clean and dry, including the manifold gauge assembly and all replacement parts.
4. Use a clean, dry delivery device and container to add compressor oil, keeping the compressor oil as free from moisture as possible.
5. Operate the A/C system with the interior exposed to air for as short a time as possible.
6. The interior of the A/C system must be re-evacuated and refilled after exposure to air. All service parts are factory dried and sealed. These sealed parts should only be opened when installation is imminent. Before unsealing, all parts should be at room temperature to prevent moisture in the air from condensing on the parts and entering the interior of the system, and reseal all parts as soon as possible.

A/C system venting, lubricant addition, evacuation and refilling procedures

Warning !

See "Warnings about Inhaling R-134a" in "Warnings and Precautions", additional health and safety information is available from refrigerant and lubricant manufacturers.

Warning !

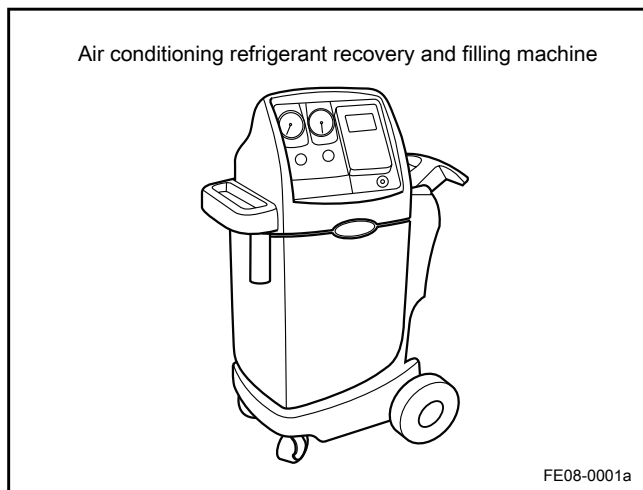
See "Warning about Goggles and Gloves" in "Warnings and Precautions".

The filler completes the A/C system venting, emptying, and re-filling procedure with a single connection. The refrigerant is filtered during both recovery and evacuation to ensure that the refrigerant charged to the A/C system is clean and dry.

1. It is prohibited to use the R-12 filler to charge the R-134a system. The refrigerant and compressor oil of the two systems are not compatible and must never be mixed, even in small quantities; mixing residual refrigerant can damage the equipment.
2. Prohibit the use of reducer joints to ensure a tight seal inside the system.

Installation and maintenance of the filler

There are many types of fillers. All of them perform a variety of tasks such as A/C system venting, refrigerant recovery, system evacuation, dosing of compressor oil, and dosing of refrigerant recharge. Refer to the filler instruction manual for initial installation procedures and maintenance procedures.

**Functions of the control panel**

The operator can control and monitor the operation process with the control buttons and indicator lights on the filler. See the filler instruction manual for details. The instructions should include the following:

1. Main power switch: The main power switch supplies power to the control panel.

2. Display screen : Display screen displays the programmed time required for evacuation and the weight of refrigerant recharged. See manufacturer's instruction manual for detailed programming information.
3. Low Pressure Side Manifold Pressure Gauge: This gauge displays the pressure on the low pressure side of the system.
4. High Pressure Side Manifold Pressure Gauge: This gauge indicates the pressure on the high pressure side of the system.
5. Control Panel: It consists of control knobs that control various operating functions.
6. Low Pressure Side Valve: This valve is used to connect the low pressure side of the A/C system to the filler.
7. Moisture Indicator: This indicator shows if the refrigerant is wet.
8. High Pressure Side Valve: This valve is used to connect the high pressure side of the A/C system to the filler.

Refrigerant Recovery**Warning !**

Use only refrigerant tanks specifically designed for the filler. The filler's anti-overfill mechanism is calibrated specifically for use with such refrigerant canisters. And the tank valve of the refrigerant tank is made specifically for this unit.

1. Check the high pressure side and low pressure side gauges on the filler control panel to make sure there is pressure in the A/C system. If there is no pressure, there is no recoverable refrigerant in the system.
2. Open the high pressure side and low pressure side valves.
3. Open the gas and liquid valves on the refrigerant tank.
4. Drain compressor oil from oil separator.
5. Close the oil drain valve.
6. Connect the filler to a suitable power outlet.
7. Turn on the main power switch.

Caution

Mixing old compressor oil with new compressor oil is prohibited. There may be aluminum deposits or other foreign matter mixed in the old oil. Always use new compressor oil when refilling the A/C system. Properly discard used compressor oil.

Caution

Compressor oil from some A/C systems may be recovered with the refrigerant. The amount of recovered compressor oil is variable. The filler separates the compressor oil from the refrigerant, so the amount of recovered compressor oil can be determined. When refilling the system, add an equal amount of compressor oil. Refer to the manufacturer's instruction manual for details on how to use the filler.

8. Start the recovery process. Refer to the manufacturer's instruction manual for details on how to use the filler.
9. Wait for 5min, then check the control panel low pressure side gauge. If the A/C system maintains vacuum, recovery is complete.

Caution

If during recovery the control panel indicator shows that the refrigerant tank is full and the filler is turned off, an empty tank is loaded to hold the refrigerant needed for the subsequent steps. The use of other types of refrigerant canisters is prohibited.

10. If the low pressure side gauge returns from zero, there is still refrigerant in the system. Recover the remaining refrigerant. Repeat this procedure until the system can hold a vacuum for 2min.

Evacuation

The filler refrigerant tank must contain a sufficient amount of R-134a refrigerant for charging. Check the amount of refrigerant in the tank. If the refrigerant level is insufficient, add new refrigerant to the refrigerant tank. See the filler instruction manual for details on how to add refrigerant.

1. Check that the high pressure side and low pressure side hoses are connected to the A/C system and open the high pressure side and low pressure side valves on the filler control panel.
2. Open the gas and liquid valves on the refrigerant tank.

Caution

See the manufacturer's instruction manual for details on how to use the filler. The system must be evacuated before refilling with new or reclaimed refrigerant.

3. Start the vacuum pump and begin the evacuation procedure. During the recovery process, non-condensable gas (mostly as air) is automatically vented from the tank. You will hear a pressure relief sound.

Caution

Change the vacuum pump oil frequently. Refer to the manufacturer's instruction manual for detailed instructions on how to use the filler.

4. Check the system for leaks. See the manufacturer's instruction manual for details on how to use the filler.

A/C system lubricant refilling replenishment

The lubricant drained from the A/C system during recovery must be replenished.

1. Use compressor oil specifically for R-134a systems.
2. Refer to the manufacturer's instruction manual for details on how to use the filler to add the proper amount of compressor oil to the system.
3. When the required amount of oil is injected, close the valve.

Caution

Remember to cap the lubricant bottle tightly to prevent moisture or contaminants from entering the lubricant. This operation requires a vacuum in the A/C system. Do not open the lubricant filler valve when the A/C system is under positive pressure, as this may cause the lubricant to flow back through the bottle vent. When refilling or replenishing the lubricant, the oil level must not be lower than the suction pipe, otherwise air will enter the A/C system.

Refill

Caution

Drain the A/C system before refilling.

1. Close the low pressure side valve on the control panel.
2. Close the high pressure side valve on the control panel.
3. See the manufacturer's instruction manual for detailed instructions on how to use the filler.
4. Refill the necessary amount of refrigerant into the A/C, making sure that the unit of measurement is correct (i. e., kilograms, kilograms, or pounds).
5. Start refilling.

Refrigerant refilling is successfully completed

1. Close the high and low pressure side valves on the filler control panel, both valves should be closed.
2. Start the vehicle and A/C system.
3. Keep the engine running until the high pressure side gauge and low pressure side gauge readings are stable.
4. Compare readings with system specifications.

5. Check the evaporator outlet temperature to ensure that the A/C system is operating in accordance with system specifications.
6. Keep the A/C running.
7. Close the high pressure side quick joint valve.
8. Disconnect the high pressure side hose from the vehicle.
9. Open the high pressure side and low pressure side valves at the control panel. The system will quickly draw refrigerant from both hoses through the low pressure side hose.
10. Close the low pressure side quick joint valve.
11. Disconnect the low pressure side hose from the vehicle.

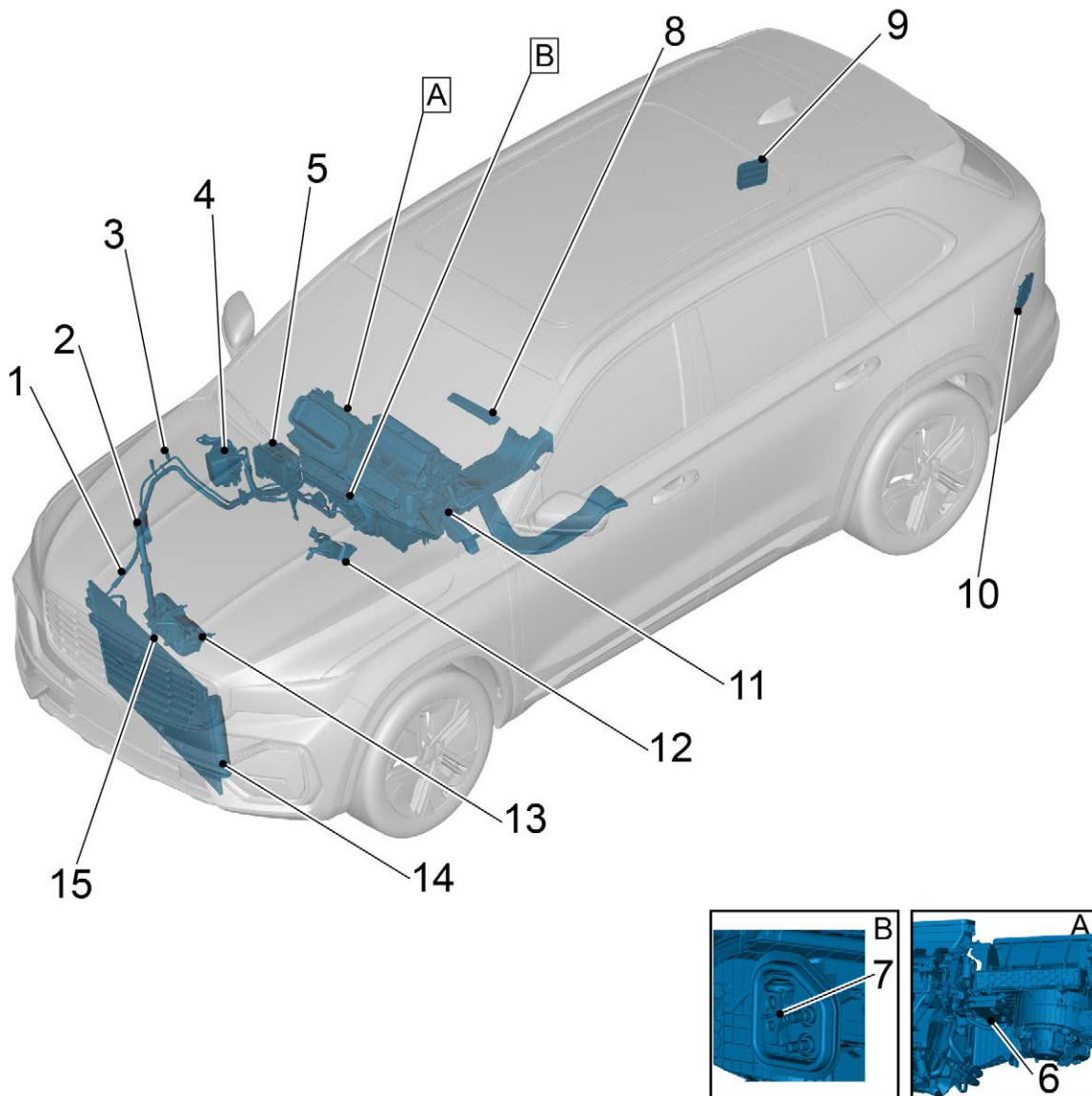
Unsuccessful refrigerant refilling

Sometimes the refrigerant entering the A/C system does not reach the total refilling amount. There are two reasons for this situation:

1. The pressure of the refrigerant tank of the filler is about the same as the pressure of the A/C system, which will cause the filling process to be too slow. See the manufacturer's instruction manual for details on how to use the filler.
2. There is not enough refrigerant in the refrigerant tank for refilling. For this, some of the refrigerant that has been refilled must be recovered from the vehicle, then the A/C system must be drained, the refrigerant tank must be refilled with refrigerant, and finally refilled A/C system. Refer to the manufacturer's instruction manual for detailed instructions on how to use the filler.

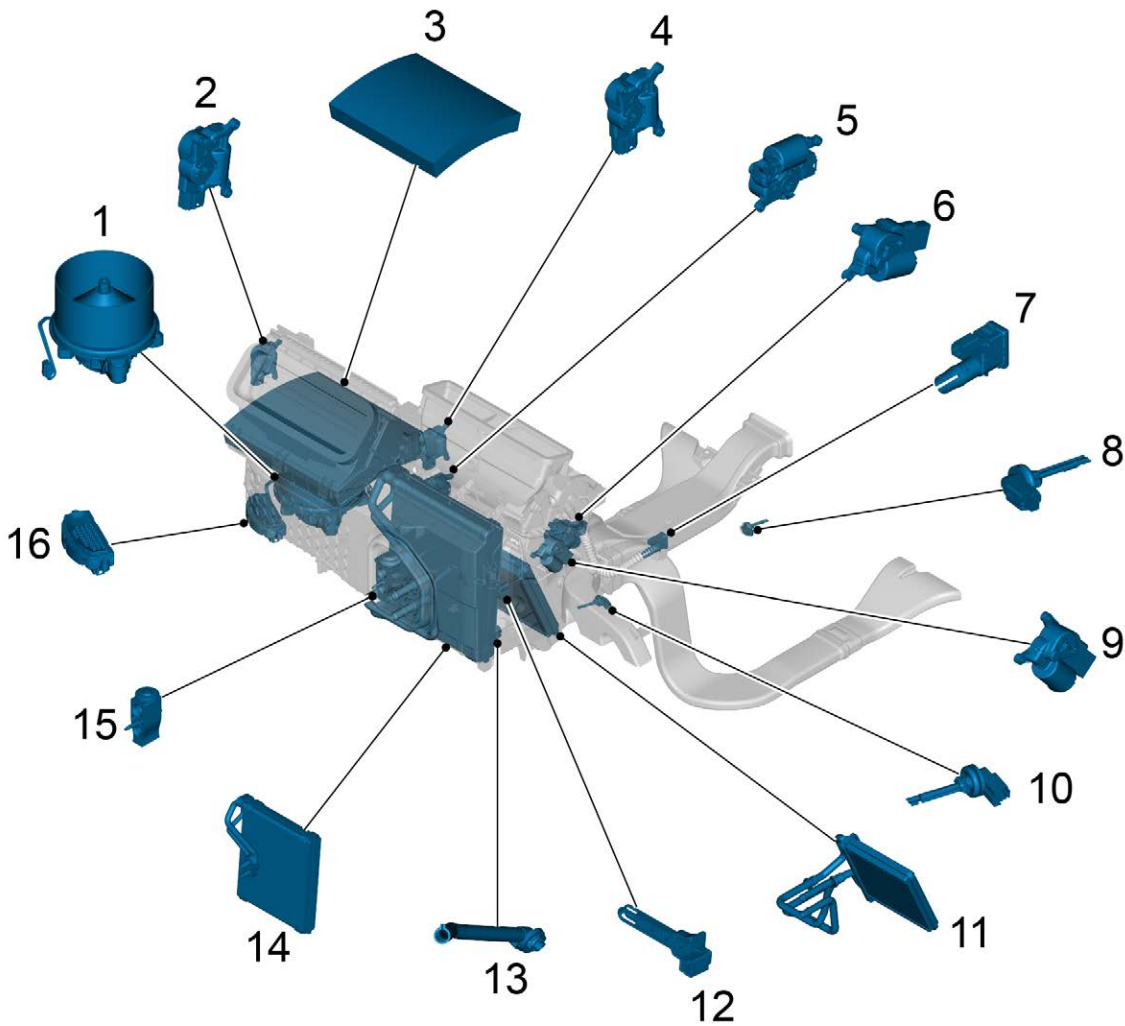
9.2.3 Part position

9.2.3.1 Part position



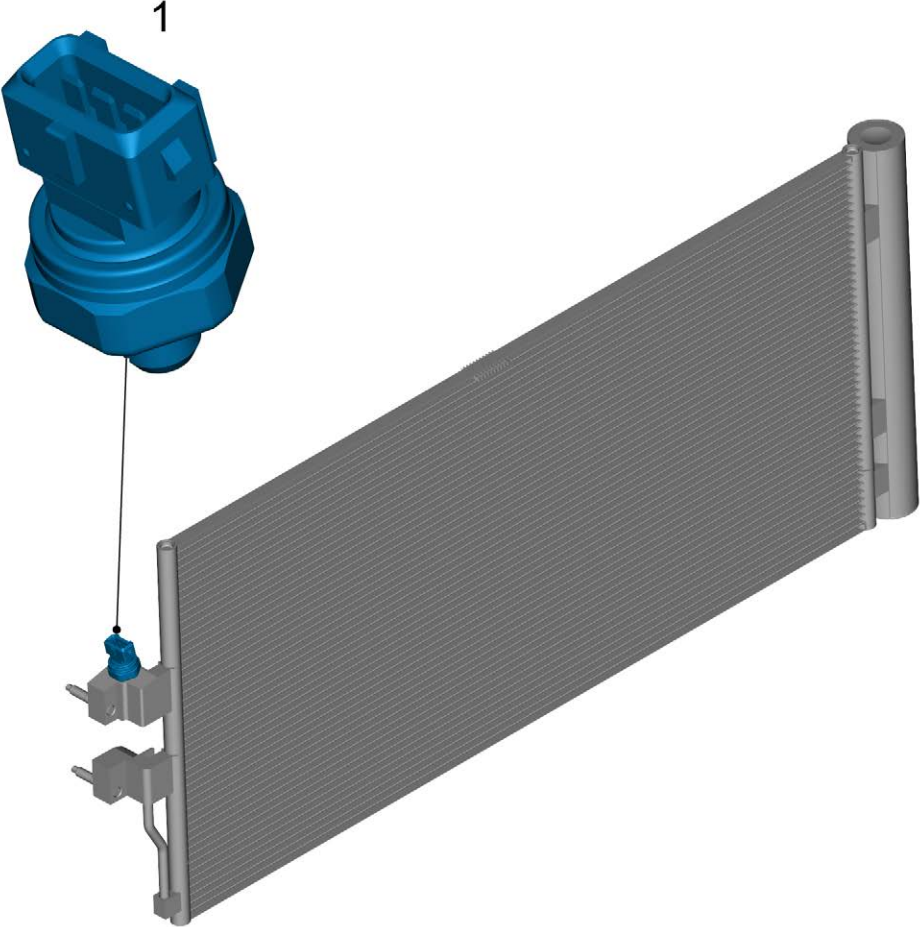
- | | |
|--|-------------------------------------|
| 1. Condenser Outlet Tube Assembly | 9. Right side pressure relief valve |
| 2. A/C Low pressure hose Assembly | 10. Left side pressure relief valve |
| 3. A/C high and low pressure hose assembly | 11. A/C main unit assembly |
| 4. Battery cooler | 12. Heat exchanger |
| 5. Heater | 13. Electric compressor |
| 6. A/C control module | 14. Condenser |
| 7. Expansion Valve | 15. A/C high pressure hose assembly |
| 8. Front A/C control switch | |

9.2.3.2 A/C Main Unit Assembly Structure Location Diagram



- | | |
|---|--|
| 1. Blower motor | 9. Temperature control damper motor (left) |
| 2. Recirculation damper motor | 10. Interior temperature sensor (front foot-blowing left air duct) |
| 3. Air filter assembly (cab) | 11. Heater core |
| 4. Air distribution damper motor (Front) | 12. Evaporator temperature sensor |
| 5. Temperature control damper motor (Right) | 13. Drain hose assembly |
| 6. Air distribution damper motor (Rear) | 14. Evaporator core assembly |
| 7. A/C temperature sensor | 15. Expansion Valve |
| 8. Interior temperature sensor (left side air outlet) | 16. Blower motor resistors |

9.2.3.3 A/C pressure sensor



1. A/C pressure sensor

9.2.4 Diagnostic information and procedure

9.2.4.1 Diagnosis description

Before diagnosing a malfunction in an automatic A/C, see [Description and Operation](#). Understanding and familiarizing yourself with the operation principle of the automatic A/C before beginning system diagnosis will help determine the correct troubleshooting steps to take in the event of a malfunction, and more importantly, this will help determine if the condition described by the customer is normal operation. Any troubleshooting of an automatic A/C should start with a [routine check](#) that guides the service technician to the next logical step in the troubleshooting process. Understanding and using the diagnostic process correctly will reduce diagnostic time and avoid misdiagnosis of the faulty area.

9.2.4.2 Routine inspection

- Check for aftersales retrofit devices that may affect the performance of the A/C system.
- Inspect easily accessible or visible A/C system components, wiring for visible damage or conditions that could cause a malfunction.
- Inspect A/C system lines that are easily accessible or can be seen for A/C system leaks.

9.2.5 Removal and Installation

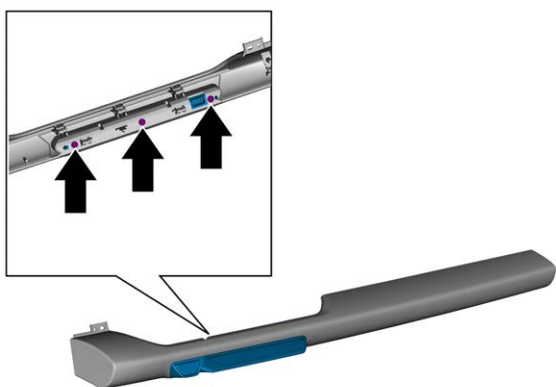
9.2.5.1 Replacement of front A/C control switch

Removal Procedure

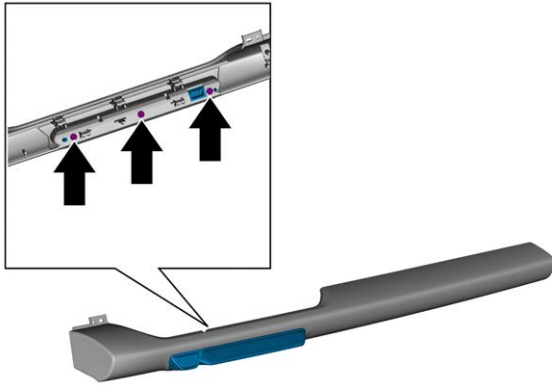
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the right clad trim panel assembly, refer to [Replacement of right clad trim panel assembly](#).
- 3 Remove the 3 fixing screws of front A/C control switch.
- 4 Remove front A/C control switch.



Installation Procedure



- 1 Install the 3 fixing screws of front A/C control switch.
Torque: 1.5N·m

- 2 Install the right clad trim panel assembly.
- 3 Connect the negative cable of battery.

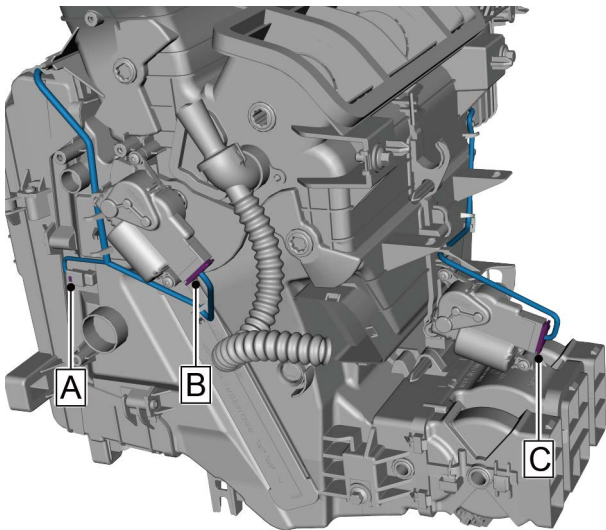
9.2.5.2 Evaporator core replacement

Removal Procedure

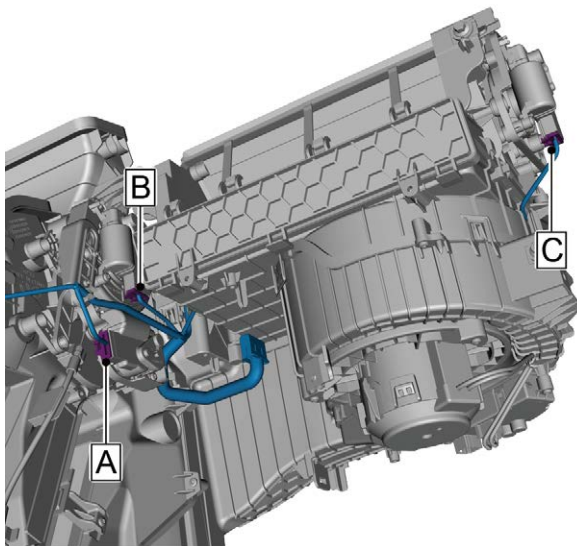
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Drain the engine coolant, see [Draining and Filling of Engine Coolant](#).
- 3 Recover refrigerant, see [A/C Refrigerant Recovery and Refill](#).
- 4 Remove console body assembly, refer to [Replacement of console body assembly](#).
- 5 Remove the instrument panel body assembly, refer to [Replacement of instrument panel body assembly](#).
- 6 Remove the instrument panel cross member assembly, see [Instrument panel cross member assembly replacement](#).
- 7 Remove the A/C main unit assembly, see [A/C Core Main Unit Assembly Replacement](#).
- 8 Remove the expansion valve, see [Expansion Valve Replacement](#).
- 9 Remove the warm air core assembly, see [Warm air core assembly replacement](#).

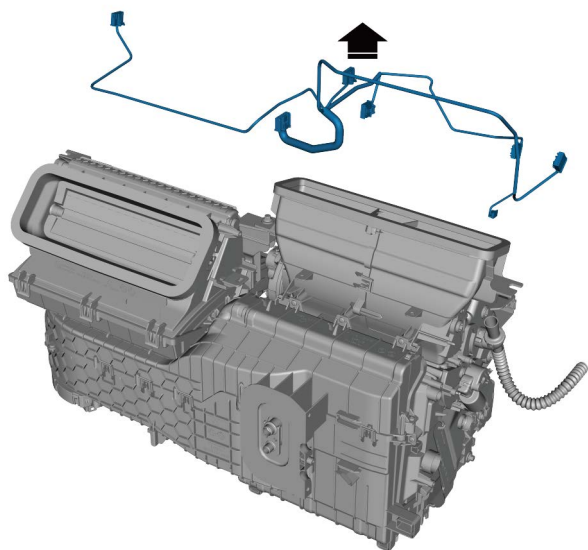


- 10 Disconnect the A/C main unit assembly harness connector A, harness connector B and harness connector C.

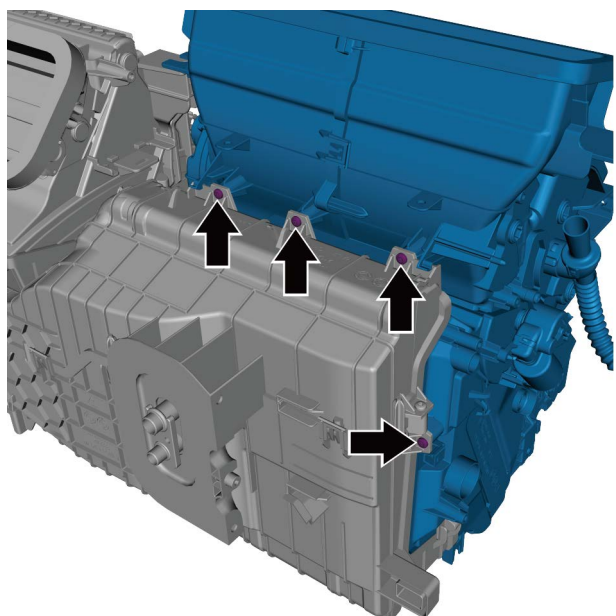


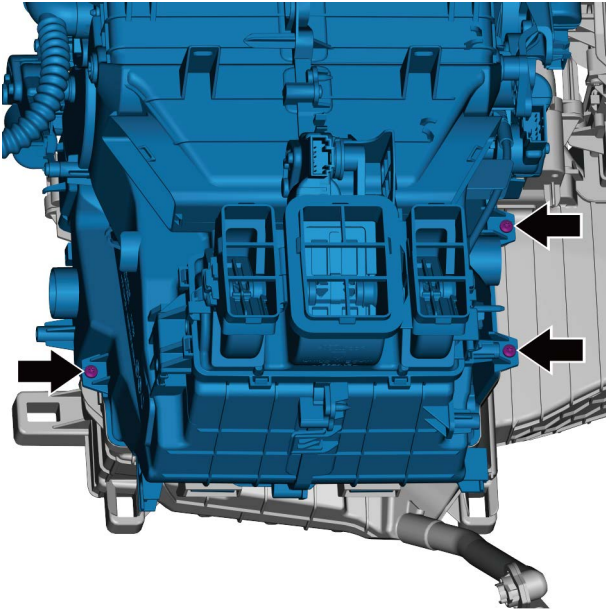
- 11 Disconnect the A/C main unit assembly harness connector A, harness connector B and harness connector C.

- 12 Remove the A/C main unit assembly wiring harness.

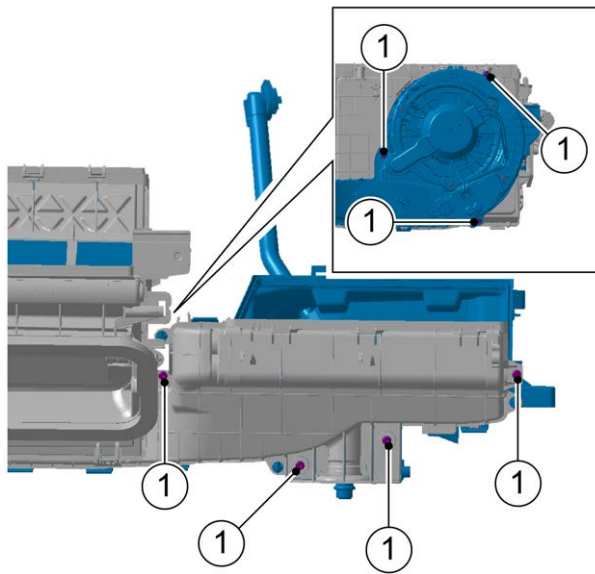


- 13 Remove 4 fixing screws of the A/C housing.

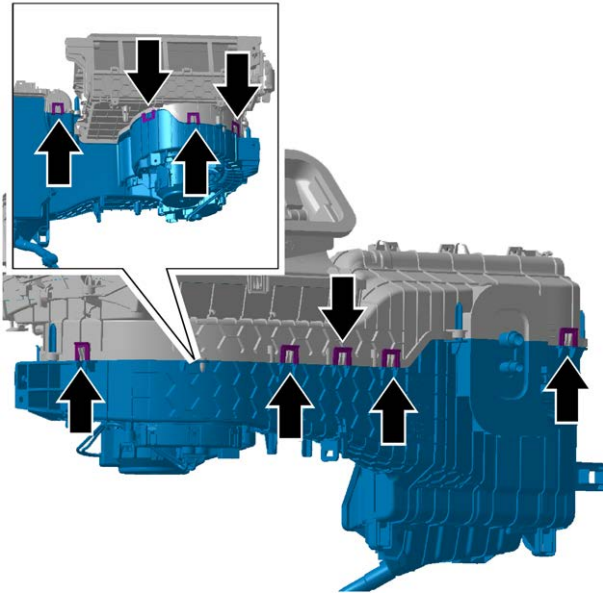




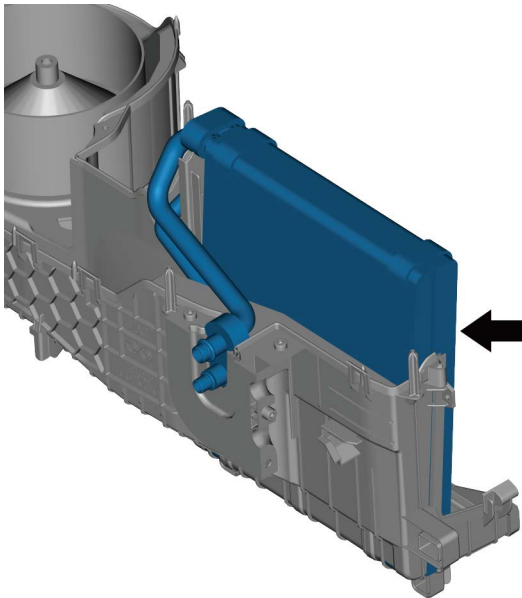
14 Remove 3 fixing screws of the A/C housing.



15 Remove the 7 fixing screws 1 from the lower housing of the A/C main unit.



16 Disengage the 9 retaining clips.



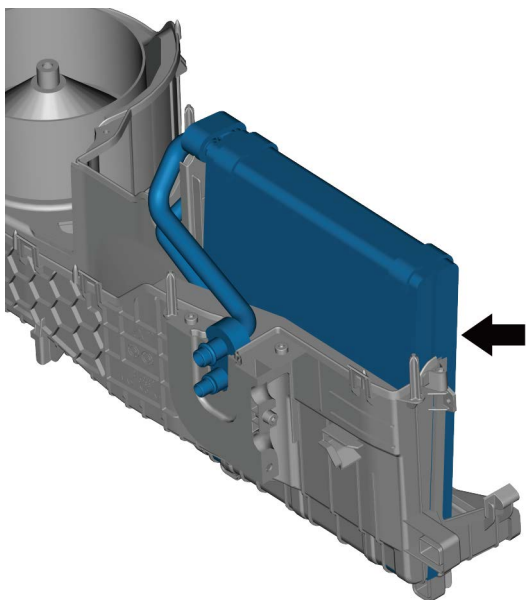
17 Remove the evaporator core.

Installation Procedure

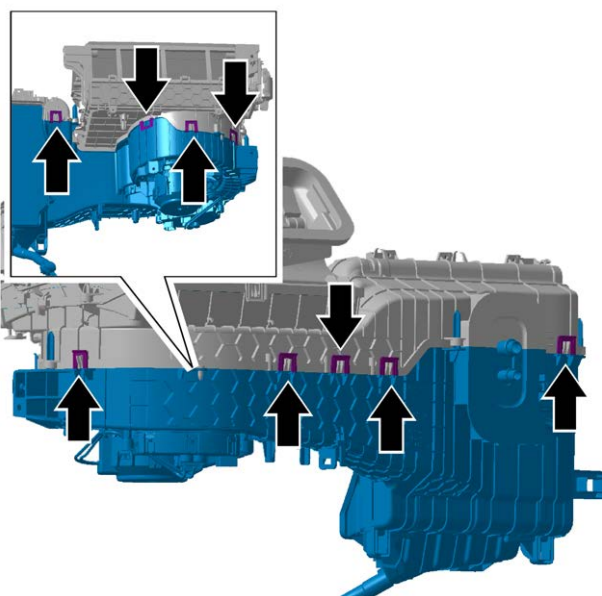
Caution

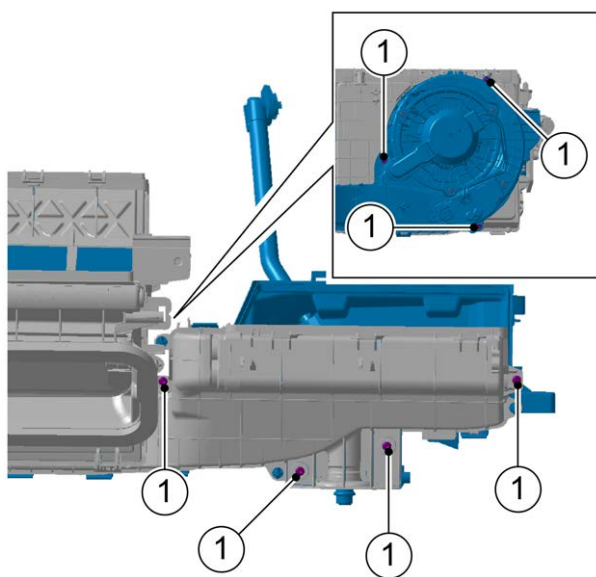
If the A/C system is replaced with a brand new evaporator core, add 40 ±5ml of compressor lubricant to the system; if it is only serviced and dismantled, there is no need to add compressor lubricant.

- 1 Install the evaporator core.

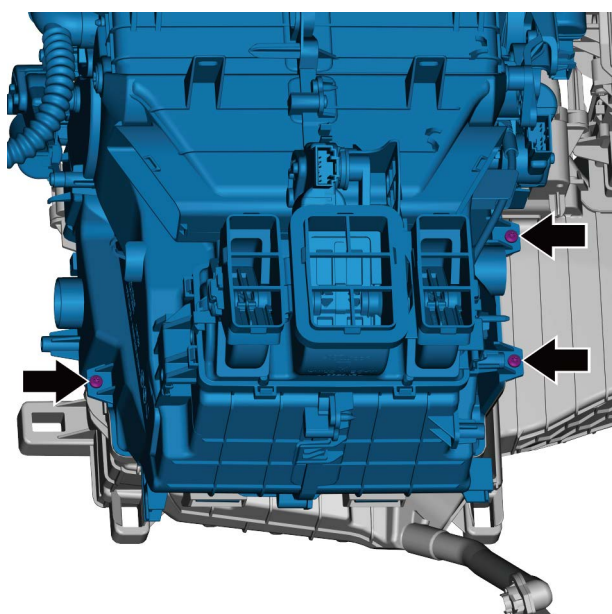


- 2 Install the 9 retaining clips.

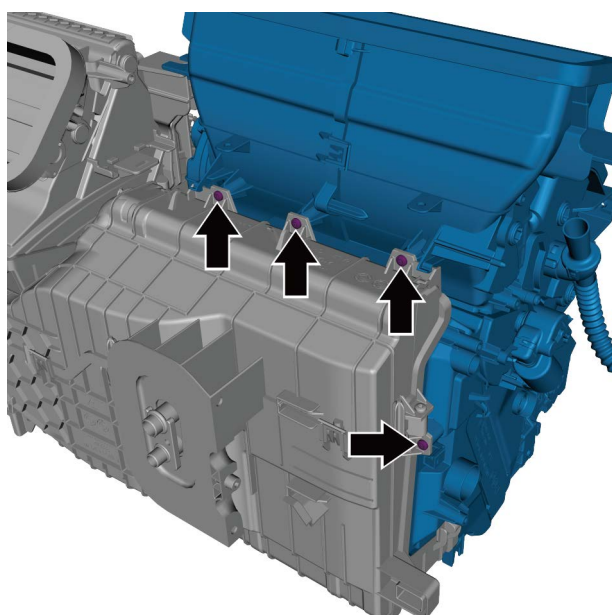




- 3 Install 7 fixing screws 1 of the A/C main unit lower housing.
Torque: 1.2N·m

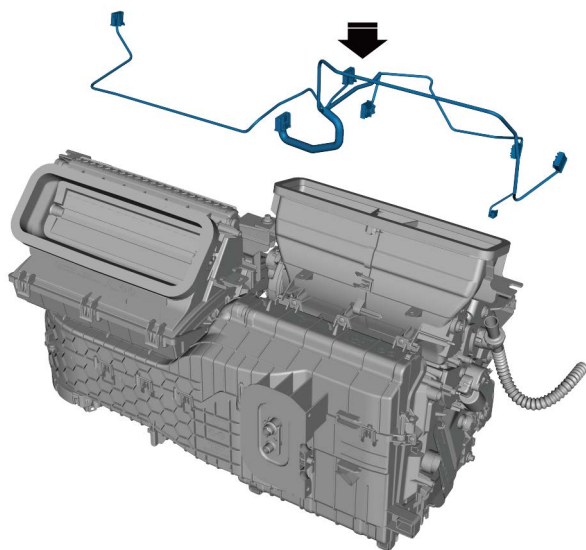


- 4 Install 3 fixing screws of A/C housing.
Torque: 1.2N·m

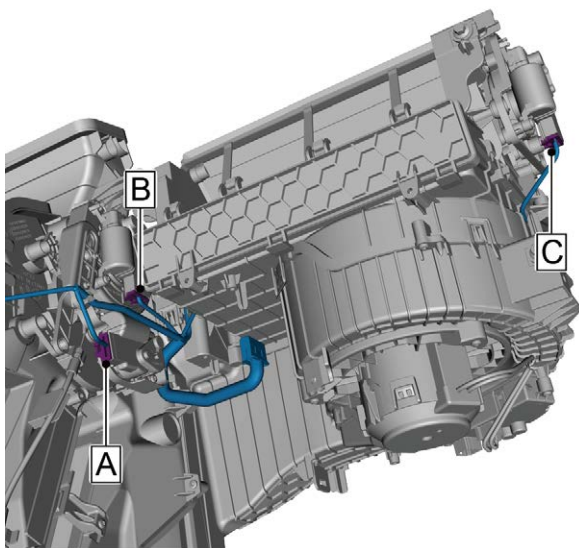


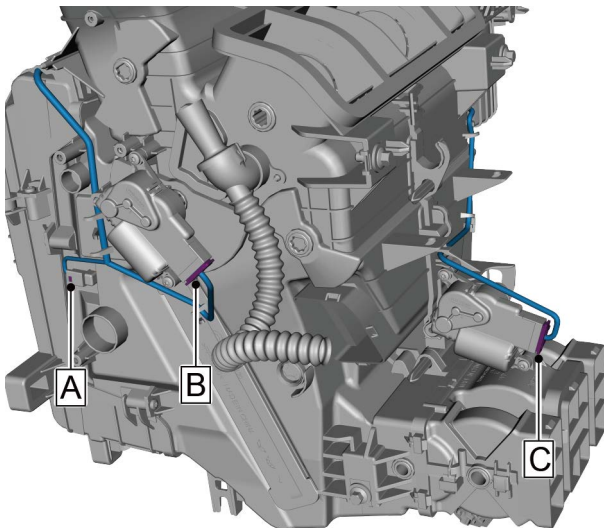
- 5 Install 4 fixing screws of A/C housing.
Torque: 1.2N·m

6 Install the A/C main unit assembly wiring harness.



7 Connect the A/C main unit assembly harness connector A, harness connector B, and harness connector C.





- 8 Connect the A/C main unit assembly harness connector A, harness connector B, and harness connector C.

- 9 Install the warm air core assembly.
- 10 Install expansion valve.
- 11 Install A/C main unit assembly.
- 12 Install the instrument panel cross member assembly.
- 13 Install the instrument panel body assembly.
- 14 Install the console body assembly.
- 15 Connect the negative cable of battery.
- 16 Fill in coolant.
- 17 Operate the A/C refrigerant filling procedure.

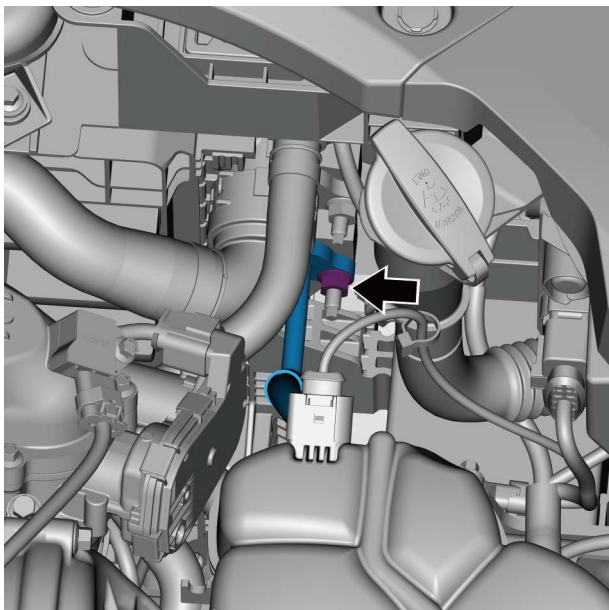
9.2.5.3 Condenser replacement

Removal Procedure

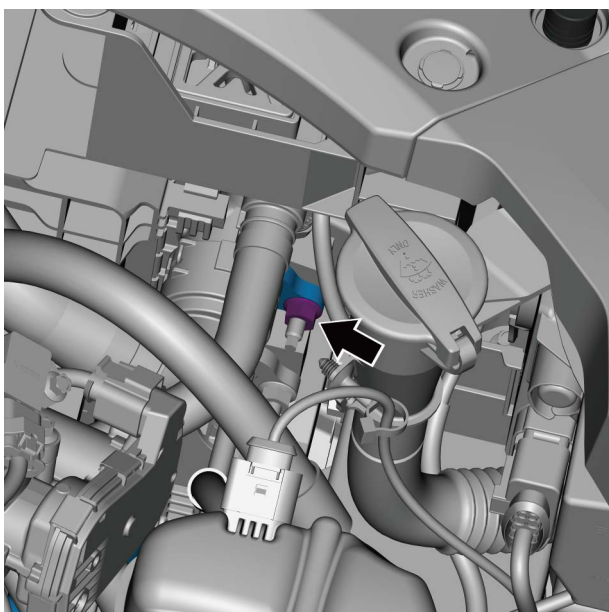
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

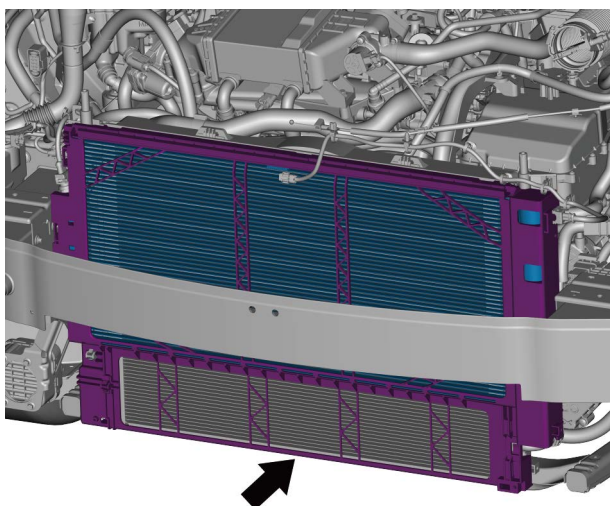
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Recover refrigerant, see [A/C Refrigerant Recovery and Refill](#).
- 3 Remove the front bumper assembly, refer to [Replacement of front bumper assembly](#).
- 4 Remove the front end module assembly, refer to [Replacement of front end module assembly](#).
- 5 Remove the intake grille shutter module, refer to [Replacement of intake grille shutter module](#).



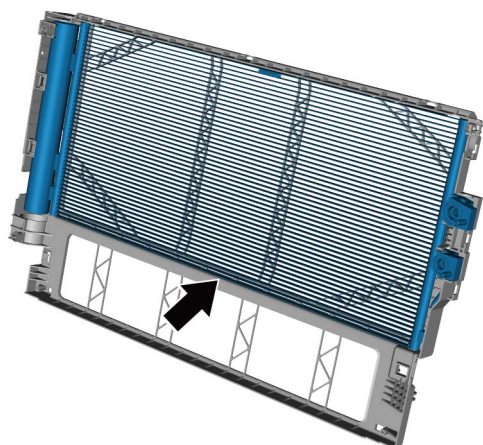
- 6 Remove A/C pressure sensor, see [A/C pressure sensor replacement](#).
- 7 Remove the fixing nut that connects the condenser outlet tube assembly to the condenser.



- 8 Remove the fixing nut that connects the A/C high pressure hose assembly to the condenser.



9 Remove the condenser frame.



10 Remove condenser.

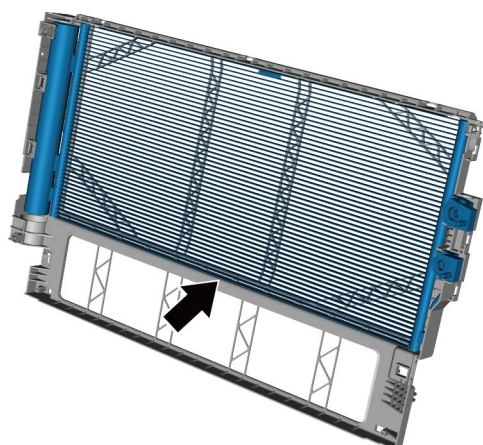
Installation Procedure

Caution

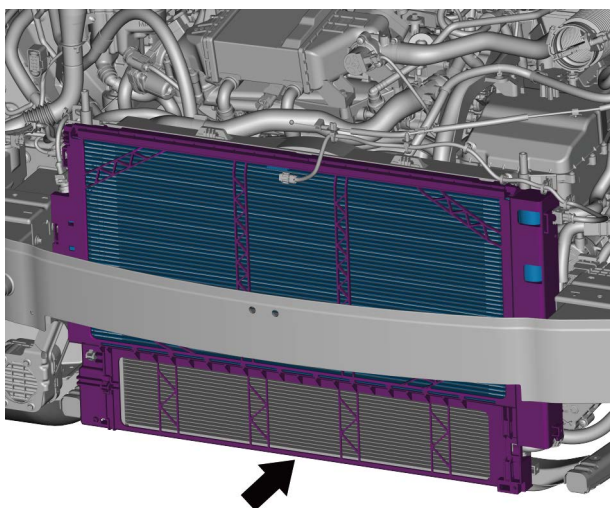
Any O-rings involved in the installation process must be replaced with new parts. When installing the A/C pipe, insert the pipe joint completely before tightening the nut to prevent damage to the O-ring and pipe joint.

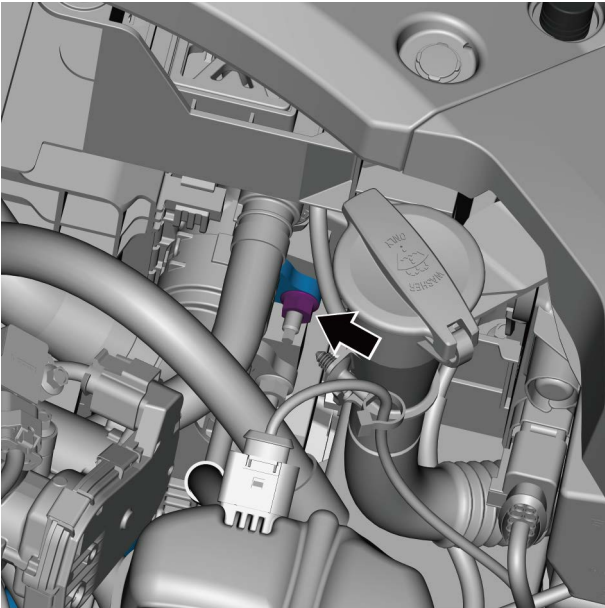
Replacing the condenser assembly requires the addition of 20ml of lubricant.

- 1 Install the condenser.

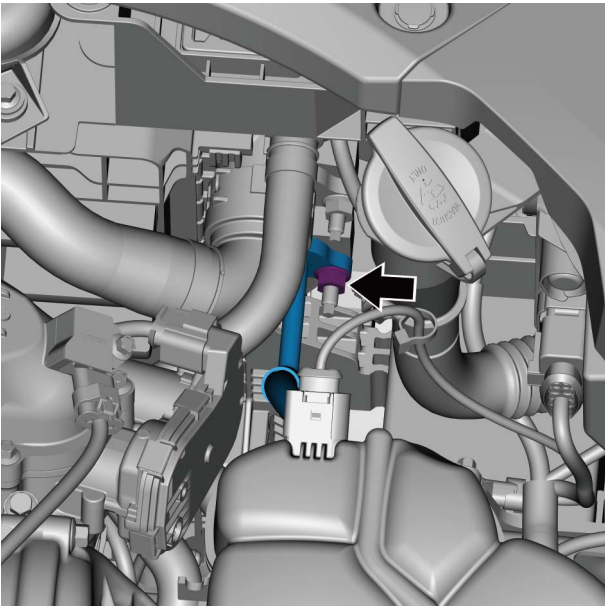


- 2 Install the condenser frame.





- 3 Install the fixing nut for connecting the A/C high pressure hose assembly to the condenser.
Torque: 24N·m



- 4 Install the fixing nut for the condenser outlet tube assembly to be connected to the condenser.
Torque: 24N·m

- 5 Install the A/C pressure sensor.
- 6 Install the intake grille shutter module.
- 7 Install the front end module assembly.
- 8 Install the front bumper assembly.
- 9 Connect the negative cable of battery.
- 10 Operate the A/C refrigerant filling procedure.

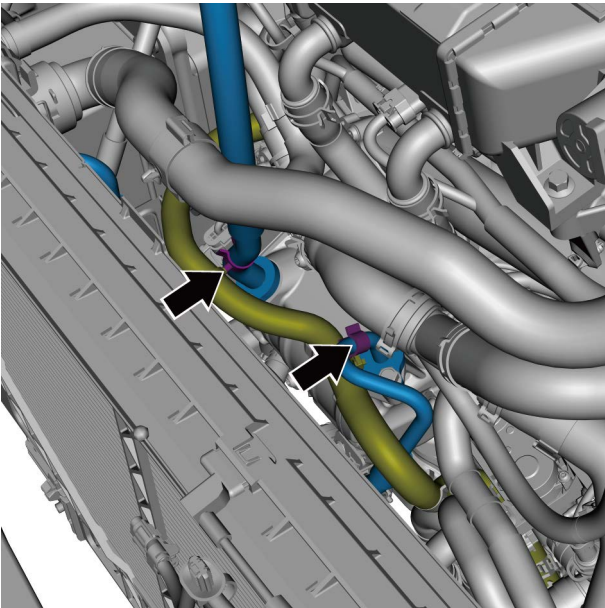
9.2.5.4 A/C compressor module replacement

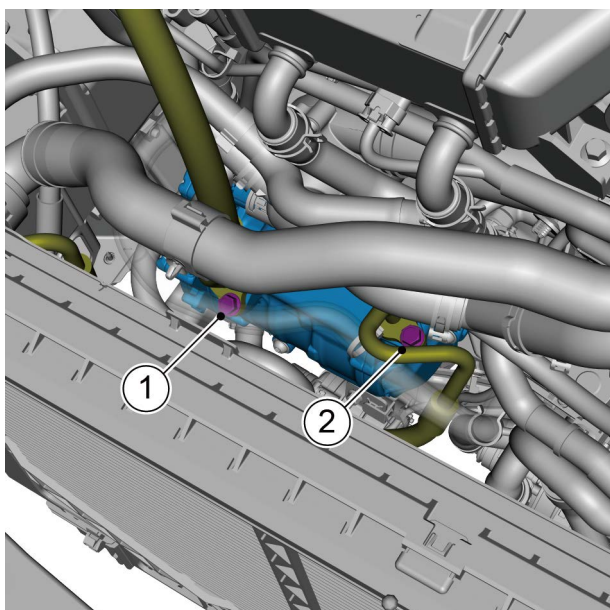
Removal Procedure

Warning !

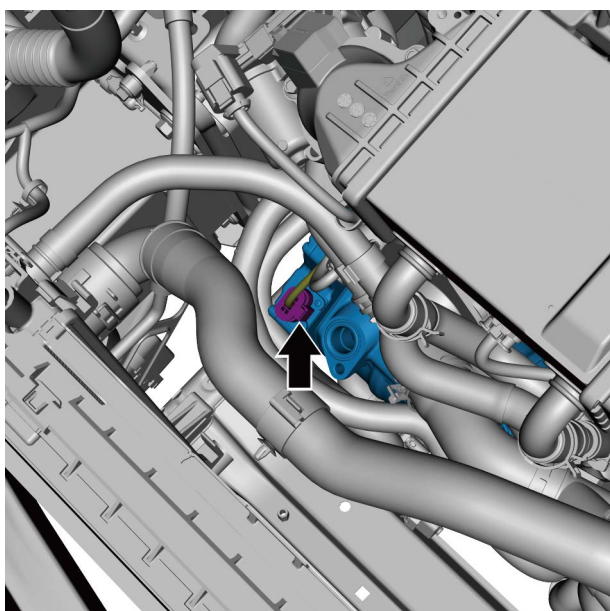
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Perform the normal power outage process for the high voltage system, see [Normal Power Outage Process for High Voltage System](#).
- 3 Recover refrigerant, see [Recovering and Refilling of A/C Refrigerant](#).
- 4 Remove the front bumper assembly, refer to [Replacement of front bumper assembly](#).
- 5 Remove the front end module assembly, refer to [Replacement of front end module assembly](#).
- 6 Remove the engine cooling fan, see [Replacement of Engine Cooling Fan](#).
- 7 Remove 2 clips of the heat exchanger hot side outlet pipe.

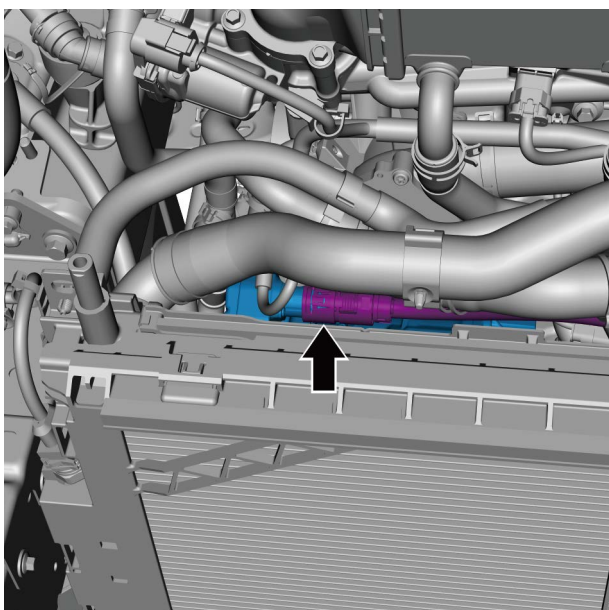




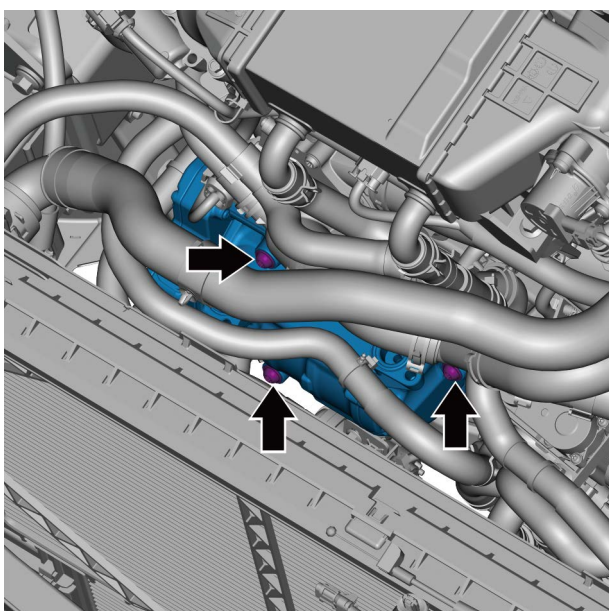
- 8 Remove the A/C low pressure hose assembly fixing bolt 1.
- 9 Remove the A/C high pressure hose assembly fixing bolt 2.



- 10 Disconnect the engine harness from the harness connector of the A/C compressor module.



- 11 Disconnect the electric compressor harness assembly harness connector.



- 12 Remove the A/C compressor module 3 fixing bolts and take off the A/C compressor module.

Installation Procedure

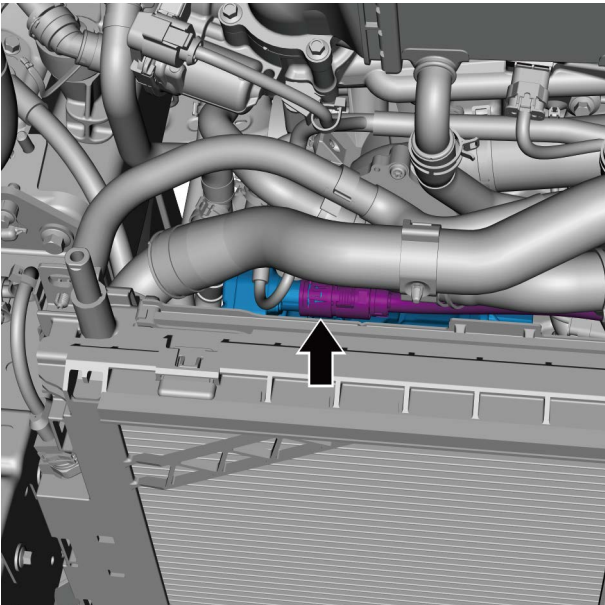
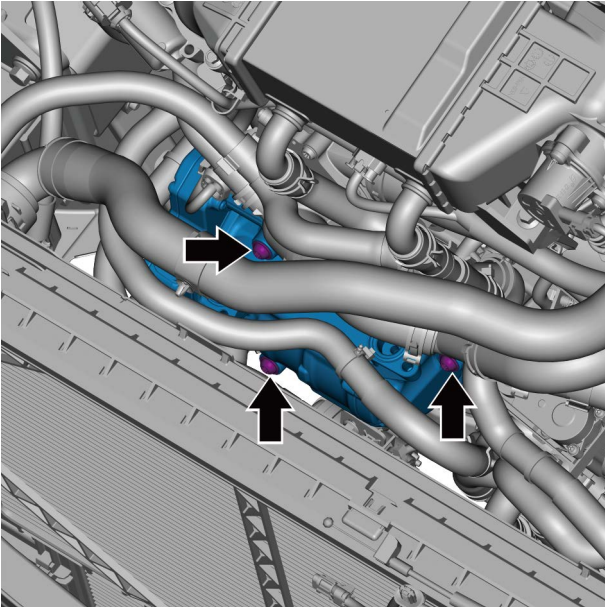
Caution

Any O-rings involved in the installation process must be replaced with new parts. When installing the A/C pipe, insert the pipe joint completely before tightening the nut to prevent damage to the O-ring and pipe joint.

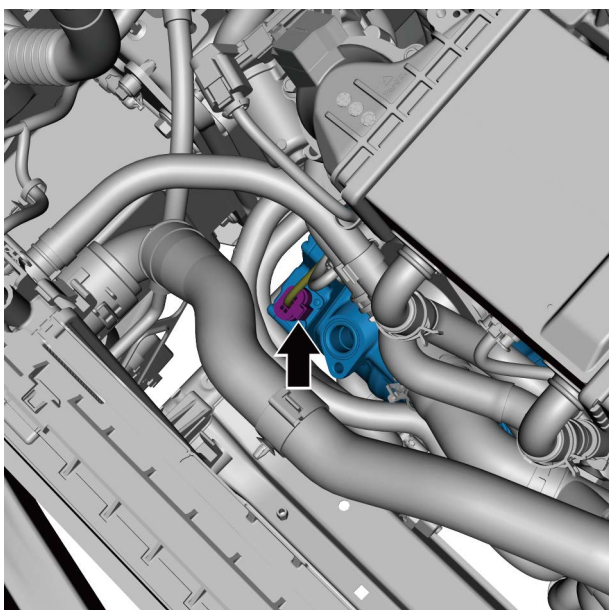
Replacing the compressor with a new compressor requires the new compressor to be drained of 40ml of compressor lubricant.

- 1 Install 3 fixing bolts of the A/C compressor module.

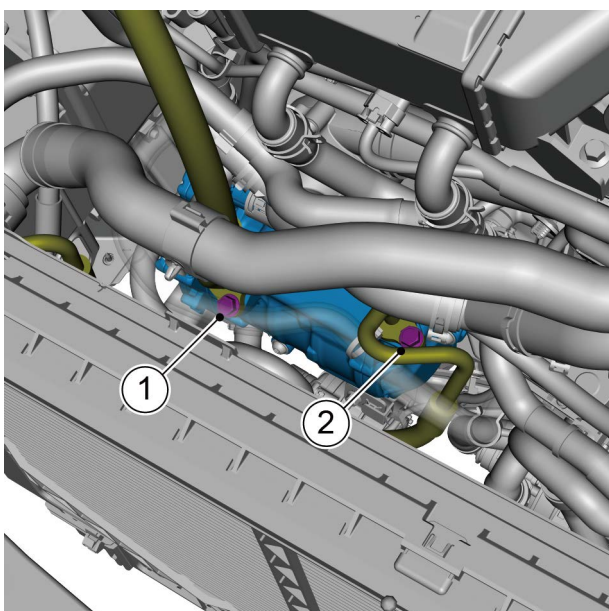
Torque: 24N·m



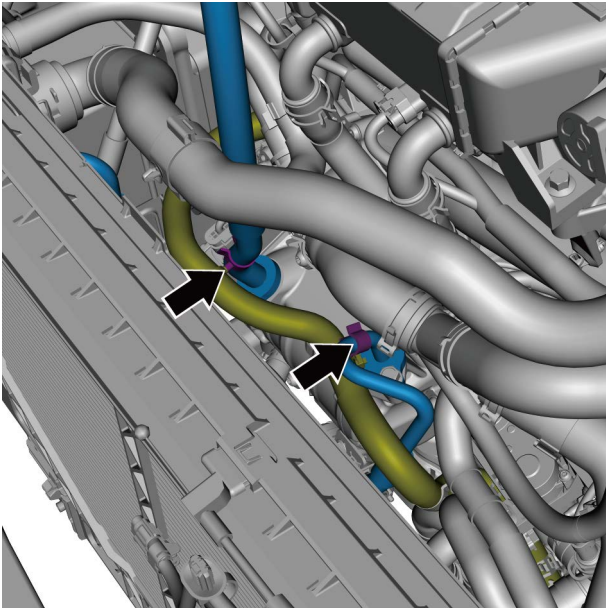
- 2 Connect the electric compressor wiring harness assembly harness connector.



- 3 Connect the harness connector connecting the engine harness and the A/C compressor module.



- 4 Install the A/C low pressure hose assembly fixing bolt 1.
Torque: 24N·m
- 5 Install the A/C high pressure hose assembly fixing bolt 2.
Torque: 24N·m



- 6 Install 2 clips of the heat exchanger hot side outlet pipe.

- 7 Install the engine cooling fan.
- 8 Install the front end module assembly.
- 9 Install the front bumper assembly.
- 10 Carry out the normal power-on process of the high voltage system, see [Normal Power-on Process of High Voltage System](#).
- 11 Connect the negative cable of battery.
- 12 Operate the A/C refrigerant filling procedure.

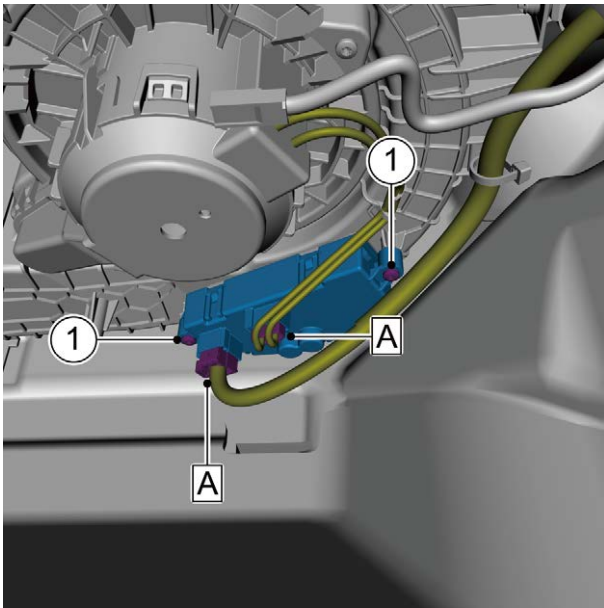
9.2.5.5 Blower motor resistors

Removal Procedure

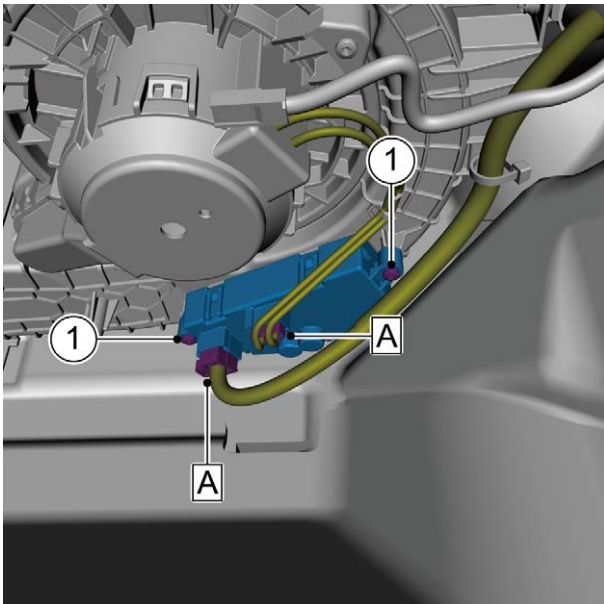
Warning !

Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the right lower toe board assembly, refer to [Replacement of right lower toe board assembly](#).



- 3 Disconnect 2 harness connector A of the blower motor resistors.
- 4 Remove the blower motor resistors by removing 2 fixing screws 1 of the blower motor resistors.



Installation Procedure

- 1 Install 2 fixing screws 1 of the blower motor resistors.
Torque: 1.2N·m
- 2 Connect 2 harness connector A of the blower motor resistors.

- 3 Install the right lower toe board assembly.
- 4 Connect the negative cable of battery.

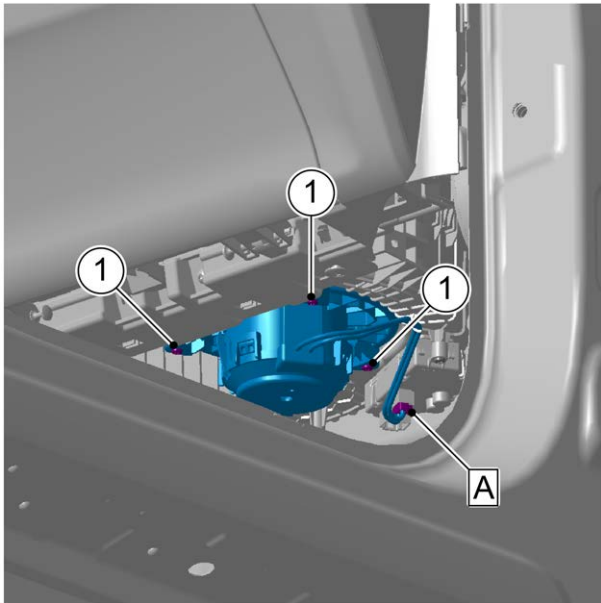
9.2.5.6 Replacement of blower motor

Removal Procedure

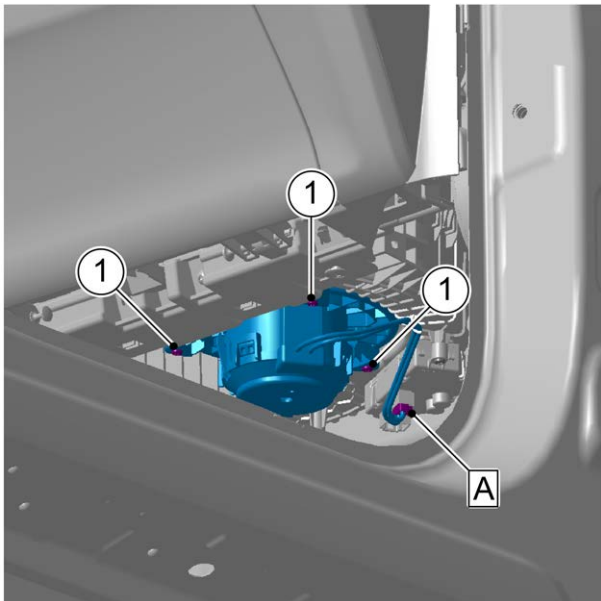
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).



- 2 Remove the right lower toe board assembly, refer to [Replacement of right lower toe board assembly](#).
- 3 Disconnect the blower motor harness connector A.
- 4 Remove blower motor by removing its 3 fixing screws 1.



Installation Procedure

- 1 Install 3 fixing screws 1 of the blower motor.
Torque: 1.2N·m
- 2 Connect the blower motor harness connector A.
CautionFirmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 3 Install the right lower toe board assembly.
- 4 Connect the negative cable of battery.

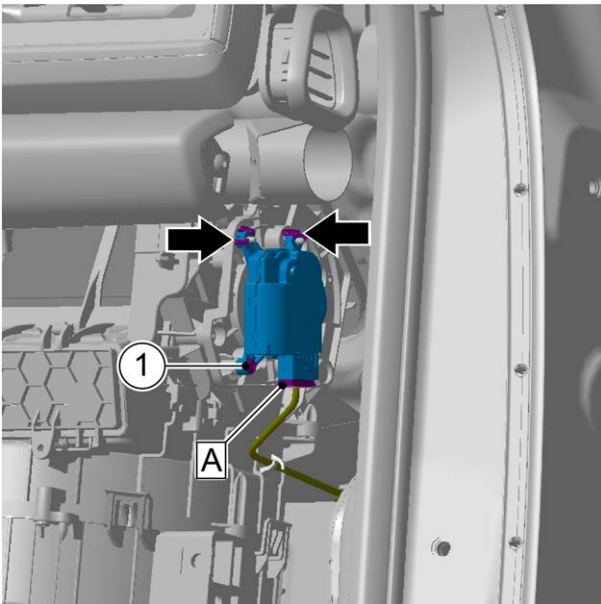
9.2.5.7 Recirculation damper motor replacement

Removal Procedure

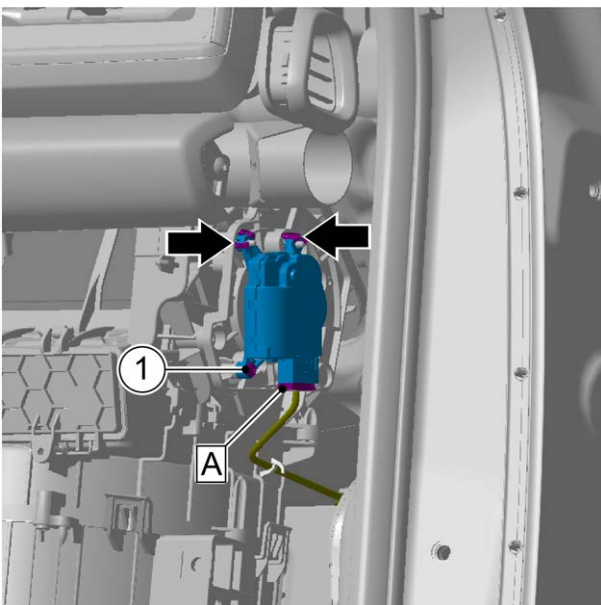
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the glove box frame assembly, refer to [Replacement of glove box frame assembly](#).
- 3 Remove the parking distance control module, see [Parking Distance Control Module Replacement](#).
- 4 Remove the recirculation damper motor fixing screws 1.
- 5 Disconnect recirculation damper motor harness connector A.
- 6 Disengage the recirculation damper motor retaining clips and remove the recirculation damper motor.

**Installation Procedure**

- 1 Place recirculation damper motor in the mounting position and install the retaining clips.
- 2 Install the recirculation damper motor fixing screws 1. Torque: 1.2N·m
- 3 Connect the recirculation damper motor harness connector A.



- 4 Install the parking distance control module.

- 5 Install the glove box fame assembly.
- 6 Connect the negative cable of battery.

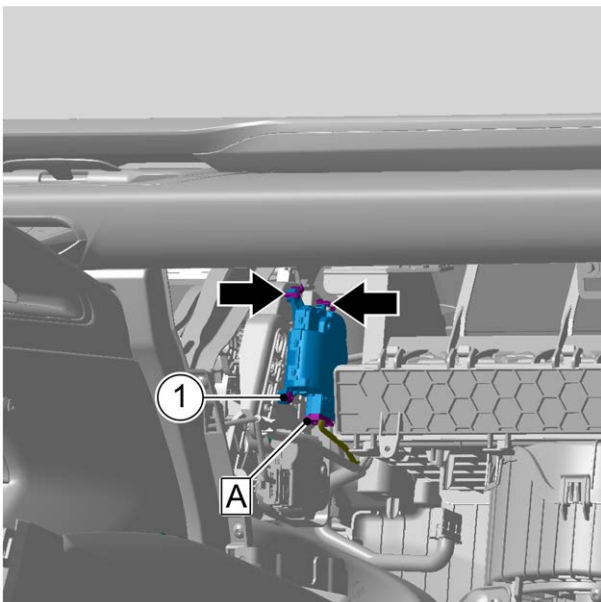
9.2.5.8 Air distribution damper motor (front) replacement

Removal Procedure

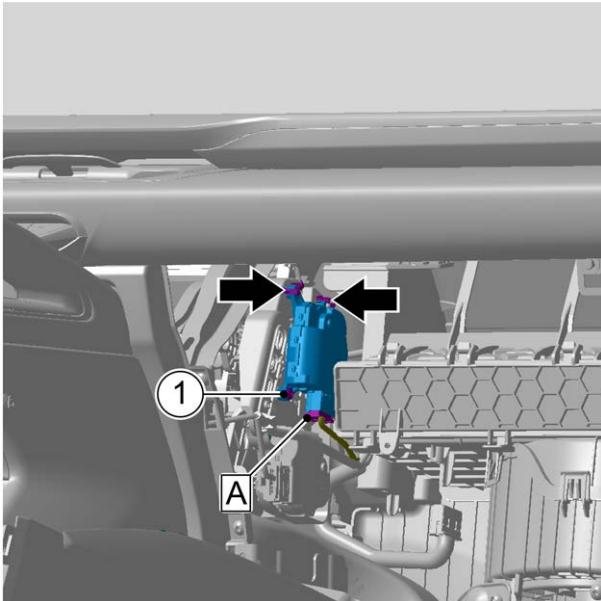
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the glove box frame assembly, refer to [Replacement of glove box frame assembly](#).
- 3 Remove air distribution damper motor (front) fixing screw 1.
- 4 Disconnect air distribution damper motor (front) harness connector A.
- 5 Disengage the air distribution damper motor (front) fixing clip and remove the air distribution damper motor (front).



Installation Procedure



- 1 Place air distribution damper motor (front) in the mounting position and install the retaining clips.
- 2 Connect the air distribution damper motor (front) harness connector A.
- 3 Install the air distribution damper motor (front) fixing screw 1.
Torque: 1.2N·m

- 4 Install the glove box fame assembly.
- 5 Connect the negative cable of battery.

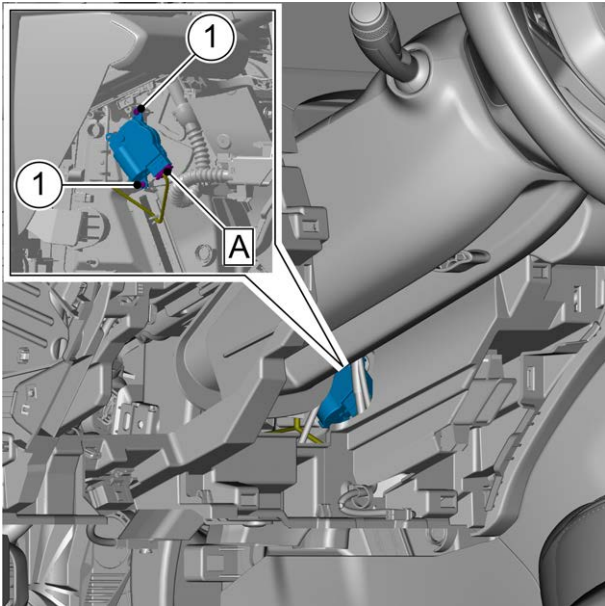
9.2.5.9 Temperature control damper motor (left) replacement

Removal Procedure

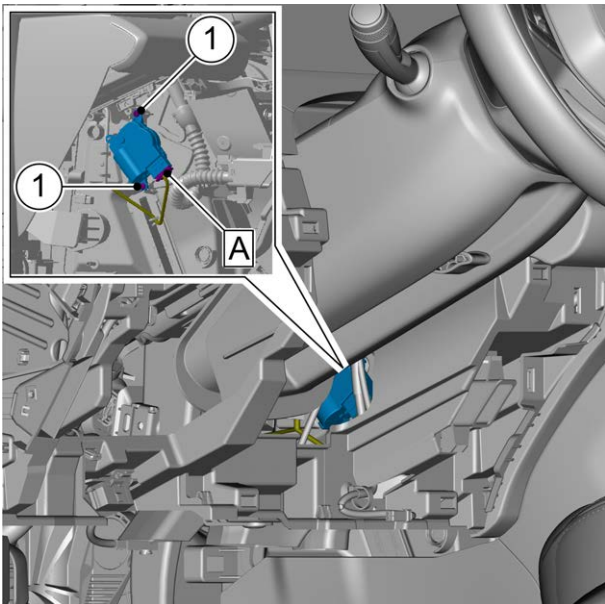
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left lower toe board assembly, refer to [Replacement of left lower toe board assembly](#).
- 3 Remove interior temperature sensor (front foot-blowing left air duct), see [Interior temperature sensor \(front foot-blowing left air duct\)](#).
- 4 Remove front blow foot left air duct, see [Replacement of Front Blow Foot Left Air Duct](#).



- 5 Remove 2 temperature control damper motor (left) fixing screws 1.
- 6 Disconnect temperature control damper motor (left) harness connector A and remove temperature control damper motor (left).



Installation Procedure

- 1 Connect temperature control damper motor (left) harness connector A.
- 2 Install 2 temperature control damper motor (left) fixing screws 1.
Torque: 1.2N·m

- 3 Install the front blow foot left duct.
- 4 Install interior temperature sensor (front foot-blowing left air duct).
- 5 Install the left lower toe board assembly.
- 6 Connect the negative cable of battery.

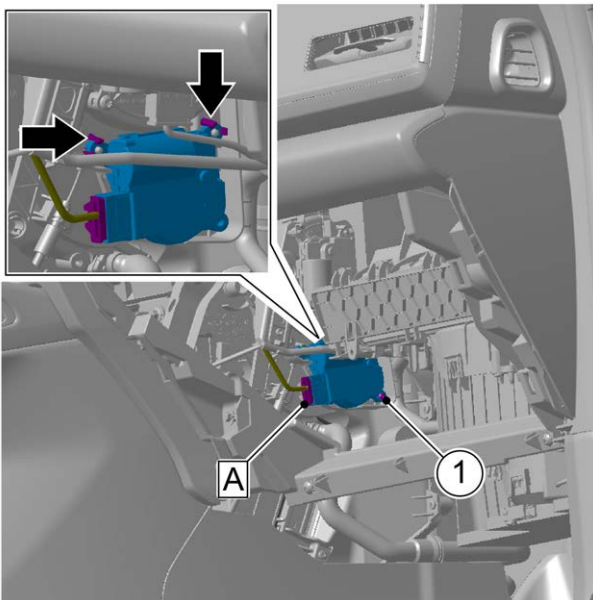
9.2.5.10 Temperature control damper motor (right) replacement

Removal Procedure

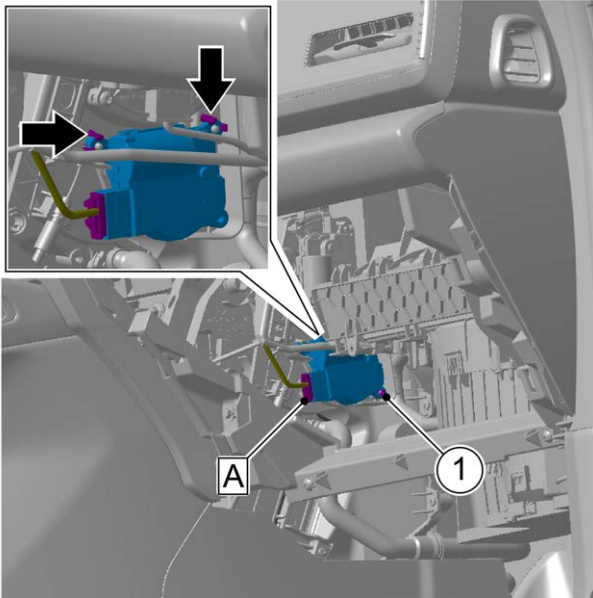
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the right lower toe board assembly, refer to [Replacement of right lower toe board assembly](#).
- 3 Remove the glove box frame assembly, refer to [Replacement of glove box frame assembly](#).
- 4 Remove the front foot-blowing right air duct, see [Front foot-blowing right air duct replacement](#).
- 5 Remove the temperature control module, see [Temperature Control Module Replacement](#).
- 6 Remove temperature control damper motor (right) fixing screw 1.
- 7 Disconnect temperature control damper motor (right) harness connector A.
- 8 Disconnect temperature control damper motor (right) retaining clips and remove temperature control damper motor (right).



Installation Procedure



- 1 Place the temperature control damper motor (right) in the mounting position and install the retaining clips.
- 2 Connect temperature control damper motor (right) harness connector A.
- 3 Install the temperature control damper motor (right) fixing screw 1.
Torque: 1.2N·m

- 4 Install the temperature control module.
- 5 Install the front foot-blowing right air duct.
- 6 Install the glove box fame assembly.
- 7 Install the right lower toe board assembly.
- 8 Connect the negative cable of battery.

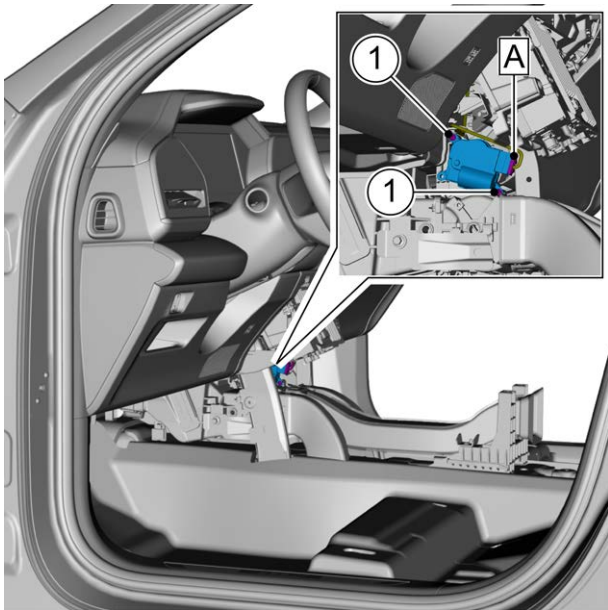
9.2.5.11 Air distribution damper motor (rear) replacement

Removal Procedure

Warning !

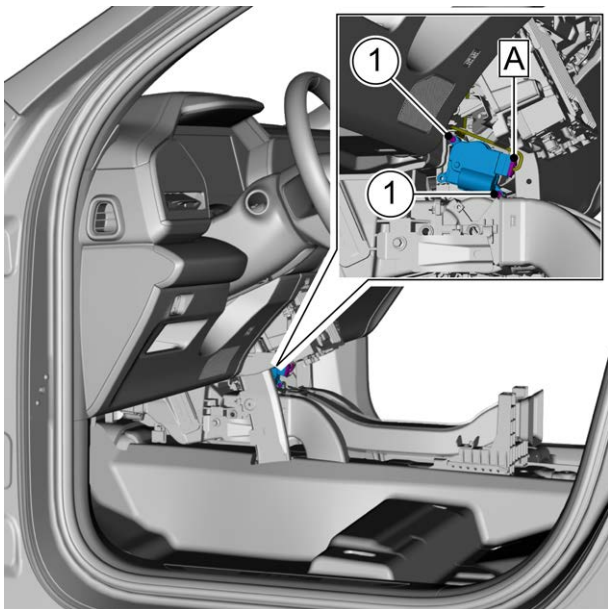
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove console body assembly, refer to [Replacement of console body assembly](#).
- 3 Remove the infotainment head unit, refer to [Replacement of infotainment head unit](#).
- 4 Remove the instrument panel middle lower shield assembly, refer to [Replacement of instrument panel middle lower shield assembly](#).



- 5 Remove 2 fixing screws 1 of air distribution damper motor (rear).
- 6 Disconnect air distribution damper motor (rear) harness connector A and remove air distribution damper motor (rear).

Installation Procedure



- 1 Connect the air distribution damper motor (rear) harness connector A.
- 2 Install 2 fixing screws 1 of air distribution damper motor (rear).
Torque: 1.2N·m

- 3 Install the instrument panel middle lower shield assembly.
- 4 Install the infotainment head unit.
- 5 Install the console body assembly.
- 6 Connect the negative cable of battery.

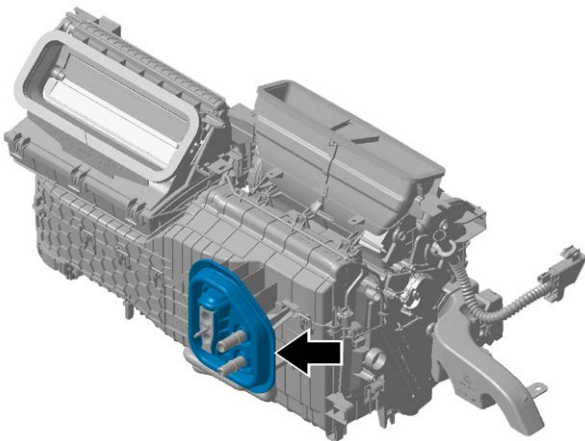
9.2.5.12 Warm air core assembly replacement

Removal Procedure

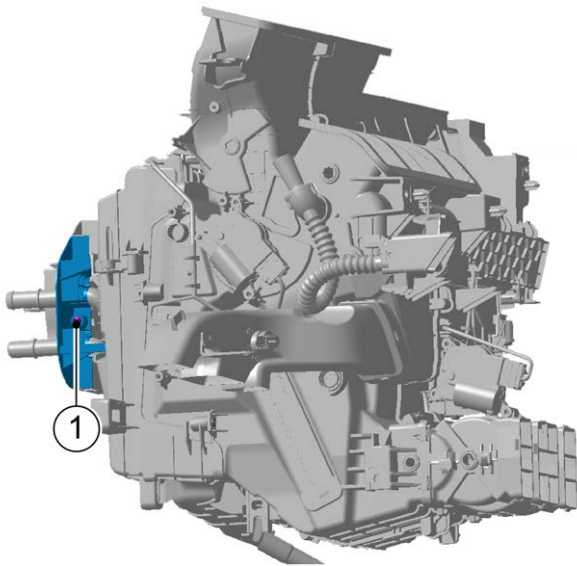
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

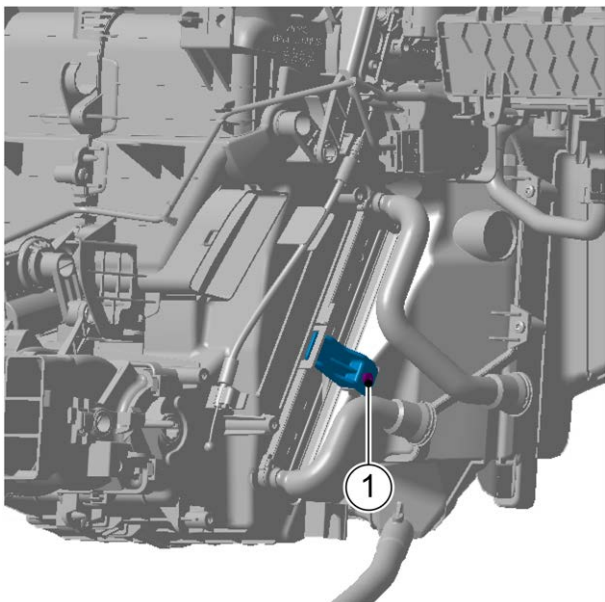
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Drain the engine coolant, see [Draining and Filling of Engine Coolant](#).
- 3 Recover refrigerant, see [A/C Refrigerant Recovery and Refill](#).
- 4 Remove console body assembly, refer to [Replacement of console body assembly](#).
- 5 Remove the instrument panel body assembly, refer to [Replacement of instrument panel body assembly](#).
- 6 Remove the instrument panel cross member assembly, see [Instrument panel cross member assembly replacement](#).
- 7 Remove the A/C main unit assembly, see [A/C Core Main Unit Assembly Replacement](#).
- 8 Remove the expansion valve sealing sponge.



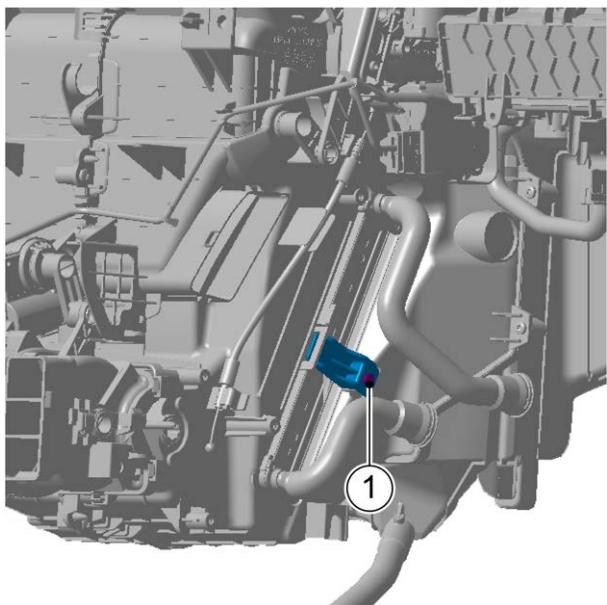
- 9 Remove the A/C main unit bracket fixing screw 1.



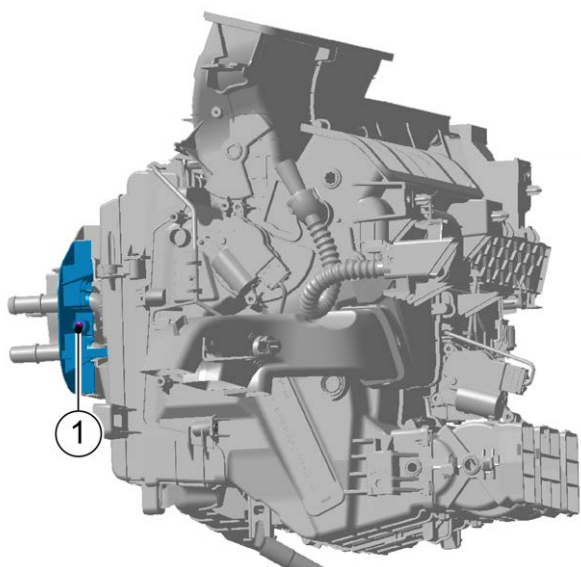
- 10 Remove warm air core plumbing bracket fixing screw 1 and remove warm air core assembly.



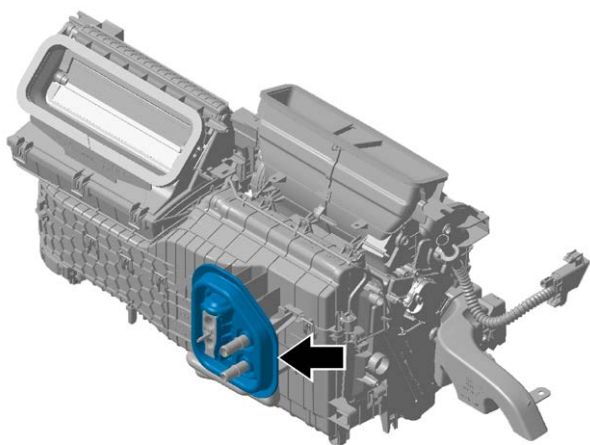
Installation Procedure



- 1 Install the warm air core body water pipe bracket fixing screw 1.
Torque: 1.2N·m



- 2 Install the A/C main unit bracket fixing screws 1.
Torque: 1.2N·m



- 3 Install the expansion valve sealing sponge.

- 4 Install A/C main unit assembly.
- 5 Install the instrument panel cross member assembly.
- 6 Install the instrument panel body assembly.
- 7 Install the console body assembly.
- 8 Operate the A/C refrigerant filling procedure.
- 9 Fill in coolant.
- 10 Connect the negative cable of battery.

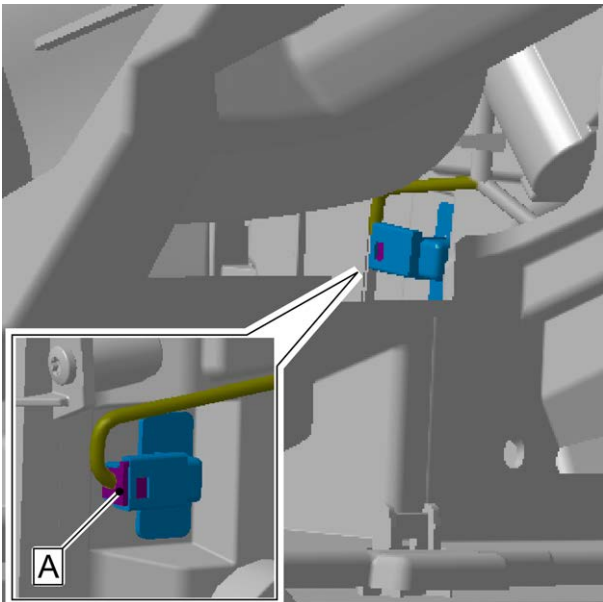
9.2.5.13 Evaporator temperature sensor replacement

Removal Procedure

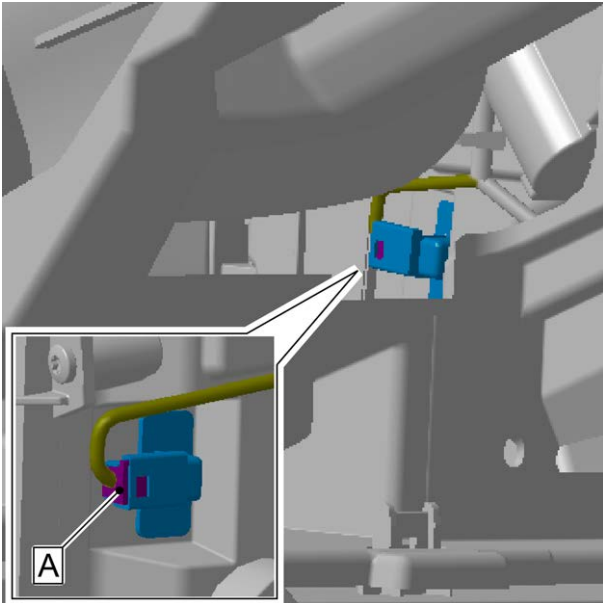
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left lower toe board assembly, refer to [Replacement of left lower toe board assembly](#).
- 3 Remove front blow foot left air duct, see [Replacement of Front Blow Foot Left Air Duct](#).
- 4 Disconnect evaporator temperature sensor harness connector A.
- 5 Withdraw the evaporator temperature sensor.



Installation Procedure



- 1 Assemble evaporator temperature sensor to the A/C main unit assembly.
- 2 Connect the evaporator temperature sensor harness connector A.

- 3 Install front foot-blowing left air duct.
- 4 Install the left lower toe board assembly.
- 5 Connect the negative cable of battery.

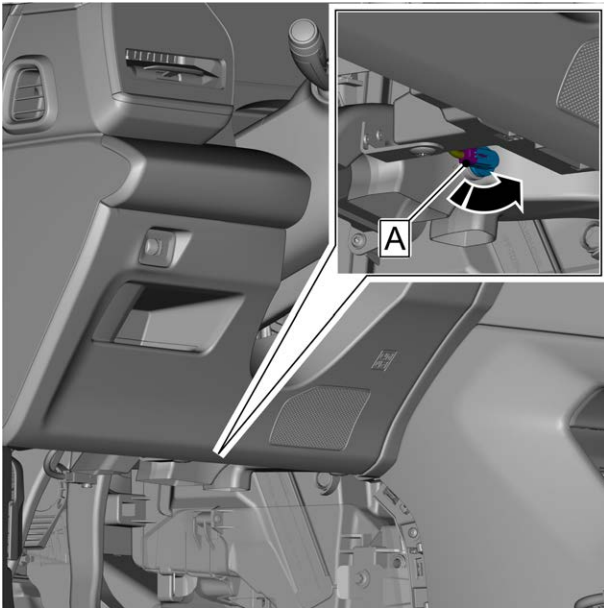
9.2.5.14 Interior temperature sensor (front foot-blowing left air duct) replacement

Removal Procedure

Warning !

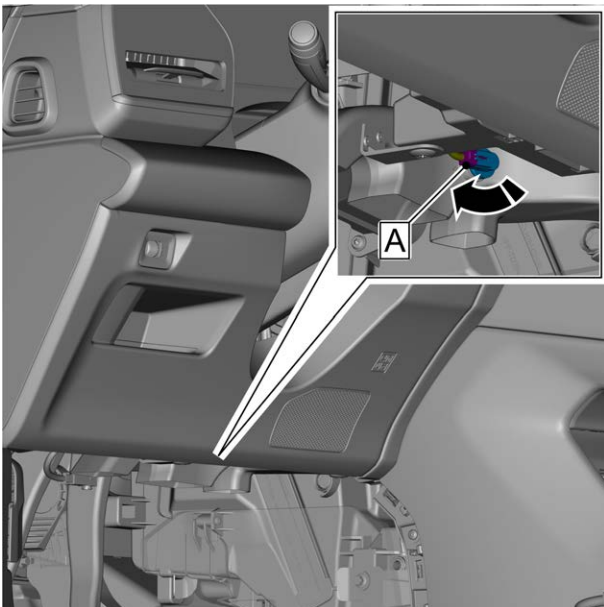
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left lower toe board assembly, refer to [Replacement of left lower toe board assembly](#).



- 3 Disconnect the interior temperature sensor (front foot-blowing left air duct) harness connector A.
- 4 Rotate the interior temperature sensor (front foot-blowing left air duct) counterclockwise and remove it.

Installation Procedure



- 1 Assemble interior temperature sensor (front foot-blowing left air duct) to the front foot-blowing left air duct and rotate clockwise to install it in place.
- 2 Connect interior temperature sensor (front foot-blowing left air duct) harness connector A.

- 3 Install the left lower toe board assembly.
- 4 Connect the negative cable of battery.

9.2.5.15 Replacement of the A/C main unit assembly

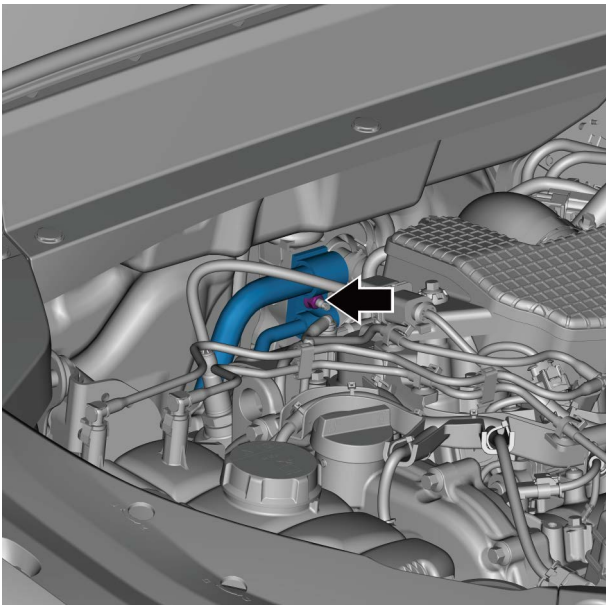
Removal Procedure

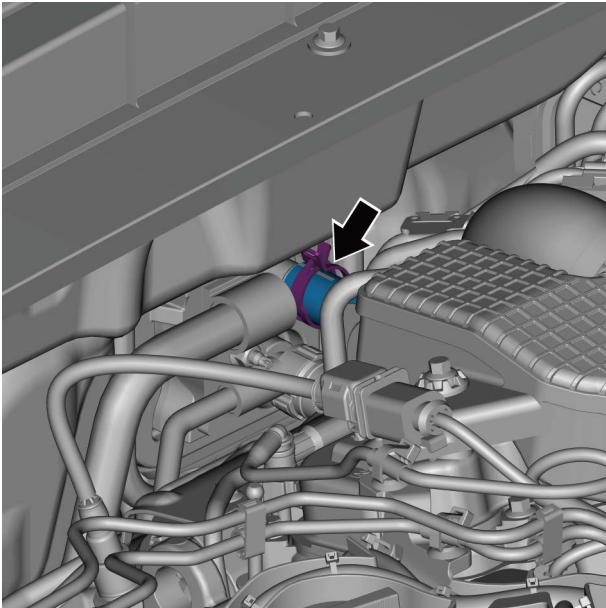
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

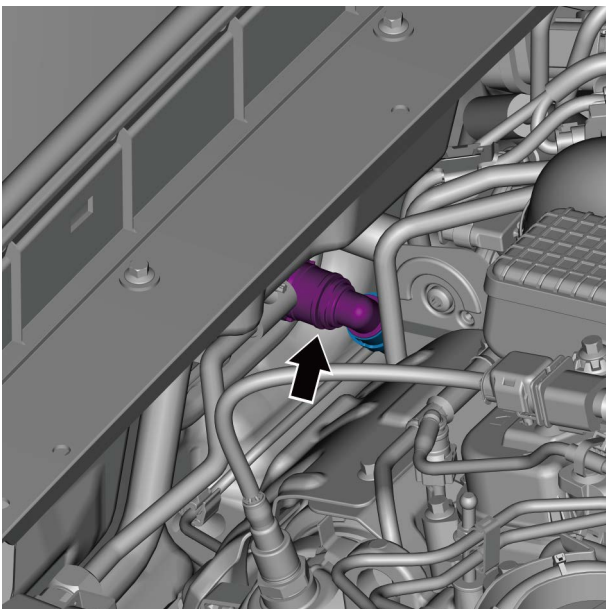
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

- 2 Drain coolant, see [Engine Coolant Drain and Fill](#).
- 3 Recover refrigerant, see [Recovering and Refilling of A/C Refrigerant](#).
- 4 Remove console body assembly, refer to [Replacement of console body assembly](#).
- 5 Remove the instrument panel body assembly, refer to [Replacement of instrument panel body assembly](#).
- 6 Remove front blow foot left air duct, see [Replacement of Front Blow Foot Left Air Duct](#).
- 7 Remove the front foot-blowing right air duct, see [Front foot-blowing right air duct replacement](#).
- 8 Remove the front section of the console face air channel, refer to [Replacement of console face air channel front section](#).
- 9 Remove the left section of the sub-instrument panel air duct assembly, see [Replacement of the left section of the sub-instrument panel air duct assembly](#).
- 10 Remove the right section of the sub-instrument panel air duct assembly, see [Replacement of the left section of the sub-instrument panel air duct assembly](#).
- 11 Remove the instrument panel cross member assembly, see [Instrument panel cross member assembly replacement](#).
- 12 Remove the fixing nut that connects the A/C high and low pressure hose assembly to the expansion valve.

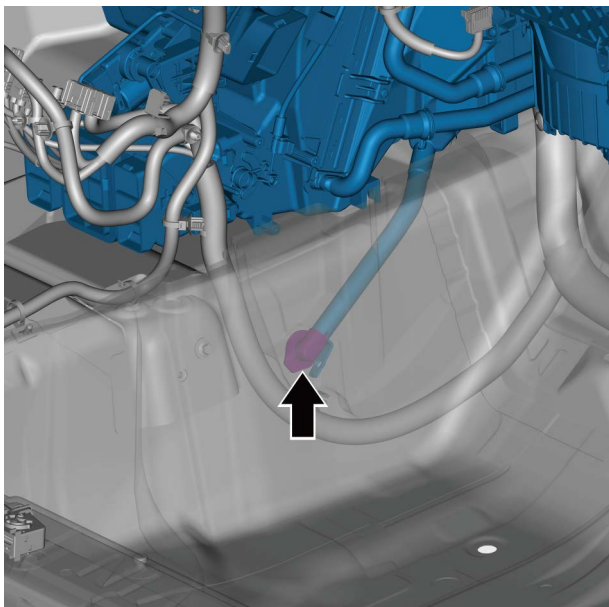




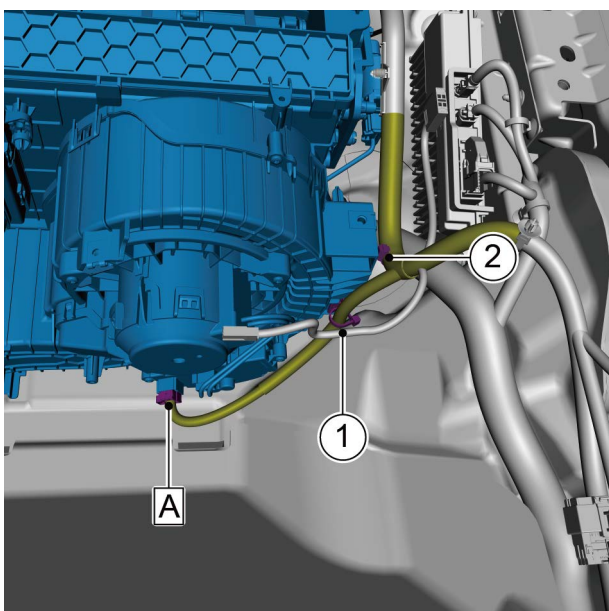
- 13 Remove the fastening collar that connects the electric heating outlet pipe to the A/C main unit assembly.



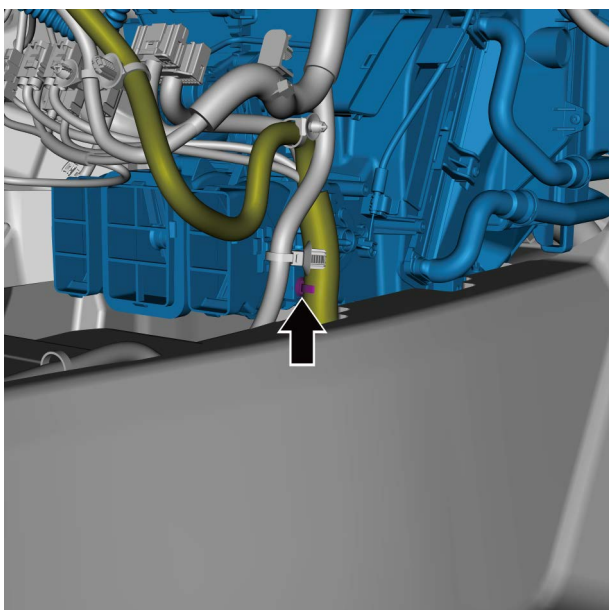
- 14 Disconnect the quick joint that connects the A/C warm air inlet pipe to the A/C main unit assembly.



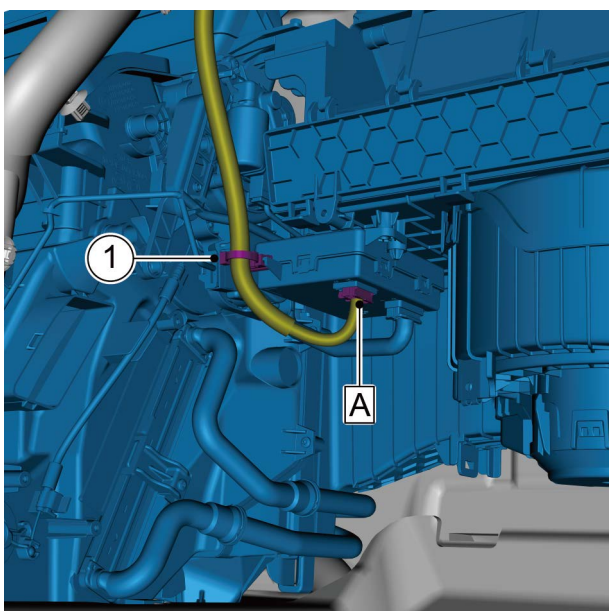
- 15 Lift the right front floor carpet assembly and remove the A/C drain hose.



- 16 Disconnect blower motor resistors harness connector A.
- 17 Remove the instrument panel harness assembly retaining clips 1 and retaining clips 2.

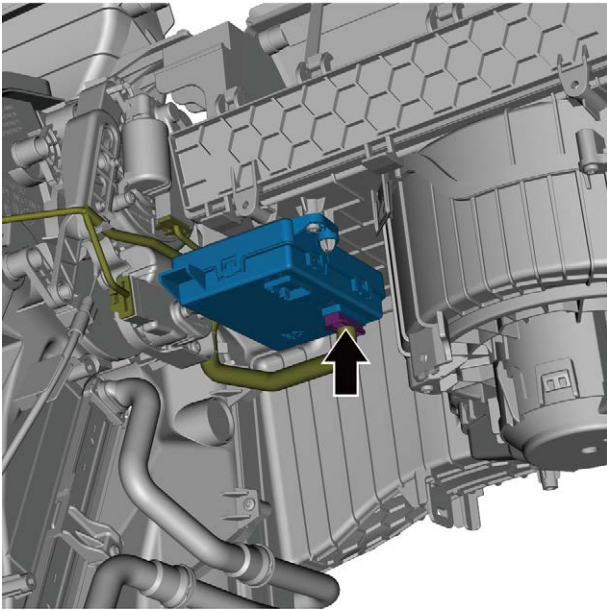


18 Remove the bottom plate harness retaining clips.

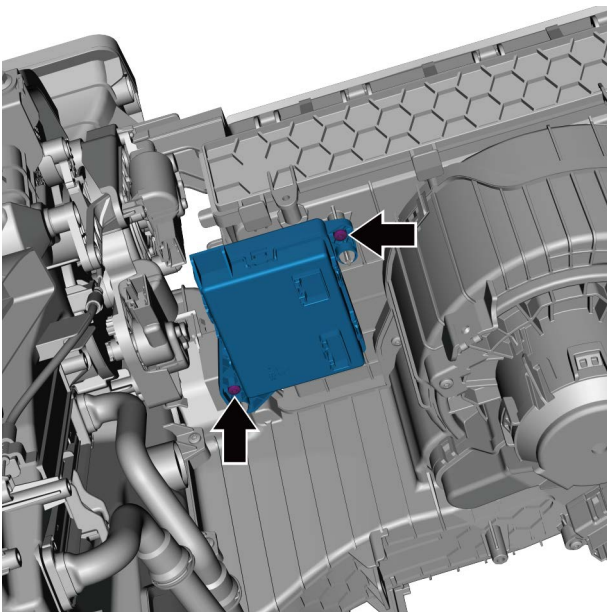


19 Disconnect the temperature control module harness connector A.

20 Remove the instrument panel wiring harness assembly retaining clips 1.

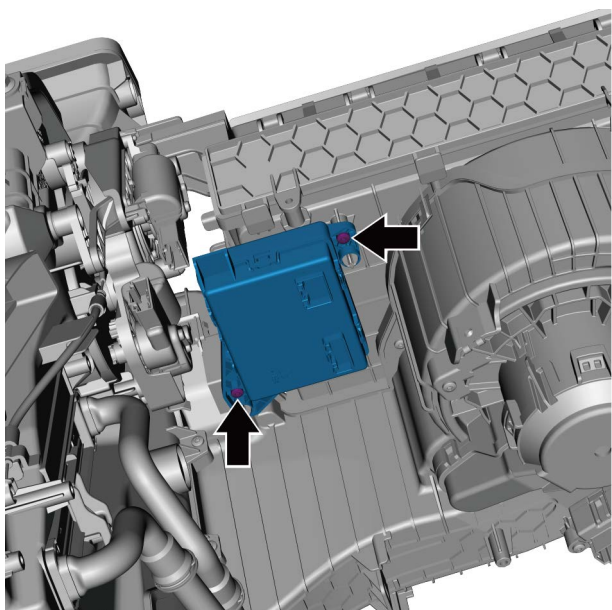


- 21 Disconnect the harness connector where the A/C main unit assembly harness is connected to the temperature control module.

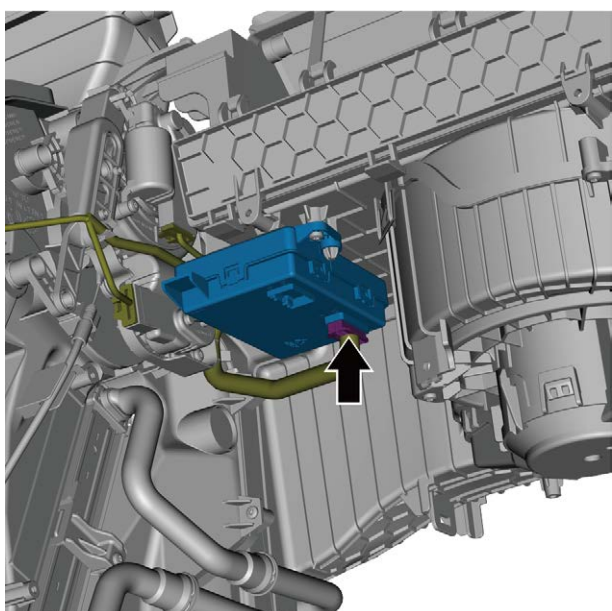


- 22 Remove 2 fixing screws of temperature control module.

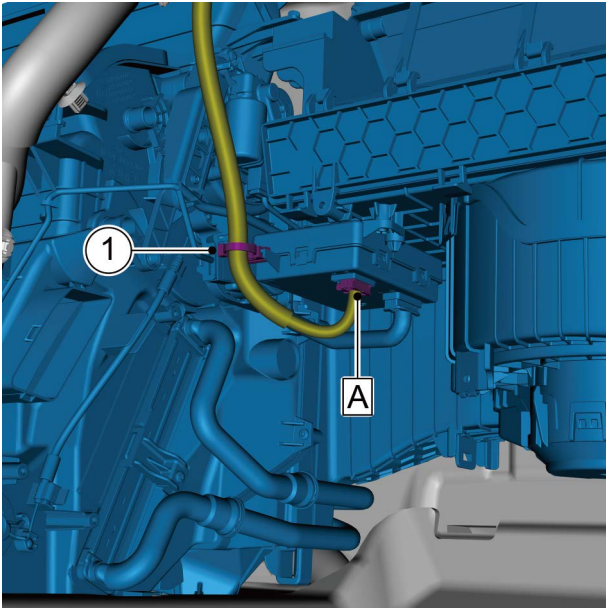
Installation Procedure



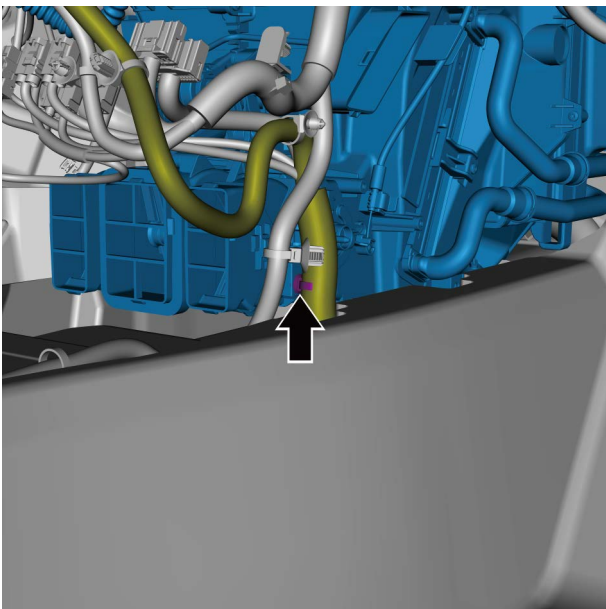
- 1 Install 2 fixing screws of temperature control module.
Torque: 1.5N·m



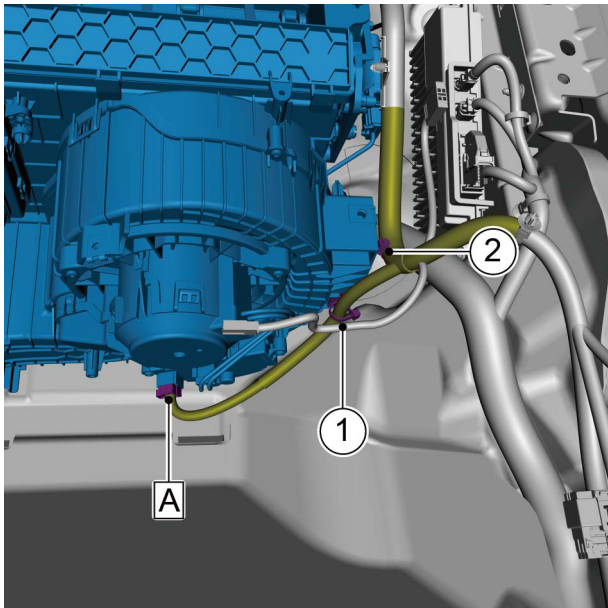
- 2 Connect the harness connector where the A/C main unit assembly harness is connected to the temperature control module.



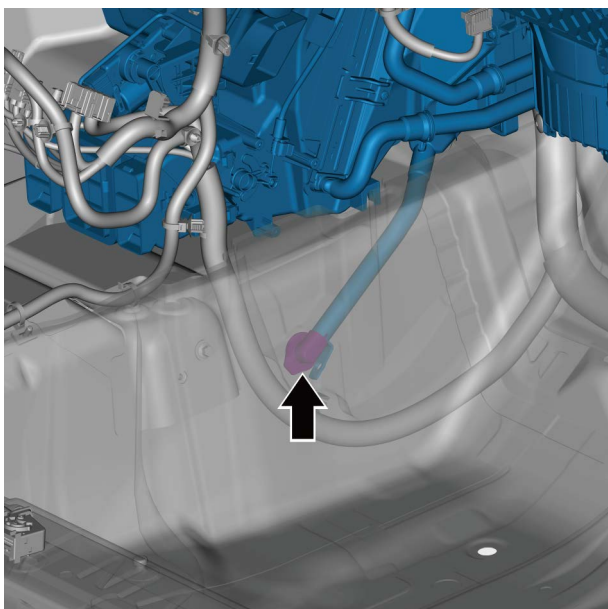
- 3 Connect the temperature control module harness connector A.
- 4 Install the instrument panel wiring harness assembly retaining clips 1.



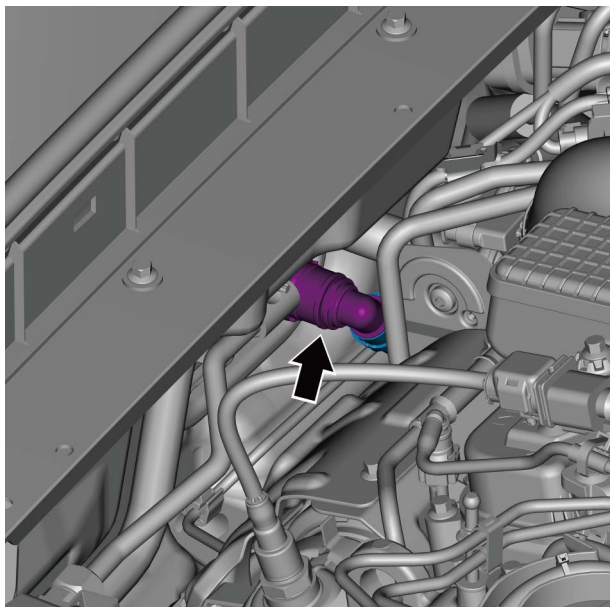
- 5 Install the bottom panel wiring harness retaining clips.



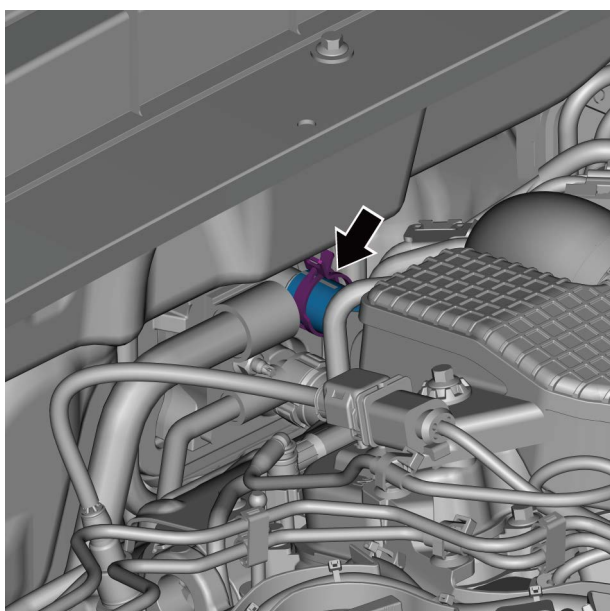
- 6 Connect blower motor resistors harness connector A.
- 7 Install instrument panel harness assembly retaining clips 1 and retaining clips 2.



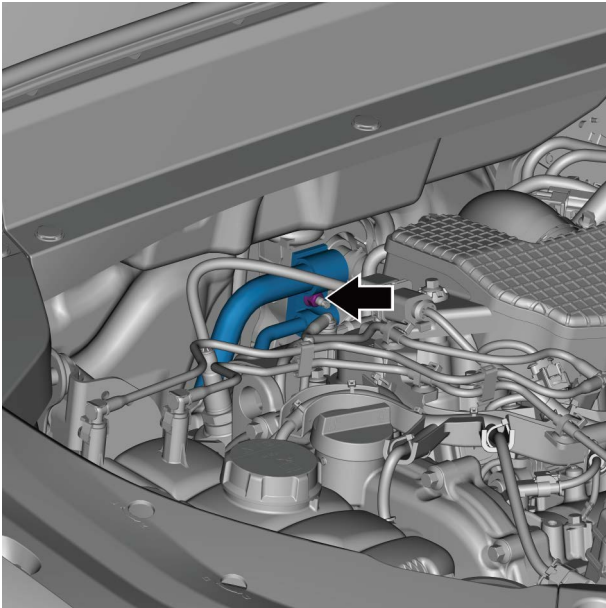
- 8 Lift the right front floor carpet assembly and install the A/C drain hose.



- 9 Connect the quick joint that connects the A/C warm air inlet pipe to the A/C main unit assembly.



- 10 Install the fastening circlips for the electric heating outlet pipe to connect to the A/C main unit assembly.



- 11 Install the fixing nut of the A/C high and low pressure hose assembly connected to the expansion valve.

Torque: 10N·m

Caution

The following precautions should be taken when adding lubricant to the A/C system:

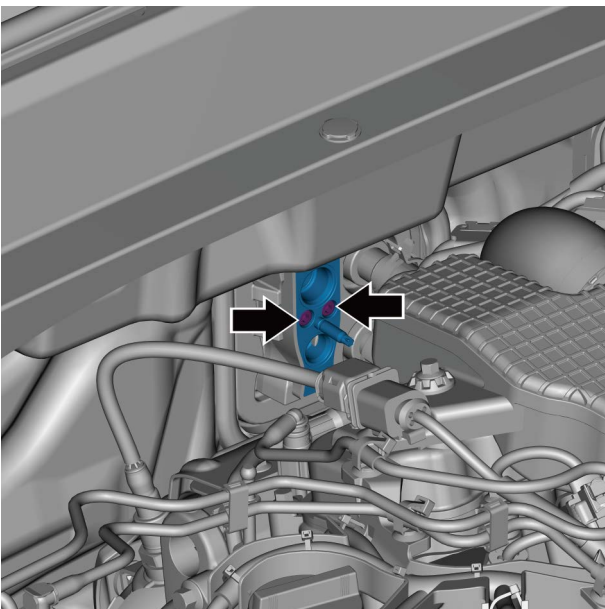
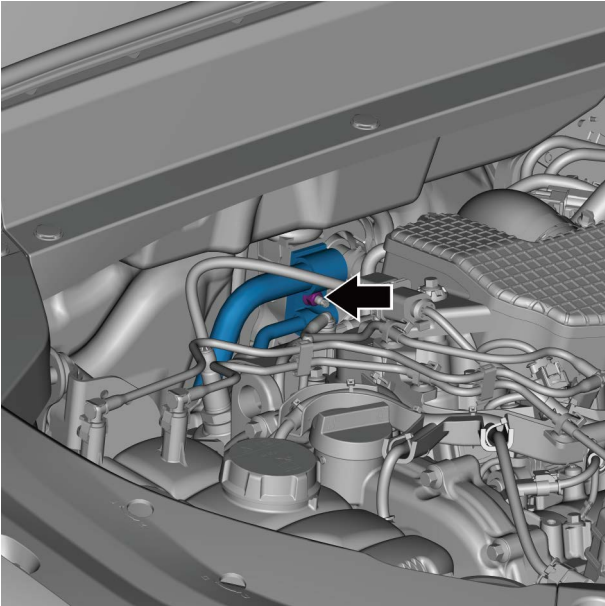
- Refrigeration oil must be brand new, not used oil containing moisture/dirt/metal shavings.
 - Do not allow excessive lubricant to be added to the system as this will affect the cooling capacity of the cooling system.
 - Discharge the refrigerant slowly when replacing the system so that the lubricant and refrigerant do not spray out together.
 - New system replacement with new compressor does not need to be filled with lubricant, it has been filled by the compressor manufacturer, but it is necessary to exclude 20 ml of lubricant from the compressor. If replacing all A/C lines, properly add 15 ml of lubricant of the same type.
 - Before refilling, the quality of lubricant in the pipeline should be checked, if serious blackening or carbon particles precipitation phenomenon is found, the whole A/C system should be thoroughly cleaned and blown, the reservoir drier and all the lubricant should be replaced; it is prohibited to clean the A/C system with water, corrosive solvents or flammable and explosive solvents, and it is recommended to use cleaners such as heptane and to clean and dry the cleaned A/C system thoroughly.
- 12 Install the instrument panel cross member assembly.
 - 13 Install the sub-instrument panel air duct assembly right section.
 - 14 Install the sub-instrument air duct assembly left section.
 - 15 Install the front section of the console face air channel.
 - 16 Install the front foot-blowing right air duct.
 - 17 Install the front blow foot left duct.
 - 18 Install the instrument panel body assembly.
 - 19 Install the console body assembly.
 - 20 Connect the negative cable of battery.

- 21 Fill in coolant.
- 22 Operate the A/C refrigerant filling procedure.

9.2.5.16 Expansion valve replacement

Removal Procedure

- 1 Recover refrigerant, see [A/C Refrigerant Recovery and Refill](#).
- 2 Remove the engine trim cover assembly, refer to [Replacement of engine trim cover assembly](#).
- 3 Remove the fixing nut of the A/C high and low pressure hose assembly and expansion valve.



- 4 Remove the 2 hexagonal bolts connecting the expansion valve to the A/C main unit assembly and remove the expansion valve.

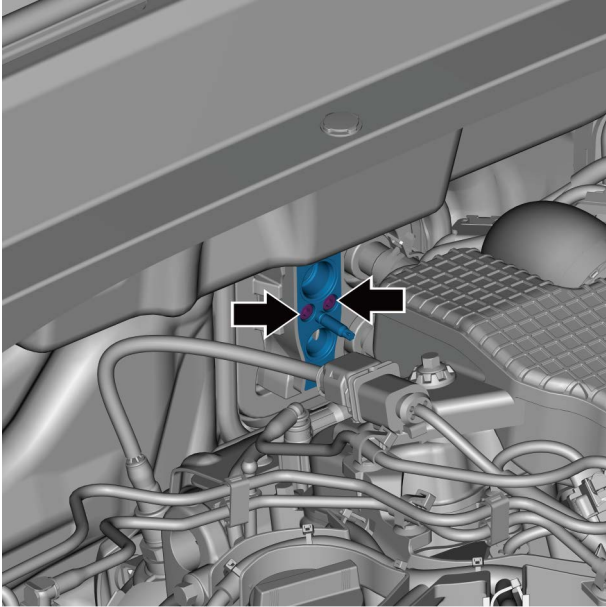
Installation Procedure

Caution

Any O-rings involved in the installation process must be replaced with new parts. When installing the A/C pipe, insert the pipe joint completely before tightening the nut to prevent damage to the O-ring and pipe joint.

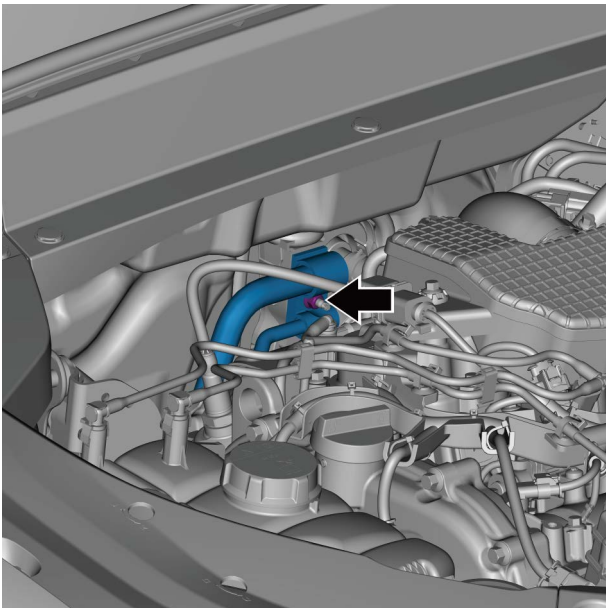
- 1 Install the 2 hexagonal bolts connecting the expansion valve to the A/C main unit assembly.

Torque: 4.5N·m



- 2 Install the fixing nut of the A/C high and low pressure hose assembly connected to the expansion valve.

Torque: 10N·m



- 3 Install the engine trim cover assembly.
- 4 Operate the A/C refrigerant filling procedure.

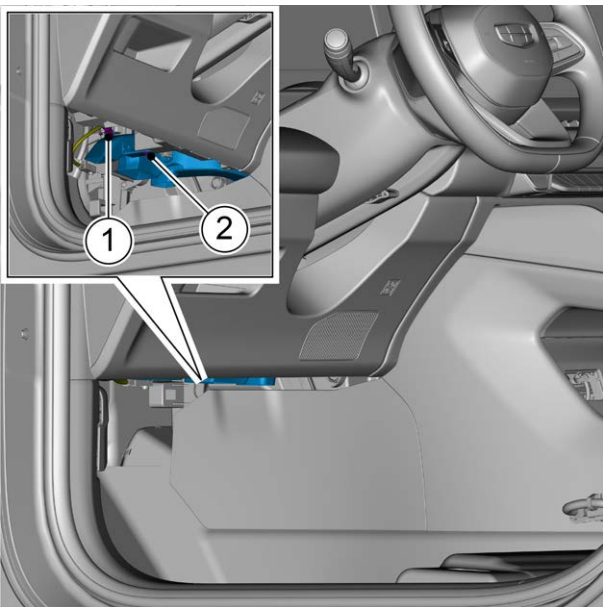
9.2.5.17 Front Foot-blowing Left Duct Replacement

Removal Procedure

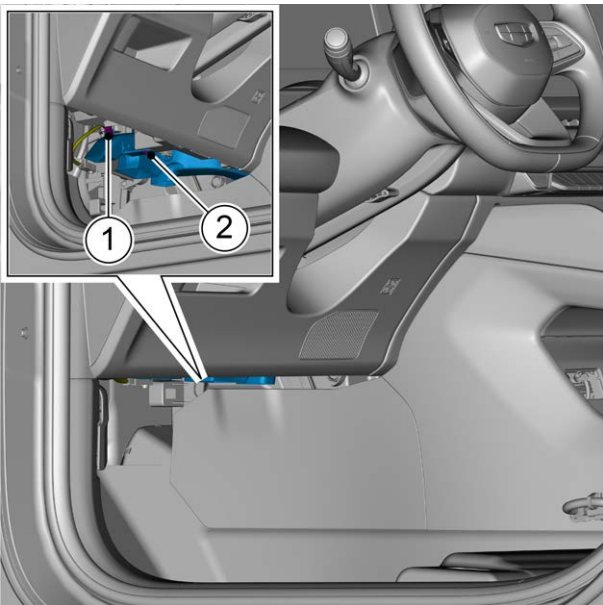
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left lower toe board assembly, refer to [Replacement of left lower toe board assembly](#).
- 3 Remove interior temperature sensor (front foot-blowing left air duct), see [Interior temperature sensor \(front foot-blowing left air duct\)](#).
- 4 Remove the front foot-blowing left air duct retaining clips 2.
- 5 Disengage the harness retaining clip1 and remove the front foot-blowing left air duct.

**Installation Procedure**

- 1 Install the harness retaining clips 1.
- 2 Install the front foot-blowing left air duct retaining clips 2.



- 3 Install interior temperature sensor (front foot-blowing left air duct).
- 4 Install the left lower toe board assembly.
- 5 Connect the negative cable of battery.

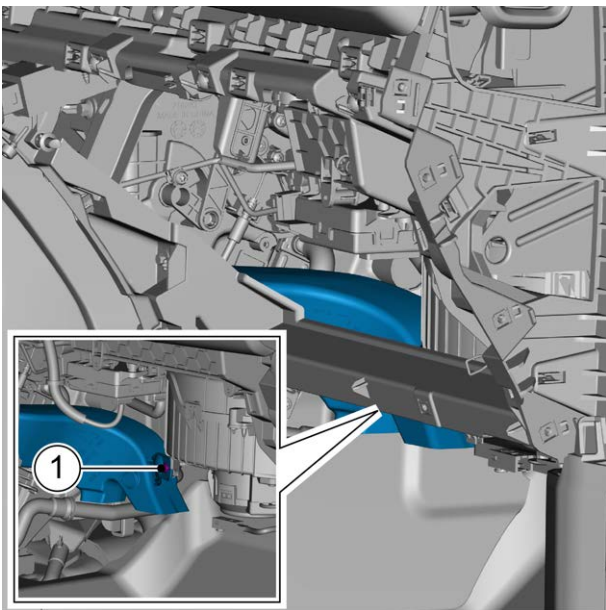
9.2.5.18 Replacement of the front foot-blowing right air duct

Removal Procedure

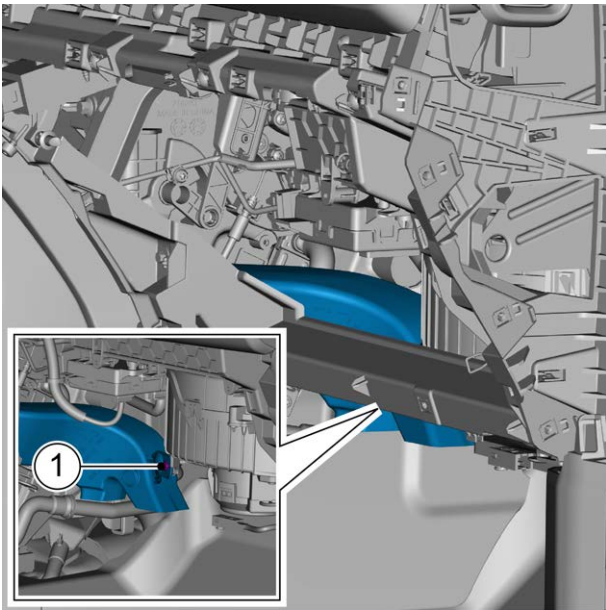
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the right lower toe board assembly, refer to [Replacement of right lower toe board assembly](#).
- 3 Remove the glove box frame assembly, refer to [Replacement of glove box frame assembly](#).
- 4 Remove the front foot-blowing right air duct fixing screw 1 and take off the front foot-blowing right air duct.



Installation Procedure



- 1 Install the front foot-blowing right duct fixing screw 1.
Torque: 1.5N·m

- 2 Install the glove box fame assembly.
- 3 Install the right lower toe board assembly.
- 4 Connect the negative cable of battery.

9.2.5.19 Sub-instrument panel air duct assembly left section replacement

Removal Procedure

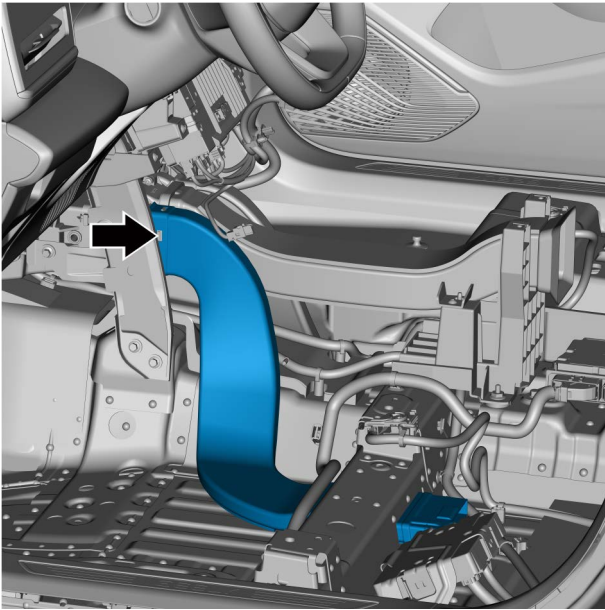
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

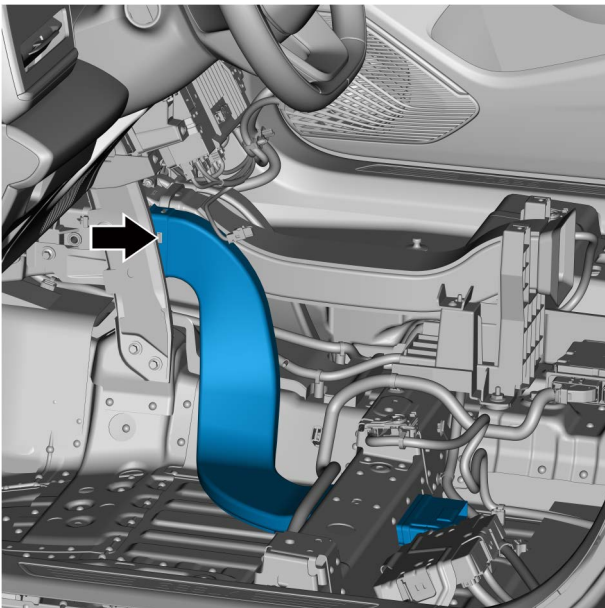
Caution

The sub-instrument panel duct assembly left and right sections are removed and installed in a similar manner.

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the driver seat assembly, refer to [Replacement of driver seat assembly](#).
- 3 Remove console body assembly, refer to [Replacement of console body assembly](#).



- 4 Remove the rear foot-blowing left air outlet, see [Rear Blow Foot Left Air Outlet Replacement](#).
- 5 Lift the driver's side carpet and remove the left section of the sub-instrument panel duct assembly.



Installation Procedure

- 1 Install the left section of the sub-instrument duct assembly and reset the driver's side carpet.

- 2 Install the rear foot-blowing left air outlet.
- 3 Install the console body assembly.
- 4 Install the driver seat assembly.
- 5 Connect the negative cable of battery.

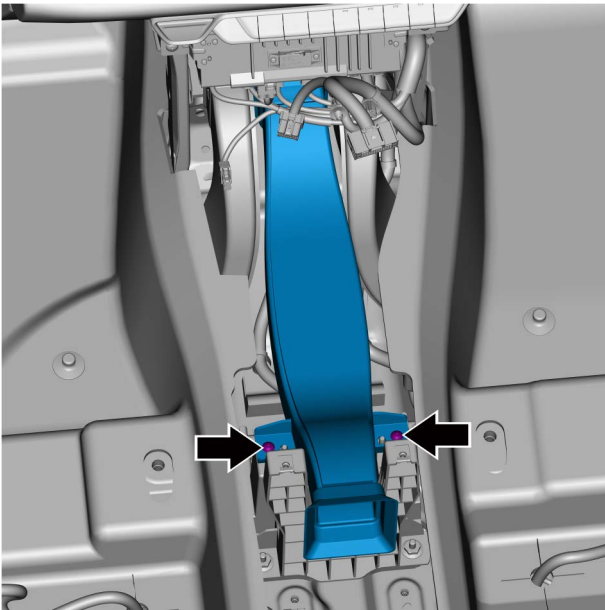
9.2.5.20 Replacement of the front section of the sub-instrument air duct assembly

Removal Procedure

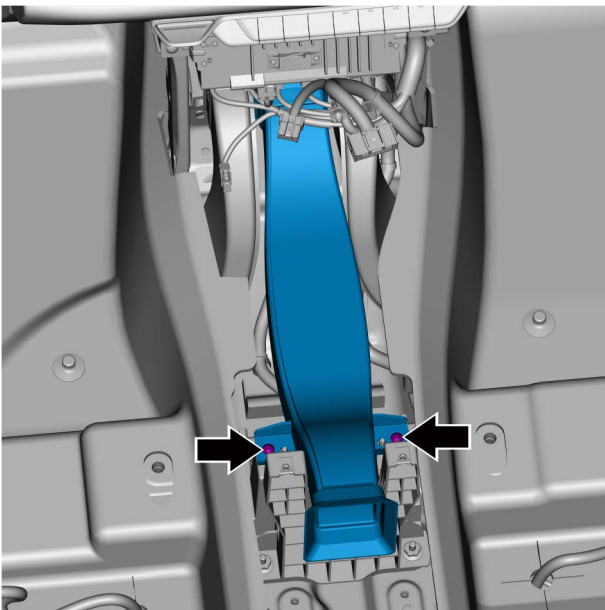
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the driver seat assembly, refer to [Replacement of driver seat assembly](#).
- 3 Remove console body assembly, refer to [Replacement of console body assembly](#).
- 4 Remove the 2 fixing screws on the front section of the sub-instrument panel duct assembly, and take off the front section of the sub-instrument panel duct assembly.

**Installation Procedure**

- 1 Install the front section of the sub-instrument duct assembly and tighten the 2 screws.
Torque: 1.5N·m



- 2 Install the console body assembly.

- 3 Install the driver seat assembly.
- 4 Connect the negative cable of battery.

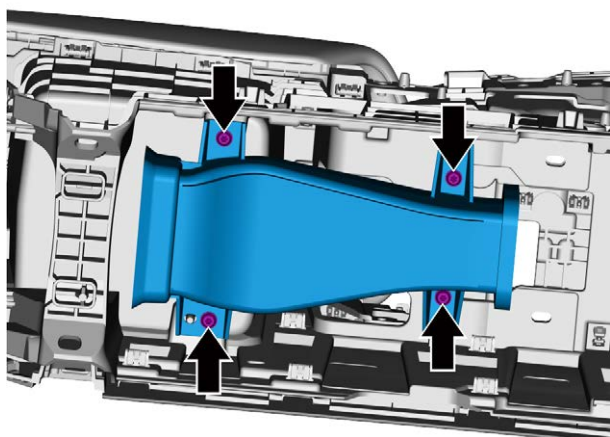
9.2.5.21 Replacement of the middle section of the sub-instrument panel face-blowing air duct

Removal Procedure

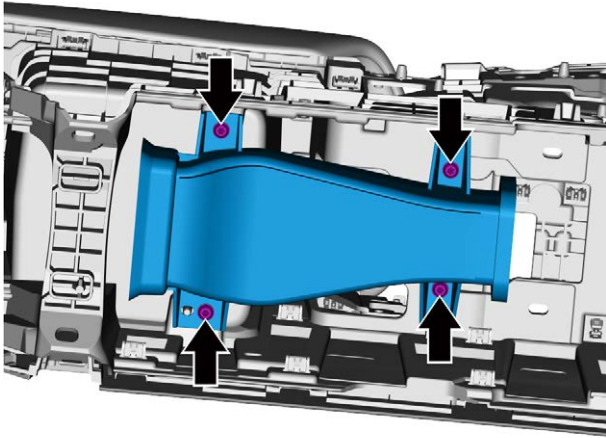
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the driver seat assembly, refer to [Replacement of driver seat assembly](#).
- 3 Remove console body assembly, refer to [Replacement of console body assembly](#).
- 4 Remove the sub-instrument panel face-blowing air duct center section by removing the 4 fixing screws and remove the sub-instrument panel face-blowing air duct center section.



Installation Procedure



- 1 Install the sub-instrument panel face-blowing air duct center section and tighten the screws.

Torque: 1.5N·m

- 2 Install the console body assembly.
- 3 Install the driver seat assembly.
- 4 Connect the negative cable of battery.

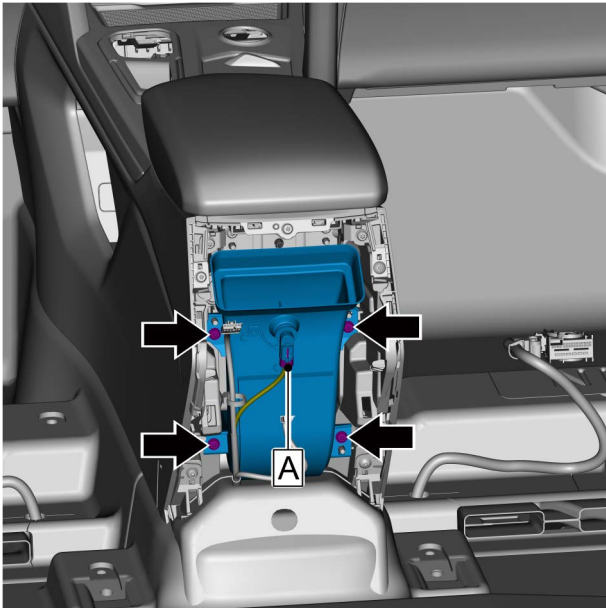
9.2.5.22 Sub-instrument panel face-blowing air duct rear section replacement

Removal Procedure

Warning !

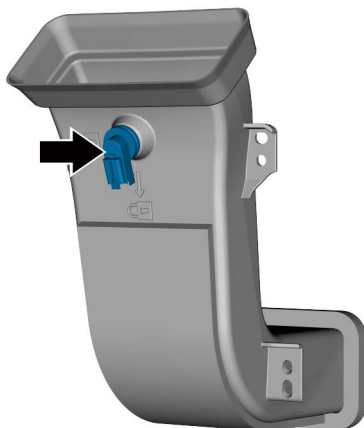
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the console rear panel assembly, refer to [Replacement of console rear panel assembly \(type I\)](#) and [Replacement of console rear panel assembly \(type II\)](#).



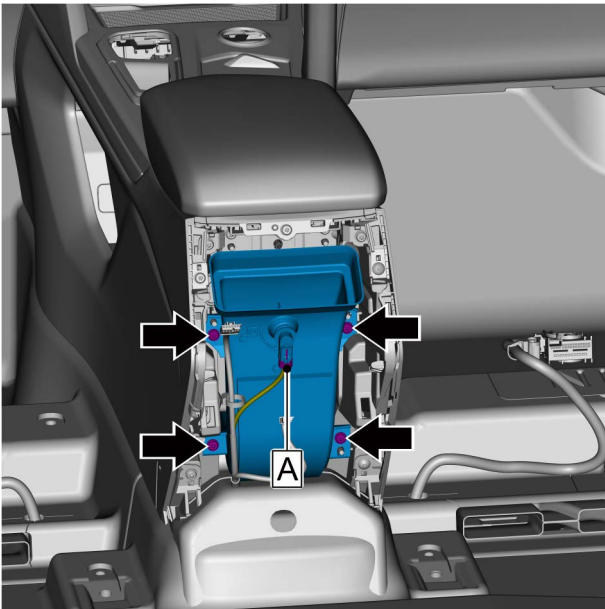
- 3 Disconnect the harness connector A of the temperature sensor.
- 4 Remove the rear section of the sub-instrument panel face-blowing air duct by removing the four fixing screws.

- 5 Remove the temperature sensor.



Installation Procedure

- 1 Install the temperature sensor.



- 2 Install the rear section of the sub-instrument panel face-blowing air duct and tighten the screws.
Torque: 1.5N·m
- 3 Connect the temperature sensor harness connector.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 4 Install the console rear panel assembly.
- 5 Connect the negative cable of battery.

9.2.5.23 Rear Foot-blowing Left Air Outlet Replacement

Removal Procedure

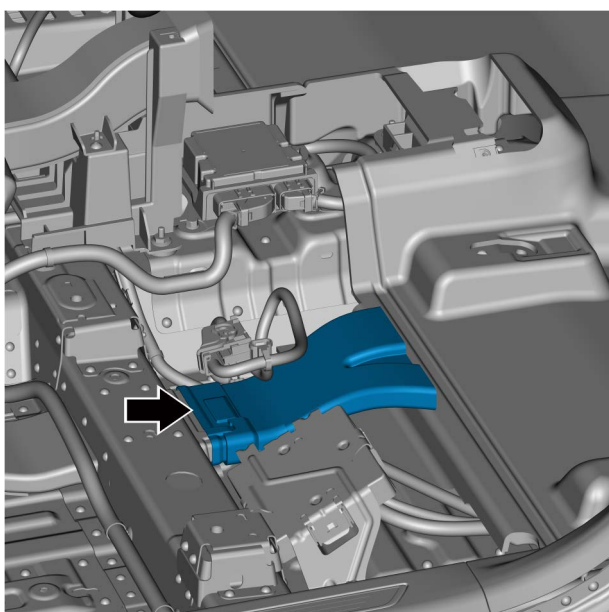
Warning !

Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#).

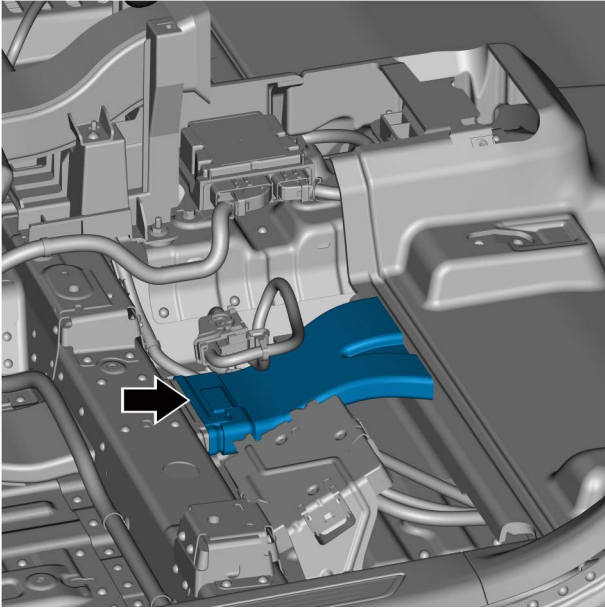
Caution

The rear foot-blowing left air outlet and the rear foot-blowing right air outlet are removed and installed in a similar manner.

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the driver seat assembly, refer to [Replacement of driver seat assembly](#).
- 3 Lift the driver's side carpet and remove the rear foot-blowing left air outlet.



Installation Procedure



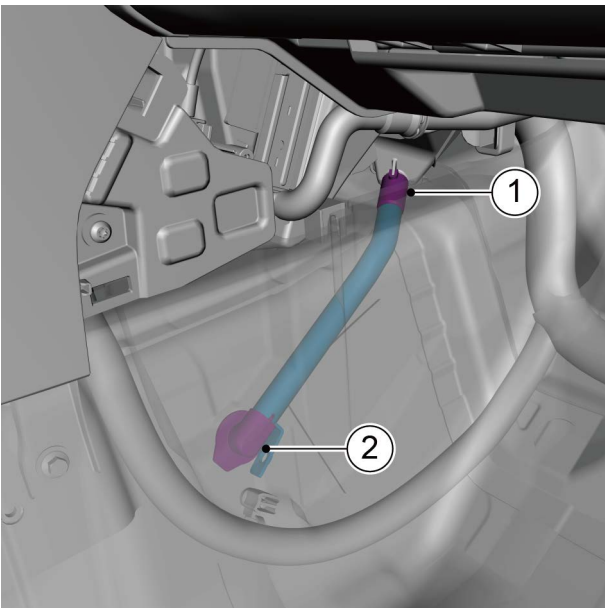
- 1 Install the rear foot-blowing left air outlet and reset the driver's side carpet.

- 2 Install the driver seat assembly.
- 3 Connect the negative cable of battery.

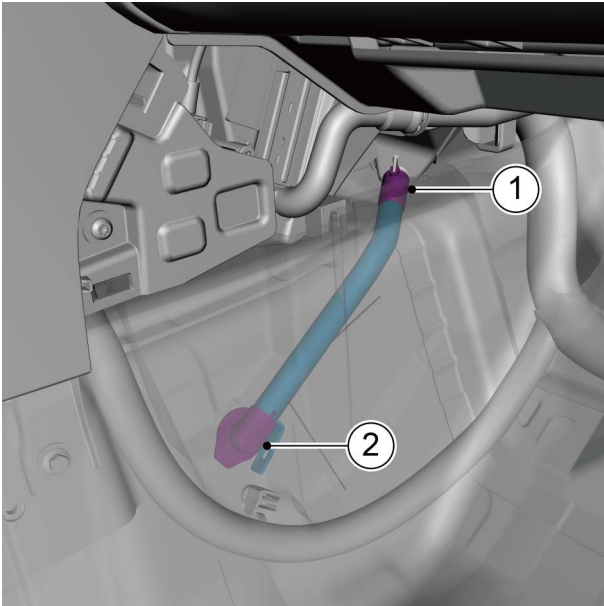
9.2.5.24 A/C drain hose replacement

Removal Procedure

- 1 Remove the console right trim panel assembly, refer to [Replacement of console right trim panel assembly](#).
- 2 Remove the connection 1 of the A/C drain hose to the A/C main unit assembly.
- 3 Remove the connection 2 of A/C drain hose to the body and remove the A/C drain hose.



Installation Procedure



- 1 Install the connection 1 of A/C drain hose to the A/C main unit assembly.
- 2 Install the connection 2 of A/C drain hose to body.

- 3 Install the console right trim panel assembly.

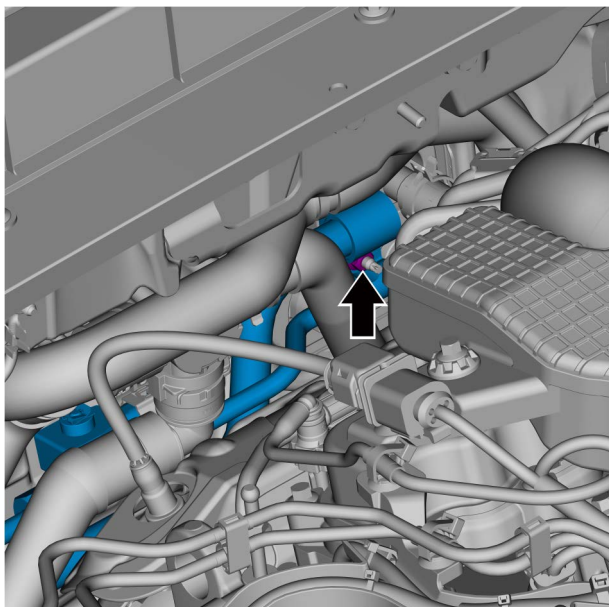
9.2.5.25 A/C high and low pressure hose assembly replacement

Removal Procedure

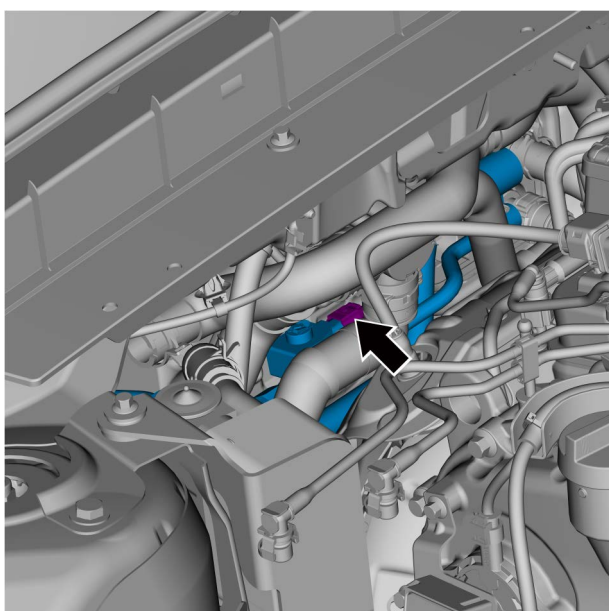
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

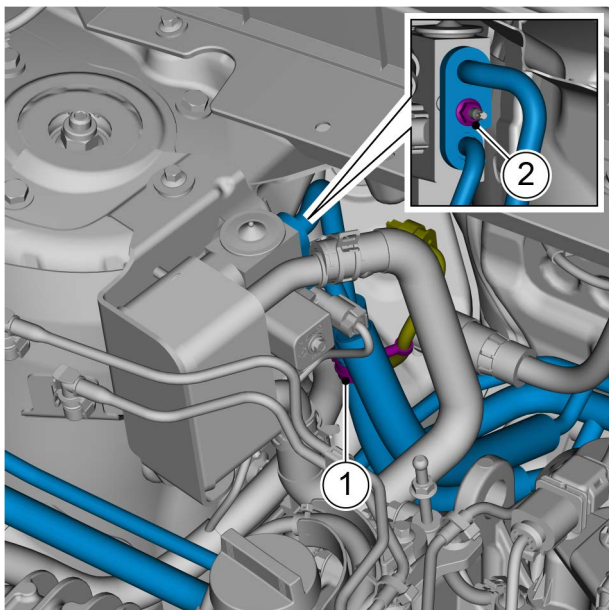
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the engine trim cover assembly, refer to [Replacement of engine trim cover assembly](#).
- 3 Remove the right engine compartment trim panel, see [Replacement of Left Engine Compartment Trim Panel](#).
- 4 Remove the heat shield, see [Replacement of Heat Shield](#).
- 5 Remove heater, see [Heater Replacement](#).
- 6 Recover refrigerant, see [A/C Refrigerant Recovery and Refill](#).
- 7 Remove the low-temperature radiator expansion kettle, see [Replacement of Radiator Expansion Kettle](#).



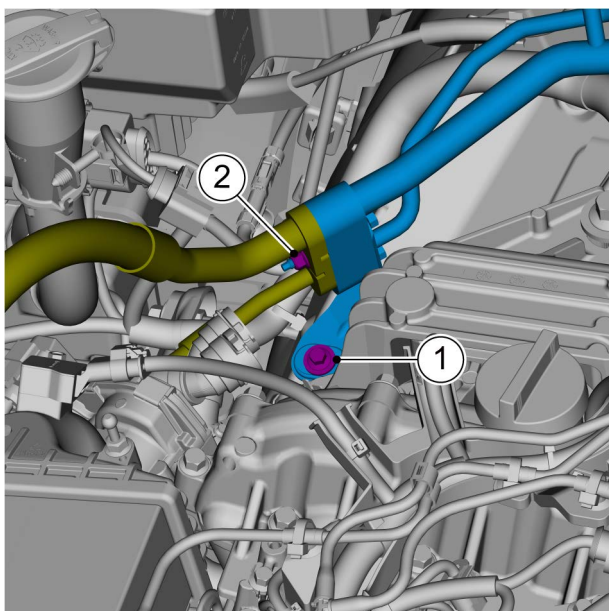
- 8 Remove the fixing nut that connects the A/C high and low pressure hose assembly to the expansion valve.



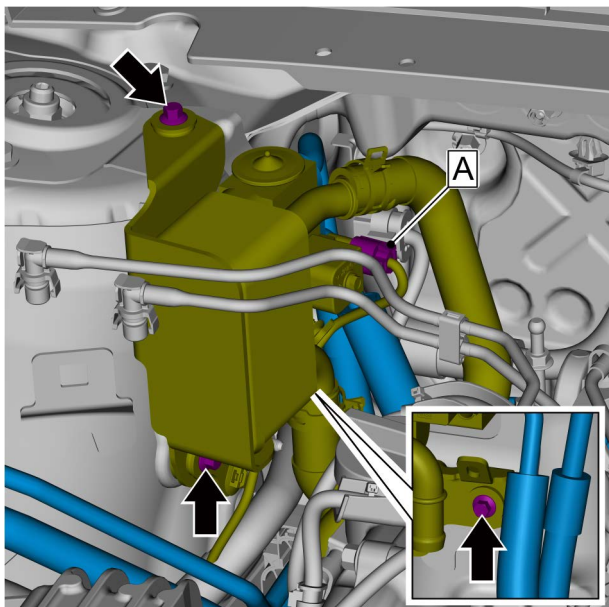
- 9 Disconnect the A/C high and low pressure hose assembly harness connector.



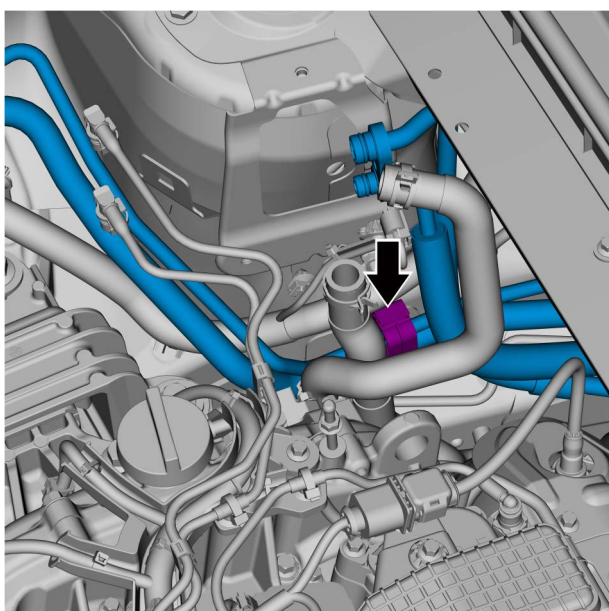
- 10 Remove harness clip 1.
- 11 Remove 1 fixing nut 2 of the A/C high and low pressure hose assembly.



- 12 Remove the A/C high and low pressure hose assembly fixing bolts 1.
- 13 Remove the fixing nut 2 that connects the A/C high and low pressure hose assembly to the A/C low pressure hose assembly.



- 14 Disconnect the high pressure battery cooler harness connector A.
- 15 Remove the 3 fixing bolts of the high-voltage battery cooler.



- 16 Remove the hose clamp and take off the A/C high and low pressure hose assembly.

Installation Procedure

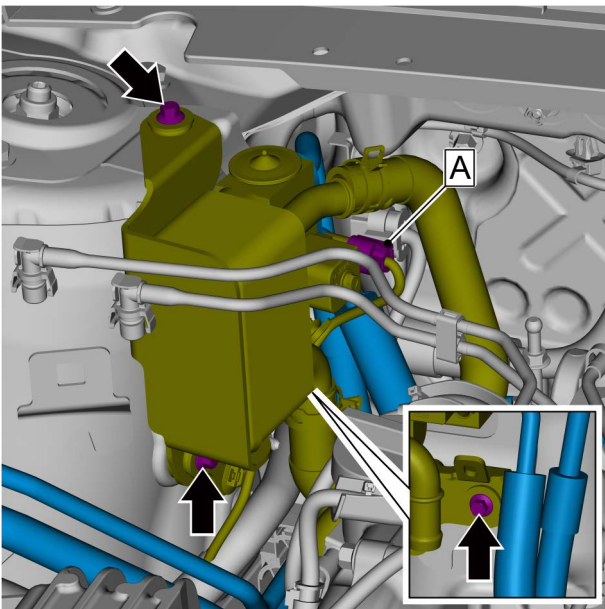
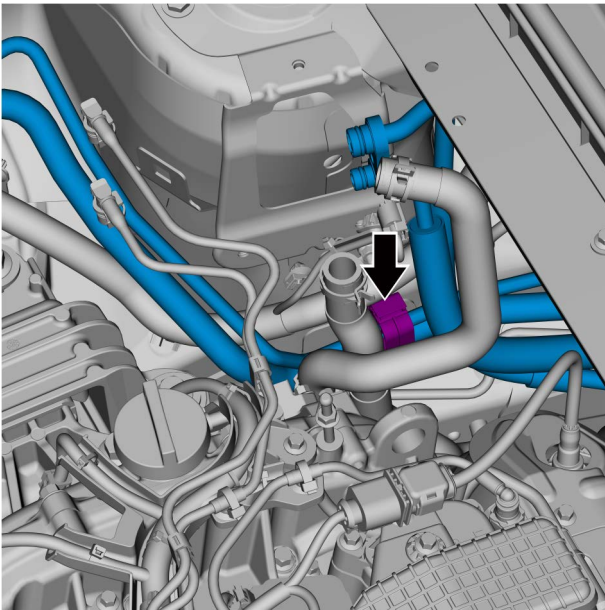
Caution

– Any O-rings involved in the installation process must be replaced with new parts. When installing the A/C pipe, insert the pipe joint completely before tightening the nut to prevent damage to the O-ring and pipe joint.

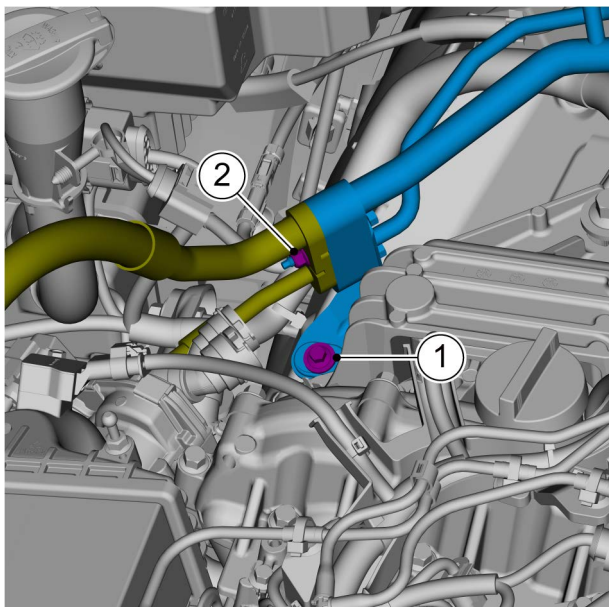
– If you are replacing all the A/C lines you need to add 15ml compressor lubricant.

– When only replacing any of the A/C lines, there is no need to add additional compressor lubricant.

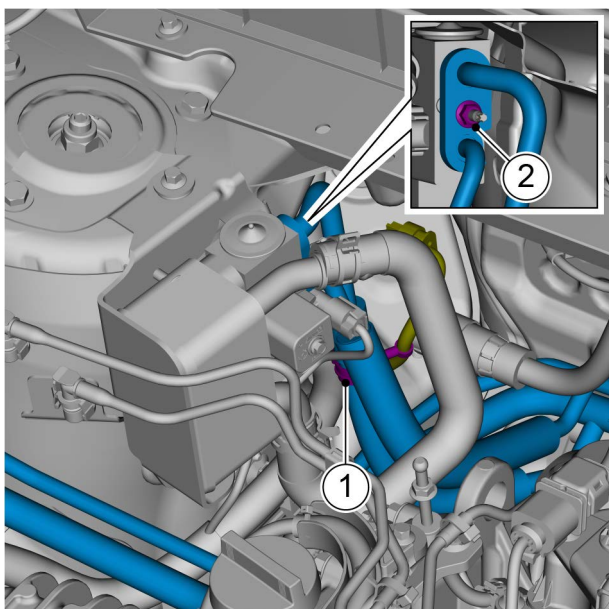
- 1 Install the A/C high and low pressure hose assembly hose clamps.



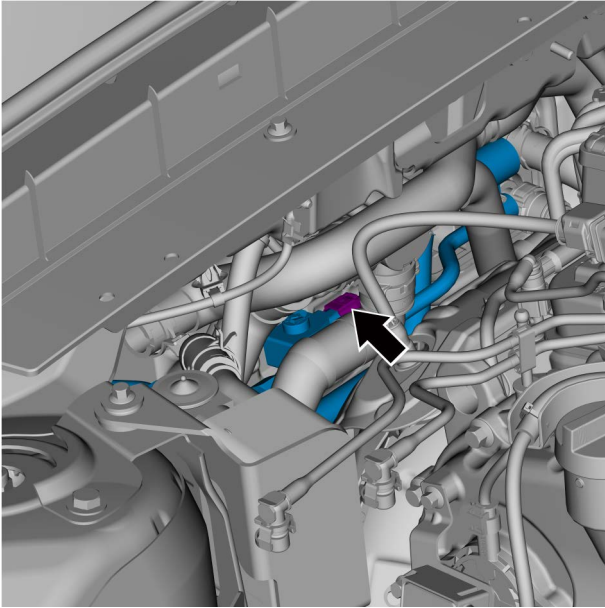
- 2 Install 3 fixing bolts of the high voltage battery cooler.
Torque: 10N·m
- 3 Connect the high voltage battery cooler harness connector A.



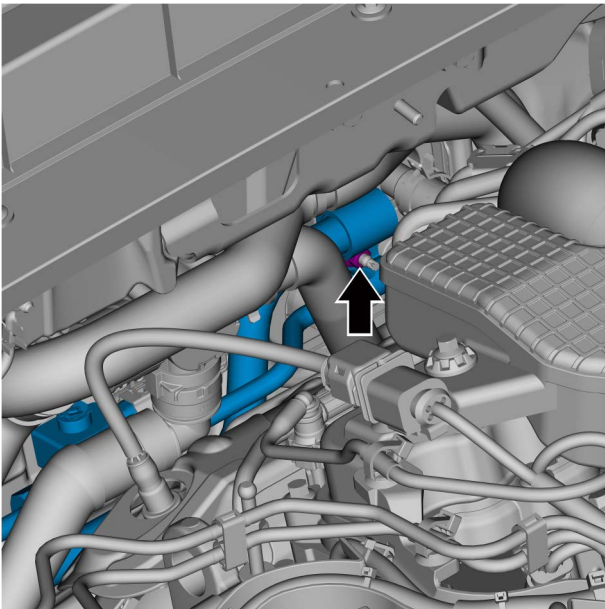
- 4 Install the A/C high and low pressure hose assembly fixing bolts 1.
Torque: 10N·m
- 5 Install the fixing nut 2 that connects the A/C high and low pressure hose assemblies to the A/C low pressure hose assembly.
Torque: 10N·m



- 6 Install the fixing nut 2 connecting A/C high and low pressure hose assembly to the high voltage battery cooler connection.
Torque: 10N·m
- 7 Install the harness clip 1.



- 8 Connect the A/C high and low pressure hose assembly harness connector.

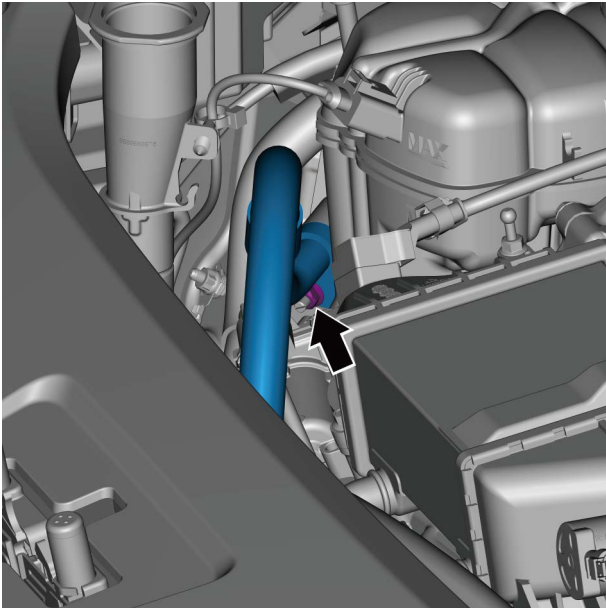


- 9 Install the fixing nut of the A/C high and low pressure hose assembly connected to the expansion valve.
Torque: 10N·m

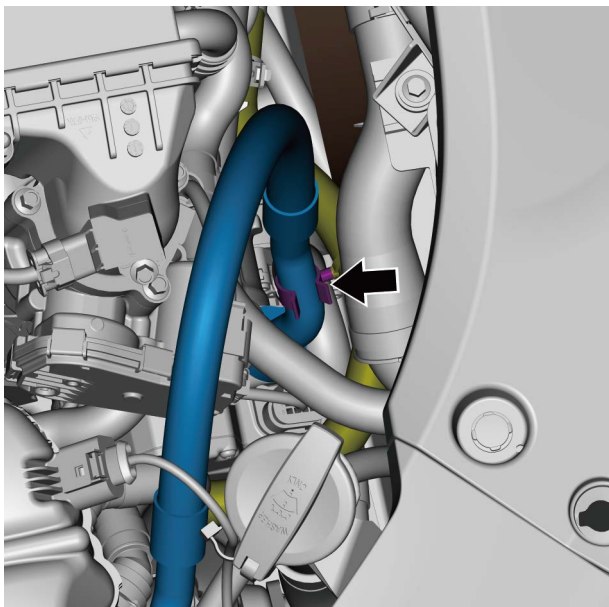
- 10 Install the heater.
- 11 Install the heat shield.
- 12 Install the low temperature radiator expansion kettle.
- 13 Install the right engine compartment trim panel.
- 14 Install the engine trim cover assembly.
- 15 Connect the negative cable of battery.
- 16 Operate the A/C refrigerant charging procedure.

9.2.5.26 A/C low pressure hose assembly replacement

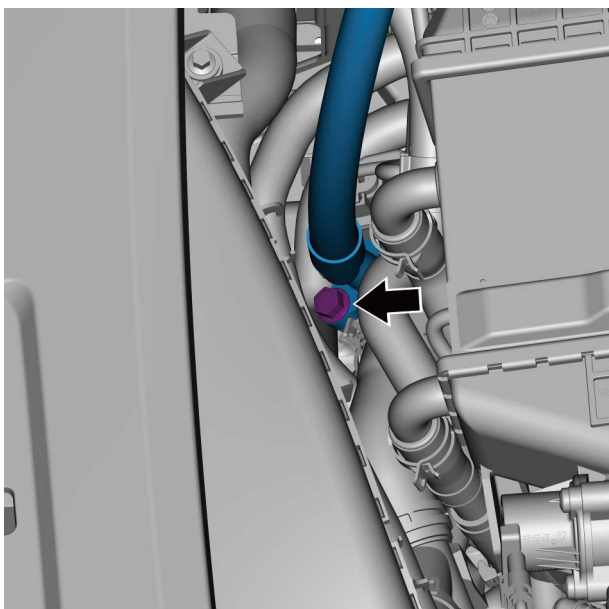
Removal Procedure



- 1 Remove the engine trim cover assembly, refer to [Replacement of engine trim cover assembly](#).
- 2 Recover refrigerant, see [A/C Refrigerant Recovery and Refill](#).
- 3 Remove the fixing nut that connects the A/C low pressure hose assembly to the A/C high and low pressure hose assembly.



- 4 Disengage the clips that connect the heat exchanger hot side outlet pipe to the A/C low pressure hose assembly.



- 5 Remove the fixing bolts connecting the A/C low pressure hose assembly to electric compressor, and take off the A/C low pressure hose assembly.

Installation Procedure

Caution

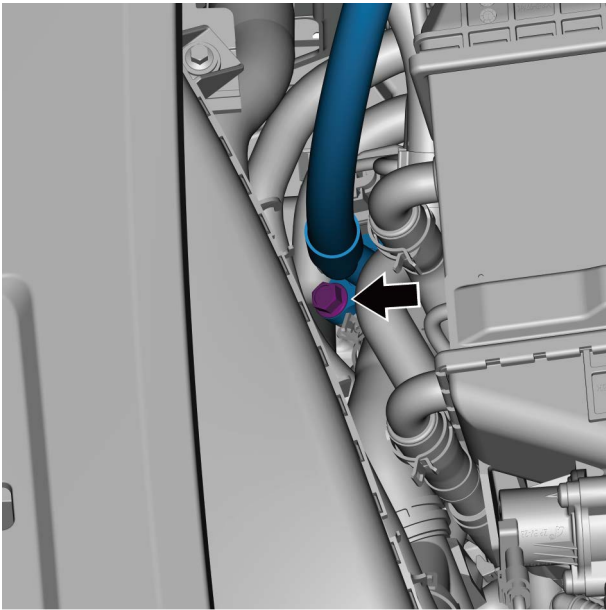
– Any O-rings involved in the installation process must be replaced with new parts. When installing the A/C pipe, insert the pipe joint completely before tightening the nut to prevent damage to the O-ring and pipe joint.

– If you are replacing all the A/C lines you need to add 15ml compressor lubricant.

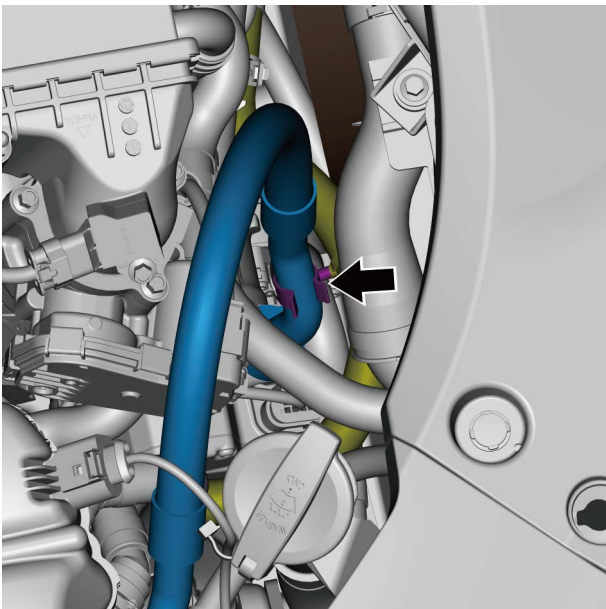
– When only replacing any of the A/C lines, there is no need to add additional compressor lubricant.

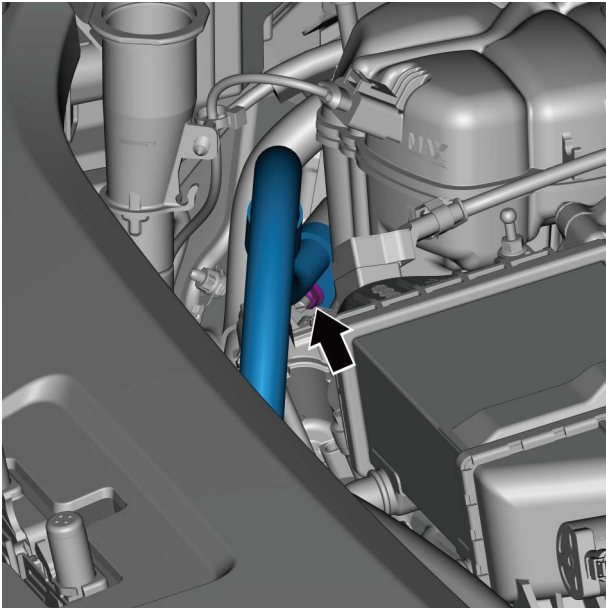
- 1 Install the fixing bolts connecting the A/C low pressure hose assembly to electric compressor.

Torque: 24N·m



- 2 Install the clips connecting the A/C low pressure hose assembly to the heat exchanger hot side outlet pipe.





- 3 Install the fixing nut that connects the A/C low pressure hose assembly to the A/C high and low pressure hose assembly.

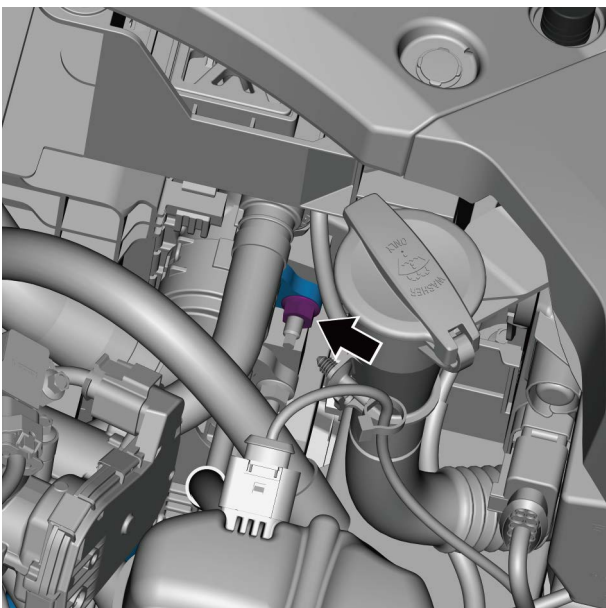
Torque: 10N·m

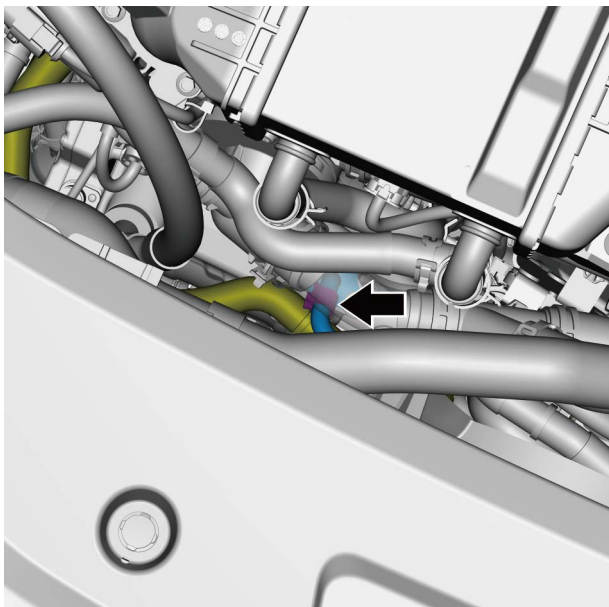
- 4 Operate the A/C refrigerant charging procedure.
- 5 Install the engine trim cover assembly.

9.2.5.27 A/C high pressure hose assembly replacement

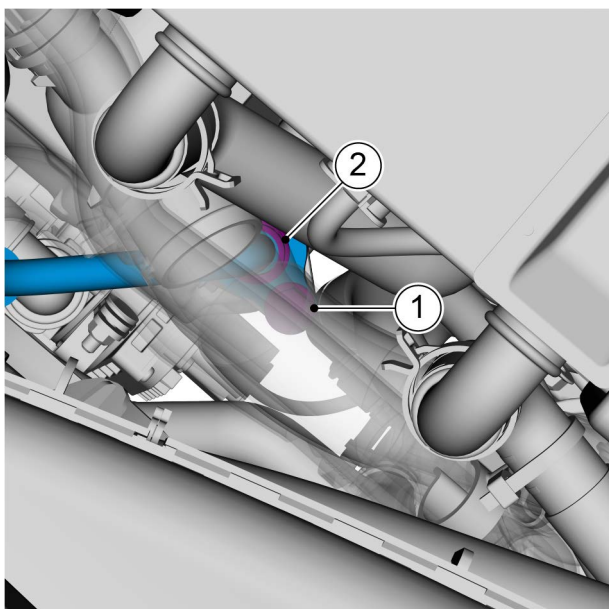
Removal Procedure

- 1 Remove the engine trim cover assembly, refer to [Replacement of engine trim cover assembly](#).
- 2 Remove the air filter intake pipe assembly. refer to [Replacement of air filter intake pipe assembly](#).
- 3 Remove right engine compartment trim panel, see [Left Engine Compartment Trim Panel Replacement](#).
- 4 Recover refrigerant, see [A/C Refrigerant Recovery and Refill](#).
- 5 Remove the fixing nut that connects the A/C high pressure hose assembly to the condenser.





- 6 Remove the low-temperature radiator inlet hose retaining clips.



- 7 Remove DC busbar assembly retaining clips 2.
- 8 Remove the fixing bolt 1 that connects the A/C high pressure hose assembly to the A/C compressor module, and remove the A/C high pressure hose assembly.

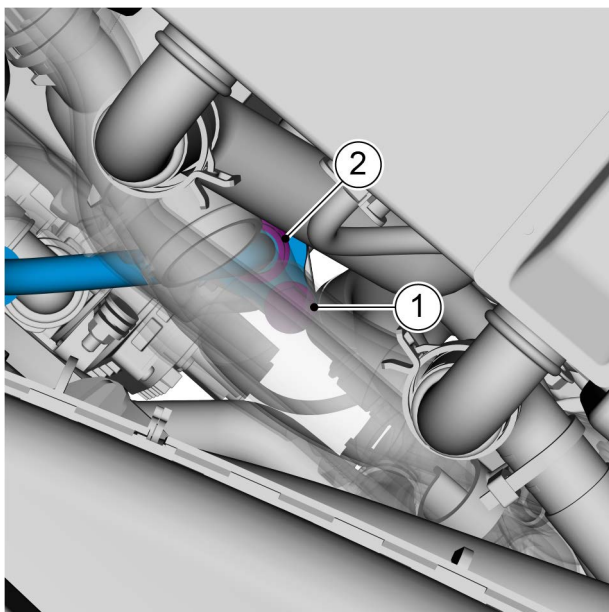
Installation Procedure

Caution

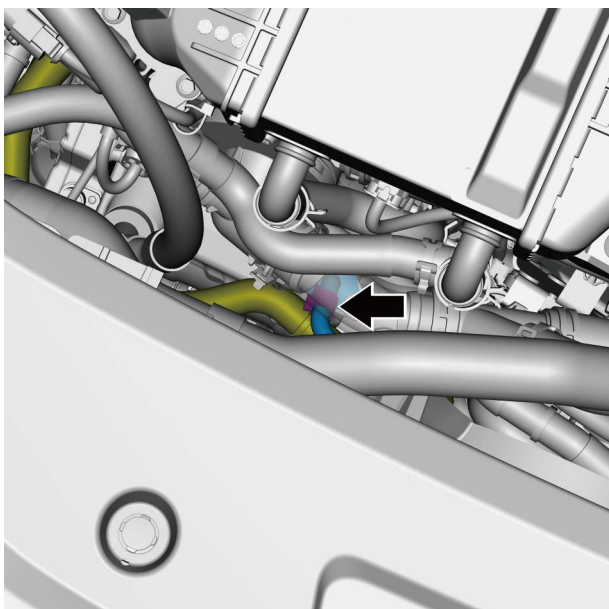
– Any O-rings involved in the installation process must be replaced with new parts. When installing the A/C pipe, insert the pipe joint completely before tightening the nut to prevent damage to the O-ring and pipe joint.

– If you are replacing all the A/C lines you need to add 15ml compressor lubricant.

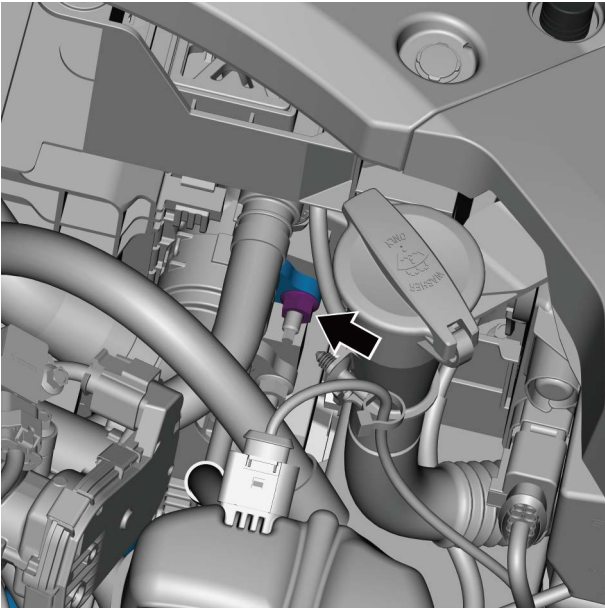
– When only replacing any of the A/C lines, there is no need to add additional compressor lubricant.



- 1 Install the fixing bolt 1 that connects the A/C high pressure hose assembly to the A/C compressor module.
Torque: 24N·m
- 2 Install the DC busbar assembly retaining clips 2.



- 3 Install heat exchanger hot side outlet pipe retaining clips.



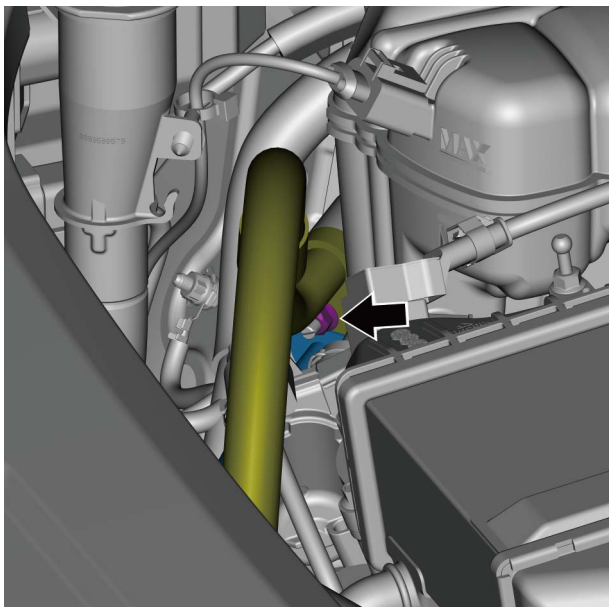
- 4 Install the fixing nut for connecting the A/C high pressure hose assembly to the condenser.
Torque: 24N·m

- 5 Install the right engine compartment trim panel.
- 6 Install the air filter intake pipe assembly.
- 7 Install the engine trim cover assembly.
- 8 Operate the A/C refrigerant charging procedure.

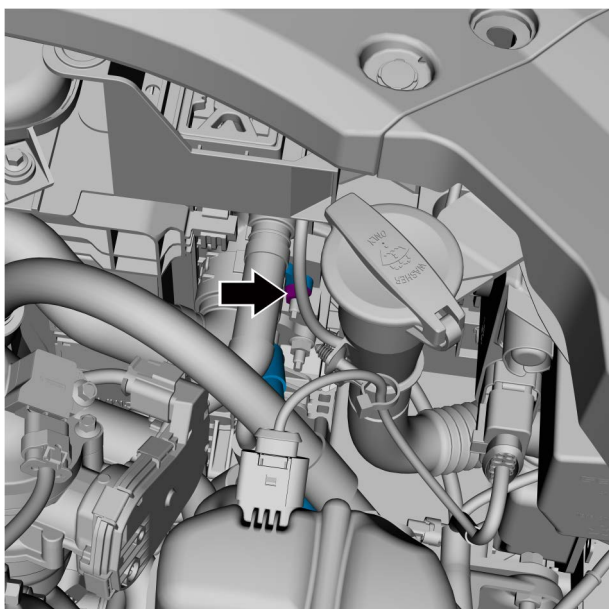
9.2.5.28 Condenser outlet tube assembly replacement

Removal Procedure

- 1 Remove the engine trim cover assembly, refer to [Replacement of engine trim cover assembly](#).
- 2 Remove the engine compartment trim panel, refer to [Replacement of engine compartment trim panel](#).
- 3 Recover refrigerant, see [A/C Refrigerant Recovery and Refill](#).



- 4 Remove the fixing nut that connects the A/C low pressure hose assembly to the condenser outlet tube assembly.



- 5 Remove the fixing nut that connects the condenser outlet tube assembly to the condenser, and remove the condenser outlet tube assembly.

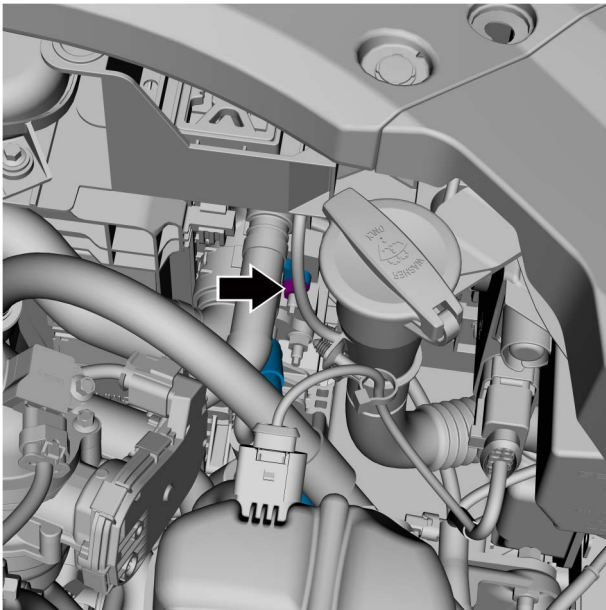
Installation Procedure

Caution

– Any O-rings involved in the installation process must be replaced with new parts. When installing the A/C pipe, insert the pipe joint completely before tightening the nut to prevent damage to the O-ring and pipe joint.

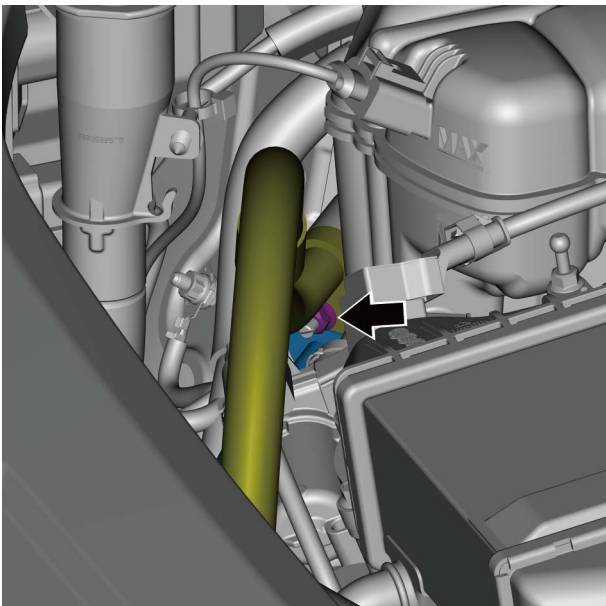
– If you are replacing all the A/C lines you need to add 15ml compressor lubricant.

– When only replacing any of the A/C lines, there is no need to add additional compressor lubricant.



- 1 Install the fixing nut for the condenser outlet tube assembly to be connected to the condenser.

Torque: 24N·m



- 2 Install the fixing nut for the A/C low pressure hose assembly to connect to the condenser outlet tube assembly.

Torque: 10N·m

- 3 Operate the A/C refrigerant charging procedure.
- 4 Install the engine compartment trim panel.
- 5 Install the engine trim cover assembly.

9.2.5.29 Replacement of A/C pressure sensor

Removal Procedure

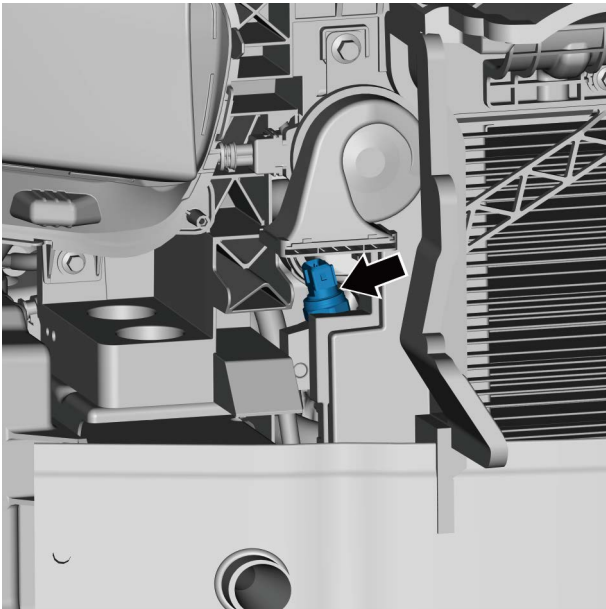
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the engine trim cover assembly, refer to [Replacement of engine trim cover assembly](#).
- 3 Remove the engine compartment trim panel, refer to [Replacement of engine compartment trim panel](#).
- 4 Recover refrigerant, see [A/C Refrigerant Recovery and Refill](#).
- 5 Remove the front bumper assembly, refer to [Replacement of front bumper assembly](#).

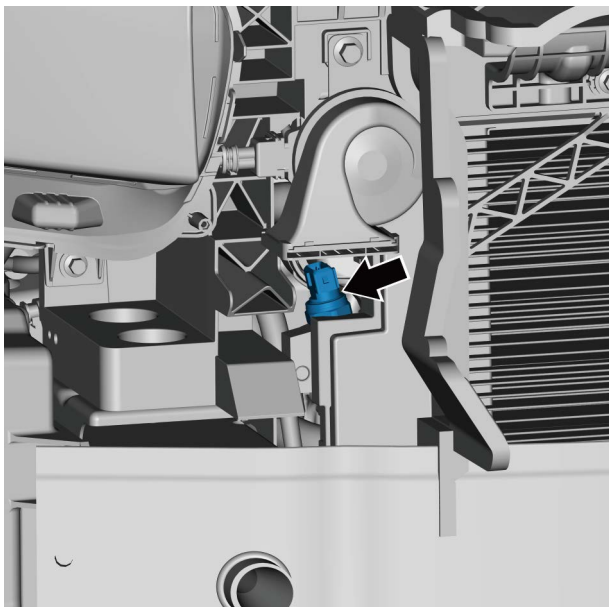


- 6 Disconnect the A/C pressure sensor harness connector.



- 7 Disassemble A/C pressure sensor and remove.

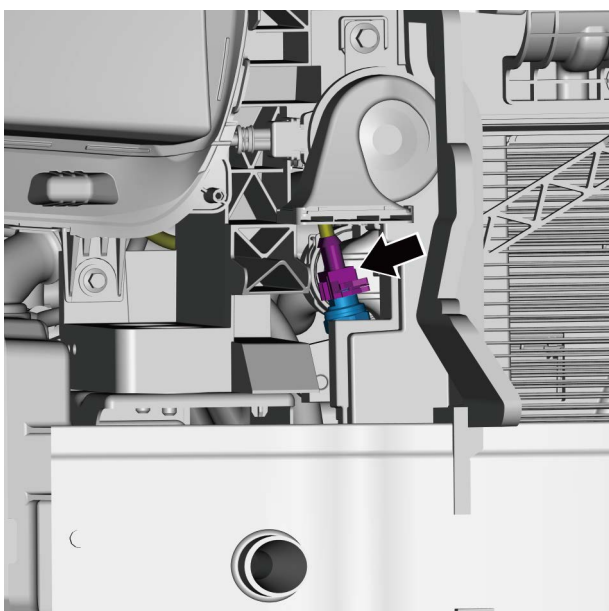
Installation Procedure



- 1 Install the A/C pressure sensor.

Caution

Take care to check that the seal is intact when tightening.



- 2 Connect A/C pressure sensor harness connector.

- 3 Install the front bumper assembly.
- 4 Operate the A/C refrigerant charging procedure.
- 5 Install the engine compartment trim panel.
- 6 Install the engine trim cover assembly.
- 7 Connect the negative cable of battery.

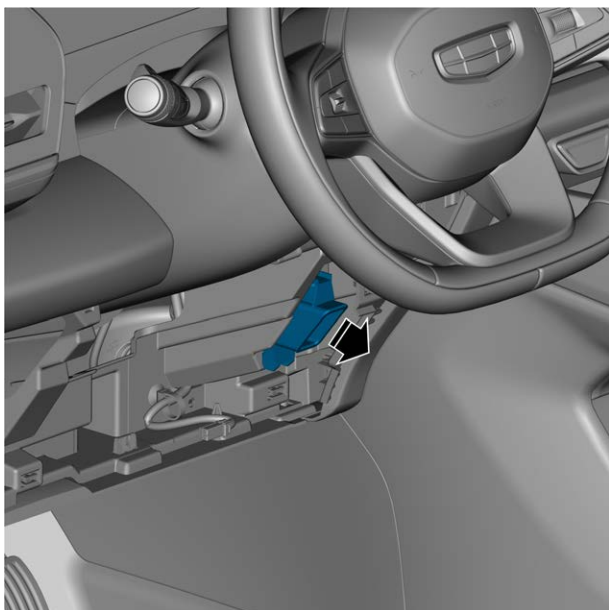
9.2.5.30 A/C temperature sensor replacement

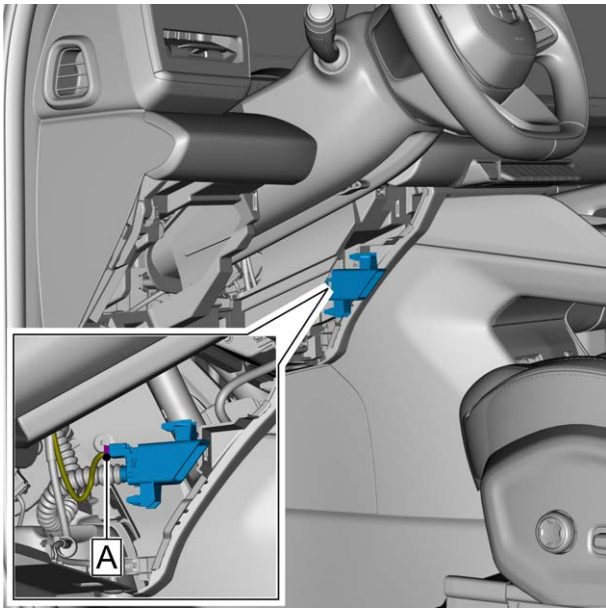
Removal Procedure

Warning !

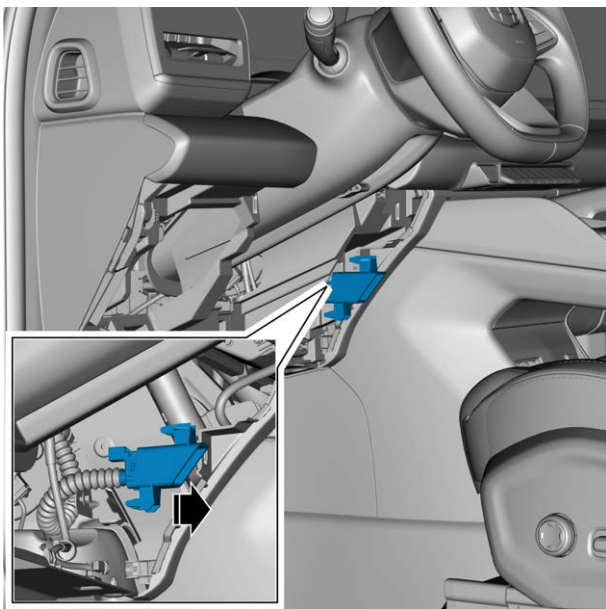
Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the instrument panel left lower shield assembly, refer to [Replacement of instrument panel left lower shield assembly](#).
- 3 Remove the A/C temperature sensor bracket.



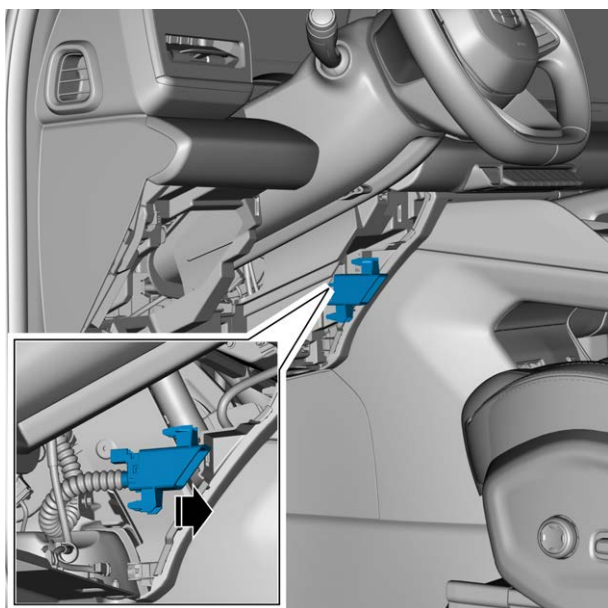


- 4 Disconnect A/C temperature sensor harness connector A.

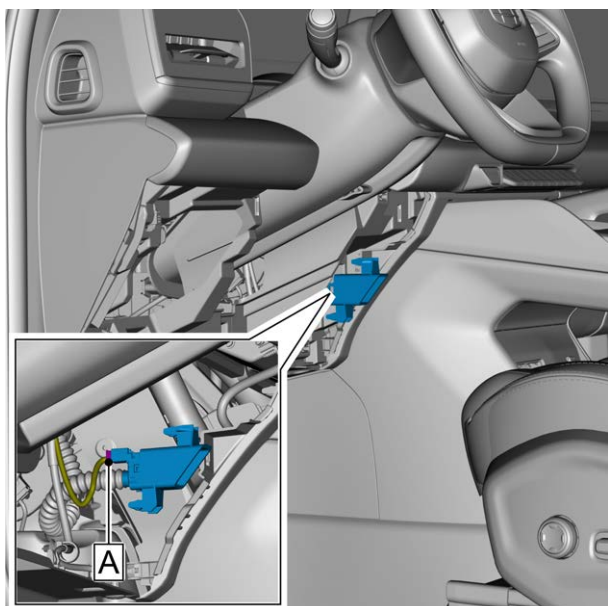


- 5 Disconnect the interior temperature sensor air duct from the A/C temperature sensor and remove the A/C temperature sensor.

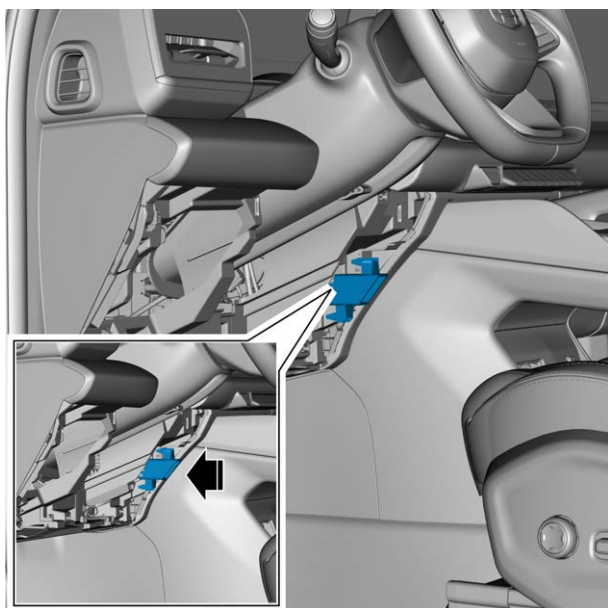
Installation Procedure



- 1 Install the interior temperature sensor air duct.



- 2 Connect A/C temperature sensor harness connector A.



- 3 Install the A/C temperature sensor bracket.

- 4 Install the left lower shield assembly of the instrument panel.
- 5 Connect the negative cable of battery.

9.2.5.31 Left side pressure relief valve replacement

Removal Procedure

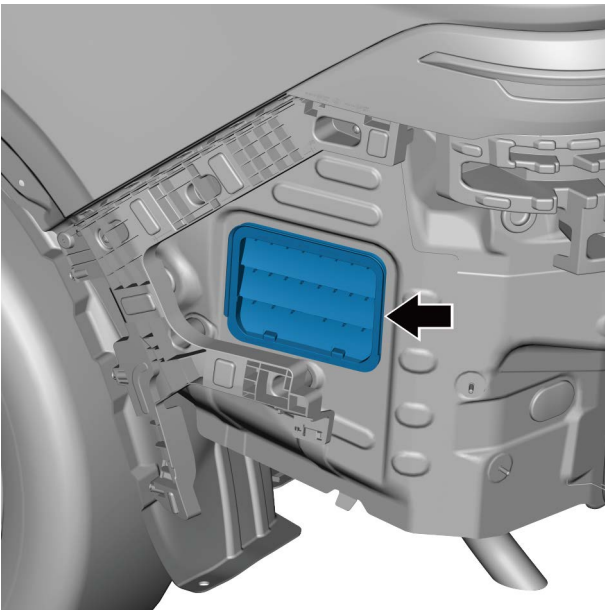
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

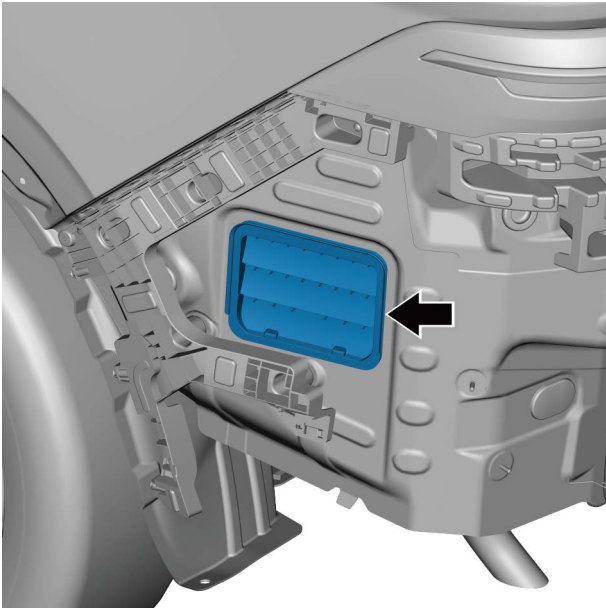
Caution

The left and right pressure relief valves are removed and installed in a similar manner.

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the rear bumper assembly, refer to [Replacement of rear bumper assembly](#).
- 3 Remove the left side pressure relief valve from the body and remove the left side pressure relief valve.



Installation Procedure



1 Install the left side pressure relief valve.

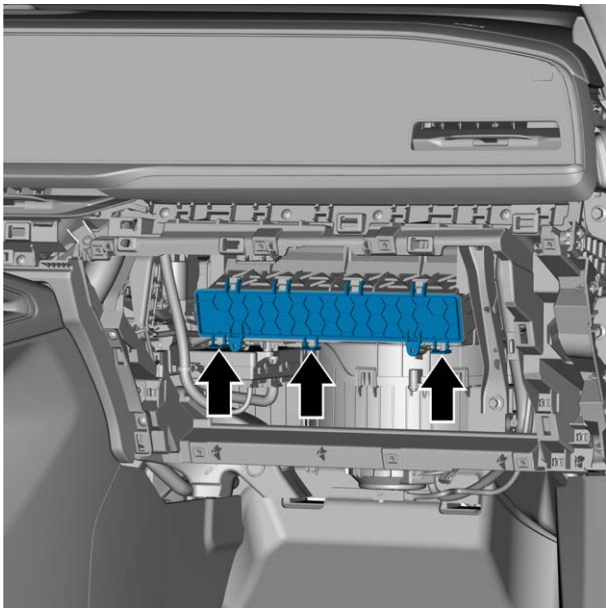
2 Install the rear bumper assembly.

3 Connect the negative cable of battery.

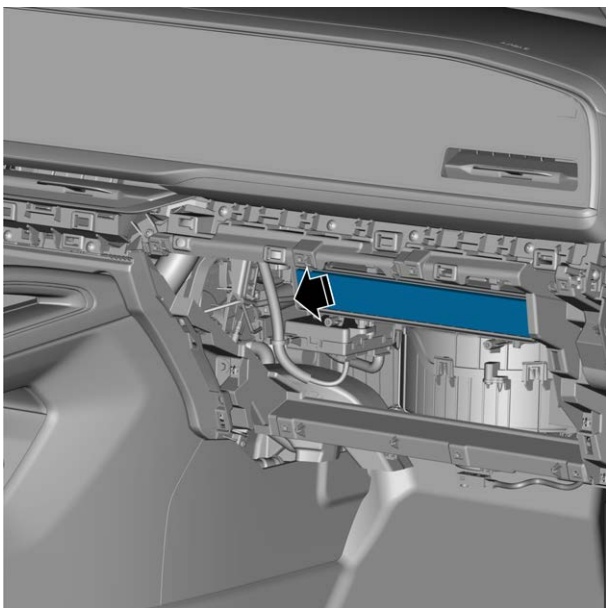
9.2.5.32 Replacement of Air Filter Combination (Cab)

Removal Procedure

- 1 Remove the glove box frame assembly, refer to [Replacement of glove box frame assembly](#).

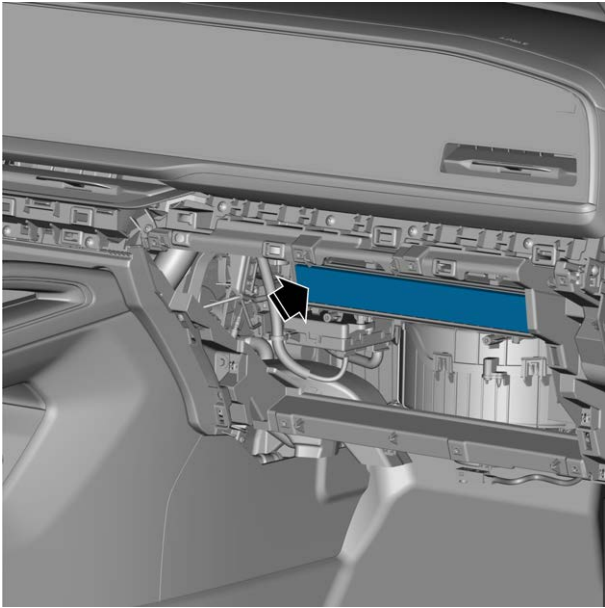


- 2 Remove the air filter cover.



- 3 Pull out the air filter assembly (cab).

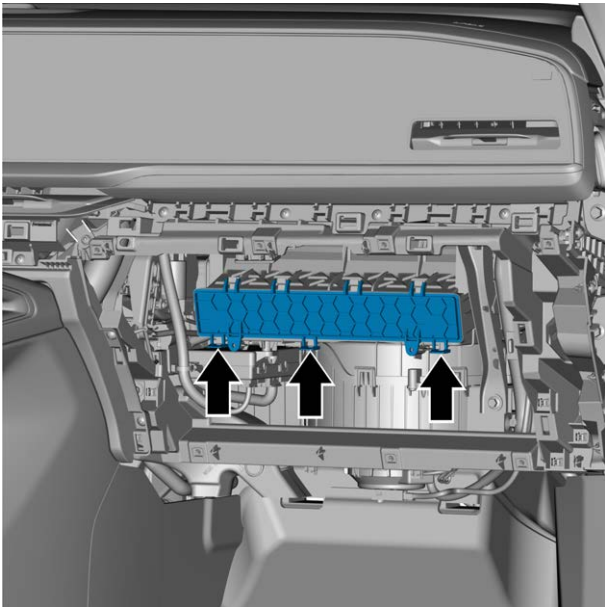
Installation Procedure



- 1 Install the air filter element combination (cab).

Caution

Confirm the orientation of the air filter assembly (cab) when installing it; do not install it backwards.



- 2 Install the air filter cover.

- 3 Install the glove box fame assembly.

9.2.5.33 Ambient Temperature Sensor (Exterior Rearview Mirror) Replacement

Removal Procedure

Remove the ambient temperature sensor (exterior rearview mirror), see [Exterior rearview mirror \(left\) replacement](#).

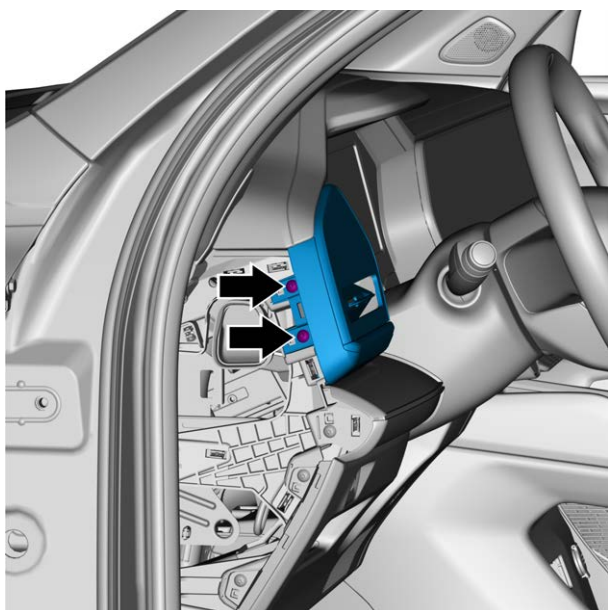
9.2.5.34 Replacement of the left side air outlet assembly of the instrument panel

Removal Procedure

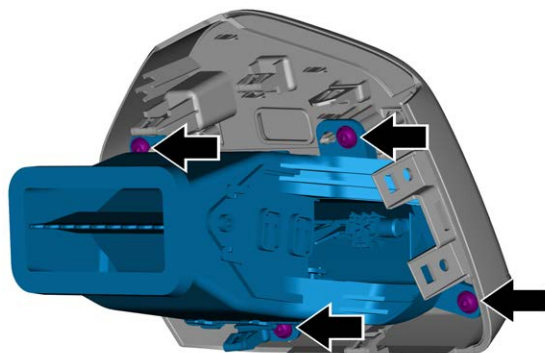
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the instrument panel front left side end cover assembly, refer to [Replacement of instrument panel front left side end cover assembly](#).
- 3 Remove the 2 fixing screws of the left air outlet panel assembly.



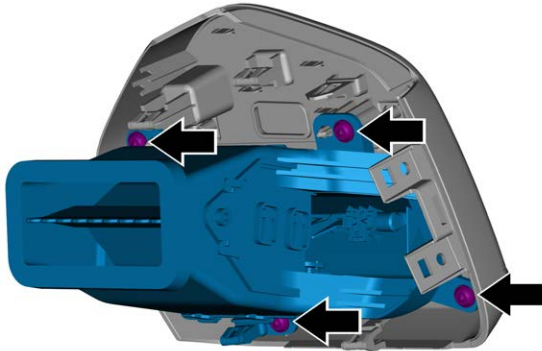
- 4 Remove the 4 fixing bolts from the instrument panel left side air outlet assembly and remove them.



Installation Procedure

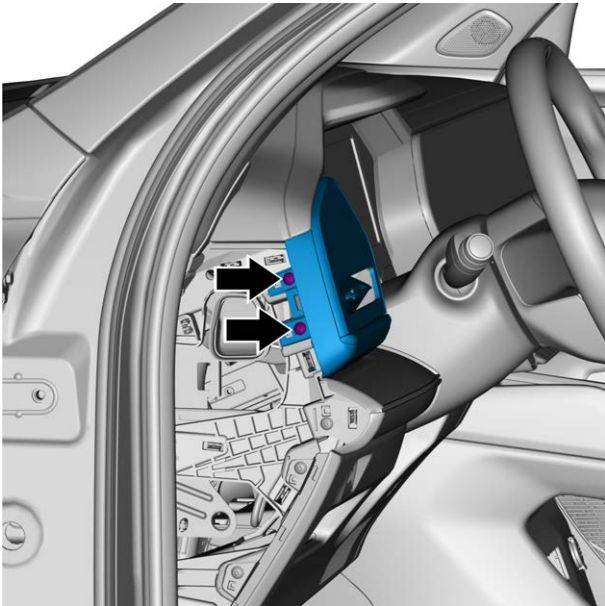
- 1 Install 4 fixing screws of the instrument panel left side air outlet assembly.

Torque: 1.5N·m



- 2 Install the 2 fixing screws of left A/C air outlet panel assembly.

Torque: 2.5N·m



- 3 Install the instrument panel front left side end cover assembly.

- 4 Connect the negative cable of battery.

9.2.5.35 Replacement of the instrument panel right side air outlet assembly

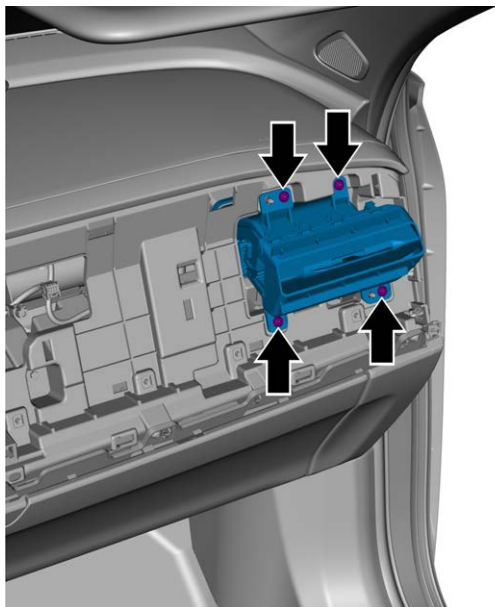
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

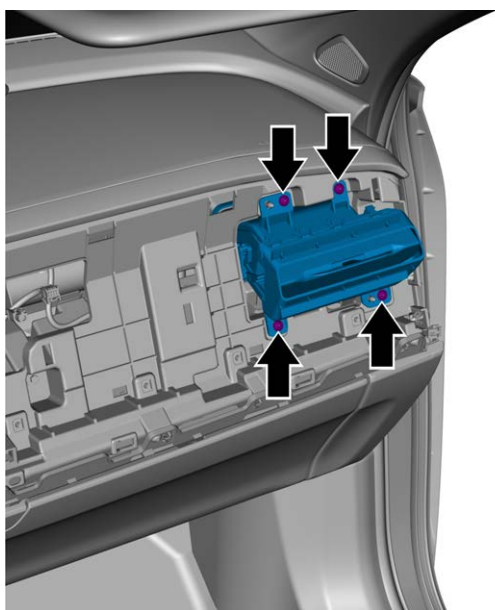
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

- 2 Remove the center console display, Refer to [Replacement of center console display](#).
- 3 Remove the 4 fixing screws of the air outlet assembly on the right side of the instrument panel and take them off.



Installation Procedure

- 1 Install the instrument panel right side air outlet assembly 4 fixing screws.
Torque: 1.5N·m



- 2 Install the center console display.
- 3 Connect the negative cable of battery.

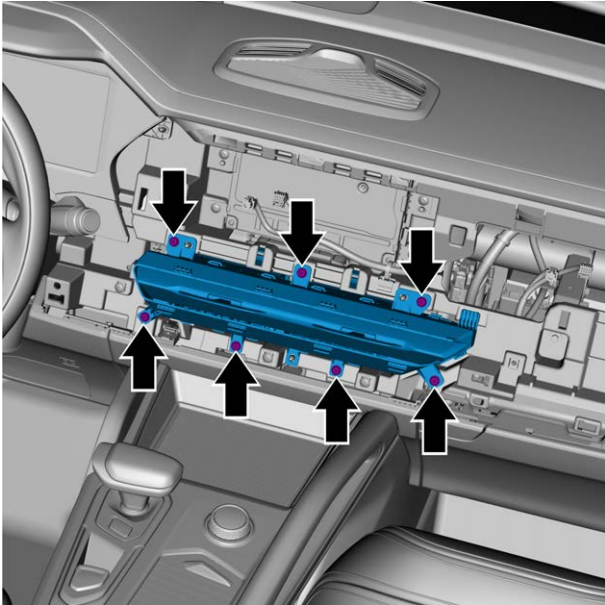
9.2.5.36 Replacement of the instrument panel center air outlet assembly

Removal Procedure

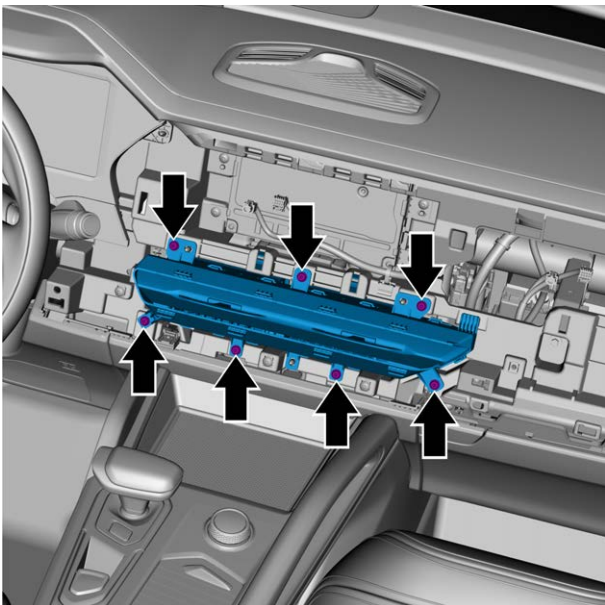
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the center console display, Refer to [Replacement of center console display](#).
- 3 Remove 7 fixing screws of the instrument panel center air outlet assembly and take them off.

**Installation Procedure**

- 1 Install 7 fixing screws of the instrument panel center air outlet assembly.
Torque: 1.5N·m



- 2 Install the center console display.
- 3 Connect the negative cable of battery.

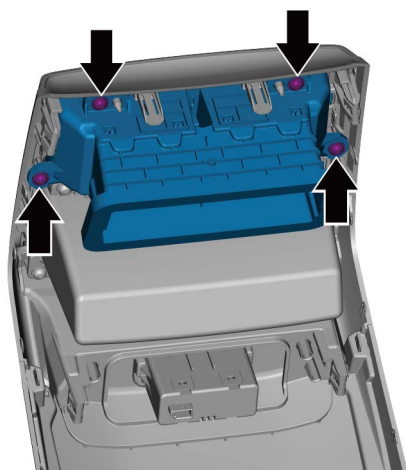
9.2.5.37 Sub-instrument rear air outlet assembly replacement

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

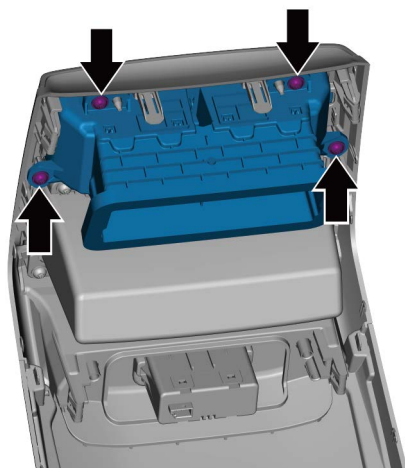
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the console rear panel assembly, refer to [Replacement of console rear panel assembly](#).
- 3 Remove 4 fixing bolts of the sub-instrument panel rear air outlet assembly and take off the sub-instrument panel rear air outlet assembly.



Installation Procedure

- 1 Install 4 fixing bolts of the sub-instrument panel rear air outlet assembly.

Torque: 1.5N·m



- 2 Install the console rear panel assembly.
- 3 Connect the negative cable of battery.

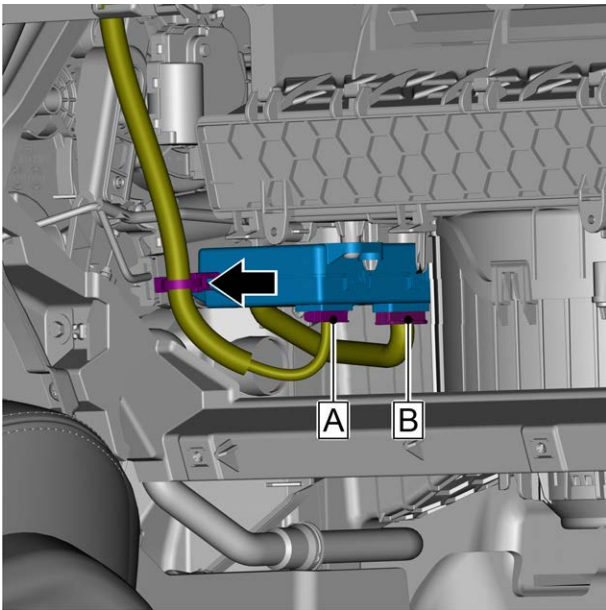
9.2.5.38 Temperature Control Module Replacement

Removal Procedure

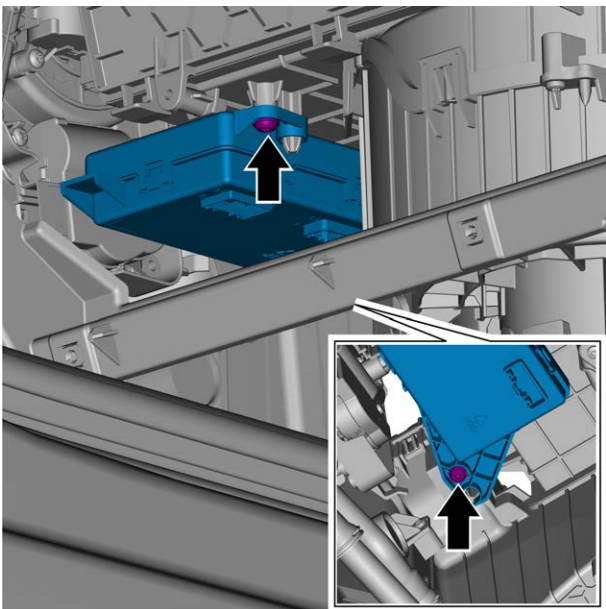
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the glove box frame assembly, refer to [Replacement of glove box frame assembly](#).
- 3 Remove the front foot-blowing right air duct, see [Front foot-blowing right air duct replacement](#).

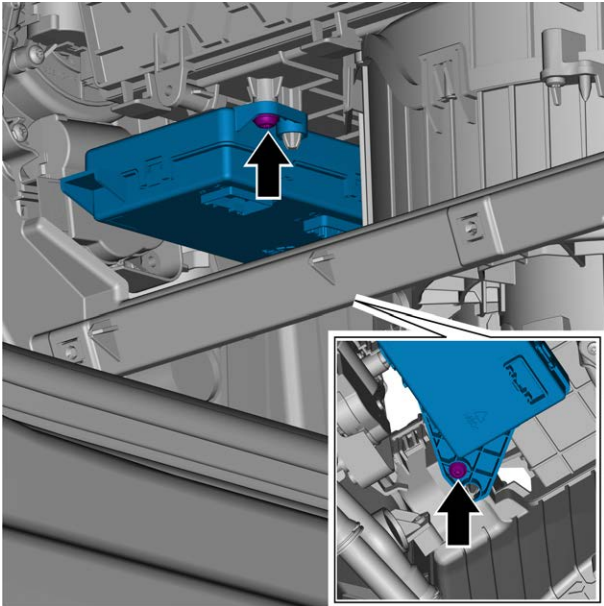


- 4 Disconnect the temperature control module harness retaining clips.
- 5 Disconnect temperature control module harness connector A and harness connector B.

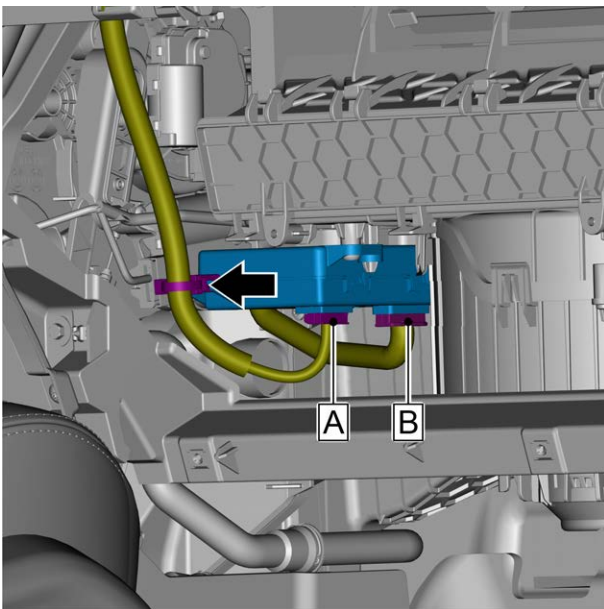


- 6 Remove the temperature control module by removing the two temperature control module fixing screws.

Installation Procedure



- 1 Install 2 fixing screws of temperature control module.
Torque: 1.5N·m



- 2 Secure the temperature control module harness retaining clips.
- 3 Install the temperature control module harness connector A and harness connector B.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 4 Install the front foot-blowing right air duct.
- 5 Install the glove box fame assembly.
- 6 Connect the negative cable of battery.
- 7 The GLDS diagnostic program is required, under the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software brushing operation.

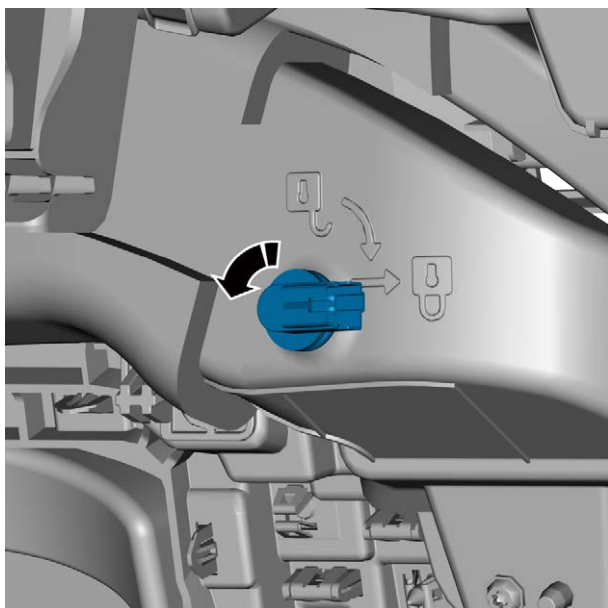
9.2.5.39 Replacement of interior temperature sensor (left side air outlet)

Removal Procedure

Warning !

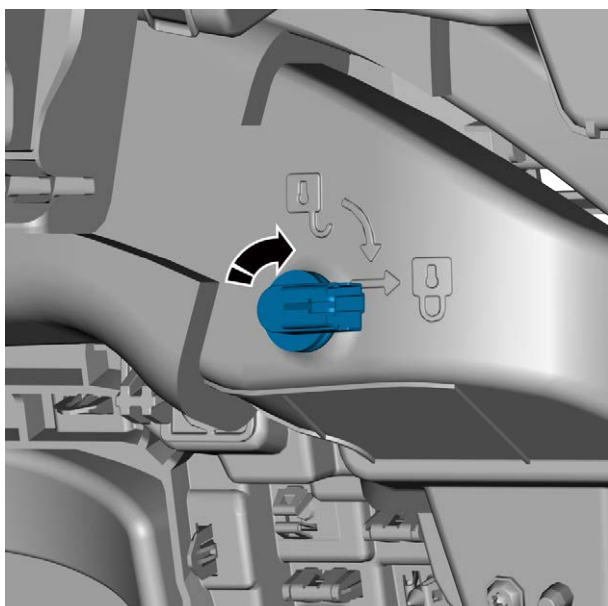
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the instrument panel body assembly, refer to [Replacement of instrument panel body assembly](#).
- 3 Remove interior temperature sensor (left side air outlet) and take it off.



Installation Procedure

- 1 Install interior temperature sensor (left side air outlet).

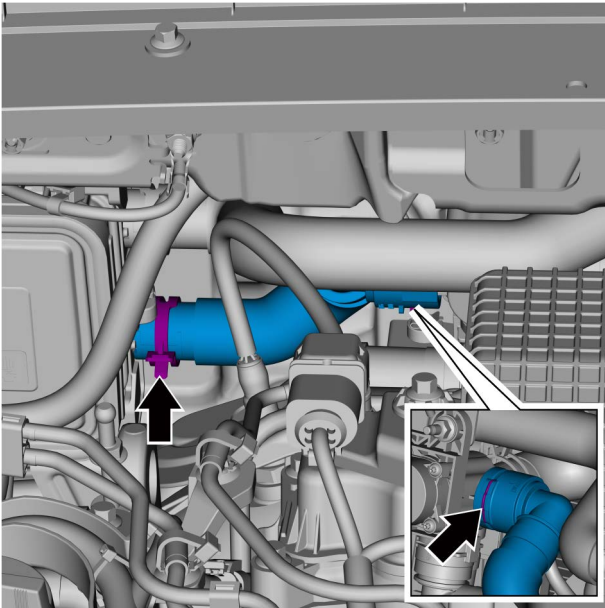


- 2 Install the instrument panel body assembly.
- 3 Connect the negative cable of battery.

9.2.5.40 Electric Heater Outlet Pipe Replacement

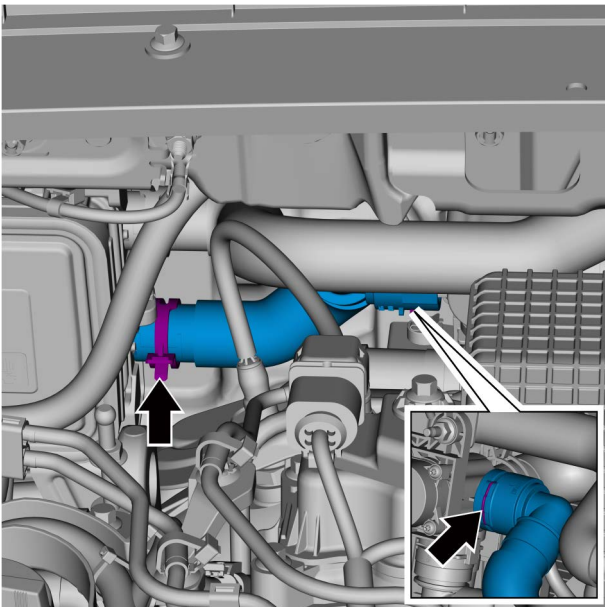
Removal Procedure

- 1 Remove the engine trim cover assembly, refer to [Replacement of engine trim cover assembly](#).
- 2 Remove the heat shield, see [Replacement of Heat Shield](#).
- 3 Drain coolant, see [Engine Coolant Drain and Fill](#).
- 4 Remove the 2 retaining clamps for the heater outlet pipe and remove the heater outlet pipe.



Installation Procedure

- 1 Install the heater outlet pipe.
- 2 Install the 2 retaining clamps.

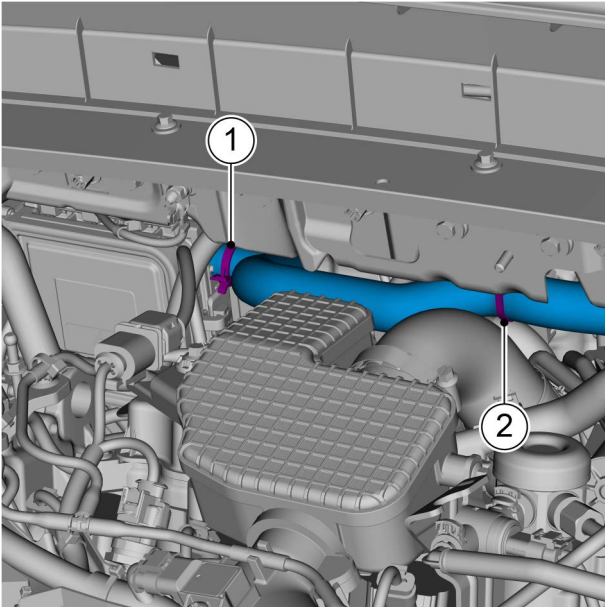


- 3 Fill in coolant.
- 4 Install the heat shield.
- 5 Install the engine trim cover assembly.

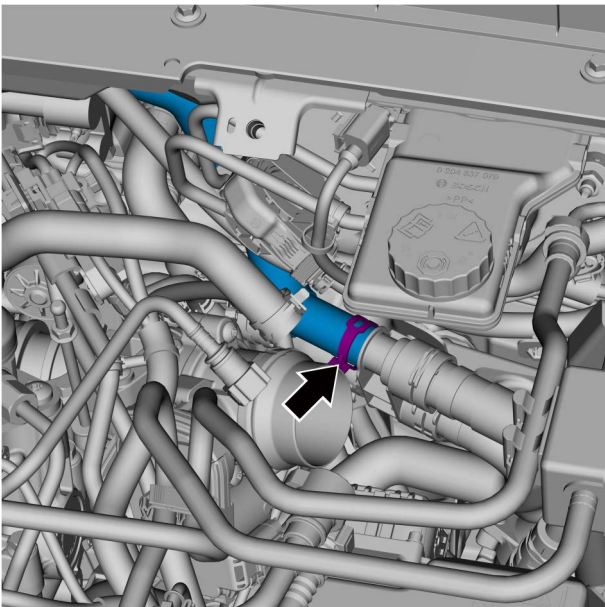
9.2.5.41 Heater inlet pipe replacement

Removal Procedure

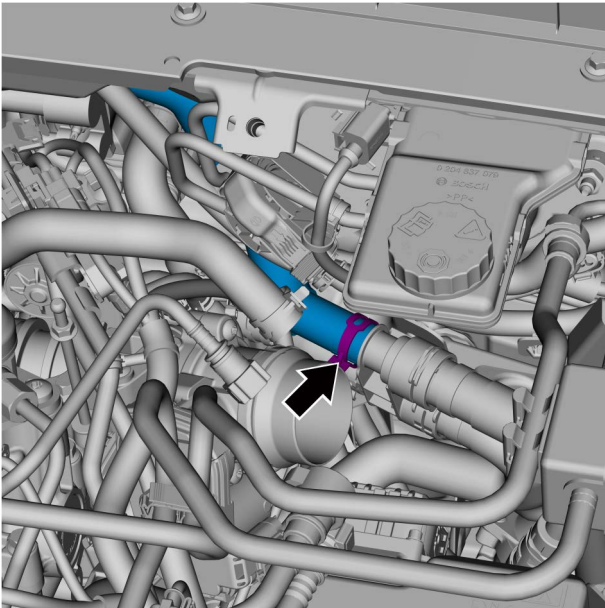
- 1 Remove the engine trim cover assembly, refer to [Replacement of engine trim cover assembly](#).
- 2 Remove the heat shield, see [Replacement of Heat Shield](#).
- 3 Drain coolant, see [Engine Coolant Drain and Fill](#).
- 4 Remove retaining clamp 1 from heater inlet pipe and disengage heater inlet pipe.
- 5 Remove the fixing clips 2 of the heater inlet pipe.



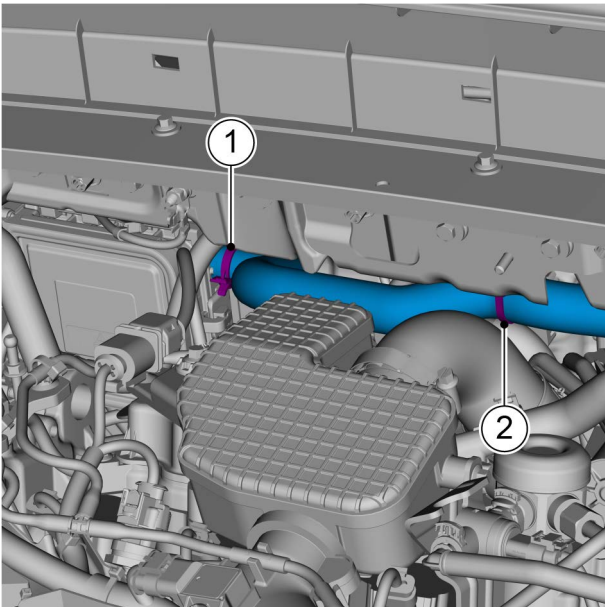
- 6 Remove the resonator assembly, see [Replacement of Resonator Assembly](#).
- 7 Remove the heater inlet pipe by removing the retaining clamp of the heater inlet pipe.



Installation Procedure



- 1 Install heater inlet pipe and tighten clamp.



- 2 Install the resonator assembly.
- 3 Install heater inlet pipe and tighten clamp 1.
- 4 Install heater inlet pipe retaining clips 2.

- 5 Fill in coolant.
- 6 Install the heat shield.
- 7 Install the engine trim cover assembly.

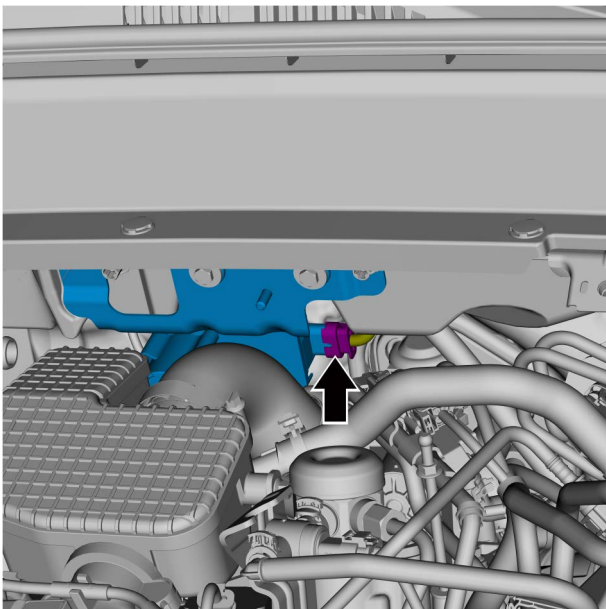
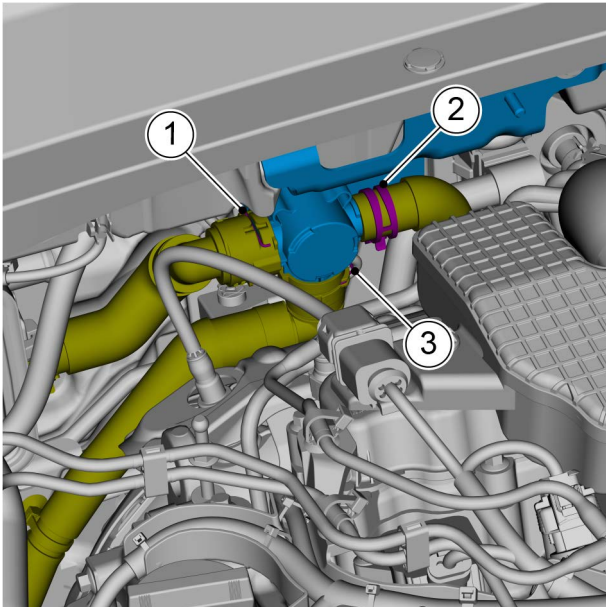
9.2.5.42 Replacement of battery circuit three-way valve

Removal Procedure

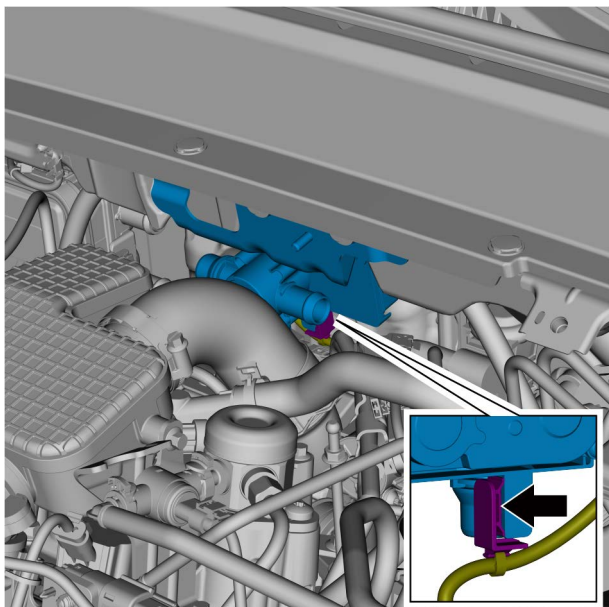
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

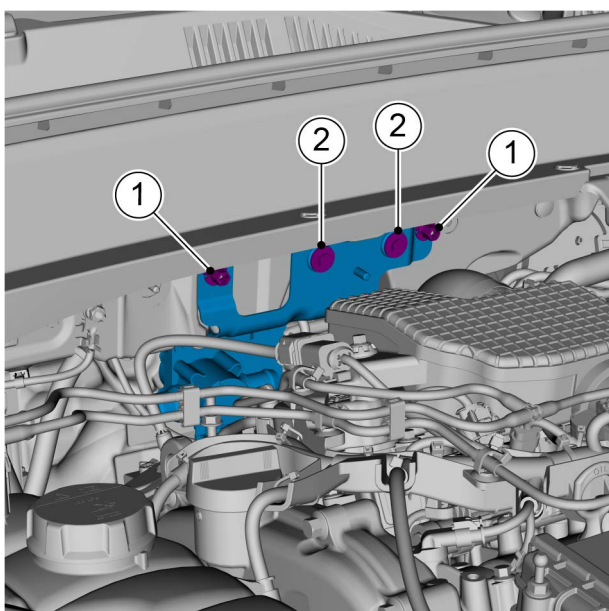
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).



- 2 Remove the engine trim cover assembly, refer to [Replacement of engine trim cover assembly](#).
- 3 Remove the heat shield, see [Replacement of Heat Shield](#).
- 4 Drain coolant, see [Engine Coolant Drain and Fill](#)
- 5 Remove the heater inlet pipe, see [Heater inlet pipe replacement](#).
- 6 Remove the retaining clamp 1 of the heater outlet pipe and disengage the heater outlet pipe.
- 7 Remove the retaining clamp 2 of the A/C warm air inlet pipe and disengage the A/C warm air inlet pipe.
- 8 Remove the retaining clamp 3 of the heat exchanger water inlet hose and disconnect the heat exchanger water inlet hose.
- 9 Disconnect the harness connector from the battery circuit three-way valve.

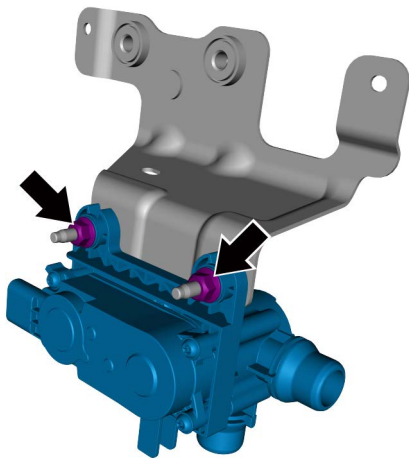


- 10 Remove the wire retaining clips and set the wiring harness aside.

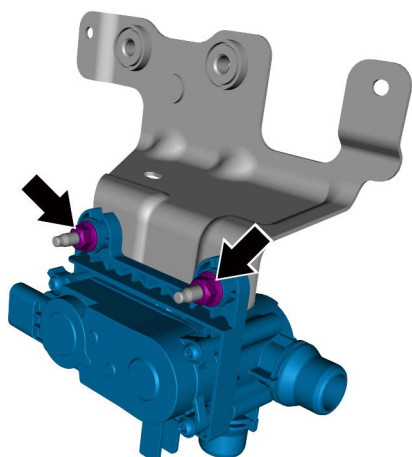


- 11 Remove the 2 plastic fixing nuts 1 of the battery circuit three-way valve and bracket.
- 12 Remove the 2 fixing bolts 2 of the battery circuit three-way valve and bracket. Remove the battery circuit three-way valve and bracket.

- 13 Remove the 2 fixing nuts of the battery circuit three-way valve. Remove the battery circuit three-way valve.

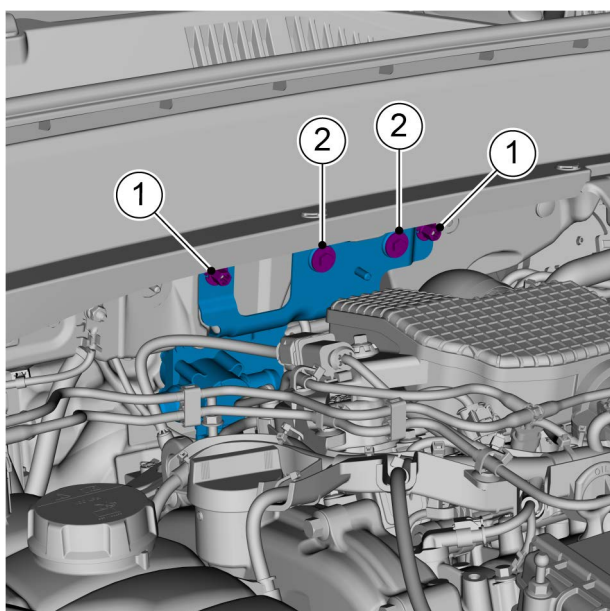


Installation Procedure



- 1 Install the 2 fixing nuts for the battery circuit three-way valve.

Torque: 10N·m

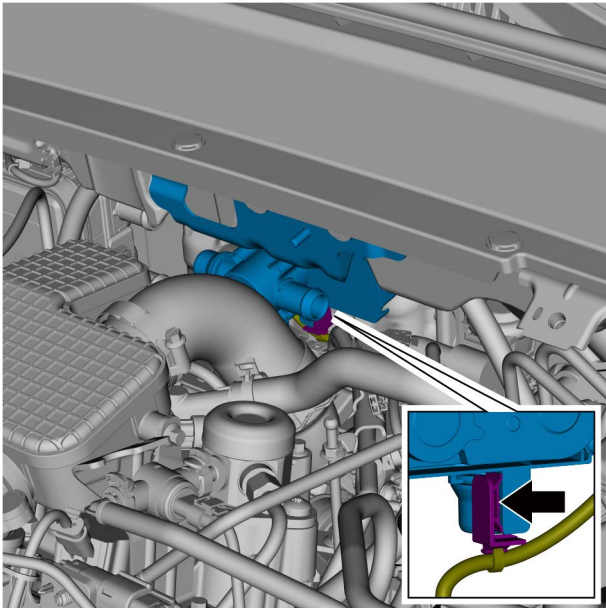


- 2 Install the battery circuit three-way valve and bracket and install the 2 fixing bolts 2.

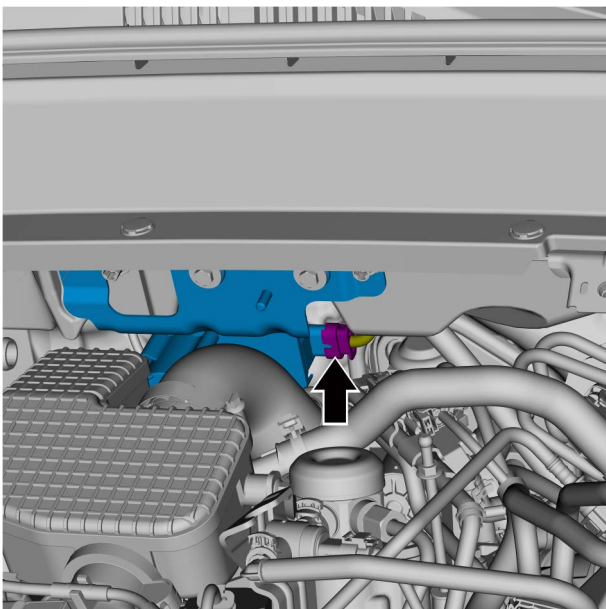
Torque: 8N·m

- 3 Install the 2 plastic fixing nuts 1 for the battery circuit three-way valve and bracket.

Torque: 2N·m



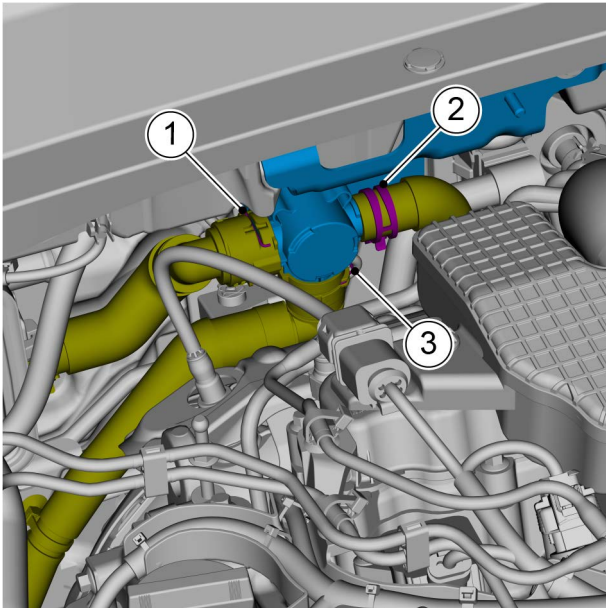
4 Install the wiring harness clips.



5 Connect the harness connector of the battery circuit three-way valve.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



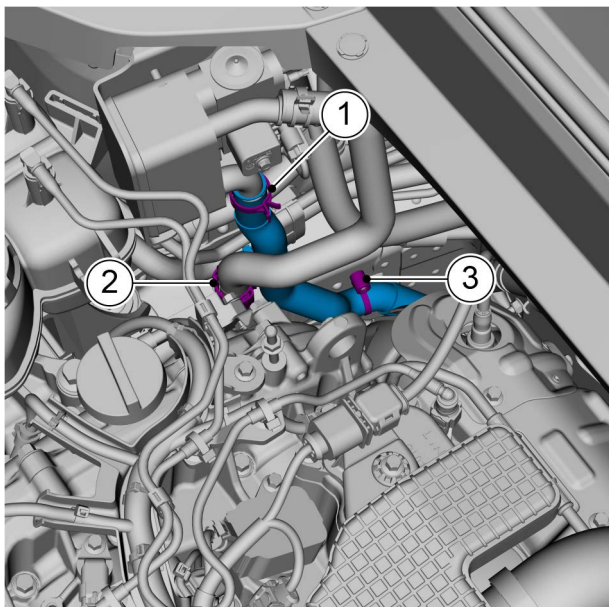
- 6 Install the heater outlet pipe 1 and tighten the clamp.
- 7 Install the A/C warm air inlet pipe 2 and tighten the clamp.
- 8 Install the heat exchanger water inlet hose 3 and tighten the clamp.

- 9 Install the heater inlet pipe.
- 10 Fill in coolant.
- 11 Install the heat shield.
- 12 Install the engine trim cover assembly.
- 13 Connect the negative cable of battery.

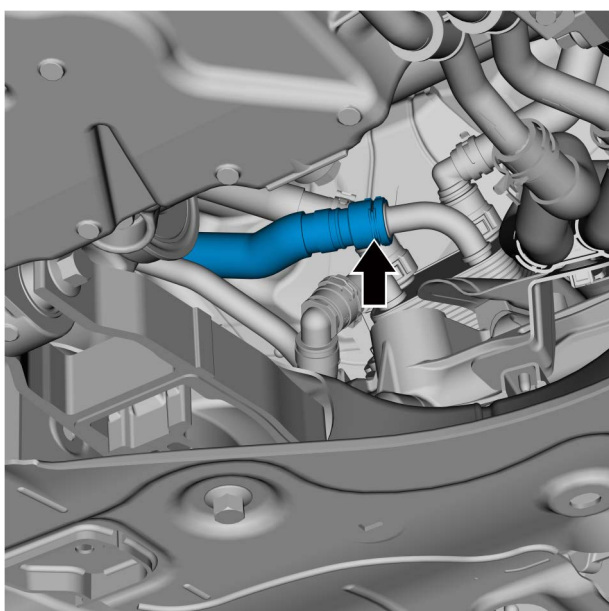
9.2.5.43 Replacement of Water Inlet Valve Hose

Removal Procedure

- 1 Remove the engine trim cover assembly, refer to [Replacement of engine trim cover assembly](#).
- 2 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 3 Drain coolant, see [Engine Coolant Drain and Fill](#)

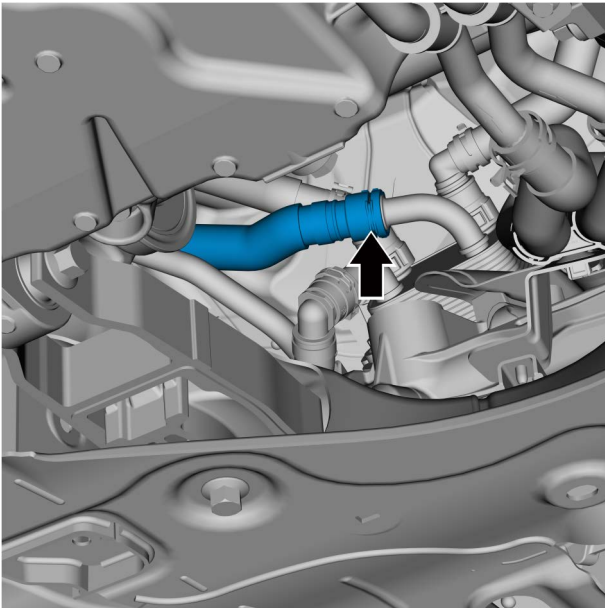


- 4 Remove the water inlet valve hose retaining clamp 1 and disconnect the water inlet valve hose.
- 5 Remove water inlet valve hose clamp 2.
- 6 Remove inlet valve hose clamp 3 and disconnect it from body.

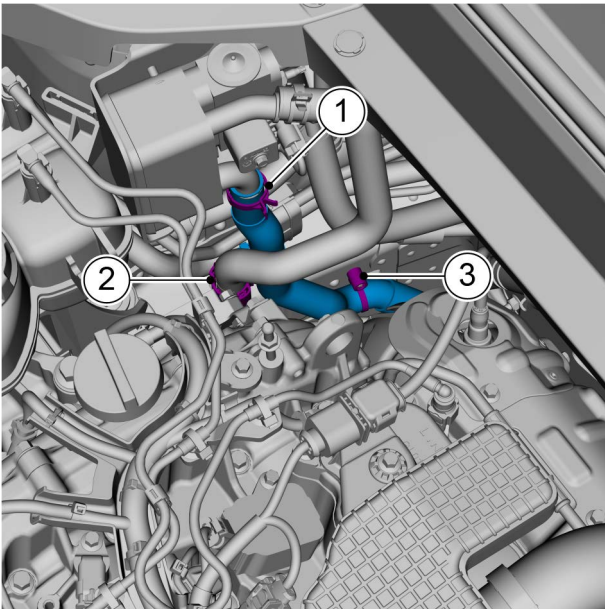


- 7 Disconnect water inlet valve hose from heat exchanger and remove water inlet valve hose.

Installation Procedure



- 1 Install the water inlet valve hose.



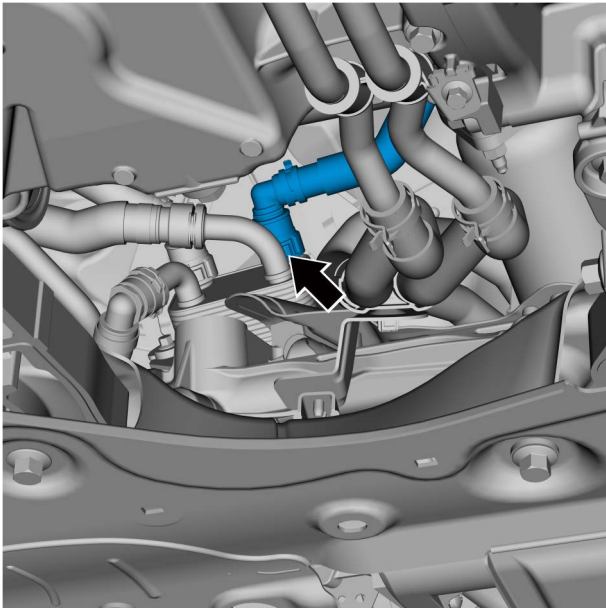
- 2 Install the water inlet valve hose and tighten the retaining clamp 1.
- 3 Install inlet valve hose retaining clamp 2.
- 4 Install inlet valve hose retaining clamp 3.

- 5 Fill in coolant.
- 6 Install the bottom engine guard assembly.
- 7 Install the engine trim cover assembly.

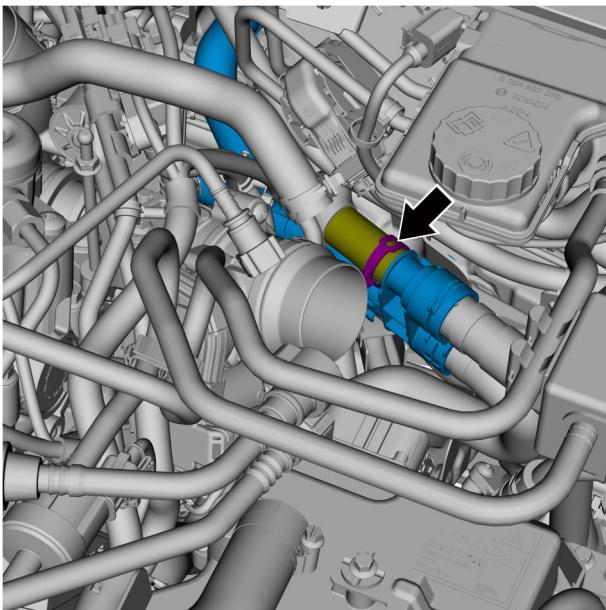
9.2.5.44 A/C warm air outlet pipe replacement

Removal Procedure

- 1 Remove the engine trim cover assembly, refer to [Replacement of engine trim cover assembly](#).
- 2 Remove the heat shield, see [Replacement of Heat Shield](#).
- 3 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 4 Drain coolant, see [Engine Coolant Drain and Fill](#)

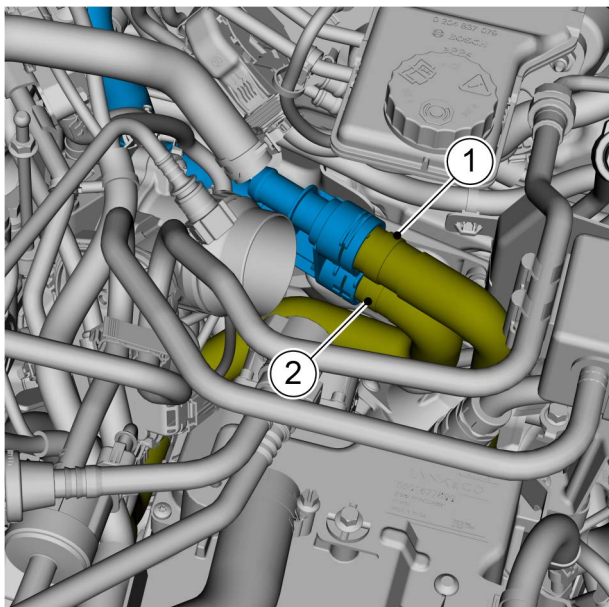


5 Remove the A/C warm air outlet pipe.

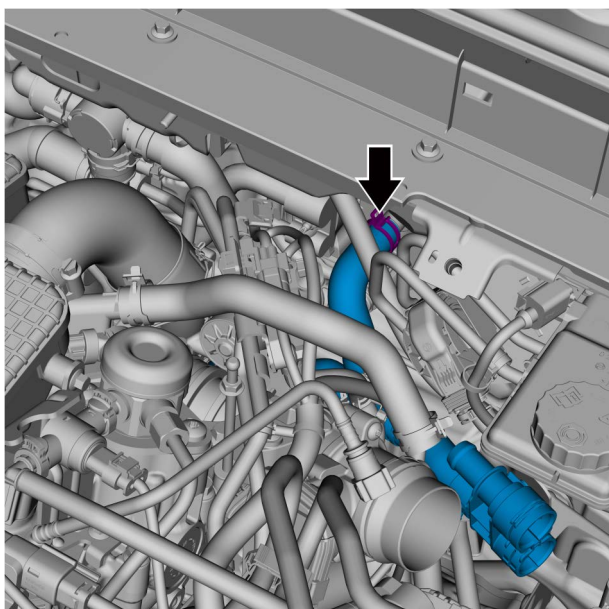


6 Remove the resonator assembly, see [Replacement of Resonator Assembly](#).

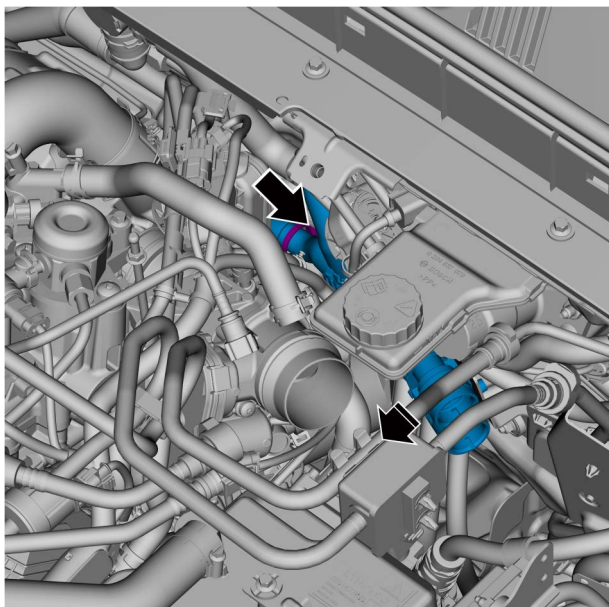
7 Remove the retaining clamps for the heater inlet pipe and disengage the heater inlet pipe.



- 8 Remove the heater inlet pipe 1 and set the heater inlet pipe aside.
- 9 Remove the transmission oil cooler inlet pipe 2 and set the transmission oil cooler inlet pipe aside.



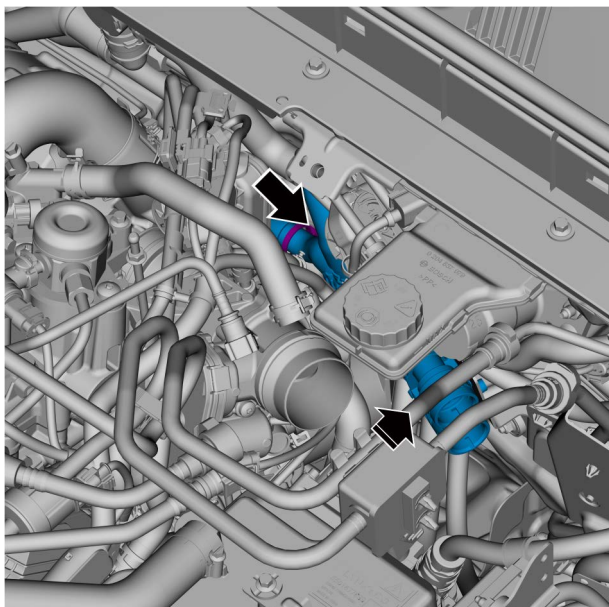
- 10 Remove the A/C warm air outlet pipe retaining clips and disengage the A/C warm air inlet pipe.

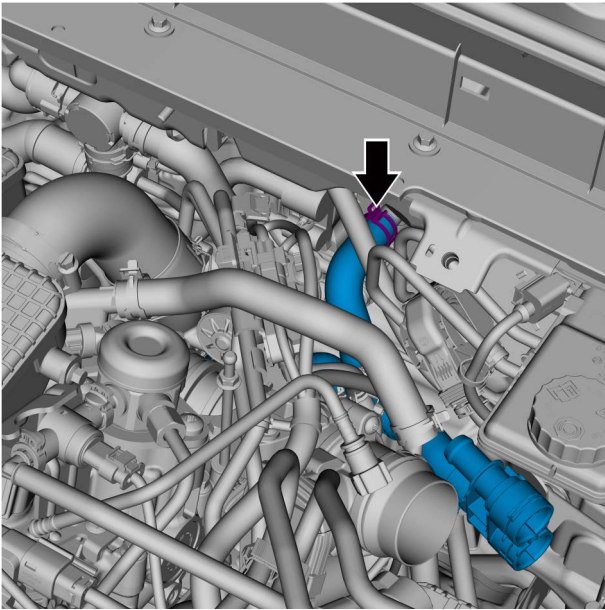


- 11 Remove the retaining clips for the A/C warm air outlet pipe.
- 12 Remove the A/C warm air outlet pipe in the direction of the arrow.

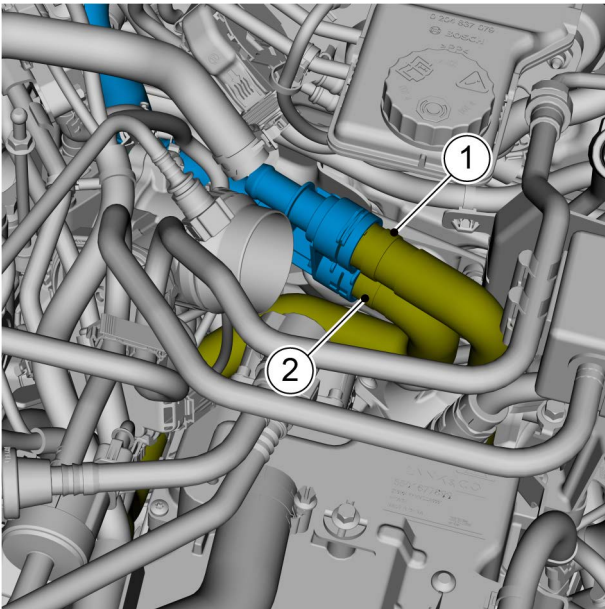
Installation Procedure

- 1 Install the A/C warm air outlet pipe in the direction of the arrow.
- 2 Install the A/C warm air outlet pipe retaining clips.

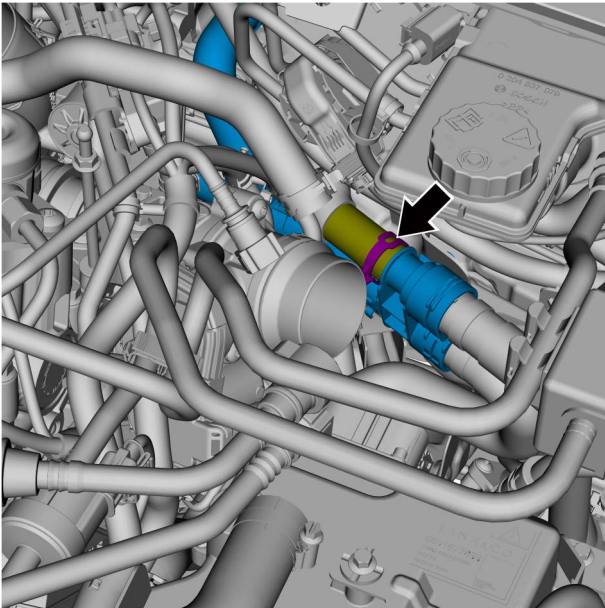




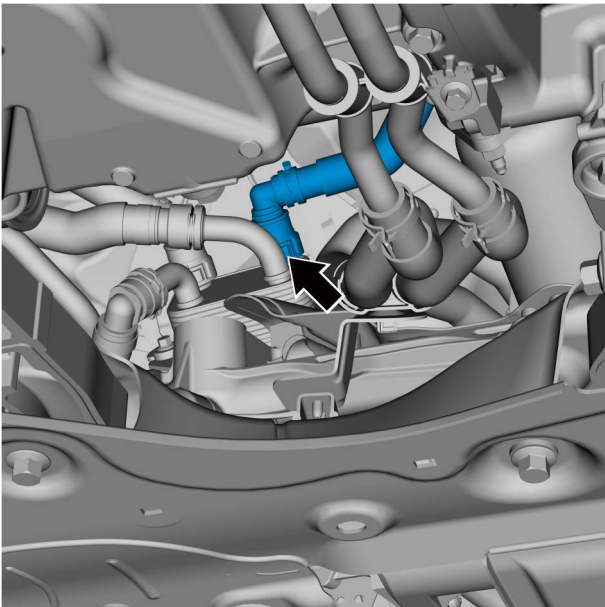
- 3 Install the A/C warm air outlet pipe and tighten the clamp.



- 4 Install the heater inlet pipe 1.
- 5 Install the transmission oil cooler inlet pipe 2.



- 6 Install heater inlet pipe and tighten clamp.



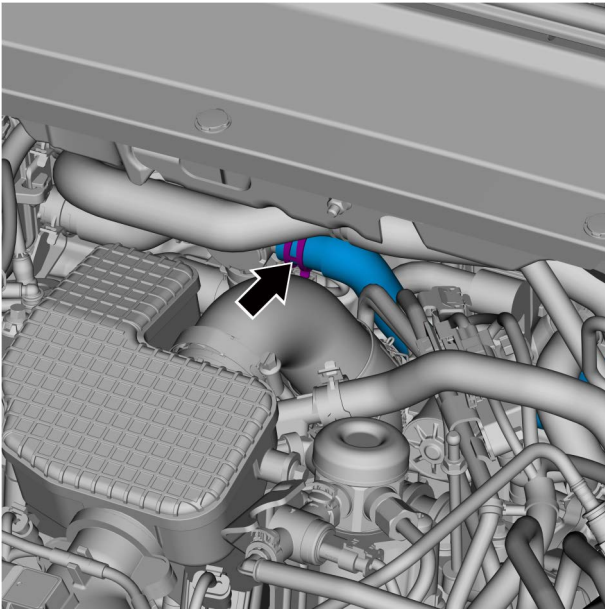
- 7 Install the resonator assembly.
- 8 Install the A/C warm air outlet pipe.

- 9 Fill in coolant.
- 10 Install the bottom engine guard assembly.
- 11 Install the heat shield.
- 12 Install the engine trim cover assembly.

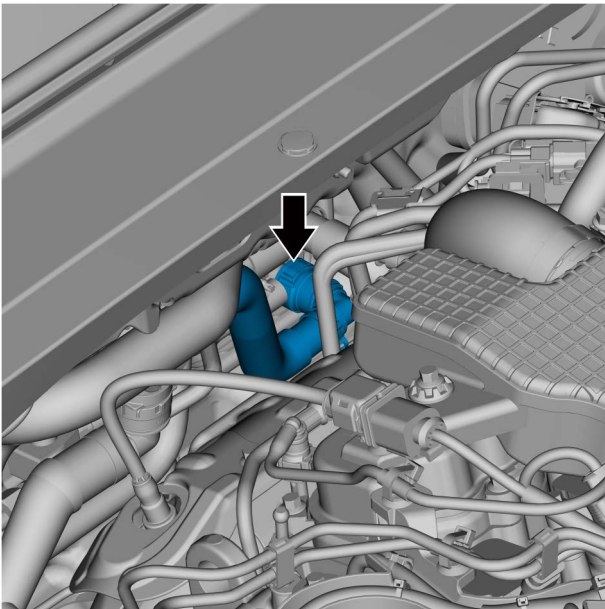
9.2.5.45 A/C Warm Air Inlet Pipe Replacement

Removal Procedure

- 1 Remove the engine trim cover assembly, refer to [Replacement of engine trim cover assembly](#).
- 2 Remove the heat shield, see [Replacement of Heat Shield](#).
- 3 Drain coolant, see [Engine Coolant Drain and Fill](#).

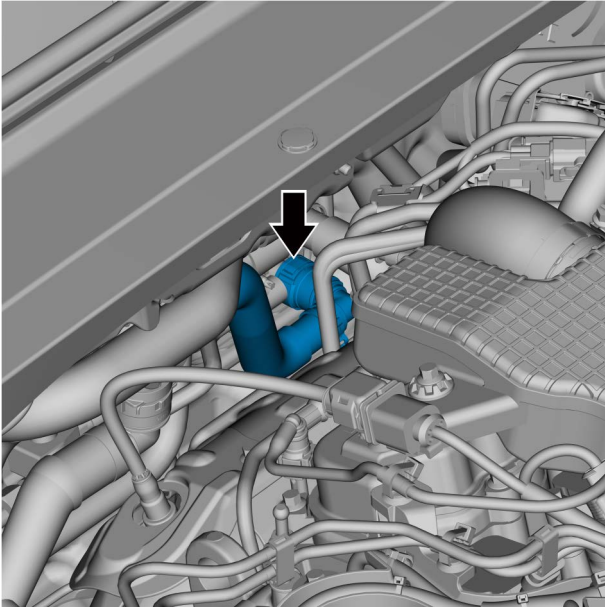


- 4 Remove the A/C warm air inlet pipe retaining clamp and disconnect the A/C warm air inlet pipe.

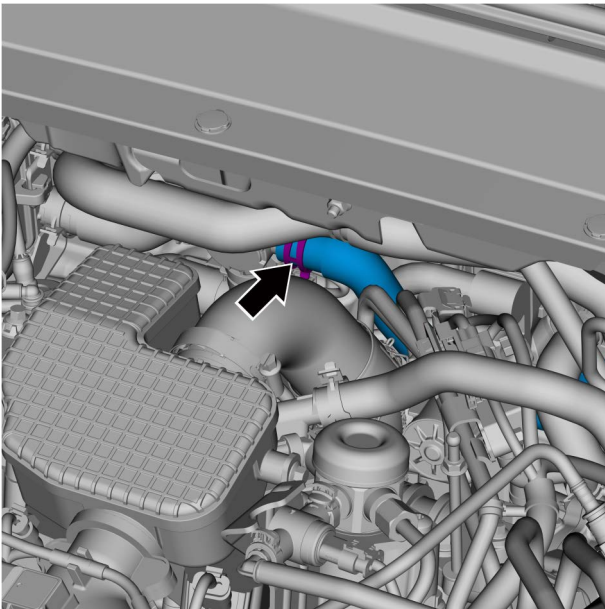


- 5 Remove the A/C warm air inlet pipe.

Installation Procedure



- 1 Install the A/C warm air inlet pipe.



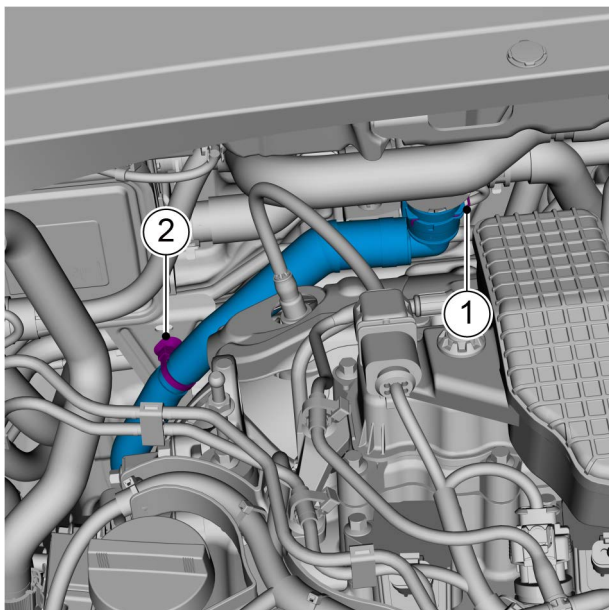
- 2 Install the A/C warm air inlet pipe and tighten the clamp.

- 3 Fill in coolant.
- 4 Install the heat shield.
- 5 Install the engine trim cover assembly.

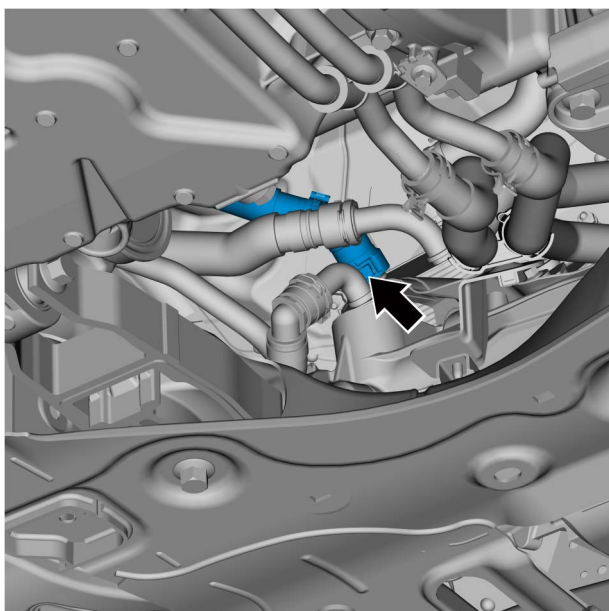
9.2.5.46 Heat exchanger water inlet hose replacement

Removal Procedure

- 1 Remove the engine trim cover assembly, refer to [Replacement of engine trim cover assembly](#).
- 2 Remove the heat shield, see [Replacement of Heat Shield](#).
- 3 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 4 Drain coolant, see [Engine Coolant Drain and Fill](#).

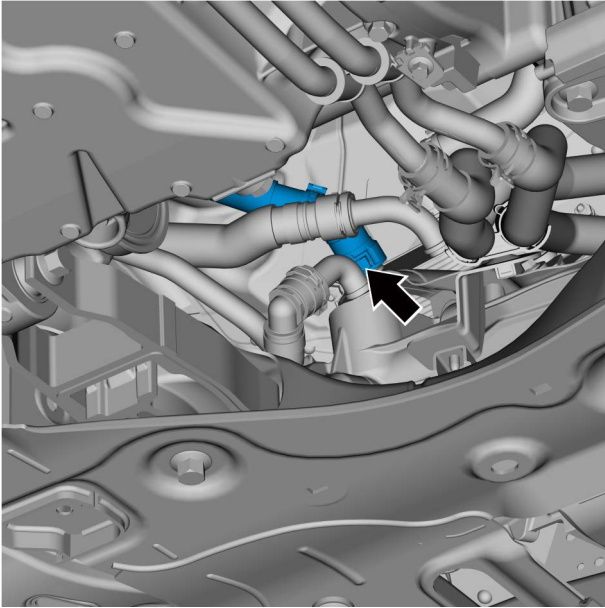


- 5 Remove the retaining clamp 1 of the heat exchanger water inlet hose and disconnect the heat exchanger water inlet hose.
- 6 Remove the heat exchanger water inlet hose retaining clips 2.

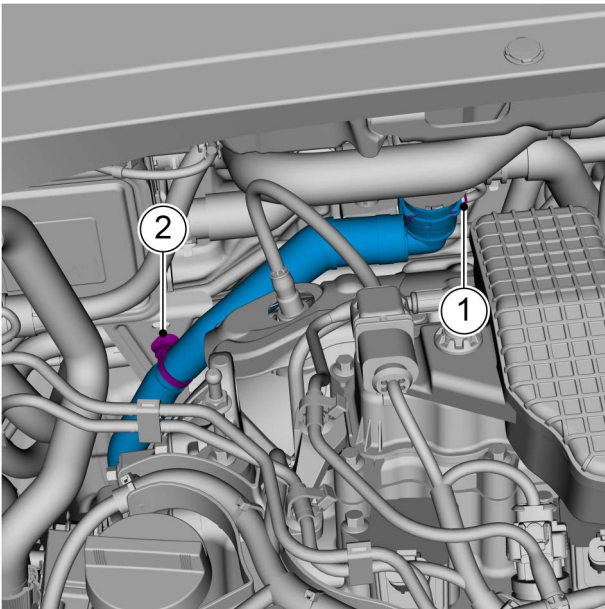


- 7 Remove heat exchanger water inlet hose.

Installation Procedure



- 1 Install heat exchanger water inlet hose.



- 2 Install the heat exchanger water inlet hose and tighten clamp 1.
- 3 Install heat exchanger water inlet hose retaining clips.

- 4 Fill in coolant.
- 5 Install the bottom engine guard assembly.
- 6 Install the heat shield.
- 7 Install the engine trim cover assembly.

9.2.5.47 Heater Replacement

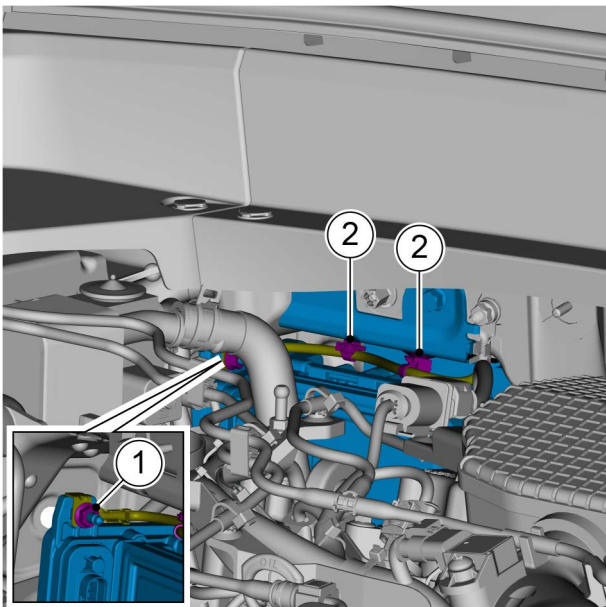
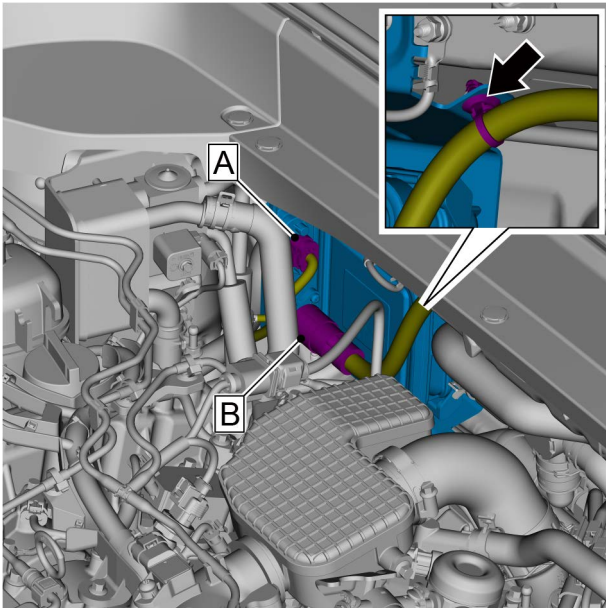
Removal Procedure

Warning !

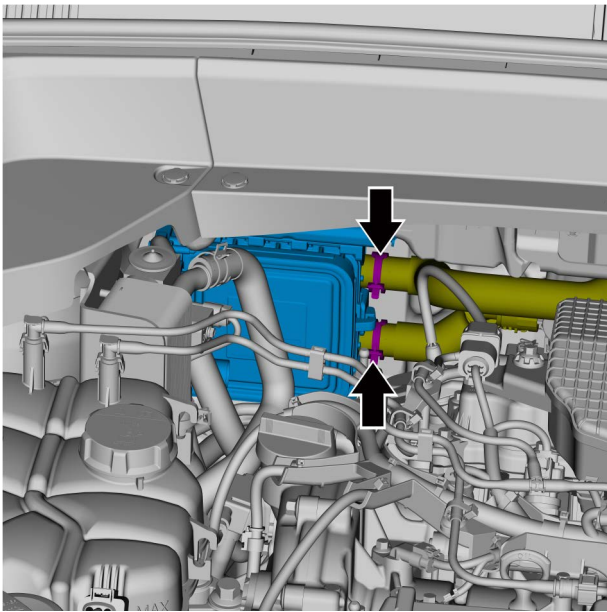
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

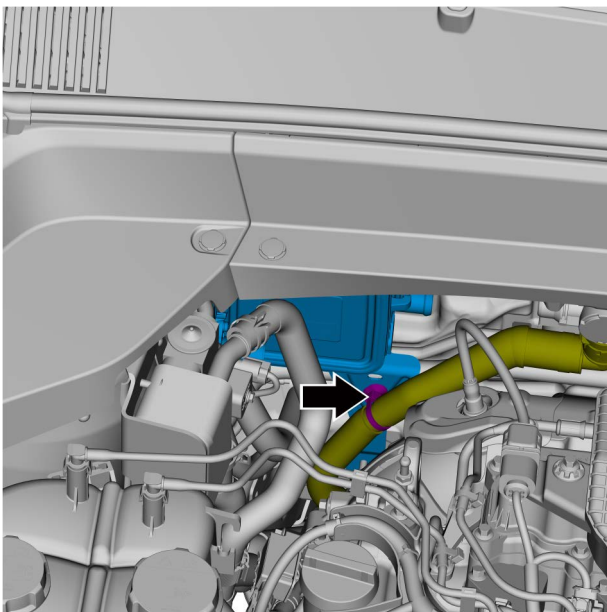
- 2 Perform the normal power outage process for the high voltage system, see [Normal Power Outage Process for High Voltage System](#).
- 3 Remove the engine trim cover assembly, refer to [Replacement of engine trim cover assembly](#).
- 4 Remove the heat shield, see [Replacement of Heat Shield](#).
- 5 Drain coolant, see [Electric System Coolant Drain and Fill Procedure](#).
- 6 Disconnect the heater low voltage harness connector A.
- 7 Disconnect the heater high voltage harness connector B and remove the heater harness retaining clips.



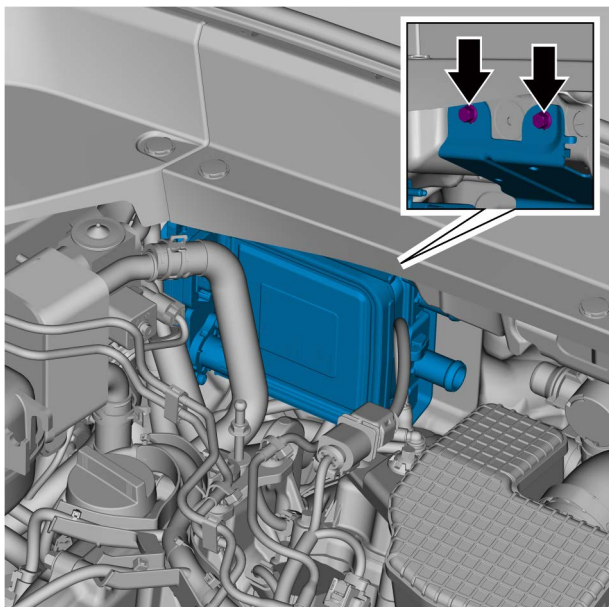
- 8 Remove the heater hitch harness fixing nut 1.
- 9 Remove the hitch wire retaining clips 2 and set the hitch wire aside.



- 10 Disconnect the electric heater inlet pipe and electric heater outlet pipe by removing the retaining clips on the electric heater inlet pipe and electric heater outlet pipe.

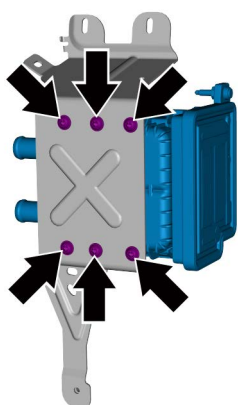


- 11 Remove the heat exchanger water inlet hose retaining clip.



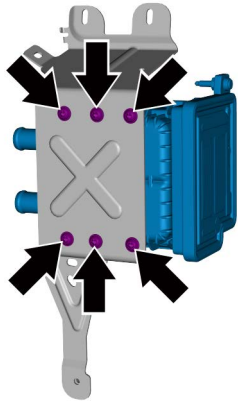
- 12 Remove the 2 fixing bolts for the heater and bracket, and take off the heater and bracket.

- 13 Remove the 6 fixing screws for the heater.

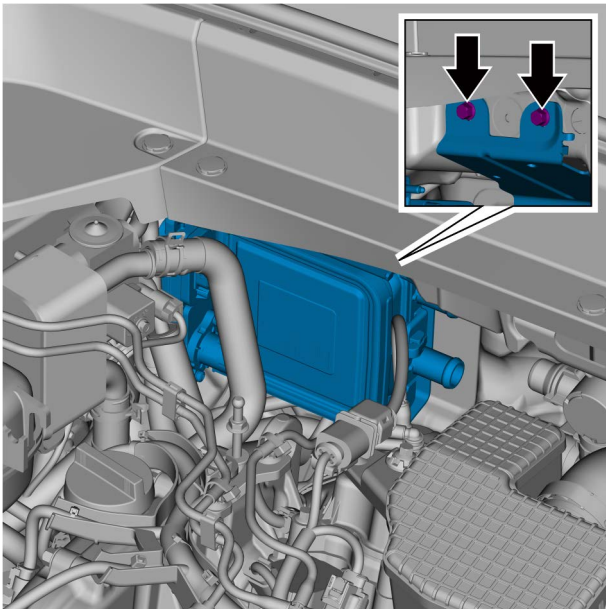


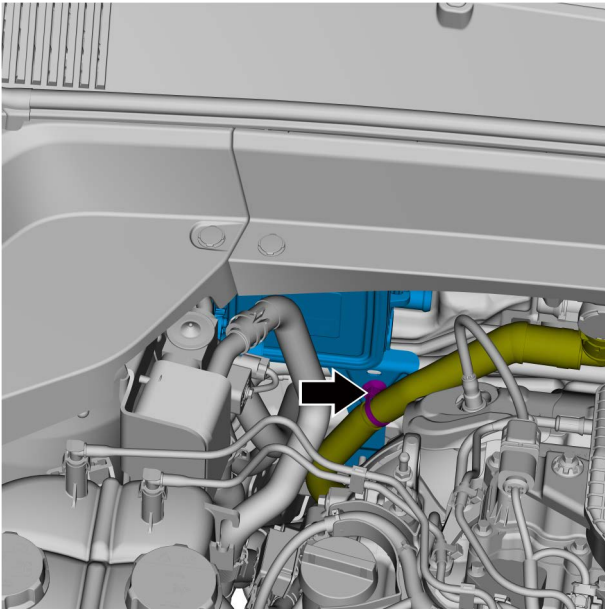
Installation Procedure

- 1 Install the heater and tighten the 6 fixing screws.
Torque: 5N·m

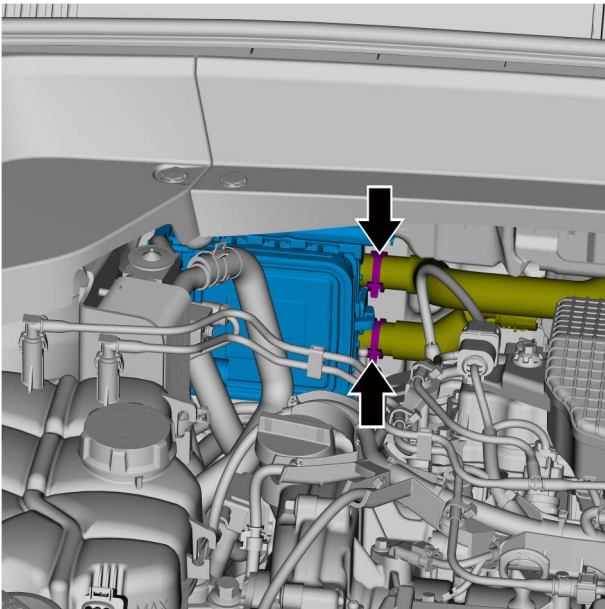


- 2 Install heater and bracket and tighten 2 fixing bolts.
Torque: 8N·m

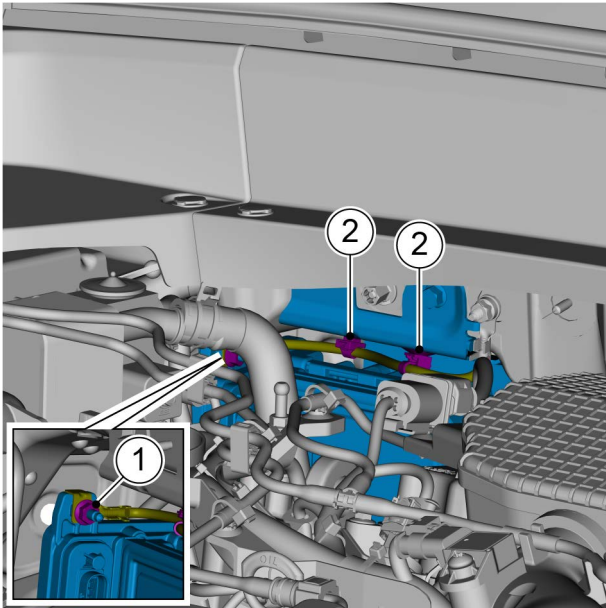




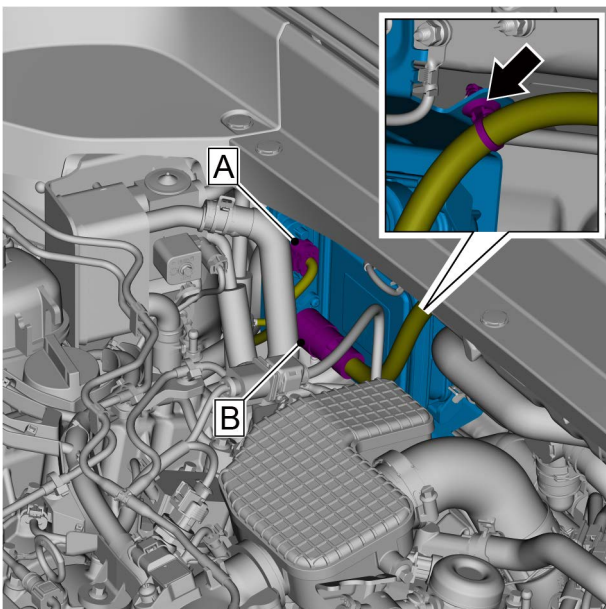
- 3 Install heat exchanger water inlet hose retaining clips.



- 4 Install the electric heater inlet pipe and electric heater outlet pipe and tighten the clamps.



- 5 Install heater hitch harness and tighten fixing nut 1.
Torque: 10N·m
- 6 Install the hitch wire retaining clips 2.



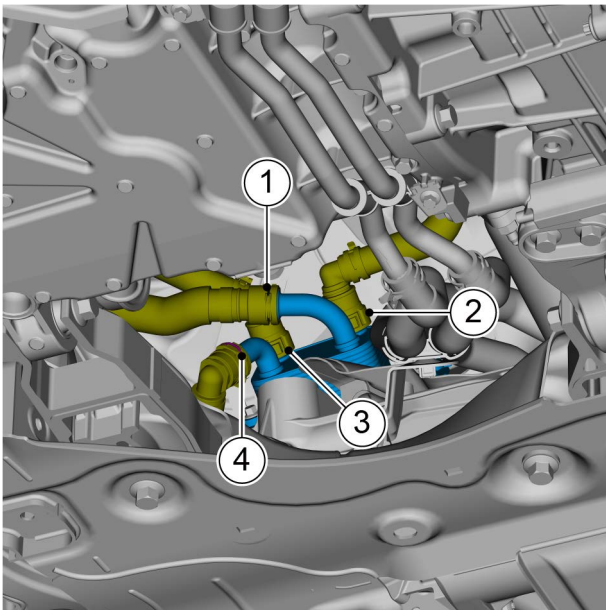
- 6 Connect heater low voltage harness connector A.
- 7 Connect heater high voltage harness connector B and install heater harness retaining clips.

- 8 Fill in coolant.
- 9 Install the heat shield.
- 10 Install the engine trim cover assembly.
- 11 Carry out the normal power-on process of the high voltage system, see [Normal Power-on Process of High Voltage System](#).
- 12 Connect the negative cable of battery.

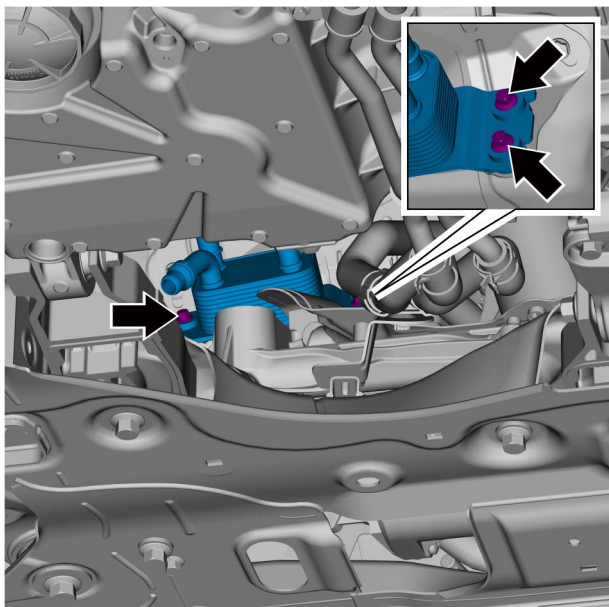
9.2.5.48 Heat exchanger replacement

Removal Procedure

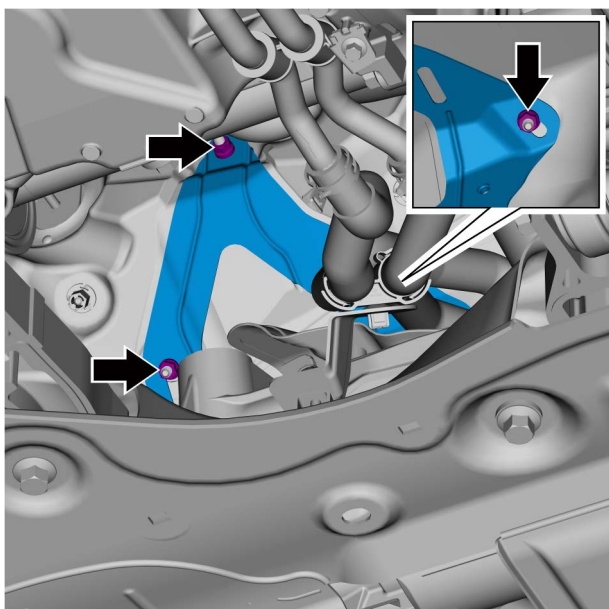
- 1 Remove the engine trim cover assembly, refer to [Replacement of engine trim cover assembly](#).
- 2 Remove the heat shield, see [Replacement of Heat Shield](#).



- 3 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 4 Drain coolant, see [Engine Coolant Drain and Fill](#).
- 5 Remove water inlet valve hose 1.
- 6 Remove the A/C warm air outlet pipe 2.
- 7 Remove the heat exchanger water inlet hose 3.
- 8 Remove the battery inlet pipe retaining clamp and disconnect the battery inlet pipe 4.

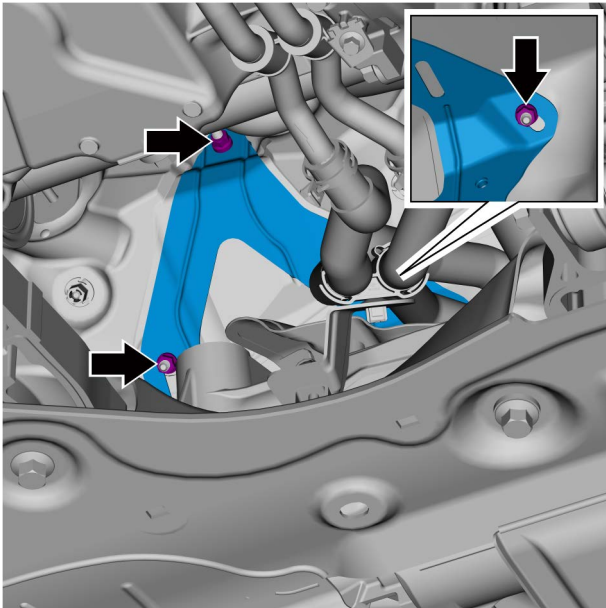


9 Remove the 3 fixing bolts of heat exchanger and take off heat exchanger.

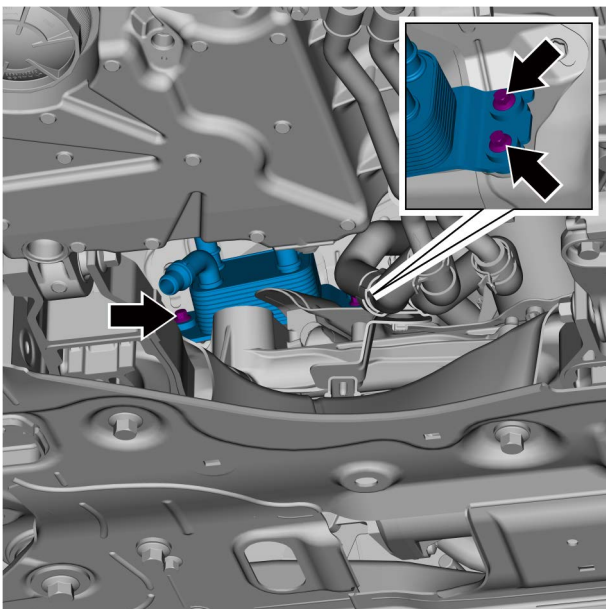


10 Remove the 3 fixing nuts of the heat exchanger bracket and take off the heat exchanger bracket.

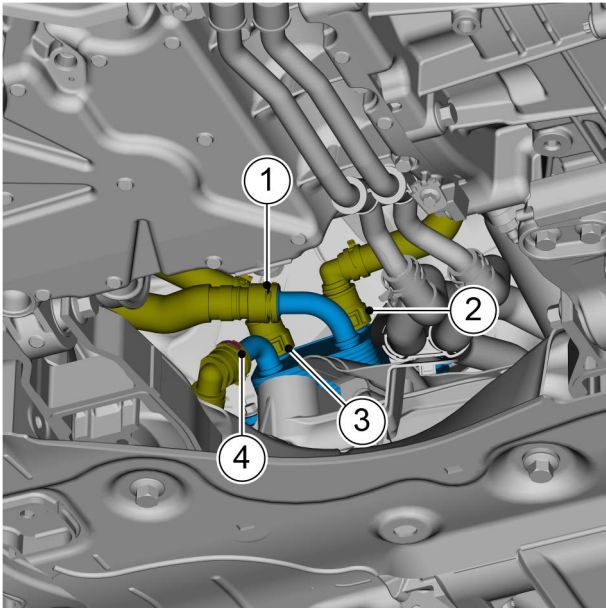
Installation Procedure



- 1 Install the heat exchanger bracket and tighten the nuts.
Torque: 8N·m



- 2 Install heat exchanger and tighten the 3 fixing bolts.
Torque: 10N·m



- 3 Install the water inlet valve hose 1.
- 4 Install the A/C warm air outlet pipe 2.
- 5 Install heat exchanger water inlet hose 3.
- 6 Install the battery inlet pipe 4 and tighten the clamp.

- 7 Fill in coolant.
- 8 Install the heat shield.
- 9 Install the bottom engine guard assembly.

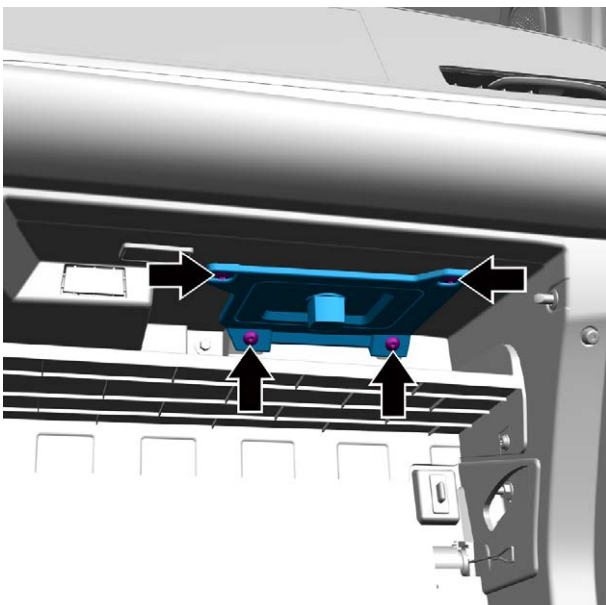
9.2.5.49 Fragrance Control Module with Motor Replacement

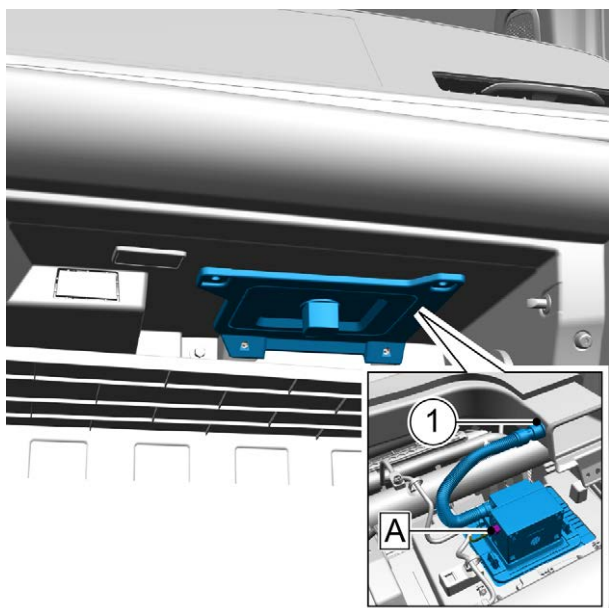
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Open the glove box.
- 3 Remove the 4 fixing screws of the fragrance control module with motor.

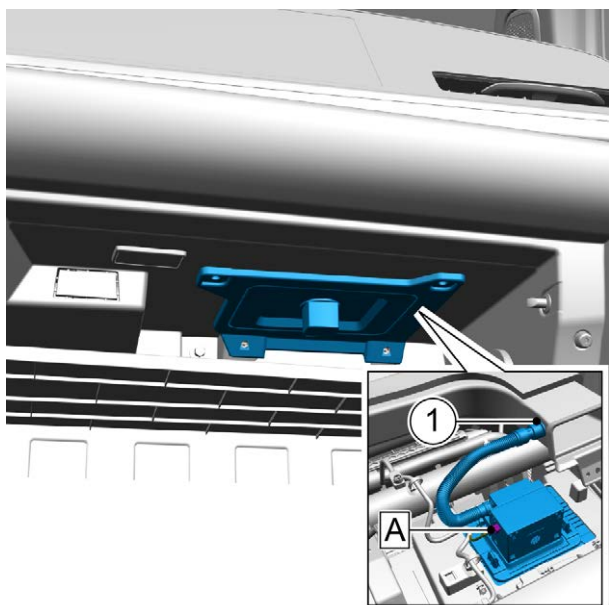


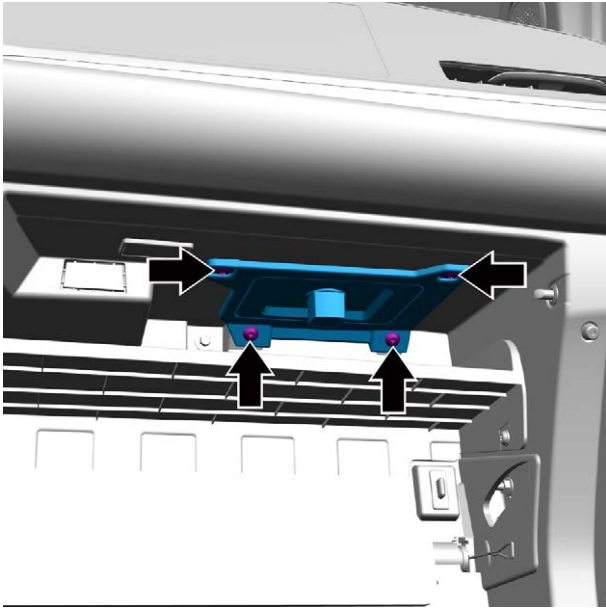


- 4 Disconnect the fragrance control module with motor from the glove box frame.
- 5 Disconnect the harness connector A from the fragrance control module with motor.
- 6 Disconnect the fragrance control module with motor line 1 from the instrument panel air outlets.
- 7 Remove the fragrance control module with motor.

Installation Procedure

- 1 Connect the fragrance control module with motor line 1 to the instrument panel air outlets.
- 2 Connect the harness connector A of the fragrance control module with motor.
- 3 Install the fragrance control module with motor.





- 4 Install the 4 fixing screws for the fragrance control module with motor and tighten.

- 5 Close the glove box.
- 6 Connect the negative cable of battery.

9.2.6 Specialized tools and equipment

9.2.6.1 Equipment

Fluorescent Agent
Electronic Leak Detectors
Torque wrenches
Vehicle A/C refrigerant recovery and filling machine

Safety protection device

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10.1 Warnings and Cautions

10.1.1 Warnings and Cautions

10.1.1.1 Warnings and Cautions

Warning about Assisted Restraint System

Warning !

This vehicle is equipped with a supplement restraint system. Failure to follow proper operating procedures can result in the following situations:

- The supplement restraint system opens unexpectedly.
- The system does not work when the airbag is needed for protection.

Warning !

Following criteria should be strictly followed to avoid the occurrence of above conditions

- Refer to the view of supplementary restraint system components to determine whether you are carrying out maintenance operations on, around the supplementary restraint system components or on their wires.
- If you are servicing a supplement restraint system component, its surroundings, or its wiring, disengage the supplement restraint system. See "Warnings regarding disconnecting the battery negative cable" in "Warnings and Precautions".

Warning regarding high temperature of deployed airbag

Warning !

After deployment, the metal surfaces of the supplement restraint system components may be hot. To avoid fire and personal injury:

- allow sufficient cooling time before touching any metal surfaces of the auxiliary restraint system components.
- Never place inflated auxiliary restraint system components next to any flammable material.

Warning about Assisted Restraint System Clock Spring

Warning !

Steering wheel module: Improper installation of the (clock spring assembly) will damage the spiral coil inside the clock spring, which may cause coil failure and make the front airbag (passengers) unable to work normally, thus leading to personal injury.

Warnings regarding safety system scrapping

Warning !

In order to prevent the accidental deployment of the airbag and cause personal injury, the undeployed airbag shall not be disposed of as conventional workshop waste. If the sealed container damages in the process of scrap, some of the substances contained in the non-deployed modules may cause serious illness or personal injury. Use the deployment procedure to safely discard the undeployed airbag.

Warning on airbag patch and storage

Warning !

For transporting an airbag that has not deployed:

- Do not carry wires or connectors from the airbag for handling.
- Make sure the airbag opening does not face yourself or someone else.

Warning !

When storing an undeployed airbag, make sure that the airbag opening is not facing the surface on which the airbag is placed. The airbag opening must not be facing downward. It is prohibited to place any objects on the airbag, and there should be enough space around the airbag for the airbag to deploy accidentally, otherwise it will injure people. It is prohibited to immerse the unfolded airbag in water or in contact with other liquids.

The undeployed airbag should be prohibited from fire sources or high temperatures to avoid accident deployment of the airbag that may hurt people.

Warning regarding treatment of supplementary restraint system impact sensor and supplementary restraint system module

Warning !

Do not hit or shake the supplement restraint system impact sensor and the supplement restraint system Module. Make sure the impact sensor and the supplement restraint system Module are securely fastened before energizing the impact sensor and the supplement restraint system module. Failure to follow the proper installation procedures may cause the supplement restraint system to detonate by mistake or not function when it is supposed to detonate, resulting in injury to personnel.

10.2 Assisted Restraint System

10.2.1 Specification

10.2.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Bolt-Connection of impact sensor (B-pillar) to the lower end of the inside of the B-pillar	M6×25×28	8.5-11.5
Bolt-Connection of impact sensor (front) to vehicle body	M6×25×28	8.5-11.5
Bolt-Connection of front airbag (passenger) and instrument cross member	M5×16	3.7-5.3
Bolt-Connection of front airbag (passenger) and instrument panel	M6×7.8	8.5-11.5
Bolt-Connection of inflatable curtains and vehicle body	M6	8.5-11.5
Bolt-Connection of supplement restraint system module and vehicle body	M6×14	8.5-11.5

10.2.2 Instructions and operations

10.2.2.1 Instructions and operations

Caution

Airbags can only provide supplemental protection for passengers in the event of a collision when the seat belt is properly fastened. When driving or riding in a vehicle, you need to fasten your seat belt, and only when you fasten your seat belt can the supplement restraint system provide better auxiliary protection in the event of a collision.

Structure composition

The supplement restraint system consists of the following components:

- Airbag warning light on combination instrument
- Supplement restraint system (SRS)
- Left impact sensor (front)
- Right impact sensor (Front)
- Left impact sensor (B-pillar)
- Right impact sensor (B-pillar)
- Passenger detection sensor
- Front airbag (driver)
- Front airbag (passenger)
- Front left side airbag
- Front right side airbag
- Inflatable curtain (left side)
- Inflatable curtain (right side)
- Clock spring
- Seat belt pretensioner (front left side)
- Seat belt pretensioner (front left side)
- Seat belt pretensioner (second row seat left side)
- Seat belt pretensioner (second row seat right side)

Note

The supplement restraint system is a passive safety system that locates on the steering wheel, on the instrument panel, on the sides of the front seatbacks and on the roof rails. In addition to the airbags, the vehicle is equipped with seat belt pretension load limiters. In the event of a vehicle collision, it will tension the seat belts, thereby slowing the reduction in distance between the passengers and the airbags while the airbags deploy. Each airbag has an ignition circuit that is controlled by the supplement restraint system module. The supplement restraint system module controls airbag deployment when it detects that the impact of the collision is sufficiently high. The supplement restraint system module

provides continuous diagnostic monitoring of the electrical components of the supplement restraint system. When a circuit malfunction is detected, the supplement restraint system module stores a diagnostic code and illuminates the airbag warning light to notify the driver. The steering column has an energy-absorbing design that retracts in the event of a frontal collision, reducing the chances of injury to the driver.

The supplement restraint system module receives signals from the sensors to determine the severity of the collision. When the signal value is greater than the set value in the memory, the supplement restraint system module issues an ignition command, which deploys the corresponding inflation module of the supplement restraint system.

The supplement restraint system module (SRS) confirms the collision signal and sends a collision output signal. When the CEM and EMS receive the collision output signal consecutively, they perform the unlocking and fuel cutoff functions, respectively.

10.2.3 System working principles

10.2.3.1 System working principles

Airbag warning light

If a fault is detected, the supplement restraint system module will store a Diagnostic Trouble Code (DTC) and then command the combination instrument to turn on the airbag warning light via the Flexray bus. Once the vehicle is started, the SRS will continuously test the circuits and if there is a fault, the supplement restraint system module will communicate with combination instrument via the Flexray bus and the airbag warning light will light up. If there is a malfunction in the supplement restraint system, it may result in the airbags failing to deploy, or deploying the airbags if the crash does not reach the set severity level. If the airbag warning light lights up, have it serviced as soon as possible at an authorized Geely service station; the airbag indicator will not go out until the faulty repair is completed.

Note

The supplement restraint system module (SRS) has a reserve power source that allows the airbags to deploy smoothly even after the battery voltage is lost during a crash. Disconnect the battery negative cable for 90s or more to drain the reserve power before performing supplement restraint system repair work.

The supplement restraint system module (SRS) is a micro-processor that serves as the control center for the supplement restraint system. When the vehicle is involved in a collision, the supplement restraint system module compares the signals from the sensors with the values in the memory, and when the value of the generated signal exceeds the stored value, the supplement restraint system module sends an ignition command (current signal) to each ignition circuit to deploy the airbags. When the airbag deploys, the supplement restraint system module records the status of the supplement restraint system and turns on the airbag indicator light on the combination instrument. After the vehicle is started, the supplement restraint system module performs continuous diagnostic monitoring of the supplement restraint system's electrical components and circuits, and if the supplement restraint system module detects a malfunction, it stores a diagnostic malfunction code and illuminates the airbag warning light to notify the driver that a malfunction exists.

Impact sensor (front) (left/right)

Impact sensor is used to enhance the performance of the supplement restraint system by transmitting vehicle forward acceleration signals to the supplement restraint system module (SRS). Impact sensor can help determine the severity of a

frontal collision. The SRS performs calculations using the measured acceleration values and compares these calculations with the values in memory. When the generated calculated values exceed the stored values, the supplement restraint system module sends an ignition command (current signal) to the frontal airbag ignition circuit, which deploys the frontal airbags and seatbelt pretensioners.

Impact sensor (B-pillar) (left side/right side)

Impact sensor (B-pillar) transmits vehicle side acceleration signals to the supplement restraint system module (SRS). Impact sensor (B-pillar) determines the severity of the side impact. The SRS performs calculations using the measured acceleration values and compares these calculations with the values in memory. When the generated calculated values exceed the stored values, the supplement restraint system module sends an ignition command (current signal) to the frontal and side airbags and inflatable curtains to deploy the front side airbags, front seatbelt pretensioners, second-row seatbelt pretensioners, and inflatable curtains (if equipped).

Front passenger detection sensor

The front passenger detection sensor is located in the front seat assembly seat cushion and is used to detect whether there is any presence seating on the front seat; it is a piezo-resistive type sensor that senses the amount of pressure by a change in resistance. When a person is in the front seat and not wearing a seatbelt, the front seatbelt unbuckled warning light in combination instrument will light up.

Front airbag (driver), front airbag (passenger)

The front airbag (driver), front airbag (passenger) module consists of a housing, inflatable curtain, an ignition trigger, and a gas generator. When the vehicle is involved in a front (side/rear) collision with sufficient impact that reaches the set detonation threshold, the supplement restraint system module sends out an ignition command (current signal), which flows through the igniter and detonates the gas generating agent, resulting in the rapid generation of a large amount of gas. The gas generated by this reaction causes the airbag to inflate and expand rapidly. Once the airbag is inflated with gas, it rapidly deflates through the airbag deflation holes.

Seat belt pretensioner

The seat belt pretensioner (front left), seat belt pretensioner (front left), seat belt pretensioner (front left), seat belt pretensioner (front left), and seat belt pretensioner (front left) all have a seat belt pretensioner that consists of a housing, an ignition trigger, and is fitted with a gas generator. The igniter is

part of the seat belt pretensioner deployment circuit. When the vehicle is involved in a front (side/rear) collision with sufficient impact that reaches the set detonation threshold, the supplement restraint system module sends a detonation command (current signal), which flows through the igniter and triggers the gas generator to produce a large amount of gas rapidly. The gas generated by this reaction will rapidly shrink and act on the seat belt retractor to quickly tighten the seat belt.

Front left side airbag and front right side airbag

Front left side airbag and front right side airbag are located on the backrests of driver seat and passenger seat respectively. The airbag front side airbag module includes the airbag, the ignition trigger, and the gas generator. The igniter is part of the airbag front side airbag module deployment circuit. When the vehicle is involved in a frontal (side/rear) collision with sufficient impact that reaches the set detonation threshold, the supplement restraint system module sends a detonation command to the frontal ignition circuit to deploy the airbag. Electrical current flows through the igniter, triggering the gas generator, which rapidly generates a large amount of gas. The gas generated by this reaction causes the side airbags to rapidly inflate and expand. Once the side airbags are inflated, they rapidly deflate through the airbag deflation holes.

Inflatable curtain (left side), inflatable curtain (right side)

Inflatable curtain (left side) and inflatable curtain (right side) are located on the left and right side roof longitudinal beams, respectively, extending from the A-pillar to the C-pillar. The roof inflatable curtain module includes the inflatable curtain, the ignition trigger and the gas generator. The igniter is part of the deployment circuit of the roof inflatable curtain module. When the vehicle is involved in a frontal (side/rear) collision with sufficient impact that reaches the set detonation threshold, the supplement restraint system module sends a detonation command to the frontal ignition circuit to deploy the inflatable curtain. Electrical current flows through the igniter, triggering the gas generator, which rapidly generates a large amount of gas. The gas generated by this reaction causes the inflatable curtain to rapidly inflate and expand. Once the inflatable curtain is filled with gas, it is quickly deflated through the inflatable curtain bleeder holes.

Clock spring

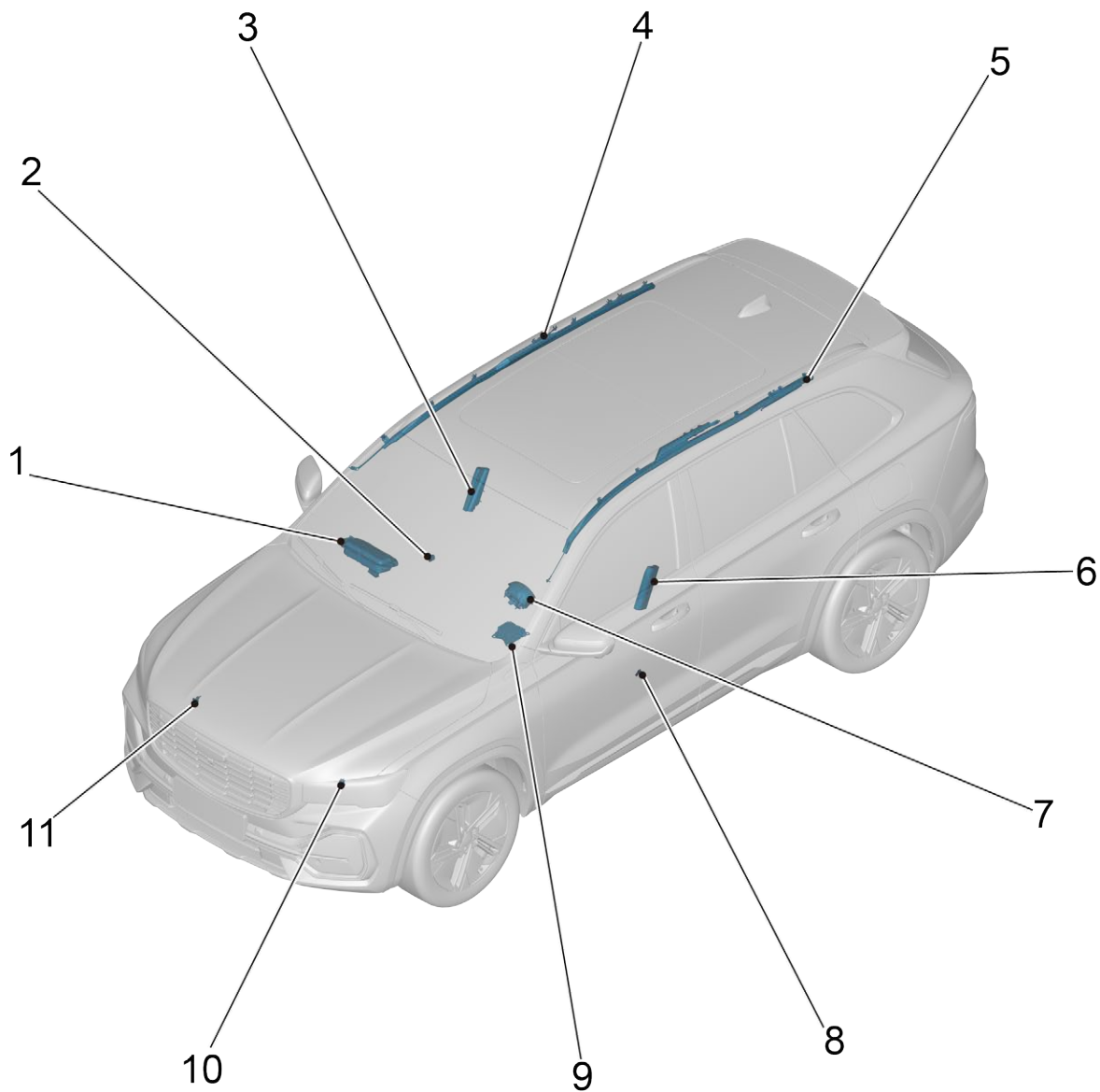
Airbag clock spring is integrated with the steering wheel module and is located below the steering wheel. The steering wheel harness is connected between driver airbag and clock spring, and the harness connector and ground connector on driver airbag maintain continuous electrical contact when the steering wheel is turned.

Steering column

The steering column is a collapsed energy-absorbing steering column. When the vehicle is involved in a frontal collision, the driver may collide directly with the steering wheel, or the impact may be loaded onto the steering wheel and steering column via an inflated airbag, and the steering column will contract downward, absorbing some of the energy of the collision, thus helping to minimize the personal injuries inflicted on the driver. After a collision, the steering wheel and steering column must be inspected for damage.

10.2.4 Part position

10.2.4.1 Part position



- | | | | |
|----|---------------------------------|-----|--------------------------------------|
| 1. | Front airbag (passenger) | 7. | Front airbag (driver) |
| 2. | Impact sensor (right B-pillar) | 8. | Impact sensor (left B-pillar) |
| 3. | Front right side airbag | 9. | Supplemental Restraint System Module |
| 4. | Inflatable curtain (right side) | 10. | Impact sensor (left front) |
| 5. | Inflatable curtain (left side) | 11. | Impact sensor (right front) |
| 6. | Front left side airbag | | |

10.2.5 Diagnostic information and procedure

10.2.5.1 Diagnosis description

Refer to [Instructions and operations](#), get familiar with the system function and operation before starting the system diagnosis. This will help to determine the correct fault diagnosis steps in case of failure. More importantly, it will also help to determine whether the condition described by the customer is a normal operation.

10.2.5.2 Routine inspection

- Confirm faults symptoms.

The most difficult situation during troubleshooting is that no symptoms appear. Under this circumstances, the fault described by the user must be thoroughly analyzed. Then it is needed to simulate the same or similar conditions and environments when the customer's vehicle fault occurs. The same or similar conditions and environment when the fault of the distributor's vehicle comes out should be simulated. No matter how experienced and skilled the maintenance personnel is, if they do not confirm the symptoms of the fault, they will ignore some important things in the repair and make wrong guesses in some places which will result in troubleshooting unable to proceed.

- Check system components that are easily accessible or can be seen to find out if there is any obvious damage or there is a situation that may cause a malfunction.

- Pivot for connector joint and vibration should be the main part subject to a thorough examination. If the fault is caused by vibration, the vibration method is recommended.

a. Gently vibrate the possible fault part with fingers, and check whether the fault occurs.

b. Gently shake the connector in both vertical and horizontal directions.

c. Gently shake the harness in both vertical and horizontal directions.

10.2.5.3 Repair strategies for supplement restrain system (SRS) components

SRS component name	Condition	Measures to be taken		
		Items that must be replaced	Inspection items - Damaged parts must be replaced	
			Frontal collision	Side collision/rollover
Front airbag (driver)	Ignition	A. Front airbag (driver) B. Impact sensor (front) C. Supplemental Restraint System Module	Steering wheel: A. Visually inspect the steering wheel for deformation. B. Check the harnesses and connectors inside the steering wheel for damage and deformation of the terminals. C. Install front airbag (driver) into the steering wheel, check and make sure that the installation position is correct and aligned with the steering wheel. D. Check the steering wheel for excessive clearance. E. If damaged, replace the damaged parts.	

SRS component name	Condition	Measures to be taken		
		Items that must be replaced	Inspection items - Damaged parts must be replaced	
			Frontal collision	Side collision/rollover
	Failure to ignite		Steering wheel module (clock spring): A. Visually inspect the steering wheel module for damage. B. Check the connector and harness for damage. C. Check the steering wheel for noise or sluggishness. D. If damaged, replace the damaged parts.	\
		\	Front airbag (driver): A. Remove front airbag (driver) and inspect the airbag housing, harness, connectors, terminals and steering wheel module (clock spring) for damage. B. Install front airbag (driver) into the steering wheel, check and make sure that the installation position is correct and aligned with the steering wheel. C. If damaged, replace the damaged parts.	\
		\	Steering wheel: A. Visually inspect the steering wheel for deformation. B. Check the harnesses and connectors inside the steering wheel for damage and deformation of the terminals. C. Install front airbag (driver) into the steering wheel, check and make sure that the installation position is correct and aligned with the steering wheel. D. Check the steering wheel for excessive clearance. E. If damaged, replace the damaged parts.	\
		\	Steering wheel module (clock spring): A. Visually inspect the steering wheel module for damage. B. Check the connector and harness for damage. C. Check the steering wheel for noise or sluggishness. D. If damaged, replace the damaged parts.	\

SRS component name	Condition	Measures to be taken		
		Items that must be replaced	Inspection items - Damaged parts must be replaced	
			Frontal collision	Side collision/rollover
		\	Impact sensor (front): A. Remove the impact sensor (front) and check for damage to the harnesses and connectors of SRS-related parts and deformation of the terminals. B. Check the impact sensor (front) and bracket for visible damage (dents, cracks, deformation). C. Install the impact sensor (front) and check that the mounting position is correct. D. If damaged, replace the damaged parts.	\
Front airbag (passenger)	Ignition	A. Front airbag (passenger) B. Impact sensor (front) C. Supplemental Restraint System Module D. Instrument panel body assembly	\	\
	Failure to ignite	\	Front airbag (passenger): A. Remove the front airbag (passenger) and inspect airbag housing, harness, connectors and terminals for damage. B. Install the front airbag (passenger) to the instrument panel, check and make sure the installation position is correct. C. If damaged, replace the damaged parts.	\
		\	Impact sensor (front): A. Remove the impact sensor (front) and check for damage to the harnesses and connectors of SRS-related parts and deformation of the terminals. B. Check the impact sensor (front) and bracket for visible damage (dents, cracks, deformation). C. Install the impact sensor (front) and check that the mounting position is correct. D. If damaged, replace the damaged parts.	\

SRS component name	Condition	Measures to be taken		
		Items that must be replaced	Inspection items - Damaged parts must be replaced	
			Frontal collision	Side collision/rollover
		\	Instrument panel body assembly: A. Visually inspect the instrument panel for damage. B. If damaged, replace the instrument panel body assembly.	\
Front left side airbag	Ignition	A. Driver side seat with airbag assembly B. Impact sensor (B-pillar) C. Supplemental Restraint System Module	\	\
	Failure to ignite	\	\	Front left side airbag: A. Inspect the driver side seatback for visible damage (dents, cracks, deformation). B. Check for damage to the SRS-related parts harness and connectors, and deformation of the terminals. C. If damaged, replace the damaged parts.
		\	\	Impact sensor (B-pillar): A. Remove impact sensor (B-pillar) and inspect harness and connectors of SRS-related parts for damage and terminals for deformation. B. Check impact sensor (B-pillar) and bracket for visible damage (dents, cracks, deformation). C. Install impact sensor (B-pillar) and check for correct mounting position. D. If damaged, replace the damaged parts.
Front right side airbag	Ignition	A. Passenger side seat with air bag assembly B. Impact sensor (B-pillar) C. Supplemental Restraint System Module	\	\

SRS component name	Condition	Measures to be taken		
		Items that must be replaced	Inspection items - Damaged parts must be replaced	
			Frontal collision	Side collision/rollover
	Failure to ignite	\	\	Front right side airbag: A. Inspect the passenger side seatback for visible damage (dents, cracks, deformation). B. Check for damage to the SRS-related parts harness and connectors, and deformation of the terminals. C. If damaged, replace the damaged parts.
		\	\	Impact sensor (B-pillar): A. Remove impact sensor (B-pillar) and inspect harness and connectors of SRS-related parts for damage and terminals for deformation. B. Check impact sensor (B-pillar) and bracket for visible damage (dents, cracks, deformation). C. Install impact sensor (B-pillar) and check for correct mounting position. D. If damaged, replace the damaged parts.
Inflatable curtain (left side)	Ignition	A. Inflatable curtain (left side) B. Impact sensor (B-pillar) C. Supplemental Restraint System Module	\	A. Check the A, B and C pillars on the collision side for visible damage (dents, cracks, deformation). B. Inspect the roof and interior trim on the collision side for visible damage (dents, cracks, deformation). C. Check for damage to the SRS-related parts harness and connectors, and deformation of the terminals. D. If damaged, replace the damaged parts.

SRS component name	Condition	Measures to be taken		
		Items that must be replaced	Inspection items - Damaged parts must be replaced	
			Frontal collision	Side collision/rollover
	Failure to ignite	\	\	<ul style="list-style-type: none"> A. Check the A, B and C pillars on the collision side for visible damage (dents, cracks, deformation). B. Inspect the roof and interior trim on the collision side for visible damage (dents, cracks, deformation). C. Check inflatable curtain (left side) for visible damage (cracks, etc.). D. Check impact sensor (B-pillar) and bracket for visible damage (dents, cracks, deformation). E. Check for damage to the SRS-related parts harness and connectors, and deformation of the terminals. F. If damaged, replace the damaged parts.
Inflatable curtain (right side)	Ignition	<ul style="list-style-type: none"> A. Inflatable curtain (right side) B. Impact sensor (B-pillar) C. Supplemental Restraint System Module 	\	<ul style="list-style-type: none"> A. Check the A, B and C pillars on the collision side for visible damage (dents, cracks, deformation). B. Inspect the roof and interior trim on the collision side for visible damage (dents, cracks, deformation). C. Check for damage to the SRS-related parts harness and connectors, and deformation of the terminals. D. If damaged, replace the damaged parts.

SRS component name	Condition	Measures to be taken		
		Items that must be replaced	Inspection items - Damaged parts must be replaced	
			Frontal collision	Side collision/rollover
	Failure to ignite	\	\	<ul style="list-style-type: none"> A. Check the A, B and C pillars on the collision side for visible damage (dents, cracks, deformation). B. Inspect the roof and interior trim on the collision side for visible damage (dents, cracks, deformation). C. Inspect the inflatable curtain (right side) for visible damage (cracks, etc.). D. Check impact sensor (B-pillar) and bracket for visible damage (dents, cracks, deformation). E. Check for damage to the SRS-related parts harness and connectors, and deformation of the terminals. F. If damaged, replace the damaged parts.
Seat belt pretensioner	Ignition with a person seated	<ul style="list-style-type: none"> A. Seat belt assembly B. Height adjuster C. Seat belt buckle sensor D. Supplemental Restraint System Module 	<ul style="list-style-type: none"> A. Check for damage to the SRS-related parts harness and connectors, and deformation of the terminals. B. Inspect the inside of the B-pillar for deformation or damage. C. Check the impact sensor (front) and bracket for visible damage (dents, cracks, deformation). D. If damaged, replace the damaged parts. 	<ul style="list-style-type: none"> A. Check for damage to the SRS-related parts harness and connectors, and deformation of the terminals. B. Inspect the inside of the B-pillar for deformation or damage. C. Check impact sensor (B-pillar) and bracket for visible damage (dents, cracks, deformation). D. If damaged, replace the damaged parts.
	Ignition with no person seated	<ul style="list-style-type: none"> A. Seat belt assembly B. Supplemental Restraint System Module 	<ul style="list-style-type: none"> D. If damaged, replace the damaged parts. 	<ul style="list-style-type: none"> D. If damaged, replace the damaged parts.

SRS component name	Condition	Measures to be taken		
		Items that must be replaced	Inspection items - Damaged parts must be replaced	
			Frontal collision	Side collision/rollover
	No ignition with a person seated	\	A. Remove the seat belt pretensioners. B. Check for damage to the SRS-related parts harness and connectors, and deformation of the terminals. C. Check that the webbing is not damaged and that the retainer is not loose. D. Check that the retractor operates smoothly. E. Check the height adjuster and seat belt buckle sensor for damage. F. Inspect the inside of the B-pillar for deformation or damage. G. Replace seat belt pretensioner assembly if the inside of B-pillar is damaged. H. If damaged, replace the damaged parts.	A. Remove the seat belt pretensioners. B. Check for damage to the SRS-related parts harness and connectors, and deformation of the terminals. C. Check that the webbing is not damaged and that the retainer is not loose. D. Check that the retractor operates smoothly. E. Check the height adjuster and seat belt buckle sensor for damage. F. Inspect the inside of the B-pillar for deformation or damage. G. Replace seat belt pretensioner assembly if the inside of B-pillar is damaged. H. If damaged, replace the damaged parts.

Warning !

After a collision, the damaged vehicle body needs to be repaired first before replacing any SRS components.

After replacing any SRS components, it is necessary to use a diagnostic instrument to check and confirm that there is no malfunction in the SRS system (no DTC set, warning light not illuminated, etc.), otherwise perform diagnosis as required.

No repair or modification of any SRS component is allowed.

The supplement restraint system module must be replaced after any airbag has detonated, seat belt pretensioner has detonated, or the control unit has logged a crash-related DTC.

Throughout the service life of the supplement restraint system module, the same supplement restraint system module must always be installed in the vehicle in which it was initially installed and is not allowed to be reused in another vehicle.

The airbag, supplement restraint system module and impact sensor have a high-precision structure and require extra care during handling, installation, removal and replacement. Parts that fall to the ground accidentally or are struck must be scrapped.

10.2.6 Removal and Installation

10.2.6.1 Replacement of supplement restraint system module

Removal Procedure

Warning !

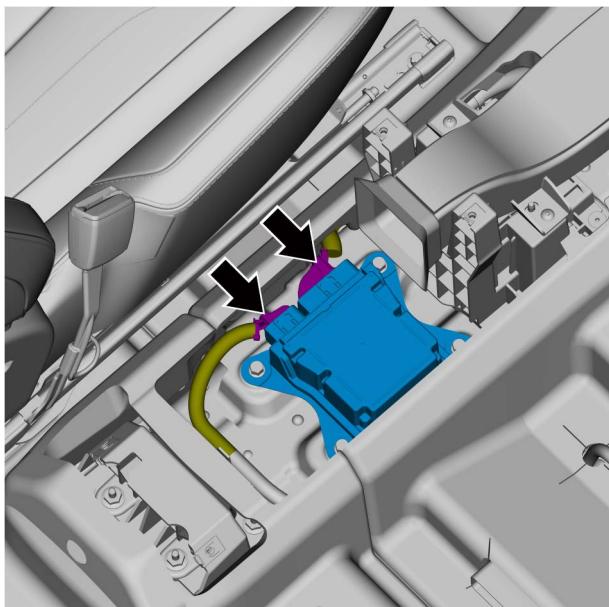
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

Caution

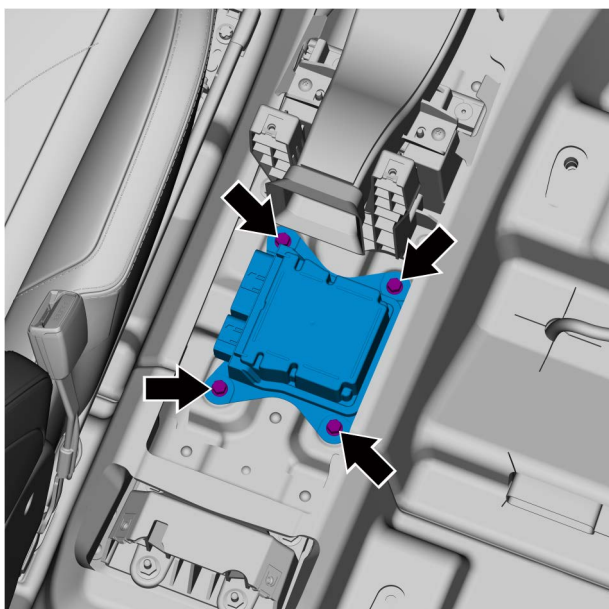
Before operating any of the assisted restraint system components, you must wait at least three minutes after disconnecting the battery to allow the ECU capacitors to fully discharge.

Touch the body grounding to discharge its own static electricity before removing or installing the supplement restraint system module.

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove console body assembly, refer to [Replacement of console body assembly](#).

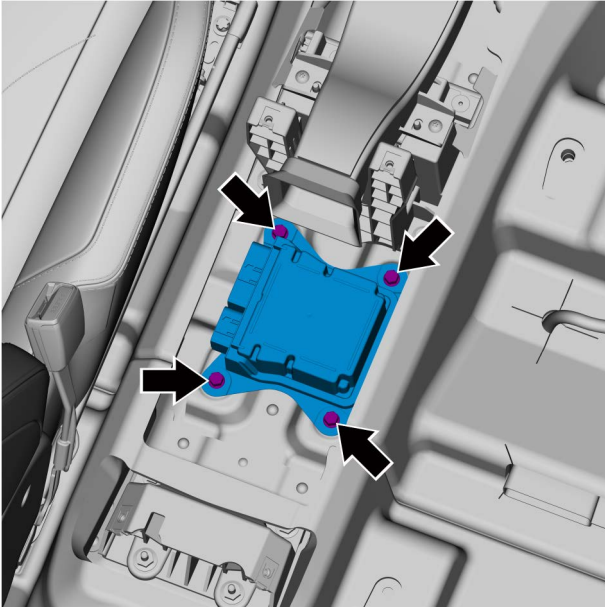


- 3 Disconnect the 2 harness connectors of supplement restraint system module.

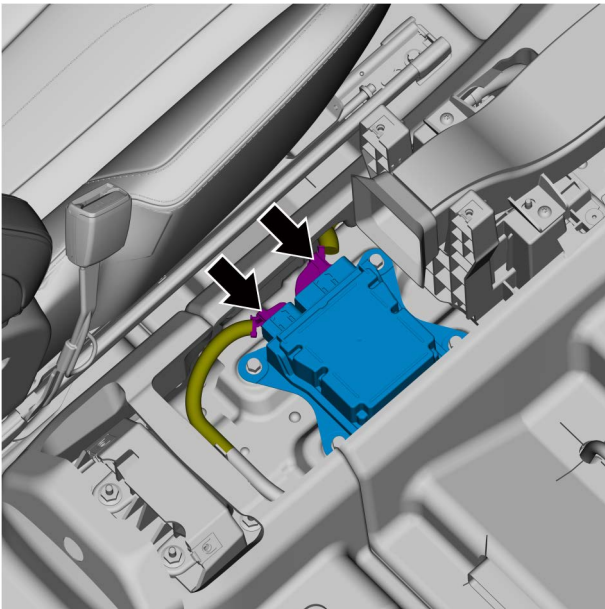


- 4 Remove the 4 fixing bolts of the supplement restraint system module and remove the supplement restraint system module.

Installation Procedure



- 1 Install the 4 fixing bolts of the supplement restraint system module.
Torque: 10N·m



- 2 Connect the 2 harness connectors of the supplement restraint system module.

Caution

Firmly plug in the harnesses according to the principle of "plugging, sounding and confirming".

- 3 Install the console body assembly.
- 4 Connect the negative cable of battery.
- 5 The GLDS diagnostic program is required, under the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software brushing operation.

10.2.6.2 Replacement of front airbag (driver)

Removal Procedure

Warning !

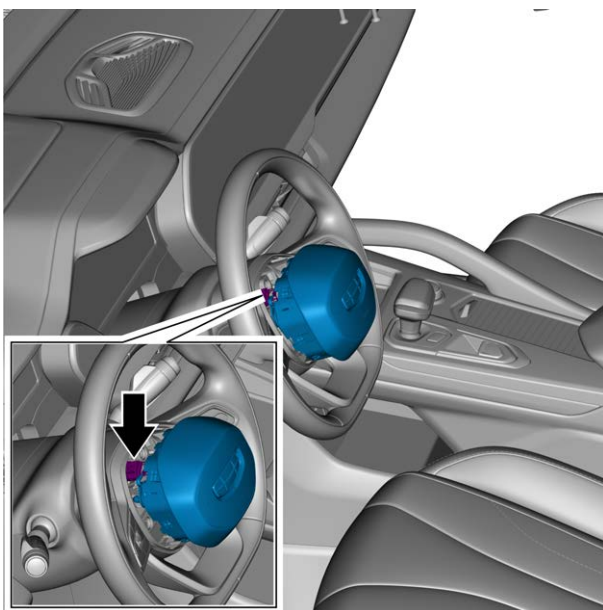
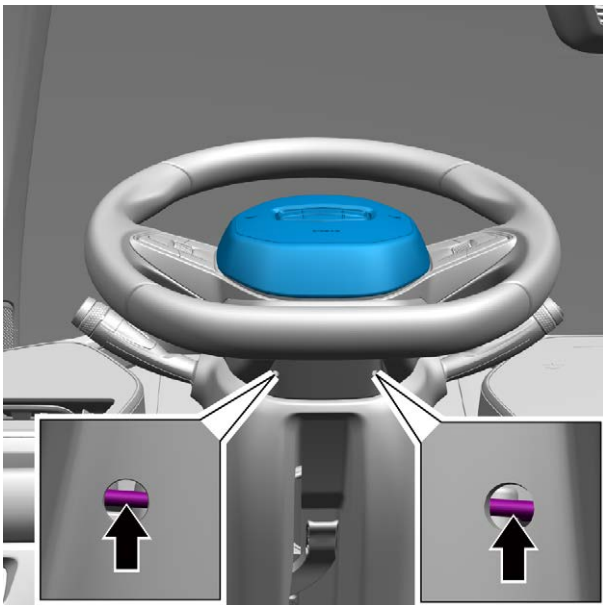
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

Caution

If the airbag is being serviced, the negative pole of the battery must be disconnected for at least 90 s before other operations can be carried out.

- 2 Use a slender slotted screwdriver, insert it into the two holes in turn, apply force inward, push the buckle, move the airbag upward, and take out the driver side airbag.



- 3 Disconnect the front airbag (driver) harness connector and remove the front airbag (driver).

Caution

Ensure that parts are handled gently during maintenance.

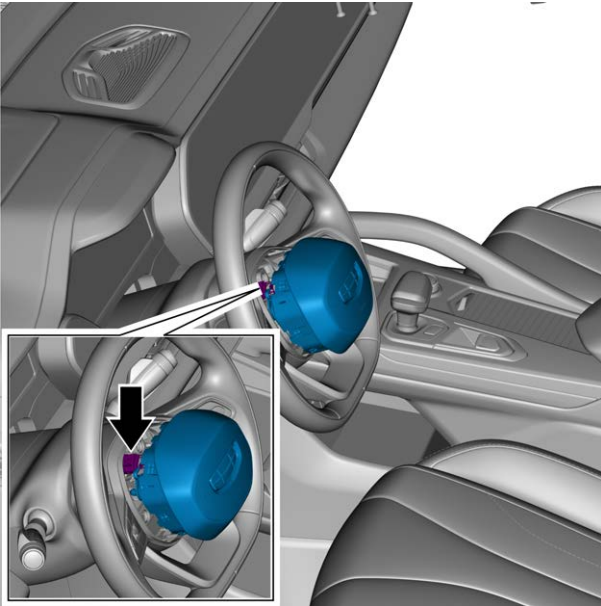
Always operate on the side of the airbag, not on the front.

Do not use pneumatic or electric service tools.

Always place the air bag with the deployed side up.

The airbag must not be disassembled.

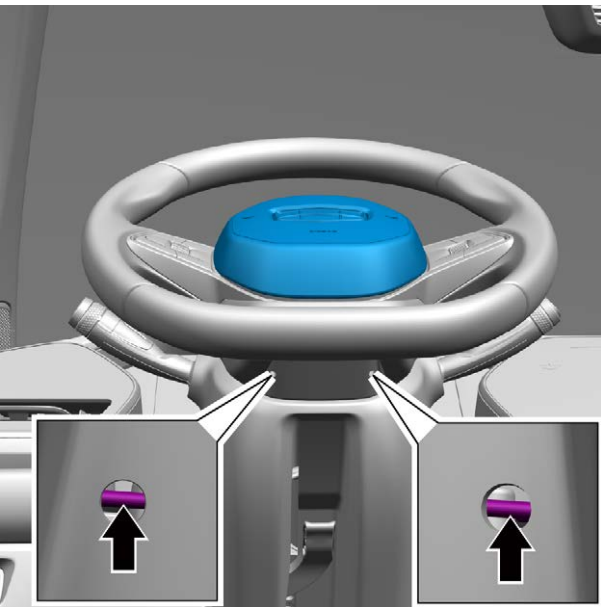
Installation Procedure



- 1 Connect the front airbag (driver) harness connector.

Caution

Firmly plug in the harnesses according to the principle of "plugging, sounding and confirming".



- 2 Install front airbag (driver).

Caution

Confirm that the lap gap is even.

- 3 Connect the negative cable of battery.

10.2.6.3 Replacement of front airbag (passenger)

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

Caution

If the airbag is being serviced, the negative pole of the battery must be disconnected for at least 90 s before other operations can be carried out.

- 2 Remove the instrument panel body assembly, refer to [Replacement of instrument panel body assembly](#).
- 3 Remove the 6 fixing nuts of front airbag (passenger) and take off the front airbag (passenger).

Caution

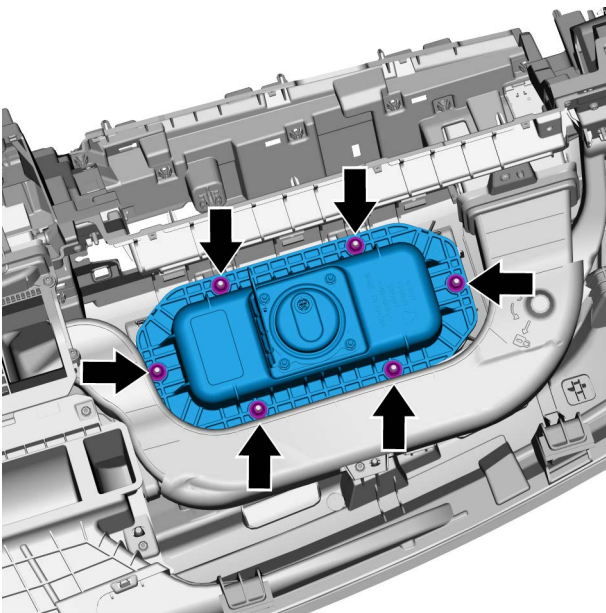
Ensure that parts are handled gently during maintenance.

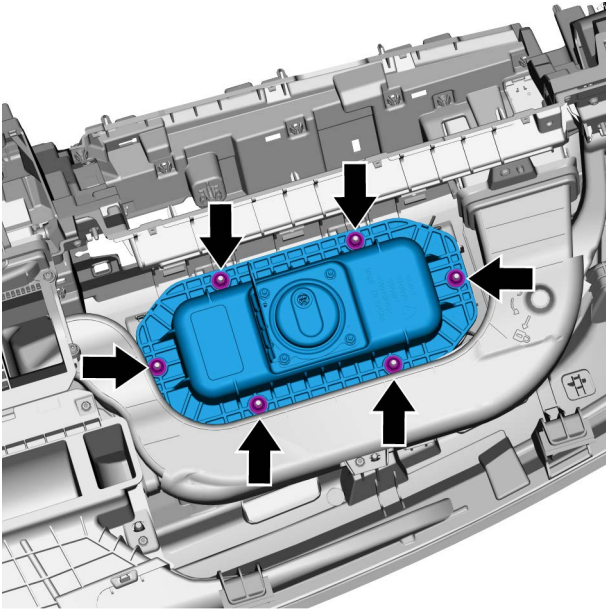
Always operate on the side of the airbag, not on the front.

Do not use pneumatic or electric service tools.

Always place the air bag with the deployed side up.

The airbag must not be disassembled.

**Installation Procedure**



- 1 Install the 6 fixing nuts of front airbag (passenger).
Torque: 4.5N·m

- 2 Install the instrument panel body assembly.
- 3 Connect the negative cable of battery.

10.2.6.4 Replacement of inflatable curtain (left side)

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

Caution

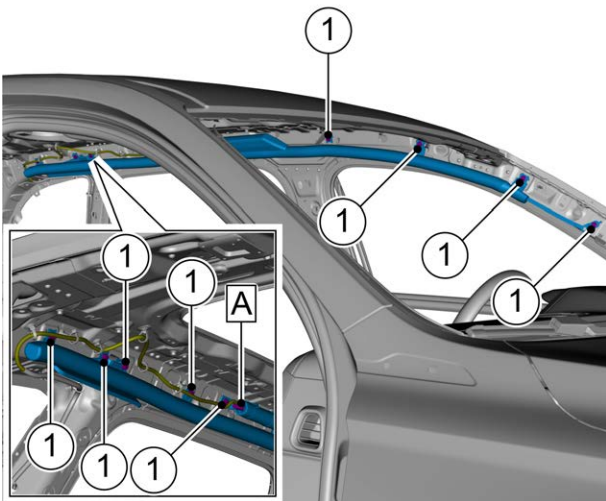
The removal and installation methods of left and right side inflatable curtains are similar.

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

Caution

If the airbag is being serviced, the negative pole of the battery must be disconnected for at least 90 s before other operations can be carried out.

- 2 Remove the roof assembly, refer to [Replacement of roof assembly](#).



- 3 Disconnect the inflatable curtain (left side) harness connector A.
- 4 Remove the 9 fixing bolts 1 of the inflatable curtain (left side) and remove the inflatable curtain (left side).

Caution

Ensure that parts are handled gently during maintenance.

Always operate on the side of the airbag, not on the front.

Do not use pneumatic or electric service tools.

Always place the air bag with the deployed side up.

The airbag must not be disassembled.

Installation Procedure

- 1 Install the 9 fixing bolts 1 of the inflatable curtain (left side).

Torque: 10N·m

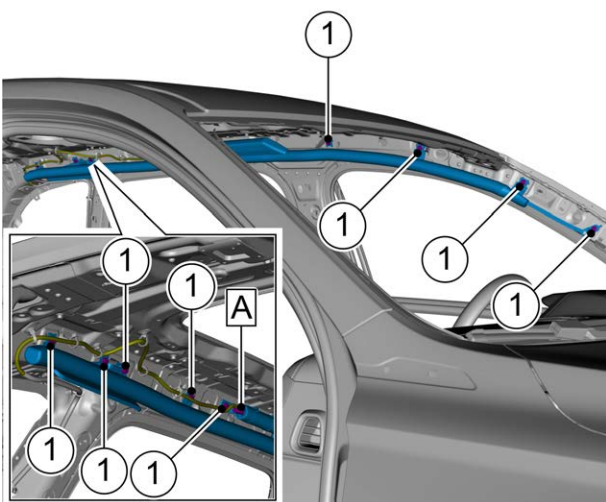
Caution

Check the surface of the parts for scratches before assembly.

- 2 Connect inflatable curtain (left side) harness connector A.

Caution

Firmly plug in the harnesses according to the principle of "plugging, sounding and confirming".



- 3 Install the roof assembly.
- 4 Connect the negative cable of battery.

10.2.6.5 Replacement of impact sensor (front)

Removal Procedure

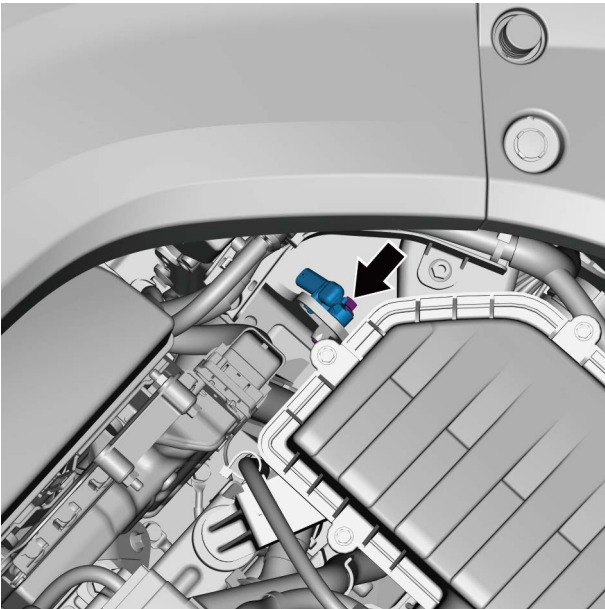
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).



- 2 Disconnect the impact sensor (front) harness connector.



- 3 Remove the impact sensor (front) fixing bolts and take off the impact sensor (front).

Installation Procedure



- 1 Install the fixing bolts of impact sensor (front).
Torque: 10N·m



- 2 Connect the impact sensor (front) harness connector.
Caution
Firmly plug in the harnesses according to the principle of "plugging, sounding and confirming".

- 3 Connect the negative cable of battery.

10.2.6.6 Replacement of impact sensor (B-pillar)

Removal Procedure

Warning !

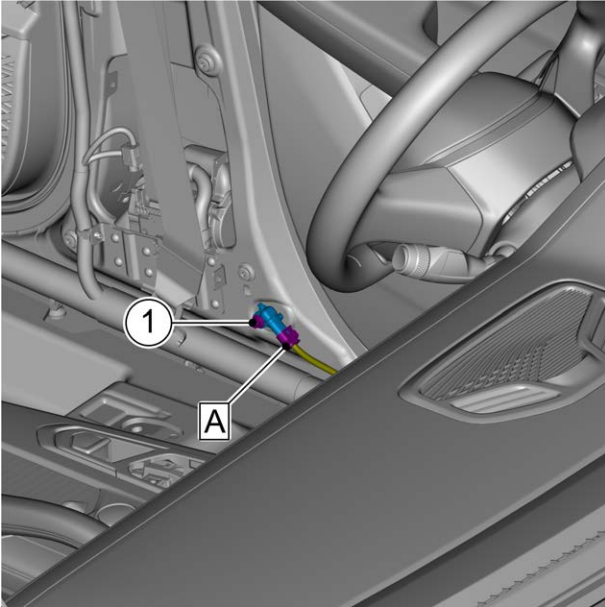
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

Caution

The removal and installation methods of left and right impact sensors (B-pillar) are similar.

- 1 Move driver seat forward to the maximum displacement.

- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the left B-pillar lower trim panel assembly, refer to [Replacement of left B-pillar lower trim panel assembly](#).
- 4 Disconnect the impact sensor (B-pillar) harness connector A.
- 5 Remove impact sensor (B-pillar) fixing bolt 1, and remove impact sensor (B-pillar).

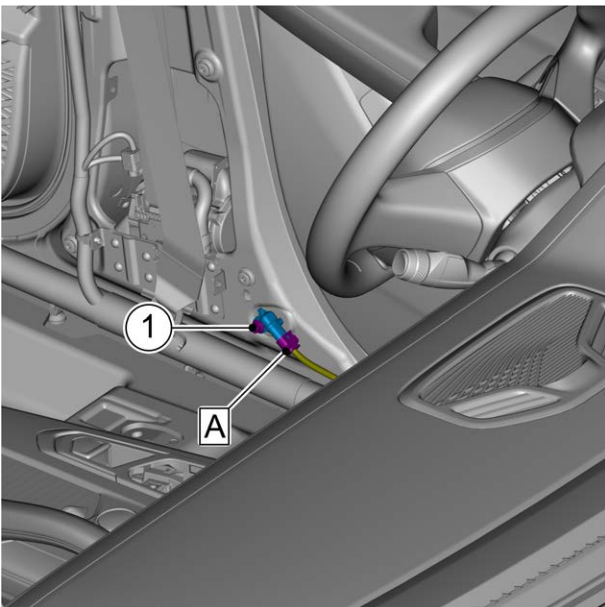


Installation Procedure

- 1 Install the impact sensor (B-pillar) fixing bolt 1.
Torque: 10N·m
- 2 Connect the impact sensor (B-pillar) harness connector A.

Caution

Firmly plug in the harnesses according to the principle of "plugging, sounding and confirming".



- 3 Install the left B-pillar lower trim panel assembly.
- 4 Connect the negative cable of battery.
- 5 Reset the driver seat position.

10.2.7 Specialized tools and equipment

10.2.7.1 Equipment

Torque wrenches

10.3 Pre-tensioner seat belt

10.3.1 Specification

10.3.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Seat belt pretensioner (front left side) and side wall fixing bolts	M10×25×30.65M	34-46
Seat belt pretensioner (left side of front seat) lower end piece and seat frame fixing bolt	M10	34-46
Center guide bracket and side sheet metal fixing bolt	M6	8.5-11.5
Guide ring and the side sheet metal fixing bolt	Imperial system 7/16	34-46
Seat belt pretensioner (second row seat left side) and the side wall fixing bolt	M10×25×30.65M	34-46
Seat belt pretensioner (second row seat left side) lower end piece and body sheet metal fixing bolt	M10×30	34-46
Seat belt buckle sensor (front left side) and seat fixing bolt	M8	30-40
Seat belt buckle sensor (second row seat middle and left side) and body fixing nut	M12	41-55
Seat belt buckle sensor (second row seat right side) and body fixing nut	M12	41-55

10.3.2 Instructions and operations

10.3.2.1 Instructions and operations

Seat belt

Vehicles have seat belts in both the front and rear seats, which are the primary means of protecting passengers. Seat belts keep passengers in the passenger compartment and gradually reduce the force of an impact in the following situations:

- Front impact
- Rear impact
- Side impact
- Overturn caused impact

Seat belt unfastened warning light

The seat belt unfastened warning light is located on the combination instrument to remind the driver and passenger to fasten their seat belts.

Child seat protection system

Warning !

The sun visor for front passengers has a warning sticker that rear-facing child seats should not be placed in seats protected by airbags, which, if deployed, pose a significant risk to rear-facing children.

Please install the child seat unit in the rear seats, which are equipped with ISOFIX ports, and follow the child seat manufacturer's instructions for installing and fixing the child seat.

10.3.3 System working principles

10.3.3.1 System working principles

Seat belt pretensioner (front left), seat belt pretensioner (front right)

The seat belt pretensioner (front left) and seat belt pretensioner (front right) module consist of a housing, an ignition trigger and is equipped with a gas generator. The ignition trigger is part of the seat belt pretensioner deployment circuit. When the vehicle is involved in a frontal or side or rear collision of sufficient force that reaches the set detonation threshold, the airbag control unit sends out a detonation command (current signal), which flows through the igniter and triggers the gas generator to produce a large amount of gas rapidly. The gas generated by this reaction will rapidly shrink to the seat belt retractor module, thus tightening the seat belt quickly.

Front seat belt system

The front seat belt system consists of driver and front passenger seat belt pretensioner retractors, a front passenger identification sensor, and 2 front seat belt switches. The passenger recognition sensor is used to detect the presence of a passenger in the passenger seat. If no passenger is detected, the passenger seat belt warning light is extinguished. The two front seat belt switches are located in the seat buckles and are used to control the seat belt warning light and buzzer.

Seat belt unfastened warning light

- This vehicle is equipped with the driver and front passenger seat belt unbuckled warning function, and some models are equipped with the rear passenger seat belt unbuckled warning function. When the seat belt not fastened alarm is triggered, the seat belt unfastened warning light on combination instrument display will light up in different states and the seat with unfastened seat belt will also be displayed on combination instrument display.
- When the start switch is in the ON position, the airbag control unit (SRS) signals the seat belt status to combination instrument. If the front seat belts are not fastened, the seat belt unfastened warning light on the combination instrument will light up to remind to fasten the seat belts.

Rear seat belt system

Rear seat belt system includes the following components:

- The rear seat belt retractors are located in the C-pillar middle shield and in the rear seatbacks.
- The lower portion of the rear seat belt is fixed to the floor.
- The rear seat belt buckles are fixed to the floor.

Rear passenger seat belt unfastened alarm

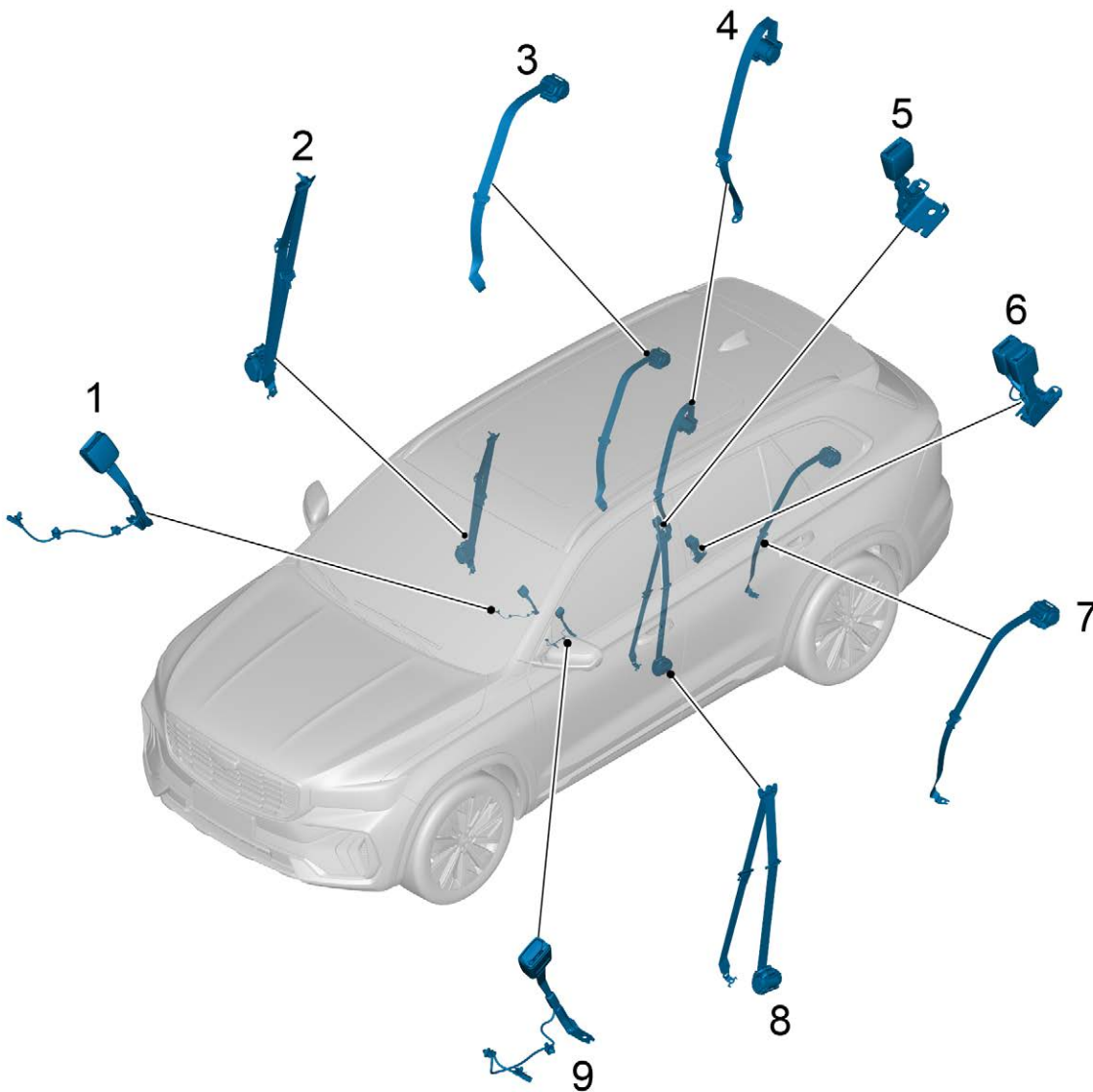
1. When a rear passenger is not wearing the seat belt, a red seat belt unfastened symbol of the seat with unfastened

seat belt will be displayed on the combination instrument display, and the seat belt unfastened warning light will light up. When a rear passenger has fastened the seat belt, a white seat belt fastened symbol of the corresponding rear seat will be displayed on the combination instrument display.

2. When the start switch is in the ON position or the engine is started, if the rear passenger's seatbelt is not fastened, the warning light will light up to prompt the passenger to fasten the seatbelt; when the rear seatbelt is unfastened while the vehicle is moving forward at a speed of more than 10km/h, the warning light flashes with a warning beep until the unfastened rear seatbelt is re-fastened. If the warning light goes off or the unfastened state of the seatbelt lasts for more than 32 seconds, the warning beep disappears.

10.3.4 Part position

10.3.4.1 Part position



- | | | | |
|----|--|----|--|
| 1. | Seat belt buckle sensor (front right side) | 6. | Seat belt buckle sensor (second row seat middle and left side) |
| 2. | Seat belt pretensioner (front right side) | 7. | Seat belt pretensioner (second row seat left side) |
| 3. | Seat belt pretensioner (second row seat right side) | 8. | Seat belt pretensioner (front left side) |
| 4. | Seat belt pretensioners (second row seat middle) | 9. | Seat belt buckle sensor (front left side) |
| 5. | Seat belt buckle sensor (second row seat right side) | | |

10.3.5 Diagnostic information and procedure

10.3.5.1 Diagnosis description

Refer to [Instructions and operations](#), get familiar with the system function and operation before starting the system diagnosis. This will help to determine the correct fault diagnosis steps in case of failure. More importantly, it will also help to determine whether the condition described by the customer is a normal operation.

10.3.5.2 Routine inspection

Confirm trouble symptom

The most difficult situation during troubleshooting is that no symptoms appear. Under this circumstances, the fault described by the user must be thoroughly analyzed. Then it is needed to simulate the same or similar conditions and environments when the customer's vehicle fault occurs. The same or similar conditions and environment when the fault of the distributor's vehicle comes out should be simulated. No matter how experienced and skilled the maintenance personnel is, if they do not confirm the symptoms of the fault, they will ignore some important things in the repair and make wrong guesses in some places which will result in troubleshooting unable to proceed.

Check system components that are easily accessible or can be seen to find out if there is any obvious damage or there is a situation that may cause a malfunction.

Connector joints and fulcrums of vibration should be the main parts to be checked, and if the fault may be caused by vibration, the vibration method is recommended:

- a. Gently vibrate the possible fault part with fingers, and check whether the fault occurs.
- b. Gently shake the connector in both vertical and horizontal directions.
- c. Gently shake the harness in both vertical and horizontal directions.

In-vehicle check

Seat belt pretensioner (front left side) unfastened alarm:

1. When the driver's seat belt is not fastened, a red seatbelt unfastened symbol of the driver seat will be displayed on the combination instrument display and the seatbelt unfastened warning light illuminates.
2. When the driver's seat belt is fastened, a white seat belt fastened symbol of the driver seat will be displayed on the combination instrument display.
3. If the driver's seat belt is not fastened when start switch is in the ON position or when the engine is started, the seat belt unfastened warning light on combination instrument display illuminates continuously;
4. When the vehicle speed exceeds 10 km/h or the distance exceeds 300 meters, the warning light flashes with a warning sound;
5. When the driver's seat belt is not fastened while the vehicle is moving forward at a speed of more than 10 km/h, this warning light flashes and is accompanied by a warning sound until the driver fastens the seat belt or the seat belt unbuckled state lasts for more than 120 seconds before the warning light goes out and the warning sound disappears.

Front right seatbelt unfastened alarm:

1. When a passenger not wearing a seatbelt is seated on the front seat, a red seatbelt unfastened symbol of the front passenger seat is displayed on the combination instrument display and the seatbelt unfastened warning light illuminates.
2. A white seat belt fastened symbol of the front passenger seat is displayed on the combination instrument display when the front passenger has fastened the seat belt.
3. If the front passenger's seat belt is not fastened when start switch is in the ON position or when the engine is started, the seat belt unfastened warning light on combination instrument display illuminates continuously;
4. When the vehicle speed exceeds 10 km/h or the distance exceeds 300 meters, the warning light flashes with a warning sound;

5. When the front passenger's seat belt is not fastened while the vehicle is moving forward at a speed of more than 10 km/h, this warning light flashes and is accompanied by a warning sound until the front passenger fastens the seat belt or the seat belt unfastened state lasts for more than 120 seconds before the warning light goes out and the warning sound disappears.

Rear passenger seat belt unfastened alarm:

1. When the rear passenger's seat belt is not fastened, a red seatbelt unfastened symbol of the rear passenger seat will be displayed on the combination instrument display and the seatbelt unfastened warning light illuminates.
2. A white seat belt fastened symbol of the corresponding rear seat is displayed on the combination instrument display when the rear passenger has fastened the seat belt.
3. When the start switch is in the ON position or the engine is started, if the rear passenger's seat belt is not fastened, this warning light illuminates to prompt the passenger to fasten the seat belt;
4. When the rear passenger's seat belt is not fastened while the vehicle is moving forward at a speed of more than 10 km/h, this warning light flashes and is accompanied by a warning sound until the unfastened rear seat belt is fastened or the seat belt unfastened state lasts for more than 32 seconds before the warning light goes out and the warning sound disappears.

10.3.6 Removal and Installation

10.3.6.1 Replacement of seat belt pretensioner (front left side)

Removal Procedure

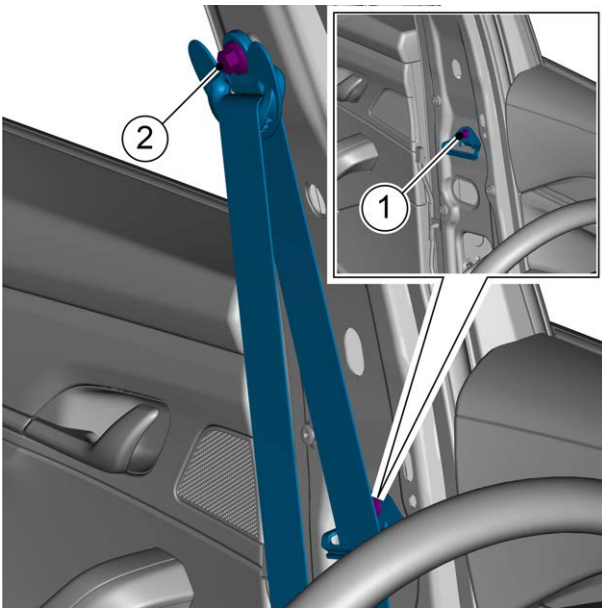
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

Caution

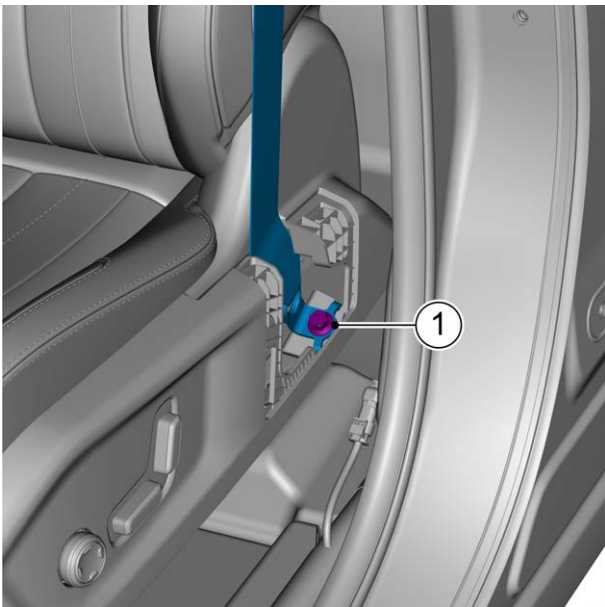
The removal and installation methods of front left and right side safety assemblies are similar.

- 1 Move driver seat forward to the maximum displacement.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the left B-pillar lower trim panel assembly, refer to [Replacement of left B-pillar lower trim panel assembly](#).
- 4 Remove the left B-pillar upper trim panel assembly, refer to [Replacement of left B-pillar upper trim panel assembly](#).
- 5 Remove the seat belt pretensioner (front left side) bracket fixing bolt 1.
- 6 Remove the upper mounting point fixing bolt 2 of the seat belt pretensioner (front left side).

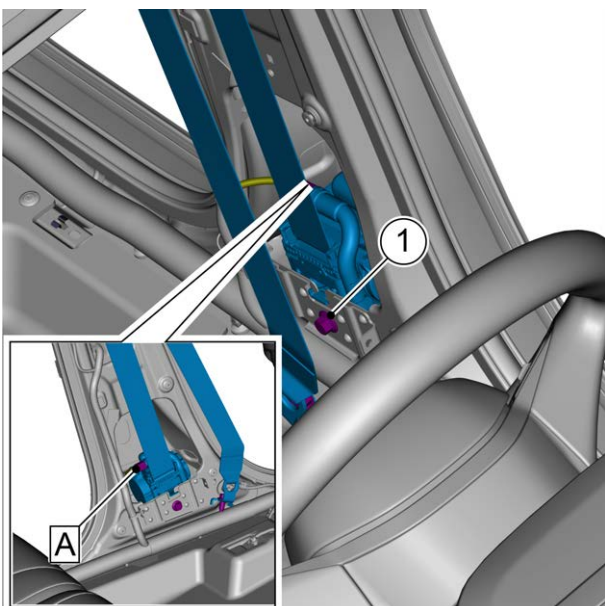




7 Remove the left front seat belt outlet cover.



8 Remove the seat belt pretensioner (front left side) fixing bolt 1.



9 Disconnect the seat belt pretensioner (front left) harness connector A.

10 Remove the seat belt pretensioner (front left side) lower mounting point fixing bolts 1 and take off the seat belt pretensioner (front left side).

Installation Procedure

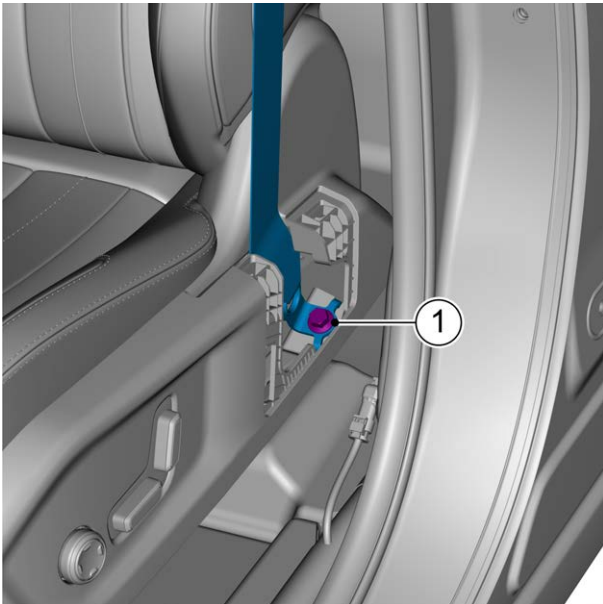
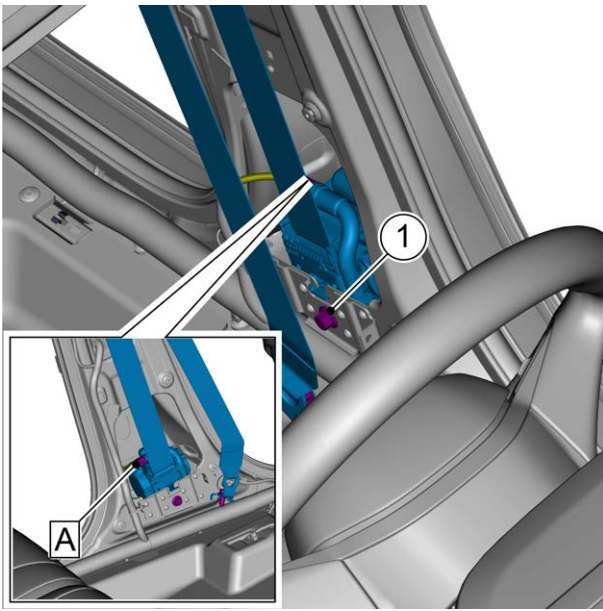
- 1 Install the lower mounting point fixing bolt 1 of the seat belt pretensioner (front left side).

Torque: 40N·m

- 2 Connect the seat belt pretensioner (front left) harness connector A.

Caution

Firmly plug in the harnesses according to the principle of "plugging, sounding and confirming".

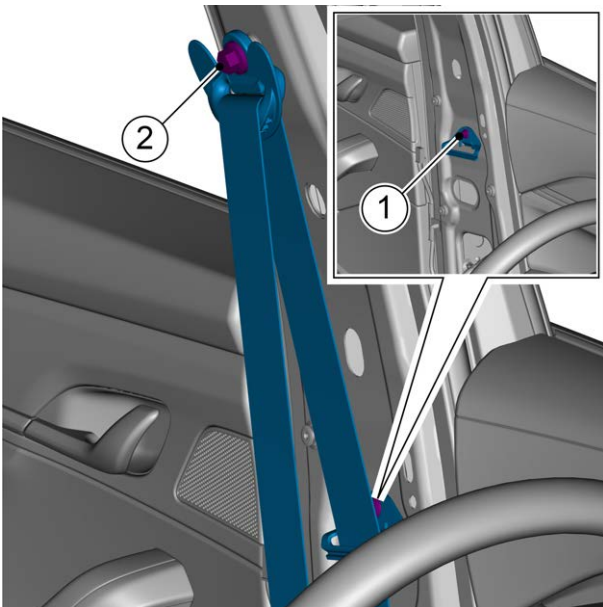


- 3 Install the seat belt pretensioner (front left side) fixing bolt 1.

Torque: 40N·m



- 4 Install the left front seat belt outlet cover.



- 5 Install the upper mounting point fixing bolt 2 of the seat belt pretensioner (front left side).
Torque: 40N·m
- 6 Install the seat belt pretensioner (front left side) bracket fixing bolt 1.
Torque: 10N·m

Caution

Check that the seat belt can be pull out and put back smoothly.

- 7 Install the left B-pillar upper trim panel assembly.
- 8 Install the left B-pillar lower trim panel assembly.
- 9 Connect the negative cable of battery.
- 10 Reset the driver seat position.
- 11 The GLDS diagnostic program is required, under the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software brushing operation.

10.3.6.2 Replacement of seat belt pretensioner (second row seat left side)

Removal Procedure

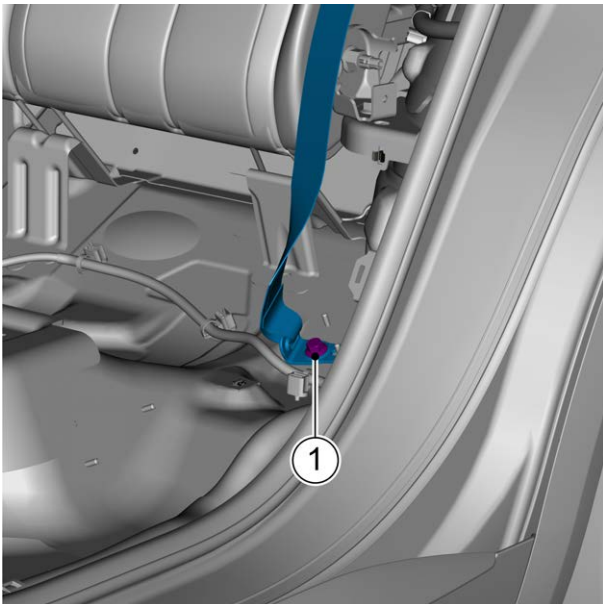
Warning !

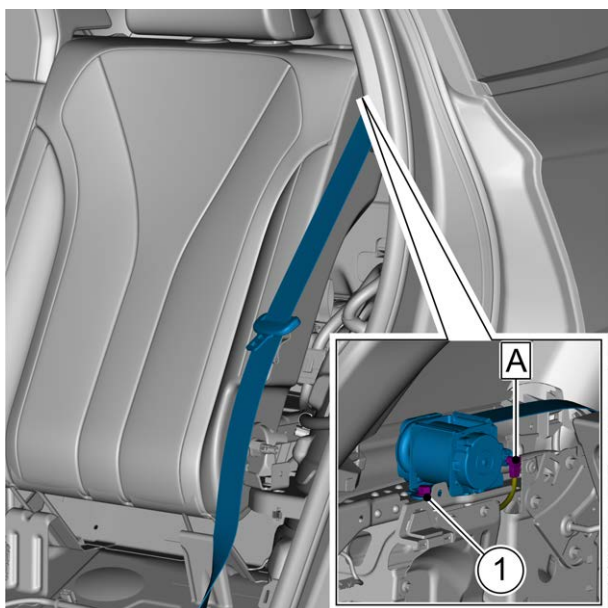
Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#).

Caution

The removal and installation methods of second row seat left and right side seat belt assemblies are similar.

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the rear seat cushion assembly, refer to [Replacement of rear seat cushion assembly](#).
- 3 Remove the left upper trim panel of luggage compartment, refer to [Replacement of luggage compartment left upper trim panel](#).
- 4 Remove the lower mounting point fixing bolt 1 of the seat belt pretensioner (second row seat left side).

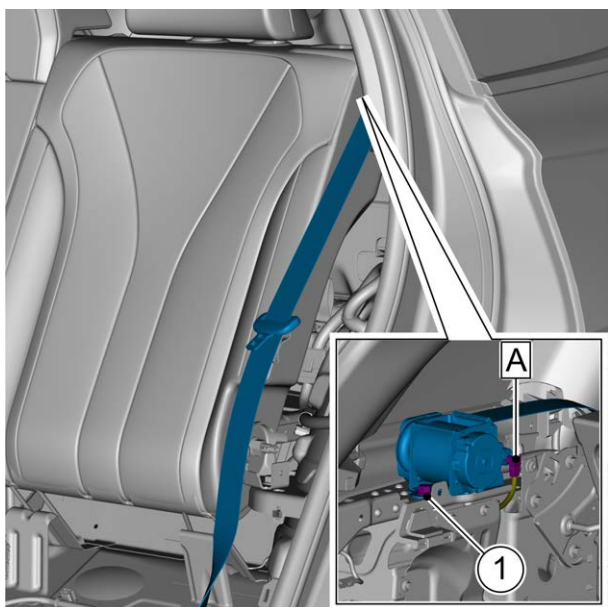


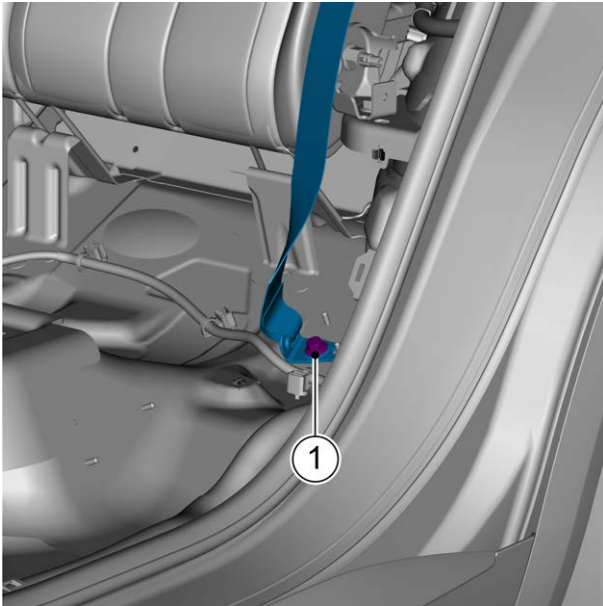


- 5 Disconnect the seat belt pretensioner (second row seat left side) harness connector A.
- 6 Remove the seat belt pretensioner (second row seat left side) fixing bolt 1 and take off the seat belt pretensioner (second row seat left side).

Installation Procedure

- 1 Install the seat belt pretensioner (second row seat left side) fixing bolt 1.
Torque: 40N·m
- 2 Connect the seat belt pretensioner (second row seat left side) harness connector A.





- 3 Install the lower mounting point fixing bolt 1 of the seat belt pretensioner (second row seat left side).
Torque: 40N·m

- 4 Install the left upper trim panel of luggage compartment.
- 5 Install the rear seat cushion assembly.
- 6 Connect the negative cable of battery.

10.3.6.3 Replacement of seat belt buckle sensor (front left side)

Removal Procedure

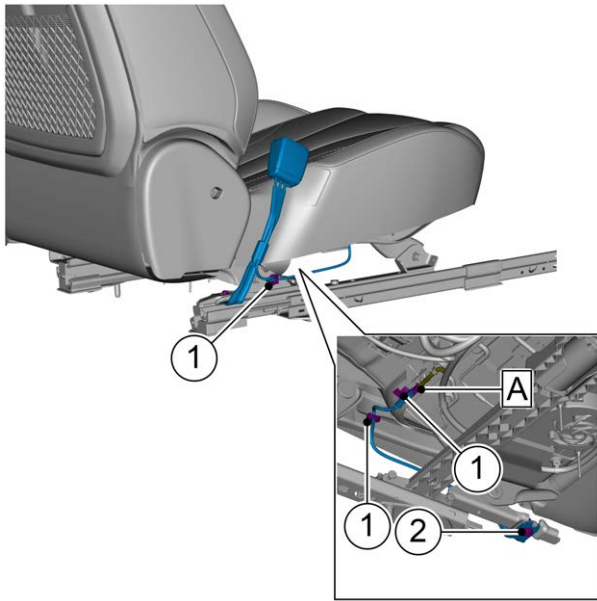
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

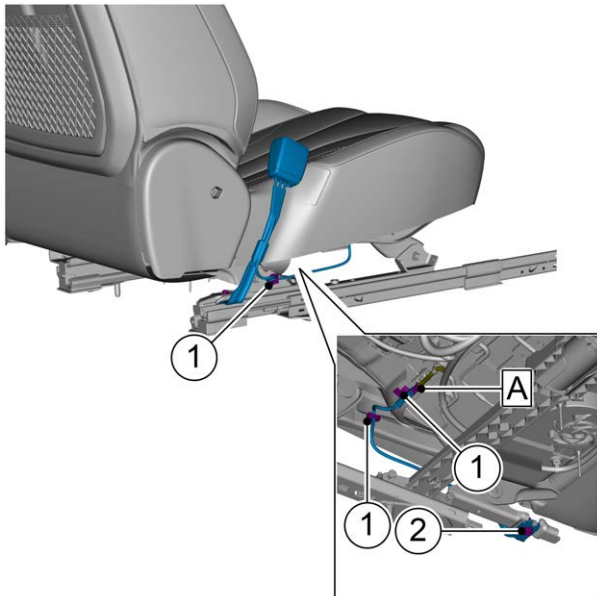
Caution

The removal and installation methods of front left and right side seat belt buckles are similar.

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the driver seat assembly, refer to [Replacement of driver seat assembly](#).



- 3 Disconnect the seat belt buckle sensor (front left) harness connector A.
- 4 Remove the 3 harness clips 1 of seat belt buckle sensor (front left side).
- 5 Remove the seat belt buckle sensor (front left side) fixing bolt 2, and take off the seat belt buckle sensor (front left side).



Installation Procedure

- 1 Install the seat belt buckle sensor (front left side) fixing bolt 2.

Torque: 35N·m

Caution

Make sure that the buckle fits flat against the bottom plate.

- 2 Install the 3 harness clips 1 of seat belt buckle sensor (front left side).
- 3 Connect the seat belt buckle sensor (front left) harness connector A.

- 4 Install the driver seat assembly.
- 5 Connect the negative cable of battery.

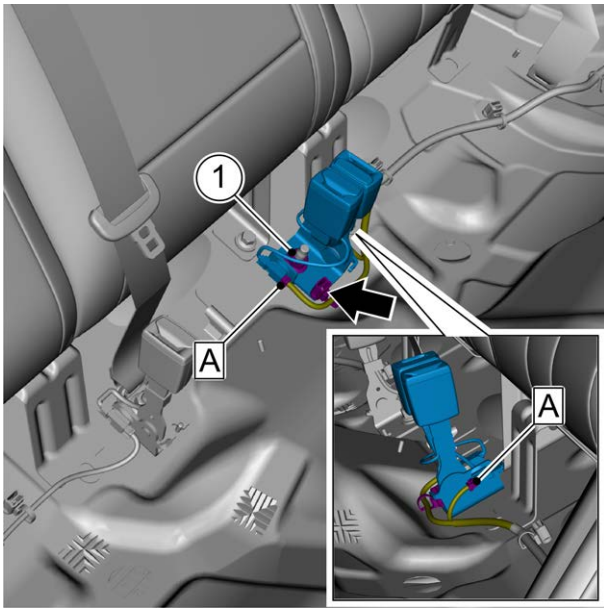
10.3.6.4 Replacement of seat belt buckle sensor (second row seat middle and left side)

Removal Procedure

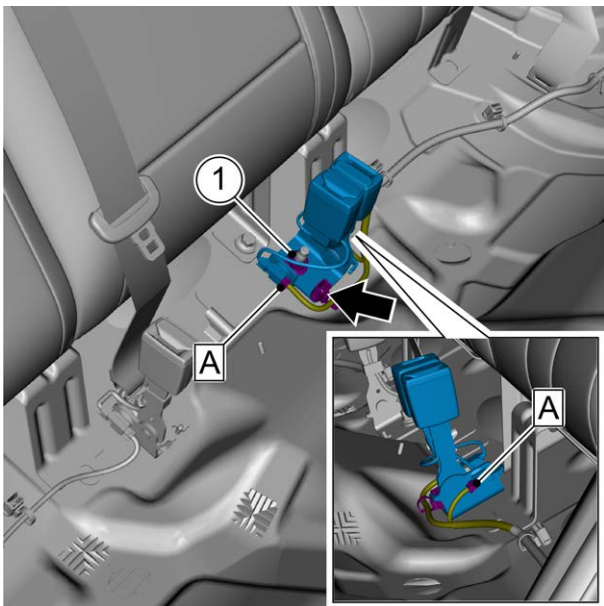
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).



- 2 Remove the rear seat cushion assembly, refer to [Replacement of rear seat cushion assembly](#).
- 3 Disconnect the 2 harness connectors A of seat belt buckle sensor (second row seat middle and left side).
- 4 Disengage the harness fixing clips.
- 5 Remove seat belt buckle sensor (second row seat middle and left side) fixing nut 1, and remove seat belt buckle sensor (second row seat middle and left side).



Installation Procedure

- 1 Install seat belt buckle sensor (2nd row seat middle and left side) fixing nut 1.

Torque: 48N·m

Caution

Make sure that the buckle fits flat against the bottom plate.

- 2 Connect the 2 harness connectors A of seat belt buckle sensor (second row seat middle and left side).
- 3 Install the harness fixing clips.

- 4 Install the rear seat cushion assembly.
- 5 Connect the negative cable of battery.

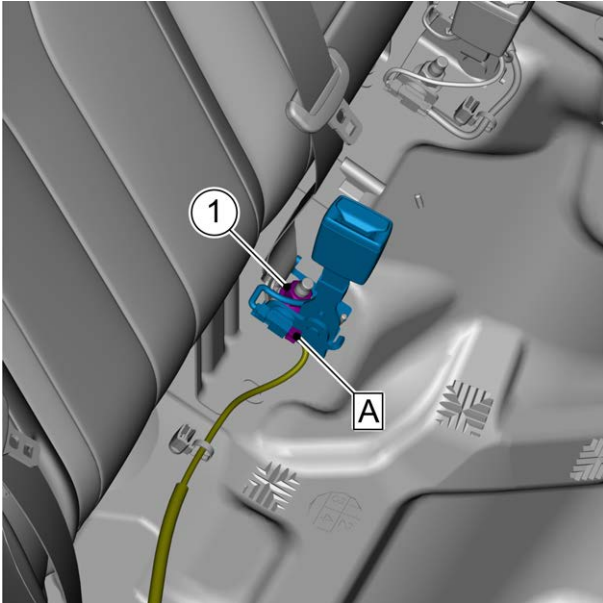
10.3.6.5 Replacement of seat belt buckle sensor (second row seat right side)

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the rear seat cushion assembly, refer to [Replacement of rear seat cushion assembly](#).
- 3 Disconnect the seat belt buckle sensor (second row seat right side) harness connector A.
- 4 Remove the seat belt buckle sensor (second row seat right side) fixing bolt 1 and remove the seat belt buckle sensor (second row seat right side).

**Installation Procedure**

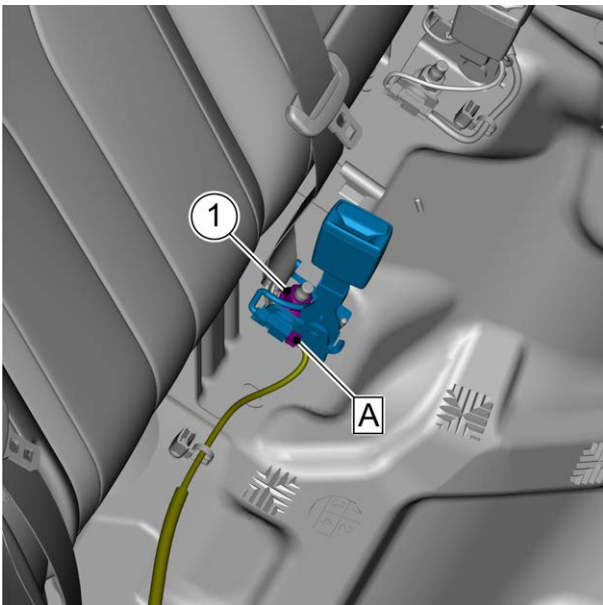
- 1 Install seat belt buckle sensor (second row seat right side) fixing bolt 1.

Torque: 45N·m

Caution

Make sure that the buckle fits flat against the bottom plate.

- 2 Connect the seat belt buckle sensor (second row seat right side) harness connector A.



- 3 Install the rear seat cushion assembly.
- 4 Connect the negative cable of battery.

10.4 Active safety

10.4.1 Specification

10.4.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Active safety domain controller bracket 2 plastic fixing nut	T5×11	3.0-4.0

10.4.2 Instructions and operations

10.4.2.1 Instructions and operations

Lane Keeping Assist (LKA)

The Lane keeping assist system consists of Lane Departure Warning (LDW), Lane Departure Assist (LDP), and Emergency Lane Keeping Assist (ELKA). The system uses the front view camera to recognize the lane lines, calculates the distance between the vehicle and the left and right lane lines, and when the vehicle deviates from the lane, the system will provide active corrective action to prevent deviation from the lane or remind the driver to keep the vehicle in the lane. LKA is available when the vehicle speed is 60-180 km/h and the lane lines are clearly visible. This function is applicable to highways or similar main roads.

1. Lane Departure Warning (LDW)

Lane Departure Warning (LDW) alerts the driver in the event of an unconscious lane departure of the vehicle. Unconscious lane departure includes lane departure that has already occurred as well as lane departure that is about to occur.

2. Lane Departure Prevention (LDP)

Lane Departure Program (LDP) is a system that actively steers the vehicle back into its lane by applying torque to the steering wheel when the vehicle is approaching the lane line and there is a risk of deviation. LDP provides the driver with steering assistance from 55-180km/h to prevent the vehicle from drifting out of its own lane without the driver being aware of it.

3. Emergency Lane Keeping Assist (ELKA) (if equipped)

ELKA function can help the vehicle return to its own lane in the following situations:

- The vehicle is about to run off the road or collide with a traversable road edge.
- Unintentional lane departure and collision with a vehicle from the opposite direction.
- Unintentional lane departure and collision with vehicle behind (this is only available on models equipped with rear side medium range radar).
- Unintentional lane departure and collision with pedestrian in adjacent lane.

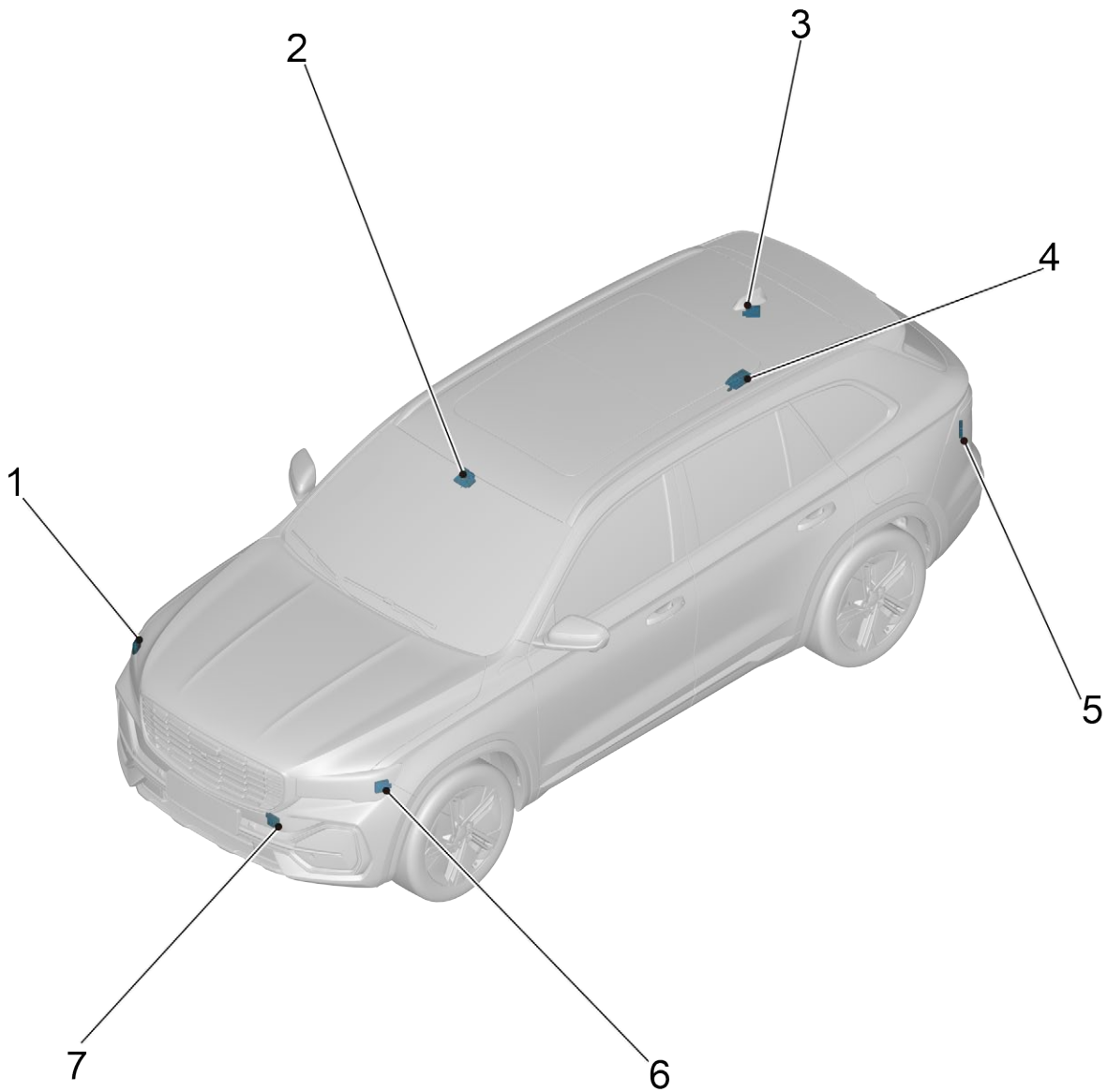
Automatic Speed Limit Control (LIM)

With the automatic speed limit control system (LIM), it is possible to keep the vehicle speed from exceeding the pre-set speed limit. The automatic speed limit control system can be selected in combination instrument display by using the function menu switching button on the left side of the steering wheel, and when selected, the automatic speed limit control

system enters the standby state, and the automatic speed limit control system (LIM) status indicator lights up in white.

10.4.3 Part position

10.4.3.1 Part position



- | | |
|---|--|
| 1. Front right radar module | 5. Left side obstacle detection control module |
| 2. Front Looking Camera | 6. Front left radar module |
| 3. Right side obstacle detection control module | 7. Forward Looking Radar |
| 4. Active Safety Domain Controller | |

10.4.4 Diagnostic information and procedure

10.4.4.1 Diagnosis description

Refer to [Instructions and operations](#), get familiar with the system function and operation before starting the system diagnosis. This will help to determine the correct fault diagnosis steps in case of failure. More importantly, it will also help to determine whether the condition described by the customer is a normal operation.

10.4.4.2 Routine inspection

1. Check after-sale installations that may affect the operation of the active safety system to ensure that they do not affect the operation of the active safety system.
2. Check system components that are easily accessible or can be seen to find out if there is any obvious damage of the component or there is a situation that may cause a fault.
3. Check the harness and harness connector to ensure that there is no sign of loosening, damage, poor contact, aging, etc.

10.4.4.3 Forward looking camera calibration device requirements

FLR calibration board

1. Dimension and flatness:

- Planar mirror: H*W*D: 540mmx900mmx3mm
- Aluminum plate: H*W*D: 540mmx900mmx10mm

Flatness $\leq 0.13\text{mm}$

2. The tilt angle of FLR calibration board should be adjustable in the vertical direction, respectively -2° , 0° , and 2° , precision: $\pm 0.05^\circ$ and easy to adjust.
3. Vertical calibration accuracy of FLR calibration board is $\pm 0.1^\circ$, horizontal calibration accuracy is $\pm 0.3^\circ$.
4. FLR calibration board mounting error:

Angle error

Yaw angle	Tilting angle	Inclination angle
$\pm 0.15^\circ$	$\pm 0.15^\circ$	$\pm 0.15^\circ$

Axial movement error

X	Y	Z
$\pm 50\text{mm}$	$\pm 10\text{mm}$	$\pm 10\text{mm}$

5. FLR calibration board center height adjustment range: 290mm-790mm, based on the horizontal ground.
6. The distance between the lower edge of the lowest position of the FLR calibration board and the ground is $\geq 20\text{mm}$.
7. Horizontal adjustment range of the center of FLR calibration board: -500 mm-+500 mm, based on the driving axis of the vehicle.
8. Horizontal and vertical situation of FLR calibration board should be easy for visualization.

FLC calibration board

1. FLC calibration board size: 1340x740mm.

2. Adjustment range of FLC calibration board center height from the ground: 1000mm-1800mm.

3. FLC calibration board mounting errors are as follows:

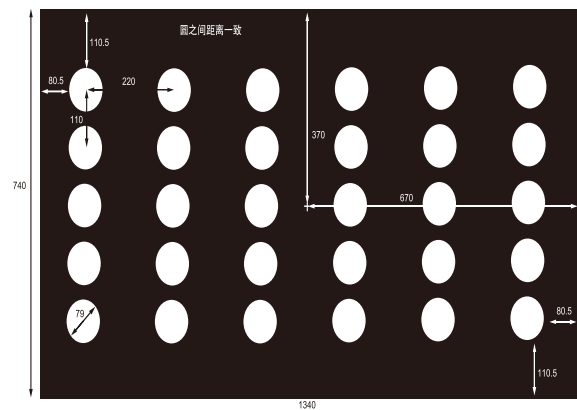
Angle error

Yaw angle	Tilting angle	Inclination angle
$\pm 0.15^\circ$	$\pm 0.15^\circ$	$\pm 0.15^\circ$

Axial movement error

X	Y	Z
$\pm 50\text{mm}$	$\pm 10\text{mm}$	$\pm 10\text{mm}$

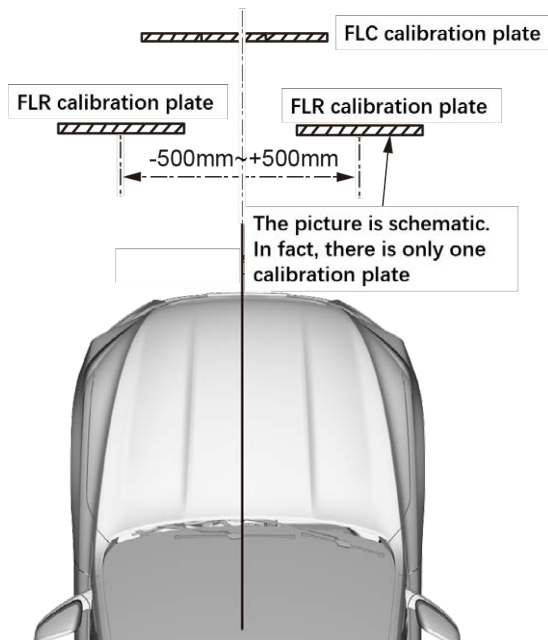
4. Specific dimensions are as follows:



It should be the same as the figure shown above, the overall background color is black and the round hole is white.

Requirements for assembly

1. Overall requirement: The FLC calibration board plane shall be perpendicular to the vehicle driving direction and the FLC calibration board plane normal shall be consistent with the vehicle driving axis, the FLR calibration board plane shall be perpendicular to the vehicle driving direction and the FLR calibration board plane normal should be adjustable in the range of -500 mm~+500 mm (based on the vehicle driving axis) as shown in the figure below:



6. Each set of calibration assemblies contains 2 socket wrenches, which is used to adjust the radar sensor.
 7. The FLR and FCS calibration boards need to be easily adjusted within the adjustable range, and shall be able to be locked at any position within the adjusted range (the latest locking length unit is 5 mm).
2. The calibration device assembly supports the accurate measurement of FLR calibration board and FLC calibration board equipment to the FLR and FLC equipment of the vehicle.
 3. The calibration device assembly can accurately read the horizontal and vertical position information of the FLR calibration board and the FLC calibration board within an adjustable range (for example, there is a ruler on the corresponding bracket or cross member that can reflect the central position, with a minimum accuracy of 5 mm), and is relatively reliable.
 4. The calibration device assembly, and the parts and components shall be installed firmly. The FLR calibration board and FLC calibration board shall be reliably fixed on the device assembly. The device assembly shall be easy to move and lock.
 5. The calibration device assembly needs to be equipped with a mechanism that can be used to adjust the FLR calibration board and FLC calibration board to a direction perpendicular with the vehicle's driving axis and ground, and the adjustment range is required to be ≥ 50 mm.

10.4.5 Removal and Installation

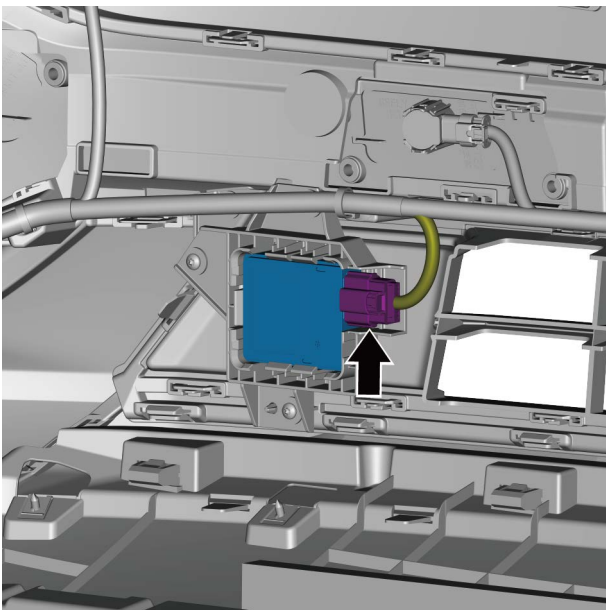
10.4.5.1 Replacement of forward looking radar

Removal Procedure

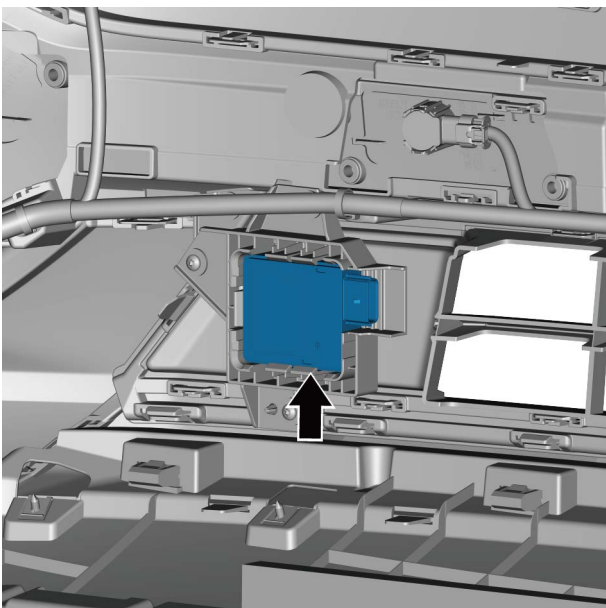
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

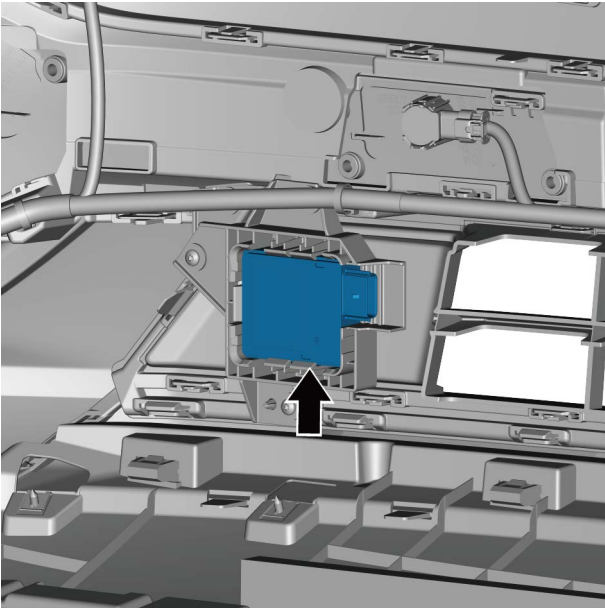
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the front bumper assembly, refer to [Replacement of front bumper assembly](#).
- 3 Disconnect the forward looking radar harness connector.



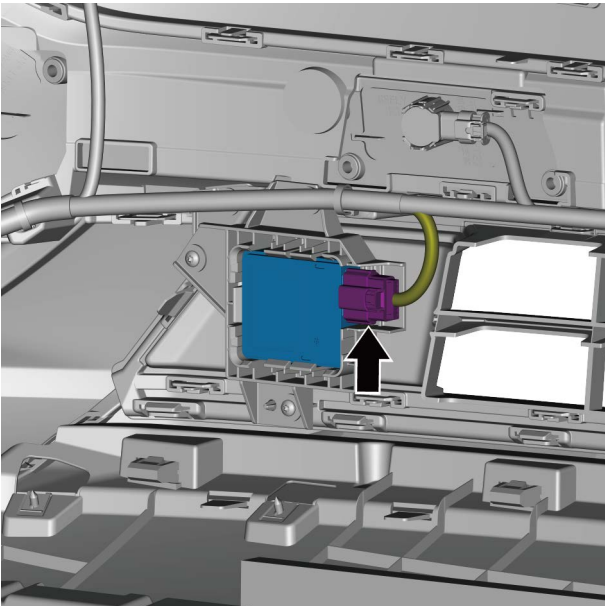
- 4 Remove the forward looking radar.



Installation Procedure



- 1 Install the forward looking radar.



- 2 Connect the forward looking radar harness connector.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 3 Install the front bumper assembly.
- 4 Connect the negative cable of battery.
- 5 The GLDS diagnostic program is required, under the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software brushing operation.

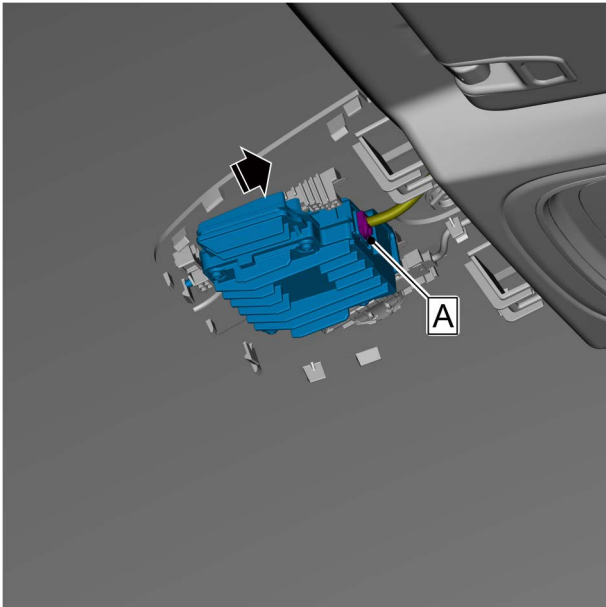
10.4.5.2 Replacement of forward looking camera

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

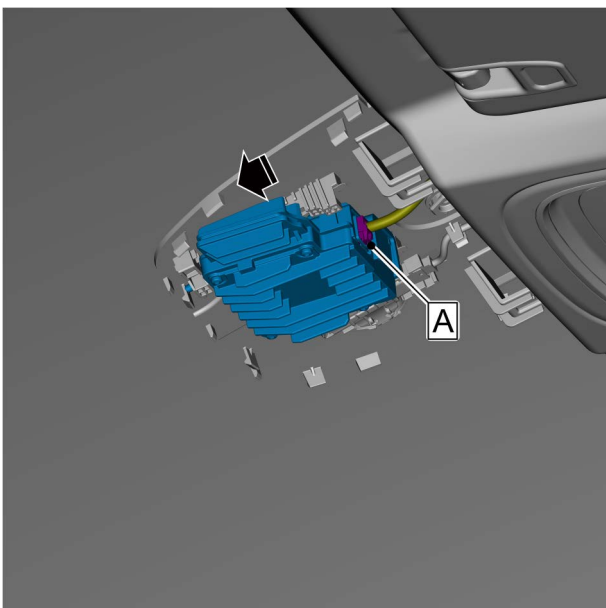
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the mechanical inside dimming rearview mirror, refer to [Replacement of mechanical inside dimming rearview mirror](#).
- 3 Disconnect the forward looking camera harness connector A, and disengage the fixing clip upward and remove it.

**Installation Procedure**

- 1 Fix the forward looking camera and connect the forward looking camera harness connector A.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 2 Install the mechanical inside dimming rearview mirror.

- 3 Connect the negative cable of battery.
- 4 The GLDS diagnostic program is required, under the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software brushing operation.

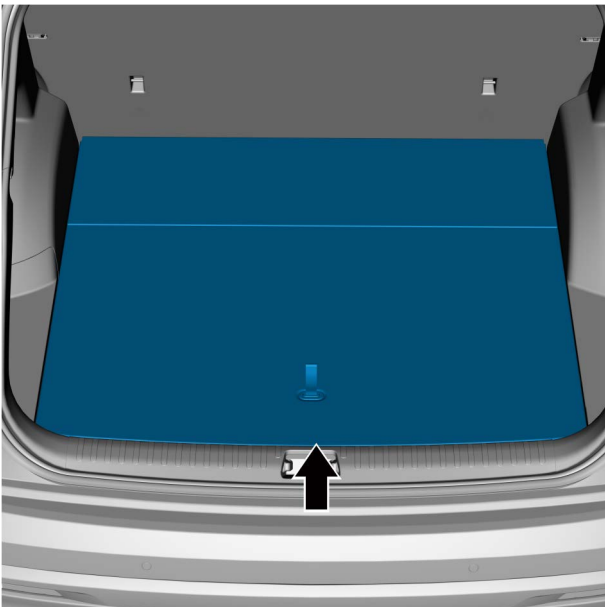
10.4.5.3 Replacement of active safety domain controller

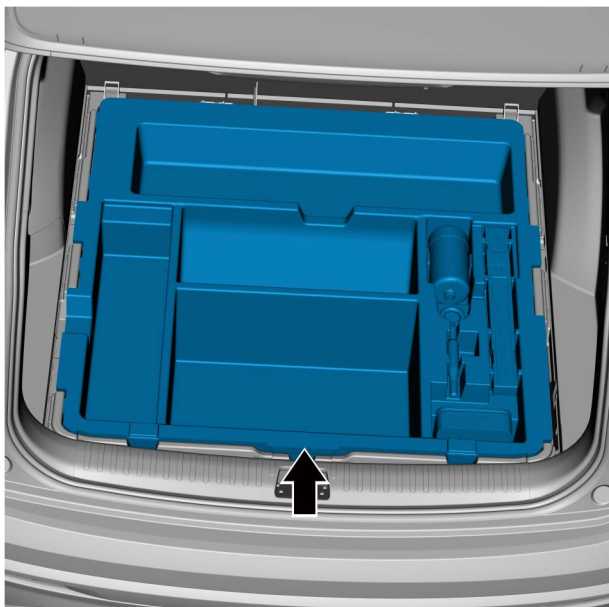
Removal Procedure

Warning !

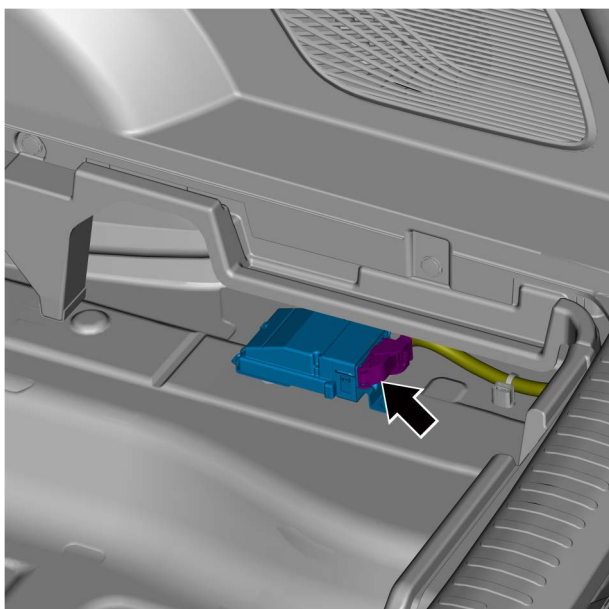
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Take out the luggage compartment cover.

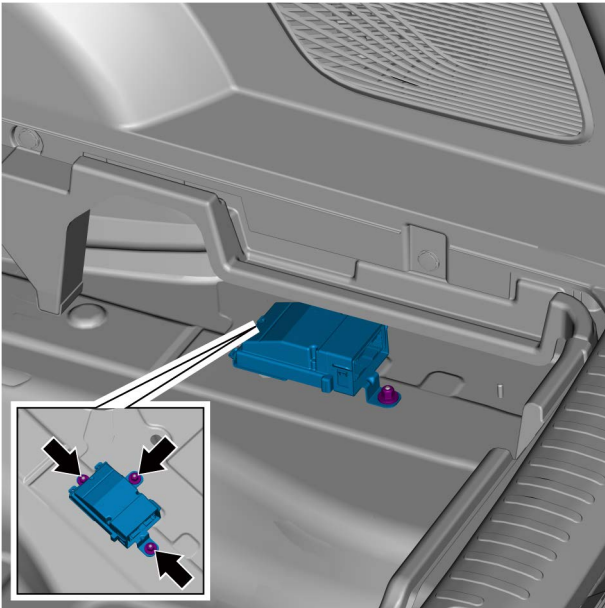




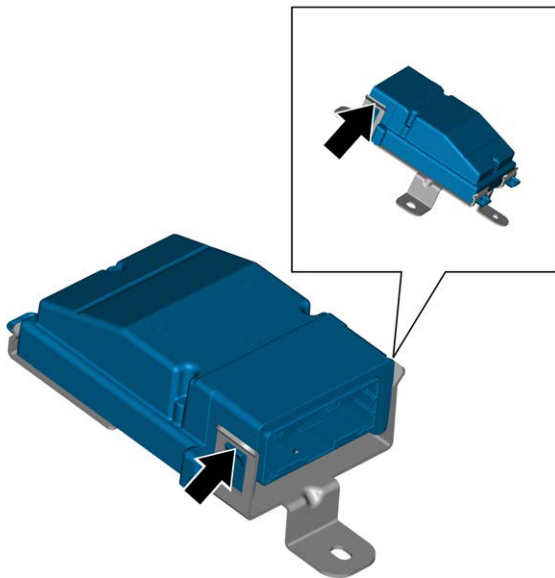
3 Remove the luggage compartment storage box.



4 Disconnect the active safety domain controller harness connector.

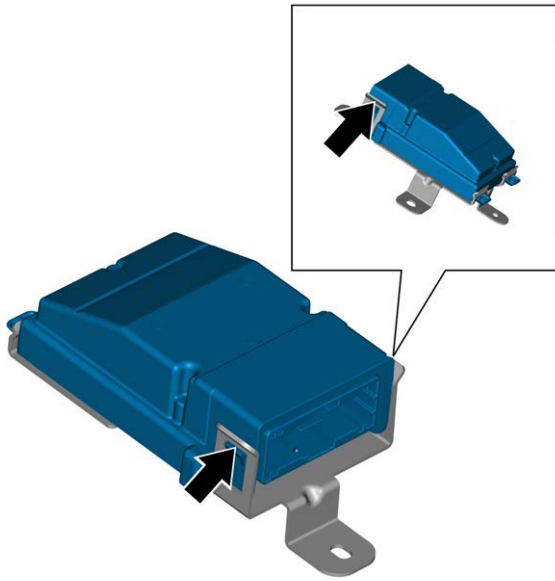


- 5 Remove the 3 plastic fixing nuts of the active safety domain controller.

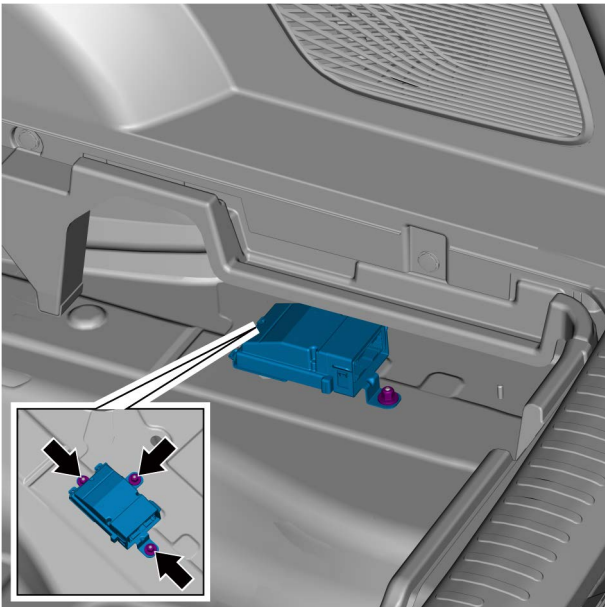


- 6 Disengage the active safety domain controller fixing clips and remove the active safety domain controller.

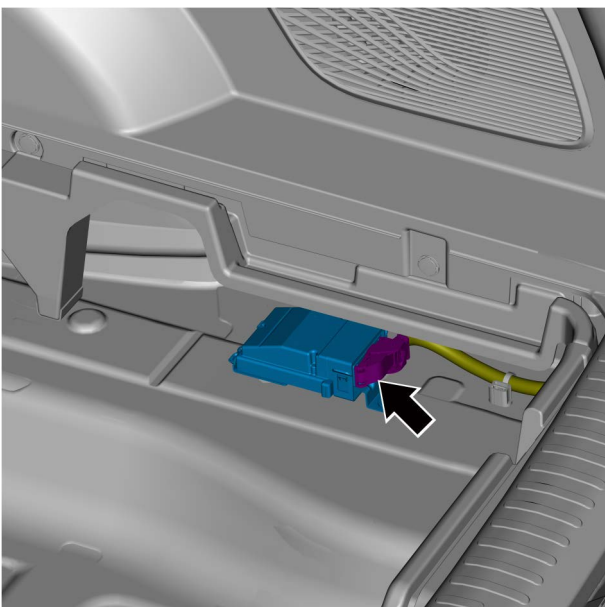
Installation Procedure



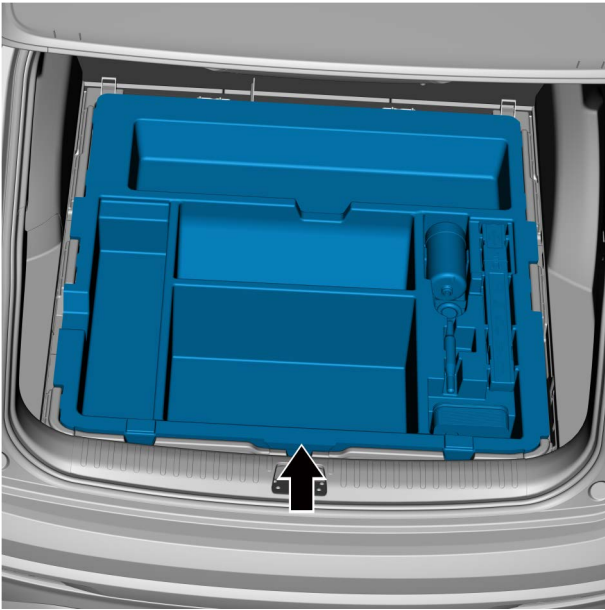
- 1 Place the active safety domain controller in the active safety domain controller bracket.



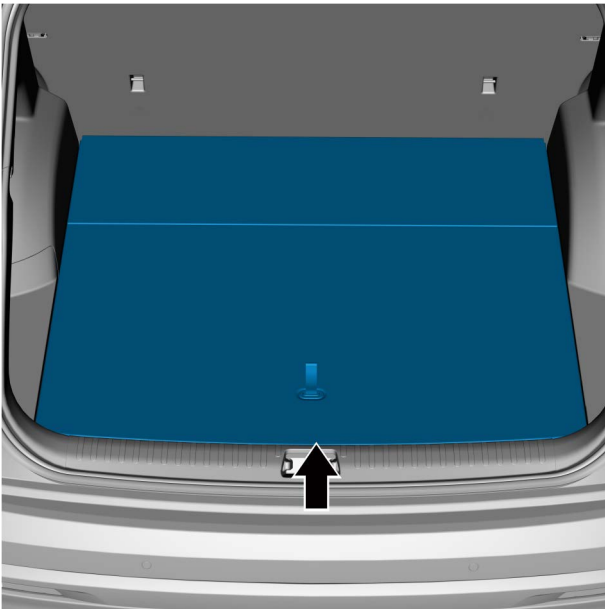
- 2 Install the 3 plastic fixing nuts of the active safety domain controller.
Torque: 3.5N·m



- 3 Connect the active safety domain controller harness connector.



- 4 Install the luggage compartment storage box.



- 5 Install the luggage compartment cover.

- 6 Connect the negative cable of battery.
- 7 The GLDS diagnostic program is required, under the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software brushing operation.

10.4.5.4 Replacement of front left radar module

Removal Procedure

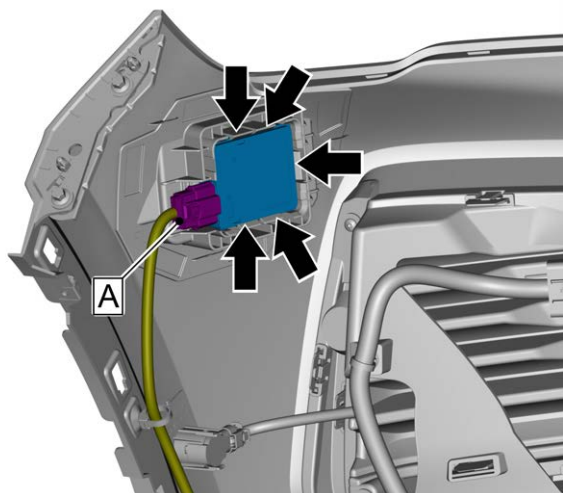
Caution

The removal and installation methods of left and right side front left radar modules are similar.

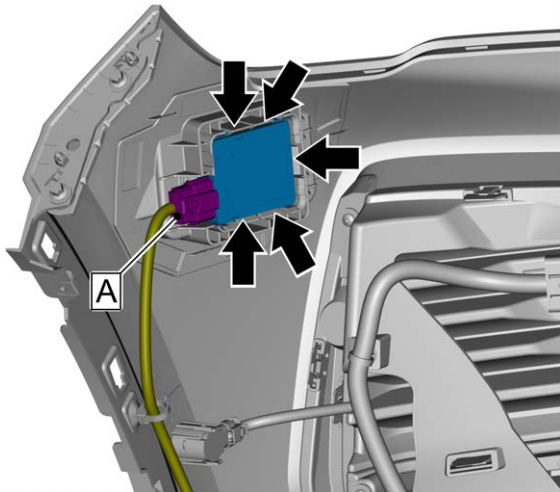
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the front bumper assembly, refer to [Replacement of front bumper assembly](#).
- 4 Disconnect the front left radar module harness connector A.
- 5 Disengage the front left radar module fixing clip and remove the front left radar module.



Installation Procedure



- 1 Install the front left radar module and fix the front left radar module fixing clip.
- 2 Install the front left radar module harness connector A.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 3 Install the front bumper assembly.
- 4 Connect the negative cable of battery.
- 5 The GLDS diagnostic program is required, under the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software brushing operation.
- 6 Close the engine compartment cover.

10.4.5.5 Replacement of left side obstacle detection control module

Removal Procedure

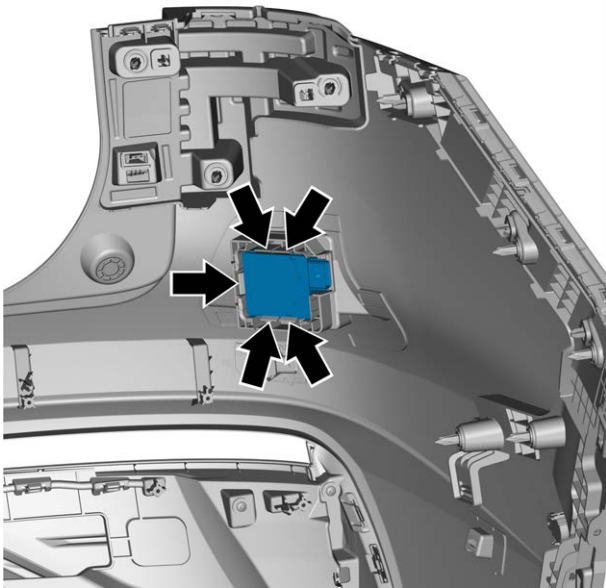
Caution

The removal and installation methods of left and right side right obstacle detection control modules are similar.

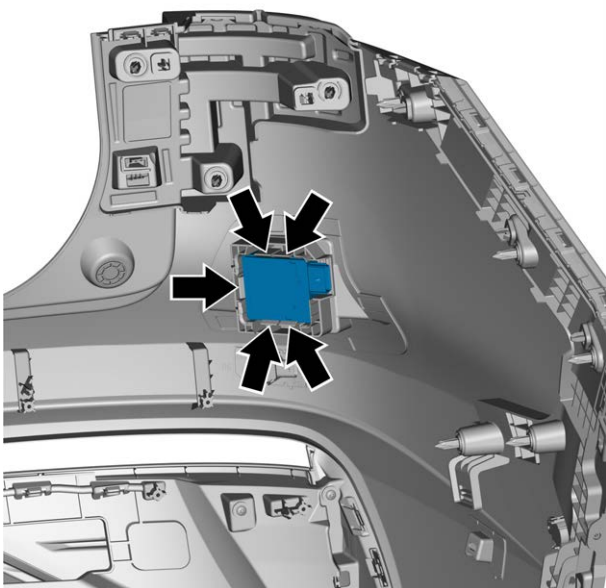
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).



- 3 Remove the rear bumper assembly, refer to [Replacement of rear bumper assembly](#).
- 4 Disengage the left side obstacle detection control module fixing clip and remove the left side obstacle detection control module.



Installation Procedure

- 1 Install the left side obstacle detection control module and fix the left side obstacle detection control module fixing clip.
- 2 Install the rear bumper assembly.
- 3 Connect the negative cable of battery.
- 4 The GLDS diagnostic program is required, under the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software brushing operation.
- 5 Close the engine compartment cover.

Vehicle Control System

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11.1 Warnings and Cautions

11.1.1 Warnings and Cautions

11.1.1.1 Warnings and Cautions

Warning about Battery Disconnection

Warning !

Before servicing any electrical component, the start switch power mode should be OFF and all electrical loads must be "OFF" unless otherwise noted in the operating procedures. Also disconnect the battery negative cable if tools or equipment are likely to come into contact with exposed energized electrical terminals. Violation of these safety instructions may result in personal injury and/or damage to the vehicle or vehicle components.

Warning about Road Test

Warning !

Road test the vehicle in a safe manner and obey all traffic laws. Do not attempt any operation that could jeopardize vehicle control. Failure to comply with the above safety instructions could result in serious personal injury and damage to the vehicle.

Warning regarding window quick regulating function

Warning !

When the driver door operates the electric window switch, the fast up/down function makes the window move extremely fast without stopping, which may result in personal injury.

Notices for placing the starting switch in the OFF position when disconnecting the battery

Caution

Be sure to put the start switch in the OFF position when connecting or disconnecting battery cables, battery chargers, or jumper cables. Otherwise, the control module or other electrical components may be damaged.

Notices of the power system control module and electrostatic discharge

Caution

Do not touch connector pins or solder components on circuit boards to prevent electrostatic discharge from damaging the electronic control module on the vehicle.

11.2 Body control system

11.2.1 Specification

11.2.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Central electronic module bracket fixing bolt	M6×16	8.5-11.5
Central electronic module bracket fixing nut	M6×7.3	8.5-11.5

11.2.2 Instructions and operations

11.2.2.1 Instructions and operations

Overview

For lower vehicle failure rate and more effective humanized control, the centralized control method (CEM) is adopted for the electrical accessories.

External anti-theft

When the start switch is operated to the "OFF" state and the doors, trunk door and engine hood are closed, press the lock button on the intelligent key or touch the sensor area on the driver door or front passenger door handle, the turn signal light flashes once, the four doors, the trunk door and the fuel tank lid are locked. After the locking action is successfully executed, the anti-theft alarm system will start the pre-defense stage and enter the defense state after 1s. When the anti-theft alarm system enters the alarm state and the door, trunk door or engine hood is illegally opened, the turn signal will flash with the cycle of lighting up for 500ms and going off for 500ms and the duration is 5min; the horn will beep with the cycle of turning on for 500ms and turning off for 500ms and the maximum duration of the sound alert is 30s. If not all doors (four doors, engine hood and trunk) are closed, after the locking action is successfully executed, the anti-theft alarm system will enter the reminder phase, the turn signal will flash 3 times, and the anti-theft horn will beep 3 times, reminding the driver that not all doors (four doors, engine hood and trunk) are closed. If the four doors and two hoods are closed within the reminding period (10 seconds), the reminder state will be aborted, and the anti-theft alarm system will be transferred to the warning state or the alarm released state according to the situation. If the reminding period (10 seconds) ends and there is still a door or hood left open, the alarm system will enter the alarm state.

Door lock control function

The vehicle body control system provides the following central locking functions:

1. Remote key locking/unlocking

Start switch is in OFF state, press the unlock button on the remote control twice within 500ms, four doors are unlocked, the turn signal blinks twice to confirm, the interior light gradually lights up, and the position lamp lights up.

Start switch is in OFF state, press the lock button on the remote control once within 1s, four doors are locked, turn signal flashes to confirm, interior light fades out, position lamp goes out.

Start switch is in OFF state, press the remote lock button for more than 2s, then the power windows will be closed automatically, and this signal is transmitted through the LIN line.

2. Inside center control switch unlocking/locking

When the center control switch lock button is pressed, the CEM actuates the four doors to unlock. When the vehicle speed is greater than 15km/h, the center control unlock command is disabled. The inside center control switch unlock can only be executed when the anti-theft is disarmed and there is no response in other anti-theft states.

3. Unlock the door at driver's side individually

Turn the mechanical key to the UNLOCK position, the driver side door is unlocked. Press the remote unlock button once within 1s, the driver side door is unlocked.

4. Automatic re-locking

30s after using the remote control to unlock and any of the four doors or the luggage compartment lid is not opened, the doors will automatically relock. The interior lamps are turned off and the system enters the arming state.

5. Automatic locking during running

When the vehicle speed accelerates from 0 to ≥ 20 km/h, the four doors will be automatically locked.

6. Automatic unlocking in case of collision

When a collision signal is received from the CAN bus, the CEM will trigger the center control unlock twice within three seconds, and the left and right turn signals will keep flashing, and the center control lock will be disabled. Unless a door is opened and the power mode is OFF, and the collision signal has expired (4s).

7. Automatic unlocking after flameout

When the door lock is in lock status and the power supply mode is in OFF status, the four-door will unlock automatically.

8. Trunk door unlocking

When the starting switch is in OFF position, press down the remote control unlock button of trunk door for more than 1s to unlock the trunk door.

9. Trunk door auto-lock

The trunk door will automatically unlock after 1.5s of closing. The trunk door will also be unlocked during the automatic re-locking process.

10. Trunk door unlocking is prohibited:

The power mode is in ON state and the vehicle speed is greater than 15km/h, the unlocking of the trunk door will not be executed.

11. Prohibit remote control command

When the power supply is in ON status, any remote commands other than the unalarm operation and the trunk door unlocking will not be executed.

12. Door lock motor protection against overheat

The door lock overheat protection function is activated when six consecutive locking or unlocking actions are performed with an interval of no more than 1280ms each. At this time, only the collision automatic unlocking and other unlocking requests can be executed once more, other than that, no other locking/unlocking requests will be executed within 20s.

Driver alarm information

When the driver has some abnormal operations, the body control system sends CAN message to the instrument and the instrument generates a beep warning to alert the driver. The following functions are included: Lights not turned off warning: the power mode is in OFF state, the headlight or position lamp is turned on by the steering wheel module, if the driver side door is open, the body control system will generate a warning signal to the instrument, and the instrument will emit an audible warning.

Comfort light control function

1. Follow me home function on: Click: Vehicle Settings→Lighting→Lighting Language on the multimedia display screen in turn, select any timing under the follow me home setting interface and then the follow me home is on. When the vehicle anti-theft state is released and the follow me home function is turned off in multimedia display, the following 2 ways can activate the follow me home function:

- When the light steering wheel module is in a non-AUTO gear, within 10min after the vehicle is turned off, toggle the light control steering wheel module in the direction of the arrow to the limit position, then release it, and the high beams flash once to activate the follow me home function.

- At night, when the light steering wheel module is in the AUTO gear and the vehicle is turned off, the follow me home function will be automatically activated.

Turn off the follow me home function: Click: Vehicle Settings→Lighting→Light Language on multimedia display screen in turn, and then click Close under the follow me home setting interface to turn off follow me home function. When any

of the following conditions are met, the follow me home function will be temporarily turned off:

- Start switch is not turned off.
- Timeout.
- High beam is turned on or flashes.

2. Automatic light function: When the start switch is in "ON" gear and the steering wheel module is in AUTO gear, turn on the headlight auto-lighting function, and the auto-lighting system will automatically control the headlight to light up and turn off according to the external light intensity. The automatic lighting system can recognize dark environment and tunnel light environment to realize the automatic control of position lamp and low beam. When the vehicle enters the tunnel, the position lamps and low beams will be it automatically lighted up, and the position lamps and low beams will be automatically turned off after leaving the tunnel. When the outside environment is dark, the system will also light up the position lamps and low beams.

3. Turn signals and hazard warning lights: When the power mode is "ON", turn on the turn signal switch, the turn signal flashes, and when the steering is completed, the light switch handle automatically returns to the original position, and the turn signal turns off.

4. Interior light control: Press the left or right overhead console unit (front reading lamp assembly) switch to turn on or off the left or right overhead console unit (front reading lamp assembly) separately; press the interior light switch to turn on or off the front and rear overhead consoles (rear interior lights) simultaneously.

5. Emergency brake warning light: If the vehicle speed (obtained by CEM via CAN bus) decreases rapidly due to emergency braking, all turn signals are activated to flash; if the rapid decrease of the vehicle speed ends, the hazard warning flasher function is deactivated.

6. Daytime running lamp: the daytime running lamp lights up automatically when the engine is running. When the low beams are on, the daytime running lamp turns off automatically. For configurations in which the daytime running lamps are integrated inside the headlamps, the brightness of the daytime running lamps on the relevant side of the vehicle is reduced to the brightness of the front position lamps when the turn signals are operating.

Remote unlock search lamp function

When the vehicle is in anti-theft mode, press the lock button on the smart key twice quickly to activate the car-seeking function, the position lamp will be on for 25 seconds, the turn signals will flash 6 times, and the horn will sound 3 times.

Automatic lights

When the power supply mode is in ON status and the steering wheel module is in AUTO position, if the environment light sensor is required to light up, the position lamp relay and the headlamp relay will automatically pull in at the request of the ambient light sensor.

When the power mode is ON and the steering wheel module is in the AUTO position, if the ambient light sensor is required to turn off, the position lamp relay and headlamp relay will be automatically disconnected after a 2s delay in response to the ambient light sensor's request.

When the steering wheel module is in the AUTO position and the power mode exits the ON state, this function is immediately turned off if the status of the headlamps or position lamp is lit.

Turn signals

The turn signal system will respond to various body control requests using the turn signal flashing signal. The main requests from the turn signal system's internal modules are: left turn signal switch, right turn signal switch, and warning light switch. Requests from other external modules are: central door control, diagnostic operations, anti-theft alarm system, emergency brakes, and collision flashing. The collision flashing has the highest priority and the alarm lights the next highest priority.

1. Flashing due to collision

When the power mode is ON, if CEM receives a collision signal from the hardware, the front, rear, left, and right turn signals flash simultaneously at a frequency of 85 times/minute, and the warning flash function is canceled by pressing the warning switch button again.

2. Warning lamp

Regardless of the power mode, press the warning switch button and the left and right turn signals flash simultaneously at a frequency of approximately 75 times/minute. Press the warning switch button again and the warning flash function is canceled.

3. Steering prompt

When the power mode is ON, turn on the left turn signal switch and the left turn signal flashes at a frequency of about 85 times/minute. When the power mode is ON, turn on the right turn signal switch, the right turn signal flashes at a frequency of about 85 times/minute.

4. Self-diagnosis of turn signals

In the steering state, the front and rear turn signals are LEDs, when the current output from the turn signal is less than 110mA, it is regarded as faulty (when the LED turn signal is faulty, the output waveform of the fault feedback line at the turn signal end is opposite to the output waveform of the CEM switch); the turn signal on the same side flashes at a frequency of approximately double that of the normal mode. With the alarm activated, if one of the turn signals is damaged, the turn signals on both sides flashes at a frequency of approximately 170 times/minute.

5. Lane changing lamp function:

When the turn signal lamp switch is turned on and off between 100ms and 700ms, the corresponding turn signal will flash three times as a lane changing signal.

6. Emergency brake warning light:

All turn signals are activated to flash if the vehicle speed (CEM obtains the speed and brake signals through the CAN bus) is rapidly reduced due to emergency braking; if the rapid reduction of the vehicle speed ends, the hazard warning flasher function is deactivated.

Interior lights and power saving function

Interior light system is mainly divided into two parts: one is interior light control and the other is power saving control. Interior light control, mainly interior light activation and deactivation. Power saving control, mainly to open or close the power saving control relay.

1. Interior lights:

When one of the following situations occurs, the interior dome lamp will fade in and light up after about 0.7s:

- Any one of the doors opens.
- Switch power supply mode from other gear to OFF state.
- When the power mode is in OFF state, and an unlock request is issued (including remote control, door handle keyless unlock sensor and center door lock switch unlocking).

When one of the following situations occurs, the indoor ceiling light will fade out and go out after about 1.7s:

- Power supply is in ON status and all doors are closed.
- When the power supply is in OFF status and all doors are closed, send the unlock request (including the locking of remote control, locking switch for door handle and central locking.)
- When the central control is in unlocking status and power supply mode is in OFF status, disable the last door after 15s delay.
- The interior lamp is lighted up for 15s, and there is no condition to activate it again.

- Disenable all the doors and lock central control.

The conditions when interior dome lamp goes out immediately:

- After the power saving protection is delayed to start for 10min.

Power saving function: When any of the following actions occur, the power saving function will be retimed:

- Alteration of the status of power supply mode.
- Change of the status of any door.
- Issue unlock command (including the unlocking of remote control, keyless unlock sensor for door handle, and central locking switch).
- When the power saving protection is delayed to start for 20min, the power saving protection relay will cut off the power supply output of CEM.

2. Front footwell light:

- When either door is opened, the front footwell lighting turns on and turns off 3min after the door is closed.
- Power mode is in ON state, footwell light is off.
- The locking command, the footwell light goes out.
- If any door is open, the footwell light turns on, after 10min if the door is still open, the footwell light turns off, within 10min, any door is open, the timer resets.
- With the power mode in OFF and all doors closed, the footwell light goes out.

Heating function

1. Rear defroster heating function:

A voltage signal is obtained from the CAN bus, allowing the rear defroster heating to operate when the battery voltage is greater than 10.7V and the power mode is in the ON state. When the battery voltage is detected to be lower than 10.3V, the rear defroster heating is not allowed to work.

The rear defroster heating switch is a inching button switch. Press the rear defroster heating switch, the rear defroster heater heats up for 20min; if the rear defroster heating switch is pressed again during the rear defroster heating operation, it stops the rear defroster heating operation. Press the rear defroster heating switch again, and the rear defroster heater heats up until 12min (12min of cumulative operation) after the first time the rear defroster heating switch is pressed, and then stops. After 36min, previous heating time is not counted as cumulative for the next time.

Wiper and washing control

When the power supply mode is in ON status, the wiper and washing can be operated. Mainly including:

- Front wiper point wipe function.

- Low speed function of wiper.
- High speed function of wiper.
- Washing linkage mode of wiper.
- Washing function.
- Wiper return function.
- Automatic wiper.

Power exterior rearview mirror folding/unfolding

1. Rearview mirror folding/unfolding through switch: manually fold and unfold the exterior rearview mirrors by operating the driver side switch exterior rearview mirror switch.
2. Rearview mirror folding/unfolding through remote control: when the remote control sets up the defense successfully, the exterior rearview mirror will be folded; when the remote control undefense successfully, the exterior rearview mirror will be unfolded.

CAN network management

1. In this model, the CEMCAN network wake-up conditions are as follows:

Wake-up conditions of local network:

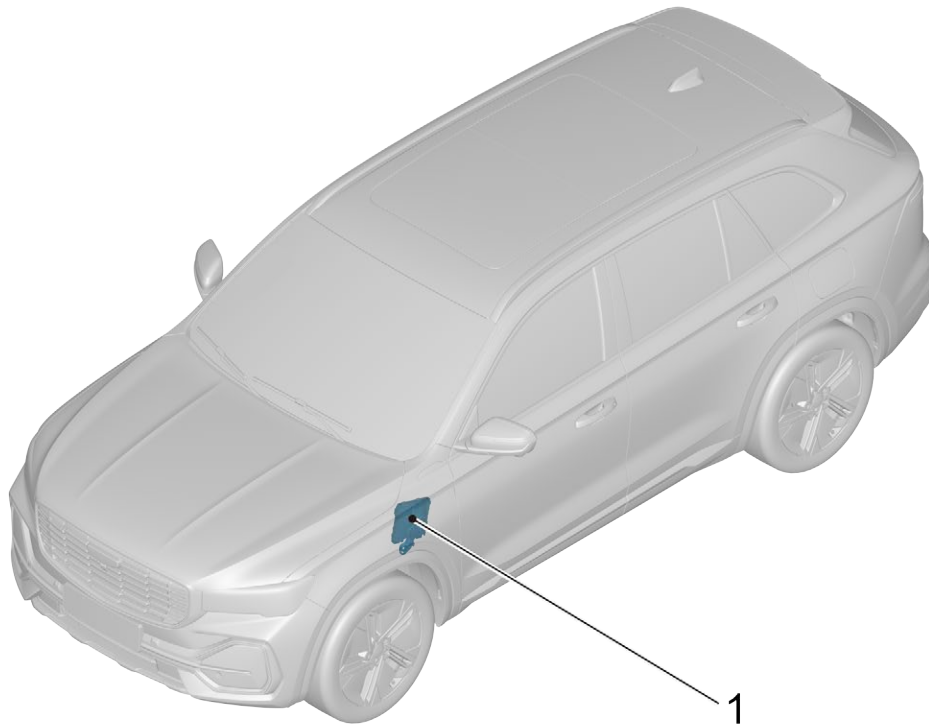
- Power supply mode is in ON status.
- Hazard warning lamp switch is in ON gear.
- Starting switch status change.
- Lights not turned off alarm is activated.
- Receive smart key command.
- Change of the status of any doors.

Wake-up conditions of remote network:

- There is random CAN signal transmission CEM on the CAN bus.
2. Sleep conditions of CAN network:
 - Power supply mode is in OFF status.
 - Starting switch status change.
 - Turn signal lamp is not activated.
 - Smart key command is not received.
 - No lights left on alarm function is activated.
 - No change of any door status.
 - No signal is transmitted on the CAN bus.

11.2.3 Part position

11.2.3.1 Part position



1. Central electronic module (CEM)

11.2.4 Diagnostic information and procedure

11.2.4.1 Diagnosis description

See [Description and Operation](#) before diagnosing a malfunction in the vehicle control system. Understanding and familiarizing yourself with the operation of the vehicle control system before beginning system diagnosis will help determine the correct troubleshooting steps to take in the event of a malfunction, and more importantly this will help determine if the condition described by the customer is normal operation. Any troubleshooting of a vehicle control system should start with a [Routine Check](#) that guides the repairer to the next logical step in the troubleshooting process. Understanding and using the diagnostic process correctly will reduce diagnostic time and avoid misdiagnosis of the fault area.

11.2.4.2 Routine inspection

- a. Check if there is any after-sales installation that may affect the normal operation of CEM, and confirm that CEM can operate normally.
- b. Check system components that are easily accessible or visible to ensure that there are no obvious damages or conditions that might cause malfunctions.

11.2.5 Removal and Installation

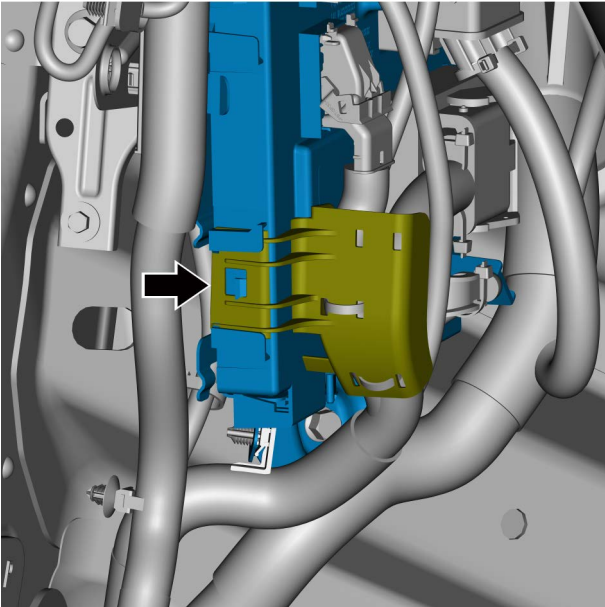
11.2.5.1 Replacement of central electronic module

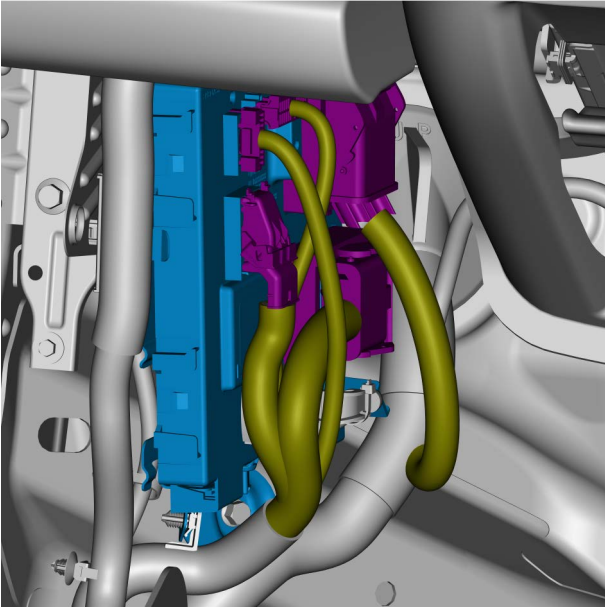
Removal Procedure

Warning !

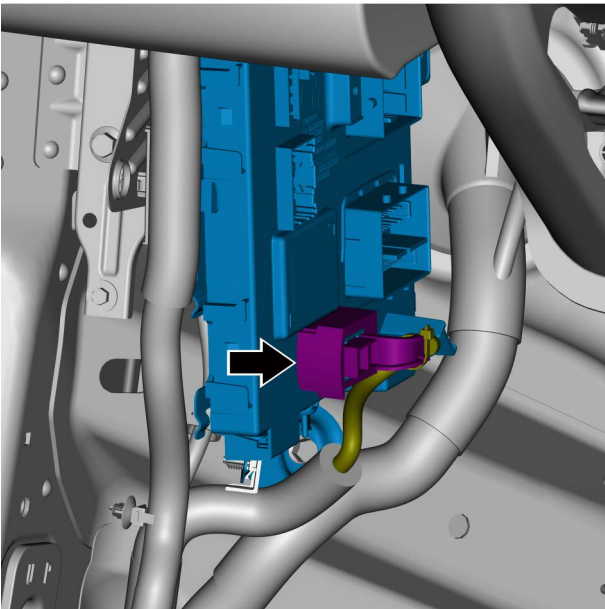
Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left lower toe board assembly, refer to [Replacement of left lower toe board assembly](#).
- 3 Remove the instrument panel left lower shield assembly, refer to [Replacement of instrument panel left lower shield assembly](#).
- 4 Disconnect the central electronics module harness bracket.

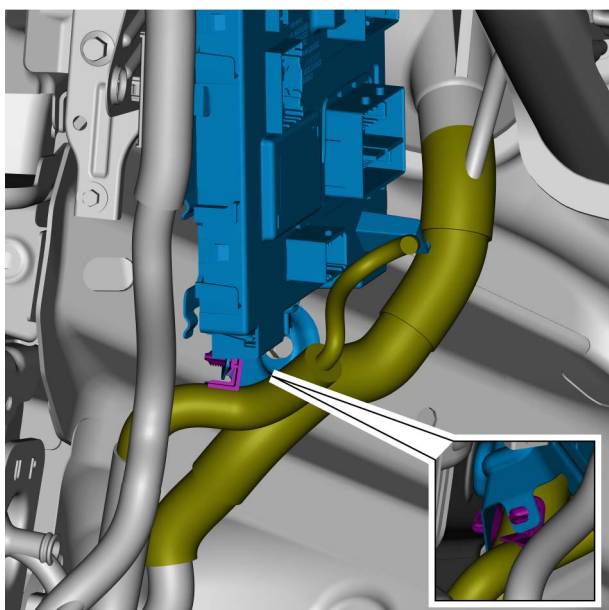




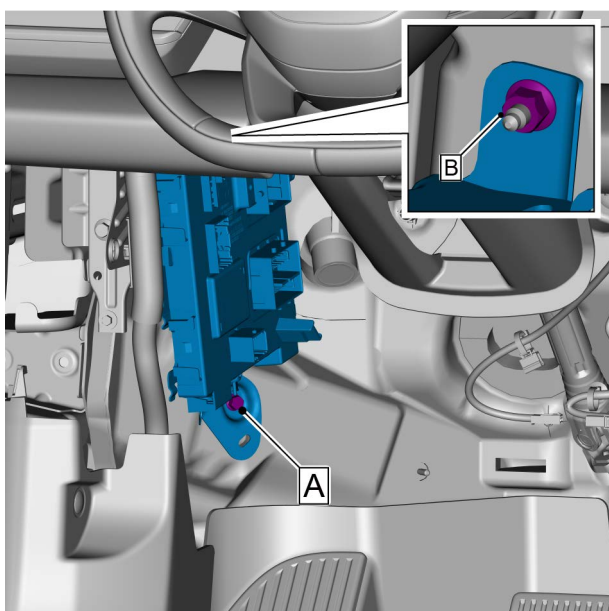
- 5 Disconnect the central electronics module harness connector.



- 6 Disconnect the central electronics module power harness connector.

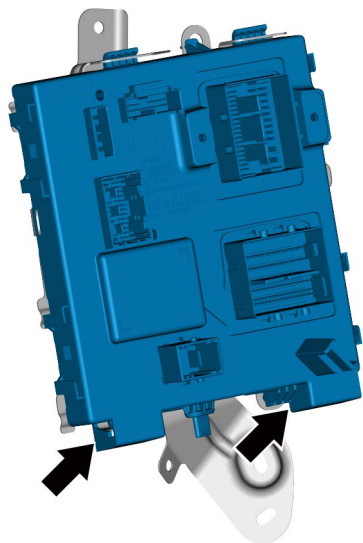


- 7 Remove the harness fixing clips from the central electronics module bracket.



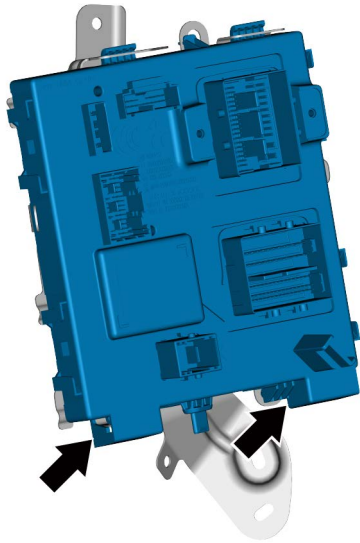
- 8 Remove the fixing bolt A and fixing nut B of central electronics module and bracket assembly.
- 9 Remove the central electronics module and bracket assembly.

- 10 Remove the central electronics module from the indicated position.

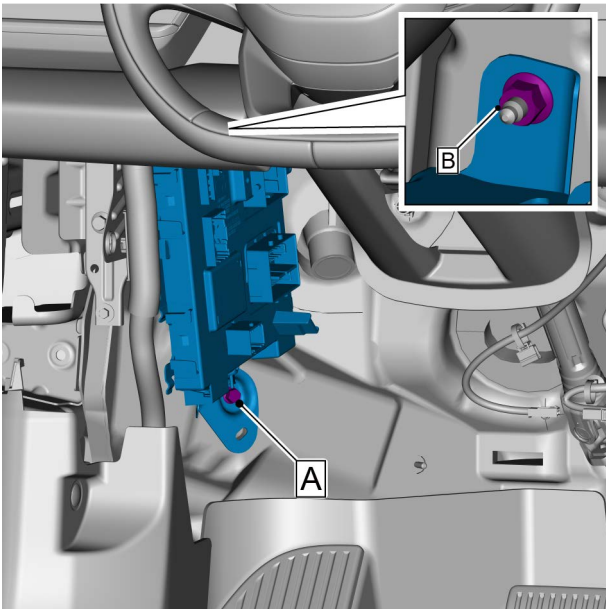


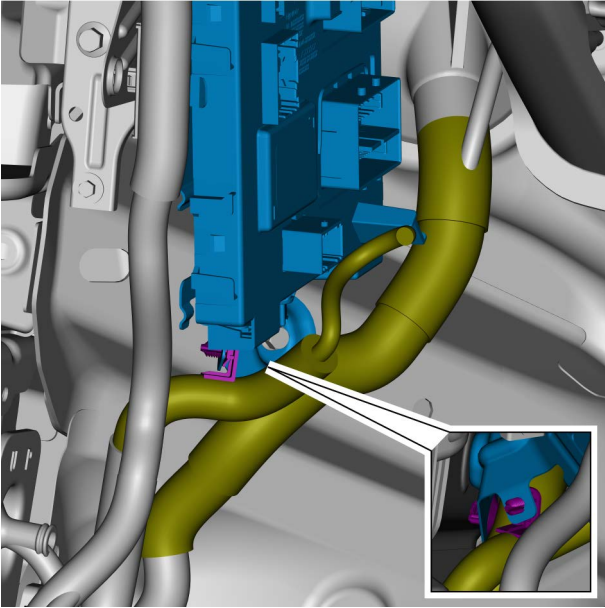
Installation Procedure

- 1 Install the central electronics module back into the body domain bracket.

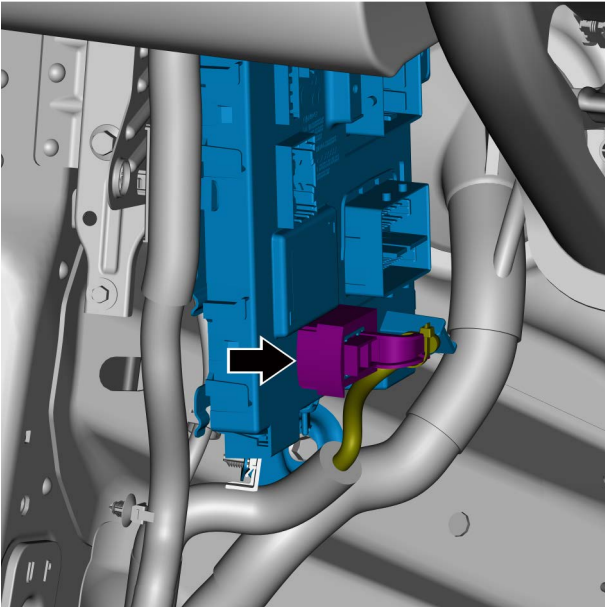


- 2 Install the central electronic module and bracket assembly and tighten bolt A and nut B.
Bolt torque: 10 N·m
Nut torque: 10N·m

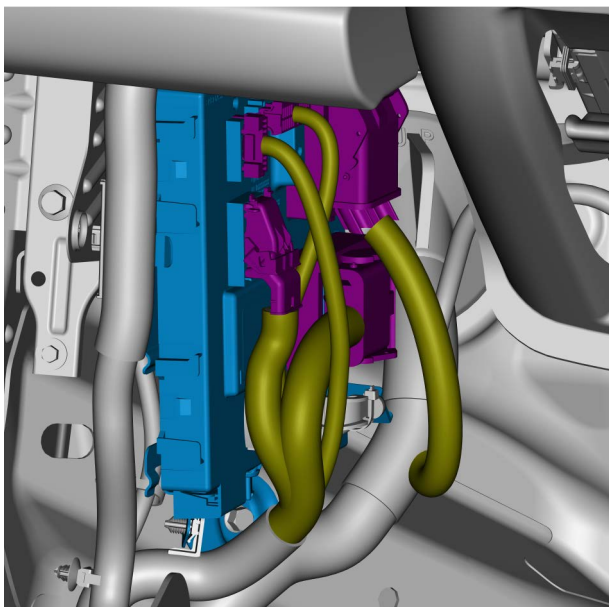




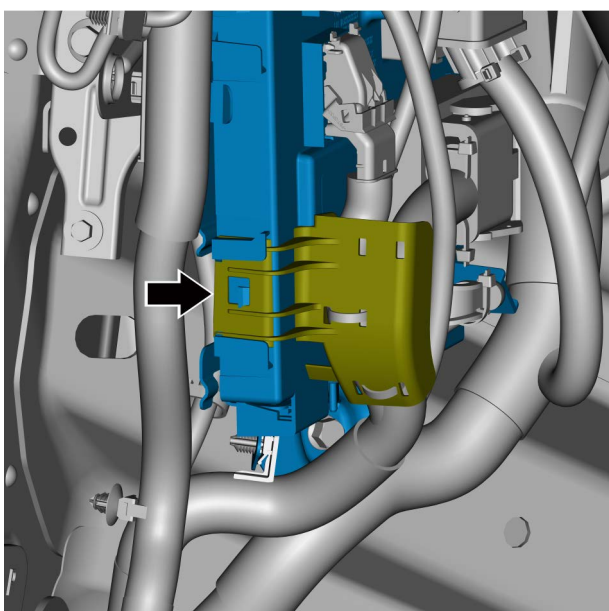
3 Install the harness fixing clips.



4 Connect the central electronics module power harness connector.



- 5 Connect the central electronics module harness connector.



- 6 Install the central electronics module harness bracket.

- 7 Install the left lower shield assembly of the instrument panel.
- 8 Install the left lower toe board assembly.
- 9 Connect the negative cable of battery.
- 10 The GLDS diagnostic program is required, under the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software brushing operation.

Body electrics

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12.1 Warnings and Cautions

12.1.1 Warnings and Cautions

12.1.1.1 Warnings and Cautions

Warning about Lifting Vehicle

Warning !

To avoid vehicle damage, serious personal injury and even death, when the main components are removed from the vehicle, and the lifter is used for support, the jack should be used to support the vehicle part corresponding to the components to be removed.

Warning about Battery Disconnection

Warning !

Before servicing any electrical component, the start switch power mode should be OFF and all electrical loads must be "OFF" unless otherwise noted in the operating procedures. Also disconnect the battery negative cable if tools or equipment are likely to come into contact with exposed energized electrical terminals. Violation of these safety instructions may cause damage to the vehicle or vehicle components or result in personal injury.

Warning about Cracked Window

Warning !

If a window is cracked but still intact, protective tape should be applied to the window in a crisscross pattern to prevent further damage to the window or personal injury.

Warning regarding window fast up/down function

Warning !

When operating the power window switch in the driver's door, the window glass moves so fast that a window without anti-pinch cannot be stopped against resistance, which may result in personal injury.

Warning regarding halogen bulb

Warning !

Halogen bulbs contain high-pressure gas. Improper handling can cause the bulb to explode into glass fragments. To avoid personal injury: turn off the light switch and allow the bulb to cool before replacing it. Keep the light switch OFF until the bulb is replaced. Always wear goggles when replacing halogen bulbs. Hold bulb by the base only. Avoid touching the glass. Keep bulbs away from dust and moisture. Scrap old bulbs properly. Keep halogen bulbs away from children.

12.2 Audio Entertainment System

12.2.1 Specification

12.2.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Center console display fixing screw	ST4.8×19	2.5-3.5
Infotainment head unit fixing screw	ST4.8×19	2.5-3.5
Left rear woofer fixing screw	PF5X20	0.85-1.15
Emergency backup speaker fixing screw	PF4×12	0.6-0.8
Shark fin trim cover assembly fixing nut	M5×5	2.1-2.9
Antenna amplifier fixing bolt	M6×16	8-10
Filter fixing bolt	M6×16	8-10
Subwoofer fixing bolt	M6	8.5-11.5
Subwoofer fixing nut	M6	8.5-11.5
Audio module fixing nut	M6	8.5-11.5
Audio module bracket fixing bolt	M6	8.5-11.5
Vehicle-mounted mobile terminal fixing bolt	M6	8.5-11.5

12.2.2 Instructions and operations

12.2.2.1 Instructions and operations

Brief description of system

Support AM/FM switching.

The vehicle-mounted multimedia infotainment system mainly consists of infotainment head unit, front center console display assembly, radio antenna, Bluetooth antenna, speakers (woofer, tweeter, etc.), external amplifier (flagship), microphone, steering wheel switch buttons related to this system, and various interfaces and other components.

It mainly realizes the functions of radio, USB audio and video playback, clock display, Bluetooth phone, information display, vehicle setting, voice control function demand, reversing video/dynamic reversing assist line/360 image/reversing radar icon display, navigation, air conditioning information display and setting.

Front and rear speakers

There are two configurations for the audio system of this vehicle.

Type I: six speakers: two woofers in the front door and two door tweeters in the A-pillar upper trim panel; two woofers and two door tweeters in the rear door.

Type II: eight speakers: two woofers in the front door and two door tweeters in the A-pillar upper trim panel; two woofers and two door tweeters in the rear door.

Bluetooth phone and Bluetooth music logic

Support BT4.0 BLE (Bluetooth 4.0, compatible with 2.1 and 3.0, support Bluetooth low power consumption). Include interaction to Bluetooth phone HFT (Bluetooth call), Bluetooth music (Bluetooth Audio), Bluetooth and smart key information.

HFT (Bluetooth call) is a function that allows you to make calls without directly operating your cell phone after connecting your cell phone with the MMI of the head unit, and by providing easy HFT operation, you can make calls safely while driving. It also supports the search and dialing of address book/call records.

If the audio/video remote control profile does not match or the Bluetooth audio device side does not correspond, the playback action will not be executed even if a request is made to the player function. The specific playback action and display information depends on the Bluetooth device and the playback software on the Bluetooth device.

Navigation

Launching navigation

Navigation can be started by clicking on the desktop application [AutoNavi] or the navigation widget on the home page, or by voice.

Searching for destinations

1. Manual search

Tap the Search Destinations button in the main interface, enter keywords in the search box, and select the destination from the search results, then you can start navigation.

2. Map punctuation

Drag the map, click directly on the map to select a destination, and click [Go Here] to start navigation.

3. Voice navigation

After voice wake up, the common voice navigation commands are as follows:

- How to go to Window of the World
- I want to go to Geely Building
- I want to go home
- I want to navigate to Hangzhou West Lake
- Find a nearby gas station
- Navigate to the National Convention and Exhibition Center
- You can also check the road conditions, check the remaining time to the destination, favorite places, search neighborhood and other navigation-related issues
- More functions are waiting for you to discover.....

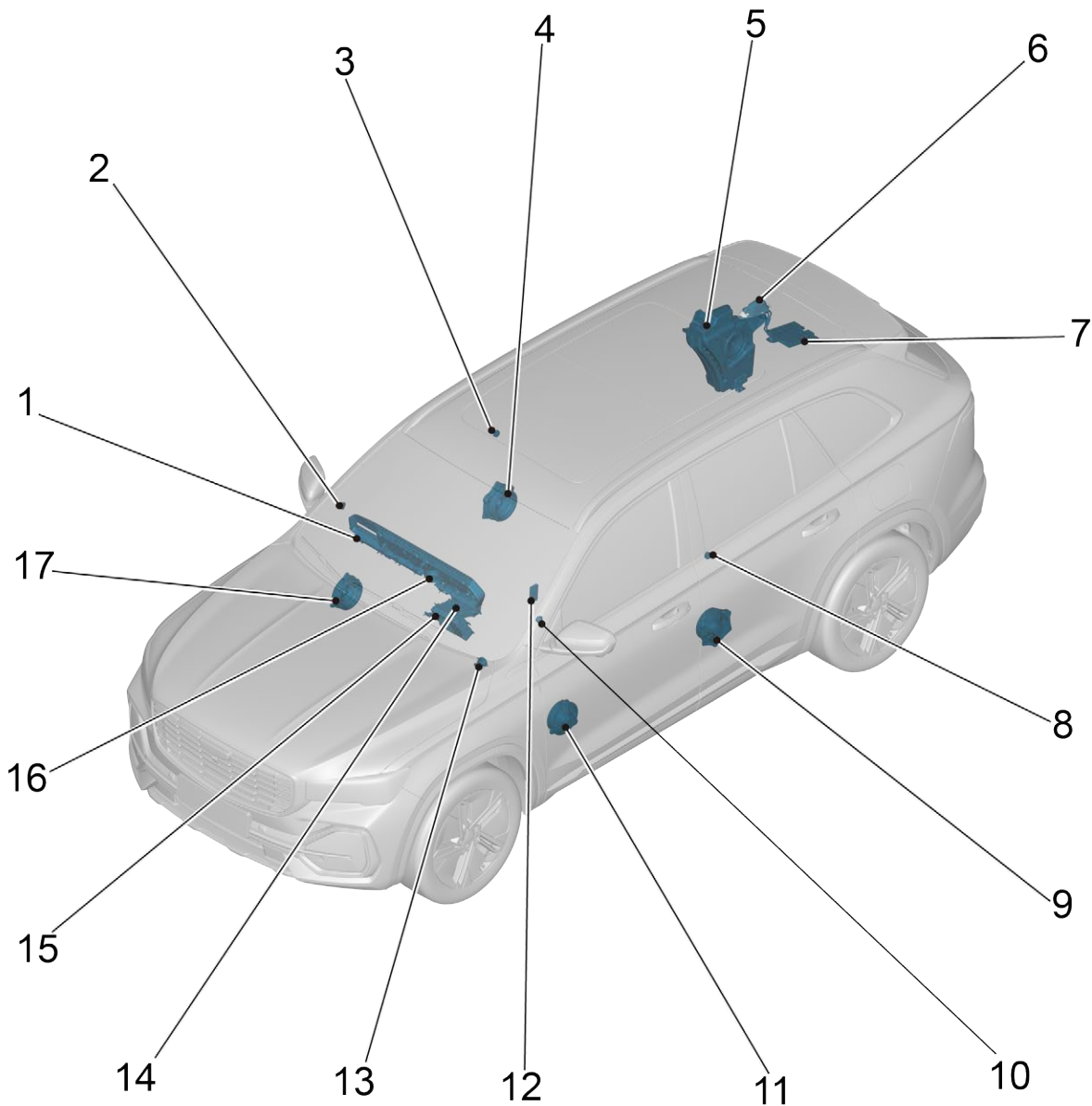
Map updates

Tools & Settings-Offline Data-Offline Map.

You can download the offline map data of your city, and with offline map data, you can navigate normally without network.

12.2.3 Part position

12.2.3.1 Part position



- | | |
|-----------------------------------|---|
| 1. Center Console Display | 12. Left rear door tweeter |
| 2. Door tweeter (right A-pillar) | 13. Door speaker (left rear door) |
| 3. Right rear door tweeter | 14. Door tweeter (left A-pillar) |
| 4. Door speaker (right rear door) | 15. Door speaker (left front door) |
| 5. Subwoofer | 16. BLE NFC Communication Module |
| 6. Shark fin | 17. Vehicle wireless control module speaker |
| 7. AM/FM/DAB antenna amplifier | 18. Audio Control Module |
| 8. Wave trap filter | 19. Infotainment Head Unit |
| 9. Window antenna amplifier | 20. Instrument panel speaker |

- 10. + side coil filter
- 11. Telematics and connected antenna module (type II)
- 21. Door speaker (right front door)

12.2.4 Diagnostic information and procedure

12.2.4.1 Diagnosis description

See [Description and Operation](#) before diagnosing a malfunction in the audio entertainment system. Understanding and familiarizing yourself with the operation of the audio entertainment system before beginning system diagnosis will help determine the correct troubleshooting steps to take in the event of a malfunction, and more importantly this will help determine if the condition described by the customer is normal operation. Any troubleshooting of the audio entertainment system should start with a [Visual Check](#) that guides the repairer to the next logical step in the troubleshooting process. Understanding and using the diagnostic process correctly will reduce diagnostic time and avoid misdiagnosis of the fault area.

12.2.4.2 Visual check

- Check after-sale installations that may affect the operation of the audio system to ensure that they do not affect the operation of the audio system.
- Check system components that are easily accessible or can be seen to find out if there is any obvious damage of the component or there is a situation that may cause a fault.
- Check the harness and harness connector to ensure that there is no sign of loosening, damage, poor contact, aging, etc.
- For faults where all of the speakers are inoperative, focus on areas of the speaker circuit that are prone to short to GND, to facilitate quick removing the fault.
- For the fault of a single speaker inoperative, the distributor may inadvertently use the sound channel shielding function of the host/intelligent vehicle host to make a single sound channel inoperative in the process of use, which is not a fault of the sound system. You can consult the handbook for instructions of sound system.

12.2.5 Removal and Installation

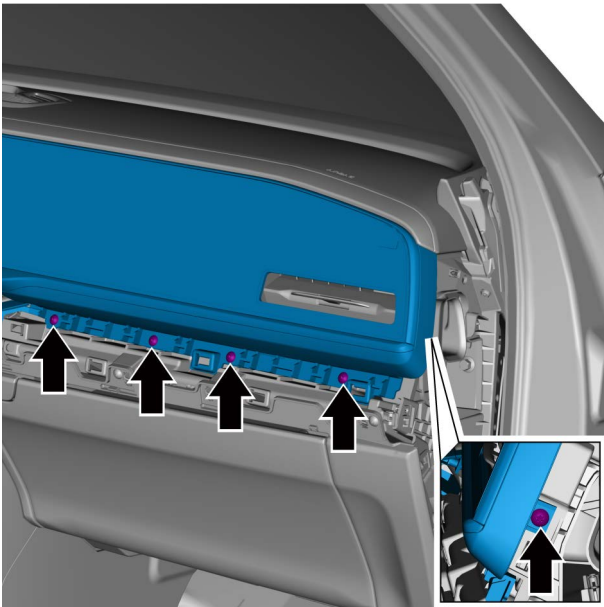
12.2.5.1 Replacement of center console display

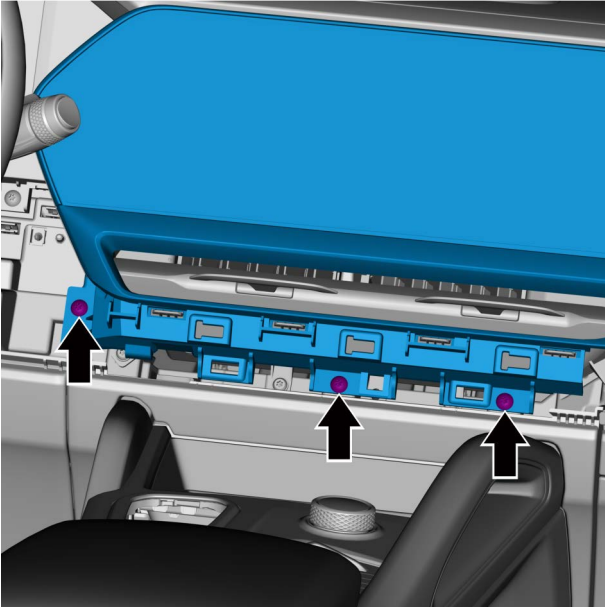
Removal Procedure

Warning !

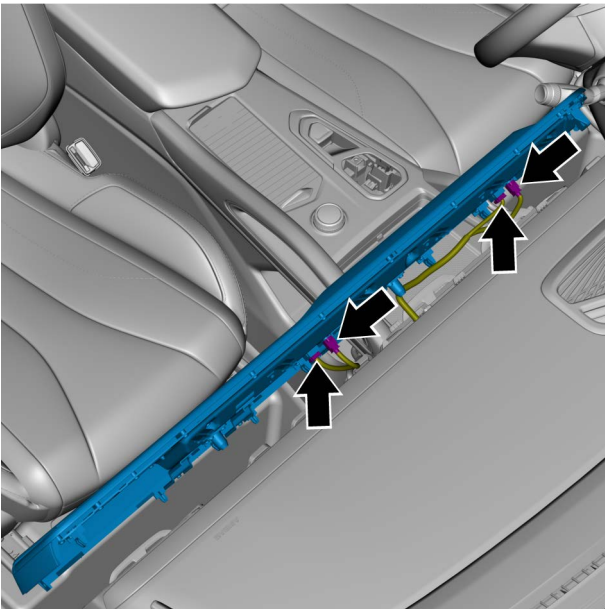
Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the instrument panel front right side end cover assembly, refer to [Replacement of instrument panel front left side end cover assembly](#).
- 3 Remove the right clad trim panel assembly, refer to [Replacement of right clad trim panel assembly](#).
- 4 Remove the 5 fixing screws on the right side of the center console display.



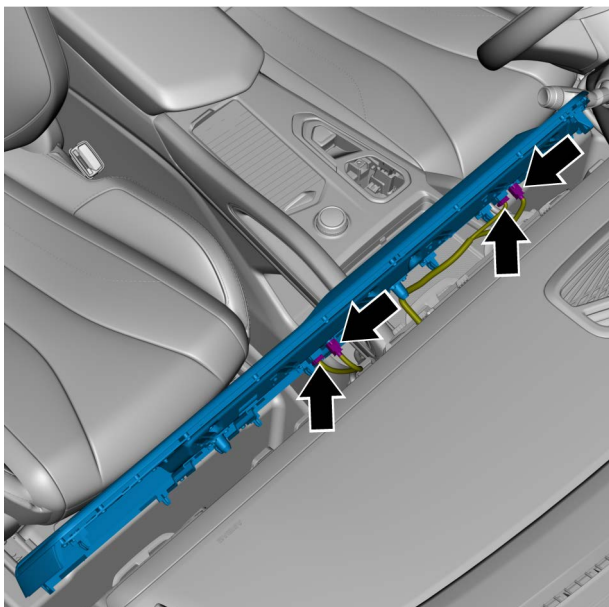


- 5 Remove the 3 fixing screws on the left side of the center console display.



- 6 Disconnect the 4 harness connectors from the center console display and remove the center console display.

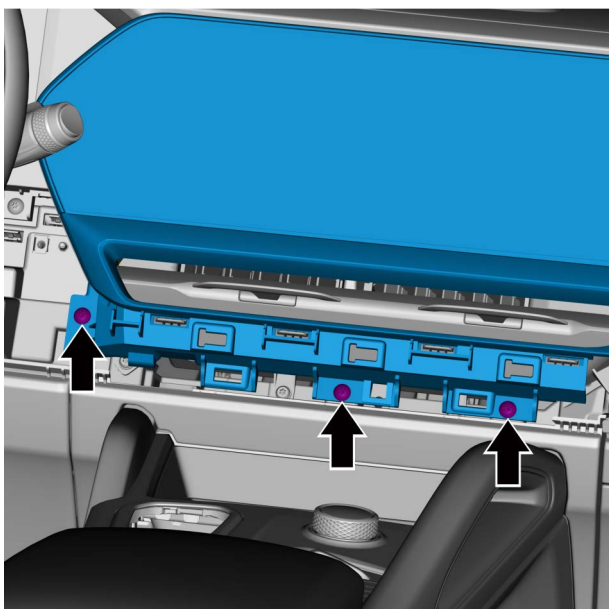
Installation Procedure



- 1 Connect the 4 harness connectors of center console display.

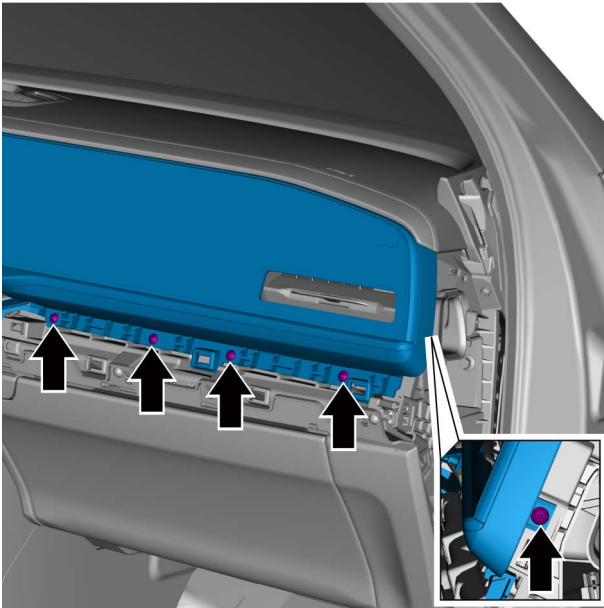
Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 2 Install the 3 fixing screws on the left side of the center console display.

Torque: 3N·m



- 3 Install the 5 fixing screws on the right side of the center console display.
Torque: 3N·m

- 4 Install the right clad trim panel assembly.
- 5 Install the instrument panel front right side end cover assembly.
- 6 Connect the negative cable of battery.
- 7 The GLDS diagnostic program is required, under the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software brushing operation.

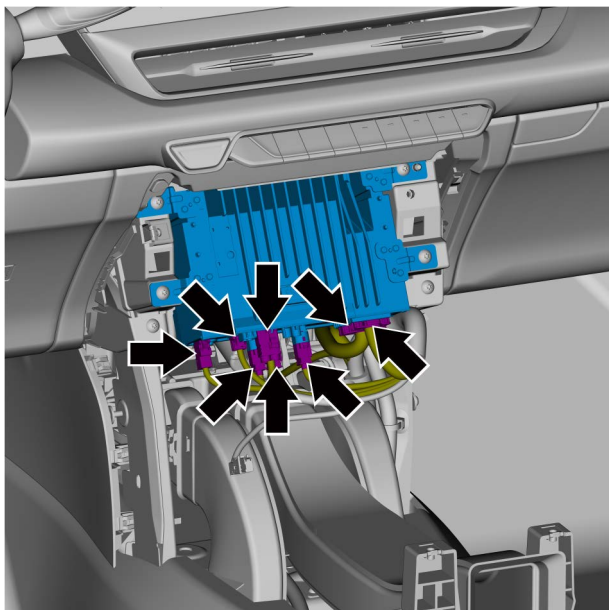
12.2.5.2 Replacement of infotainment head unit

Removal Procedure

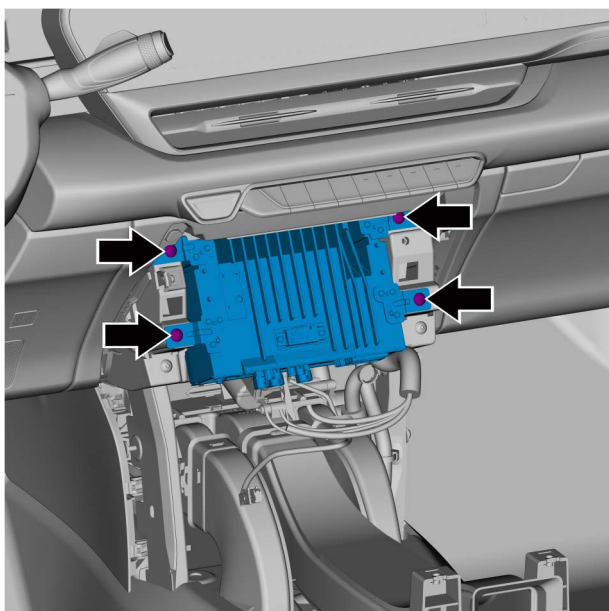
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove console body assembly, refer to [Replacement of console body assembly](#).

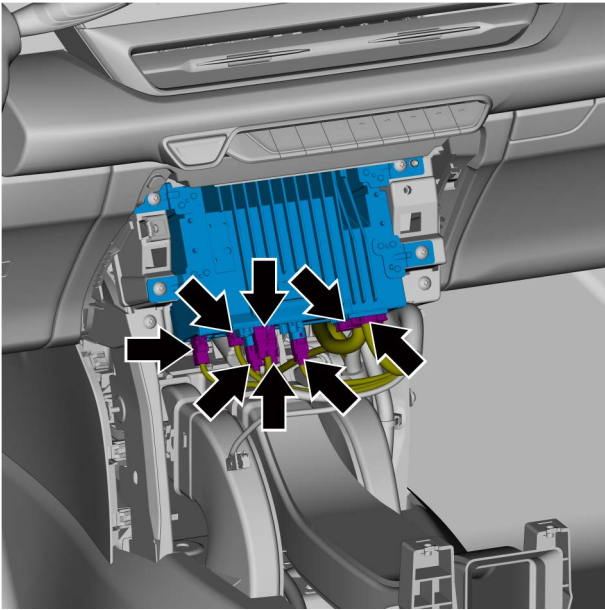


- 3 Disconnect the 8 harness connectors of the infotainment head unit.



- 4 Remove the 4 fixing screws of infotainment head unit and take off the infotainment head unit.

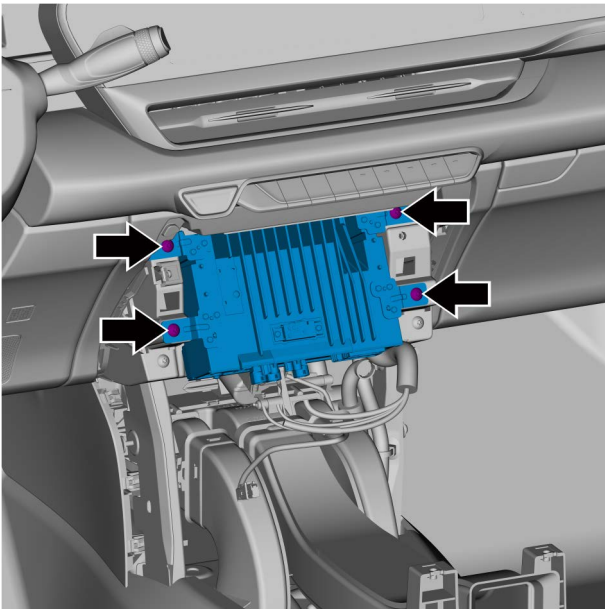
Installation Procedure



- 1 Connect the 6 harness connectors of the infotainment head unit.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 2 Install the 4 fixing screws of the infotainment head unit.
Torque: 3N·m

- 3 Install the console body assembly.
- 4 Connect the negative cable of battery.
- 5 The GLDS diagnostic program is required, under the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software brushing operation.

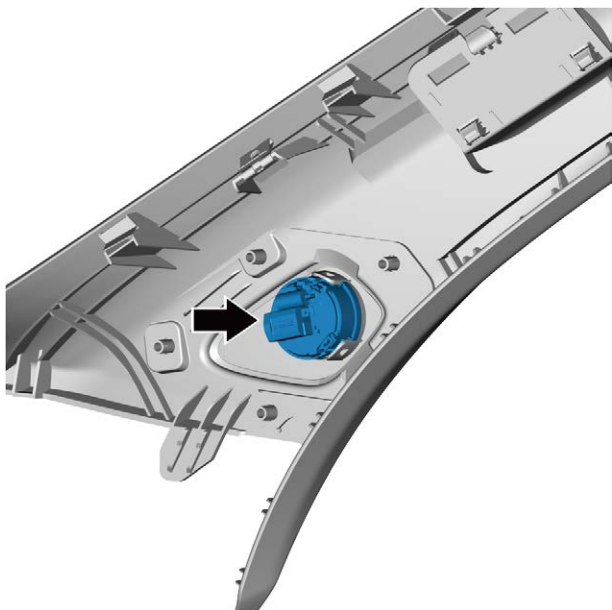
12.2.5.3 Replacement of left A-pillar door tweeter

Removal Procedure

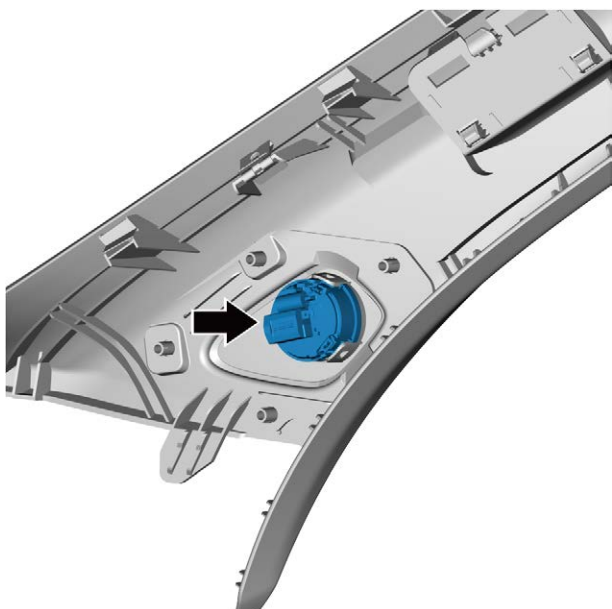
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left A-pillar upper trim panel assembly, refer to [Replacement of left A-pillar upper trim panel assembly](#).
- 3 Remove the left A-pillar door tweeter.

**Installation Procedure**

- 1 Install the left A-pillar door tweeter.



- 2 Install the left A-pillar upper trim panel assembly.
- 3 Connect the negative cable of battery.

12.2.5.4 Replacement of left front door woofer

Removal Procedure

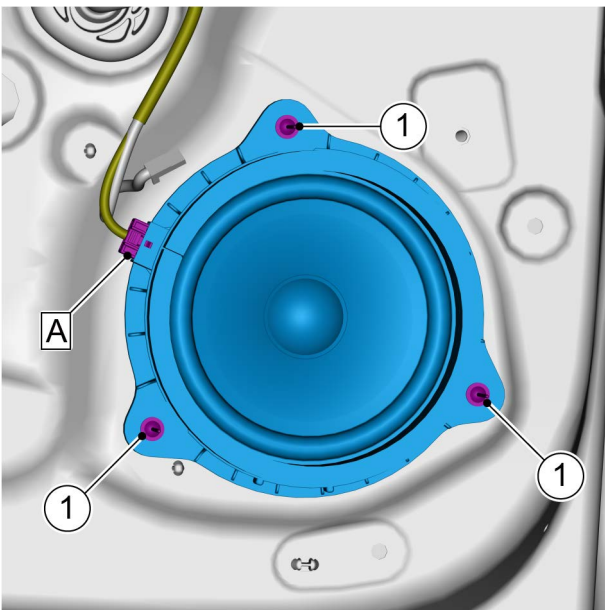
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left front door interior trim panel assembly, refer to [Replacement of left front door interior trim panel assembly](#).
- 3 Disconnect the left front door woofer harness connector A.
- 4 Remove the 3 fixing rivets 1 of left front door woofer and remove the woofer.

Caution

The rivets cannot be reused and must be replaced after removal.

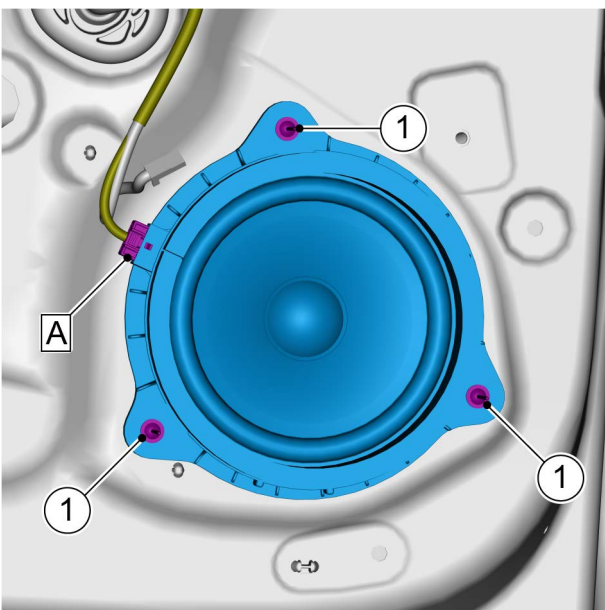


Installation Procedure

- 1 Install the 3 fixing rivets 1 of the left front door woofer.
- 2 Connect the left front door woofer harness connector A.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 3 Install the assembly-interior trim panel left front door.
- 4 Connect the negative cable of battery.

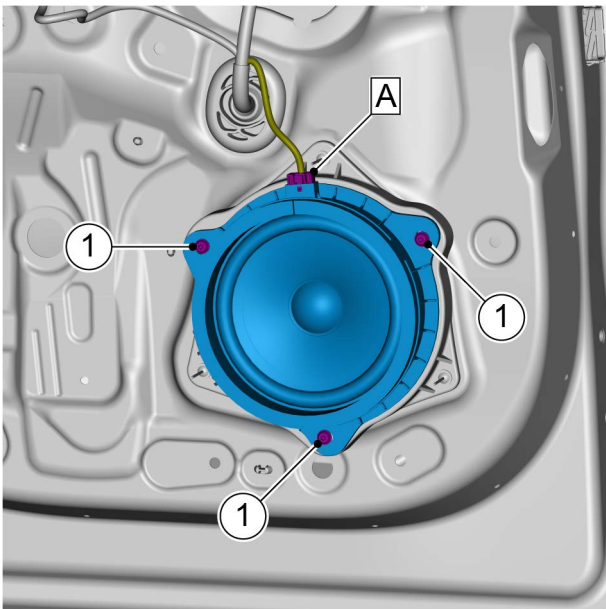
12.2.5.5 Replacement of left rear door woofer

Removal Procedure

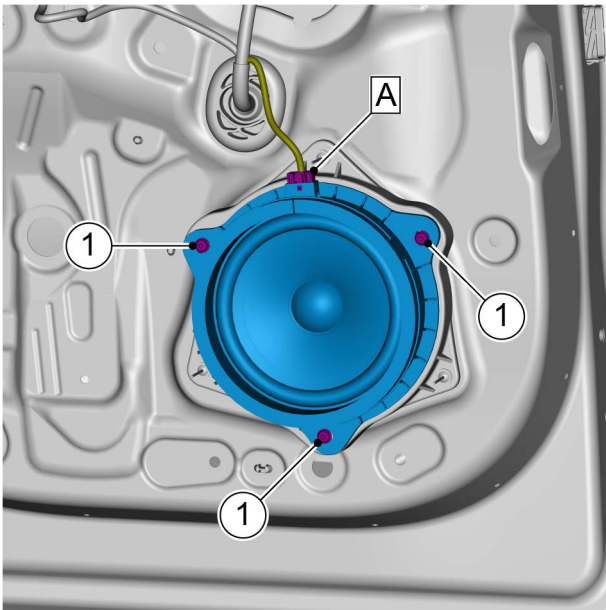
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left rear door interior trim panel assembly, refer to [Replacement of left rear door interior trim panel assembly](#).
- 3 Disconnect the left rear door woofer harness connector A.
- 4 Remove the 3 fixing screws 1 of left rear door woofer and remove the left rear door woofer.



Installation Procedure



- 1 Install the 3 fixing screws 1 of the left rear door woofer.
Torque: 1N·m
- 2 Connect the left rear door woofer harness connector A.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 3 Install the left rear door interior trim panel assembly.
- 4 Connect the negative cable of battery.

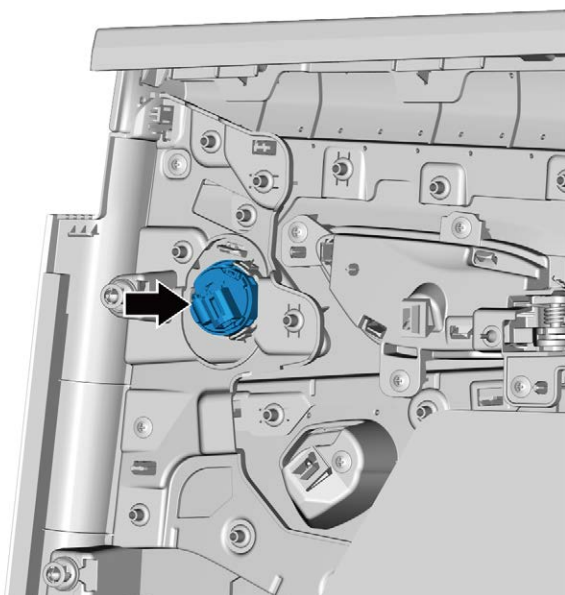
12.2.5.6 Replacement of left rear door tweeter

Removal Procedure

Warning !

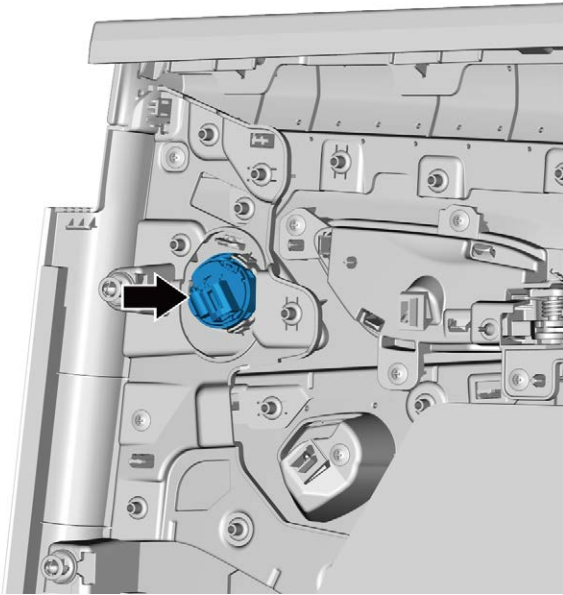
Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left rear door interior trim panel assembly, refer to [Replacement of left rear door interior trim panel assembly](#).
- 3 Remove the left rear door tweeter and take it down.



Installation Procedure

- 1 Install the left rear door tweeter.



- 2 Install the left rear door interior trim panel assembly.
- 3 Connect the negative cable of battery.

12.2.5.7 Replacement of instrument panel speaker

Removal Procedure

Warning !

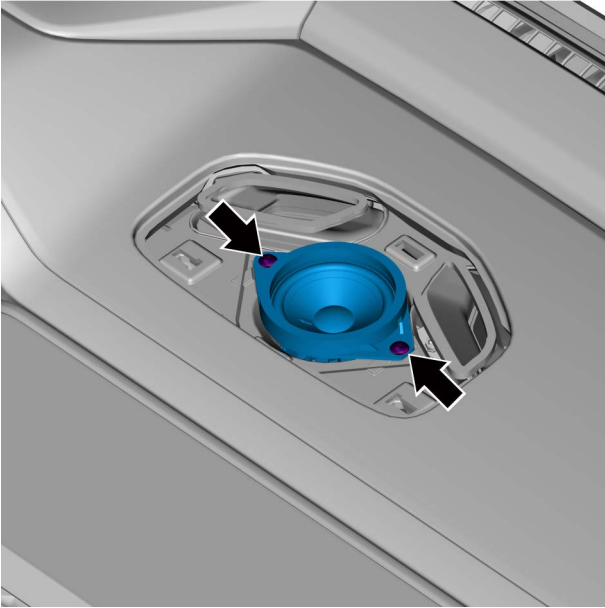
Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Use a plastic pry bar to pry open the instrument panel speaker cover plate assembly.

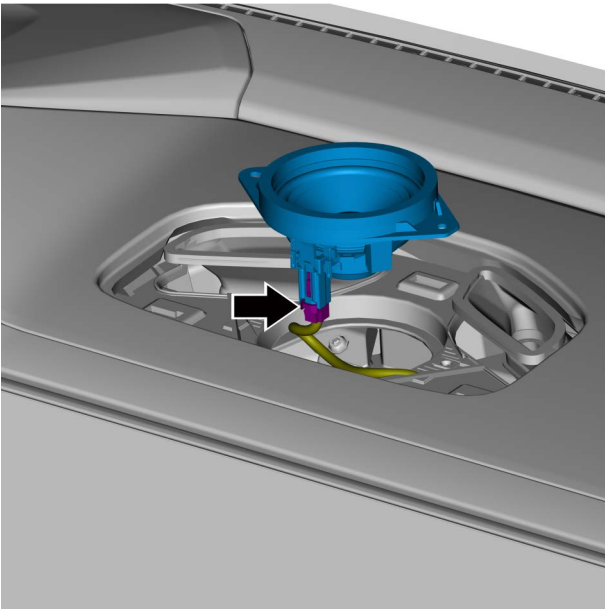
Caution

Do not scratch the instrument panel.



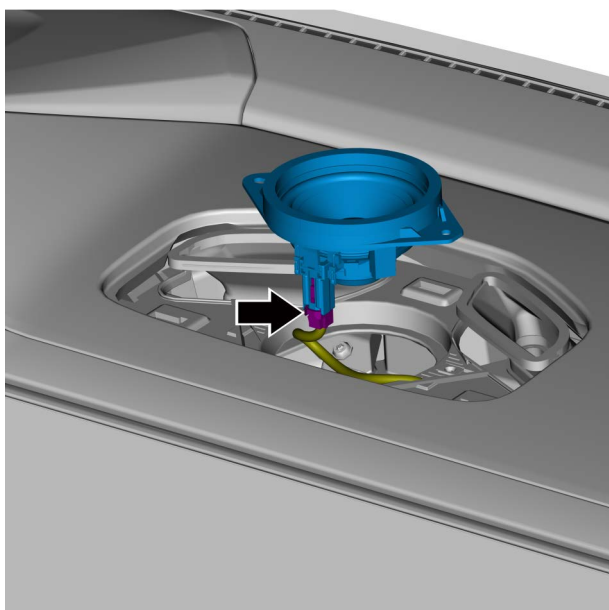


- 4 Remove the 2 fixing screws of instrument panel speaker.



- 5 Disconnect the harness connector of instrument panel speaker.
- 6 Remove the instrument panel speaker.

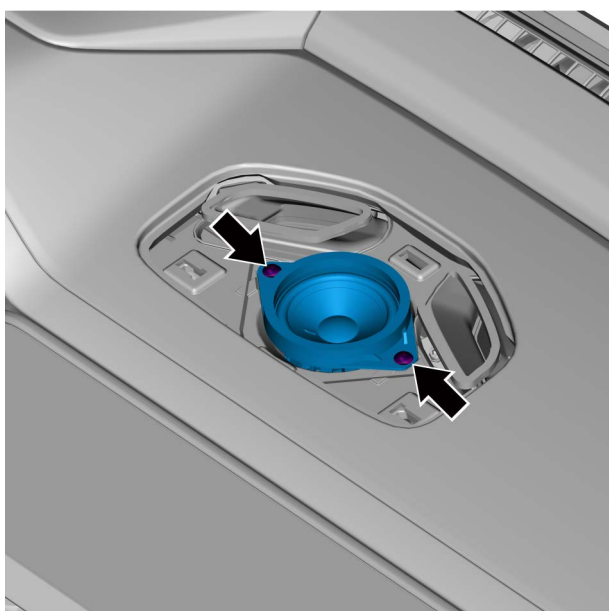
Installation Procedure



- 1 Connect the instrument panel speaker harness connector.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 2 Install the 2 fixing screws of instrument panel speaker.
Torque: 2.5N·m



- 3 Install the instrument panel speaker cover plate assembly.

- 4 Connect the negative cable of battery.
- 5 Close the engine compartment cover.

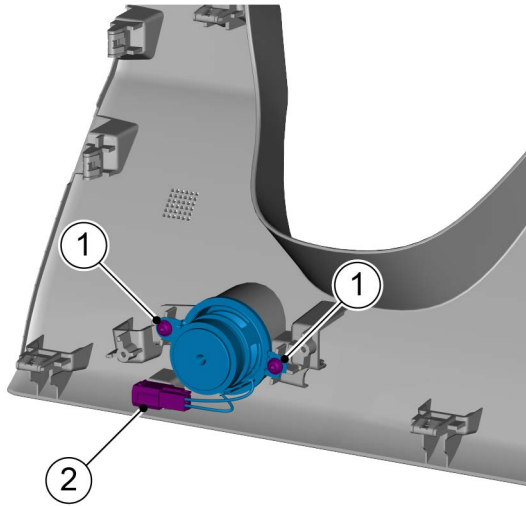
12.2.5.8 Replacement of vehicle wireless control module speaker

Removal Procedure

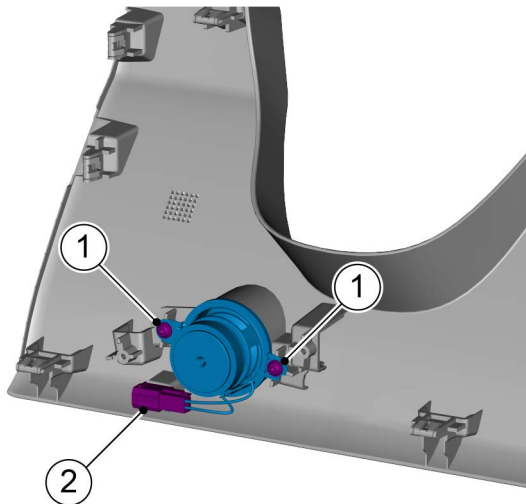
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the instrument panel left lower shield assembly, refer to [Replacement of instrument panel left lower shield assembly](#).



- 3 Remove the 2 fixing screws 1 of vehicle wireless control module speaker.
- 4 Remove the vehicle wireless control module speaker harness clip 2 and remove the vehicle wireless control module speaker.



Installation Procedure

- 1 Install the 2 fixing screws 1 of vehicle wireless control module speaker.
Torque: 0.7N·m
- 2 Install the vehicle wireless control module speaker harness clip 2.

- 3 Install the left lower shield assembly of the instrument panel.
- 4 Connect the negative cable of battery.

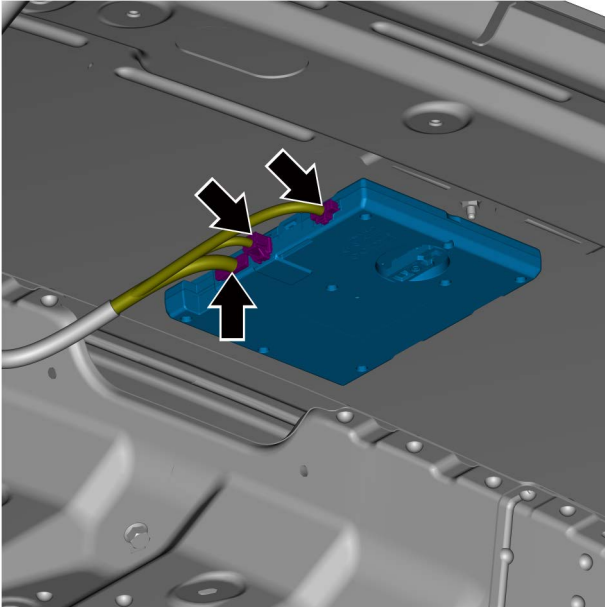
12.2.5.9 Replacement of telematics and connected antenna module (type I)

Removal Procedure

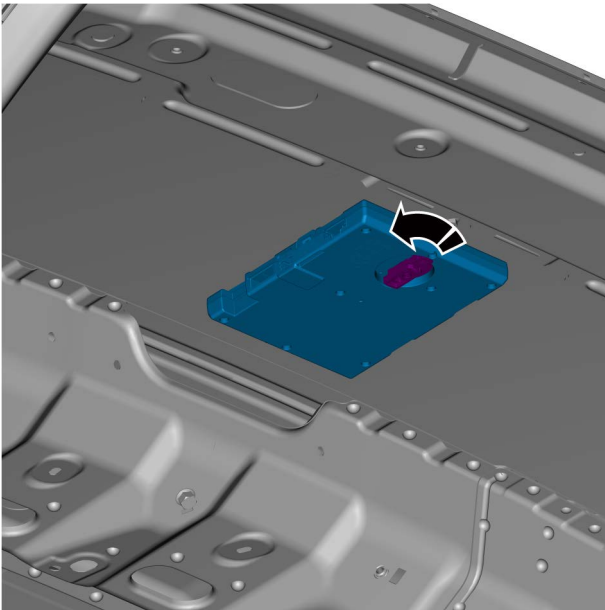
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

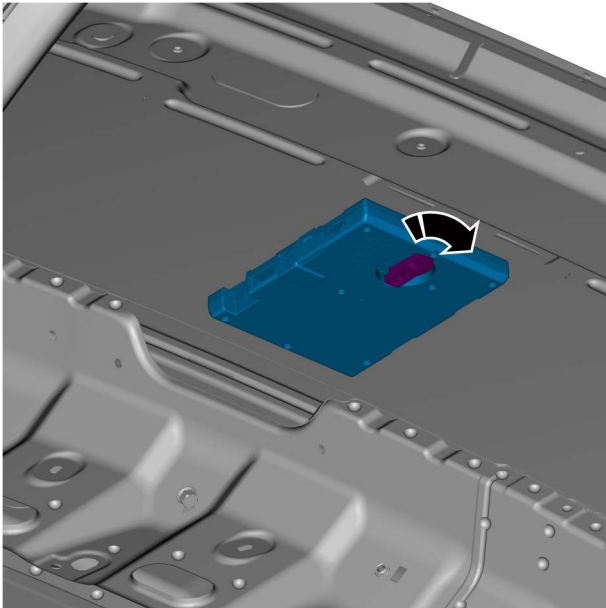


- 2 Remove the roof assembly, refer to [Replacement of roof assembly](#).
- 3 Disconnect the 3 harness connectors of the telematics and interconnect antenna module (type I).

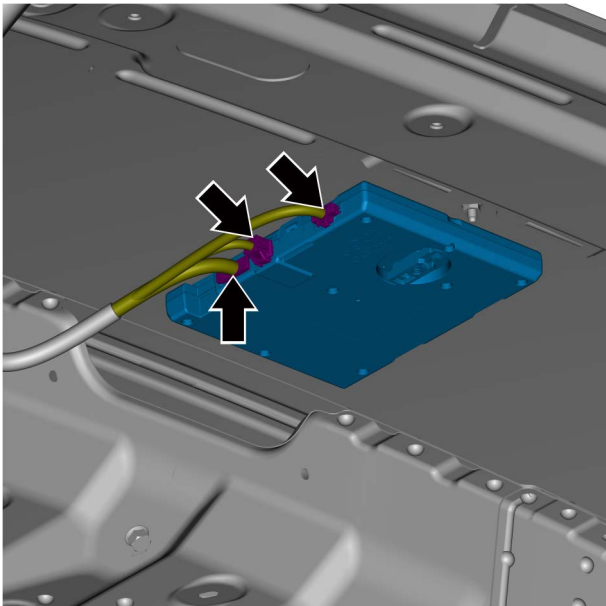


- 4 Remove the telematics and connected antenna module (type I) by turning the latch counterclockwise.

Installation Procedure



- 1 Install the telematics and interconnect antenna module (type I) and turn the locking latch clockwise.



- 2 Connect the 3 harness connectors of the telematics and interconnect antenna module (type I).

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 3 Install the roof assembly.
- 4 Connect the negative cable of battery.
- 5 The GLDS diagnostic program is required, under the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software brushing operation.

12.2.5.10 Replacement of shark fin

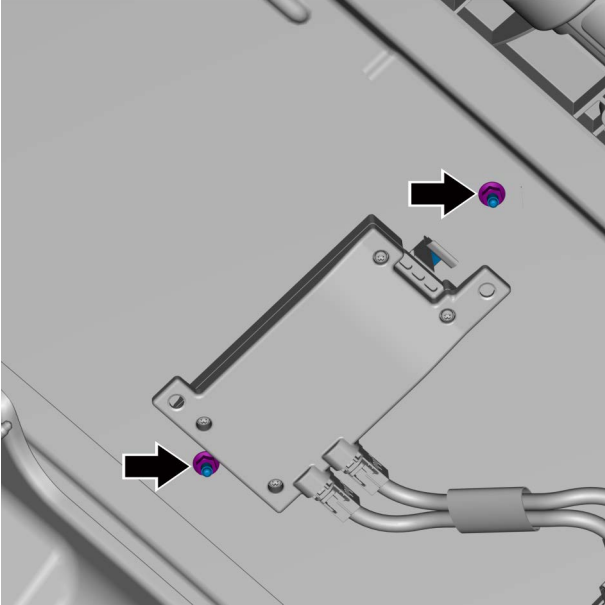
Removal Procedure

Warning !

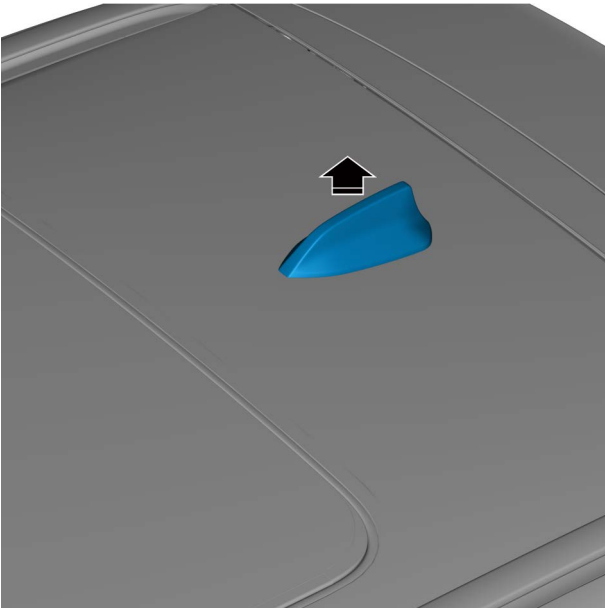
Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

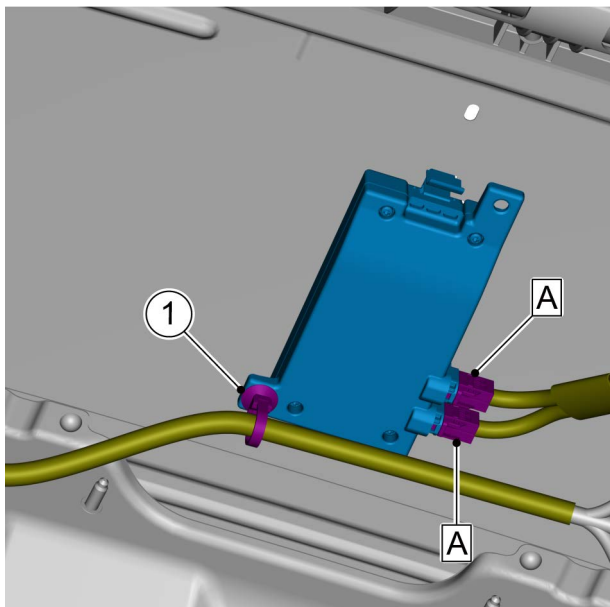
- 1 Open the engine compartment hood.

- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the roof assembly, refer to [Replacement of roof assembly](#).
- 4 Remove the 2 fixing nuts of shark fin trim cover assembly.

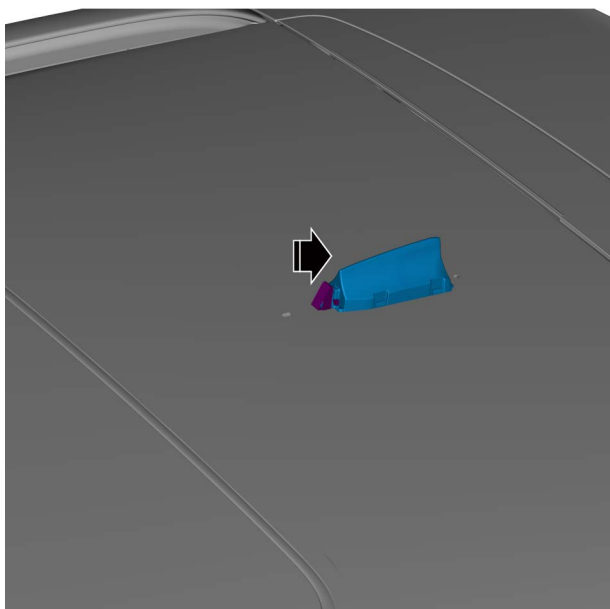


- 5 Remove the shark fin trim cover assembly.



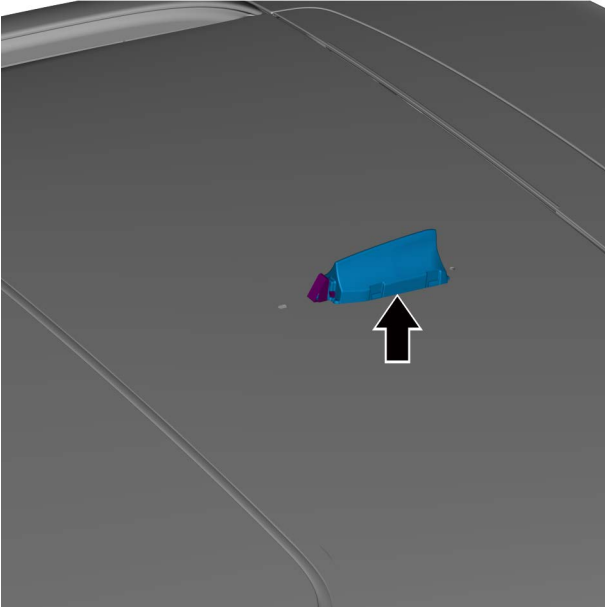


- 7 Disconnect the shark fin harness connector A.
- 8 Disengage the telematics and interconnect antenna module (type II) harness connector fixing clips 1.

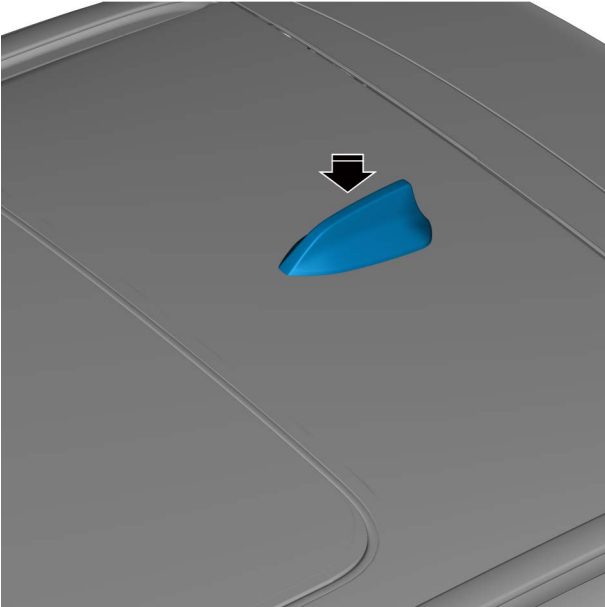


- 9 Push the shark fin fixing clips in the direction of the arrows.
- 10 Remove the shark fin.

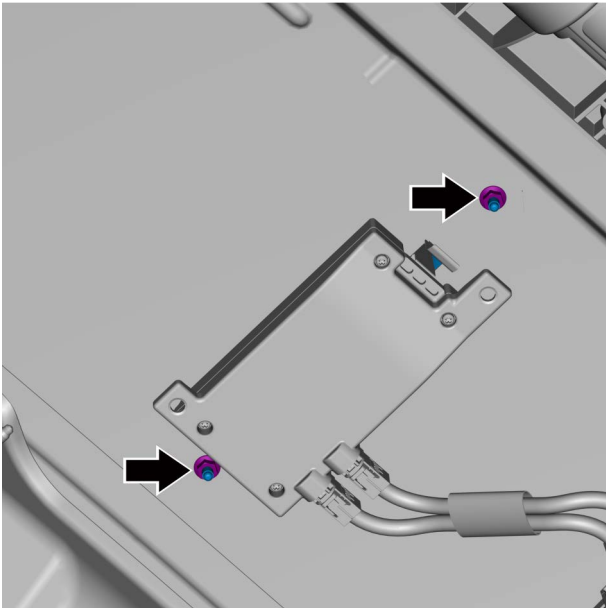
Installation Procedure



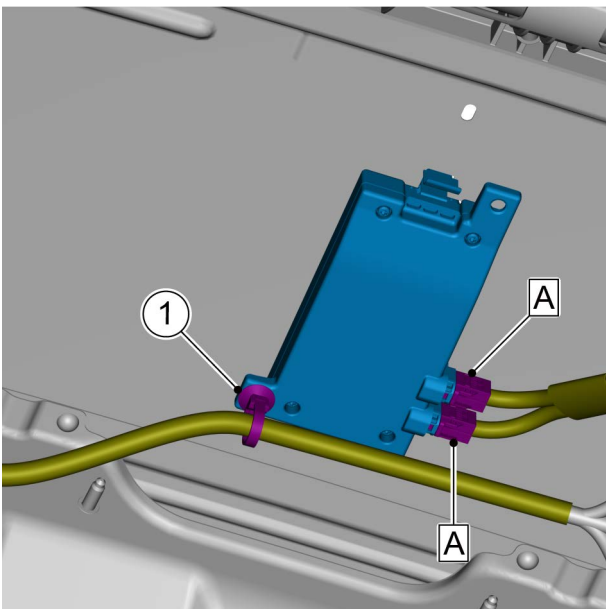
1 Install the shark fin.



- 2 Apply sealant evenly around the edge of the shark fin trim cover assembly.
- 3 Install the shark fin trim cover assembly.



- 4 Install and tighten the shark fin trim cover assembly 2 fixing nuts.
Torque: 2.5N·m



- 5 Connect the shark fin harness connector A.
Caution
Firmly plug in the harness according to the principle of "plugging, sounding and confirming".
- 6 Install the telematics and interconnect antenna module (type II) harness connector fixing clips 1.

- 7 Install the roof assembly.
- 8 Connect the negative cable of battery.
- 9 Close the engine compartment cover.

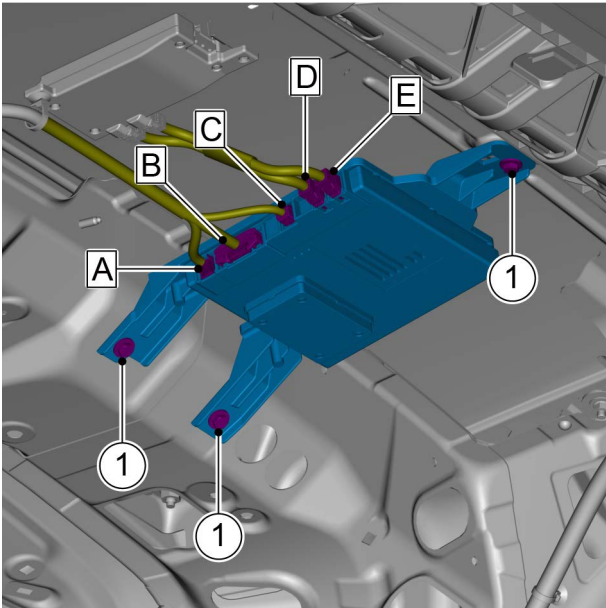
12.2.5.11 Replacement of telematics and connected antenna module (type II)

Removal Procedure

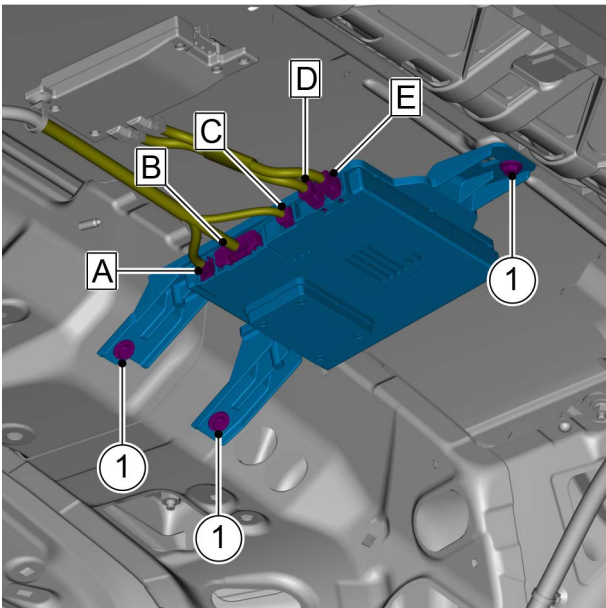
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).



- 3 Remove the roof assembly, refer to [Replacement of roof assembly](#).
- 4 Disconnect the telematics and connected antenna module (type II) harness connectors A, B, C, D, and E.
- 5 Remove the 3 fixing bolts 1 of the telematics and interconnection antenna module (type II).
- 6 Remove the telematics and interconnect antenna module (type II).



Installation Procedure

- 1 Install and tighten the telematics and interconnect antenna module (type II) 3 fixing bolts 1.
Torque: 10N·m
- 2 Connect the telematics and connected antenna module (type II) harness connectors A, B, C, D, and E.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 3 Install the roof assembly.
- 4 Connect the negative cable of battery.
- 5 The GLDS diagnostic program is required, under the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software brushing operation.
- 6 Close the engine compartment cover.

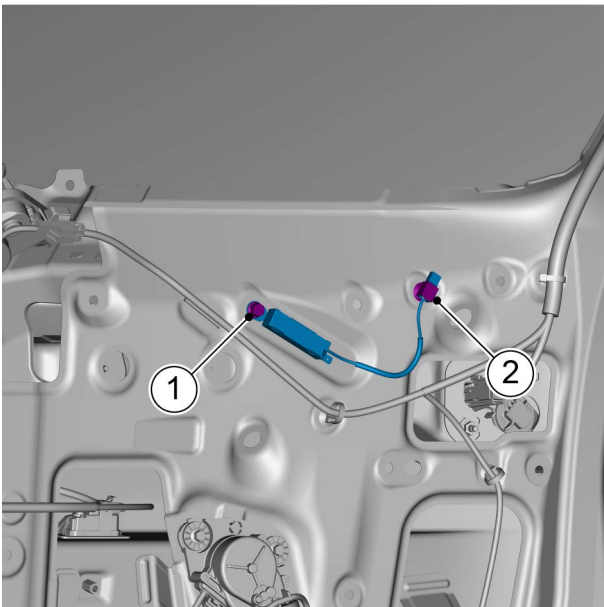
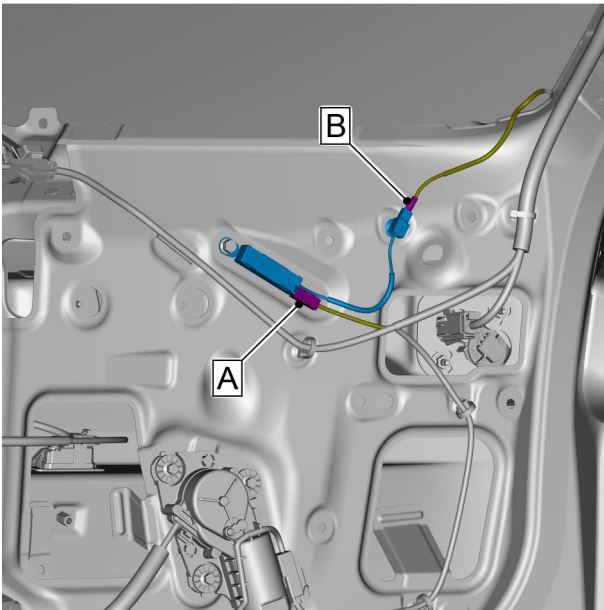
12.2.5.12 Replacement of + side coil filter

Removal Procedure

Warning !

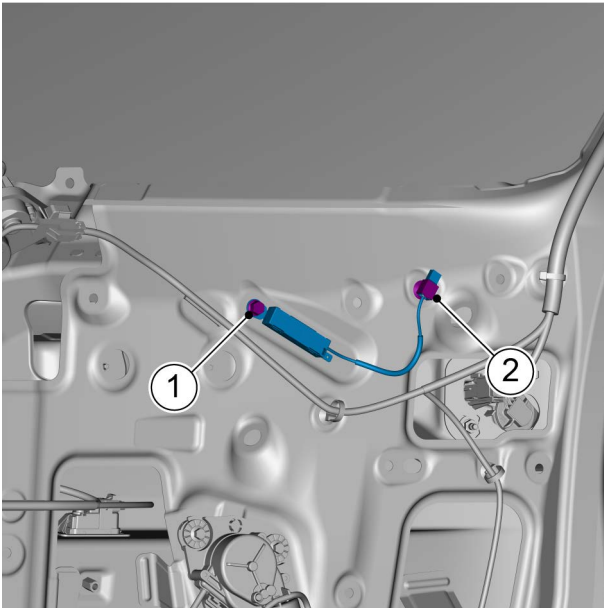
Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the trunk door lower interior trim panel assembly, refer to [Replacement of trunk door lower interior trim panel assembly](#).
- 3 Disconnect the + side coil filter harness connectors A and B.

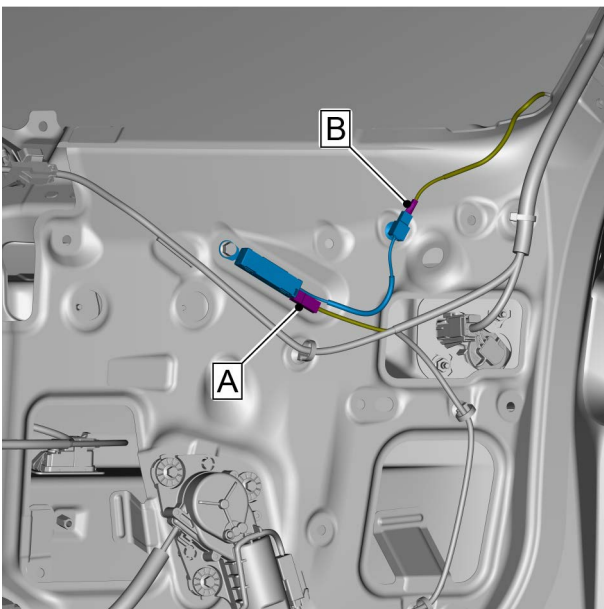


- 4 Remove the + side coil filter fixing bolt 1.
- 5 Disengage the +side coil filter harness fixing clip 2 and remove the +side coil filter.

Installation Procedure



- 1 Install the +side coil filter fixing bolt 1.
Torque: 9N·m
- 2 Install the + side coil filter harness fixing clip 2.



- 3 Connect the + side coil filter harness connectors A and B.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 4 Install assembly of interior trim panel of tail gate.
- 5 Connect the negative cable of battery.

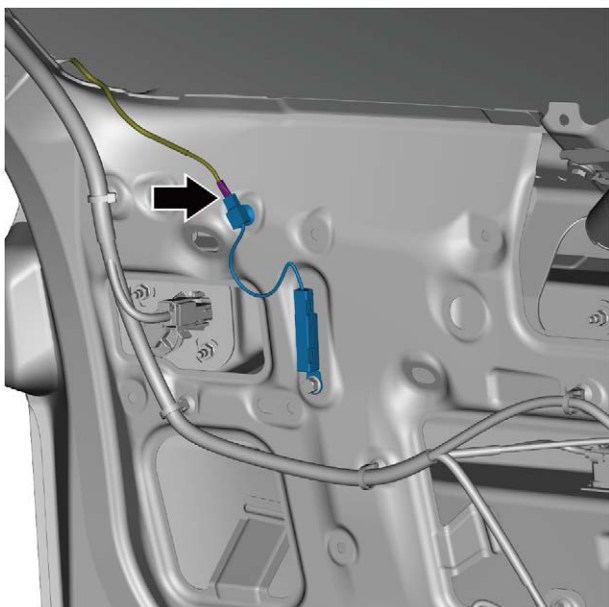
12.2.5.13 Replacement of wave trap filter

Removal Procedure

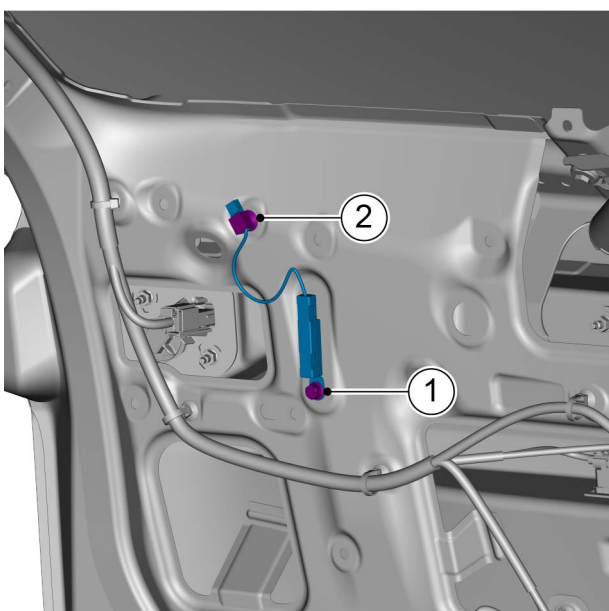
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the trunk door lower interior trim panel assembly, refer to [Replacement of trunk door lower interior trim panel assembly](#).



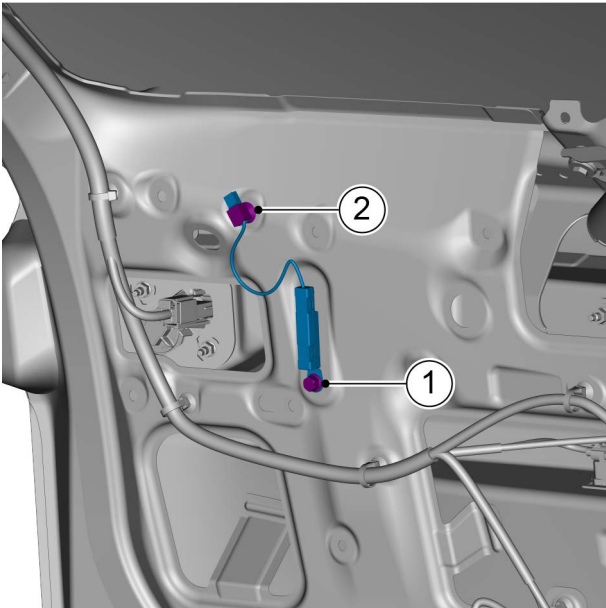
3 Disconnect the wave trap filter harness connector.



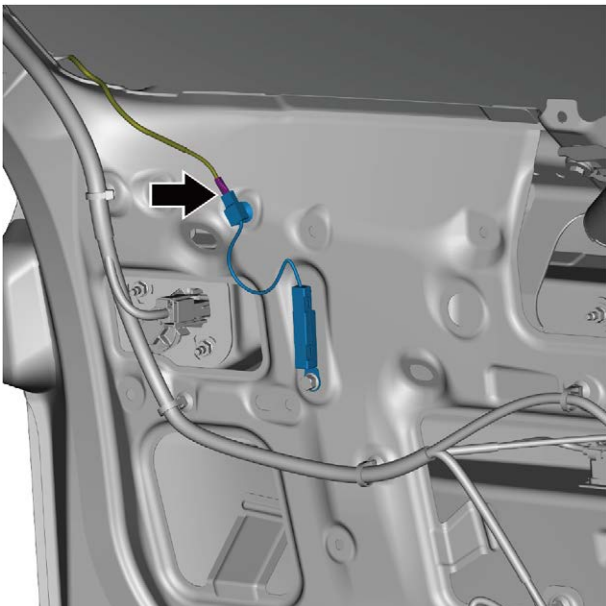
4 Remove the wave trap filter fixing bolt 1.

5 Remove the wave trap filter harness fixing clip 2 and remove the wave trap filter.

Installation Procedure



- 1 Install the wave trap filter fixing bolt 1.
Torque: 9N·m
- 2 Install the wave trap filter harness fixing clips 2.



- 3 Connect the wave trap filter harness connector.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 4 Install assembly of interior trim panel of tail gate.
- 5 Connect the negative cable of battery.

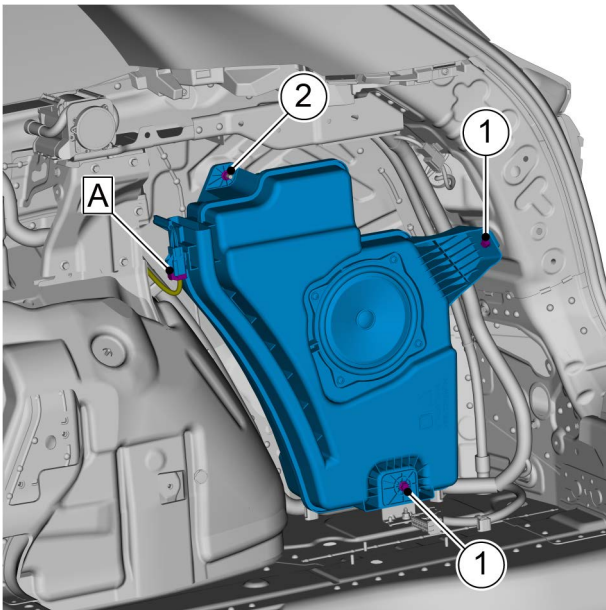
12.2.5.14 Replacement of subwoofer

Removal Procedure

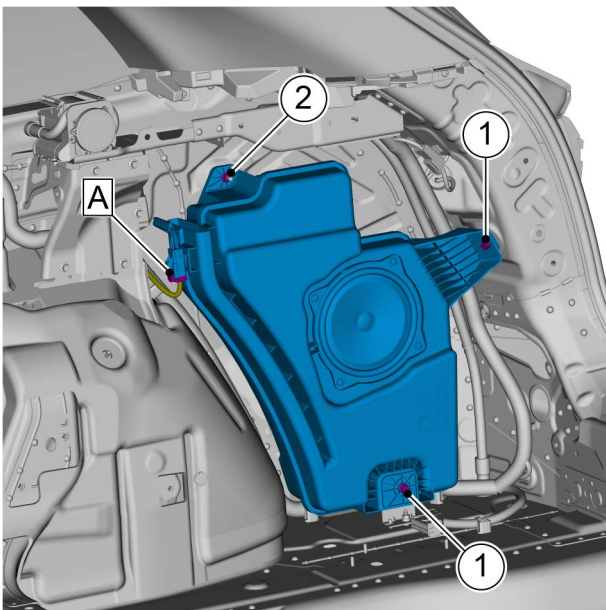
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).



- 3 Remove the luggage compartment side shield assembly, refer to [Replacement of left luggage compartment side shield assembly](#).
- 4 Disconnect the subwoofer harness connector A.
- 5 Remove 2 fixing bolts 1 and 1 fixing nut 2 of the subwoofer.
- 6 Remove the subwoofer.



Installation Procedure

- 1 Install the subwoofer.
- 2 Tighten the 2 fixing bolts 1 and 1 fixing nut 2 of the subwoofer.
Bolt torque: 10 N·m
Nut torque: 10N·m
- 3 Connect the subwoofer box harness connector.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 4 Install the right luggage compartment side shield assembly.
- 5 Connect the negative cable of battery.
- 6 Close the engine compartment cover.

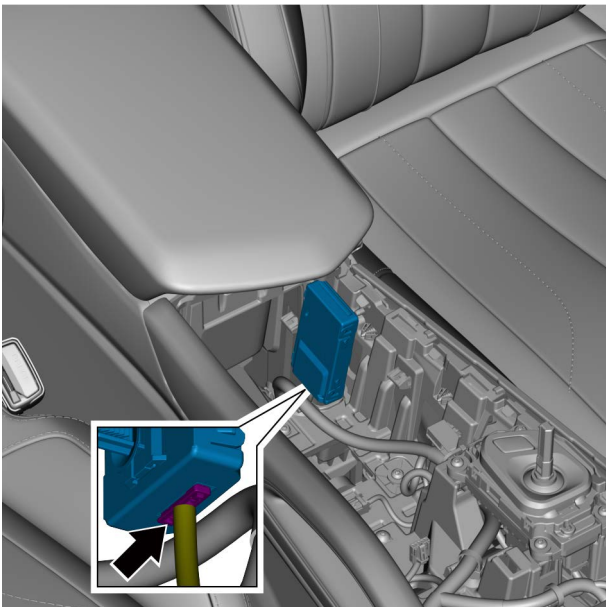
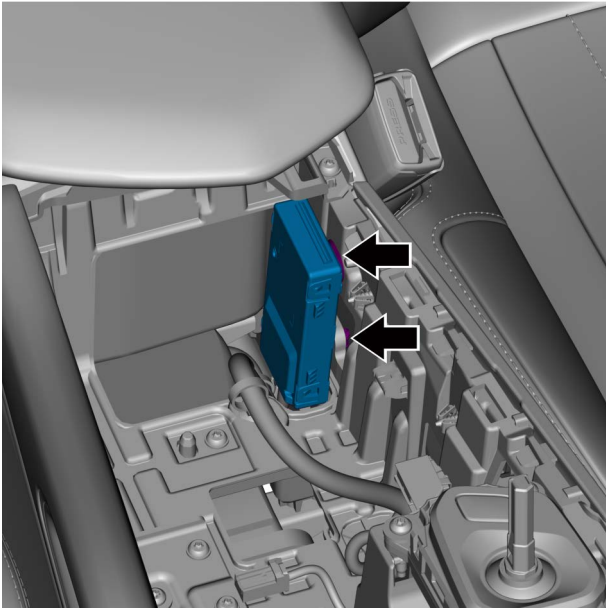
12.2.5.15 Replacement of BLE NFC communication module

Removal Procedure

Warning !

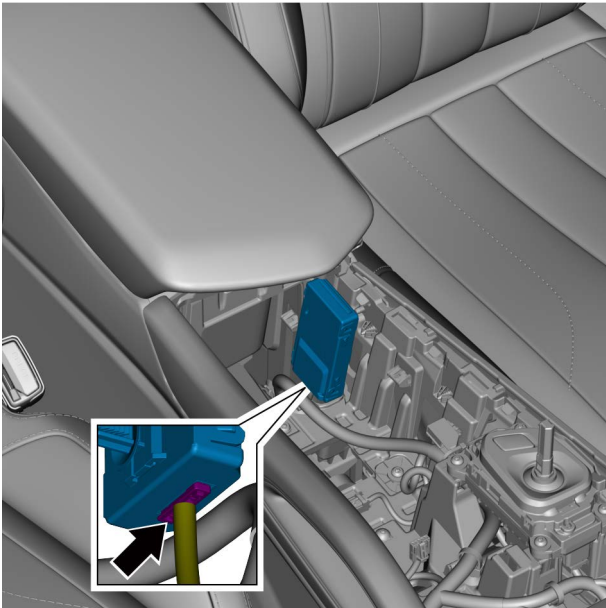
Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the gear shift panel assembly, refer to [Replacement of gear shift panel assembly](#).
- 3 Remove the BLE NFC communication module fixing clips and take out the BLE NFC communication module.



- 4 Disconnect the BLE NFC communication module harness connector and remove the BLE NFC communication module.

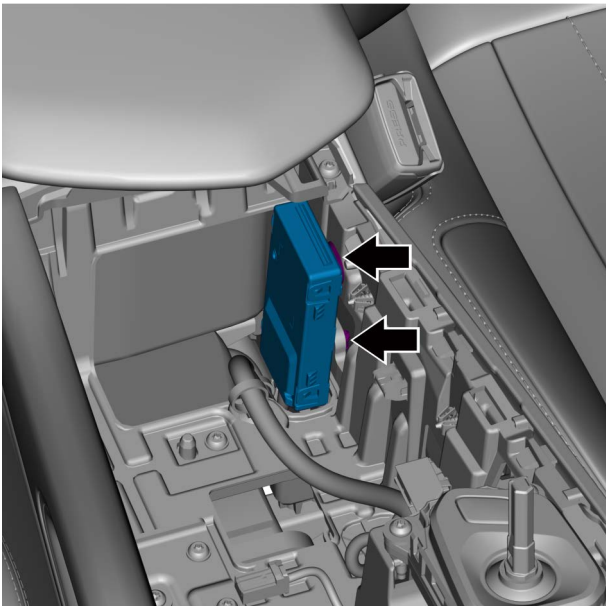
Installation Procedure



- 1 Connect the BLE NFC communication module harness connector.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 2 Install the BLE NFC communication module and snap it on securely.

- 3 Install the gear shift panel assembly.
- 4 Connect the negative cable of battery.
- 5 The GLDS diagnostic program is required, under the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software brushing operation.

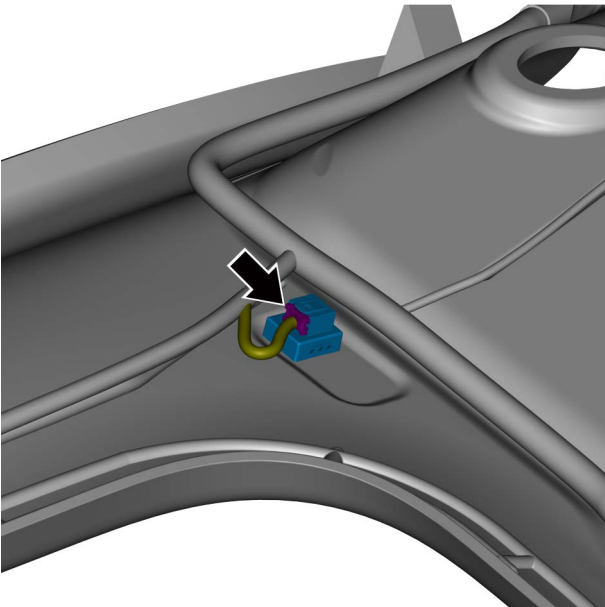
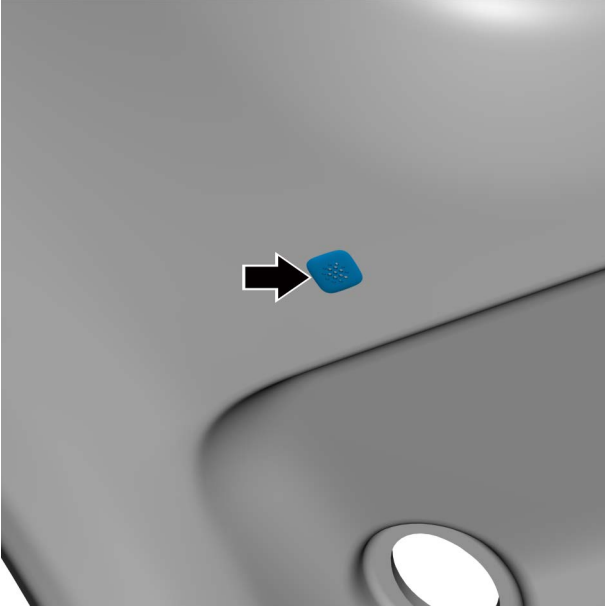
12.2.5.16 Replacement of microphone

Removal Procedure

Warning !

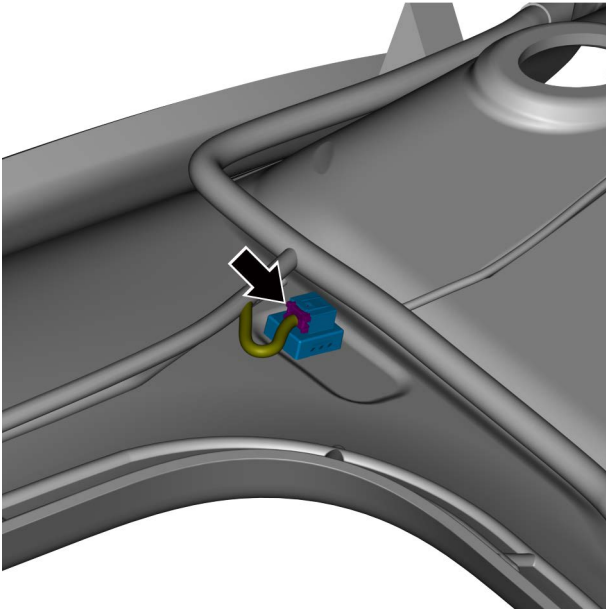
Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the roof assembly, refer to [Replacement of roof assembly](#).
- 3 Remove the microphone cover.



- 4 Disconnect microphone harness connector and take off the microphone.

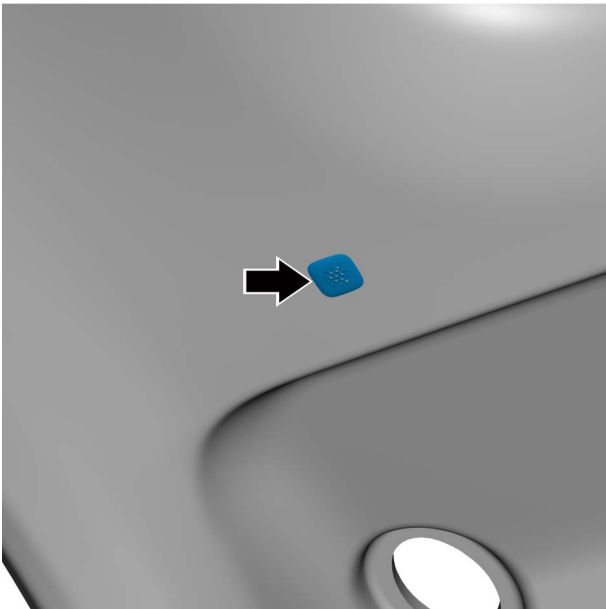
Installation Procedure



- 1 Install the microphone and connect the harness connector.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 2 Install the microphone cover.

- 3 Install the roof assembly.
- 4 Connect the negative cable of battery.

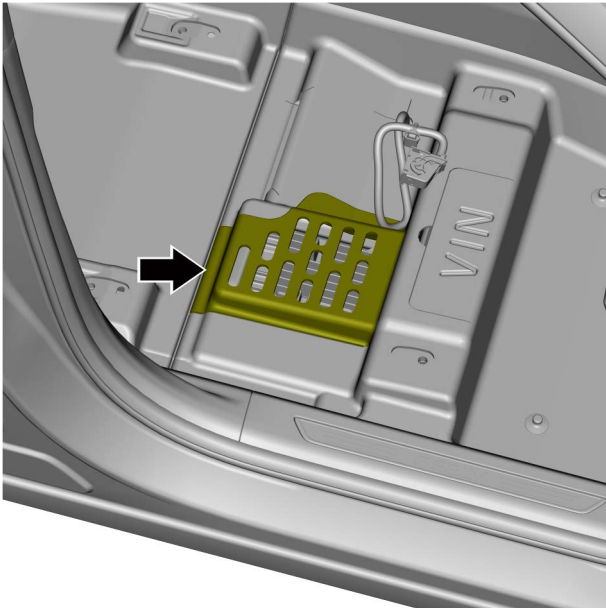
12.2.5.17 Replacement of audio control module

Removal Procedure

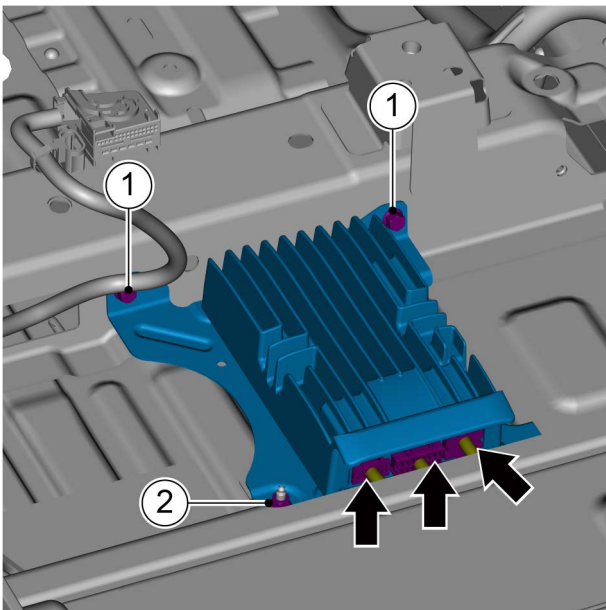
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

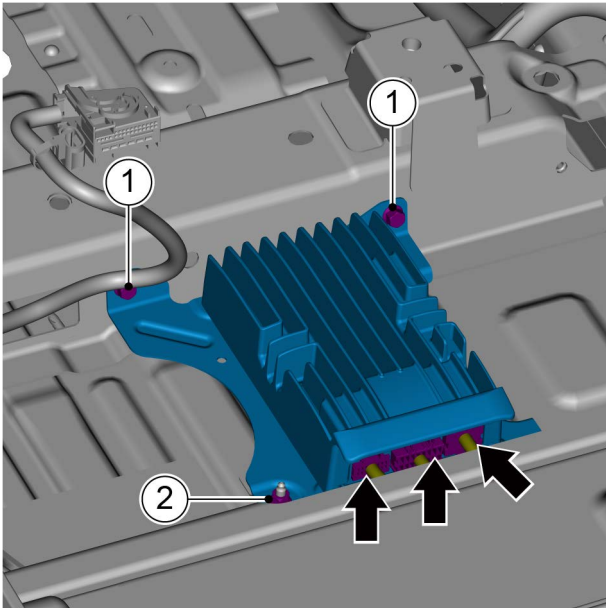


- 3 Remove the passenger seat, refer to [Replacement of passenger seat](#).
- 4 Lift the right front floor front section carpet assembly.



- 5 Remove the 2 fixing bolts 1 of audio control module.
- 6 Remove the 1 fixing nut 2 of audio control module.
- 7 Disconnect the audio control module harness connector.
- 8 Remove the audio control module.

Installation Procedure

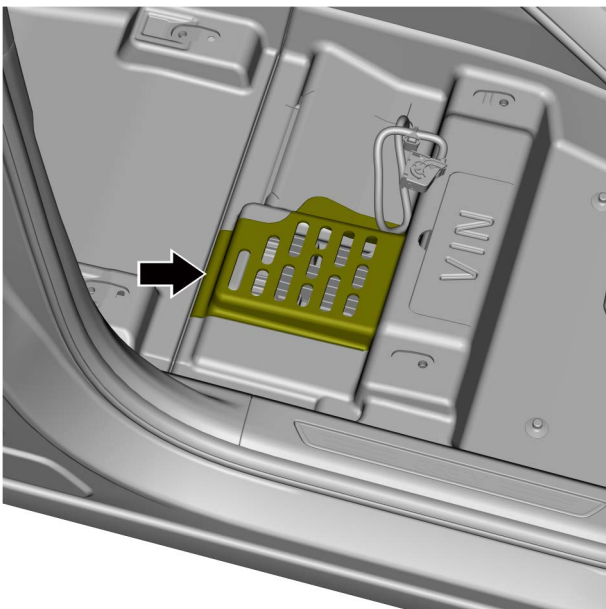


- 1 Install the audio control module.
- 2 Connect the audio control module harness connector.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 3 Install the 2 fixing bolts 1 of audio control module.
Torque: 10N·m
- 4 Install the 1 fixing nut 2 of audio control module.
Torque: 10N·m



- 5 Reset the right front floor front section carpet assembly.

- 6 Install the passenger seat.
- 7 Connect the negative cable of battery.
- 8 The GLDS diagnostic program is required, under the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software brushing operation.
- 9 Close the engine compartment cover.

12.3 Lighting system

12.3.1 Specification

12.3.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Headlight unit (left front) fixing bolt	M6×20	4.2-5.8
Fixing bolt of trunk door check	M6×25	5-7
Left tail light fixing bolt	M6×25	2.5-3.5
Tailgate tail light fixing nut	M6×7.8	2.5-3.5
Left rear fog lamp fixing screw	PF5×16	1.3-1.7
Rear window brake lamp fixing nut	M6×7.3	1-2.3
Left front door side defroster duct assembly fixing screw	PF5×16	1.7-2.3
Left front door ambient lamp fixing screw	PF5×16	1.7-2.3
Steering wheel module fixing bolt	M6×20×22.85	5-7
Left upper front grille light fixing screw	PF5×16	1.3-1.7

12.3.1.2 Bulb specifications

Part Name	Bulb Name	Bulb Model	Power
Front headlight unit	High beam	LED	-
	Low beam	LED	-
	Daytime running lamp	LED	-
	Front turn signal	LED	-
	Front position lamp	LED	-
Grille light	Grille light	LED	-
Rear headlight unit	Brake lamp	LED	-
	Rear turn signal	LED	-
	Rear position lamp	LED	-
	Rear reverse lamp	LED	-
Side turn signal	Side turn signal	LED	-
Rear fog lamp	Rear fog lamp	LED	-
Rear window brake lamp	Rear window brake lamp	LED	-
License plate light	License plate light	LED	-
Overhead console unit	Reading lamp	LED	-
Rear overhead console	Reading lamp	LED	-
Front footwell illumination lamp (if equipped)	Front footwell illumination lamp	LED	-
Console lower storage box illumination lamp	Console lower storage box illumination lamp	LED	-
Ambient lamp (if equipped)	Ambient lamp	LED	-

Part Name	Bulb Name	Bulb Model	Power
Luggage compartment light	Luggage compartment light	LED	-
Glovebox illumination lamp	Glovebox illumination lamp	LED	-
Sun visor light	Sun visor light	LED	-

12.3.2 Instructions and operations

12.3.2.1 Cautions

Warning about Battery Disconnection

Warning !

Before servicing any electrical component, the starter switch power mode should be OFF and all electrical loads must be "OFF" unless otherwise noted in the operating procedures. Also disconnect the battery negative cable if tools or equipment are likely to come into contact with exposed energized electrical terminals. Violation of these safety instructions may cause damage to the vehicle or vehicle components or result in personal injury.

Notices for using the battery during inspection

Warning !

When using the battery in an inspection, keep the positive and negative tester probes separated to prevent short circuit.

Notices for placing the starter switch in OFF position when disconnecting the battery

Caution

Be sure to put the starter switch in the OFF position when connecting or disconnecting battery cables, battery chargers, or jumper cables. Otherwise, the control module or other electrical components may be damaged.

Notices of the power system control module and electrostatic discharge

Caution

Do not touch connector pins or solder components on circuit boards to prevent electrostatic discharge from damaging the electronic control module on the vehicle.

12.3.2.2 System description

Outdoor illumination

- Position lamp

When the engine is started and the light steering wheel module is rotated to the first position, the rear position lamps and daytime running lamps are illuminated. Rotate to the initial position and the rear position lights and daytime running lamps turn off.

- Low beam

Rotate the light steering wheel module to the second position and the low beam lights up. Rotate to the initial position and the low beam turns off.

- Automatic lights (if equipped)

Rotate the light steering wheel module to the AUTO position to turn on the headlamp auto-lighting function, and the auto-lighting system then automatically controls the headlamps to light up and turn off according to the ambient lamp. The automatic lighting system can recognize the dark environment and tunnel light environment and realize the automatic control of position lamp and low beam. When the vehicle enters the tunnel, it will automatically light up the position lamps and low beams, and turn off the position lamps and low beams automatically after leaving the tunnel. When the outside environment is dark, the system will also light up the position lamps and low beams.

Caution

The system has a manual priority function in the automatic mode, if there is a light signal input, the system will exit the automatic lighting mode.

- Automated high beam control (if equipped)

The intelligent high beams can be turned on and off by the light steering wheel module. In automatic lighting mode (i.e. AUTO), rotate the light steering wheel module to the intelligent high beam position, the intelligent high beam control system is activated, the knob automatically returns to the AUTO position, and the automated high beam control (AHBC) status indicator on the combination instrument lights up in white. Rotate the light control switch again to the automated high beam control position, the automated high beam control system is deactivated and the knob automatically returns to the AUTO position.

- Rear fog lamp

With the low beams on, press the fog lamp control switch and the rear fog light turns on. Press the fog lamp control switch again and the rear fog lamp turns off.

- Reversing lamp

There are two reverse lamps, locating in the rear combination lamp. They will come on when the transmission is in reverse gear. The reverse lamp is operated by the reverse gear switch connected to the transmission.

- License plate light

License plate light lights up when the headlight or position lamps are on. License plate light is mounted above the license plate.

- Light show (if equipped)

The light show function can be turned on by clicking Play in the light show interface. The exterior lights will follow the rhythm of the music being played, and the music currently being played is from a multimedia audio source. When the light show function is turned on, you need to move to the outside of the car to watch it.

You can turn off the light show function at any time during the light show, just click Stop in the interface.

- Courtesy lamp (if equipped)

On the multimedia display screen, click in order: Vehicle Settings → Lights → Light Language, and then turn on the courtesy lamp function in the courtesy lamp setting interface. The low beam lights up when approaching the vehicle with a valid key.

- Courtesy lamp language (if equipped)

On multimedia display screen, click: Vehicle Settings → Lights → Light Language, and then turn on the courtesy lamp function in the courtesy lamp setting interface. When the function is turned on, you can also select among the three lighting modes of the courtesy lamp message.

When an unlock signal is received when the vehicle is in the off state, the headlight and tail light welcome function is turned on.

Headlight height adjustment

The headlight height can be adjusted by the headlight height adjustment knob, which is divided into four positions: 0, 1, 2 and 3.

The position of the knob can be adjusted according to the load status:

- 0: Only the driver is inside the vehicle.
- 1: Only the driver and front passenger are inside the vehicle.
- 2: The vehicle is full of passengers and the luggage compartment is fully loaded.
- 3: Only the driver is inside the vehicle and the luggage compartment is fully loaded.

Caution

Do not cause glare to the driver on the opposite side of the road when adjusting the height of the headlight illumination.

Daytime running lamp

Daytime running lamp on

When activated, the daytime running lamps turn on when the low beams are off.

Daytime running lamp off

The daytime running lamps automatically turn off when the low beams are on.

The daytime running lamps are integrated inside the headlamps, and the brightness of the daytime running lamps on the relevant side of the vehicle is reduced to the brightness of the front position lamps when the turn signals are on.

Overhead console unit (front reading lamp assembly)

Overhead console unit (front reading lamp assembly) operation

Press the left or right overhead console unit (front reading lamp assembly) switch to turn on or off the left or right front interior light separately; press the overhead console unit (front reading lamp assembly) switch to turn on or off the front and rear interior lights simultaneously.

Caution

When using front reading lamp assembly door control function to turn on the left and right front reading lamp assemblies, you can turn off the corresponding lights by pressing the left or right front reading lamp assembly switch.

When the four doors are locked, the front reading lamp assembly lights up automatically when the courtesy lamp function is unlocked or triggered in nighttime. If the doors are not unlocked at this time, the front reading lamp assembly continues to light up, if the doors are locked through the smart key or by touching the door handle during this time, the front reading lamp assembly goes off.

After unlocking the four doors with the smart key or by touching the door handle, if any door (excluding the trunk door) is open before the front reading lamp assembly is extinguished, the front reading lamp assembly will be illuminated continuously from the time the door is opened. After the engine is started and all four doors are closed, the front reading lamp assembly will go out quickly. If the start switch is in mode ON and all four doors are closed, the front reading lamp assembly will go out slowly. If start switch is in mode OFF and all four doors are closed, the front reading lamp assembly will go out slowly after 30 seconds. The front reading lamp assembly door control can be turned off in the multimedia display screen

Caution

Avoid using overhead console unit (front reading lamp assembly) when driving at night. Bright lights may affect the driver's driving and cause traffic accidents.

Interior light door control function

The interior light door control function is turned on by default, if you want to turn it off, click on multimedia display screen: Vehicle Settings→Lighting→Door Lamp→Off.

1. Lighting up

- In low-light environment, with all four doors and the trunk door closed, the interior light is illuminated gradually when the start switch is turned off.
- In low-light environment, with all four doors and rear doors closed, when unlocking and triggering the courtesy lamp function, the interior light lights up automatically.
- In low-light environment, with the door control function turned on, when any door is opened, the interior light lights up gradually.

2. Going off

- With the vehicle started and all four doors and trunk door closed, the interior light fades out.
- With all four doors and trunk doors closed, the interior light fades out when a lock command is received with the engine off.
- With start switch in mode ON, the interior light fades out when all doors are closed and a door is unlocked.
- If start switch is in mode OFF and all four doors are closed, the interior light fades out after 30 seconds.

Rear overhead console (rear interior light)

Press the left or right rear overhead console (rear interior light) switch to turn on or off the corresponding rear overhead console (rear interior light).

Press and hold the left or right rear overhead console (rear interior light) switch to adjust the brightness of rear overhead console (rear interior light).

Caution

If the rear overhead console (rear interior light) switch is in the ON position, turn the rear overhead console (rear interior light) switch off after leaving the vehicle to avoid draining the vehicle battery.

Ambient lamp (if equipped)

Caution

The ambient lamp will not light up if the brightness is adjusted to 0 in the ambient lamp mode interface on multimedia display screen.

Door ambient lamps are installed on the driver side and front passenger side door trim panels.

Ambient lamp settings

On the multimedia display screen, click Vehicle Settings → Lights → Ambient Lights, and then click Ambient Light Mode to open the Ambient Lamp Mode setting menu. Welcome

ambient lamp and farewell ambient lamp can also be turned on or off under this interface.

Ambient lamp mode

Customized mode or driving mode can be selected in the ambient lamp mode setting menu.

- Custom mode: under this mode, the ambient lamp illumination mode can be set to Solid Color or Breathing. When solid color is selected, the color and brightness of the ambient lamp can be customized.
- Driving mode association: under this mode, the lighting mode of the ambient lamp will be associated with the selected driving mode.

Glovebox illumination lamp

The glovebox illumination light lights up when the glove box is opened and goes out automatically when the glove box is closed.

Footwell illumination lamp (if equipped)

The footwell illumination lamps are located on the instrument panel lower shield above the feet of the driver and front passenger.

1. Activation

- The footwell illumination lamp turns on when the door lamps are on.
- When driving at night, the footwell illumination lamps are on and the brightness is adjustable according to the backlight level.

2. Deactivation

- The footwell illumination lamp is turned off when the door lamps are off.
- The footwell illumination lamps are off when driving at night.

Luggage compartment light

The luggage compartment light on the left side lights up automatically when the trunk door is opened.

Follow me home

Follow me home activation

On multimedia display screen, click Vehicle Settings→Lighting→Lighting Language, select any time under the follow me home setting interface and the follow me home function will be turned on.

When the vehicle immobilizer is disarmed and the follow me home function is not turned off in multimedia display screen, the follow me home function can be activated in the following 2 ways:

- When the light steering wheel module is in a non-AUTO gear, within 10min after the vehicle is turned off, toggle the

light control steering wheel module in the direction of the arrow to the limit position, then release it, and the high beams flash once to activate the follow me home function.

– At night, when the light steering wheel module is in the AUTO gear and the vehicle is turned off, the follow me home function will be automatically activated.

Follow me home deactivation

On multimedia display screen, click: Vehicle Settings→Lighting→Light Language, and then click Close under the follow me home setting interface to turn off the follow me home function.

When any of the following conditions are met, the follow me home function will be temporarily turned off:

- Start switch is not turned off.
- Timeout.
- High beam is turned on or flashes.

Follow me home timing

On multimedia display screen, click Vehicle Settings→Lighting→Lighting Language, and select the timing time under the follow me home setting interface according to your needs, and the available timing times are 30 seconds, 60 seconds and 90 seconds. When the follow me home function is activated, the timer is the pre-selected time. Before this timer times out, if any door (including the trunk door) is opened, the timer will be reset to 180 seconds, and if all doors (including the trunk door) are closed, the timer will be reset to the pre-selected timer.

12.3.2.3 Vehicle light adjustment instructions

Equipment and site preparation

- Tools: Phillips screwdriver or hexagon wrench.
- Tape measure or laser rangefinder (electronic ruler).
- Site: The dark environment site shall be level and flat, the size shall allow the vehicle to enter, and the distance between the reference center of the headlight and the screen should be at least 10m.
- Test screen: thick white paper or white wall (for easy observation of the light shape, the width of the test screen should be $\geq 2m$ wider than the vehicle).

Vehicle preparation

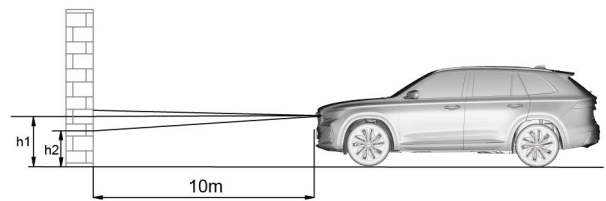
- The tires shall be inflated according to the full load pressure specified in the technical conditions of the complete vehicle.
- Vehicle is refilled with fuel, engine coolant, washer fluid and lubrication oil, and provided with all accessories and tools for the test vehicle (spare tyre, tools, etc.). Refilling means that the fuel tank is filled with no less than 90% of its volume.
- A 75Kg load is placed on the driver's seat to simulate the driver's sitting state.
- Prior to measurement, the vehicle shall be in a state of natural stillness. The vehicle shall travel backward at least

one wheel circumference distance, and then travel forward the same distance.

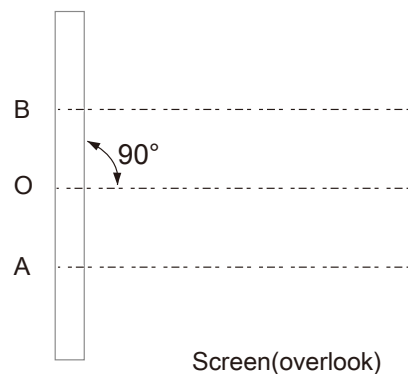
- Make sure the exterior covers of the headlamps are clean.
- Start the vehicle.

Light measurement

1. Park the vehicle as shown in the figure, and the distance L between the reference center of the headlight and the screen is 10m.



2. For vehicles with manual light height adjustment, turn the height adjustment switch to "0".
3. Draw Line O, Line A, Line A1, Line A2, Line B, Line B1 and Line B2 on the screen.



– Line O: Draw a vertical line in the center of the test screen aligned with the center of the vehicle.

– Line A: Draw a line to the left of Line O, parallel to Line O, with a distance from the O line of 686.5mm for the reflective bowl type and 721.1mm for lens type (solid red line).

– Line A1: Draw a line to the left of Line A, parallel to Line A, with a distance of 170mm from Line A (dashed red line).

– Line A2: Draw a line to the right of Line A, parallel to Line A, with a distance of 350mm from Line A (dashed red line).

– Line A: Draw a line to the right of Line O, parallel to Line O, with a distance from the O line of 686.5mm for the reflective bowl type and 721.1mm for lens type (solid red line).

– Line B1: Draw a line to the left of Line B, parallel to Line B, with a distance of 170mm from Line B (dashed red line).

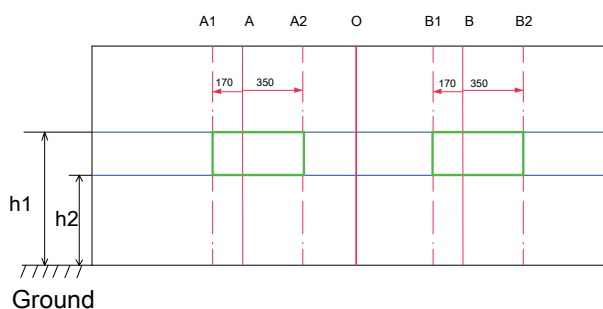
– Line B2: Draw a line to the right of Line B, parallel to Line B, with a distance of 350mm from Line B (dashed red line).

4. Draw Line h1 and Line h2 on the screen:

– Line h1: Draw a horizontal line parallel to the ground at a distance from the ground of 797mm for the reflective bowl type and 785mm for lens type.

– Line h2: Draw a horizontal line parallel to the ground at a distance from the ground of 547mm for the reflective bowl type and 535mm for lens type.

5. Complete all lines to form the green box shown in the figure.



Screen (front view)

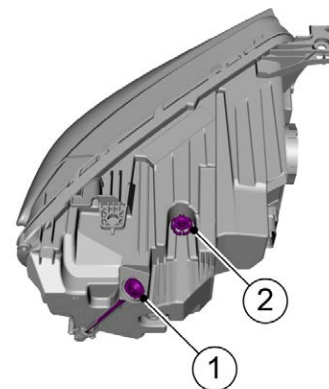
b. Left side light: Insert a Phillips screwdriver or hexagon wrench into the low beam adjustment port. Rotate the headlamp adjustment handle 1 to adjust the headlamp horizontally (left and right); rotate the headlamp adjustment handle 2 to adjust the headlamp vertically () as shown below:

Note

Adjust the lights on the right with the same method as that on the left.

Caution

In order to observe the effect of light adjustment, the light on one side may be adjusted while the light on the other side is shielded.



c. It is required that the turning point of the low beam cut-off line is located within the frame, and the light adjustment is completed, as shown in the figure below:

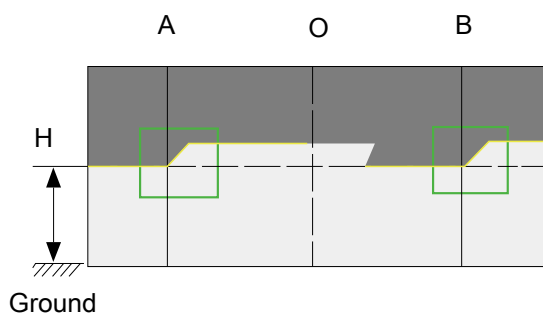
Caution

After commissioning, the light height on left and right sides should be consistent.

Lighting adjustment

1. Low beam adjustment

a. Turn on the low beam lamp.



Low beam area



2. High beam adjustment

The headlamp of this model is integrated with the high and low beams.

Caution

For headlamps integrated with low and high beams, only adjust the low beams.

12.3.3 System working principles

12.3.3.1 System working principles

Working principles of headlight

When the light steering wheel module is in the "headlight" gear, the working voltage is output from the harness connector of the light steering wheel module to drive the headlight relay to close and light up the headlight. The headlight power supply voltage is transmitted to the headlight shaft adjustment switch and the left and right headlight shaft adjustment motors, at this time, toggle the adjustment switch up and down to change the signal voltage of the adjustment motor, so as to realize the headlight height adjustment function.

Caution

Too frequent toggling of the key may cause damage or no operation to the motor.

When the CEM (Central Electronic Module) monitors the light steering wheel module harness connector voltage, it means that the switch is in the "AUTO" (automatic light), at this time the CEM will monitor the signal from the ambient lamp sensor, if the ambient lamp is not strong, the CEM will output voltage through the harness connector to drive the headlights relay to close, automatically lighting the headlights;; when the ambient lamp is strong, the CEM will cut off the voltage output of the harness connector to automatically turn off the headlight. When the light steering wheel module is switched to the high beam position, the harness connector controls the ground to drive the high beam relay to close and light up the high beams, and at the same time, the high beam supply voltage is transmitted to the instrument, lighting up the high beam indicator in the instrument.

Caution

The working voltage of the high beam lamp relay comes from the headlight power supply circuit.

Working principles of position lamp

When the light steering wheel module is at "position lamp" gear, the switch signal outputs working voltage through the harness connector terminal of light steering wheel module to drive the position lamp relay to pull in and light up all position lamps, instrument backlight, and left and right license plate lights.

Working principles of daytime running lamp

The CEM harness connector terminal outputs an operating voltage to drive the daytime running lamp relay to illuminate the daytime running lamps. At the same time, this voltage is transmitted to the instrument to illuminate the daytime running lamp indicators.

Working principles of rear fog lamp

When the front low beam or high beam is turned on, the switch will control the position lamp relay to operate and send the driving power to the rear fog lamp relay. When the rear fog lamp switch is closed, the switch provides the output voltage from the position lamp relay to drive the rear fog lamp relay to close to illuminate the rear fog lamp. At the same time, this voltage is transmitted to the instrument to illuminate the rear fog lamp indicator.

Working principles of turn signal

The multifunction joystick controls the ground circuit of the light steering wheel module harness connector terminal to drive the turn signal relay to close, and at the same time, the voltage is transmitted to the left and right turn signals respectively.

Caution

When the hazard warning lamp button is pressed, CEM outputs voltage to both circuits at the same time, turning on all turn signals at the same time.

Working principles of brake lamp

The brake lights are controlled by the brake light switch on the brake pedal. The operating voltage is fed to the CEM through the on/off signal inside the switch to illuminate the brake lights.

Working principles of reverse lamp

The electronic gear shifting harness connector outputs an operating voltage to drive the reverse lamp relay and illuminate the reverse lamp. The instrumentation reverse gear information is received and displayed via the CAN network.

Working principles of interior door lamp

When the front reading lamp switch is in DOOR gear, the front reading lamp is powered by the CEM harness connector. When the door is opened, the door switch ground circuit is energized, causing the front reading lamp to illuminate.

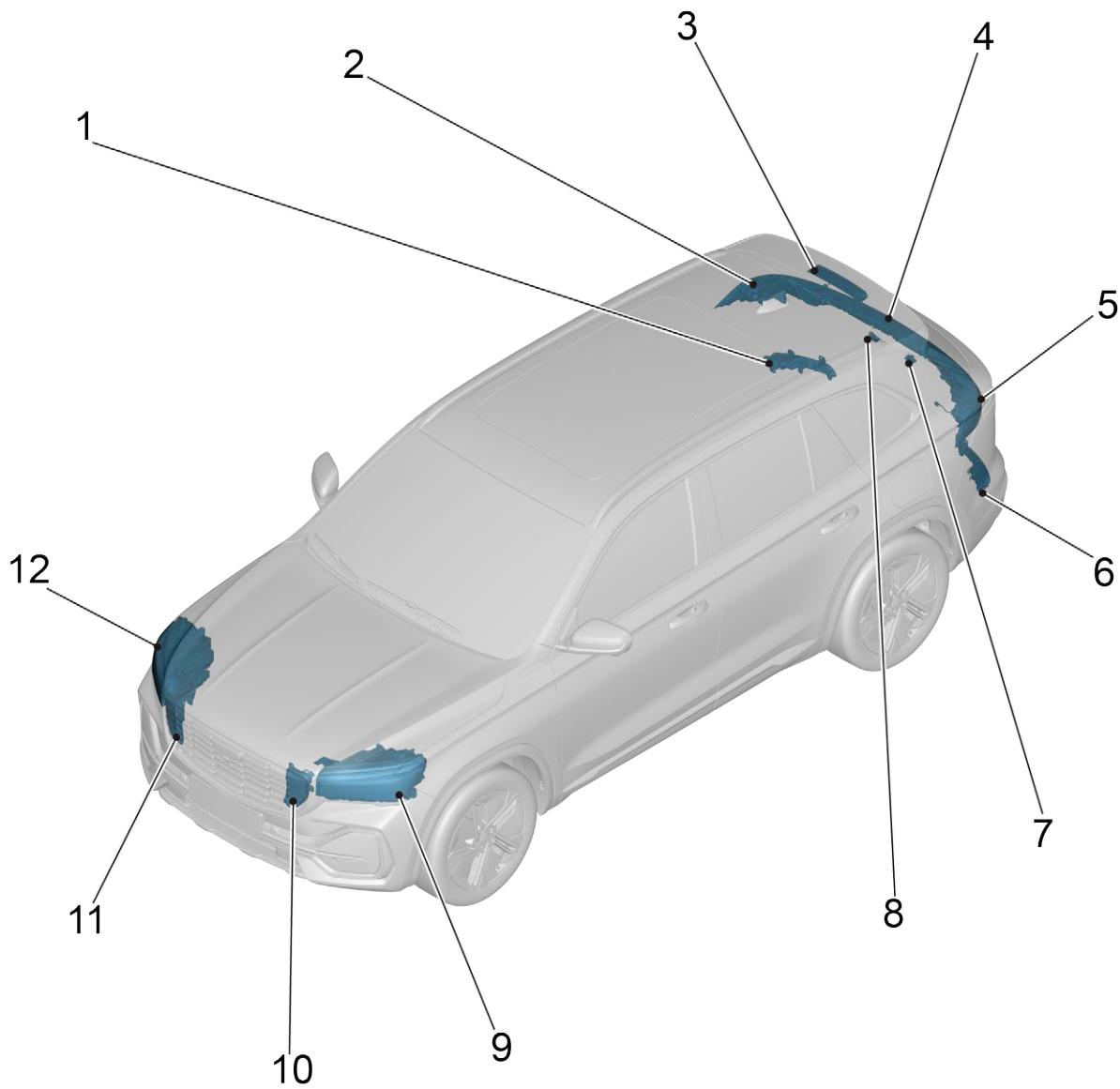
The courtesy lamps are powered by the fuse. The low beam lights up when approaching the vehicle with a valid key.

The luggage compartment light is powered by the fuse. When the trunk door is opened, the door control switch ground circuit is energized, causing the luggage compartment light to illuminate.

12.3.4 Part position

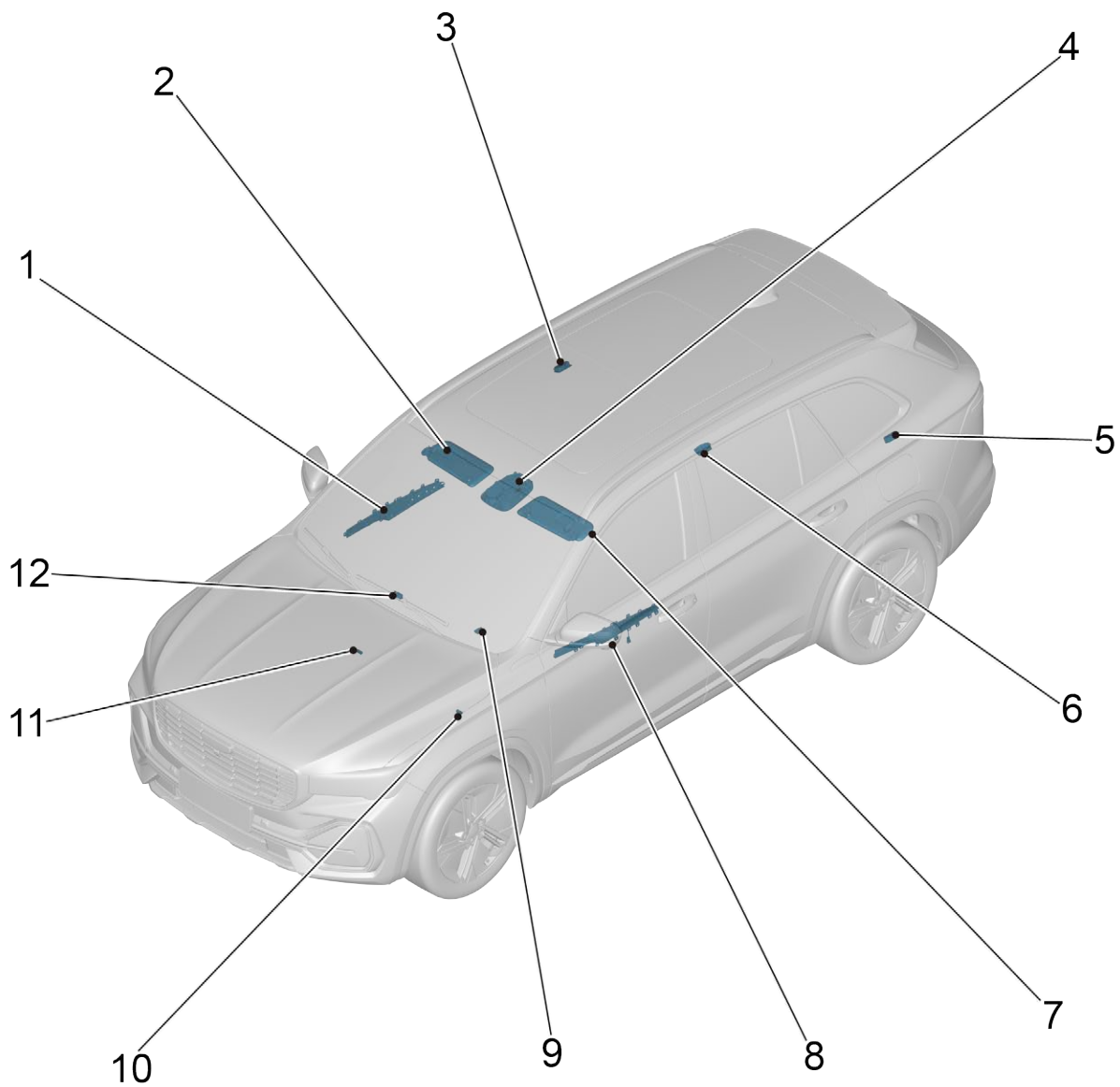
12.3.4.1 Part position

Exterior lighting



- | | |
|---------------------------|----------------------------------|
| 1. Rear fog lamp (right) | 7. Left license plate light |
| 2. Right tail light | 8. Right license plate light |
| 3. Rear window brake lamp | 9. Headlight unit (left front) |
| 4. Tailgate tail light | 10. Left front grille lamp |
| 5. Left tail light | 11. Right front grille lamp |
| 6. Rear fog lamp (left) | 12. Headlight unit (right front) |

Interior lighting



- | | |
|---|-------------------------------------|
| 1. Right front door ambient lamp | 7. Sun visor light (left) |
| 2. Sun visor light (right) | 8. Left front door ambient lamp |
| 3. Rear overhead console (right rear reading lamp assembly) | 9. Footwell multicolor illumination |
| 4. Overhead console unit | 10. Footwell illumination lamp |
| 5. Luggage compartment light | 11. Floor console illumination |
| 6. Rear overhead console (left rear reading lamp assembly) | 12. Glovebox illumination lamp |

12.3.5 Diagnostic information and procedure

12.3.5.1 Diagnosis description

See [Description and Operation](#) and [System Working Principles](#) before diagnosing a malfunction in the lighting system. Understanding and familiarizing yourself with the operation of the lighting system before beginning system diagnosis will help determine the correct troubleshooting steps to take in the event of a malfunction, and more importantly this will help determine if the condition described by the customer is normal operation. Any troubleshooting of the lighting system should start with a [Visual Check](#) that guides the repairer to the next logical step in the troubleshooting process. Understanding and using the diagnostic process correctly will reduce diagnostic time and avoid misdiagnosis of the fault area.

12.3.5.2 Visual check

- Check after-sale installations that may affect the operation of the lighting system to ensure that they do not affect the operation of the lighting system.
- Check system components that are easily accessible or can be seen to find out if there is any obvious damage of the component or there is a situation that may cause a fault.
- Check the harness and harness connector to ensure that there is no sign of loosening, damage, poor contact, aging, etc.
- If only one bulb is inoperative, check and repair the power supply or poor contact or open circuit fault at the grounding circuit before replacing the bulb.

12.3.6 Removal and Installation

12.3.6.1 Replacement of headlight unit (left front)

Removal Procedure

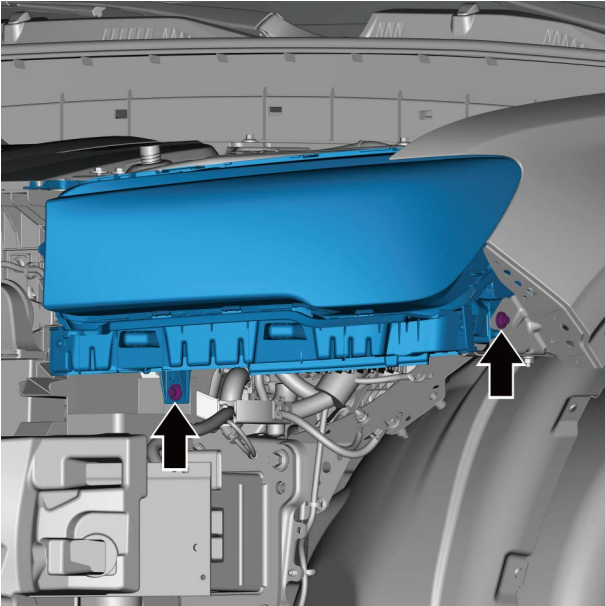
Warning !

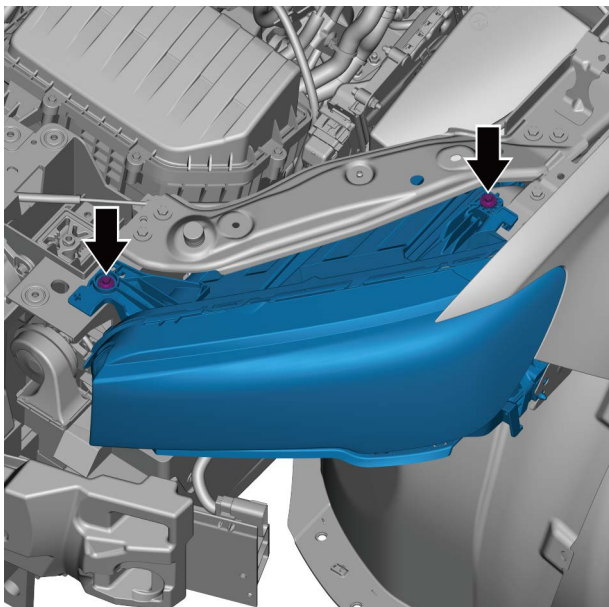
Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

Caution

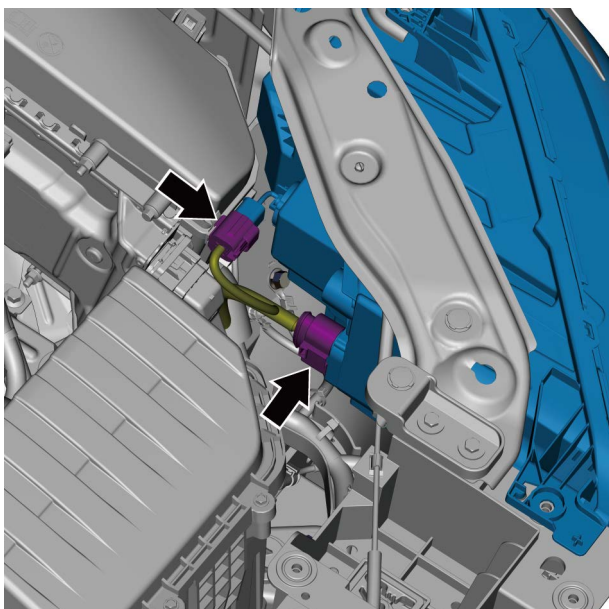
Headlight unit (left front) and headlight unit (right front) are removed and installed in a similar way.

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the front bumper assembly, refer to [Replacement of front bumper assembly](#).
- 3 Remove the 2 fixing bolts of headlight unit (left front).



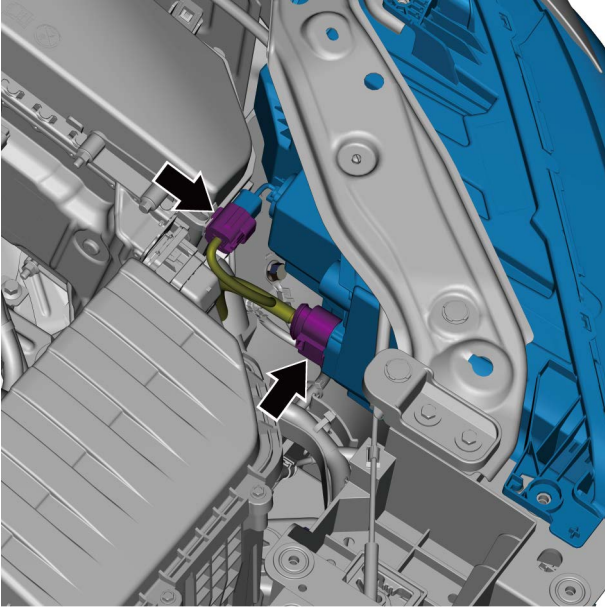


4 Remove the 2 fixing bolts of headlight unit (left front).



5 Disconnect the 2 harness connectors of headlight unit (left front) and remove headlight unit (left front).

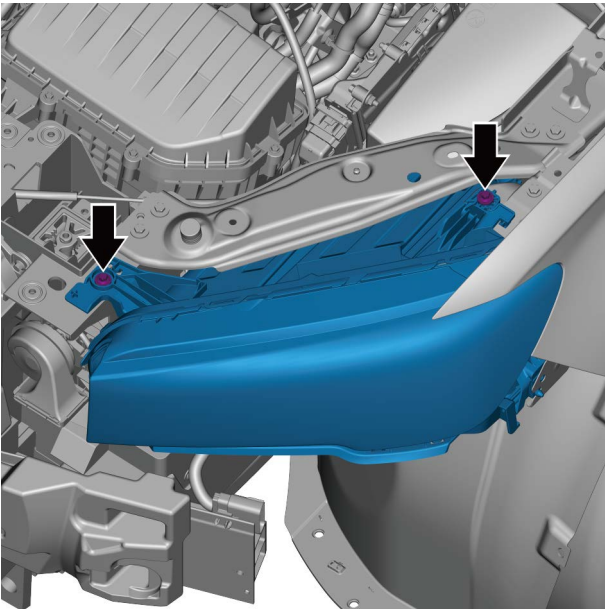
Installation Procedure



- 1 Connect the 2 harness connectors of headlight unit (left front).

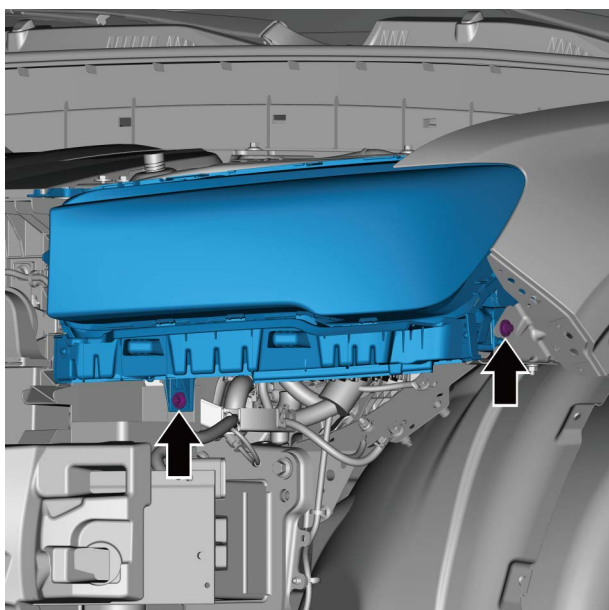
Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 2 Install the 2 fixing bolts of headlight unit (left front).

Torque: 5N·m



- 3 Install the 2 fixing bolts of headlight unit (left front).
Torque: 5N·m

- 4 Install the front bumper assembly.
- 5 Connect the negative cable of battery.
- 6 The GLDS diagnostic program is required, under the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software brushing operation.

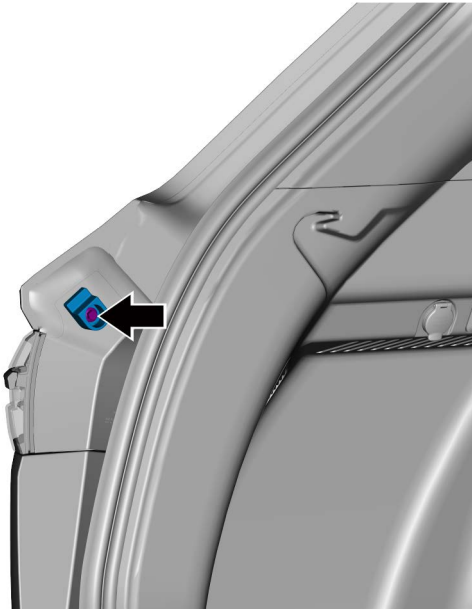
12.3.6.2 Replacement of left tail light

Removal Procedure

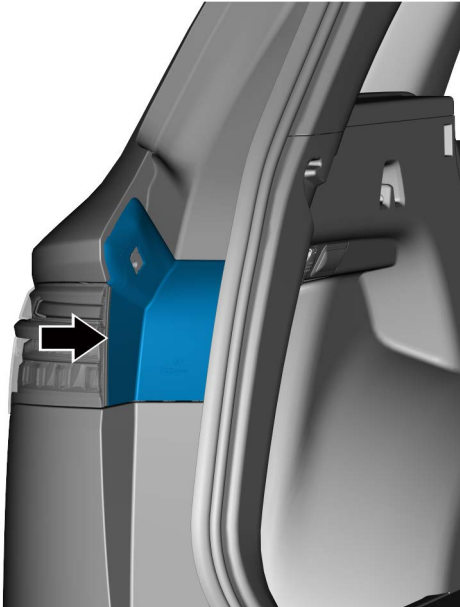
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

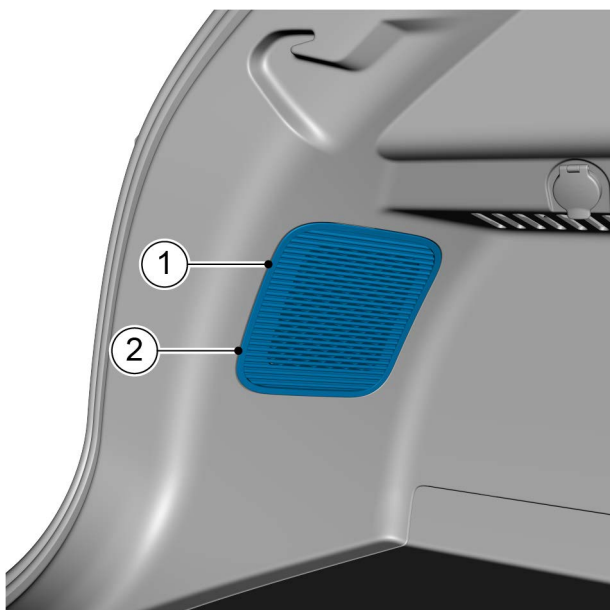
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).



2 Remove the body check fixing bolts.



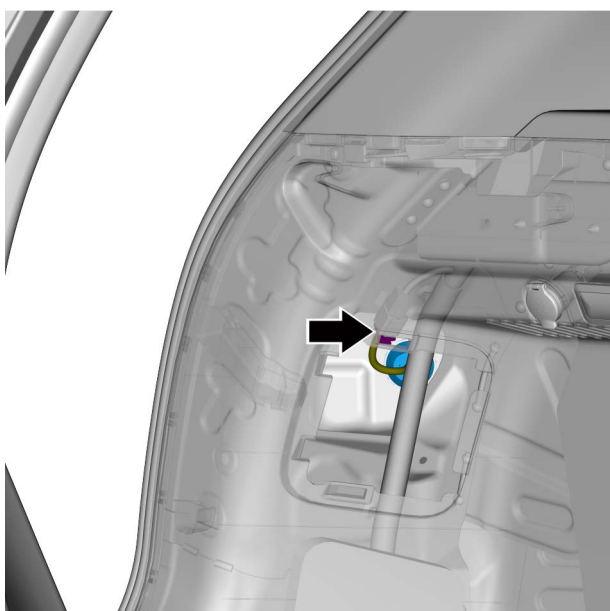
3 Remove the left tail light A trim panel.



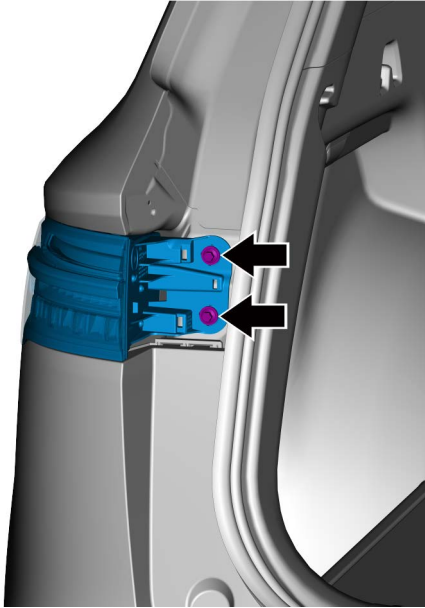
- 4 Remove the left tail light access cover.

Caution

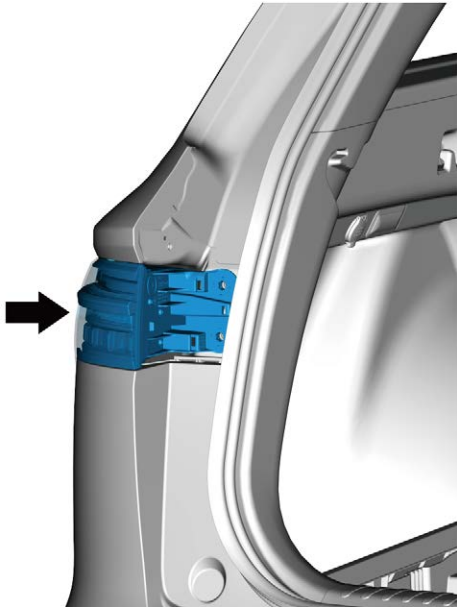
When removing the left tail light access cover, pry open the cover from position 1 and then remove the cover from position 2.



- 5 Disconnect the left tail light harness connector.

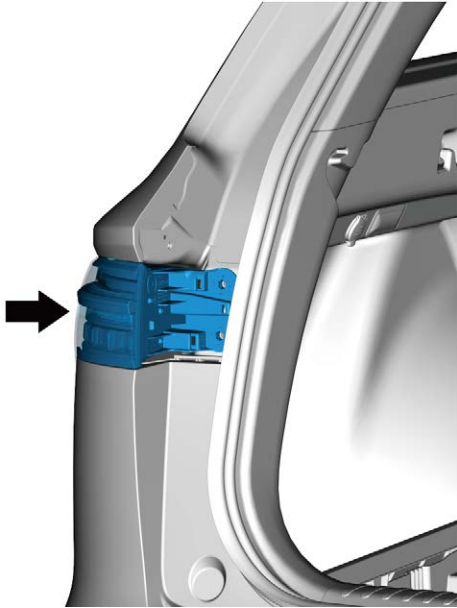


6 Remove the 2 fixing bolts of left tail light.

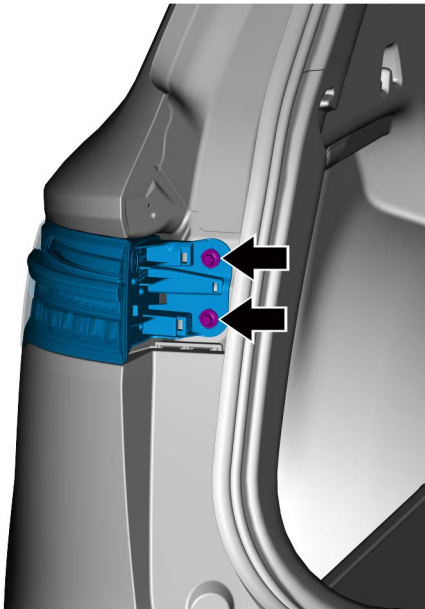


7 Remove the left tail light.

Installation Procedure

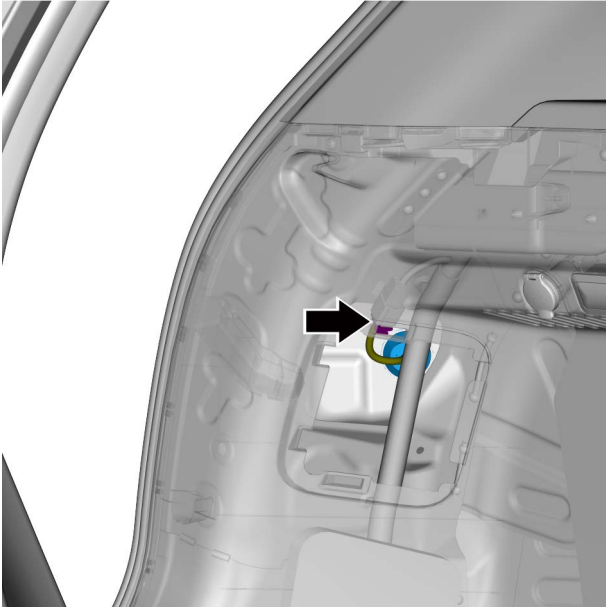


1 Install the left tail light.



2 Install the 2 fixing bolts of left tail light.

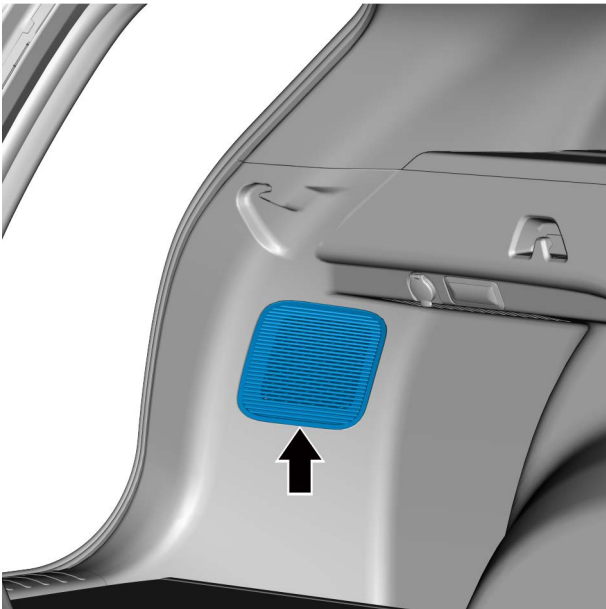
Torque: 3N·m



- 3 Connect the left tail light harness connector.

Caution

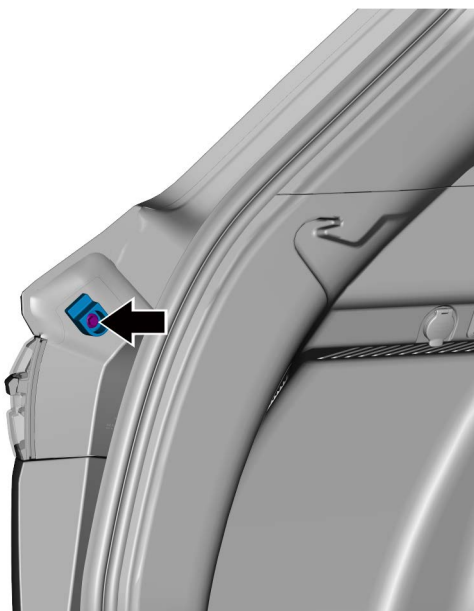
Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 4 Install the left tail light access cover.



- 5 Install the left tail light A trim panel.



- 6 Install the body check fixing bolts.
Torque: 6N·m

- 7 Connect the negative cable of battery.

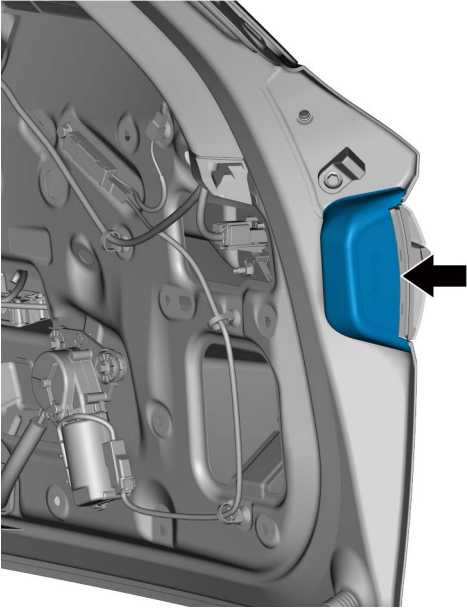
12.3.6.3 Replacement of tailgate tail light

Removal Procedure

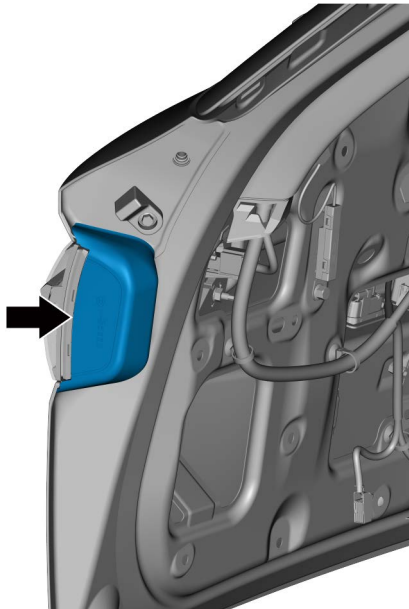
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

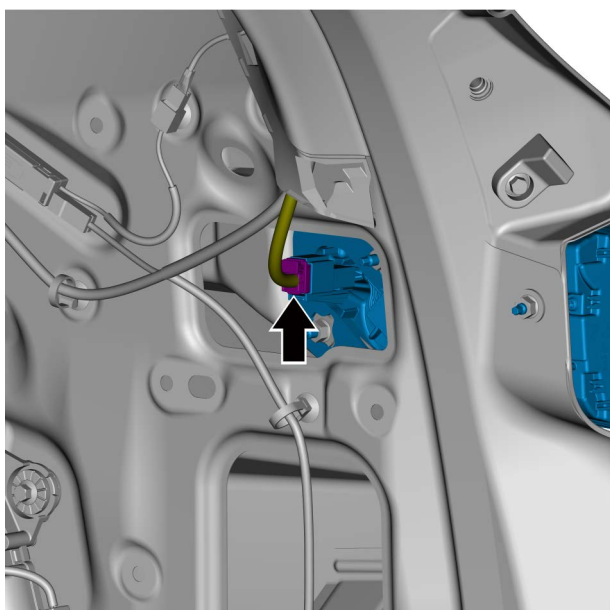
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the trunk door lower interior trim panel assembly, refer to [Replacement of trunk door lower interior trim panel assembly](#).



- 3 Remove the side body left rear combination lamp B trim panel.



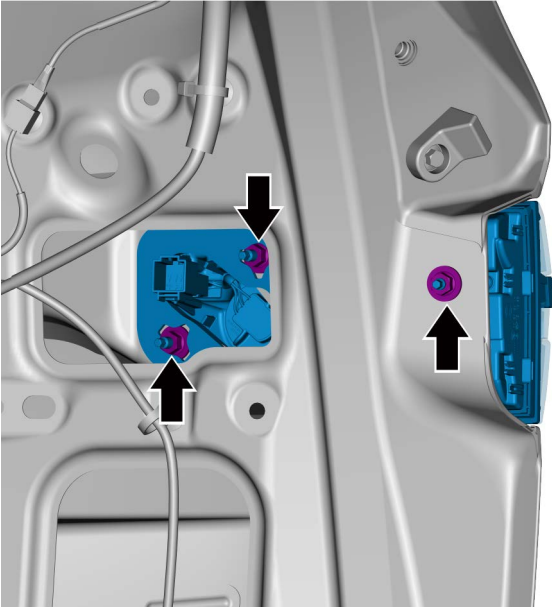
- 4 Remove the side body right rear combination lamp B trim panel.



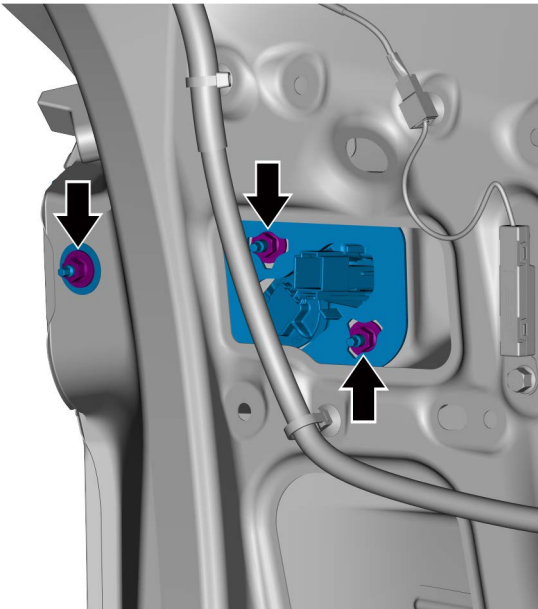
5 Disconnect the tailgate tail light left harness connector.



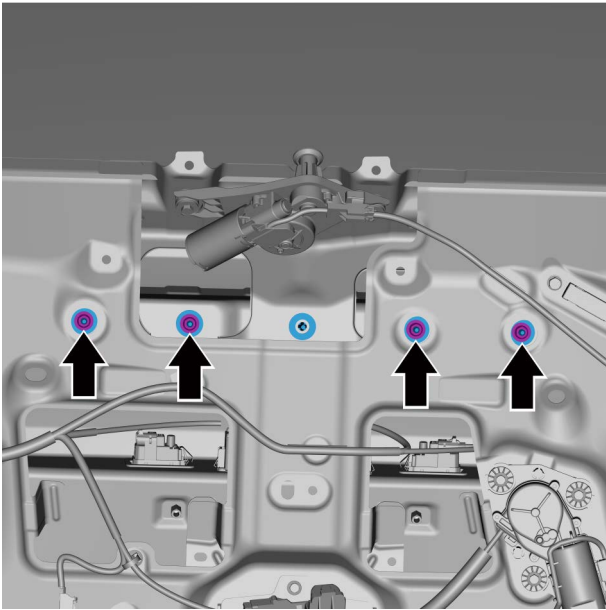
6 Disconnect the tailgate tail light right harness connector.



- 7 Remove the 3 fixing nuts on the left side of tailgate tail light.



- 8 Remove the 3 fixing nuts on the right side of tailgate tail light.



9 Remove the 4 fixing nuts in the middle of tailgate tail light.

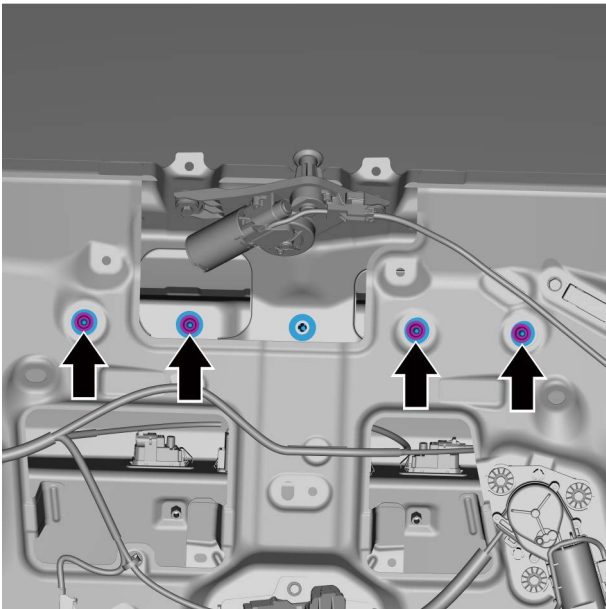


10 Remove the tailgate tail light.

Installation Procedure

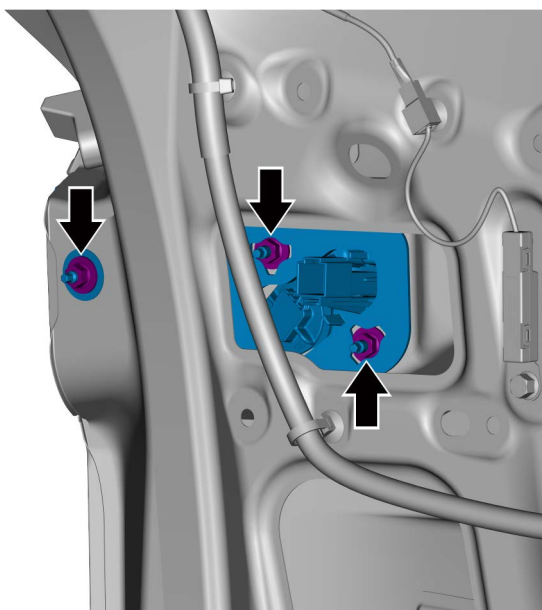


- 1 Install the tailgate tail light.

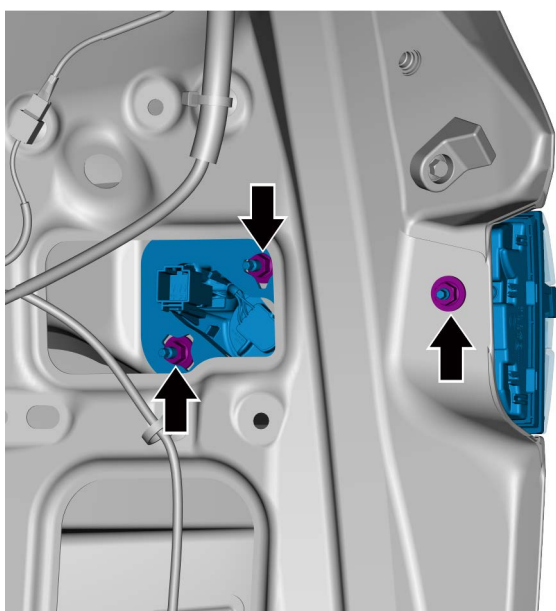


- 2 Install the 4 fixing nuts in the middle of tailgate tail light.

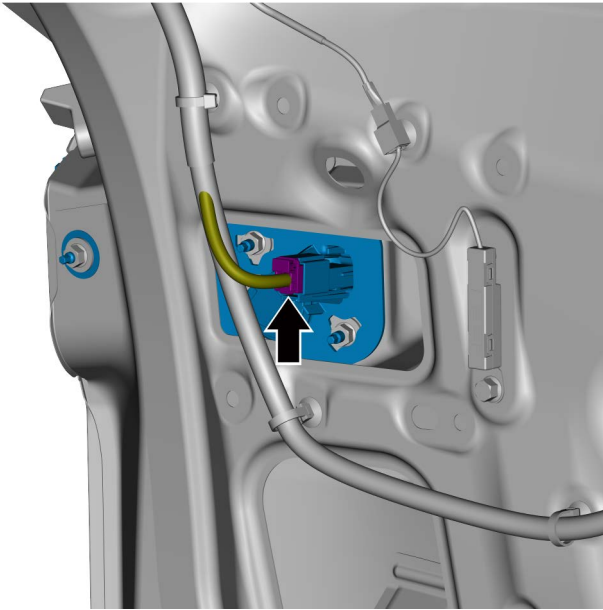
Torque: 3N·m



- 3 Install the 3 fixing nuts on the right side of tailgate tail light.
Torque: 3N·m



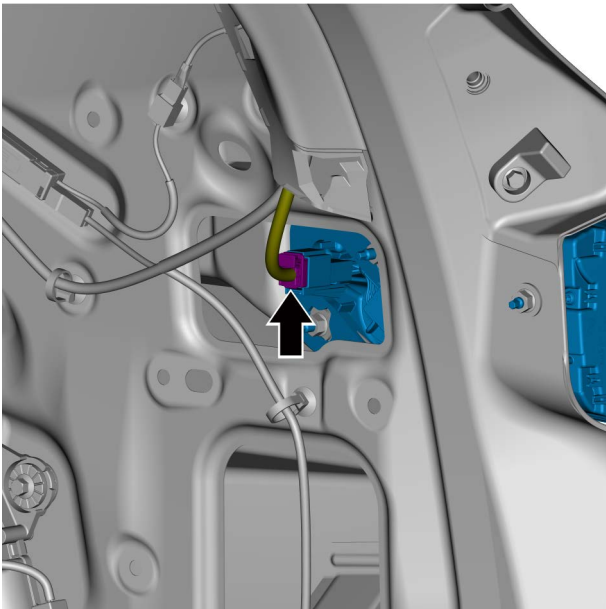
- 4 Install the 3 fixing nuts on the left side of tailgate tail light.
Torque: 3N·m



- 5 Connect the tailgate tail light right harness connector.

Caution

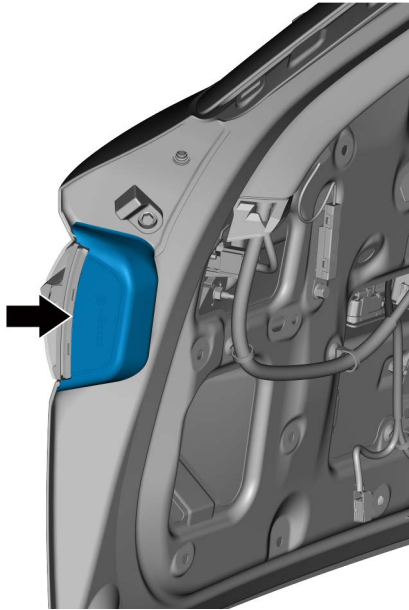
Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



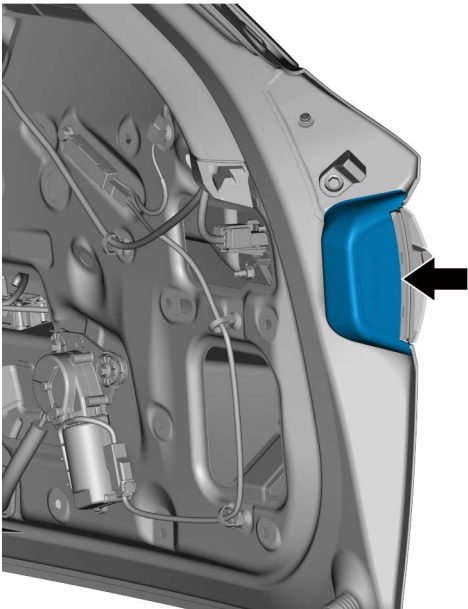
- 6 Connect the tailgate tail light left harness connector.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 7 Install the side body right rear combination lamp B trim panel.



- 8 Install the side body left rear combination lamp B trim panel.

- 9 Install the trunk door lower trim panel assembly.
- 10 Connect the negative cable of battery.

12.3.6.4 Replacement of license plate light

Removal Procedure

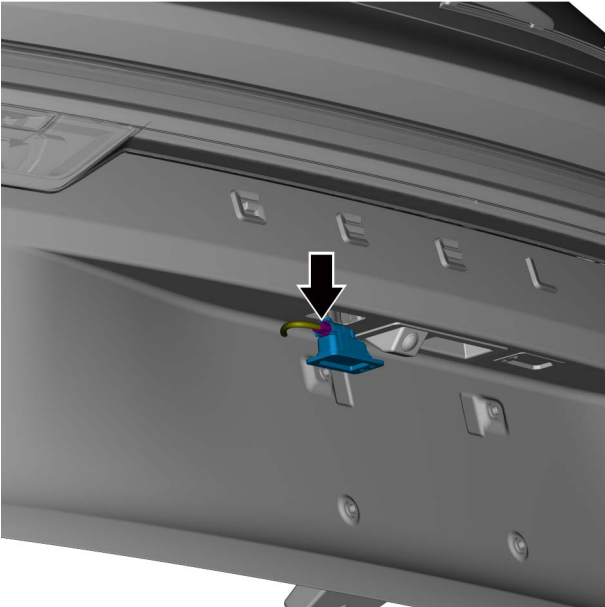
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

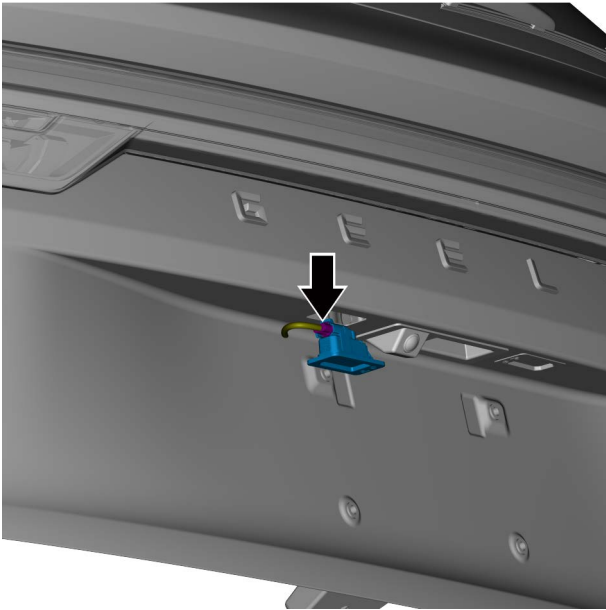


2 Remove the license plate light.



3 Disconnect the license plate light harness connector and remove the license plate light.

Installation Procedure



- 1 Connect the license plate light harness connector.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 2 Snap the license plate light into the mounting position and make sure it is in place.

- 3 Connect the negative cable of battery.

12.3.6.5 Replacement of rear fog lamp (left)

Removal Procedure

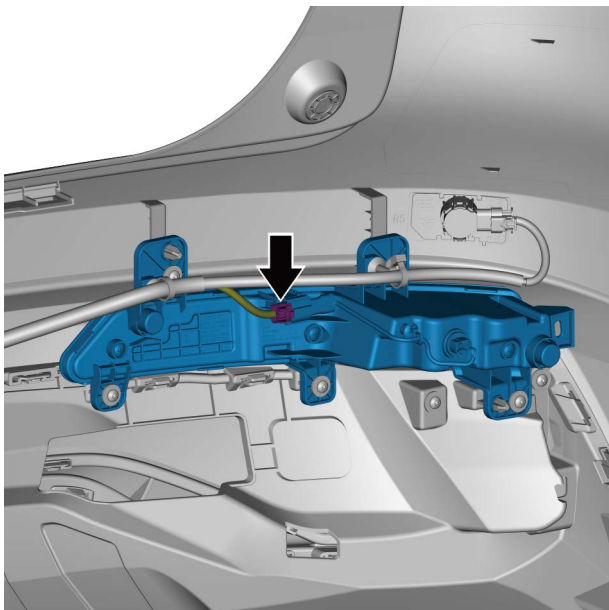
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

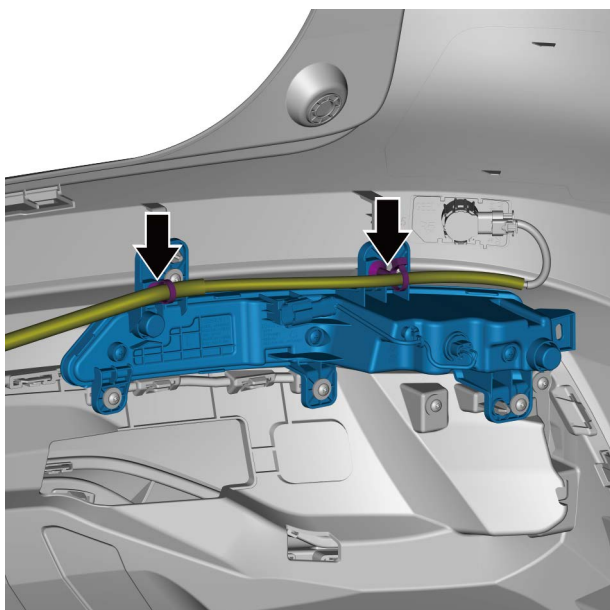
Caution

Rear fog lamp (left) and rear fog lamp (right) are removed and installed in a similar way.

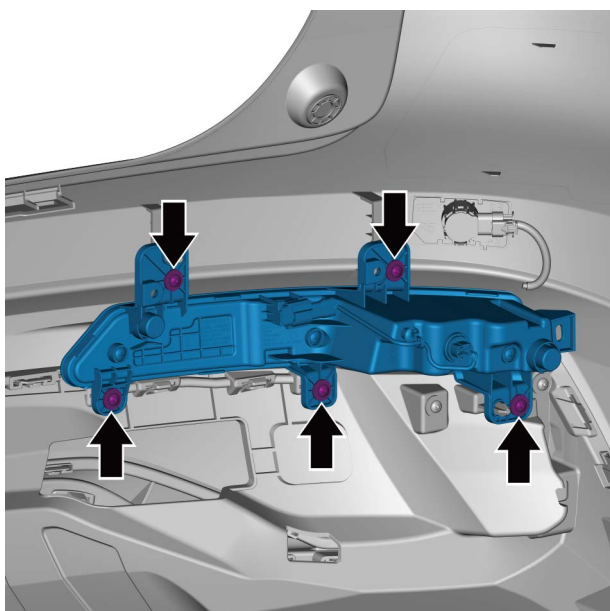
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).



- 2 Remove the rear bumper assembly, refer to [Replacement of rear bumper assembly](#).
- 3 Disconnect the rear fog lamp (left) harness connector.

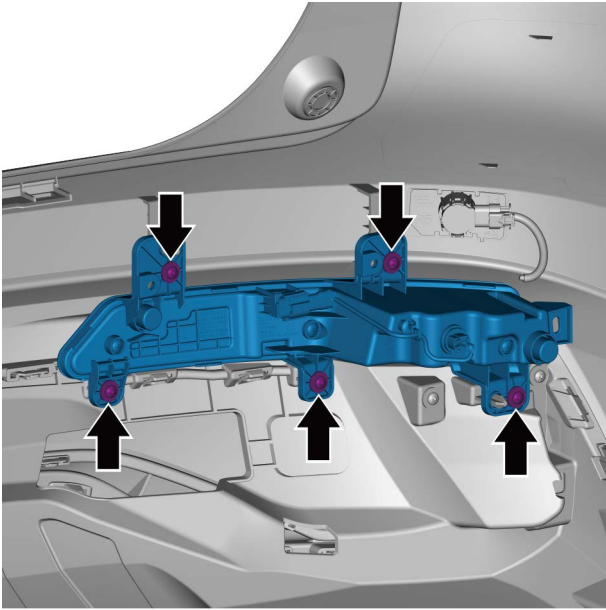


- 4 Disconnect the 2 fixing clips of rear bumper harness.

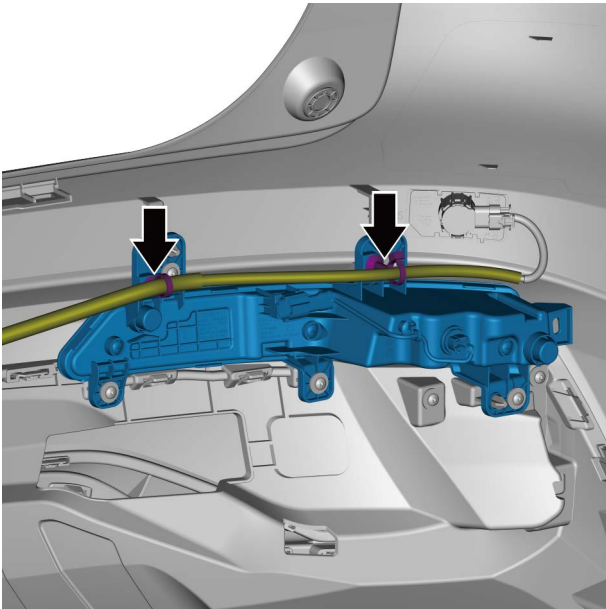


- 5 Remove the 5 fixing screws of rear fog lamp (left) and take off the rear fog lamp (left).

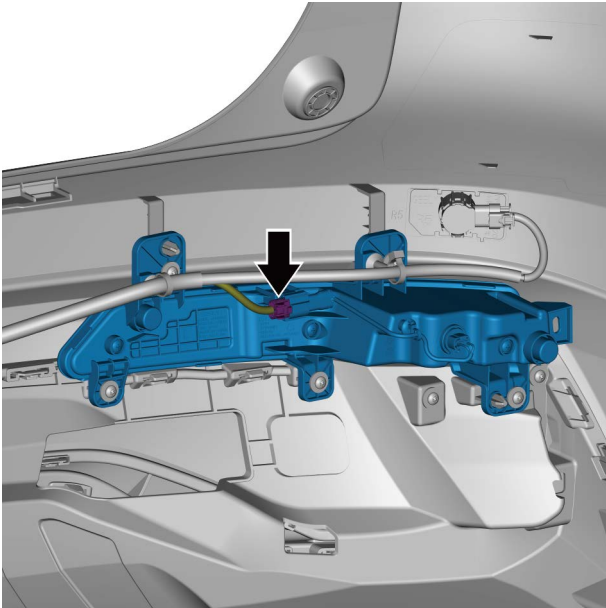
Installation Procedure



- 1 Install the 5 fixing screws of rear fog lamp (left).
Torque: 1.5N·m



- 2 Install the 2 fixing clips of rear bumper harness.



- 3 Connect the rear fog lamp (left) harness connector.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 4 Install the rear bumper assembly.
- 5 Connect the negative cable of battery.

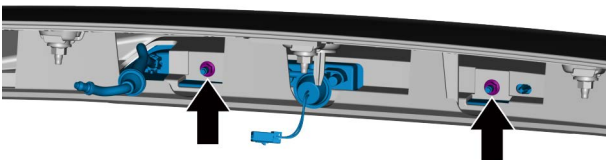
12.3.6.6 Replacement of rear window brake lamp

Removal Procedure

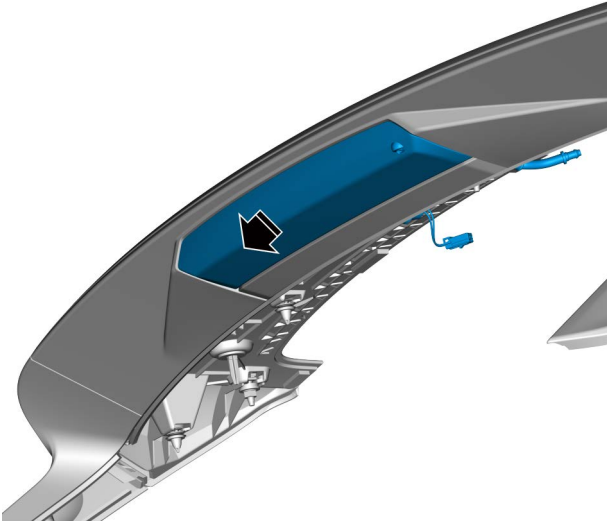
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

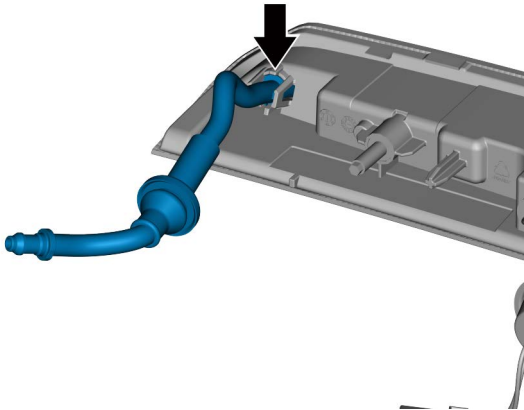
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove spoiler assembly, refer to [Replacement of spoiler assembly](#).
- 3 Remove the 2 fixing nuts of rear window brake lamp.



- 4 Remove the rear window brake lamp and rear wiper nozzle assembly.

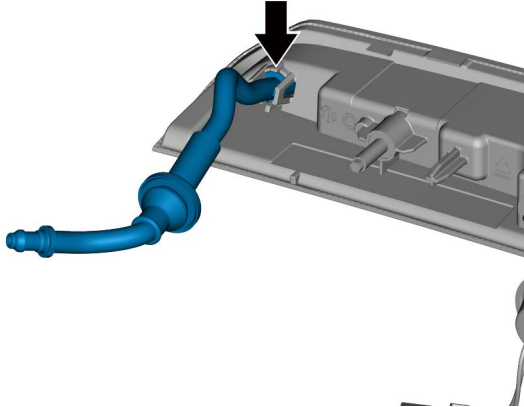


- 5 Remove the rear wiper nozzle and hose assembly.

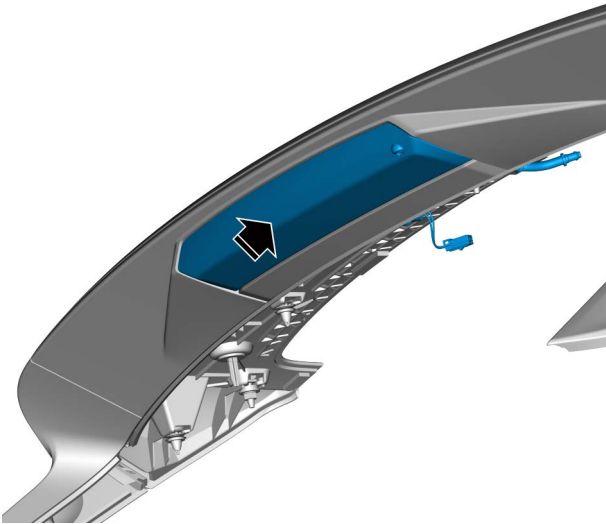


Installation Procedure

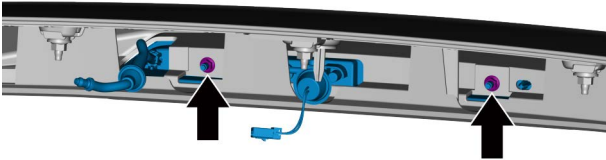
- 1 Install the rear wiper nozzle and hose assembly.



- 2 Install the rear window brake lamp and rear wiper nozzle assembly.



- 3 Install the 2 fixing nuts of rear window brake lamp.
Torque: 1.7N·m



- 4 Install spoiler assembly.
- 5 Connect the negative cable of battery.

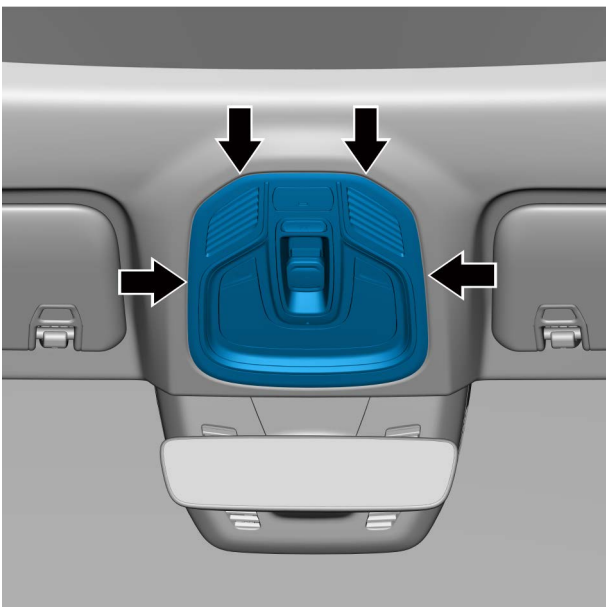
12.3.6.7 Replacement of overhead console unit (type I)

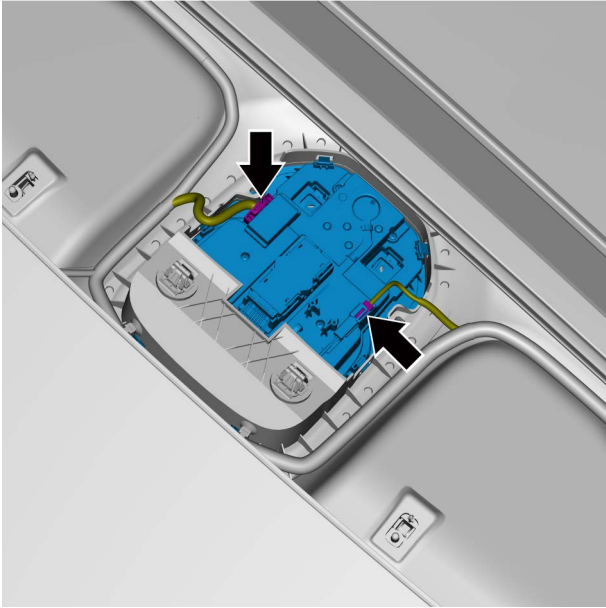
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

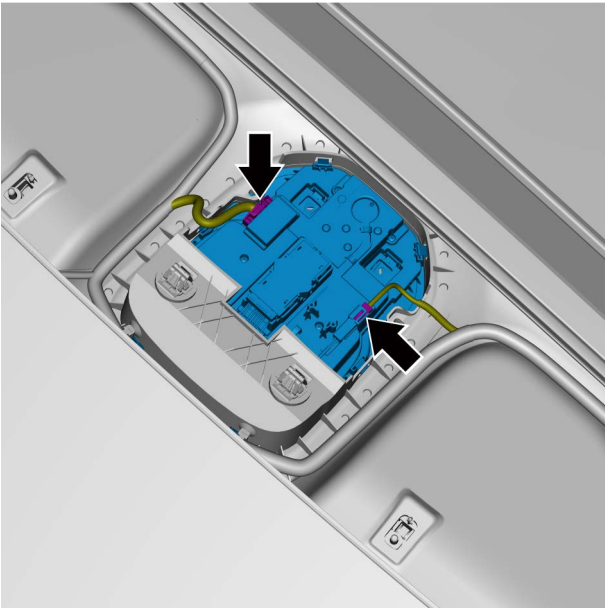
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the overhead console unit by slowly prying up the edges with a plastic prying plate and then remove it.





- 3 Disconnect the 2 harness connectors of overhead console unit.
- 4 Remove the overhead console unit.

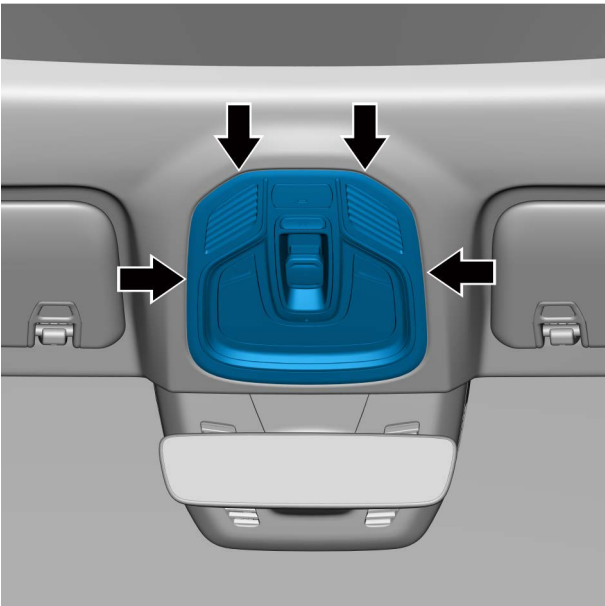
Installation Procedure



- 1 Connect the 2 harness connectors of overhead console unit.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 2 Install the overhead console unit.

- 3 Connect the negative cable of battery.

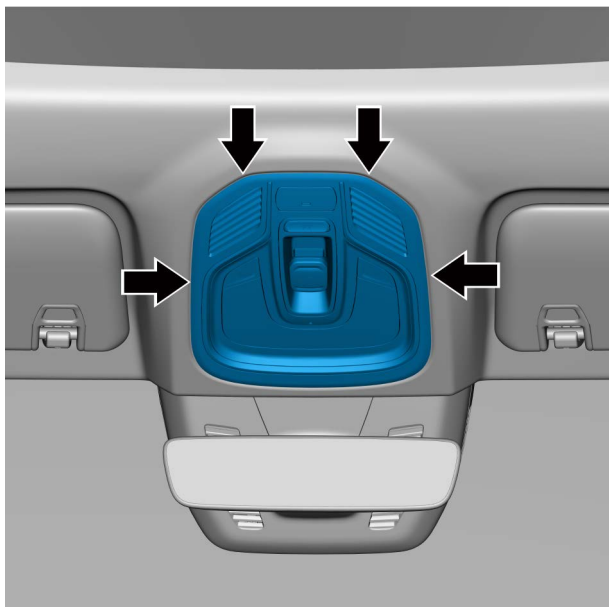
12.3.6.8 Replacement of overhead console unit (type II)

Removal Procedure

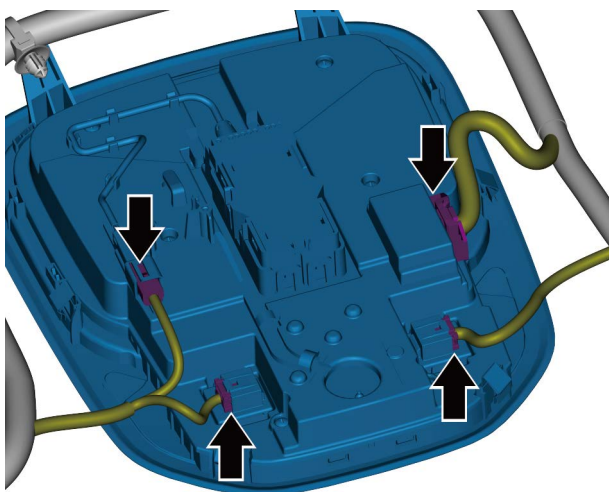
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

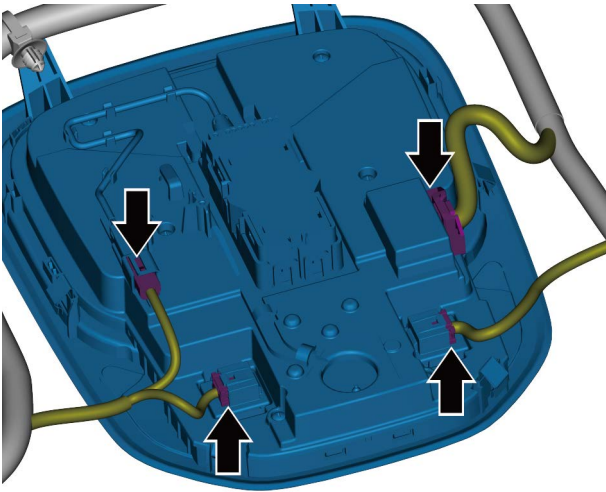


- 2 Remove the overhead console unit by slowly prying up the edges with a plastic prying plate and then remove it.



- 3 Disconnect the 4 harness connectors of overhead console unit, and remove the overhead console unit.

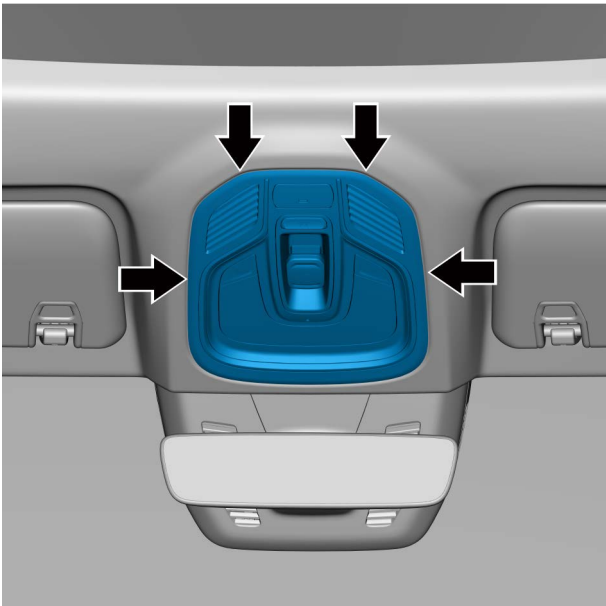
Installation Procedure



- 1 Connect the 4 harness connectors of overhead console unit.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 2 Install the overhead console unit.

- 3 Connect the negative cable of battery.

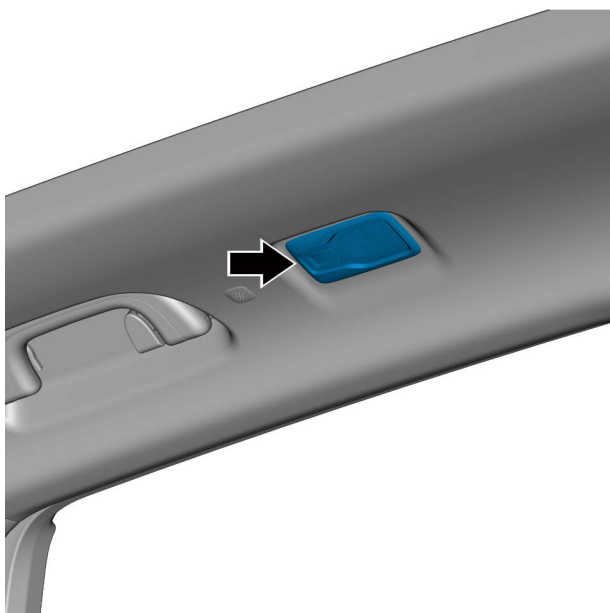
12.3.6.9 Replacement of rear overhead console (rear interior light)

Removal Procedure

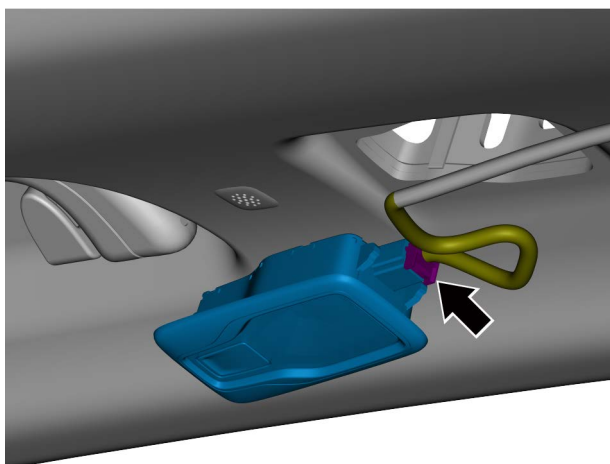
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

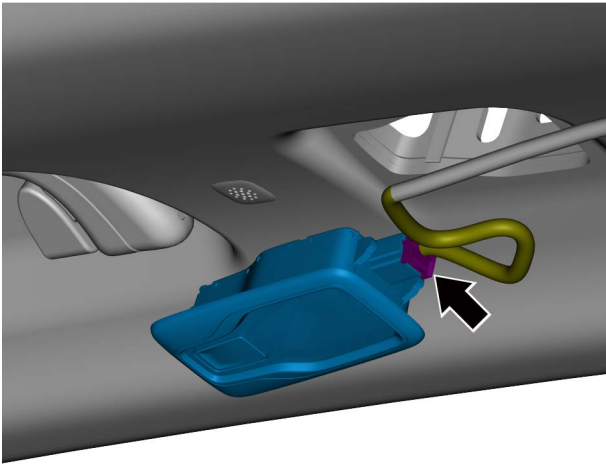


- 2 Remove rear overhead console (rear interior light) with the plastic prying plate.



- 3 Disconnect the harness connector of rear overhead console (rear interior light) and remove rear overhead console (rear interior light).

Installation Procedure



- 1 Connect the rear overhead console (rear interior light) harness connector.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 2 Snap rear overhead console (rear interior light) into its mounting position and ensure that it is in place.

- 3 Connect the negative cable of battery.

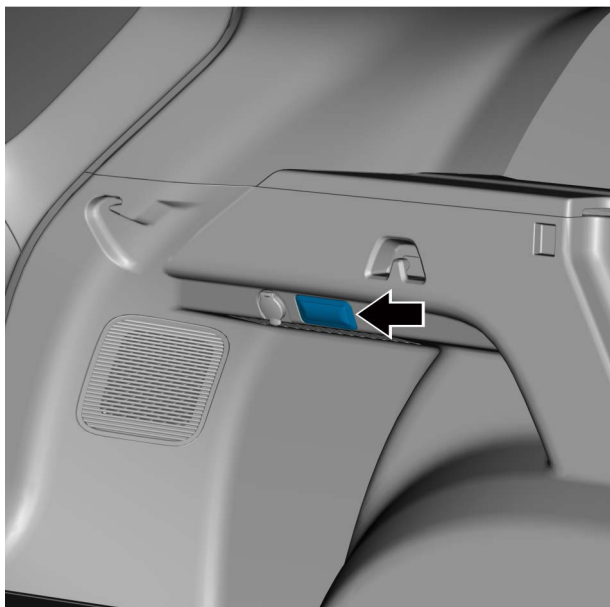
12.3.6.10 Replacement of luggage compartment light

Removal Procedure

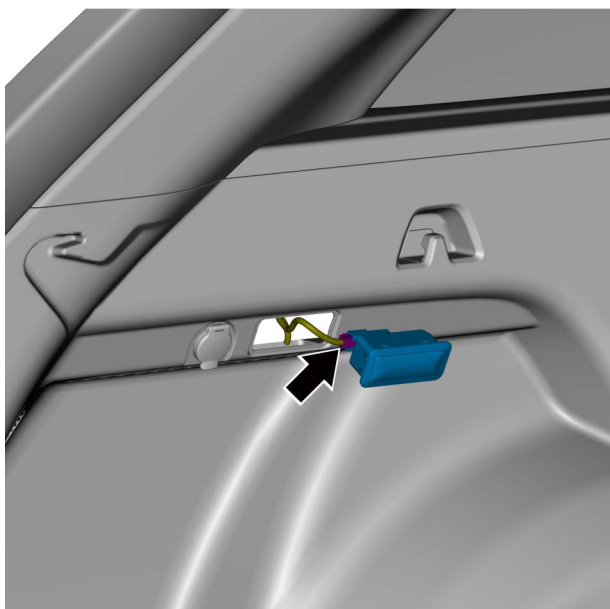
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

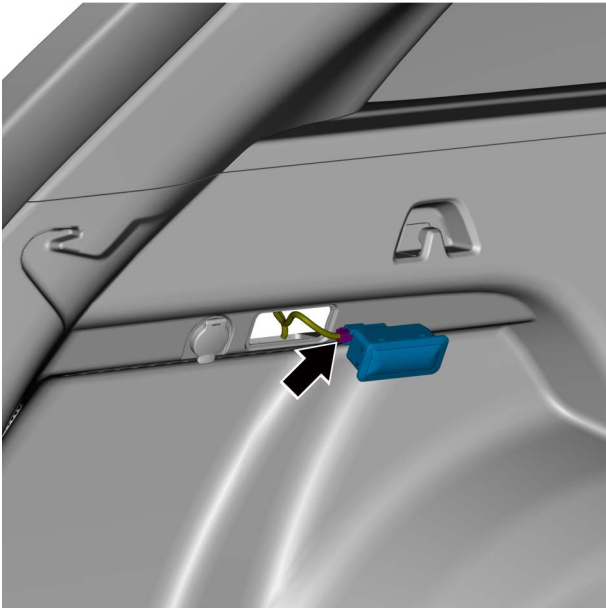


- 2 Remove the luggage compartment light with the plastic prying plate.



- 3 Disconnect the luggage compartment light harness connector and remove the luggage compartment light.

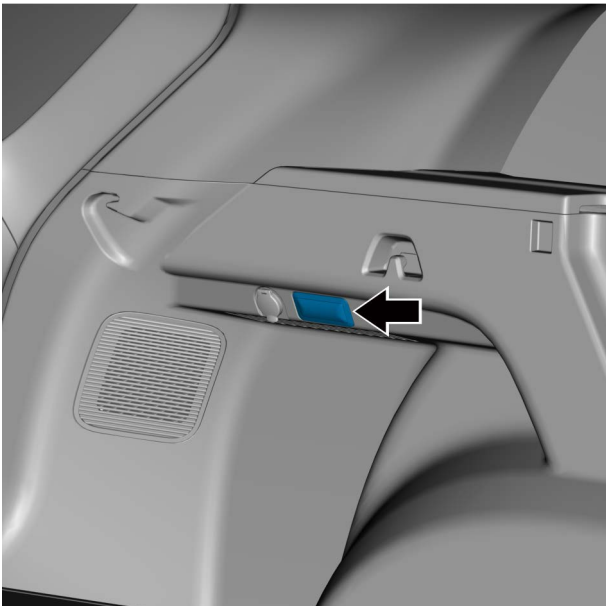
Installation Procedure



- 1 Connect the luggage compartment light harness connector.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 2 Install the boot lamp.

- 3 Connect the negative cable of battery.

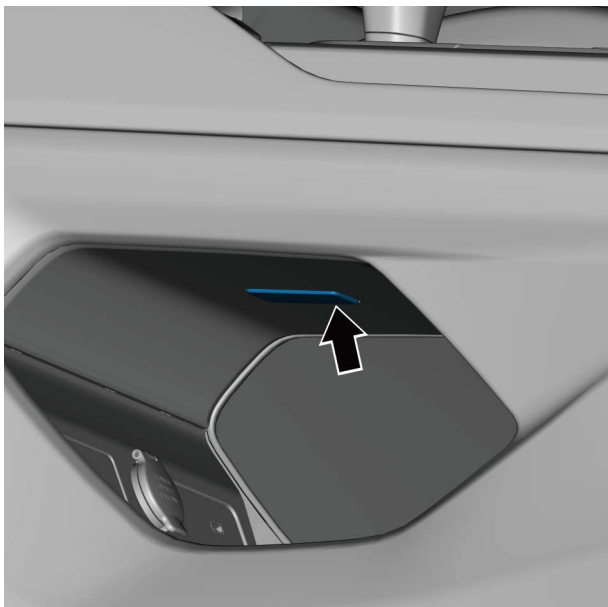
12.3.6.11 Replacement of floor console illumination

Removal Procedure

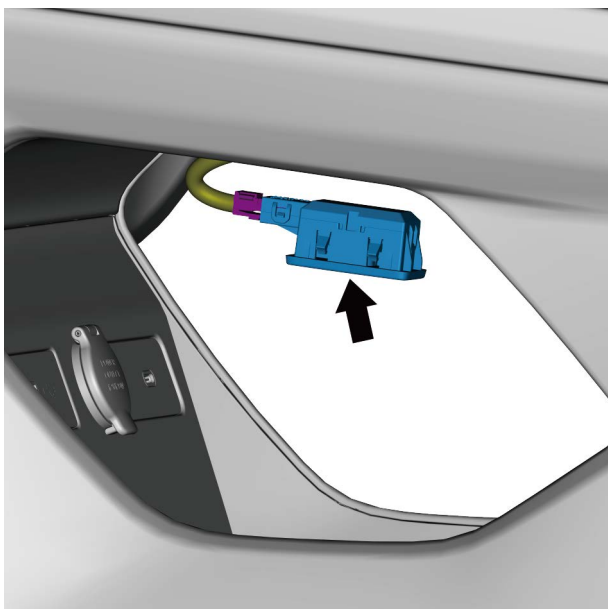
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

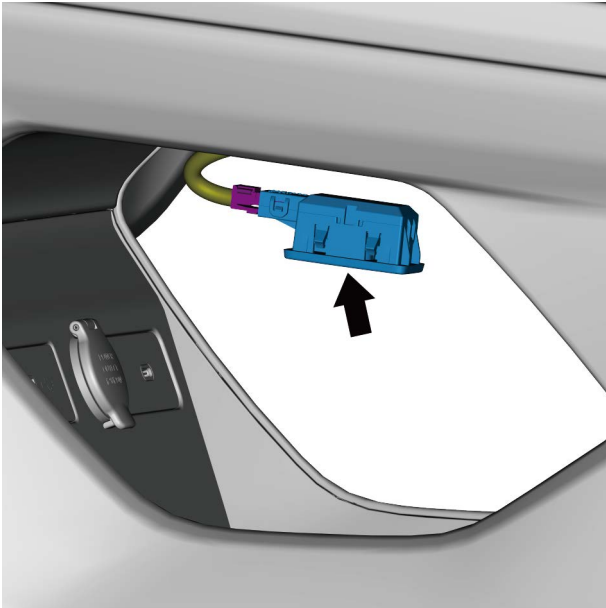


2 Remove the floor console illumination.



3 Disconnect the floor console illumination harness connector and remove the floor console illumination.

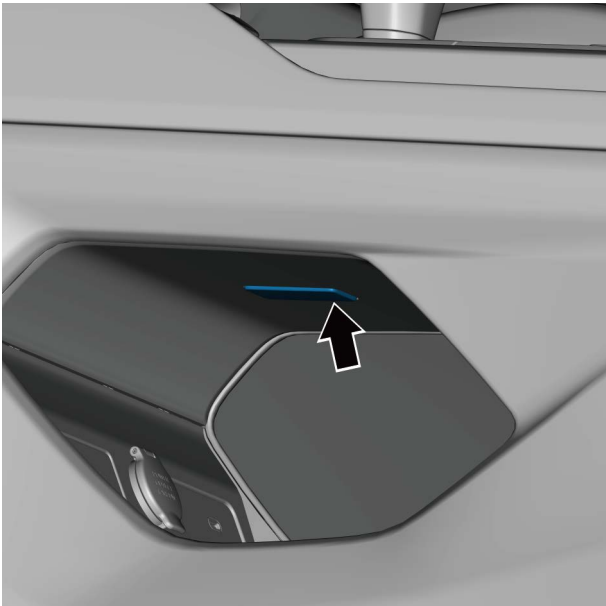
Installation Procedure



- 1 Connect the floor console illumination harness connector.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 2 Install the floor console illumination.

- 3 Connect the negative cable of battery.

12.3.6.12 Replacement of left front door ambient lamp

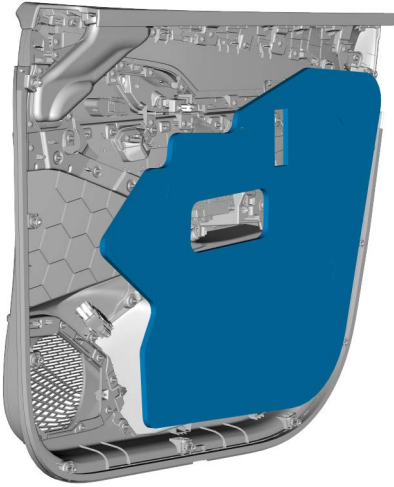
Removal Procedure

Warning !

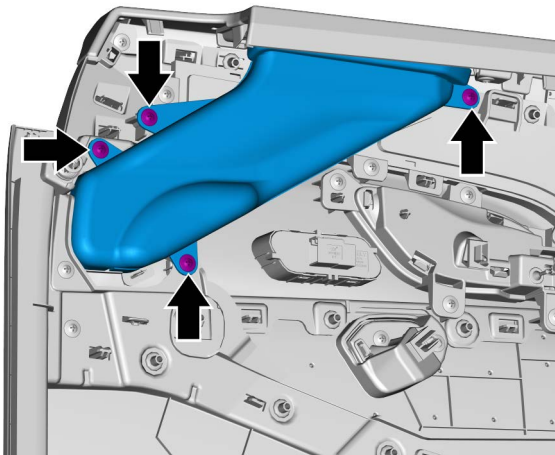
Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

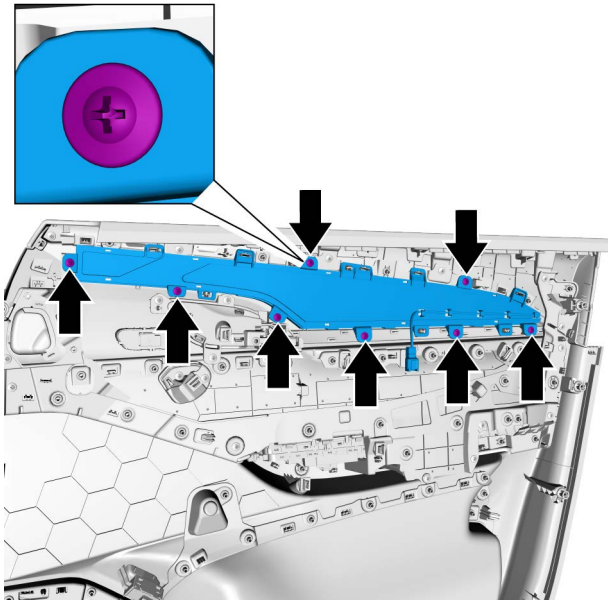
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left front door interior trim panel assembly, refer to [Replacement of left front door interior trim panel assembly](#).

- 3 Remove the left front door sound insulation cotton.



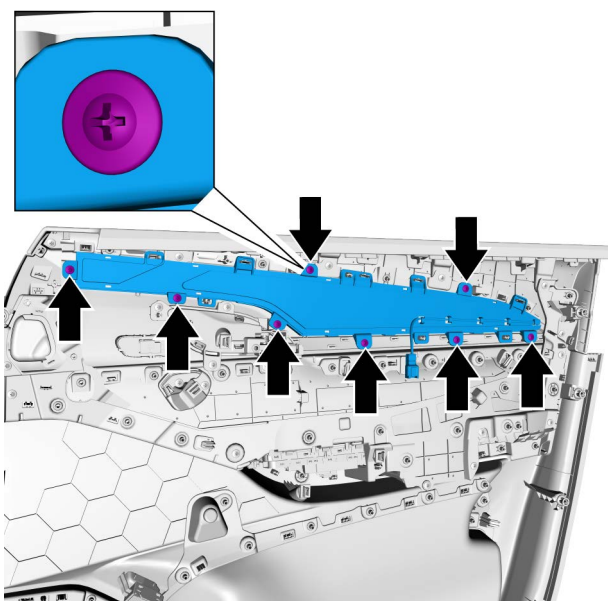
- 4 Remove the 4 fixing screws of the left front door side defroster duct assembly.





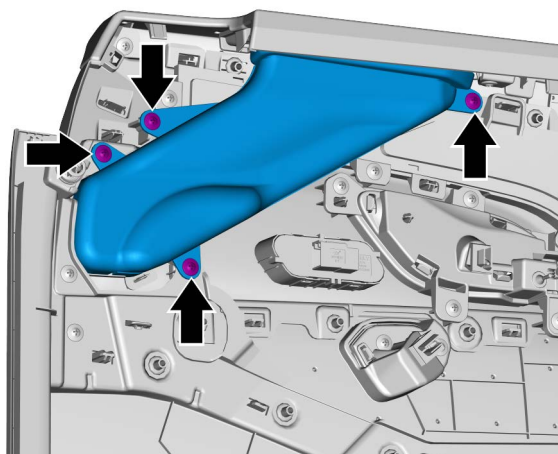
- 5 Remove the 8 fixing screws of left front door ambient lamp and remove the left front door ambient lamp.

Installation Procedure

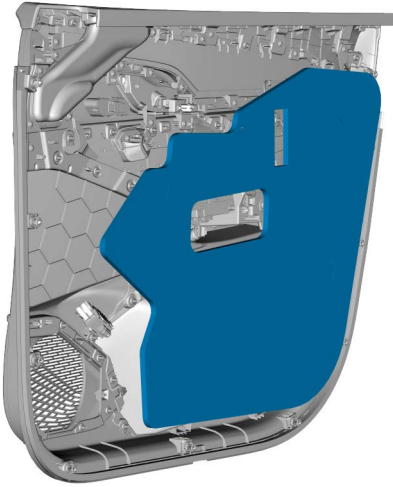


- 1 Install the 8 fixing screws of left front door ambient lamp.
Torque: 2N·m

- 2 Install the 4 fixing screws of the left front door side defroster duct assembly.
Torque: 2N·m



- 3 Install the left front door sound insulation cotton.



- 4 Install the assembly-interior trim panel left front door.
- 5 Connect the negative cable of battery.

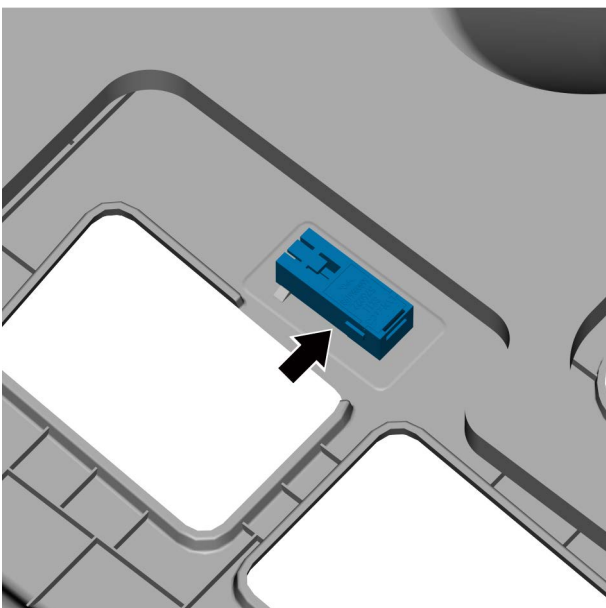
12.3.6.13 Replacement of footwell illumination lamp

Removal Procedure

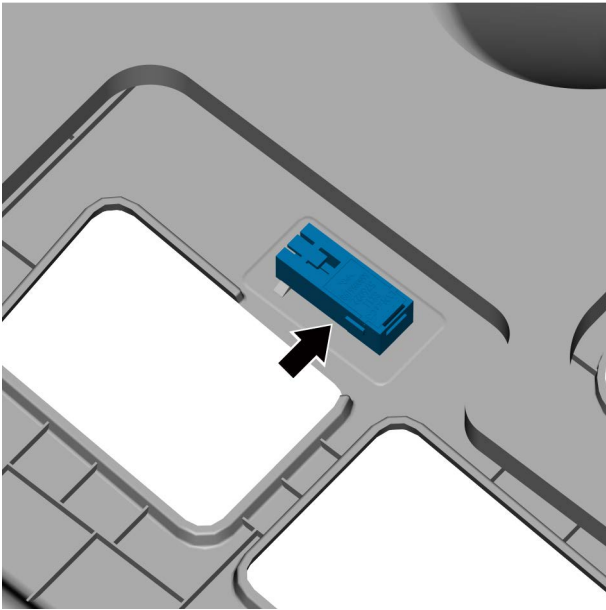
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left lower toe board assembly, refer to [Replacement of left lower toe board assembly](#).
- 3 Remove the footwell illumination lamp.



Installation Procedure



- 1 Install the footwell illumination lamp.

- 2 Install the left lower toe board assembly.
- 3 Connect the negative cable of battery.

12.3.6.14 Replacement of hazard warning lamp switch

Refer to [Replacement of center console module](#).

12.3.6.15 Replacement of instrument panel switch unit

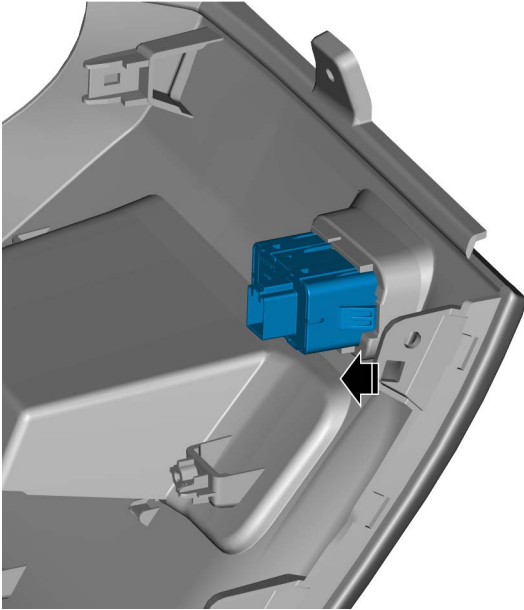
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

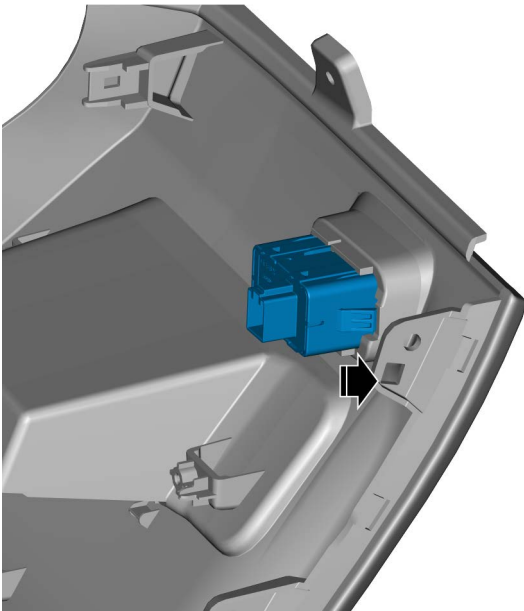
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

- 2 Remove the instrument panel left lower shield assembly, refer to [Replacement of instrument panel left lower shield assembly](#).
- 3 Remove the instrument panel switch unit.



Installation Procedure

- 1 Install the instrument panel switch unit.



- 2 Install the left lower shield assembly of the instrument panel.
- 3 Connect the negative cable of battery.

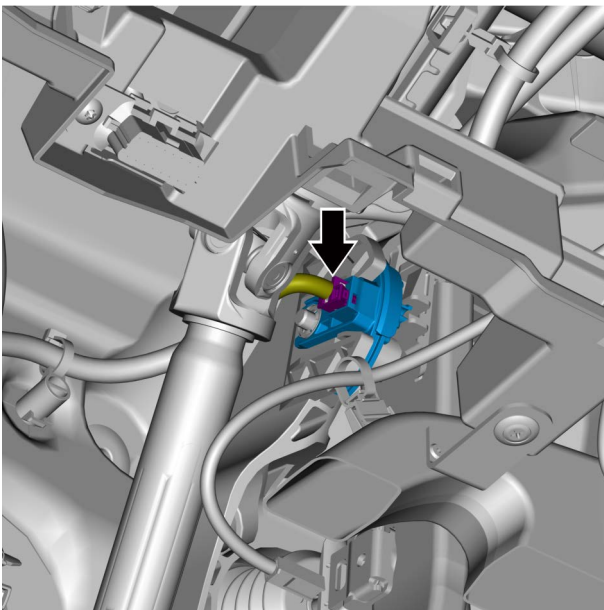
12.3.6.16 Replacement of brake light switch

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

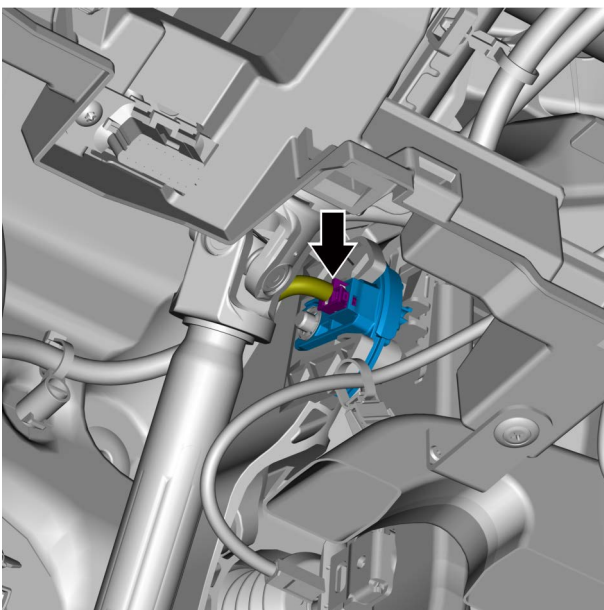
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left lower toe board assembly, refer to [Replacement of left lower toe board assembly](#).
- 3 Remove the instrument panel left lower shield assembly, refer to [Replacement of instrument panel left lower shield assembly](#).
- 4 Disconnect the brake light switch harness connector.
- 5 Remove the brake light switch.

**Installation Procedure**

- 1 Install the brake light switch.
- 2 Connect the brake light switch harness connector.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 3 Install the left lower shield assembly of the instrument panel.
- 4 Install the left lower toe board assembly.
- 5 Connect the negative cable of battery.
- 6 Label the brake light switch with "0".

12.3.6.17 Replacement of steering wheel module

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the steering wheel assembly, refer to [Replacement of steering wheel assembly](#).

Caution

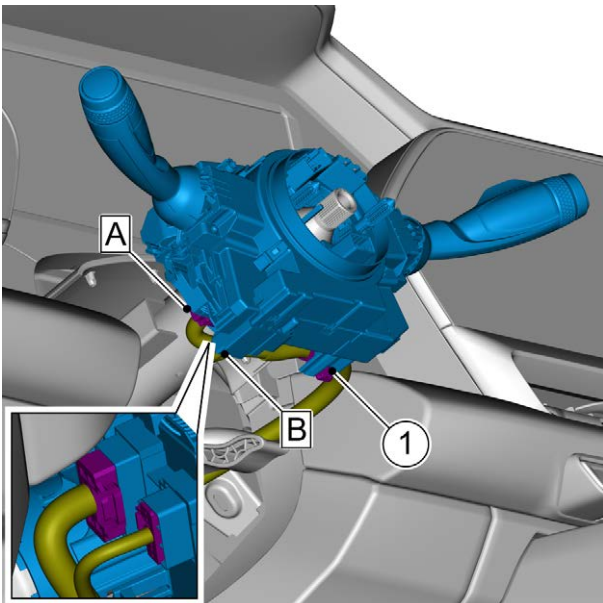
Ensure that the front wheels are back in place before removal, otherwise the clock spring internal cable may be damaged and steering wheel angle sensor angle output may be incorrect.

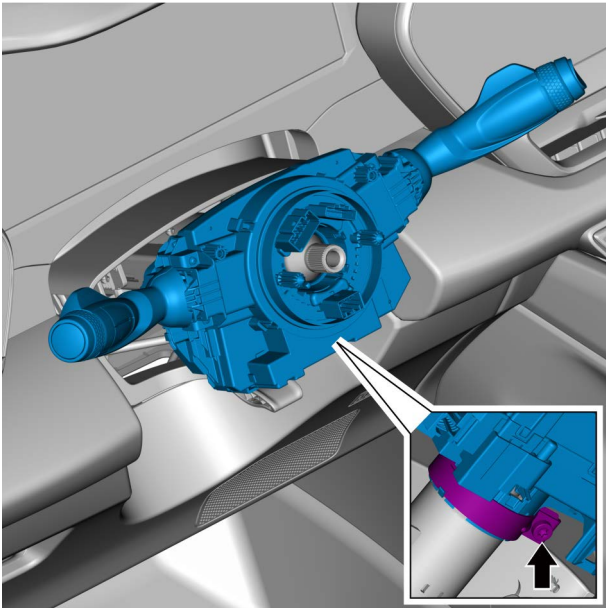
- 3 Remove the steering column lower cowl, refer to [Replacement of steering column lower cowl](#).
- 4 Disconnect steering wheel module harness connectors A and B, and disengage harness clip 1.

Caution

The steering wheel module and steering column need to be fixing to the inner ring of the clock spring with straps before splitting to avoid rotation after removal.

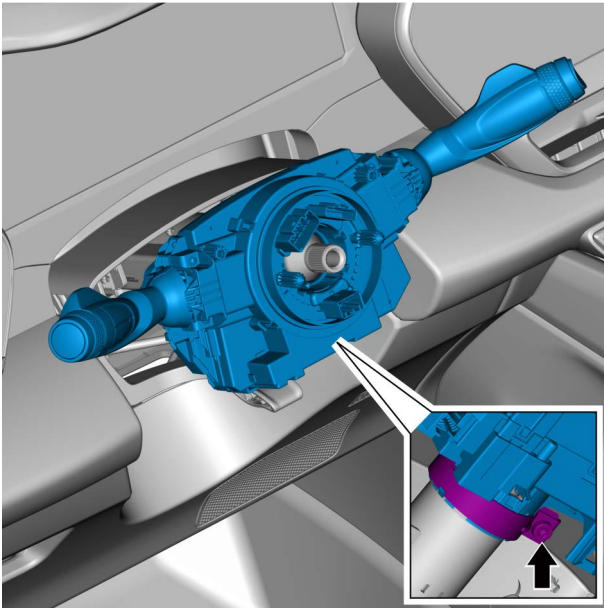
When removal is complete, make sure that clock spring cannot be rotated and that clock spring has several vertical stripes on the cable inside the clear viewing window.



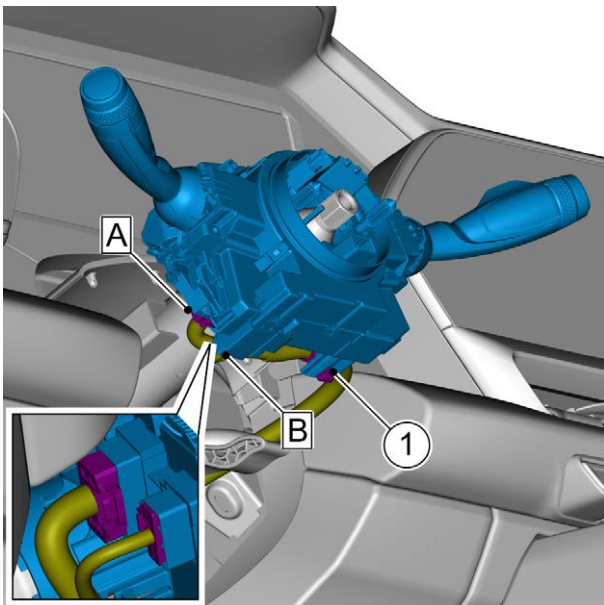


- 5 Loosen the steering wheel module clamp fixing bolt.
- 6 Disengage the steering wheel module clamp and remove the steering wheel module.

Installation Procedure



- 1 Install the steering wheel module clamp fixing bolt.
Torque: 6N·m



- 2 Connect the steering wheel module harness connectors A and B, and install the harness clip 1.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 3 Install the lower cowl of the steering column.
- 4 Install the steering wheel assembly.
- 5 Connect the negative cable of battery.
- 6 The GLDS diagnostic program is required, under the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software brushing operation.

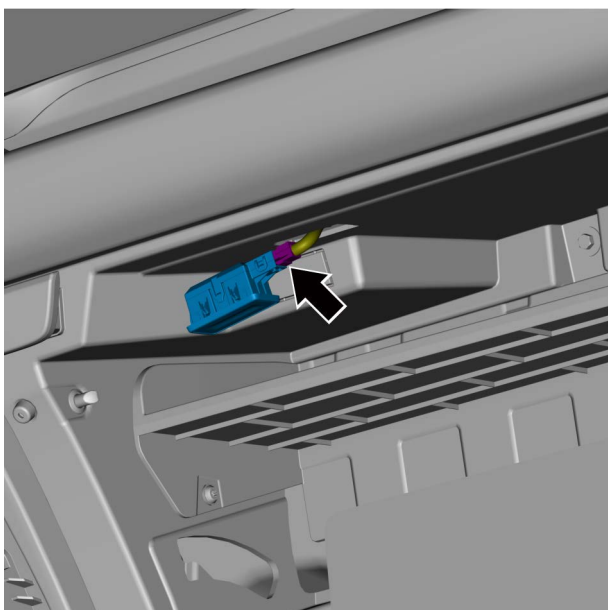
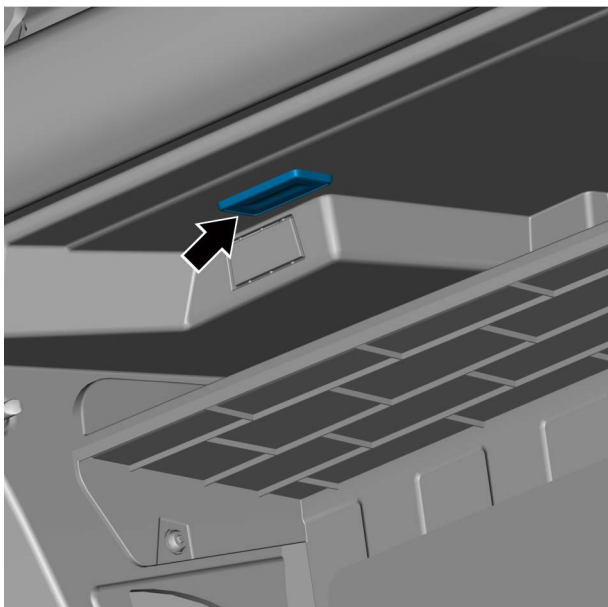
12.3.6.18 Replacement of glovebox illumination lamp

Removal Procedure

Warning !

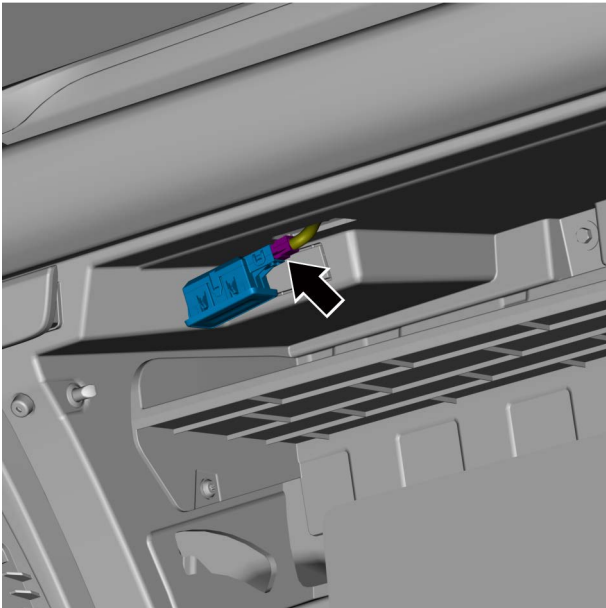
Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the glovebox illumination lamp.



- 3 Disconnect the glovebox illumination lamp harness connector and remove the glovebox illumination lamp.

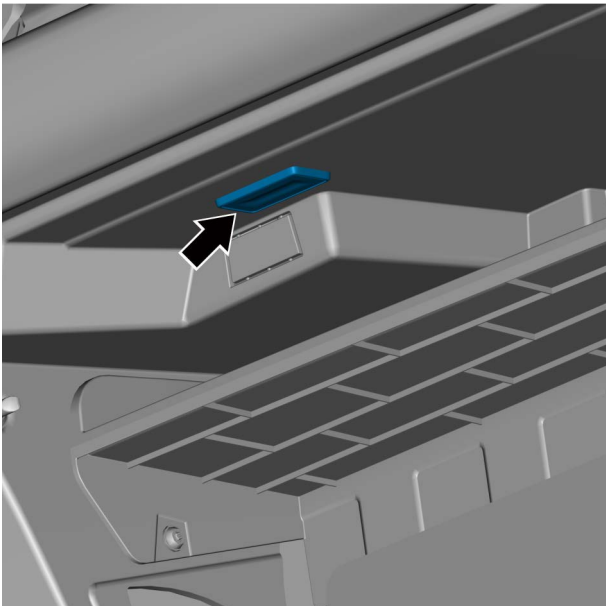
Installation Procedure



- 1 Connect the glovebox illumination lamp harness connector.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 2 Install the glovebox illumination lamp.

- 3 Connect the negative cable of battery.

12.3.6.19 Replacement of left front grille lamp

Removal Procedure

Warning !

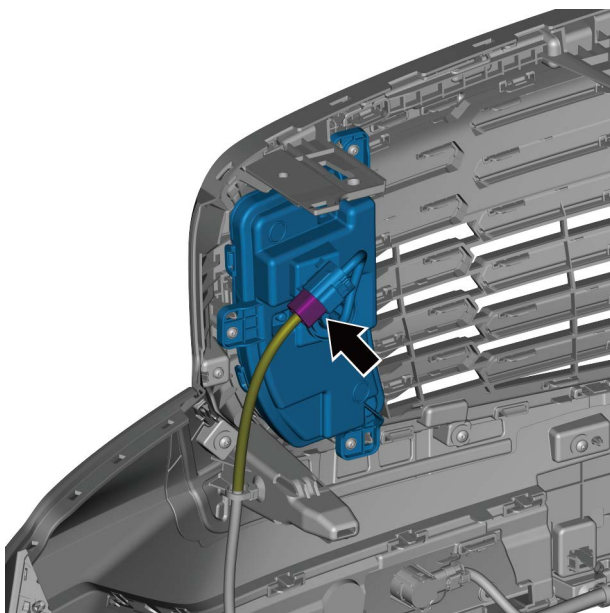
Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

Caution

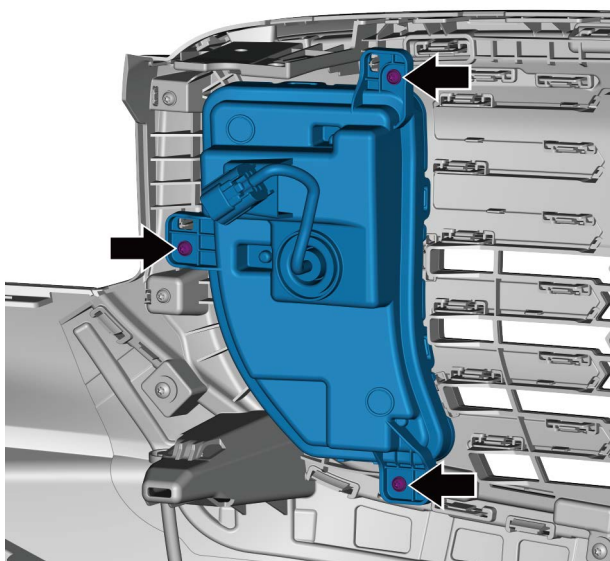
The left upper front grille lamp and right front grille lamp are removed and installed in a similar way.

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

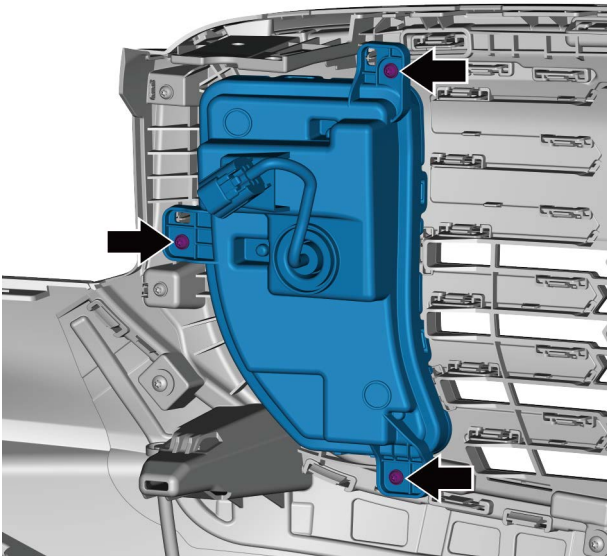
- 2 Remove the front bumper assembly, refer to [Replacement of front bumper assembly](#).
- 3 Disconnect the left front grille lamp harness connector.



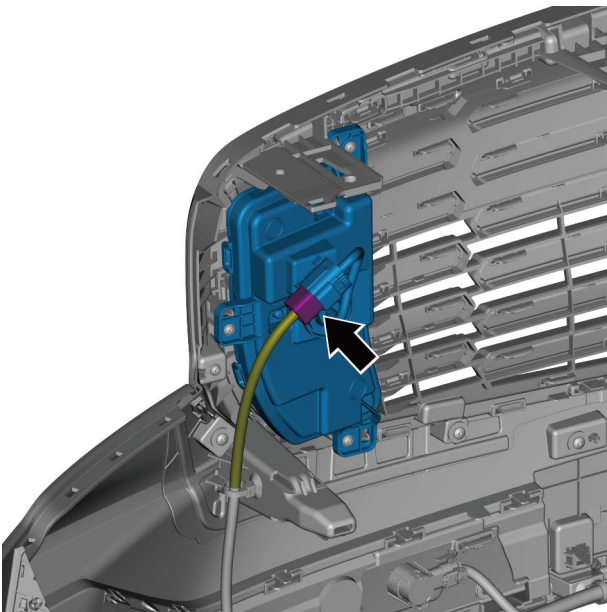
- 4 Remove the 3 fixing screws of left front grille lamp and remove the left front grille lamp.



Installation Procedure



- 1 Install the 3 fixing screws of left front grille lamp.
Torque: 1.5N·m



- 2 Connect the left front grille lamp harness connector.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 3 Install the front bumper assembly.
- 4 Connect the negative cable of battery.

12.4 Glass/ window/ rearview mirror

12.4.1 Specification

12.4.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Left rear outer triangle window fixing bolt	M6×10	8.5-11.5
Left rear outer body side triangle window fixing nut	M5×6.8	5-7
Power window motor fixing bolt	M6	8.5-11.5
Left rear door glass rear guide rail assembly fixing bolt	M6×12	8.5-11.5
Exterior rearview mirror (left) fixing nut	M6	8.5-11.5
Driver door module fixing bolt	M5×16	2.2-2.8
Left rear door module fixing bolt	M5×16	2.2-2.8

12.4.2 Instructions and operations

12.4.2.1 Instructions and operations

Instruction and operation of door window regulator

Caution

Never leave children, incapacitated adults or pets in a vehicle with the windows closed and locked. Otherwise, personal injury or death may occur due to high temperature or failure to open the windows.

Do not test the anti-pinch function with your body as this may cause personal injury or death. When the window is closing and distance between the top of the window and the window frame is less than 4 mm, the anti-pinch function may not work.

1. Manual operation

Open: press the window switch downward to the manual down position (first gear) and hold it to open the window.

Close: pull up the window switch to the manual up position (first gear) and hold it to close the window.

During the manual opening or closing of the windows, if the window switch is released, the windows will stop moving.

2. Automatic operation

Open: press the window switch downward to the auto down gear (second gear), then release the switch, the window will open automatically.

Close: pull up the window switch to the auto up position (second gear), then release the switch, and the window will close automatically.

If the window switch is pressed or pulled up again while the window is in the automatic opening or closing process, the window will stop moving.

3. Window locking switch

The window locking switch is located on the driver side door behind the window switch.

Pressing the switch disables the opening and closing operation of the rear windows. When the locking function is enabled, the window locking switch indicator lights up and the rear windows can still be opened or closed by the driver side window switch.

To resume the opening and closing operation of the rear windows, press the window locking switch again to unlock the windows, the window locking switch indicator goes out and the locking function is turned off.

4. Power window thermal protection

If the windows are operated repeatedly within a short period of time, the power window control switch may be disabled to protect the motor. Wait for a short period of time and then resume power window operation.

Caution

There is a long wait time for automatic recovery, so if you need to operate the windows immediately, restart the vehicle by disconnecting the power and then operate the power windows again.

5. Anti-pinch function

During the automatic closing operation, if an obstruction in the anti-pinch zone is detected, the window will automatically stop and return to the initial state. If the window is under violent impact, this function may work even if no object is caught. If the anti-pinch function of the power windows does not work correctly, conduct power windows self-learning.

Caution

Moments before the window is fully closed (the top of the glass is less than 4 mm from the window frame), the anti-pinch function may not work if an object is stuck.

Do not attempt to activate the anti-pinch function by intentionally jamming the window with any part of your body, as this could result in serious injury or even death.

6. Anti-pinch power window self-learning

During the automatic closing operation, if an obstruction in the anti-pinch zone is detected, the window will automatically stop and return to the initial state. If the window is under violent impact, this function may work even if no object is caught. If the anti-pinch function of the power windows does not work correctly, conduct power windows self-learning.

No window position self-learning

At this time, the window has no automatic closing function and can be closed manually or opened automatically/manually.

The self-learning method is as follows:

- Pull up the window switch until the window is completely closed, continuously pull up the window switch and hold it for 3 seconds and then release it, at this time the

power window will have automatic closing and anti-pinch function.

No window initialization data self-learning

At this time, the window has no automatic closing function and can be closed manually or opened automatically/manually.

The self-learning method is as follows:

- Pull up the window switch until the window is completely closed, continuously pull up the window switch and hold it for 3 seconds and then release it;
- Press the window switch downward until the window is fully open, continuously press the window switch and hold it for 3 seconds and then release it;
- Pull up the window switch until the window is completely closed, continuously pull up the window switch and hold it for 3 seconds and then release it, at this time the power window will relearn the window initialization data and have automatic closing and anti-pinch function.

Window position upward offset self-learning

At this time, the window cannot close automatically to the fully closed position (when the window runs to the fully closed state, the anti-pinch function will be triggered and the window will open again).

The self-learning method is as follows:

- Pull up the window switch until the window is completely closed, and release the switch after the anti-pinch function is triggered and the window opens again. Within 5 seconds, pull up the window switch until the window is completely closed, and release the switch after the anti-pinch function is triggered and the window opens again;
- Pull up the window switch within 5 seconds until the window is completely closed, continuously pull up the window switch and hold it for 3 seconds and then release it, at this time the power window will have automatic closing and anti-pinch function.

If the power windows still do not work properly after the above operations, have them serviced at a Geely service station.

7. Delay operation function

None of the doors are open, and operation of the window can be maintained via the window switch within 120 seconds after the start switch is turned off.

8. Smart key remotely opens/closes windows

When start switch is turned off and the gas filler cap, sunroof, trunk door, engine hood and all four doors are closed, press and hold the unlock button on the smart key, all four windows will open at the same time; press and hold the lock

button on the smart key, all four windows will close at the same time.

9. Automatic window closing in rainy weather (if equipped)

When the vehicle is turned off and locked and enters the defense state, the vehicle can automatically close the sunroof and power windows if it suddenly rains when the sunroof and power windows are open.

Caution

If the window/sunroof does not perform self-learning, the window cannot be closed automatically on rainy days.

Description and operation of exterior rearview mirror

The exterior rearview mirror is controlled by the power rearview mirror switch assembly on the driver side door trim panel. The switch is operated to select the rearview mirror to be adjusted. The rearview mirrors can be operated in four directions: up, down, left and right. Choose the most suitable position.

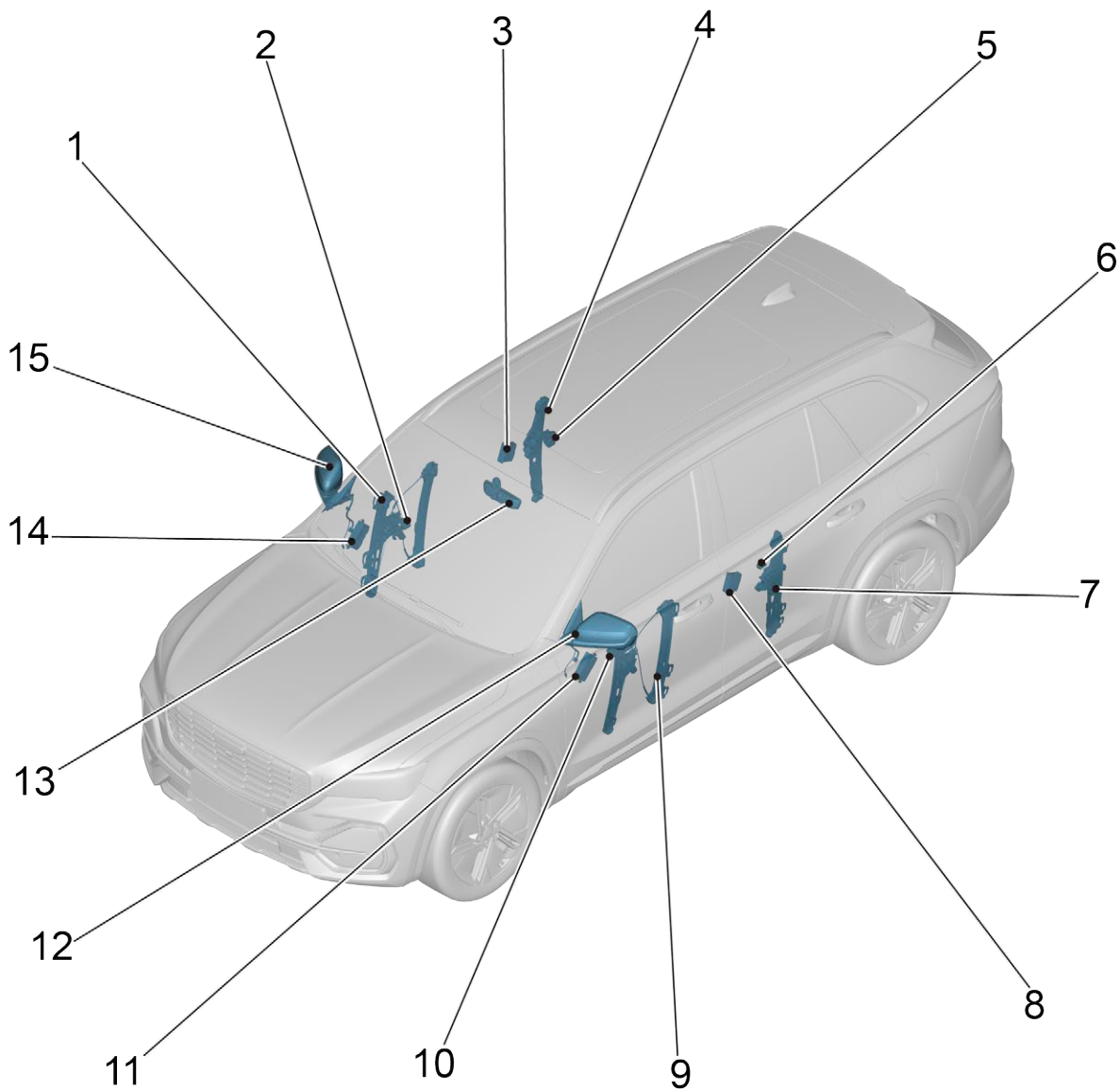
The exterior rearview mirror also has heating elements in the mirrored glass, and when the rear window defogger switch is pressed, the exterior rearview mirror heating elements will also operate.

Press the exterior rearview mirror/rear windshield defrost button on the center console switch module, the button indicator lights up, the exterior rearview mirror heating and rear windshield defrost turn on at the same time, and turn off automatically after 5-15 minutes. The time is related to the ambient temperature, the lower the outside ambient temperature, the longer the heating time.

For driving safety, exterior rearview mirror must not be adjusted while the vehicle is in motion; the vehicle must not be driven with the mirrors folded, and the driver and passenger side mirrors must be unfolded and correctly adjusted before driving.

12.4.3 Part position

12.4.3.1 Part position

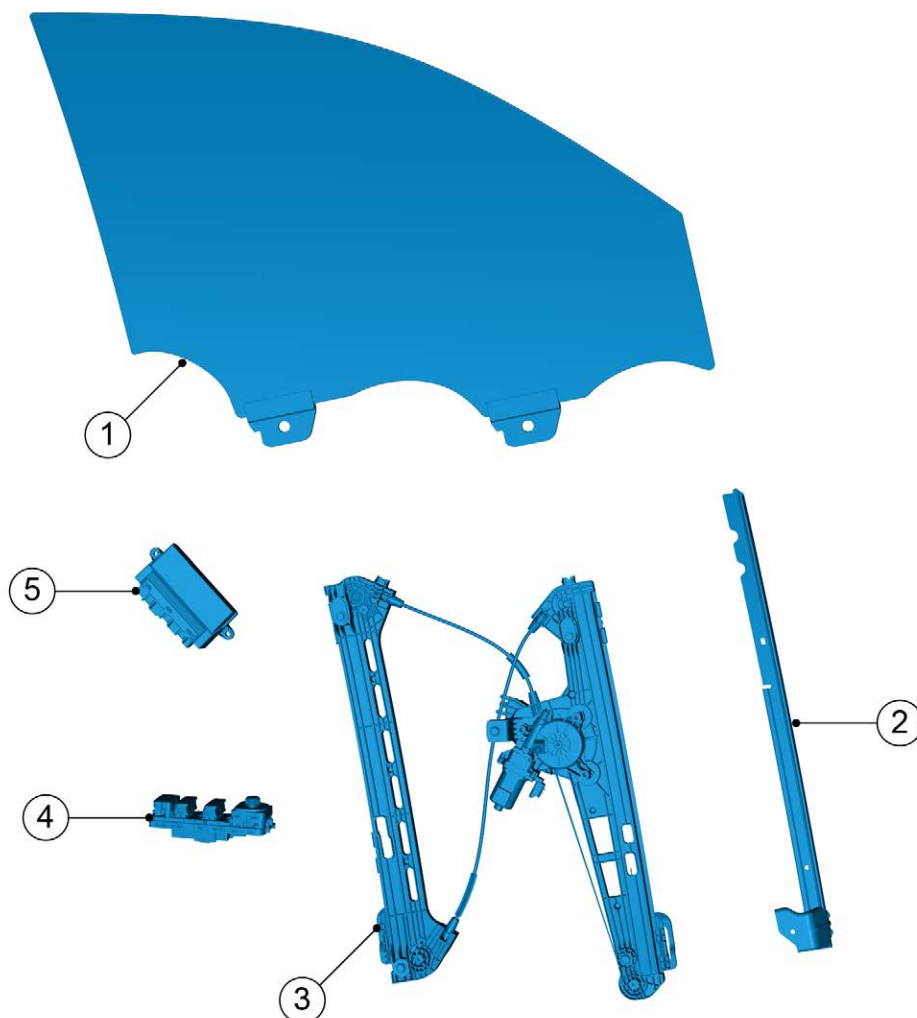


- | | | | |
|----|-------------------------------------|-----|---|
| 1. | Power window motor (right front) | 9. | Power window motor (left front) |
| 2. | Window control switch (right front) | 10. | Driver's Door Switch |
| 3. | Rear Right Door Module | 11. | Driver's Door Module |
| 4. | Power window motor (right rear) | 12. | Exterior rearview mirror (left) |
| 5. | Window control switch (right rear) | 13. | Mechanical dimming interior rearview mirror |
| 6. | Power window motor (left rear) | 14. | Passenger Door Module |
| 7. | Window control switch (left rear) | 15. | Exterior rearview mirror (right) |
| 8. | Rear Left Door Module | | |

12.4.4 Breakdown drawing

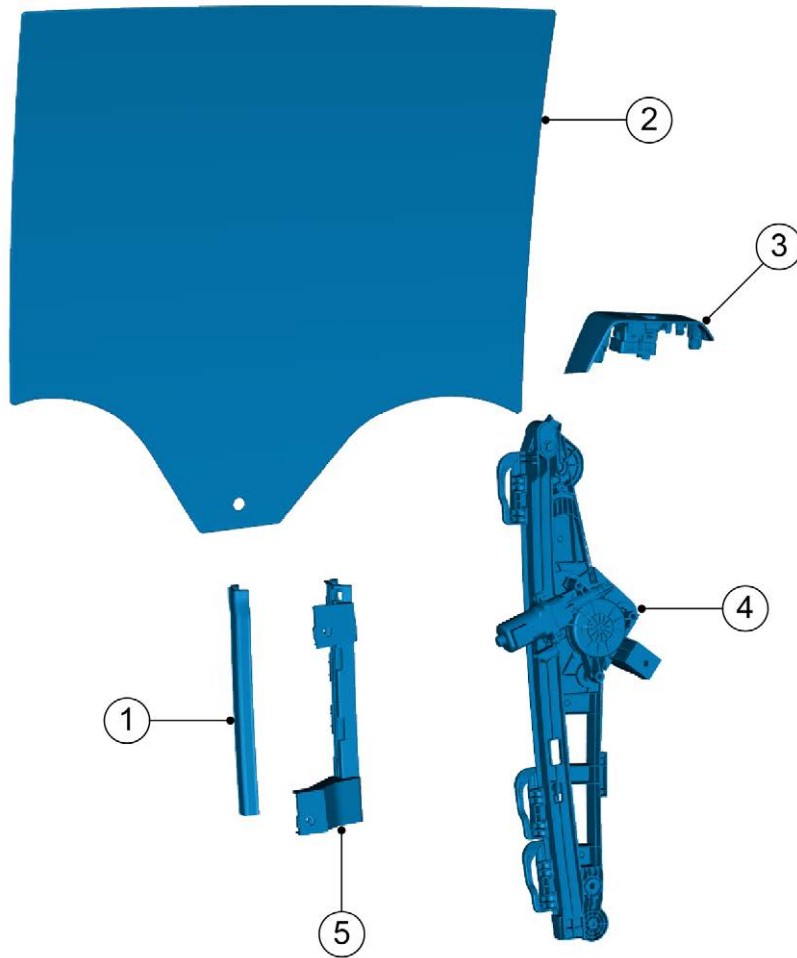
12.4.4.1 Breakdown drawing

Left front door



- | | | | |
|----|--|----|----------------------|
| 1. | Front door window assembly | 4. | Driver's Door Switch |
| 2. | Front door window rear guide rail assembly | 5. | Driver's Door Module |
| 3. | Power window motor (left front) | | |

Left rear door



- | | |
|--|---|
| 1. Rear door window guide rail sealing strip | 4. Power window motor |
| 2. Rear door window assembly | 5. Rear door window guide rail assembly |
| 3. Window control switch | |

12.4.5 Diagnostic information and procedure

12.4.5.1 Diagnosis description

See [Description and Operation](#) before diagnosing a malfunction in the glass/window/rearview mirror. Understanding and familiarizing yourself with the operation of the glass/window/rearview mirror before beginning system diagnosis will help determine the correct troubleshooting steps to take in the event of a malfunction, and more importantly this will help determine if the condition described by the customer is normal operation. Any troubleshooting of the glass/window/rearview mirror should start with a [Routine Check](#) that guides the repairer to the next logical step in the troubleshooting process. Understanding and using the diagnostic process correctly will reduce diagnostic time and avoid misdiagnosis of the fault area.

12.4.5.2 Visual check

- Check after-sales installations which may influence the operation of glass/window/rearview mirror. Make sure that these installations do not affect the operations of glass/window/rearview mirror.
- Check system components that are easily accessible or can be seen to find out if there is any obvious damage of the component or there is a situation that may cause a fault.
- Check the harness and harness connector to ensure that there is no sign of loosening, damage, poor contact, aging, etc.

12.4.6 Removal and Installation

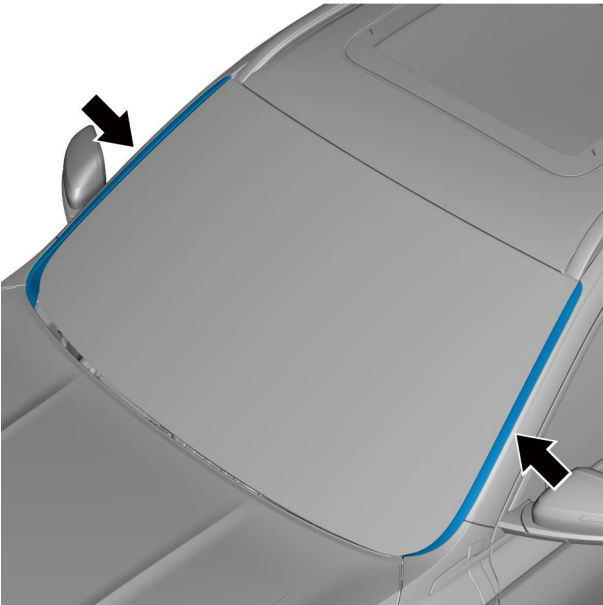
12.4.6.1 Replacement of front windshield assembly

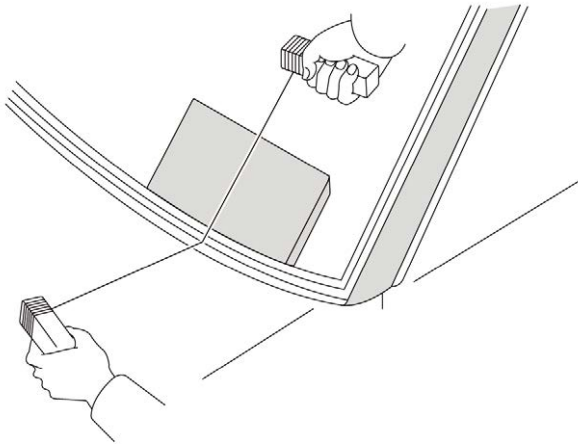
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the front wiper arm, refer to [Replacement of front wiper arm](#).
- 3 Remove the ventilation cover plate assembly, refer to [Replacement of ventilation cover plate assembly](#).
- 4 Remove the A-pillar upper trim panel assembly, refer to [Replacement of left A-pillar upper trim panel assembly](#).
- 5 Remove the mechanical inside dimming rearview mirror, refer to [Replacement of mechanical inside dimming rearview mirror](#).
- 6 Remove the forward looking camera, refer to [Replacement of forward looking camera](#).
- 7 Remove the rain and light sensor, refer to [Replacement of rain and light sensor](#).
- 8 Remove the front windshield glass trim strip on both sides and apply protective tape to the vehicle body and mounting locations of front windshield glass assembly.



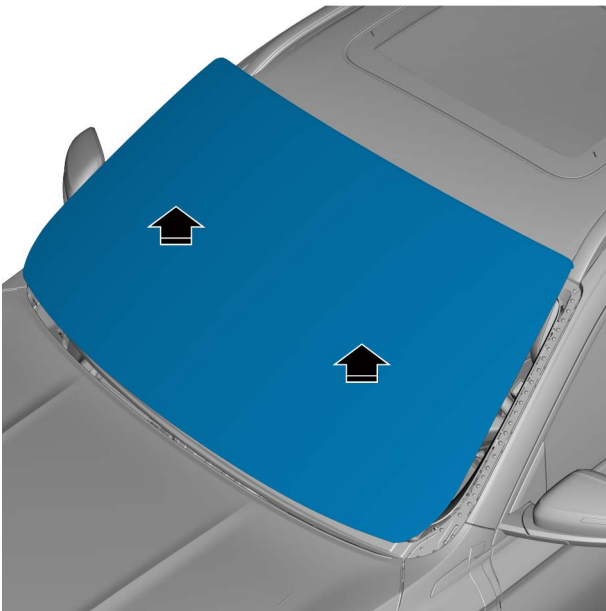


- 9 From inside the vehicle, pass the cutting wire through the seam between the vehicle body and the front windshield assembly, and tie a block or similar object to the ends of the cutting wire.

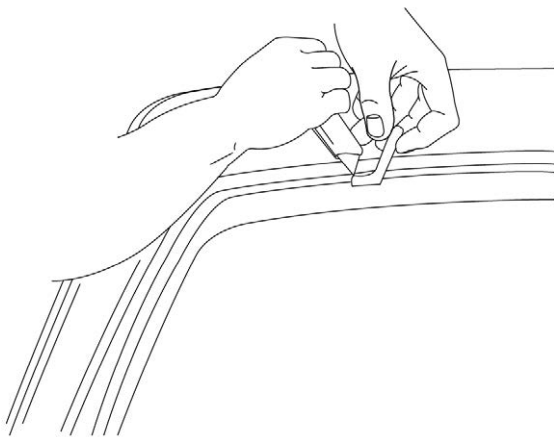
Caution

Tie a block or similar object to the ends of the cutting wire to prevent cutting your hands.

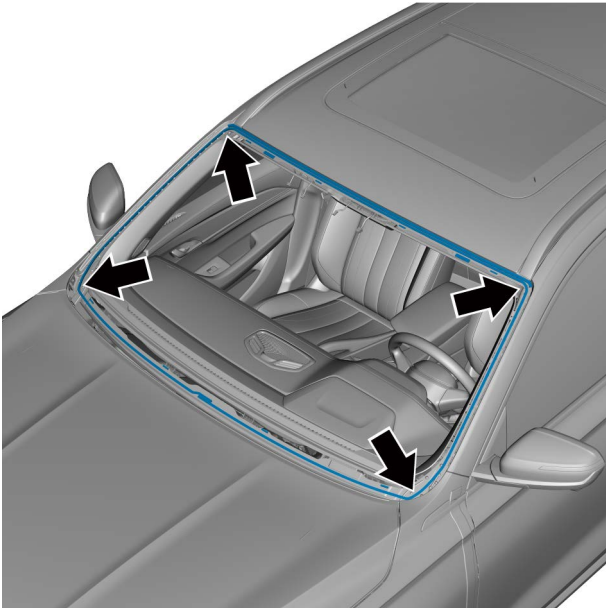
When separating the windshield from the vehicle, be careful not to damage the paint or interior or exterior trim pieces.



- 10 Remove the front windshield assembly.



- 11 Use a blade to clean the adhesives on the frame of front windshield assembly.

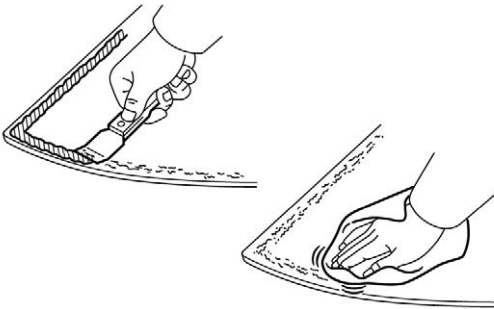


- 12 Use a blade to remove the adhesives from the vehicle frame.

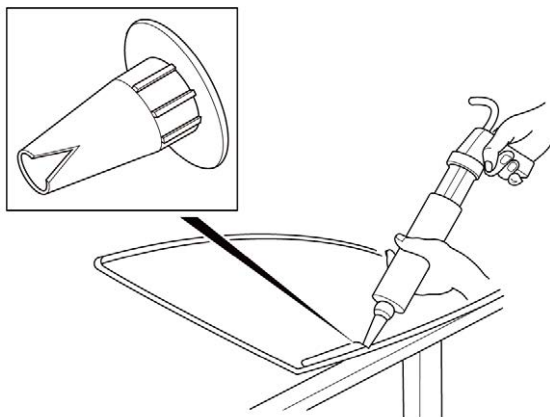
- 13 Clean the mating surfaces of the vehicle body and front windshield glass assembly with suitable cleaner.

Caution

Do not touch the mating surface between the vehicle body and the front windshield assembly after cleaning.



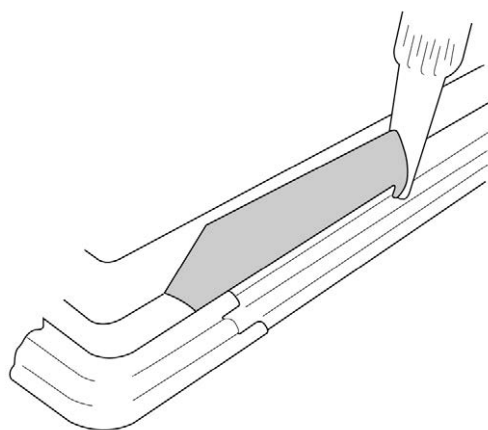
Installation Procedure



- 1 Place the front windshield assembly on the mounting table and cut the Geely special glass sealant applicator nozzle.

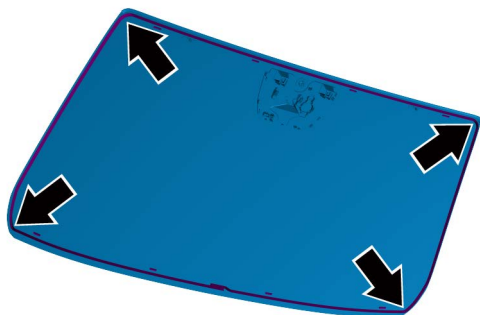
Caution

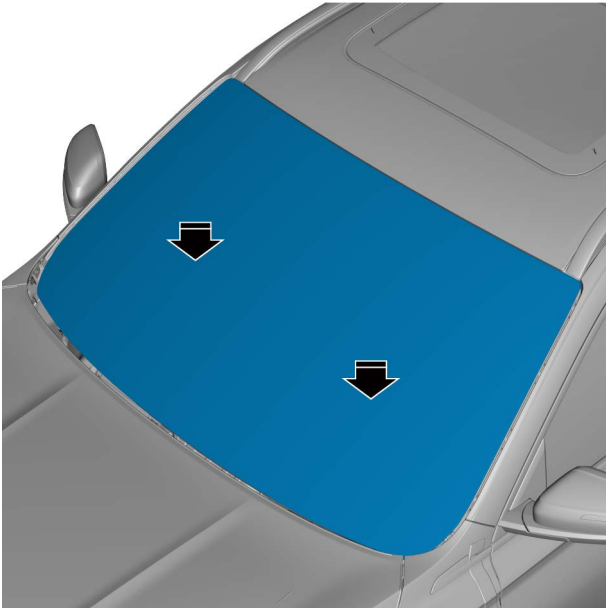
Avoid bumps and scratches during assembly.



- 2 Use the Geely special glass sealant applicator nozzle to make a sprayed glass adhesive flange edge up to 8mm (0.3in) wide and 8mm (0.3in) high.

- 3 Apply the glass sealant flange edge evenly and continuously with a cased filler gun, ensuring that the glass sealant is uniform in width.





- 4 Install the front windshield assembly and press in gently along the edge of the glass.

Caution

The installation process requires careful handling by at least two technicians.

- 5 Slightly press the outside surface of glass to ensure that it is solidly installed to the body.

Caution

Check that the front windshield assembly baffle plate is properly bonded to the body.

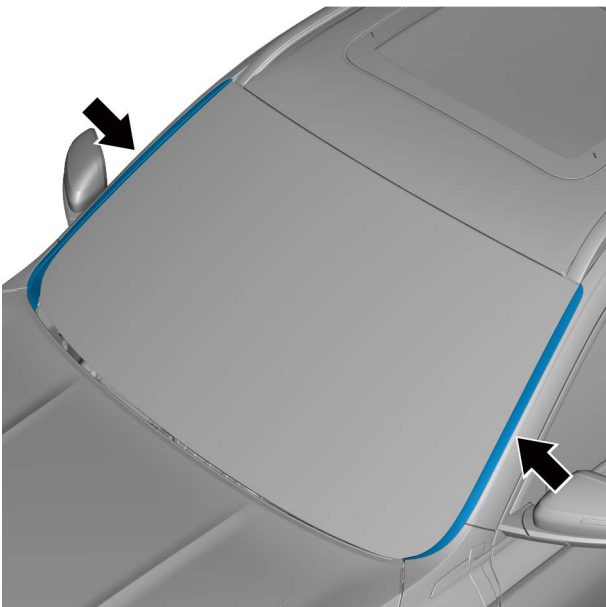
Check the clearance between the body and the front windshield assembly.

Press down the glass with a force of 98N (10 kgf, 22 lbf) or more.

- 6 Where necessary, use a scraper to correct the height or position of painted adhesives.
- 7 Fix the windshield with protective tape until the applied adhesive hardens.
- 8 After the adhesive hardens, sprinkle water from the outside of the vehicle and check whether water seeps into the compartment. If water leaks into the compartment, add adhesives after water is dried.
- 9 Remove protective tapes.
- 10 Install the front windshield trims on both sides.

Caution

Do not move the vehicle for six hours; do not wash the vehicle for three days; the special glass sealant will dry completely after two days of application, avoid potholes until the sealant is dry.



- 11 Install the rain and light sensor.
- 12 Install the forward looking camera.
- 13 Install the mechanical inside dimming rearview mirror.
- 14 Install the A-pillar upper trim panel assembly.

- 15 Install the ventilation cover plate assembly.
- 16 Install the front wiper arm and blade assembly.
- 17 Connect the negative cable of battery.

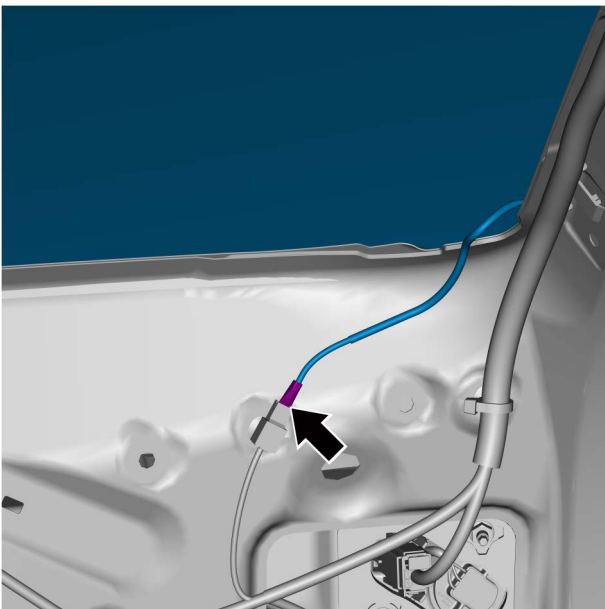
12.4.6.2 Replacement of rear windshield assembly

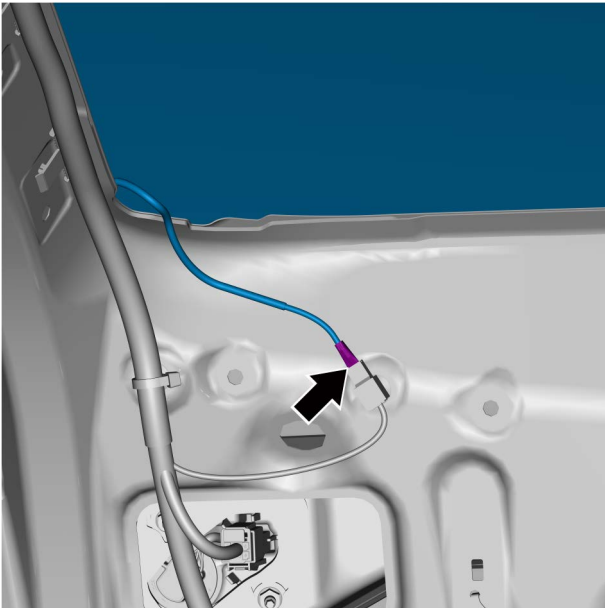
Removal Procedure

Warning !

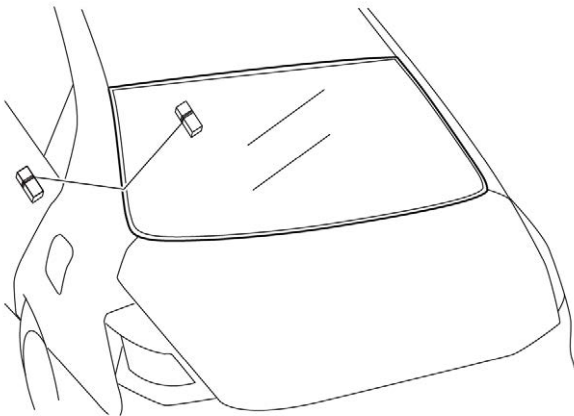
Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the rear wiper arm and blade assembly, refer to [Replacement of rear wiper arm and blade assembly](#).
- 3 Remove the trunk door lower interior trim panel assembly, refer to [Replacement of trunk door lower interior trim panel assembly](#).
- 4 Remove the rear wiper motor, refer to [Replacement of rear wiper motor](#).
- 5 Remove spoiler assembly, refer to [Replacement of spoiler assembly](#).
- 6 Disconnect the rear windshield assembly harness connector.





- 7 Disconnect the rear windshield assembly harness connector.

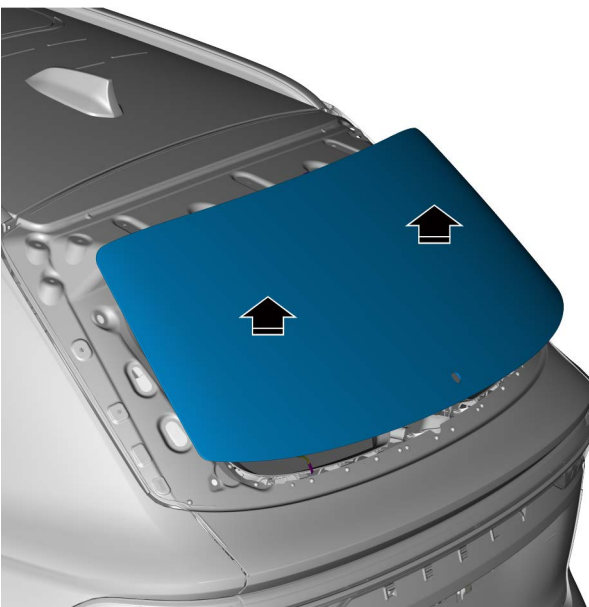


- 8 From inside the vehicle, pass the cutting wire through the seam between the vehicle body and the rear windshield assembly, and tie a block or similar object to the ends of the cutting wire.

Caution

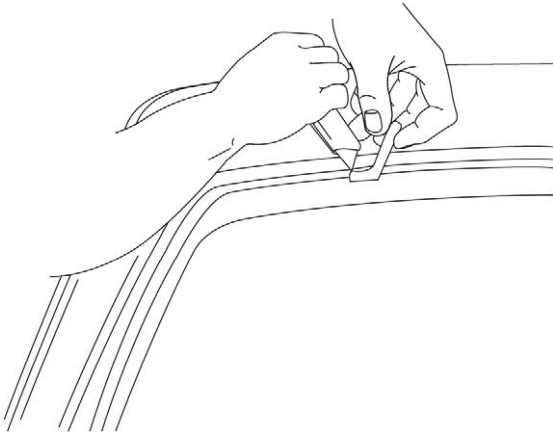
Tie a block or similar object to the ends of the cutting wire to prevent cutting your hands.

When separating the rear windshield assembly from the vehicle, be careful not to damage the body paint or interior or exterior trim pieces.

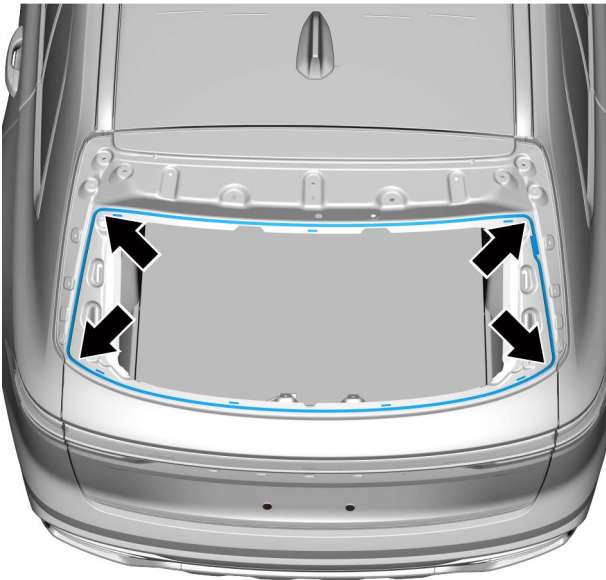


- 9 Remove the rear windshield assembly.

- 10 Use a blade to clean the adhesives on the frame of rear windshield.



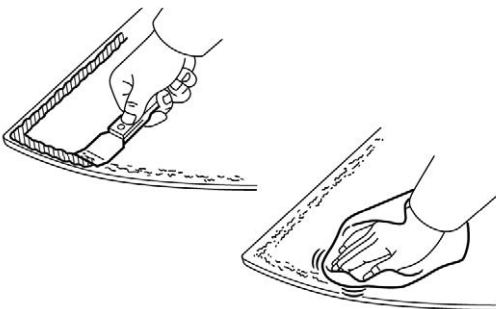
- 11 Use a blade to remove the adhesives from the vehicle frame.



- 12 Clean the mating surfaces of the vehicle body and rear windshield assembly with suitable cleaner.

Caution

Do not touch the mating surface between the vehicle body and the rear windshield assembly after cleaning.

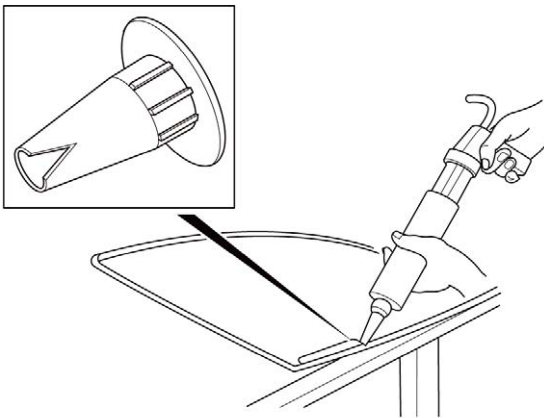


Installation Procedure

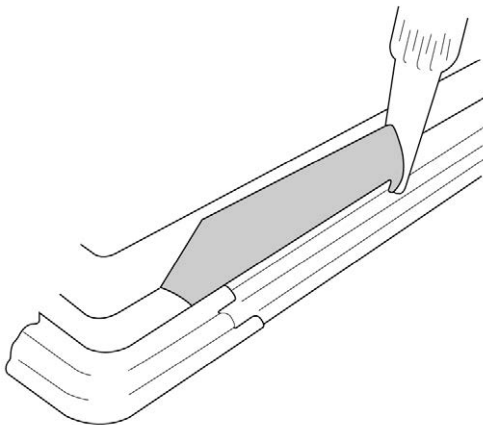
- 1 Place the rear windshield assembly on the mounting table and cut the Geely special glass sealant applicator nozzle.

Caution

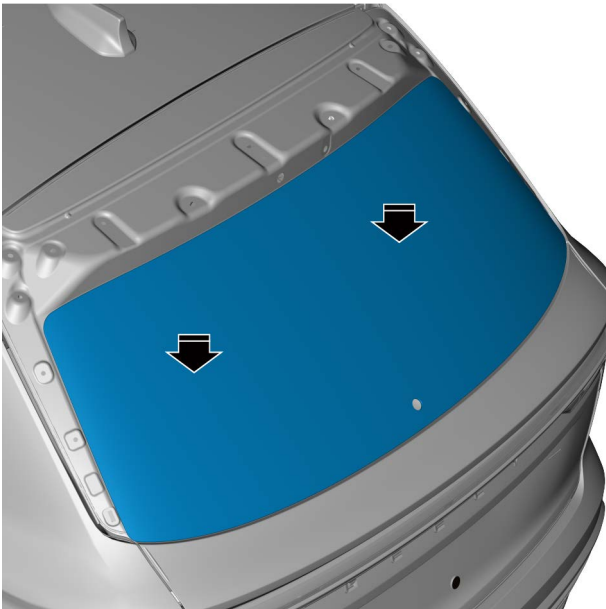
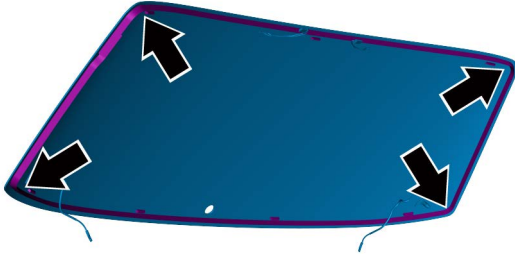
Avoid bumps and scratches during assembly.



- 2 Use the Geely special glass sealant applicator nozzle to , make a sprayed glass adhesive flange edge up to 8mm wide and 8mm high.



- 3 Apply the glass sealant flange edge evenly and continuously Use a cased filler gun, ensuring that the glass sealant is uniform in width.



- 4 Install the rear windshield assembly.

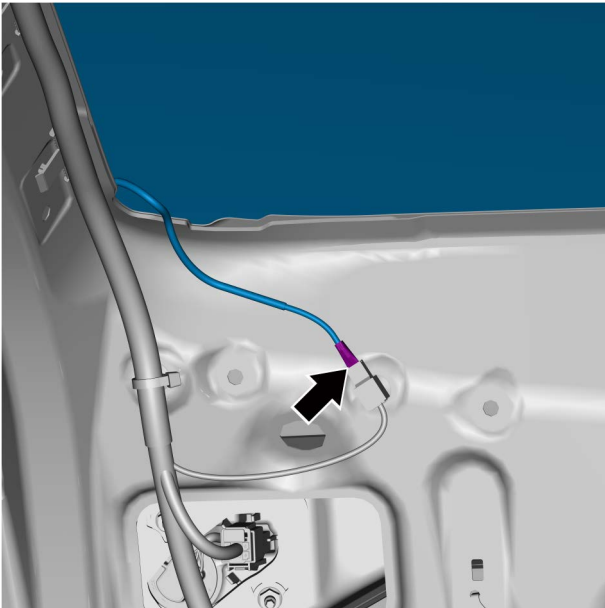
Caution

The installation process requires careful handling by at least two technicians.

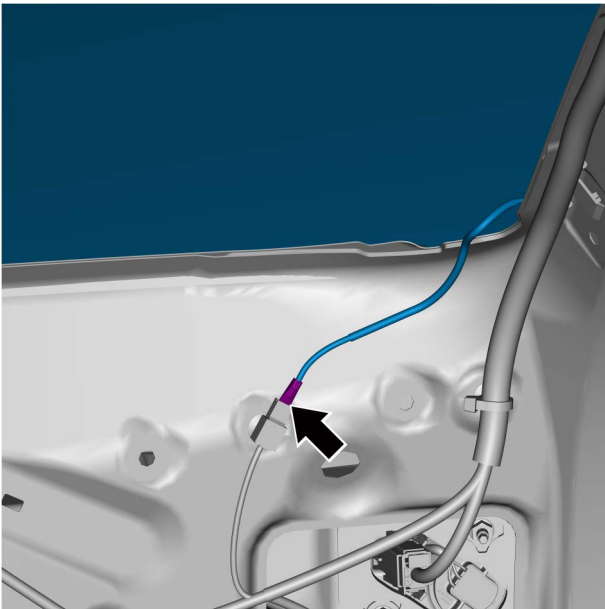
- 5 Fix the rear windshield assembly by pressing down on the rear windshield assembly and then applying the adhesive tape to the rear windshield assembly and the rear windshield assembly frame.
- 6 Wait for the adhesive to harden.
- 7 After the adhesive has hardened, pour water over the rear windshield assembly to check for leaks. If water leaks, allow the rear windshield assembly to dry and plug the leak with glass sealant. If water still leaks, disassemble the rear windshield assembly and repeat the entire repair procedure.

Caution

Do not move the vehicle for six hours; do not wash the vehicle for three days; the special glass sealant will dry completely after two days of application, avoid potholes until the sealant is dry.



- 8 Connect the rear windshield assembly harness connector.



- 9 Connect the rear windshield assembly harness connector.

- 10 Install the rear spoiler assembly.
- 11 Install the rear wiper motor.
- 12 Install assembly of interior trim panel of tail gate.
- 13 Install the rear wiper arm and blade assembly.
- 14 Connect the negative cable of battery.

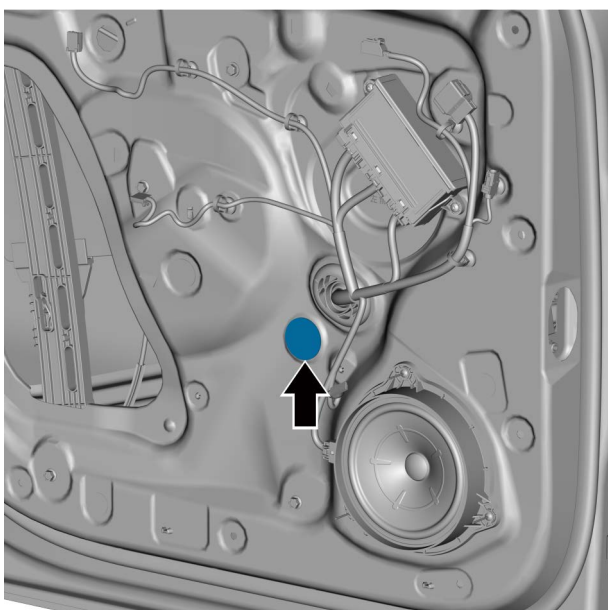
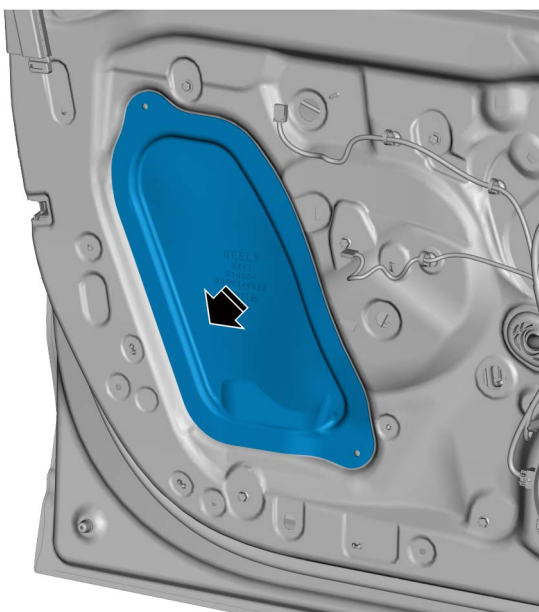
12.4.6.3 Replacement of left front door window assembly

Removal Procedure

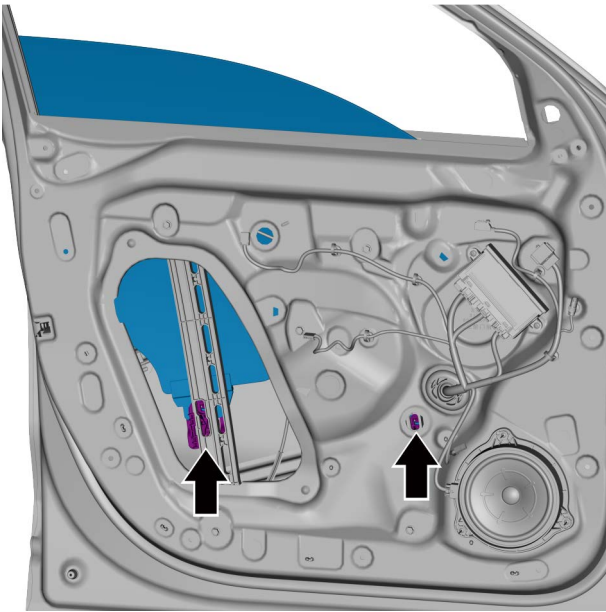
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

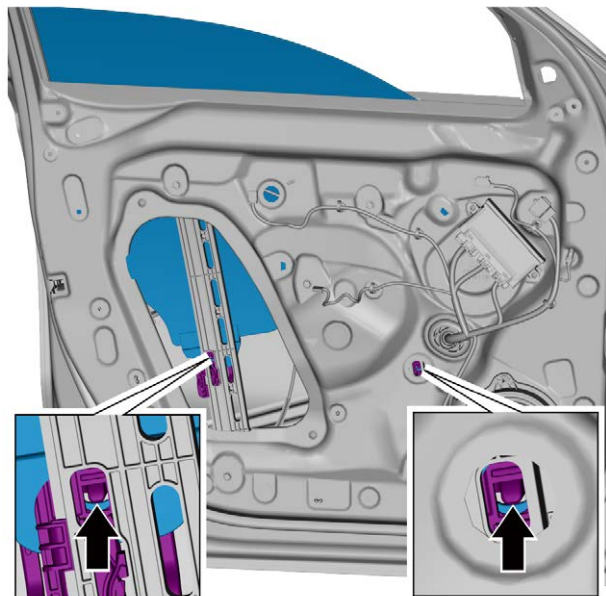
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery negative cable](#).
- 2 Remove the left front door interior trim panel assembly, refer to [Replacement of left front door interior trim panel assembly](#).
- 3 Remove the left front door inner belt line moulding, refer to [Replacement of left front door inner belt line moulding](#).
- 4 Remove the left front door outer belt line moulding, refer to [Replacement of left front door outer belt line moulding](#).
- 5 Remove the left front door rear waterproof membrane.



- 6 Remove the plug.

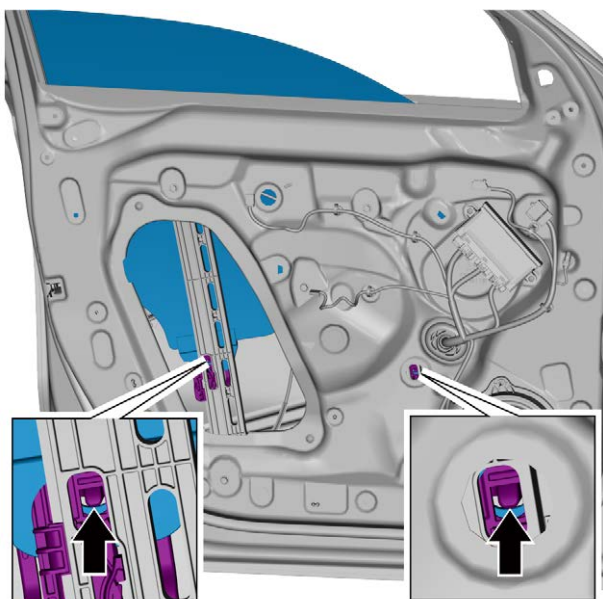


- 7 Lower the left front door window assembly to the position shown, at the removal process hole.



- 8 Insert a slotted screwdriver to the left front door window assembly bracket from the outside of the left front door window assembly and apply force in the Y direction to open the left front door window assembly bracket clips while lifting the left front door window assembly upward with your left hand, and then remove the left front door window assembly.
- 9 Remove the left front door window assembly.

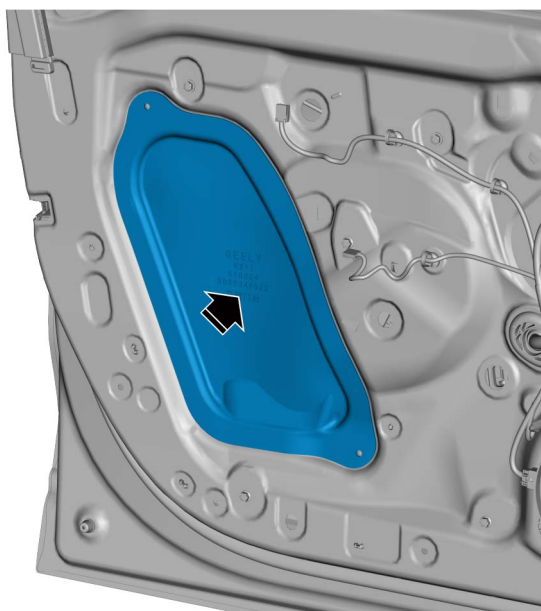
Installation Procedure



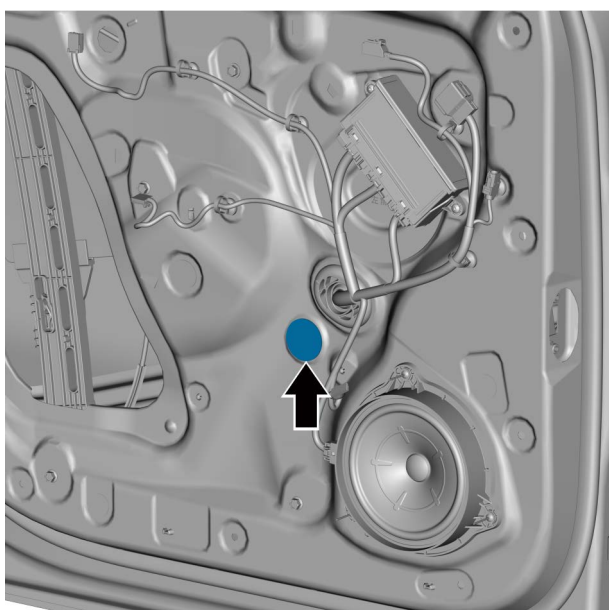
- 1 Install the left front door window assembly into the front door and snap it into the window assembly slot.

Caution

Avoid bumps and scratches during assembly.



- 2 Install the left front door rear waterproof membrane.



- 3 Install the plug.

- 4 Install the inner belt line moulding of left front door.
- 5 Install the left front door outer belt line moulding.
- 6 Install the assembly-interior trim panel left front door.
- 7 Connect the negative cable of battery.

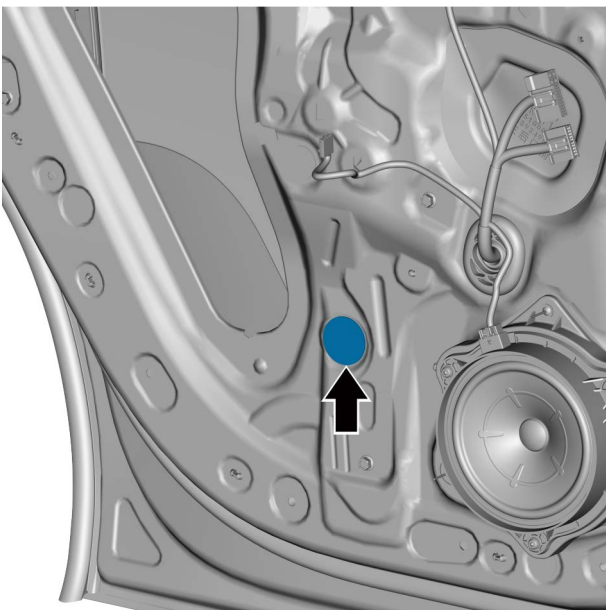
12.4.6.4 Replacement of left rear door window assembly

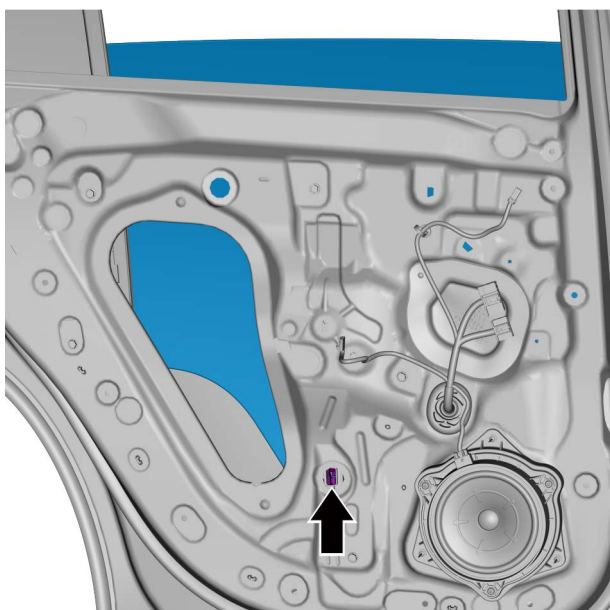
Removal Procedure

Warning !

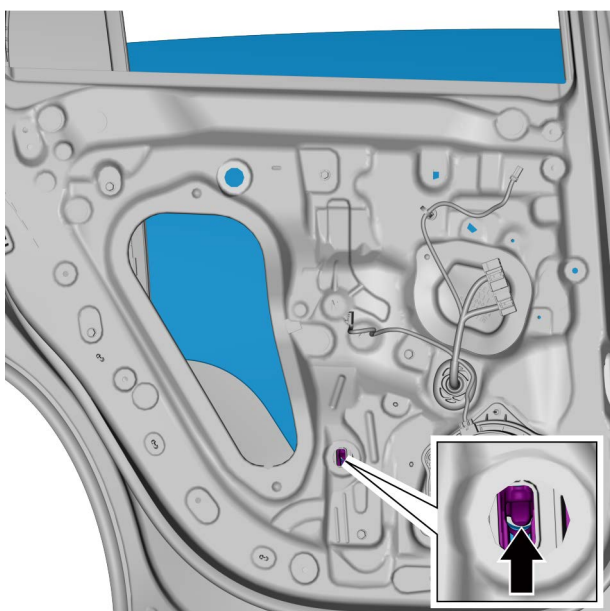
Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery negative cable](#).
- 2 Remove the left rear door interior trim panel assembly, refer to [Replacement of left rear door interior trim panel assembly](#).
- 3 Remove the left rear door inner belt line moulding, refer to [Replacement of left rear door inner belt line moulding](#).
- 4 Remove the left rear door outer belt line moulding, refer to [Replacement of left rear door outer belt line moulding](#).
- 5 Remove the left rear door window rear guide rail assembly, refer to [Replacement of left rear door window rear guide rail assembly](#).
- 6 Remove the plug.



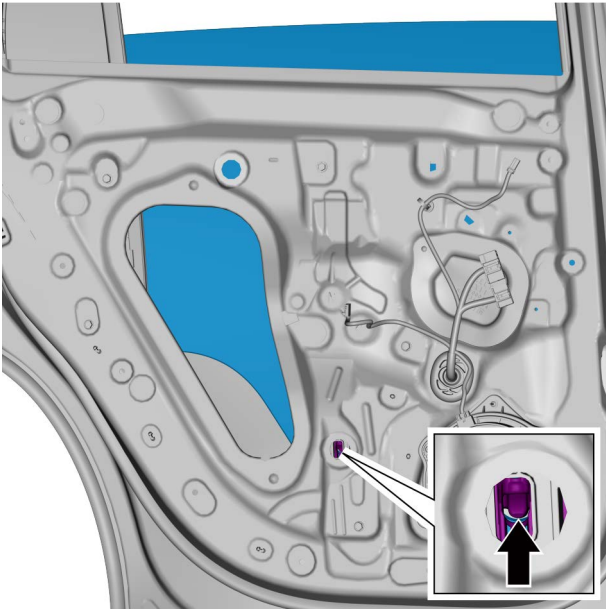


- 7 Move the left rear door window assembly to the position shown, at the removal process hole.



- 8 Insert a slotted screwdriver to the window bracket from the outside of the window and apply force in the Y direction to open the window bracket clips while lifting the window upward with your left hand, and then remove the window.
- 9 Remove the left rear door window assembly.

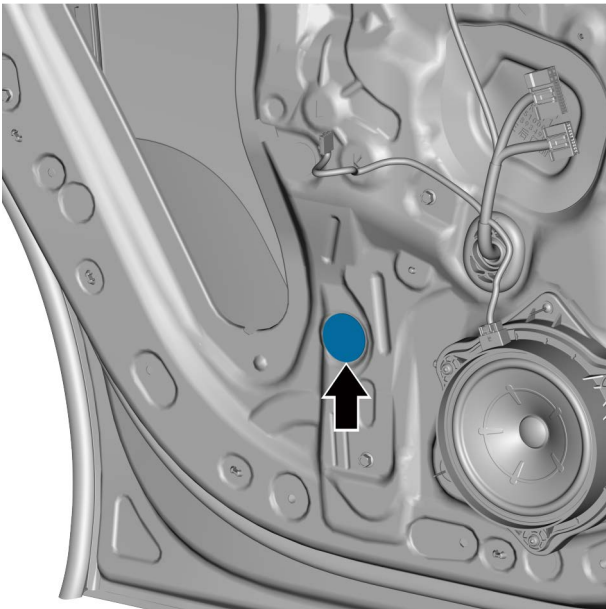
Installation Procedure



- 1 Install the left rear door window assembly into the front door and snap it into the window assembly slot.

Caution

Avoid bumps and scratches during assembly.



- 2 Install the plug.

- 3 Install the left rear door window rear guide rail assembly.
- 4 Install the inner belt line moulding of left rear door.
- 5 Install the outer belt line mouldings of left rear doors.
- 6 Install the left rear door interior trim panel assembly.
- 7 Connect the negative cable of battery.

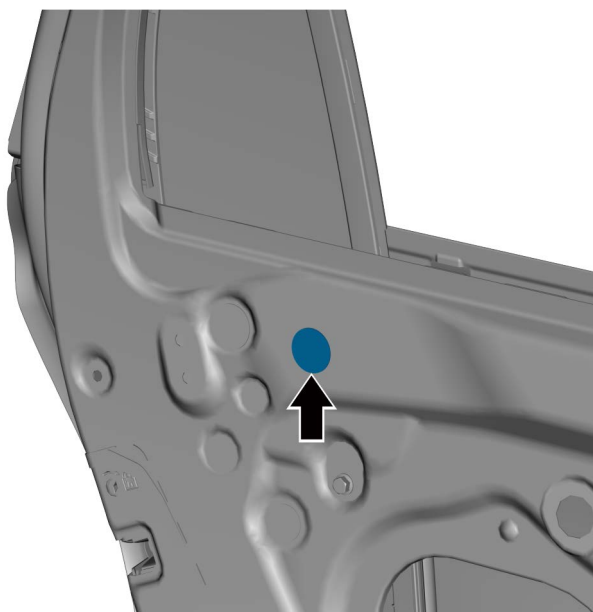
12.4.6.5 Replacement of left rear outer triangle window

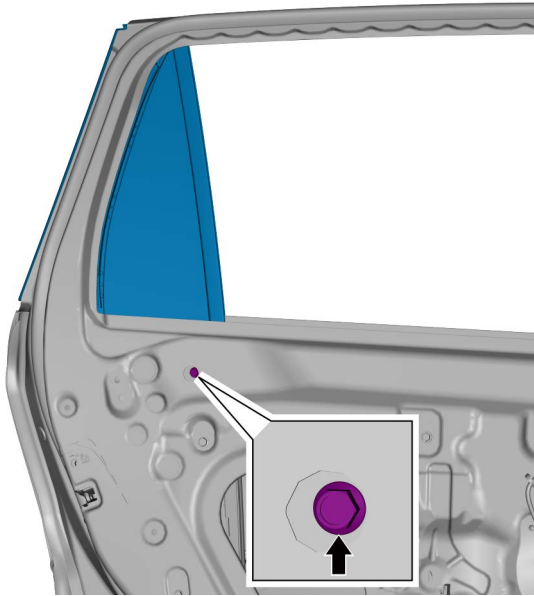
Removal Procedure

Warning !

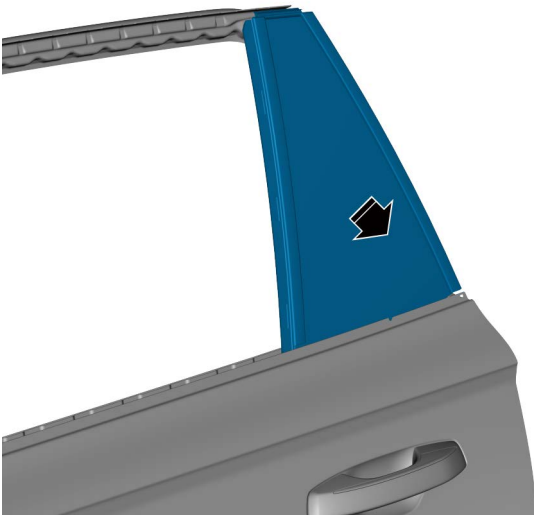
Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery negative cable](#).
- 2 Remove the left rear door interior trim panel assembly, refer to [Replacement of left rear door interior trim panel assembly](#).
- 3 Remove the left rear door window assembly, refer to [Replacement of left rear door window assembly](#).
- 4 Remove the left rear door window run channel, refer to [Replacement of left rear door window run channel](#).
- 5 Remove the plug.





6 Remove the left rear outer triangle window fixing bolt.



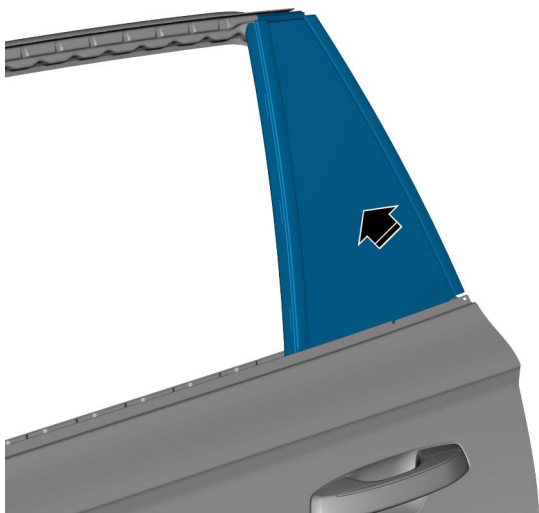
7 Remove the left rear outer triangular window.

Installation Procedure

- 1 Install the left rear outer triangle window.

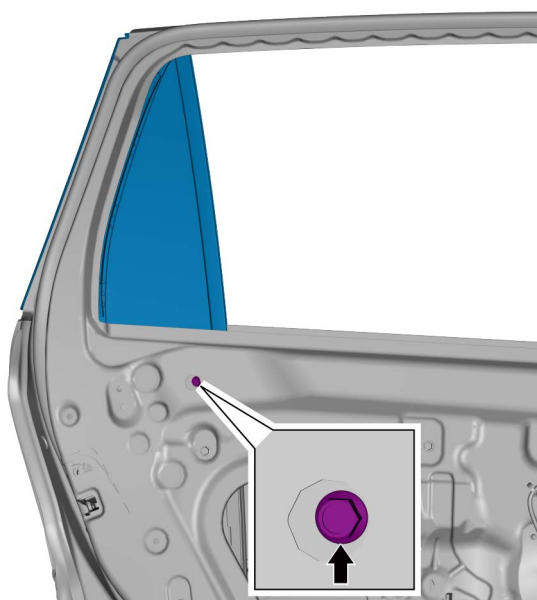
Caution

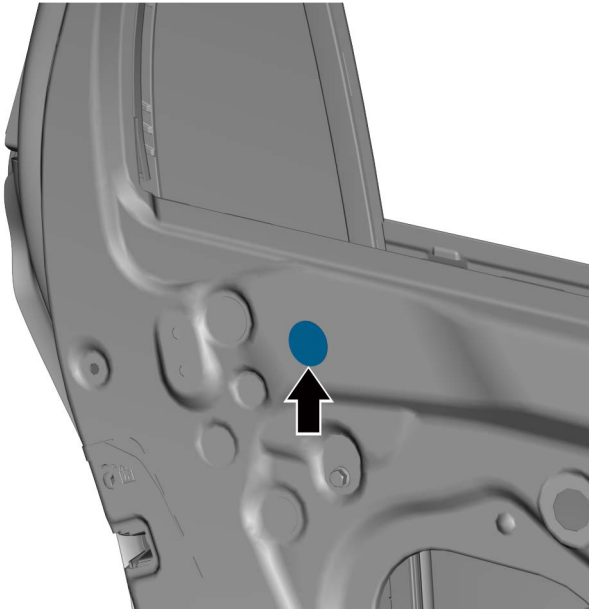
Avoid bumps and scratches during assembly.



- 2 Install the left rear outer triangle window fixing bolts.

Torque: 10N·m





3 Install the plug.

4 Install the left rear door window run channel.

5 Install the left rear door window assembly.

6 Install the left rear door interior trim panel assembly.

7 Connect the negative cable of battery.

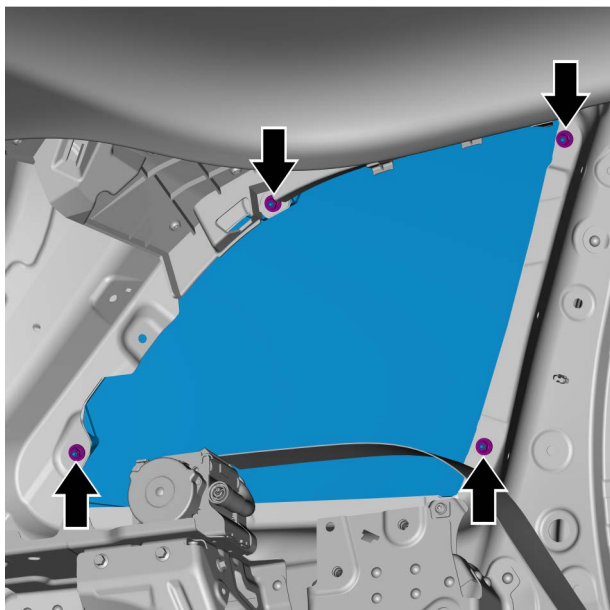
12.4.6.6 Replacement of left rear outer body side triangle window

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery negative cable](#).
- 2 Remove the left luggage compartment side shield assembly, refer to [Replacement of left luggage compartment side shield assembly](#).
- 3 Remove the left C-pillar upper trim panel assembly, refer to [Replacement of left C-pillar upper trim panel assembly](#).
- 4 Remove the left D-pillar upper trim panel assembly, refer to [Replacement of left D-pillar upper trim panel assembly](#).

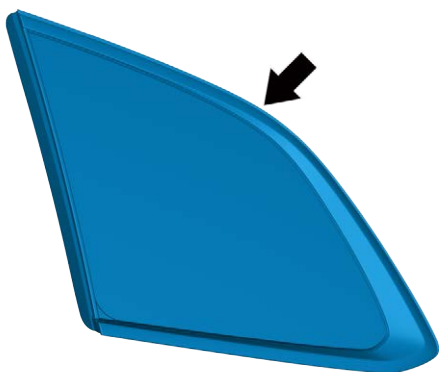


- 5 Remove the 4 fixing nuts of the left rear outer body side triangle window.

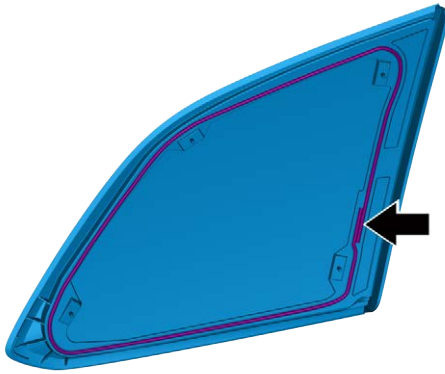
Caution

The left rear outer body side triangle window is fixed by bolts and butyl rubber, after removing the nuts, use an electric heating gun to heat up to more than 50 degrees to soften the butyl rubber before removing the left rear outer body side triangle window.

- 6 Remove the left rear outer body side triangle window.



Installation Procedure



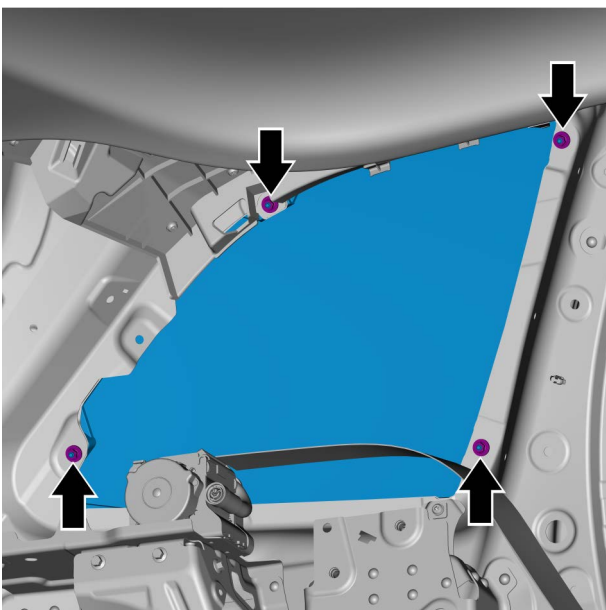
- 1 Use the Geely special butyl adhesive applicator nozzle to make a sprayed butyl adhesive flange edge up to 8mm (0.3in) wide and 8mm (0.3in) high.

Apply the butyl adhesive flange edge evenly and continuously with a cased filler gun, ensuring that the butyl adhesive is uniform in width and consistent.

Warning !

Wear chemical and thermal gloves and proper eye protection devices when applying sealant. Skin and eye injuries may occur.

- 2 Install the left rear exterior body side triangle window.



- 3 Install the 4 fixing nuts of the left rear outer body side triangle window.

Torque: 6N·m

- 4 Install the left D-pillar upper trim panel assembly.
- 5 Install the left C-pillar upper trim panel assembly.
- 6 Install the left luggage compartment side shield assembly.
- 7 Connect the negative cable of battery.

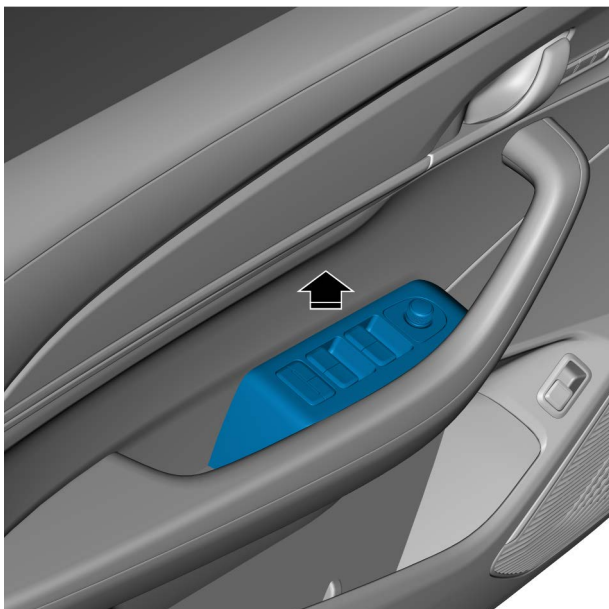
12.4.6.7 Replacement of driver door switch cluster

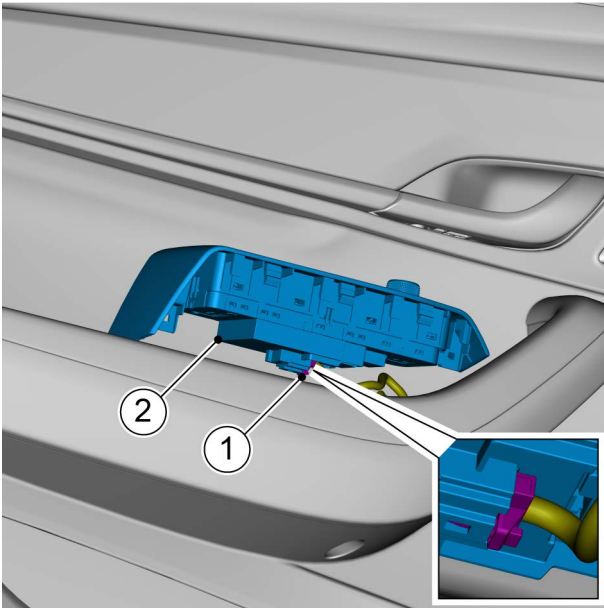
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

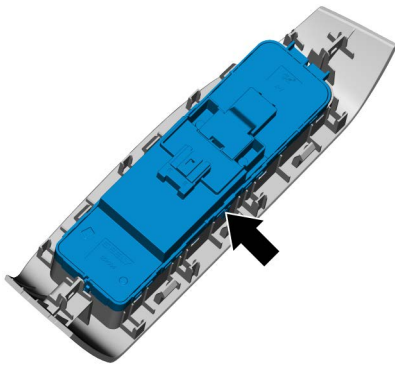
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the driver door switch cluster panel assembly.





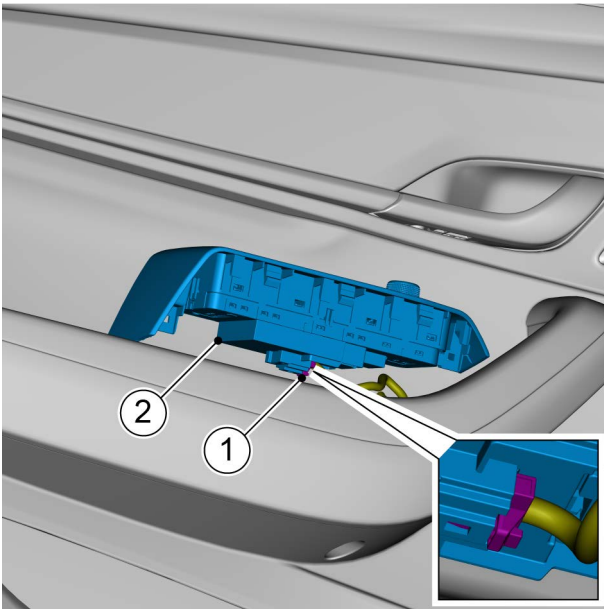
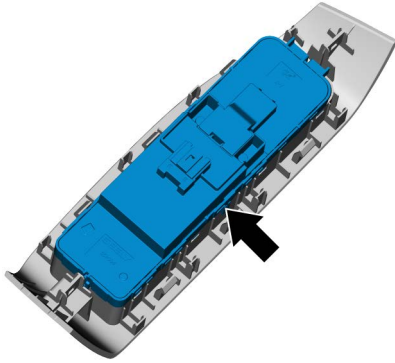
- 3 Disconnect the driver door switch cluster harness connector 1.
- 4 Remove the driver door switch cluster panel assembly 2.

- 5 Remove the driver door switch cluster.



Installation Procedure

- 1 Install the driver door switch block.



- 2 Connect the driver door switch cluster harness connector 1.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 3 Install the driver door switch cluster panel assembly 2.

- 4 Connect the negative cable of battery.

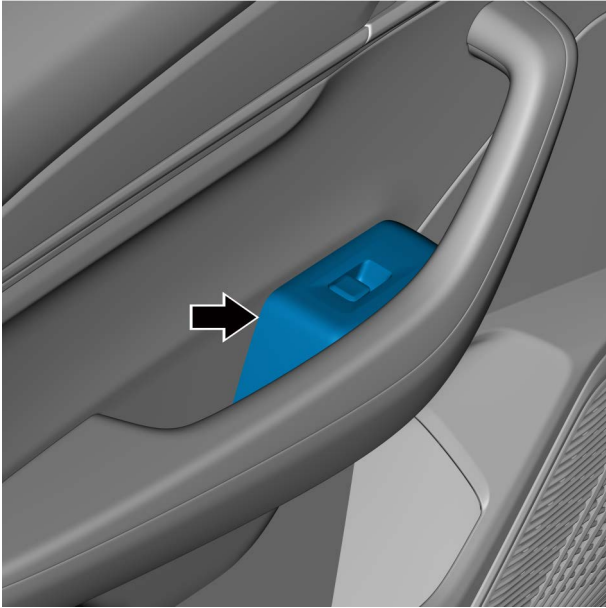
12.4.6.8 Replacement of window control switch (left rear)

Removal Procedure

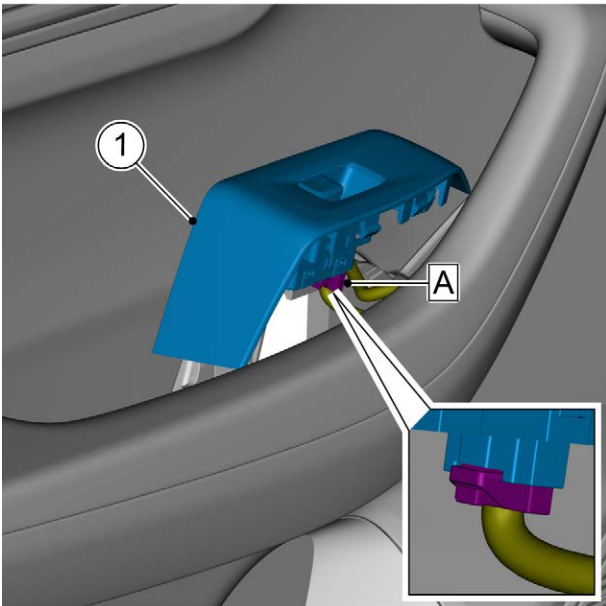
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

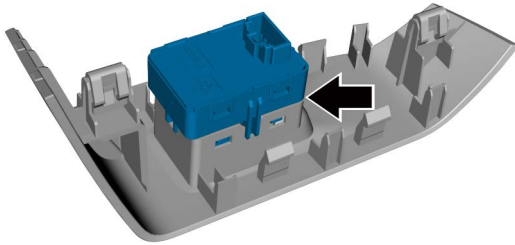


- 2 Remove the window control switch (left rear) panel assembly.



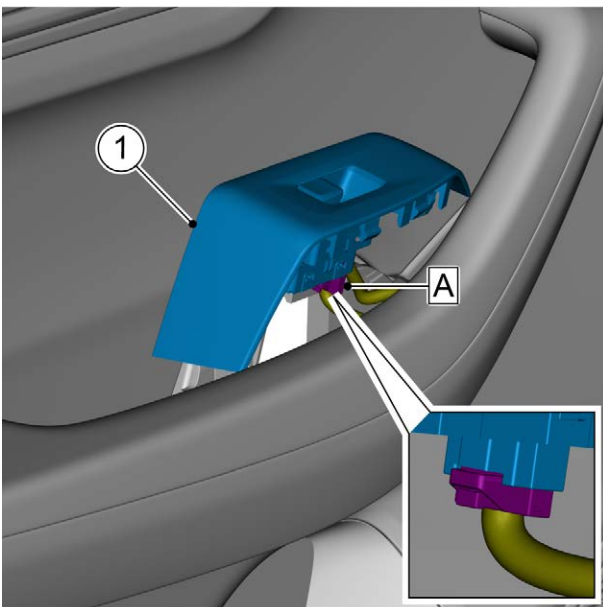
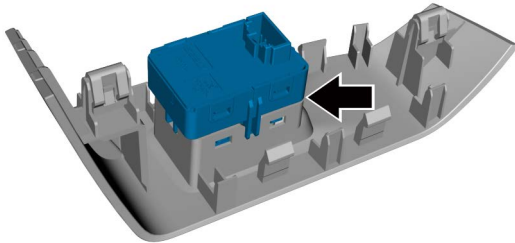
- 3 Disconnect the window control switch (left rear) harness connector A.
- 4 Remove the window control switch (left rear) panel assembly 1.

- 5 Remove the window control switch (left rear).



Installation Procedure

- 1 Install the window control switch (left rear).



- 2 Connect the window control switch (left rear) harness connector A.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 3 Install the window control switch (left rear) panel assembly 1.

- 4 Connect the negative cable of battery.

12.4.6.9 Replacement of power window motor (left front)

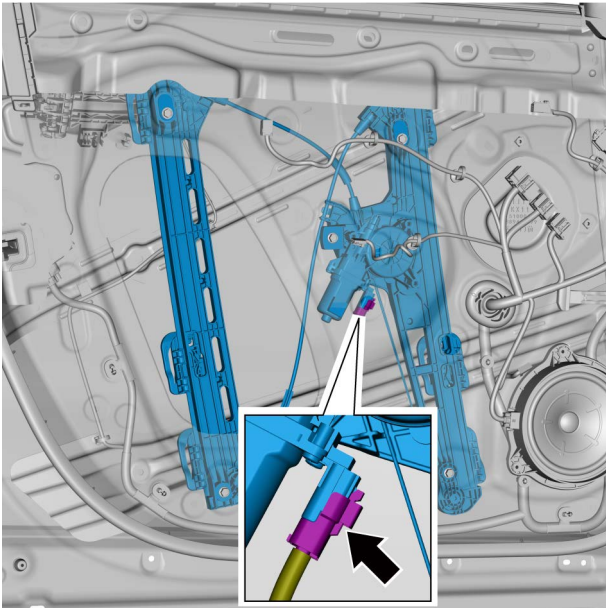
Removal Procedure

Warning !

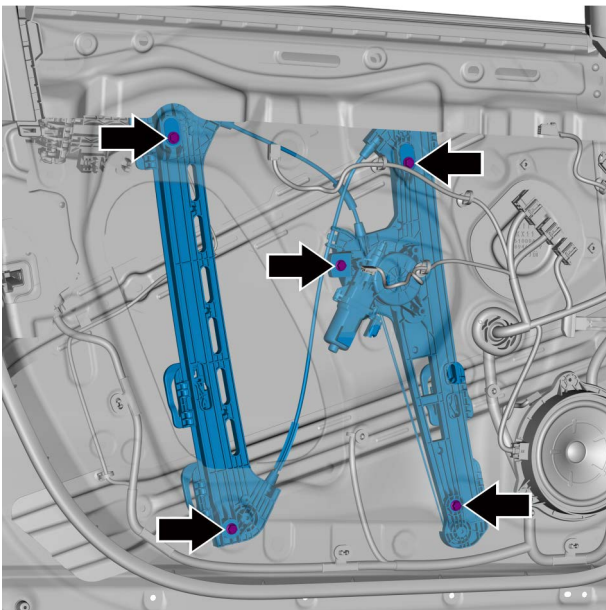
Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left front door interior trim panel assembly, refer to [Replacement of left front door interior trim panel assembly](#).

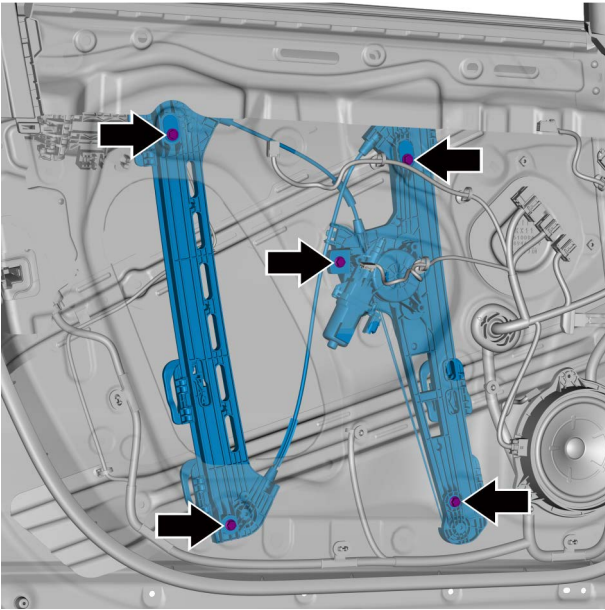
- 3 Remove the left front door window assembly, refer to [Replacement of left front door window assembly](#).
- 4 Disconnect the power window motor (left front) harness connector.



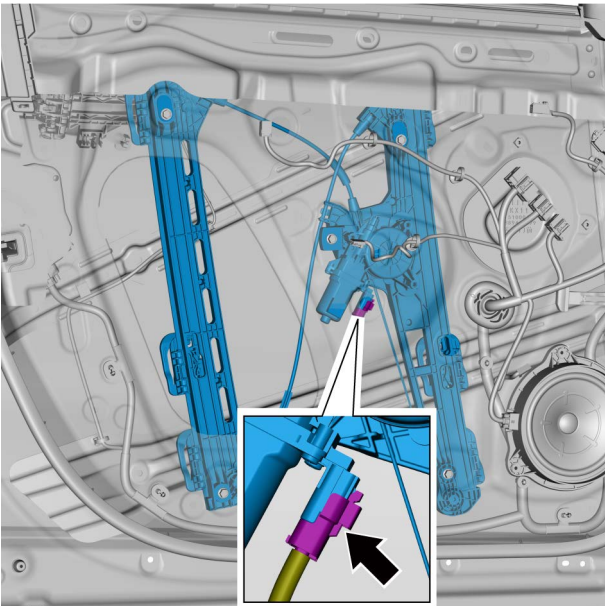
- 5 Remove the 5 fixing bolts of power window motor (left front) and remove the power window motor (left front).



Installation Procedure



- 1 Install the 5 fixing bolts of power window motor (left front).
Torque: 10N·m



- 2 Connect the power window motor (left front) harness connector.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 3 Install the left front door window assembly.
- 4 Install the left front door interior trim panel assembly.
- 5 Connect the negative cable of battery.

12.4.6.10 Replacement of power window motor (left rear)

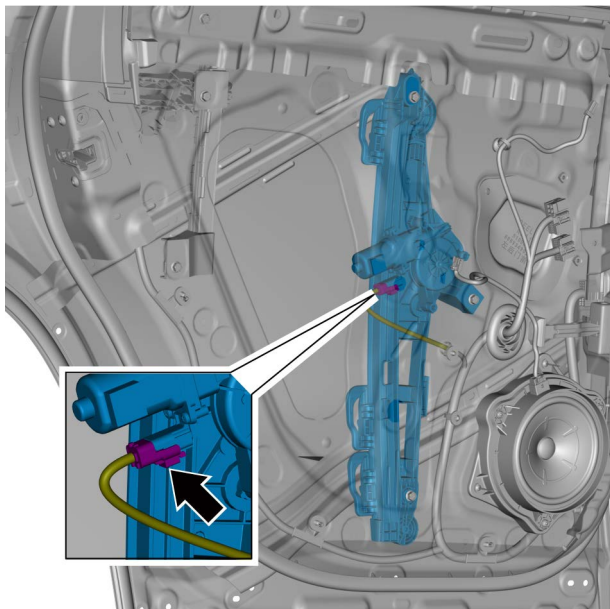
Removal Procedure

Warning !

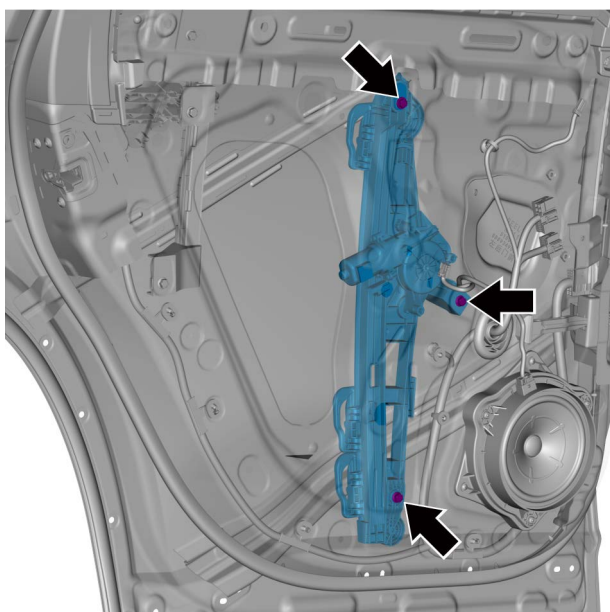
Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

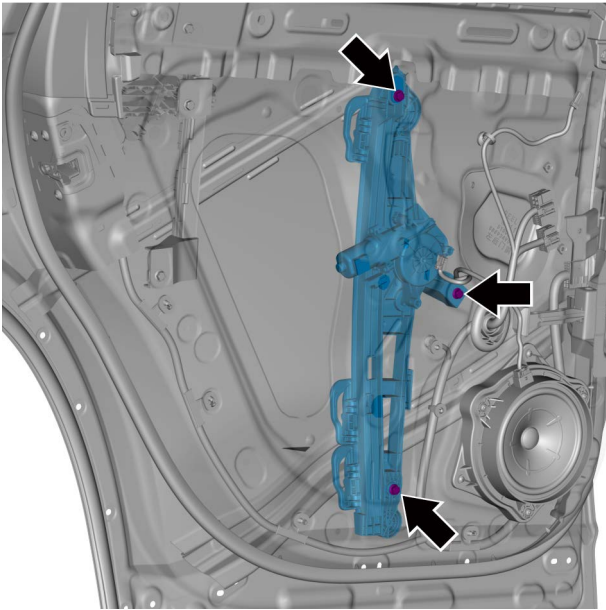
- 2 Remove the left rear door interior trim panel assembly, refer to [Replacement of left rear door interior trim panel assembly](#).
- 3 Remove the left rear door window assembly, refer to [Replacement of left rear door window assembly](#).
- 4 Disconnect the power window motor (left rear) harness connector.



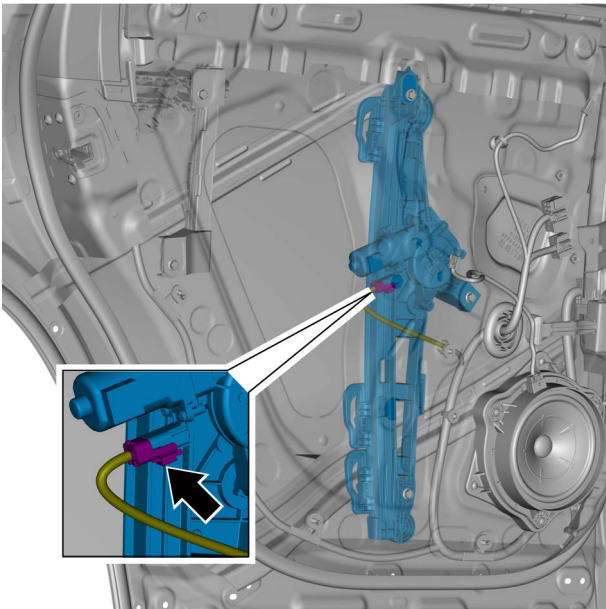
- 5 Remove the 3 fixing bolts of power window motor (left rear) and take off the power window motor (left rear).



Installation Procedure



- 1 Install the 3 fixing bolts of power window motor (left rear).
Torque: 10N·m



- 2 Connect the power window motor (left rear) harness connector.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 3 Install the left rear door window assembly.
- 4 Install the assembly-interior trim panel left front door.
- 5 Connect the negative cable of battery.

12.4.6.11 Replacement of left front door window run channel

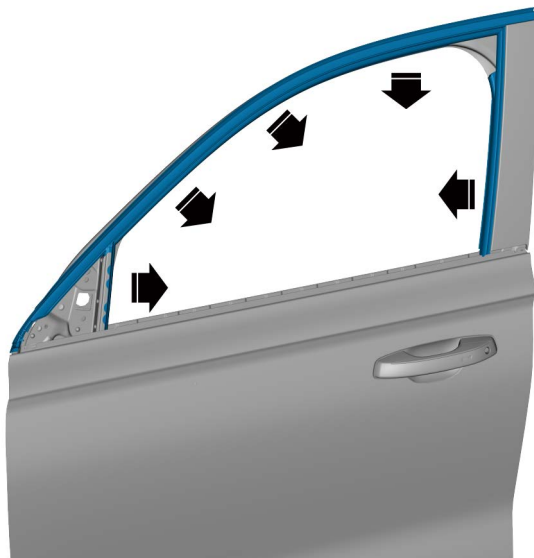
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

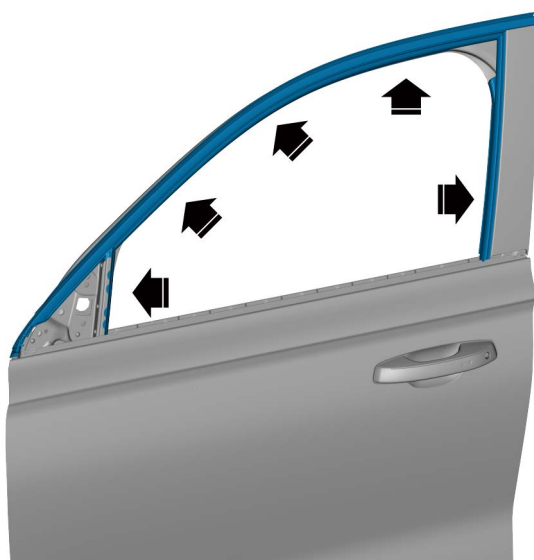
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

- 2 Remove the left front door interior trim panel assembly, refer to [Replacement of left front door interior trim panel assembly](#).
- 3 Remove the left front door window assembly, refer to [Replacement of left front door window assembly](#).
- 4 Remove the left front door B-pillar trim panel, refer to [Replacement of left front door B-pillar trim panel assembly](#).
- 5 Remove the left front door window run channel.



Installation Procedure

- 1 Install left front door window run channel.



- 2 Install the left front door B-pillar trim panel.
- 3 Install the left front door window assembly.

- 4 Install the left front door interior trim panel assembly.
- 5 Connect the negative cable of battery.

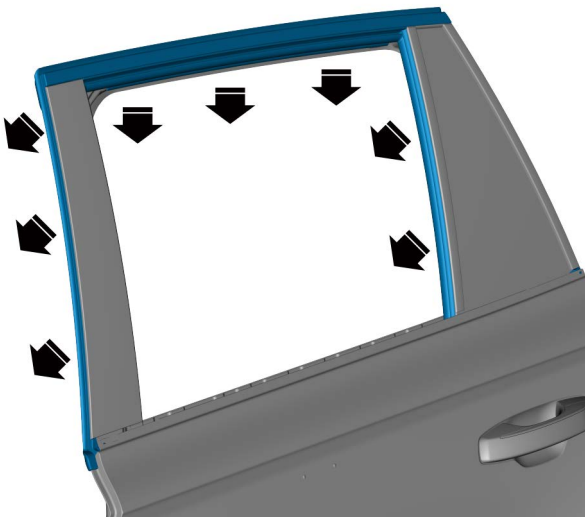
12.4.6.12 Replacement of left rear door window run channel

Removal Procedure

Warning !

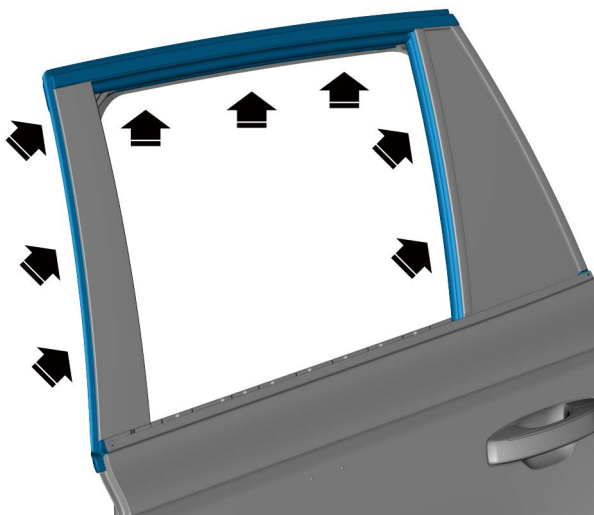
Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left rear door interior trim panel assembly, refer to [Replacement of left rear door interior trim panel assembly](#).
- 3 Remove the left rear door window assembly, refer to [Replacement of left rear door window assembly](#).
- 4 Remove the left rear door B-pillar trim panel, refer to [Replacement of left rear door B-pillar trim panel](#).
- 5 Remove the left rear door window run channel.



Installation Procedure

- 1 Install the left rear door window run channel.



- 2 Install the left rear door B-pillar trim panel.
- 3 Install the left rear door window assembly.
- 4 Install the left rear door interior trim panel assembly.
- 5 Connect the negative cable of battery.

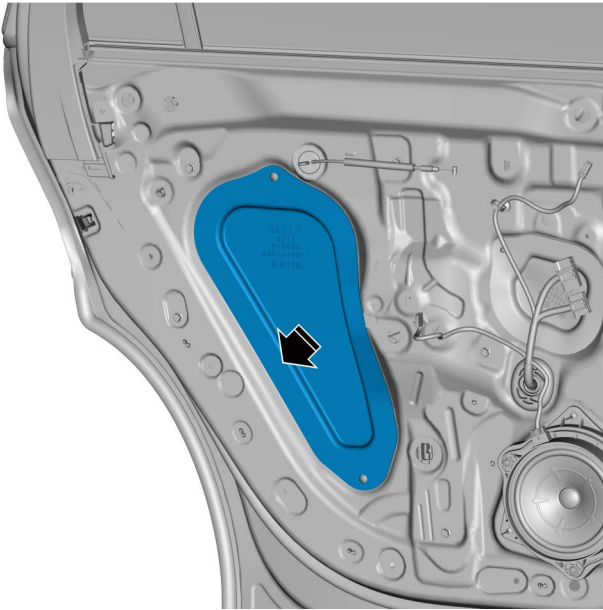
12.4.6.13 Replacement of left rear door window rear guide rail assembly

Removal Procedure

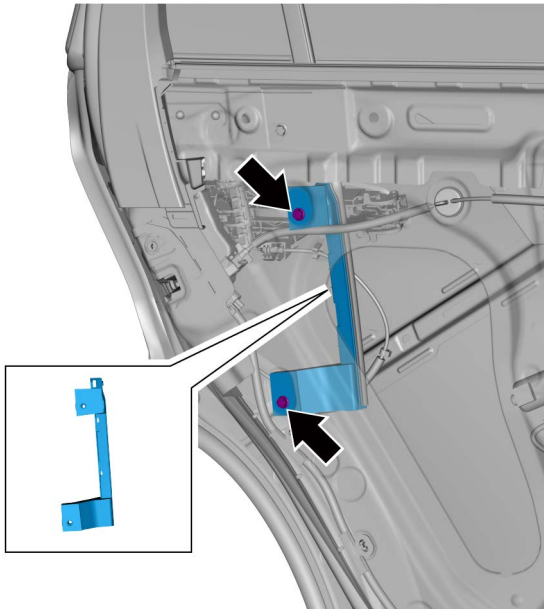
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left rear door interior trim panel assembly, refer to [Replacement of left rear door interior trim panel assembly](#).

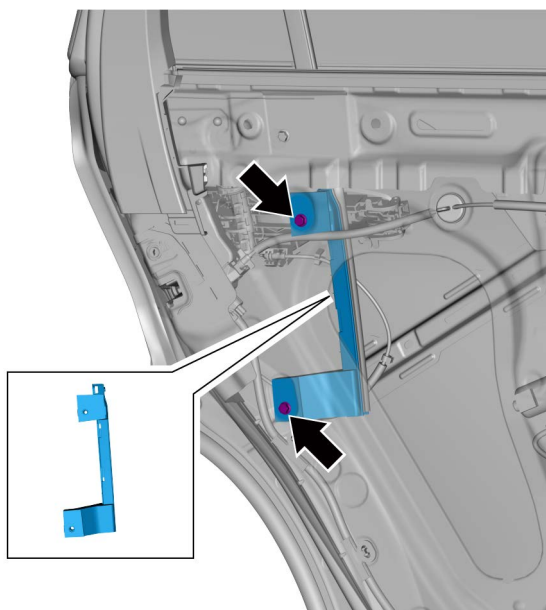


3 Remove the left rear door rear waterproof membrane.

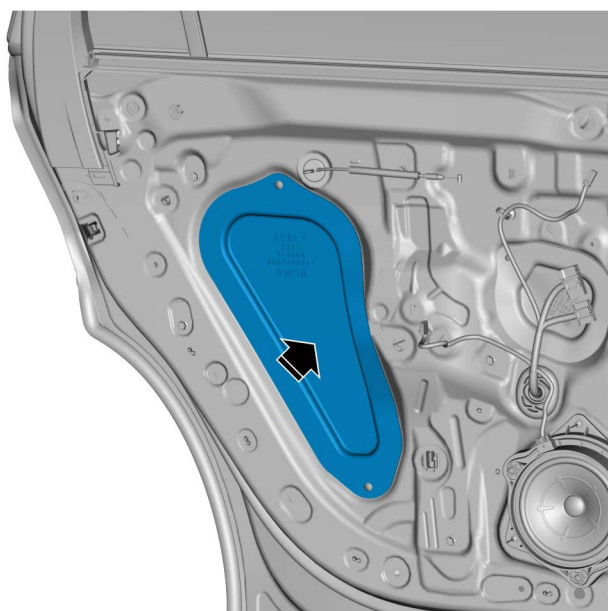


4 Remove the 2 fixing bolts of left rear door window rear guide rail assembly and remove the left rear door window rear guide rail assembly.

Installation Procedure



- 1 Install the 2 fixing bolts of left rear door window rear guide rail assembly.
Torque: 10N·m



- 2 Install the left rear door rear waterproof membrane.

- 3 Install the left rear door interior trim panel assembly.
- 4 Connect the negative cable of battery.

12.4.6.14 Replacement of left front door inner belt line moulding

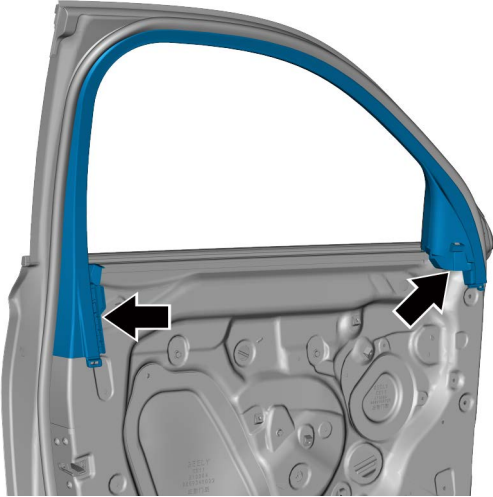
Removal Procedure

Warning !

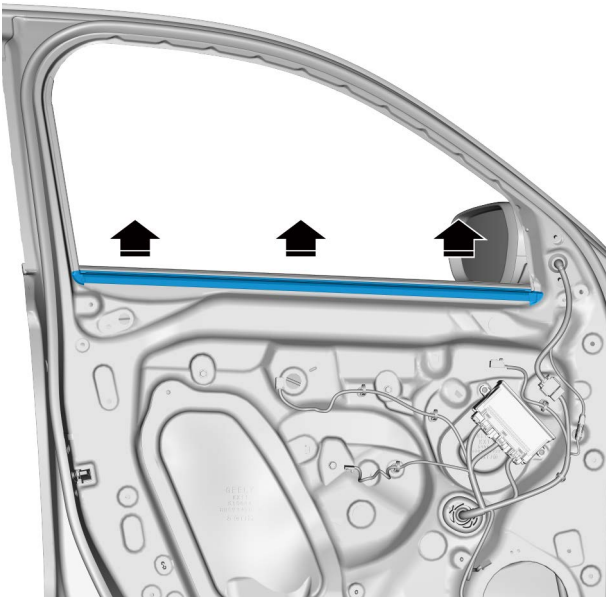
Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

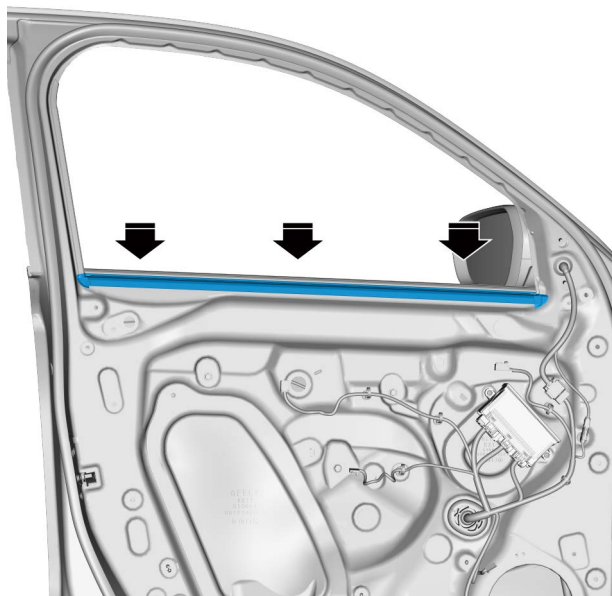
- 2 Remove the left front door interior trim panel assembly, refer to [Replacement of left front door interior trim panel assembly](#).
- 3 Remove the left front door frame trim strip assembly.



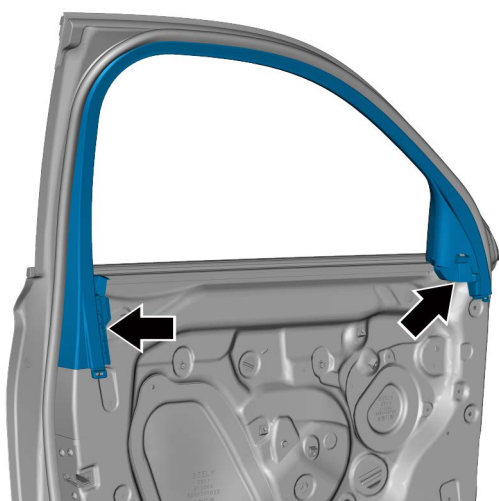
- 4 Remove the inner belt line moulding of left front door.



Installation Procedure



- 1 Install the inner belt line moulding of left front door.



- 2 Install the left front door window frame trim strip assembly.

- 3 Install the assembly-interior trim panel left front door.
- 4 Connect the negative cable of battery.

12.4.6.15 Replacement of left front door outer belt line moulding

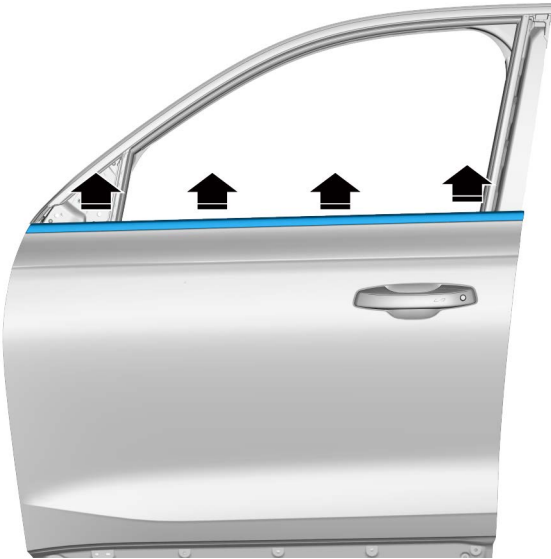
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

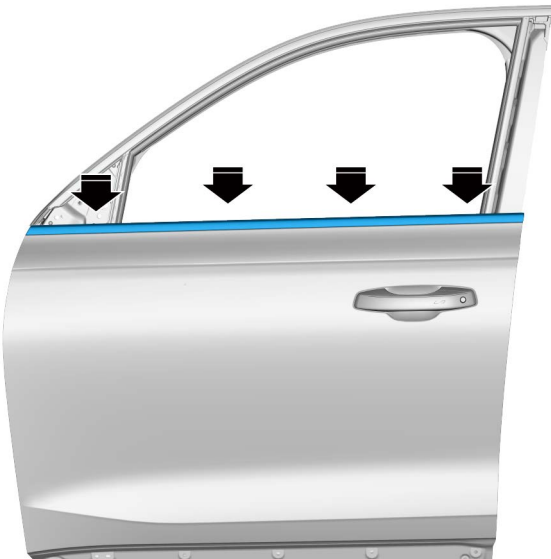
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

- 2 Remove the left front door interior trim panel assembly, refer to [Replacement of left front door interior trim panel assembly](#).
- 3 Remove exterior rearview mirror (left), refer to [Replacement of exterior rearview mirror \(left\)](#).
- 4 Remove the left front door outer belt line moulding.



Installation Procedure

- 1 Install the left front door outer belt line moulding.



- 2 Install the exterior rearview mirror (left).
- 3 Install the assembly-interior trim panel left front door.
- 4 Connect the negative cable of battery.

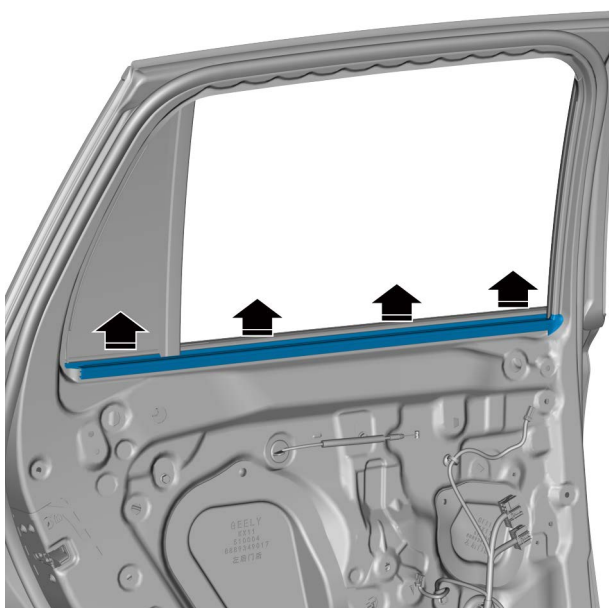
12.4.6.16 Replacement of left rear door inner belt line moulding

Removal Procedure

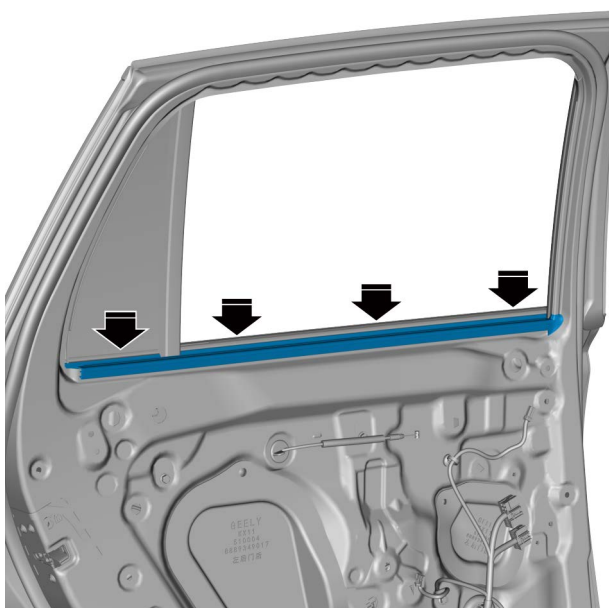
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left rear door interior trim panel assembly, refer to [Replacement of left rear door interior trim panel assembly](#).
- 3 Remove the inner belt line mouldings of left rear doors.

**Installation Procedure**

- 1 Install the inner belt line moulding of left rear door.

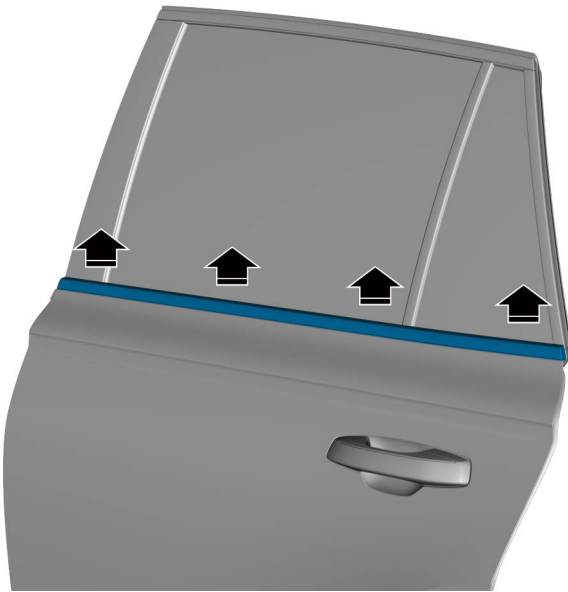


- 2 Install the left rear door interior trim panel assembly.
- 3 Connect the negative cable of battery.

12.4.6.17 Replacement of left rear door outer belt line moulding

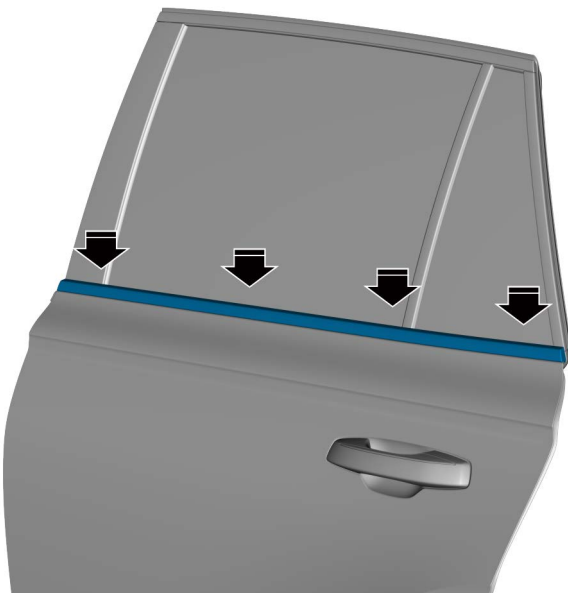
Removal Procedure

- 1 Remove the outer belt line mouldings of left rear doors.



Installation Procedure

- 1 Install the outer belt line mouldings of left rear doors.



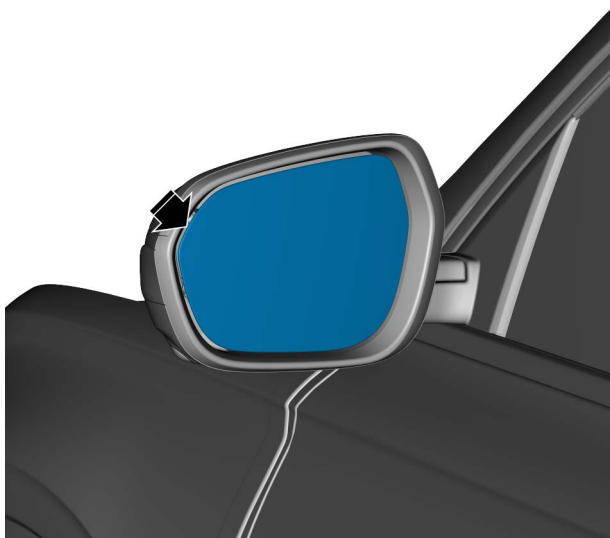
12.4.6.18 Replacement of left rearview mirror convex glass

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).



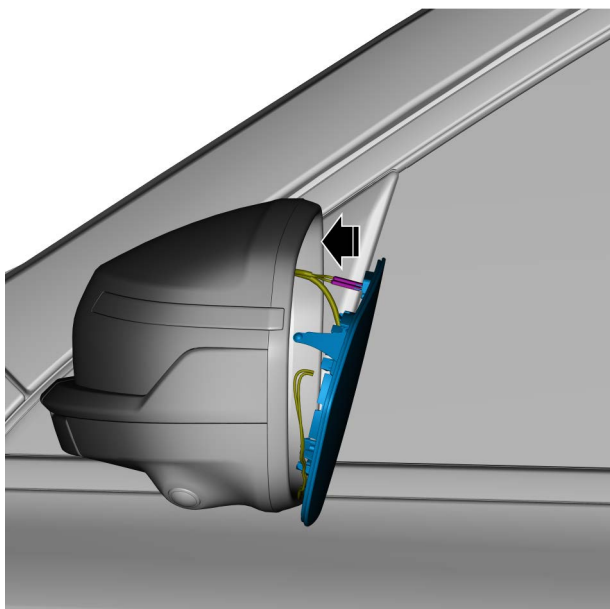
- 2 Remove the convex glass of the left rearview mirror.

Caution

Do not scratch your hands.

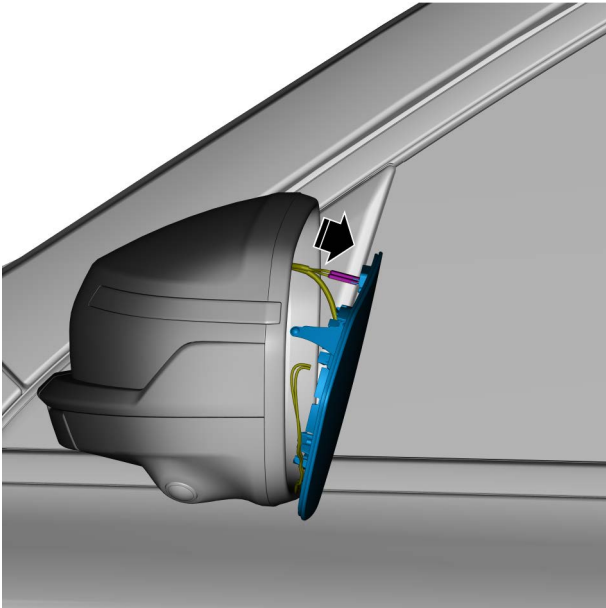
Caution

Be careful not to break the lens.



- 3 Disconnect the 2 defroster harness connectors from the convex glass of the left rearview mirror.
- 4 Remove the left rearview mirror convex glass.

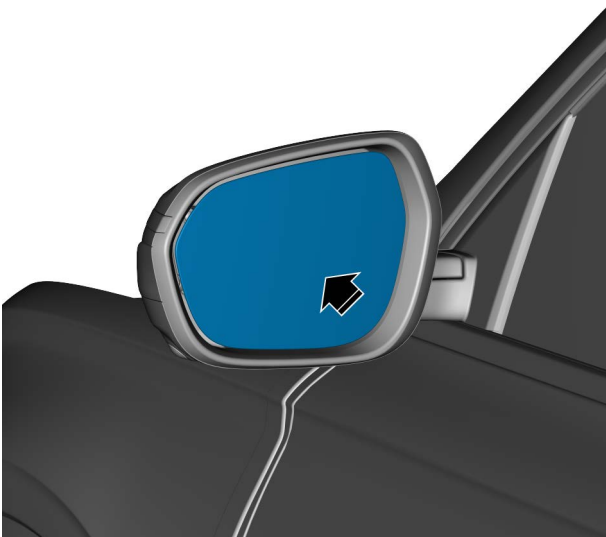
Installation Procedure



- 1 Connect the 2 defroster harness connectors on the convex glass of the left rearview mirror.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 2 Install the convex glass of the left rearview mirror.

Caution

Do not scratch your hands.

Caution

Be careful not to break the lens.

- 3 Connect the negative cable of battery.

12.4.6.19 Replacement of exterior rearview mirror (left)

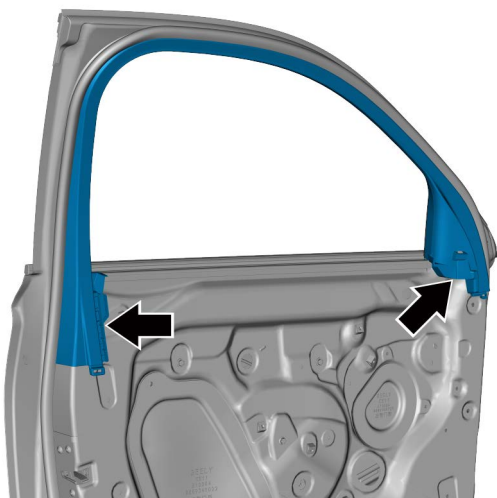
Removal Procedure

Warning !

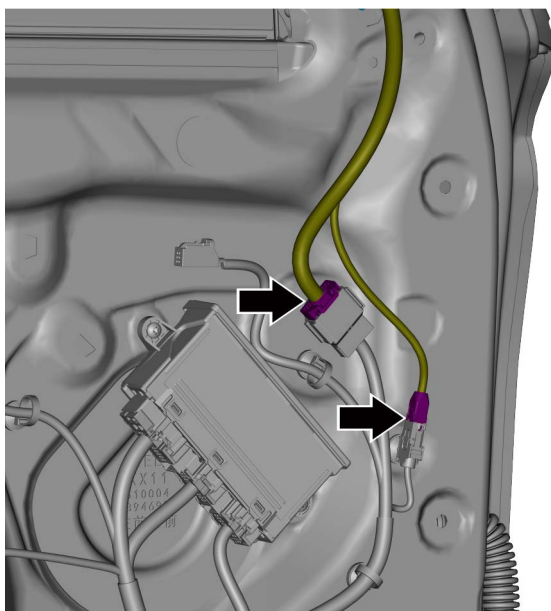
Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left front door interior trim panel assembly, refer to [Replacement of left front door interior trim panel assembly](#).

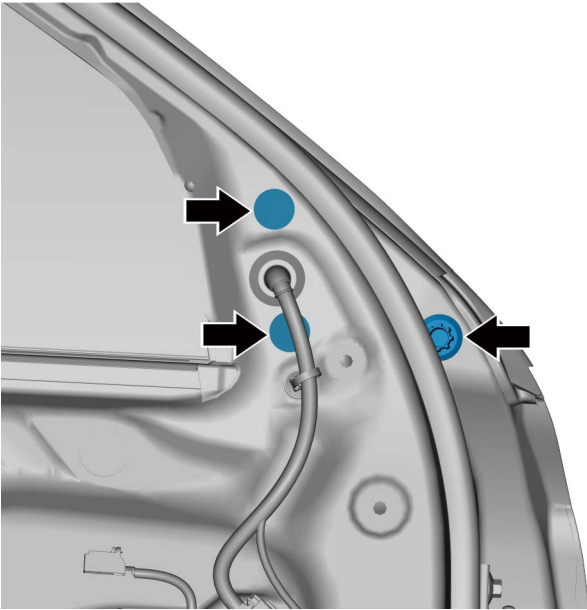
- 3 Remove the left front door frame trim strip assembly.



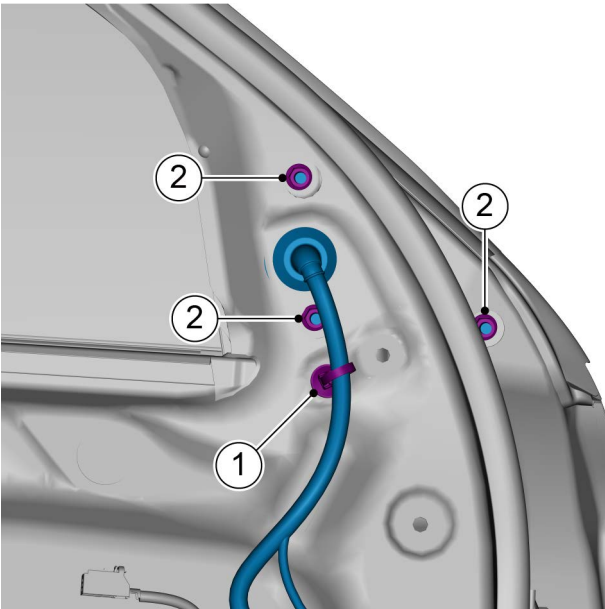
- 4 Disconnect the 2 harness connectors from the exterior rearview mirror (left) harness.



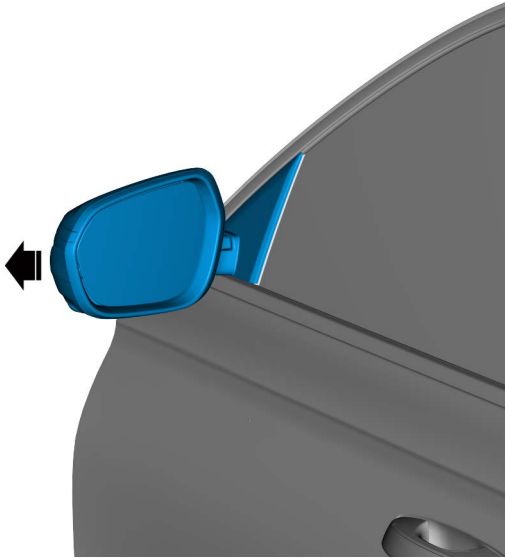
- 5 Remove the exterior rearview mirror (left) nut plug cover



- 6 Remove the 3 fixing nuts 2 and fixing clips 1 of exterior rearview mirror (left).

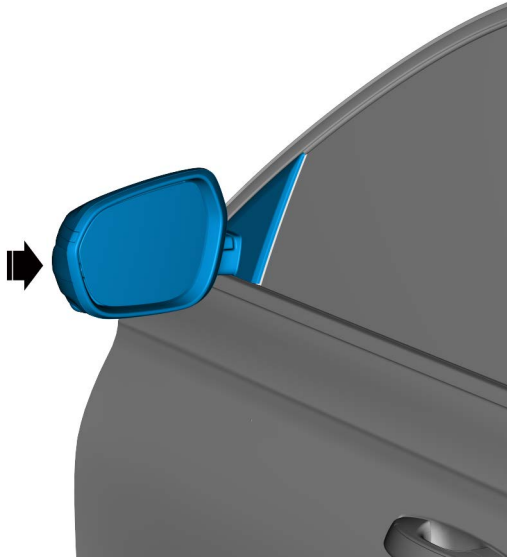


- 7 Remove the exterior rearview mirror (left).



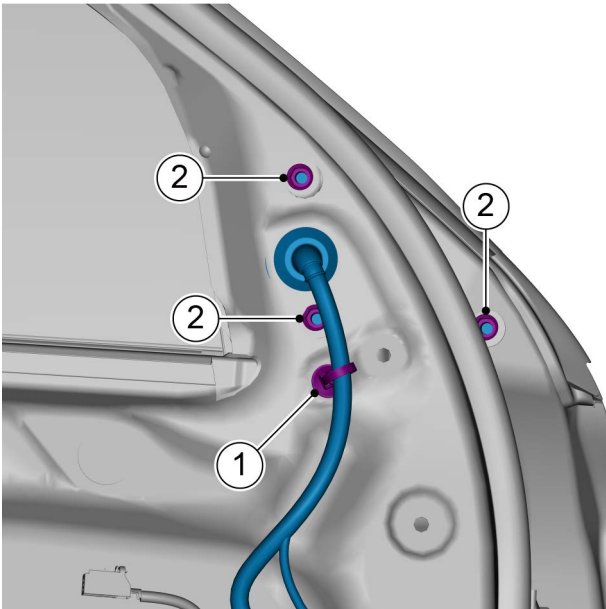
Installation Procedure

- 1 Install the exterior rearview mirror (left).

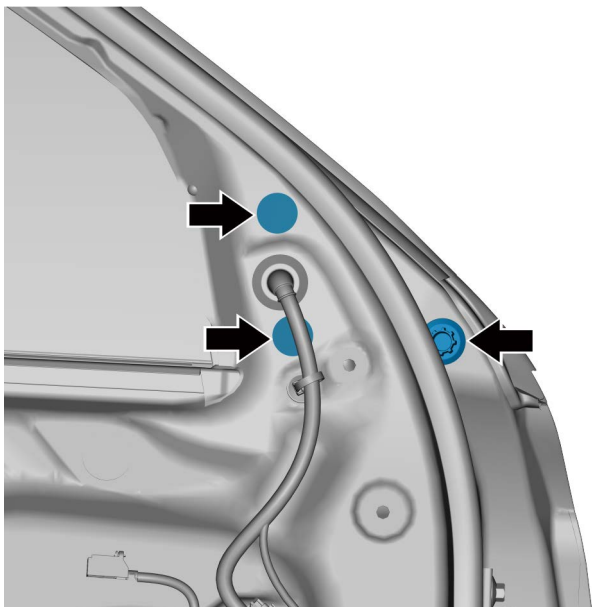


- 2 Install the 3 fixing nuts 2 and fixing clips 1 of exterior rearview mirror (left).

Torque: 10N·m



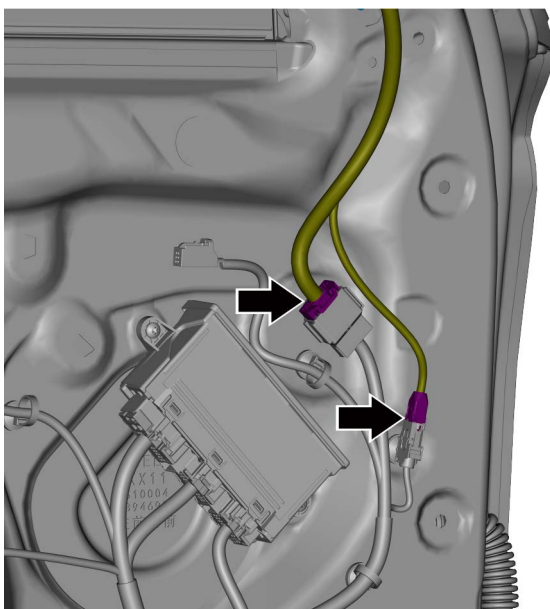
- 3 Install the exterior rearview mirror (left) nut plug cover.



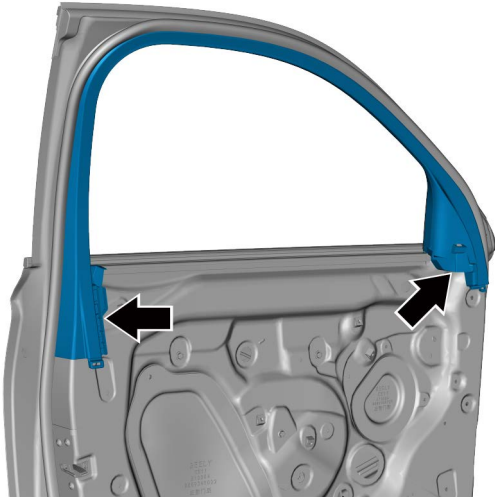
- 4 Connect the 2 harness connectors on the exterior rearview mirror (left) harness.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 5 Install the left front door window frame trim strip assembly.



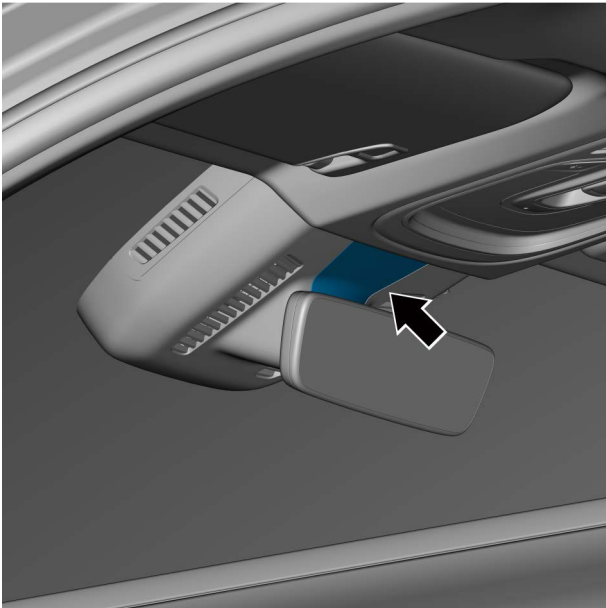
- 6 Install the assembly-interior trim panel left front door.
- 7 Connect the negative cable of battery.

12.4.6.20 Replacement of power rearview mirror adjustment switch

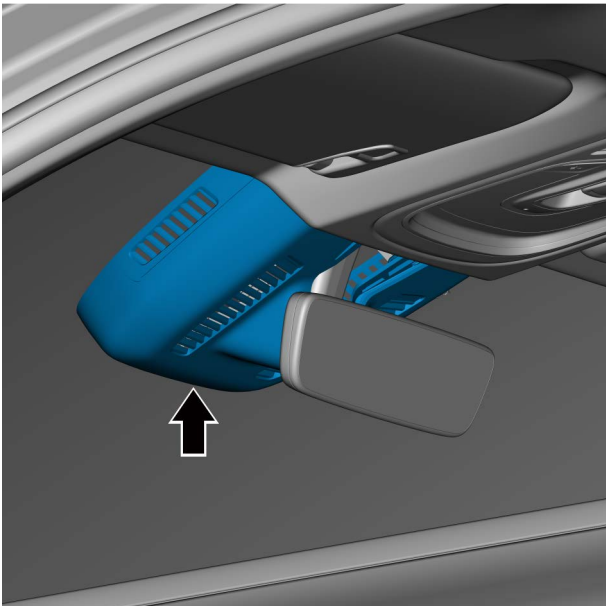
Refer to [Replacement of driver door switch cluster](#).

12.4.6.21 Replacement of mechanical inside dimming rearview mirror

Removal Procedure



- 1 Remove the rain and light sensor front trim cover.



- 2 Remove the rain and light sensor rear trim cover.

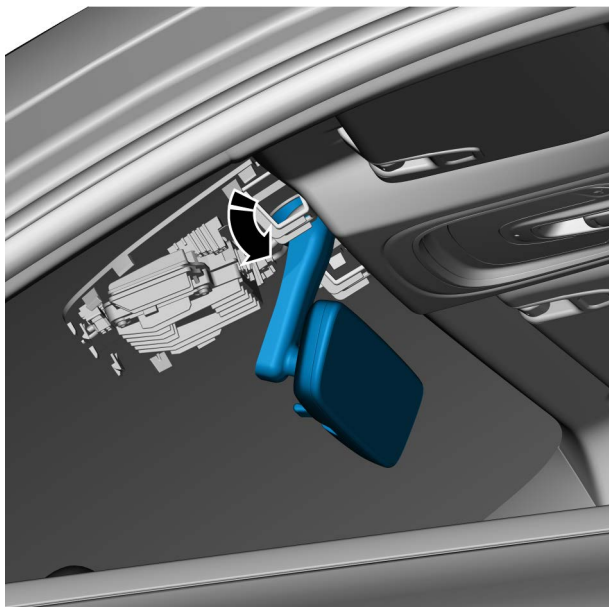


- 3 Rotate the mechanical inside dimming rearview mirror and take it off.

Caution

Be careful not to scratch the glass.

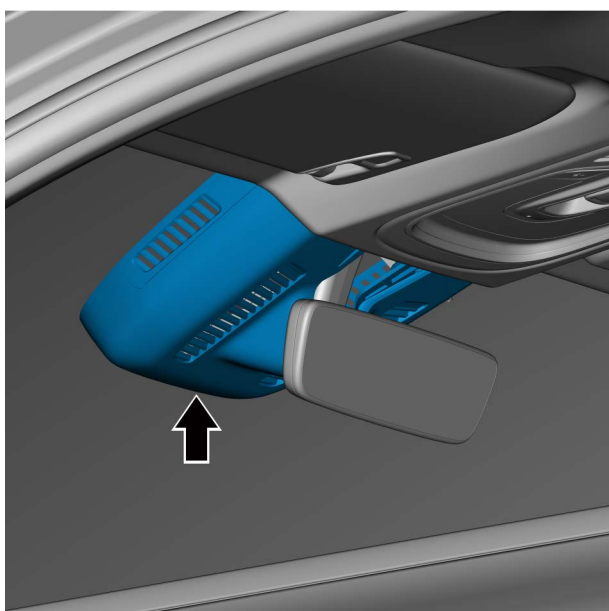
Installation Procedure



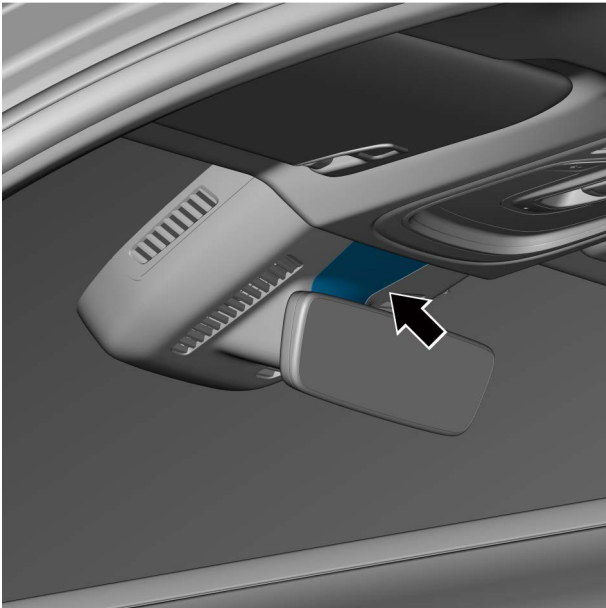
- 1 Snap the mechanical inside dimming rearview mirror into the base and rotate the mechanical inside dimming rearview mirror to the mounting position.

Caution

Be careful not to scratch the glass.



- 2 Install the rain and light sensor rear trim cover.



- 3 Install the rain and light sensor front trim cover.

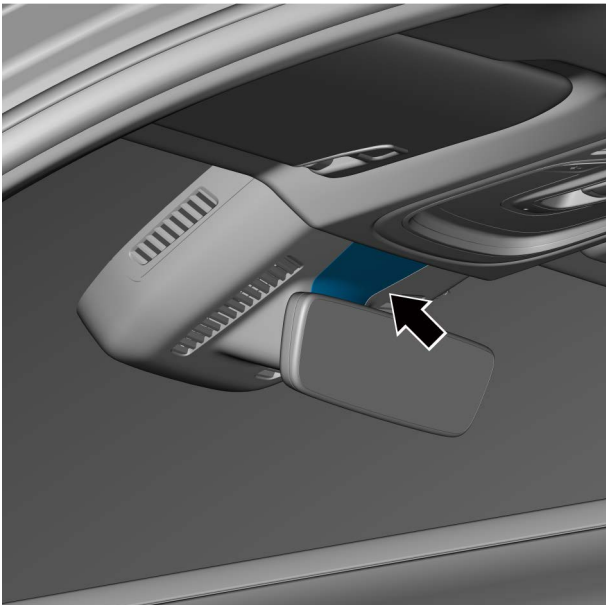
12.4.6.22 Replacement of interior rearview mirror module

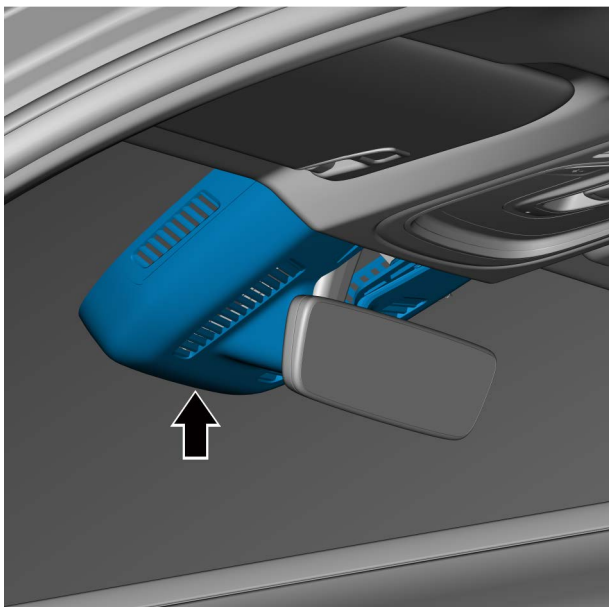
Removal Procedure

Warning !

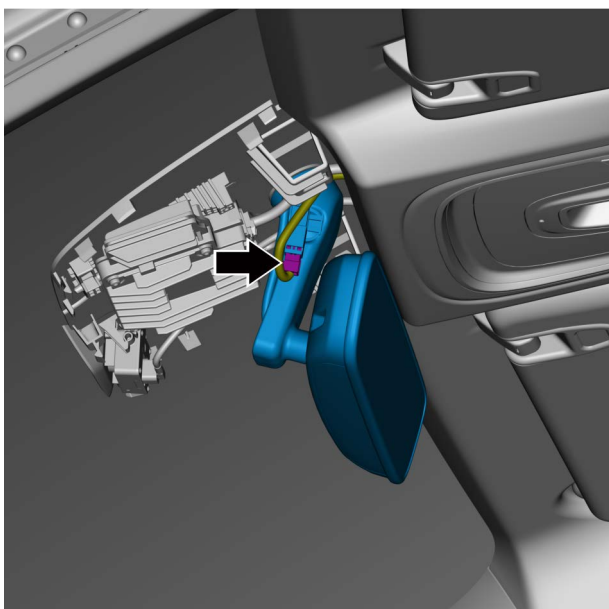
Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the rain and light sensor front trim cover.

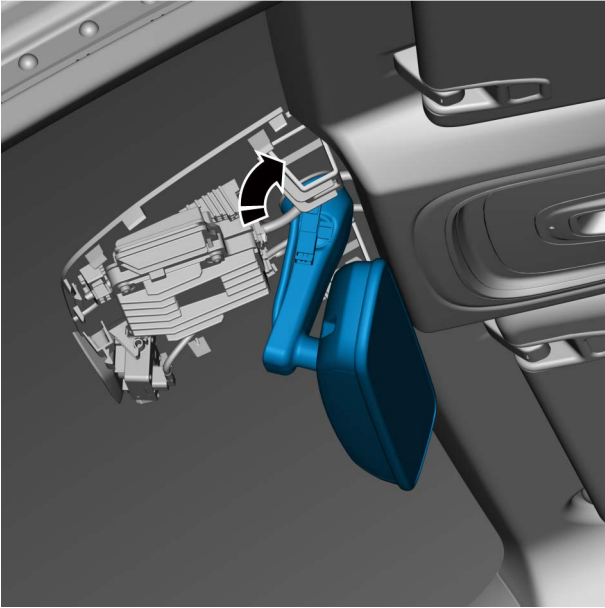




3 Remove the rain and light sensor rear trim cover.



4 Disconnect the harness connector of interior rearview mirror.

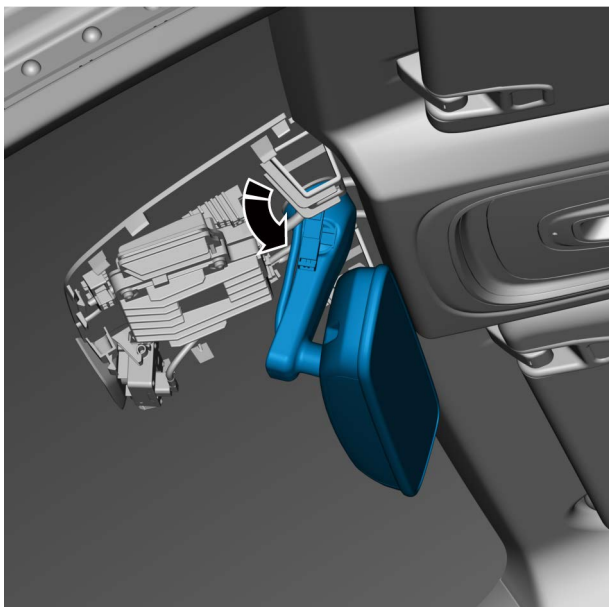


- 5 Rotate the interior mirror module base to remove the interior mirror module.

Caution

Be careful not to scratch the glass.

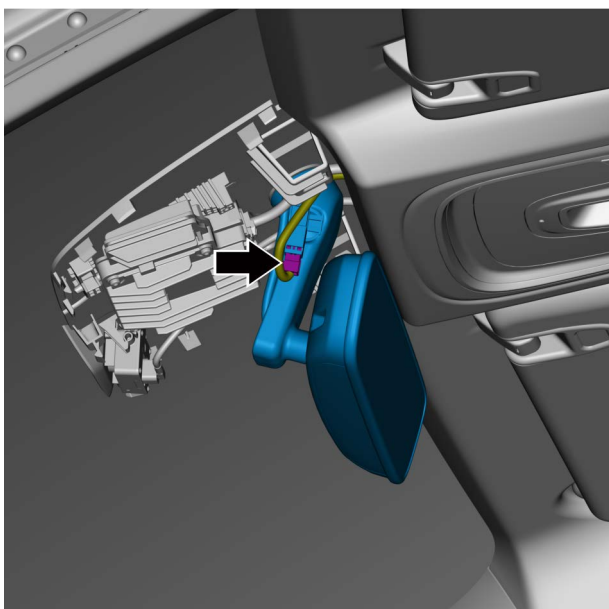
Installation Procedure



- 1 Snap the interior rearview mirror module into the base and rotate the module to the mounting position.

Caution

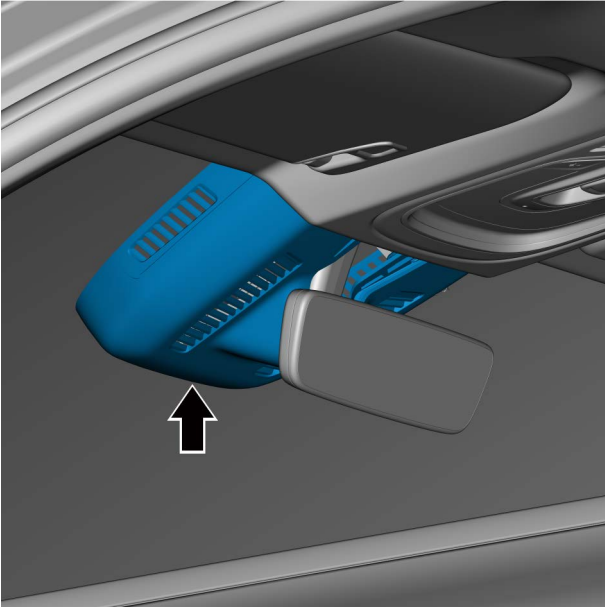
Be careful not to scratch the glass.



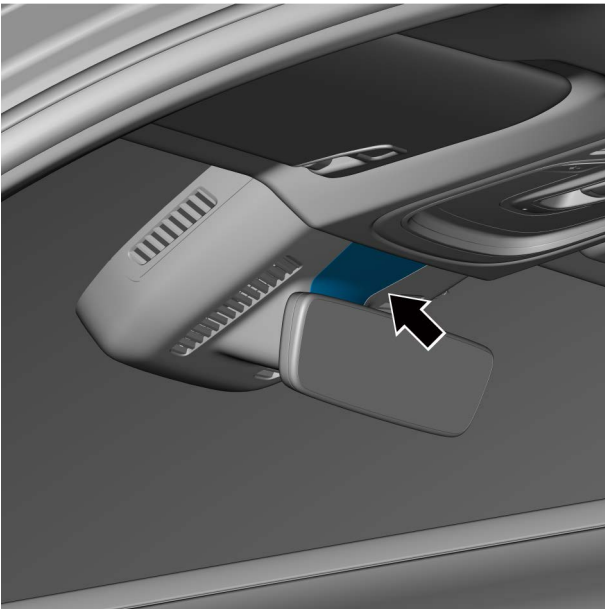
- 2 Connect the harness connector of interior rearview mirror.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 3 Install the rain and light sensor rear trim cover.



- 4 Install the rain and light sensor front trim cover.

- 5 Connect the negative cable of battery.

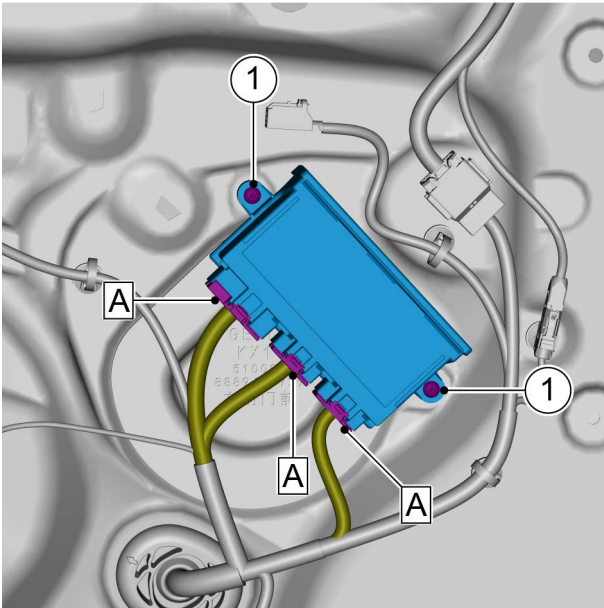
12.4.6.23 Replacement of driver door module

Removal Procedure

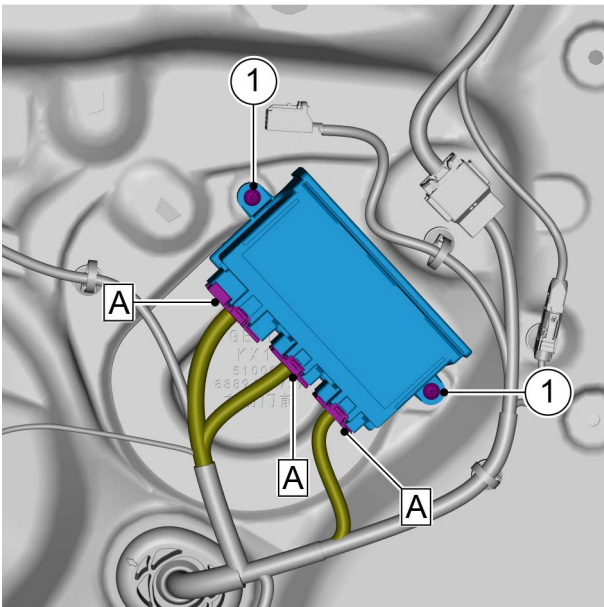
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left front door interior trim panel assembly, refer to [Replacement of left front door interior trim panel assembly](#).



- 3 Disconnect 3 harness connectors A of driver door module.
- 4 Remove the 2 fixing bolts 1 of driver door module and remove the driver door module.



Installation Procedure

- 1 Install the 2 fixing bolts 1 of driver door module.
Torque: 2.5N·m
- 2 Connect the 3 harness connectors A of driver door module.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 3 Install the assembly-interior trim panel left front door.
- 4 Connect the negative cable of battery.
- 5 The GLDS diagnostic program is required, under the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software brushing operation.

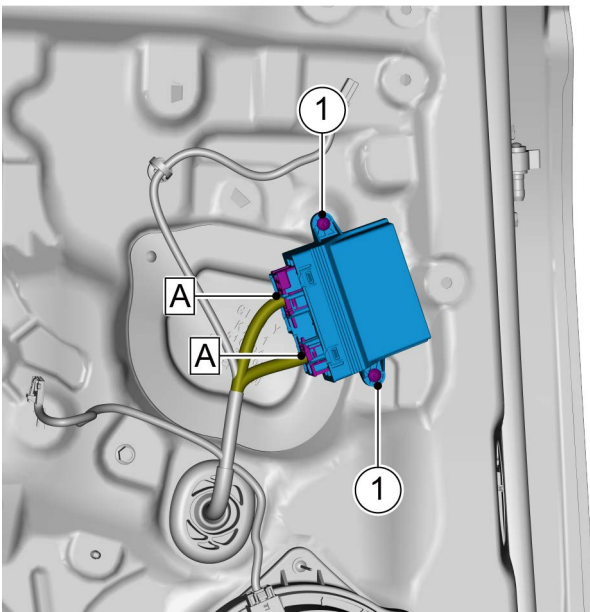
12.4.6.24 Replacement of left rear door module

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

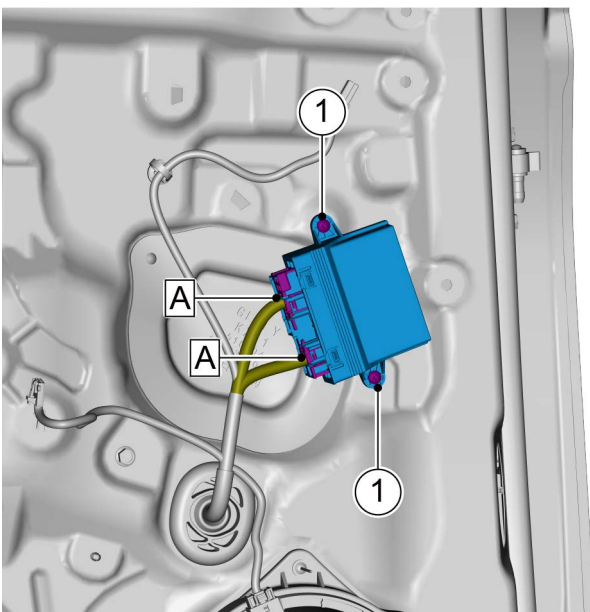
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left rear door interior trim panel assembly, refer to [Replacement of left rear door interior trim panel assembly](#).
- 3 Disconnect the 2 harness connectors A of left rear door module.
- 4 Remove the 2 fixing bolts 1 of left rear door module and remove the left rear door module.

**Installation Procedure**

- 1 Install the 2 fixing bolts 1 of left rear door module.
Torque: 2.5N·m
- 2 Connect the 2 harness connectors A of left rear door module.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 3 Install the left rear door interior trim panel assembly.

- 4 Connect the negative cable of battery.
- 5 The GLDS diagnostic program is required, under the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software brushing operation.

12.5 Wiper/washer system

12.5.1 Specification

12.5.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Front wiper arm fixing nut	M10×10	25-35
Front wiper motor fixing bolt	M6×30	8.5-11.5
Cleaning agent box fixing nut	M6×7.8	5-7
Rear wiper arm and blade assembly fixing nut	M8×8	11-15
Rear wiper motor fixing bolt	M6×25	8.5-11.5

12.5.2 Instructions and operations

12.5.2.1 Instructions and operations

The wiper/washer system consists of the following parts:

- Central electronic module (CEM)
- Wiper steering wheel module
- Front wiper fuse
- Cleaning agent box
- Front wiper motor
- Window washer pump
- Front wiper arm and blade
- Rear wiper arm and blade assembly
- Rear wiper motor
- Front washer nozzle assembly
- Rear washer nozzle
- Rain and Light Sensor Module

After front and rear wiper switches provide signal to central electronic module (CEM) and CEM receives the signal of wiper switch, front wiper motor is started. When the wiper switch is in low speed gear, the current flows from the low-speed brush of the motor into the armature coil, generating a great counter electromotive force, as a result of which the motor rotates at a low speed; when the wiper switch is in high gear, the current flows from the high-speed brush of the motor into the armature coil, generating a small counter electromotive force, as a result of which the motor rotates at a high speed; when the wiper washer switch is activated, the wiper jet pump is in operation at this time; after the washer switch is operated continuously, the wiper motor starts to rotate at a low gear as well. When the wiper switch is turned off, the wiper motor will not stop immediately under the inertia of the armature and will continue to rotate for a while, and at the same time, the armature generates a counter electromotive force, which produces an electric brake on the wiper motor, and the motor stops at a fixed position.

The wiper/washer system is divided into the front wiper/washer system and the rear wiper/washer system. The wiper switch is located on the lever on the right side of the steering column and is integrated into the steering wheel module.

1. Front wiper/washer system

The front wiper/washer system consists of the wiper steering wheel module, rain and light sensor function, front wiper motor, wiper arms and blades, glass cleaning agent, cleaning agent box, window washer pump, hose and nozzle. The front wiper circuit has a self-stop device consisting of a worm gear and a cam disc designed to briefly keep the circuit intact even

after the wiper/washer switch has been disconnected until the wiper arm is fully returned to its initial position. The wiper system is driven by a permanent magnet motor, which is mounted on the front wall and is directly connected to the front wiper linkage.

The front windshield cleaning agent box is mounted under the right headlamp assembly and in front of the right front wing liner. Window washer pump is fixed to the cleaning agent box and window washer pump enables the cleaning agent to be delivered to the 2 nozzles via a hose.

2. Rear wiper/washer system

The rear wiper/washer system consists of glass cleaning agent, cleaning agent box, window washer pump, hose, nozzle, rear wiper motor, wiper arm and blade and wiper steering wheel module. The rear windshield cleaning agent box is mounted under the right headlamp assembly, in front of the right front fender liner. Window washer pump is fixed to the cleaning agent box, and window washer pump allows the cleaning agent to be transported through the hose to 1 nozzle.

Front wiper automatic mode

When the vehicle ignition is in the ON position, toggle the wiper control handle to the AUTO position to let the front wiper enter automatic mode and perform automatic wiping operation. At this time, the wiper control system automatically adjusts the wiping speed according to the amount of rain. The sensitivity of the wiper system to rain can be adjusted by turning the automatic wiper sensitivity adjustment knob. When the scale bar pointed to by the logo changes from wide to narrow, it indicates that the sensitivity of the wiper system is from strong to weak.

Switching from low speed to high speed or from high speed to low speed in automatic mode can only be done after the front wiper reaches the stop position, and the wiper will immediately switch to high speed mode when a heavy rain signal request is received.

When rain and light sensor requests to switch from high speed or low speed mode to off, the body controller will continue to control the front wiper at low speed until it returns to the stop position. If the wipers are already in the stop position when the rain and light sensor requests to turn off, the body controller will immediately turn off the front wipers.

Rear wiper



Press switch 1 for intermittent rear wiper, press switch 2 for continuous rear wiper, when the button is in the centered position, the rear wiper stops.

Rain and light sensor function

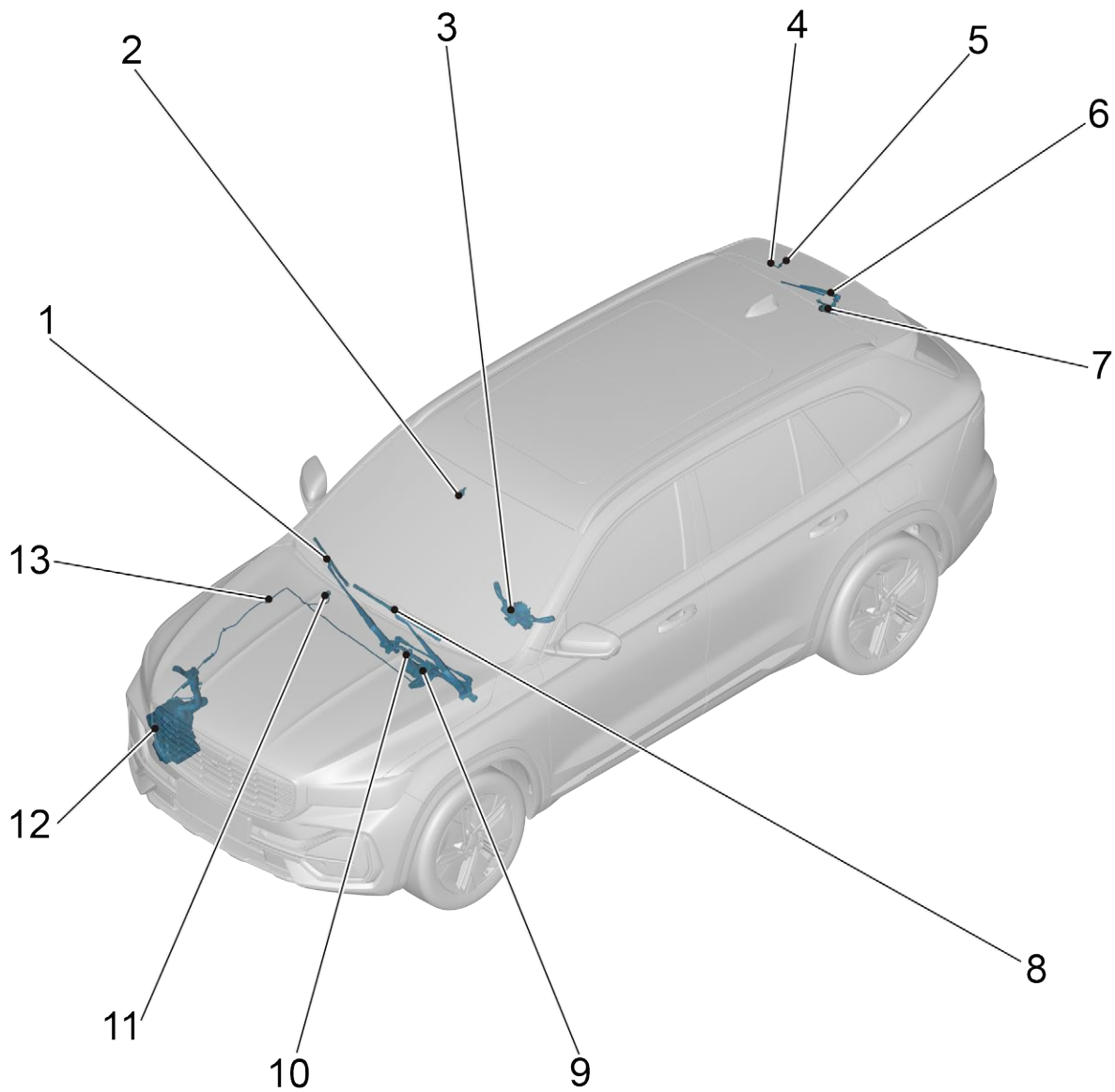
When rain and light sensor is activated, the wiper action is activated by raindrops falling in the sensing area. Depending on the amount of rain and the sensitivity selected by the driver, the sensor sends signals via the LIN bus to control the wiper speed, including intermittent wiping, low-speed continuous wiping, and high-speed continuous wiping. The transition between each mode is smooth without uneven speed.

Rain and light sensor can not recognize fog, you must manually turn on the defogging (except for sensors with automatic defogging function), if the fog condenses into water droplets falling on the sensor sensing area, depending on the sensitivity of the setting, the wiper may act correspondingly.

Rain and light sensor have an anti-interference mechanism, external interference such as marks on the glass, changes in ambient light, strong ambient light, temperature changes, icing and dust on the glass surface will not cause the wiper to malfunction or reduce the sensitivity of the sensors, but it is still necessary to keep the area of rain and light sensor clean.

12.5.3 Part position

12.5.3.1 Part position

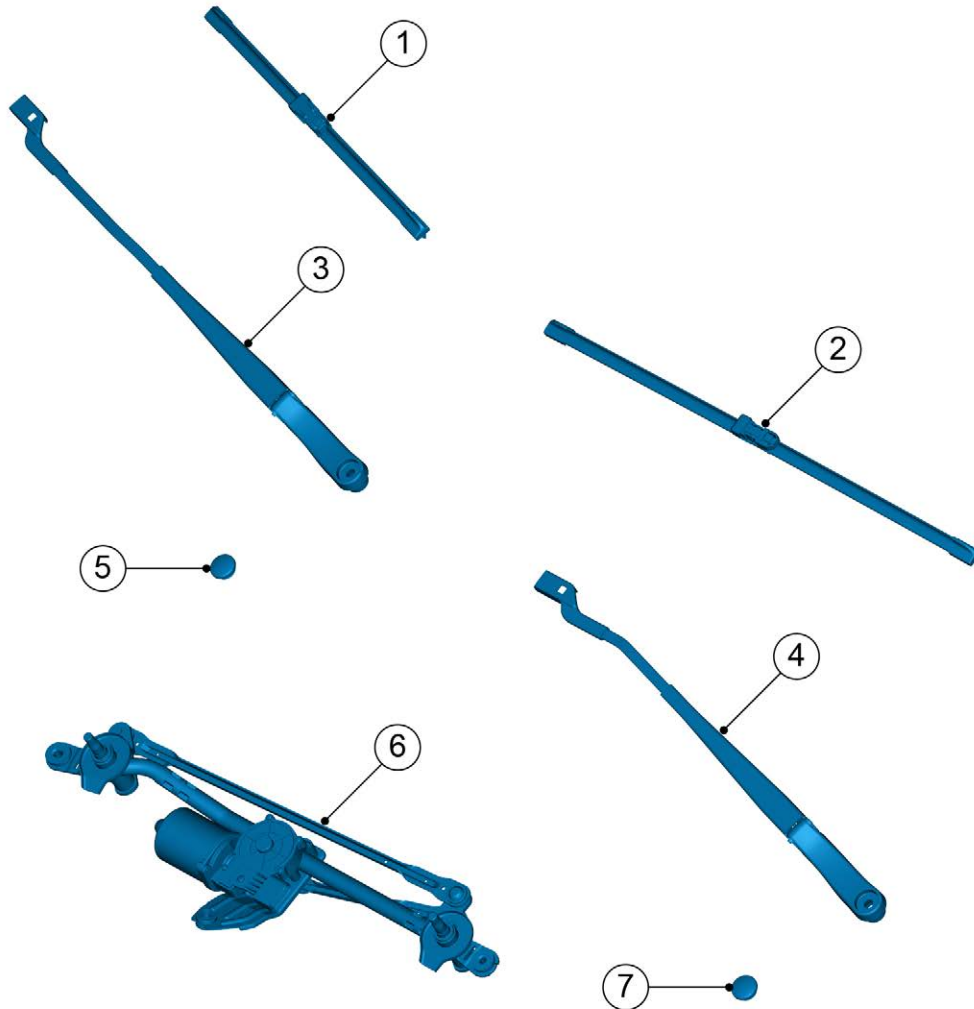


- | | |
|---|--|
| 1. Right front wiper arm and blade assembly | 8. Left front wiper arm and blade assembly |
| 2. Rain and Light Sensor Module | 9. Front wiper motor and linkage assembly |
| 3. Steering wheel module (wiper combination switch) | 10. Front washer nozzle assembly |
| 4. Rear washer hose assembly | 11. Front washer nozzle assembly |
| 5. Rear washer nozzle | 12. Cleaning agent box |
| 6. Rear wiper arm and blade assembly | 13. Front washer hose (2) |
| 7. Rear wiper motor | |

12.5.4 Breakdown drawing

12.5.4.1 Breakdown drawing

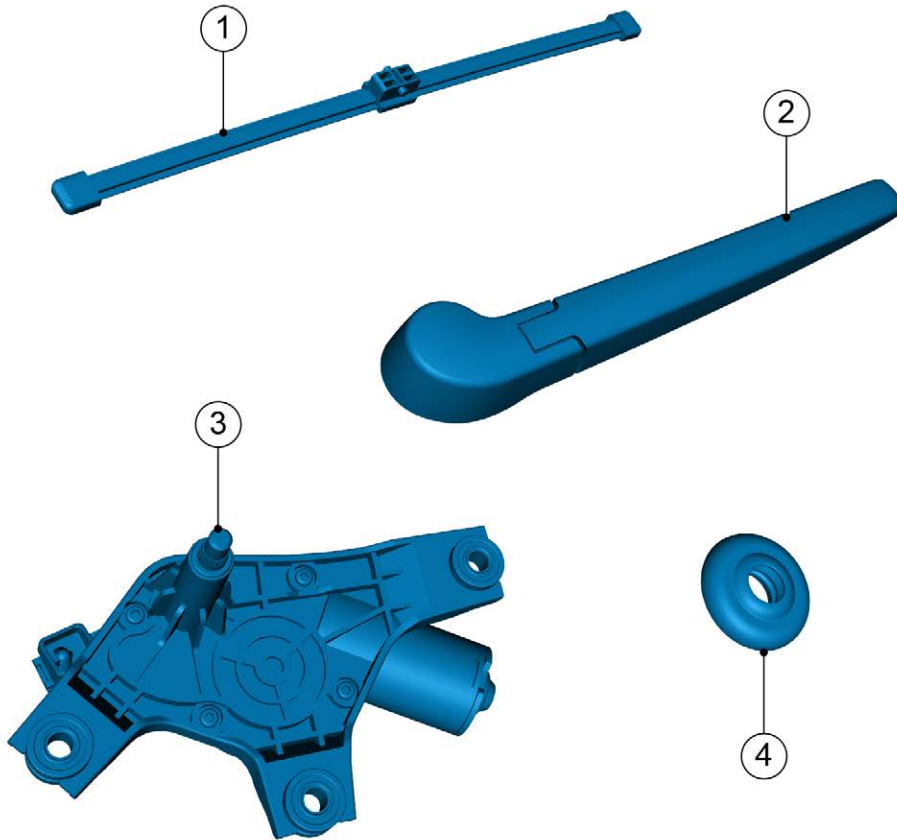
Wiper mechanisms



1. Right wiper blade assembly
2. Left wiper blade assembly
3. Right wiper arm assembly
4. Left wiper arm assembly

5. Nut caps of front wiper arms
6. Wiper motor and linkage assembly
7. Nut caps of front wiper arms

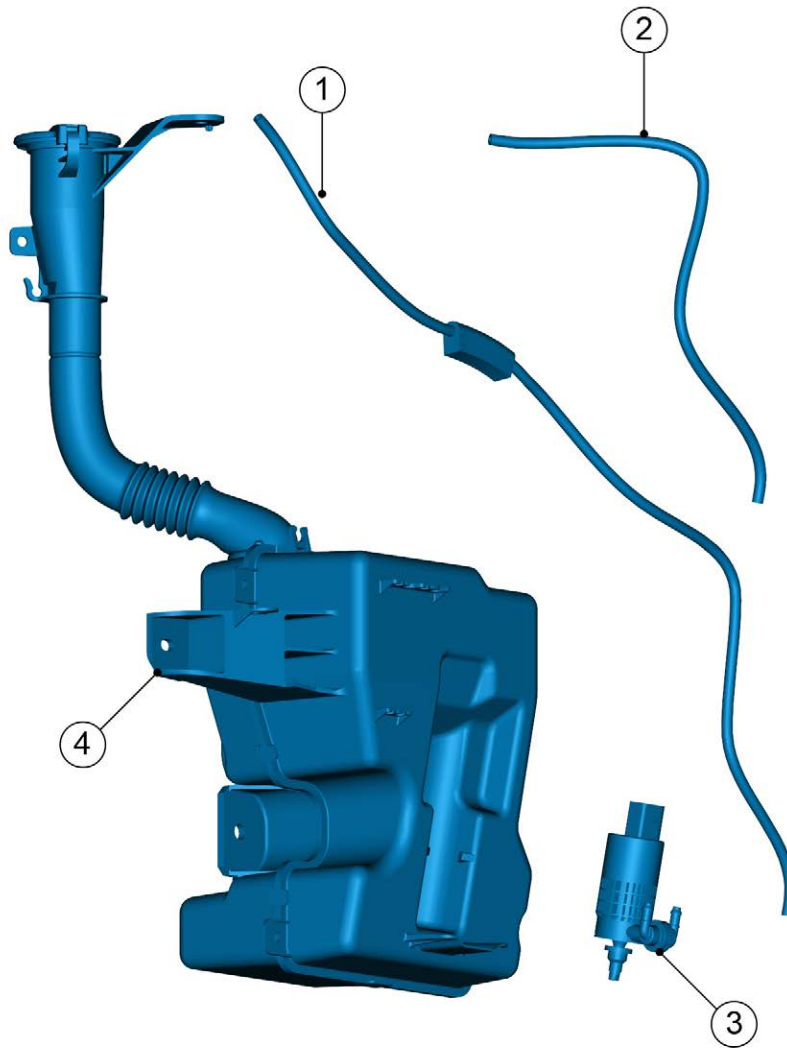
Rear wiper mechanism



1. Rear wiper blade assembly
2. Rear wiper arm assembly

3. Rear wiper motor
4. Rear wiper rubber plug

Washer



1. Window washer hose

2. Window washer rear washer hose

3. Window washer pump

4. Cleaning agent box

12.5.5 Diagnostic information and procedure

12.5.5.1 Diagnosis description

See [Description and Operation](#) before diagnosing a malfunction in the wiper/cleaning system. Understanding and familiarizing yourself with the operation of the wiper/cleaning system before beginning system diagnosis will help determine the correct troubleshooting steps to take in the event of a malfunction, and more importantly this will help determine if the condition described by the customer is normal operation. Any troubleshooting of the wiper/cleaning system should start with a [Visual Check](#) that guides the repairer to the next logical step in the troubleshooting process. Understanding and using the diagnostic process correctly will reduce diagnostic time and avoid misdiagnosis of the fault area.

12.5.5.2 Visual check

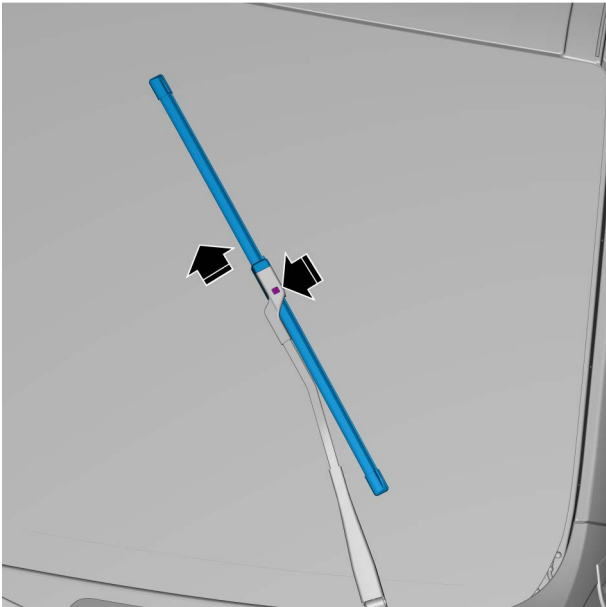
- Check after-sales installations that may affect the operation of the wiper/cleaning system to ensure that these devices cannot affect the operation of the wiper/cleaning system.
- Check system components that are easily accessible or can be seen to find out if there is any obvious damage of the component or there is a situation that may cause a fault.
- Check the harness and harness connector to ensure that there is no sign of loosening, damage, poor contact, aging, etc.
- Check and confirm that the cleaning agent level of cleaning agent tank is normal.

12.5.6 Removal and Installation

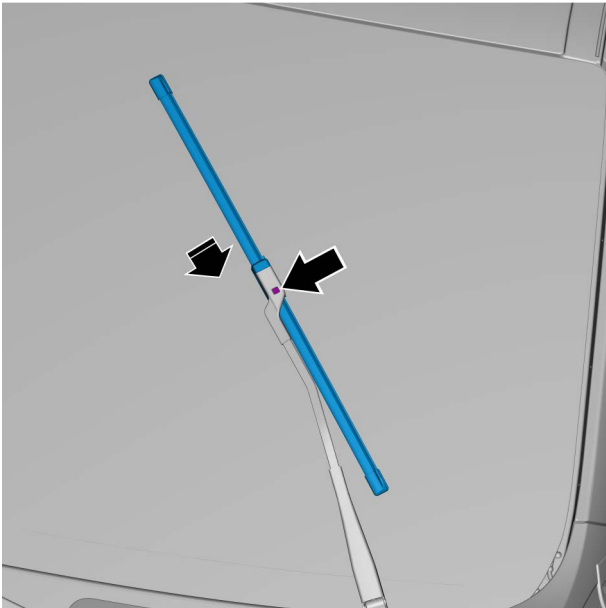
12.5.6.1 Replacement of front wiper blades

Removal Procedure

- 1 It is necessary to turn the wiper to the service mode before lifting the wiper arm assembly.
- 2 Enable the front wiper service position. (When the vehicle is stationary and the wiper steering wheel module is in the O gear, select: Vehicle Settings→Basic Vehicle Settings→Wipers on the multimedia display screen in order, and then enable or disable the front wiper service position function in this interface. The wiper automatically moves to the vertical position after the function is turned on.)
- 3 Lift the front wiper arm assembly.
- 4 Press the wiper blade fixing clips downward and remove the front wiper blade from the front wiper arm outward.



Installation Procedure



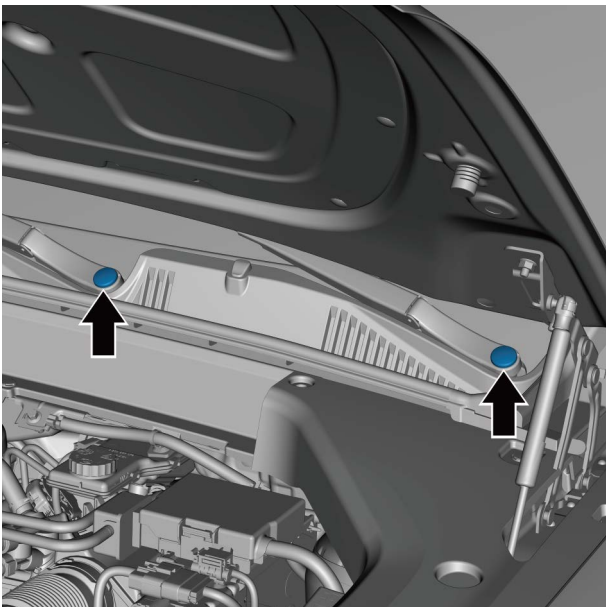
- 1 Install the front wiper blade onto the wiper arm, press the front wiper blade toward the center and hold both sides of the front wiper blade fixing clips so that the front wiper blade is firmly installed.
- 2 Gently lower the front wiper arm.

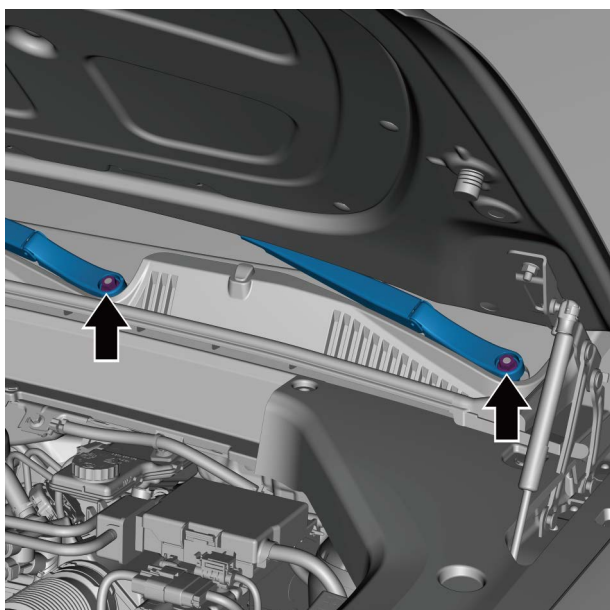
- 3 Close the front wiper service position.
- 4 Switch the start switch to ON and operate the wiper steering wheel module, the wipers will automatically return to the original position.

12.5.6.2 Replacement of front wiper arm

Removal Procedure

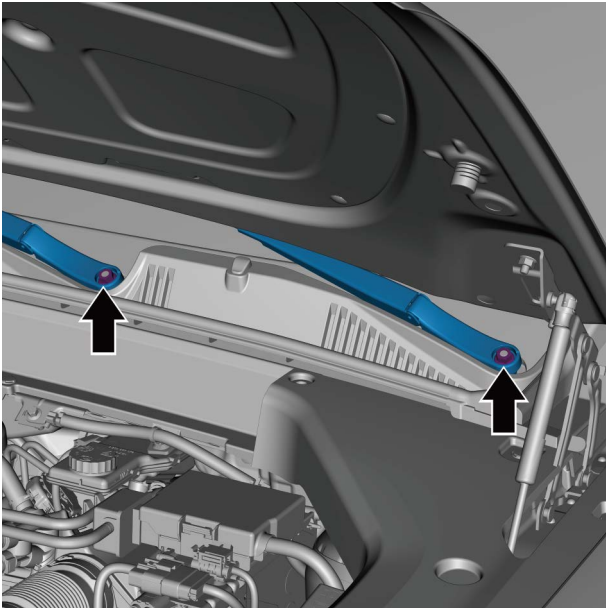
- 1 Open the engine compartment hood.
- 2 Stop the front wiper arm assembly in the initial position before removing it.
- 3 Remove the cover plate on the front wiper arm.



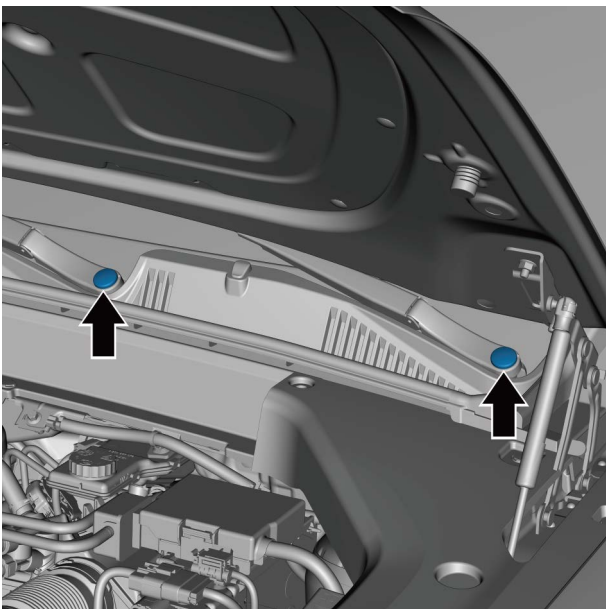


- 4 Remove the wiper arm fixing nut.
- 5 Remove the front wiper arm.

Installation Procedure



- 1 Install the front wiper arm and tighten the fixing nut.
Torque: 30N·m



- 2 Install the cover plate on the front wiper arm nut.

- 3 Close the engine compartment cover.

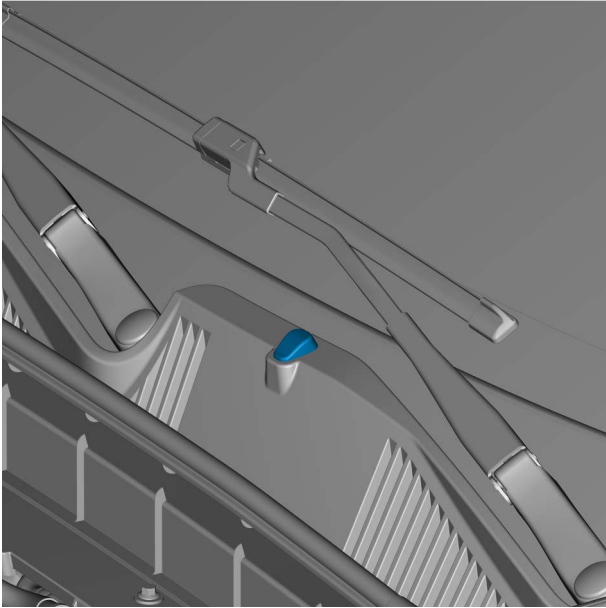
12.5.6.3 Replacement of front washer nozzle assembly

Removal Procedure

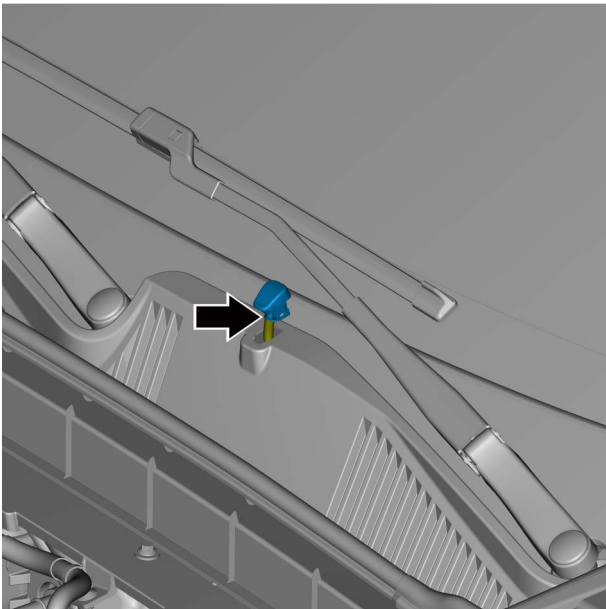
Caution

The following is the procedure for replacing the left front washer nozzle assembly, the right front washer nozzle assembly is removed in a similar manner to the left front.

- 1 Open the engine compartment hood.

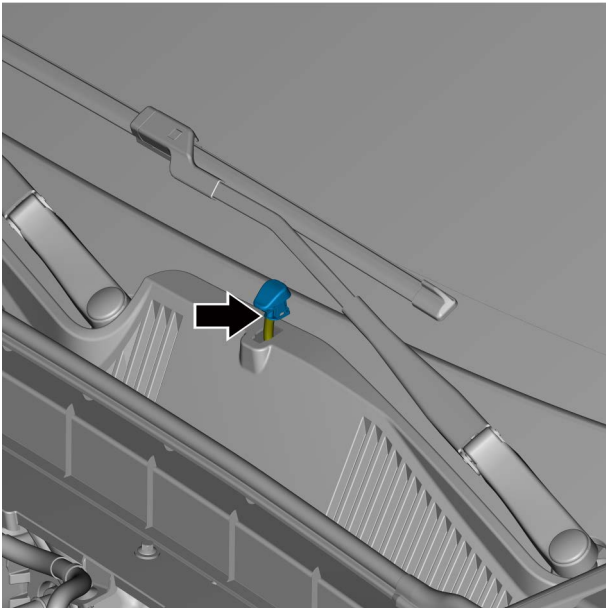


2 Remove the front washer nozzle assembly.

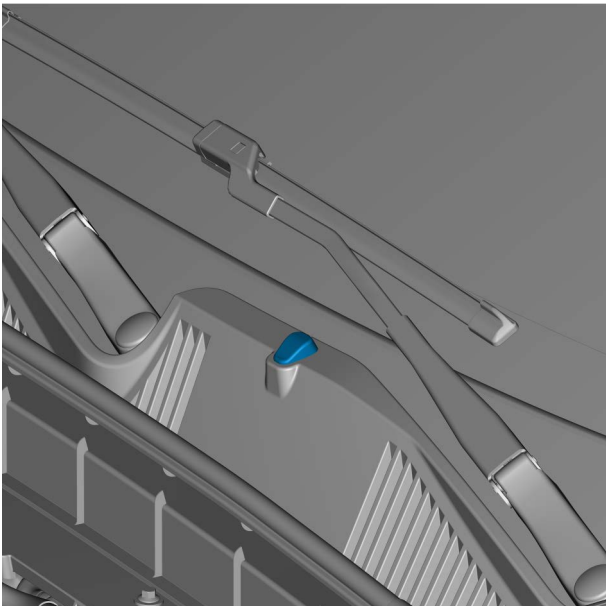


3 Disconnect the distributor nozzle connection hose and remove the front washer nozzle assembly.

Installation Procedure



- 1 Connect the front washer nozzle hose.

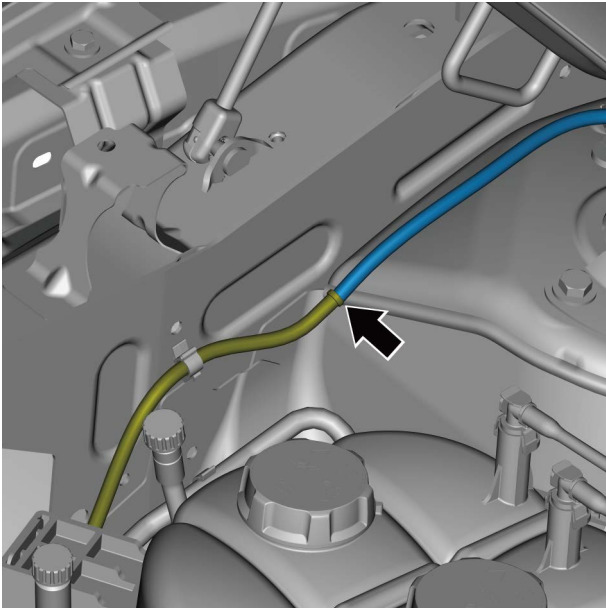


- 2 Install the front washer nozzle assembly.

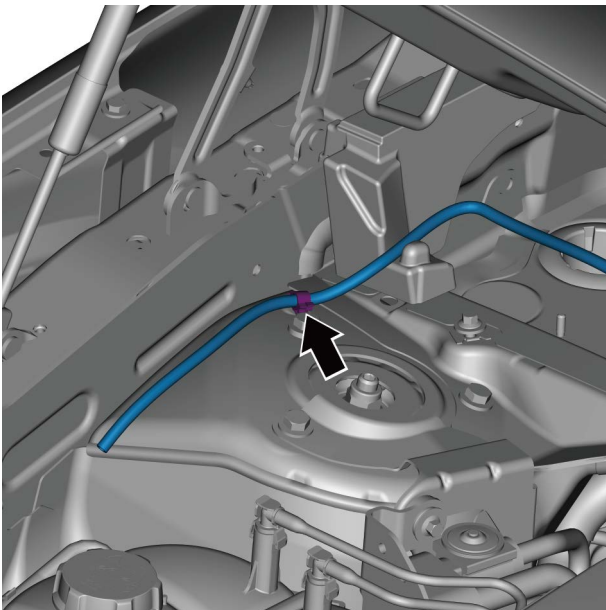
- 3 Close the engine compartment cover.

12.5.6.4 Replacement of front washer hose (2)

Removal Procedure

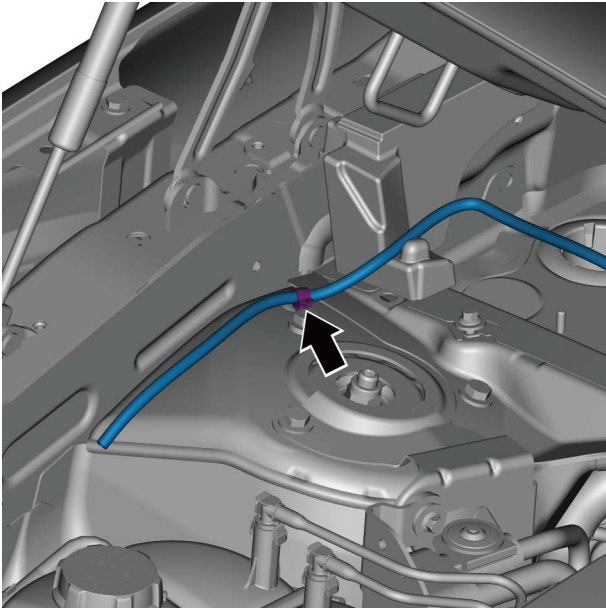


- 1 Remove the ventilation cover plate assembly, refer to [Replacement of ventilation cover plate assembly](#).
- 2 Disconnect the connection between the front washer hose (2) and the window washer hose.

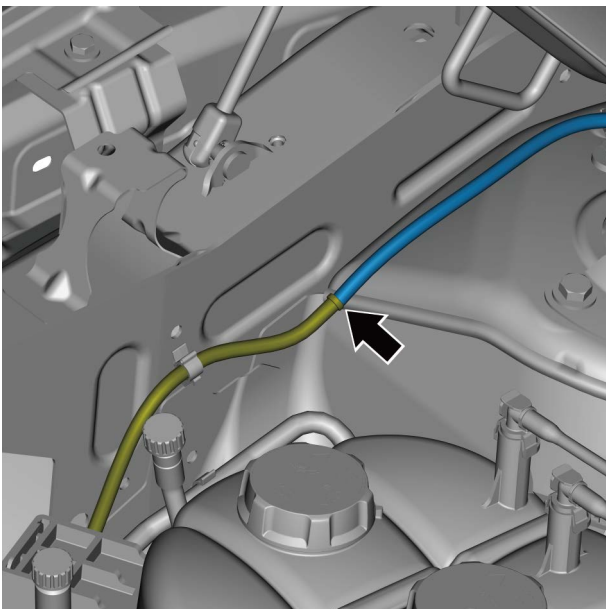


- 3 Remove the fixing clip of front washer hose (2) and take off the front washer hose (2).

Installation Procedure



- 1 Install the fixing clip of front washer hose (2).

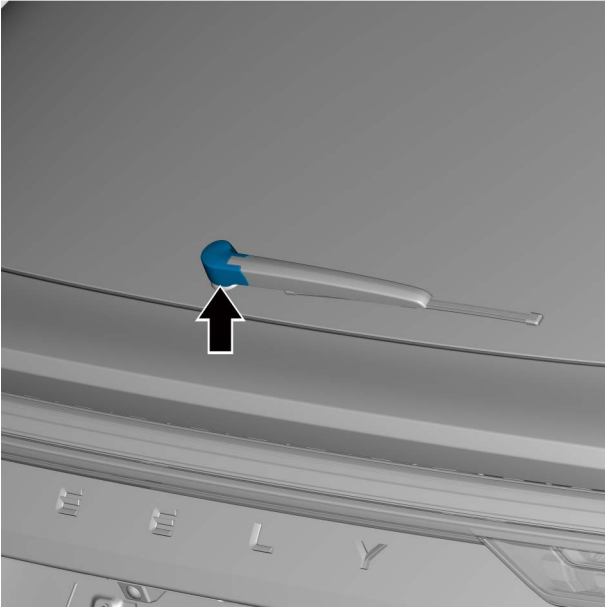


- 2 Connect the connection between the front washer hose (2) and the window washer hose.

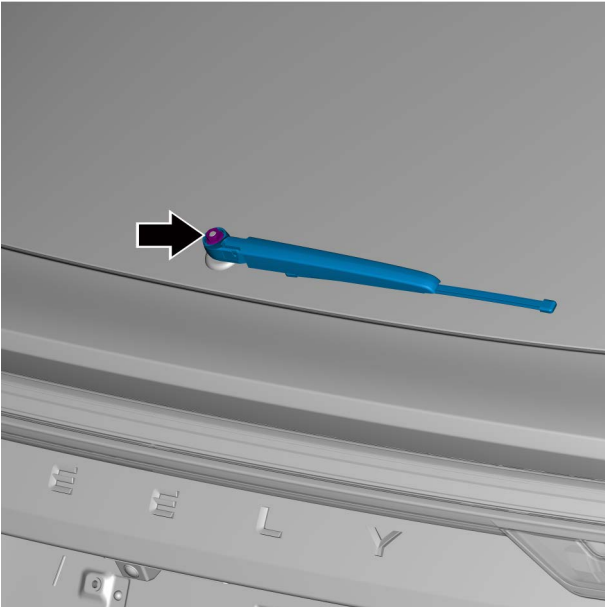
- 3 Install the ventilation cover plate assembly.

12.5.6.5 Replacement of rear wiper arm and blade assembly

Removal Procedure

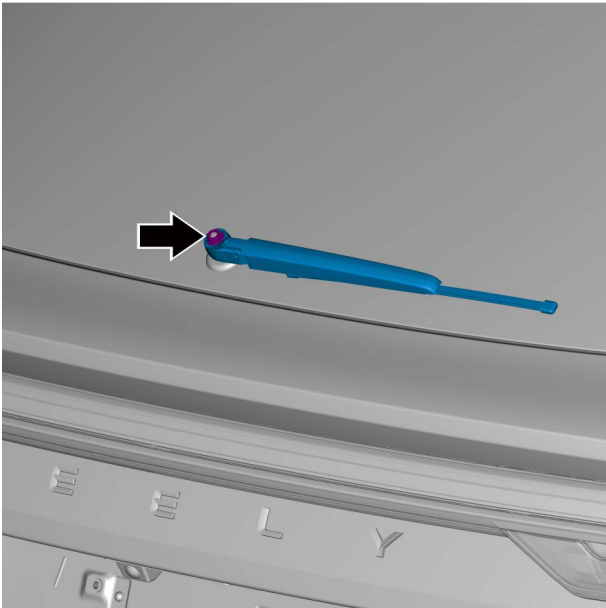


- 1 Remove the fixing nut cap of rear wiper arm and blade assembly.

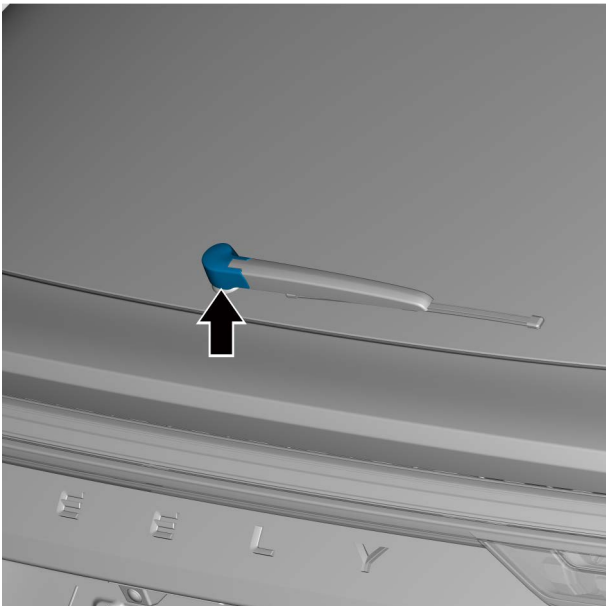


- 2 Remove the rear wiper arm and blade assembly fixing nut.
- 3 Remove the rear wiper arm and blade assembly.

Installation Procedure



- 1 Install the rear wiper arm and blade assembly fixing nut.
Torque: 13N·m



- 2 Install the fixing nut cap of rear wiper arm and blade assembly.

12.5.6.6 Replacement of rear washer nozzle

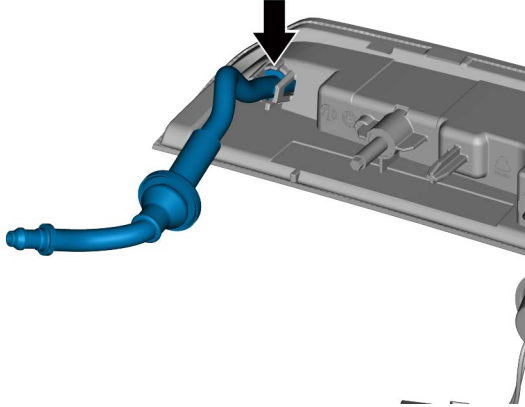
Removal Procedure

Warning !

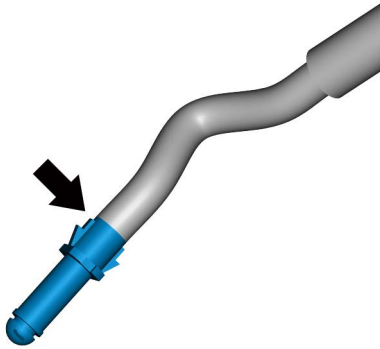
Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the rear window brake lamp, refer to [Replacement of rear window brake lamp](#).

- 3 Remove the rear washer hose assembly and nozzle.

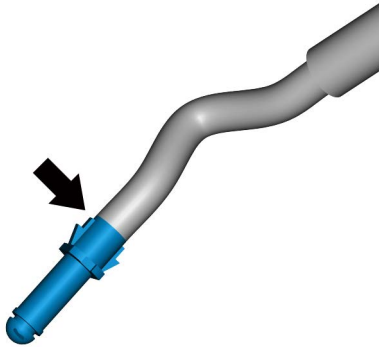


- 4 Disconnect the rear washer nozzle from the hose and remove the rear washer nozzle.

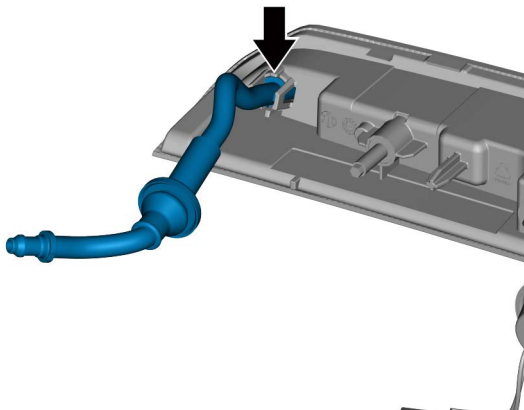


Installation Procedure

- 1 Connect the rear washer nozzle and hose.



- 2 Connect the rear washer nozzle and hose to the rear window brake lamp.



- 3 Install the rear window brake lamp.
- 4 Connect the negative cable of battery.

12.5.6.7 Replacement of rear washer hose assembly

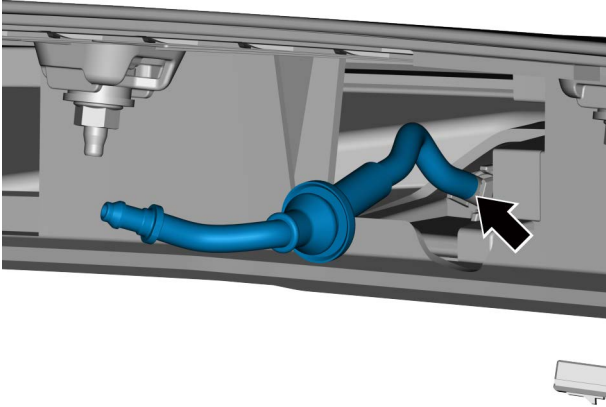
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

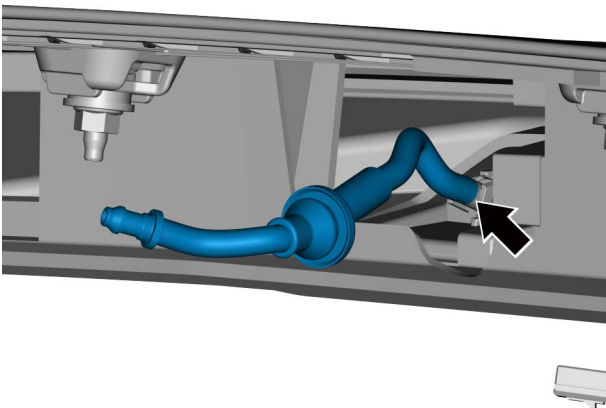
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

- 2 Remove spoiler assembly, refer to [Replacement of spoiler assembly](#).
- 3 Remove the rear washer hose assembly.



Installation Procedure

- 1 Install the rear washer hose assembly.



- 2 Install the rear spoiler assembly.
- 3 Connect the negative cable of battery.

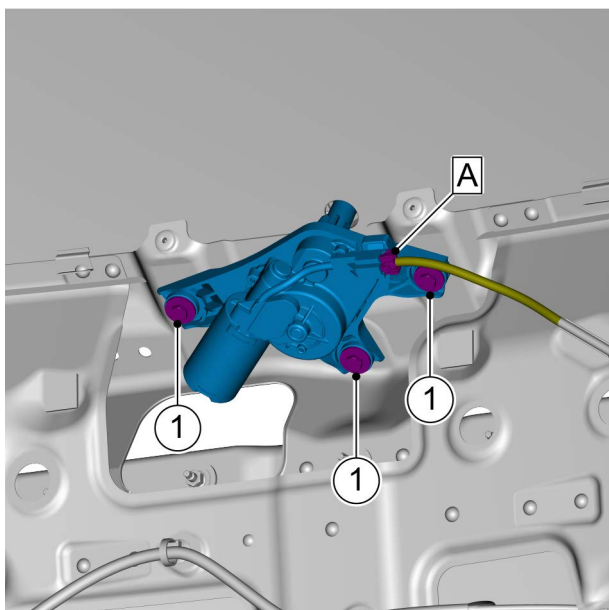
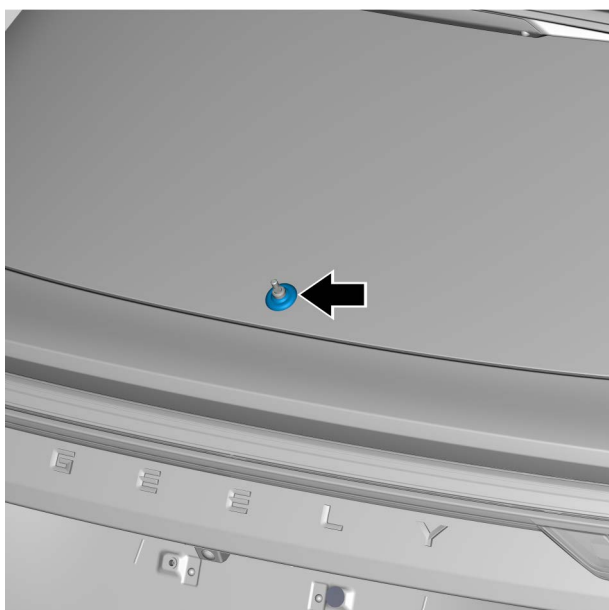
12.5.6.8 Replacement of rear wiper motor

Removal Procedure

Warning !

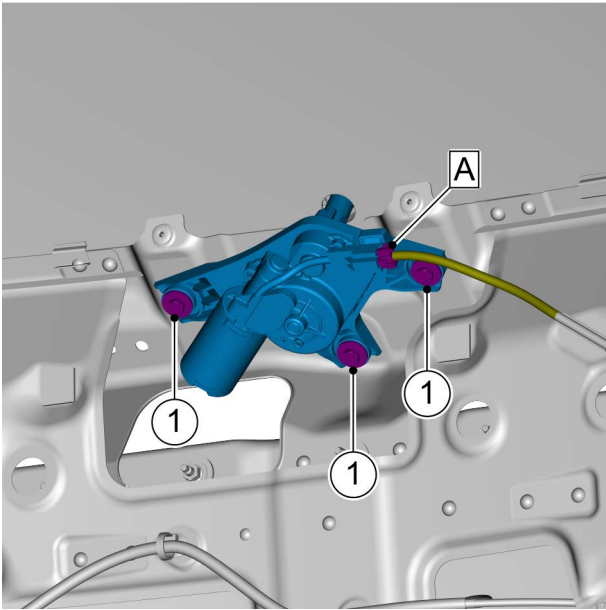
Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the rear wiper arm and blade assembly, refer to [Replacement of rear wiper arm and blade assembly](#).
- 3 Remove the trunk door lower interior trim panel assembly, refer to [Replacement of trunk door lower interior trim panel assembly](#).
- 4 Remove the rear wiper rubber plug.



- 5 Disconnect the rear wiper motor harness connector A.
- 6 Remove the 3 fixing bolts 1 of rear wiper motor.
- 7 Remove the rear wiper motor.

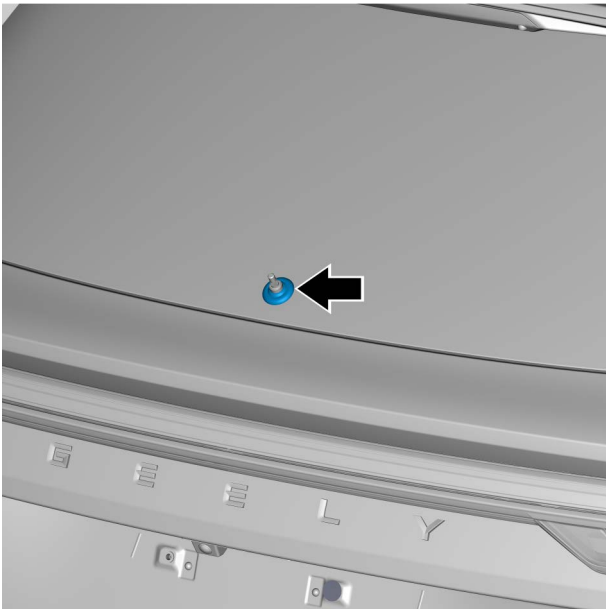
Installation Procedure



- 1 Install the 3 fixing bolts 1 of rear wiper motor.
Torque: 10N·m
- 2 Connect rear wiper motor harness connector A.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 3 Install the rear wiper rubber plug.

- 4 Install assembly of interior trim panel of tail gate.
- 5 Install the rear wiper arm and blade assembly.
- 6 Connect the negative cable of battery.

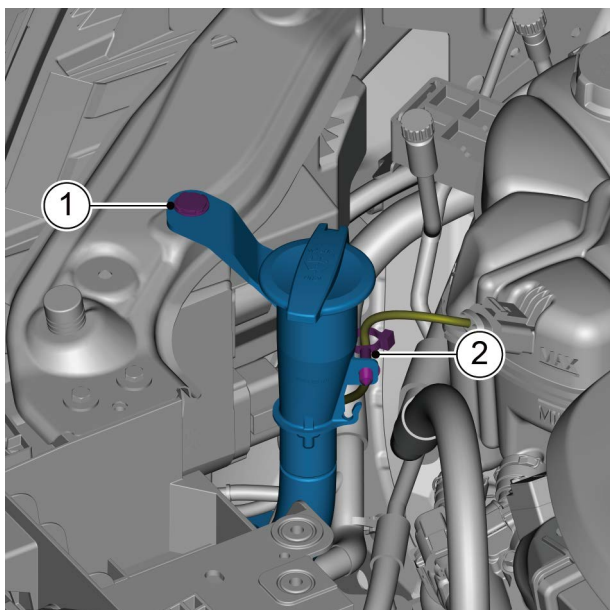
12.5.6.9 Replacement of cleaning agent box

Removal Procedure

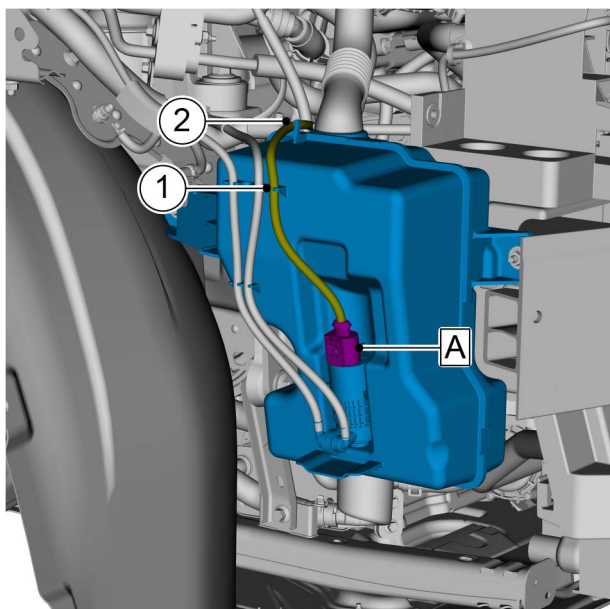
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

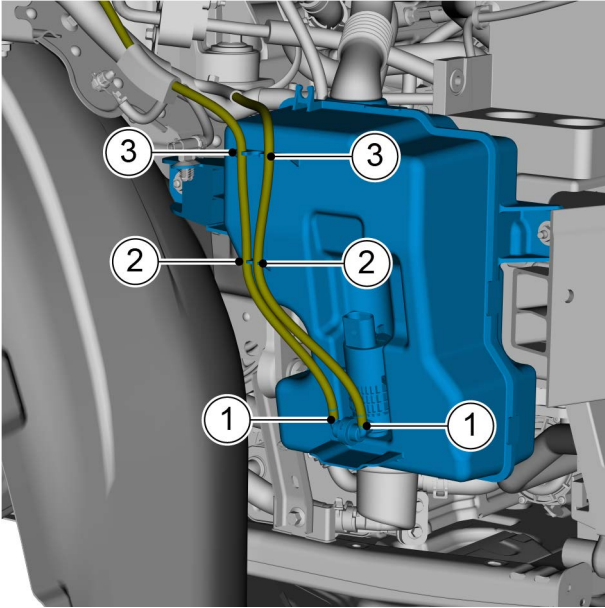
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the front bumper assembly, refer to [Replacement of front bumper assembly](#).



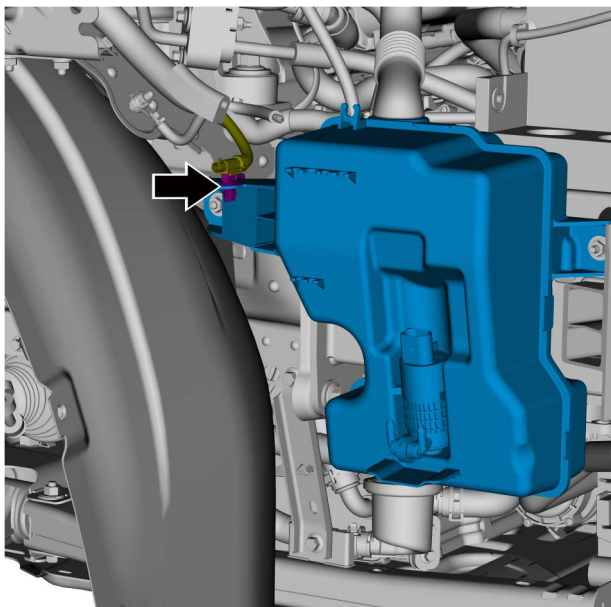
- 3 Drain the glass cleaning agent.
- 4 Remove the fixing clip 1 and harness clip 2 of window washer filler tube with lid assembly.



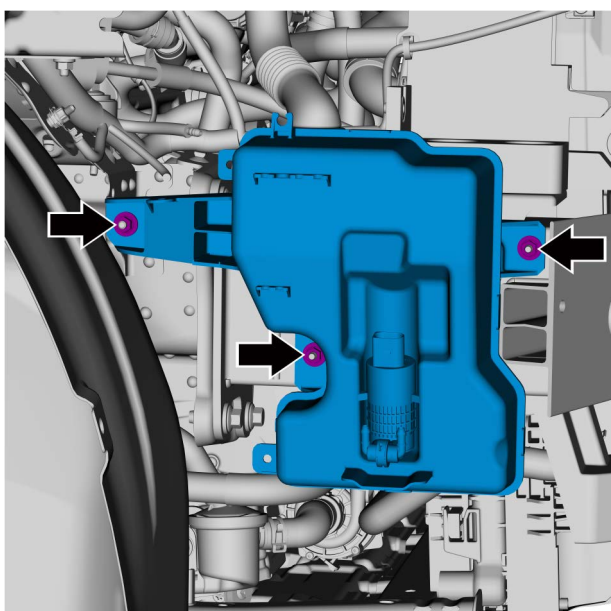
- 5 Disconnect window washer pump harness connector A and disengage harness clips 1 and 2.



- 6 Disconnect the window washer hose from the window washer pump connection 1.
- 7 Disengage the slot 2 and slot 3 where the window washer hose is connected to the cleaning agent box.

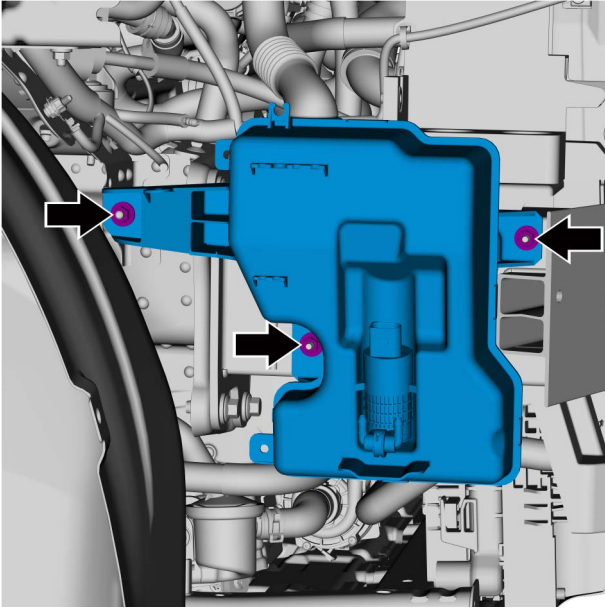


8 Remove the 1 fixing clip of floor harness.

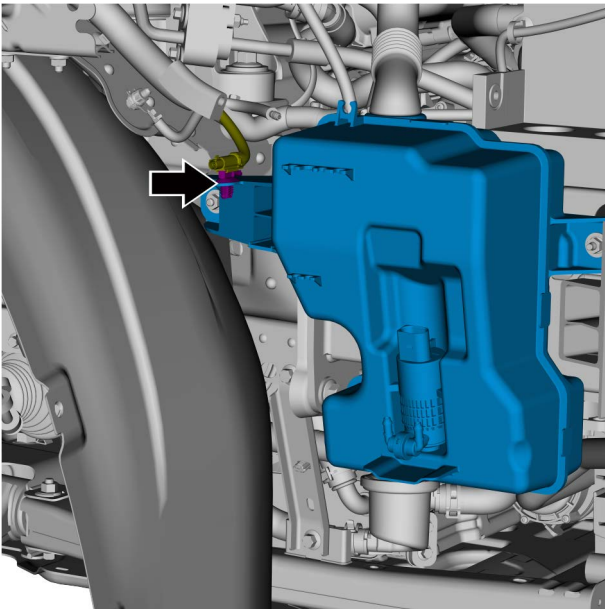


9 Remove the 3 fixing nuts of the cleaning agent box and remove the box.

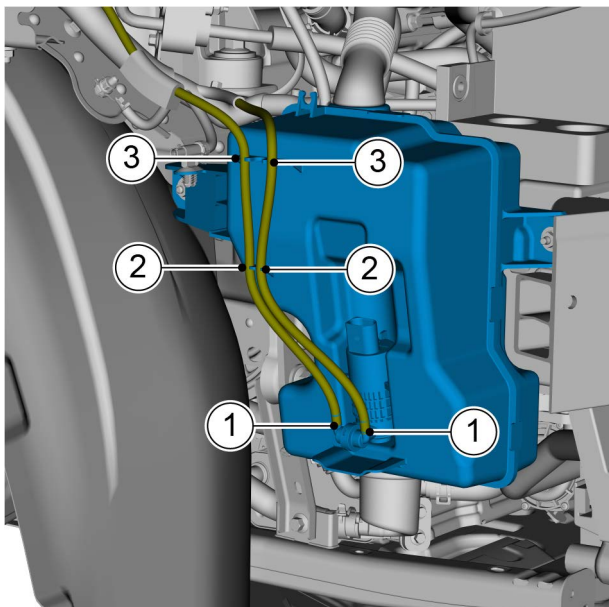
Installation Procedure



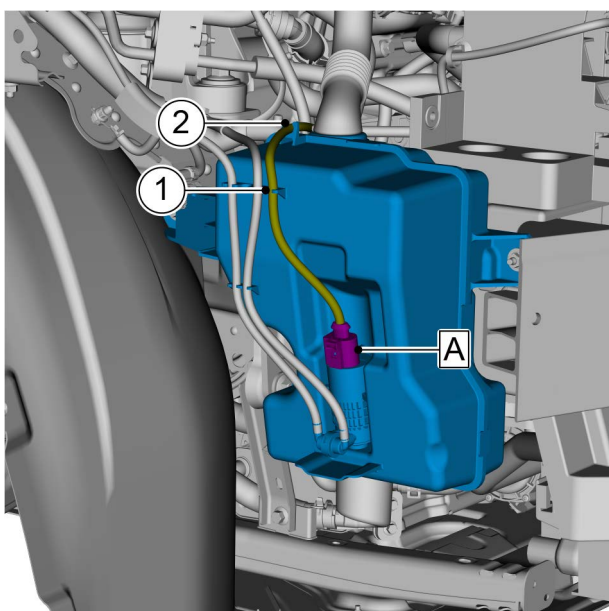
- 1 Install the 3 fixing nuts of cleaning agent box.
Torque: 6N·m



- 2 Install the 1 fixing clip of floor harness.



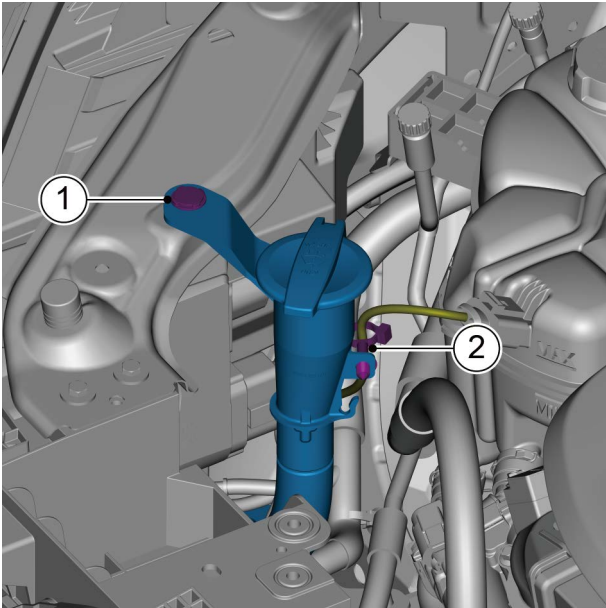
- 3 Connect the window washer hose to the window washer pump connection 1.
- 4 Install the slot 2 and slot 3 where the washer bottle hose is connected to the cleaning agent box.



- 5 Connect the window washer pump harness connector A and install the harness clips 1 and 2.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 6 Install the fixing clip 1 and harness clip 2 of window washer filler tube with lid assembly.

- 7 Fill glass cleaning agent.
- 8 Install the front bumper assembly.
- 9 Connect the negative cable of battery.

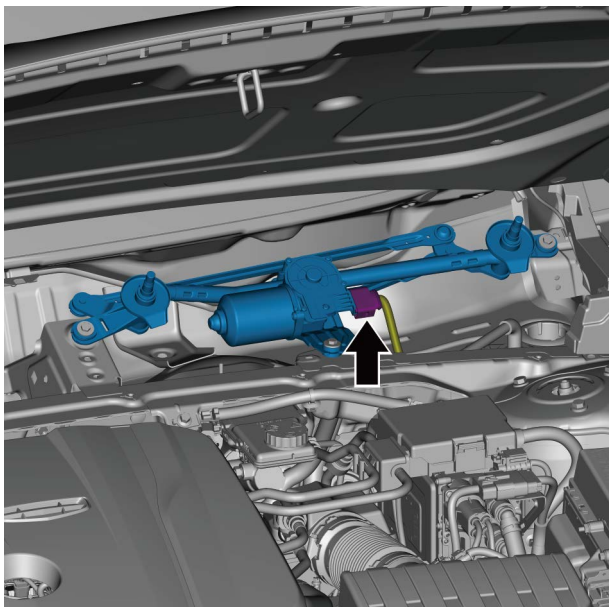
12.5.6.10 Replacement of front wiper motor

Removal Procedure

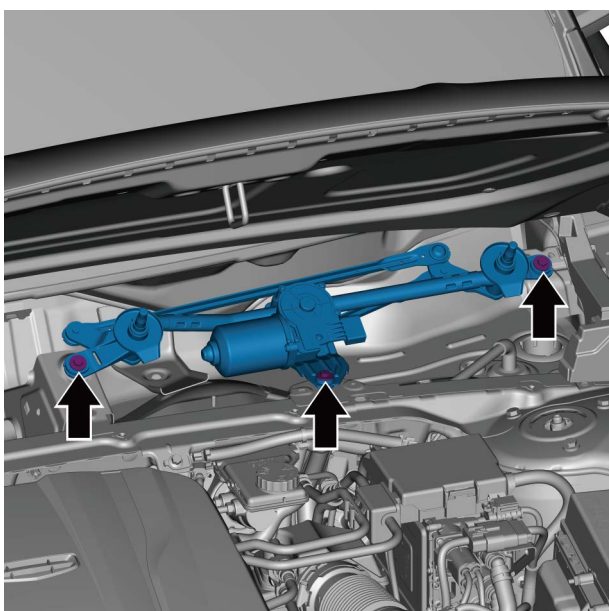
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the front wiper arm, refer to [Replacement of front wiper arm](#).
- 3 Remove the ventilation cover plate assembly, refer to [Replacement of ventilation cover plate assembly](#).

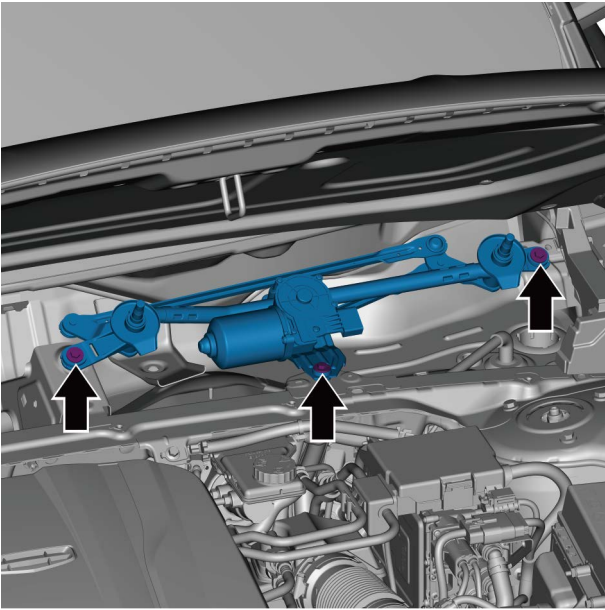


- 4 Disconnect the front wiper motor harness connector.

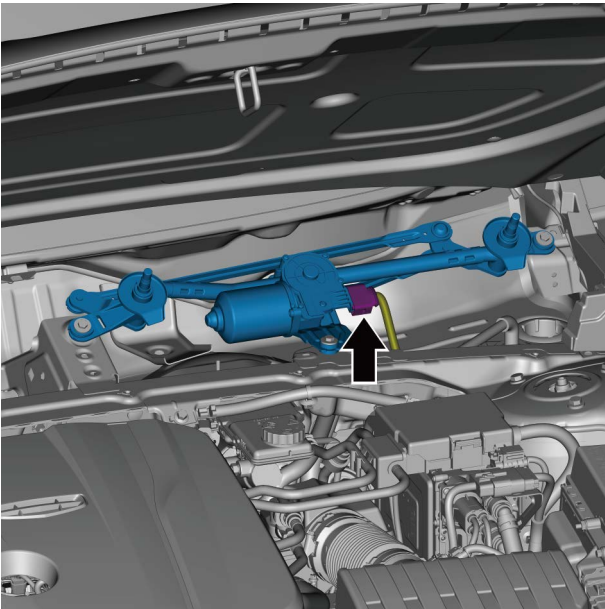


- 5 Remove the 3 fixing bolts of the front wiper motor and take off the front wiper motor.

Installation Procedure



- 1 Install the 3 fixing bolts of front wiper motor.
Torque: 10N·m



- 2 Connect the front wiper motor harness connector.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 3 Install the ventilation cover plate assembly.
- 4 Install the front wiper arm.
- 5 Connect the negative cable of battery.

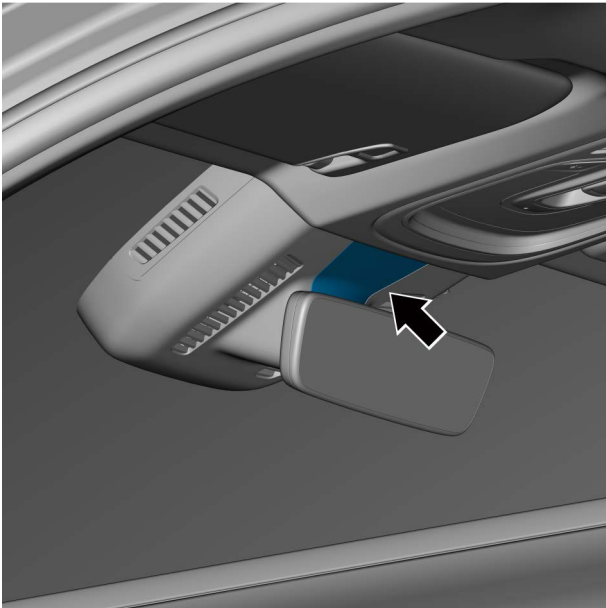
12.5.6.11 Replacement of rain and light sensor

Removal Procedure

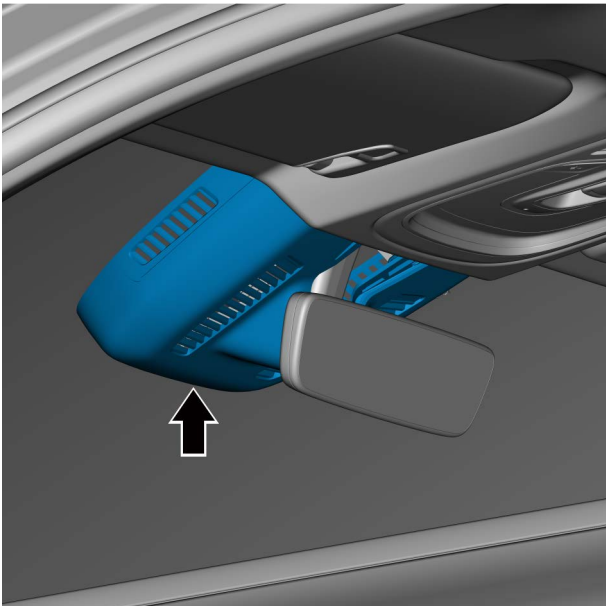
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

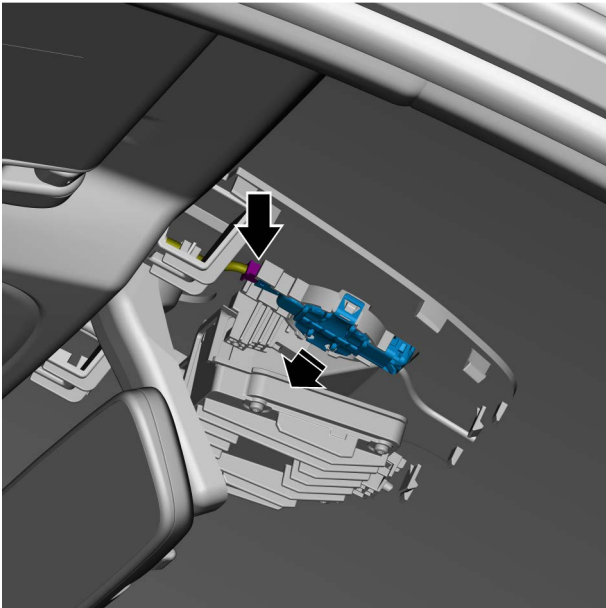
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).



- 2 Remove the rain and light sensor front trim cover.



- 3 Remove the rain and light sensor rear trim cover.



- 4 Remove the rain and light sensor.
- 5 Disconnect the rain and light sensor harness connector and remove the rain and light sensor.

Caution

When disassembly is complete, make sure that the glass is clean and free of dust and other debris.

Installation Procedure

Caution

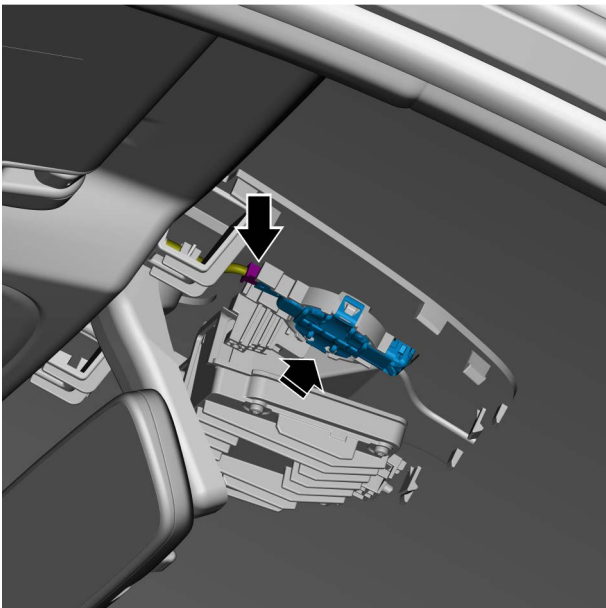
The rainwater and light sensor are disposable parts and will need to be replaced with a new one after removal.

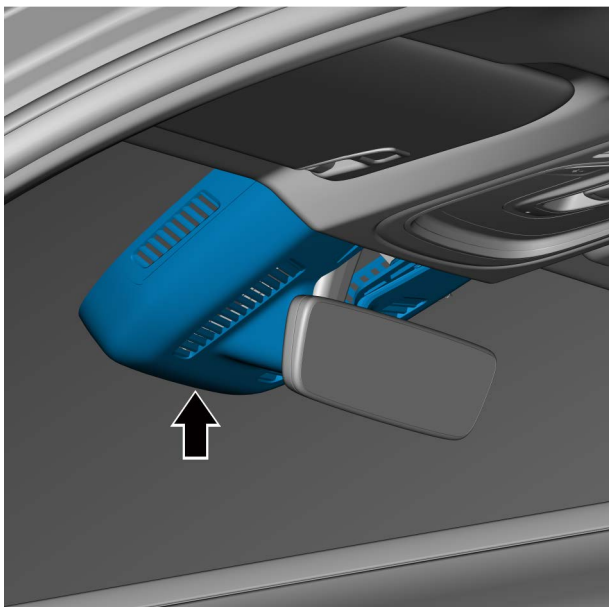
- 1 Connect the rain and light sensor harness connector.

Caution

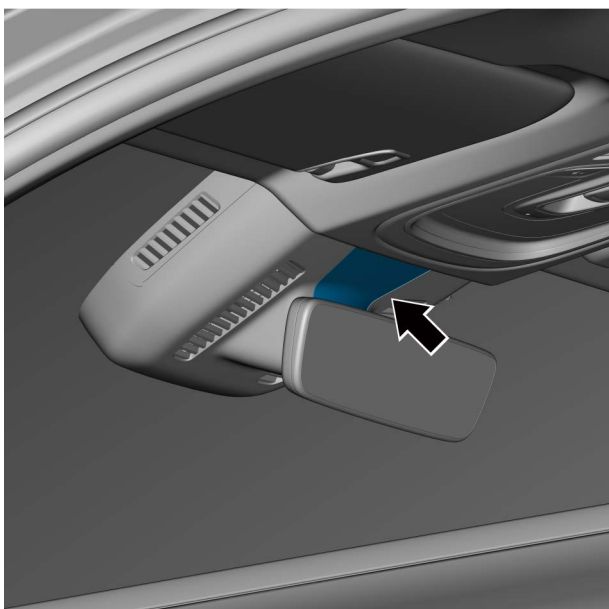
Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 2 Install the rain and light sensor.





- 3 Install the rain and light sensor rear trim cover.



- 4 Install the rain and light sensor front trim cover.

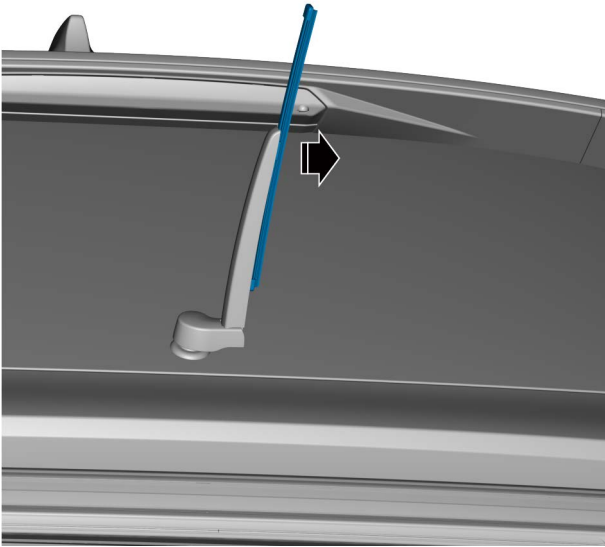
- 5 Connect the negative cable of battery.

12.5.6.12 Replacement of wiper combination switch

Refer to [Replacement of steering wheel module](#).

12.5.6.13 Replacement of rear wiper blade assembly

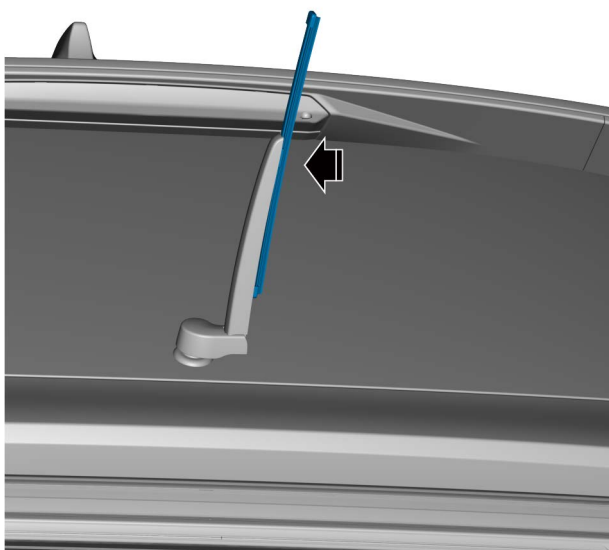
Removal Procedure



- 1 Lift the rear wiper arm assembly.
- 2 Remove the rear wiper blade assembly from the rear wiper arm in the direction of the arrow.

Installation Procedure

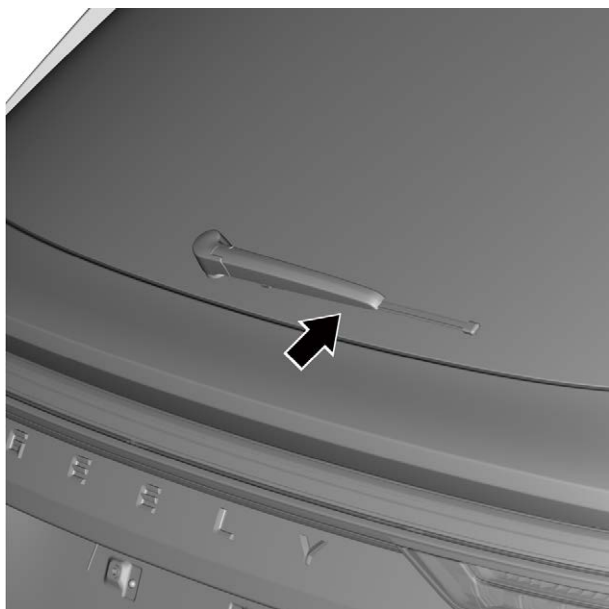
- 1 Install the rear wiper blade assembly to the wiper arm.



- 2 Gently lower the rear wiper arm.

Caution

Do not damage the glass.



12.6 Combination instrument /Driver Information System

12.6.1 Specification

12.6.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Driver information module fixing screws	ST4.8×19	2.2-2.8
Driver information screen fixing screw	ST4.8×19	2.2-2.8

12.6.2 Instructions and operations

12.6.2.1 Instructions and operations

The driving information display module transmits driving information to driver information screen via LVDS transmission image.

The driver information screen displays the vehicle status, through the driver information screen display the driver can know some important information of the vehicle, such as the engine speed, vehicle speed, engine coolant temperature, fuel gauge, various warning lights and indicator information and so on.

The driver information system consists of the driver information display module, the driver information screen, the Head-up display (if equipped) and the steering wheel switches:

- Driver Information Screen - core interaction of driving functions, displaying complete driving information, while cooperating with the steering wheel buttons to complete operations related to intelligent driving.
- Steering wheel switches - the core inputs for instrumentation control, allowing the user to operate intelligent driving and entertainment connectivity while maintaining driving focus.

12.6.3 System working principles

12.6.3.1 System working principles

Power battery power meter

Displays the remaining power of the power battery in the form of a bar.

Driving power meter

The driving power meter displays differently when the vehicle is in different operating conditions.

1. Electric-only mode

- When the vehicle is in pure electric mode, the pure electric area indicator lights up.

2. Fuel-only mode

- When the vehicle is in fuel-only mode, the driving power meter displays the engine speedometer.
- It can be utilized to select the correct gear-shifting timing when driving to prevent the engine from being overloaded or revving too high.
- If the engine speed is too high while driving, the engine is more prone to wear and tear and consumes more fuel. In most cases, it is more fuel efficient to run the engine at a lower speed.

3. Hybrid mode

- When the vehicle is in hybrid mode, both the fuel-only and electric indicators are illuminated.

4. Energy recovery mode

- When the vehicle is in energy recovery mode, the energy recovery area indicator illuminates and displays the current energy recovery level.

Fuel gauge

When start switch is in Mode II or the engine is started, the fuel gauge displays the remaining fuel in the fuel tank and the available range.

1. Display of remaining fuel level in the fuel tank

- The fuel gauge shows the fuel level in the tank, when the vehicle is traveling on bends or mountainous roads, the fuel level shown on the fuel gauge will be slightly different from the actual condition; when the vehicle is on flat ground and the start switch is in Mode II or when the engine is started, the fuel level indicated by the fuel gauge is the actual condition.
- It is reasonable to keep fuel above 1/4 of the tank. If the low fuel level warning light comes on, refueling must be done as soon as possible.
- The low fuel level warning light will go out automatically after refueling, if this warning light does not go out, contact a Geely service station for service as soon as possible.

- The low fuel level warning light may come on earlier than usual when traveling uphill or turning because fuel flows in the tank.

Caution

Vehicle operation at low fuel level for a long period of time is prone to premature damage to the fuel pump, as well as damage to the three-way catalytic converter due to engine stalling.

2. Display of rangeable mileage

- The endurance mileage is used to display the miles that the vehicle can travel with the current fuel level in the tank. The system calculates the endurance mileage every second and the interface is updated every 10 seconds.
- The endurance mileage is calculated in a rolling manner based on fuel consumption per minute. Due to different road conditions and driving conditions, the displayed endurance mileage will be different from the actual driving distance. This value is for reference only. After each refueling, the last endurance mileage will be reset.
- When the low pressure side fuel pressure sensor is faulty, the interface displays -km; Based on driving habits, the endurance mileage is displayed 0 km at least. The endurance mileage cannot be reset manually.

Coolant temperature gauge

When the start switch is in Mode II or when the engine is started, the coolant temperature gauge indicates the temperature of the engine coolant, which varies depending on the air temperature and engine load.

If the coolant temperature gauge needle reaches the red or right zone, you should stop the vehicle and let the engine cool down.

Under severe driving conditions, the engine may overheat, for example:

- Long-distance hill climbing in hot weather.
- Reduce the speed or stop the car after traveling at high speed.
- In heavy traffic areas, use the air conditioning system and leave the engine idling for long periods of time.

Speedometer

The speedometer displays the current vehicle speed in km/h, with a maximum display value of 260 km/h.

It is possible to drive at high speeds on good roads, but for driving safety, stability and comfort, the vehicle speed should not be higher than 120 km/h on ordinary roads.

Tachometer

The tachometer indicates the engine speed per minute in rpm, the scale range of the tachometer is 0rpm-7500rpm, and 6000rpm-7500rpm is the speed danger zone.

It can be utilized to select the correct gear-shifting timing (under manual mode) when driving to prevent the engine from being overloaded or revving too high.

If the engine speed is too high while driving, the engine is more prone to wear and tear and consumes more fuel. In most cases, it is more fuel efficient to run the engine at a lower speed.

Caution

Do not let the engine tachometer needle reach the red zone for a long time, serious damage will be caused to the engine.

Overspeed alarm

When the display value of combination instrument speedometer is higher than the set speed for overspeed alarm, the buzzer will beep and the combination instrument display will display: You have exceeded the speed limit, please drive safely. This is to remind the driver to slow down and drive safely. The speed range for overspeed alarm is 30-235 km/hour. If the overspeed alarm speed is set to 120km/h, the alarm will be activated when the speed is greater than 120km/h to remind the driver to control the speed. When the speed is less than 117km/h, the alarm is released.

Click: Vehicle Settings→Driving Assistance & Safety→Speed Alarm on multimedia display screen, under this interface, you can turn on or off the customized overspeed alarm function, and you can also set the value of overspeed alarm.

Current mileage

The current mileage displays information about the driving data since the last time it was cleared, including mileage, time, average fuel consumption, and average speed. The driving data included in current mileage are as follows:

- a. Mileage: The display range of this data is 0-9999.9km. On multimedia display screen, click: System Setting→System→Unit Setting in turn in this interface, you can adjust the mileage unit to kilometer or miles.
- b. Time: The maximum driving time shown in this data is 99:59. When the engine is checked to be running, the driving time will start to be totaled, and the timing will be suspended when the engine is stopped or turned off.
- c. Average Fuel Consumption: the value is displayed in L/100km by default, after the value is cleared to zero, within

300 meters of driving, the average fuel consumption shows -. - (unit). This information helps the driver to adjust his driving habits in order to achieve the desired fuel consumption value, and the interface is updated every 10 seconds. If you want to measure the average fuel consumption for a specific driving cycle, zero out the average fuel consumption before starting to measure the fuel consumption. The amount of fuel injected at idle will be accumulated in the single fuel consumption. On the multimedia display screen, click: System Settings→System→Unit Settings, in which the fuel consumption unit can be adjusted to L/100km, km/L, mpg (US) or mpg (UK).

- d. Average Speed: the average speed starts to calculate when the engine is started, and is suspended when the vehicle is stopped or turned off. On multimedia display screen, click in order: System Setting→System→Unit Setting, in which the speed unit can be adjusted to km/h or mph.

Caution

Fuel consumption varies with different driving styles. In order to save energy and protect the environment, please drive economically.

Subtotal mileage

The subtotal mileage displays information about the driving data since the last time it was cleared, including mileage, time, average fuel consumption, and average speed.

The driving data in subtotal mileage are as follows:

- a. Mileage: this display is updated every 0.1km or 0.1mile (according to the unit setting). The display ranges from 0 to 9999.9km, and when the maximum value is reached, the mileage display is recalculated from 0.0. Click: System Setting→System→Unit Setting in order on multimedia display screen, and the mileage unit can be adjusted to km or miles in this interface.
- b. Time: when the engine is checked to be running, the driving time starts to accumulate, and the timing is suspended when the engine is stopped or turned off. After the engine is started, the time continues to accumulate. This data is updated every 60 seconds. The maximum displayed driving time is 99:59.
- c. Average Fuel Consumption: The average fuel consumption after the last clearing is displayed in L/100km by default, this information can help drivers adjust their driving habits to achieve the desired fuel consumption value, the interface is updated at a frequency of 10 seconds each time. If you want to measure the average fuel consumption for a specific driving cycle, zero the average fuel consumption before you start to measure the fuel consumption, and

then drive for a certain distance before the average fuel consumption is displayed again. After each ignition, the average fuel consumption is the value from the last time it was turned off. On the multimedia display screen, click in turn: System Settings→System→Unit Settings, in which the fuel consumption unit can be adjusted to L/100km, km/L, mpg (US) or mpg (UK).

d. Average Speed: the average speed is calculated after the engine is started and pauses when the engine is stopped or turned off. The display value is refreshed every 10 seconds. On multimedia display screen, click: System Setting→System→Unit Setting in this interface to adjust the speed unit to km/h or mph.

Caution

Fuel consumption varies with different driving styles. In order to save energy and protect the environment, please drive economically.

Vehicle status

1. Instantaneous Fuel Consumption: instantaneous fuel consumption is updated every second when the vehicle is running, and is displayed in L/100km. When the engine is running and the vehicle speed is ≤ 2 km/h, the instantaneous fuel consumption is displayed as L/100km. when the accelerator pedal sensor is not pressed, and the vehicle is coasting, the instantaneous fuel consumption is displayed as 0. Click System Settings→System→Unit Settings on multimedia display screen, and the unit of fuel consumption can be adjusted to L/100km, km/L, mpg (US), or mpg (UK) in this interface. This interface helps drivers to adjust their driving habits to achieve the desired fuel consumption value.
2. Oil level: the oil level can be fed back to combination instrument through the oil level sensor, and the current status is displayed on combination instrument display. When start switch is in Mode II or the engine is started, switch combination instrument on-board computer interface to check whether the oil level information is normal.
3. Total mileage: It shows the total mileage of the vehicle, which cannot be reset.

Tire status

Tire pressure and temperature can be displayed on combination instrument display in real time through the settings.

On multimedia display screen, click System Setting→System→Unit Setting, in this interface, you can adjust the unit of pressure to bar, PSI or kPa. you can also adjust the unit of temperature to °C or °F.

– High tire temperature, tire leakage, low sensor power alarm. When the alarm of high tire temperature, tire leakage, low sensor power is activated, the icons of corresponding tires start to flash, accompanied by sound alarm and text prompt interface.

– Low tire pressure alarm

When the low tire pressure alarm is activated, the icons of corresponding tires begin to flash, the tire pressure monitoring system status indicator continues to light up until the alarm is eliminated, accompanied by an audible alarm and a text prompt interface, and the low tire pressure alarm is released after the tire is inflated to the standard tire pressure value in a cold state.

– System fault alarm

When the system fault alarm is activated, the icons of corresponding tires begin to flash, the tire pressure monitoring system status indicator flashes for 60 seconds and then stays always ON until the alarm is eliminated, accompanied by an audible alarm and a text prompt interface.

Caution

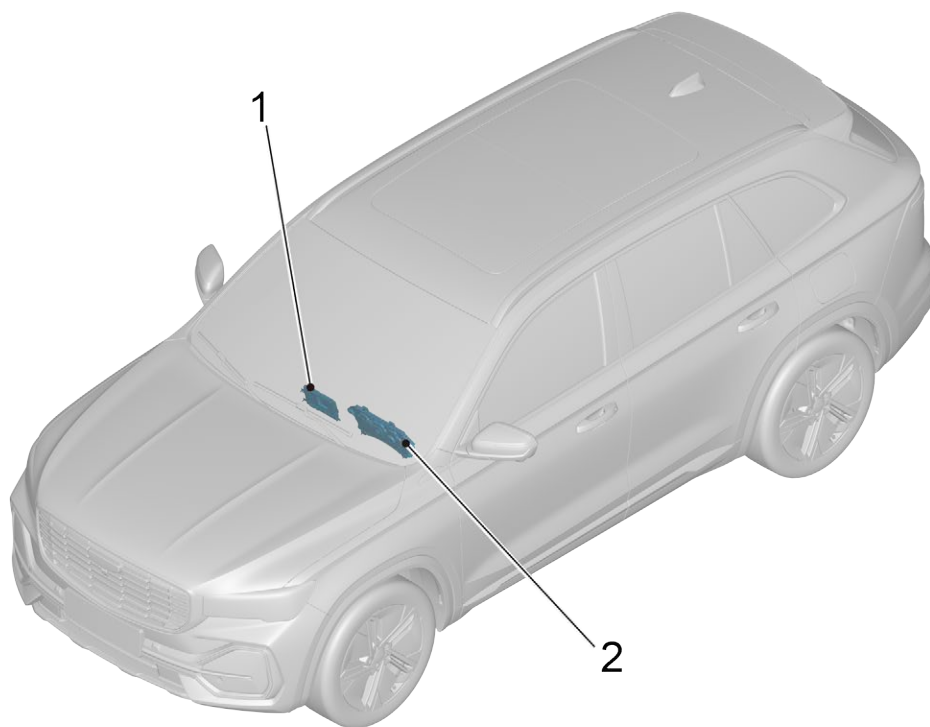
After the vehicle is turned off and the vehicle is restarted, after combination instrument self-check, if the tire pressure value is displayed in gray, it means that the tire pressure value is the last recorded tire pressure value, and when the vehicle reaches a certain speed, the tire pressure will be displayed in real time; if the status indicator of the tire pressure monitoring system lights up, stop the vehicle in time and contact Geely service station as soon as possible for overhaul!

Unclosed door reminder

If any of the engine hood, four doors, or trunk door is not properly closed, an alert message will appear on the combination instrument to prevent accidental door opening while the vehicle is in motion.

12.6.4 Part position

12.6.4.1 Part position



1. Driver Information module

2. Driver Information Screen

12.6.5 Diagnostic information and procedure

12.6.5.1 Diagnosis description

See [Description and Operation](#) and [System Working Principles](#) before diagnosing a malfunction in the combination instrument/driver information system. Understanding and familiarizing yourself with the operation of the combination instrument/driver information system before beginning system diagnosis will help determine the correct troubleshooting steps to take in the event of a malfunction, and more importantly this will help determine if the condition described by the customer is normal operation. Any troubleshooting of the combination instrument/driver information system should start with a [Visual Check](#) that guides the repairer to the next diagnosis step in the troubleshooting process. Understanding and using the diagnostic process correctly will reduce diagnostic time and avoid misdiagnosis of the fault area.

12.6.5.2 Visual check

- Check after-sales installations that may affect the operation of combination instrument/driver information system. Make sure these installations will have no influence in the operation of combination instrument/driver information system.
- Check system components that are easily accessible or can be seen to find out if there is any obvious damage of the component or there is a situation that may cause a fault.
- Check the harness and harness connector to ensure that there is no sign of loosening, damage, poor contact, aging, etc.
- Check and make sure the sensors of various instrument display information are normal.

12.6.6 Removal and Installation

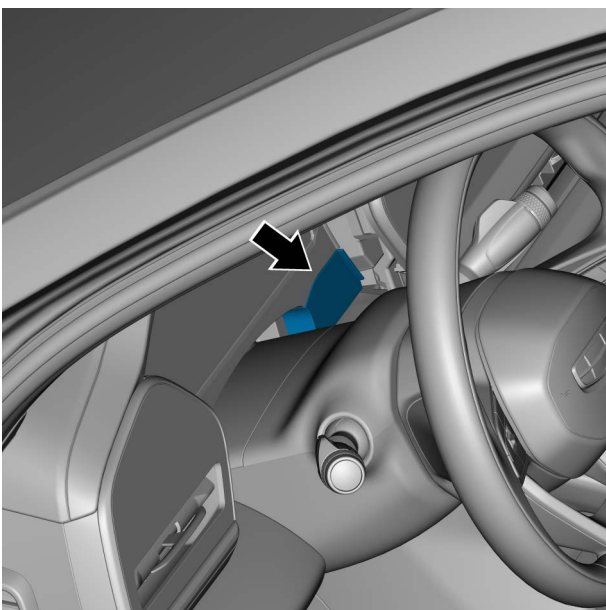
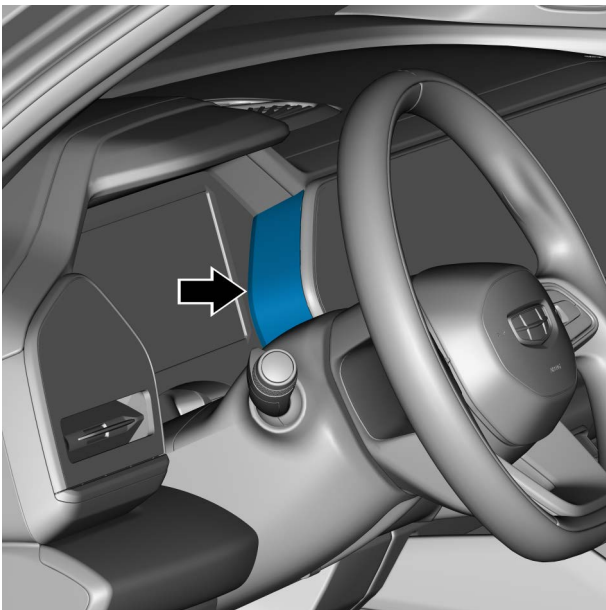
12.6.6.1 Replacement of driver information screen

Removal Procedure

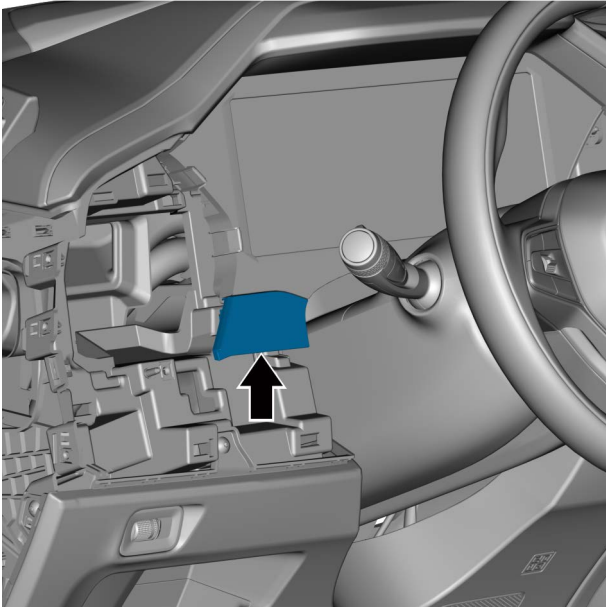
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

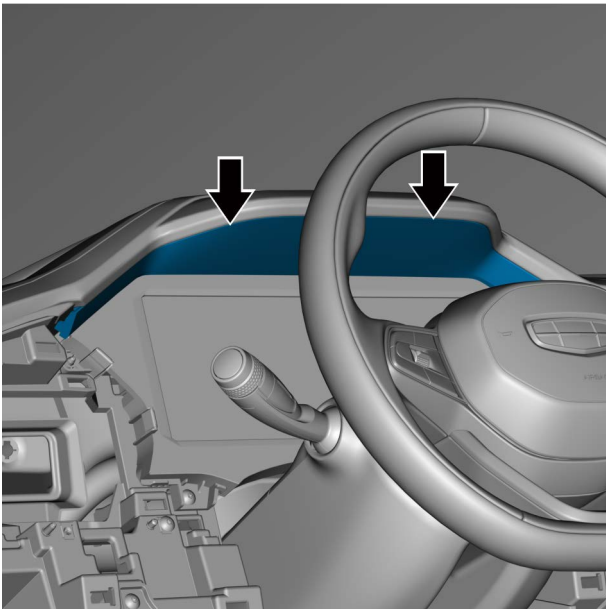
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left A/C air outlet panel assembly, refer to [Replacement of left A/C air outlet panel assembly](#).
- 3 Remove the center console display trim cover.



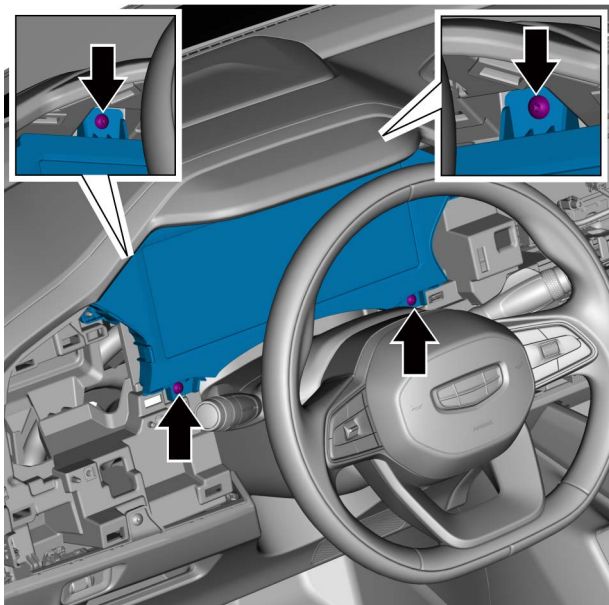
- 4 Remove the combination instrument hood right cover panel assembly.



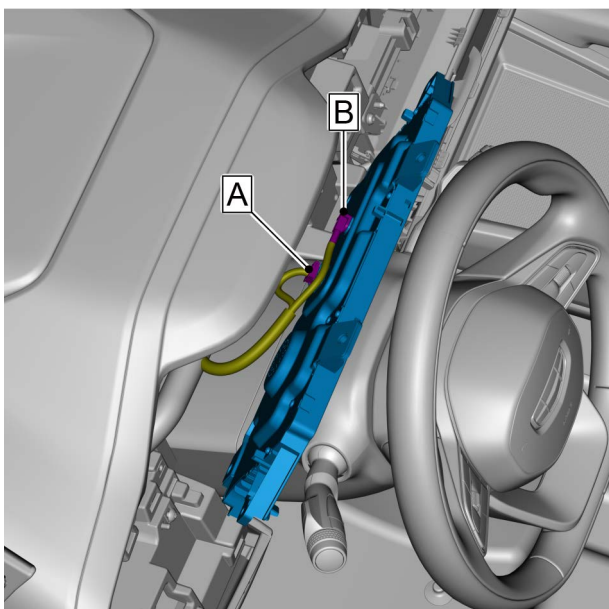
- 5 Remove the combination instrument hood left cover panel assembly.



- 6 Remove the combination instrument brim assembly.

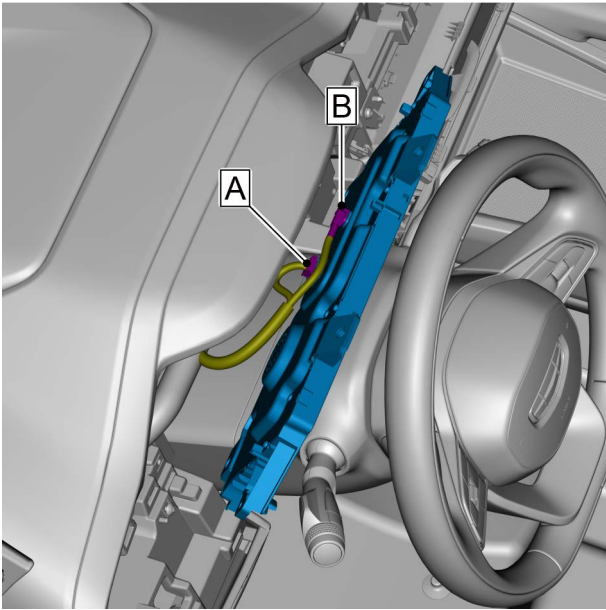


7 Remove the 4 fixing screws for the driver information screen.



8 Disconnect the driver information screen harness connectors A and B, and remove the driver information screen.

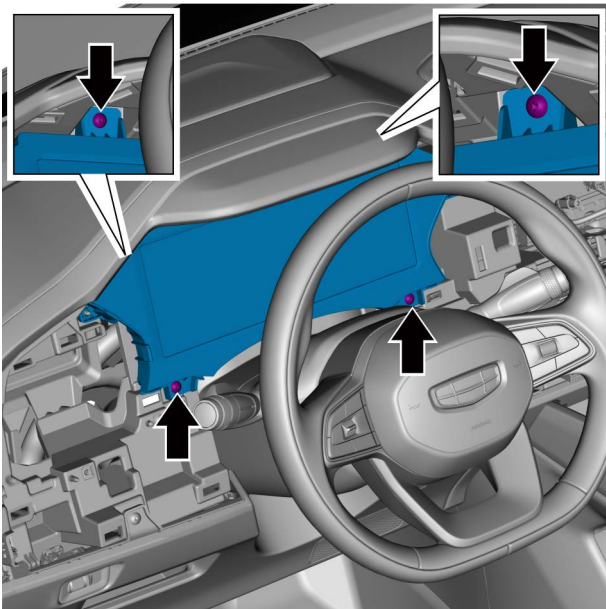
Installation Procedure



- 1 Connect the driver information screen harness connectors A and B.

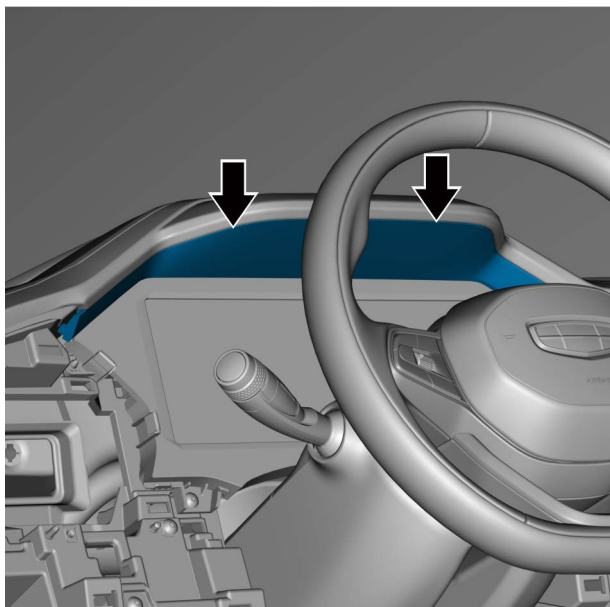
Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

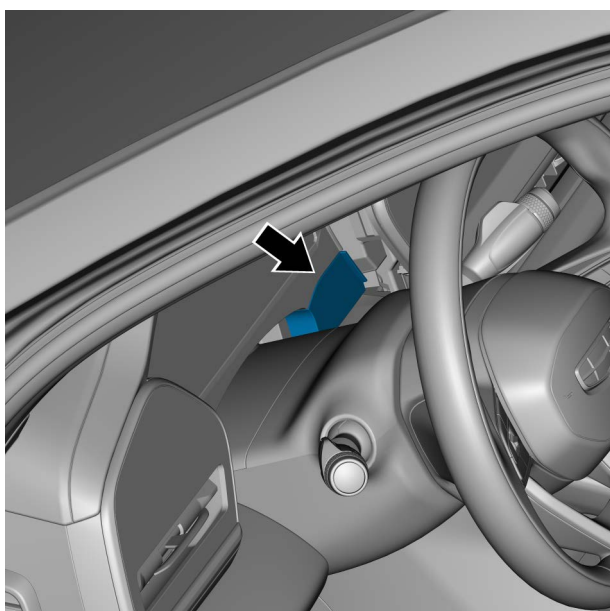


- 2 Install the 4 fixing screws for the driver information screen.

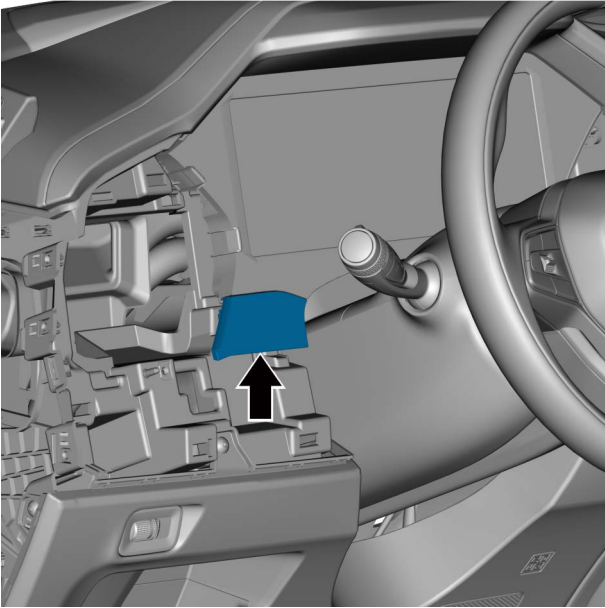
Torque: 2.5N·m



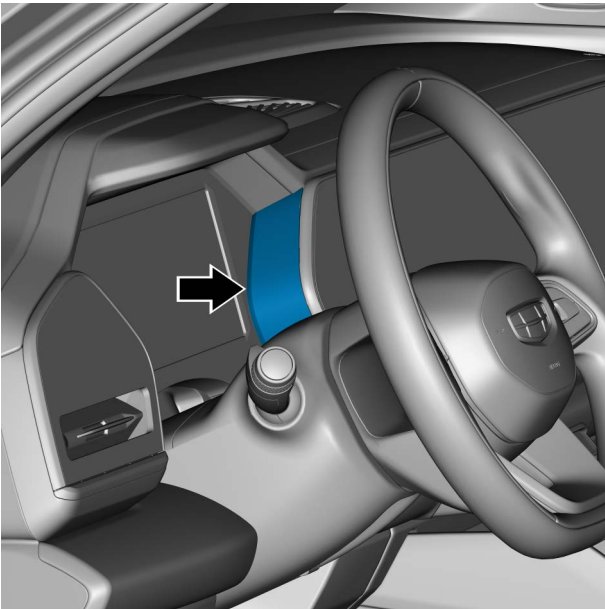
3 Install the combination instrument brim assembly.



4 Install the combination instrument hood right cover panel assembly.



- 5 Install the combination instrument hood left cover panel assembly.



- 6 Install the center console display trim cover.

- 7 Install the left side A/C air outlet panel assembly.
- 8 Connect the negative cable of battery.
- 9 The GLDS diagnostic program is required, under the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software brushing operation.

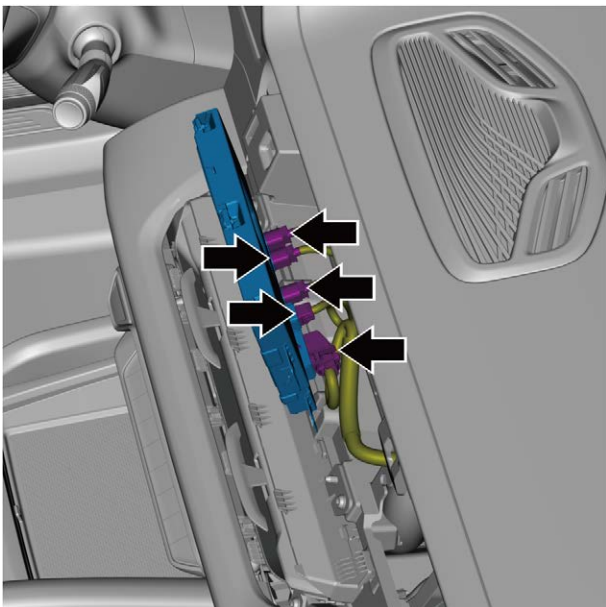
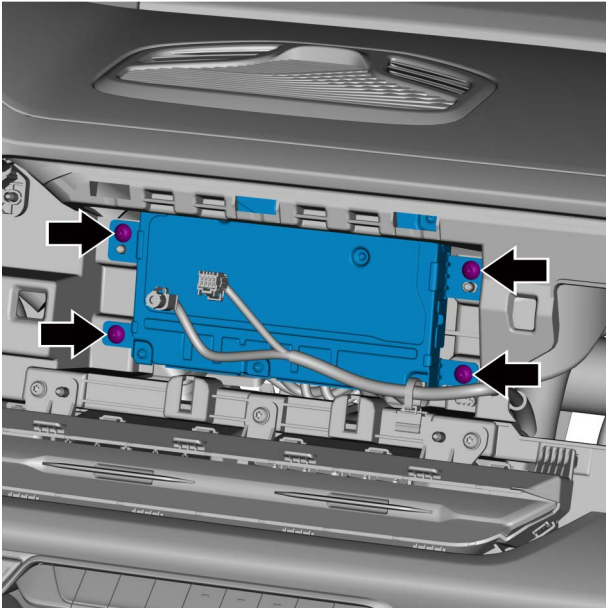
12.6.6.2 Replacement of driver information module

Removal Procedure

Warning !

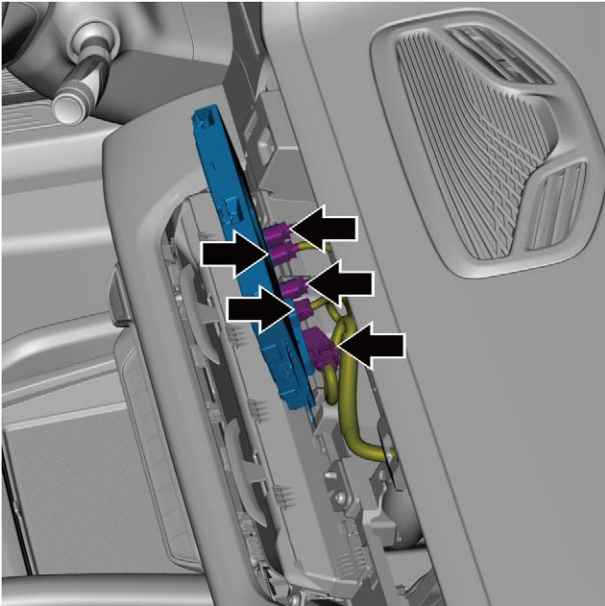
Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the center console display, Refer to [Replacement of center console display](#).
- 3 Remove the 4 fixing screws of the driver information module.



- 4 Disconnect the 5 harness connectors of the driver information module and remove the driver information module.

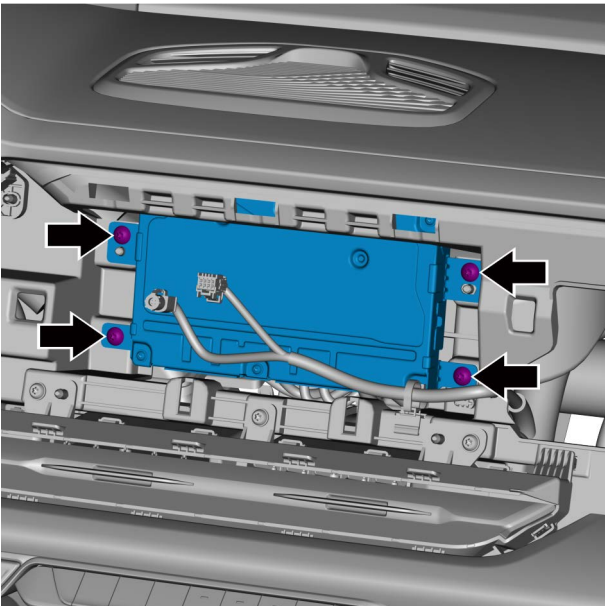
Installation Procedure



- 1 Connect the 5 harness connectors of driver information module.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 2 Install the 4 fixing screws of the driver information module.

Torque: 2.5N·m

- 3 Install the center console display.
- 4 Connect the negative cable of battery.
- 5 The GLDS diagnostic program is required, under the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software brushing operation.

12.7 Panoramic sunroof

12.7.1 Specification

12.7.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Sunroof module (panoramic sunroof) fixing bolt	M6×16	8-10
Sunroof main motor fixing bolt	M5X0.8X30	2.7-3.3
Sunroof main motor fixing screw	M5X303(double head)X33	2.7-3.3
Sunroof sub-motor fixing bolt	M5X0.8X30	2.7-3.3
Sunroof sub-motor fixing screw	M5X303(double head)X33	2.7-3.3

12.7.2 Instructions and operations

12.7.2.1 Instructions and operations

The sunroof switch is located on the front interior roof light control panel.

Caution

The sunroof switch can still be operated within 2 minutes after the vehicle is turned off.

- It is important that all occupants keep their heads, hands and other parts of their bodies away from the opening of the sunroof while the vehicle is in motion, as this could result in injury during emergency braking or an accident.
- It is strictly prohibited to extend your head or other parts of your body out of the sunroof when it is in operation.
- Make sure that you do not leave the Smart Key in the vehicle when you leave the vehicle.
- Children should not be left alone in the vehicle as playing with the sunroof switch may cause a serious accident.
- When closing the sunroof, make sure that the heads, hands and other parts of the body of all occupants are not in the sunroof opening.
- Do not sit around the sunroof opening.

If a child is involved in an accident because of the sunroof, the guardian is significantly responsible for the accident.

Do not open the sunroof when there is ice on the sunroof to avoid overloading it, which could cause damage to the sunroof parts.

Sunroof operating conditions

The start switch needs to be in Mode I or Mode II before sunroof operation.

Temperature requirement

- When the temperature is -20-85°C: the sunroof and sunroof sunshade are fully functional and can be operated normally in response to the smart key and voice commands.
- When the temperature is -30-20°C: sunroof only has manual closing function, no anti-pinch function. It does not respond to intelligent key and voice commands; sunroof sunshade only has manual operation function, no automatic operation function, no anti-pinch function. Does not respond to smart key and voice commands.

Sunroof opening/closing

Sunroof automatic operation

After the sunroof sunshade is fully opened, push sunroof switch backward to the limit position and release it, the sunroof glass will automatically run to the maximum opening position.

Push sunroof switch forward to the limit position and release it, the sunroof glass automatically operates to the fully closed position.

During automatic operation of the sunroof glass, if the switch is operated in the opposite direction, the sunroof glass will stop.

Sunroof rapid operation

Push sunroof switch backward to the limit position twice consecutively and release it, the sunroof glass and sunroof sunshade will open automatically at the same time.

Push sunroof switch forward to the limit position twice consecutively and then release it, the sunroof glass and sunshade will close automatically at the same time.

During rapid operation of the sunroof glass, pressing the switch again will stop the operation of the sunroof glass.

Manual operation of sunroof

When the sunroof sunshade has been fully opened, push sunroof switch backward to the first gear, the sunroof glass will be opened by manual operation, and the sunroof glass will stop operation after releasing the sunroof switch.

Push sunroof switch forward to the first gear, the sunroof glass will be closed manually, and the sunroof glass will stop after releasing the sunroof switch.

Opening/closing the sunroof via multimedia display screen

On multimedia display screen, click: Vehicle Settings→Basic Vehicle Settings→Sunroof and Sunshade in turn, then select sunroof in this interface and click open or close as required. An animated example of the sunroof will also be displayed on the multimedia display screen during the opening or closing of the sunroof.

Sunroof comfort position

When the sunroof glass is at about 70% of its full opening stroke, the wind noise is minimized at high speeds.

When the vehicle speed is greater than 5 km/h, opening the sunroof by manual/automatic operation, the sunroof will first operate to the comfort position, open the sunroof again by manual/automatic operation, and then the sunroof glass will operate to the fully open position.

Tilt opening/closing

Tilt opening

Press the end of sunroof switch upwards to open the sunroof.

Tilt closing

If the sunroof is in the tilt opening position, push down on the end of sunroof switch to close the sunroof.

The sunroof glass cannot be paused by sunroof switch during the tilt opening/closing operation, the sunroof glass will automatically operate to the fully tilted or fully closed position.

Remotely closing the sunroof

When the start switch is turned off and the fuel filler cap, trunk door, engine hood and all four doors are closed, press and hold the smart key lock button, and the sunroof closes until it is completely closed.

Safety anti-pinch protection

Tilt anti-pinch

- When the sunroof glass tilts, the tilting action stops if it encounters an obstacle.
- When the sunroof glass is closed in the tilting position, the sunroof glass will return to the fully tilt position if it encounters an obstacle.

Anti-pinch of sunroof glass and sunroof sunshade

- If an obstacle is encountered while the sunroof glass or sunshade is sliding open, the sunroof glass will retreat by 5 millimeters or return to the fully closed position.
- If an obstacle is encountered while the sunroof glass or sunshade is sliding close, the sunroof glass will retreat by 200 millimeters or return to difficult the fully open position.

Caution

When the sunroof is in operation, if an anti-pinch occurs once, the anti-pinch function and the automatic operation function will be suspended for 10 seconds (i. e., the sunroof can only be operated manually at this time). 10 seconds later, the anti-pinch function and the automatic operation function will be resumed.

Automatic window closing in rainy weather (if equipped)

When the vehicle is turned off and locked and enters the defense state, the vehicle can automatically close the sunroof and power windows if it suddenly rains when the sunroof and power windows are open.

Caution

If the window/sunroof does not perform self-learning, the window cannot be closed automatically on rainy days.

Automatic window overtime closing

When the vehicle is turned off and locked for 28 hours, if the sunroof or power windows are in the open state, the vehicle will automatically close the power windows and sunroof and sunroof sunshade.

Ice breaking function

After the sunroof glass/sunroof sunshade has triggered the anti-pinch function once, the ice breaking function will be activated and the sunroof glass/sunroof sunshade will no longer support the anti-pinch function when it is operated in the same direction again. When the ice breaking function is activated, the system will only support manual operation, and the switch's auto operation command will be treated as a manual operation command.

The ice breaking function will be deactivated and the anti-pinch function will be reactivated when the following events occur:

- 10 seconds after the anti-pinch function ends.
- After the next run stops.
- Switch is operated in the opposite direction of the operation.
- Remote control operation.

12.7.3 System working principles

12.7.3.1 System working principles

The basic structure of power sunroof mainly consists of sliding mechanism, driving mechanism, control system and switch. The operation principle of each part of the structure is as follows:

a. Sliding mechanism

The sliding mechanism of power sunroof is mainly composed of a guide block, a guide pin, a linkage, a bracket, a front and rear rests.

b. Driving mechanism

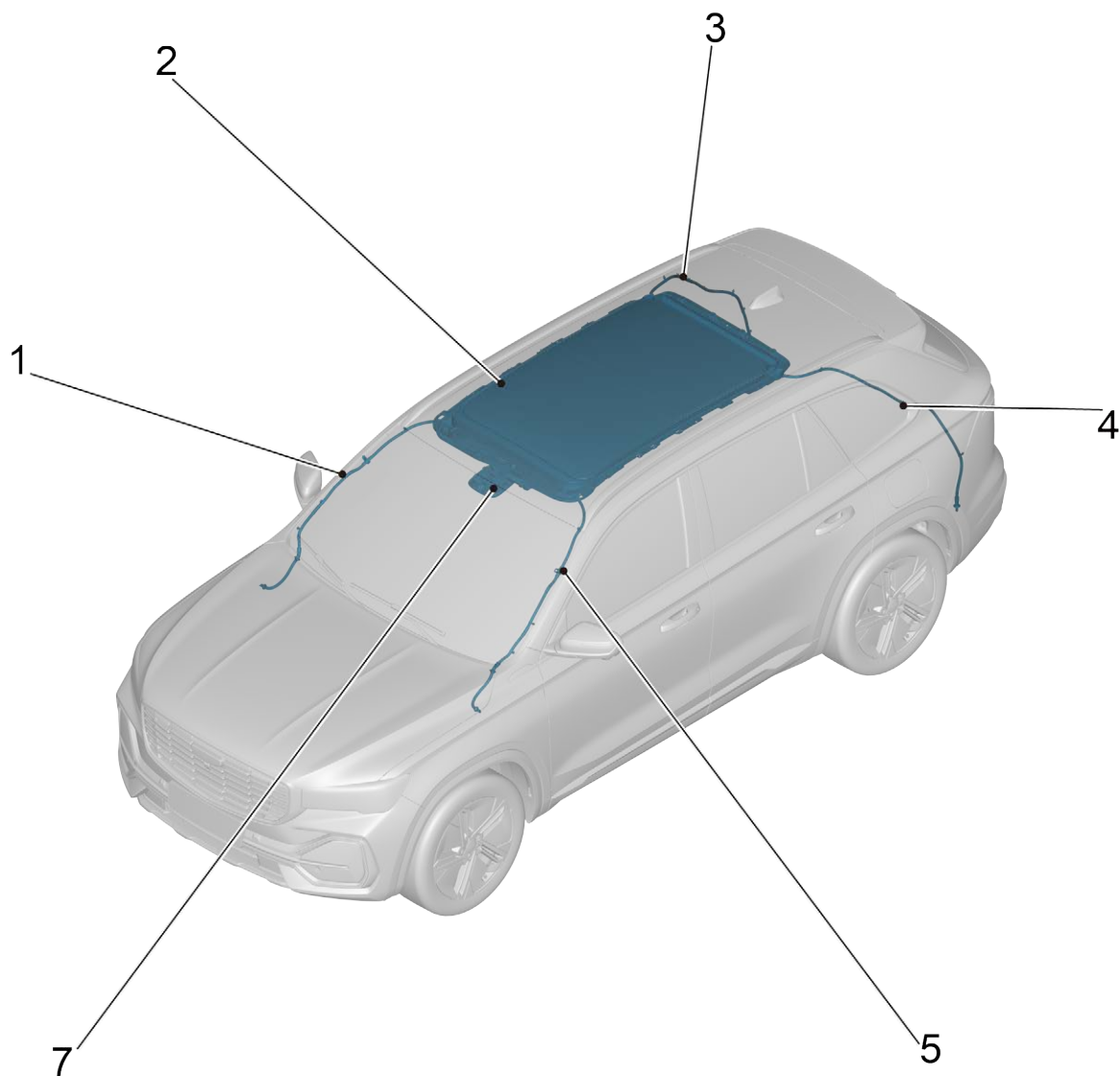
The driving mechanism of power sunroof is mainly composed of an motor, a transmission mechanism, and sliding screws.

Motor: provides power for the opening and closing of the sunroof through the transmission device. The motor can rotate in both directions, that is, by changing the direction of the current, the direction of rotation of the motor can be changed, thus realizing the opening and closing of the sunroof.

Transmission mechanism: the transmission mechanism mainly consists of worm gear transmission mechanism, intermediate gear transmission mechanism (active intermediate gear, transition intermediate gear) and drive gear. The gear transmission mechanism accepts the power of the motor, changes the direction of rotation, and decelerates and increases the torque and then transmits the power to the sliding screw, thus realizing the opening and closing of the sunroof; and at the same time, it transmits the power to the cam, so that the cam touches the limit switch to open and close. The active intermediate gear and the worm gear are fixed on the same shaft and rotate synchronously with the worm gear; the transition intermediate gear and the drive gear are fixed on the same output shaft and driven by the active intermediate gear, so that the drive gear drives the glass to open and close.

12.7.4 Part position

12.7.4.1 Part position

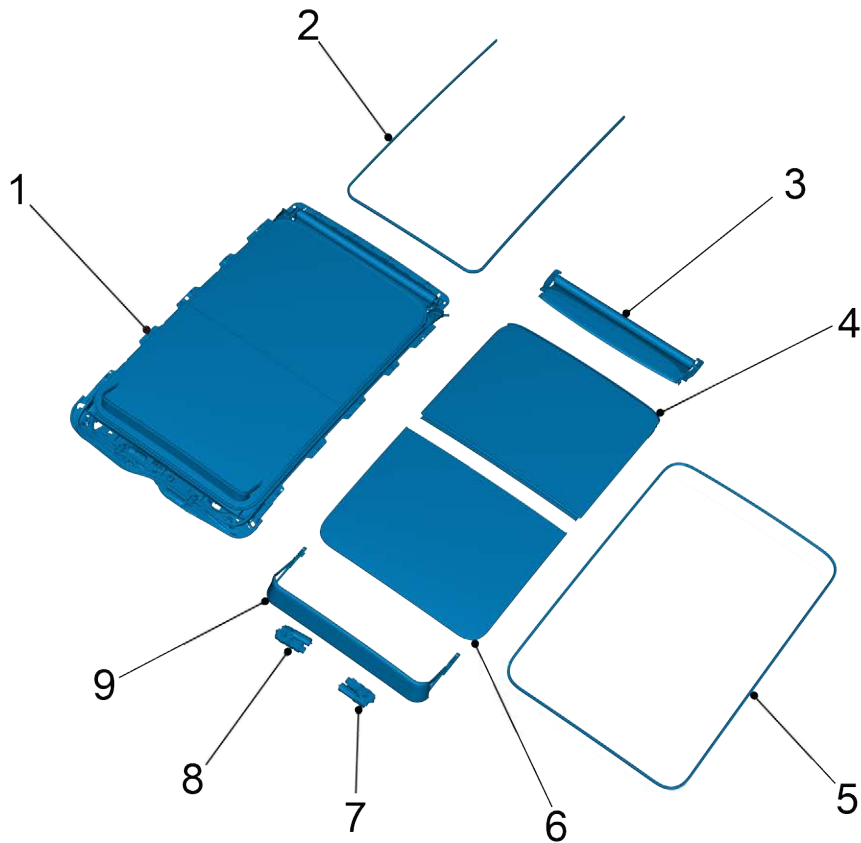


1. Sunroof right front water drain pipe assembly
2. Large sunroof subassembly
3. Sunroof right rear water drain pipe assembly

4. Sunroof left rear water drain pipe assembly
5. Sunroof left front water drain pipe assembly
6. Overhead console unit (sunroof switch)

12.7.5 Breakdown drawing

12.7.5.1 Breakdown drawing



- | | | | |
|----|------------------------------------|----|---|
| 1. | Large sunroof subassembly | 6. | Large sunroof front glass |
| 2. | Sunroof inner sealing strip | 7. | Sunroof control module with glass motor |
| 3. | Sunroof sunshade | 8. | Sunroof sunshade motor |
| 4. | Large sunroof rear glass | 9. | Sunroof windshield |
| 5. | Sunroof vehicle body sealing strip | | |

12.7.6 Diagnostic information and procedure

12.7.6.1 Diagnosis description

See [Description and Operation](#) and [System Working Principles](#) before diagnosing a malfunction in the sunroof module (panoramic sunroof) system. Understanding and familiarizing yourself with the operation of the sunroof module (panoramic sunroof) system before beginning system diagnosis will help determine the correct troubleshooting steps to take in the event of a malfunction, and more importantly this will help determine if the condition described by the customer is normal operation. Any troubleshooting of the sunroof module (panoramic sunroof) system should start with a [Routine Check](#) that guides the repairer to the next diagnosis step in the troubleshooting process. Understanding and using the diagnostic process correctly will reduce diagnostic time and avoid misdiagnosis of the fault area.

12.7.6.2 Visual check

- Check after-sales installations that may affect the operation of sunroof module (panoramic sunroof) to ensure that these installations cannot affect the operation of sunroof module (panoramic sunroof)
- Check system components that are easily accessible or can be seen to find out if there is any obvious damage of the component or there is a situation that may cause a fault.
- Check the harness and harness connector to ensure that there is no sign of loosening, damage, poor contact, aging, etc.

12.7.6.3 Sunroof initialization learning

Sunroof self-learning conditions

When the temperature is greater than 0°C, start switch is in Mode II and the vehicle speed is less than 5 kilometers per hour, the sunroof self-learning can be performed.

Caution

It is recommended to operate the self-learning when the engine is started.

There are four types of sunroof self-learning, namely sunroof no position self-learning, sunroof position self-learning, sunroof position offset self-learning, and sunroof false anti-pinch self-learning.

Sunroof no position self-learning

At this time, the sunroof has no opening function and automatic operation function, and can only be closed manually.

The self-learning method is as follows:

1. Push sunroof switch forward to the first gear position (during which you cannot let go or push sunroof switch to the limit position).
2. At this time, the operation logic of sunroof self-learning is as follows: sunroof glass and sunroof sunshade will run to fully closed position → fully open → fully closed.
3. Sunroof self-learning is complete when the sunroof glass and sunroof sunshade are operated for the second time and are fully closed and there are no subsequent operations.

Sunroof position self-learning

At this time the sunroof can operate manually or automatically.

The self-learning method is as follows:

1. Release sunroof switch after both the sunroof glass and sunroof sunshade reach the fully closed position.
2. Push sunroof switch forward to the first gear position and hold it for more than 10 seconds.
3. At this time, the operation logic of sunroof self-learning is as follows: sunroof glass and sunroof sunshade will run to fully closed position → fully open → fully closed.
4. Sunroof self-learning is complete when the sunroof glass and sunroof sunshade are operated for the second time and are fully closed and there are no subsequent operations.

Sunroof position offset self-learning

At this time, the sunroof cannot automatically close to the fully closed position (when the sunroof glass runs to the fully closed position, the anti-pinch function will be triggered and the sunroof will return).

The self-learning method is as follows:

1. Push sunroof switch forward to the limit position and release it, the sunroof glass automatically operates to the fully closed position and triggers the anti-pinch and returns.
2. Within 10 seconds after triggering the anti-pinch return, push sunroof switch forward to the first gear position to trigger the ice-breaking function, so that the sunroof glass operates to the fully closed position. At this time the sunroof will be blocked (you can hear the motor blocking sound).
3. Release sunroof switch and push sunroof switch forward again to the first gear position, at this time the sunroof will be blocked again.
4. Press sunroof switch forward and hold it for more than 10 seconds.
5. At this point, the sunroof position is actively lost and enters the no-position state.
6. Activate self-learning again, the subsequent self-learning method is the same as "sunroof no position self-learning".

Sunroof false anti-pinch self-learning

The sunroof triggers the anti-pinch and returns by itself without encountering obstacles during the automatic closing process.

The self-learning method is as follows:

1. Push sunroof switch forward to the limit position and release it, the sunroof triggers the anti-pinch and returns by itself.
2. Within 10 seconds after triggering the anti-pinch return, push sunroof switch forward to the first gear position to trigger the ice-breaking function, so that the sunroof glass operates to the fully closed position.
3. Activate self-learning again, the subsequent self-learning method is the same as "sunroof position self-learning".

12.7.7 Removal and Installation

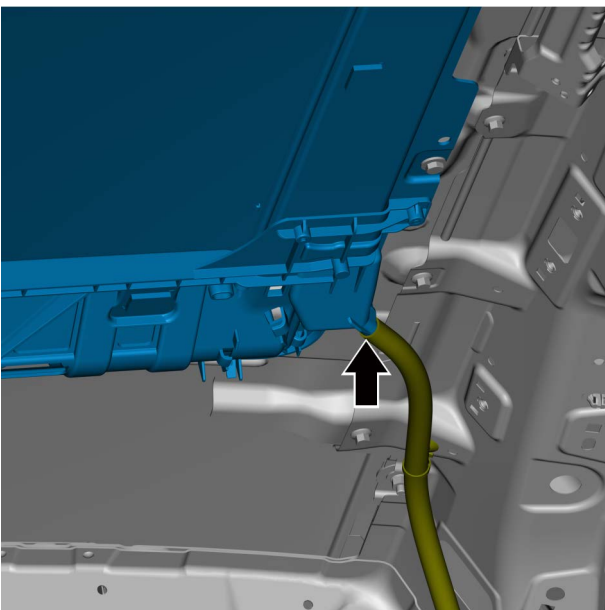
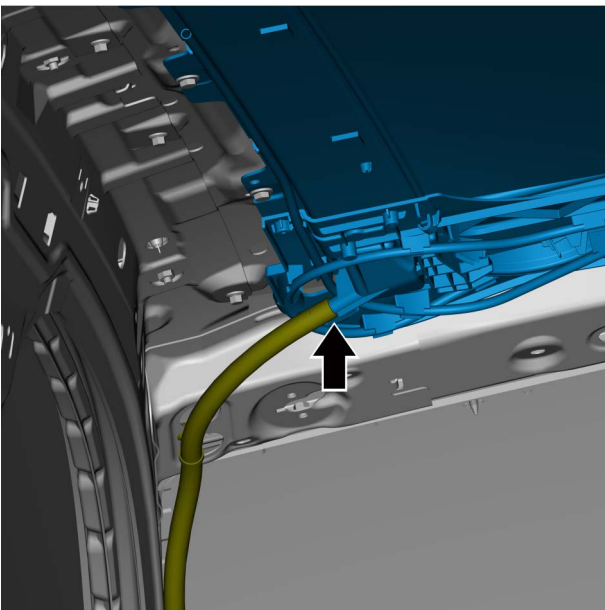
12.7.7.1 Replacement of sunroof module (panoramic sunroof)

Removal Procedure

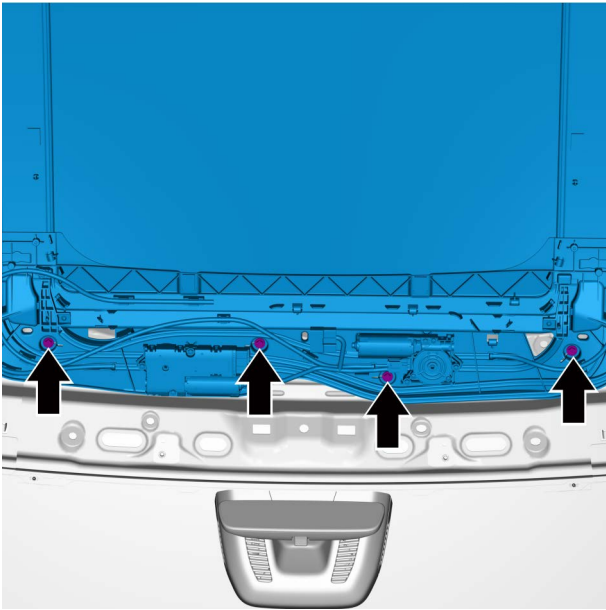
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

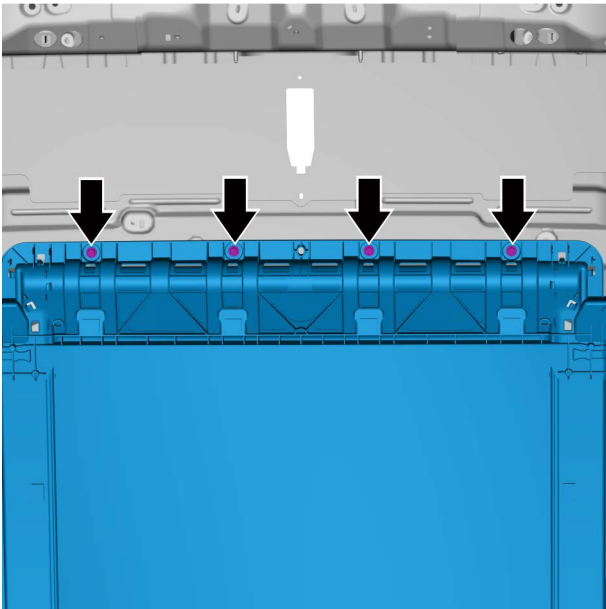
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the roof assembly, refer to [Replacement of roof assembly](#).
- 3 Disconnect the sunroof left and right front water drain pipe assemblies with the large sunroof subassembly.



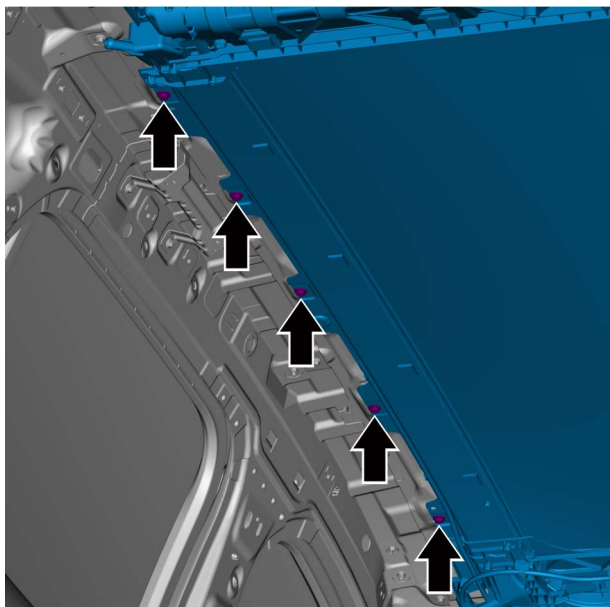
- 4 Disconnect the sunroof left and right rear water drain pipe assemblies from the large sunroof subassembly.



- 5 Remove the 4 fixing bolts between the front of the large sunroof subassembly and the body.



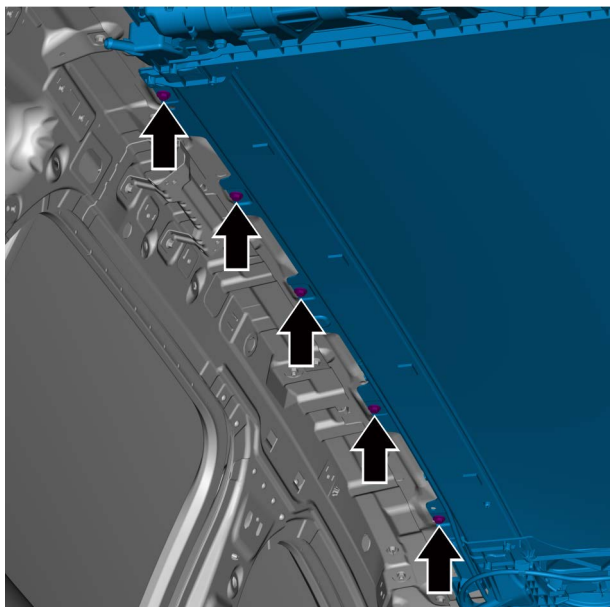
- 6 Remove the 4 fixing bolts between the rear of the large sunroof subassembly and the body.



- 7 Remove each of the 5 fixing bolts between the left and right sides of the large sunroof subassembly and the vehicle body.
- 8 Remove the large sunroof subassembly.

Caution

The sunroof assembly is heavy and requires the assistance of two technicians.



Installation Procedure

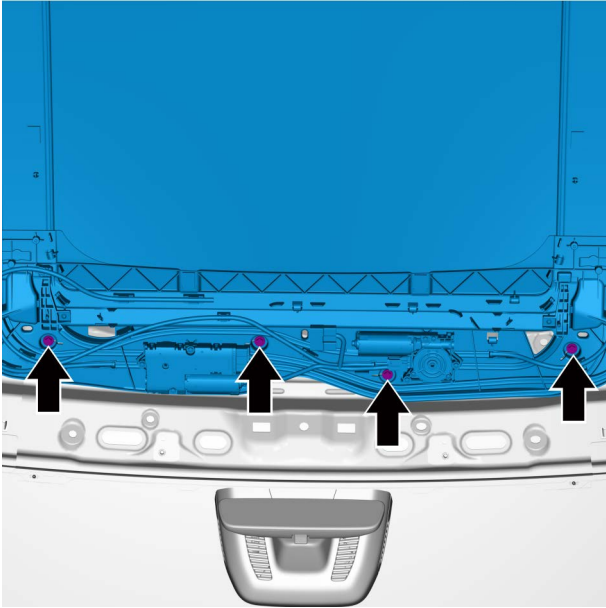
- 1 Install the large sunroof subassembly and pre-install the fixing bolts.

Caution

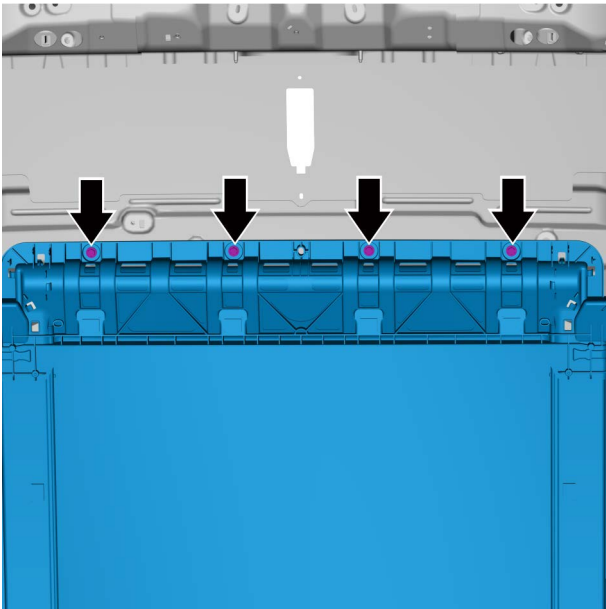
The sunroof assembly is heavy and requires the assistance of two technicians.

- 2 Install each of the 5 fixing bolts between the left and right sides of the large sunroof subassembly and the vehicle body.

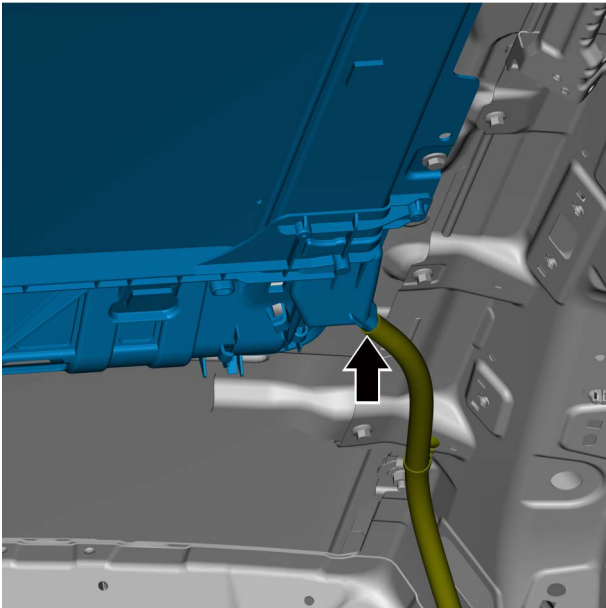
Torque: 9N·m



- 3 Install the 4 fixing bolts between the front of the large sunroof subassembly and the body.
Torque: 9N·m



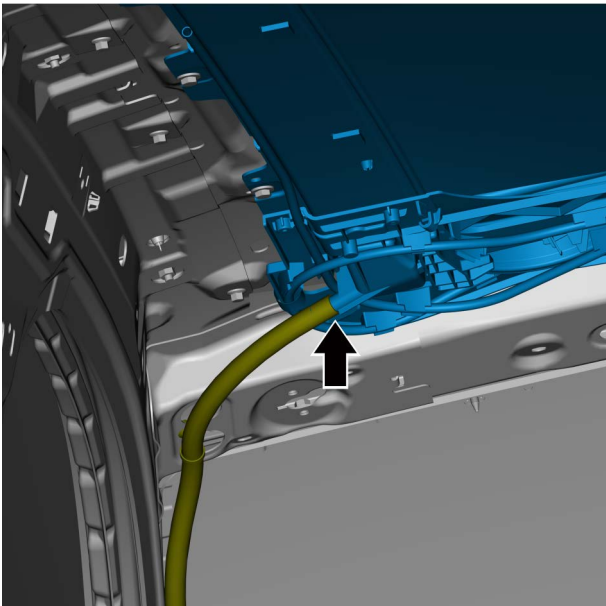
- 4 Install the 4 fixing bolts between the rear of the large sunroof subassembly and the body.
Torque: 9N·m



- 5 Connect the sunroof left and right rear water drain pipe assemblies to the large sunroof subassembly.

Caution

Plug the hoses in place, route them correctly, and avoid bending them.



- 6 Connect the sunroof left and right front water drain pipe assemblies to the large sunroof subassembly.

Caution

Plug the hoses in place, route them correctly, and avoid bending them.

- 7 Install the roof assembly.
- 8 Connect the negative cable of battery.
- 9 Perform initialization learning for the sunroof, refer to [Sunroof initialization learning](#).

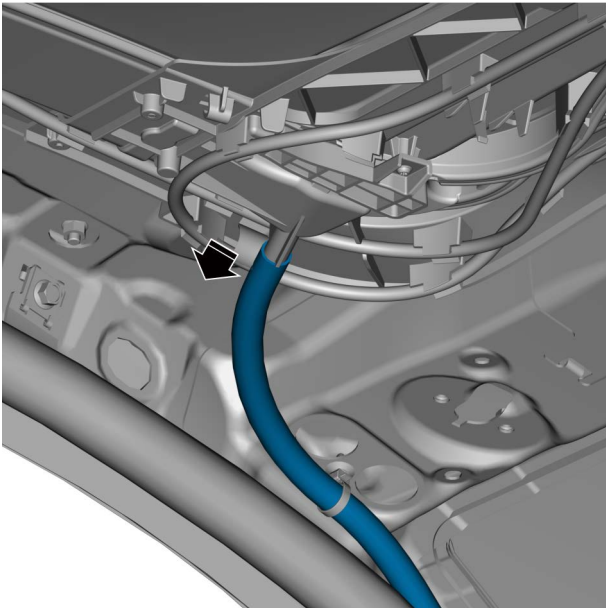
12.7.7.2 Replacement of sunroof left front water drain pipe assembly

Removal Procedure

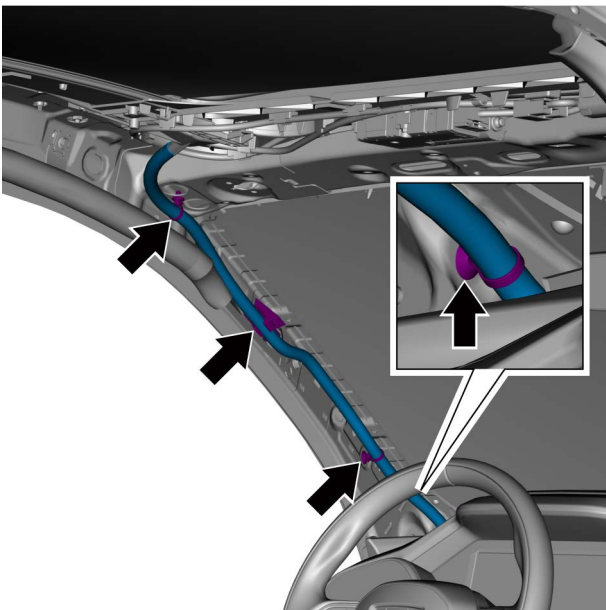
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

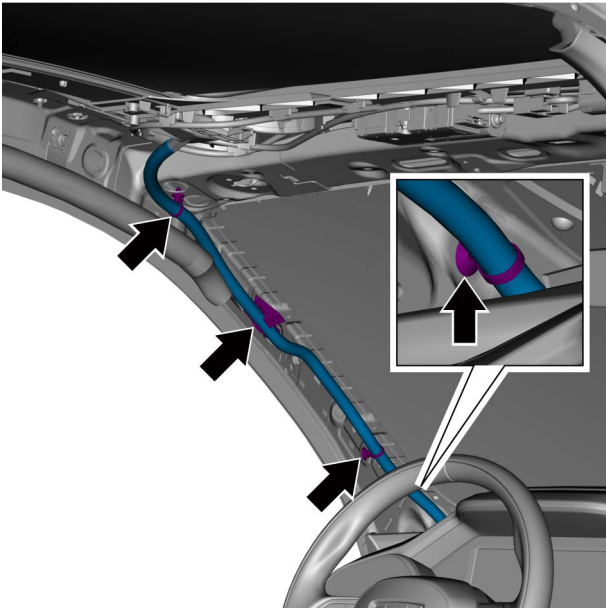


- 2 Remove the roof assembly, refer to [Replacement of roof assembly](#).
- 3 Disconnect the sunroof left front water drain pipe assembly from the sunroof module (panoramic sunroof).

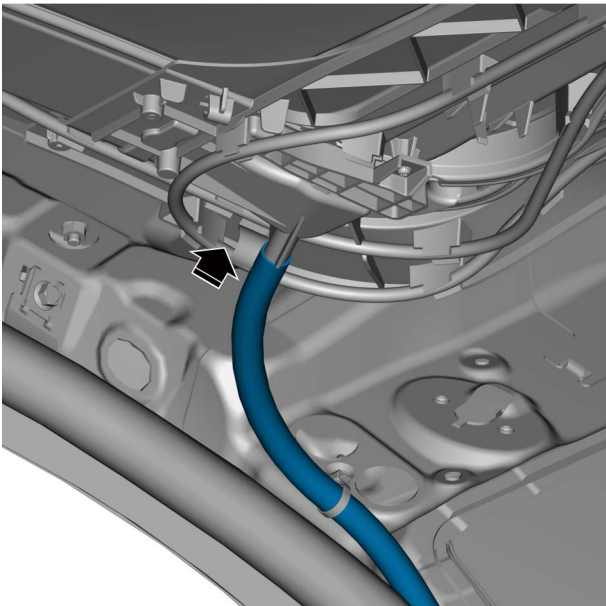


- 4 Remove the 4 fixing clips of sunroof left front water drain pipe assembly.
- 5 Pull the sunroof left front water drain pipe assembly out of the body drain hole.

Installation Procedure



- 1 Install the sunroof left front water drain pipe assembly into the body drain hole.
- 2 Install the 4 fixing clips of sunroof left front water drain pipe assembly.



- 3 Connect the sunroof left front water drain pipe assembly with the sunroof module (panoramic sunroof).

Caution

Plug the hoses in place, route them correctly, and avoid bending them.

- 4 Install the roof assembly.
- 5 Connect the negative cable of battery.

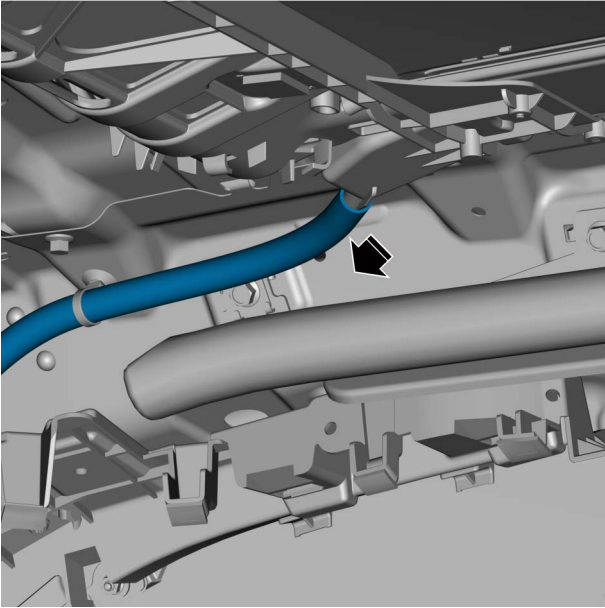
12.7.7.3 Replacement of sunroof left rear water drain pipe assembly

Removal Procedure

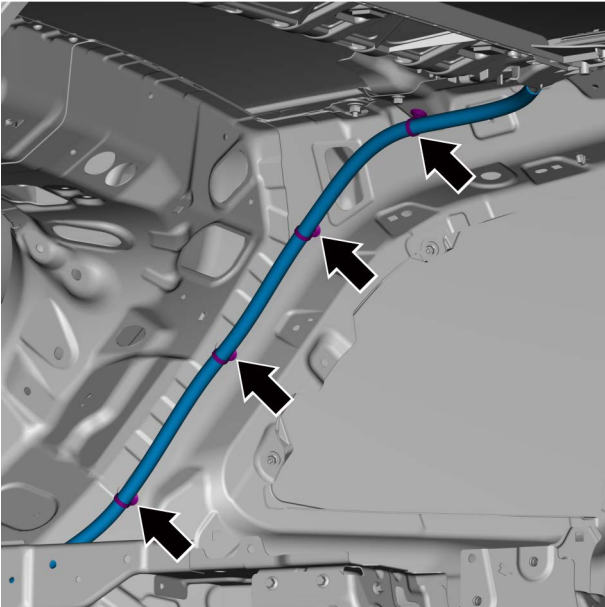
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

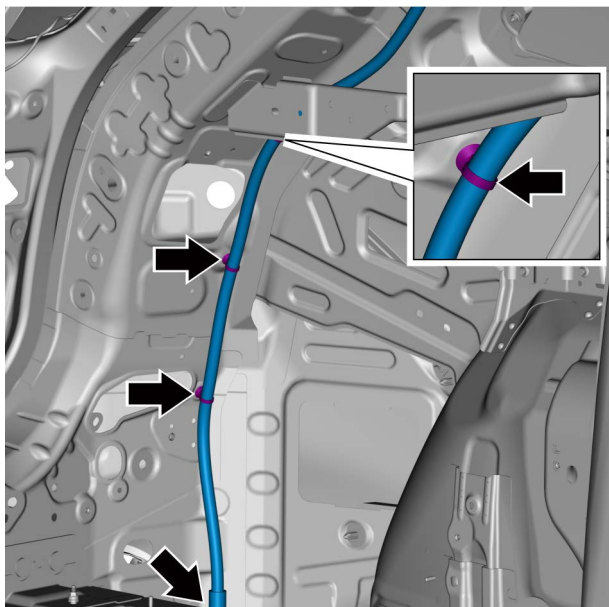
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the roof assembly, refer to [Replacement of roof assembly](#).



- 3 Disconnect the sunroof left rear water drain pipe assembly from the sunroof module (panoramic sunroof).

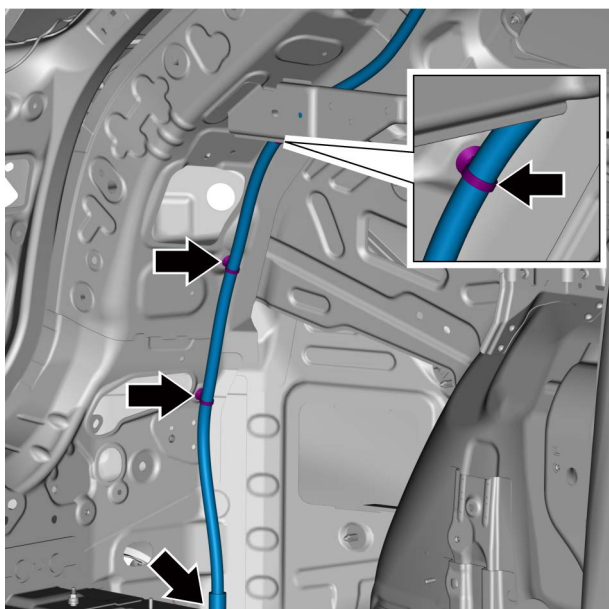


- 4 Remove the 4 fixing clips of sunroof left rear water drain pipe assembly.

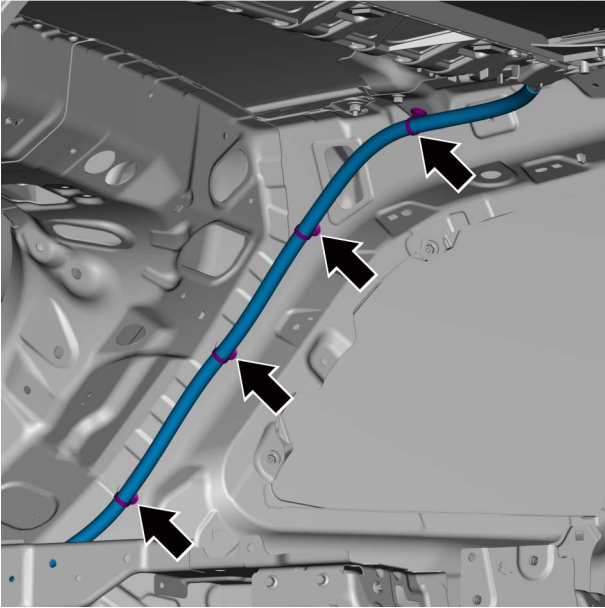


- 5 Remove the 3 fixing clips of sunroof left rear water drain pipe assembly.
- 6 Pull the sunroof left rear water drain pipe assembly out of the body drain hole.

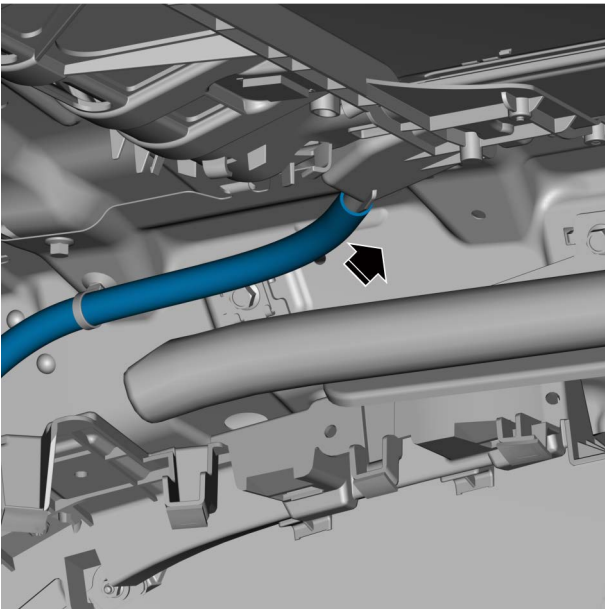
Installation Procedure



- 1 Install the sunroof left rear water drain pipe assembly into the body drain hole.
- 2 Install the 3 fixing clips of sunroof left rear water drain pipe assembly.



- 3 Install the 4 fixing clips of sunroof left rear water drain pipe assembly.



- 4 Connect the sunroof left rear water drain pipe assembly with the sunroof module (panoramic sunroof).

Caution

Plug the hoses in place, route them correctly, and avoid bending them.

- 5 Install the roof assembly.
- 6 Connect the negative cable of battery.

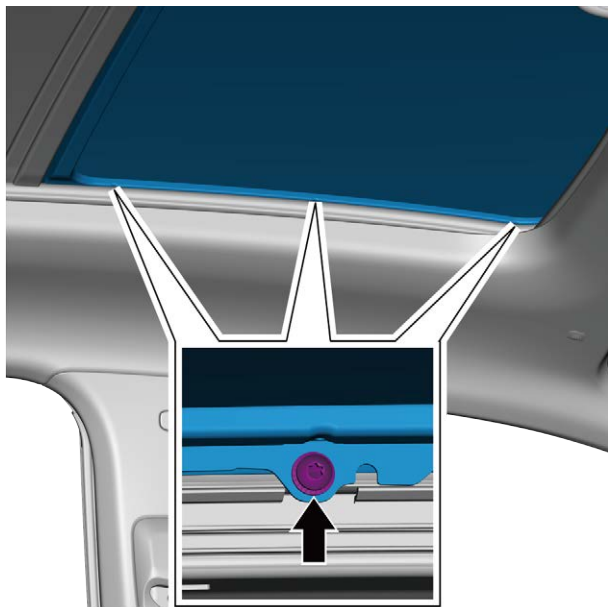
12.7.7.4 Replacement of sunroof switch

Refer to [Replacement of overhead console unit \(type I\)](#) and [Replacement of overhead console unit \(type II\)](#).

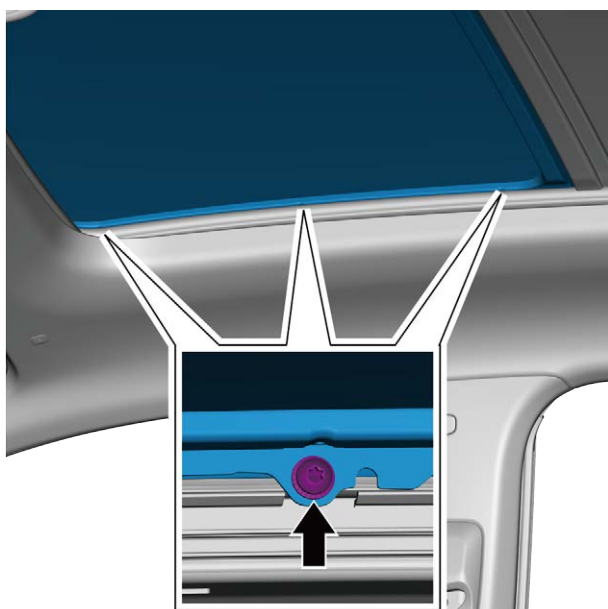
12.7.7.5 Replacement of large sunroof front glass

Removal Procedure

- 1 Open the sunshade.
- 2 Operate the sunroof switch to open the sunroof front glass assembly.

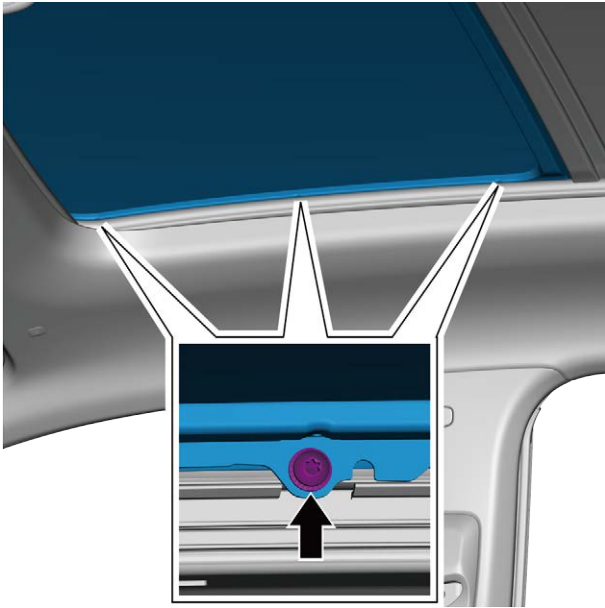


- 3 Remove the 3 fixing bolts on the left side of the large sunroof front glass.



- 4 Remove the 3 fixing bolts on the right side of the large sunroof front glass and remove the large sunroof front glass.

Installation Procedure



- 1 Install the large sunroof front glass and pre-install the fixing bolts.

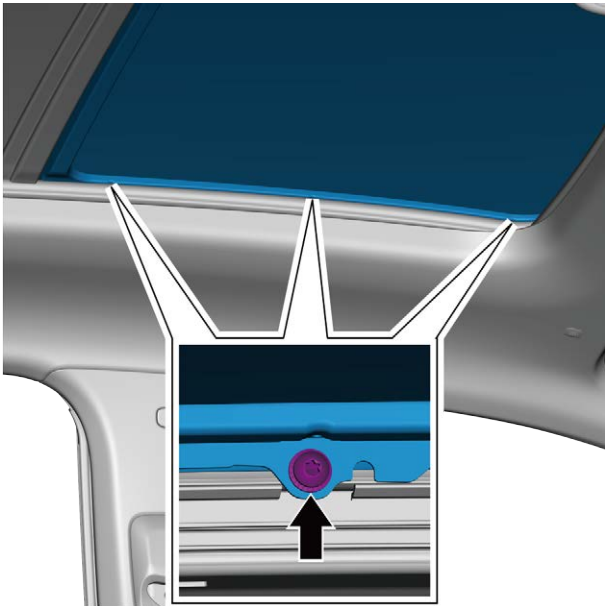
Caution

The large sunroof front glass assembly is heavy and requires the assistance of a partner.

Press evenly on the sunroof front glass assembly until the flat surface is free of unevenness.

- 2 Install and tighten the 3 fixing bolts on the right side of the large sunroof front glass.

Torque: 10N·m



- 3 Install and tighten the 3 fixing bolts on the left side of the large sunroof front glass.

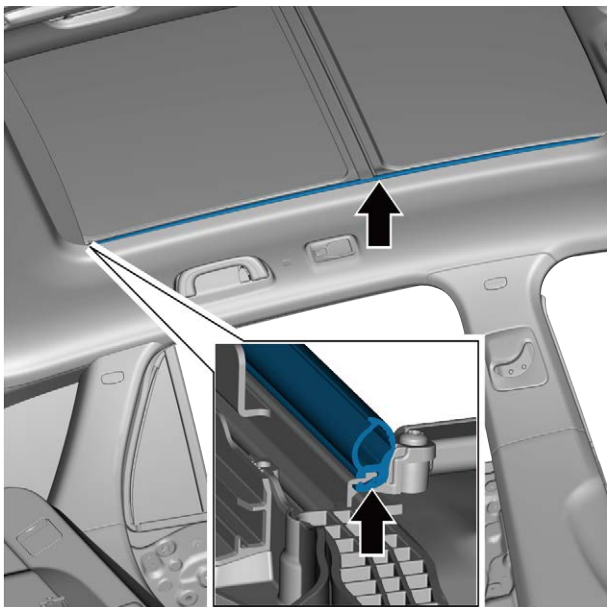
Torque: 10N·m

- 4 Close the sunroof.
- 5 Close the sunshade.

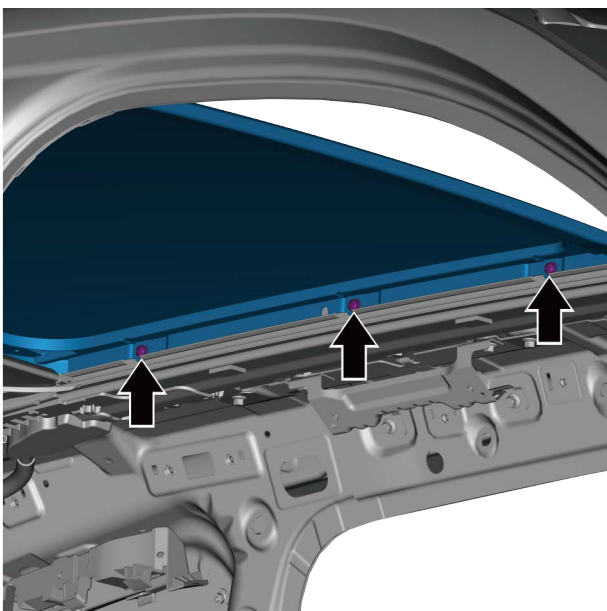
12.7.7.6 Replacement of large sunroof rear glass

Removal Procedure

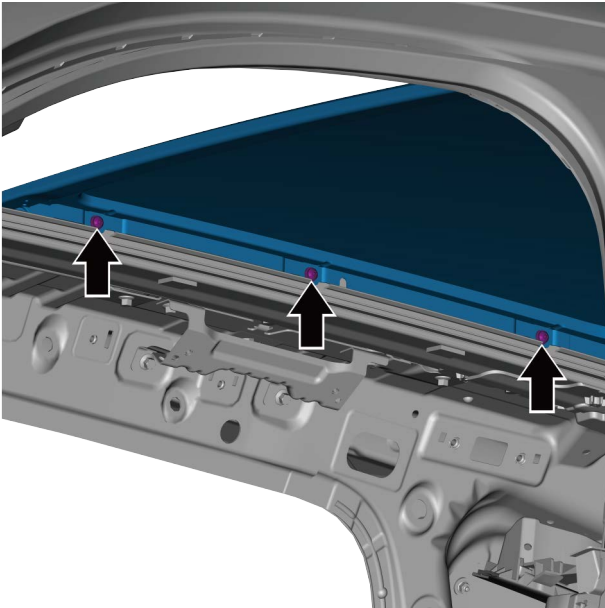
- 1 Open the sunshade.
- 2 Operate the sunroof switch to open the sunroof front glass assembly.
- 3 Remove the large sunroof front glass, refer to [Replacement of large sunroof front glass](#).



- 4 Remove the sunroof inner sealing tape.



- 5 Remove the 3 fixing bolts on the left side of the large sunroof rear glass.



- 6 Remove the 3 fixing bolts on the right side of the large sunroof rear glass and remove the large sunroof rear glass.

Installation Procedure

- 1 Install the large sunroof rear glass and pre-install the fixing bolts.

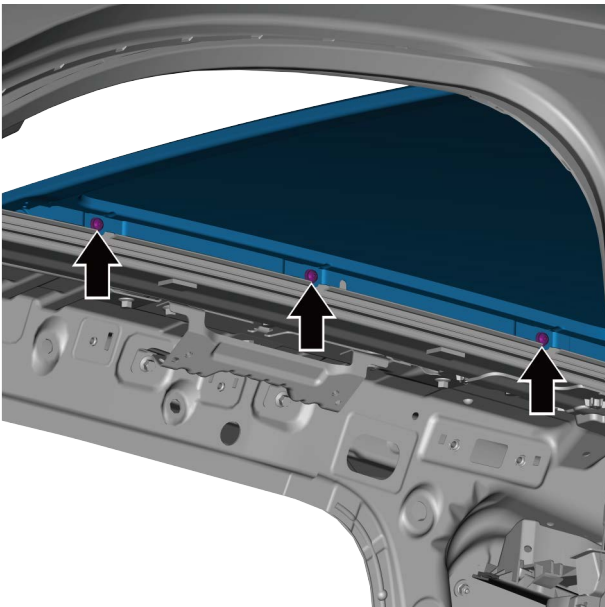
Caution

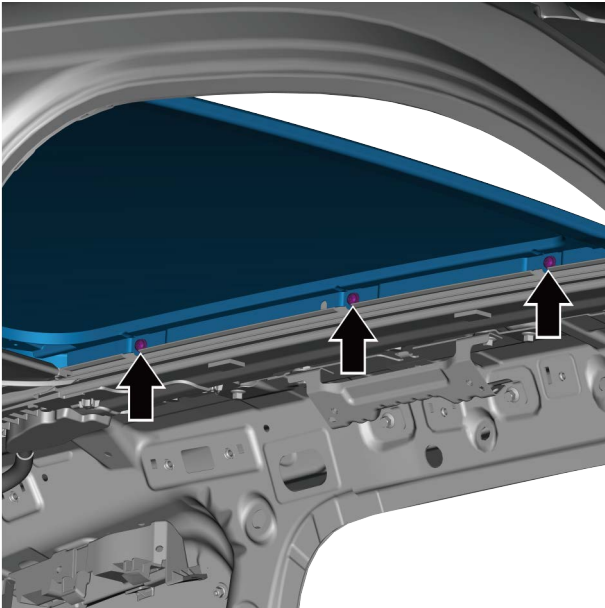
The large sunroof rear glass assembly is heavy and requires the assistance of a partner.

Press evenly on the sunroof rear glass assembly until the flat surface is free of unevenness.

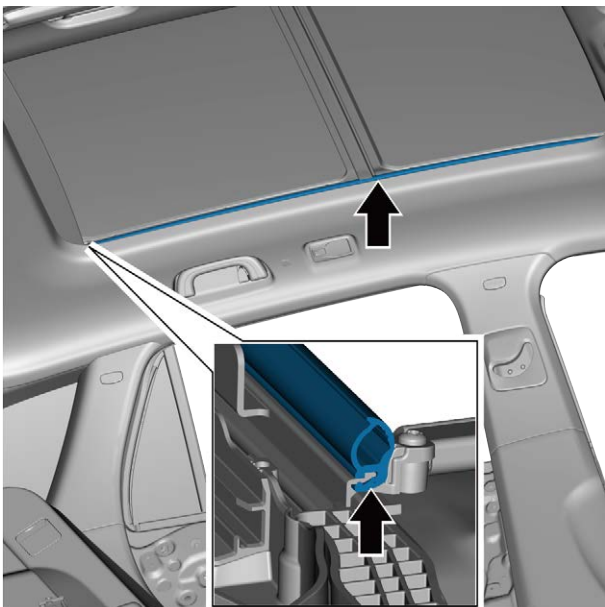
- 2 Install and tighten the 3 fixing bolts on the right side of the large sunroof rear glass.

Torque: 10N·m





- 3 Install and tighten the 3 fixing bolts on the left side of the large sunroof rear glass.
Torque: 10N·m



- 4 Install the sunroof inner sealing tape.

- 5 Install the large sunroof front glass.
- 6 Close the sunroof.
- 7 Close the sunshade.

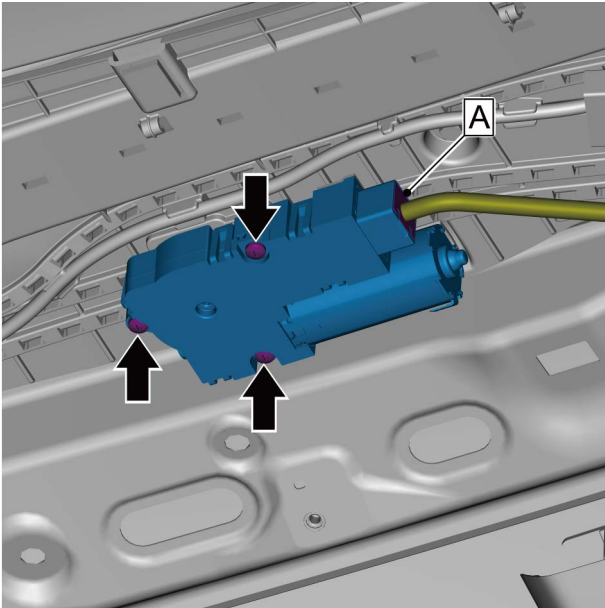
12.7.7.7 Replacement of sunroof control module with glass I

Removal Procedure

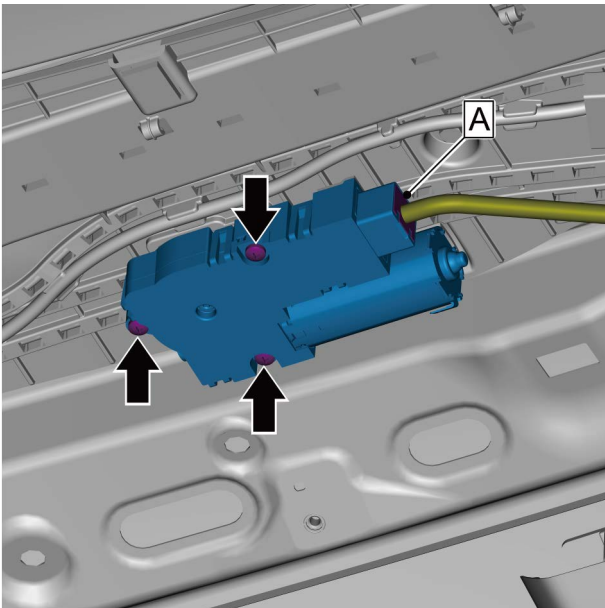
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).



- 2 Remove the roof assembly, refer to [Replacement of roof assembly](#).
- 3 Disconnect the harness connector A from sunroof harness assembly to sunroof control module with glass motor.
- 4 Remove the 3 fixing bolts from the sunroof control module with glass motor to the large sunroof subassembly.
- 5 Remove the sunroof control module with glass motor.



Installation Procedure

- 1 Install the sunroof control module with glass motor.
- 2 Install the 3 fixing bolts from the sunroof control module with glass motor to the large sunroof subassembly.
Torque: 3 N·m
- 3 Connect the harness connector A from sunroof harness assembly to sunroof control module with glass motor.

- 4 Install the roof assembly.
- 5 Connect the negative cable of battery.
- 6 Perform initialization learning for the sunroof, refer to [Sunroof initialization learning](#).

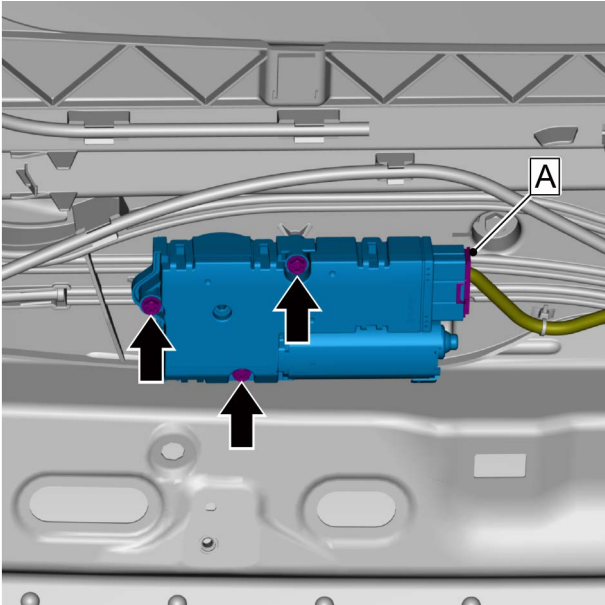
12.7.7.8 Replacement of sunroof control module with glass motor (type II)

Removal Procedure

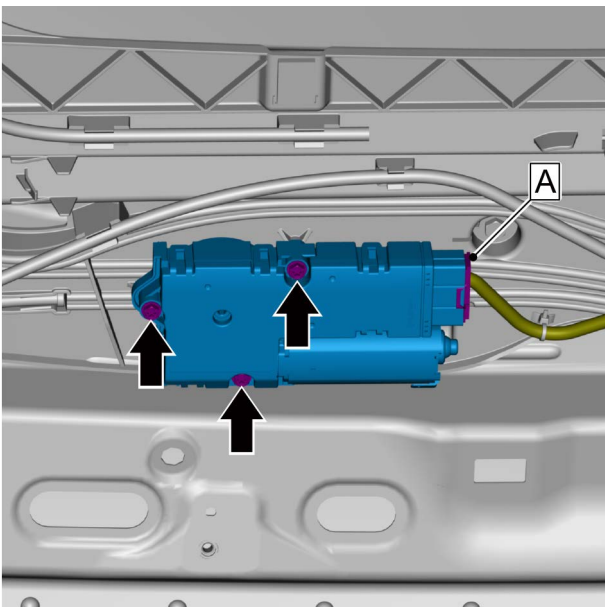
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the roof assembly, refer to [Replacement of roof assembly](#).
- 3 Disconnect the harness connector A from sunroof harness assembly to sunroof control module with glass motor.
- 4 Remove the 3 self-tapping screws from the sunroof control module with glass motor to the large sunroof subassembly.
- 5 Remove the sunroof control module with glass motor.

**Installation Procedure**

- 1 Install the sunroof control module with glass motor.
- 2 Install the 3 self-tapping screws from the sunroof control module with glass motor to the large sunroof subassembly.
Torque: 3 N·m
- 3 Connect the harness connector A from sunroof harness assembly to sunroof control module with glass motor.
- 4 Install the roof assembly.
- 5 Connect the negative cable of battery.
- 6 Perform initialization learning for the sunroof, refer to [Sunroof initialization learning](#).



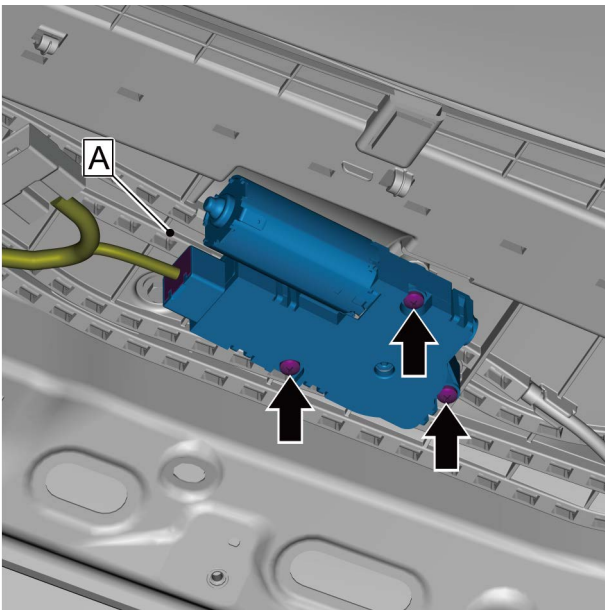
12.7.7.9 Replacement of sunroof sunshade motor (type I)

Removal Procedure

Warning !

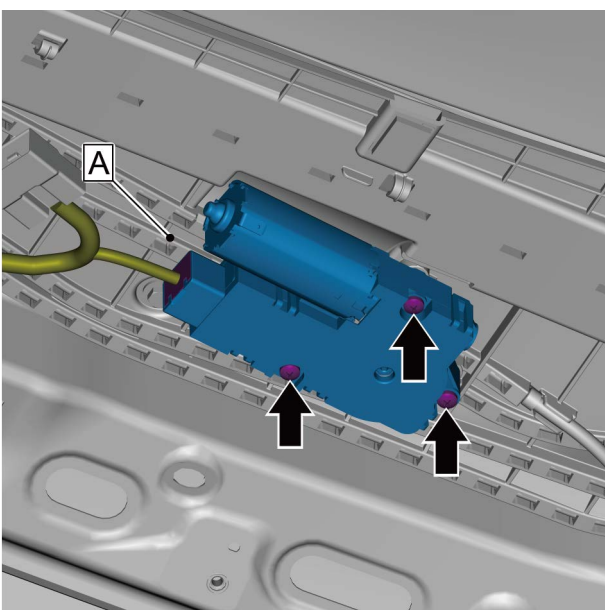
Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the roof assembly, refer to [Replacement of roof assembly](#).
- 3 Disconnect the 1 harness connector A from the sunroof harness assembly to the sunroof sunshade motor.
- 4 Remove the 3 fixing bolts from the sunroof sunshade motor to the large sunroof subassembly.
- 5 Remove the sunroof sunshade motor.



Installation Procedure

- 1 Install the sunroof sunshade motor.
- 2 Connect the 3 fixing bolts from the sunroof sunshade motor to the large sunroof subassembly.
Torque: 3 N·m
- 3 Connect the 1 harness connector A from the sunroof harness assembly to the sunroof sunshade motor.



- 4 Install the roof assembly.
- 5 Connect the negative cable of battery.
- 6 Perform initialization learning for the sunroof, refer to [Sunroof initialization learning](#).

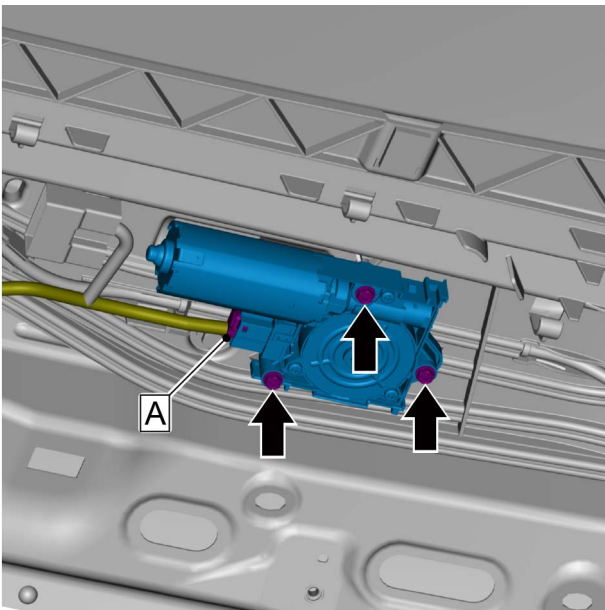
12.7.7.10 Replacement of sunroof sunshade motor (type II)

Removal Procedure

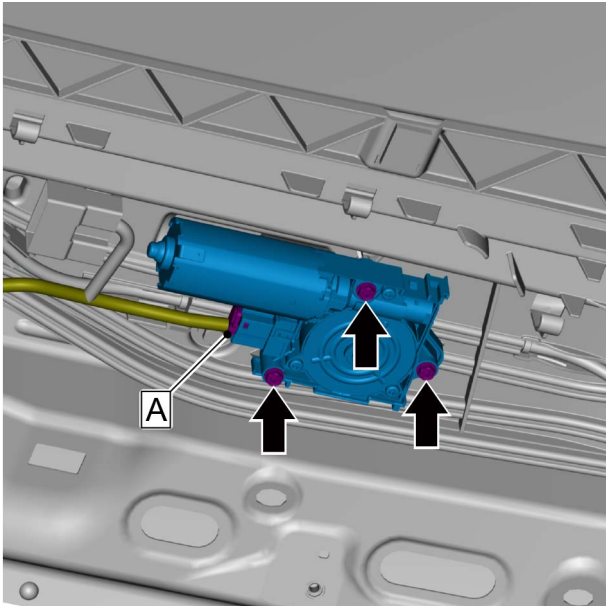
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the roof assembly, refer to [Replacement of roof assembly](#).
- 3 Disconnect the 1 harness connector A from the sunroof harness assembly to the sunroof sunshade motor.
- 4 Remove the 3 self-tapping screws from the sunroof sunshade motor to the large sunroof sub-assembly.
- 5 Remove the sunroof sunshade motor.



Installation Procedure



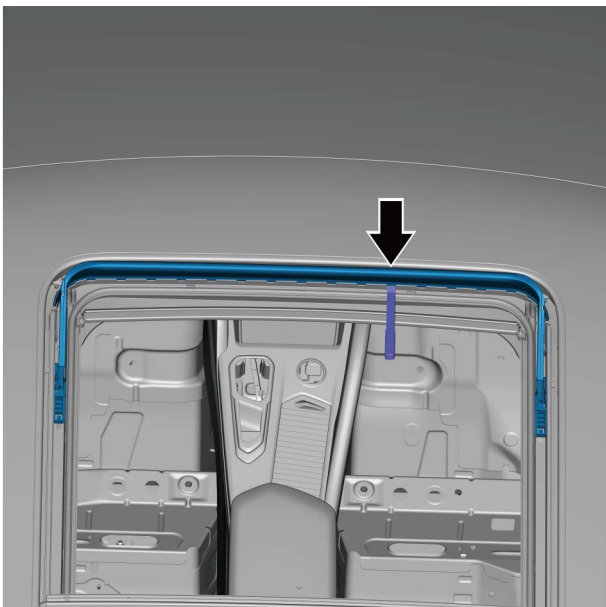
- 1 Install the sunroof sunshade motor.
- 2 Connect the 3 self-tapping screws from the sunroof sunshade motor to the large sunroof sub-assembly.
Torque: 3 N·m
- 3 Connect the 1 harness connector A from the sunroof harness assembly to the sunroof sunshade motor.

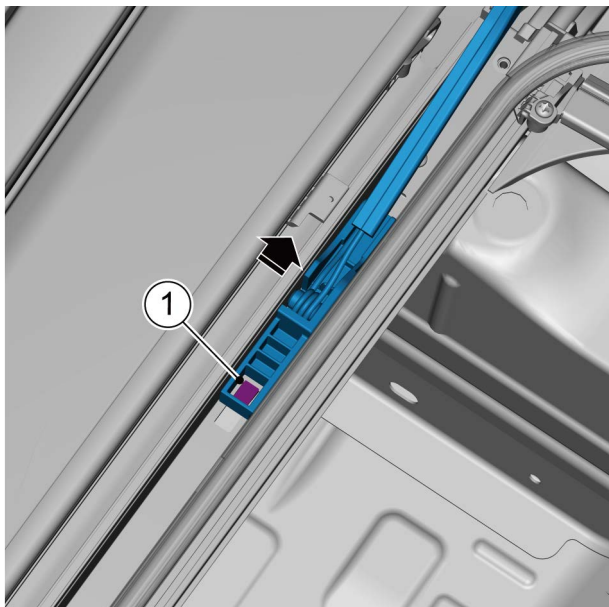
- 4 Install the roof assembly.
- 5 Connect the negative cable of battery.
- 6 Perform initialization learning for the sunroof, refer to [Sunroof initialization learning](#).

12.7.7.11 Replacement of sunroof windshield

Removal Procedure

- 1 Open the sunshade.
- 2 Open the sunroof.
- 3 Pry open the front end of the sunroof windshield using a suitable tool.

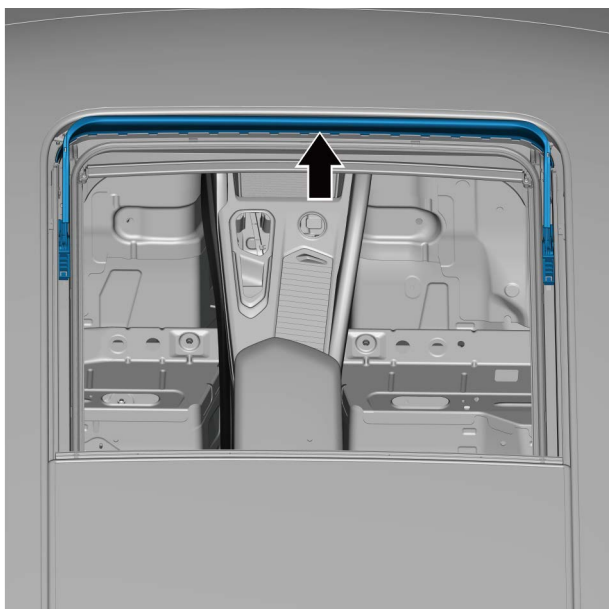




- 4 Pry up the left clip 1 of sunroof windshield and push it in the direction of the arrow.

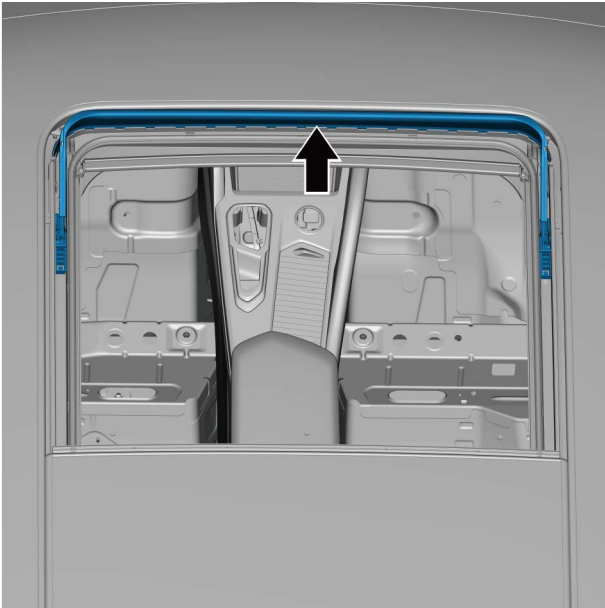
Caution

The right side of the sunroof windshield assembly is the same as the left side

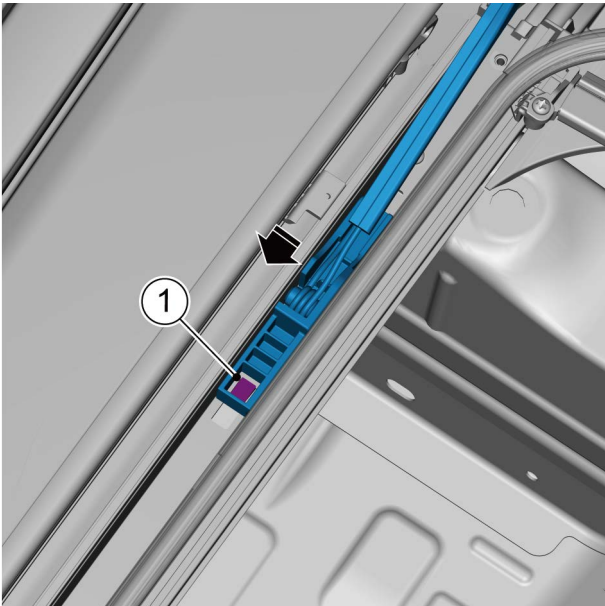


- 5 Remove the sunroof windshield.

Installation Procedure



- 1 Install the sunroof windshield.



- 2 Push the sunroof windshield left clip in the direction of the arrow and push the sunroof windshield left clip 1 to the standard position.

Caution

The right side of the sunroof windshield is the same as the left side.

- 3 Close the sunroof.
- 4 Close the sunshade.

12.7.7.12 Replacement of sunroof sunshade

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

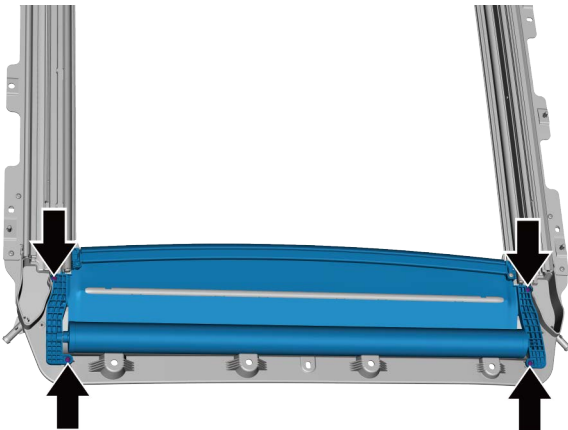
- 1 Open the sunshade.
- 2 Open the sunroof.
- 3 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

- 4 Remove the large sunroof front glass, refer to [Replacement of large sunroof front glass](#).
- 5 Remove the large sunroof rear glass, refer to [Replacement of large sunroof rear glass](#).
- 6 Remove the roof assembly, refer to [Replacement of roof assembly](#).
- 7 Remove the 4 fixing screws from the sunroof sunshade to the large sunroof subassembly.
- 8 Remove the sunroof sunshade.



Installation Procedure

- 1 Install the sunroof sunshade.
- 2 Install the 4 fixing screws from the sunroof sunshade to the large sunroof subassembly.



- 3 Install the roof assembly.
- 4 Install the large sunroof rear glass.
- 5 Install the large sunroof front glass.
- 6 Connect the negative cable of battery.

- 7 Close the sunroof.
- 8 Close the sunshade.

12.8 Center door lock

12.8.1 Specification

12.8.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Door latch (left front door lock) fixing bolt	M6×12	8.5-11.5
Left front door latch assembly fixing bolt	M8×22×25.9	20-28
Door latch (left rear door lock) fixing bolt	M6×12	8.5-11.5
Left rear door latch assembly fixing bolt	M8×22×25.9	20-28
Power operated tailgate closing unit fixing bolt	M6×25	8.5-11.5
Power operated tailgate closing unit fixing bolt	M6×16	8.5-11.5
Tailgate latch assembly fixing bolt	M8×20	20-28

12.8.2 Instructions and operations

12.8.2.1 Instructions and operations

Remote locking and unlocking

Locking

Short press the lock button on smart key, the four doors and fuel filler cap will be locked, turn signal will be on for 1 second, interior light will be off gradually, and audio entertainment system will be turned off; press and hold the lock button, the four door glass, sunroof and sunroof sunshade will be turned off.

Unlocking

Short press the unlock button on smart key, the four vehicle doors and fuel filler cap will be unlocked, the turn signal flashes twice, and the interior lights and position lamp light up.

Caution

Never allow children to enter the luggage compartment. Make sure the luggage compartment is closed when the vehicle is unattended. Children trapped in the luggage compartment may not be able to escape and will suffer heatstroke or suffocation.

Two-step unlock function

On multimedia display screen, click: Vehicle Settings → Basic Vehicle Settings → Locks & Keys in turn, and then select Driver (i.e., two-step unlock function) or Whole Vehicle in the Key Unlock Setting menu.

– Driver: After this function is turned on, short press the smart key unlock button once, then only the driver door will be unlocked, and other doors will remain locked. To unlock all doors, press the button again.

– Whole Vehicle: When this function is turned on, short press the smart key unlock button once to unlock all the doors.

Mechanical key locking and unlocking

Lock and unlock the driver side door with mechanical key

- a. Remove the mechanical key from the smart key.
- b. Insert the mechanical key into the driver side door latch. Turn clockwise and the driver side door unlocks. Turn counterclockwise and the driver side door is locked.

Lock the front passenger side door and rear doors with mechanical key

- a. Remove the mechanical key from the smart key.
- b. Insert the mechanical key into the front passenger side door latch. Turn clockwise and close the front passenger side door to lock it. The rear doors that need to be locked can be locked separately in the same way.

Internal locking and unlocking

With all four doors closed, press the lock button on the door to lock all doors.

With all four doors closed, press the unlock button to unlock all doors.

Caution

The center control key unlocking in the vehicle can only be executed in the anti-theft disarm state, and there is no response in other anti-theft states.

Automatic locking and unlocking

Automatic re-locking

45 second after using the smart key to unlock and any of engine hood, four doors, and trunk door is not opened, the four doors will be automatically re-locked. The interior lights are turned off and the system enters the arming state.

Automatic locking during running

When start switch is in Mode II or engine is started, if the vehicle speed is greater than 7 km/h, the four door locks will be locked automatically.

Collision unlocking

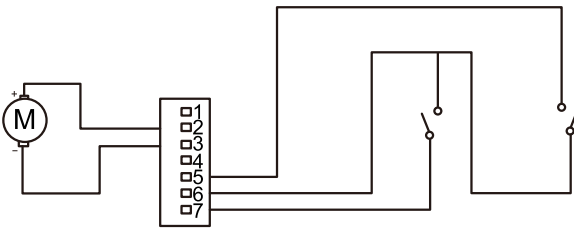
If a serious frontal collision occurs while the vehicle is in motion, the four doors will be automatically unlocked to facilitate the rapid exit of occupants from the vehicle.

12.8.3 System working principles

12.8.3.1 System working principles

Door lock

- The door lock is mainly composed of the motor, micro switch, shell, pull rod, etc.
- All four door locks have a motor and two microswitches. The working voltage of the motor is 9-16V, the working current is $\leq 3.5\text{A}$, and the blocking current is 3.5-7 A. The microswitch reacts to whether the door is open or not.



Lock operation

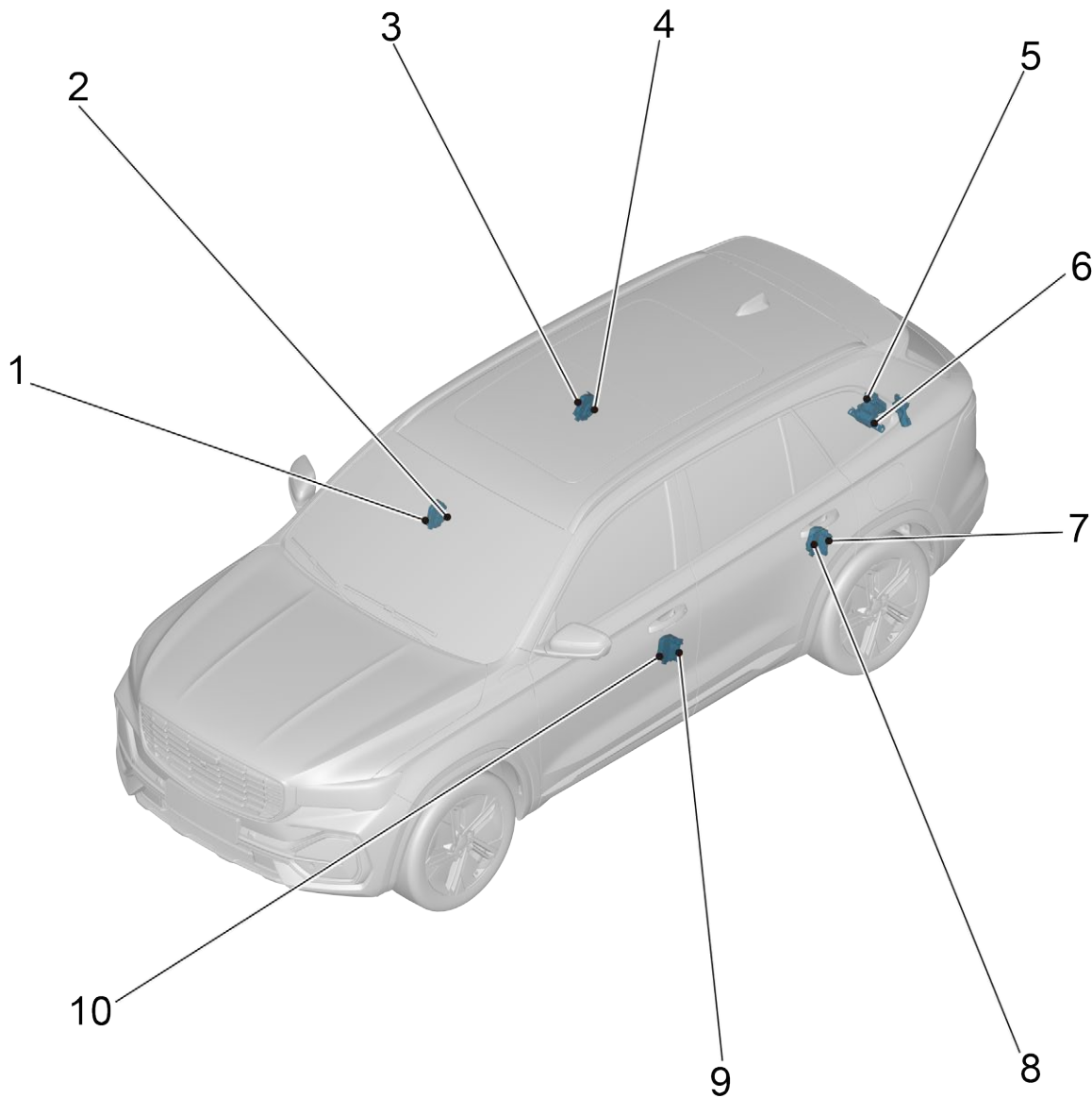
When the CEM receives the switch locking input signal or meets the automatic locking condition, it outputs power from the locking output terminal of the CEM, and controls the door lock motors of the five doors to perform the locking operation.

Unlock operation

When the CEM receives the switch unlock input signal or meets the automatic unlock condition, power is output from the unlock output terminal of the CEM to control the door lock motors of the four doors plus the back door to perform the unlocking operation. The tailgate can be opened individually by operating the tailgate switch and controlling it with the CEM signal through the keyless entry module.

12.8.4 Part position

12.8.4.1 Part position



- | | |
|---------------------------------------|---------------------------------------|
| 1. Door latch (right front door lock) | 6. Tailgate latch assembly |
| 2. Door latch | 7. Door latch |
| 3. Door latch (right rear door lock) | 8. Door latch (left rear door lock) |
| 4. Door latch | 9. Door latch |
| 5. Tailgate lock body assembly | 10. Door latch (left front door lock) |

12.8.5 Diagnostic information and procedure

12.8.5.1 Diagnosis description

See [Description and Operation](#) and [System Working Principles](#) before diagnosing a malfunction in the central locking. Understanding and familiarizing yourself with the operation of the central locking before beginning system diagnosis will help determine the correct troubleshooting steps to take in the event of a malfunction, and more importantly this will help determine if the condition described by the customer is normal operation. Any troubleshooting of the central locking should start with a [Visual Check](#) that guides the repairer to the next logical step in the troubleshooting process. Understanding and using the diagnostic process correctly will reduce diagnostic time and avoid misdiagnosis of the fault area.

12.8.5.2 Visual check

- Check the after-sales installations which may affect central locking and ensure these installations cannot affect the normal work of central locking.
- Check system components that are easily accessible or can be seen to find out if there is any obvious damage of the component or there is a situation that may cause a fault.
- Check the harness and harness connector to ensure that there is no sign of loosening, damage, poor contact, aging, etc.
- If all the door lock operations fail, check and repair any poor contact or open circuit of the power supply or grounding circuit before replacing the bulb.

12.8.6 Removal and Installation

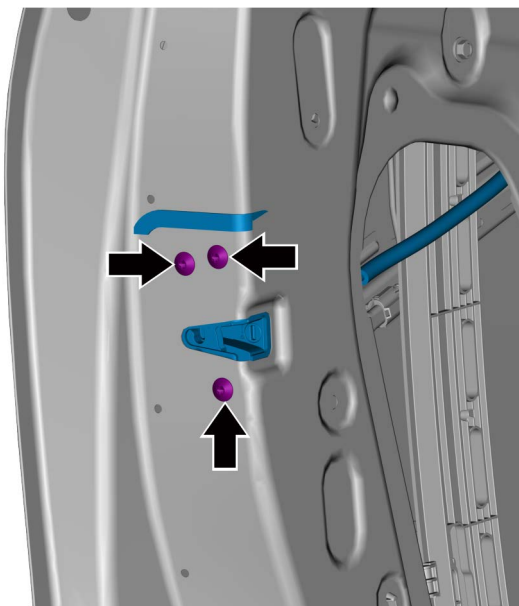
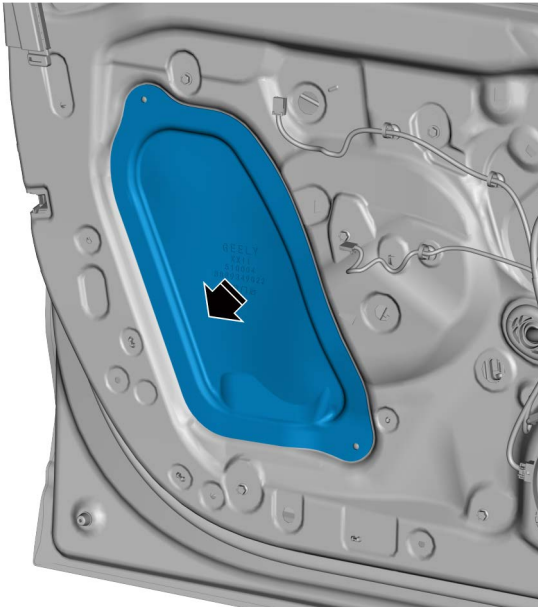
12.8.6.1 Replacement of door latch (left front door lock)

Removal Procedure

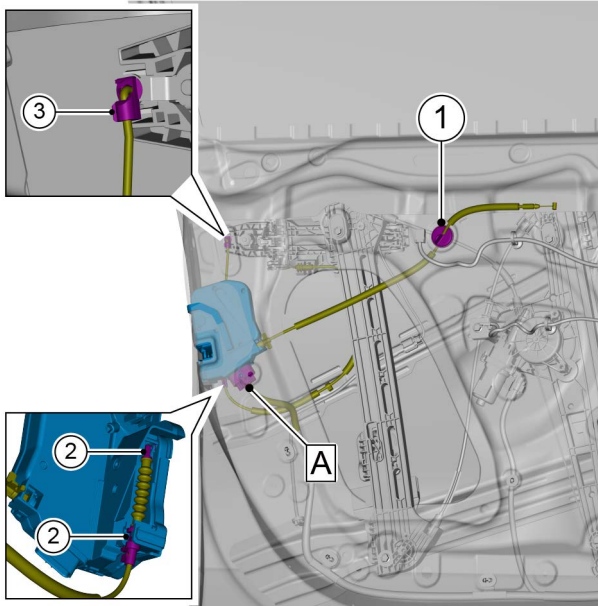
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left front door interior trim panel assembly, refer to [Replacement of left front door interior trim panel assembly](#).
- 3 Remove the left front door rear waterproof membrane.



- 4 Remove the 3 fixing bolts of door latch (left front door lock).



- 5 Disengage the door latch (left front door lock) inner cable rubber plug cover 1, disengage the door handle cable fixing point 2, and disengage the door lock fixing clip 3.
- 6 Disconnect the door latch (left front door lock) harness connector A and remove the door latch (left front door lock).

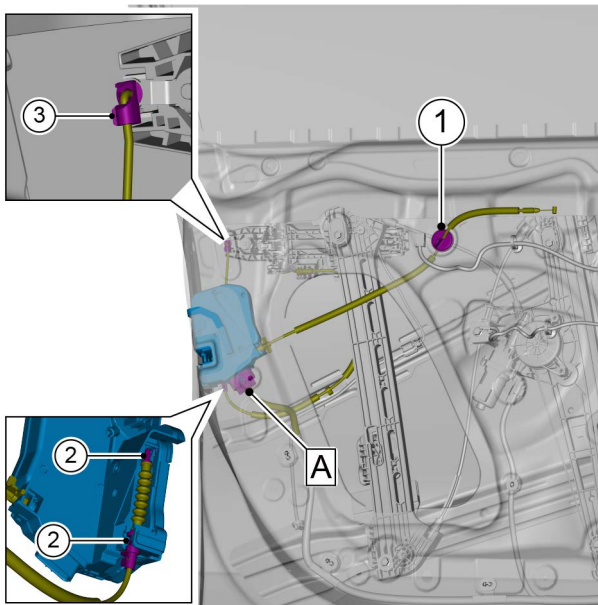
Installation Procedure

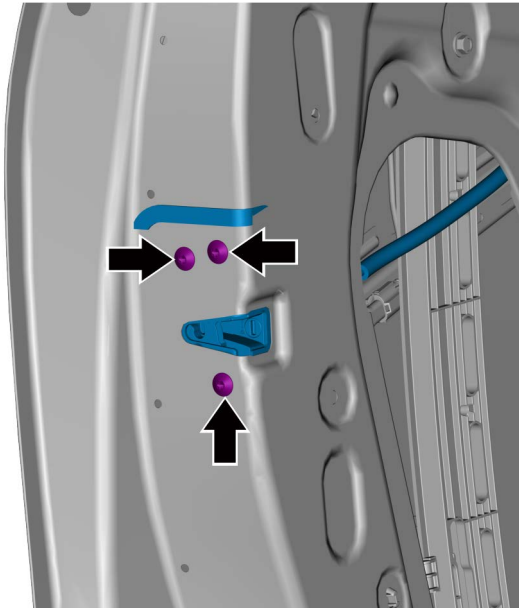
- 1 Connect the door latch (left front door lock) harness connector A.

Caution

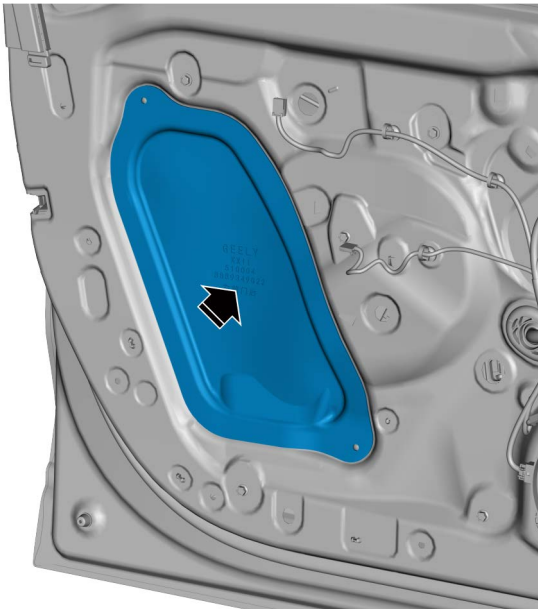
Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 2 Install the door handle pull cable fixing point 2, install the door lock fixing clip 3, and install the door latch (left front door lock) inner pull cable rubber plug cover 1.





- 3 Install the 3 fixing bolts of door latch (left front door lock).
Torque: 10N·m

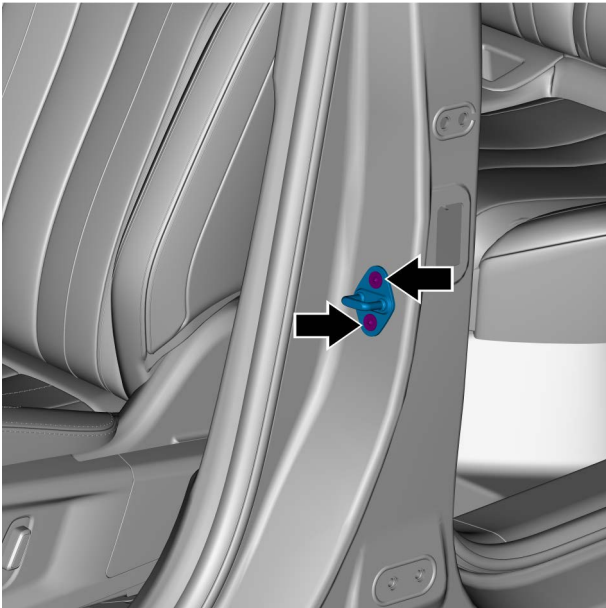


- 4 Install the left front door rear waterproof membrane.

- 5 Install the left front door trim panel assembly.
- 6 Connect the negative cable of battery.

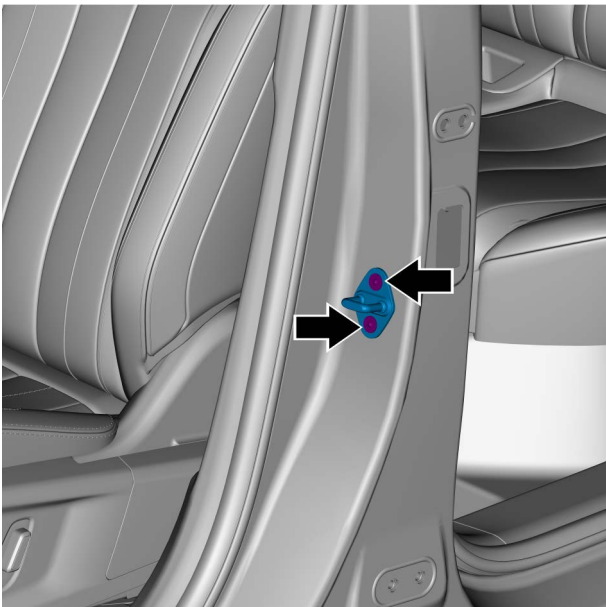
12.8.6.2 Replacement of left front door latch assembly

Removal Procedure



- 1 Remove the 2 countersunk head screws of the left front door latch assembly.
- 2 Remove the left front door latch assembly.

Installation Procedure



- 1 Place the left front door latch assembly into the mounting position.
- 2 Install the 2 countersunk head screws of the left front door latch assembly.
Torque: 24N·m

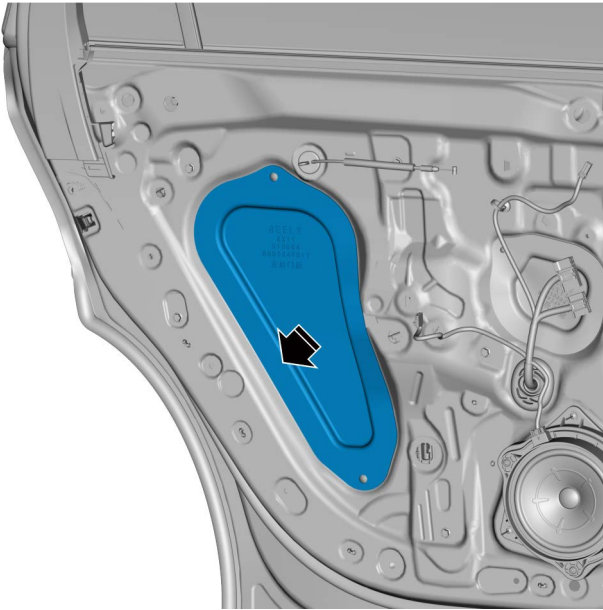
12.8.6.3 Replacement of door latch (left rear door lock)

Removal Procedure

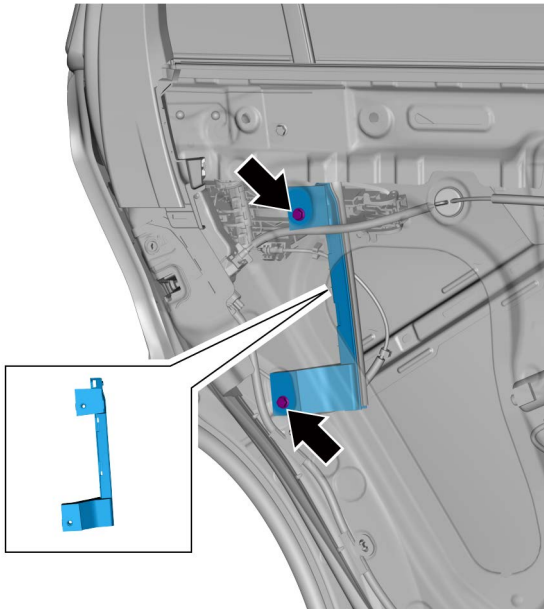
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

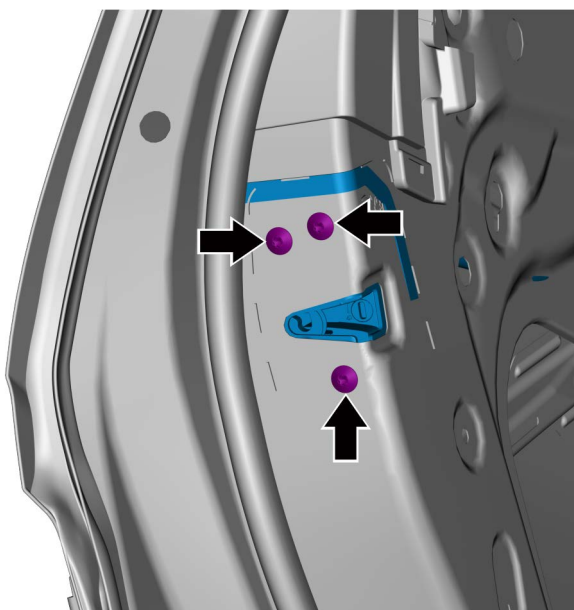
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left rear door interior trim panel assembly, refer to [Replacement of left rear door interior trim panel assembly](#).



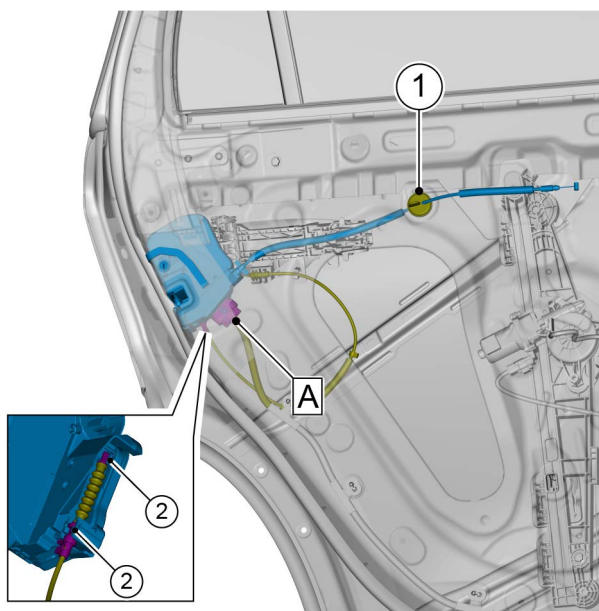
3 Remove the left rear door rear waterproof membrane.



4 Remove the 2 fixing bolts of left rear door window rear guide rail assembly.



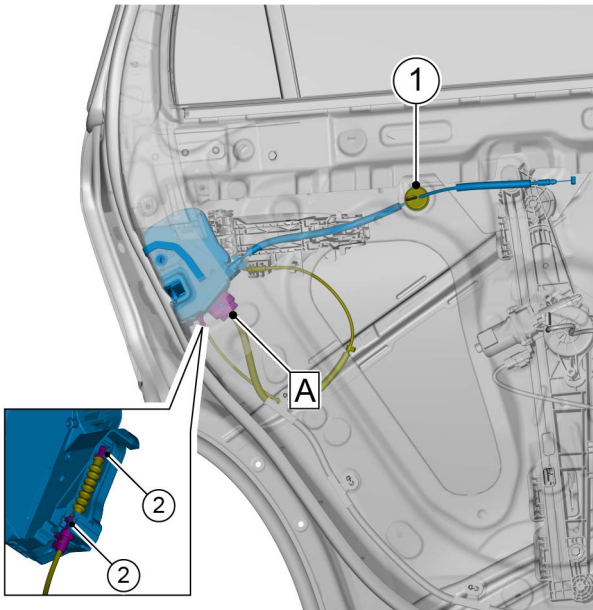
5 Remove the 3 fixing bolts of door latch (left rear door lock).



6 Remove the door lock cable rubber plug cover 1 and disconnect the door lock cable from the door lock fixing point 2.

7 Disconnect the door latch (left rear door lock) harness connector A and remove the door latch (left rear door lock).

Installation Procedure

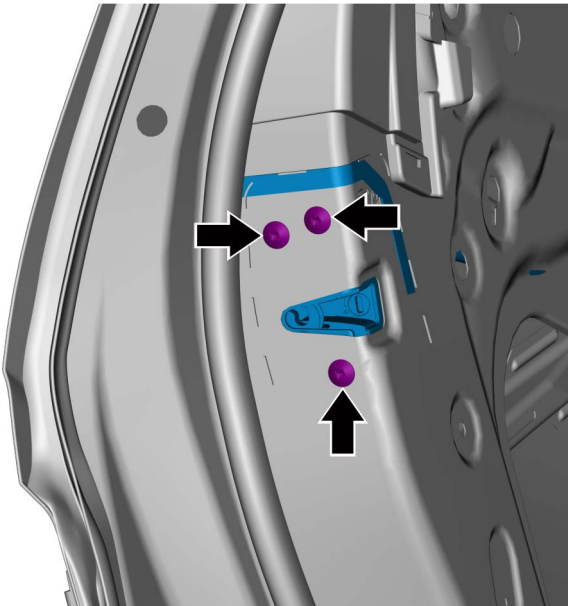


- 1 Connect the door latch (left rear door lock) harness connector A.

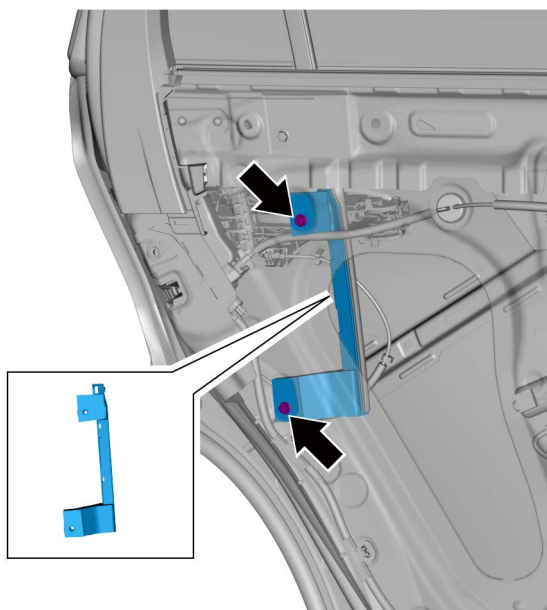
Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

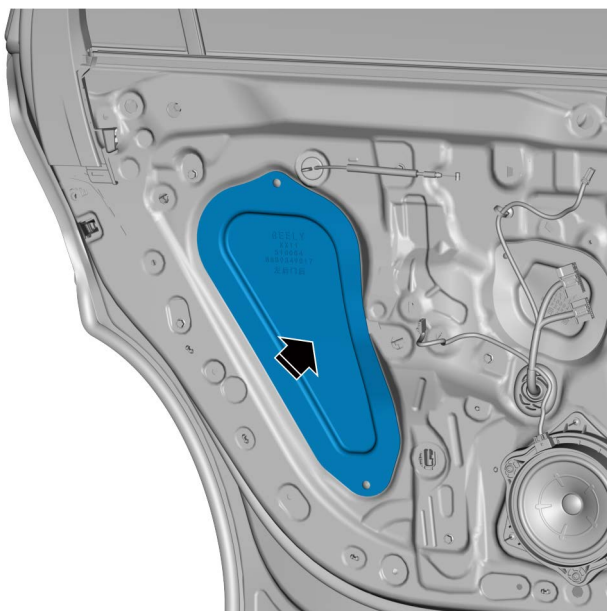
- 2 Connect the fixing point 2 of the door lock outer release cable and the door lock, and install the door lock cable rubber plug cover 1.



- 3 Install the 3 fixing bolts of door latch (left rear door lock).
Torque: 10N·m



- 4 Install the 2 fixing bolts of left rear door window rear guide rail assembly.
Torque: 10N·m

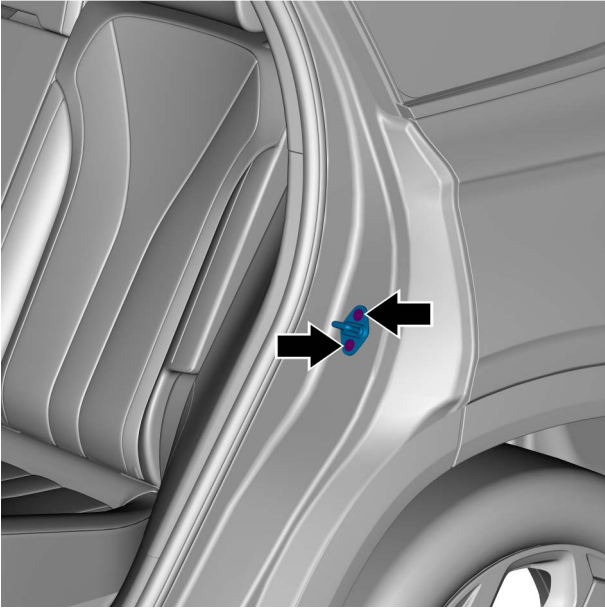


- 5 Install the left rear door rear waterproof membrane.

- 6 Install the left front door interior trim panel assembly.
- 7 Connect the negative cable of battery.

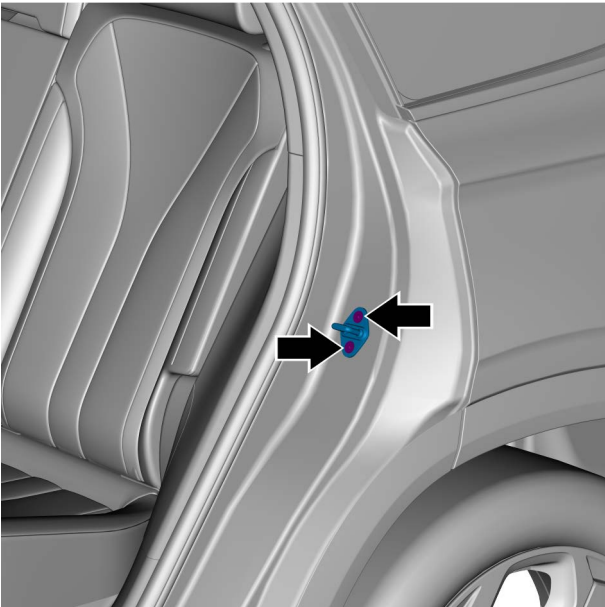
12.8.6.4 Replacement of left rear door latch assembly

Removal Procedure



- 1 Remove the 2 countersunk head screws of the left rear door latch assembly.
- 2 Remove the left rear door latch assembly.

Installation Procedure



- 1 Place the left rear door latch assembly into the mounting position.
- 2 Install the 2 countersunk head screws of the left rear door latch assembly.
Torque: 24N·m

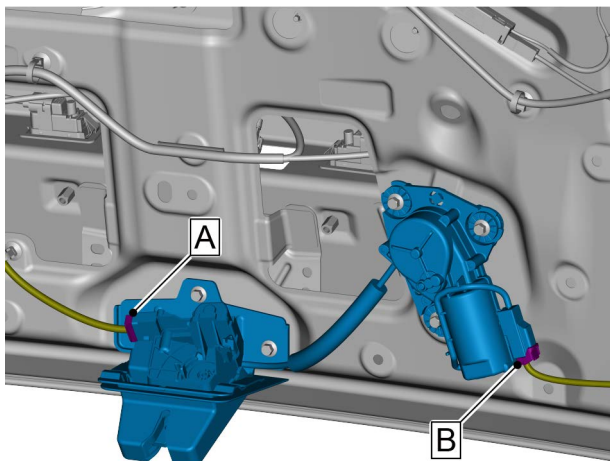
12.8.6.5 Replacement of power operated tailgate closing unit

Removal Procedure

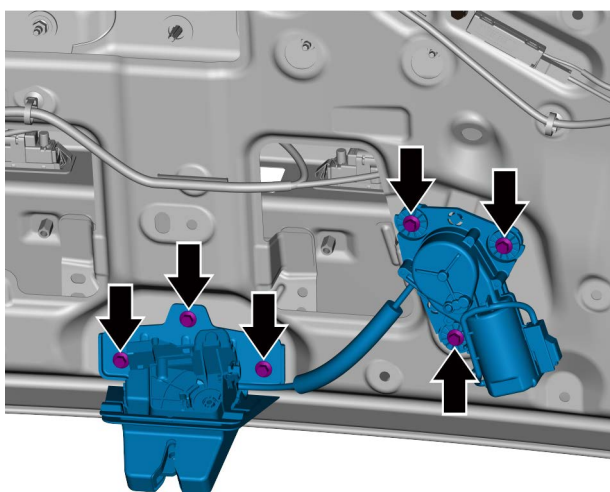
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the trunk door lower interior trim panel assembly, refer to [Replacement of trunk door lower interior trim panel assembly](#).

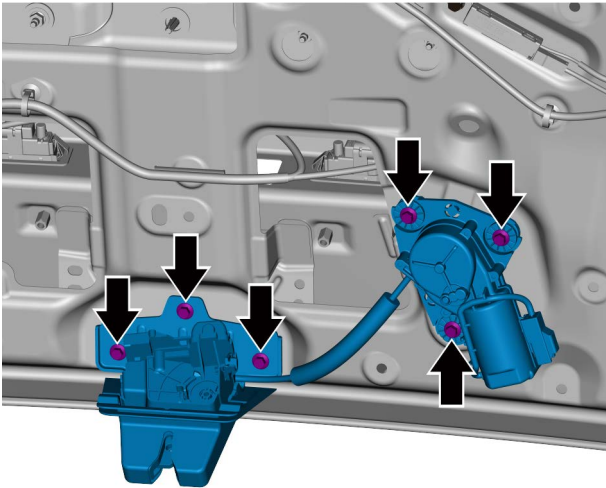


- 3 Disconnect power operated tailgate closing unit harness connectors A and B.

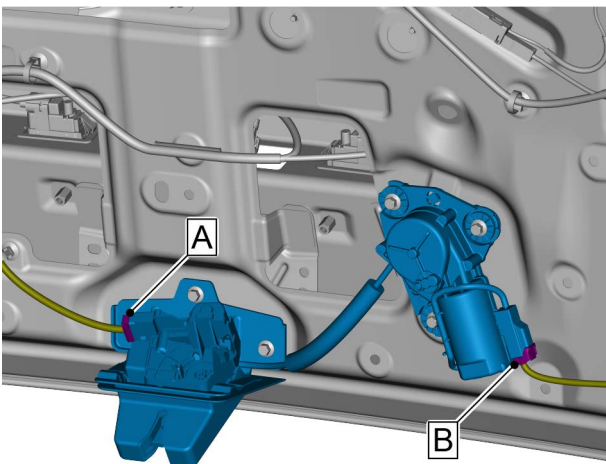


- 4 Remove the 6 fixing bolts of power operated tailgate closing unit and remove the power operated tailgate closing unit.

Installation Procedure



- 1 Install the 6 fixing bolts of power operated tailgate closing unit.
Torque: 10N·m



- 2 Connect power operated tailgate closing unit harness connectors A and B.

Caution

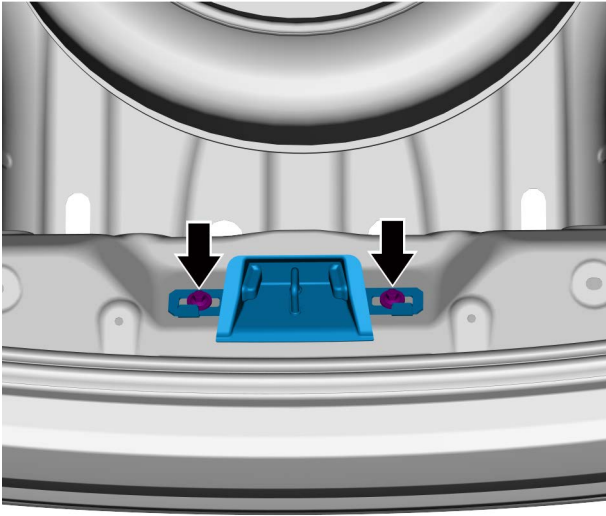
Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 3 Install assembly of interior trim panel of tail gate.
- 4 Connect the negative cable of battery.

12.8.6.6 Replacement of tailgate latch assembly

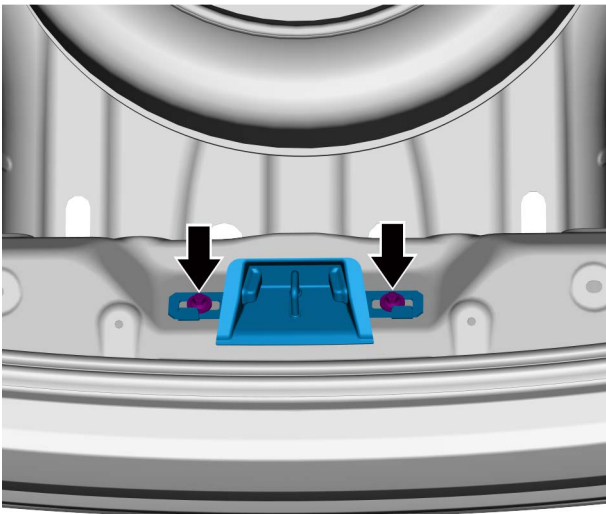
Removal Procedure

- 1 Remove the luggage compartment door sill trim panel, refer to [Replacement of luggage compartment door sill trim panel](#).
- 2 Remove the 2 fixing bolts of tailgate latch assembly.
- 3 Remove the tailgate latch assembly.



Installation Procedure

- 1 Place the tailgate latch assembly into the installation position.
- 2 Install the 2 fixing bolts of tailgate latch assembly.
Torque: 24N·m



- 3 Install the luggage compartment door sill trim panel assembly.

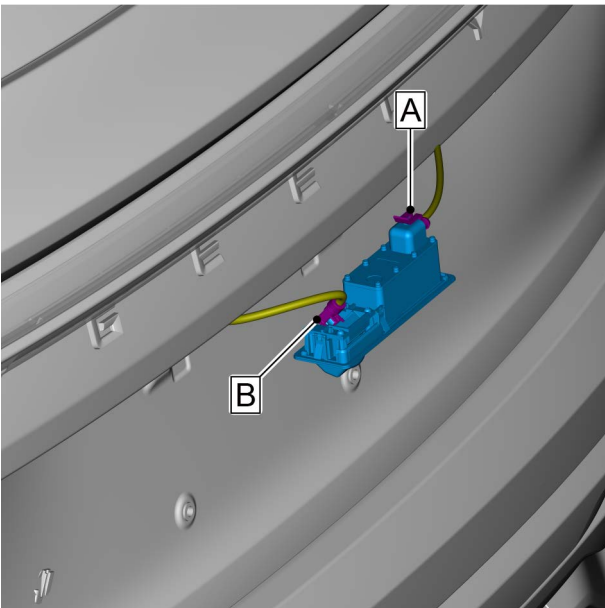
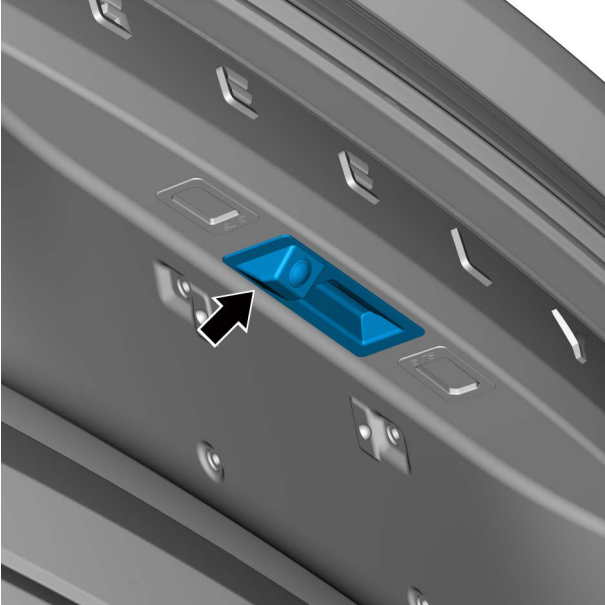
12.8.6.7 Replacement of tailgate opening switch

Removal Procedure

Warning !

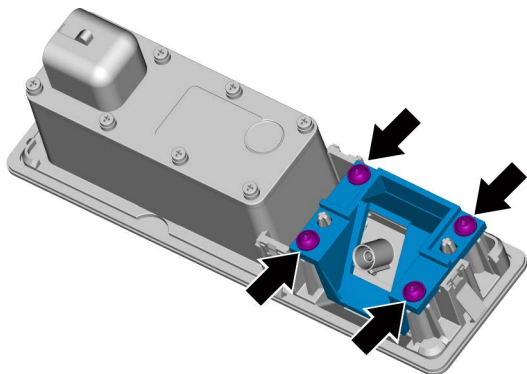
Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the tailgate opening switch.

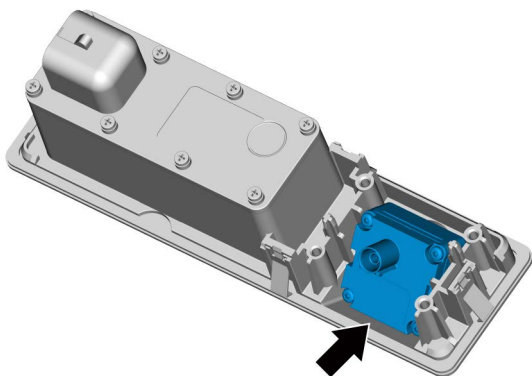


- 3 Disconnect the parking assistance camera (rear) harness connector B.
- 4 Disconnect the tailgate opening switch harness connector A.

- 5 Remove the 4 fixing screws of parking assistance camera (rear) bracket.

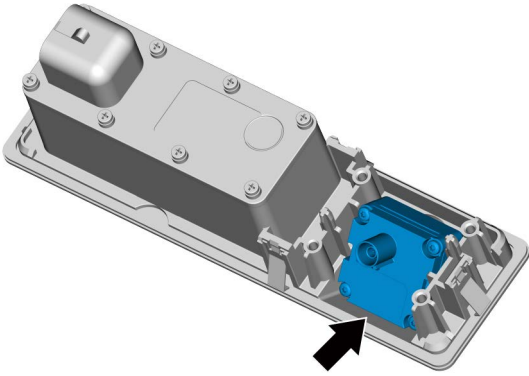


- 6 Remove the parking assistance camera (rear).
- 7 Remove the tailgate opening switch.

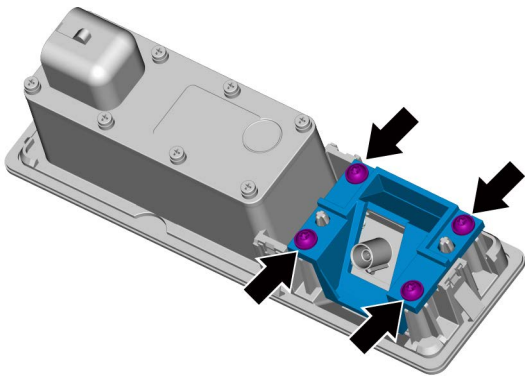


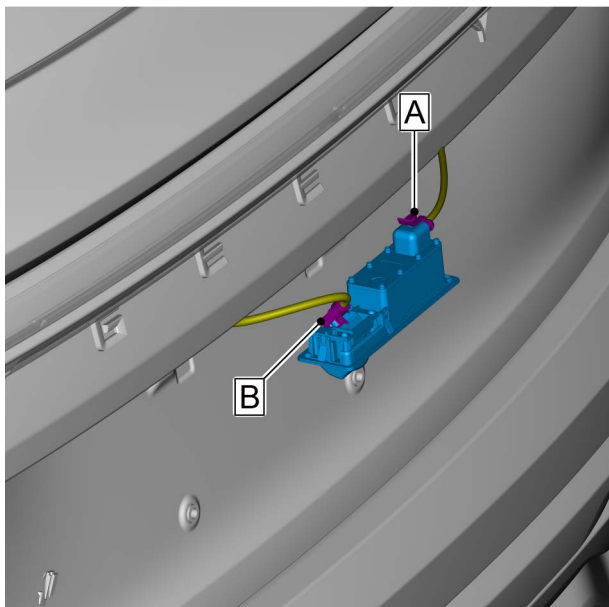
Installation Procedure

- 1 Install the parking assistance camera (rear).



- 2 Install the 4 fixing screws of parking assistance camera (rear) bracket.
Torque: 0.7N·m





- 3 Connect the tailgate opening switch harness connector A.

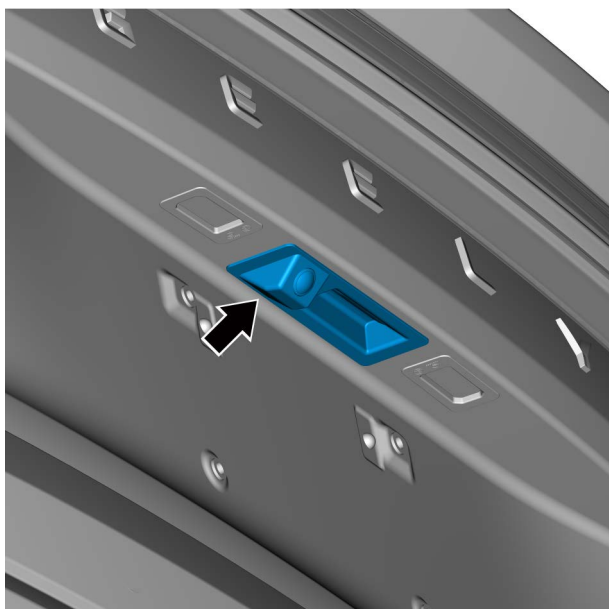
Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 4 Connect the parking assistance camera (rear) harness connector B.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 5 Install the tailgate opening switch.

- 6 Connect the negative cable of battery.

12.9 Remote anti-theft system

12.9.1 Specification

12.9.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Keyless vehicle antenna (front) fixing screw	PF5×20	1.5-2.5
Keyless vehicle antenna (rear) fixing nut	M6×7.8	2-4

12.9.2 Instructions and operations

12.9.2.1 Instructions and operations

Remote anti-theft system

The remote anti-theft system is an auxiliary vehicle alarm device triggered by the alarm system in the event of a forced entry. The system works in conjunction with the center door locking system. The system may be disabled due to radio frequency interference or dead battery.

The remote anti-theft system composes of the following main components:

- Central electronic module assembly(CEM)
- TCAM
- Smart key
- Keyless vehicle antenna (under cup holder)
- Keyless vehicle antenna (left)
- Keyless vehicle antenna (right)
- Outer door handle (left front door handle sensor)
- Keyless vehicle antenna (front)
- Keyless vehicle antenna (rear)
- Start switch

Remote locking and unlocking

Locking

Short press the lock button on smart key, the four doors and fuel filler cap will be locked, turn signal will be on for 1 second, interior light will be off gradually, and audio entertainment system will be turned off; press and hold the lock button, the four door glass, sunroof and sunroof sunshade will be turned off.

Unlocking

Short press the unlock button on smart key, the four vehicle doors and fuel filler cap will be unlocked, the turn signal flashes twice, and the interior lights and position lamp light up.

Two-step unlock function

On multimedia display screen, click: Vehicle Settings → Basic Vehicle Settings → Locks & Keys in turn, and then select Driver (i.e., two-step unlock function) or Whole Vehicle in the Key Unlock Setting menu.

- Driver: After this function is turned on, short press the smart key unlock button once, then only the driver door will be unlocked, and other doors will remain locked. To unlock all doors, press the button again.
- Whole Vehicle: When this function is turned on, short press the smart key unlock button once to unlock all the doors.

Automatic locking and unlocking

Automatic re-locking

45 second after using the smart key to unlock and any of engine hood, four doors, and trunk door is not opened, the four doors will be automatically re-locked. The interior lights are turned off and the system enters the arming state.

Automatic locking during running

When start switch is in ON position or engine is started, if the vehicle speed is greater than 7 km/h, the four door locks will be locked automatically.

Collision unlocking

If a serious frontal collision occurs while the vehicle is in motion, the four doors will be automatically unlocked to facilitate the rapid exit of occupants from the vehicle.

Vehicle locating function

When you can not confirm the location of your vehicle, you can use this function to find the specific location of the vehicle.

When the vehicle is in anti-theft mode, press the lock button on the smart key twice quickly to activate the car-seeking function, the position lamp will be on for 25 seconds, the turn signals will flash 6 times, and the horn will sound 3 times.

Click: Vehicle Settings→Basic Vehicle Settings→Vehicle Locating Mode on multimedia display screen in order, and then select Flashing Lights Only or Horn & Flashing Lights in the interface.

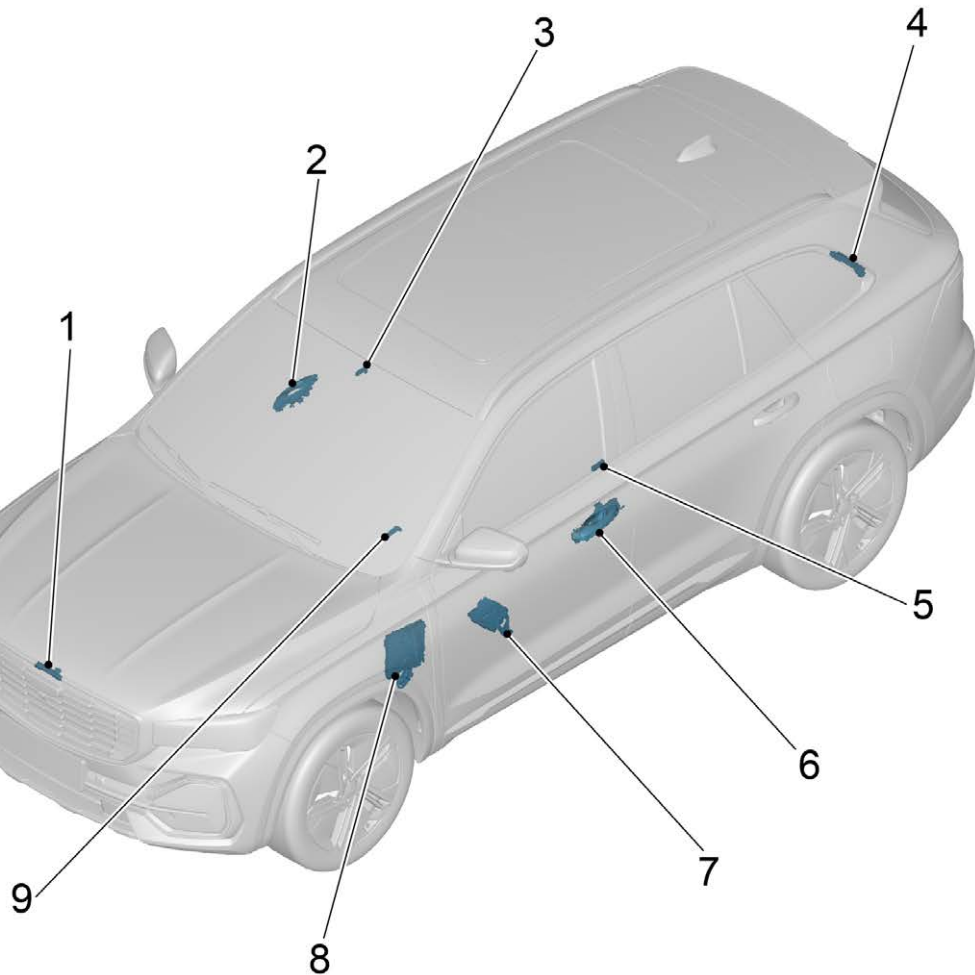
Window opening/closing function

When you need to open the windows in advance, you can press and hold the unlock button within the effective range of the smart key, and the windows will open automatically. For models equipped with sunroof, the sunroof will also open automatically at the same time.

When you need to close the windows, you can press and hold the lock button within the effective range of the smart key, and the windows will close automatically.

12.9.3 Part position

12.9.3.1 Part position



- | | |
|---|--|
| 1. Keyless vehicle antenna (front) | 6. Outer door handle (left front door handle sensor) |
| 2. Outer door handle (right front door handle sensor) | 7. Vehicle Gateway Module |
| 3. Keyless vehicle antenna (right) | 8. Central Electronic Module |
| 4. Keyless vehicle antenna (rear) | 9. Keyless vehicle antenna (under cup holder) |
| 5. Keyless vehicle antenna (left) | |

12.9.4 Diagnostic information and procedure

12.9.4.1 Diagnosis description

See [Description and Operation](#) before diagnosing a malfunction in the remote anti-theft system. Understanding and familiarizing yourself with the operation of the remote anti-theft system before beginning system diagnosis will help determine the correct troubleshooting steps to take in the event of a malfunction, and more importantly this will help determine if the condition described by the customer is normal operation. Any troubleshooting of the remote anti-theft system should start with a [Routine Check](#) that guides the repairer to the next logical step in the troubleshooting process. Understanding and using the diagnostic process correctly will reduce diagnostic time and avoid misdiagnosis of the fault area.

12.9.4.2 Routine inspection

- Check after-sales installations that may affect the remote anti-theft system to ensure that they cannot affect the remote anti-theft system.
- Check system components that are easily accessible or can be seen to find out if there is any obvious damage of the component or there is a situation that may cause a fault.
- Check the harness and harness connector to ensure that there is no sign of loosening, damage, poor contact, aging, etc.

12.9.5 Removal and Installation

12.9.5.1 Replacement of outer door handle (left front door handle sensor)

Refer to [Replacement of left front door outer release handle assembly](#).

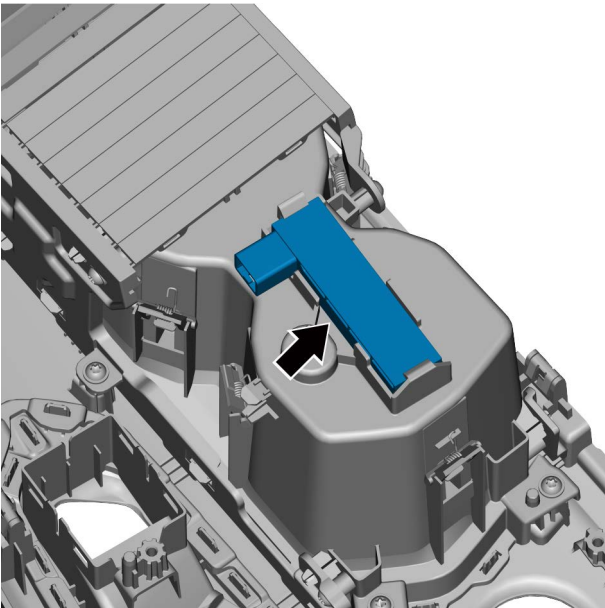
12.9.5.2 Replacement of keyless vehicle antenna (under cup holder)

Removal Procedure

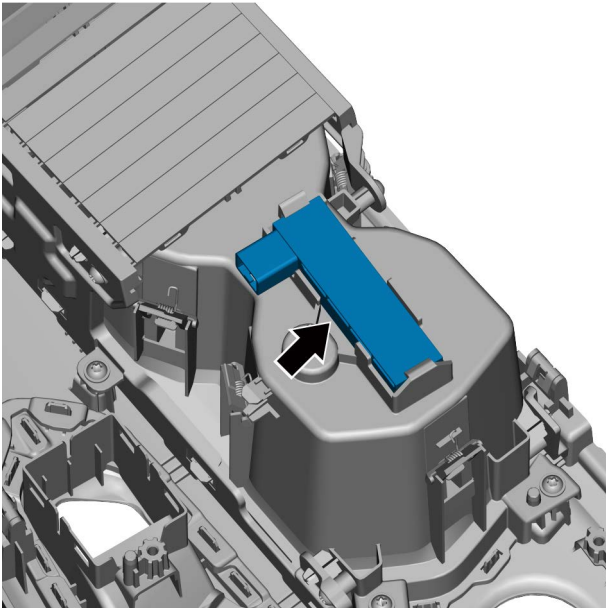
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the gear shift panel assembly, refer to [Replacement of gear shift panel assembly](#).
- 3 Remove the keyless vehicle antenna (under cup holder).



Installation Procedure



- 1 Install the keyless vehicle antenna (under cup holder).

- 2 Install the gear shift panel assembly.
- 3 Connect the negative cable of battery.

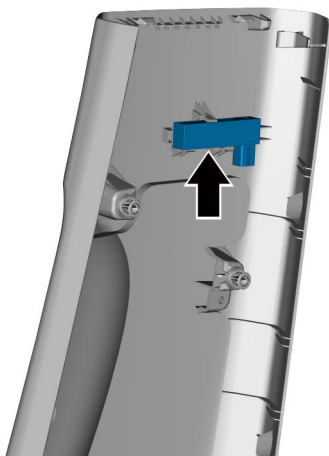
12.9.5.3 Replacement of keyless vehicle antenna (left)

Removal Procedure

Warning !

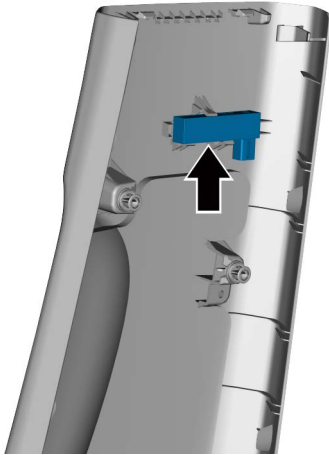
Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left B-pillar lower trim panel assembly, refer to [Replacement of left B-pillar lower trim panel assembly](#).
- 3 Remove the keyless vehicle antenna (left).



Installation Procedure

- 1 Install the keyless vehicle antenna (left)



- 2 Install the left B-pillar lower trim panel assembly.
- 3 Connect the negative cable of battery.

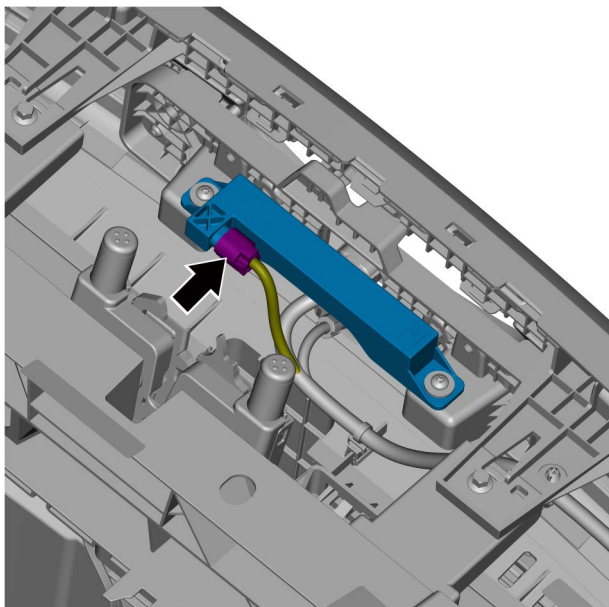
12.9.5.4 Replacement of keyless vehicle antenna (front)

Removal Procedure

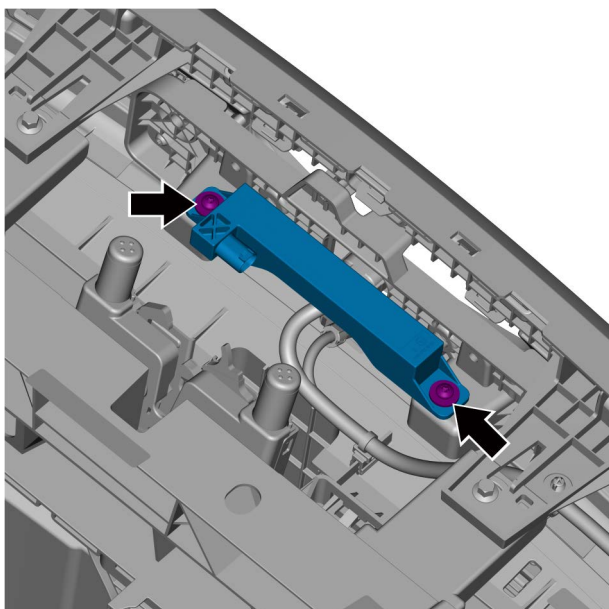
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the engine compartment trim panel, refer to [Replacement of engine compartment trim panel](#).

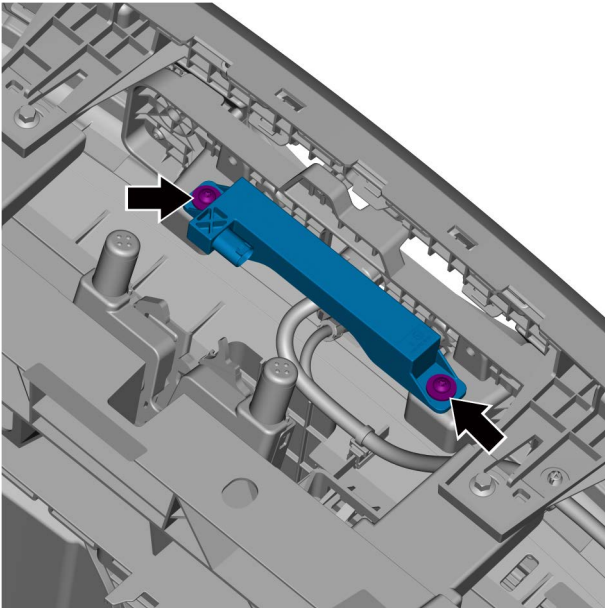


- 3 Disconnect the keyless vehicle antenna (front) harness connector.

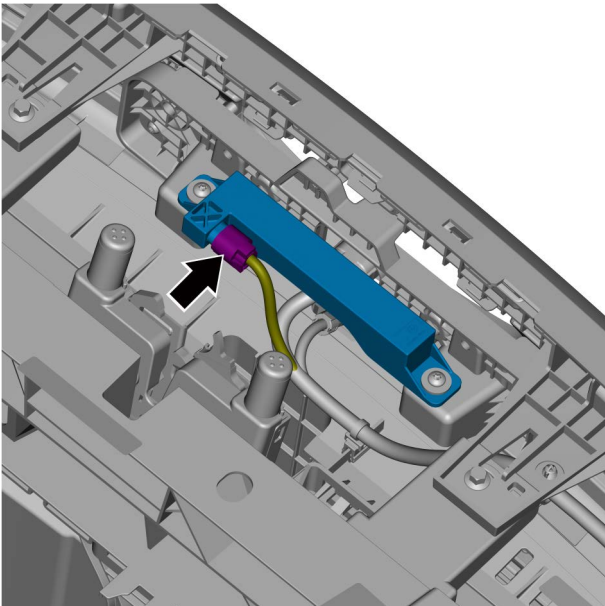


- 4 Remove the 2 fixing screws of keyless vehicle antenna (front) and take off the keyless vehicle antenna (front).

Installation Procedure



- 1 Install the 2 fixing screws of keyless vehicle antenna (front).
Torque: 2N·m



- 2 Connect the keyless vehicle antenna (front) harness connector.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 3 Install the front bumper assembly.
- 4 Connect the negative cable of battery.

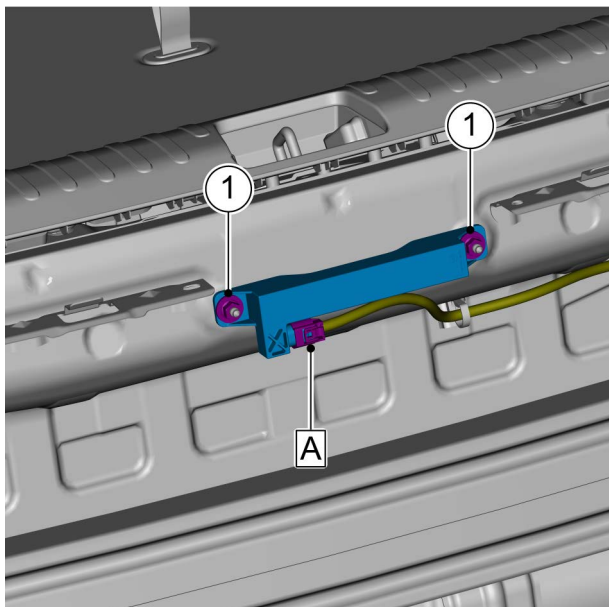
12.9.5.5 Replacement of keyless vehicle antenna (rear)

Removal Procedure

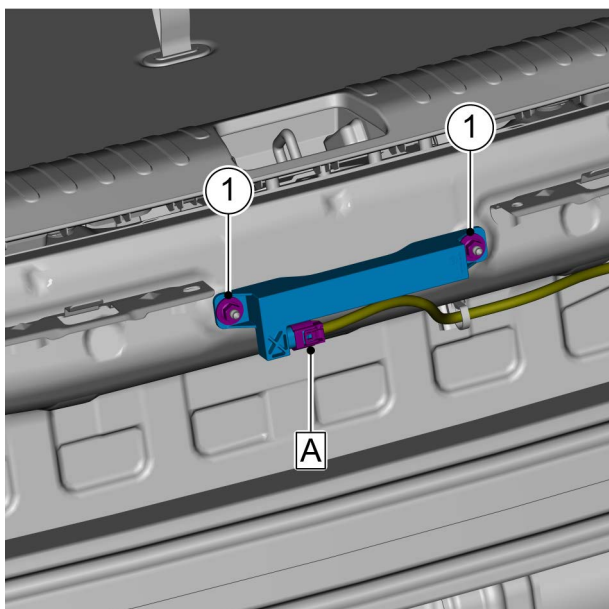
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the rear bumper assembly, refer to [Replacement of rear bumper assembly](#).



- 3 Disconnect the keyless vehicle antenna (rear) harness connector A.
- 4 Remove the 2 fixing screws 1 of keyless vehicle antenna (rear) and take off the keyless vehicle antenna (rear).



Installation Procedure

- 1 Install the 2 fixing screws 1 of keyless vehicle antenna (rear).
Torque: 3N·m
- 2 Connect the keyless vehicle antenna (rear) harness connector A.

Caution

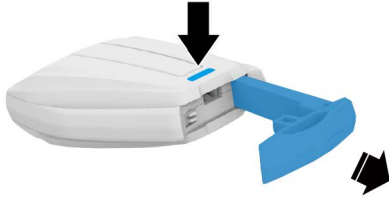
Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 3 Install the rear bumper assembly.
- 4 Connect the negative cable of battery.

12.9.5.6 Replacement of smart key battery

Removal Procedure

- 1 Press the button to remove the mechanical key.



- 2 Use the mechanical key to pry off the battery cover from the mechanical key insertion end.
- 3 Remove the remote control transmitter battery.



Installation Procedure

- 1 Install the remote transmitter battery.
- 2 Install the remote transmitter battery cover.



- 3 Install the mechanical key.



12.10 Power seat

12.10.1 Specification

12.10.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Driver seat assembly fixing bolt	M10×50.5	34-46
Seat belt pretensioner (left side of front seat) lower end piece and seat frame fixing bolt	M10	34-46
Passenger seat fixing bolt	M10×50.5	34-46
Seat belt pretensioner (front right side) lower end piece and seat frame fixing bolt	M10	34-46
Main driver seat adjustment switch fixing screw	PF6×16	4-6
Driver seat module fixing screw	PF6×16	4-6
Passenger seat module fixing screw	PF6×16	4-6

12.10.2 Instructions and operations

12.10.2.1 Instructions and operations

The driver power seat system includes the following components:

- Power seat adjustment switch, the seat adjustment switch allows forward/backward seat adjustment, upward/downward seat cushion adjustment, and forward/backward backrest tilting
- Seat forward/backward adjustment motor
- Seat angle adjustment motor
- Driver seat height adjustment motor
- Seat backrest adjustment motor
- Seat circuit breaker
- Power seat heater (if equipped)
- Power seat heating switch (if equipped)
- Lumbar support adjustment
- Seat ventilation

Front seat headrest adjustment

Adjust the height of the headrest so that the top is flush with the top of the occupant's head, reducing the risk of neck injury in the event of a crash.

Caution

It is important that the headrests are properly installed and adjusted before the vehicle is driven to avoid personal injury or death in the event of an accident.

To raise or lower the headrest, press and hold the adjustment button located under the seat headrest, lift up or press down the headrest to the desired height, then release the button. Gently press or lift the headrest again until you hear a click to ensure the headrest locks into place.

Caution

Do not adjust the seat while driving. This may cause injury or death if the vehicle loses control.

Driver seat power adjustment

The driver seat can be adjusted in six or eight directions, and on some models the driver seat also support power lumbar support adjustment, with the adjustment switch located on the left side of the seat.

Caution

Do not place objects underneath the power seat or artificially impede seat movement as this could damage the seat adjustment motor.

Front passenger seat power adjustment (if equipped)

The front passenger seat can be adjusted in six directions with the adjustment switch located on the right side of the seat.

Horizontal adjustment

When the seat adjustment switch is operated to move the entire seat forward, battery positive voltage is applied to the motor through the switch contact and the front and rear adjustment motor forward control circuit. The motor is grounded through the forward/backward adjustment motor rearward switch contact and the forward/backward adjustment motor rearward control circuit. The motor runs to drive the entire seat forward until the switch is released. Moving the entire seat backward is similar to moving the entire seat forward, except that the battery positive voltage and ground are applied to the motor through the opposite circuitry to reverse the motor operation.

Height adjustment

When the seat switch is operated to move the entire seat cushion upward, the battery positive voltage is applied to the height adjustment motor through the height adjustment motor upward switch contact and the height adjustment motor upward control circuit. Ground is applied to the height adjustment motor through the down switch contact and the height adjustment motor down control circuit. The height adjustment motor drives the entire seat upward until the switch is released. Moving the entire seat downward is similar to moving the entire seat upward, except that the battery positive voltage and ground are applied to the motor through the opposite circuit, thus reversing the motor.

Backrest adjustment

When the seat backrest adjustment switch is operated to tilt the seat backrest forward, battery positive voltage is applied to the motor through the switch contacts and the backrest adjustment motor forward control circuit. The motor is grounded through the rearward switch contact and the backrest adjustment motor rearward control circuit. The motor operates to move the seat backrest forward until the switch is released. Moving the seat backrest rearward is similar to moving the seat backrest forward, except that the battery positive voltage and ground are applied to the motor through the opposite circuit, which causes the motor to operate in the reverse direction.

Lumbar support adjustment

When the seat lumbar support adjustment switch is operated to bulge the seat lumbar support forward, battery positive voltage is applied to the air pump through the switch contacts and the lumbar support adjustment forward control circuit, and the

air bag is inflated to support the seat lumbar support forward until the switch is released.

When the seat lumbar support adjustment switch is operated to retract the seat lumbar support rearward, battery positive voltage is applied through the switch contacts and the lumbar support adjustment rearward control circuit to the normally closed air release solenoid valve, and the air pocket is deflated, causing the seat lumbar support to retract rearward until the switch is released.

When the seat lumbar support adjustment switch is operated to move the seat lumbar support upward, battery positive voltage is applied to the motor through the switch contact and lumbar support adjustment upward control circuit, and the motor is grounded through the downward switch contact and lumbar support adjustment motor downward control circuit. The motor operates to move the seat lumbar support upward until the switch is released. Moving the seat lumbar support downward is similar to moving the seat lumbar support upward, except that the battery positive voltage and ground are applied to the motor through the opposite circuit, which causes the motor to operate in reverse.

Rear seat headrest adjustment

Press and hold the adjustment button below the seat headrest and move the headrest up and down until you hear a click sound to ensure the headrest locks into place. Press and hold the adjustment button to push in or pull out the headrest.

Rear seat backrest adjustment

The rear seat backrests are equipped with unlocking buckles on each side. Depress the handles and push the backrest backward to adjust the backrest to the 2-position. The backrest can be adjusted to the 1-position by pushing the backrest forward with the handle depressed again.

Caution

Push the top of the backrest forward and backward to ensure that the backrest is securely locked. Failure to do so will prevent the seat belt from operating properly.

Rear seat backrest folding

The rear seats are composed of the left rear seat and the right rear seat respectively, with 4/6 folding functions, which can increase the luggage space and facilitate the storage of large items

The rear seat backrests are equipped with unlocking handles on each side. Place the rear seat headrests in the lowest position and release the handle to fully fold the corresponding side of the backrest.

With the backrest folded down, make sure there is a gap between the rear seat headrests and the front seats.

Rear seat backrest folding

Lock the seat backrest by flipping it backward and pushing it backward firmly until the red mark on the unlocking buckle of the corresponding side disappears. Failure to do so will prevent normal operation of the seat belt.

Caution

Occupants are not permitted to sit on the folded seat or in the luggage compartment while the vehicle is in motion; the seat should be used correctly. When the seat backrest is restored to its initial position, the following precautions should be observed to prevent injury in the event of a collision or emergency stop of the vehicle:

- Push the top of the backrest forward and backward to ensure that the backrest is securely locked. Failure to do so will prevent the seat belt from operating properly.
- Make sure that the seat belts are not twisted or pinched under the seat, but are placed in the proper position for use.

When placing a child seat in the rear seat, the child seat and the child seat mounting guide sheath must be removed before the rear seat backrest folding function can be used.

Front seat heating/ventilation (if equipped)

On multimedia display screen, click: Air conditioning → Seats in order, and then set the front seat heating/ventilation function in this screen.

Caution

The seat heating function and seat ventilation function cannot be operated simultaneously on the same seat.

Front seats heating

Select Adjust Seat Heating on the multimedia display screen, click on the seat to be adjusted, e.g. the driver side seat or the front passenger side seat, and then click on the heating adjustment button on the corresponding seat.

When 1 indicator below the seat heating adjustment button is lit, it means that the seat heating is in low gear; when 3 indicators below the seat heating adjustment button are lit, it means that the seat heating is in high gear; when all 3 indicators below the seat heating adjustment button are off, it means that the seat heating is off.

Caution

Do not use the seat heating function if your body is unable to sense pain and temperature due to medication, paralysis, or other diseases. Failure to do so may cause burns to the body.

Caution

- Do not kneel on the seat or subject the seat to concentrated loads that could damage the heating elements of the seat heater.
- Do not clean the seats by wet washing.
- The seat heating can only be switched on when the vehicle is started, which greatly reduces battery power consumption.
- If the battery voltage is too low, the seat heating function will automatically turn off so that the vehicle has sufficient power.
- The seat cannot have a seat cushion placed on it while the seat heating function is on.

Front seat ventilation

Select Adjust Seat Ventilation on the multimedia display screen, click on the seat to be adjusted and then click on the ventilation adjustment button on the corresponding seat.

When 1 indicator below the seat ventilation adjustment button is lit, it means that the seat ventilation is in low gear; when 3 indicators below the seat ventilation adjustment button are lit, it means that the seat ventilation is in high gear; when all 3 indicators below the seat ventilation adjustment button are off, it means that the seat ventilation is off.

Front seat heating/ventilation timing function

On multimedia display screen, click: Air conditioning → Seats → Settings in order, and then set the front seat heating/ventilation timing function in this screen. Select the corresponding timing time in the setting of the corresponding seat as needed, and the available timing times are 5 minutes, 15 minutes and 30 minutes. When the heating/ventilating function of the selected seat is activated, the set timing time will start to take effect, and the heating/ventilating function of the corresponding seat will be turned off automatically after the timing time is over.

Driver seat memory function (if equipped)

The seat memory button is mounted on the driver side door interior trim panel and can be set for two commonly used memory positions. It enables the driver to quickly find his or her comfortable driving position.

Operation method

1. Adjust the driver seat to the desired position, press the setting button M and then press the memory position button 1 or 2 within 3 seconds, the current driver seat position will be recorded.
2. When the vehicle stops, press position button 1 or 2, driver seat automatically adjusts to the position that was previously recorded.

Caution

Do not adjust the seat while driving. Moving the seat while driving can make the vehicle lose control, resulting in a collision and serious injury. When the start switch is in Mode II or when the engine is started, a vehicle speed of less than 5 km/h is required to activate the seat memory function.

Driver easy access function (if equipped)

Click: Vehicle settings → Comfort → Driver easy access on the multimedia display screen in order to turn the driver easy access function on or off in the interface.

- Getting out of the vehicle comfortably: When the engine is turned off and the driver side door is opened, the driver seat automatically moves backward to facilitate the driver getting out of the vehicle.
- Comfort on board: When the driver enters the vehicle, closes the door and starts the engine, the driver seat automatically returns to the position it was in before exiting the vehicle.

Caution

Changing the state of the start switch and adjusting the seats during the comfort function will interrupt the driver's ease of access function.

Seat adjustment parameters

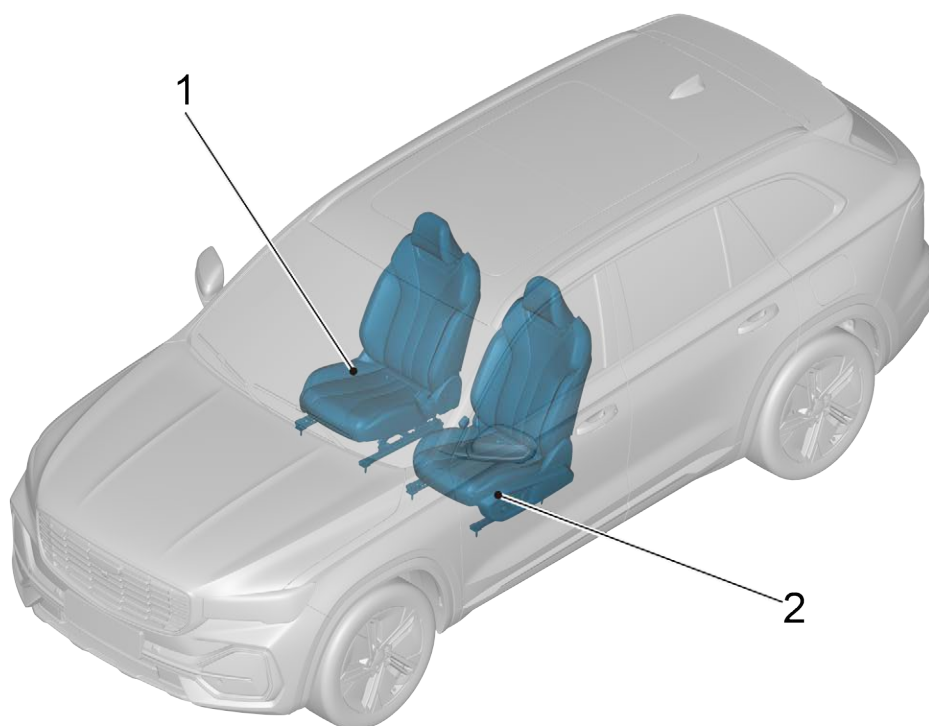
In the initial position, the seat (when measuring the cushion depth) is adjusted with the following parameters:

Item		Parameter
Driver seat	Forward/backward adjustment	Total travel 262.2mm (213.9mm forward, 48.3mm backward)
	Backrest adjustment	Total travel 71° (26° forward, 45° rearward)

Item		Parameter
Front passenger seat	Forward/backward adjustment	Total travel 262.2mm (213.9mm forward, 48.3mm backward)
	Backrest adjustment	Power seat: total travel 71° (26° forward, 45° backward)
		Manual seat: 52° total travel (18° forward, 34° rearward)

12.10.3 Part position

12.10.3.1 Part position



1. Front passenger seat assembly

2. Driver seat assembly

12.10.4 Diagnostic information and procedure

12.10.4.1 Diagnosis description

See [Description and Operation](#) before diagnosing a malfunction in the power seat. Understanding and familiarizing yourself with the operation of the power seat before beginning system diagnosis will help determine the correct troubleshooting steps to take in the event of a malfunction, and more importantly this will help determine if the condition described by the customer is normal operation. Any troubleshooting of the power seat should start with a [Routine Check](#) that guides the repairer to the next diagnosis step in the troubleshooting process. Understanding and using the diagnostic process correctly will reduce diagnostic time and avoid misdiagnosis of the fault area.

12.10.4.2 Visual check

- Check after-sales installations that may affect power seat operation. Make sure these installations cannot affect the power seat operation.
- Check system components that are easily accessible or can be seen to find out if there is any obvious damage of the component or there is a situation that may cause a fault.
- Check the harness and harness connector to ensure that there is no sign of loosening, damage, poor contact, aging, etc.

12.10.5 Removal and Installation

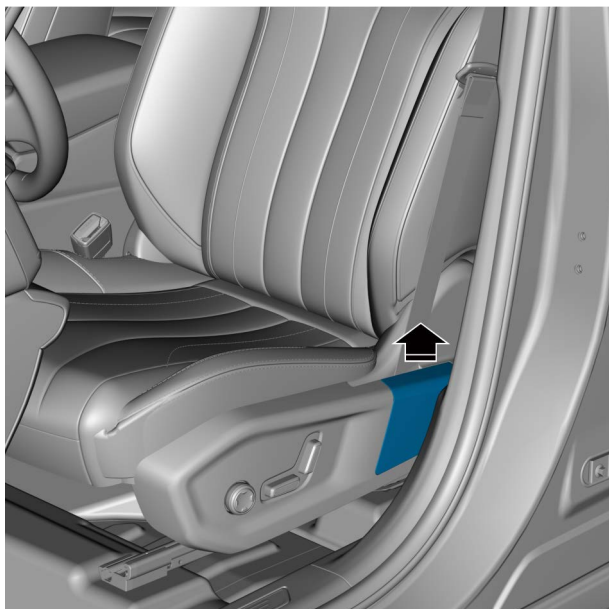
12.10.5.1 Replacement of driver seat assembly

Removal Procedure

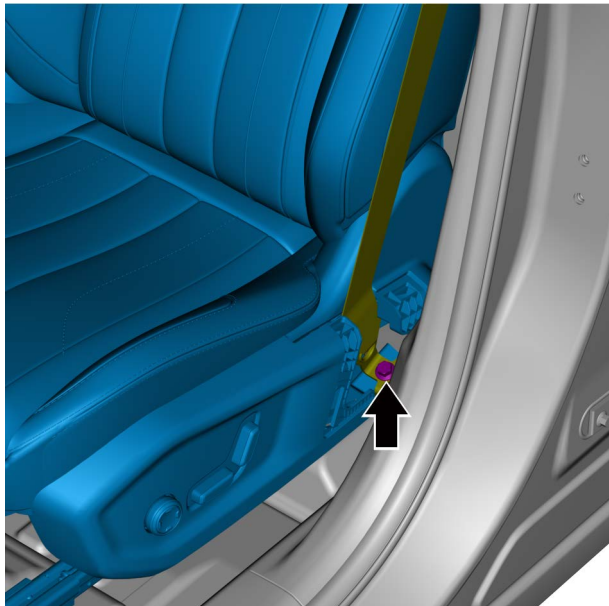
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Remove the left front seat belt outlet cover.

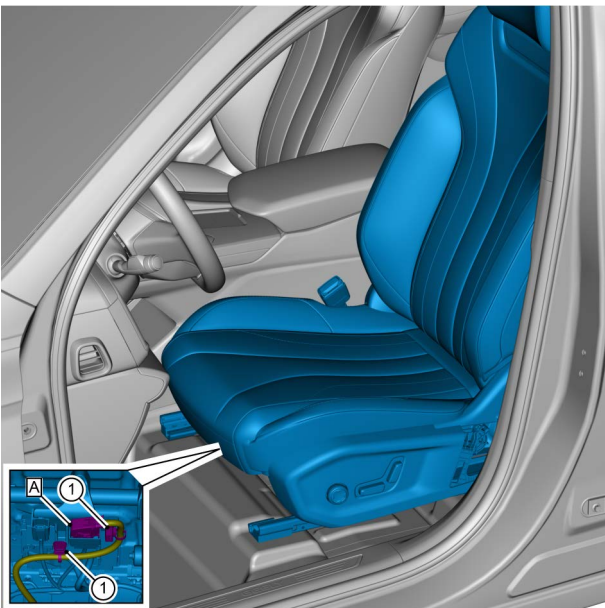


- 2 Remove the seat belt pretensioner (front left side) fixing bolts and take off the seat belt pretensioner (front left side).



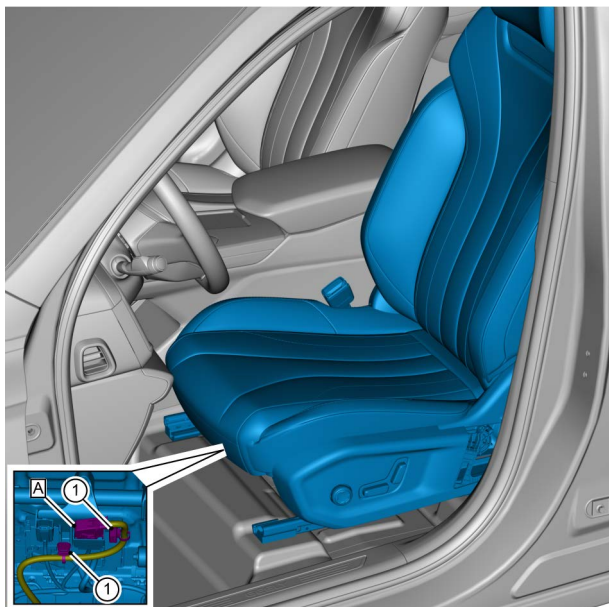


- 3 Operate the driver seat assembly forward/backward adjustment switch to slide the driver seat assembly backward to the end, and remove the 2 fixing bolts at the front of the driver seat assembly.
- 4 Operate the forward/backward adjustment switch of the driver seat assembly to slide the driver seat assembly forward to the end, and remove the 2 fixing bolts at the rear of the driver seat assembly.



- 5 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 6 Disconnect driver seat harness connector A.
- 7 Remove the 2 harness clips 1 at the bottom of the driver seat assembly and remove the driver seat assembly.

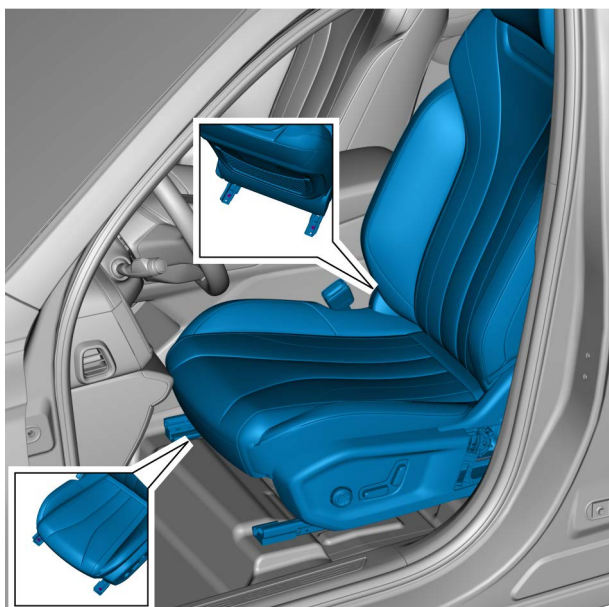
Installation Procedure



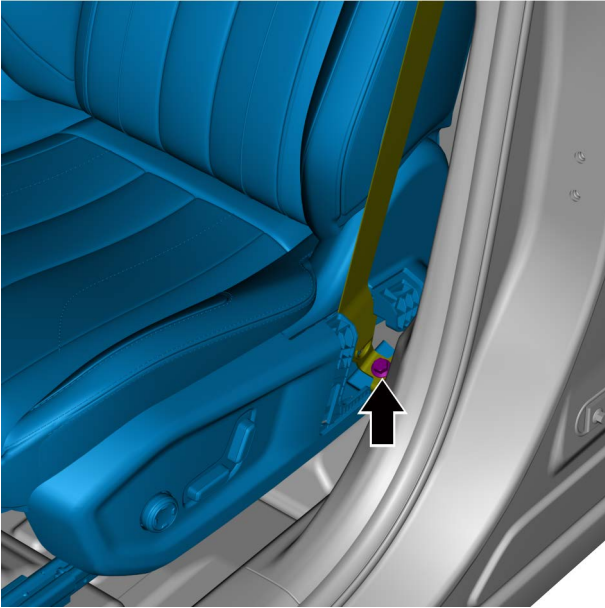
- 1 Install the 2 harness clips 1 at the bottom of the driver seat assembly.
- 2 Connect the driver seat harness connector A.

Caution

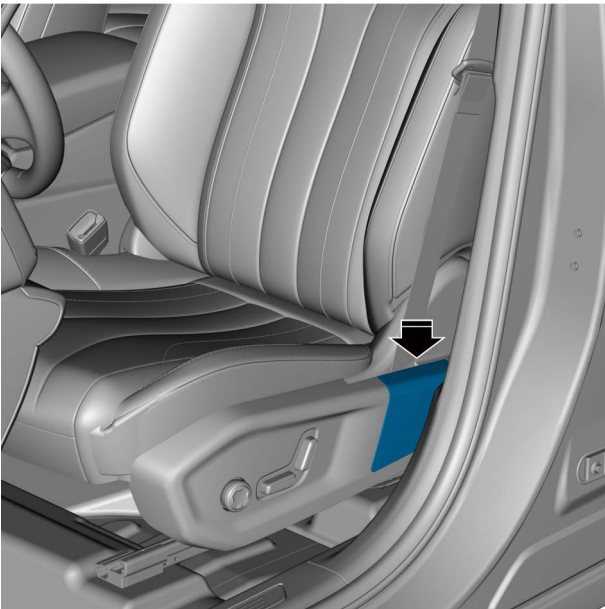
Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 3 Connect the negative cable of battery.
- 4 Operate the driver seat assembly forward/backward adjustment switch to move the driver seat assembly backward to the end, and install the 2 fixing bolts at the front of the driver seat assembly.
Torque: 40N·m
- 5 Operate the driver seat assembly forward/backward adjustment switch to move the driver seat assembly forward to the end, and install the 2 fixing bolts at the rear of the driver seat assembly.
Torque: 40N·m



- 6 Install the seat belt pretensioner (front left side) fixing bolt.
Torque: 40N·m



- 7 Install the left front seat belt outlet cover.

12.10.5.2 Replacement of driver seat adjustment switch

Removal Procedure

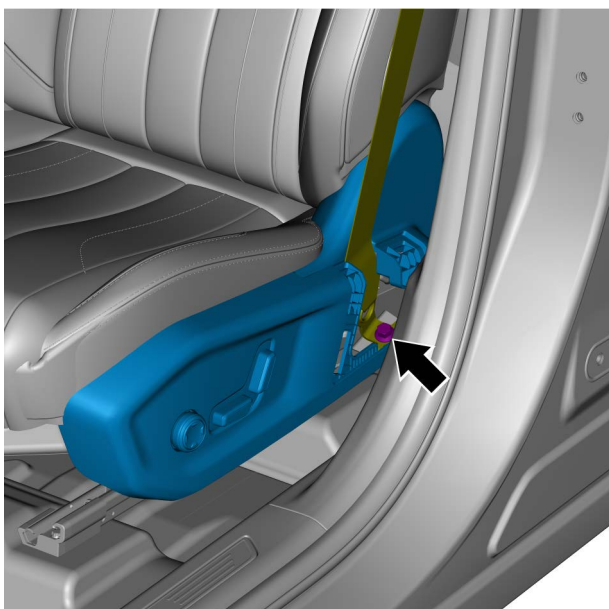
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

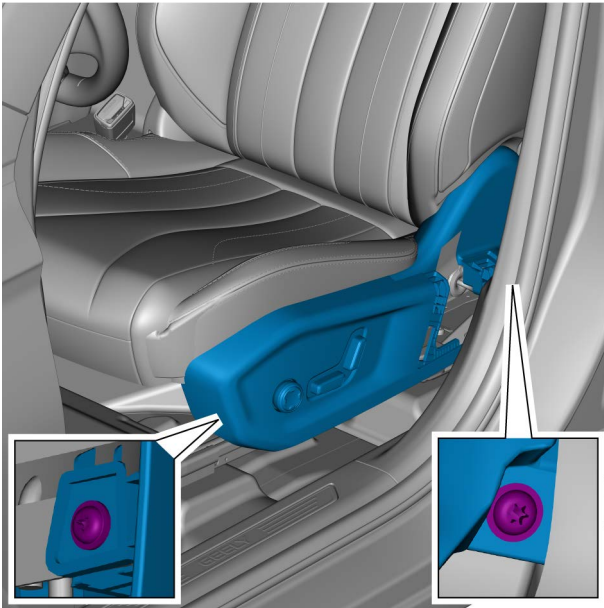
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).



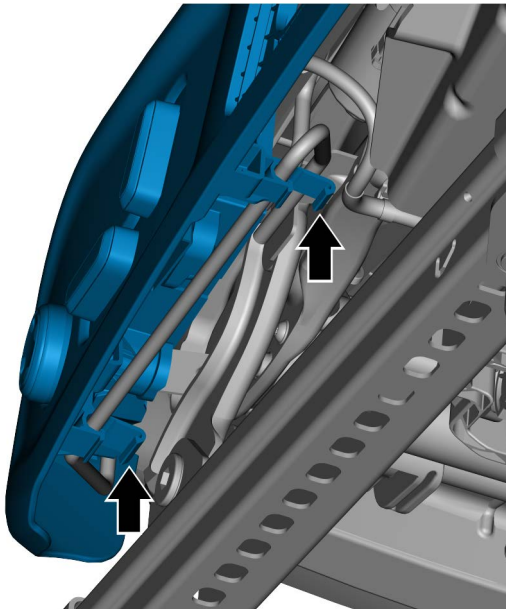
2 Remove the left front seat belt outlet cover.



3 Remove the seat belt pretensioner (front left side) fixing bolts and take off the seat belt pretensioner (front left side).



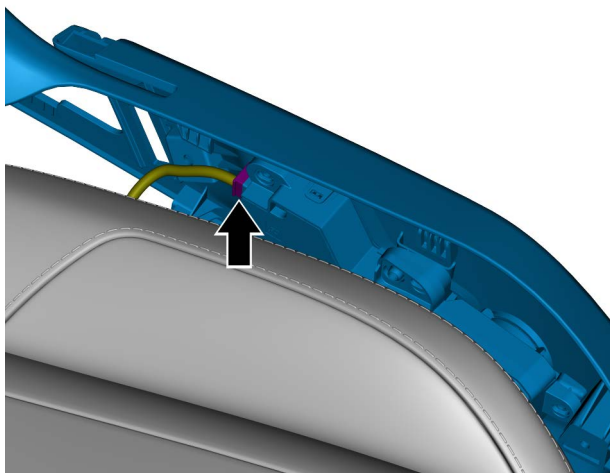
- 4 Remove the front fixing screw of the left front seat foam plastic part assembly.
- 5 Remove the rear fixing screw of the left front seat foam plastic part assembly.



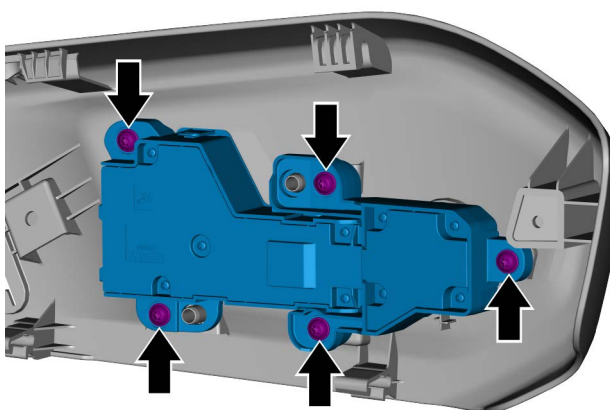
- 6 Disengage the left front seat foam plastic part assembly fixing clips.

- 7 Gently pull the lower end of the left front seat foam plastic part assembly outward by hand, so that its clip is detached from the front power seat bracket, and remove the front power seat outer shield assembly upward.

- 8 Disconnect the harness connector of the driver seat adjustment switch.

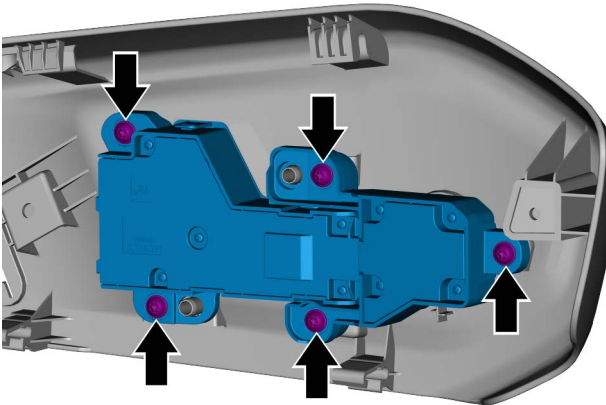


- 9 Remove the 5 fixing screws of driver seat adjustment switch and take off to driver seat adjustment switch.



Installation Procedure

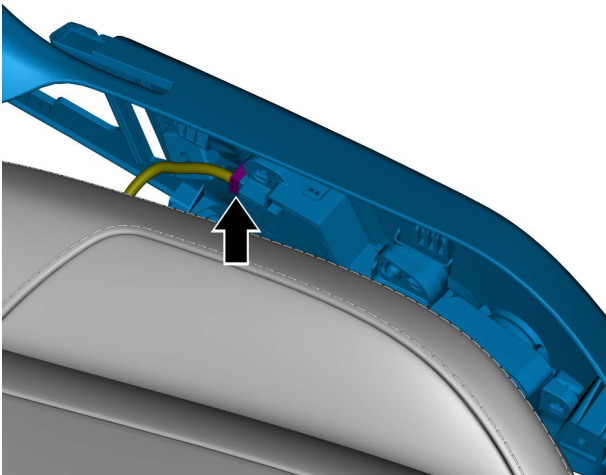
- 1 Install the 5 fixing screws for the driver seat adjustment switch.
Torque: 2N·m

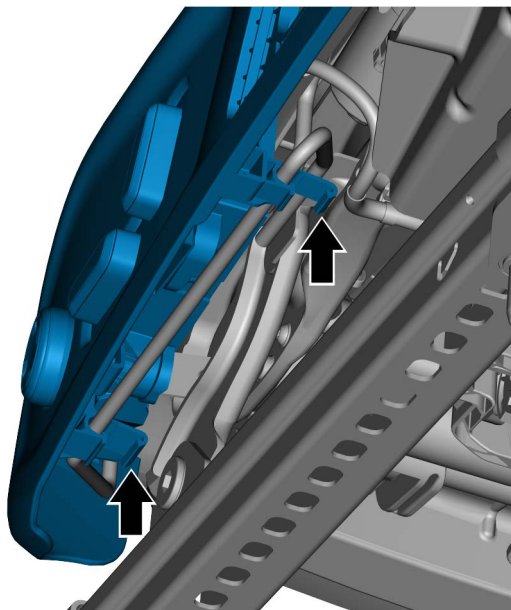


- 2 Connect the harness connector of the driver seat adjustment switch.

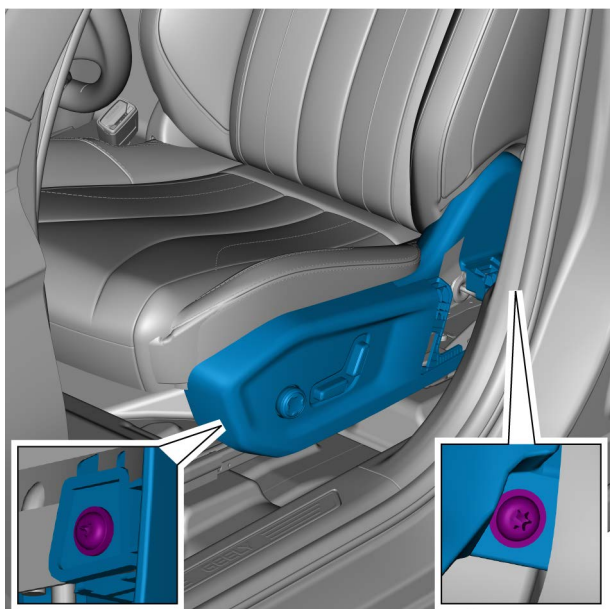
Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

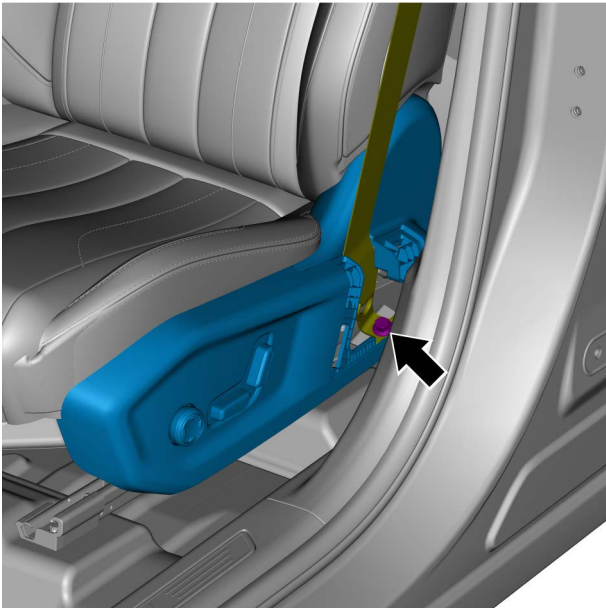




- 3 Gently press on the left front seat foam plastic part assembly so that it clips into the front power seat bracket.



- 4 Install the rear fixing screw of the left front seat foam plastic part assembly.
Torque: 2N·m
- 5 Install the front fixing screw of the left front seat foam plastic part assembly.
Torque: 2N·m



- 6 Install the seat belt pretensioner (front left side) fixing bolt.
Torque: 40N·m



- 7 Install the left front seat belt outlet cover.

- 8 Connect the negative cable of battery.

12.10.5.3 Replacement of memory switch personal settings unit

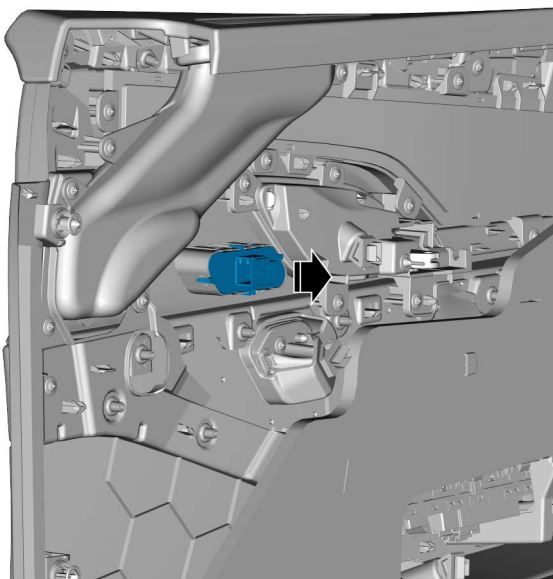
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

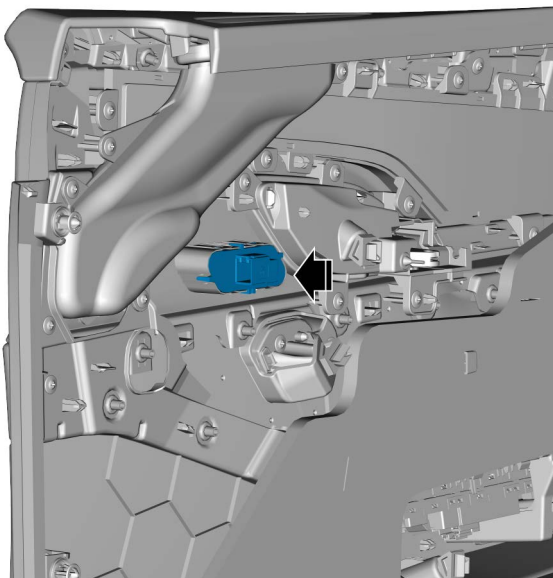
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

- 2 Remove the left front door interior trim panel assembly, refer to [Replacement of left front door interior trim panel assembly](#).
- 3 Remove the memory switch personal settings unit.



Installation Procedure

- 1 Install the memory switch personal settings unit.



- 2 Install the left front door interior trim panel assembly.
- 3 Connect the negative cable of battery.

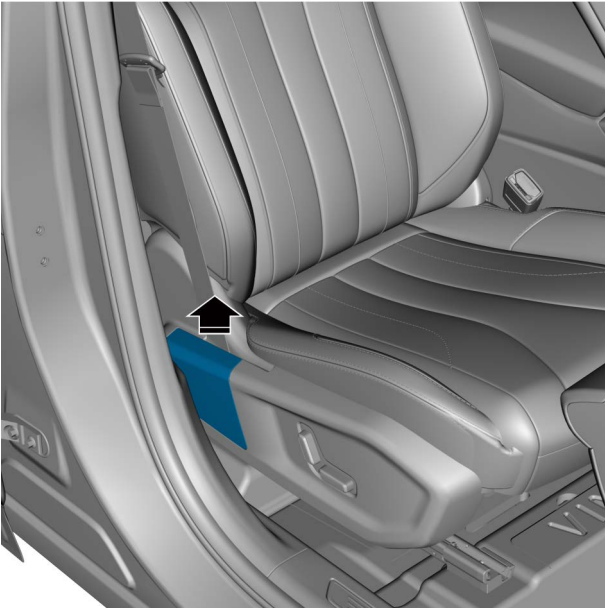
12.10.5.4 Replacement of passenger seat

Removal Procedure

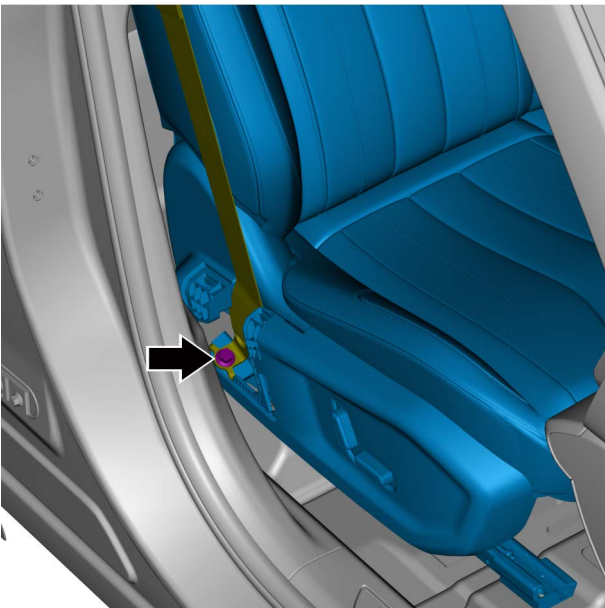
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Remove the right front seat belt outlet cover.

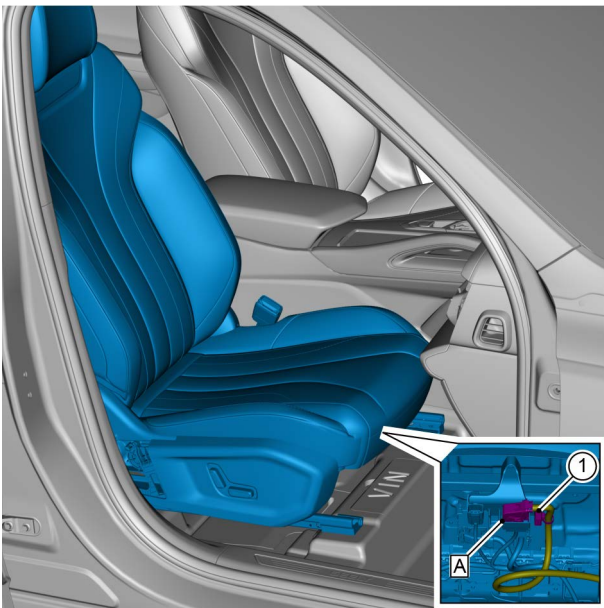


- 2 Remove the seat belt pretensioner (front right side) fixing bolts and take off the seat belt pretensioner (front right side).



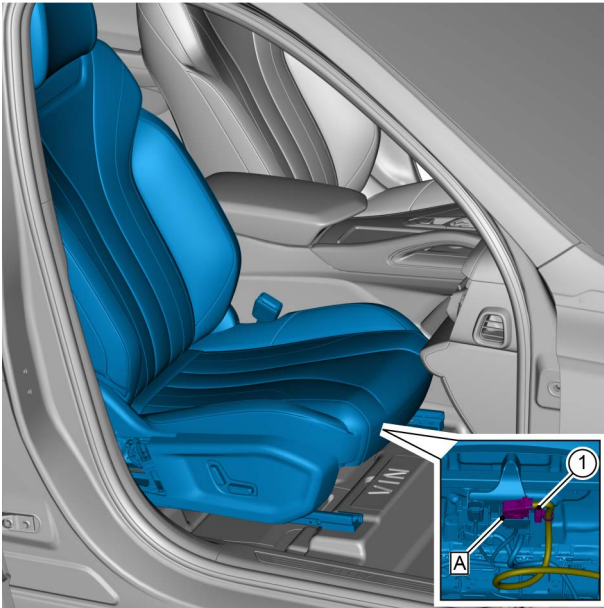


- 3 Operate the passenger seat forward/backward adjustment switch to slide the passenger seat backward to the end, and remove the 2 fixing bolts at the front of the passenger seat.
- 4 Operate the forward/backward adjustment switch of the passenger seat to slide the passenger seat forward to the end, and remove the 2 fixing bolts at the rear of the passenger seat.



- 5 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 6 Disconnect the passenger seat harness connector A.
- 7 Remove the harness clip 1 at the bottom of the passenger seat and remove the passenger seat.

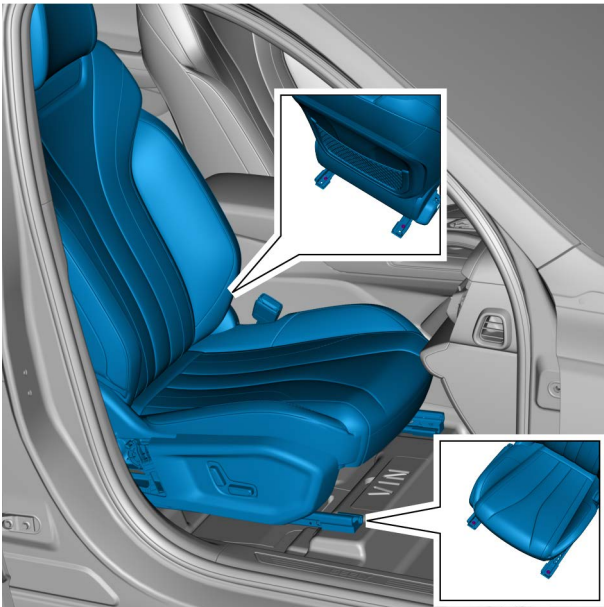
Installation Procedure



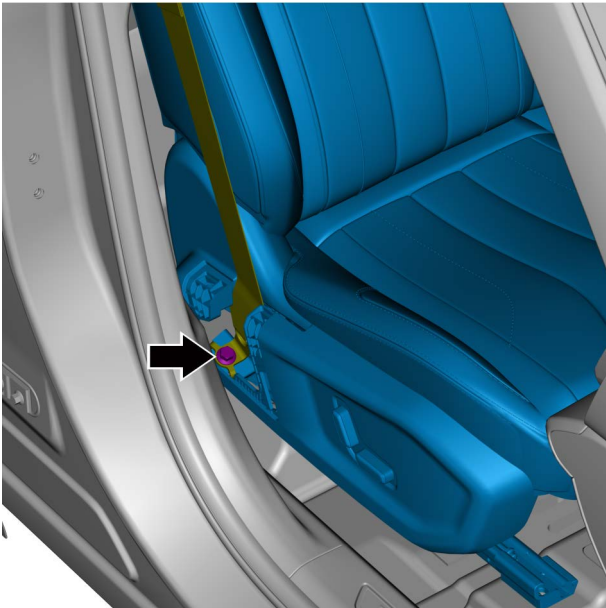
- 1 Install the harness clip 1 at the bottom of the passenger seat.
- 2 Connect the passenger seat harness connector A.

Caution

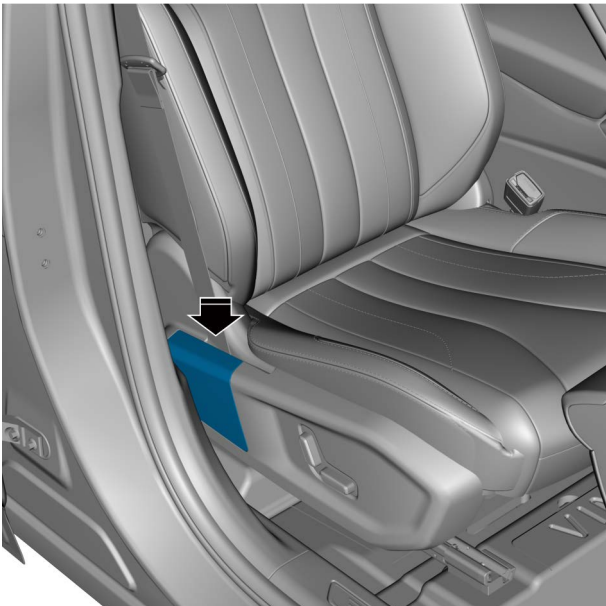
Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 3 Connect the negative cable of battery.
- 4 Operate the passenger seat forward/backward adjustment switch to move the passenger seat backward to the end, and install the 2 fixing bolts at the front of passenger seat.
Torque: 40N·m
- 5 Operate the passenger seat forward/backward adjustment switch to move the passenger seat forward to the end, and install the 2 fixing bolts at the rear of the passenger seat.
Torque: 40N·m



- 6 Install the seat belt pretensioner (front right side) fixing bolt.
Torque: 40N·m



- 7 Install the right front seat belt outlet cover.

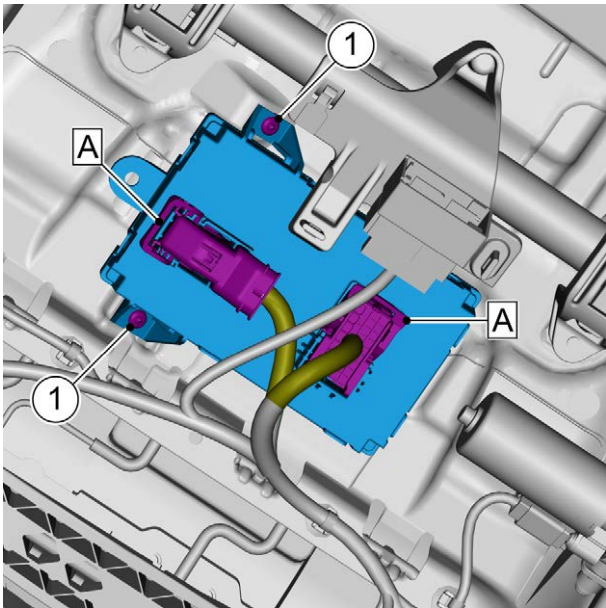
12.10.5.5 Replacement of driver seat module

Removal Procedure

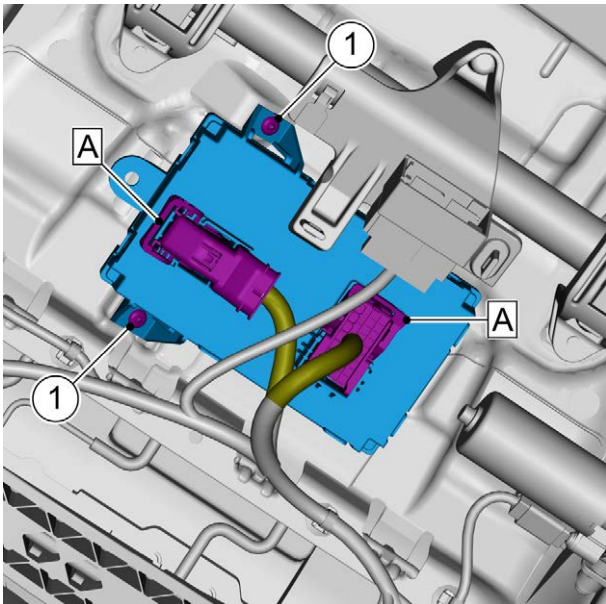
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the driver seat assembly, refer to [Replacement of driver seat assembly](#).



- 3 Disconnect 2 harness connectors A of driver seat module.
- 4 Remove the 2 fixing screws 1 of driver seat module.
- 5 Remove the driver seat module.



Installation Procedure

- 1 Place the driver seat module.
- 2 Install the 2 fixing screws 1 of driver seat module.
Torque: 5N·m
- 3 Connect the 2 harness connectors A of the driver seat module.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 4 Install the driver seat assembly.
- 5 Connect the negative cable of battery.
- 6 The GLDS diagnostic program is required, under the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software brushing operation.

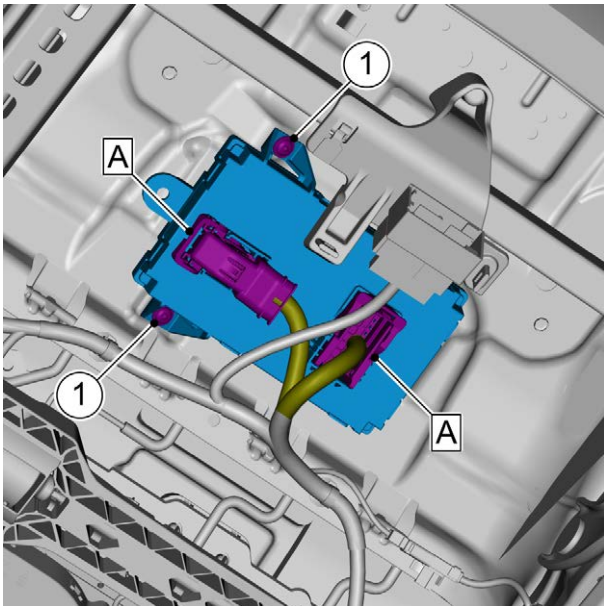
12.10.5.6 Replacement of passenger seat module

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

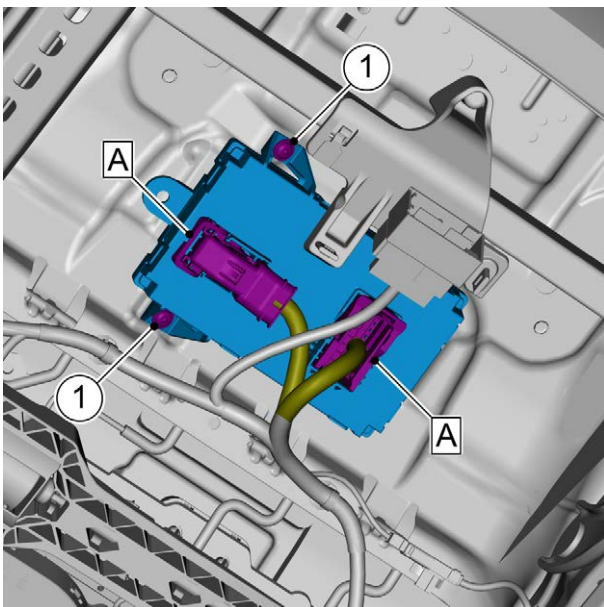
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the passenger seat, refer to [Replacement of passenger seat](#).
- 3 Disconnect the 2 harness connectors A of passenger seat module.
- 4 Remove the 2 fixing screws 1 of passenger seat module.
- 5 Remove the passenger seat module.

**Installation Procedure**

- 1 Place the passenger seat module.
- 2 Install the 2 fixing screws 1 of passenger seat module.
Torque: 5N·m
- 3 Connect the 2 harness connectors A of passenger seat module.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 4 Install the passenger seat.

- 5 Connect the negative cable of battery.
- 6 The GLDS diagnostic program is required, under the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software brushing operation.

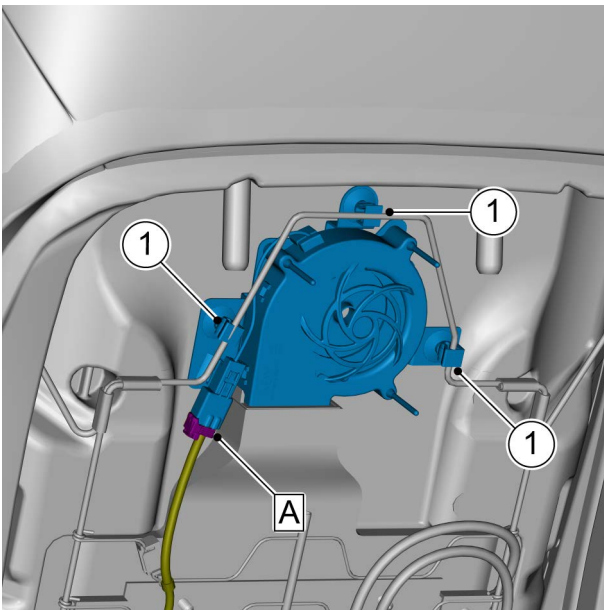
12.10.5.7 Replacement of front seat backrest ventilation fan

Removal Procedure

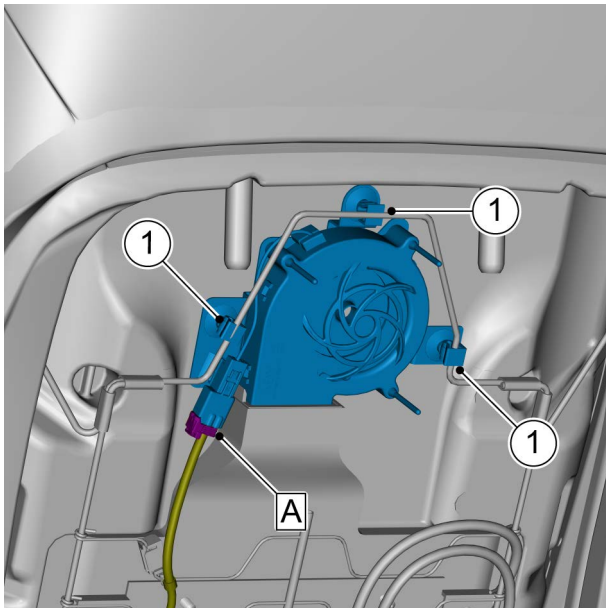
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the front seat back panel, refer to [Replacement of front seat back panel](#).
- 4 Disconnect the fixing clip 1 and disengage the front seat backrest ventilation fan harness connector A.
- 5 Remove the front seat backrest ventilation fan upward.



Installation Procedure



- 1 Gently press the front seat backrest ventilation fan onto the fixing clip 1 and fasten the cover.
- 2 Connect the front seat backrest ventilation fan harness connector A.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 3 Install the front seat back panel.
- 4 Connect the negative cable of battery.
- 5 Close the engine compartment cover.

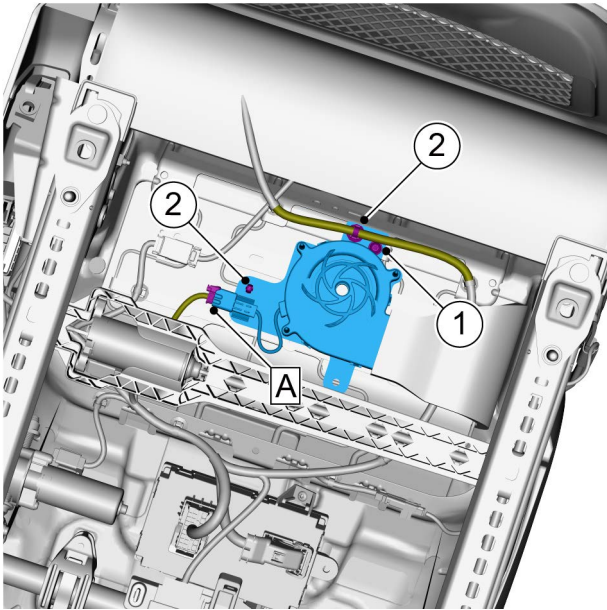
12.10.5.8 Replacement of front seat cushion ventilation fan

Removal Procedure

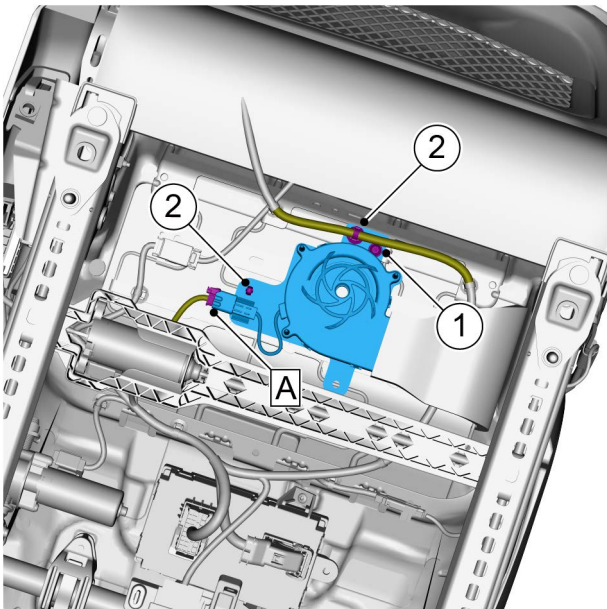
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Open the engine compartment hood.
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the driver seat assembly, refer to [Replacement of driver seat assembly](#).



- 4 Disconnect the front seat cushion ventilation fan harness connector A.
- 5 Remove the 1 fixing screw 1 of the front seat cushion ventilation fan.
- 6 Remove 2 harness clips 2.
- 7 Remove the front seat cushion ventilation fan leftward.



Installation Procedure

- 1 Install and tighten the 1 fixing screw 1 of the front seat cushion ventilation fan.
Torque: 2N·m
- 2 Install 2 harness clips 2.
- 3 Connect the front seat cushion ventilation fan harness connector A.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 4 Install the driver seat assembly.
- 5 Connect the negative cable of battery.
- 6 Close the engine compartment cover.

12.10.5.9 Replacement of angle adjuster motor assembly

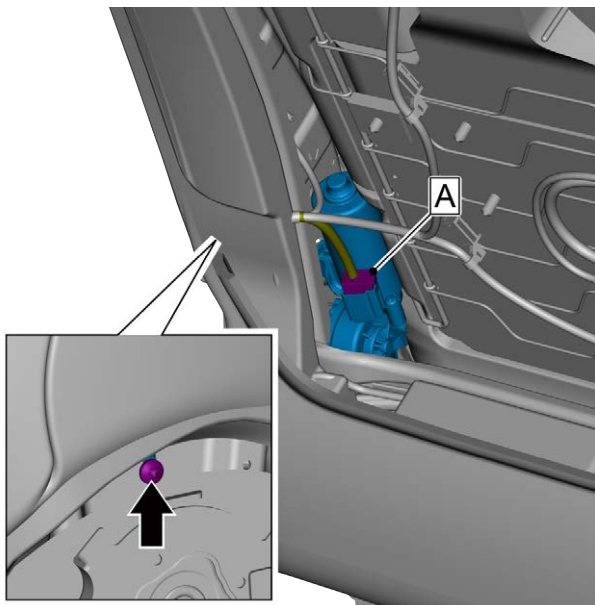
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

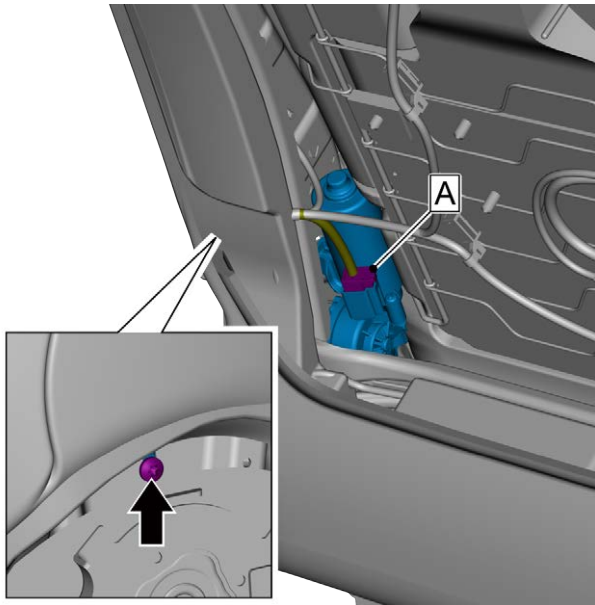
- 1 Open the engine compartment hood.

- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the driver seat assembly, refer to [Replacement of driver seat assembly](#).
- 4 Remove the driver seat adjustment switch, refer to [Replacement of driver seat adjustment switch](#).
- 5 Remove the front seat back panel, refer to [Replacement of front seat back panel](#).
- 6 Remove the left front seat right shield, refer to [Replacement of left front seat right shield](#).
- 7 Remove the 2 washers.
- 8 Remove the power angle adjuster synchronizer lever.



- 9 Remove 1 fixing bolt of the angle adjuster motor assembly.
- 10 Disconnect the harness connector A of the angle adjuster motor assembly.
- 11 Remove the angle adjuster motor assembly.

Installation Procedure



- 1 Install the angle adjuster motor assembly and tighten 1 fixing bolt.
- 2 Connect the harness connector A the angle adjuster motor assembly.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 3 Install the power angle adjuster synchronizer lever.
- 4 Install the 2 washers.

- 5 Install the left front seat right shield.
- 6 Install the front seat back panel.
- 7 Install the driver seat adjustment switch.
- 8 Install the driver seat assembly.
- 9 Connect the negative cable of battery.
- 10 Close the engine compartment cover.

12.10.5.10 Replacement of seat lift motor

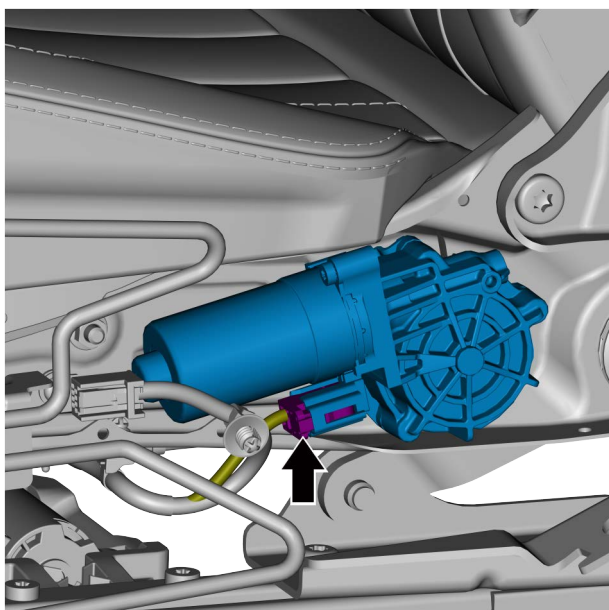
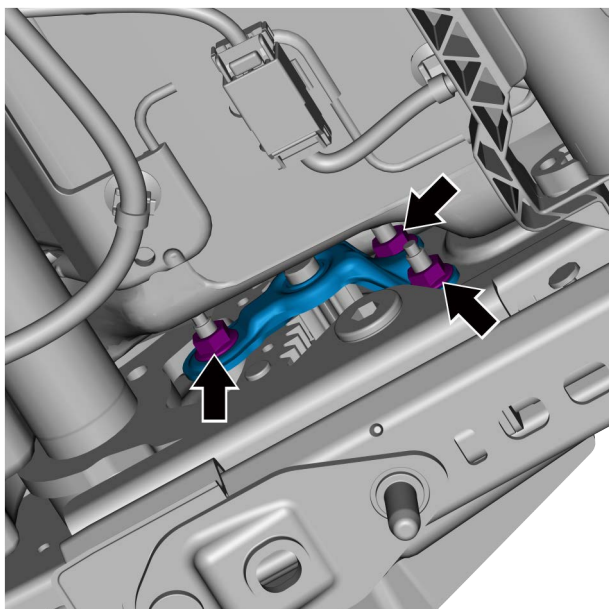
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

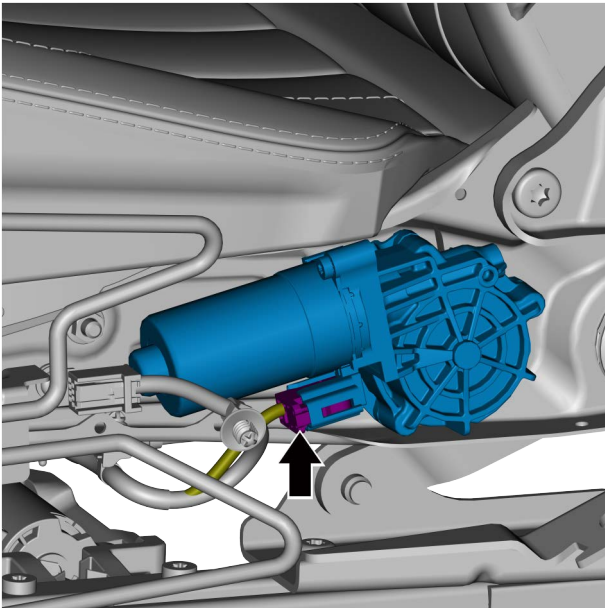
- 1 Open the engine compartment hood.

- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the driver seat assembly, refer to [Replacement of driver seat assembly](#).
- 4 Remove the driver seat adjustment switch, refer to [Replacement of driver seat adjustment switch](#).
- 5 Remove the 3 fixing nuts of seat lift motor bracket.
- 6 Remove the seat lift motor bracket.



- 7 Disconnect the harness connector of the seat lift motor.
- 8 Take off the seat up/down motor.

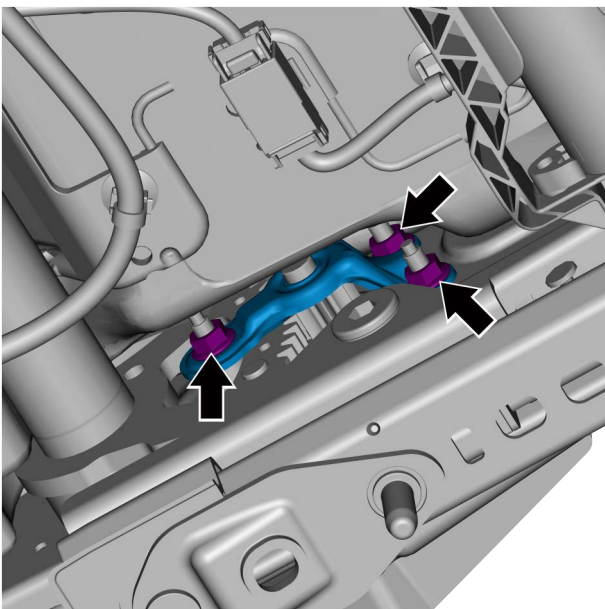
Installation Procedure



- 1 Install the seat lift motor.
- 2 Connect the harness connector for the seat lift motor.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 3 Install the seat lift motor bracket and tighten the 3 fixing nuts.

- 4 Install the driver seat adjustment switch.
- 5 Install the driver seat assembly.
- 6 Connect the negative cable of battery.
- 7 Close the engine compartment cover.

12.10.5.11 Replacement of left front seat rail

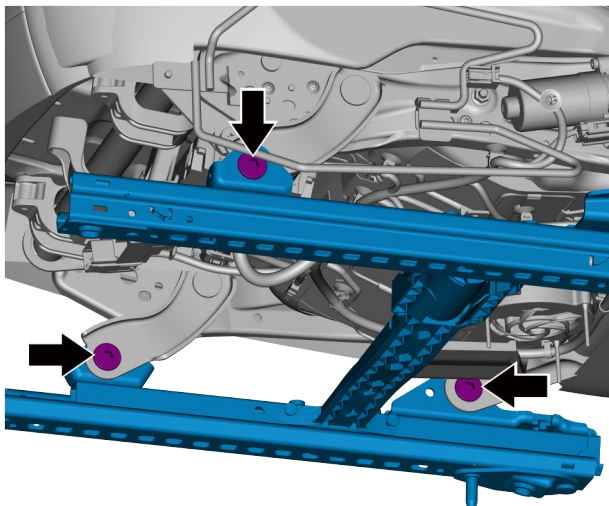
Removal Procedure

Warning !

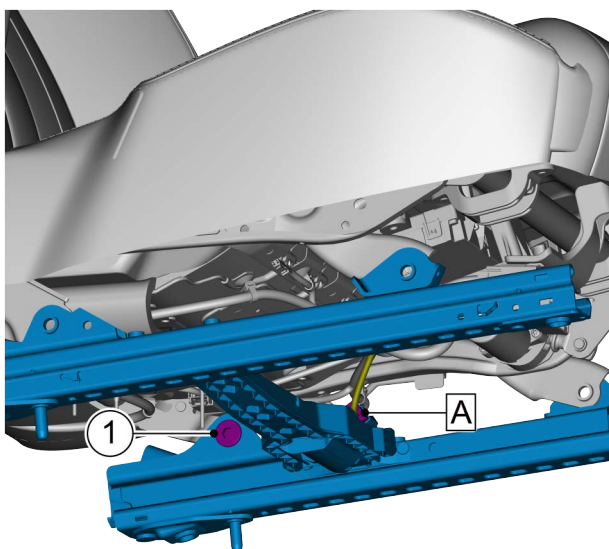
Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Open the engine compartment hood.

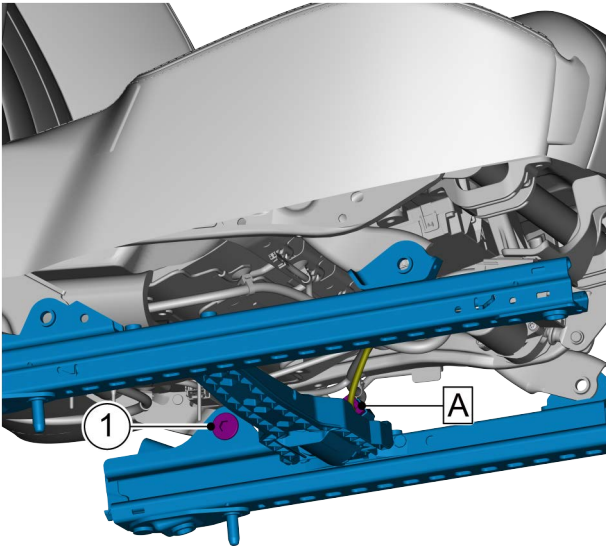
- 2 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 3 Remove the driver seat assembly, refer to [Replacement of driver seat assembly](#).
- 4 Remove the 3 fixing bolts of left front seat rail.



- 5 Disconnect harness connector A from the left front seat rail.
- 6 Remove the 1 fixing bolt 1 of the left front seat rail.
- 7 Remove the left front seat rail.



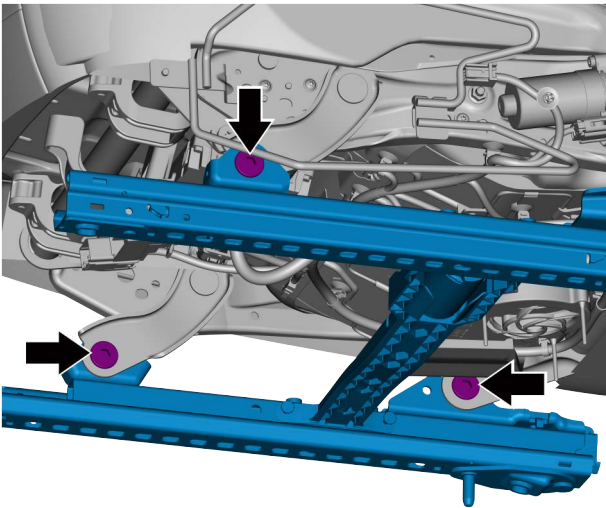
Installation Procedure



- 1 Install the left front seat rail and tighten 1 fixing bolt 1.
- 2 Connect the harness connector A of the left front seat rail.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 3 Install the left front seat rail and tighten 3 fixing bolts.

- 4 Install the driver seat assembly.
- 5 Connect the negative cable of battery.
- 6 Close the engine compartment cover.

12.11 Defrosting

12.11.1 Specification

12.11.1.1 Defrosting working condition requirements

Starting switch status	Battery voltage (V)	Defrosting working status
OFF	Rated voltage 12V	Not working
ON	Rated voltage 12V	Not working
START	Rated voltage 12V	Working

12.11.2 Instructions and operations

12.11.2.1 Instructions and operations

Main components of defrost system

- Defrost switch
- Rearview mirror heating
- Rear fixed window heater

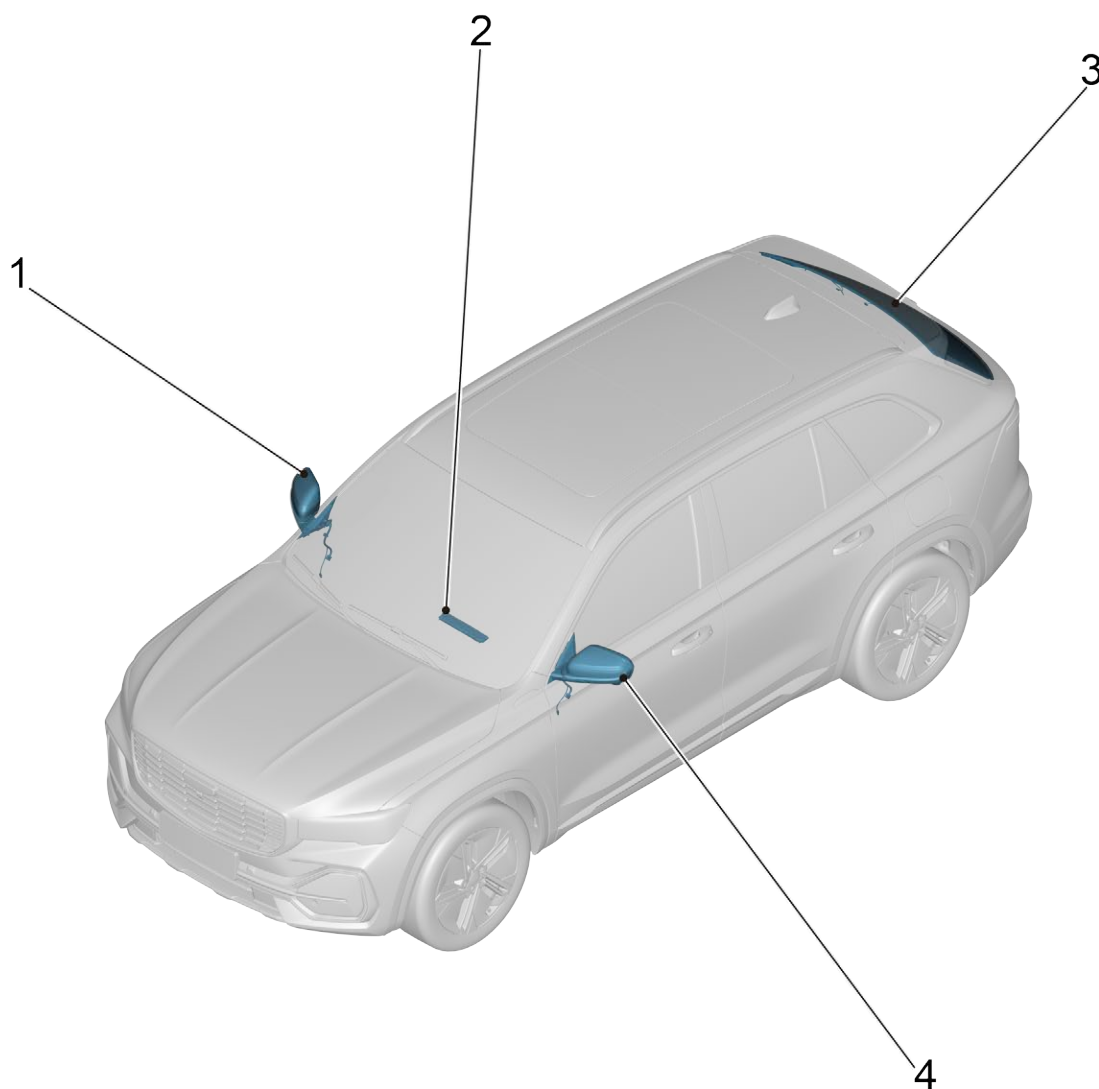
The defrost switch is on the center console switch module; the rear fixed window heater is integrated with the glass.

Heating and defrosting functions of exterior rearview mirrors

Press the exterior rearview mirror/rear windshield defrost button on the center console switch module, the button indicator lights up, the exterior rearview mirror heating and rear windshield defrost turn on at the same time, and turn off automatically after 5-15 minutes. The time is related to the ambient temperature, the lower the outside ambient temperature, the longer the heating time.

12.11.3 Part position

12.11.3.1 Part position



- | | | | |
|----|---|----|---|
| 1. | Right exterior rearview mirror defroster | 3. | Rear windshield glass defroster |
| 2. | Center console switch module (defroster switch) | 4. | Left exterior rearview mirror defroster |

12.11.4 Diagnostic information and procedure

12.11.4.1 Diagnosis description

See [Description and Operation](#) before diagnosing a malfunction in the defrosting system. Understanding and familiarizing yourself with the operation of the defrosting system before beginning system diagnosis will help determine the correct troubleshooting steps to take in the event of a malfunction, and more importantly this will help determine if the condition described by the customer is normal operation. Any troubleshooting of the defrosting system should start with a [Routine Check](#) that guides the repairer to the next logical step in the troubleshooting process. Understanding and using the diagnostic process correctly will reduce diagnostic time and avoid misdiagnosis of the fault area.

12.11.4.2 Routine inspection

- Check after-sales installations that may affect defrosting operations to ensure that they do not affect normal defrosting operation.
- Check system components that are easily accessible or can be seen to find out if there is any obvious damage of the component or there is a situation that may cause a fault.
- Check the harness and harness connector to ensure that there is no sign of loosening, damage, poor contact, aging, etc.

12.11.5 Removal and Installation

12.11.5.1 Replacement of windshield defrosting grille

Refer to [Replacement of rear windshield glass assembly](#).

12.11.5.2 Replacement of electric review mirror heater

Refer to [Replacement of left rearview mirror convex glass](#).

12.11.5.3 Replacement of rear windshield defroster switch

Refer to [Replacement of center console module](#).

12.11.5.4 Repair of rear windshield defrosting braid leads

Repair Procedures

Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Disconnect the defroster harness connector.
- 3 It is required to use the fine steel wool to polish the repair parts before repair of welding bus lead.
- 4 Use a brush to coat some rosin on the repair parts of conductors and bus leads.
- 5 Dip the soldering iron with solders enough for repair.
- 6 Heat to melt the solder is applicable only. Do not overheat the conductors during re-wiring the bus leads.
- 7 Connect the negative cable of battery.

12.12 Horn

12.12.1 Specification

12.12.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Tweeter fixing bolt	M8×25	11-15
Woofers fixing bolt	M8×25	11-15

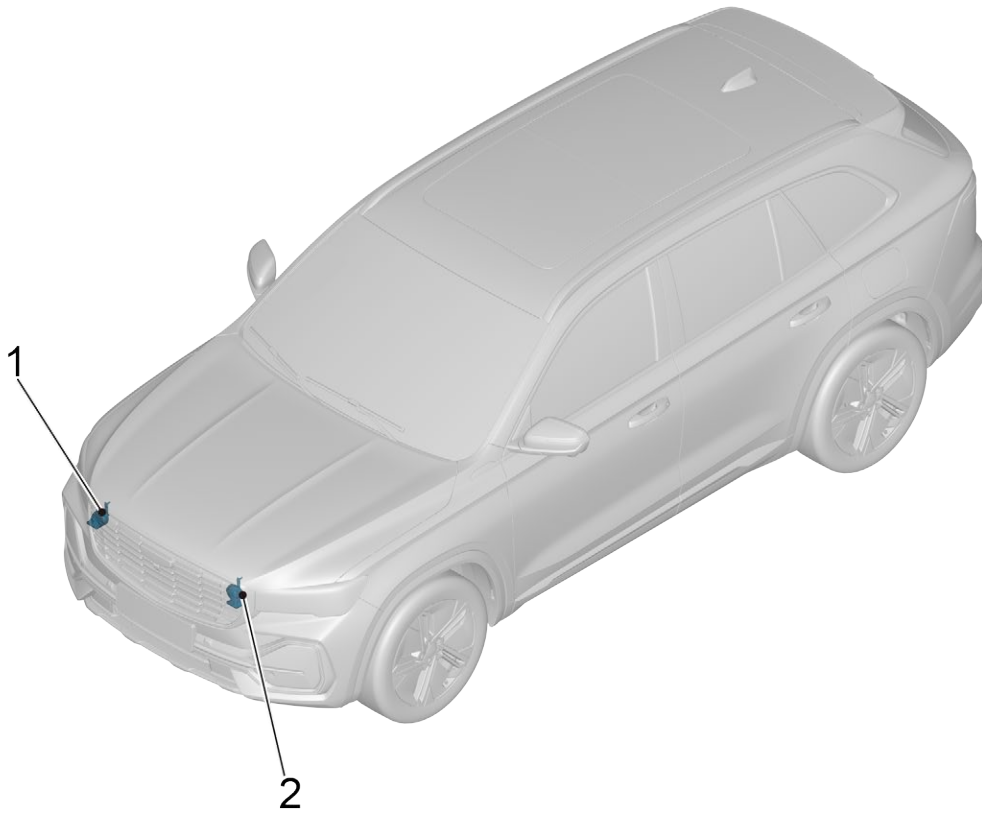
12.12.2 Instructions and operations

12.12.2.1 Instructions and operations

Horn is in the front bumper and fixed to the anti-collision beam at the front of the vehicle. The woofer on the left and tweeter on the right (vehicle traveling direction) are controlled together by steering wheel horn switch. When the steering wheel horn button is pressed, the horn circuit is powered, which causes horn to chime.

12.12.3 Part position

12.12.3.1 Part position



1. Woofer

2. Tweeter

12.12.4 Diagnostic information and procedure

12.12.4.1 Diagnosis description

See [Description and Operation](#) before diagnosing a malfunction in the horn system. Understanding and familiarizing yourself with the operation of the horn system before beginning system diagnosis will help determine the correct troubleshooting steps to take in the event of a malfunction, and more importantly this will help determine if the condition described by the customer is normal operation. Any troubleshooting of the horn system should start with a [Routine Check](#) that guides the repairer to the next logical step in the troubleshooting process. Understanding and using the diagnostic process correctly will reduce diagnostic time and avoid misdiagnosis of the fault area.

12.12.4.2 Routine inspection

- Check after-sales installations that may affect the operation of the horn to ensure that these devices cannot affect the normal operation of the horn.
- Check system components that are easily accessible or can be seen to find out if there is any obvious damage of the component or there is a situation that may cause a fault.
- Check the harness and harness connector to ensure that there is no sign of loosening, damage, poor contact, aging, etc.

12.12.5 Removal and Installation

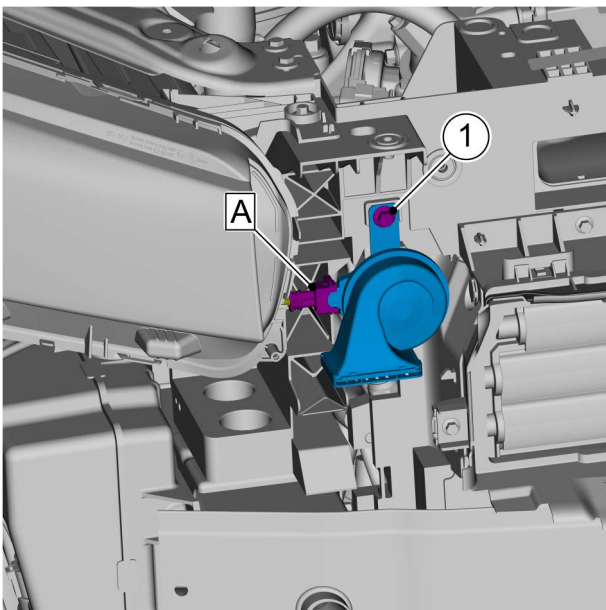
12.12.5.1 Replacement of woofer

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the front bumper assembly, refer to [Replacement of front bumper assembly](#).
- 3 Disconnect woofer harness connector A.
- 4 Remove woofer fixing bolt 1 and remove woofer.

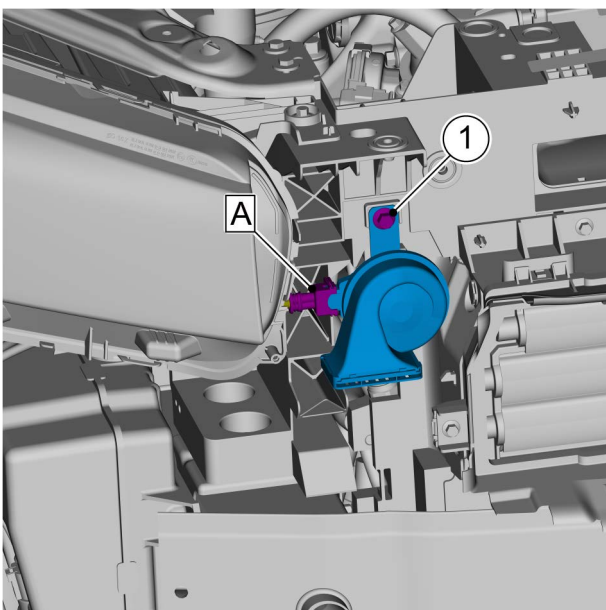


Installation Procedure

- 1 Install the woofer fixing bolt 1.
Torque: 13N·m
- 2 Connect the woofer harness connector A.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 3 Install the front bumper assembly.
- 4 Connect the negative cable of battery.

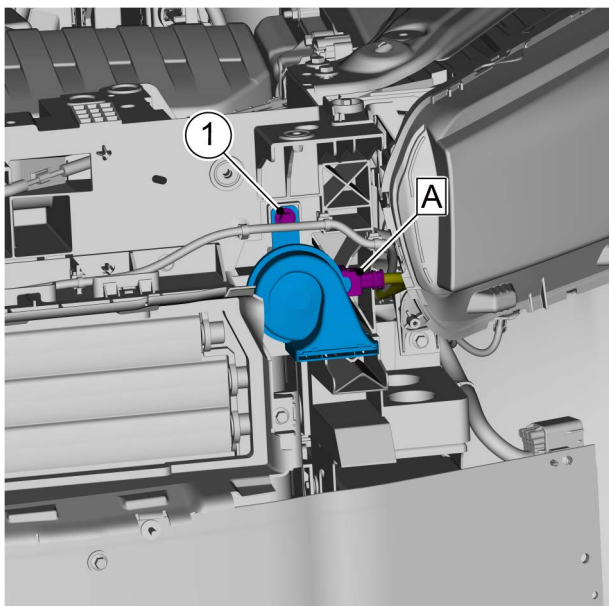
12.12.5.2 Replacement of tweeter

Removal Procedure

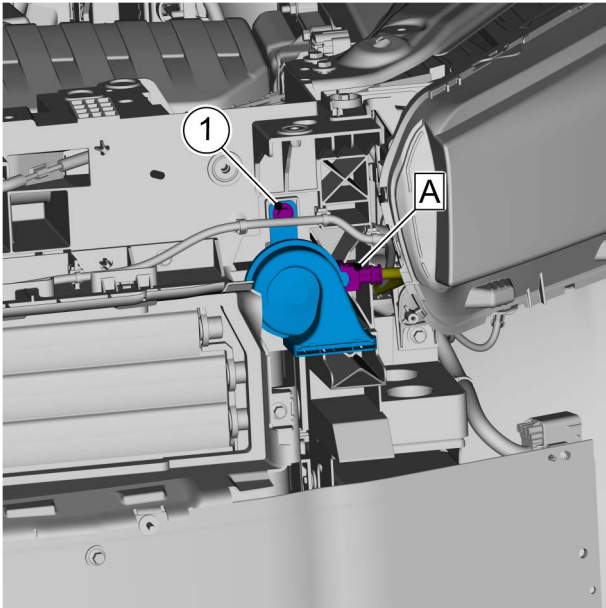
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the front bumper assembly, refer to [Replacement of front bumper assembly](#).
- 3 Disconnect tweeter harness connector A.
- 4 Remove the tweeter fixing bolt 1 and take off the tweeter.



Installation Procedure



- 1 Install tweeter fixing bolt 1.
Torque: 13N·m
- 2 Connect the tweeter harness connector A.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 3 Install the front bumper assembly.
- 4 Connect the negative cable of battery.

12.13 Parking Assistance System

12.13.1 Specification

12.13.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Parking assistance camera (front) bracket fixing screw	PF4×12	0.6-0.8
Parking assistance camera (rear) bracket fixing screw	PF4×12	0.6-0.8
Parking distance control module fixing nut	M6×6	8.5-11.5
Park assist system module fixing nut	M6×6	3-4

12.13.2 Instructions and operations

12.13.2.1 Instructions and operations

Parking Assistance System

The parking assist system helps the driver avoid hitting objects while parking.

Front reversing radar

The parking assist radar sensor in the front bumper can be used to detect objects up to 1m in front of the vehicle.

Rear reversing radar

The parking assist radar sensor in the rear bumper can be used to detect objects up to 1.5m behind the vehicle.

Caution

The parking assist system does not replace the driver's visual vision.

- The parking assist system cannot detect objects under the bumper and the vehicle or objects that are too close or too far away from the vehicle.
- The parking assist system may not detect children, pedestrians, bicyclists, or pets.
- The parking assist system cannot detect very small objects.
- Failure to be aware of the vehicle's surroundings while parking could result in serious injury or property damage. Even when equipped with the parking assist system, the driver must look carefully for obstacles before parking.

How the system works

When the parking assist system is in operation and an obstacle enters the detection range, the detection result will be displayed on the multimedia display in a color block and accompanied by a buzzer alert. The buzzer alerts to an obstacle in front of the vehicle (if equipped with front reversing radar) or behind the vehicle. The closer the vehicle is to the obstacle, the more rapid the beep. When the distance is less than 30cm, a continuous beep will be heard. Subject to environmental factors, the detection performance of the radar sensor of the parking assist system may be reduced in hot, extremely cold or wet weather.

Caution

The wide-angle camera and parking assist system radar sensor cannot recognize obstacles that are beyond the detection capability (e.g., parking lot start-stop poles, trees, grass, thin posts, barbed wire, chains, ropes, studs, fences, low obstacles, wave-absorbing objects, reflective objects, etc.), and false alarms and missed alarms of obstacles may occur. Drivers should always be aware of the surrounding conditions to avoid accidents or damage to objects.

Caution

Strong sunlight, reflections, and poorly lightening may make it difficult for the driver to see visual warning signals and may affect the detection function of the wide-angle camera.

Caution

Influenced by the installation position of the parking assist system radar sensor and wide-angle camera, the parking assist system radar sensor and wide-angle camera have a certain blind spot limitation, and the system may not be able to detect the obstacle when the rear obstacle is too close to the vehicle, resulting in missed recognition.

Caution

When the wide-angle camera and the parking assist system radar sensor are covered by other objects such as snow, water, frost, mud, dust, etc., or when there is noise or interference from an external sound source, the system may not be able to effectively recognize obstacles such as objects and people in the surrounding area.

Caution

The system may not be able to react in a timely manner to moving objects (pedestrians, animals, vehicles, etc.) crossing or coming at you, or objects to the side of the vehicle.

Caution

Please note that the parking assist system radar sensor and wide-angle camera may not detect dangerous obstacles ahead in all situations. Adverse weather conditions, such as rain, snow, fog, etc., can cause system performance to degrade, and some targets will not be detected by the system or will not be detected in a timely manner under such conditions.

Caution

Certain scenarios can affect the detection of the parking assist system radar sensor and wide-angle camera, such as roads with guardrails, in tunnels, vehicles pulling in/out in front of you, and sharply curved roads.

Caution

The system will not react in time to animals, small vehicles (e. g. tricycles), vehicles with irregular appearance, cyclists, oncoming and crossing vehicles.

Caution

The position of the parking assist system radar sensor and the wide-angle camera may shift when the vehicle is hit or under strong vibration, which may cause the system's performance to deteriorate, and in severe cases the system will indicate a malfunction, in which case the driver should contact a Geely service station as soon as possible for servicing.

Caution

Please make sure to keep the wide-angle camera and parking assist system radar sensor and its surrounding area clean to ensure that the system works properly. It is prohibited to place or paste any objects around the front of the wide-angle camera and parking assist system radar sensor. Otherwise, the system will not work properly.

Caution

For effective targets recognized by the system, the system does not always achieve the same level of performance depending on vehicles, pedestrians, riders, scenes, and road conditions.

Caution

In some cases, the view field of the wide-angle camera and the parking assist system radar sensor will be limited, and the system will detect vehicles, pedestrians, or riders later than expected or not detect vehicles, pedestrians, or riders at all.

Caution

Due to the installation position of the parking assist system radar sensor, obstacles outside the wheel track that are in the direction of travel may not be detected when the vehicle is traveling in a non-straight line.

AVM System (if equipped)

By installing 4 wide-angle cameras around the vehicle that can cover all the range of view field around the vehicle, multiple video images captured at the same moment are processed into a 360-degree top view of the body around the vehicle and finally displayed on the multimedia display screen. The AVM system allows the driver to monitor the front, rear, left and right video images outside the vehicle in real time from inside the vehicle to assist the driver in parking the vehicle.

Caution

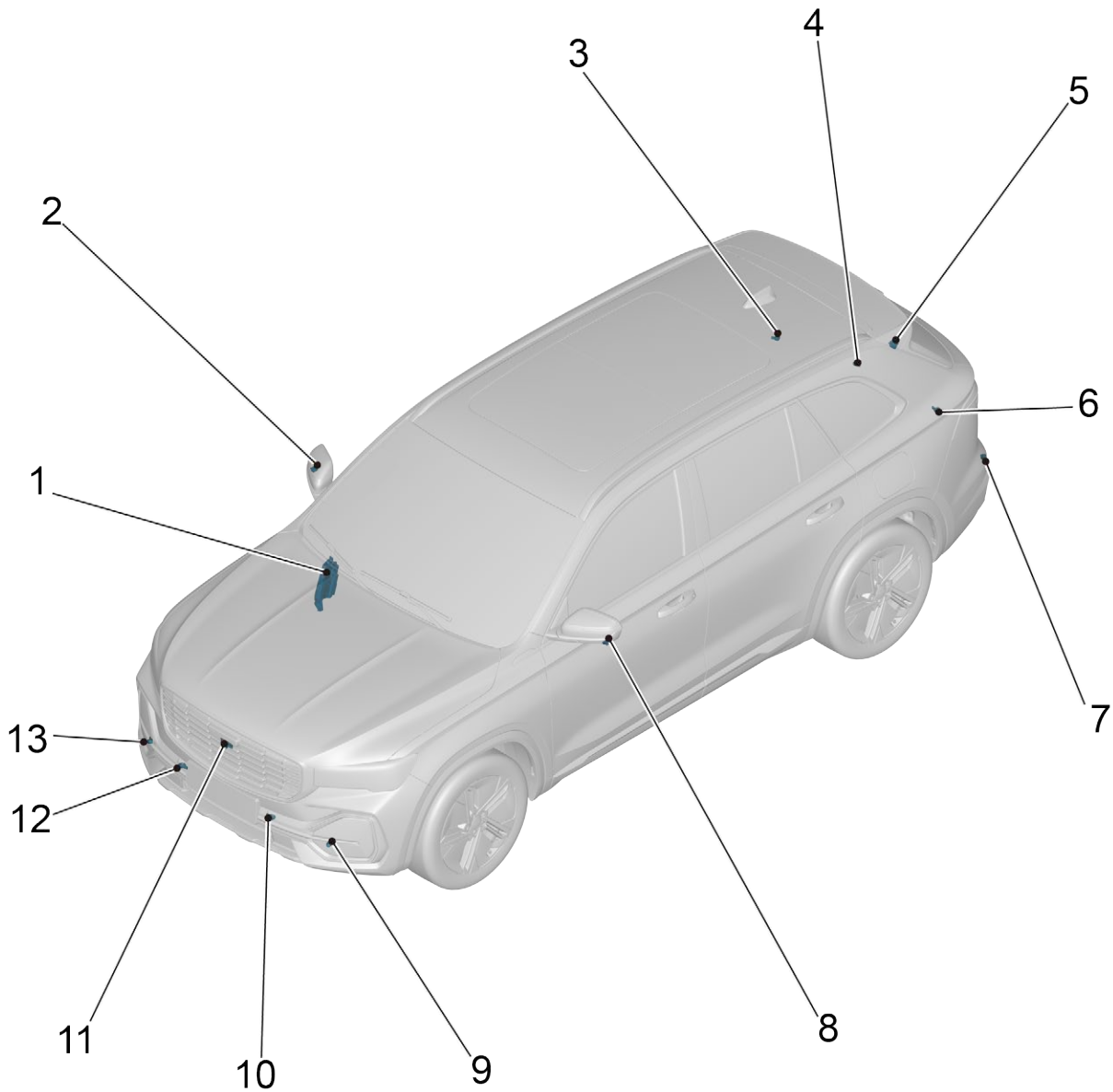
The AVM system does not replace the driver's visual vision. Even if the vehicle is equipped with a AVM system, it is still necessary to carefully check the situation behind and around the vehicle before parking.

The wide-angle camera is susceptible to environmental factors such as low illumination in foggy, rainy or snowy weather and at night. Please use the AVM system with caution in such environments, and make sure the surrounding environment is safe before use.

Due to the limitation of the physical arrangement of the wide-angle camera, the around view image will have a visual blind spot, the black area at the bottom of the vehicle model is the visual blind spot, please ensure the safety of the surrounding environment before use.

12.13.3 Part position

12.13.3.1 Part position



- | | | | |
|----|---|-----|--|
| 1. | Park assist system module (360) | 8. | Parking assistance camera (side) |
| 2. | Parking assistance camera (side) | 9. | Parking assistance sensor (left front) |
| 3. | Parking assistance sensor (right rear) | 10. | Parking assistance sensor (left front middle) |
| 4. | Parking assistance sensor (right rear middle) | 11. | Parking assistance camera (front) |
| 5. | Parking assistance camera (rear) | 12. | Parking assistance sensor (right front middle) |
| 6. | Parking assistance sensor (left rear middle) | 13. | Parking assistance sensor (right front) |
| 7. | Parking assistance sensor (left rear) | | |

12.13.4 Diagnostic information and procedure

12.13.4.1 Diagnosis description

See [Description and Operation](#) before diagnosing a malfunction in the parking assist system. Understanding and familiarizing yourself with the operation of the parking assist system before beginning system diagnosis will help determine the correct troubleshooting steps to take in the event of a malfunction, and more importantly this will help determine if the condition described by the customer is normal operation. Any troubleshooting of the parking assist system should start with a [Visual Check](#) that guides the repairer to the next logical step in the troubleshooting process. Understanding and using the diagnostic process correctly will reduce diagnostic time and avoid misdiagnosis of the fault area.

12.13.4.2 Visual check

- Check after-sales installations that may affect the parking assist system operation, to ensure these devices cannot affect the normal operation of the parking assist system.
- Check system components that are easily accessible or can be seen to find out if there is any obvious damage of the component or there is a situation that may cause a fault.
- Check and make sure that the control unit and harness connectors are installed correctly.
- Check the harness and harness connector to ensure that there is no sign of loosening, damage, poor contact, aging, etc.

12.13.4.3 PAS3 road calibration program

Note

If an error occurs with any of the cameras, the relevant field displays "no signal from XX camera".



Road calibration is the special requirement of VPA-Plus, among which signals PrkgTouchCoornReq and VehSpdLgt are shared with VPA-Plus and VPA-Basic.

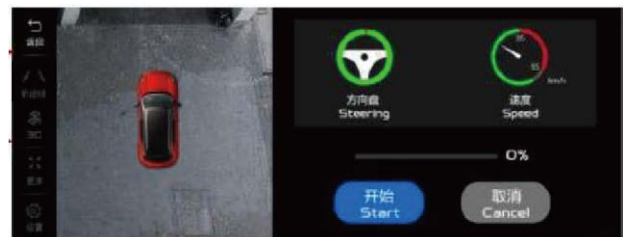
Under factory mode, VPA recognizes the operation information of the driver by identifying the PrkgTouchCoornReq. CoordinateX, PrkgTouchCoornReq. CoordinateY and PrkgTouchCoornReq. Touch Eve Typ sent by IHU.

Operation steps

1. When the driver selects "Road calibration", the display will be switched to the road calibration startup interface.



2. In the startup interface, if the vehicle speed is $\leq 35\text{km/h}$, "Start" is available, when the driver selects "Start", the automatic calibration starts; when the driver selects "Cancel", it will return to the calibration selection interface.



3. During road calibration, the calibration progress bar is displayed, and the steering wheel angle and vehicle speed are also displayed in real time.

If "Cancel" is selected during calibration, the display returns to the calibration selection interface.



Vehicle speed correlation

- If the vehicle speed is $\leq 35\text{km/h}$, the calibration process is normal.
- If $35\text{km/h} < \text{vehicle speed} \leq 50\text{km/h}$, the driver is prompted to reduce the speed.
- If speed $> 50\text{km/h}$, exit to IHU main interface.

Steering wheel angle correlation

If the steering wheel angle exceeds the limit value, the driver is prompted to return the steering wheel to the original position and continue the calibration process.

4. If the calibration is successful, VPA will display "Apply" or "Exit". When the driver selects "Apply", the calibration results will be used in the VPA; if the driver selects "Exit", the view will return to the Top + 3D front view interface.



5. If the calibration fails, the VPA will display "Retry" or "Exit". If the driver selects "Retry", the calibration process will restart; if the driver selects "Exit", the view will return to the Top + 3D front view interface.



6. If the user selects "Back" at any stage of the road calibration process, the view switches back to the main IHU interface.

Other prerequisites

1. Lighting conditions: >50Lux
2. Continuous driving time: 2min
3. Vehicle front wheel steering angle: < 1°
4. Road line presence

12.13.5 Removal and Installation

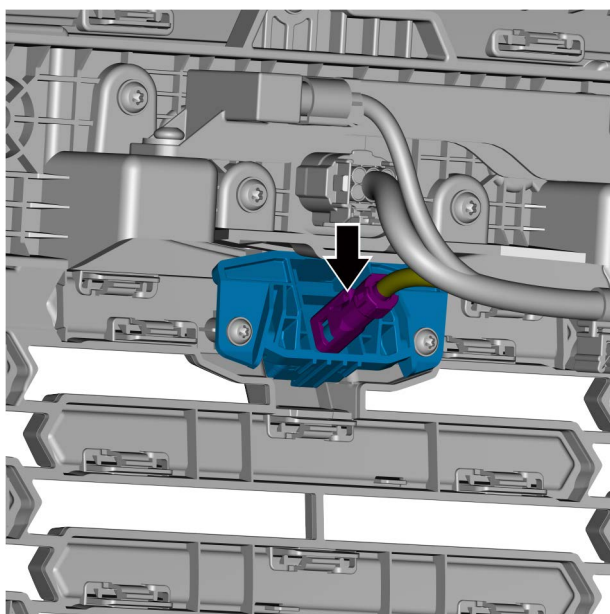
12.13.5.1 Replacement of parking assistance camera (front)

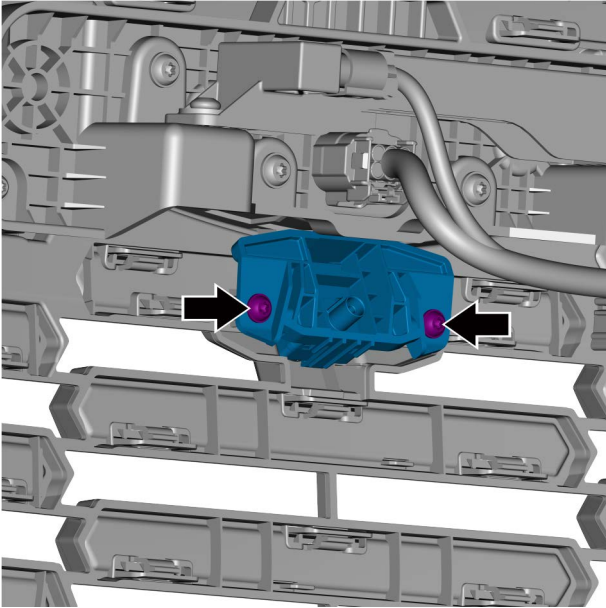
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

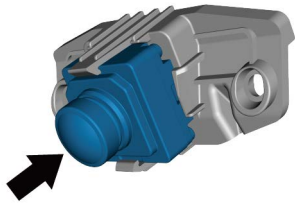
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the front bumper assembly, refer to [Replacement of front bumper assembly](#).
- 3 Disconnect the parking assistance camera (front) harness connector.





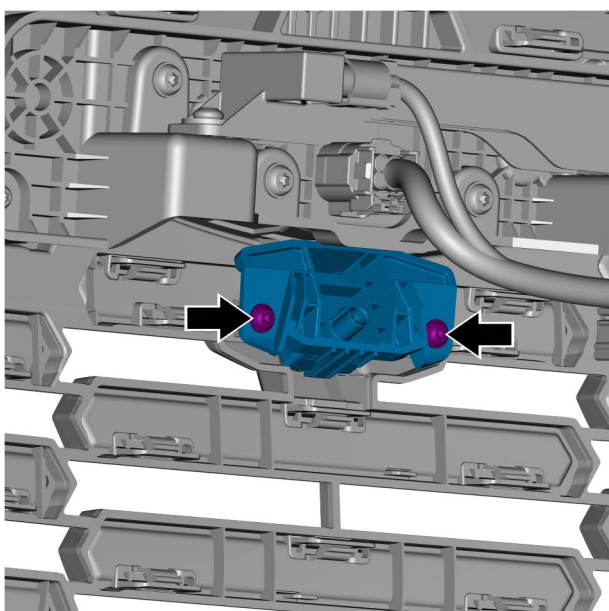
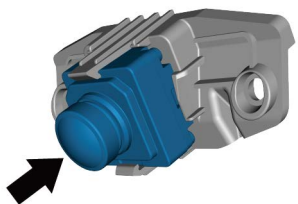
- 4 Remove the 2 fixing screws of parking assistance camera (front) bracket.

- 5 Remove the parking assistance camera (front) from parking assistance camera (front) bracket.

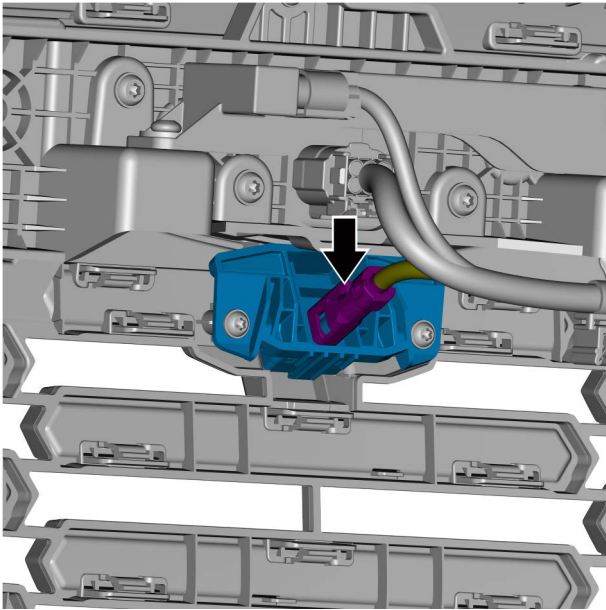


Installation Procedure

- 1 Install the parking assistance camera (front).



- 2 Install the 2 fixing screws of parking assistance camera (front) bracket.
Torque: 0.7N·m



- 3 Connect the parking assistance camera (front) harness connector.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 4 Install the front bumper assembly.
- 5 Connect the negative cable of battery.

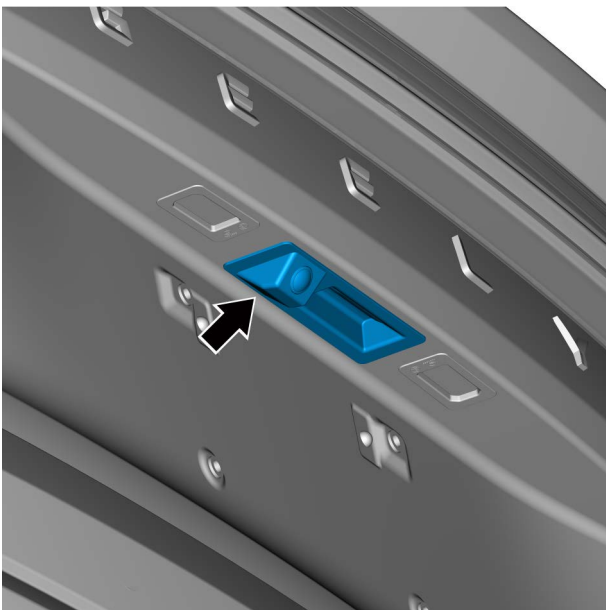
12.13.5.2 Replacement of parking assistance camera (rear)

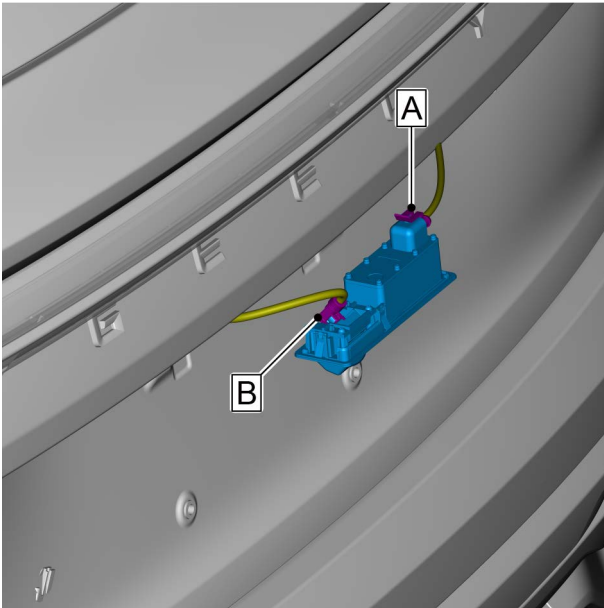
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

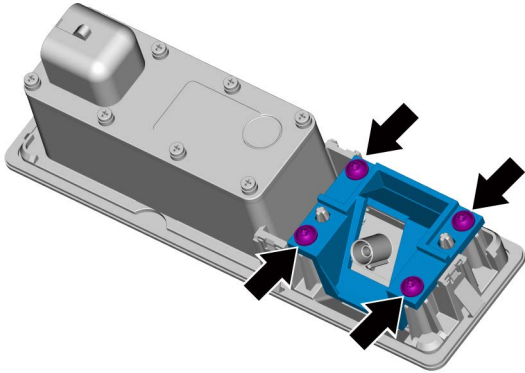
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the tailgate opening switch.



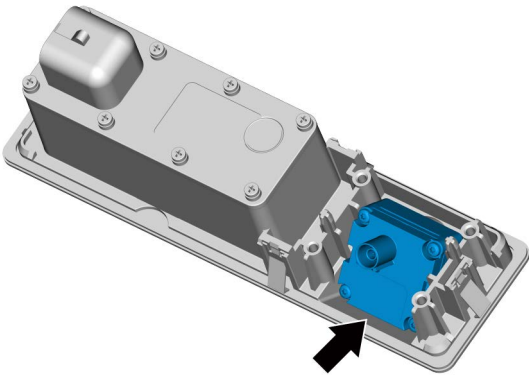


- 3 Disconnect the parking assistance camera (rear) harness connector B.
- 4 Disconnect the tailgate opening switch harness connector A.

- 5 Remove the 4 fixing screws of parking assistance camera (rear) bracket.

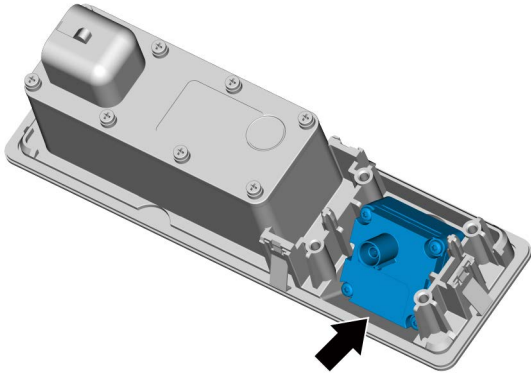


- 6 Remove the parking assistance camera (rear).

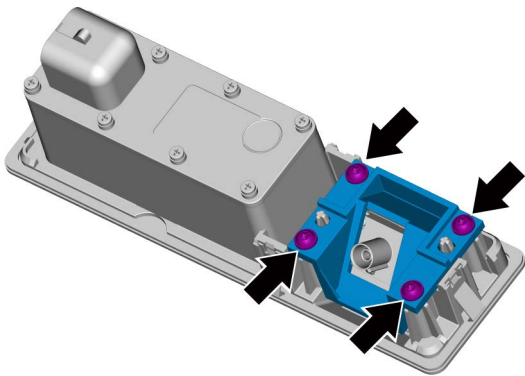


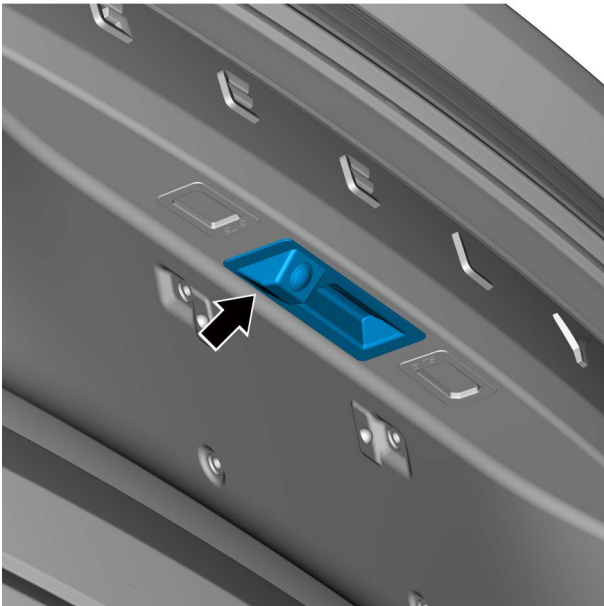
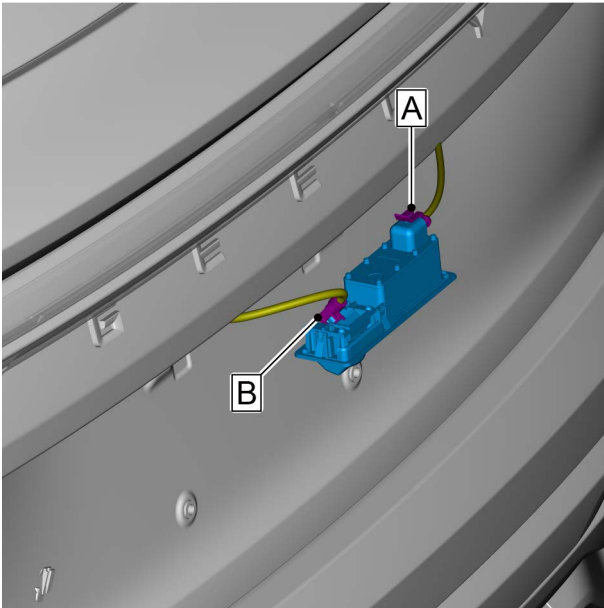
Installation Procedure

- 1 Install the parking assistance camera (rear).



- 2 Install the 4 fixing screws of parking assistance camera (rear) bracket.
Torque: 0.7N·m





- 3 Connect the tailgate opening switch harness connector A.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 4 Connect the parking assistance camera (rear) harness connector B.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 5 Install the tailgate opening switch.

- 6 Connect the negative cable of battery.

12.13.5.3 Replacement of parking assistance camera (left)

Refer to [Replacement of exterior rearview mirror \(left\)](#).

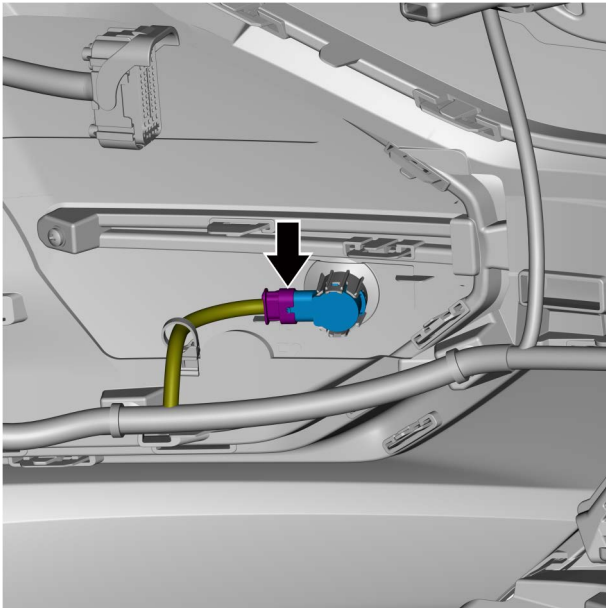
12.13.5.4 Replacement of ultrasonic parking sensor

Removal Procedure

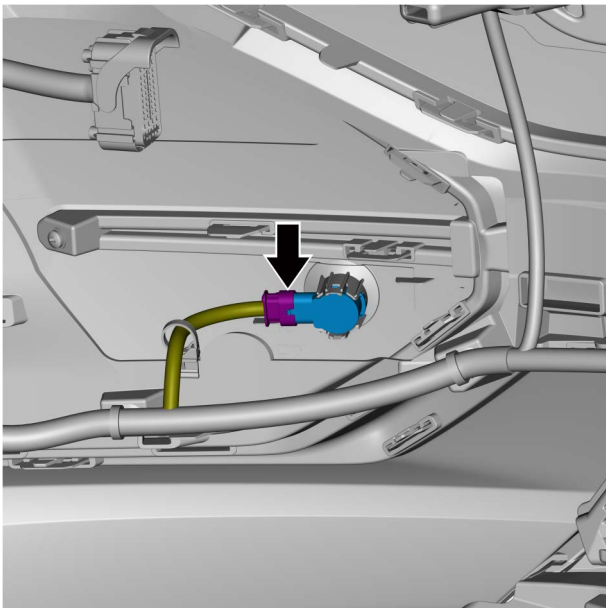
Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).



- 2 Remove the front bumper assembly, refer to [Replacement of front bumper assembly](#).
- 3 Disconnect the harness connector of ultrasonic parking sensor.
- 4 Remove the ultrasonic parking sensor.



Installation Procedure

- 1 Install the ultrasonic parking sensor.
- 2 Connect the harness connector of ultrasonic parking sensor.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 3 Install the front bumper assembly.
- 4 Connect the negative cable of battery.

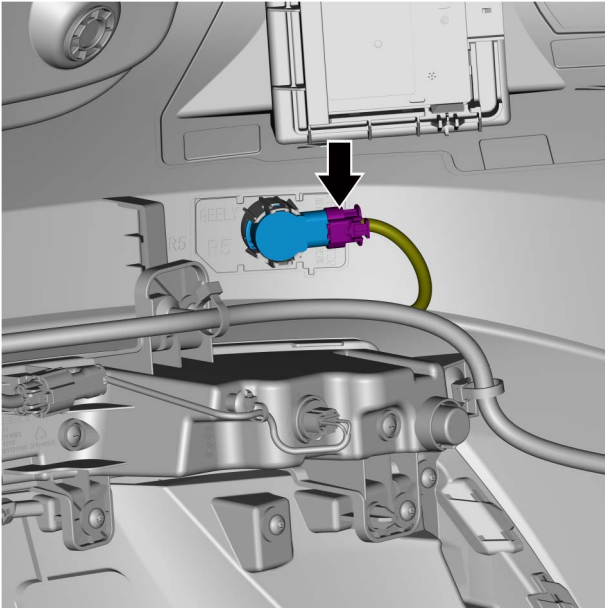
12.13.5.5 Replacement of parking assistance sensor

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

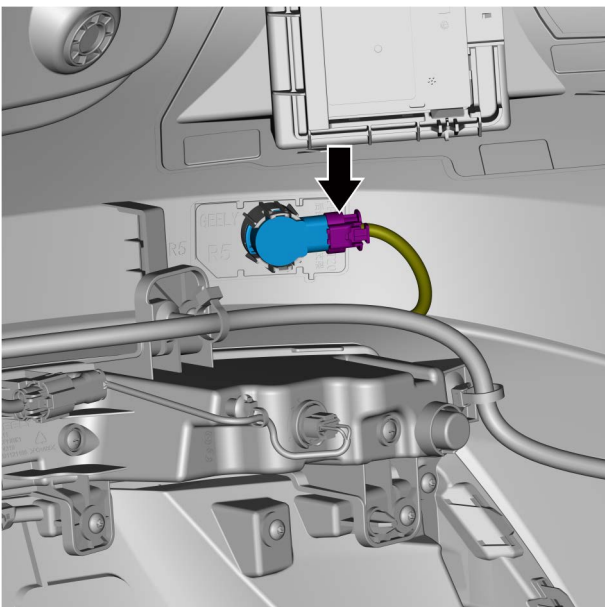
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the rear bumper assembly, refer to [Replacement of rear bumper assembly](#).
- 3 Disconnect the harness connector of parking assistance sensor.
- 4 Remove the parking assistance sensor.

**Installation Procedure**

- 1 Install the parking assistance sensor.
- 2 Connect the harness connector of parking assistance sensor.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 3 Install the rear bumper assembly.
- 4 Connect the negative cable of battery.

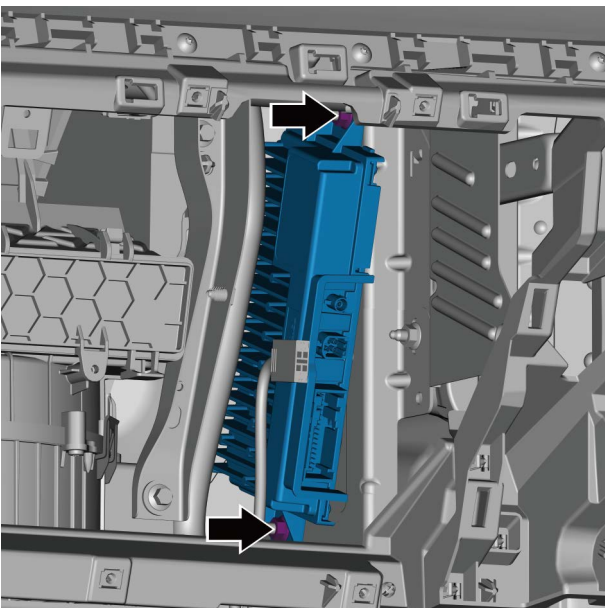
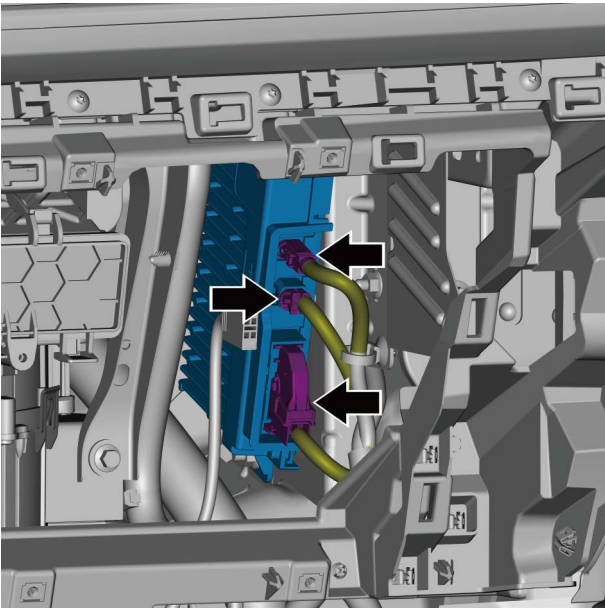
12.13.5.6 Replacement of parking distance control module

Removal Procedure

Warning !

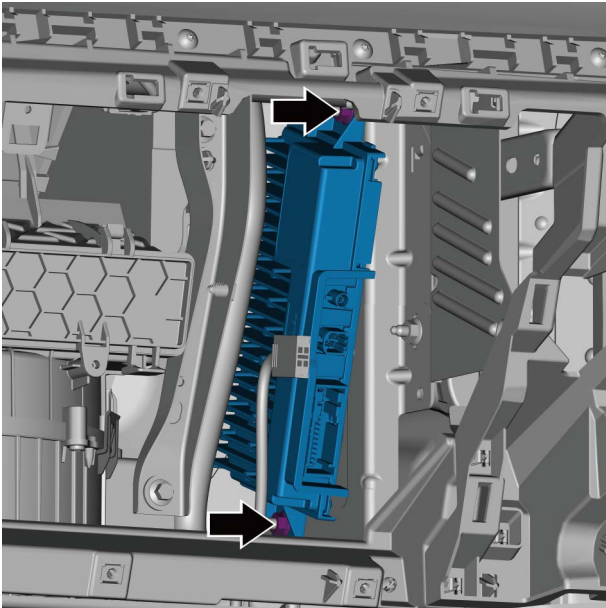
Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the glove box frame assembly, refer to Replacement of glove box frame assembly.
- 3 Disconnect the 3 harness connectors of the parking distance control module.



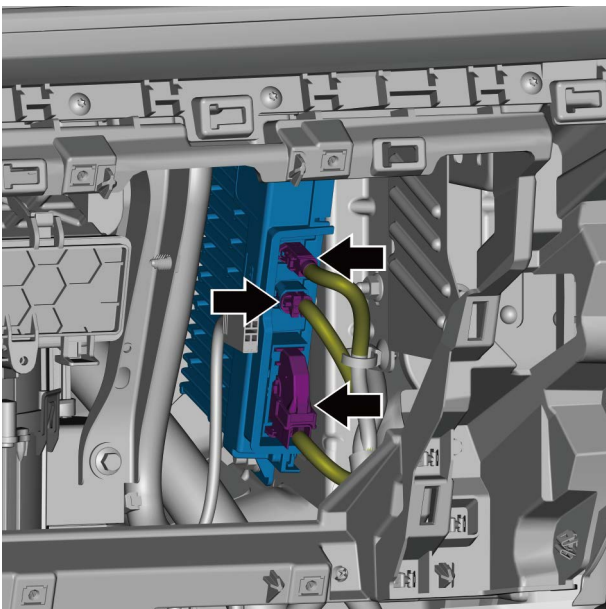
- 4 Remove the 2 fixing nuts of parking distance control module.
- 5 Remove the parking distance control module.

Installation Procedure



- 1 Install the 2 fixing nuts of parking distance control module.

Torque: 3.5N·m



- 2 Connect the 3 harness connectors of the parking distance control module.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 3 Install the glove box fame assembly.
- 4 Connect the negative cable of battery.
- 5 The GLDS diagnostic program is required, under the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software brushing operation.

12.14 Backup power

12.14.1 Instructions and operations

12.14.1.1 Instructions and operations

12V socket (center console)

The 12V socket (center console) is located in the console lower storage box and can be used to connect electrical equipment with a maximum limit of 120 W.

12V socket (luggage compartment)

The luggage compartment is equipped with a 12V socket (luggage compartment) located on the left trim panel of the luggage compartment. The backup power can be used to connect electrical devices with a maximum limitation of 120W.

Multimedia interface

The USB multimedia interface is located in the console lower storage box and has data transfer and charging functions.

Front charging port

The front charging port is located in the console lower storage box and has charging function only.

Caution

The use of high-power electrical equipment is prohibited in the USB charging port.

Rear charging port

The rear charging port is located in the console lower storage box and has charging function only.

Backup power

The backup power is located in the right trim panel assembly of the luggage compartment and is used to power the telematics and connected antenna module (type I) (TCAM).

Wireless phone charger

This vehicle is equipped with a wireless phone charger above the console. The wireless phone charger complies with the Qi wireless charging standard, which allows you to wirelessly charge cell phones that support the Qi standard, which uses electromagnetic induction to transmit power to mobile devices.

To use the wireless phone charger, make sure that the coil inside your cell phone is aligned with the coil in the middle position of the wireless phone charger. It may be necessary to adjust the position of the cell phone as the coil position varies.

On the Multimedia display screen, click Vehicle Settings → Basic Vehicle Settings → More Basic Settings to turn the wireless phone charger function on or off. To use the wireless phone charger function, turn on the wireless phone charger

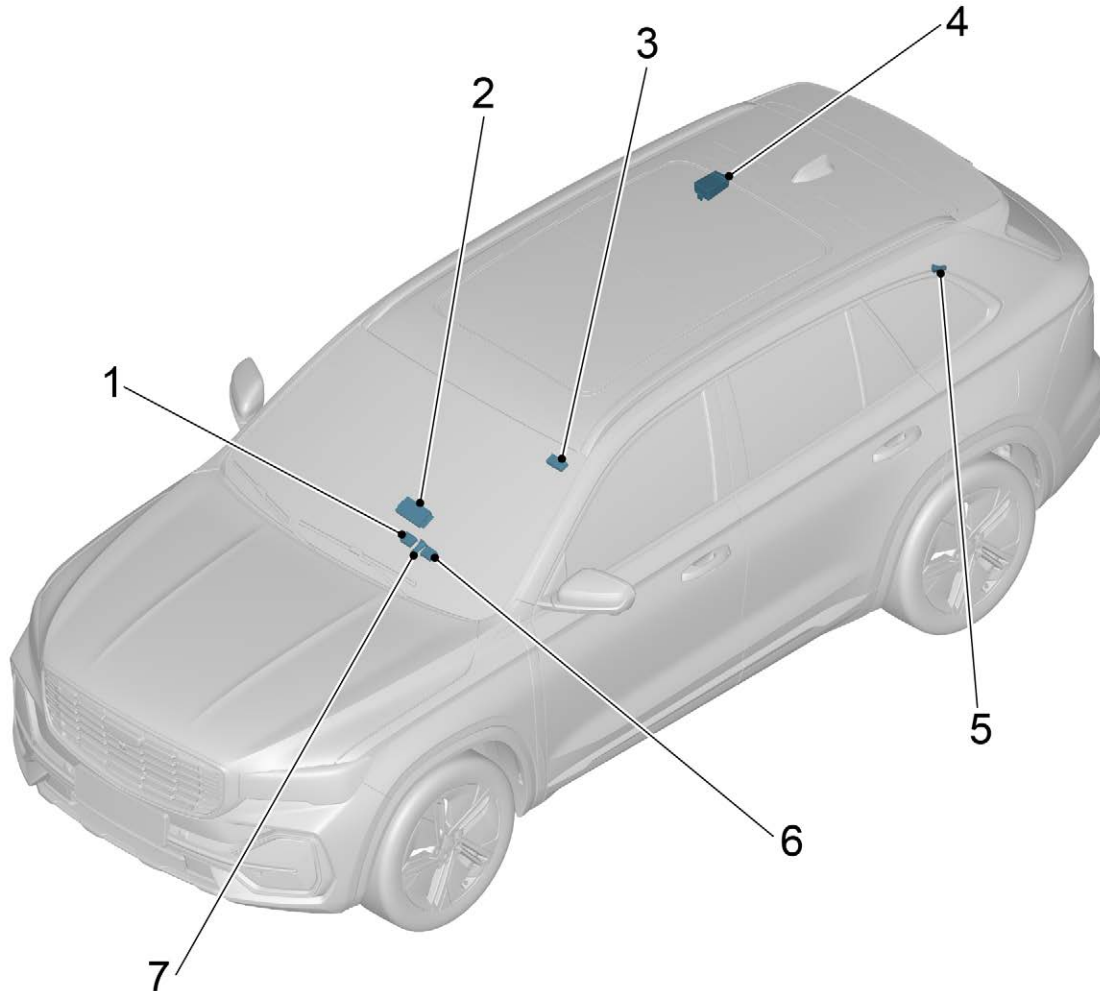
on multimedia display screen, and make sure that the coil inside the cell phone is aligned with the coil at the middle position of the wireless phone charger. Since the coil position varies, it may be necessary to adjust the position of the phone.

Caution

Do not place any metal objects such as coins, rings or keys between the phone and the wireless phone charger as this will affect the charging of the phone and cause the metal objects to become very hot.

12.14.2 Part position

12.14.2.1 Part position



- | | |
|-----------------------------|-------------------------------------|
| 1. USB port | 4. 12V socket (luggage compartment) |
| 2. Wireless phone charger | 5. USB port 2 |
| 3. USB power for rear seats | 6. 12V socket (center console) |
| 4. Backup power | |

12.14.3 Diagnostic information and procedure

12.14.3.1 Diagnosis description

See [Description and Operation](#) before diagnosing a malfunction in the backup power. Understanding and familiarizing yourself with the operation of the backup power before beginning system diagnosis will help determine the correct troubleshooting steps to take in the event of a malfunction, and more importantly this will help determine if the condition described by the customer is normal operation. Any troubleshooting of the backup power should start with a [Routine Check](#) that guides the repairer to the next logical step in the troubleshooting process. Understanding and using the diagnostic process correctly will reduce diagnostic time and avoid misdiagnosis of the fault area.

12.14.3.2 Routine inspection

- Check after-sales installations that may affect the back-up power supply, to ensure that these devices cannot affect the back-up power supply.
- Check system components that are easily accessible or can be seen to find out if there is any obvious damage of the component or there is a situation that may cause a fault.
- Check the harness and harness connector to ensure that there is no sign of loosening, damage, poor contact, aging, etc.

12.14.4 Removal and Installation

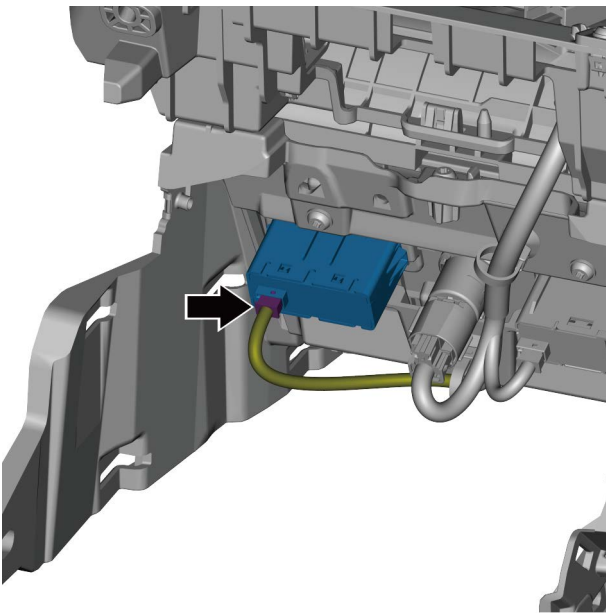
12.14.4.1 Replacement of USB port (type I)

Removal Procedure

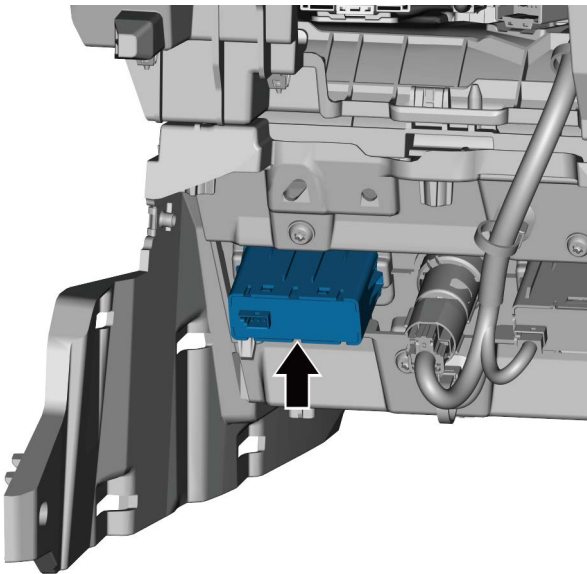
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

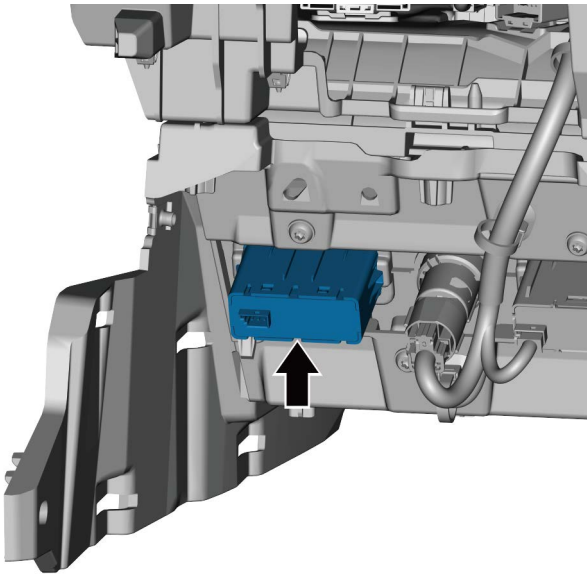
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove console body assembly, refer to [Replacement of console body assembly](#).
- 3 Disconnect the USB port harness connector.



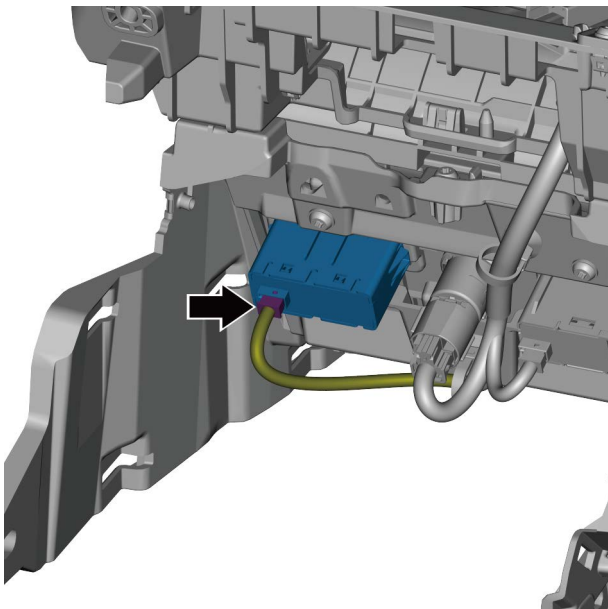
- 4 Remove the USB port.



Installation Procedure



- 1 Install the USB port.



- 2 Connect the USB port harness connector.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 3 Install the console body assembly.
- 4 Connect the negative cable of battery.

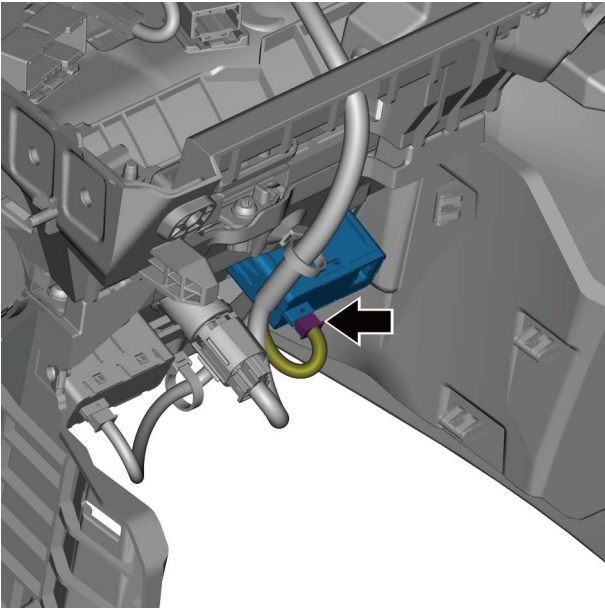
12.14.4.2 Replacement of USB port (type II)

Removal Procedure

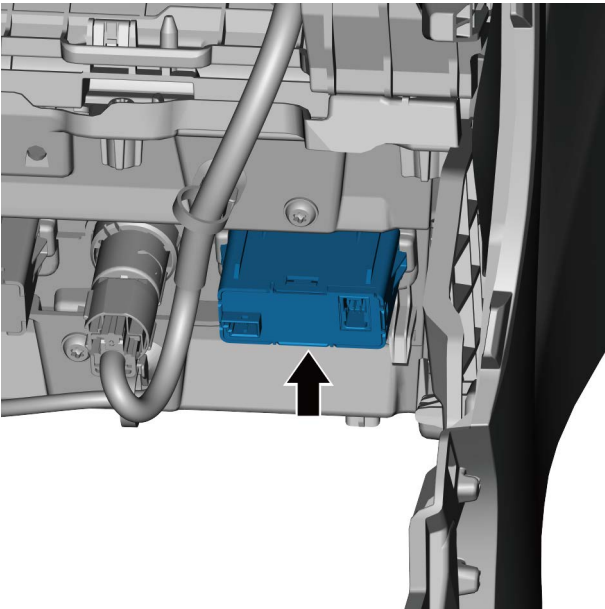
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove console body assembly, refer to [Replacement of console body assembly](#).

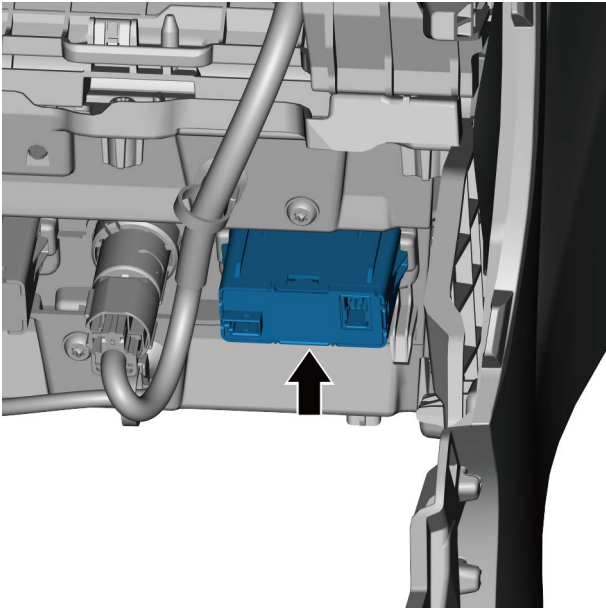


3 Disconnect the USB port harness connector.

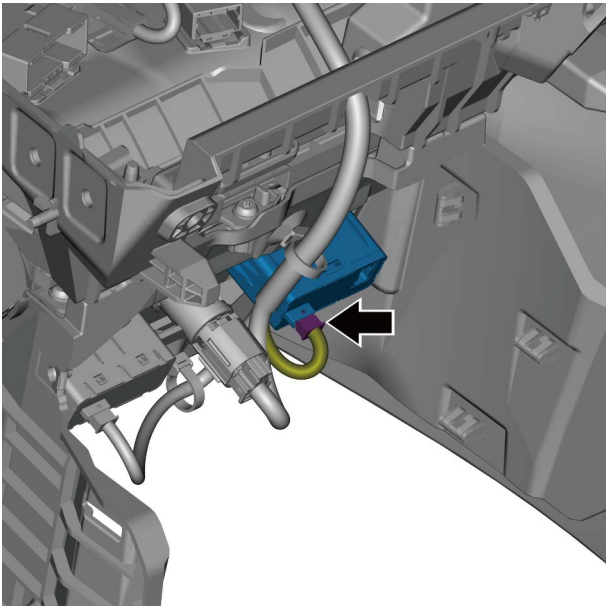


4 Remove the USB port.

Installation Procedure



- 1 Install the USB port.



- 2 Connect the USB port harness connector.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 3 Install the console body assembly.
- 4 Connect the negative cable of battery.

12.14.4.3 Replacement of rear USB interface (type I)

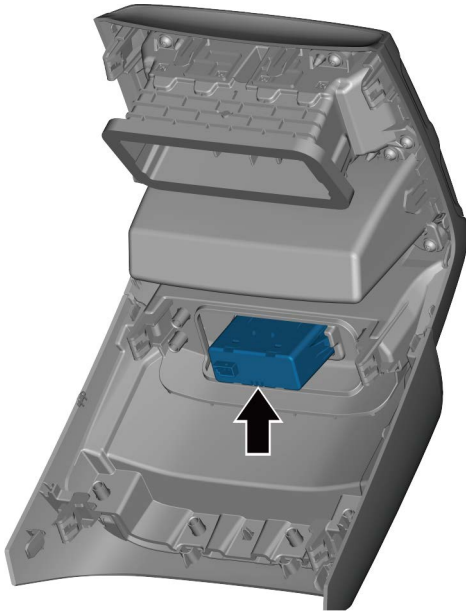
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

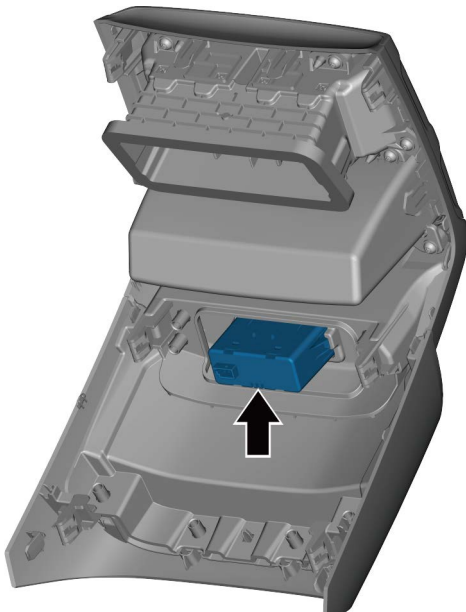
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

- 2 Remove the console rear panel assembly, refer to [Replacement of console rear panel assembly](#).
- 3 Disassemble the USB port and remove it.



Installation Procedure

- 1 Install the USB interface.



- 2 Install the console rear panel assembly.
- 3 Connect the negative cable of battery.

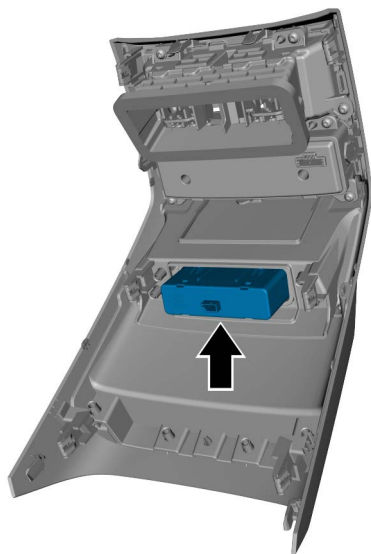
12.14.4.4 Replacement of rear USB interface (type II)

Removal Procedure

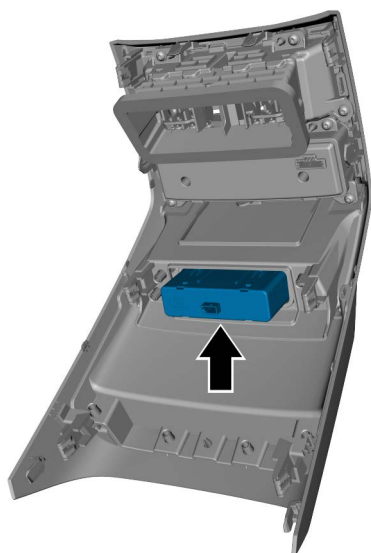
Warning !

Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#)

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the console rear panel assembly, refer to [Replacement of console rear panel assembly \(type II\)](#).
- 3 Disassemble the USB interface and remove the USB interface.

**Installation Procedure**

- 1 Install the USB interface.



- 2 Install the console rear panel assembly.
- 3 Connect the negative cable of battery.

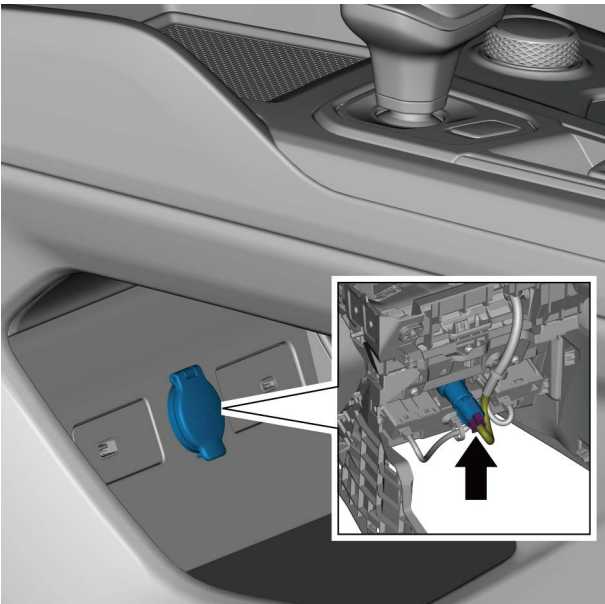
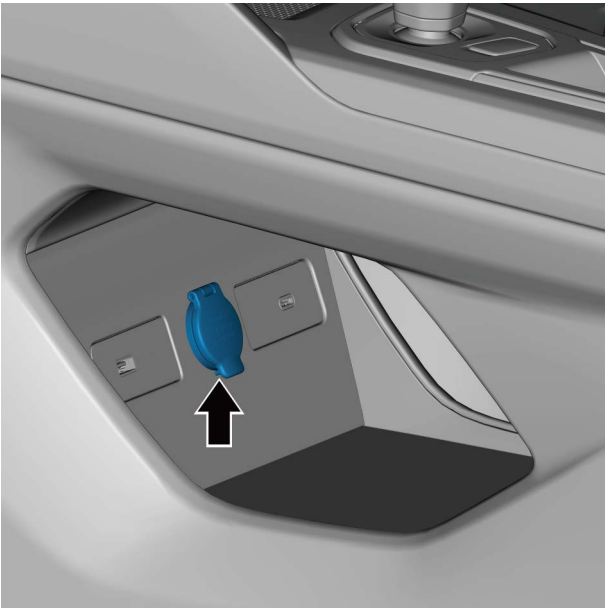
12.14.4.5 Replacement of 12V socket (center console)

Removal Procedure

Warning !

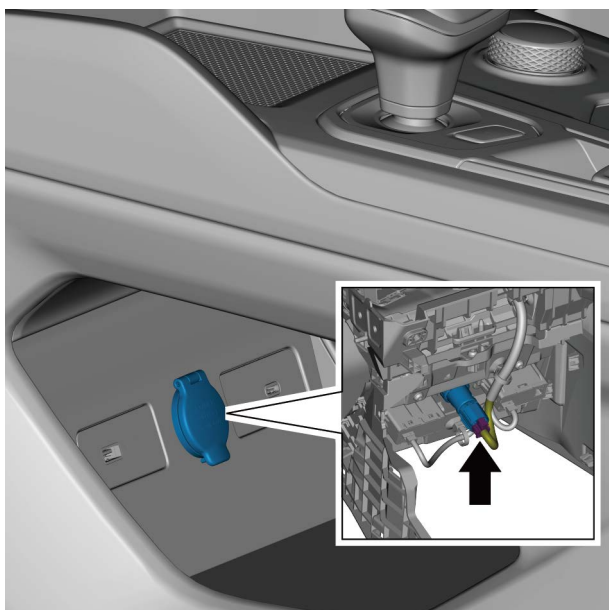
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the 12V socket (center console).



- 3 Disconnect the 12V socket (center console) harness connector and remove the 12V socket (center console).

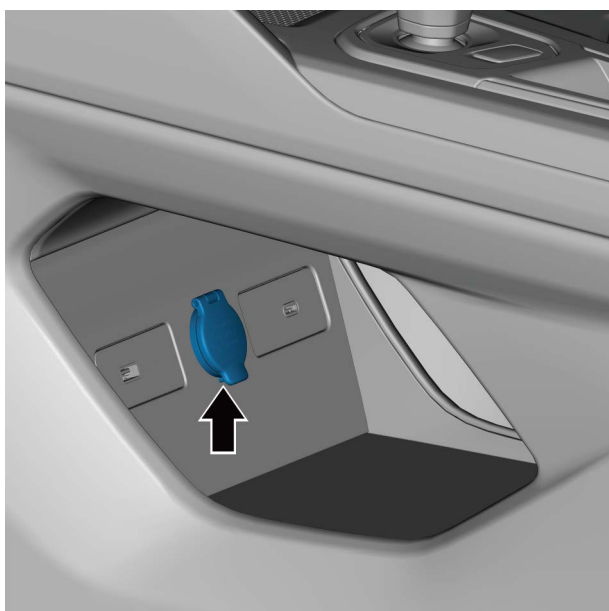
Installation Procedure



- 1 Connect the 12V socket (center console) harness connector.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 2 Install the 12V socket (center console).

- 3 Connect the negative cable of battery.

12.14.4.6 Replacement of 12V socket (luggage compartment)

Removal Procedure

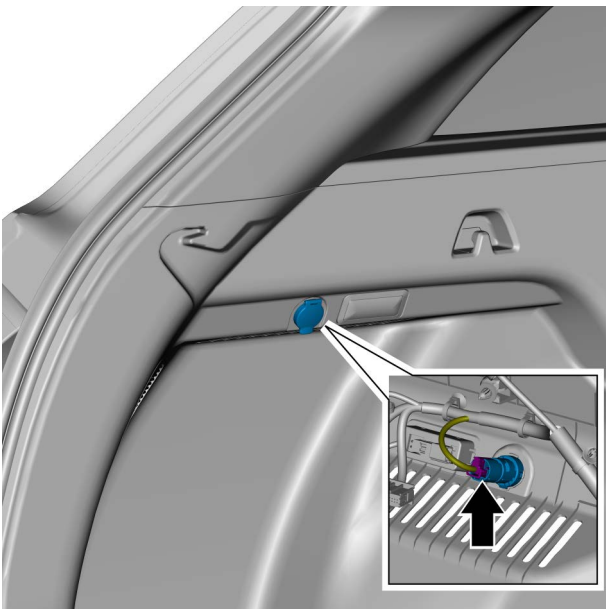
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

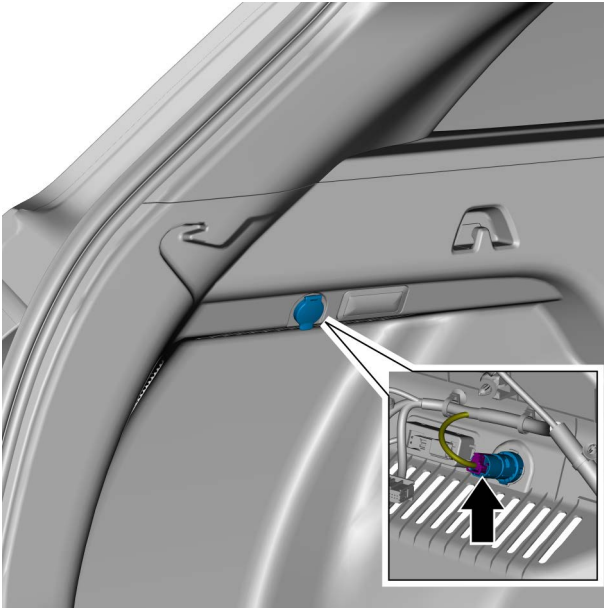


2 Remove the 12V socket (luggage compartment).



3 Disconnect the 12V socket (luggage compartment) harness connector and remove the 12V socket (luggage compartment).

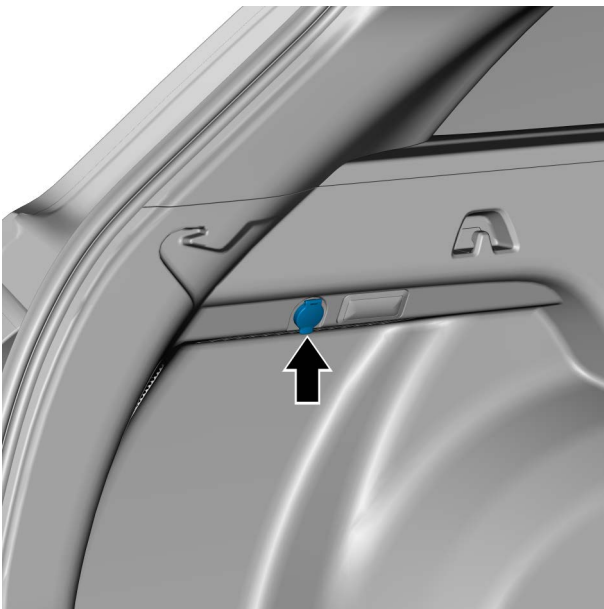
Installation Procedure



- 1 Connect the 12V socket (luggage compartment) harness connector.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 2 Install the 12V socket (luggage compartment).

- 3 Connect the negative cable of battery.

12.14.4.7 Replacement of wireless phone charger

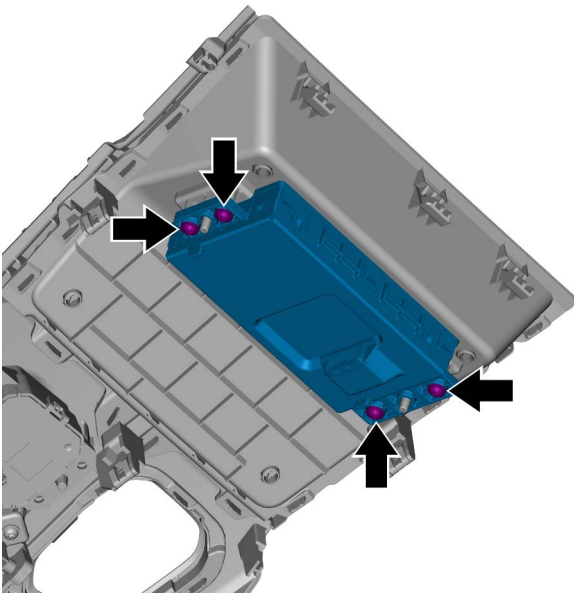
Removal Procedure

Warning !

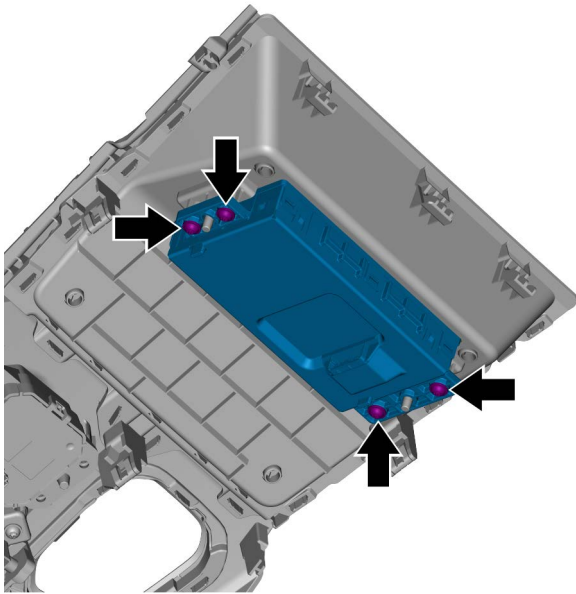
Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#)

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable.](#)
- 2 Remove the passenger seat, refer to [Replacement of passenger seat.](#)

- 3 Remove the passenger side extension trim panel, refer to [Replacement of driver side extension trim panel assembly](#).
- 4 Remove the console rear panel assembly, refer to [Replacement of console rear panel assembly \(type II\)](#).
- 5 Remove the console right trim panel assembly, refer to [Replacement of console right trim panel assembly](#).
- 6 Remove console right outer handle assembly, refer to [Replacement of console right outer handle assembly](#).
- 7 Remove the gear selector lever, refer to [Replacement of gear selector lever](#).
- 8 Remove the gear shift panel assembly, refer to [Replacement of gear shift panel assembly](#).
- 9 Remove the 4 fixing screws of wireless phone charger and remove the wireless phones charger.



Installation Procedure



- 1 Install the 4 fixing screws of wireless phone charger.
Torque: 1.5N·m

- 2 Install the gear shift panel assembly.
- 3 Install the gear selector lever.
- 4 Install the console right outer handle assembly.
- 5 Install the console right trim panel assembly.
- 6 Install the console rear panel assembly.
- 7 Install the front passenger side extension trim panel.
- 8 Install the passenger seat.
- 9 Connect the negative cable of battery.

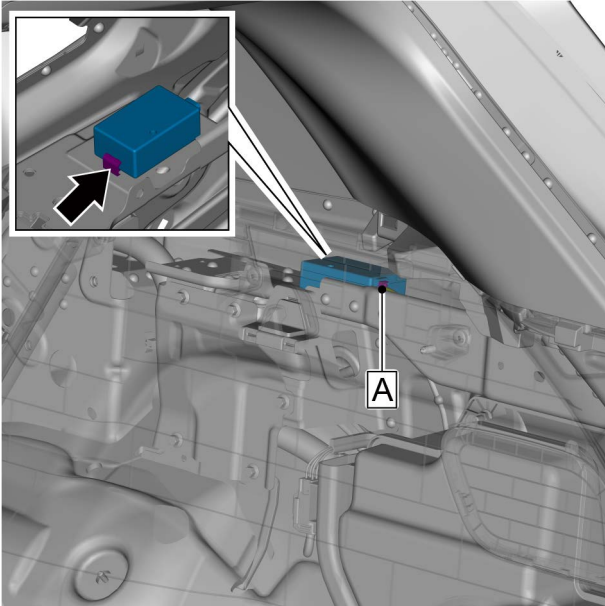
12.14.4.8 Replacement of backup power

Removal Procedure

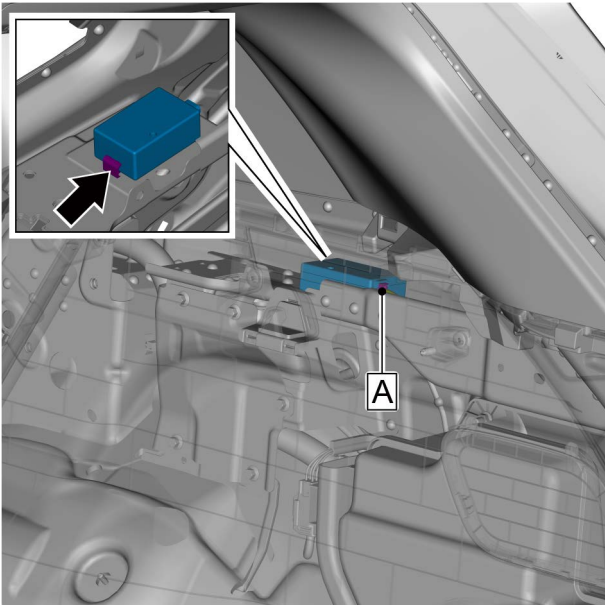
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the upper trim panel cover of right luggage compartment, refer to [Replacement of luggage compartment left upper trim panel](#).



- 3 Disconnect the harness connector A of backup power.
- 4 Remove the backup battery by pressing the clips along the arrows.



Installation Procedure

- 1 Install the backup power fixing clips.
- 2 Connect the harness connector A of backup power.
- 3 Install the upper trim panel cover of right luggage compartment.
- 4 Connect the negative cable of battery.

12.15 Data communication system

12.15.1 Specification

12.15.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Vehicle gateway module fixing nut	M6×19	0.8-4

12.15.2 Instructions and operations

12.15.2.1 Instructions and operations

Overview

The whole vehicle network adopts a domain-distributed architecture, which includes: dynamic driving domain, active safety domain, entertainment domain and vehicle body domain, and FlexRay serves as the backbone to realize the communication among the domains. The domain controllers are: VDDM, IHU, ASDM and CEM. CAN and LIN are used for communication between controllers other than the domain controllers. The advantages of the whole vehicle network design are as follows:

- Reduced number of control circuit wires.
- Greatly reduced weight of the wiring harness.
- Fewer pins in the control plug.
- Improved reliability and durability.

Transmission speed of each network:

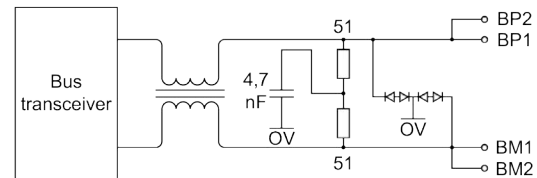
- FlexRay: 10Mbit/s, single channel.
- CAN: 500kbit/s
- CANFD: 2Mbit/s
- LIN: 19.2kbit/s

The FlexRay bus is a new communication standard designed for in-vehicle networking. It uses a time-triggered mechanism with high bandwidth and good fault-tolerance performance, and has certain advantages in terms of real-time, reliability, and flexibility. When using time-triggered communication, each node in the network knows in advance the time when they will communicate with each other, the receiver knows in advance the time when the message arrives, and the time when the message is on the bus can be predicted. Even if the harsh and changing driving environment interferes with the system transmission, the FlexRay protocol ensures that message delays and jitter are minimized and the transmission is as synchronized and predictable as possible. This is important for applications that require continuous and high-speed performance (e. g., brake-by-wire, steer-by-wire, etc.) FlexRay physically communicates over two separate buses, each with a data rate of 10 MBit/s. FlexRay also offers reliability features that many networks do not. In particular, FlexRay's redundant communication capabilities allow for complete replication of the network configuration in hardware and progress monitoring.

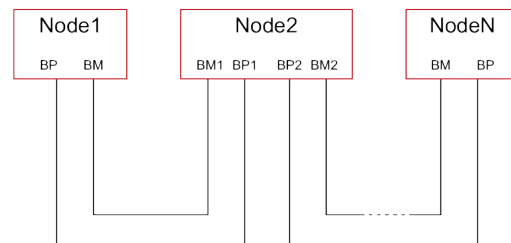
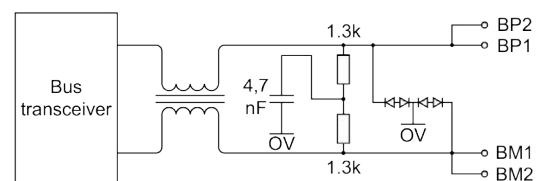
The FlexRay bus is daisy-chained. The terminal node has a termination resistance of 102 ohms (between BP and BM) and the non-terminal node has a termination resistance of 2.6K ohms (between BP and BM).

The internal schematic structure of the ECU terminal node is shown below (terminal node):

Low impedance termination(102 Ω)



High impedance termination(2,6 kΩ)



CAN is the abbreviation of Controller Area Network, the full name is Controller Area Network Bus, that is, control devices are connected to each other for data exchange. It is one of the most widely used field buses internationally, designed as a microcontroller communication bus in the automotive environment. It exchanges information between each electronic control unit ECM to form a vehicle electronic control network.

LIN is mainly used as an auxiliary network or sub-network of high-speed buses such as CAN. In occasions where bandwidth requirements are not high, functions are simple, and real-time requirements are low, such as the control of body

electrical appliances (glass lifting, anti-pinch, sunroofs, etc.), the use of LIN bus can effectively simplify the network harnesses, reduce costs, and improve the efficiency and reliability of the network communication. The features of the LIN bus include:

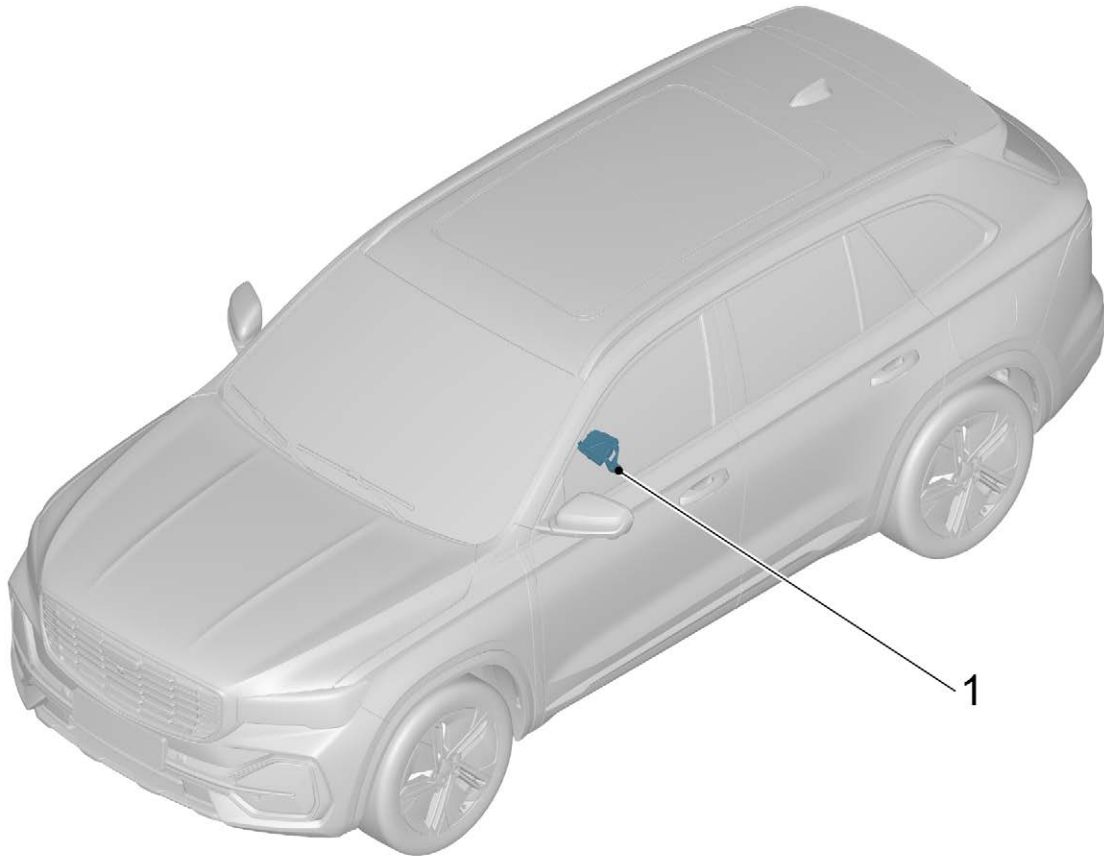
- Data format based on UART
- Single master multi slave structure
- Single line transmission: 0-12V
- Communication rate: 19.2kbps

The data link connector (DLC) is the result of negotiation and regulation between the world's automobile manufacturers. This connector must be used when communicating with the vehicle using the diagnosis instrument and when programming the communication system used in the vehicle using the diagnosis instrument. The connector must have the following conditions:

- Be able to connect 16-pin connector of all fault diagnosis instruments.
- Always supply battery power to fault diagnosis instrument through Pin No.16.
- Always supply grounding connection for fault diagnosis instrument through Pin No.4.
- The remaining pins are used for serial data communication with the vehicle system. The microprocessor-controlled modules in the vehicle communicate with each other and with the diagnosis instrument via the serial data circuit.

12.15.3 Part position

12.15.3.1 Part position



1. Vehicle Gateway Module

12.15.4 Diagnostic information and procedure

12.15.4.1 Diagnosis description

See [Description and Operation](#) before diagnosing a malfunction in the data communication system. Understanding and familiarizing yourself with the operation of the data communication system before beginning system diagnosis will help determine the correct troubleshooting steps to take in the event of a malfunction, and more importantly this will help determine if the condition described by the customer is normal operation. Any troubleshooting of the data communication system should start with a [Visual Check](#) that guides the repairer to the next logical step in the troubleshooting process. Understanding and using the diagnostic process correctly will reduce diagnostic time and avoid misdiagnosis of the fault area.

12.15.4.2 Visual check

- Check the after-sales installations that may affect the operation of the data communication system to ensure that they cannot affect the operation of the data communication system.
- Check system components that are easily accessible or can be seen to find out if there is any obvious damage of the component or there is a situation that may cause a fault.
- If the data communication system is faulty, check and ensure that each control module harness connector connected to the data communication system is properly connected before making repairs.
- Check the harness and harness connector to ensure that there is no sign of loosening, damage, poor contact, aging, etc.

12.15.4.3 CAN bus fault precaution

- The CAN bus harness should not be stretched.
- Do not detach the CAN bus harness by more than 4cm (1.6in).
- The CAN bus harness should not be connected with other wires.
- The fault diagnosis should be conducted with the diagnostic apparatus recommended by manufacturers.

12.15.4.4 CAN bus harness repair specifications

- The two wires CAN_H and CAN_L must be articulated.
- In the event of a CAN bus break, the length of the wire connection must not exceed L1: 50mm (1.97in).
- If there are more than two breaks, the distance between the two breaks must be more than L2: 100mm (3.94in) before repair is allowed, otherwise replace the CAN bus wires.

12.15.4.5 CAN bus signal diagnosis

The signals transmitted on the CAN bus can be monitored using the oscilloscope dual-channel inputs and should have the following characteristics:

- The voltage signal at CANH bus is 2.5-3.5V, and that at CANL bus is 1.5-2.5V.
- These two signals are mirror images of each other.
- Signal transmission starts with the opening of the start and stop button, but ends when the start and stop button is closed for 2s.

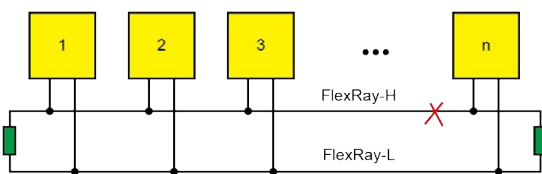
12.15.4.6 Diagnosis and repair of FlexRay

The following three methods can be used to find the failure point and troubleshooting when FlexRay is malfunctioning.

Resistance measurement method

Same as the high-speed CAN bus, the connection method of the system can be determined by measuring the resistance. Under normal circumstances, there are 2 termination resistors inside each branch, each with a resistance value of about 90-110 ohms, and if measured in parallel, the resistance value is about 45-55 ohms.

For example, if there is a break at X, the break point can be determined by measuring the line between 3 and n.



Unlike the high-speed bus, if the resistance of a branch circuit is measured within the assembly range, it does not indicate the condition of the other branches, and it is necessary to measure the resistance of all the branches to determine the resistance connection of the FlexRay, and they need to be diagnosed separately from each other.

Voltage measurement method

Same as the high-speed CAN bus, the FlexRay system can be judged using the voltage measurement method; the voltage value of the FlexRay-H in the case of the assembly is around 2.6V, while the voltage value of the FlexRay-L is around 2.4V. If the measured the value is 0V or 12V, it means that the system is shorted to ground or to the power supply.

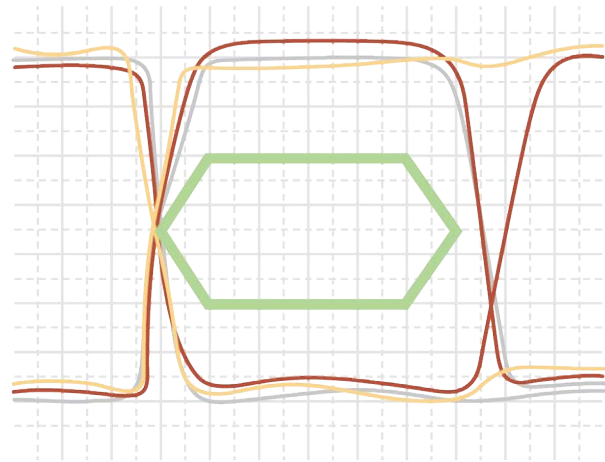
Unlike the high-speed CAN bus, and similar to the resistance measurement method, even if the voltage value of a branch circuit is totaled, it only indicates that the branch circuit is normal; it is necessary to measure the voltage values of all branches to determine whether the system is normal.

Oscilloscope measurement method

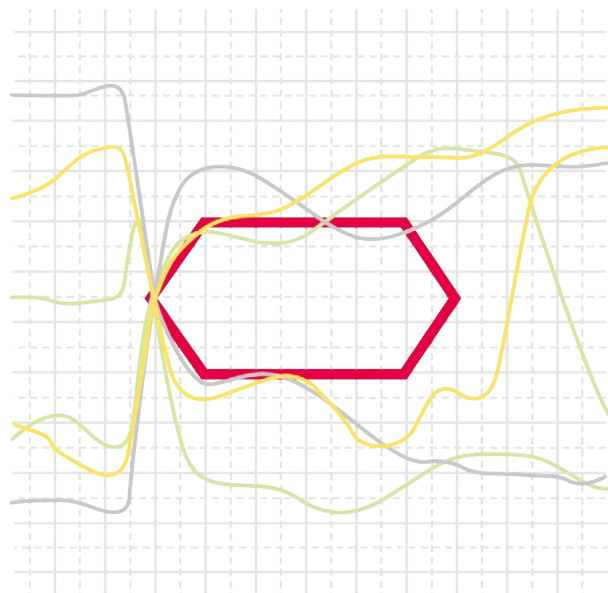
Limitations:

Special oscilloscope should be used and the connection must be complicated. The technicians for dual-channel oscilloscope should be very skilled in the operations and can accurately analyze the differences between different waveforms.

Similar to high-speed CAN bus, its normal waveform is also very similar, except that its speed is 20 times that of high-speed CAN.



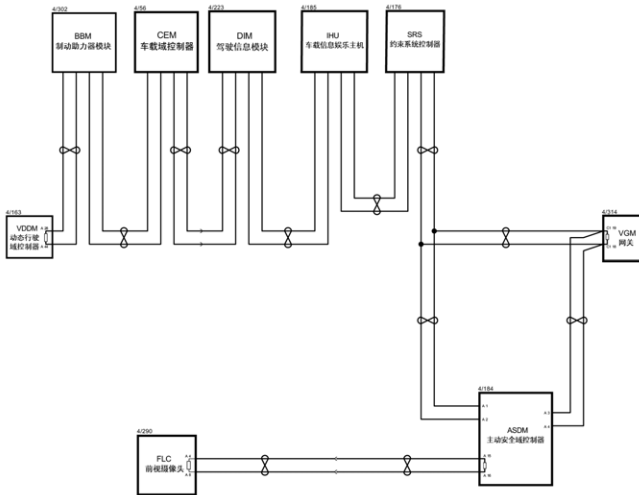
If interference occurs, the waveform looks like the following:



Unlike the high-speed CAN bus, and the same as the resistance and voltage methods, even if the waveform of a branch is normal, it does not represent the situation of the other branches, and it is necessary to measure the waveforms of all

the branches in order to determine whether the system is normal or not.

12.15.4.7 FlexRay wiring diagram



12.15.5 Removal and Installation

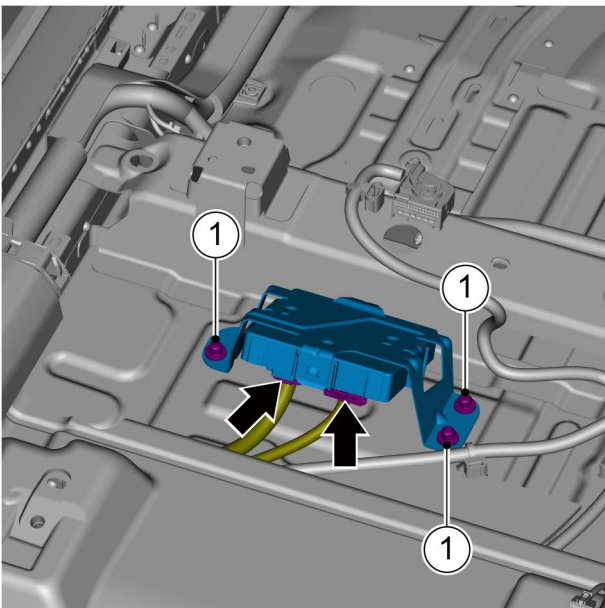
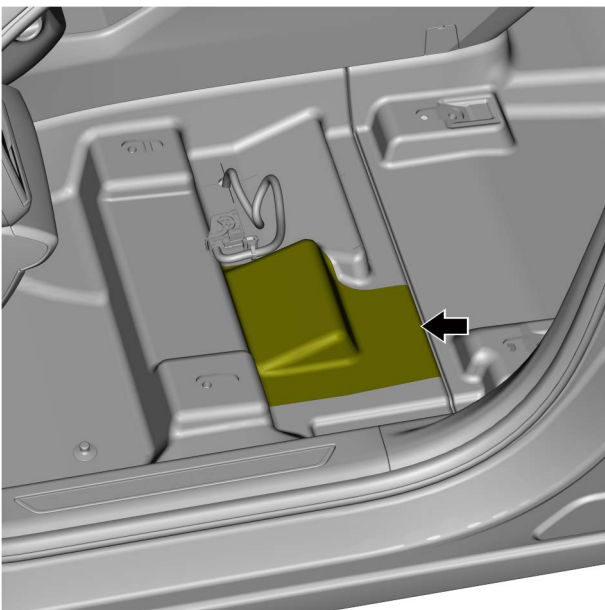
12.15.5.1 Replacement of gateway module

Removal Procedure

Warning !

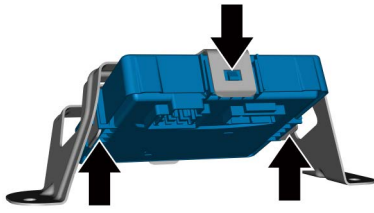
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the driver seat assembly, refer to [Replacement of driver seat assembly](#).
- 3 Lift the left front floor front section carpet assembly.



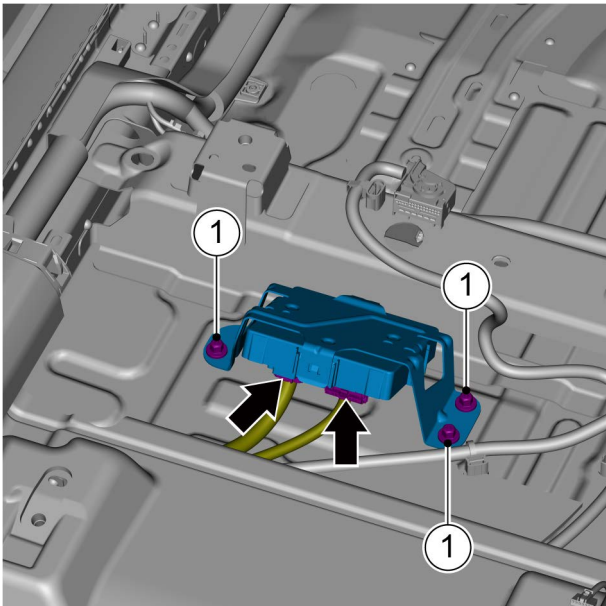
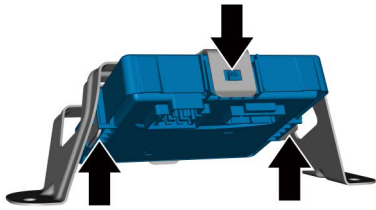
- 4 Disconnect the 2 harness connectors of the gateway module.
- 5 Remove the 3 fixing nuts 1 of gateway module and remove the gateway module and bracket.

- 6 Remove the gateway module from the bracket.



Installation Procedure

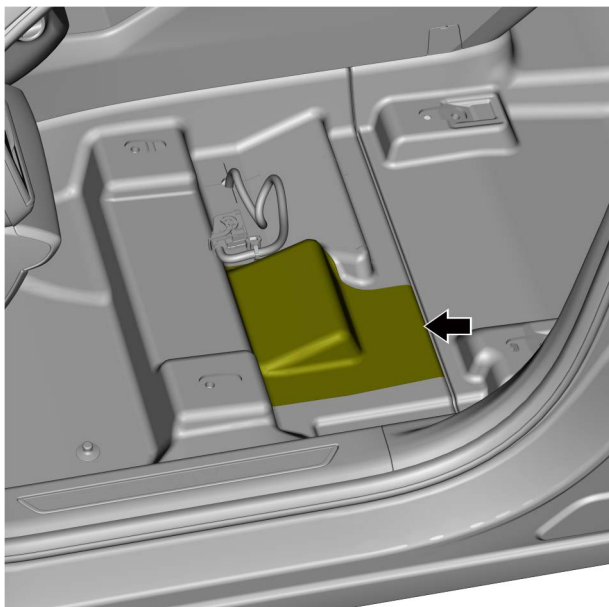
- 1 Install the gateway module onto the bracket.



- 2 Install the gateway module and tighten the 3 fixing nuts 1.
Torque: 4N·m
- 3 Connect the 2 harness connectors of the gateway module.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



4 Reset the left front floor front section carpet assembly.

5 Install the driver seat assembly.

6 Connect the negative cable of battery.

7 The GLDS diagnostic program is required, under the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software brushing operation.

12.16 Cruise control system

12.16.1 Specification

12.16.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Steering wheel assembly fixing bolt	M12×30×36.07	50-70

12.16.2 Instructions and operations

12.16.2.1 Cautions

Precautions for operating the cruise control system

1. Turn off the cruise control main switch when the cruise control system is not in use.
2. Be careful when driving on a downhill road with the cruise control activated and when increasing the speed of the vehicle.
3. Do not use the cruise control system under the following road conditions:
 - Traffic congestion
 - Steep slopes
 - Roads with sharp turns
 - Ice or snow-covered roads
 - Slippery roads

12.16.2.2 System description

Cruise control system

With the cruise control system, the vehicle speed can be maintained between 30 and 180 km/h without having to keep the accelerator pedal sensor depressed.

Caution

Do not use cruise control on winding roads or when traffic is congested, as this can be dangerous. When driving with the cruise control system on a slippery road, sharp changes in tire traction can cause the wheel to idle unnecessarily and the vehicle may lose control.

Function selection

Cruise control can be selected in combination instrument display via the function menu switching button on the left side of the steering wheel. After selection, the cruise control system enters standby mode and the cruise control (CC) status indicator turns white.

Setting vehicle speed

When cruise control has been enabled, push up or pull down the speed adjustment and confirmation button to adjust to the desired cruise speed, and press the button to set the current speed as the cruise speed.

Resume pre-set vehicle speed

If the cruise control is set to the desired speed, press the brake pedal to disengage the cruise control. To resume the pre-set speed, press the cruise control resume button to

activate it when the vehicle speed reaches 30 km/h or more. The system controls the vehicle at the pre-set speed.

Speed up when using cruise control

There are two ways to increase speed:

- Depressing accelerator pedal sensor increases vehicle speed.
- If cruise control has been activated, push up on the speed adjustment and confirmation button and hold it, the vehicle speed will continue to increase by 5 km/h until the vehicle accelerates to the desired speed or to the maximum set speed of 180 km/h, then release it. To accelerate slightly, push the button upwards. A short push upwards will increase the vehicle speed by 1 km/h. A long push upwards will increase the vehicle speed by 5 km/h.

Decelerate when using cruise control

If cruise control is enabled:

- Push down on the speed adjustment and confirmation button and hold it, the vehicle speed will be continuously reduced by 5 km/h until the vehicle slows down to the desired speed or to the minimum set speed of 30 km/h, then release it.
- To slow down slightly, push the button downward. A short push downwards will reduce the vehicle speed by 1 km/h. A long push downwards will reduce the vehicle speed by 5 km/h.

Overtaking when using cruise control

Use accelerator pedal sensor to increase vehicle speed. When the accelerator pedal sensor is released, the vehicle slows down to the preset cruise control speed.

Using cruise control on ramps

The performance of the cruise control on ramps depends on the vehicle speed, the load, and the gradient of the ramp. When climbing a steep hill, it is necessary to depress the accelerator pedal sensor to maintain vehicle speed. When going downhill, braking or downshifting to a lower gear is required to maintain vehicle speed. Cruise control is turned off when the brake is engaged.

Ending cruise control

There are three ways to end cruise control:

- Press the CNCL button, the cruise control (CC) status indicator switches from green to white and cruise control is in standby.
- Press the brake pedal, the cruise control (CC) status indicator switches from green to white and cruise control is in standby.
- Press CNCL when cruise is in standby state and cruise control is off.

Clear vehicle speed memory

When cruise control or start switch is turned off, the cruise control set speed memory is cleared.

Adaptive cruise control system (if equipped)

The adaptive cruise control system can control the vehicle speed within the range of 0-150km/h according to the set speed and the time and distance between the vehicle and the following vehicle.

The adaptive cruise control system is mainly to provide driving assistance for the driver on highways or roads in good conditions. The driver needs to maintain control over the vehicle at all times.

The adaptive cruise control system (ACC) uses the following sensors:

- a. Forward Looking Radar
- b. Front Looking Camera

The adaptive cruise control system uses forward looking radar and a forward-looking camera to detect vehicles in front of it and automatically adjusts the vehicle speed to maintain the driver's set inter-vehicle distance. The driver can control the vehicle at any time depending on driving conditions.

Caution

The adaptive cruise control system initiates a self-test when the vehicle is powered on and system functions are not available during the test.

Caution

The adaptive cruise control system is a comfort system, not a warning and collision avoidance system for emergencies. The driver must maintain control of the vehicle at all times and has full driving responsibility for vehicle handling, and the driver is required to drive in a regulated manner in accordance with laws and regulations.

The adaptive cruise control system does not work on vehicles or objects crossing the travel lane.

Changes in the vehicle's status due to overloading the luggage area, etc., can cause the adaptive cruise control system's target recognition performance to deteriorate or become ineffective.

If other vehicles travel at low speeds to the front of the vehicle, the adaptive cruise control system may not be able to react in time, thus, the driver is required to brake in time.

If the vehicle suddenly accelerates and approaches the vehicle in front at a high speed (there is a significant speed difference with the vehicle in front), the driver is required to brake in time.

The driver needs to adjust the inter-vehicle distance and set the adaptive cruise control system appropriately based on the amount of traffic ahead and current weather conditions, such as rain or snow. The driver needs to be able to actively control the vehicle at all times to ensure safe driving.

It is the driver's proper responsibility to keep a distance from the vehicle in front.

When traveling on steep downhill roads, it may be difficult for the cruise control system to maintain the correct distance from the vehicle in front. In these situations, use extreme caution and be ready to brake at all times. Never use the adaptive cruise control system under heavy load.

The adaptive cruise control system does not recognize pedestrians, tricycles, vehicles loaded with irregularly shaped cargo, or odd-shaped vehicles.

The adaptive cruise control system does not recognize stationary or slow-moving vehicles, nor does it recognize oncoming vehicles.

If the adaptive cruise control system is activated while the vehicle is stationary, the system recognizes stationary obstacles in front of the vehicle as vehicles and remains stationary, this is to ensure a safe start and

avoid unanticipated starts that result in collisions with stationary targets. Stationary targets include, but are not limited to, intersection speed bumps, trees, people, railings, etc.

The adaptive cruise control system assists the driver, but does not substitute the driver. Even if the adaptive cruise control system is active, the driver must exercise caution and obey traffic regulations.

If the driver presses the accelerator pedal sensor while the adaptive cruise control system is operating, the vehicle will be taken over by the driver in response to the driver's need to accelerate. The control functions of the adaptive cruise control system will not work.

Target selection may be delayed or disturbed when entering and exiting bends. The adaptive cruise control system may brake unintentionally or too late.

In some cases (the speed of the vehicle in front is too low in relation to the speed of the vehicle, the vehicle in front cuts close to the lane, etc.), the adaptive cruise control system does not have enough time to reduce the relative speed, thus, the driver must react appropriately in such situations.

If the vehicle in front brakes suddenly, the adaptive cruise control system may not be able to react in time or react too slowly. In this case, the driver will not receive a takeover request and will need to brake actively.

On sharply bends, such as serpentine roads, the adaptive cruise control system is unable to properly detect the vehicle in front due to limited view field of the forward-looking camera and forward looking radar, which may result in acceleration of the ACC vehicle and require the driver to react appropriately according to the actual conditions.

If the distance between the ACC vehicle and the adjacent lane is too small (or if a vehicle in the adjacent lane is too close to the ACC vehicle's lane), there is a possibility that the adaptive cruise control system will react and brake that vehicle.

When a vehicle in the adjacent lane ahead of the vehicle cuts into the ACC vehicle's trajectory, detection may be affected or delayed in certain environments, such as when the reflective intensity of the target is too small (pedestrians, two-wheeled vehicles, three-wheeled vehicles), electromagnetic interference and other influences, resulting in the adaptive cruise control system failing to recognize the target or accurately calculate the distance to the vehicle in front of it. In this

case, there will be no response from the adaptive cruise control system or delayed braking and the driver will need to actively control the vehicle.

The view of the forward looking radar must not be obscured by contaminants. In particular, complete snow cover can cause the adaptive cruise control system to exit and a message of system exit will be transmitted to the driver via the combination instrument.

The installation of the forward looking camera and forward looking radar may be affected by vibration or collision, degrading system performance. In this case, the forwarding looking camera and forward looking radar need to be recalibrated.

The driver must be especially alert in the following situations:

- When the adaptive cruise control system is activated while the vehicle is stationary and the start is confirmed, if there are pedestrians, children, animals, two-wheelers, three-wheelers or obstacles in front of the vehicle that cannot be detected and recognized by the adaptive cruise control system, there will be a serious risk of a collision. The driver must first confirm that the area in front of the vehicle is safe before activating the adaptive cruise control system to control the vehicle start.
- When the vehicle is at a high speed, if the left turn signal is turned on when overtaking on the left side of the vehicle, the adaptive cruise control system automatically accelerates the vehicle to shorten the distance from the vehicle in front. If the vehicle moves into the overtaking lane and there is no vehicle ahead, the adaptive cruise control system automatically accelerates the vehicle to the set cruising speed.
- The adaptive cruise control system cannot detect objects or mounted accessories loaded on the target vehicle that protrude from its sides, rear end or roof. If the vehicle in front is equipped with special loads or special equipment as described above, be sure to turn off the adaptive cruise control system when overtaking such a vehicle.
- Metallic objects such as road tracks or metal plates for road construction can interfere with the forward looking radar and prevent it from functioning properly.
- Towing a trailer reduces the dynamic characteristics of the adaptive cruise control system operation.
- For safety reasons, do not use the adaptive cruise control system when visibility is poor, or when driving along ramps and curvy roads, or when driving on slippery surfaces (e.g., snow, ice, wet, or waterlogged roads).
- After the system requires the driver to takeover the vehicle, if the vehicle continues to move, the driver must apply the brakes to the vehicle by pressing the brake pedal.
- If the driver is prompted to take over the vehicle in the combination instrument display, the driver must immediately control the distance between the vehicle and the vehicle in front.

- The driver must always be prepared to take control of the vehicle by accelerating or braking.
- The forward looking radar is mounted under the front bumper, if the forward looking radar is covered by dirt and the adaptive cruise control system does not work, the combination instrument display will display a text message, please clean it up in time or go to a Geely service station for inspection and maintenance.
- The area in front of and around the forward looking radar must not be obstructed by other objects (e.g., license plate frame), or the adaptive cruise control system may be affected.
- Structural modifications to the vehicle, such as lowering the chassis height or changing the front license plate mounting plate may affect the adaptive cruise control system.
- The adaptive cruise control system may be affected and rendered inoperable if the front camera has a system failure, in low-light conditions, subjected to direct light, blocked by objects, or under alternating light and darkness.

Function selection

The adaptive cruise control system can be selected in combination instrument display by using the function menu switching buttons on the left side of the steering wheel; when selected, the adaptive cruise control system goes into standby and the adaptive cruise control system (ACC) status indicator lights up in white.

Activate and set vehicle speed

1. With the vehicle is stationary, activate and set the vehicle speed as follows:
 - Select and turn on the adaptive cruise control system, the adaptive cruise control system (ACC) status indicator on the combination instrument display lights up in white.
 - Depress the brake pedal or activate the AUTOHOLD function.
 - Press the intelligent driving button or the speed adjustment and confirmation button to activate the adaptive cruise control system and the adaptive cruise control system (ACC) status indicator on the combination instrument display lights up in green.
 - Release the brake pedal and the ACC system keeps the vehicle stationary.
 - The driver is required to press the intelligent driving button again or step on the accelerator pedal sensor to enable the adaptive cruise control system to control the vehicle start.
 - The adaptive cruise control system controls the vehicle in accordance with the set cruise speed.
2. When the vehicle is in motion, activate and set the vehicle speed in the following steps:
 - Select and turn on the adaptive cruise control system, the adaptive cruise control system (ACC) status indicator on the combination instrument display lights up in white.

- Press the intelligent driving button or the speed adjustment and confirmation button to activate the adaptive cruise control system; the cruise setting speed is 30 km/h, and the adaptive cruise control system (ACC) status indicator on the combination instrument display lights up in green. When the vehicle speed is below 30 km/h, the set cruise speed is 30 km/h; when the vehicle speed is above 30 km/h, the set cruise speed is the current vehicle speed.
- If the cruise automatic speed limit assist function has been turned on by clicking: Vehicle Settings → Driving Assistance & Safety → Intelligent Driving Assistance → Cruise Automatic Speed Limit Assist on the multimedia display screen in sequence, the set speed will automatically fuse the recognized speed limit sign as the set speed, but will not fuse the speed limit that is higher than the set speed.
- The adaptive cruise control system controls the vehicle in accordance with the set cruise speed.

Caution

When the automatic speed limit recognition is on, there may be situations where the cruise speed does not change with the speed limit, such as when the speed limit value is below the threshold or the difference with the current target speed is greater than the threshold; at the same time, due to the influence of light and the location of the road sign, etc., there may be situations where the speed limit is incorrectly recognized or omitted. The driver cannot rely on the fusion system to determine the appropriate cruising speed and has the responsibility to choose the appropriate cruising speed based on the actual road conditions.

When the speed limit is fused, the system will accelerate or decelerate according to the new set value. The driver should always keep an eye on the surroundings, and can interrupt the speed limit fusion at any time by pressing the accelerator pedal sensor or operating the speed adjustment and confirmation button.

Setting the inter-vehicle time distance

Caution

It is the driver's responsibility to select a safe inter-vehicle time distance.

The driver can adjust the inter-vehicle time distance for ACC following according to the current road condition. The inter-vehicle time distance refers to the time required for the vehicle to travel to the current position of the front vehicle at the current vehicle speed, i.e., the inter-vehicle distance divided by the vehicle speed.

The driver can decrease or increase the distance between the vehicle and the vehicle in front by pressing the inter-vehicle time distance adjustment button. There are three levels of inter-vehicle time distance: near, medium and far, and the default inter-vehicle time distance of the adaptive cruise control system is far every time the engine is ignited.

Caution

In all cases, the driver must maintain sufficient braking distance from the vehicle in front and note that local highway traffic regulations have corresponding requirements for minimum distance or minimum time, and it is the driver's responsibility to comply with the law.

Using adaptive cruise control to control speed

1. There are two ways to accelerate when using the adaptive cruise control:

- Depress the accelerator pedal sensor for active acceleration. In the case of active acceleration, the driver takes over control of the vehicle, the combination instrument displays the effect of active acceleration, and the adaptive cruise control system continues to control the vehicle for cruising when the driver releases the accelerator pedal sensor.
- If the cruise control system is already enabled and you want to accelerate slightly, push the speed adjustment and confirmation button. A short push upwards will increase the vehicle speed by 1 km/h; with a long push, the vehicle speed will continue to increase by 5 km/h until the button is released, up to a maximum set speed of 150 km/h.

2. Overtaking assist mode

In cruise control mode, when following the vehicle in front and turning on the left turn signal, the adaptive cruise control system accelerates or decelerates the vehicle to help the driver overtake or change lanes before the vehicle reaches the overtaking lane until the vehicle completes the lane change or the left turn signal is turned off.

To enable overtaking assistance, at least the following conditions need to be met at the same time:

- There must be a target vehicle ahead.
- Current speed needs to exceed 60 km/h.
- The current lane is a dotted line.
- The set speed should be high enough to safely complete an overtake.
- Turn on the left turn signal. When using overtaking assistance, the following situations may result in unintended acceleration and require the driver to be especially alert. Therefore, when using overtaking assistance, the driver should be prepared to respond to sudden changes in conditions and maneuver the vehicle in a timely manner.

- The vehicle is approaching a corner exit in the same direction as it would normally perform an overtake.
- The speed of the vehicle in front is reduced before the vehicle crosses and moves into the overtaking lane.
- The speed of the vehicle in the overtaking lane decreases. When using overtaking assistance, the following situations may result in unintended deceleration and require the driver to be especially alert. Therefore, when using overtaking assistance, the driver should be prepared to respond to sudden changes in conditions and maneuver the vehicle in a timely manner.
- The speed of the vehicle in the overtaking lane is lower than the speed of the vehicle.
- Vehicles in the overtaking lane are in close longitudinal proximity to the vehicle.
- Vehicles in the overtaking lane are large vehicles with long bodies and are parallel to the vehicle.

Caution

Overtaking assist mode requires the driver to control the vehicle to change lanes.

Note that this function can be activated in more situations than just overtaking, such as when the vehicle briefly accelerates when changing lanes using the left turn signal or entering another road.

3. Start-stop mode

In cruise following mode, if the vehicle in front gradually brakes, the vehicle will also gradually decelerate following the vehicle in front until it stops and keep a safe distance.

- Within 10s of following stop, cruise control will automatically resume if the vehicle in front resumes driving.
- Over 10s after following stop, if the vehicle in front resumes driving, the driver needs to step on the accelerator pedal sensor or press the intelligent driving button to resume cruising.
- In ACC start-stop mode, the maximum time to hold the vehicle stationary is 3 minutes, after which the adaptive cruise control system is deactivated.
- In ACC start-stop mode, if the driver actively exits the adaptive cruise control system, the vehicle will not start automatically; if the accelerator pedal sensor is pressed at this time, the vehicle starts, requiring the driver to take over the vehicle and pay attention to safe driving.

The adaptive cruise control system does not recognize stationary vehicles and cannot provide brake control for stationary vehicles.

Caution

The adaptive cruise control system can still control the vehicle movement after following stop, which may cause the vehicle to move in an unmanned condition.

Vehicle movement in an unmanned condition could result in a crash and cause serious injury or death.

The adaptive cruise control system will experience unintended acceleration in the following situations, so please maintain a high level of alertness and actively apply the brakes:

- When adaptive cruise control system follows another moving vehicle and the target changes from a moving vehicle to a stationary vehicle, ACC may ignore the stationary vehicle and continues to cruise at the driver's set speed.
- Low-speed following of the vehicle in front at intersections, where the target vehicle disappears due to steering, the adaptive cruise control system may still accelerate at the set vehicle speed.

4. Decelerate when using adaptive cruise control

If the cruise control system is already enabled and you want to decelerate slightly, push the speed adjustment and confirmation button. A short push downward will reduce the vehicle speed by 1 km/h; with each long push, the vehicle speed will continue to decrease by 5 km/h until the button is released, up to a lowest set speed of 30 km/h.

Resume pre-set vehicle speed

If the driver has set the adaptive cruise control system at the desired speed and then depresses the brake pedal or presses the CNCL button so that the adaptive cruise control system is deactivated, the set speed is then pre-stored and the set speed continues to be displayed on combination instrument display. To activate the adaptive cruise control system and cruise at the last set speed, you will need to activate it by pressing the intelligent driving button.

Ending adaptive cruise control

The following method can end the adaptive cruise control:

- Depress the brake pedal to exit adaptive cruise control.
- Press the CNCL switch button to exit the adaptive cruise control system.

The adaptive cruise control is dependent on the operation of other systems, such as the electronic stability control system VDDM. If either of these systems stops working, the adaptive cruise control will automatically turn off.

In the case of automatic deactivation of the system, an acoustic signal is emitted and the combination instrument display displays a text message. The driver must intervene to match the speed and distance to the vehicle in front.

The adaptive cruise control system may be affected and rendered inoperable if the front looking camera has a system

malfunction, is in low-light conditions, subjected to direct light, blocked by objects, or under alternating light and darkness.

Reasons for adaptive cruise control deactivation may be (including but not limited to):

- Any door, engine hood or trunk door is opened.
- The driver unbuckles the seat belt.
- Wheel loses grip.
- Brake system performance is degraded or malfunctions.
- The parking brake is applied.
- The forward looking radar and front looking camera are covered by wet snow or heavy rain.

Detecting problems

Forward looking radar and forward looking camera have a limited detectable range. In some cases, the forward looking radar and forward looking camera may not be able to detect the vehicle or may delay the detection of the vehicle.

1. A vehicle is moving slowly along the driver's lane. The system can only detect the corresponding vehicle that is moving fully into the driver's lane.
2. When the vehicle in front is a large truck, detection may be delayed.
3. When the driver enters or exits a bend, detection problems related to the vehicle in front may occur.
4. When the entire vehicle is powered up, the forward looking radar and forward looking camera need to initialize and cannot accurately detect the vehicle in front for 10 seconds.

In these cases, the driver should remain alert and, if necessary, take emergency measures and temporarily deactivate the adaptive cruise control system.

Advanced intelligent driving (if equipped)

The advanced intelligent driving system can simultaneously control the vehicle with cruise control and directional assistance in the range of 0-130 km/h. The system can control the speed of the vehicle according to the set speed and the time distance between following vehicles, conduct steering wheel assist control according to the lane lines on the left and right sides or following the vehicle in front, offset control when overtaking trucks, prompt alarms when disengaging, and activate the G-Pilot lane changing assist through the light steering wheel module by operating the turn signal at the corresponding side.

The advanced intelligent driving system is primarily designed to assist the driver on roads with good road conditions, such as highways or elevated roads.

Advanced intelligent driving (G-Pilot) uses the following sensors:

- a. Front and side obstacle detection radar
- b. Front Looking Camera
- c. Forward Looking Radar
- d. Rear and side obstacle detection radar

Caution

Advanced intelligent driving initiates a self-test when the vehicle is powered on and system functions are not available during the test.

Make sure the forward looking camera and forward looking radar are clean. Unclean forward looking camera and forward looking radar and environmental conditions such as rain and faded lane markings may affect the performance of the advanced intelligent driving system.

Advanced intelligent driving is a function that requires manual operations. The driver must always hold the steering wheel with both hands.

The advanced intelligent driving function is only suitable for use on expressways and roads with restricted access, while the driver needs to concentrate on driving the vehicle. When using the advanced intelligent driving, hold the steering wheel and pay attention to the road and surrounding traffic conditions. Do not use this function on city streets, construction zones or roads where cyclists or pedestrians may be present. Do not rely on the advanced intelligent driving system to determine a suitable driving route. Always be prepared to take prompt action. Failure to follow these instructions could result in property damage, serious injury or death.

The G-Pilot system is a comfort system, not a warning and collision avoidance system in case of emergency, and the driver is required to drive in accordance with the laws and regulations.

The advanced intelligent driving function will not work for vehicles or objects crossing the travel lane.

Changes in the vehicle's status due to overloading the luggage area, etc., can reduce or disable the advanced intelligent driving system's target recognition performance.

If other vehicles insert themselves in front of the vehicle at low speeds, the advanced intelligent driving system may not be able to react in time, thus, the driver is required to brake in time.

If the vehicle suddenly accelerates and approaches the vehicle in front at a high speed (there is a significant speed difference with the vehicle in front), the driver is required to brake in time.

The driver needs to adjust the inter-vehicle distance and set the G-Pilot system appropriately based on the

amount of traffic ahead and current weather conditions, such as rain or snow. The driver needs to be able to actively control the vehicle at all times to ensure safe driving.

It is the driver's proper responsibility to keep a distance from the vehicle in front.

When traveling on steep downhill roads, it may be difficult for the cruise control system to maintain the correct distance from the vehicle in front. In these situations, use extreme caution and be ready to brake at all times. Never use the advanced intelligent driving control system under heavy load.

The G-Pilot system does not recognize pedestrians, tricycles, vehicles loaded with irregularly shaped cargo, or odd-shaped vehicles.

The G-Pilot system does not recognize stationary or slow-moving vehicles, nor does it recognize oncoming vehicles.

If the G-Pilot system is activated while the vehicle is stationary, the system recognizes stationary obstacles in front of the vehicle as vehicles and remains stationary, this is to ensure a safe start and avoid unanticipated starts that result in collisions with stationary targets. Stationary targets include, but are not limited to, intersection speed bumps, trees, people, railings, etc.

If the driver presses the accelerator pedal sensor while the G-Pilot system is operating, the vehicle will be taken over by the driver in response to the driver's need to accelerate. The speed control functions of the G-Pilot system will not work.

Target selection may be delayed or disturbed when entering and exiting bends. The G-Pilot system may brake unintentionally or too late.

In some cases (the speed of the vehicle in front is too low in relation to the speed of the vehicle, the vehicle in front cuts close to the lane, etc.), the G-Pilot system does not have enough time to reduce the relative speed, thus, the driver must react appropriately in such situations.

If the vehicle in front brakes suddenly, the G-Pilot system may not be able to react in time or react too slowly. In this case, the driver will not receive a takeover request and will need to brake actively.

On sharply bends, such as serpentine roads, the G-Pilot system is unable to properly detect the vehicle in

front due to limit of the forward-looking camera and forward looking radar, which may result in acceleration of the G-Pilot vehicle and require the driver to react appropriately according to the actual conditions.

If the distance between the G-Pilot vehicle and the adjacent lane is too small (or if a vehicle in the adjacent lane is too close to the G-Pilot vehicle's lane), there is a possibility that the G-Pilot system will react and brake that vehicle.

When a vehicle in the adjacent lane ahead of the vehicle cuts into the G-Pilot vehicle's trajectory, detection may be affected or delayed in certain environments, such as when the reflective intensity of the target is too small (pedestrians, two-wheeled vehicles, three-wheeled vehicles), electromagnetic interference and other influences, resulting in the G-Pilot system failing to recognize the target or accurately calculate the distance to the vehicle in front of it. In this case, there will be no response from the G-Pilot system or delayed braking and the driver will need to actively control the vehicle.

The view field of the forward looking camera, forward looking radar, front-side obstacle detection radar and rear-side obstacle detection radar must not be obstructed by pollutants. In particular, complete snow cover can cause the G-Pilot system to exit, and a message that the system has exited will be transmitted to the driver via the combination instrument display.

The installation of the forward looking camera, forward looking radar, front side obstacle detection radar and rear side obstacle detection radar may be affected by vibration or collision, which may degrade the system performance. In this case, the forward looking radar needs to be recalibrated.

The driver must be especially alert in the following situations:

- When the G-Pilot system is activated while the vehicle is stationary and the start is confirmed, if there are pedestrians, children, animals, two-wheelers, three-wheelers or obstacles in front of the vehicle that cannot be detected and recognized by the G-Pilot system, there will be a serious risk of a collision. The driver must first confirm that the area in front of the vehicle is safe before activating the G-Pilot system to control the vehicle start.
- If the left turn signal is turned on when overtaking on the left side of the vehicle, the G-Pilot system automatically accelerates the vehicle to shorten the distance from the vehicle in front. If the vehicle moves into the overtaking lane and there is no vehicle ahead, the G-Pilot system

automatically accelerates the vehicle to the set cruising speed.

- The G-Pilot system cannot detect objects or mounted accessories loaded on the target vehicle that protrude from its sides, rear end or roof. If the vehicle in front is equipped with special loads or special equipment as described above, be sure to turn off the G-Pilot system when overtaking such a vehicle.
- Metallic objects such as road tracks or metal plates for road construction can interfere with the forward looking radar and prevent it from functioning properly.
- Towing a trailer reduces the dynamic characteristics of the G-Pilot system operation.
- For safety reasons, do not use the G-Pilot system when visibility is poor, or when driving along ramps and curvy roads, or when driving on slippery surfaces (e.g., snow, ice, wet, or waterlogged roads).
- After the system requires the driver to takeover the vehicle, if the vehicle continues to move, the driver must apply the brakes to the vehicle by pressing the brake pedal.
- If the driver is prompted to take over the vehicle in the combination instrument display, the driver must immediately control the distance between the vehicle and the vehicle in front.
- The driver must always be prepared to take control of the vehicle by accelerating or braking.
- The forward looking radar is mounted on the inside of the front bumper, if the forward looking radar is covered by dirt, which prevents the G-Pilot system from working, the combination instrument display will display a text message, please clean it in time or go to a Geely service station for inspection and maintenance.
- The area in front of and around the forward looking radar must not be obstructed by other objects (e.g., license plate frame), or the G-Pilot system may be affected.
- Structural modifications to the vehicle, such as lowering the chassis height or changing the front license plate mounting plate may affect the G-Pilot system.
- The G-Pilot system may be affected and rendered inoperable if the front camera has a system failure, in low-light conditions, subjected to direct light, blocked by objects, or under alternating light and darkness.

The performance of G-Pilot system's direction assist function will be reduced or will not work properly under the following road conditions, and the driver needs to be alert:

- The G-Pilot system is not suitable for bends with too small a radius.
- The G-Pilot system is not suitable for roads with invisible lane lines.
- The G-Pilot system is not suitable for roads with forked intersections.
- The G-Pilot system is not suitable for roads with vehicle marks (e.g. tire tracks).

- The G-Pilot system is not suitable for roads where the number of lanes increases or decreases.
- The G-Pilot system does not apply to roads with large deviations between the original and new lanes.
- The G-Pilot system may recognize road edges (walls, guardrails, curbstones, grass, greenbelts, asphalt seam joints) as lane lines in order to operate.
- The G-Pilot system is not suitable for potholes, raised surfaces, and undulating surfaces.
- The G-Pilot system does not recognize road markings (cones), so it is not applicable to roads under construction.
- The G-Pilot system is not suitable for extra-wide and extra-narrow roads.
- The G-Pilot system is not suitable for roads with curved lane lines.
- The G-Pilot system is not suitable for inclement weather with reduced visibility.

When the G-Pilot system follows the vehicle in front to cross an intersection, the vehicle will follow the vehicle in front for lateral movement, at this time there is a risk of side collision with the neighboring lanes, which requires the driver to supervise and take over the function. Driving on a highway or main road entrance, due to road changes, the G-Pilot system is unable to change lanes and appears to be downgraded to only adaptive cruise control. the G-Pilot system is unable to work in complex road conditions, such as: severe congestion, changing traffic, cut-through, intersections, on-ramps, no lane lines, etc., thus, the driver should supervise and take over the function. The G-Pilot system only works in appropriate road conditions. The system provides a comfortable experience only under the right conditions on the road and the driver needs to take full responsibility for safe driving.

The forward looking camera is mounted behind the front windshield of the vehicle. It is important to note that the forward looking camera's view field cannot be blocked by pollutants or disturbed by bright light. Otherwise, the function will be disabled and the combination instrument display will have a text message prompting the driver to wipe the windshield in the front camera area or to avoid dark conditions and bright direct light. The forward looking camera blindness is a normal protection and reminder of the camera in specific scenarios, which can be solved by avoiding dark environments and bright direct light when the forward looking camera is not blocked.

Function selection

The G-Pilot function can be selected in the combination instrument display via the function menu switch button on the left side of the steering wheel. When selected, G-Pilot enters standby mode and the G-Pilot status indicator lights up in white.

Activate and set vehicle speed

1. With the vehicle is stationary, activate and set the vehicle speed as follows:

- Select and turn on the advanced intelligent driving system and the advanced intelligent driving (G-Pilot) status indicator on the combination instrument display lights up in white.
- Depress the brake pedal or activate the AUTOHOLD function.
- The G-Pilot system can be activated by pressing the intelligent driving button or the speed adjustment and confirmation button; the cruise setting speed is 30 km/h, and the advanced intelligent driving (G-Pilot) status indicator on the combination instrument display lights up in green.
- Release the brake pedal and the G-Pilot system keeps the vehicle stationary.
- The driver is required to press the intelligent driving button again or step on the accelerator pedal sensor to enable the G-Pilot system to control the vehicle start.
- The G-Pilot system controls the vehicle in accordance with the set cruise speed.

2. When the vehicle is in motion, activate and set the vehicle speed in the following steps:

- Select and turn on the advanced intelligent driving system and the advanced intelligent driving (G-Pilot) status indicator on the combination instrument display lights up in white.
- The G-Pilot system can be activated by pressing the intelligent driving button or the speed adjustment and confirmation button, and the advanced intelligent driving (G-Pilot) status indicator on the combination instrument display lights up in green. When the vehicle speed is below 30km/h, the set cruise speed is 30km/h; when the vehicle speed is above 30km/h, the set cruise speed is the current vehicle speed.

Caution

The maximum cruising speed is 130 km/h. It is the driver's responsibility to cruise at a safe speed based on road conditions and speed limits.

- If the cruise automatic speed limit assist function has been turned on by clicking: Vehicle Settings → Driving Assistance & Safety → Intelligent Driving Assistance → Cruise Automatic Speed Limit Assist on the multimedia display screen in sequence, the set speed will automatically fuse the recognized speed limit sign as the set speed, but will not fuse the speed limit that is higher than the set speed.

Caution

The speed limit warning function is forced on when the cruise automatic speed limit assist function is on.

- The G-Pilot system controls the vehicle in accordance with the set cruise speed.

3. Push the speed adjustment and confirmation button to set the desired cruising speed.

Caution

When the cruise automatic speed limit assistance is on, there may be situations where the cruise speed does not change with the speed limit, such as when the speed limit value is below the threshold or the difference with the current target speed is greater than the threshold; at the same time, due to the influence of light and the location of the road sign, etc., there may be situations where the speed limit is incorrectly recognized or omitted. The driver cannot rely on the fusion system to determine the appropriate cruising speed and has the responsibility to choose the appropriate cruising speed based on the actual road conditions.

When the speed limit is fused, the system will accelerate or decelerate according to the new set value. The driver should always keep an eye on the surroundings, and can interrupt the speed limit fusion at any time by pressing the accelerator pedal sensor or operating the speed adjustment and confirmation buttons.

Setting the inter-vehicle time distance

Caution

It is the driver's responsibility to select a safe inter-vehicle time distance.

The driver can adjust the inter-vehicle time distance for G-Pilot following according to the current road condition. The inter-vehicle time distance refers to the time required for the vehicle to travel to the current position of the front vehicle at the current vehicle speed, i. e., the inter-vehicle distance divided by the vehicle speed.

The driver can decrease or increase the distance between the vehicle and the vehicle in front by pressing the inter-vehicle time distance control button. There are three levels of inter-vehicle time distance: near, medium and far, and the default inter-vehicle time distance is far every time the G-Pilot switch is turned on.

Caution

In all cases, the driver must maintain sufficient braking distance from the vehicle in front and note that local highway traffic regulations have corresponding requirements for minimum distance or minimum time, and it is the driver's responsibility to comply with the law.

Offset control (if equipped)

For models with the offset control function, when the advanced intelligent driving system is activated and the vehicle is about to overtake a truck, trailer or other large vehicle in front of it (or be overtaken by a large vehicle), the system controls the vehicle to move a short distance away from the truck's position, i.e., to move away from the large vehicle actively, and then controls the vehicle to return to the center of the lane after overtaking (or being overtaken) for a short distance. This process does not require any action by the driver.

Caution

This function can only be turned on automatically at speeds greater than 50 km/h. It is the driver's responsibility to continuously keep his hands on the steering wheel and concentrate on driving.

Hands-off alarm

The advanced intelligent driving system requires the driver to keep hands on the steering wheel when the system is activated. If no hands on the steering wheel are detected for an extended period of time, a reminder message will appear on the combination instrument display.

Advanced intelligent driving detects the driver's hands by recognizing the presence of slight resistance when the steering wheel is turned or the resistance created when the driver turns the steering wheel slightly.

Caution

When two hands are detected, this message disappears and the advanced intelligent driving continues to work normally.

If the advanced intelligent driving system still doesn't detect hands on the steering wheel, the request will escalate, resulting in a beep, while still displaying a reminder message.

If the reminders of the advanced intelligent driving system is still ignored and no hands are on the steering wheel, the advanced intelligent driving function will automatically exit at the end of the beeping alarm.

Caution

When hands are detected during the beeping alarm, this message disappears and the advanced intelligent driving continues to work normally.

Caution

A beep sounds when advanced intelligent driving is exited.

Ending advanced intelligent driving

The advanced intelligent driving can be disabled by the following methods:

- Depress the brake pedal to exit advanced intelligent driving.
- Press the CNCL switch button to exit advanced intelligent driving.

The advanced intelligent driving is dependent on the operation of other systems, such as the electronic stability control system VDDM. If either of these systems stops working, advanced intelligent driving will automatically turn off.

In the case of automatic deactivation of the system, an acoustic signal is emitted and the combination instrument display displays a text message. The driver must intervene to match the speed and distance to the vehicle in front.

Reasons for advanced intelligent driving deactivation may be (including but not limited to):

- Any door, engine hood or trunk door is opened.
- The driver unbuckles the seat belt.
- Wheel loses grip.
- Brake system performance is degraded or faulty.
- The parking brake is applied.
- The forward looking radar and front looking camera are covered by wet snow or heavy rain.

G-Pilot lane changing assist (if equipped)

When the advanced intelligent driving is enabled on a vehicle equipped with G-Pilot lane changing assist, the turn signal can be used to maneuver the vehicle to automatically change lanes to an adjacent lane without having to turn the steering wheel (so as not to cancel the automatic assisted steering).

Caution

It is the driver's responsibility to determine if a lane change is safe and appropriate. Therefore, before beginning a lane change, be sure to check your blind spots, lane lines, and the surrounding roadway to confirm that it is safe and appropriate to move into the target lane.

Do not rely on G-Pilot lane changing assist to determine the appropriate driving route. Observe the road and traffic conditions ahead, watch the surrounding area, check for warnings on the combination instrument, and concentrate on driving. Always be prepared to take quick action.

The performance of G-Pilot lane changing assist is dependent on the recognition calculation capabilities of all forward looking radars and forward looking cameras.

Do not use G-Pilot lane changing assist on continuous bends with sharp turns, icy or slippery roads, or when weather conditions (e.g., heavy rain, snow, dense fog, etc.) may obstruct the view field of the forward looking camera or forward looking radar.

Failure to comply with all warnings and instructions can result in serious property damage and injury.

Caution

G-Pilot lane changing assist can only be activated for use when the advanced intelligent driving system is activated and on an elevated or highway with a corresponding variable lane color change.

Using G-Pilot lane changing assist

Tap: Vehicle Settings → Driver Assistance & Safety → Intelligent Driving Assistance → G-Pilot Lane Changing Assist on multimedia display screen and turn on the G-Pilot lane changing assist function in this interface.

G-Pilot lane changing assist can be used by activating G-Pilot lane changing assist. Use G-Pilot lane changing assist to change lanes:

- a. Ensure safe and proper approach to the target lane by visual inspection. When the following conditions are met, G-Pilot lane changing assist will control the vehicle to drive into the adjacent lane in the direction indicated by the turn signal:
 - The driver should hold the steering wheel.
 - The forward looking camera or forward looking radar detects that there is no vehicle or obstacle in the middle of the target lane.

- Lane markings indicate that lane changes are permitted.
- The view of the forward looking camera is not obstructed.
- No other vehicles are detected in blind zones.
- Travel speed is at least 60 km/h.

b. The corresponding side turn signal is completely or briefly turned on.

c. Entering the target lane, the turn signal will be automatically or manually turned off when the prompt of the lane change is in process disappears.

During a lane change, overtaking assist is activated and the vehicle accelerates to approach the vehicle in front.

Caution

G-Pilot lane changing assist can assist the vehicle to move into one lane at a time. Changing lanes again requires the turn signal to be activated again after completing the first lane change.

If the driver turns on the turn signal briefly to activate the automatic lane changing function, the turn signal flashes continuously during the lane change and goes out automatically after the lane change is completed or fails. If the driver turns on the turn signal fully to activate the automatic lane change function, the driver needs to manually reset the light steering wheel module before the turn signal turns off after the lane change is completed or fails.

When using G-Pilot lane changing assist, be sure to pay attention to the driving route ahead and the surrounding area, and pay attention to the lane change process. Be ready to take over control of the vehicle at any time. When crossing into an adjacent lane, the lane lines on the combination instrument are displayed in gray. Upon entering a new lane, the lane lines are again displayed as solid blue.

Combination instrument displays a series of warnings when G-Pilot lane changing assist is not working at optimum performance, or when it fails to work due to inadequate conditions. Therefore, when using G-Pilot lane changing assist, be sure to pay attention to the combination instrument and be prepared to manually maneuver the vehicle.

System limitations

The detectable range of the forward looking camera, forward looking radar, front side obstacle detection radar and rear side obstacle detection radar is limited, and in some cases the vehicle may not be detected or there may be a delay in detecting the vehicle.

Detection problems may occur in the following cases:

- a. A vehicle is moving slowly along the driver's lane. The system can only detect the corresponding vehicle that is moving fully into the driver's lane.
- b. When the vehicle in front is a large truck, detection may be delayed.
- c. When the driver enters or exits a bend, detection problems related to the vehicle in front may occur.

In these cases, the driver should remain alert and, if necessary, take emergency measures and temporarily deactivate the G-Pilot system.

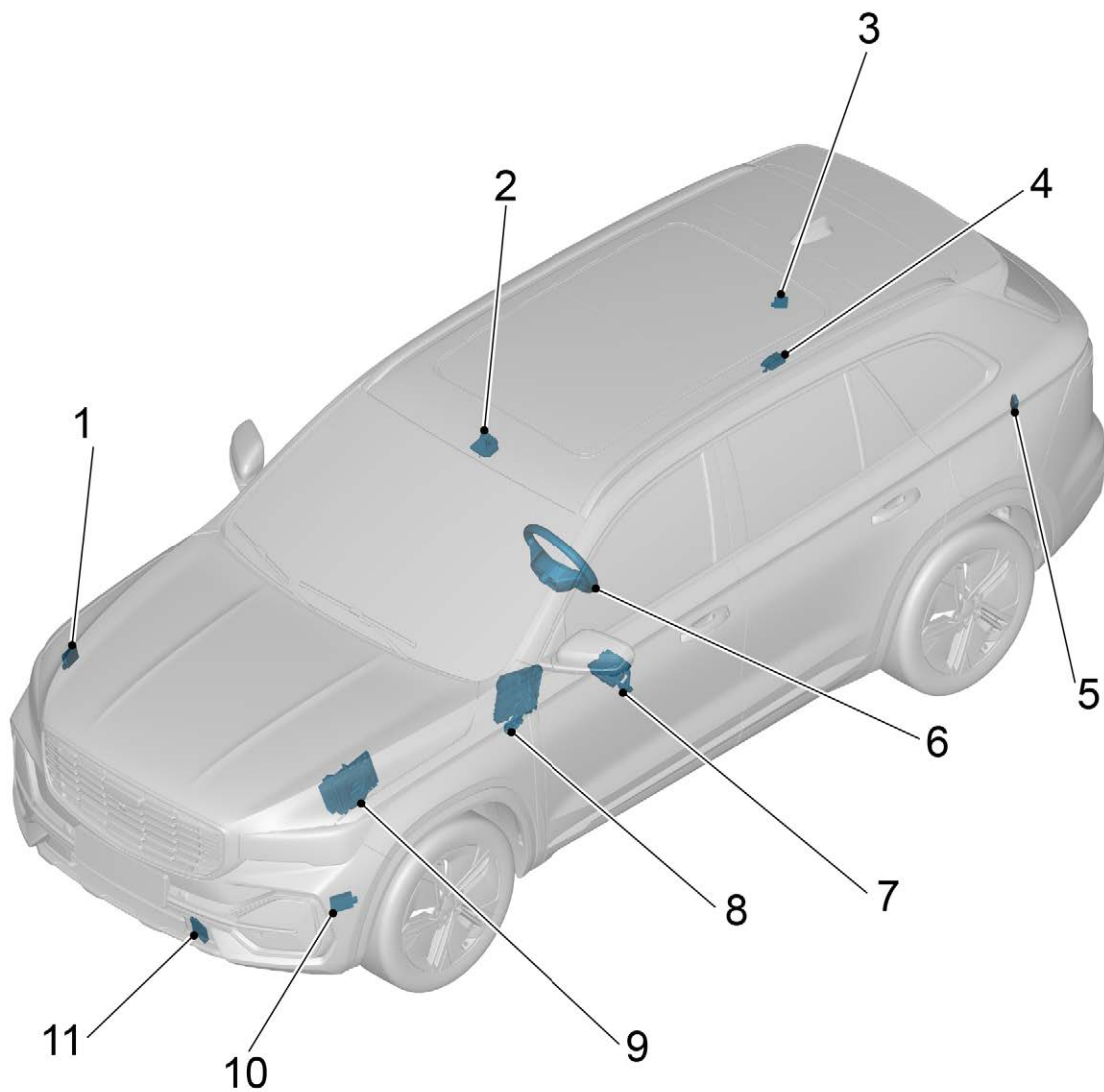
The forward looking camera has limited detectable capability. In some cases, the forward looking camera may not be able to accurately judge lane lines and may be easily disturbed by the environment.

Lane line detection problems may occur in the following situations:

- a. Lane lines are not laid according to national standards and cannot be recognized.
- b. Lane lines are clear and of low contrast and cannot be recognized.
- c. Lane line surface is covered with sand, water, snow, etc. and cannot be recognized.
- d. Wheel marks from a car driving past in front on a rainy or snowy day and wheel marks caused by the braking of the vehicle in front may be recognized as lane lines due to the high contrast.
- e. Road dividers, curbs, etc., may be recognized as lane lines.
- f. Continuous lane line-like projections on the road, such as the shadow of a railing, may be recognized as lane lines.

12.16.3 Part position

12.16.3.1 Part position



- | | | | |
|----|---------------------------------|-----|-------------------------------|
| 1. | Side obstacle detection radar | 7. | Vehicle Gateway Module |
| 2. | Front Looking Camera | 8. | Central Electronic Module |
| 3. | Side obstacle detection radar | 9. | Engine Control Module |
| 4. | Active Safety Domain Controller | 10. | Side obstacle detection radar |
| 5. | Side obstacle detection radar | 11. | Forward Looking Radar |
| 6. | Steering wheel | | |

12.16.4 Diagnostic information and procedure

12.16.4.1 Diagnosis description

See [Description and Operation](#) before diagnosing a malfunction in the cruise control system. Understanding and familiarizing yourself with the operation of the cruise control system before beginning system diagnosis will help determine the correct troubleshooting steps to take in the event of a malfunction, and more importantly this will help determine if the condition described by the customer is normal operation. Any troubleshooting of the cruise control system should start with a [Visual Check](#) that guides the repairer to the next logical step in the troubleshooting process. Understanding and using the diagnostic process correctly will reduce diagnostic time and avoid misdiagnosis of the fault area.

12.16.4.2 Visual check

- Confirm customer's fault before repair.
- Check system components that are easily accessible or can be seen to find out if there is any obvious damage or there is a situation that may cause a fault.
 - Check whether the front millimeter wave radar is correctly installed.
 - Check the front bumper for signs of a collision causing displacement of the front millimeter wave radar.
 - Whether the front windshield forward looking camera area is clean and free of foreign objects.
 - Whether other electrical devices are installed causing the system components to work improperly.

If so, repair the defective area or replace the part.

- Check the harness and harness connector to ensure that there is no sign of loosening, damage, poor contact, aging, etc.

12.16.5 Removal and Installation

12.16.5.1 Replacement of cruise control main switch

- 1 Refer to [Replacement of steering wheel assembly](#).

12.17 Electric trunk door

12.17.1 Specification

12.17.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Power operated tailgate module fixing nut	M5	3-4

12.17.2 Instructions and operations

12.17.2.1 Instructions and operations

Introduction of power operated tailgate

The power operated tailgate assembly includes: electric stay bar, tailgate lock+electric-powered motor, power operated tailgate module, control switch and other accessories.

The working principle of the electric stay bar is to realize the optimal design of the electric stay bar through mechanical calculation, and the optimal state can be realized by adjusting the torque of the motor, the gear box speed ratio, the lead of the screw rod, the spring force value and other variables. Through the power operated tailgate controller, the electric stay bar to achieve smooth movement and double bar synchronization. Active learning, back door soft stop, intelligent anti-pinch are available. Open the door with low noise, temperature protection, voltage protection, and cope with malicious operation. Comes with sound reminder function.

Power operated tailgate learning method

Manual learning

1. Close the tailgate completely manually;
2. Operate the switch to open the tailgate automatically to the mechanical stop position, and the power operated tailgate controller sends out the prompt of learning is successful (sound feedback of 3S);
3. Operate the switch to close the tailgate automatically and the learning is finished.

Power operated tailgate protection strategy

Stay bar motor protection

1. If the stay bar motor action time is too long, it will enter the software thermal protection state.
2. If the motor energy exceeds the calibrated value, the tailgate auto open/close function will be prohibited.
3. After the motor temperature returns to normal, it will enter the non-thermal protection state, and the automatic tailgate open/close function will be resumed.

Electric-powered lock motor protection

1. If the electric-powered lock motor action time is too long, it will enter the software thermal protection state.
2. If the motor energy exceeds the calibrated value, the tailgate auto locking function will be prohibited.
3. After the motor temperature returns to normal, it will enter the non-thermal protection state, and the automatic locking function will be resumed.

Caution

The function will be triggered 10 times continuously within 60S, and there will be no function within 60S after triggering.

Tailgate soft stop protection

To protect the stay bar motor from automatically opening to the mechanical stop blocking and tailgate rattling, set the tailgate 95% opening position as the soft stop position. If the tailgate is not learned, the soft stop function is canceled.

Lost position protection

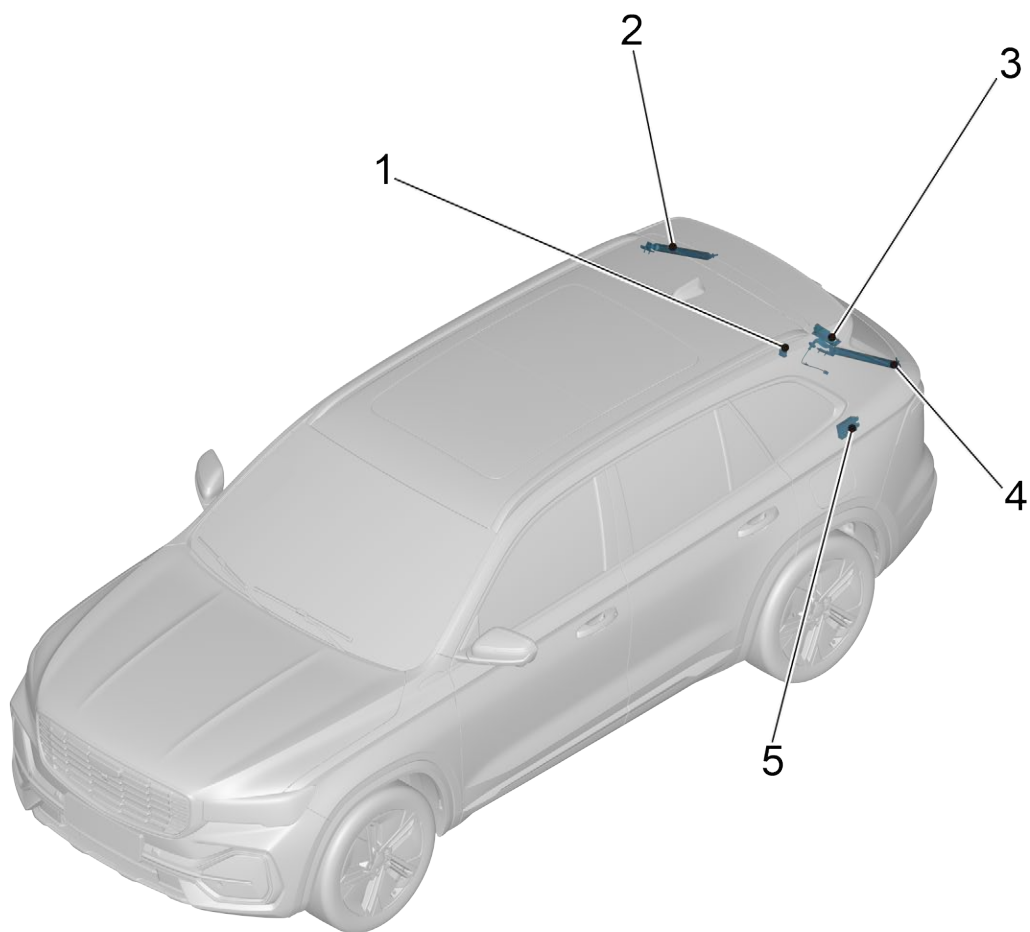
When the power operated tailgate is powered off or in long time sleep after being turned on, the tailgate will lose the current position. The tailgate can still be closed automatically after the position is lost, and cannot be opened automatically. The automatic closing is performed at a calibrated minimum speed, which is longer than the normal tailgate closing time.

Caution

After the tailgate has lost its position, it can be closed automatically or manually once to retrieve the position of the tailgate.

12.17.3 Part position

12.17.3.1 Part position



- | | |
|--|----------------------------------|
| 1. Tailgate closing and vehicle locking switch | 4. Power operated tailgate motor |
| 2. Trunk door right balance support rod | 5. Power Tailgate Module |
| 3. Tailgate opening switch | |

12.17.4 Diagnostic information and procedure

12.17.4.1 Diagnosis description

See [Description and Operation](#) before diagnosing a malfunction in the power operated tailgate system. Understanding and familiarizing yourself with the operation of the data communication system before beginning system diagnosis will help determine the correct troubleshooting steps to take in the event of a malfunction, and more importantly this will help determine if the condition described by the customer is normal operation. Any troubleshooting of the power operated tailgate system should start with a [Visual Check](#) that guides the repairer to the next logical step in the troubleshooting process. Understanding and using the diagnostic process correctly will reduce diagnostic time and avoid misdiagnosis of the fault area.

12.17.4.2 Visual check

- Check after-sales installations that may affect the operation of power operated tailgate system. Make sure these installations cannot affect the power operated tailgate system.
- Check system components that are easily accessible or can be seen to find out if there is any obvious damage of the component or there is a situation that may cause a fault.
- Check the harness and harness connector to ensure that there is no sign of loosening, damage, poor contact, aging, etc.

12.17.5 Removal and Installation

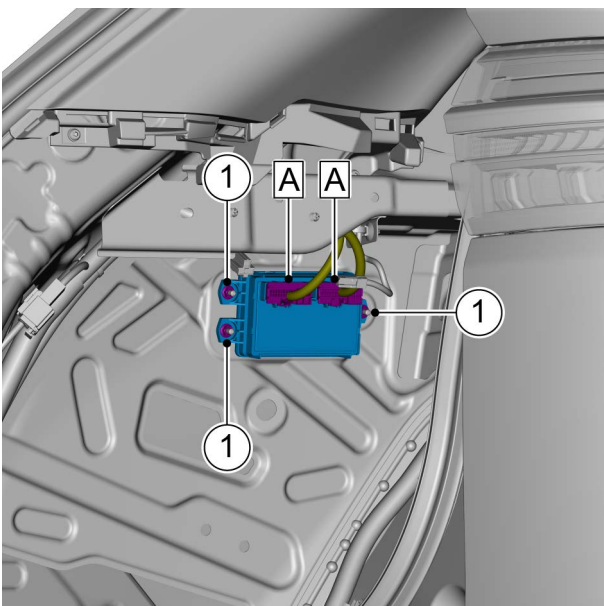
12.17.5.1 Replacement of power operated tailgate module

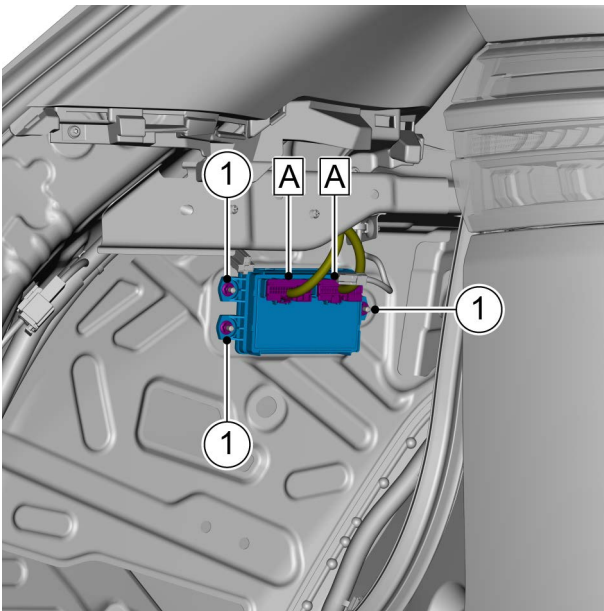
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the rear seat cushion assembly, refer to [Replacement of rear seat cushion assembly](#).
- 3 Remove the rear seat left backrest assembly, refer to [Replacement of rear seat left backrest assembly](#).
- 4 Remove the luggage compartment door sill trim panel assembly, refer to [Replacement of luggage compartment door sill trim panel assembly](#).
- 5 Remove the left upper trim panel of luggage compartment, refer to [Replacement of luggage compartment left upper trim panel](#).
- 6 Remove the luggage compartment light, refer to [Replacement of luggage compartment light](#).
- 7 Remove the 12V socket (luggage compartment), refer to [Replacement of 12V socket \(luggage compartment\)](#).
- 8 Remove the left luggage compartment side shield assembly, refer to [Replacement of left luggage compartment side shield assembly](#).
- 9 Disconnect the 2 harness connectors A of power operated tailgate module.
- 10 Remove the 3 fixing nuts 1 of power operated tailgate module and remove the power operated tailgate module.





Installation Procedure

- 1 Install the 3 fixing nuts 1 of power operated tailgate module.
Torque: 3.5N·m
- 2 Connect the 2 harness connectors A of power operated tailgate module.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 3 Install the left luggage compartment side shield assembly.
- 4 Install the 12V socket (luggage compartment).
- 5 Install the boot lamp.
- 6 Install the left upper trim panel of luggage compartment.
- 7 Install the luggage compartment door sill trim panel assembly.
- 8 Install the rear seat left backrest assembly.
- 9 Install the rear seat cushion assembly.
- 10 Connect the negative cable of battery.
- 11 The GLDS diagnostic program is required, under the [Software] tab, select the corresponding module and follow the steps prompted by the diagnostic program to complete the software brushing operation.

12.17.5.2 Replacement of power operated tailgate motor

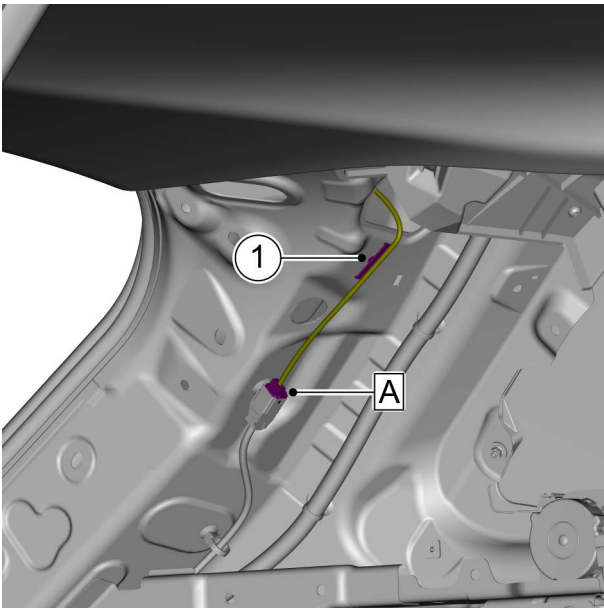
Removal Procedure

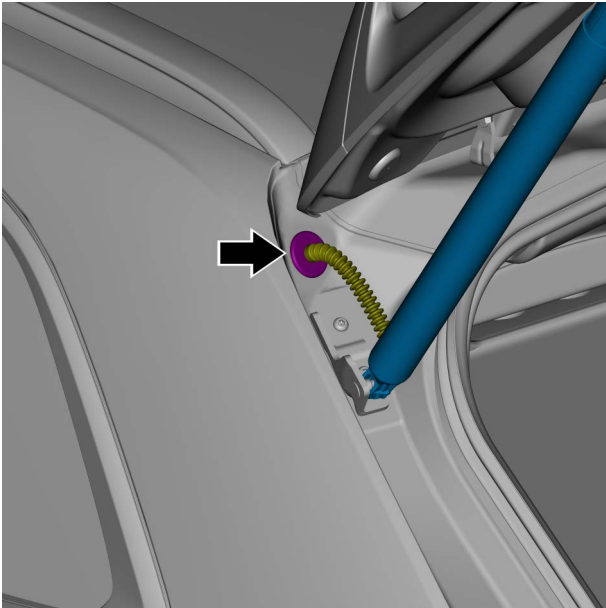
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

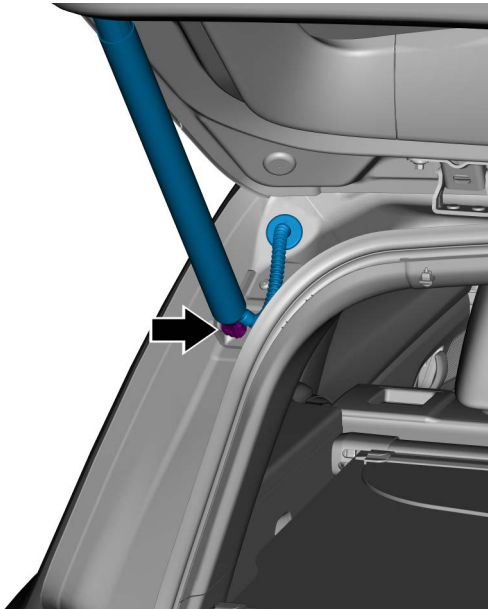
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the rear seat cushion assembly, refer to [Replacement of rear seat cushion assembly](#).

- 3 Remove the rear seat left backrest assembly, refer to [Replacement of rear seat left backrest assembly](#).
- 4 Remove the luggage compartment door sill trim panel assembly, refer to [Replacement of luggage compartment door sill trim panel assembly](#).
- 5 Remove the left upper trim panel of luggage compartment, refer to [Replacement of luggage compartment left upper trim panel](#).
- 6 Remove the luggage compartment light, refer to [Replacement of luggage compartment light](#).
- 7 Remove the 12V socket (luggage compartment), refer to [Replacement of 12V socket \(luggage compartment\)](#).
- 8 Remove the left luggage compartment side shield assembly, refer to [Replacement of left luggage compartment side shield assembly](#).
- 9 Remove the left C-pillar upper trim panel assembly, refer to [Replacement of left C-pillar upper trim panel assembly](#).
- 10 Remove the left D-pillar upper trim panel assembly, refer to [Replacement of left D-pillar upper trim panel assembly](#).
- 11 Remove the harness connection A and harness fixing clip 1 of power operated tailgate motor.



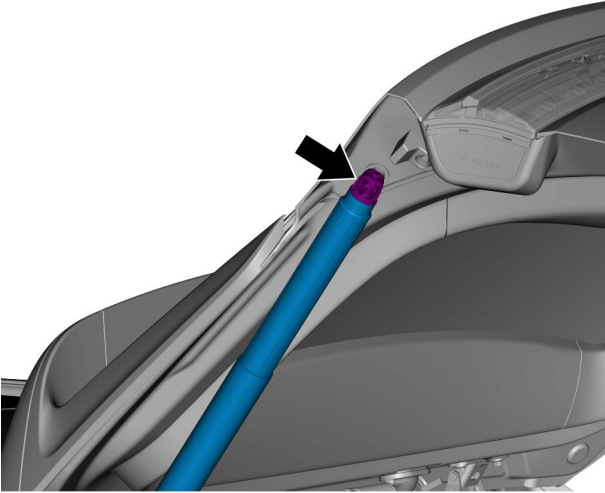


- 12 Remove the harness rubber sheath of power operated tailgate motor.



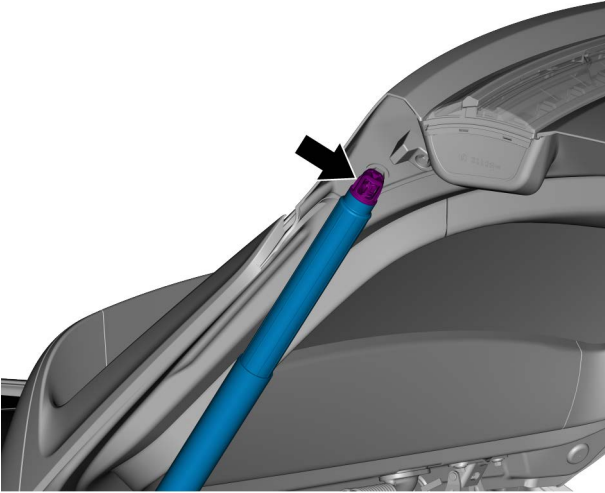
- 13 Pry off the power operated tailgate motor lower connector with a slotted screwdriver.

- 14 Pry off the power operated tailgate motor upper connector with a slotted screwdriver and remove the power operated tailgate motor.

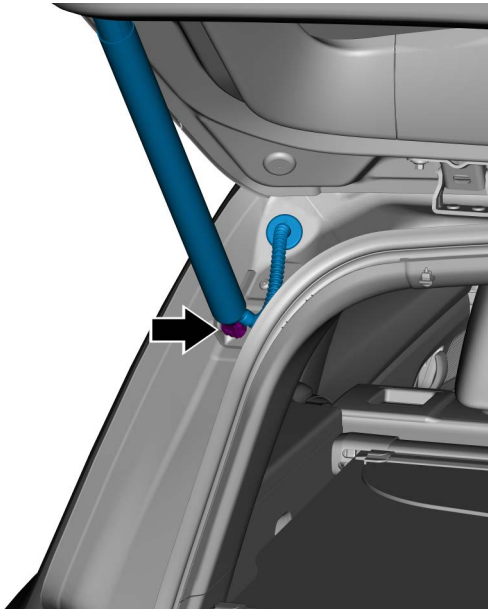


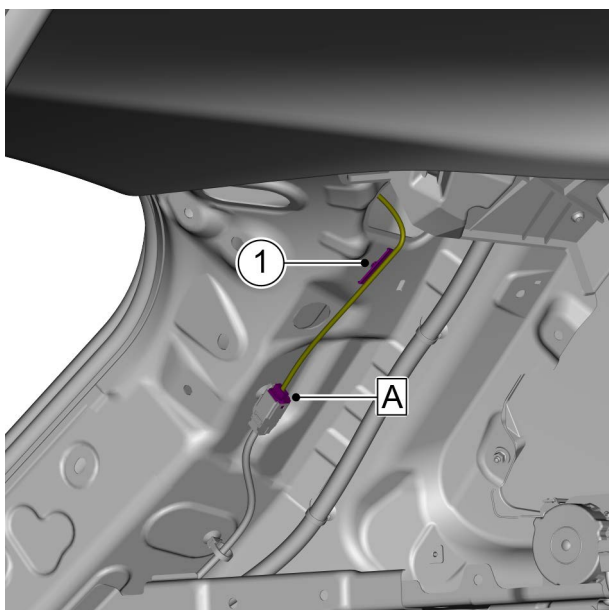
Installation Procedure

- 1 Install the power operated tailgate motor upper connector.

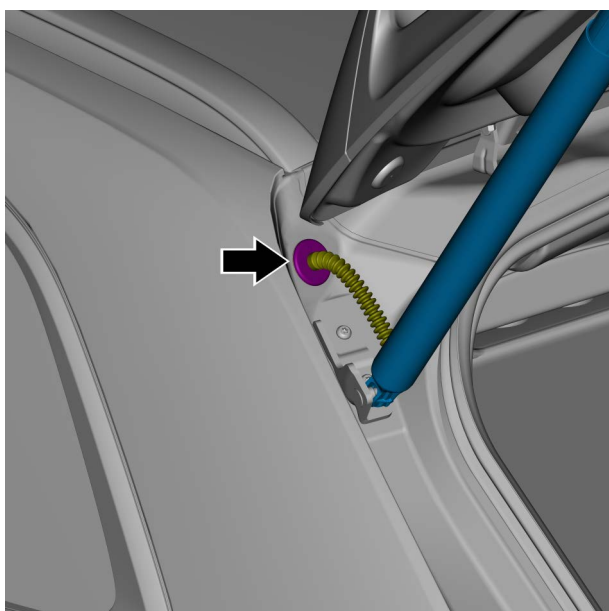


- 2 Install the power operated tailgate motor lower connector.





- 3 Install the harness connection A and harness fixing clip 1 of power operated tailgate motor.



- 4 Install the harness rubber sheath of power operated tailgate motor.

- 5 Install the left C-pillar upper trim panel assembly.
- 6 Install the left D-pillar upper trim panel assembly.
- 7 Install the left luggage compartment side shield assembly.
- 8 Install the 12V socket (luggage compartment).
- 9 Install the boot lamp.
- 10 Install the left upper trim panel of luggage compartment.
- 11 Install the luggage compartment door sill trim panel assembly.
- 12 Install the rear seat left backrest assembly.
- 13 Install the rear seat cushion assembly.
- 14 Connect the negative cable of battery.

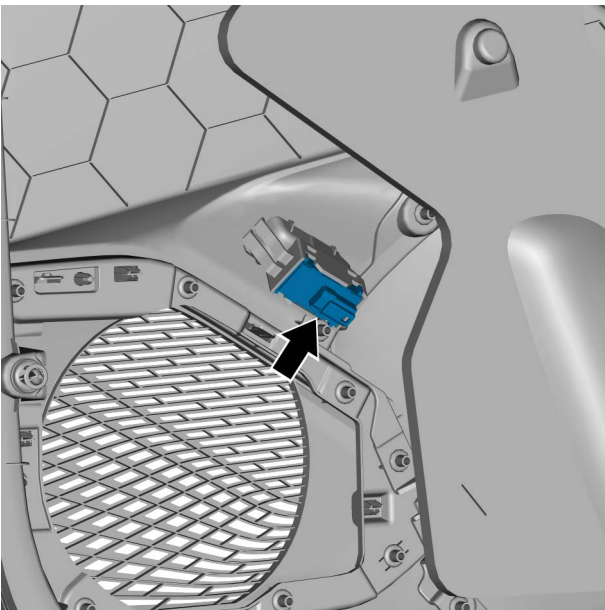
12.17.5.3 Replacement of tailgate opening switch

Removal Procedure

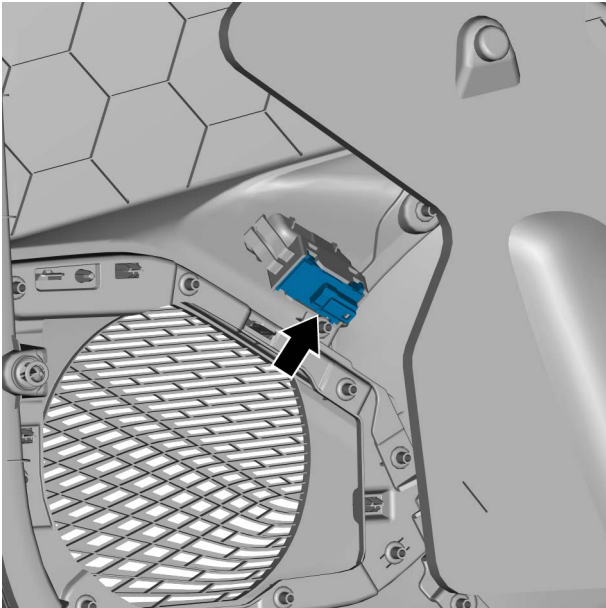
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left front door interior trim panel assembly, refer to [Replacement of left front door interior trim panel assembly](#).
- 3 Remove the tailgate opening switch and take it off.



Installation Procedure



- 1 Install the tailgate opening switch.

- 2 Install the assembly-interior trim panel left front door.
- 3 Connect the negative cable of battery.

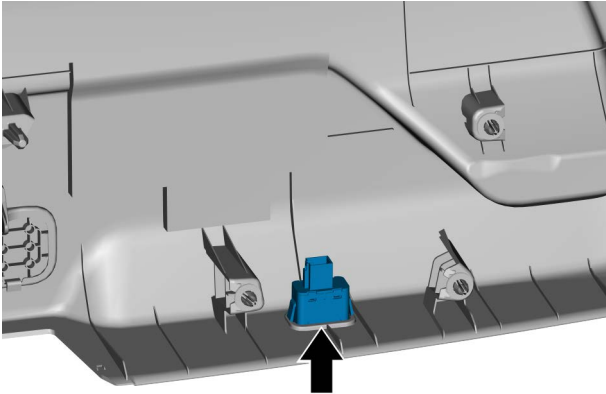
12.17.5.4 Replacement of tailgate closing and vehicle locking switch

Removal Procedure

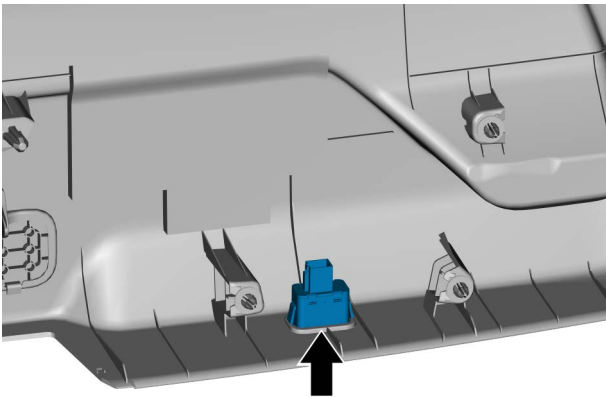
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the trunk door middle upper interior trim panel assembly, refer to [Replacement of trunk door middle upper interior trim panel assembly](#).



- 3 Remove the trunk door lower interior trim panel assembly, refer to [Replacement of trunk door lower interior trim panel assembly](#).
- 4 Disassemble the tailgate closing and vehicle locking switch and remove it.



Installation Procedure

- 1 Install the tailgate closing and vehicle locking switch.

- 2 Install assembly of interior trim panel of tail gate.
- 3 Install the tail gate middle upper interior trim panel assembly.
- 4 Connect the negative cable of battery.

12.18 Low-speed alarm system

12.18.1 Specification

12.18.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
External sound module fixing bolt	M6×10×13.3M	8.5-11.5

12.18.2 Instructions and operations

12.18.2.1 Instructions and operations

Function description

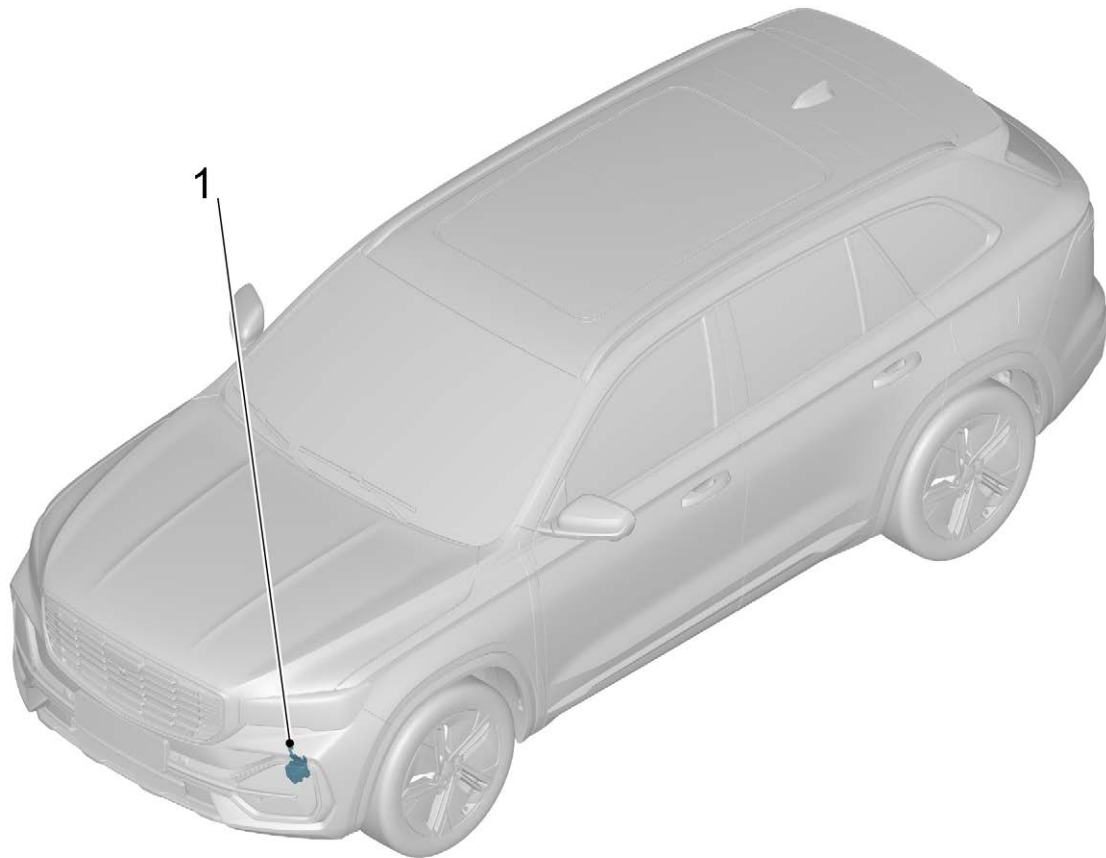
Hybrid vehicles are less noisy when the vehicle is driven in electric mode. Pedestrians with impaired vision or those who do not observe carefully may be in danger when passing through the roadway where the vehicle is traveling. Therefore, hybrid vehicles often have a low-speed alarm system, which automatically emits a tone to alert pedestrians when the vehicle speed is below 30km/h, in order to reduce the injury rate of hybrid vehicles colliding with pedestrians.

System composition

The low-speed alarm system is mainly composed of an external sound module and the related wiring harness. The external sound module is internally composed of power module, amplifier module, voice module, MCU module, CAN communication module and so on.

12.18.3 Part position

12.18.3.1 Part position



1. External sound module

12.18.4 Diagnostic information and procedure

12.18.4.1 Diagnosis description

See [Description and Operation](#) before diagnosing a malfunction in the low-speed alarm system. Understanding and familiarizing yourself with the operation of the low-speed alarm system before beginning system diagnosis will help determine the correct troubleshooting steps to take in the event of a malfunction, and more importantly this will help determine if the condition described by the customer is normal operation. Any troubleshooting of the low-speed alarm system should start with the routine check that guides the repairer to the next logical step in the troubleshooting process. Understanding and using the diagnostic process correctly will reduce diagnostic time and avoid misdiagnosis of the fault area.

12.18.4.2 Visual check

- Check after-sales installations that may affect the low-speed alarm system, which control to ensure that they cannot affect cruise control system.
- Check system components that are easily accessible or can be seen to find out if there is any obvious damage of the component or there is a situation that may cause a fault.
- Check the harness and harness connector to ensure that there is no sign of loosening, damage, poor contact, aging, etc.

12.18.5 Removal and Installation

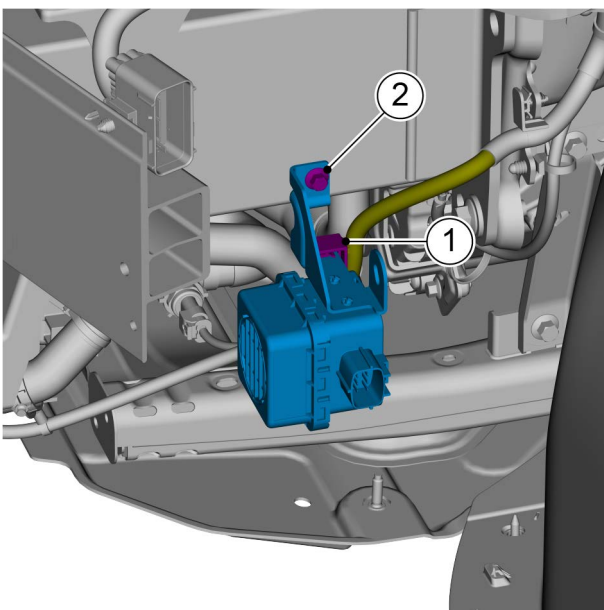
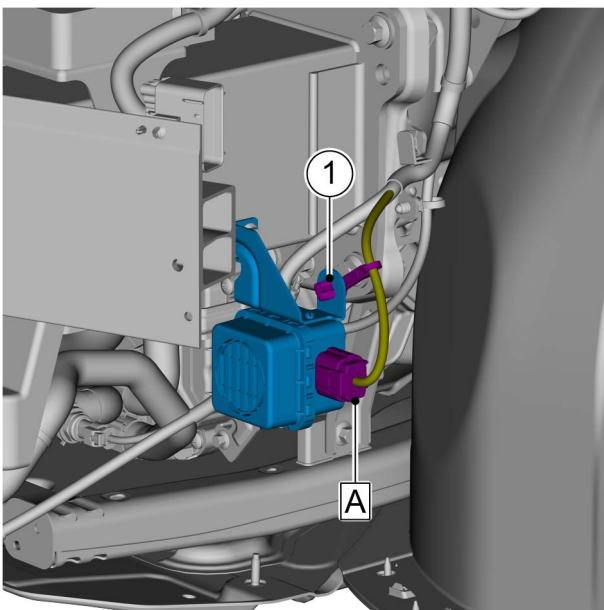
12.18.5.1 Replacement of external sound module

Removal Procedure

Warning !

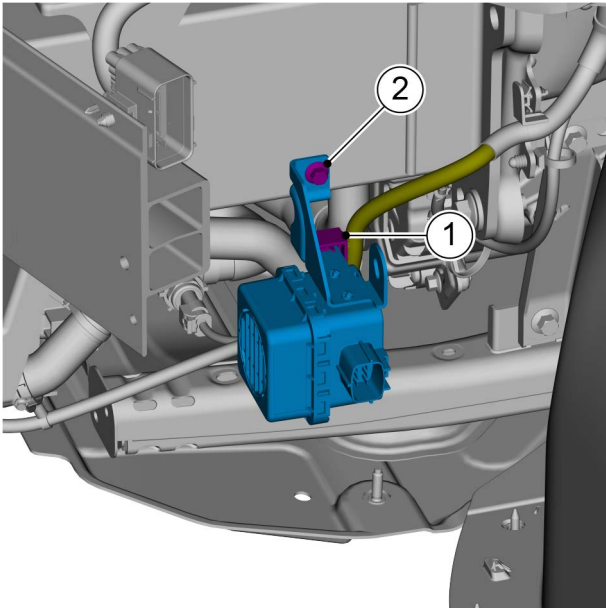
Refer to "Warnings regarding battery disconnection" in [Warnings and Precautions](#).

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the front bumper assembly, refer to [Replacement of front bumper assembly](#).
- 3 Disconnect the external sound module harness connector A.
- 4 Remove harness clip 1.

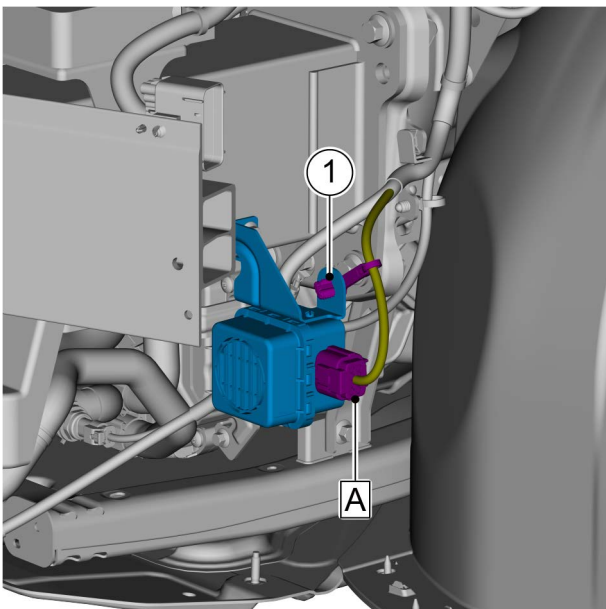


- 5 Remove harness clip 1.
- 6 Remove the 1 fixing bolt 2 of external sound module and remove the external sound module.

Installation Procedure



- 1 Install the external sound module and tighten 1 fixing bolt
2.
Torque: 10N·m
- 2 Install the harness clip 1.



- 3 Connect the external sound module harness connector A.
Caution
Firmly plug in the harness according to the principle of "plugging, sounding and confirming".
- 4 Install the harness clip 1.

- 5 Install the front bumper assembly.
- 6 Connect the negative cable of battery.

Body, sheet metal and paint

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13.1 Warnings and Cautions

13.1.1 Warnings and Cautions

13.1.1.1 Warnings and Cautions

Warning about Collision Profiling

Warning !

Only carry out cutting in the recommended components. Otherwise, it will destroy the integrity of the vehicle structure. The vehicle collision may lead to personal injury.

Warning about Cracked Window

Warning !

If a window is cracked but still intact, protective tape should be applied to the window in a crisscross pattern to prevent further damage to the window or personal injury.

Warning about Glass and Sheet Metal Handling

Warning !

When any type of glass or metal plate with sharp edges or burrs is handled, it is needed to wear approved goggles and gloves to reduce the risk of personal injury.

Warnings about goggles and compressed air

Warning !

When using compressed air, wear goggles to avoid eye damage. of exterior trim logo removal pay attention. Notice of exterior trim logo removal.

Caution

When the badges/nameplates are removed, flat-edged plastic tools should be used to prevent damage to the paint.

Caution for damage to Machined Surfaces

Caution

The sealing surface must not be cut, scratched or damaged. As the sealing surface is machining surface, its damage will lead to leakage.

Caution for Sealant

Caution

The sealant cured at room temperature must not enter the thread blind holes. If the sealant cured at room temperature enters the thread blind holes, the fastener will have a hydraulic lock up effect when it is tightened. The hydraulic lock up of fasteners will cause damage to fasteners and other components. It will also make it unable to get the correct clamp force of fasteners when tightening, resulting in incorrect tightness of fasteners, loose or separation of components and serious damage to the vehicle.

Notice of damage to window edges

Caution

Windows must be 1mm (0.025 in) below the sheet metal surface to avoid damage to windows caused by impingement due to bare edges.

13.2 Body Front End

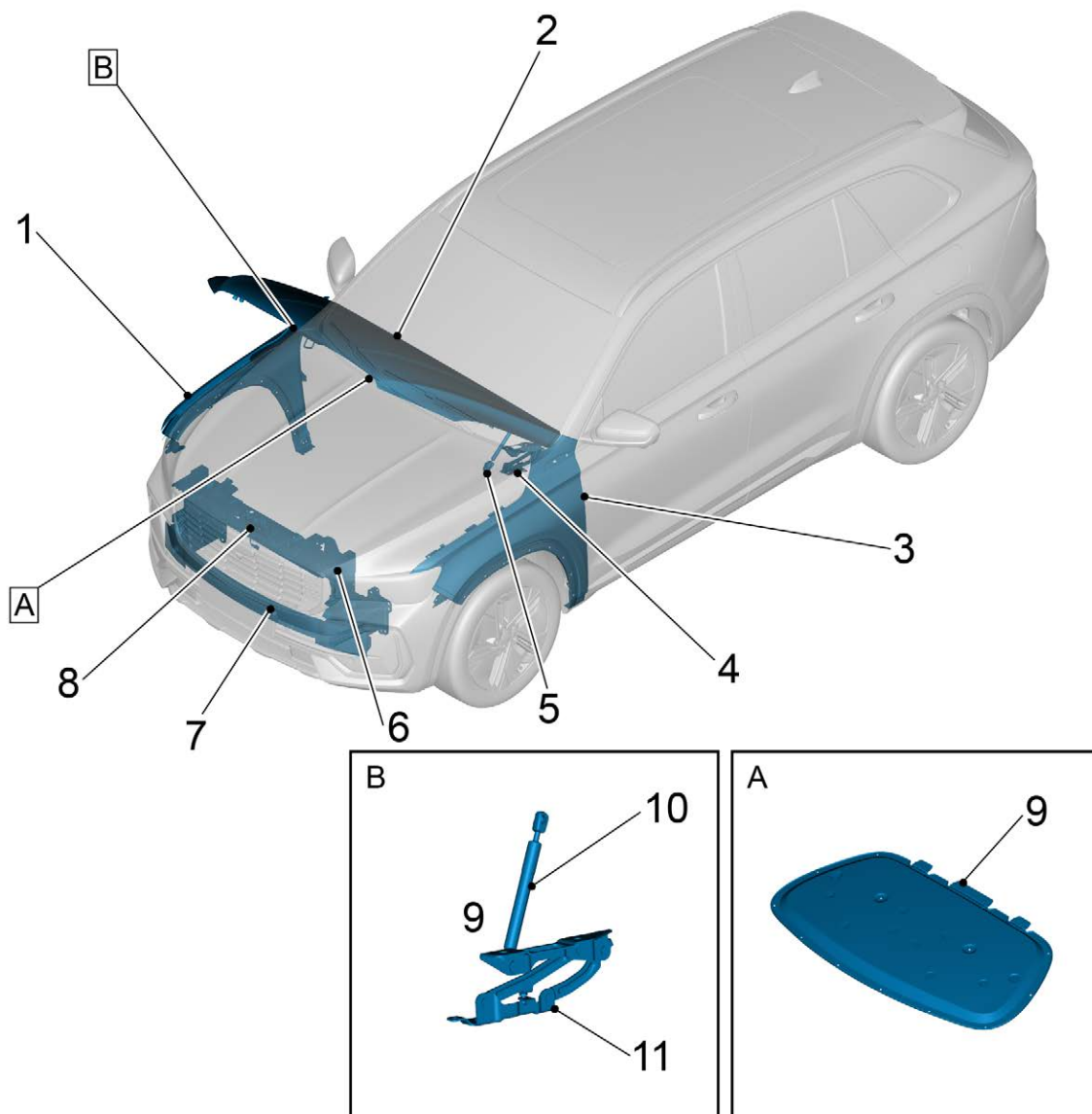
13.2.1 Specification

13.2.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Fixing bolt of left front fender	M6×20	8.5-11.5
Fixing nut of left front fender	M6×20	8.5-11.5
Fixing nut of engine hood assembly	M8	20-28
Fixing bolt of engine left hinge assembly	M8×20	20-28
Fixing bolt of engine hood latch	M8	20-28
Left headlamp cross beam fixing bolt	M10×30	50-70
Right headlamp cross beam fixing bolt	M10×30	50-70
Radiator upper deflector fixing bolt	M6×20	2.5-3.5
Fixing bolt for air intake baffle	M6×25	8.5-11.5
Front end module assembly fixing bolt	M8×30	20-28
Air filter lower mounting bracket fixing bolt	M6×20	8.5-11.5
Radiator module middle bracket assembly fixing nut	M8×8	20-28
Cooling module fixing bolt	M8×50	20-28
Exterior speaker module bracket fixing bolt	M6×20	8.5-11.5
Front anti-collision cross beam assembly fixing bolt	M10×30	50-70

13.2.2 Part position

13.2.2.1 Part position



- | | |
|------------------------------------|---|
| 1. Right front fender assembly | 7. Front anti-collision cross beam assembly |
| 2. Engine hood assembly | 8. Engine hood latch |
| 3. Left front fender assembly | 9. Engine hood sound/heat insulation pad |
| 4. Engine hood left hinge assembly | 10. Right engine hood air spring |
| 5. Left engine hood air spring | 11. Engine hood right hinge assembly |
| 6. Front end module assembly | |

13.2.3 Removal and Installation

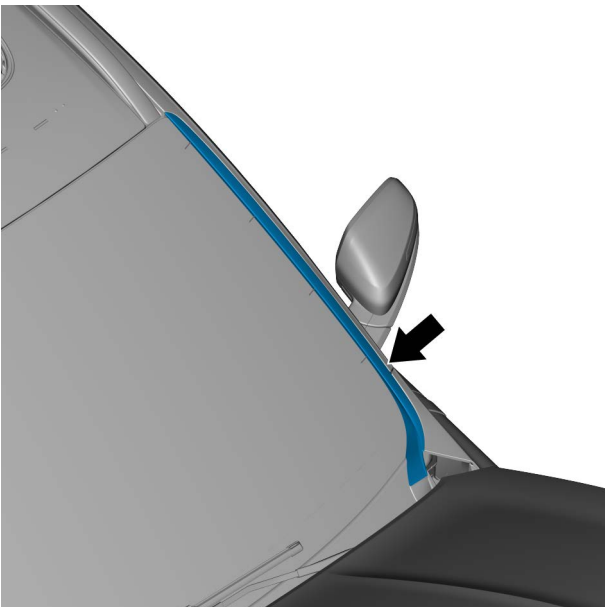
13.2.3.1 Replacement of left front fender

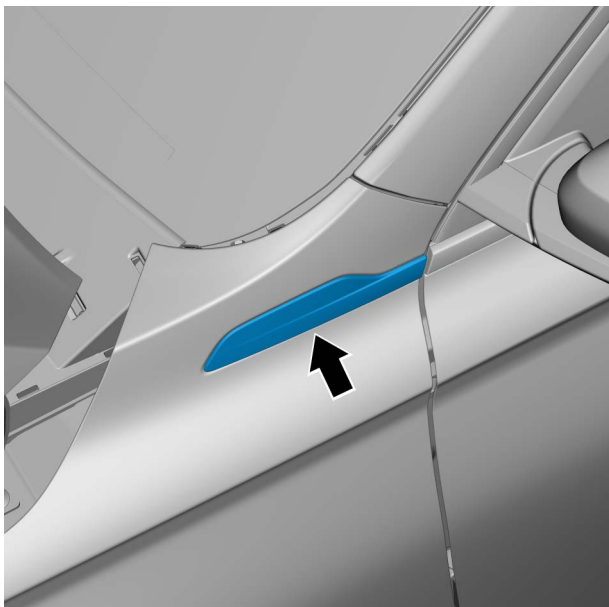
Removal Procedure

Warning !

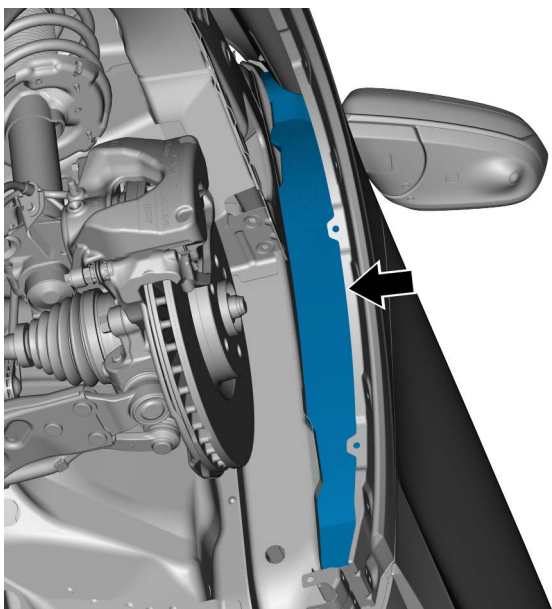
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left and right engine compartment trim panel, refer to [Replacement of left engine compartment trim panel](#).
- 3 Remove the engine compartment trim panel, refer to [Replacement of engine compartment trim panel](#).
- 4 Remove the left and right front fender flare, refer to [Replacement of left front fender flare](#).
- 5 Remove the front bumper assembly, refer to [Replacement of front bumper assembly](#).
- 6 Remove the headlight unit (left front), refer to [Replacement of headlight unit \(left front\)](#).
- 7 Remove the left front wheel arch splash guard assembly, refer to [Replacement of left front wheel arch splash guard assembly](#).
- 8 Remove the left front windshield trim strip.

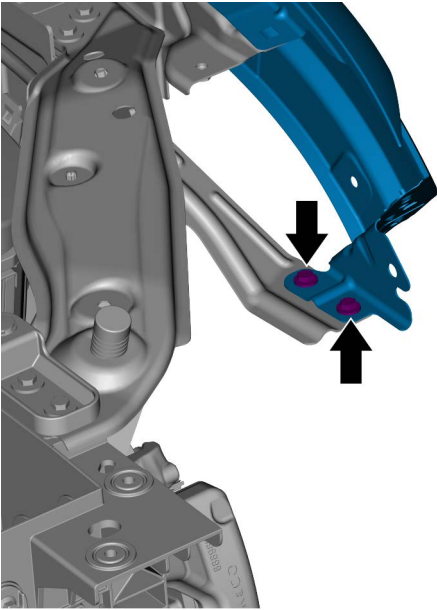




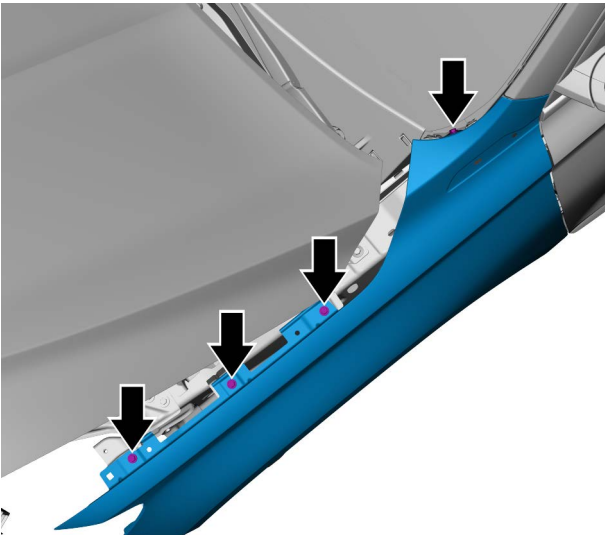
9 Remove the left front door exterior corner trim.



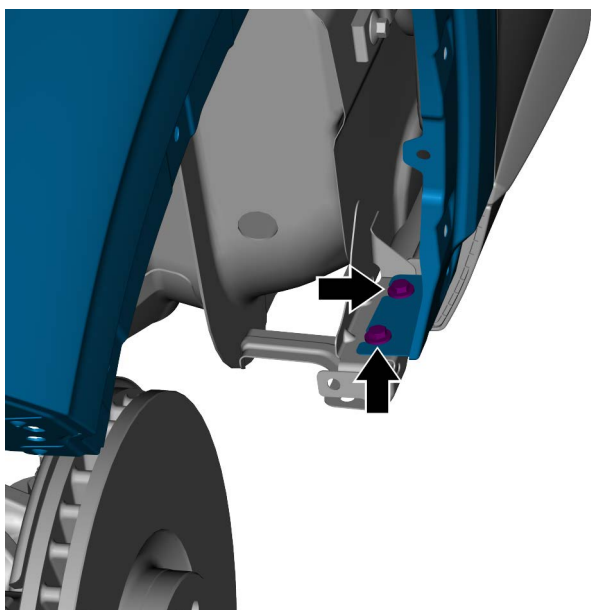
10 Remove the fender left filling block.



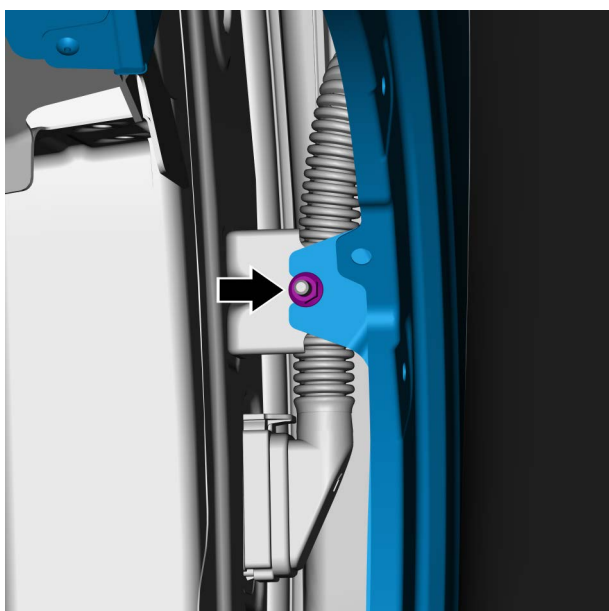
- 11 Remove the 2 fixing bolts at the front of the left front fender.



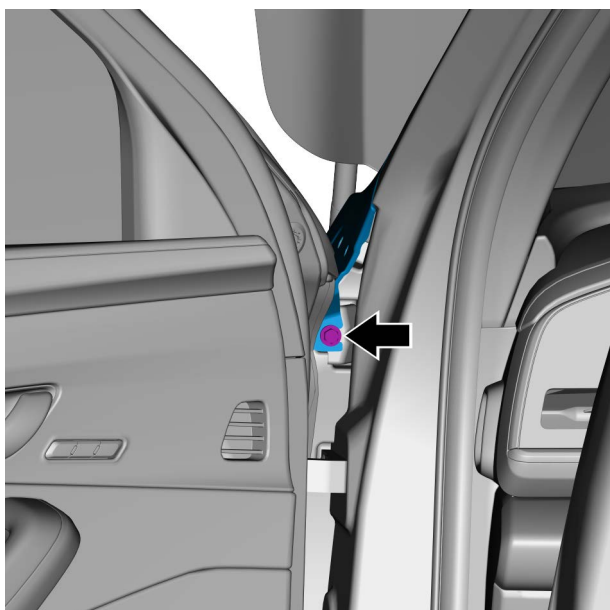
- 12 Remove the 4 fixing bolts at the top of the left front fender.



- 13 Remove the 2 fixing bolts at the lower rear of the left front fender.

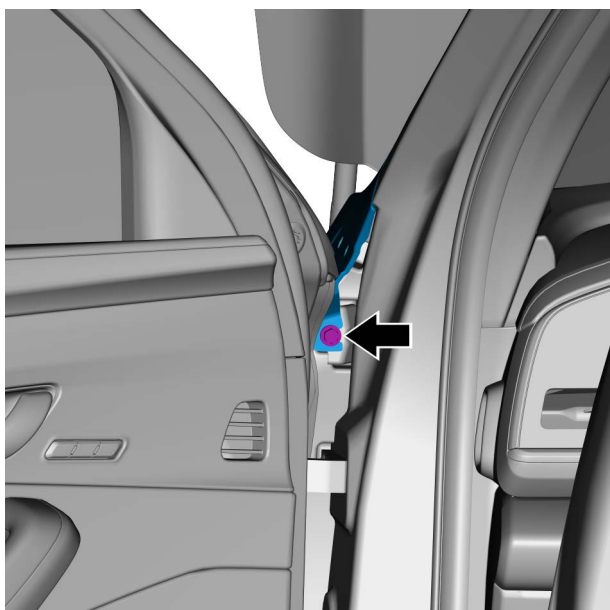


- 14 Remove the left front fender rear middle fixing nut.

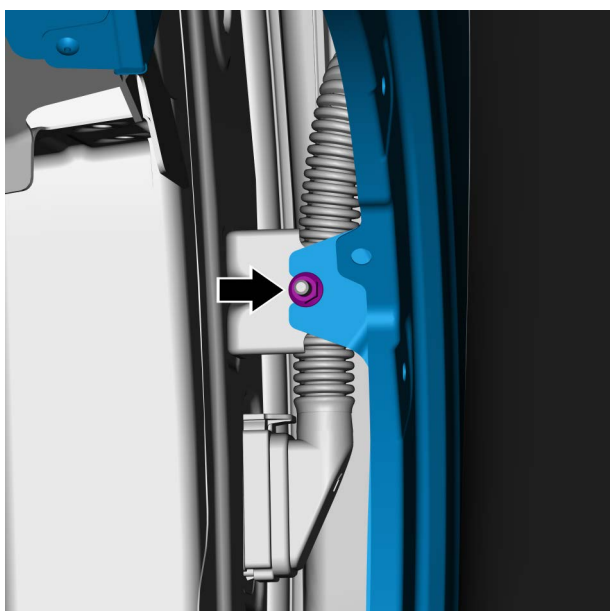


- 15 Remove the upper rear fixing bolt of left front fender and remove the left front fender.

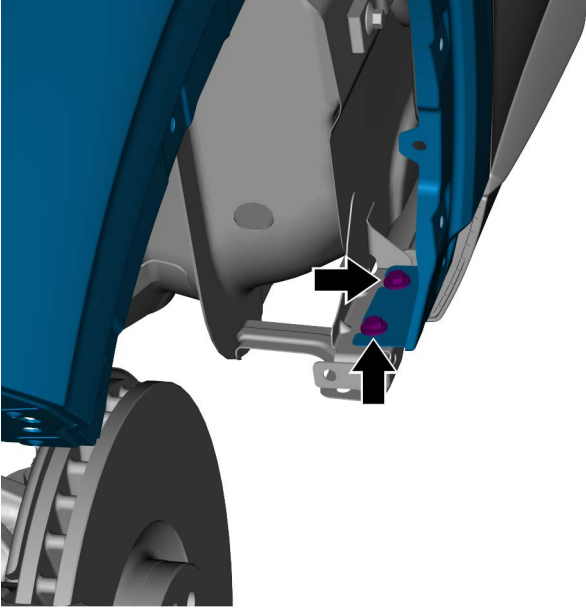
Installation Procedure



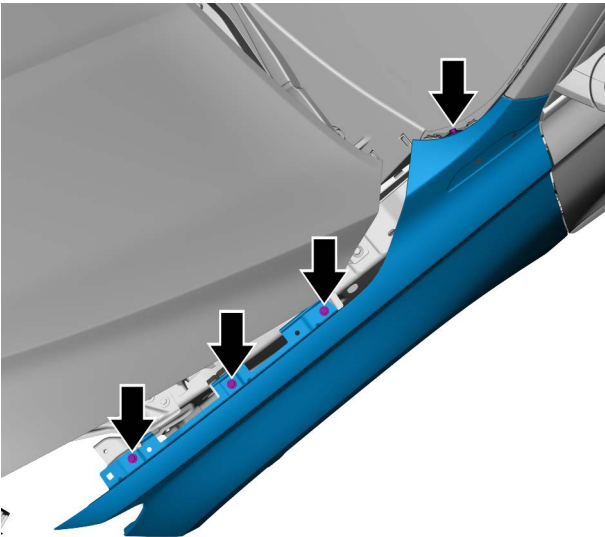
- 1 Install the fixing bolt at the upper rear of the left front fender.
Torque: 10N·m



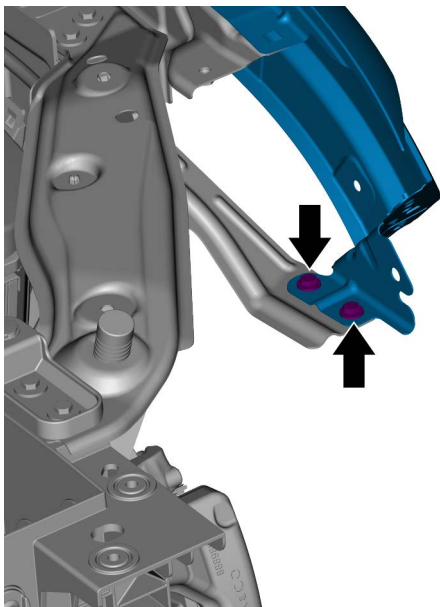
- 2 Install the left front fender rear middle fixing nut.
Torque: 10N·m



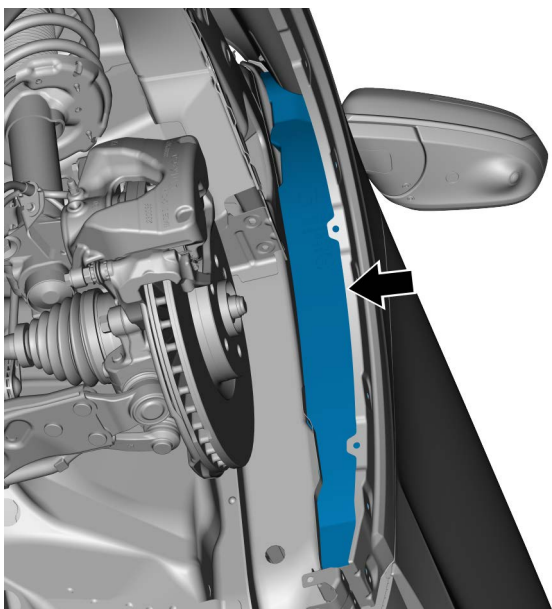
- 3 Install the 2 fixing bolts at the lower rear of the left front fender.
Torque: 10N·m



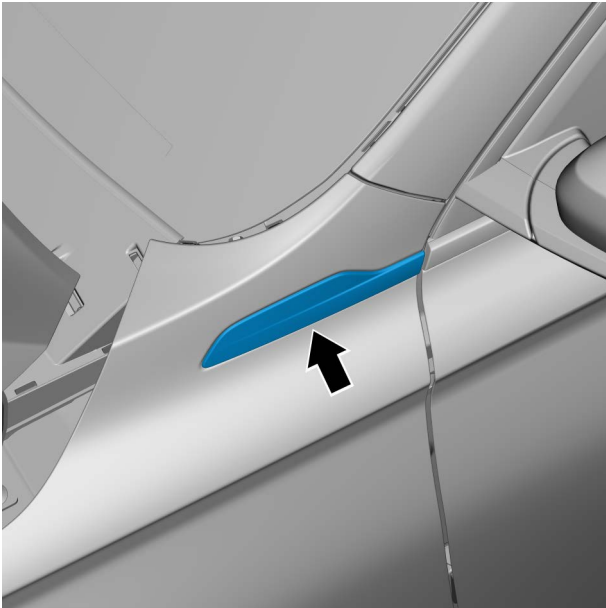
- 4 Install the 4 fixing bolts at the top of the left front fender.
Torque: 10N·m



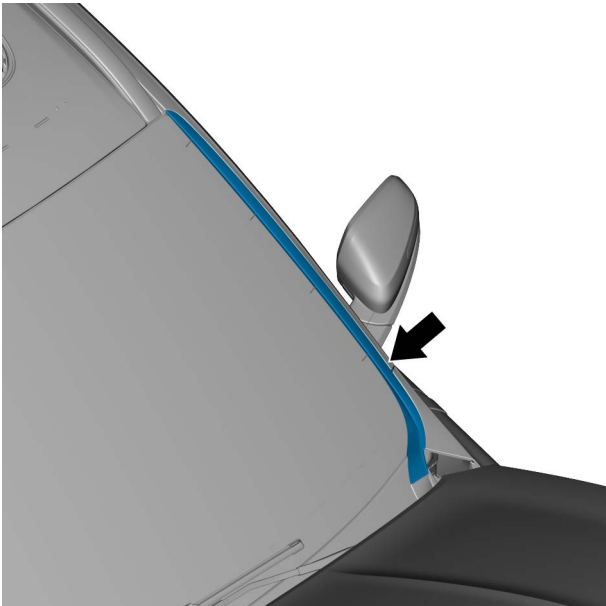
- 5 Install the 2 fixing bolts at the front of the left front fender.
Torque: 10N·m



- 6 Install the fender left filling block.



- 7 Install the left front door exterior corner trim.



- 8 Install the left front windshield trim strip.

- 9 Install the left front wheel arch splash guard assembly.
- 10 Install the headlight unit (left front).
- 11 Install the front bumper assembly.
- 12 Install the left front fender flare.
- 13 Install the engine compartment trim panel.
- 14 Install the left engine compartment trim panel.
- 15 Connect the negative cable of battery.

13.2.3.2 Replacement of engine hood assembly

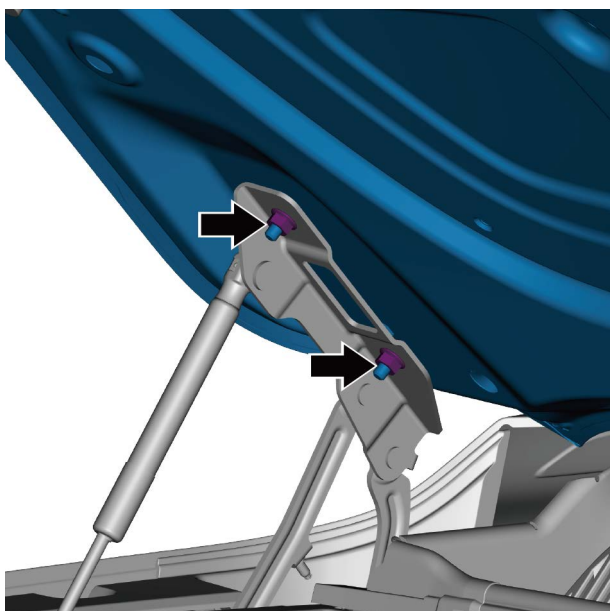
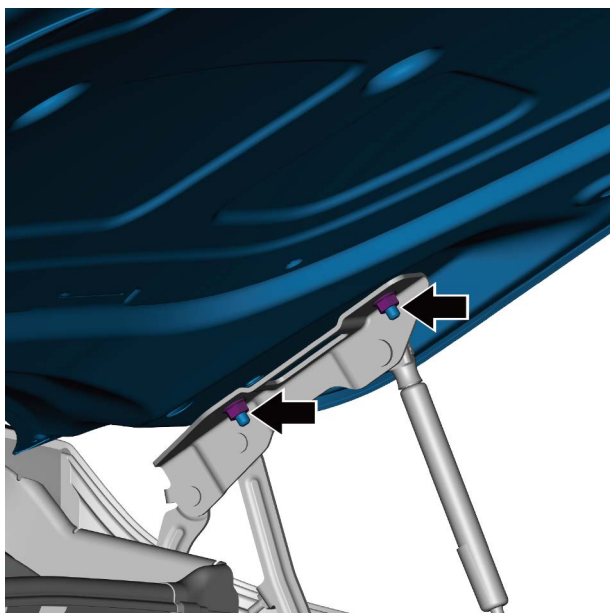
Removal Procedure

Caution

Two people are required to work together during engine hood removal and installation. Protect with protective tape or rags to prevent damage.

When removing the engine hood, the position of the hood and hinge must be marked for positioning during installation.

- 1 Open the engine hood.
- 2 Remove the 2 fixing nuts connecting engine hood assembly and engine hood left hinge.
- 3 Remove the 2 fixing nuts engine hood assembly and engine hood right hinge and remove the engine hood assembly.



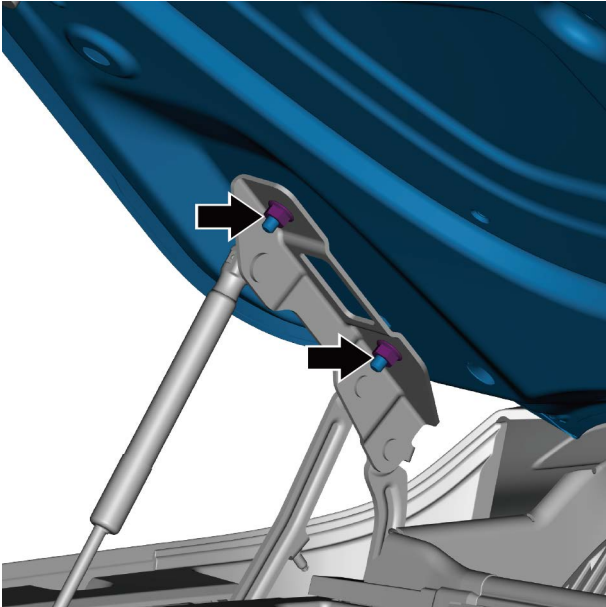
Installation Procedure

Caution

Adjust the clearance between the engine hood and the left and right fenders and radiator cover, and then tighten the bolts and adjust the buffer block.

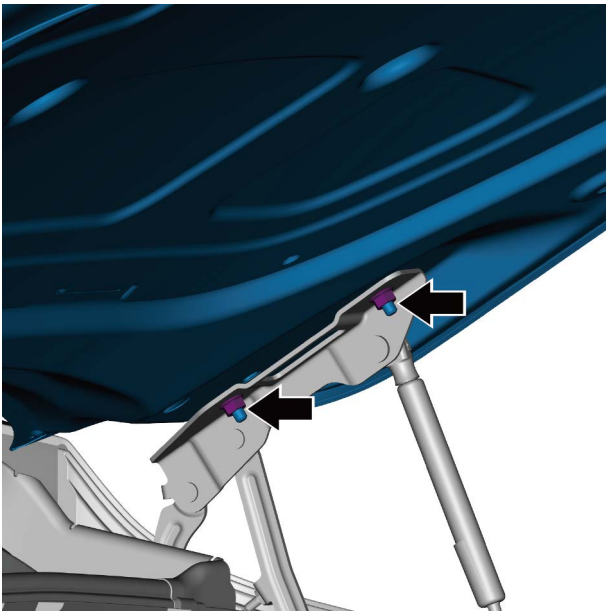
- 1 Install the 2 fixing nuts connecting engine hood assembly and engine hood right hinge.

Torque: 24N·m



- 2 Install the 2 fixing nuts connecting engine hood assembly and engine hood left hinge.

Torque: 24N·m

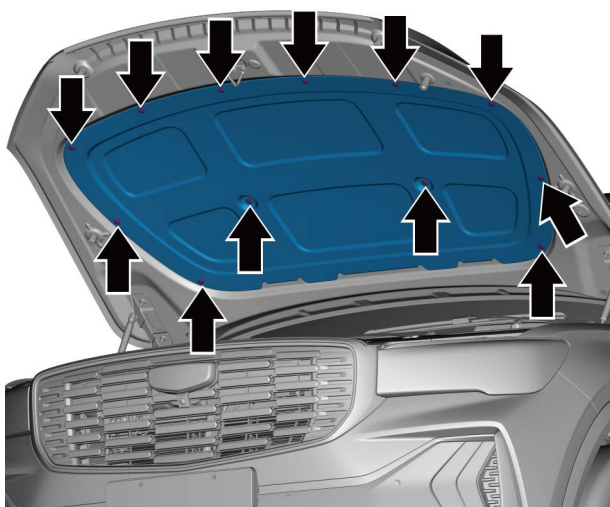


- 3 Close the engine hood.

13.2.3.3 Replacement of engine hood sound/heat insulation pads

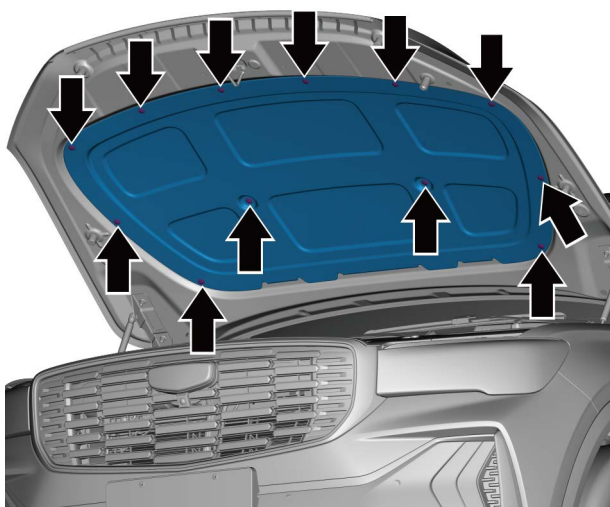
Removal Procedure

- 1 Open the engine hood.
- 2 Remove the 12 fixing clips of the engine hood sound/heat insulation pad.



Installation Procedure

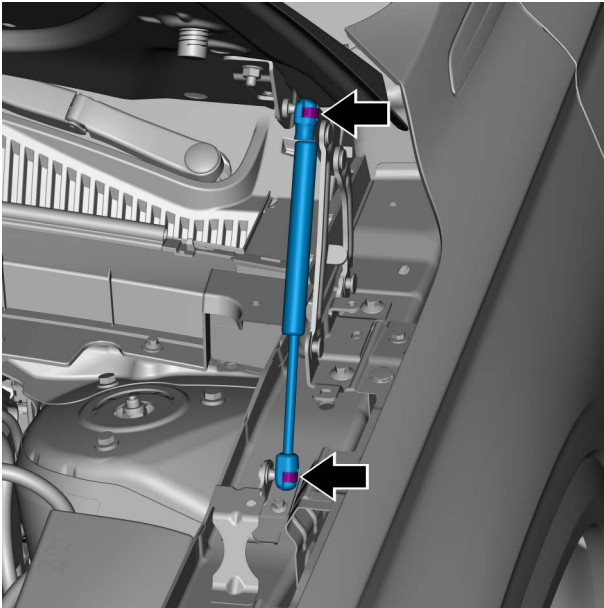
- 1 Install the 12 fixing clips of the engine hood sound/heat insulation pad.



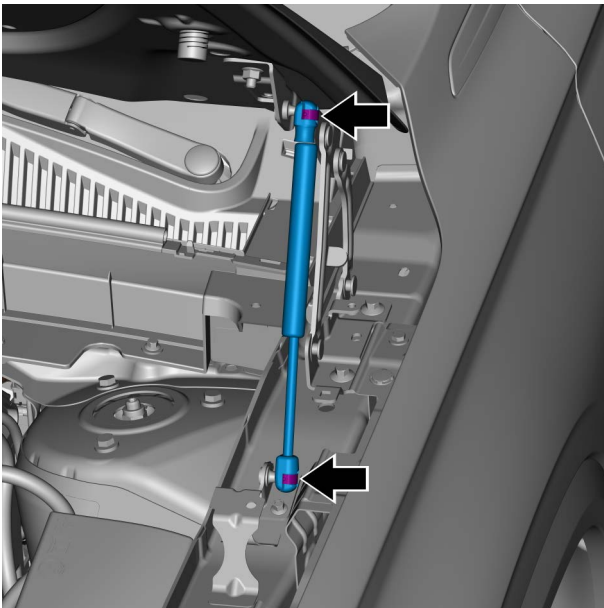
- 2 Close the engine hood.

13.2.3.4 Replacement of left engine hood air spring

Removal Procedure



- 1 Remove the left engine compartment trim panel, refer to [Replacement of left engine compartment trim panel](#).
- 2 Pry up the fixing clip of left engine hood air spring with a slotted screwdriver, disconnect the fixing ball joint, and take off the left engine hood air spring.



Installation Procedure

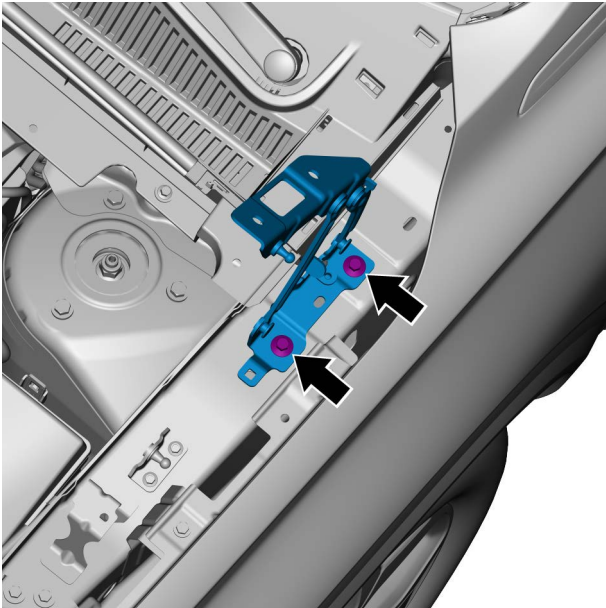
- 1 Install the left engine hood air spring with the air hood air spring mounting hole pressed into the fixing ball joint.

- 2 Install the left engine compartment trim panel.

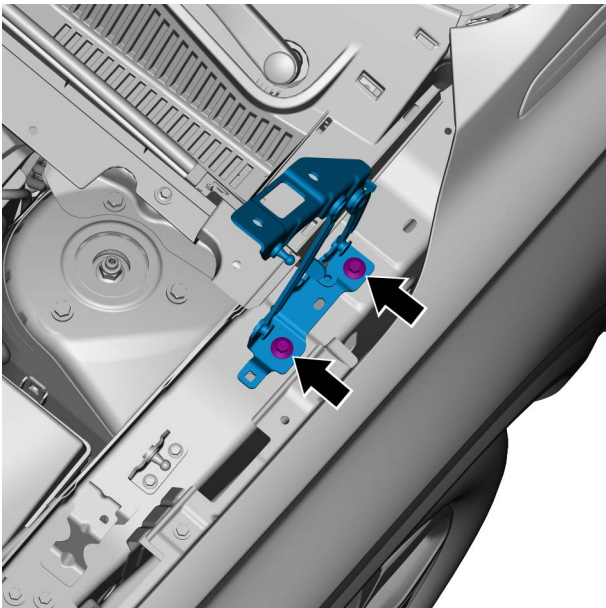
13.2.3.5 Replacement of engine hood left hinge assembly

Removal Procedure

- 1 Remove the engine hood assembly, refer to [Replacement of engine hood assembly](#).
- 2 Remove the left engine compartment trim panel, refer to [Replacement of left engine compartment trim panel](#).



- 3 Remove the left engine hood air spring, refer to [Replacement of left engine hood air spring](#).
- 4 Remove the 2 fixing bolts of engine hood left hinge assembly and take off the engine hood left hinge assembly.



Installation Procedure

- 1 Install the 2 fixing bolts of the engine hood left hinge assembly.

Torque: 24N·m

Caution

Adjust the hinge position and then tighten the bolts.

- 2 Install the left engine hood air spring.
- 3 Install the left engine compartment trim panel.
- 4 Install the engine hood assembly.

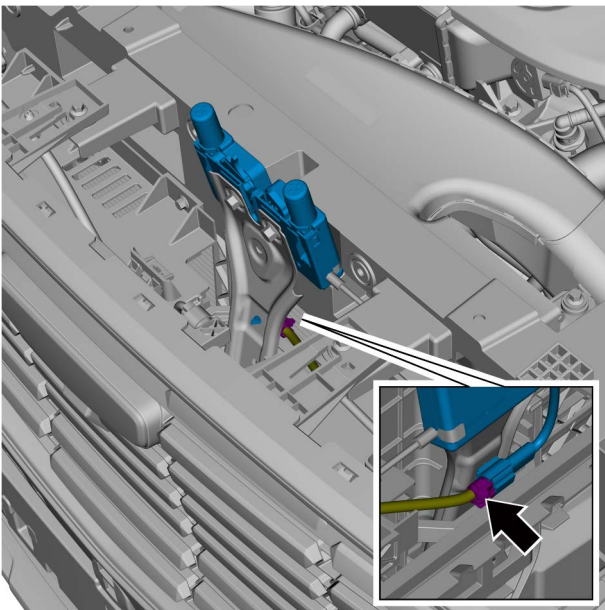
13.2.3.6 Replacement of engine hood latch

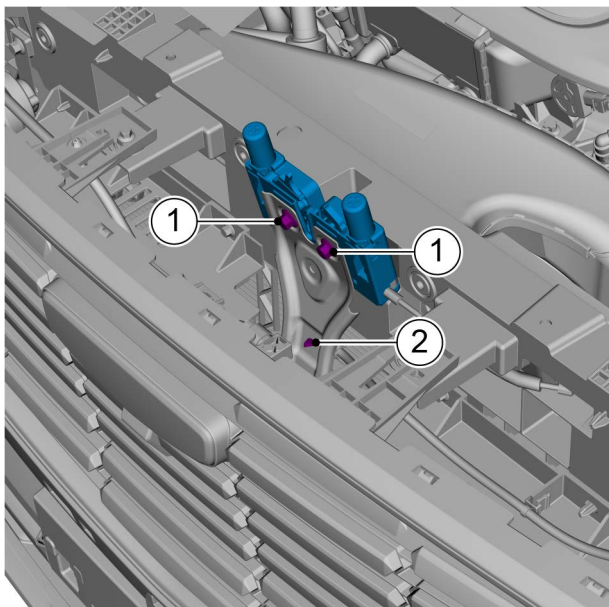
Removal Procedure

Warning !

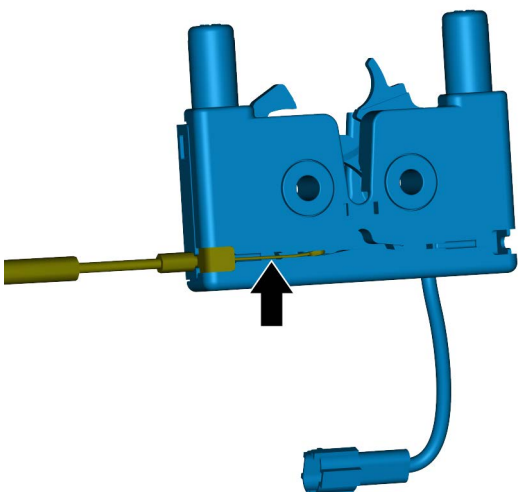
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left and right engine compartment trim panel, refer to [Replacement of left engine compartment trim panel](#).
- 3 Remove the engine compartment trim panel, refer to [Replacement of engine compartment trim panel](#).
- 4 Disconnect the engine hood latch harness connector.





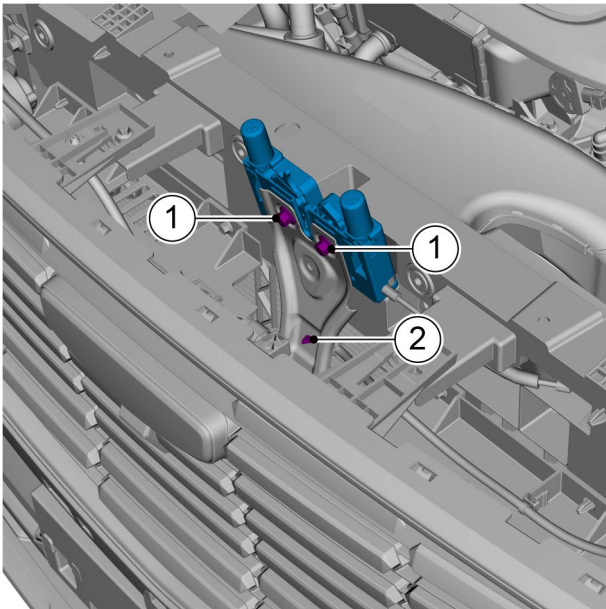
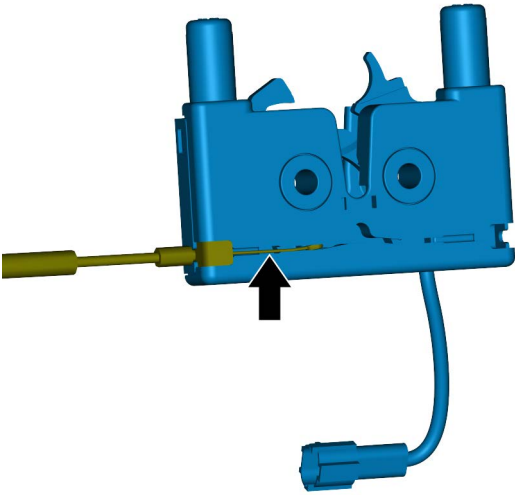
5 Remove the 2 fixing bolts 1 and harness clips 2 of engine hood latch



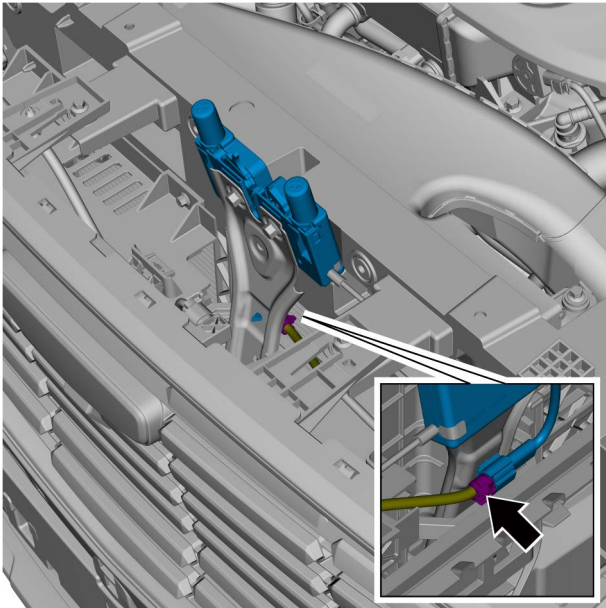
6 Remove the engine hood latch front cable and remove the engine hood latch.

Installation Procedure

- 1 Install the engine hood latch front cable.



- 2 Install the 2 fixing bolts 1 and harness clips 2 of engine hood latch
Torque: 24N·m



- 3 Connect the engine hood latch harness connector.

Caution

After installation, test the engine hood cable function to see if it can be pulled easily and open the engine hood, and if the engine hood lock and latch snap together securely without tilting or shifting when the engine hood is closed.

- 4 Install the front bumper assembly.
- 5 Install the engine compartment trim panel.
- 6 Install the left and right engine compartment trim panel.
- 7 Connect the negative cable of battery.

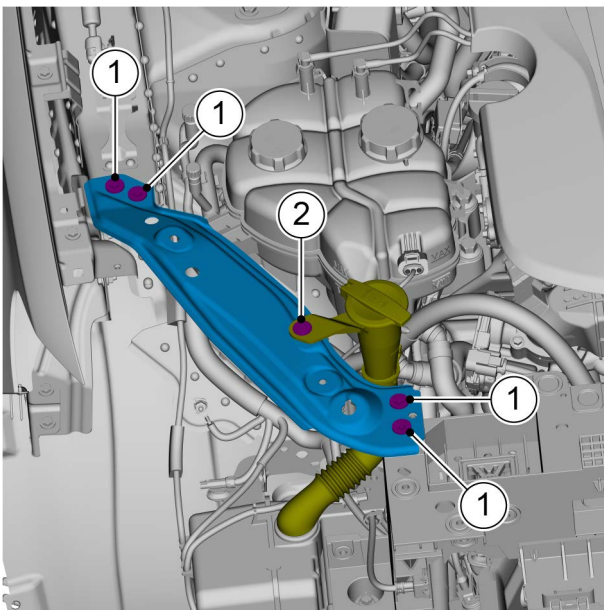
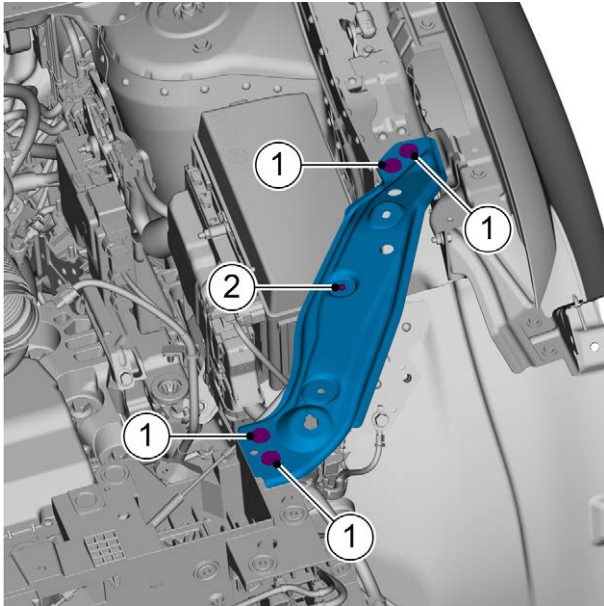
13.2.3.7 Replacement of front end module assembly

Removal Procedure

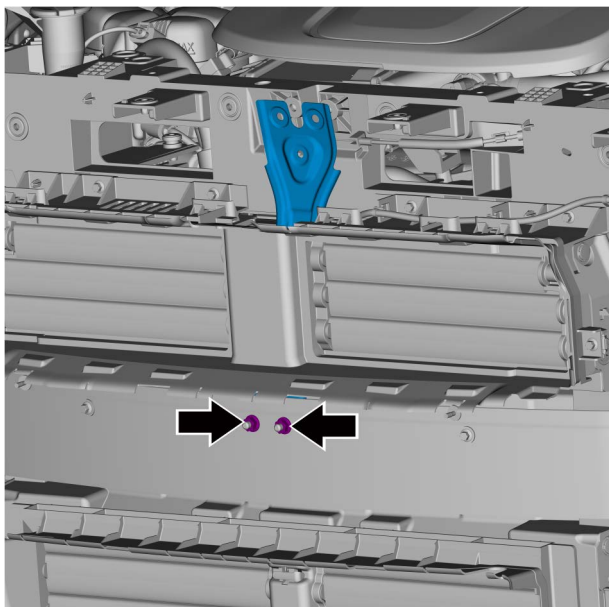
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

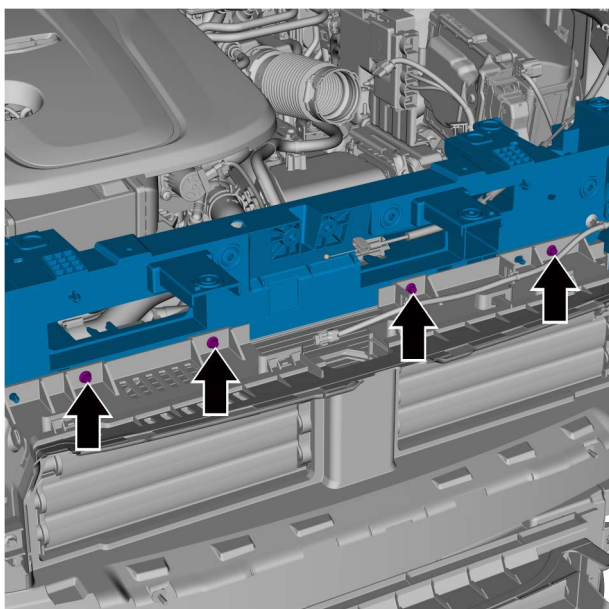
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left and right engine compartment trim panel, refer to [Replacement of left engine compartment trim panel](#).
- 3 Remove the engine compartment trim panel, refer to [Replacement of engine compartment trim panel](#).
- 4 Remove the front bumper assembly, refer to [Replacement of front bumper assembly](#).
- 5 Remove the engine hood latch, refer to [Replacement of engine hood latch](#).
- 6 Remove the headlight unit (left front), refer to [Replacement of headlight unit \(left front\)](#).
- 7 Remove the tweeter, refer to [Replacement of tweeter](#).
- 8 Remove the woofer, refer to [Replacement of woofer](#).



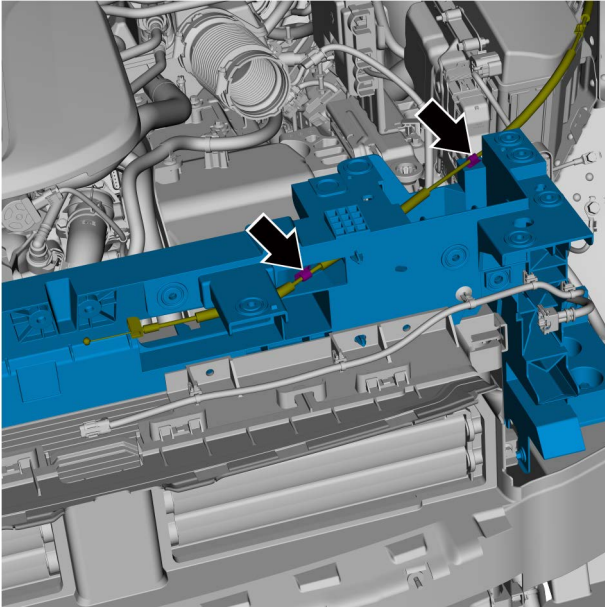
- 9 Remove the air filter intake pipe assembly. refer to [Replacement of air filter intake pipe assembly](#).
- 10 Remove the air filter assembly, refer to [Replacement air filter assembly](#).
- 11 Remove the 4 fixing bolts 1 from the left headlamp cross beam.
- 12 Remove the engine hood latch front cable fixing clip 2.
- 13 Remove the 4 fixing bolts 1 from the right headlamp cross beam.
- 14 Remove the window washer filler tube with lid assembly fixing clips 2.



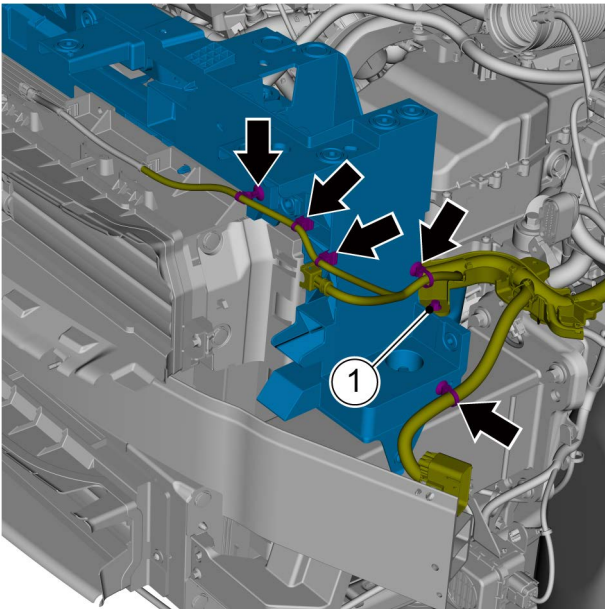
- 15 Remove the 2 fixing nuts of front end module bracket and remove the front end module bracket.



- 16 Remove the front end module 4 fixing bolts.

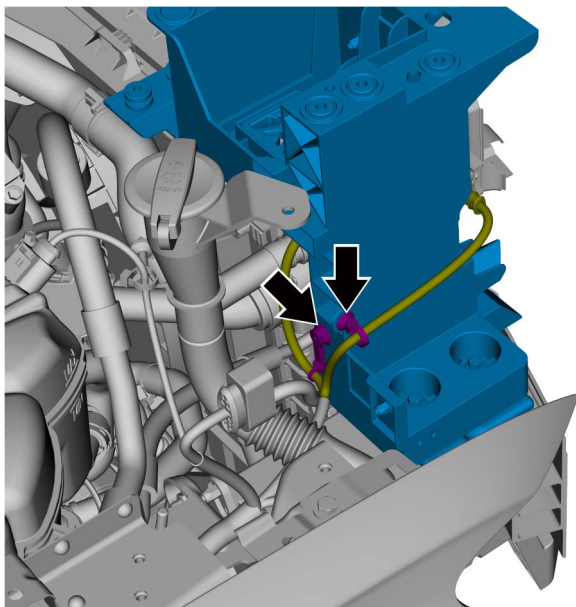


17 Remove the engine hood latch front cable 2 fixing clips.

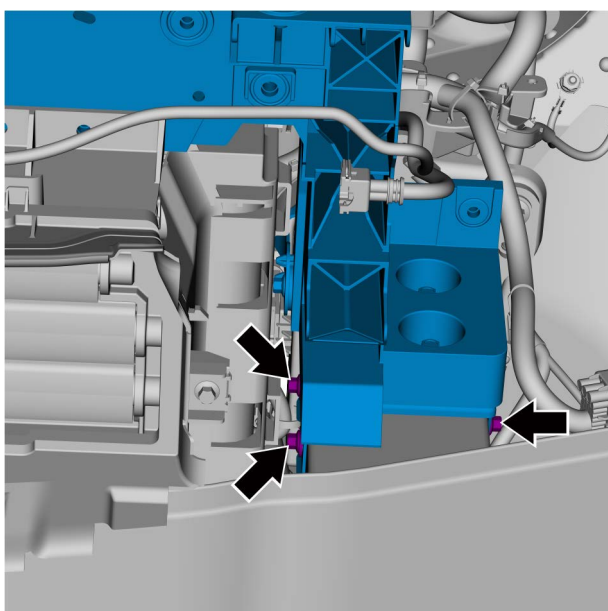


18 Remove the 5 harness clips on the left side of the front end module assembly.

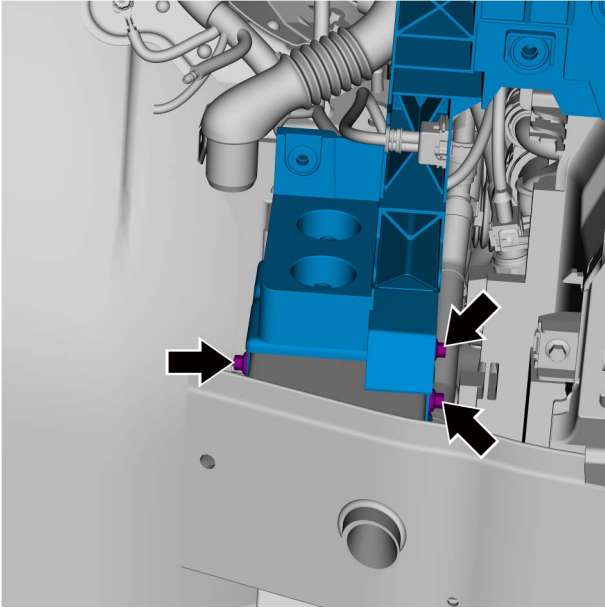
19 Remove the engine compartment harness fixing nut 1.



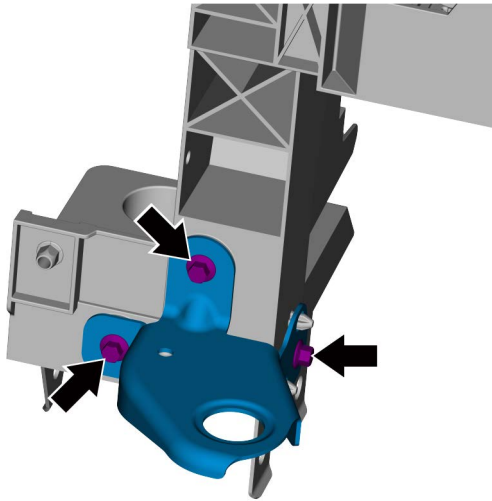
20 Remove the 2 harness clips on the right side of the front end module assembly.



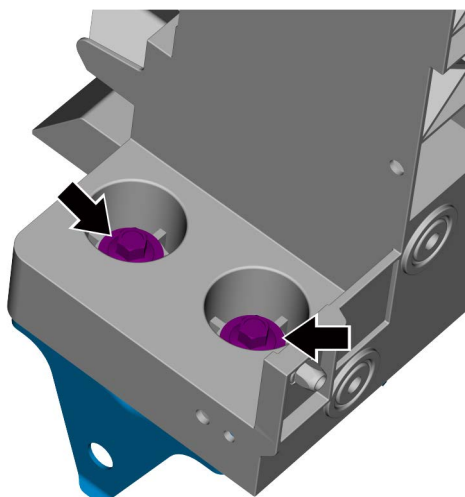
21 Remove the 3 fixing bolts on the left side of the front end module assembly.



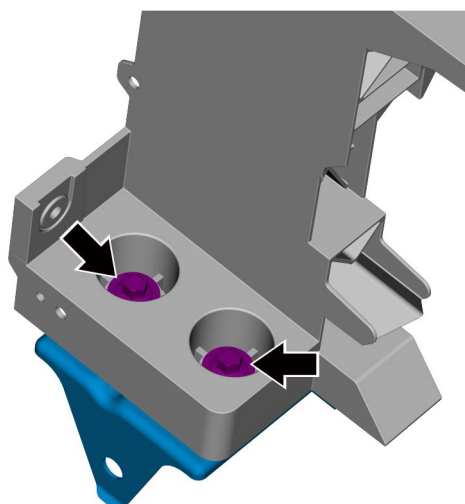
- 22 Remove the 3 fixing bolts on the right side of the front end module assembly and remove the front end module assembly.



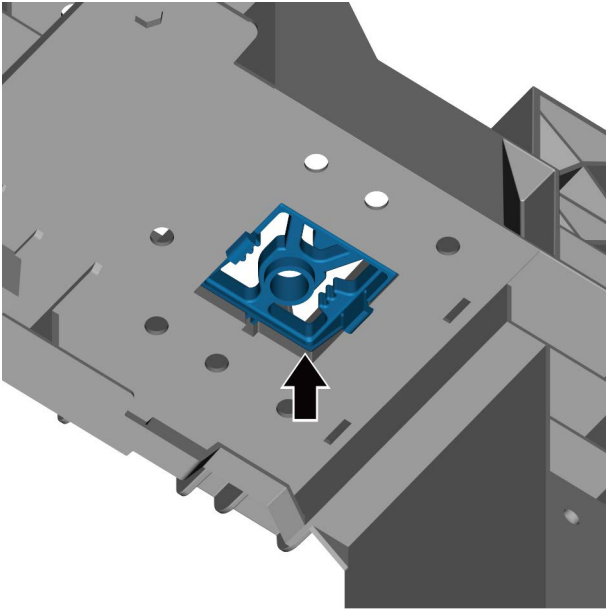
- 23 Remove the 3 fixing bolts of air filter lower mounting bracket.



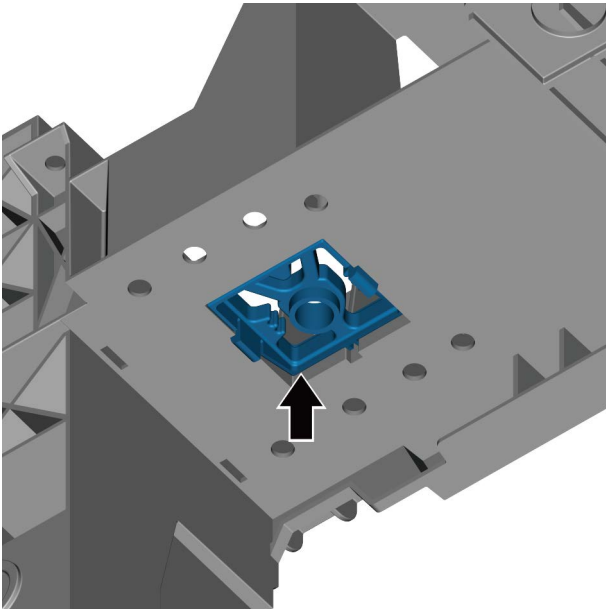
- 24 Remove the 2 fixing bolts of the front end module left bracket and remove the left bracket.



- 25 Remove the 2 fixing bolts of the front end module right bracket and remove the right bracket.

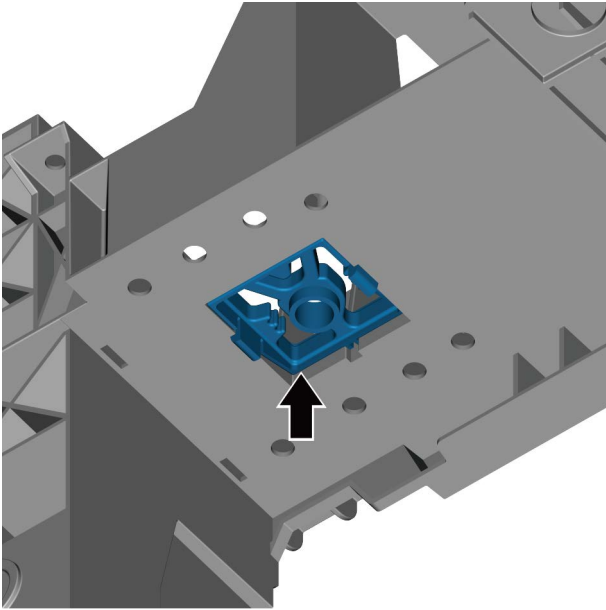


26 Remove the upper cushion of the right radiator.

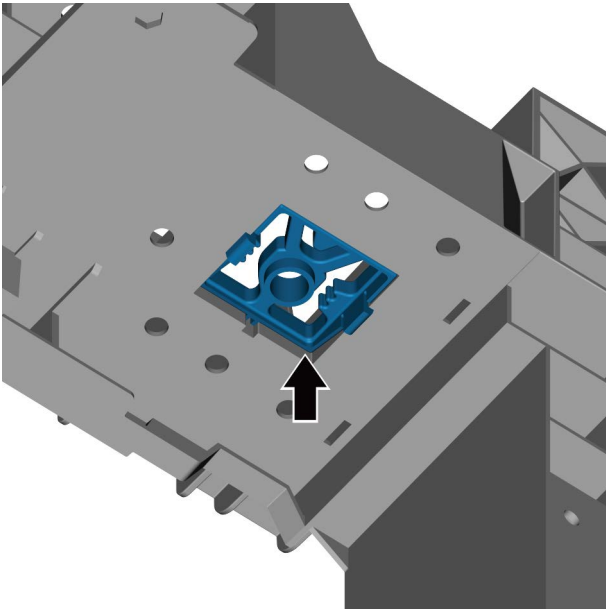


27 Remove the upper cushion of the left radiator.

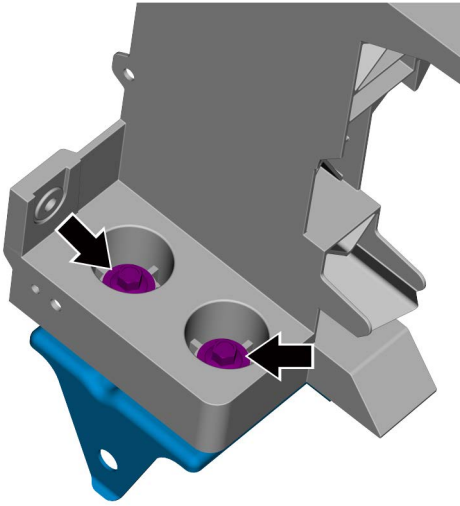
Installation Procedure



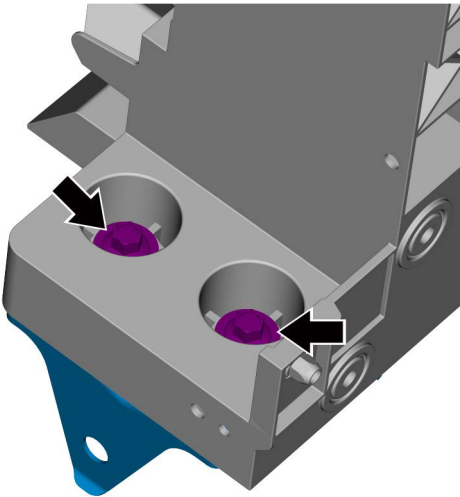
1 Install the left radiator upper cushion.



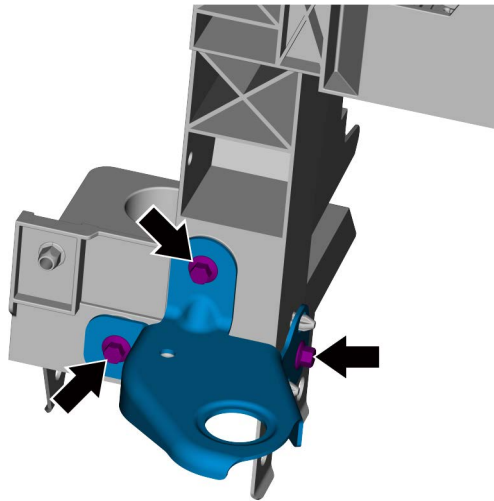
2 Install the right radiator upper cushion.



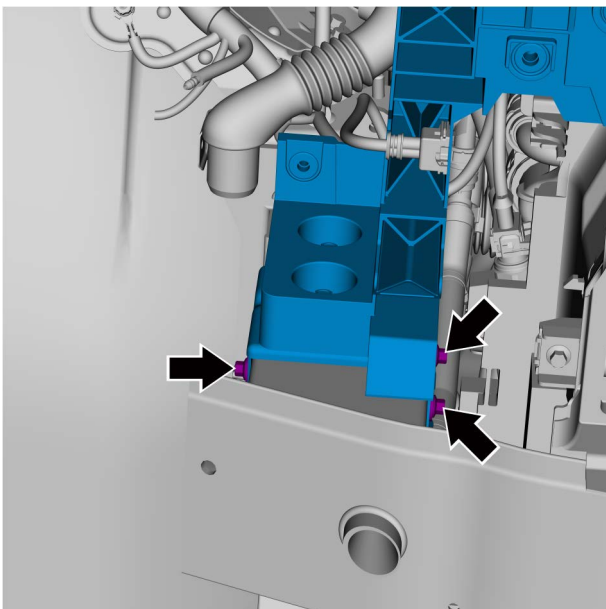
- 3 Install the right front end module bracket and tighten the bolts.



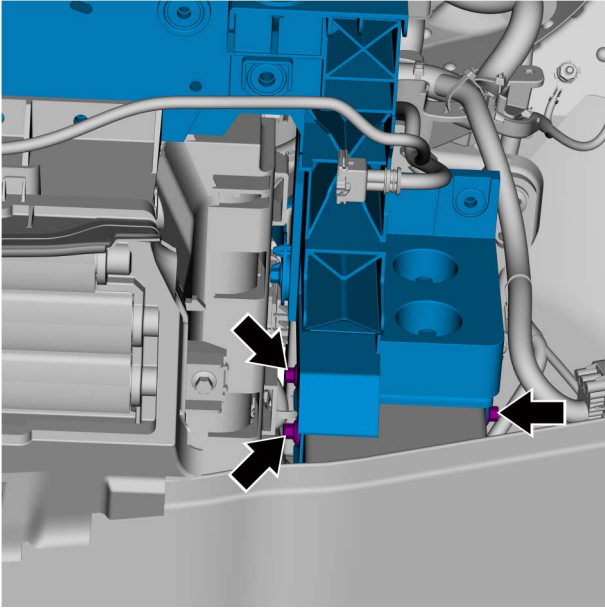
- 4 Install the left front end module bracket and tighten bolts.



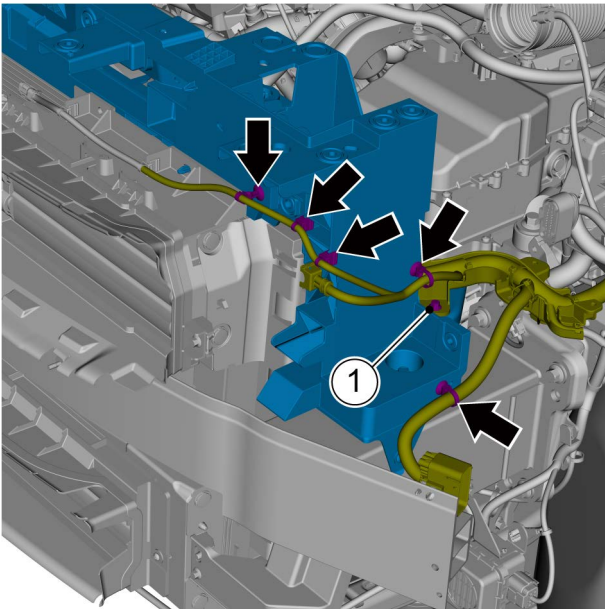
- 5 Install the 3 fixing bolts of air filter lower mounting bracket.
Torque: 8N·m



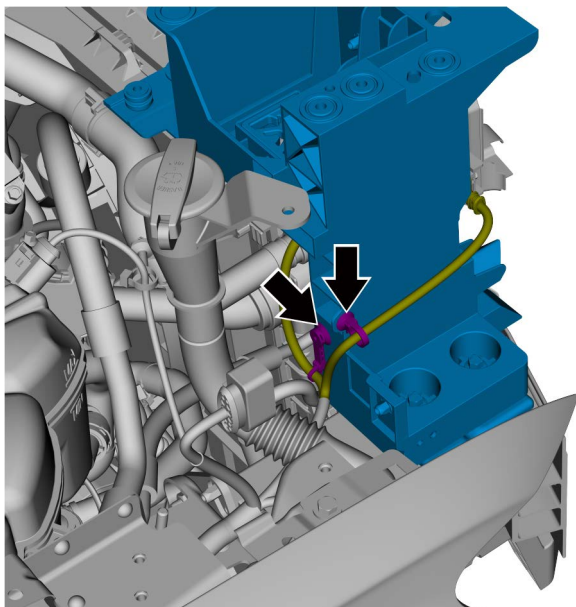
- 6 Install the 3 fixing bolts at the right side of front end module assembly.
Torque: 10N·m



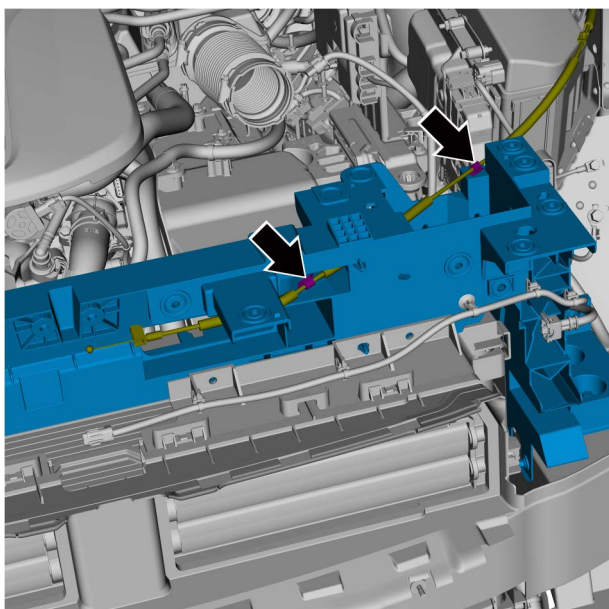
- 7 Install the 3 fixing bolts on the left side of the front end module assembly.
Torque: 10N·m



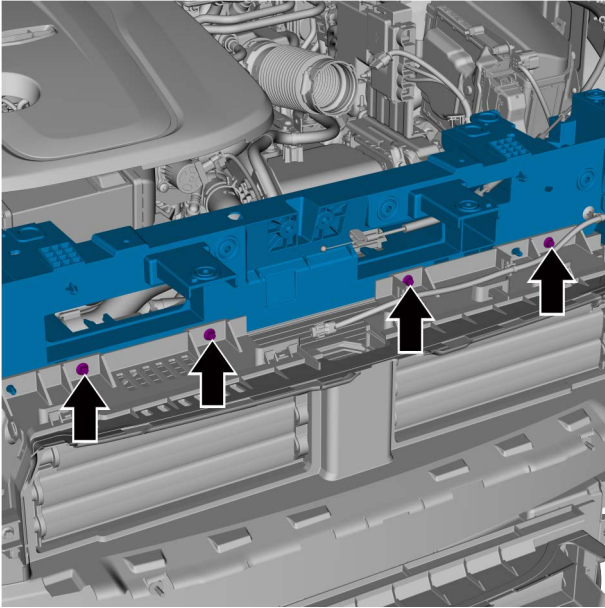
- 8 Install the engine compartment harness fixing nut 1.
Torque: 10N·m
- 9 Install the 5 harness clips on the left side of the front end module assembly.



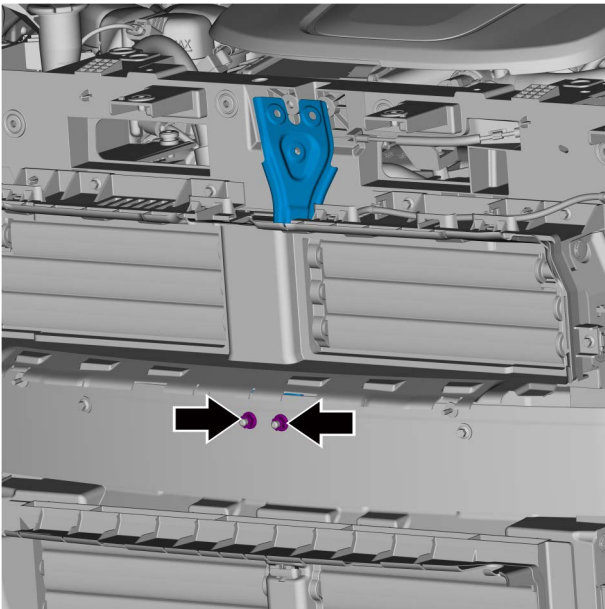
- 10 Install the 2 harness clips on the right side of the front end module assembly.



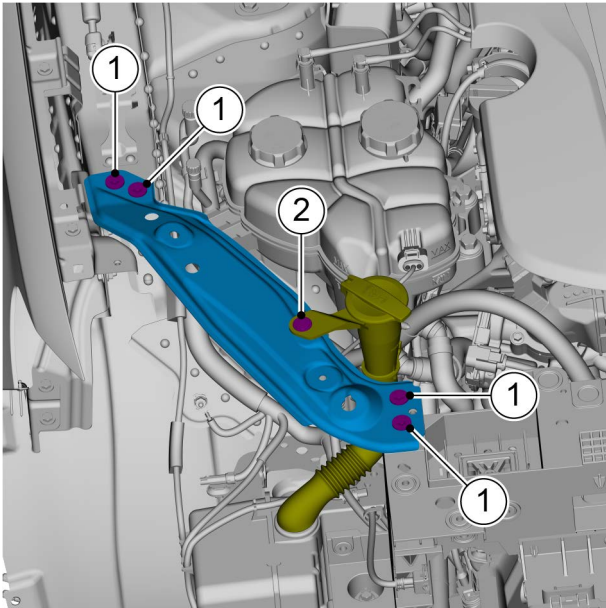
- 11 Install the engine hood latch front cable 2 fixing clips.



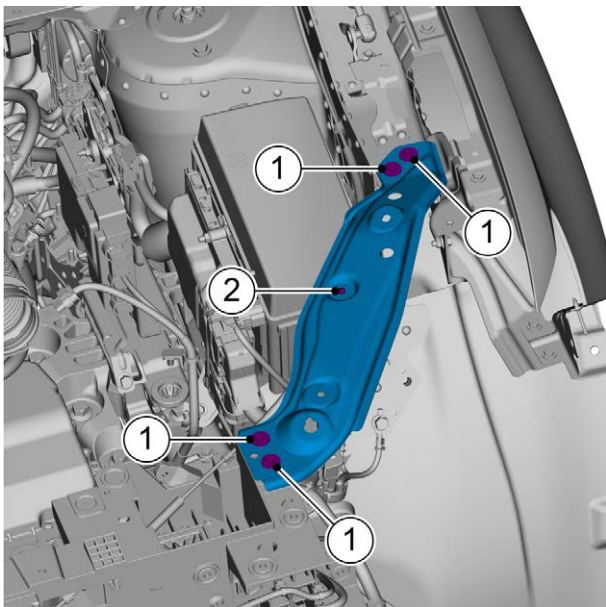
- 12 Install the 4 fixing bolts of the front end module.
Torque: 10N·m



- 13 Install the front end module bracket and tighten 2 nuts.
Torque: 24N·m



- 14 Install the 4 fixing bolts 1 of the right headlamp cross beam.
Torque: 10N·m
- 15 Install the window washer filler tube with lid assembly fixing clips 2.



- 16 Install the 4 fixing bolts 1 from the left headlamp cross beam.
Torque: 10N·m
- 17 Install the engine hood latch front cable fixing clip 2.

- 18 Install the air filter assembly.
- 19 Install the air filter intake pipe assembly.
- 20 Install the woofer.
- 21 Install the tweeter.
- 22 Install the left headlight unit (right front).
- 23 Install the engine hood latch.
- 24 Install the front bumper assembly.
- 25 Install the engine compartment trim panel.
- 26 Install the left and right engine compartment trim panel.
- 27 Connect the negative cable of battery.

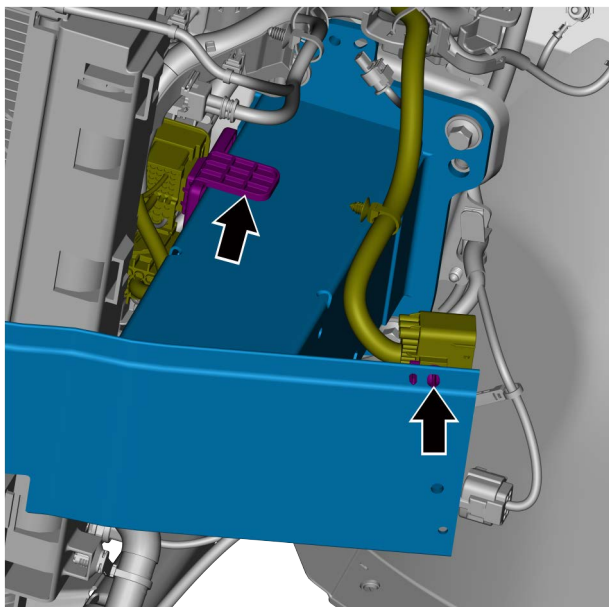
13.2.3.8 Replacement of front anti-collision cross beam assembly

Removal Procedure

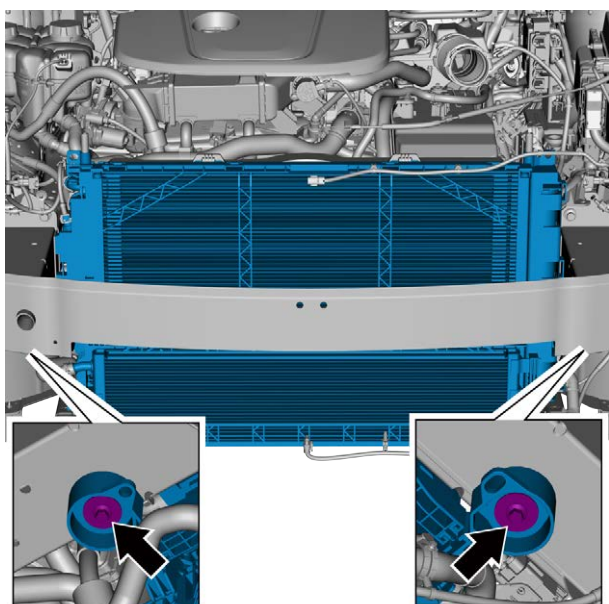
Warning !

Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#)

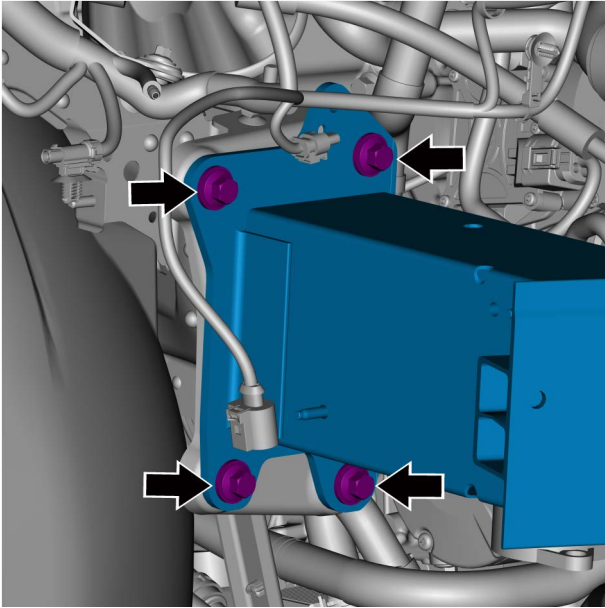
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left and right engine compartment trim panel, refer to [Replacement of left engine compartment trim panel](#).
- 3 Remove the engine compartment trim panel, refer to [Replacement of engine compartment trim panel](#).
- 4 Remove the front bumper assembly, refer to [Replacement of front bumper assembly](#).
- 5 Remove the engine hood latch, refer to [Replacement of engine hood latch](#).
- 6 Remove the headlight unit (left front), refer to [Replacement of headlight unit \(left front\)](#).
- 7 Remove the tweeter, refer to [Replacement of tweeter](#).
- 8 Remove the woofer, refer to [Replacement of woofer](#).
- 9 Remove the air filter intake pipe assembly. refer to [Replacement of air filter intake pipe assembly](#).
- 10 Remove the air filter assembly, refer to [Replacement air filter assembly](#).
- 11 Remove the front end module assembly, refer to [Replacement of front end module assembly](#).
- 12 Remove the cleaning agent box, refer to [Replacement of cleaning agent box](#).
- 13 Remove the left and right impact sensor (front), refer to [Replacement of impact sensor \(front\)](#).
- 14 Remove the intake grille shutter module, refer to [Replacement of intake grille shutter module](#).
- 15 Remove the external sound module, refer to [Replacement of external sound module](#).



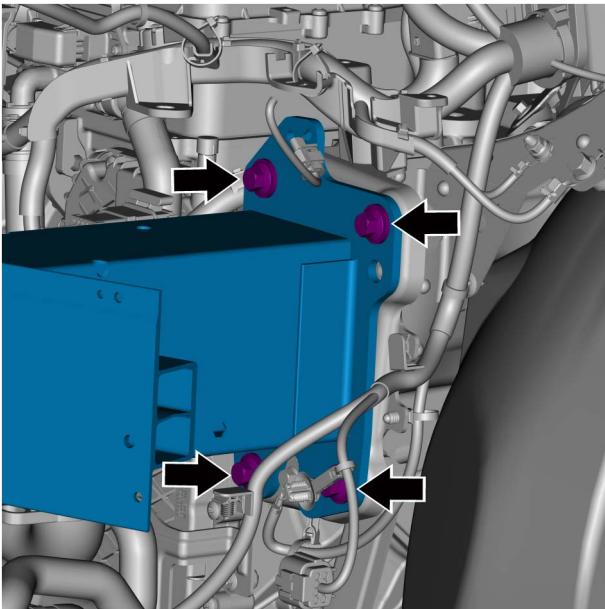
- 16 Remove the 2 harness clips on the left side of the front anti-collision cross beam assembly.



- 17 Support the front cooling module with a suitable tool and remove the 2 fixing bolts of cooling module.

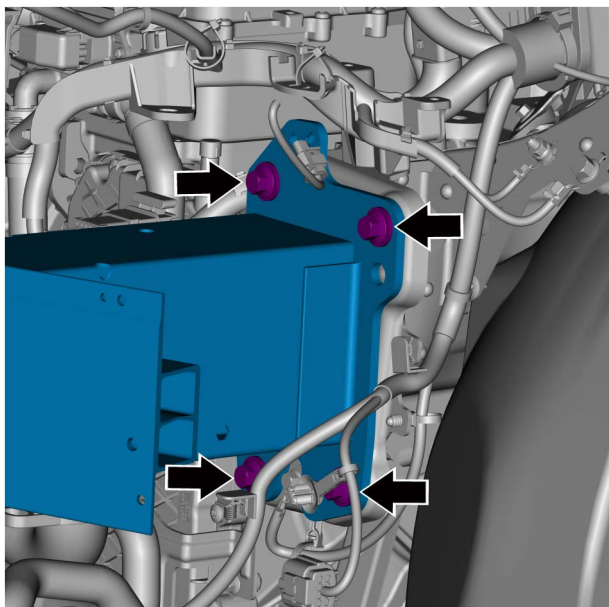


- 18 Remove the 4 fixing bolts on the right side of the front anti-collision cross beam assembly.



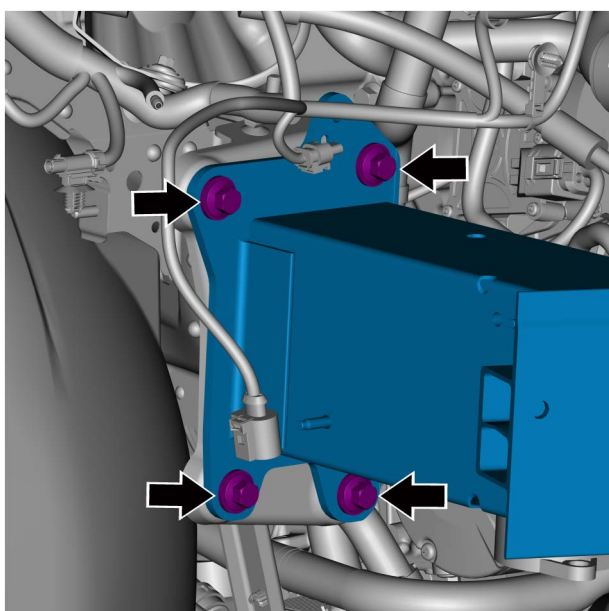
- 19 Remove the 4 fixing bolts on the left side of the front anti-collision cross beam assembly and remove the front anti-collision cross beam assembly.

Installation Procedure



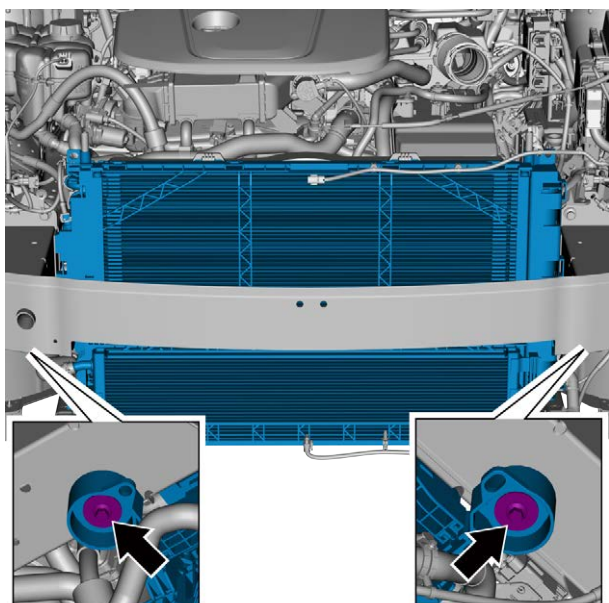
- 1 Install the 4 fixing bolts on the left side of the front anti-collision cross beam assembly.

Torque: 60N·m



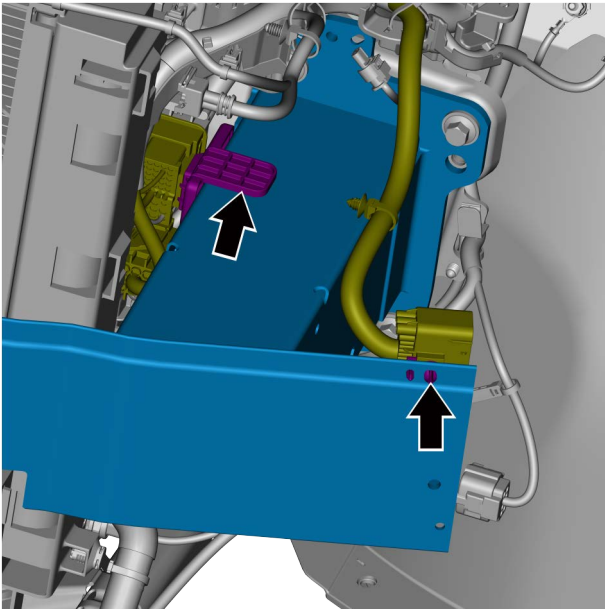
- 2 Install the 4 fixing bolts on the right side of the front anti-collision cross beam assembly.

Torque: 60N·m



- 3 Install the 2 fixing bolts of the cooling module.

Torque: 24N·m



- 4 Install the 2 harness clips on the left side of the front anti-collision cross beam assembly.

- 5 Install the external sound module.
- 6 Install the intake grille shutter module.
- 7 Install left and right impact sensor (front).
- 8 Install the cleaning agent box.
- 9 Install the front end module assembly.
- 10 Install the air filter assembly.
- 11 Install the air filter intake pipe assembly.
- 12 Install the woofer.
- 13 Install the tweeter.
- 14 Install the left headlight unit (right front).
- 15 Install the engine hood latch.
- 16 Install the front bumper assembly.
- 17 Install the engine compartment trim panel.
- 18 Install the left and right engine compartment trim panel.
- 19 Connect the negative cable of battery.

13.2.3.9 Replacement of intake grille shutter module

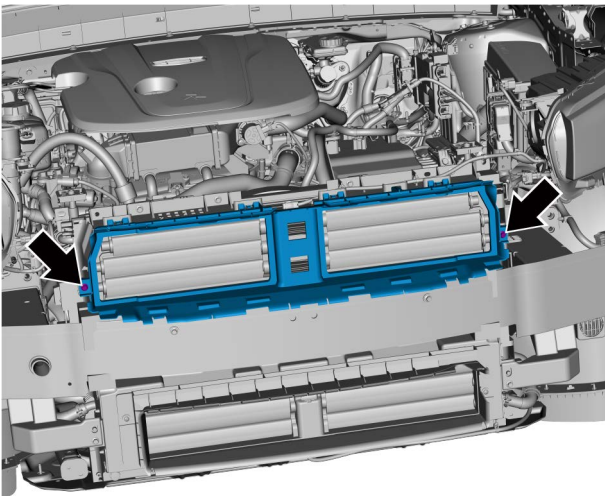
Removal Procedure

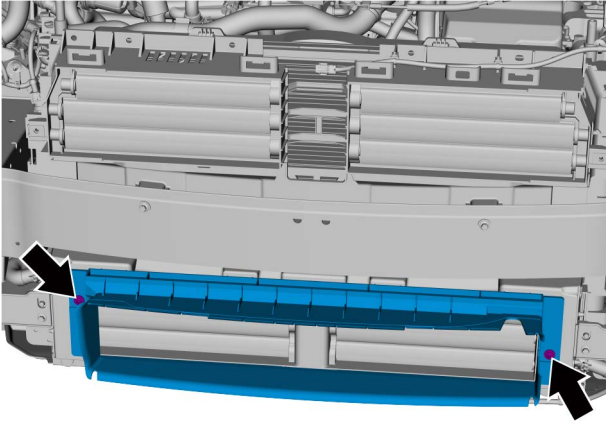
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

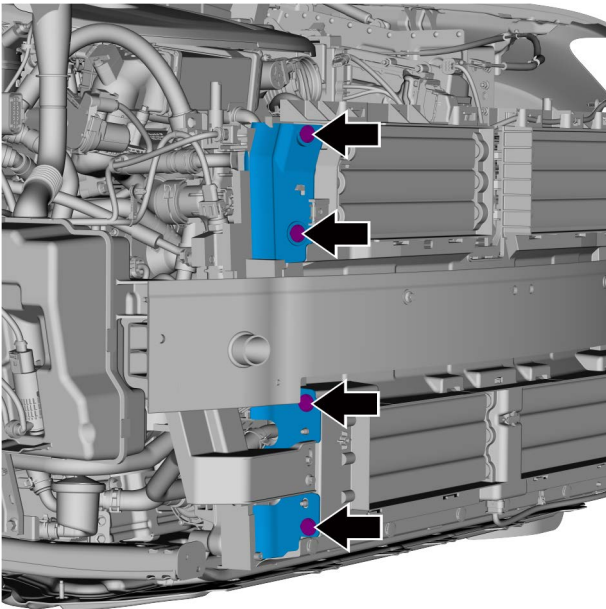
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

- 2 Remove the left and right engine compartment trim panel, refer to [Replacement of left engine compartment trim panel](#).
- 3 Remove the engine compartment trim panel, refer to [Replacement of engine compartment trim panel](#).
- 4 Remove the front bumper assembly, refer to [Replacement of front bumper assembly](#).
- 5 Remove the engine hood latch, refer to [Replacement of engine hood latch](#).
- 6 Remove the headlight unit (left front), refer to [Replacement of headlight unit \(left front\)](#).
- 7 Remove the tweeter, refer to [Replacement of tweeter](#).
- 8 Remove the woofer, refer to [Replacement of woofer](#).
- 9 Remove the air filter intake pipe assembly. refer to [Replacement of air filter intake pipe assembly](#).
- 10 Remove the air filter assembly, refer to [Replacement air filter assembly](#).
- 11 Remove the front end module assembly, refer to [Replacement of front end module assembly](#).
- 12 Remove the 2 fixing bolts of the active intake grille upper assembly, and remove the active intake grille upper assembly.

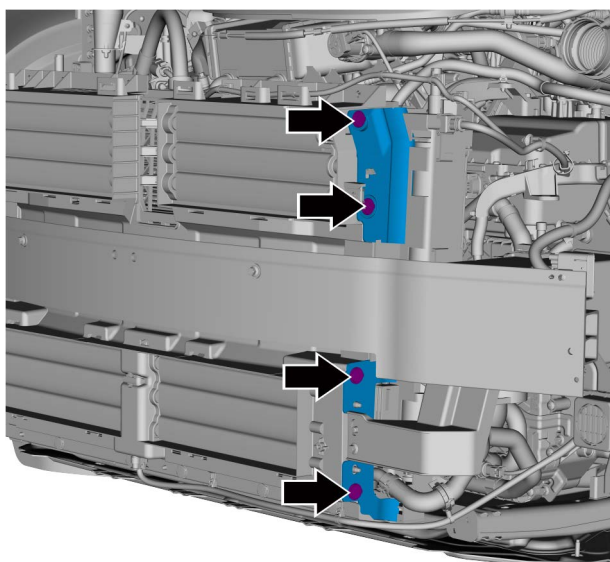




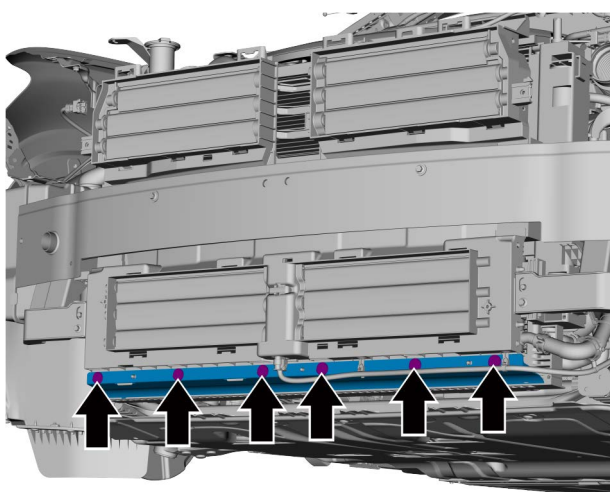
- 13 Remove the 2 fixing screws of the active intake grille lower assembly and remove the active intake grille lower assembly.



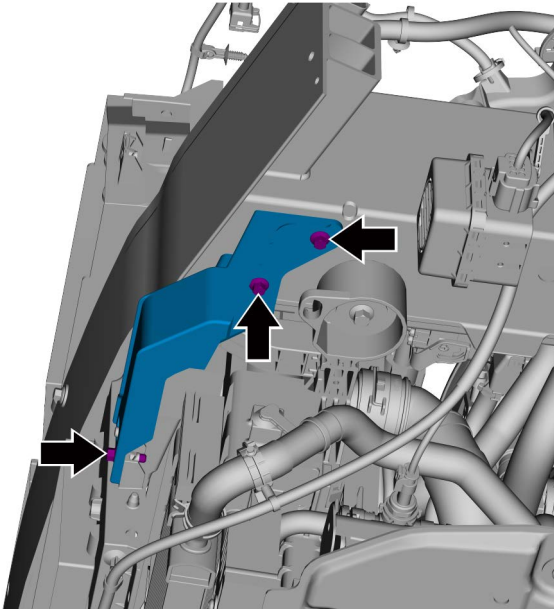
- 14 Remove the 4 fixing clips of the active intake grille right deflector, and take off the active intake grille right deflector.



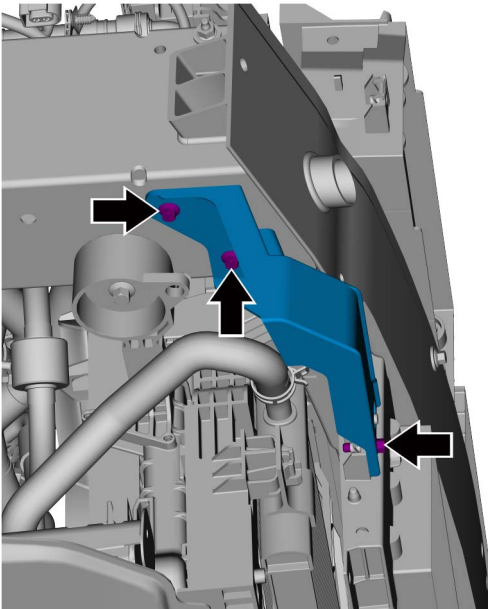
- 15 Remove 4 fixing clips of the active intake grille left deflector and take off the active intake grille left deflector.



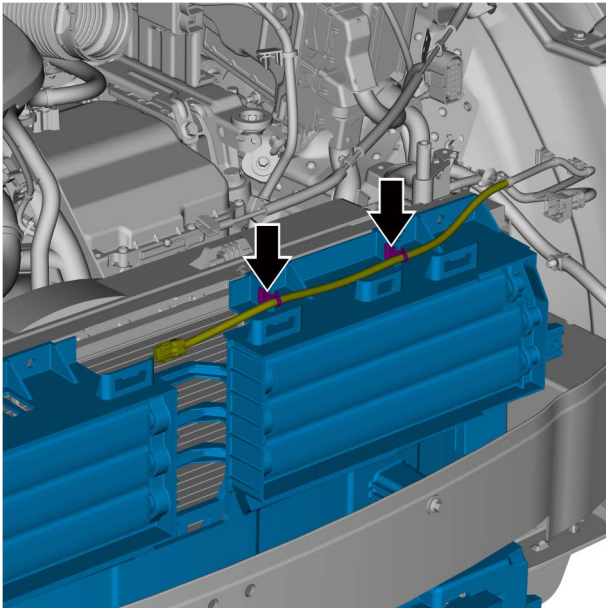
- 16 Remove the 6 fixing clips of the active intake grille lower deflector and take off the active intake grille lower deflector.



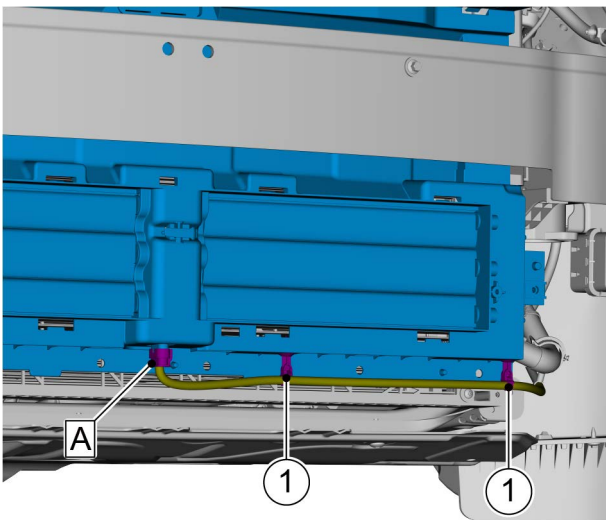
- 17 Remove the 3 fixing bolts of intake grille shutter module mounting bracket and take off the intake grille shutter module mounting bracket.



- 18 Remove the 3 fixing bolts of intake grille shutter module mounting bracket and take off the intake grille shutter module mounting bracket.

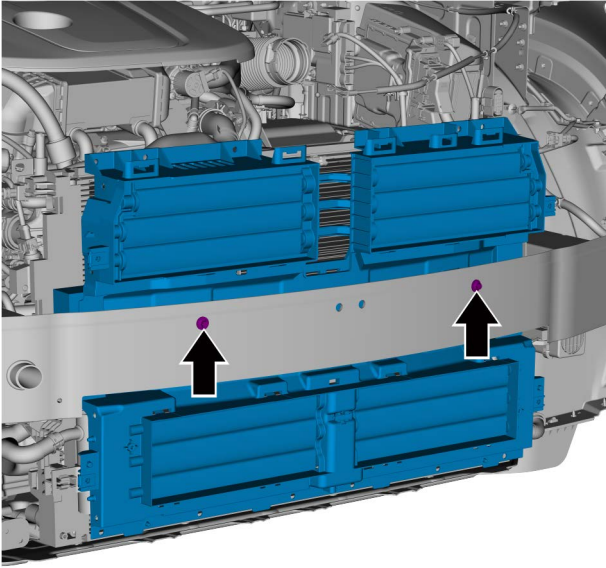


19 Remove 2 harness clips.



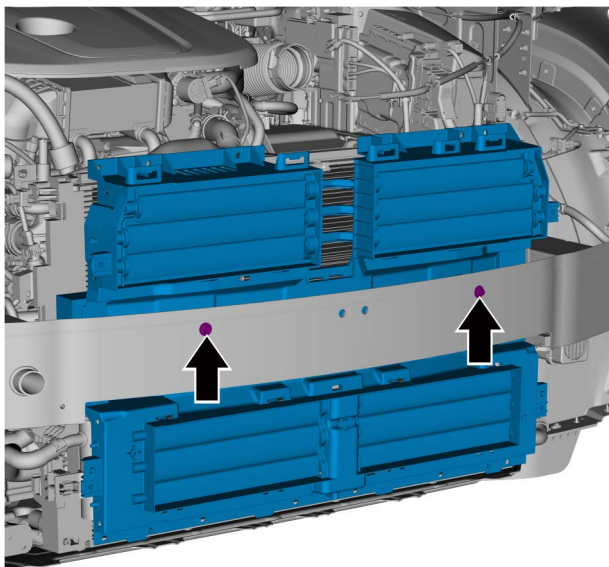
20 Disconnect harness connector A of intake grille shutter module.

21 Remove 2 harness clips 1.

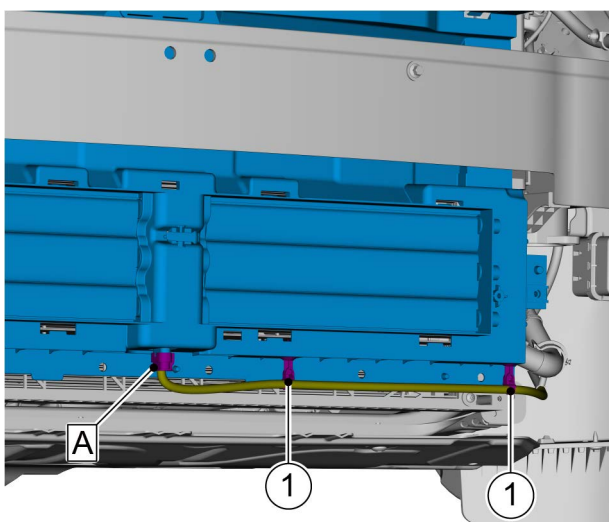


- 22 Remove the 2 fixing bolts of intake grille shutter module and take off the intake grille shutter module.

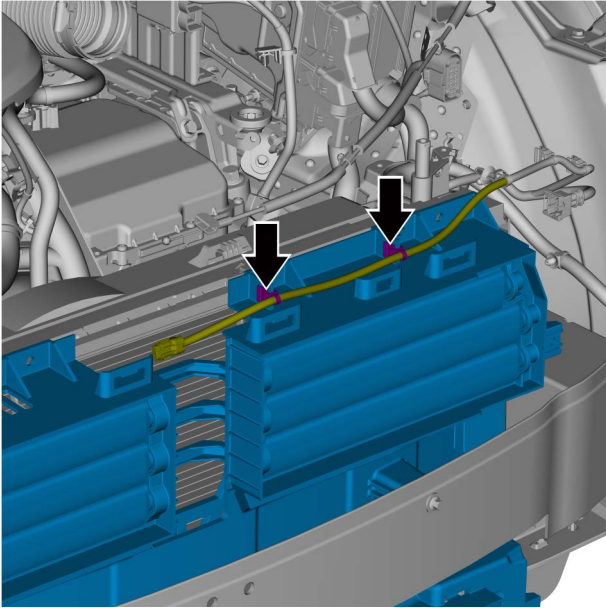
Installation Procedure



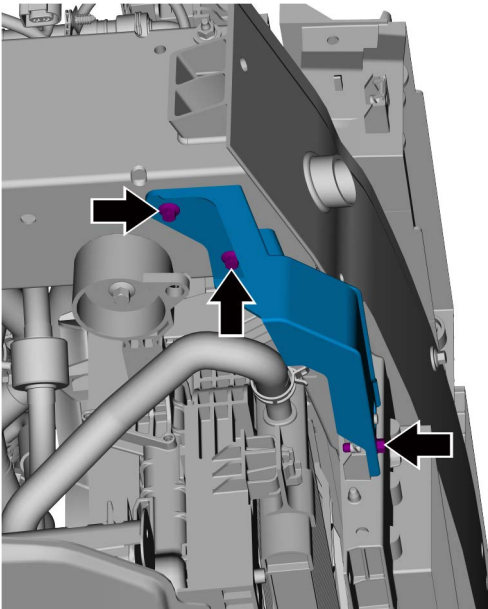
- 1 Install the intake grille shutter module and tighten the 2 bolts.
Torque: 6N·m



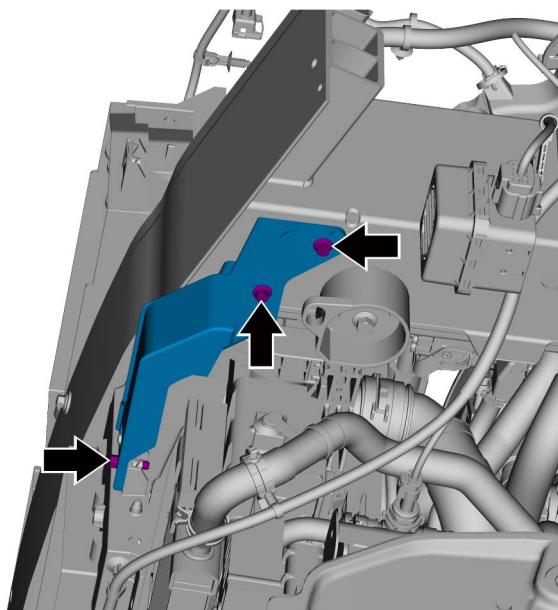
- 2 Install the 2 fixing clips 1.
- 3 Connect harness connector A of intake grille shutter module.



- 4 Install 2 harness clips.

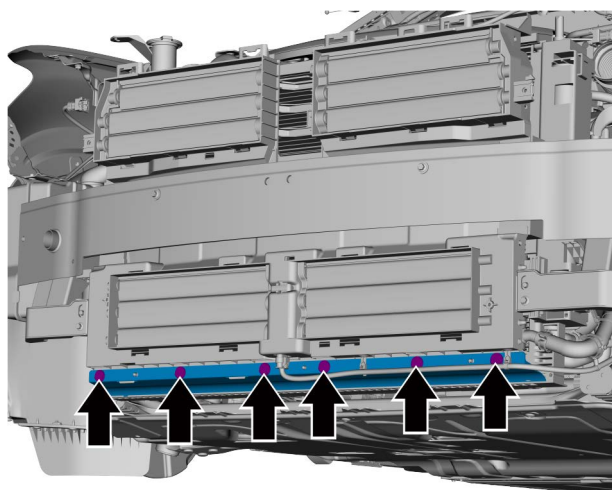


- 5 Install the intake grille shutter module mounting bracket and tighten the 3 bolts.
Torque: 6N·m

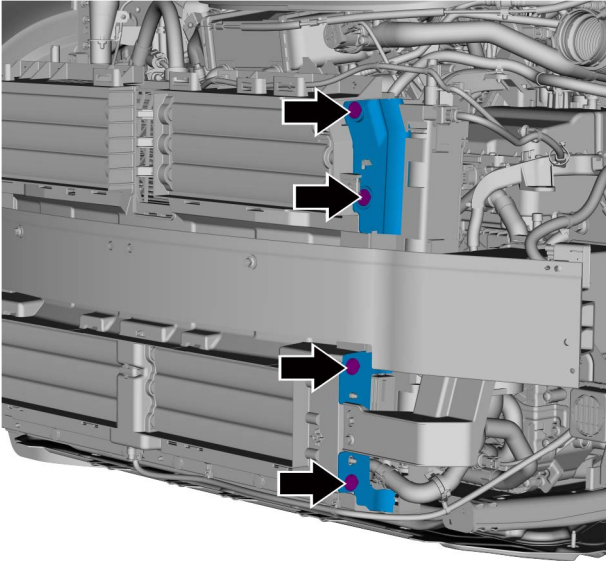


- 6 Install the intake grille shutter module mounting bracket and tighten the 3 bolts.

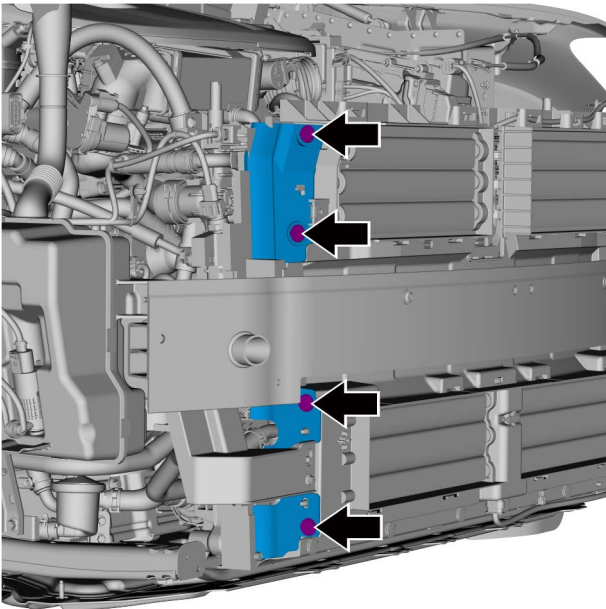
Torque: 6N·m



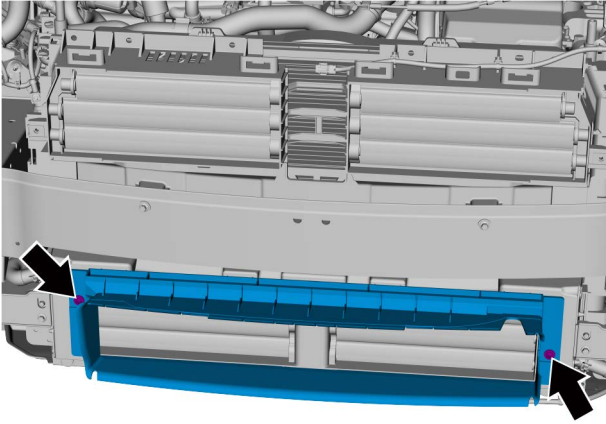
- 7 Install the active intake grille lower deflector and tighten the clips.



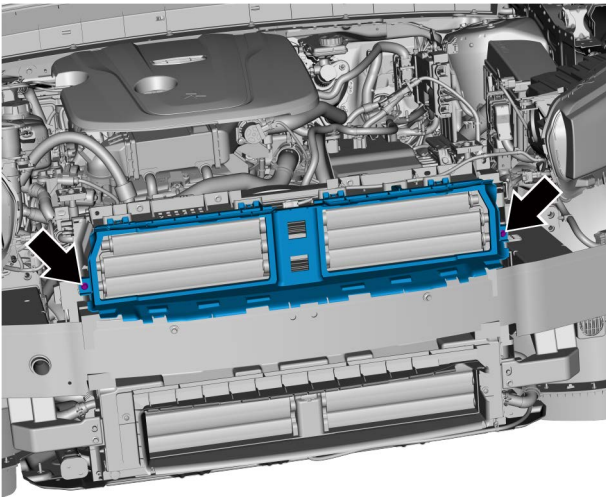
- 8 Install the active intake grille left deflector and tighten the clips.



- 9 Install the active intake grille right deflector and tighten the clips.



- 10 Install the active intake grille lower assembly and tighten the 2 screws.
Torque: 3N·m



- 11 Install the active intake grille upper assembly and tighten the 2 bolts.
Torque: 3N·m

- 12 Install the front end module assembly.
- 13 Install the air filter assembly.
- 14 Install the air filter intake pipe assembly.
- 15 Install the woofer.
- 16 Install the tweeter.
- 17 Install the left headlight unit (right front).
- 18 Install the engine hood latch.
- 19 Install the front bumper assembly.
- 20 Install the engine compartment trim panel.
- 21 Install the left and right engine compartment trim panel.
- 22 Connect the negative cable of battery.

13.3 Body Rear End

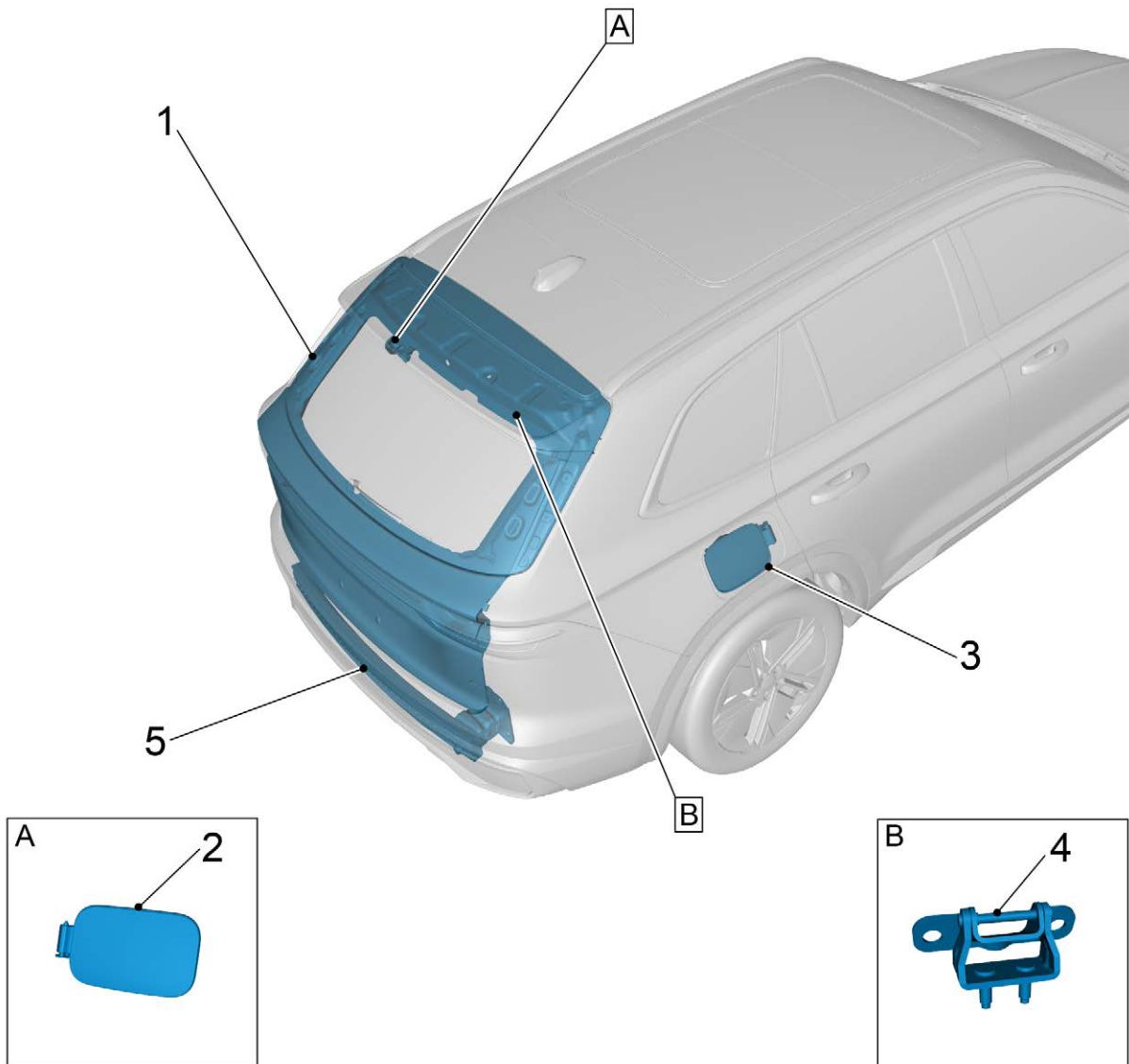
13.3.1 Specification

13.3.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Fixing bolt of trunk door hinge	M8×20	20-28
Fixing nut of trunk door hinge	M8×10.2	25-35
Fixing bolt of rear anti-collision cross beam assembly	M10×10	41-55
Fixing bolt of trunk door ground harness	M8×25	8-12

13.3.2 Part position

13.3.2.1 Part position



1. Trunk door body assembly
2. Electric vehicle DC socket cover
3. Fuel filler cap assembly

4. Trunk door hinge
5. Rear anti-collision cross beam assembly

13.3.3 Removal and Installation

13.3.3.1 Replacement of trunk door body assembly

Removal Procedure

Warning !

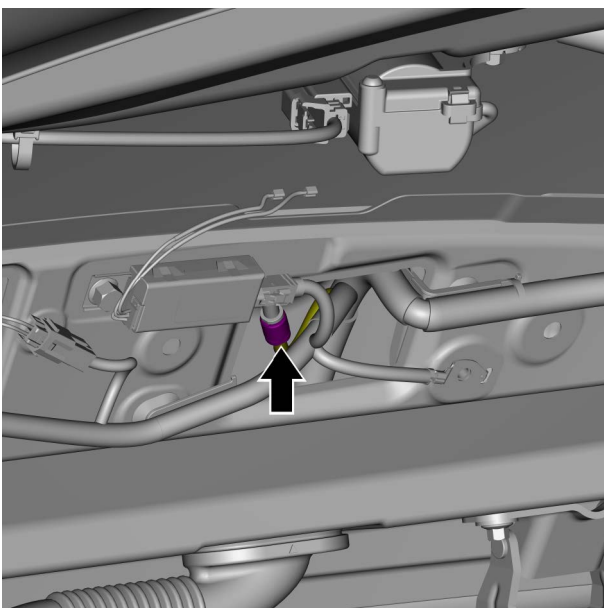
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

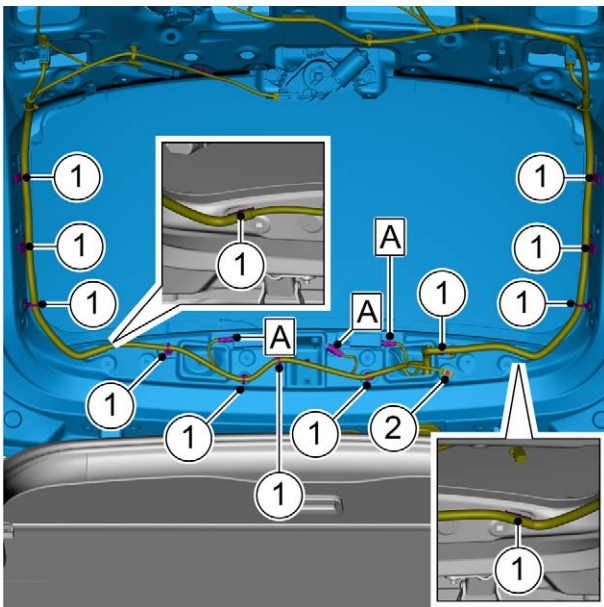
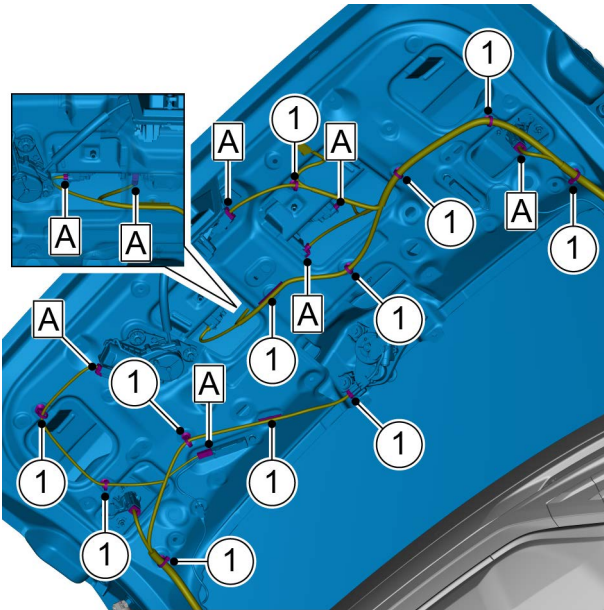
Caution

Two people must work together when removing the trunk door assembly.

When removing the trunk door assembly, the position of trunk door assembly and hinge must be marked for positioning during installation.

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the trunk door middle upper interior trim panel assembly, refer to [Replacement of trunk door middle upper interior trim panel assembly](#).
- 3 Remove the trunk door left upper interior trim panel assembly, refer to [Replacement of trunk door left upper interior trim panel assembly](#).
- 4 Remove the trunk door lower interior trim panel assembly, refer to [Replacement of trunk door lower interior trim panel assembly](#).
- 5 Remove spoiler assembly, refer to [Replacement of spoiler assembly](#).
- 6 Remove the rear washer hose assembly.



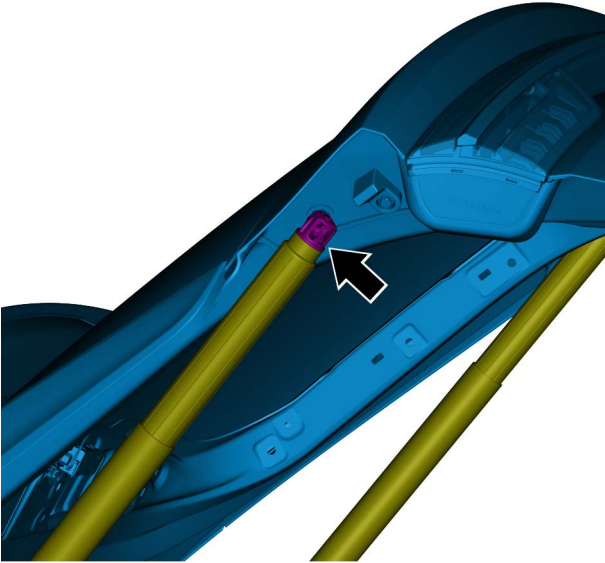


- 7 Disconnect the 8 harness connectors A of trunk door harness.
- 8 Remove the 12 harness clips 1 of the trunk door harness.

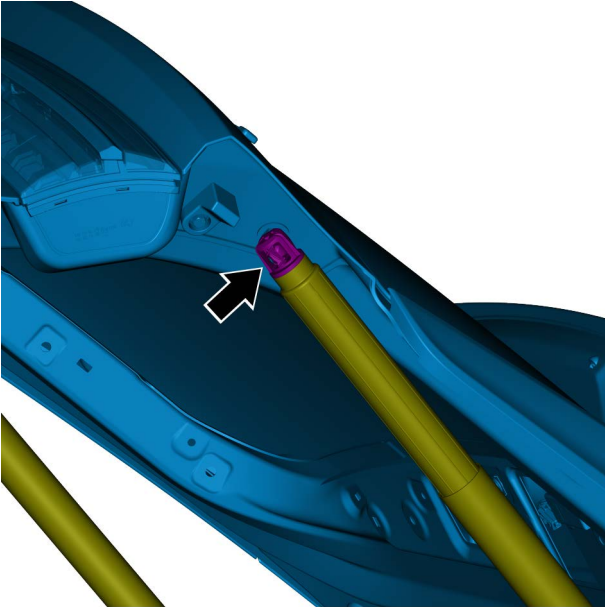
- 9 Disconnect the 3 harness connectors A of trunk door harness.
- 10 Remove the 13 harness clips 1 of trunk door harness and the ground harness fixing bolt 2.

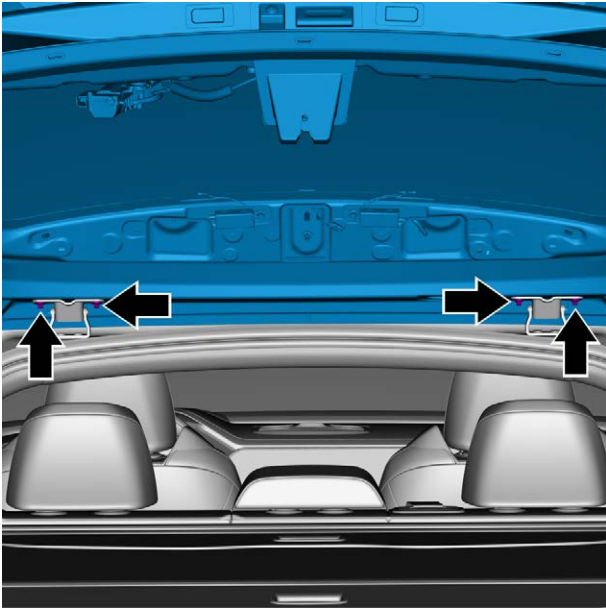
- 11 Remove the rear windshield assembly, refer to [Replacement of rear windshield assembly](#).
- 12 Remove the tailgate tail light, refer to [Replacement of tailgate tail light](#).
- 13 Remove the rear wiper motor, refer to [Replacement of rear wiper motor](#).
- 14 Remove the power operated tailgate closing unit, refer to [Replacement of power operated tailgate closing unit](#).
- 15 Remove the + side coil filter, refer to [Replacement of + side coil filter](#).
- 16 Remove the wave trap filter, refer to [Replacement of wave trap filter](#).

- 17 Disconnect the upper connectors of power operated tailgate motor.



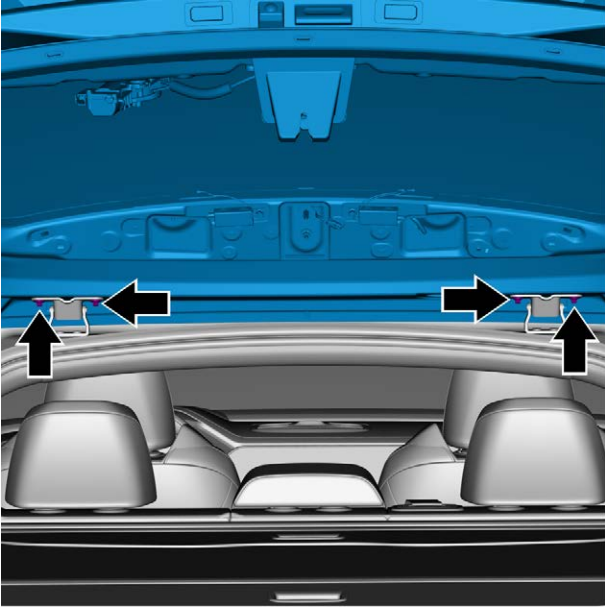
- 18 Disconnect the upper connectors of the right balance support rod of the trunk door.



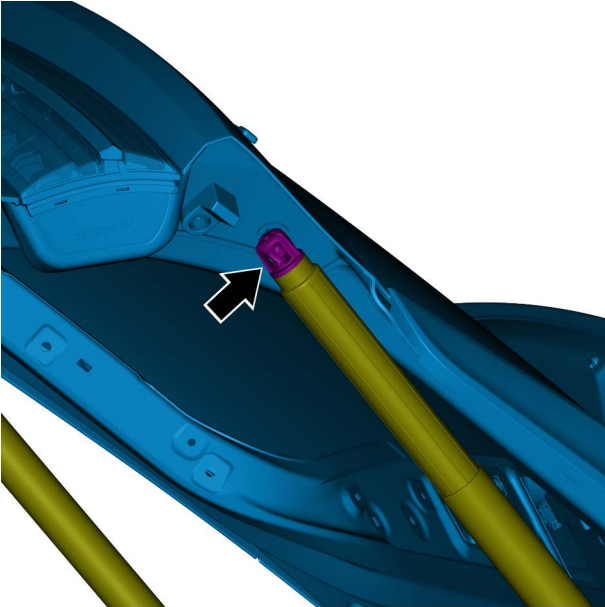


- 19 Remove the 4 fixing bolts of trunk door assembly and remove the trunk door assembly.

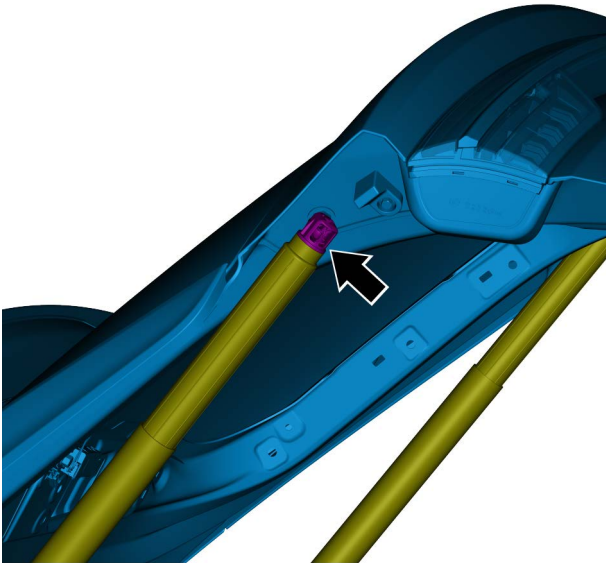
Installation Procedure



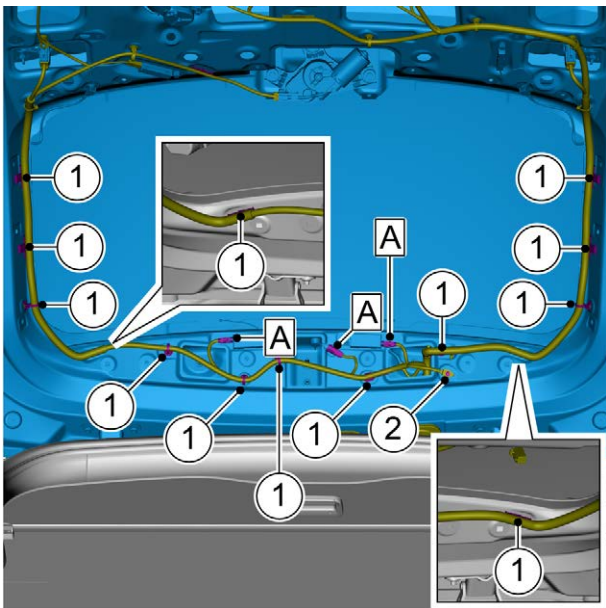
- 1 Install the 4 fixing bolts of trunk door assembly.
Torque: 24N·m



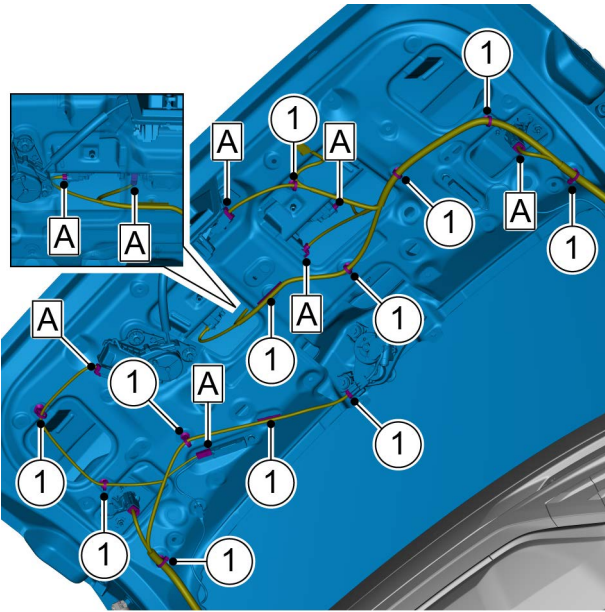
- 2 Install the upper connectors of the right balance support rod of the trunk door.



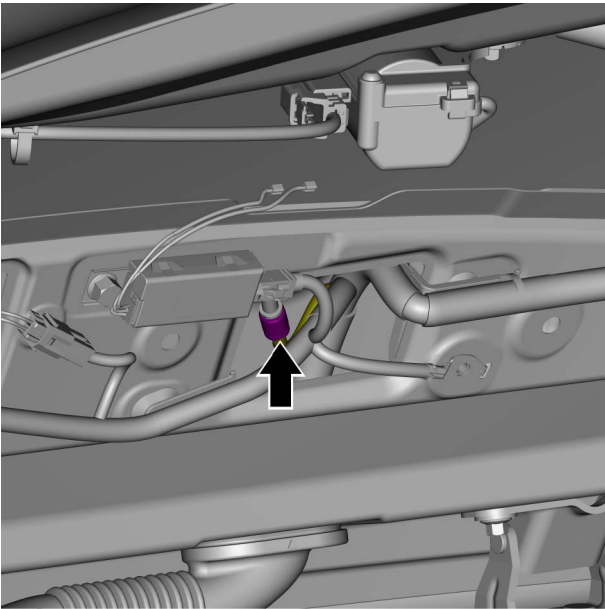
- 3 Install the power operated tailgate motor upper connector.



- 4 Install the wave trap filter.
- 5 Install the + side coil filter.
- 6 Install the power operated tailgate closing unit.
- 7 Install the rear wiper motor.
- 8 Install the tailgate tail light.
- 9 Install the rear windshield assembly.
- 10 Connect the 3 harness connectors A of trunk door harness.
- 11 Install the 13 harness clips 1 of trunk door harness and the ground harness fixing bolt 2.
Torque: 10N·m



- 12 Connect the 8 harness connectors A of trunk door harness.
- 13 Install the 12 harness clips 1 of the trunk door harness.



- 14 Install the rear washer hose assembly.

- 15 Install spoiler assembly.
- 16 Install assembly of interior trim panel of tail gate.
- 17 Install the trunk door upper left interior trim panel assembly.
- 18 Install the tail gate middle upper interior trim panel assembly.
- 19 Connect the negative cable of battery.

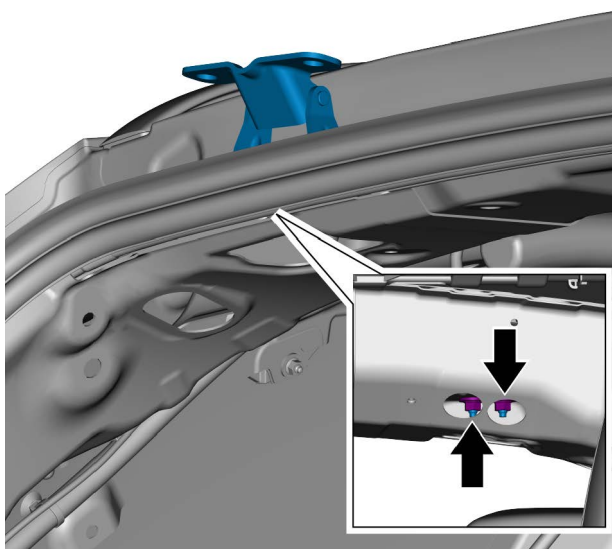
13.3.3.2 Replacement of left trunk door hinge

Removal Procedure

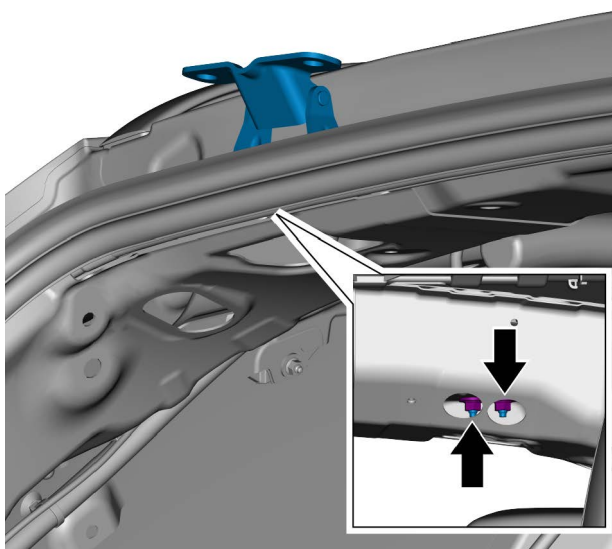
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the trunk door body assembly, refer to [Replacement of trunk door body assembly](#).
- 3 Remove the roof assembly, refer to [Replacement of roof assembly](#).
- 4 Remove the 2 fixing nuts of left trunk door hinge and remove the left trunk door hinge.

**Installation Procedure**

- 1 Install the 2 fixing nuts of left trunk door hinge.
Torque: 30N·m



- 2 Install the roof assembly.

- 3 Install the trunk door.
- 4 Connect the negative cable of battery.

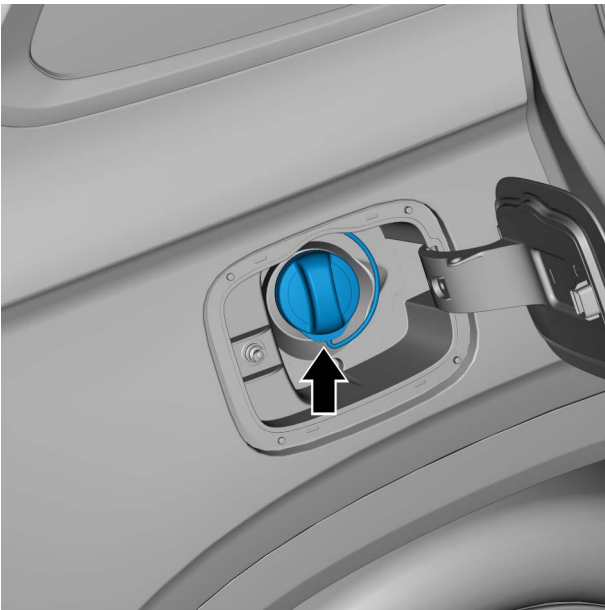
13.3.3.3 Replacement of fuel filler cap assembly

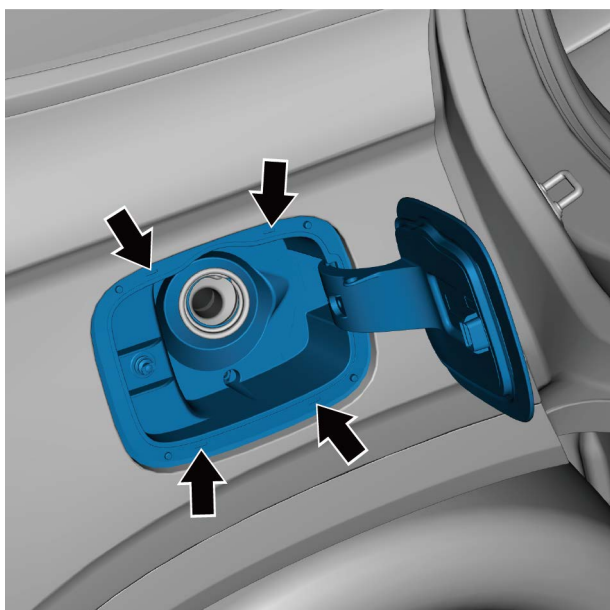
Removal Procedure

Warning !

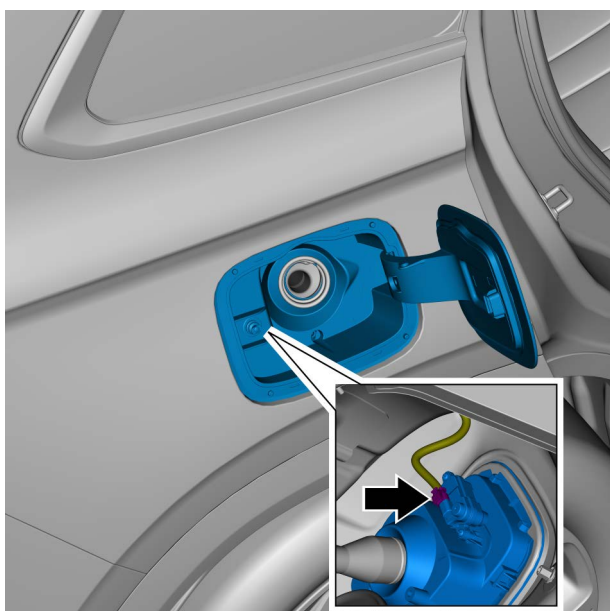
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the fuel filler cap assembly.



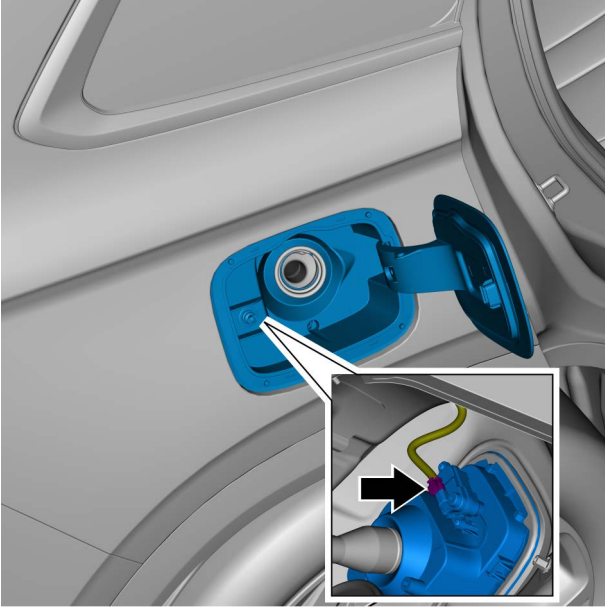


3 Remove the fuel filler cap assembly.

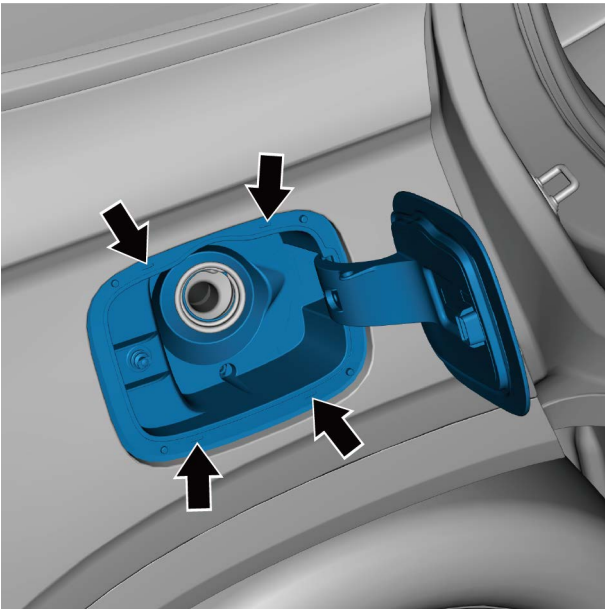


4 Disconnect the fuel filler cap motor harness connector and remove the fuel filler cap assembly.

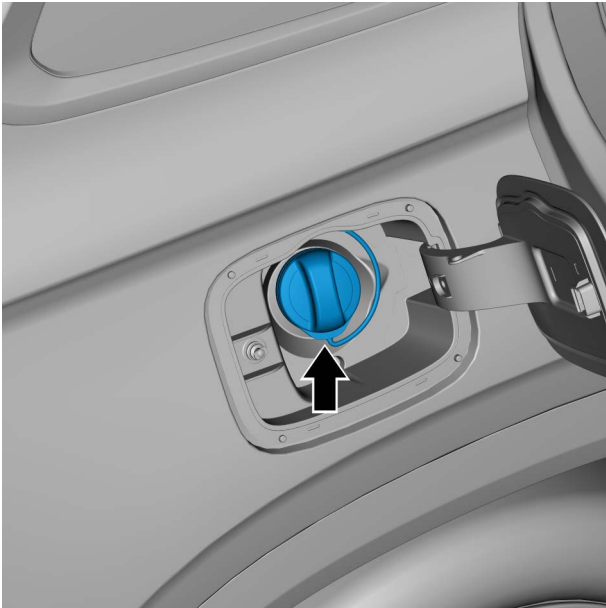
Installation Procedure



- 1 Connect the fuel filler cap motor harness connector.



- 2 Install the fuel filler cap assembly.



- 3 Install the fuel filler cap assembly.

- 4 Connect the negative cable of battery.

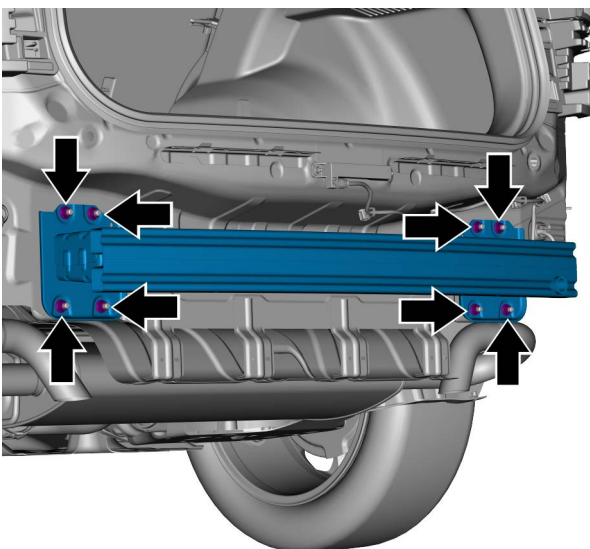
13.3.3.4 Replacement of rear anti-collision crossbeam assembly

Removal Procedure

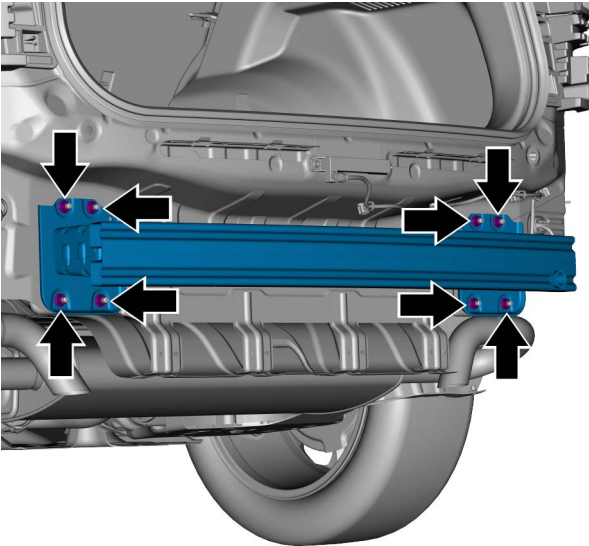
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the rear bumper assembly, refer to [Replacement of rear bumper assembly](#).
- 3 Remove the 8 fixing nuts of the rear anti-collision cross beam assembly and remove the rear anti-collision cross beam assembly.



Installation Procedure



- 1 Install the 8 fixing nuts of the rear anti-collision cross beam assembly.
Torque: 48N·m

- 2 Install the rear bumper assembly.
- 3 Connect the negative cable of battery.

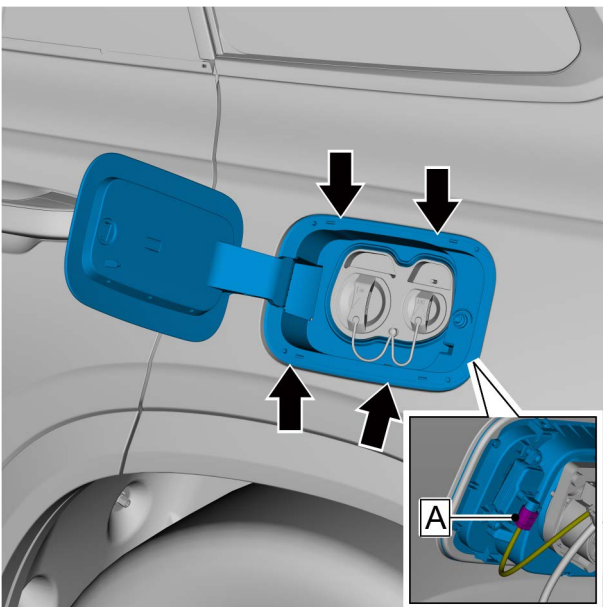
13.3.3.5 Replacement of electric vehicle DC socket cover

Removal Procedure

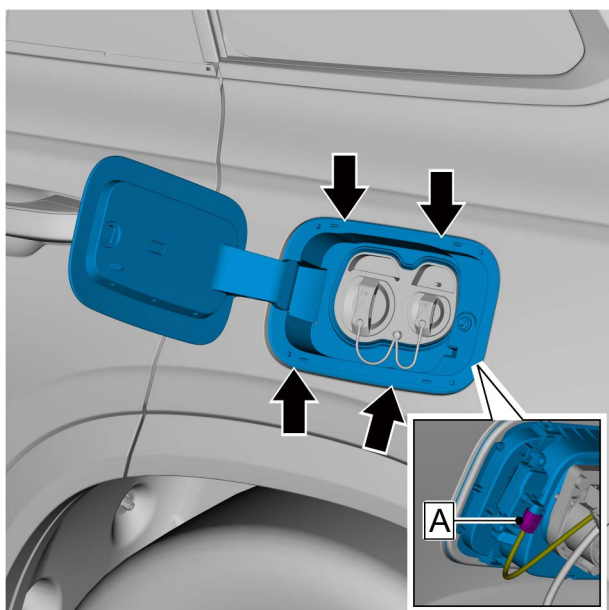
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Open the electric vehicle DC socket cover.
- 3 Remove the electric vehicle DC socket cover.
- 4 Disconnect the electric vehicle DC socket cover harness connector A and remove the electric vehicle DC socket cover.



Installation Procedure



- 1 Connect the electric vehicle DC socket cover harness connector A.
- 2 Install the electric vehicle DC socket cover.

- 3 Connect the negative cable of battery.

13.4 Bumper

13.4.1 Specification

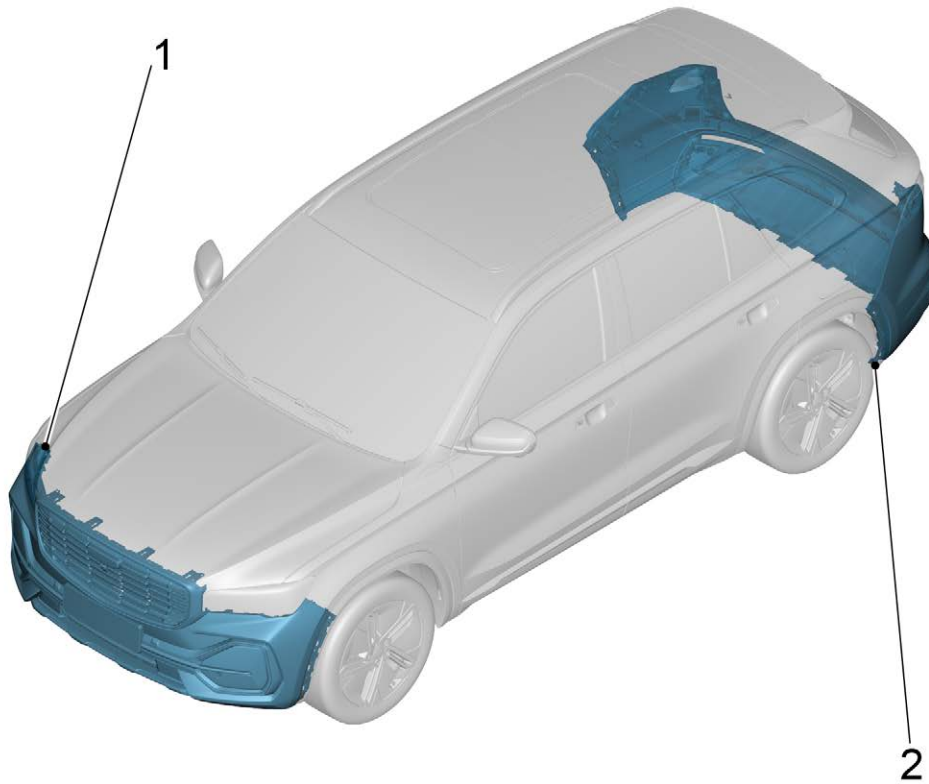
13.4.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Fixing bolt of front bumper assembly and fender	M6×25	8.5-11.5
Fixing bolt of radiator cover and front end module	M6×25	5-7
Fixing screw of front bumper assembly and left front wheel arch splash guard assembly	PF5×16	1.7-2.3
Fixing screw of front bumper assembly and right front wheel arch splash guard assembly	PF5×16	1.7-2.3
Fixing screw of pedestrian calf protection bracket and left front wheel arch splash guard assembly	PF5×16	1.7-2.3
Fixing screw of pedestrian calf protection bracket and right front wheel arch splash guard assembly	PF5×16	1.7-2.3
Fixing screw of front license plate mounting plate	PF5×16	1.3-1.7
Fixing screw of front bumper lower trim strip	ST4.8×19	1.3-1.7
Fixing screw of front bumper lower grille	PF5×16	1.3-1.7
ACC bracket fixing screw	PF5×16	1.3-1.7
Fixing screw of pedestrian calf protection bracket	ST4.8×19	1.3-1.7
Fixing screw of left front fog lamp trim cover assembly	PF5×16	1.3-1.7
Radiator cover fixing screw	PF5×16	1.3-1.7
Fixing screw of rear bumper assembly and left rear wheel arch splash guard assembly	PF5×16	1.7-2.3
Fixing screw of rear bumper assembly and right rear wheel arch splash guard assembly	PF5×16	1.7-2.3
Fixing bolt of rear bumper assembly	M6×20	5-7
Fixing screw of rear bumper assembly	PF5×16	1.3-1.7

Fastener part	Model	Torque range (N·m)
Fixing screw of rear bumper left trim strip	PF5×16	1.3-1.7
Fixing screw of rear bumper upper body and rear bumper lower body	PF5×16	1.3-1.7

13.4.2 Part position

13.4.2.1 Part position



1. Front bumper assembly

2. Rear bumper assembly.

13.4.3 Removal and Installation

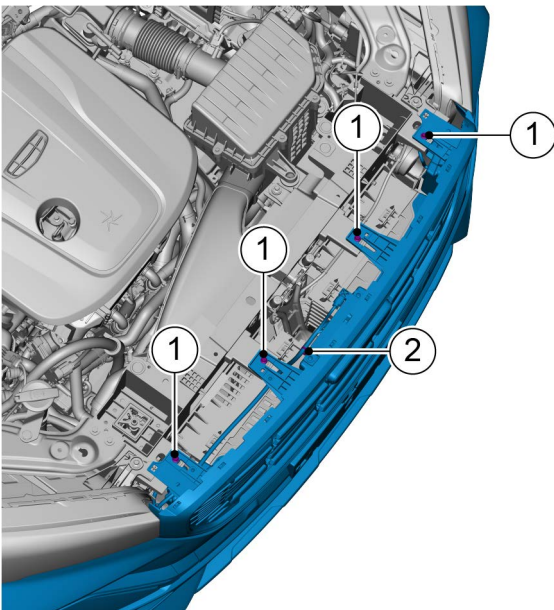
13.4.3.1 Replacement of front bumper assembly

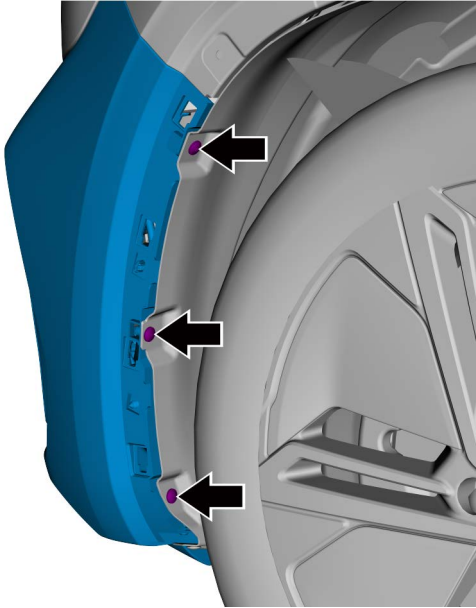
Removal Procedure

Warning !

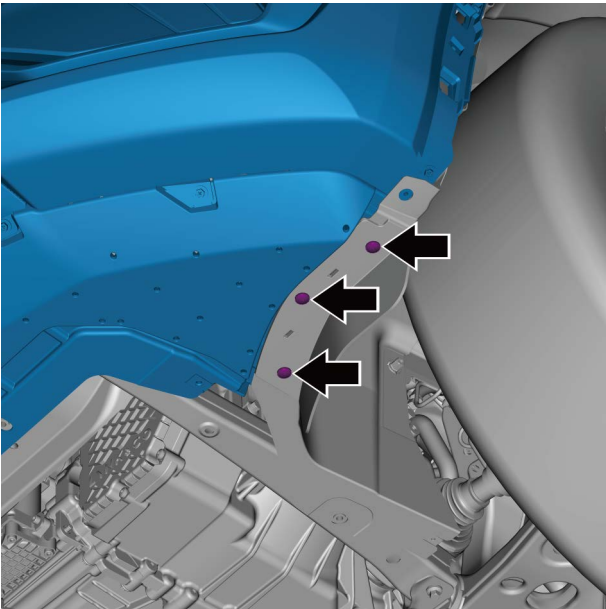
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left and right engine compartment trim panel, refer to [Replacement of left engine compartment trim panel](#).
- 3 Remove the engine compartment trim panel, refer to [Replacement of engine compartment trim panel](#).
- 4 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 5 Remove the left and right front fender flare, refer to [Replacement of left front fender flare](#).
- 6 Remove the 4 fixing bolts 1 at the upper part of the front bumper assembly and the front bumper harness clip 2.

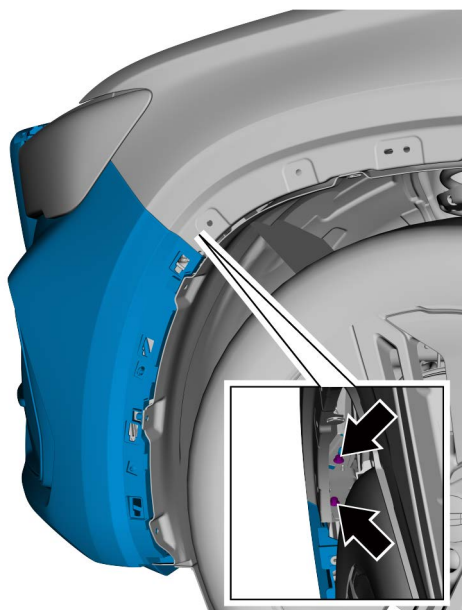




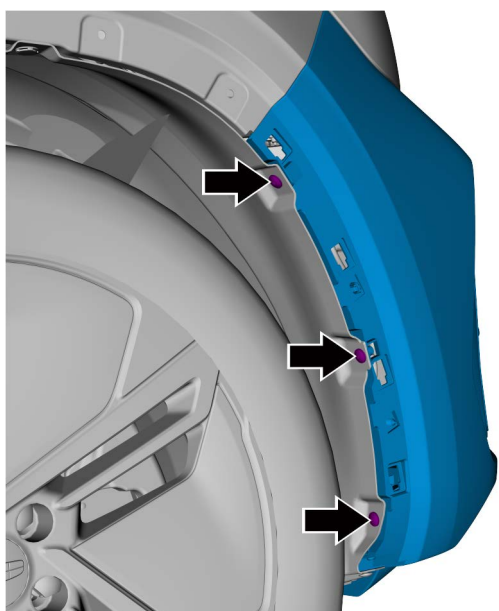
- 7 Remove the 3 fixing screws on the left side of the front bumper assembly.



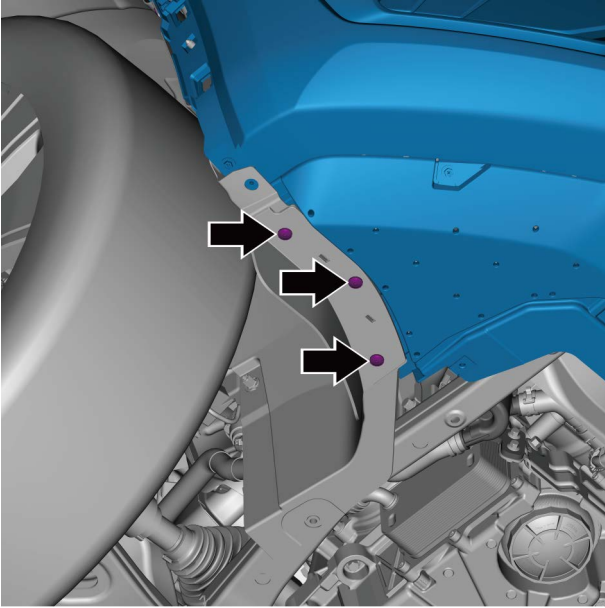
- 8 Remove the 3 fixing screws at the bottom of the left side of the front bumper assembly.



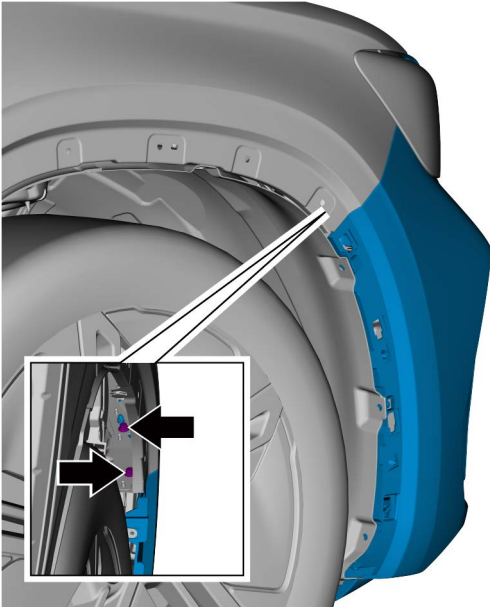
9 Remove the 2 fixing bolts on the left side of the front bumper assembly.



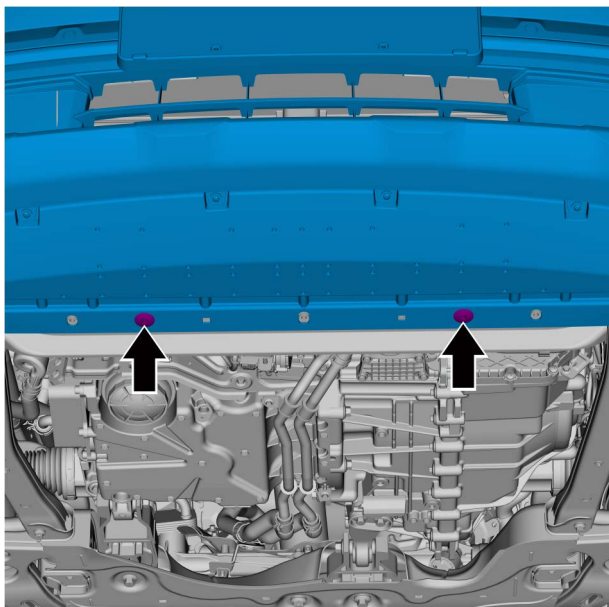
10 Remove the 3 fixing screws on the right side of the front bumper assembly.



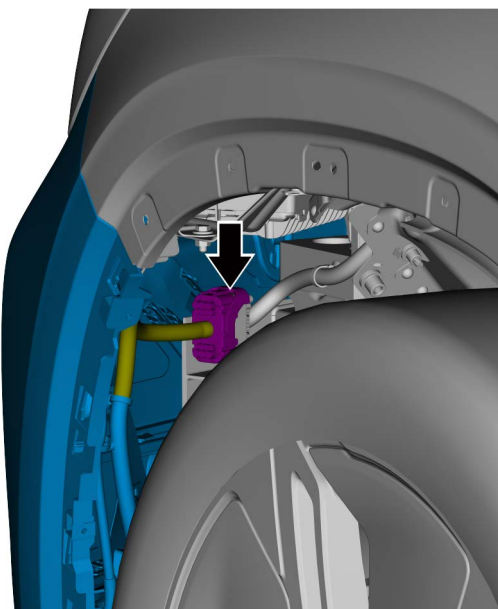
- 11 Remove the 3 fixing screws at the bottom of the right side of the front bumper assembly.



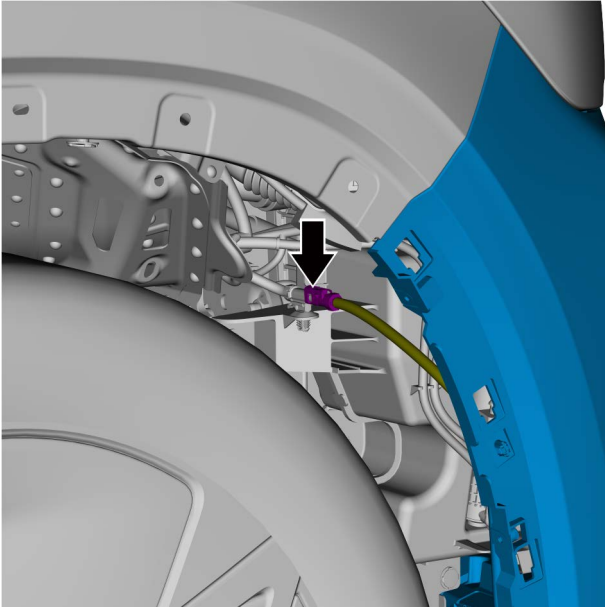
- 12 Remove the 2 fixing bolts on the right side of the front bumper assembly.



13 Remove the 2 fixing clips of the pedestrian calf protection bracket.

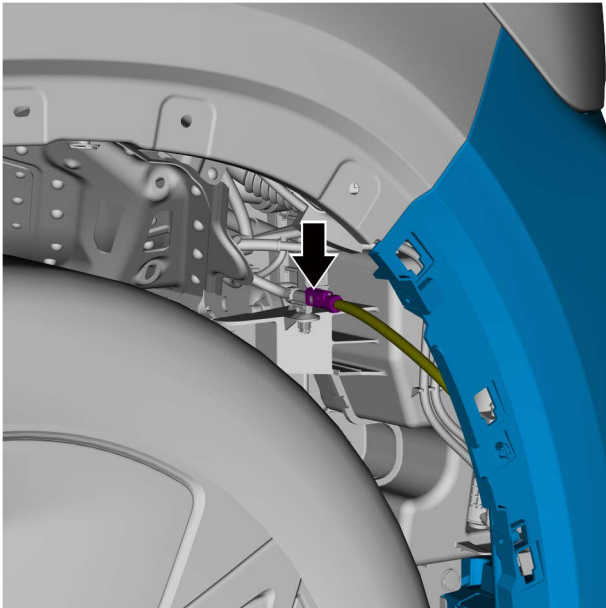


14 Disconnect the front bumper harness left harness connector.

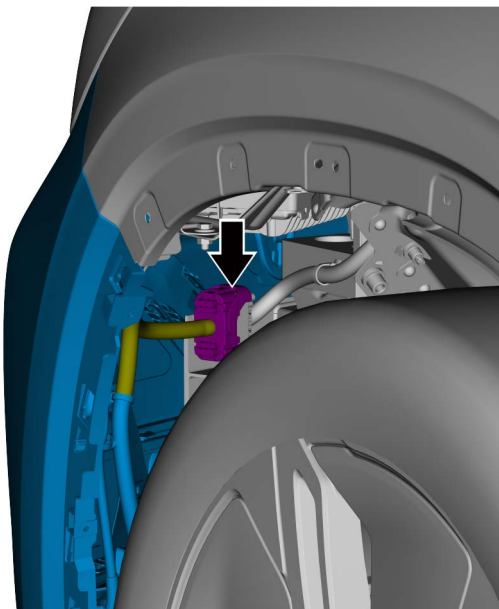


- 15 Disconnect the front bumper harness right harness connector and remove the front bumper assembly.

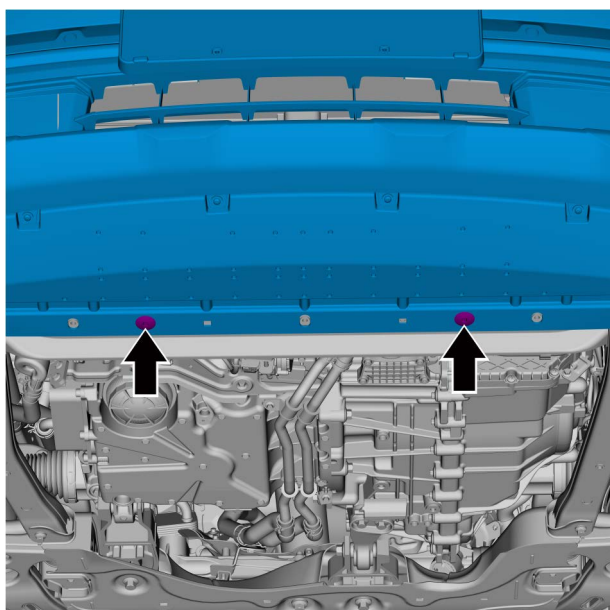
Installation Procedure



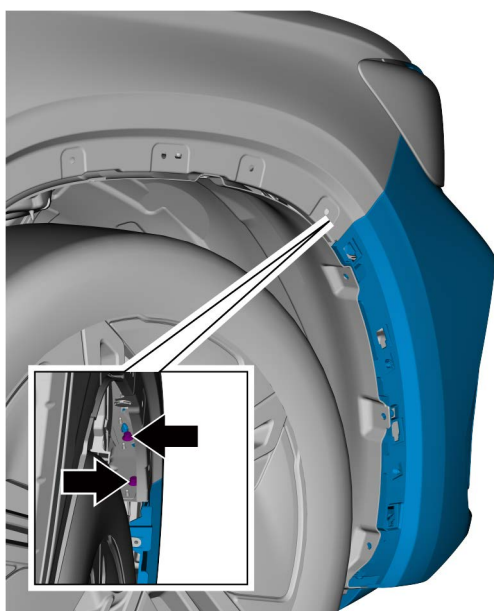
- 1 Connect the front bumper harness right harness connector.



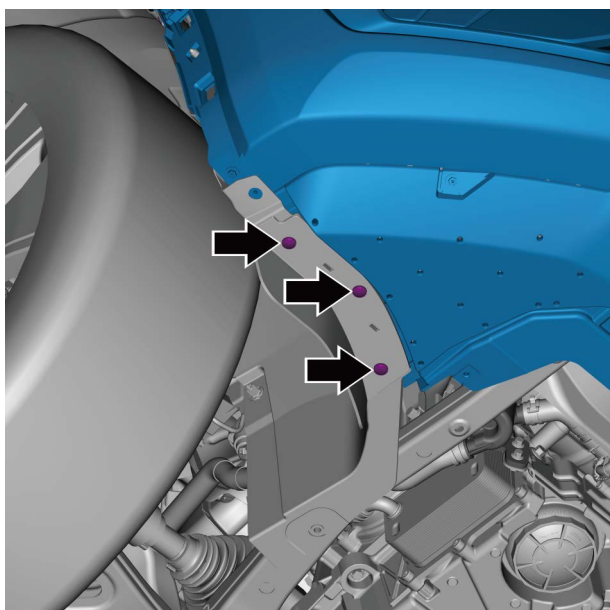
- 2 Connect the front bumper harness left harness connector.



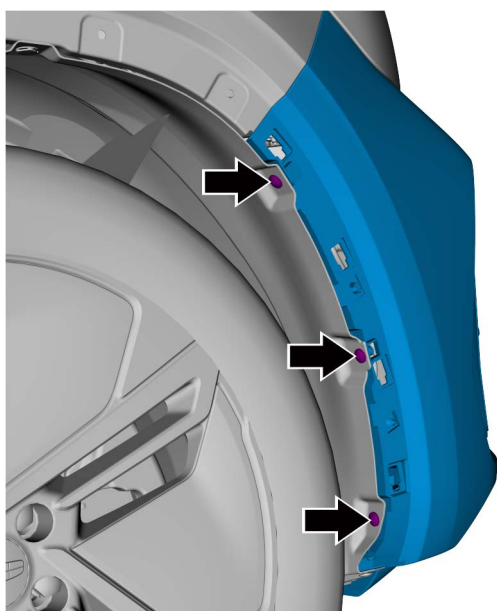
- 3 Install the 2 fixing clips of the pedestrian calf protection bracket.



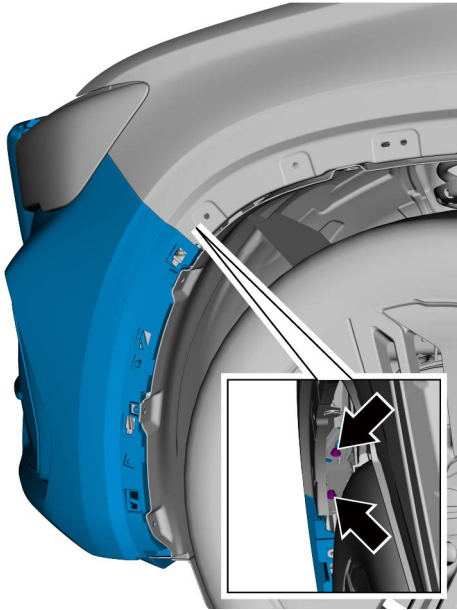
- 4 Install the 2 fixing bolts on the right side of the front bumper assembly.
Torque: 10N·m



- 5 Install the 3 fixing screws at the bottom of the right side of the front bumper assembly.
Torque: 2N·m

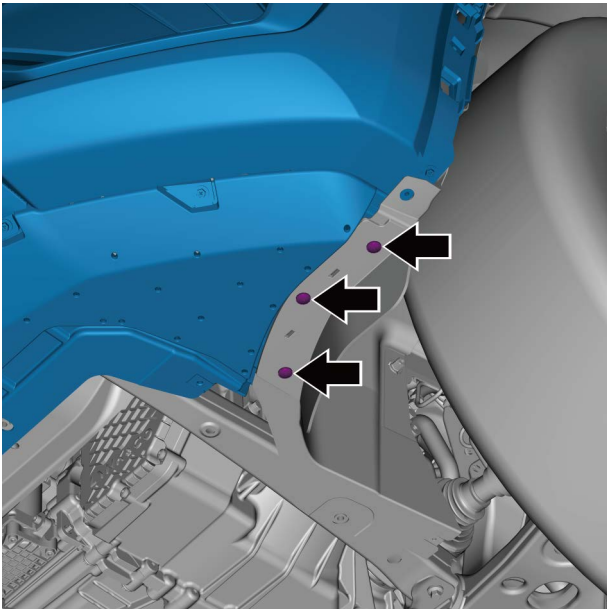


- 6 Install the 3 fixing screws on the right side of the front bumper assembly.
Torque: 2N·m



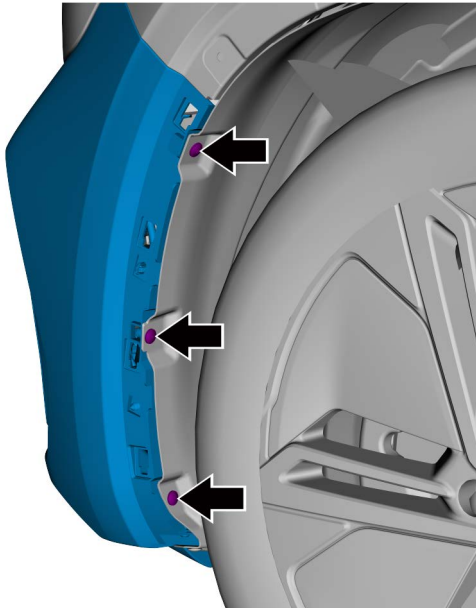
- 7 Install the 2 fixing bolts on the left side of the front bumper assembly.

Torque: 10N·m

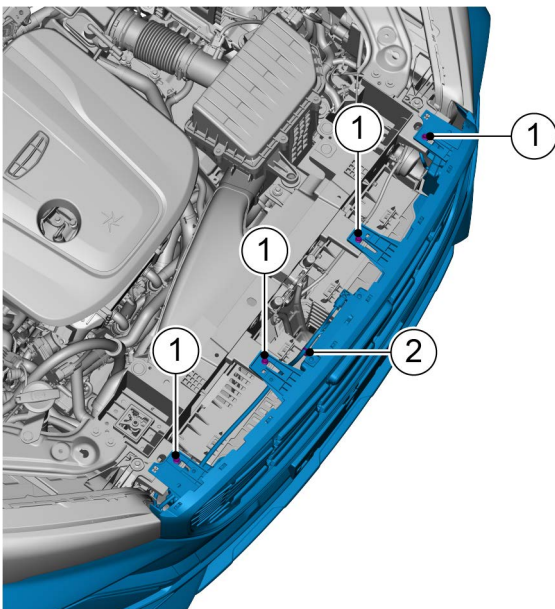


- 8 Install the 3 fixing screws at the bottom of the left side of the front bumper assembly.

Torque: 2N·m



- 9 Install the 3 fixing screws on the left side of the front bumper assembly.
Torque: 2N·m



- 10 Install the 4 fixing bolts 1 at the upper part of the front bumper assembly and the front bumper harness clip 2.
Torque: 6N·m

- 11 Install the left and right front fender flares.
12 Install the bottom engine guard assembly.
13 Install the engine compartment trim panel.
14 Install the left and right engine compartment trim panel.
15 Connect the negative cable of battery.

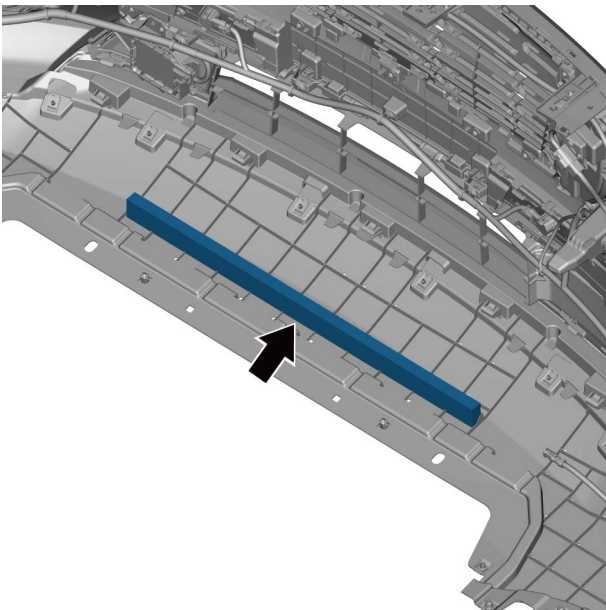
13.4.3.2 Replacement of front bumper middle foam

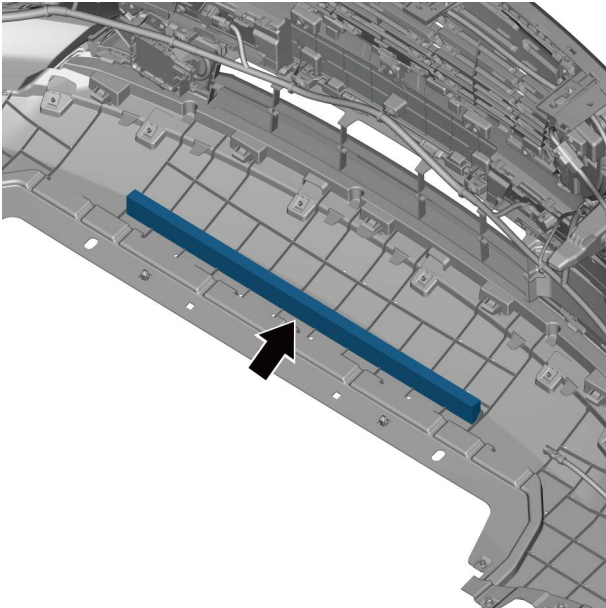
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#)

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left and right engine compartment trim panel, refer to [Replacement of left engine compartment trim panel](#).
- 3 Remove the engine compartment trim panel, refer to [Replacement of engine compartment trim panel](#).
- 4 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 5 Remove the left and right front fender flare, refer to [Replacement of left front fender flare](#).
- 6 Remove the front bumper assembly, refer to [Replacement of front bumper assembly](#).
- 7 Remove the front bumper middle foam and take it off.

**Installation Procedure**



- 1 Install the front bumper middle foam and remove.

- 2 Install the front bumper assembly.
- 3 Install the left and right front fender flares.
- 4 Install the bottom engine guard assembly.
- 5 Install the engine compartment trim panel.
- 6 Install the left and right engine compartment trim panel.
- 7 Connect the negative cable of battery.

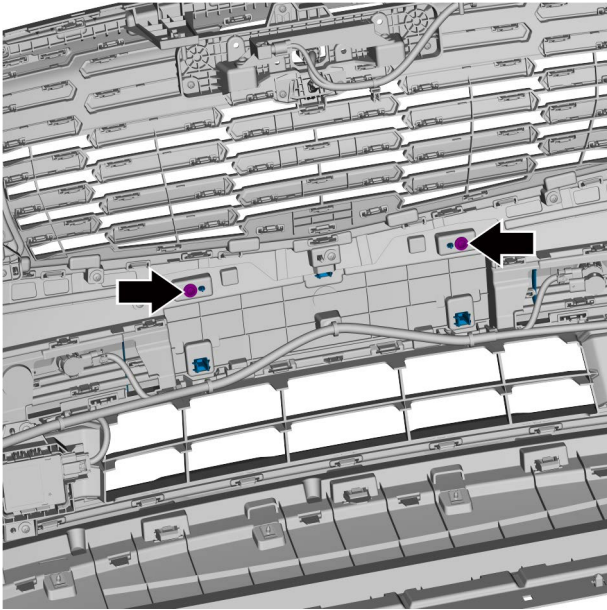
13.4.3.3 Replacement of front license plate mounting plate

Removal Procedure

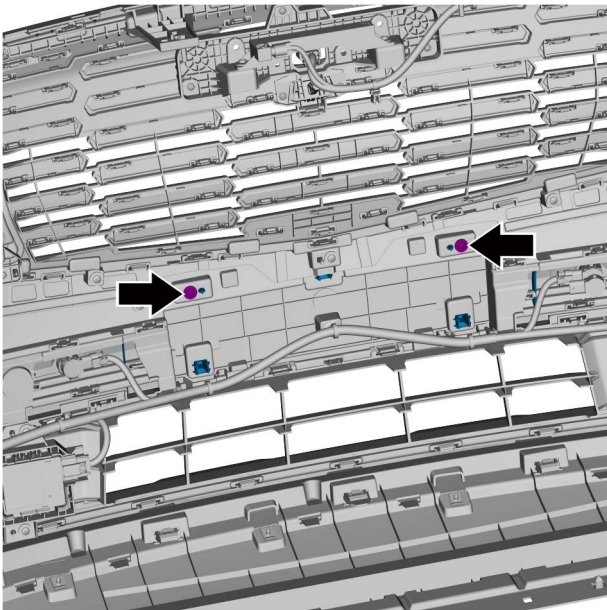
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left and right engine compartment trim panel, refer to [Replacement of left engine compartment trim panel](#).
- 3 Remove the engine compartment trim panel, refer to [Replacement of engine compartment trim panel](#).
- 4 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 5 Remove the left and right front fender flare, refer to [Replacement of left front fender flare](#).



- 6 Remove the front bumper assembly, refer to [Replacement of front bumper assembly](#).
- 7 Remove the 2 fixing screws of front license plate mounting plate and remove the front license plate mounting plate.



Installation Procedure

- 1 Install the 2 fixing screws of front license plate mounting plate.
Torque: 1.5 N m

- 2 Install the front bumper assembly.
- 3 Install the left and right front fender flares.
- 4 Install the bottom engine guard assembly.
- 5 Install the engine compartment trim panel.
- 6 Install the left and right engine compartment trim panel.
- 7 Connect the negative cable of battery.

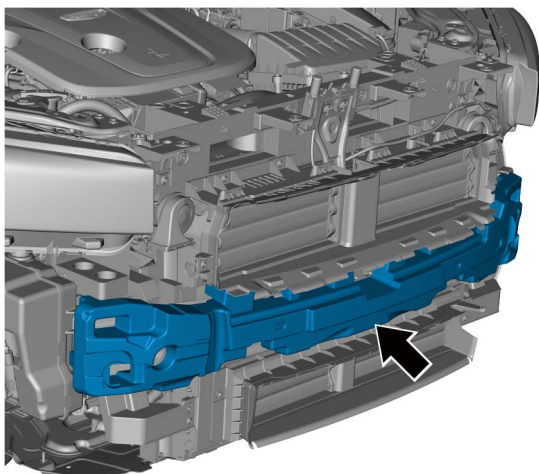
13.4.3.4 Replacement of front bumper buffer block

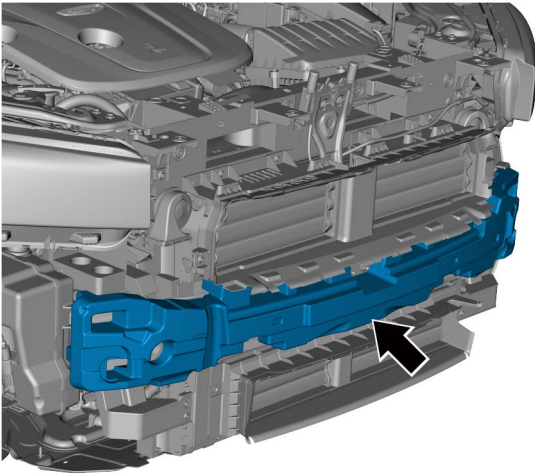
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left and right engine compartment trim panel, refer to [Replacement of left engine compartment trim panel](#).
- 3 Remove the engine compartment trim panel, refer to [Replacement of engine compartment trim panel](#).
- 4 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 5 Remove the left and right front fender flare, refer to [Replacement of left front fender flare](#).
- 6 Remove the front bumper assembly, refer to [Replacement of front bumper assembly](#).
- 7 Remove the front bumper buffer block and remove it.

**Installation Procedure**



- 1 Install the front bumper buffer block and remove.

- 2 Install the front bumper assembly.
- 3 Install the left and right front fender flares.
- 4 Install the bottom engine guard assembly.
- 5 Install the engine compartment trim panel.
- 6 Install the left and right engine compartment trim panel.
- 7 Connect the negative cable of battery.

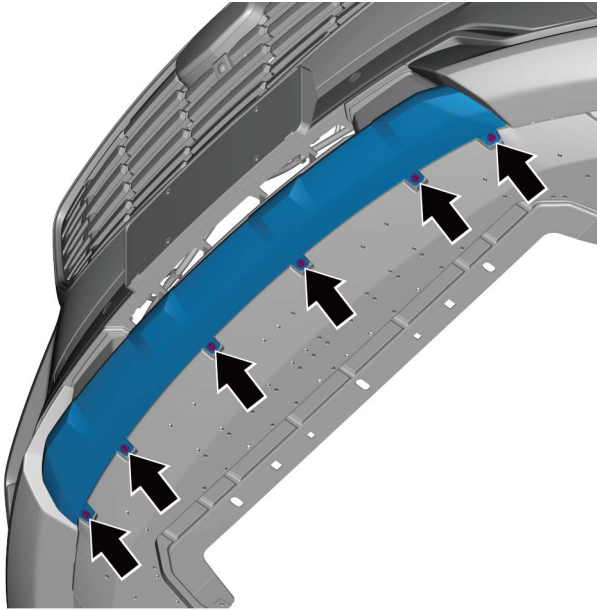
13.4.3.5 Replacement of front bumper lower trim strip

Removal Procedure

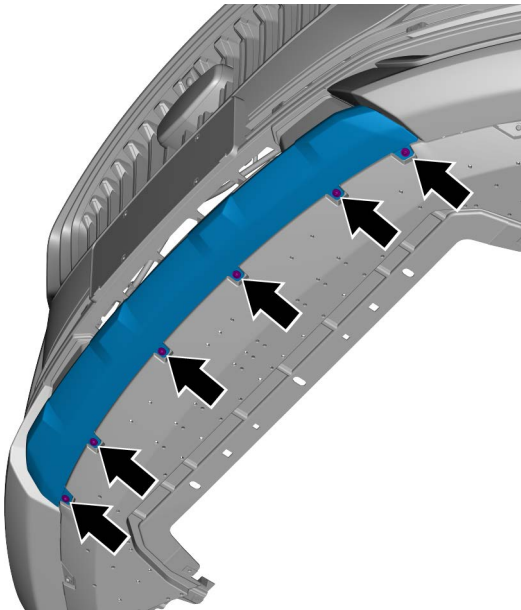
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left and right engine compartment trim panel, refer to [Replacement of left engine compartment trim panel](#).
- 3 Remove the engine compartment trim panel, refer to [Replacement of engine compartment trim panel](#).
- 4 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 5 Remove the left and right front fender flare, refer to [Replacement of left front fender flare](#).



- 6 Remove the front bumper assembly, refer to [Replacement of front bumper assembly](#).
- 7 Remove the 6 fixing screws of the front bumper lower trim strip and take off the front bumper lower trim strip.



Installation Procedure

- 1 Install the 6 fixing screws of front bumper lower trim strip.
Torque: 1.5N·m

- 2 Install the front bumper assembly.
- 3 Install the left and right front fender flares.
- 4 Install the bottom engine guard assembly.
- 5 Install the engine compartment trim panel.
- 6 Install the left and right engine compartment trim panel.
- 7 Connect the negative cable of battery.

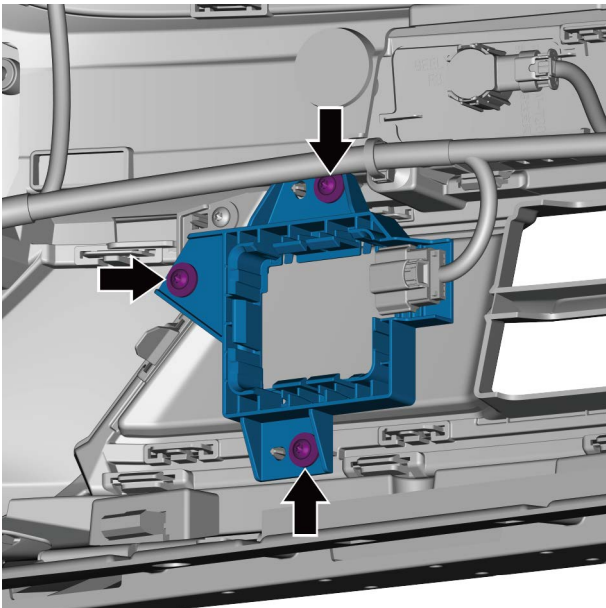
13.4.3.6 Replacement of front bumper lower grille

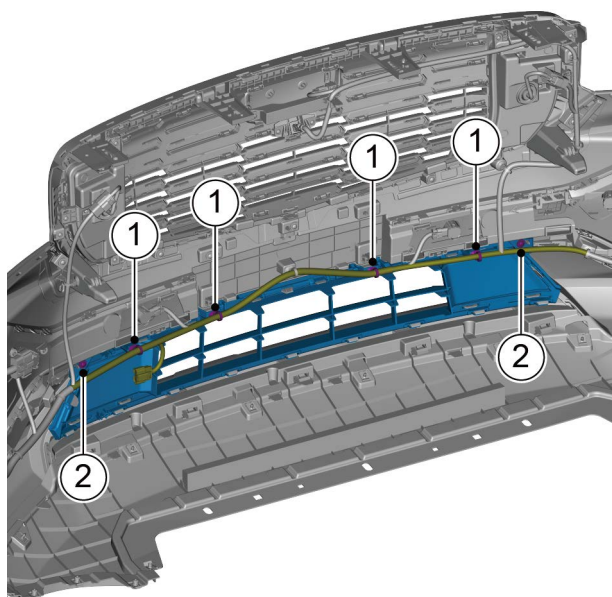
Removal Procedure

Warning !

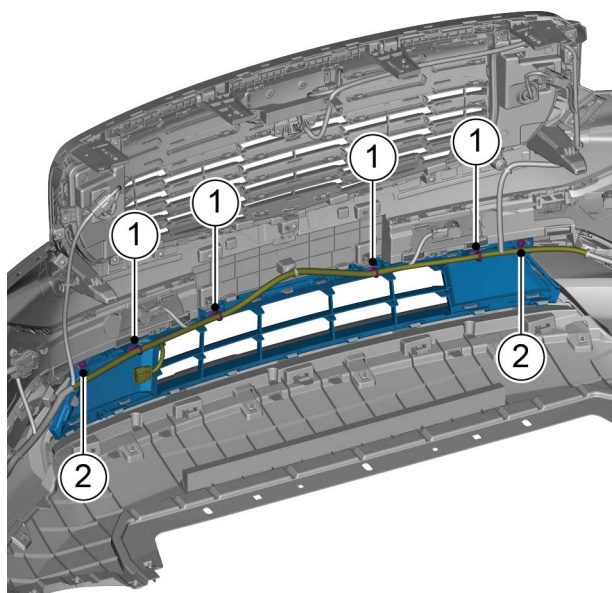
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left and right engine compartment trim panel, refer to [Replacement of left engine compartment trim panel](#).
- 3 Remove the engine compartment trim panel, refer to [Replacement of engine compartment trim panel](#).
- 4 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 5 Remove the left and right front fender flare, refer to [Replacement of left front fender flare](#).
- 6 Remove the front bumper assembly, refer to [Replacement of front bumper assembly](#).
- 7 Remove the forward looking radar, refer to [Replacement of forward looking radar](#).
- 8 Remove the 3 fixing screws of ACC bracket.



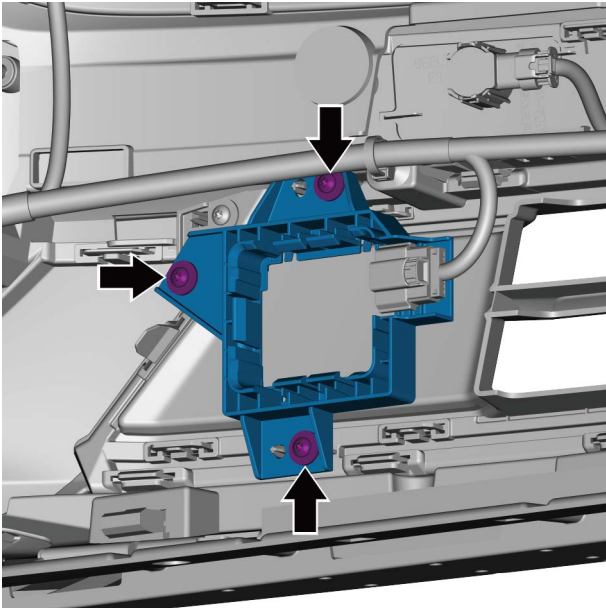


- 9 Remove the 4 harness clips 1 of front bumper harness.
- 10 Remove the 2 fixing screws 2 of the front bumper lower grille and take off the front bumper lower grille.



Installation Procedure

- 1 Install the 4 harness clips 1 of front bumper harness.
 - 2 Install the 2 fixing screws 2 of front bumper lower grille.
- Torque: 1.5N·m



- 3 Install the 3 fixing screws of ACC bracket.

Torque: 1.5N·m

- 4 Install the forward looking radar.
- 5 Install the front bumper assembly.
- 6 Install the left and right front fender flares.
- 7 Install the bottom engine guard assembly.
- 8 Install the engine compartment trim panel.
- 9 Install the left and right engine compartment trim panel.
- 10 Connect the negative cable of battery.

13.4.3.7 Replacement of pedestrian calf protection bracket

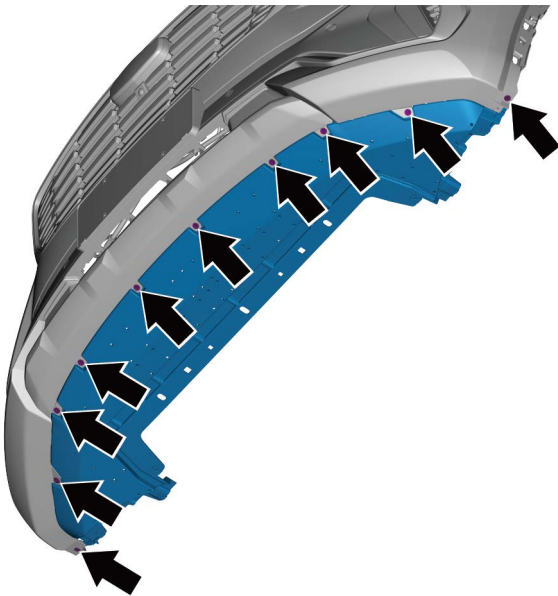
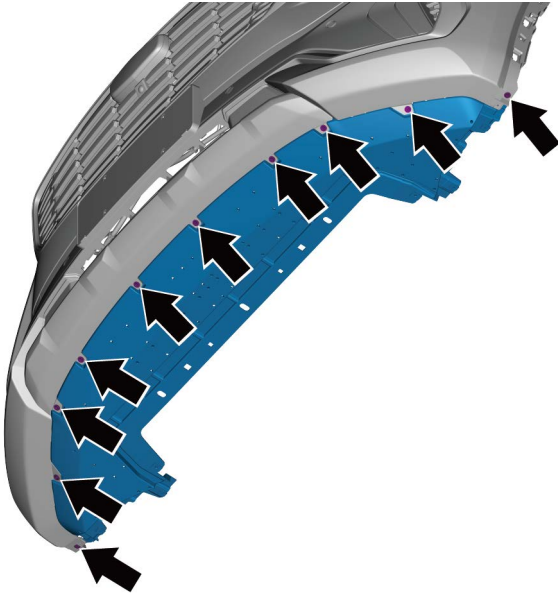
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left and right engine compartment trim panel, refer to [Replacement of left engine compartment trim panel](#).
- 3 Remove the engine compartment trim panel, refer to [Replacement of engine compartment trim panel](#).
- 4 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 5 Remove the left and right front fender flare, refer to [Replacement of left front fender flare](#).

- 6 Remove the front bumper assembly, refer to [Replacement of front bumper assembly](#).
- 7 Remove the front bumper middle foam, refer to [Replacement of front bumper middle foam](#).
- 8 Remove the 10 fixing screws of the pedestrian calf protection bracket and take off the pedestrian calf protection bracket.



Installation Procedure

- 1 Install the 10 fixing screws of the pedestrian calf protection bracket.

Torque: 1.5N·m

- 2 Install the front bumper middle foam.
- 3 Install the front bumper assembly.
- 4 Install the left and right front fender flares.
- 5 Install the bottom engine guard assembly.
- 6 Install the engine compartment trim panel.
- 7 Install the left and right engine compartment trim panel.
- 8 Connect the negative cable of battery.

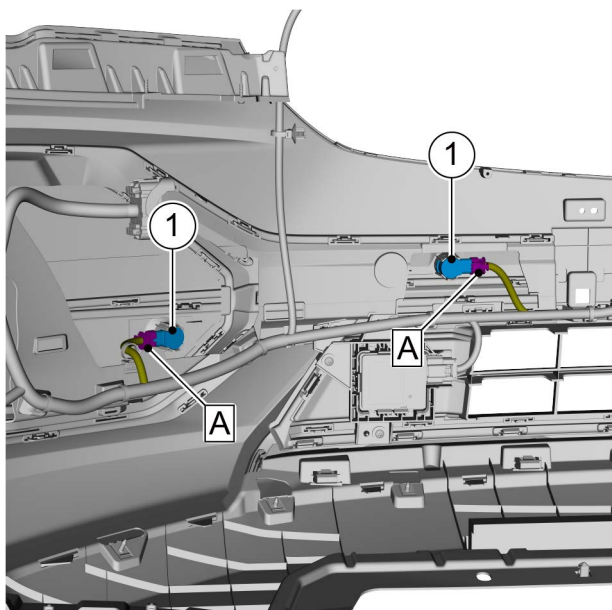
13.4.3.8 Replacement of left front fog lamp trim cover assembly

Removal Procedure

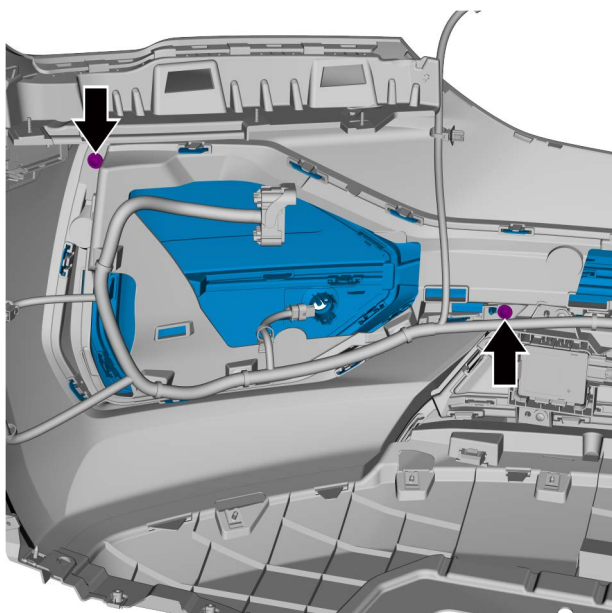
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left and right engine compartment trim panel, refer to [Replacement of left engine compartment trim panel](#).
- 3 Remove the engine compartment trim panel, refer to [Replacement of engine compartment trim panel](#).
- 4 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 5 Remove the left and right front fender flare, refer to [Replacement of left front fender flare](#).
- 6 Remove the front bumper assembly, refer to [Replacement of front bumper assembly](#).
- 7 Remove the front license plate mounting plate, refer to [Replacement of front license plate mounting plate](#).

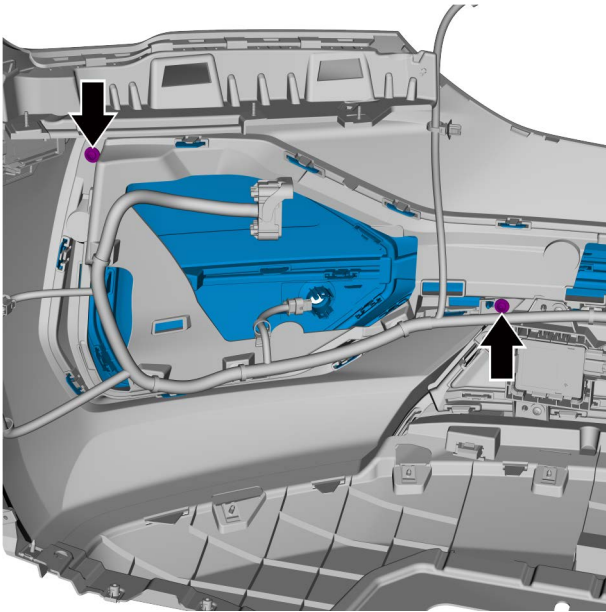


- 8 Disconnect the ultrasonic sensor harness connector A and remove the ultrasonic sensor 1.



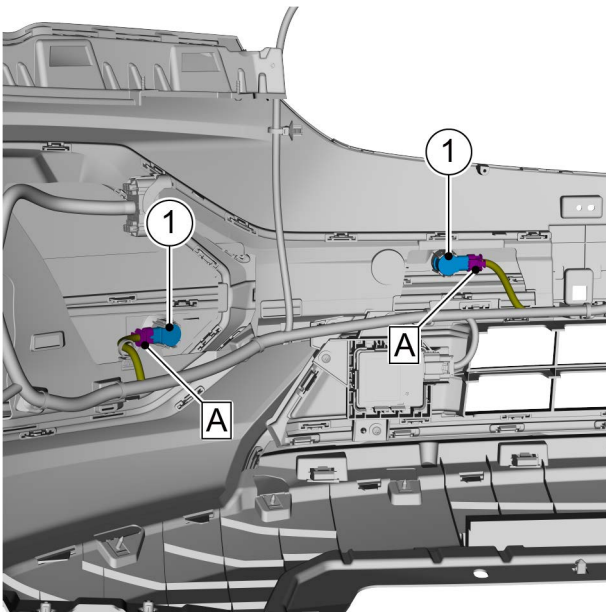
- 9 Remove the 2 fixing screws of the left front fog lamp trim cover assembly and take off the left front fog lamp trim cover assembly.

Installation Procedure



- 1 Install the 2 fixing screws of left front fog lamp trim cover assembly.

Torque: 1.5N·m



- 2 Install the ultrasonic sensor 1 and connect the ultrasonic sensor harness connector A.

- 3 Install the front license plate mounting plate.
- 4 Install the front bumper assembly.
- 5 Install the left and right front fender flares.
- 6 Install the bottom engine guard assembly.
- 7 Install the engine compartment trim panel.
- 8 Install the left and right engine compartment trim panel.
- 9 Connect the negative cable of battery.

13.4.3.9 Replacement of front bumper body

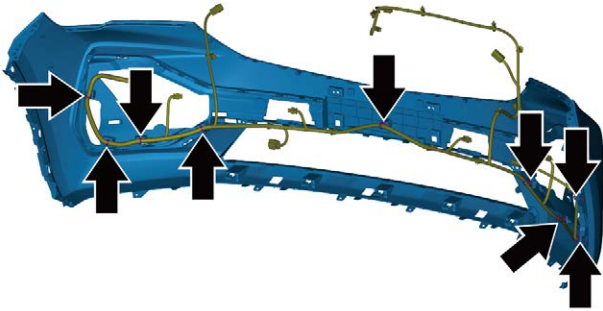
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#)

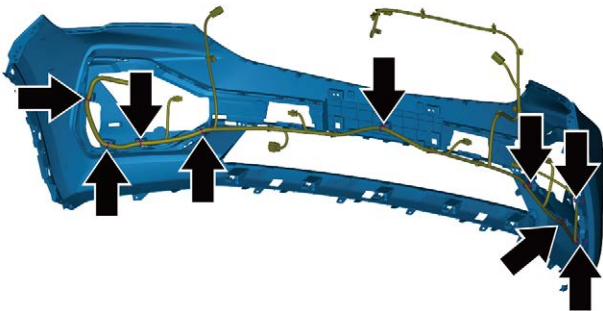
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left and right engine compartment trim panel, refer to [Replacement of left engine compartment trim panel](#).
- 3 Remove the engine compartment trim panel, refer to [Replacement of engine compartment trim panel](#).
- 4 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 5 Remove the left and right front fender flare, refer to [Replacement of left front fender flare](#).
- 6 Remove the front bumper assembly, refer to [Replacement of front bumper assembly](#).
- 7 Remove the front license plate mounting plate, refer to [Replacement of front license plate mounting plate](#).
- 8 Remove the left and right front fog lamp trim cover assembly, refer to [Replacement of left front fog lamp trim cover assembly](#).
- 9 Remove the front bumper lower trim strip, refer to [Replacement of front bumper lower trim strip](#).
- 10 Remove the front bumper lower grille, refer to [Replacement of front bumper lower grille](#).
- 11 Remove the pedestrian calf protection bracket, refer to [Replacement of pedestrian calf protection bracket](#).

- 12 Remove the radiator cover, refer to [Replacement of radiator cover](#).
- 13 Disconnect the 9 fixing clips of the front bumper harness and take off the front bumper body.



Installation Procedure

- 1 Install the 9 harness clips of front bumper harness.



- 2 Install the radiator cover.
- 3 Install the pedestrian calf protection bracket.
- 4 Install the front bumper lower grille.
- 5 Install the front bumper lower trim strip.
- 6 Install the left and right front fog lamp trim cover assembly.
- 7 Install the front license plate mounting plate.
- 8 Install the front bumper assembly.
- 9 Install the left and right front fender flares.

- 10 Install the bottom engine guard assembly.
- 11 Install the engine compartment trim panel.
- 12 Install the left and right engine compartment trim panel.
- 13 Connect the negative cable of battery.

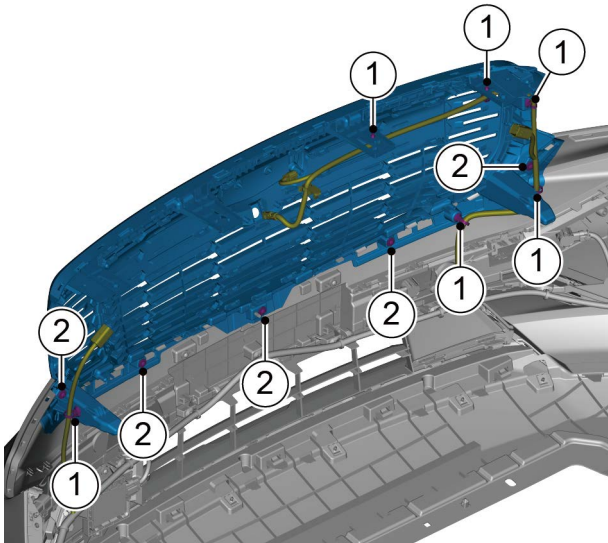
13.4.3.10 Replacement of radiator cover assembly

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left and right engine compartment trim panel, refer to [Replacement of left engine compartment trim panel](#).
- 3 Remove the engine compartment trim panel, refer to [Replacement of engine compartment trim panel](#).
- 4 Remove the engine bottom guard, see [Replacement of Engine Bottom Guard](#).
- 5 Remove the left and right front fender flare, refer to [Replacement of left front fender flare](#).
- 6 Remove the front bumper assembly, refer to [Replacement of front bumper assembly](#).
- 7 Remove the parking assistance camera (front), refer to [Replacement of parking assistance camera \(front\)](#).
- 8 Remove the keyless vehicle antenna (front), refer to [Replacement of keyless vehicle antenna \(front\)](#).

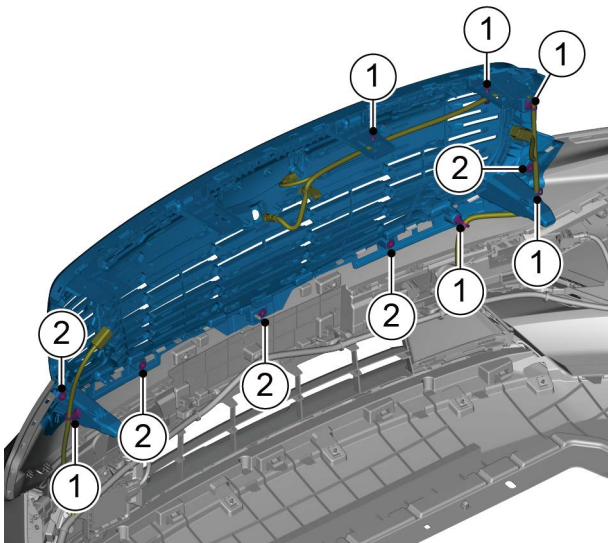


- 9 Remove the left front grille lamp, refer to [Replacement of left front grille lamp](#).
- 10 Remove the 5 fixing screws 2 of the radiator cover assembly and the 6 harness clips 1 of the front bumper harness and take off the radiator cover assembly.

Installation Procedure

- 1 Install the 5 fixing screws 2 of radiator cover assembly and 6 harness clips 1 of front bumper harness.

Torque: 1.5N·m



- 2 Install the left front grille lamp.
- 3 Install the keyless vehicle antenna (front).
- 4 Install the parking assistance camera (front).
- 5 Install the front bumper assembly.
- 6 Install the left and right front fender flares.
- 7 Install the bottom engine guard assembly.
- 8 Install the engine compartment trim panel.
- 9 Install the left and right engine compartment trim panel.
- 10 Connect the negative cable of battery.

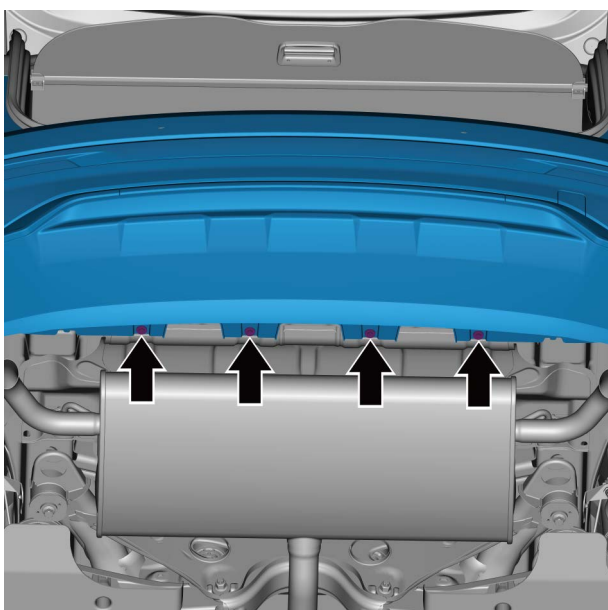
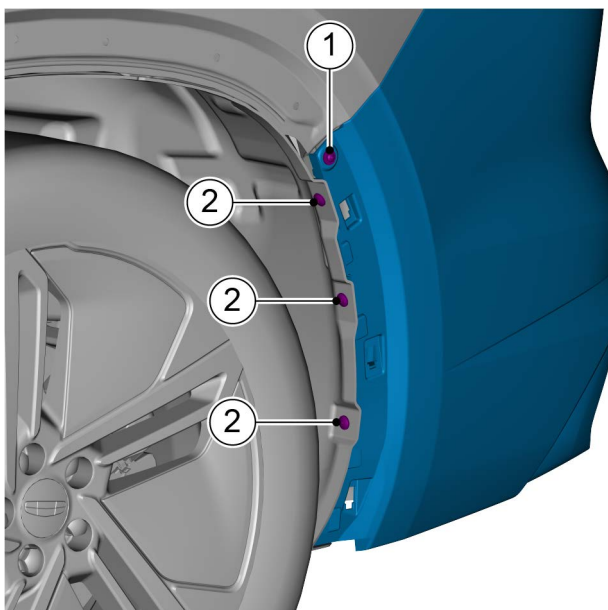
13.4.3.11 Replacement of rear bumper assembly

Removal Procedure

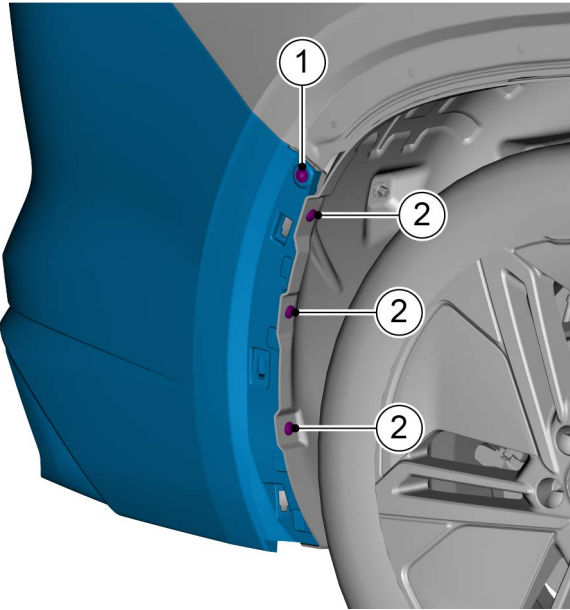
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

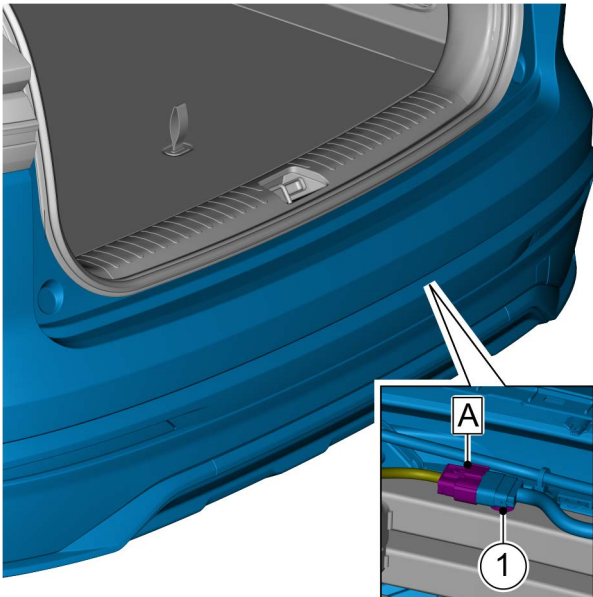
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left and right rear front fender flares, refer to [Replacement of left rear fender flare](#).
- 3 Remove the fixing screws 1 and 2 at the left side of rear bumper assembly.



- 4 Remove the 4 fixing bolts at the bottom of the rear bumper assembly.

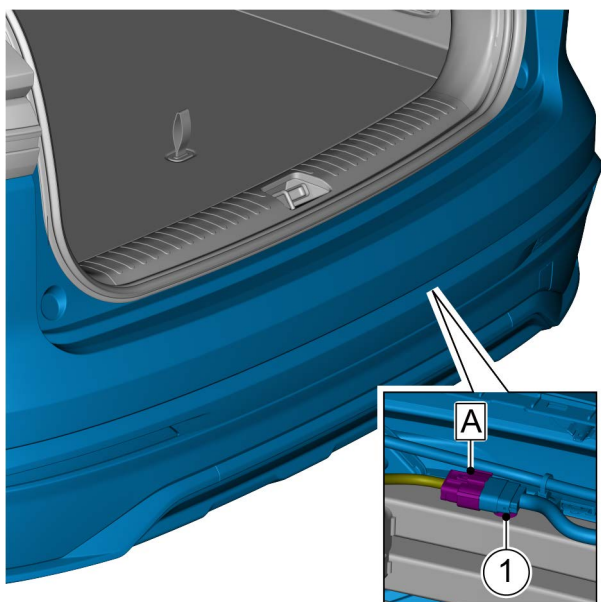


- 5 Remove the fixing bolts 1 and 2 on the right side of the rear bumper assembly.

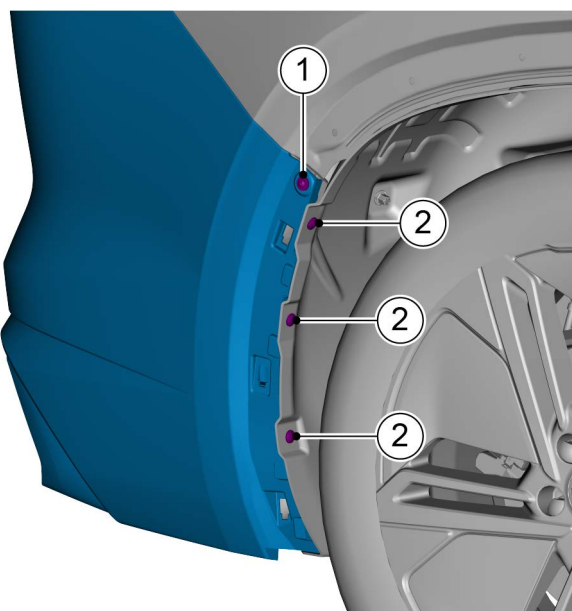


- 6 Disconnect the harness connector A and harness clip 1 of rear bumper harness, and remove the rear bumper assembly.

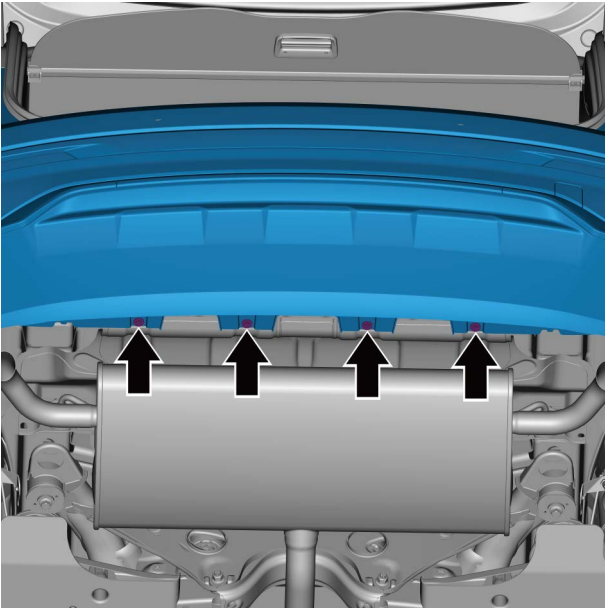
Installation Procedure



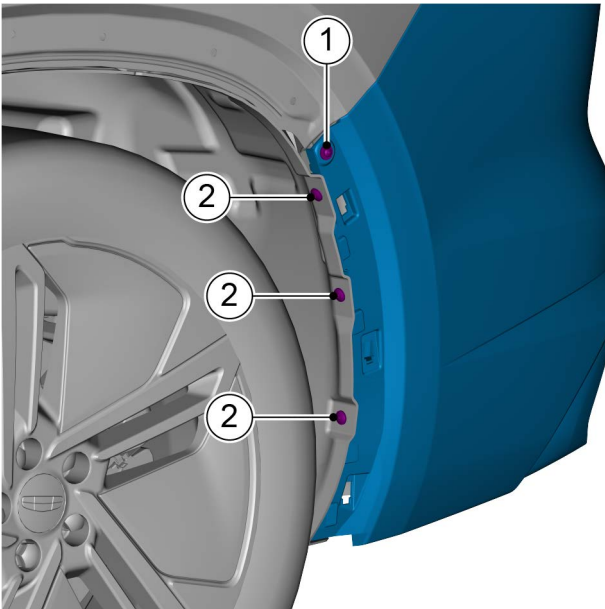
- 1 Connect the harness connector A and the harness clip 1 of rear bumper harness.



- 2 Install the fixing bolts 1 and 2 on the right side of the rear bumper assembly.
Torque: 1.5N·m



- 3 Install the 4 fixing bolts at the bottom of the rear bumper assembly.
Torque: 6N·m



- 4 Install the fixing screws 1 and 2 at the left side of rear bumper assembly.
Torque: 1.5N·m

- 5 Install the left and rear fender flares.
- 6 Connect the negative cable of battery.

13.4.3.12 Replacement of rear bumper left trim strip

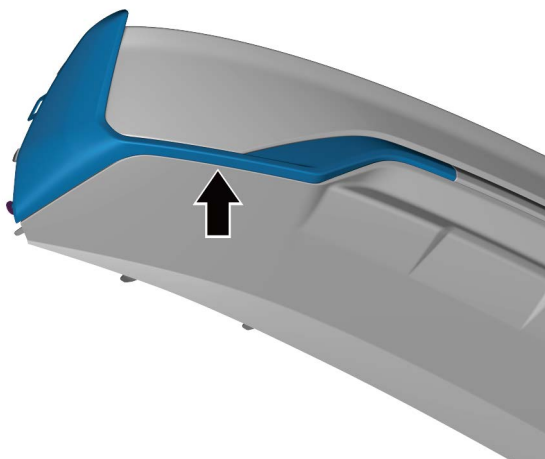
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

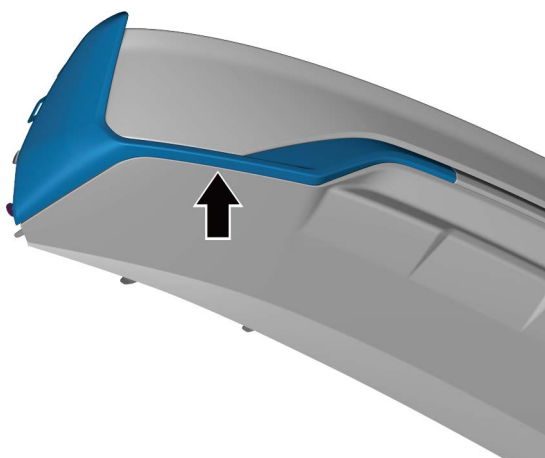
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the rear bumper assembly, refer to [Replacement of rear bumper assembly](#).

- 3 Remove the rear bumper upper body, refer to [Replacement of rear bumper upper body](#).
- 4 Remove the rear bumper left trim strip and take it off.



Installation Procedure

- 1 Install the rear bumper left trim and remove.



- 2 Install the rear bumper upper body.
- 3 Install the rear bumper assembly.
- 4 Connect the negative cable of battery.

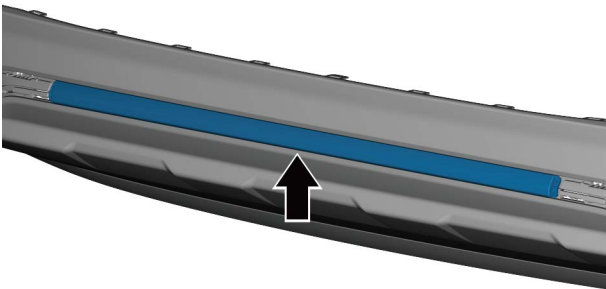
13.4.3.13 Replacement of rear bumper middle trim strip

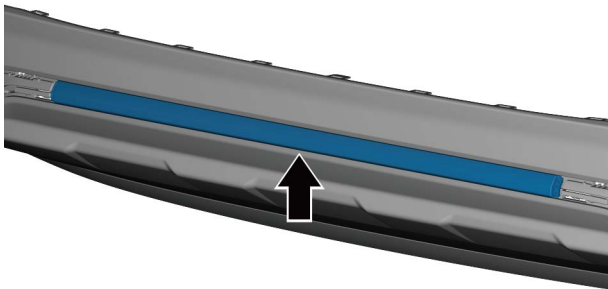
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the rear bumper assembly, refer to [Replacement of rear bumper assembly](#).
- 3 Remove the rear bumper upper body, refer to [Replacement of rear bumper upper body](#).
- 4 Remove the rear bumper left and right trim strips, refer to [Replacement of rear bumper left trim strip](#).
- 5 Remove the rear bumper middle trim strip and take it off.

**Installation Procedure**



- 1 Install the rear bumper middle trim strip and remove.

- 2 Install the rear bumper left and right trim strips.
- 3 Install the rear bumper upper body.
- 4 Install the rear bumper assembly.
- 5 Connect the negative cable of battery.

13.4.3.14 Replacement of rear bumper lower body trim panel

- 1 Refer to [Replacement of rear bumper middle trim strip](#).

13.4.3.15 Replacement of rear bumper upper body

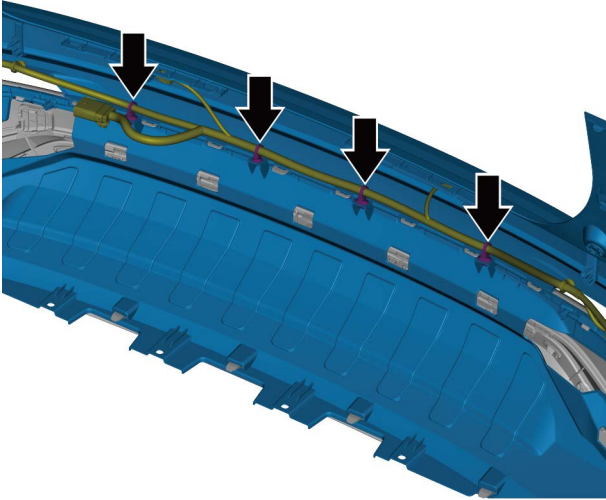
Removal Procedure

Warning !

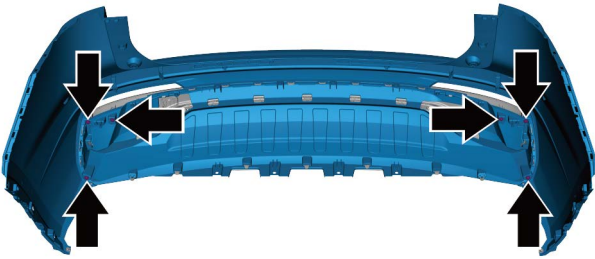
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the rear bumper assembly, refer to [Replacement of rear bumper assembly](#).
- 3 Remove left and right rear fog lamps, refer to [Replacement of rear fog lamp \(left\)](#).
- 4 Remove the parking assistance sensor. Refer to Replacement of parking assistance sensor.

- 5 Remove the 4 harness clips on the upper body of the rear bumper.

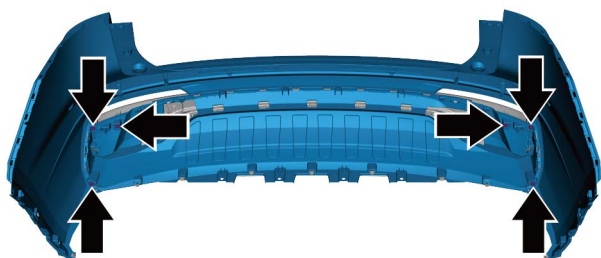


- 6 Remove the 6 fixing bolts of rear bumper upper body and remove the rear bumper upper body.

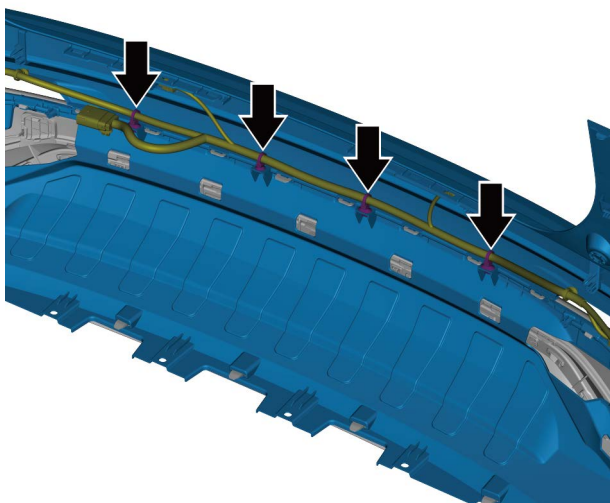


Installation Procedure

- 1 Install the 6 fixing screws of rear bumper upper body.
Torque: 2N·m



- 2 Install the 4 harness clips on the upper body of the rear bumper.



- 3 Install the parking assistance sensor.
- 4 Install the left and right rear fog lamp.
- 5 Install the rear bumper assembly.
- 6 Connect the negative cable of battery.

13.5 Vehicle doors

13.5.1 Specification

13.5.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Left front door check fixing bolt	M8×25	20-28
Left front door check fixing nut	M6×9.1	8.5-11.5
Left front door hinge fixing bolt	M8×30	30-40
Left rear door hinge fixing bolt	M8×30	30-40
Left front door inner release handle fixing screw	ST4.8×16	1.3-1.7
Left rear door inner release handle fixing screw	ST4.8×16	1.3-1.7
Left front door lock cylinder assembly fixing bolt	M6×20	8.5-11.5

13.5.2 Removal and Installation

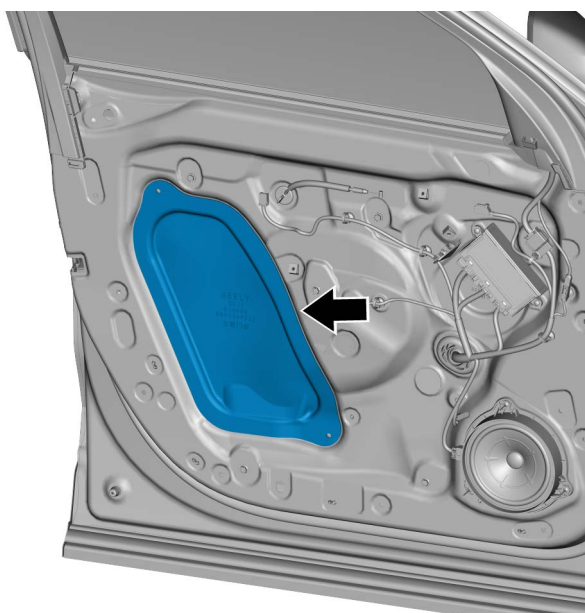
13.5.2.1 Replacement of left front door check

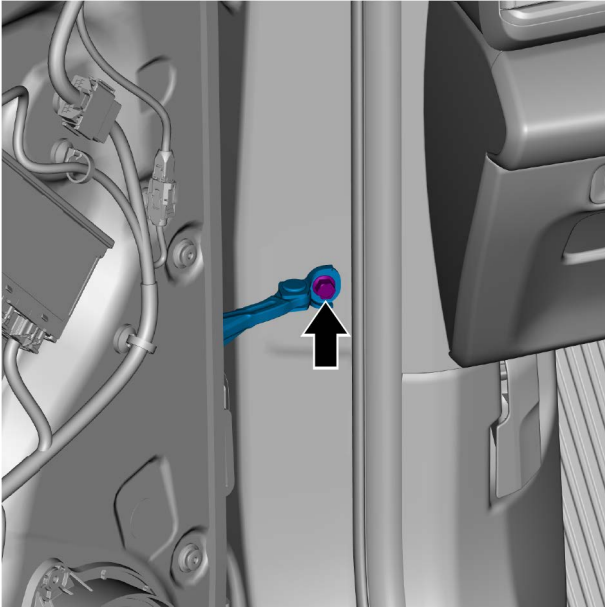
Removal Procedure

Warning !

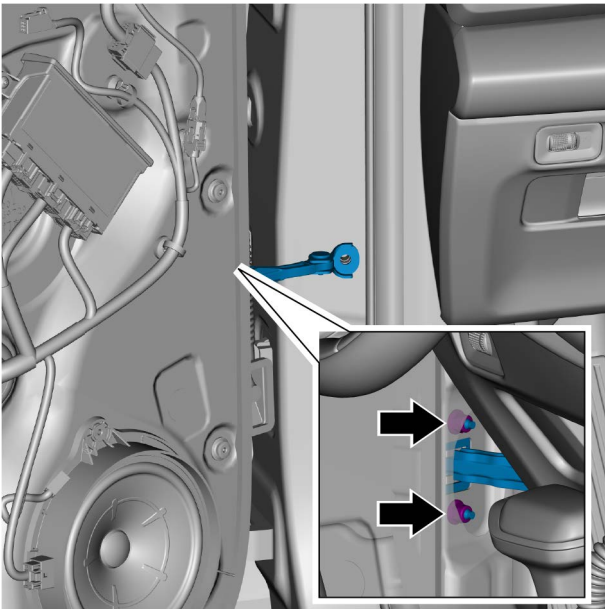
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left front door interior trim panel assembly, refer to [Replacement of left front door interior trim panel assembly](#).
- 3 Remove the left front door rear waterproof membrane.



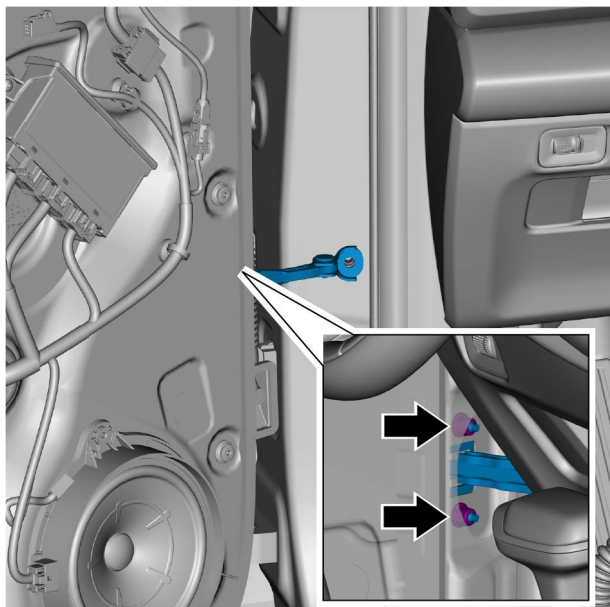


- 4 Remove the left front door check body side fixing bolt.

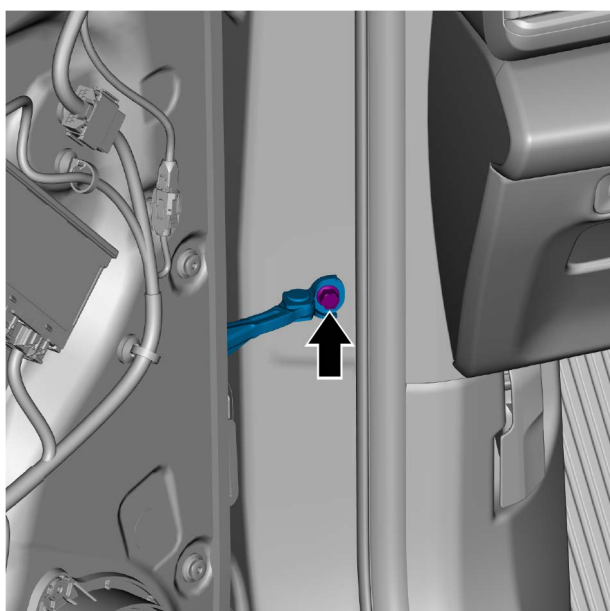


- 5 Remove the 2 fixing nuts on the door side of the left front door check and remove the left front door check.

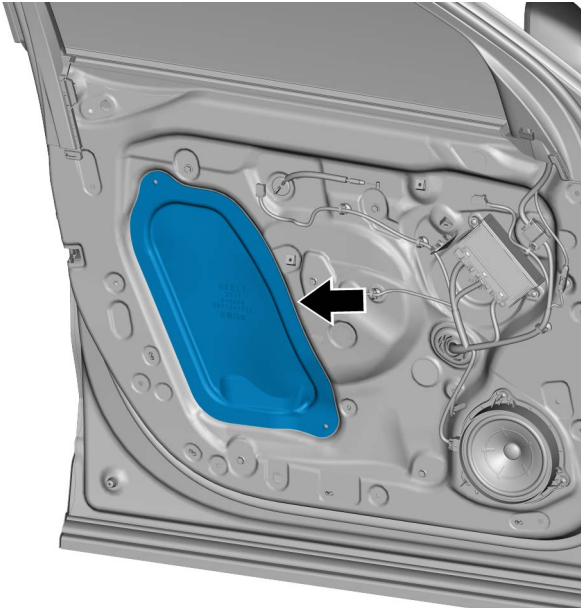
Installation Procedure



- 1 Install the 2 fixing nuts on the door side of the left front door check.
Torque: 10N·m



- 2 Install the left front door check body side fixing bolt.
Torque: 24N·m



3 Install the left front door rear waterproof membrane.

4 Install the assembly-interior trim panel left front door.

5 Connect the negative cable of battery.

13.5.2.2 Replacement of left front door hinge

Removal Procedure

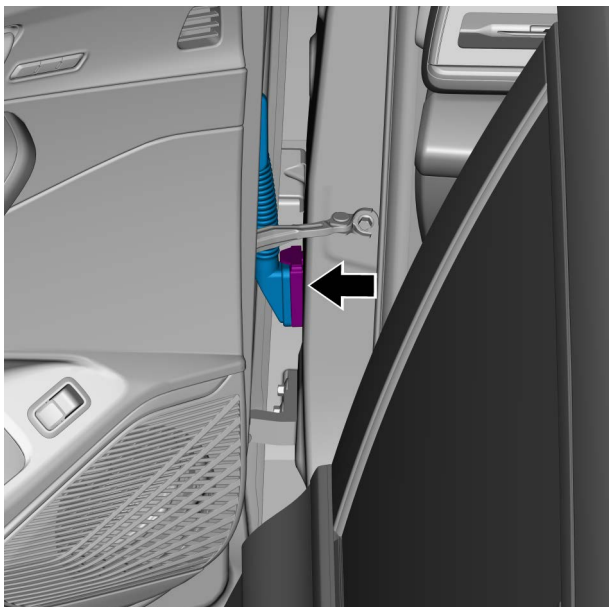
Warning !

Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#)

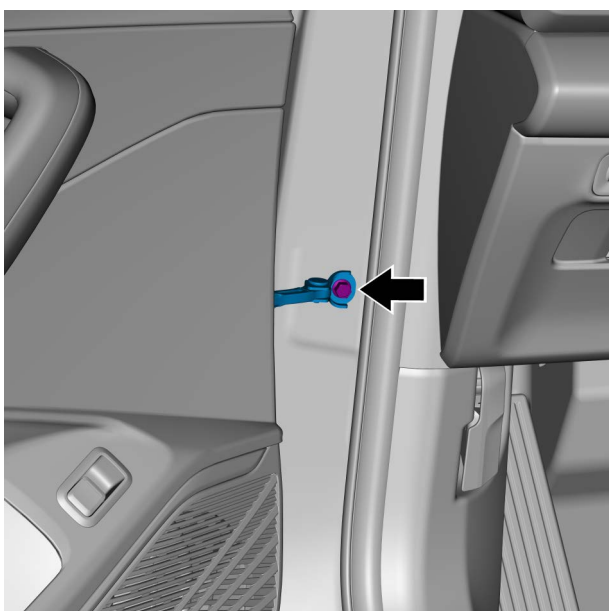
Caution

Two people must together when removing the door assembly.

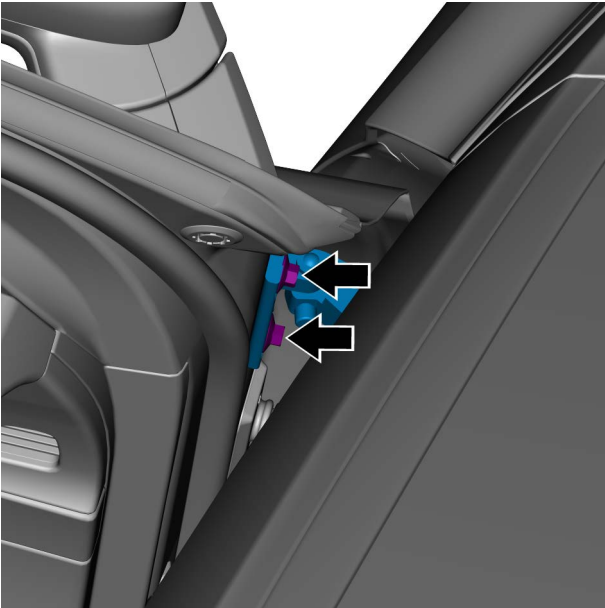
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Clean the door hinge assembly surface with a rag and use a marker or other marking tool to mark the position of the hinges on the door and body mounting surfaces.



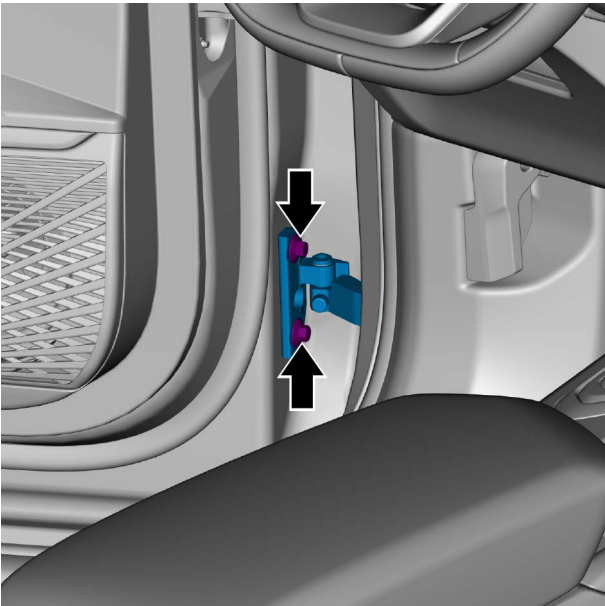
- 3 Disconnect the left front door harness from the floor harness.



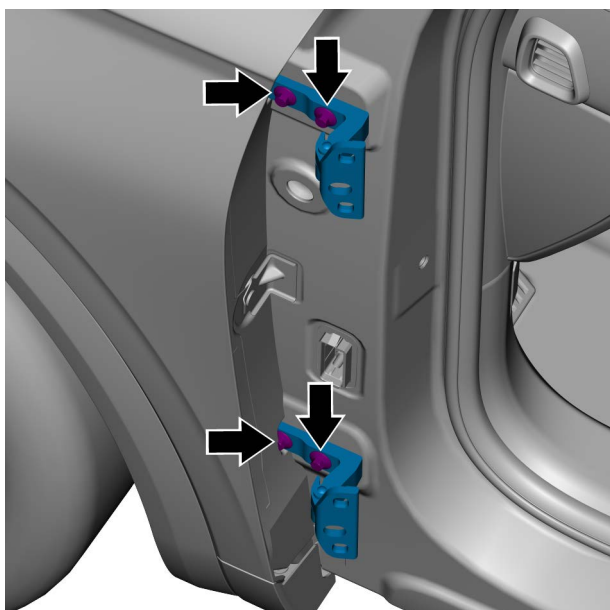
- 4 Remove the fixing bolts of left front door check and body.



- 5 Remove the 2 fixing bolts of the left front door upper hinge on the door side.

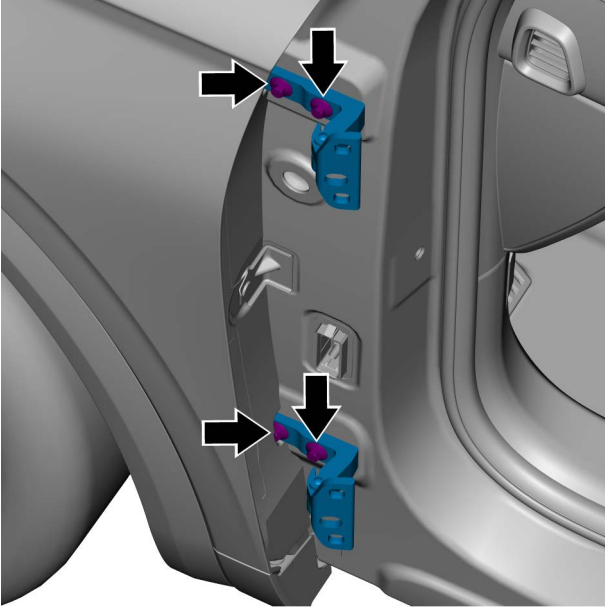


- 6 Remove the 2 fixing bolts of the left front door lower hinge on the door side.

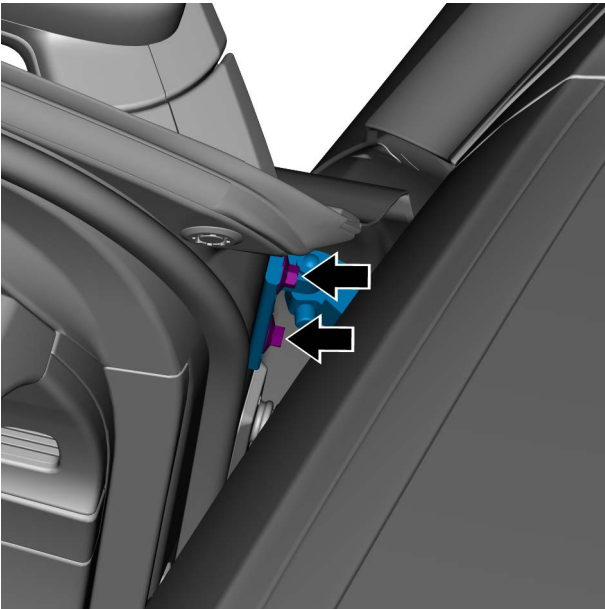


- 7 Remove the 4 fixing bolts of the left front door upper and lower hinges on the body side and take them off.

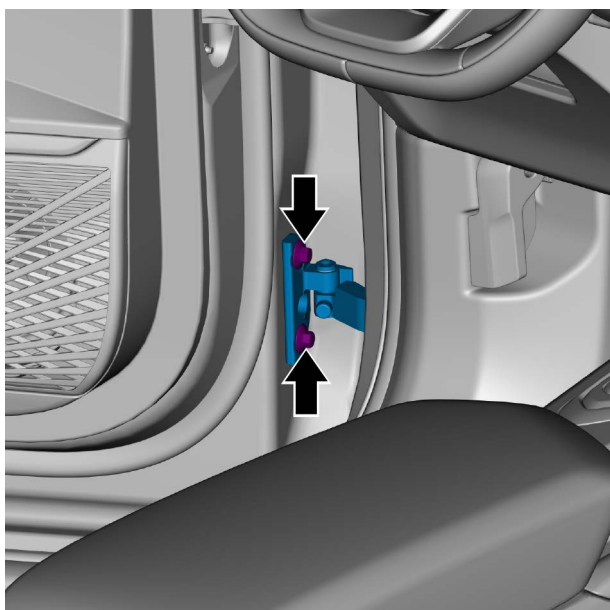
Installation Procedure



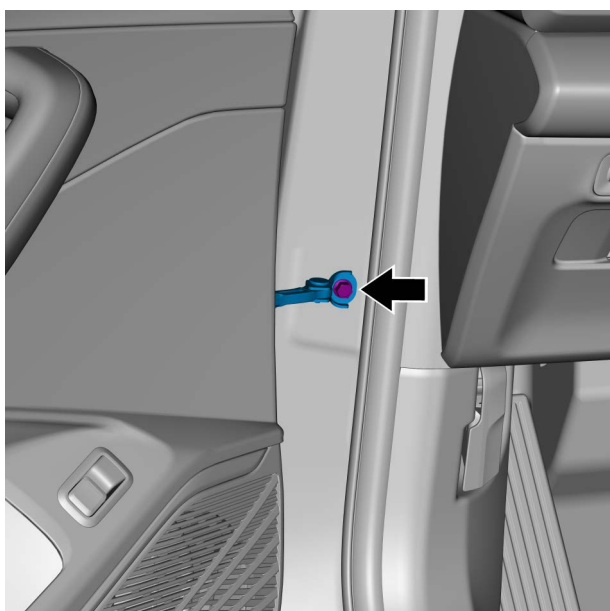
- 1 Install the 4 fixing bolts of left front door upper hinge on the body side.
Torque: 35N·m



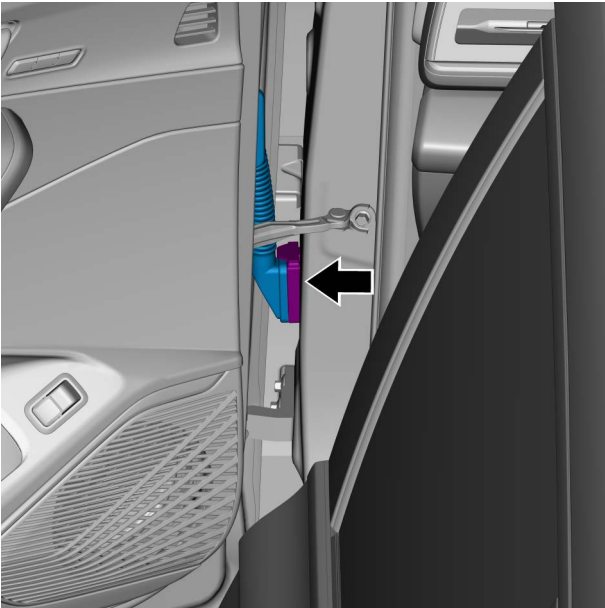
- 2 Install the 2 fixing bolts of the left front door upper hinge on the door side.
Torque: 35N·m



- 3 Install the 2 fixing bolts of the left front door lower hinge on the door side.
Torque: 35N·m



- 4 Install the fixing bolts of the left front door check and the body.
Torque: 24N·m



- 5 Connect the left front door harness and the floor harness.

- 6 Connect the negative cable of battery.

13.5.2.3 Replacement of left rear door hinge

Removal Procedure

Warning !

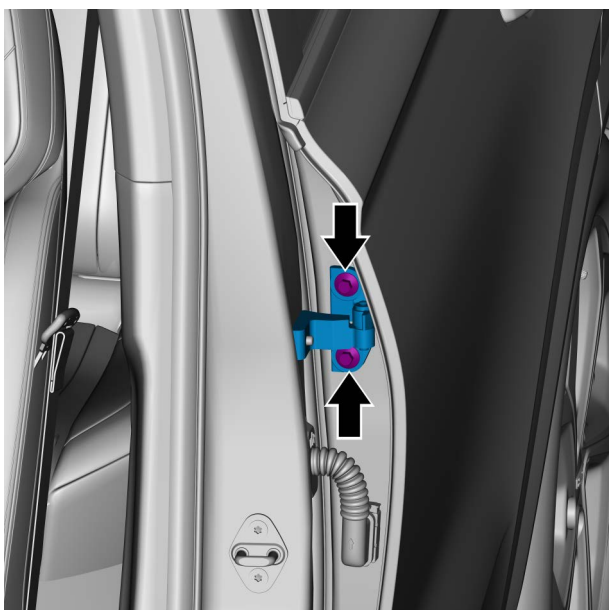
Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#)

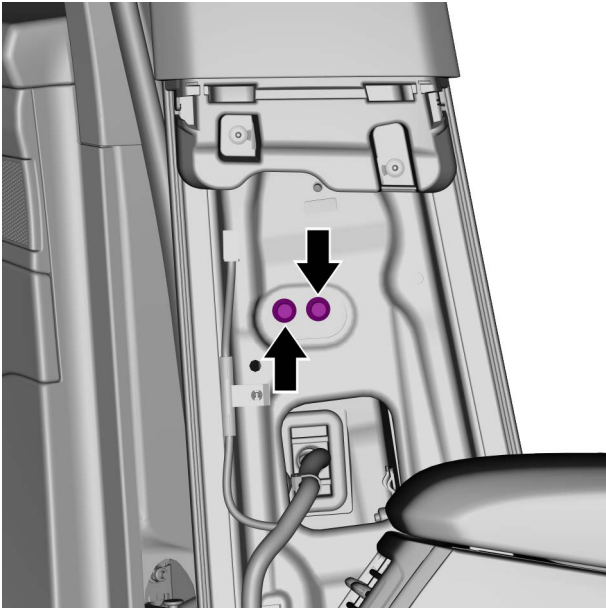
Caution

The doors need to be secured after the door hinges are removed.

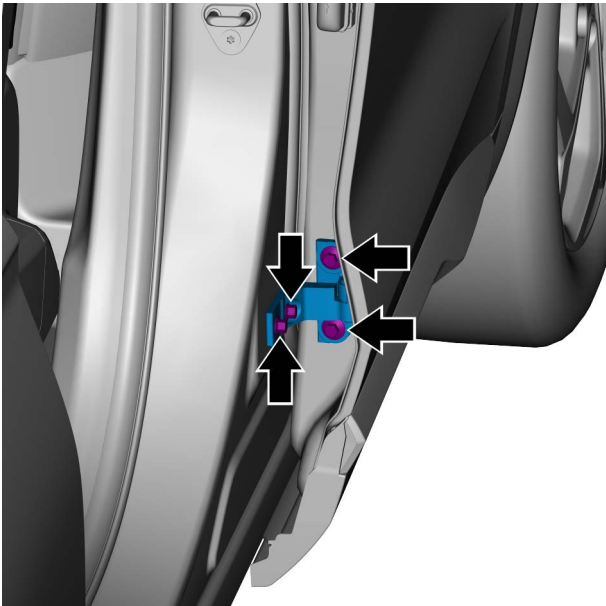
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the rear seat cushion assembly, refer to [Replacement of rear seat cushion assembly](#).
- 3 Remove the rear seat left backrest assembly, refer to [Replacement of rear seat left backrest assembly](#).
- 4 Remove the luggage compartment door sill trim panel assembly, refer to [Replacement of luggage compartment door sill trim panel assembly](#).
- 5 Remove the left upper trim panel of luggage compartment, refer to [Replacement of luggage compartment left upper trim panel](#).
- 6 Remove the luggage compartment light, refer to [Replacement of luggage compartment light](#).
- 7 Remove the 12V socket (luggage compartment), refer to [Replacement of 12V socket \(luggage compartment\)](#).

- 8 Remove the left luggage compartment side shield assembly, refer to [Replacement of left luggage compartment side shield assembly](#).
- 9 Remove the left rear door sill interior trim panel assembly, refer to [Replacement of left rear door sill interior trim panel assembly](#).
- 10 Remove the left B-pillar lower trim panel assembly, refer to [Replacement of left B-pillar lower trim panel assembly](#).
- 11 Clean the door hinge assembly surface with a rag and use a marker or other marking tool to mark the position of the hinges on the door and body mounting surfaces.
- 12 Remove the 2 fixing bolts of the left rear door upper hinge on the door side.



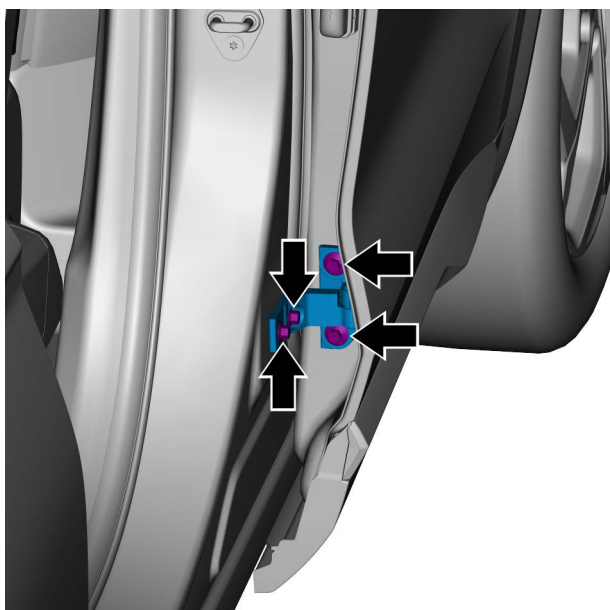


- 13 Remove the 2 fixing bolts of the left rear door upper hinges on the body side and take off the left rear door lower hinge.

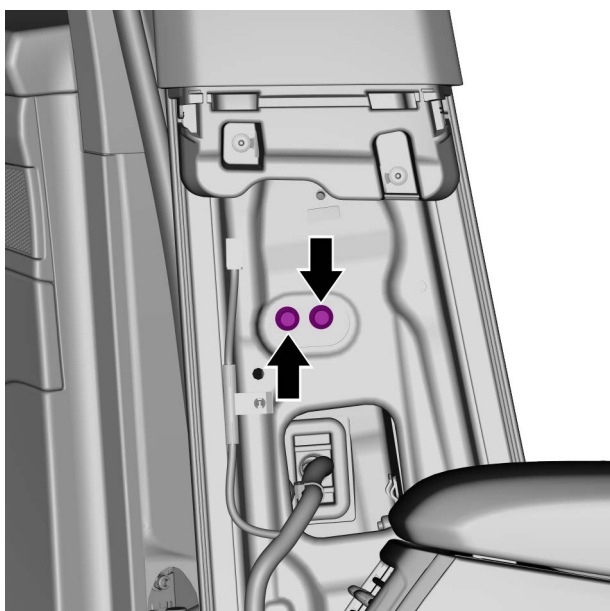


- 14 Remove the 4 fixing bolts of the left rear door lower hinges and take off the left rear door upper hinge.

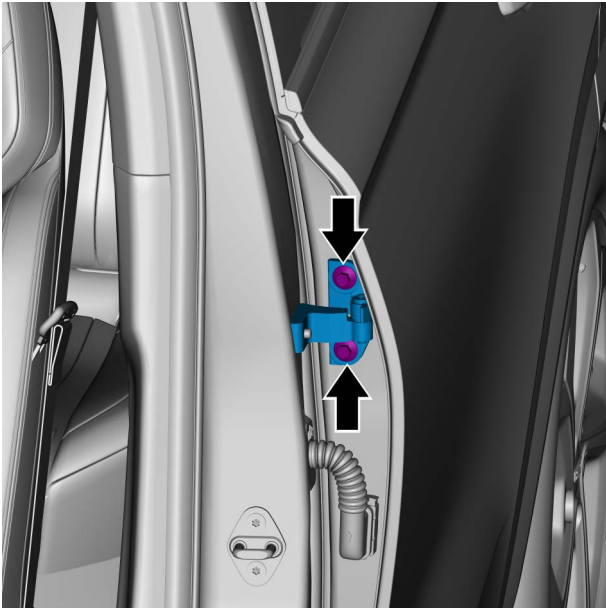
Installation Procedure



- 1 Install the 4 fixing bolts of the left rear door lower hinge.
Torque: 35N·m



- 2 Install the 2 fixing bolts of left rear door upper hinge on the body side.
Torque: 35N·m



- 3 Install the 2 fixing bolts of the left rear door upper hinge on the door side.

Torque: 35N·m

- 4 Install the left B-pillar lower trim panel assembly.
- 5 Install the left rear door sill interior trim panel assembly.
- 6 Install the left luggage compartment side shield assembly.
- 7 Install the 12V socket (luggage compartment).
- 8 Install the boot lamp.
- 9 Install the left upper trim panel of luggage compartment.
- 10 Install the luggage compartment door sill trim panel assembly.
- 11 Install the rear seat left backrest assembly.
- 12 Install the rear seat cushion assembly.
- 13 Connect the negative cable of battery.

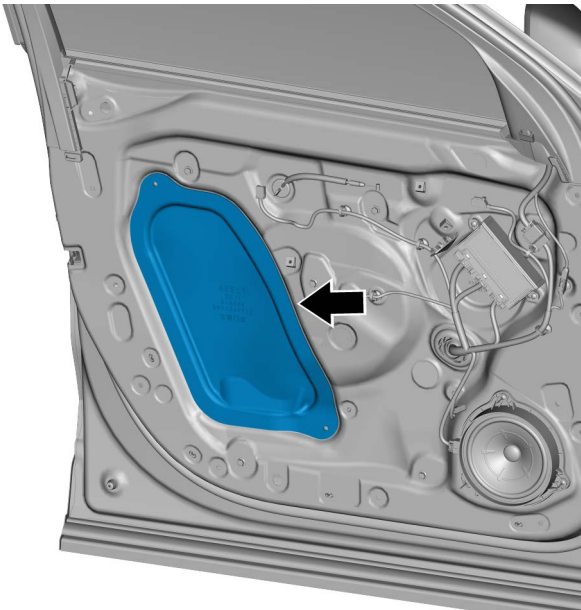
13.5.2.4 Replacement of left front door outer release handle assembly

Removal Procedure

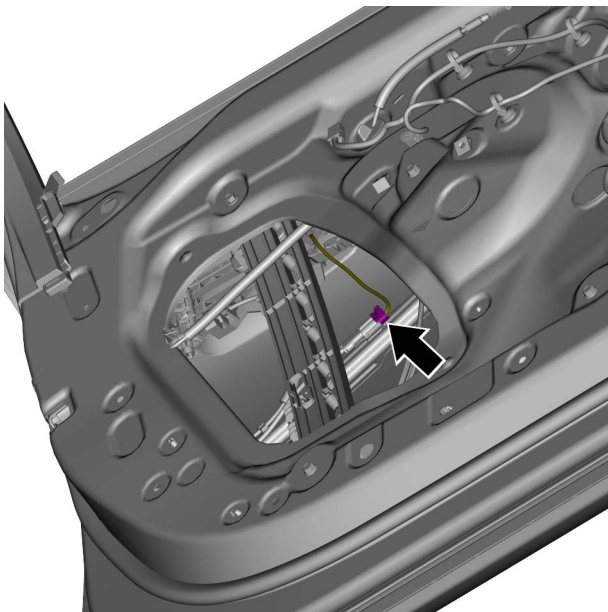
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

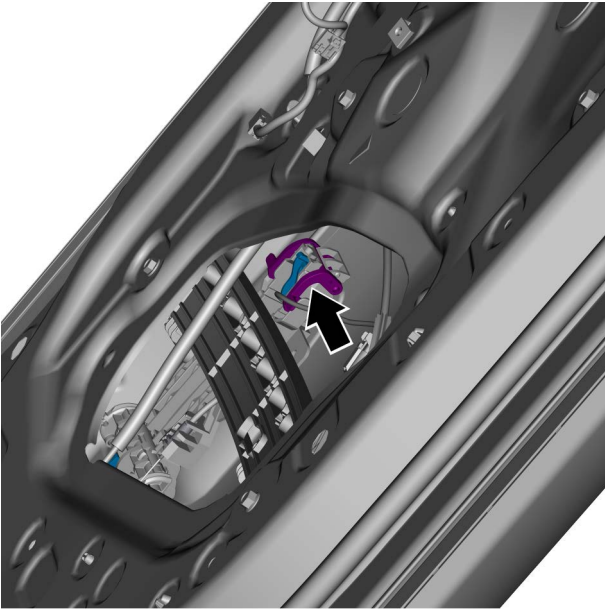
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left front door interior trim panel assembly, refer to [Replacement of left front door interior trim panel assembly](#).



3 Remove the left front door rear waterproof membrane.



4 Disconnect the outer door handle (left front door handle sensor) harness connector.



- 5 Disengage the fixing clip of left front door outer release handle assembly.

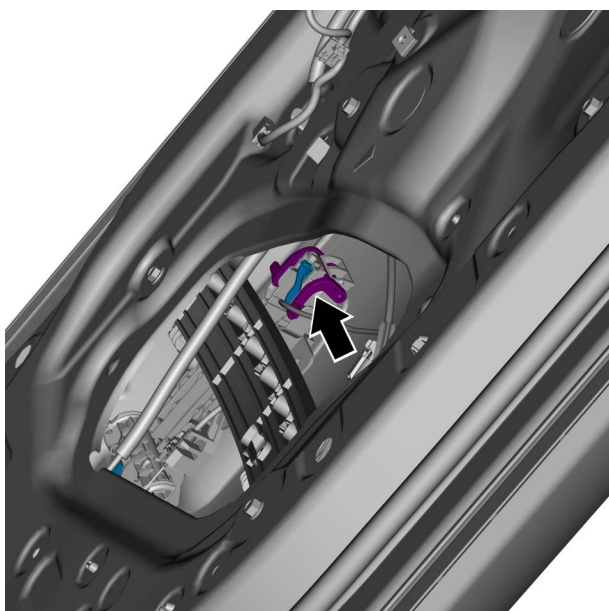


- 6 Pull the left front door outer release handle assembly diagonally outward to disengage it and remove the left front door outer release handle assembly.

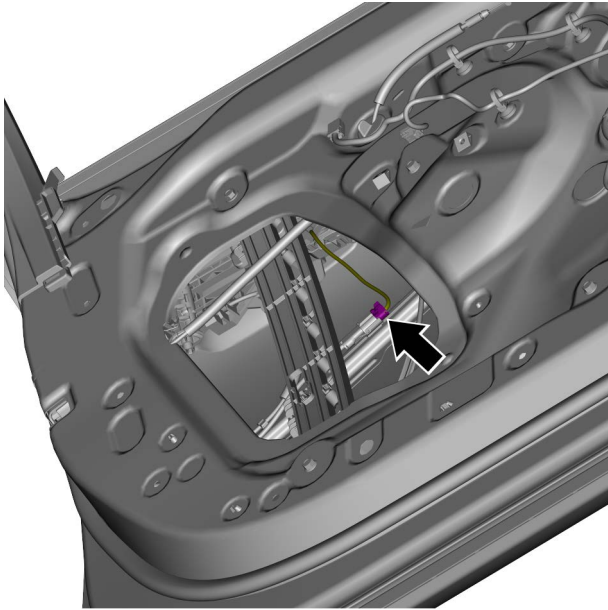
Installation Procedure



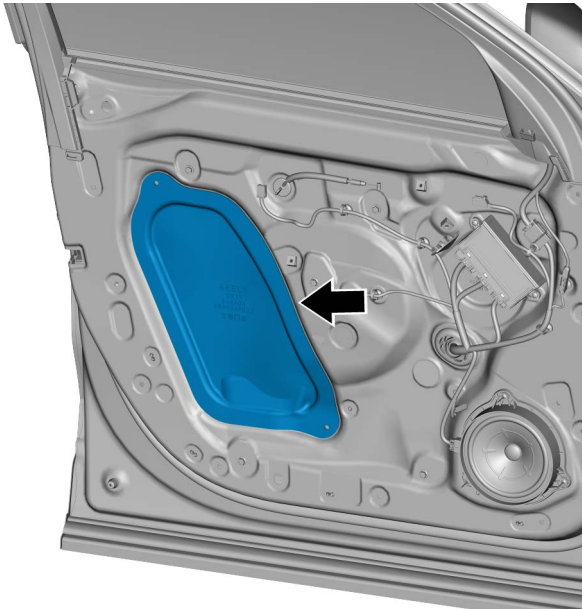
- 1 Install the left front door outer release handle assembly to the fixed position.



- 2 Install the fixing clip of left front door outer release handle assembly.



- 3 Connect the outer door handle (left front door handle sensor) harness connector.



- 4 Install the left front door rear waterproof membrane.

- 5 Install the assembly-interior trim panel left front door.
- 6 Connect the negative cable of battery.

13.5.2.5 Replacement of left rear door outer release handle

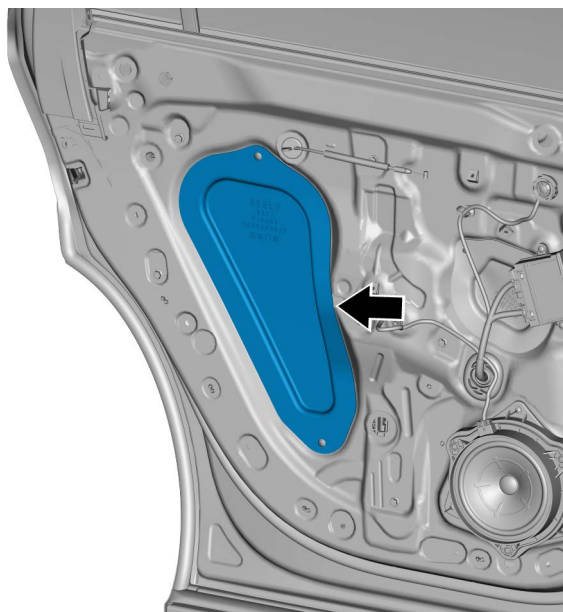
Removal Procedure

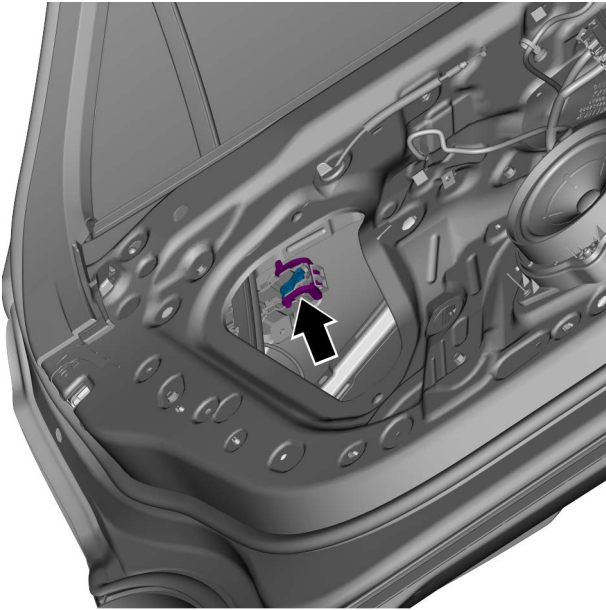
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

- 2 Remove the left rear door interior trim panel assembly, refer to [Replacement of left rear door interior trim panel assembly](#).
- 3 Remove the left rear door rear waterproof membrane.





- 4 Remove the left rear door outer release handle fixing clip.

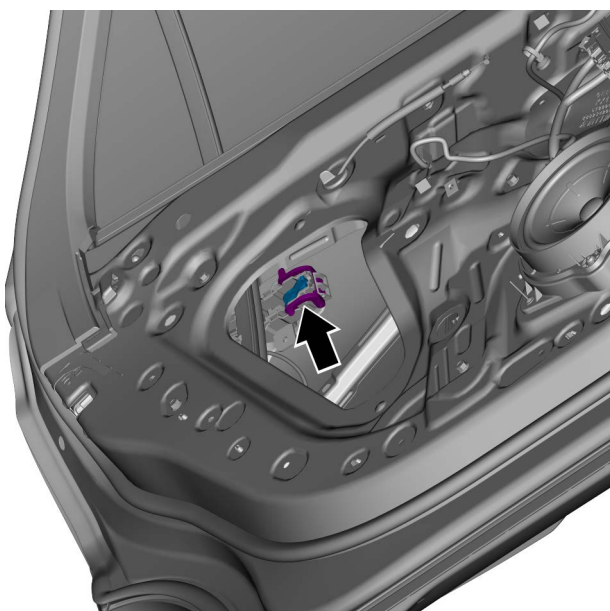


- 5 Pull the left rear door outer release handle diagonally outward to disengage it and remove the left rear door outer release handle.

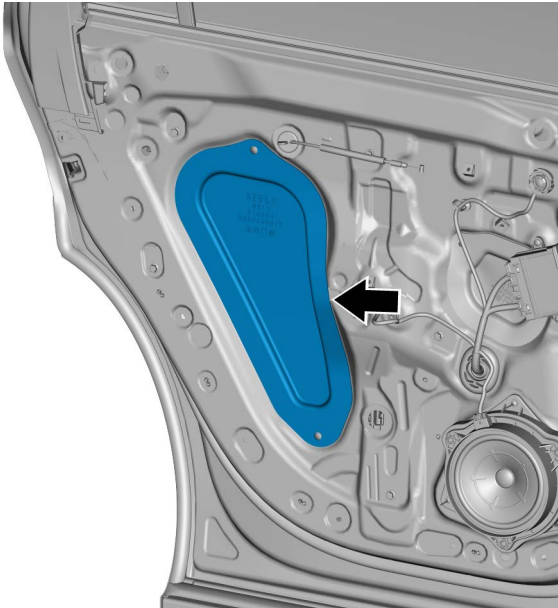
Installation Procedure



- 1 Install the left rear door outer release handle to the fixed position.



- 2 Install the left rear door outer release handle fixing clip.



3 Install the left rear door rear waterproof membrane.

4 Install the left rear door interior trim panel assembly.

5 Connect the negative cable of battery.

13.5.2.6 Replacement of left front door inner release handle

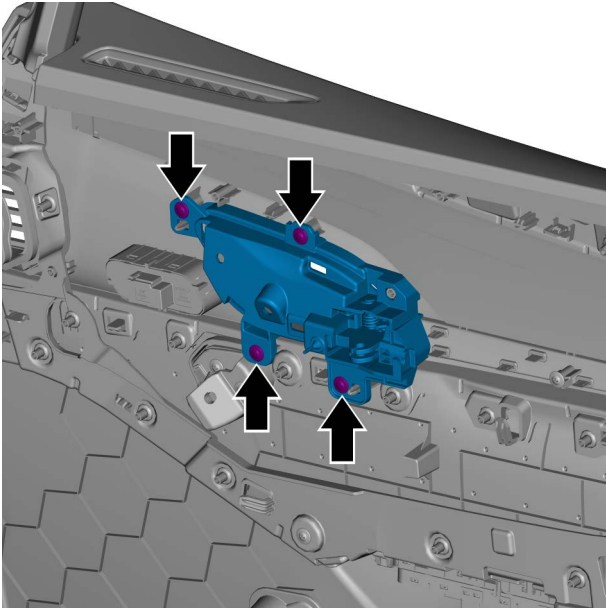
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

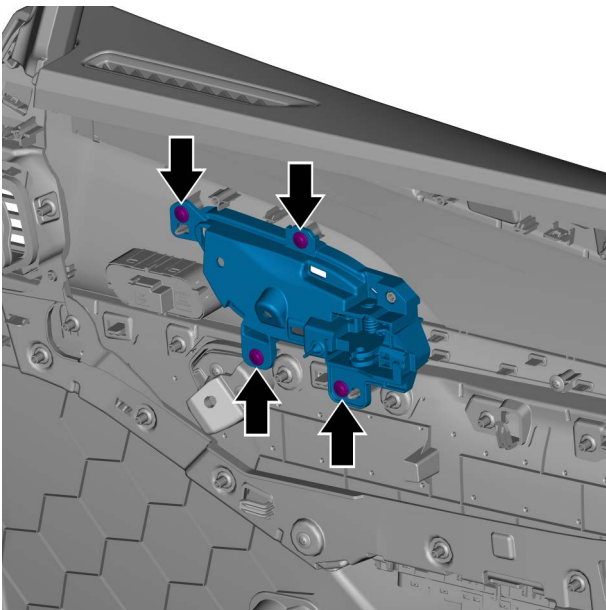
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left front door interior trim panel assembly, refer to [Replacement of left front door interior trim panel assembly](#).

- 3 Remove the left front door ambient lamp, refer to [Replacement of left front door ambient lamp](#).
- 4 Remove the 4 fixing screws of the left front door inner release handle and take off the left front door inner release handle.



Installation Procedure

- 1 Install the 4 fixing screws of left front door inner release handle.
Torque: 1.5N·m



- 2 Install the left front door ambient lamp.
- 3 Install the assembly-interior trim panel left front door.
- 4 Connect the negative cable of battery.

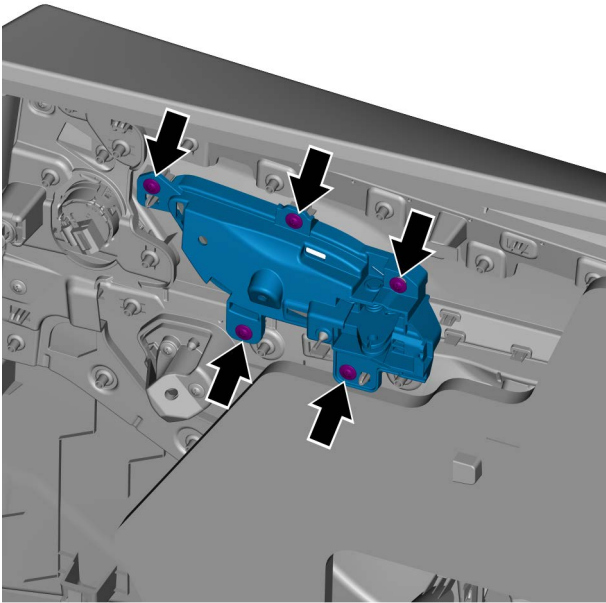
13.5.2.7 Replacement of left rear door inner release handle

Removal Procedure

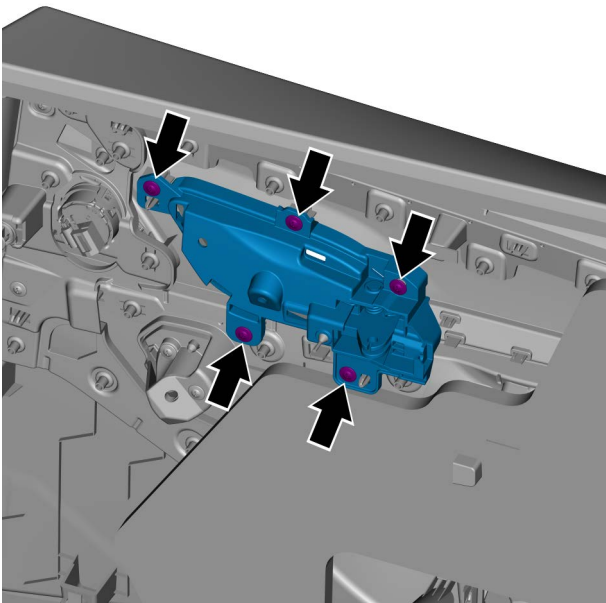
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left rear door interior trim panel assembly, refer to [Replacement of left rear door interior trim panel assembly](#).
- 3 Remove the 5 fixing screws of the left rear door inner release handle and take off the left rear door inner release handle.

**Installation Procedure**

- 1 Install the 5 fixing screws of left rear door inner release handle.
Torque: 1.5N·m



- 2 Install the left rear door interior trim panel assembly.
- 3 Connect the negative cable of battery.

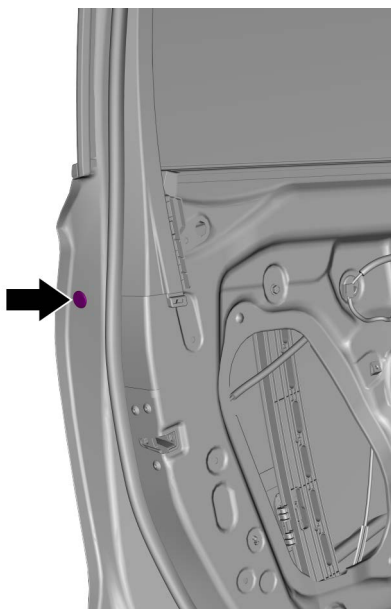
13.5.2.8 Replacement of left front door lock cylinder assembly

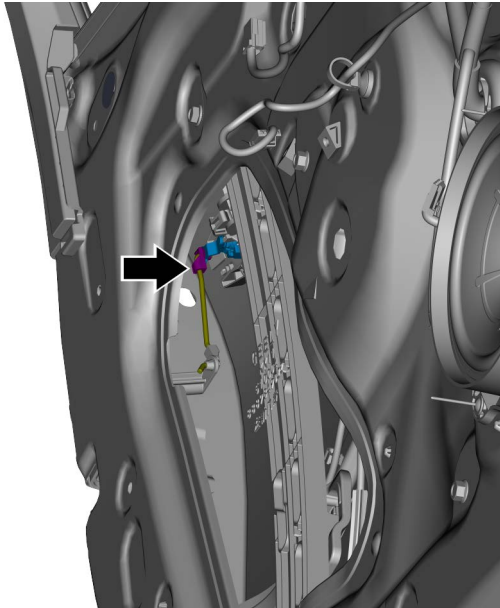
Removal Procedure

Warning !

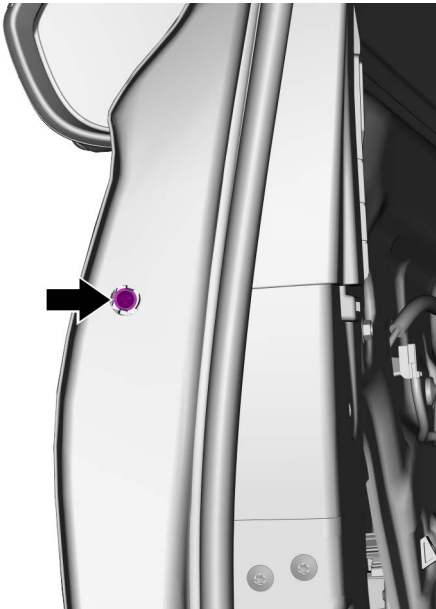
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left front door interior trim panel assembly, refer to [Replacement of left front door interior trim panel assembly](#).
- 3 Remove the left front door outer release handle assembly, refer to [Replacement of left front door outer release handle assembly](#).
- 4 Remove the rubber plug of the lock cylinder bolt.





5 Remove the left front door lock cylinder tie rod.



6 Remove the left front door lock cylinder assembly fixing bolt.

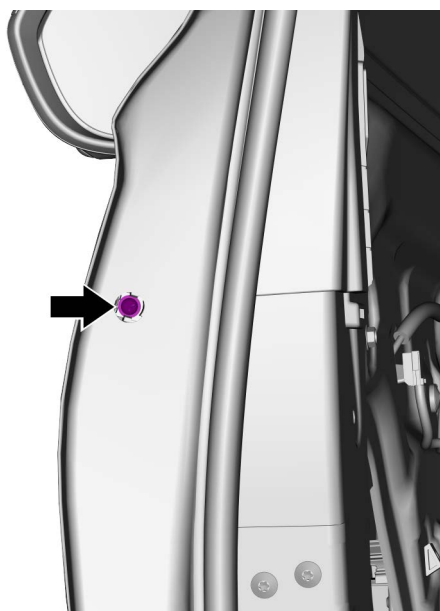


- 7 Remove the left front door lock cylinder assembly.

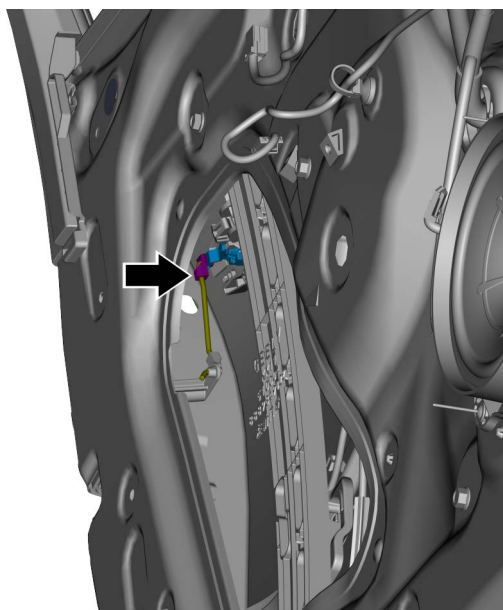
Installation Procedure



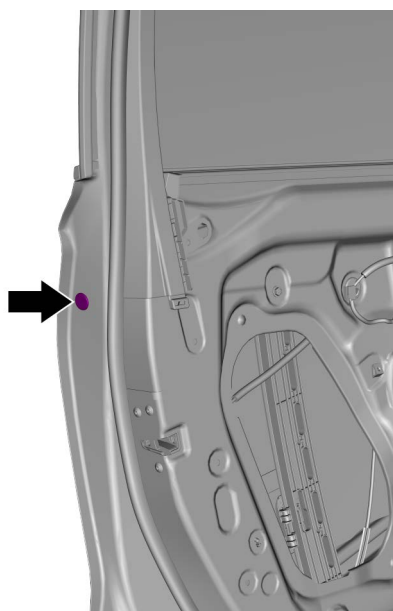
- 1 Install the left front door lock cylinder assembly.



- 2 Install the left front door lock cylinder assembly fixing bolt.
Torque: 5N·m



3 Install the left front door lock cylinder tie rod.

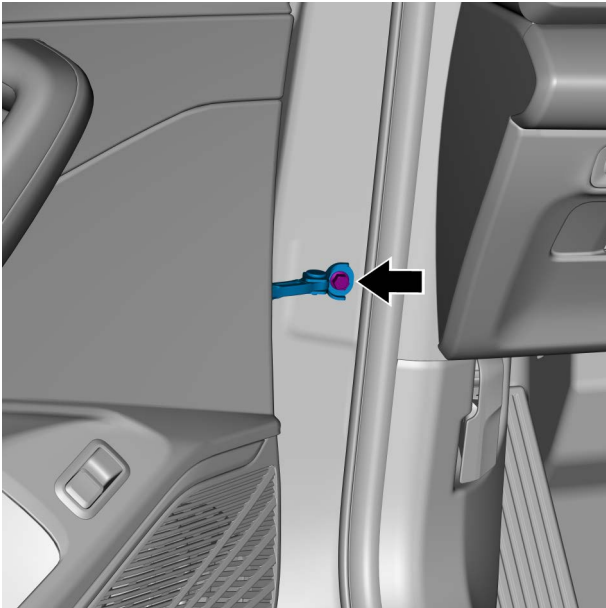


4 Install the rubber plug of the lock cylinder bolt.

- 5 Install the left front door outer release handle assembly.
- 6 Install the assembly-interior trim panel left front door.
- 7 Connect the negative cable of battery.

13.5.2.9 Replacement of left front door primary sealing strip

Removal Procedure



- 1 Remove the fixing bolts of left front door check and body.

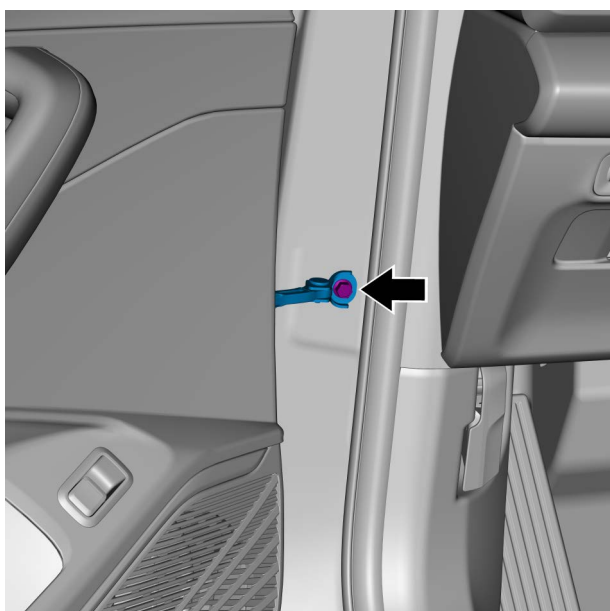


- 2 Remove the left front door primary sealing strip and remove it.

Installation Procedure



- 1 Install the left front door primary sealing strip.



- 2 Install the fixing bolts of the left front door check and the body.

Torque: 24N·m

13.5.2.10 Replacement of left front door opening sealing strip

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

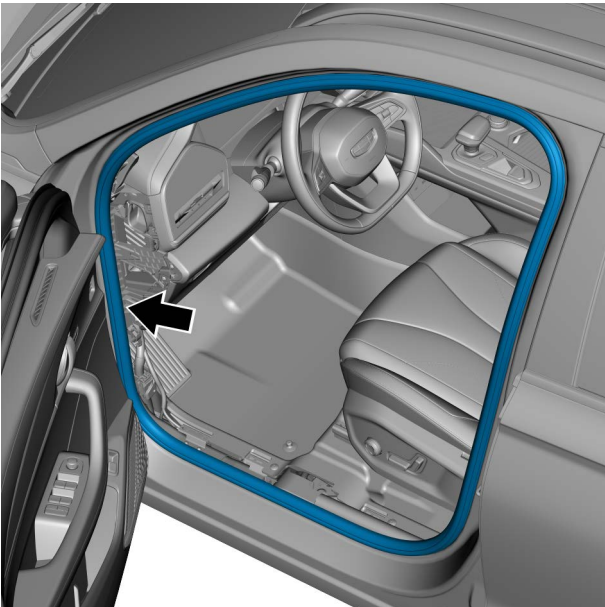
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the instrument panel front left side end cover assembly, refer to [Replacement of instrument panel front left side end cover assembly](#).

- 3 Remove the left front door sill trim panel assembly, refer to [Replacement of left front door sill trim panel assembly](#).
- 4 Remove the left A-pillar upper trim panel assembly, refer to [Replacement of left A-pillar upper trim panel assembly](#).
- 5 Remove the left B-pillar lower trim panel assembly, refer to [Replacement of left B-pillar lower trim panel assembly](#).
- 6 Remove the left B-pillar upper trim panel assembly, refer to [Replacement of left B-pillar upper trim panel assembly](#).
- 7 Remove the left front door opening sealing strip and take it off.



Installation Procedure

- 1 Install the left front door opening sealing strip.



- 2 Install the left B-pillar upper trim panel assembly.
- 3 Install the left B-pillar lower trim panel assembly.
- 4 Install the left A-pillar upper trim panel assembly.

- 5 Install the left front door sill trim panel assembly.
- 6 Install the instrument panel front left side end cover assembly.
- 7 Connect the negative cable of battery.

13.6 Frame and underbody

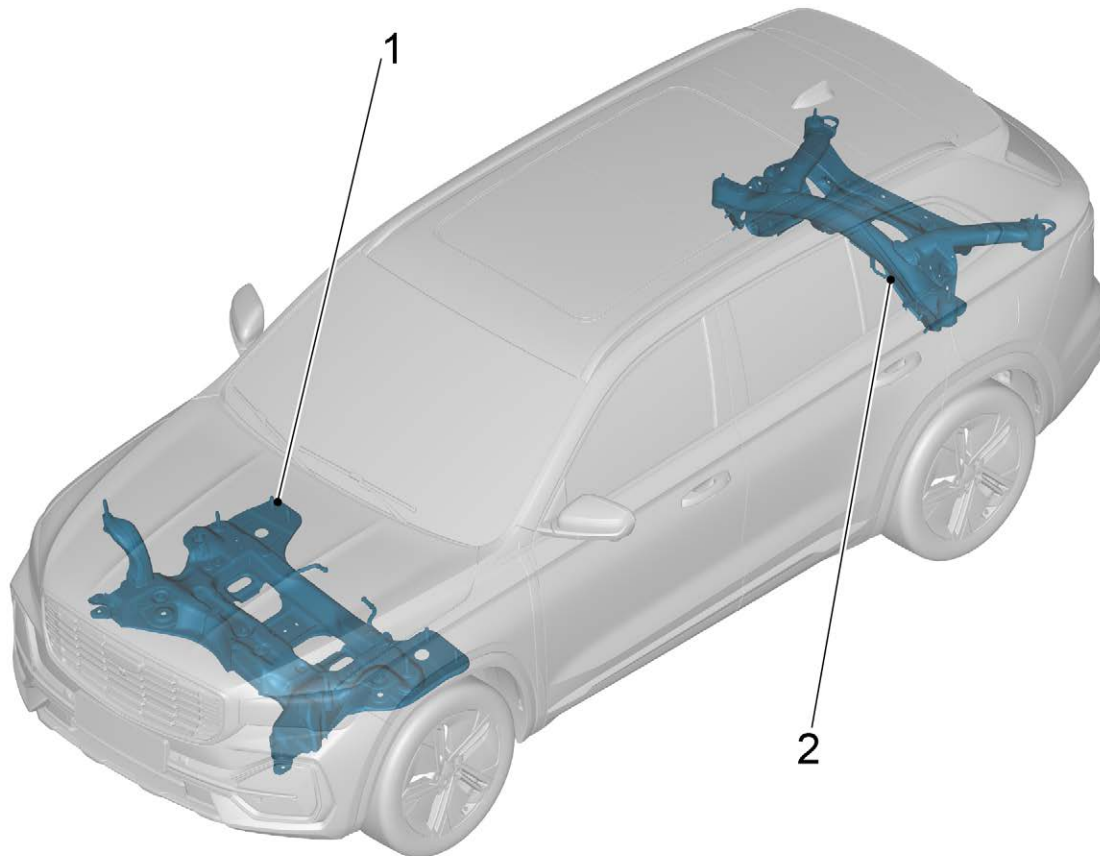
13.6.1 Specification

13.6.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Fixing bolt of front subframe front point and vehicle body	M12×100	90 N·m+90°
Fixing bolt of front subframe rear point and vehicle body	M12×100	90 N·m+90°
Fixing bolt of subframe reinforcement point and vehicle body	M14×40	140 N·m+90°
Fixing bolt of rear subframe and vehicle body front point	M12×120×126.35	90 N·m+140°
Fixing bolt of rear subframe and vehicle body rear point	M12×120×126.35	90 N·m+140°

13.6.2 Part position

13.6.2.1 Part position



1. Front subframe

2. Rear subframe

13.6.3 Removal and Installation

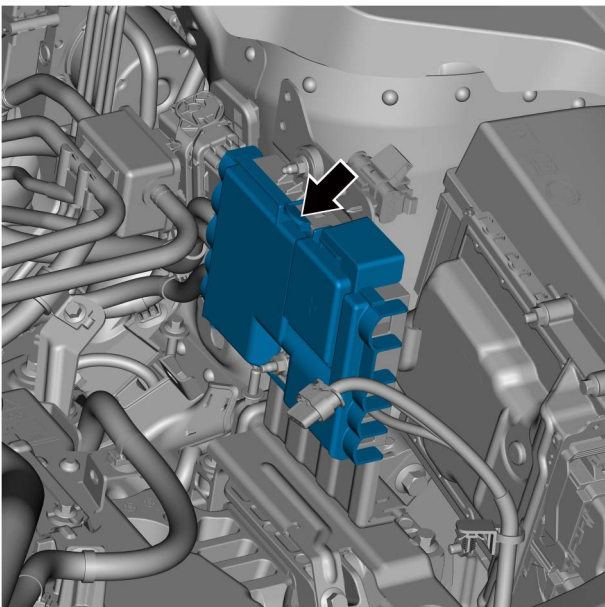
13.6.3.1 Replacement of Front Subframe

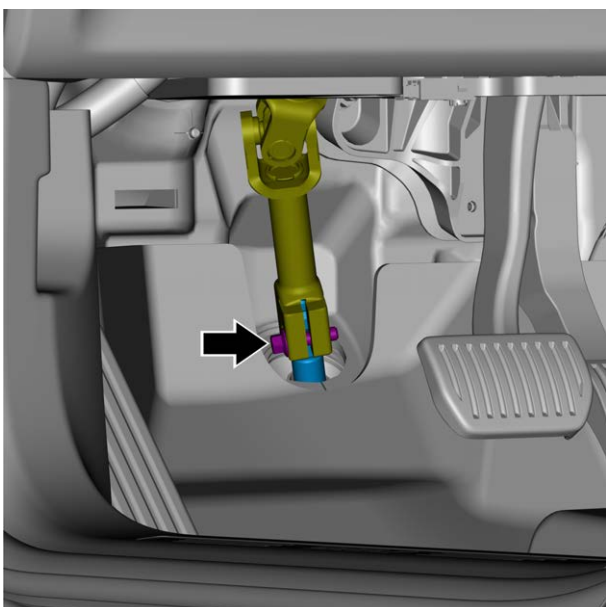
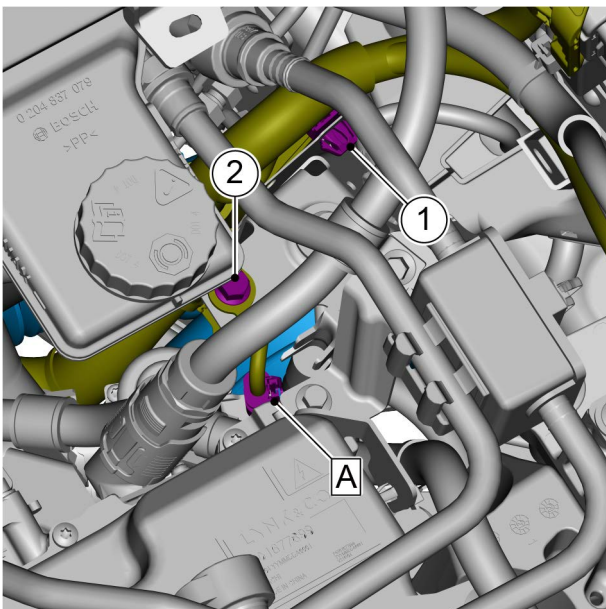
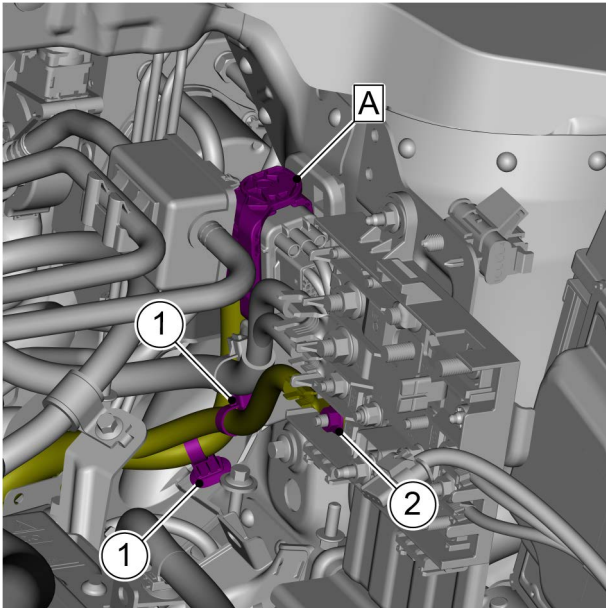
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the air filter assembly, see [Replacement of Air Filter Assembly](#).
- 3 Remove the resonator assembly, see [Replacement of Resonator Assembly](#).
- 4 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 5 Remove wheel, see [Replacement of Wheel Assembly](#).
- 6 Remove the front access heat shield (1), see [Replacement of Front Access Heat Shield \(1\)](#).
- 7 Remove the lower U-beam of the front suspension, see [Replacement of Lower U-beam of Front Suspension](#).
- 8 Remove the front bumper assembly, refer to [Replacement of front bumper assembly](#).
- 9 Remove the rear right suspension vibration isolator pad, see [Replacement of Rear Right Suspension Vibration Isolation Pad](#).
- 10 Remove the rear left suspension vibration isolation pad, see [Replacement of Rear Left Suspension Vibration Isolation Pad](#).
- 11 Remove the front cabin positive cover.

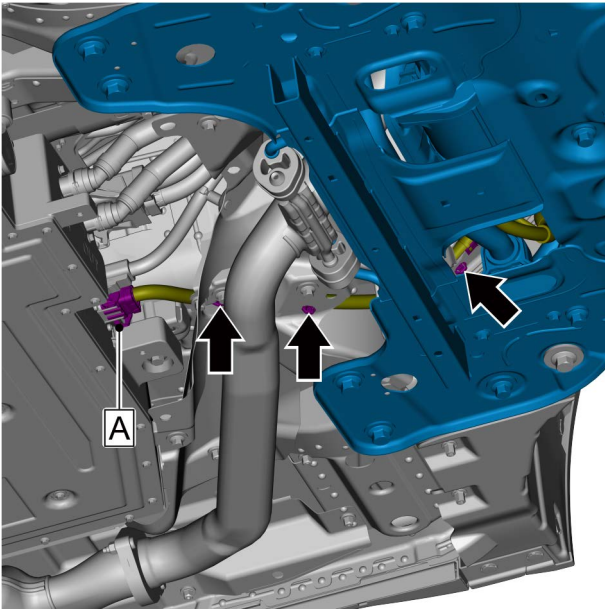




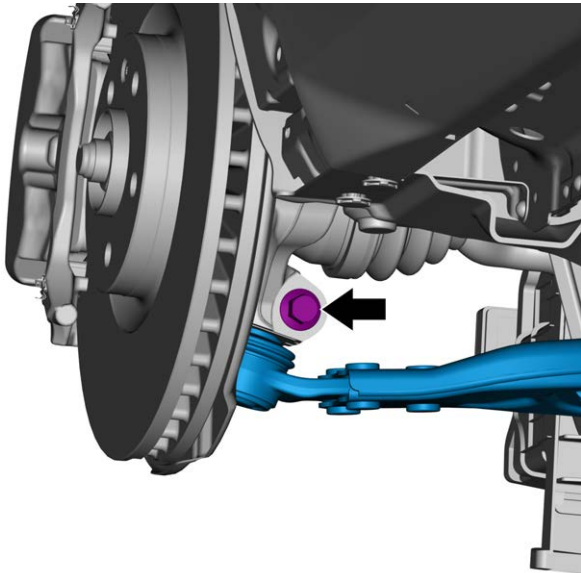
- 12 Remove electric power assisted steering gear with cross tie rod assembly harness fixing nut 2.
- 13 Disconnect harness connector A from the electric power assisted steering gear with cross tie rod assembly harness.
- 14 Remove the retaining clips 1 of the electric power assisted steering gear with cross tie rod assembly harness.
- 15 Disconnect harness connector A from the electric power assisted steering gear with cross tie rod assembly harness.
- 16 Remove the fixing bolt 2 of the electric power assisted steering gear with cross tie rod assembly harness.
- 17 Remove the retaining clips 1 of the electric power assisted steering gear with cross tie rod assembly harness.
- 18 Remove and discard the fixing bolt on the mechanical steering column assembly and disengage it from the electric power assisted steering gear with cross tie rod assembly.

Caution

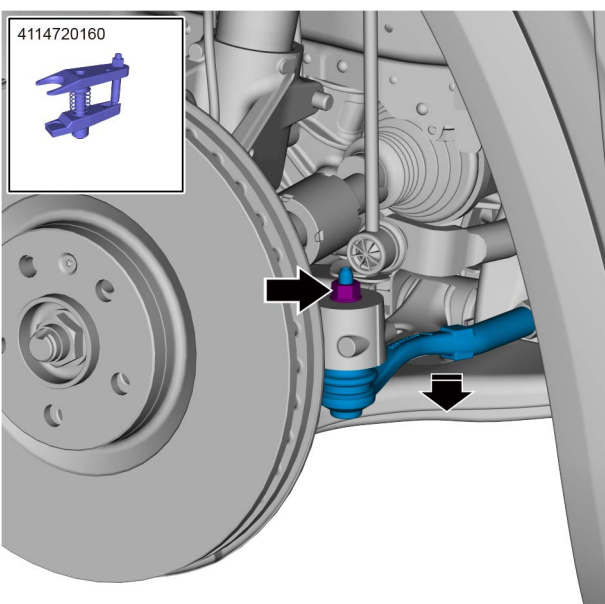
After removing the column to steering gear link bolts, the steering wheel needs to be locked to prevent the steering wheel from turning and damaging the clock spring.



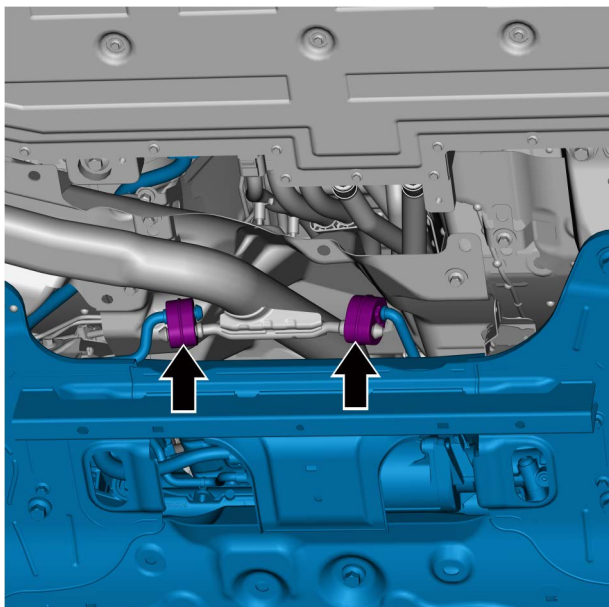
- 19 Disconnect the electric power assisted steering gear with cross tie rod assembly harness connection plug A.
- 20 Remove the 3 retaining clips from the electric power assisted steering gear with cross tie rod assembly harness.



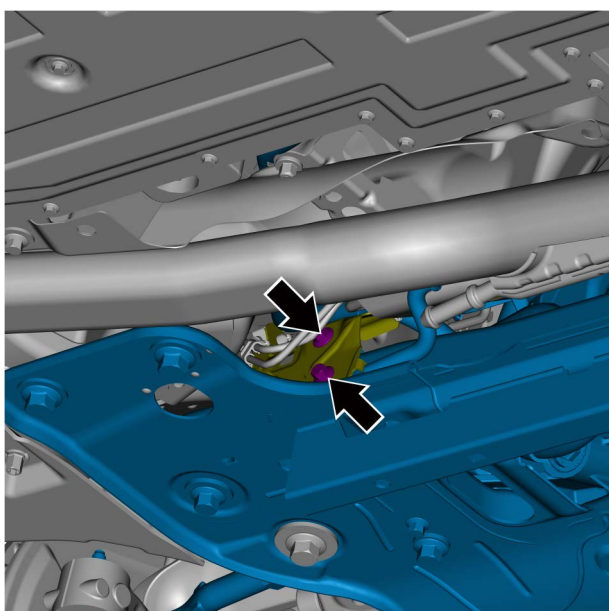
- 21 Remove and discard the front left and right lower swing arm ball head retaining locking bolts and disengage the left and right lower swing arm ball heads from the steering knuckle.



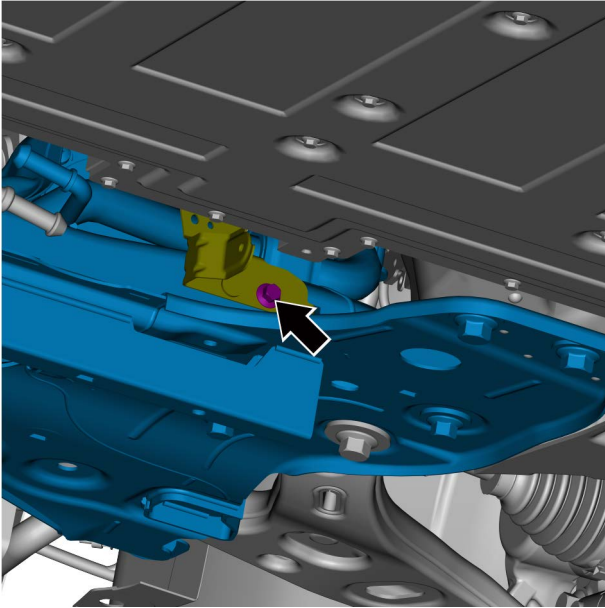
- 22 Remove and discard the left and right steering cross tie rod ball head fixing nuts, and disengage the steering cross tie rod ball head from the steering knuckle.
Special tool: 4114720160



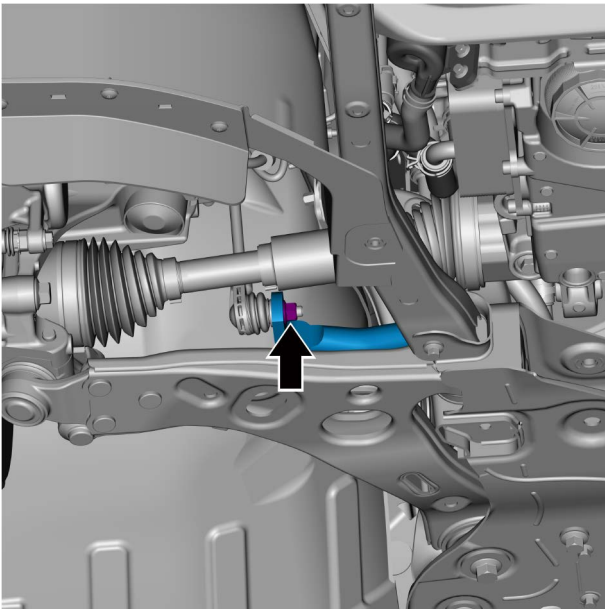
23 Remove the left and right exhaust pipe lugs.



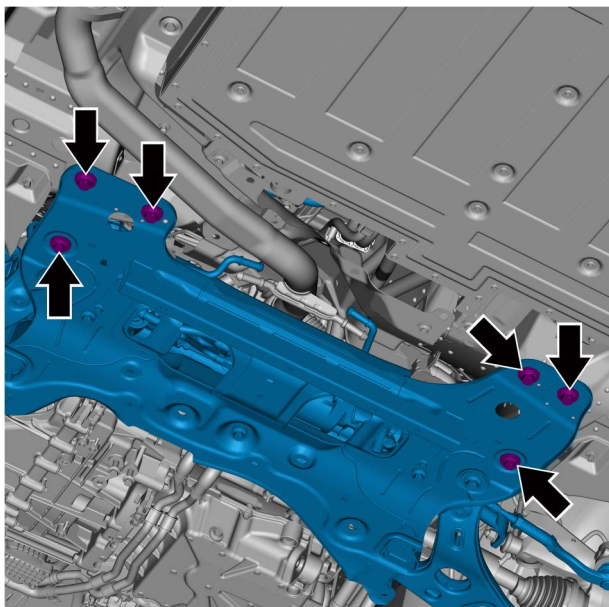
24 Remove the 2 fixing bolts of the front subframe to the front access heat shield left bracket.



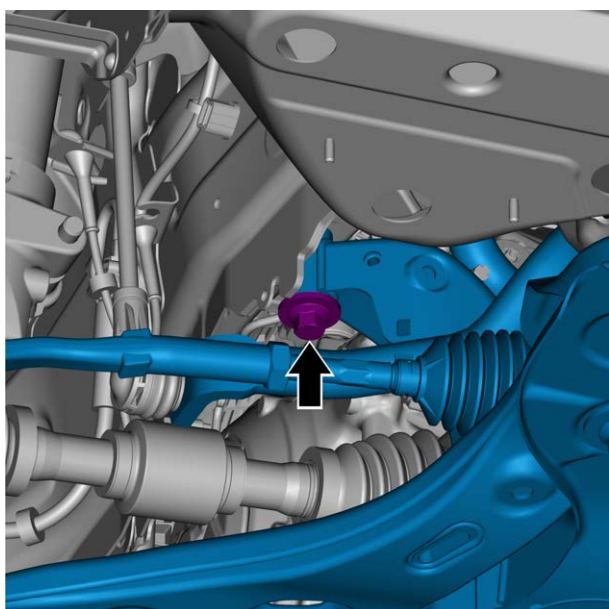
- 25 Remove the fixing bolts from the front subframe to the right front bracket of the heat shield.



- 26 Remove and discard 1 fixing nut on each side of the front stabilizer bar and front stabilizer bar connecting rod.

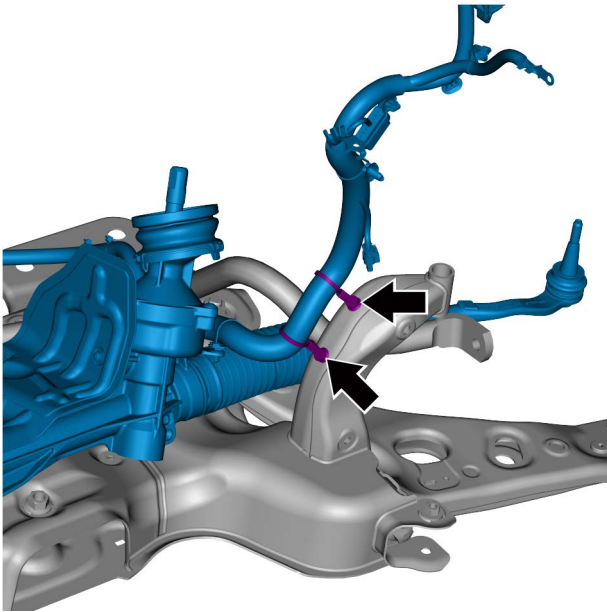


27 Holding the front subframe with a hydraulic jack, remove and discard the 6 fixing bolts attaching the left and right sides of the front subframe reinforcement plate to the body.

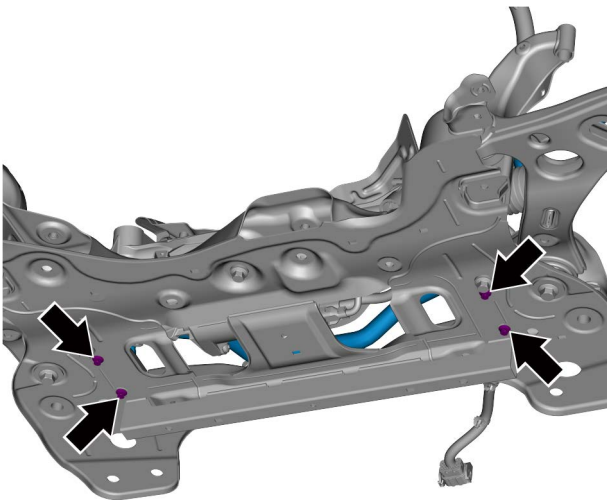


28 Remove and discard the 2 fixing bolts on the front left and right side of the front subframe that are connected to the body.

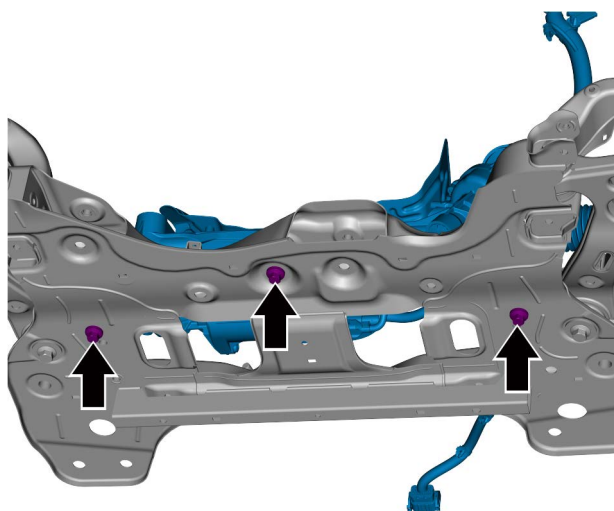
29 Slowly lower the hydraulic jack and remove the subframe along with the steering gear assembly, stabilizer bar, and left and right lower swing arm assemblies.



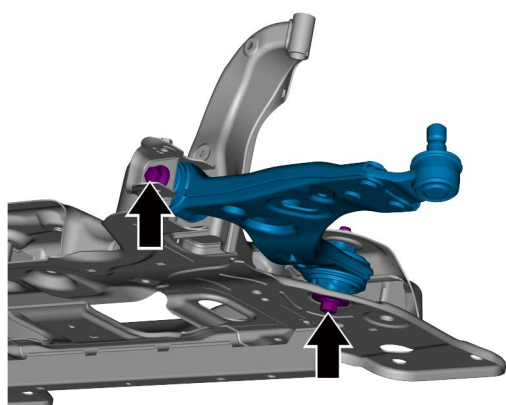
30 Disconnect the 2 harness clips.



31 Remove and discard the 4 fixing bolts from the left and right sides of the stabilizer bar bracket to the subframe assembly, and remove the stabilizer bar assembly.



- 32 Remove and discard the 3 fixing bolts of the electric power assisted steering gear with cross tie rod assembly and remove the electric power assisted steering gear with cross tie rod assembly.



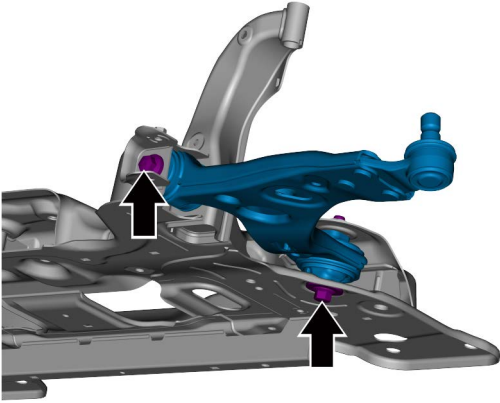
- 33 Remove and discard the 2 fixing bolts of the front suspension left lower swing arm assembly and subframe assembly, and remove the front suspension lower swing arm assembly.

Caution

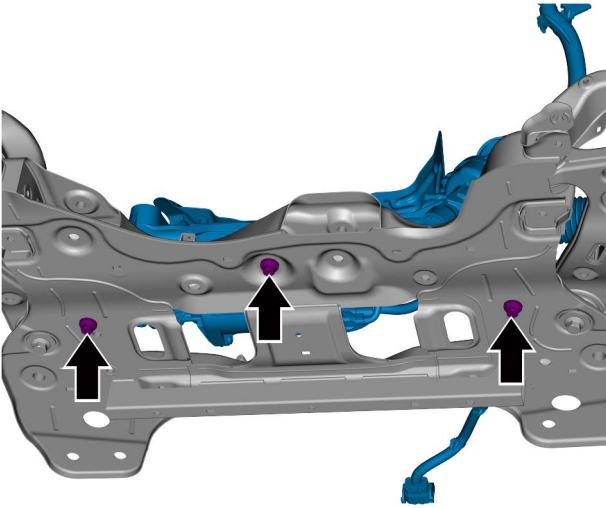
Remove the left and right lower swing arm assemblies in a similar manner.

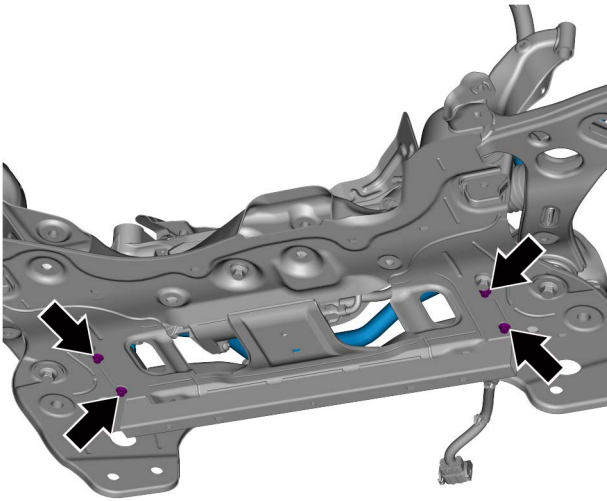
Installation Procedure

- 1 Install the front suspension lower swing arm assembly, install and tighten 2 new fixing bolts.
Torque: 140 N·m + 90°

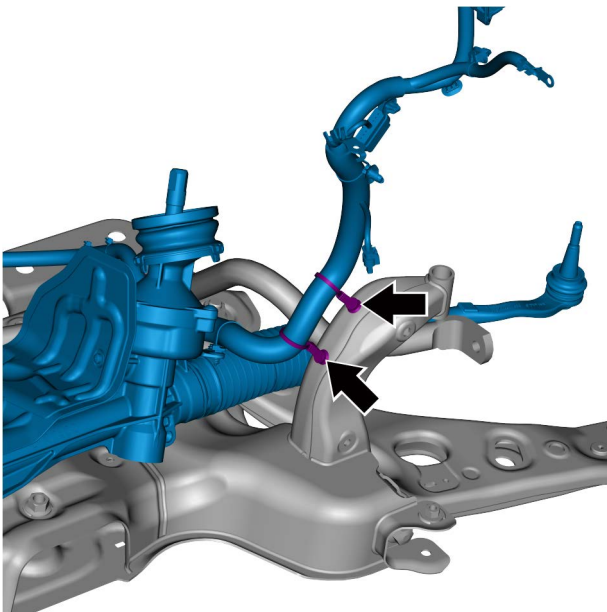


- 2 Install the electric power assisted steering gear with cross tie rod assembly, install and tighten the 3 new fixing bolts.
Torque: 90 N·m + 90°

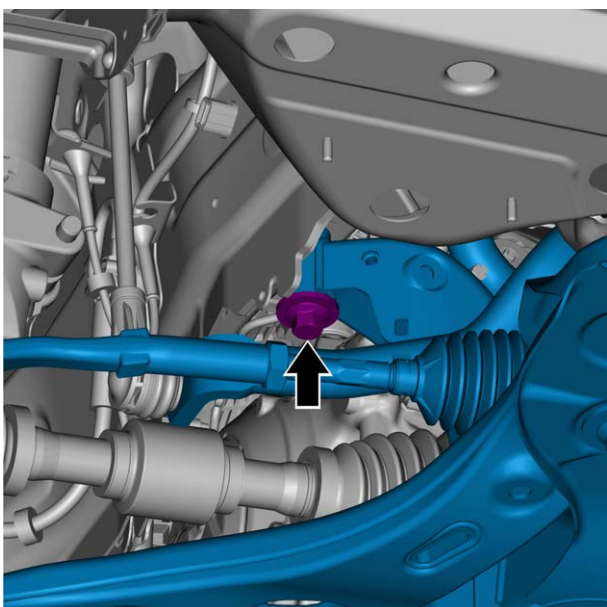




- 3 Install the stabilizer bar assembly, install and tighten the 4 new fixing bolts.
Torque: 24N·m



- 4 Install 2 harness clips.

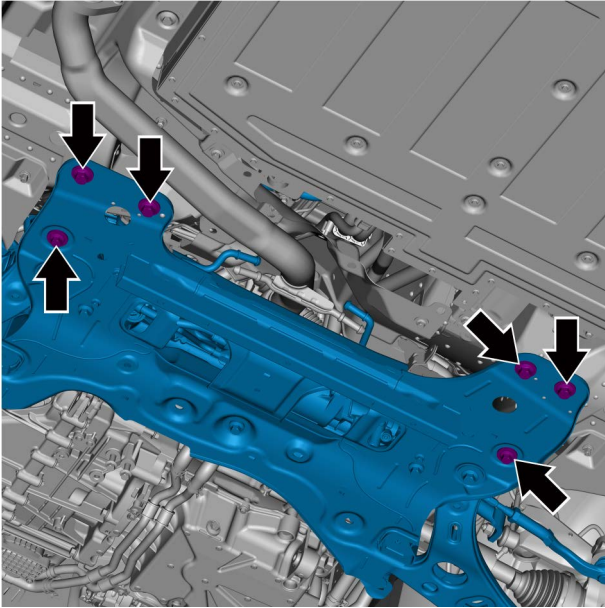


- 5 Using a jack, lift the subframe along with the steering gear assembly, stabilizer bar, and left and right lower swing arm assemblies into the mounting position, install the tools and tighten the new subframe front left and right side bolts to the body.
Torque: 90 N·m + 90°

Caution

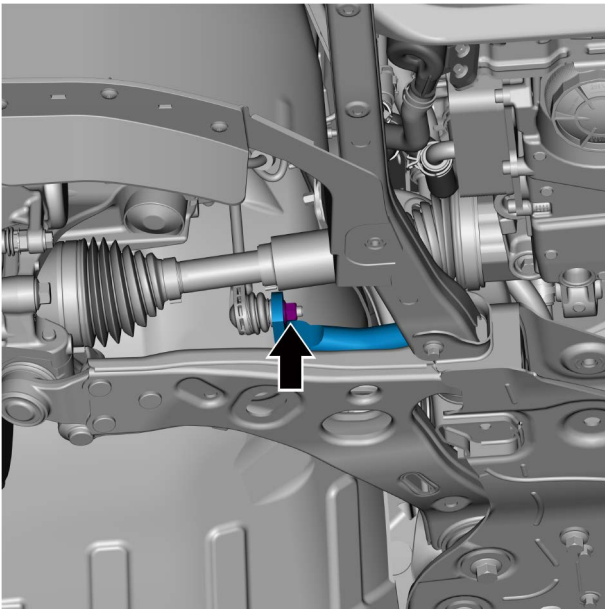
The subframe should be installed with a 14 mm auxiliary locating pin to locate the locating holes first, then tighten the four bolts, otherwise it may cause the subframe assembly to tilt.

Pre-tighten the fixing bolts of the subframe at each position first, and then tighten the subframe fixing bolts after the bolt holes are aligned.



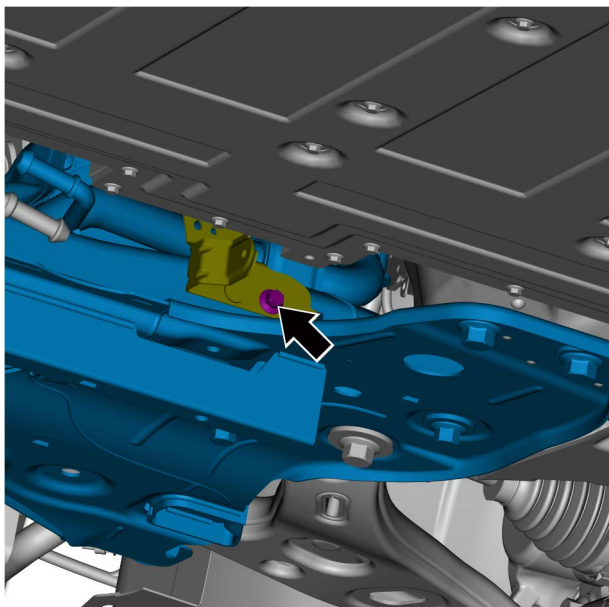
- 6 Install and tighten the 6 fixing bolts attached to the body on the left and right sides of the rear end of the new subframe.

Torque: 140 N·m + 90°

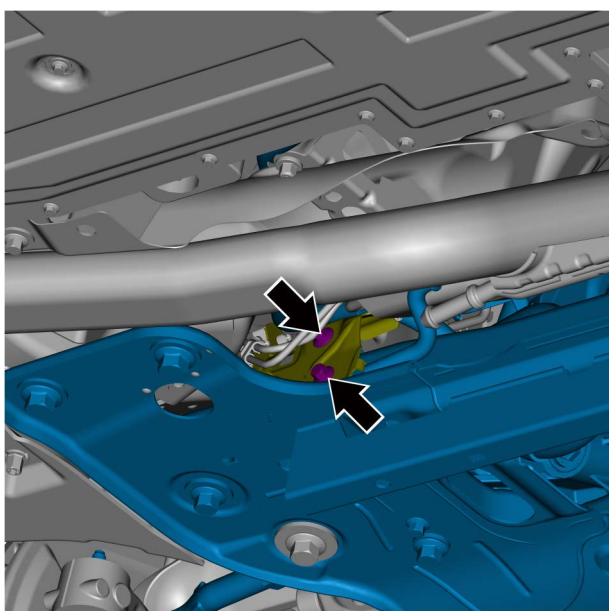


- 7 Install the front stabilizer bar connecting rods on both sides, and install and tighten the new fixing nuts.

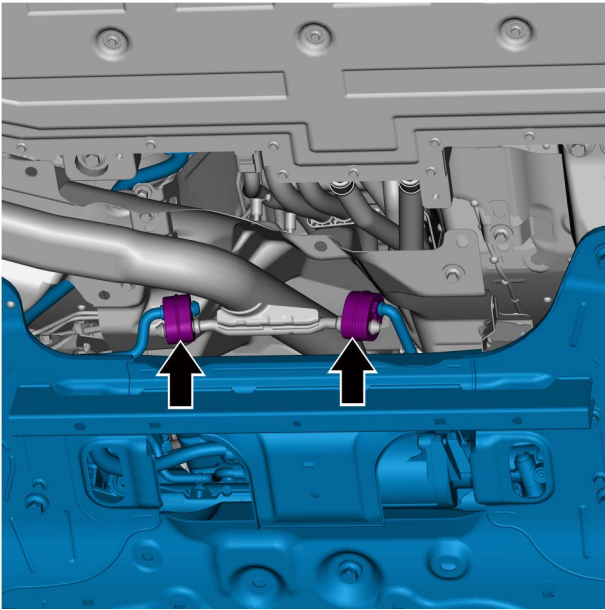
Torque: 70N·m



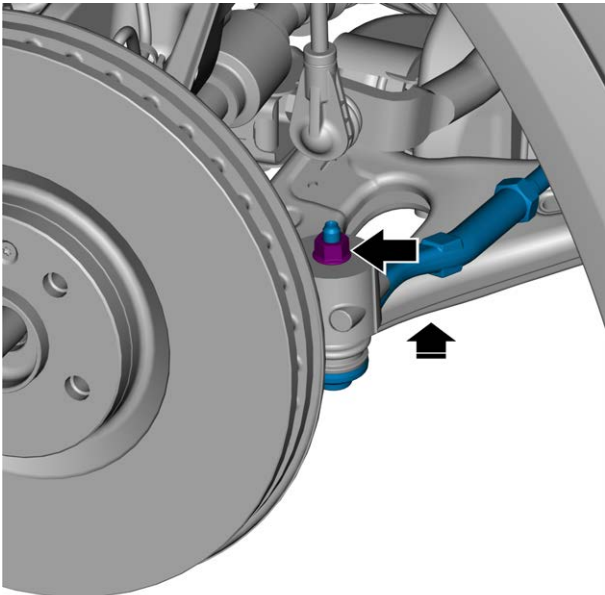
- 8 Install the front access heat shield right bracket and tighten the fixing bolt.
Torque: 24N·m



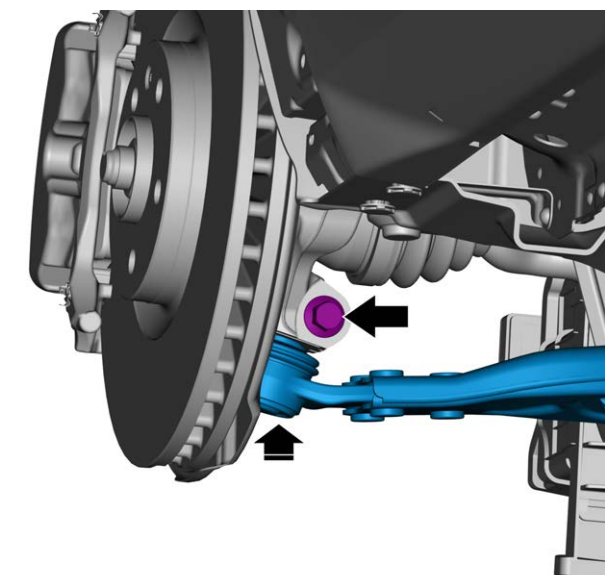
- 9 Install the front access heat shield left bracket and tighten the 2 fixing bolts.
Torque: 24N·m



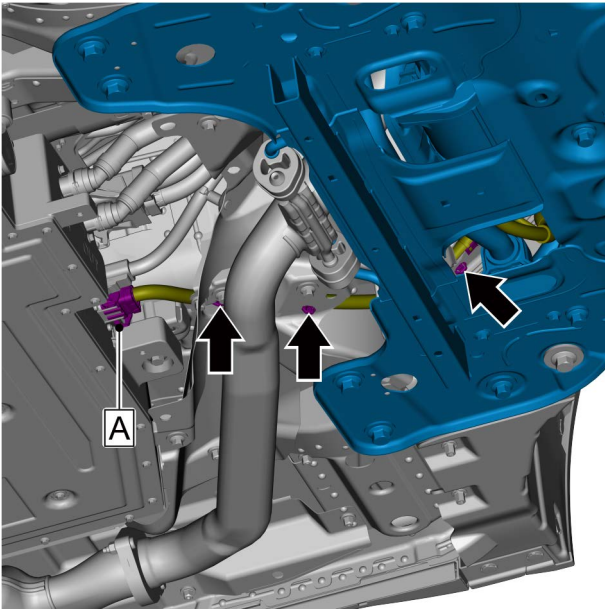
10 Attach the left and right exhaust pipe lugs.



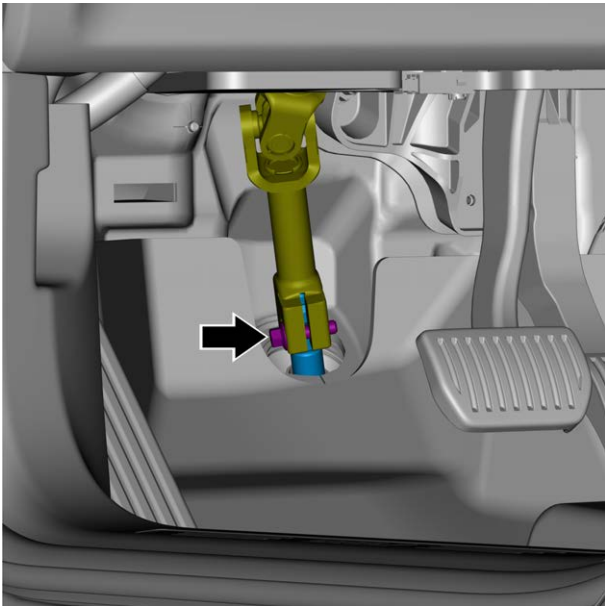
11 Install the left and right sides steering cross tie rods to the steering knuckles and tighten the new fixing nuts.
Torque: 30 N·m + 90°



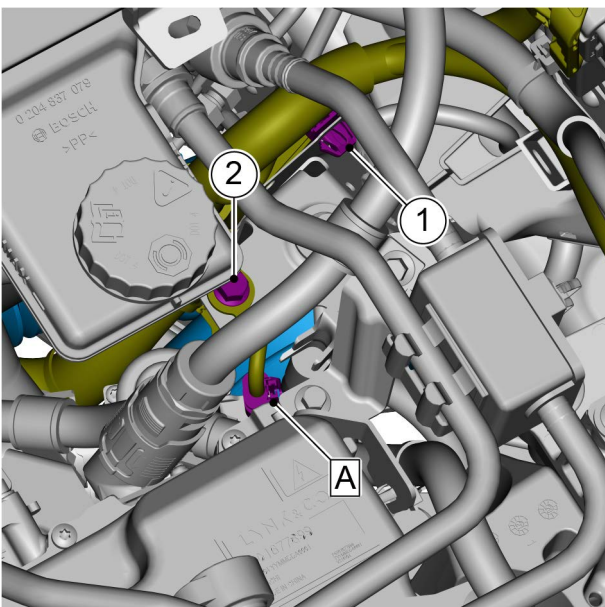
12 Place the left and right side front lower swing arm assemblies in the front steering knuckle mounting position, install and tighten the new fixing bolts.
Torque: 90 N·m + 75°



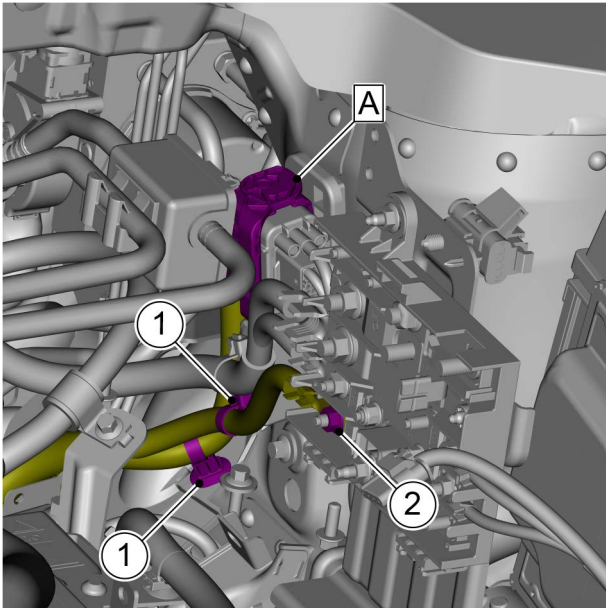
- 13 Connect the electric power assisted steering gear with cross tie rod assembly harness connection plug A.
- 14 Install the 3 retaining clips for the electric power assisted steering gear with cross tie rod assembly harness.



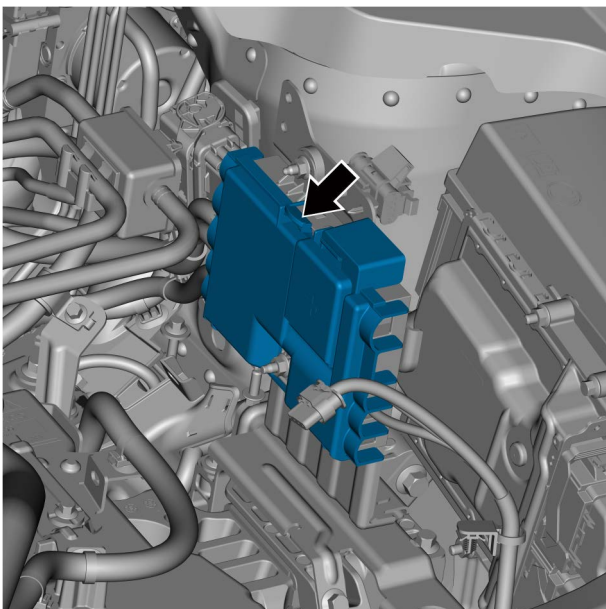
- 15 Install the mechanical steering column assembly to the electric power assisted steering gear with cross tie rod assembly, install and tighten the new fixing bolts.
Torque: 24N·m



- 16 Connect the electric power assisted steering gear with cross tie rod assembly harness connection plug A.
- 17 Install electric power assisted steering gear with cross tie rod assembly harness retaining clip 1.
- 18 Install the fixing bolt 2 of the electric power assisted steering gear with cross tie rod assembly harness.
Torque: 10N·m



- 19 Install the electric power assisted steering gear with cross tie rod assembly harness fixing nut 2.
Torque: 10N·m
- 20 Connect the harness connector A of the electric power assisted steering gear with cross tie rod assembly harness.
- 21 Install the retaining clips 1 for the electric power assisted steering gear with cross tie rod assembly harness.



- 22 Install the front cabin positive cover.

- 23 Install the lower U-shaped beam of the front suspension.
- 24 Install the front bumper assembly.
- 25 Install the resonator assembly.
- 26 Install the air filter assembly.
- 27 Install the left rear suspension vibration isolation pad assembly.
- 28 Install the right rear suspension vibration isolation pad assembly.
- 29 Install the front access heat shield (1).
- 30 Install the left and right front wheels.
- 31 Lower the vehicle.

- 32 Connect the negative cable of battery.
- 33 Perform a vehicle four-wheel alignment.

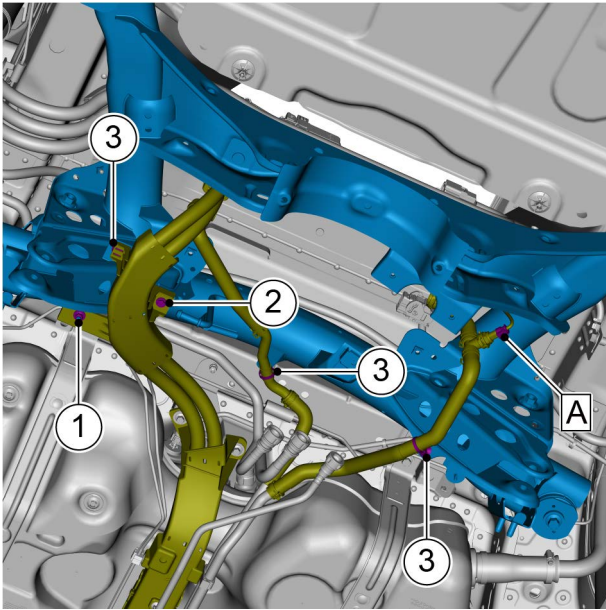
13.6.3.2 Replacement of Rear Subframe

Removal Procedure

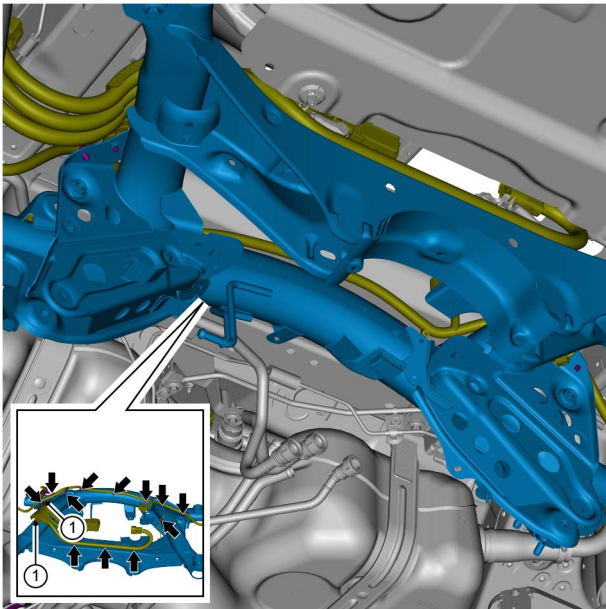
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

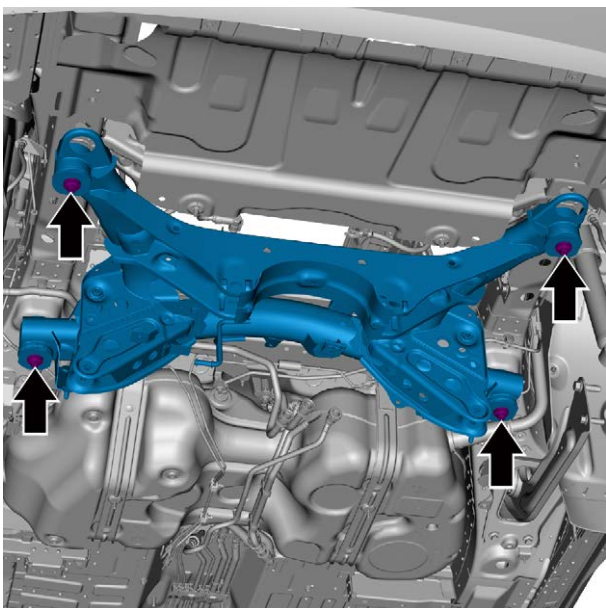
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 3 Remove wheel, see [Replacement of Wheel Assembly](#).
- 4 Remove the exhaust pipe muffler assembly, see [Replacement of Exhaust Pipe Muffler Assembly](#).
- 5 Remove the rear caliper assembly, see [Replacement of Left Rear Caliper Body with EPB Assembly](#).
- 6 Remove the rear suspension coil spring, see [Replacement of Rear Suspension Coil Spring](#).
- 7 Remove the rear suspension stabilizer bar, see [Replacement of Rear Suspension Stabilizer Bar](#).
- 8 Remove the left and right side rear subframe front beam bar assemblies, see [Replacement of Left Rear Subframe Front Beam Bar Assembly](#).
- 9 Remove the left and right side rear suspension lower arm assemblies, see [Replacement of Left Rear Suspension Lower Arm Assembly](#).
- 10 Remove the left and right side steering knuckle assemblies, see [Replacement of Left Rear Steering Knuckle Assembly](#).
- 11 Remove the left and right rear upper cross arm assemblies, see [Replacement of Left Rear Upper Cross Arm Assembly](#).
- 12 Remove carbon canister, see [Replacement of Canister](#).
- 13 Remove the vehicle charger module, see [Replacement of Vehicle Charger Module](#).



- 14 Disconnect harness connector A.
- 15 Remove the harness fixing nut 1 on the rear subframe.
- 16 Remove the harness fixing bolt 2 on the rear subframe.
- 17 Remove the 3 harness retaining clips 3 on the rear subframe.

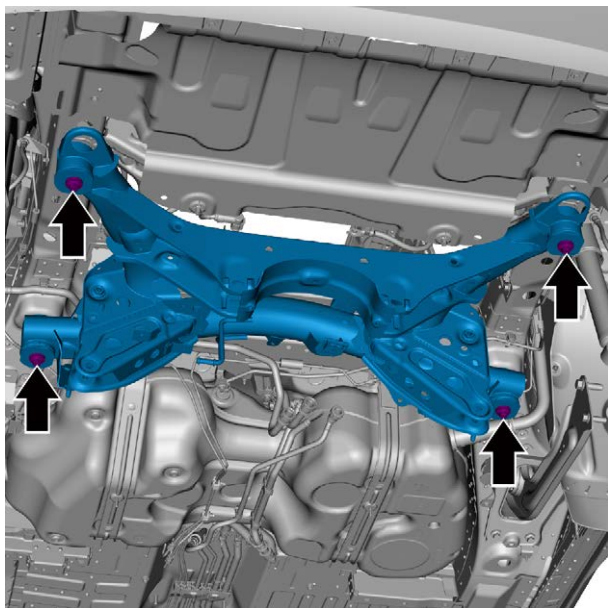
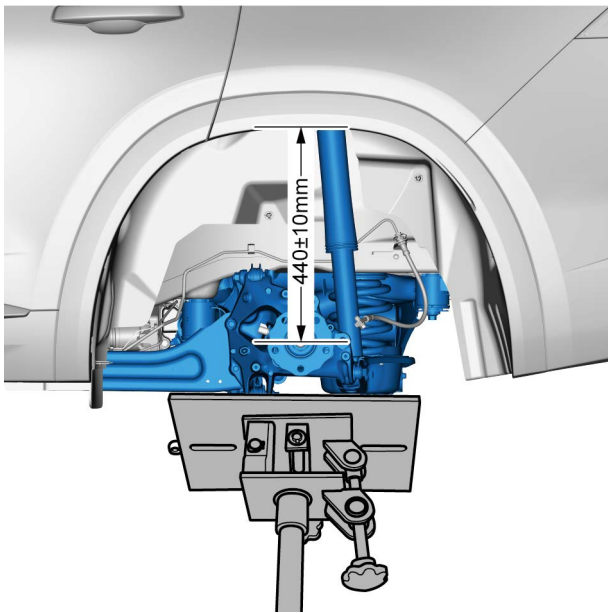


- 18 Remove the 2 harness fixing bolts 1 on the rear subframe.
- 19 Remove the 12 harness retaining clips on the rear subframe.



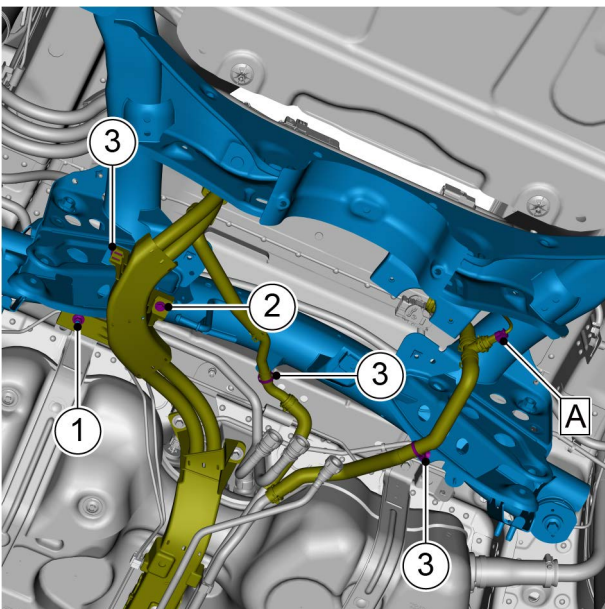
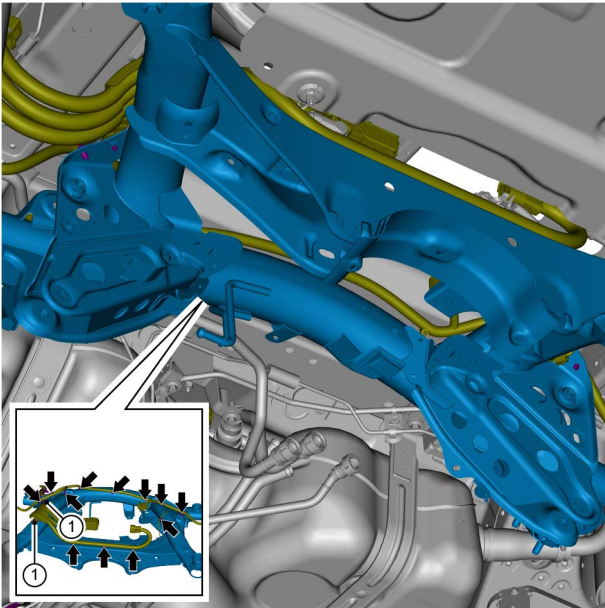
- 20 Remove and discard the 4 rear subframe fixing bolts and slowly lower the hydraulic jack to remove the rear subframe.

Installation Procedure



Caution

1. The subframe should be installed with a 14 mm auxiliary locating pin to locate the locating holes first, then tighten the fixing bolts, otherwise it may cause the subframe assembly to tilt.
 2. Pre-tighten the fixing bolts of the subframe at each position first, and then tighten the subframe fixing bolts after the bolt holes are aligned.
 3. The 4 fixing bolts of the subframe are tightened in the order of left rear, right front, right rear, and left front.
 4. When installing the left and right rear upper cross arms, left and right side steering knuckles, left and right side rear subframe front beam bar assemblies and left and right side rear suspension lower swing arm assemblies, use a flatbed jack to drag the lower swing arm, measure the distance from the center of the rear wheel to the wheel brow, and make sure that the vehicle is at the correct driving height before tightening the fixing bolts of each part.
- 1 Tow the rear subframe with a hydraulic jack, place the rear subframe in the mounting position, and tighten the 4 new fixing bolts on the rear subframe.
Torque: 90 N·m + +140°



- 2 Install the 12 harness retaining clips on the rear subframe.
- 3 Install the 2 harness fixing bolts 1 on the rear subframe.
Torque: 10N·m

- 4 Connect the wiring harness connector A.
- 5 Install harness fixing nut 1 on rear subframe.
Torque: 10N·m
- 6 Install the harness fixing bolt 2 on the rear subframe.
Torque: 10N·m
- 7 Install the 3 harness retaining clips 3 on the rear subframe.

- 8 Install the on-board charger module.
- 9 Install the carbon canister.
- 10 Install the left and right rear upper cross arm assemblies
- 11 Install the left and right side steering knuckle assemblies.
- 12 Install the left and right side rear subframe front beam bar assemblies.
- 13 Install the left and right side rear suspension lower swing arm assemblies.
- 14 Install the rear suspension coil springs.
- 15 Install the rear suspension stabilizer bar.
- 16 Install the brake caliper assembly.
- 17 Install exhaust cold end.
- 18 Install the wheel.

- 19 lower the vehicle.
- 20 Connect the negative cable of battery.
- 21 Perform a vehicle four-wheel alignment.

13.7 Seat

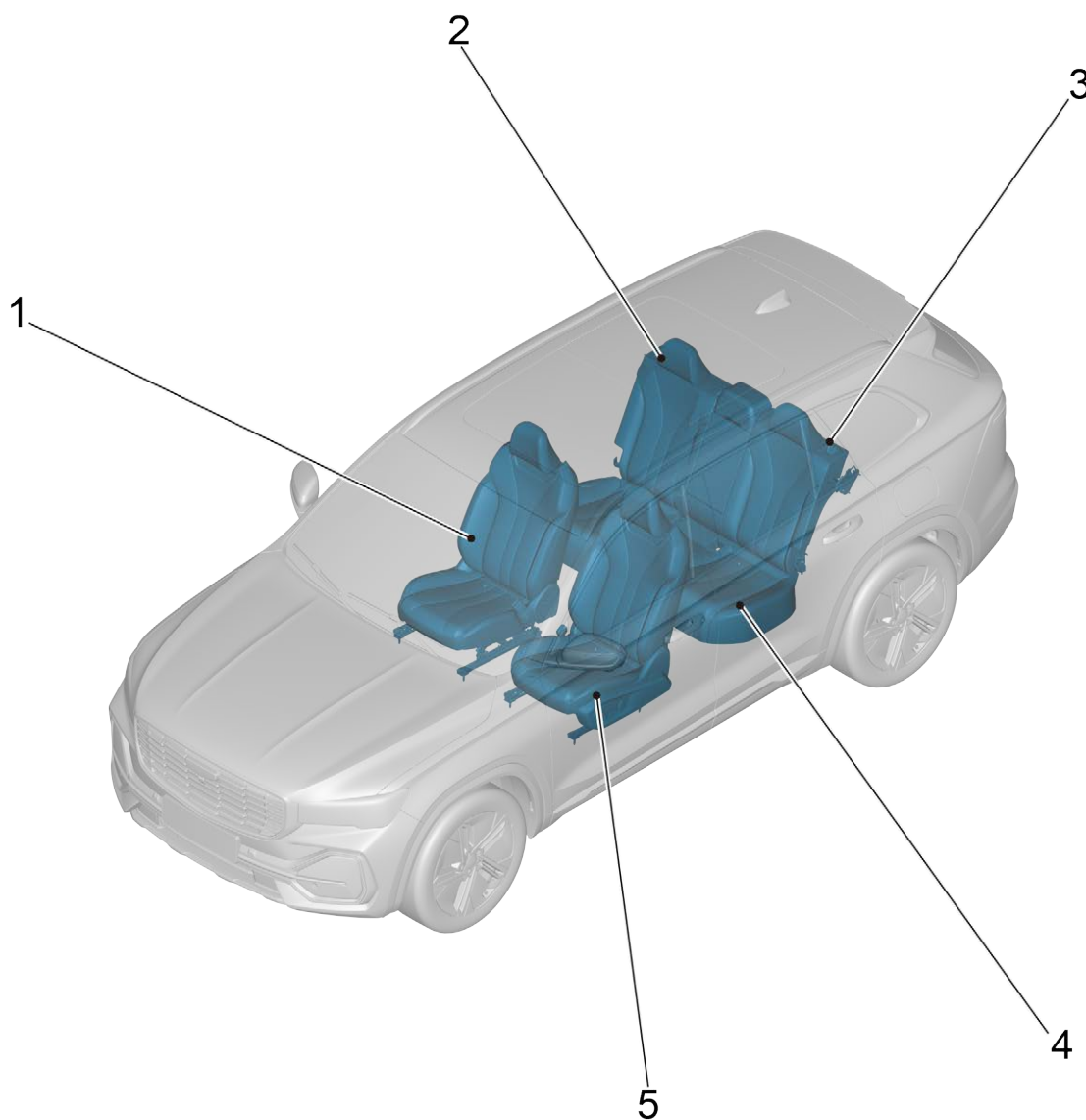
13.7.1 Specification

13.7.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Driver seat assembly fixing bolt	M10×50.5	34-46
Seat belt pretensioner (left side of front seat) lower end piece and seat frame fixing bolt	M10	34-46
Passenger seat assembly fixing bolt	M10×50.5	34-46
Seat belt pretensioner (front right side) lower end piece and seat frame fixing bolt	M10	34-46
Rear seat left backrest assembly fixing bolt	M10×25×30.65	41-55
Rear seat right backrest assembly fixing bolt	M10×25×30.65	41-55

13.7.2 Part position

13.7.2.1 Part position



- | | |
|--------------------------------------|-------------------------------|
| 1. Passenger seat assembly | 4. Rear seat cushion assembly |
| 2. Rear seat right backrest assembly | 5. Driver seat assembly |
| 3. Rear seat left backrest assembly | |

13.7.3 Removal and Installation

13.7.3.1 Replacement of driver seat assembly

Removal Procedure

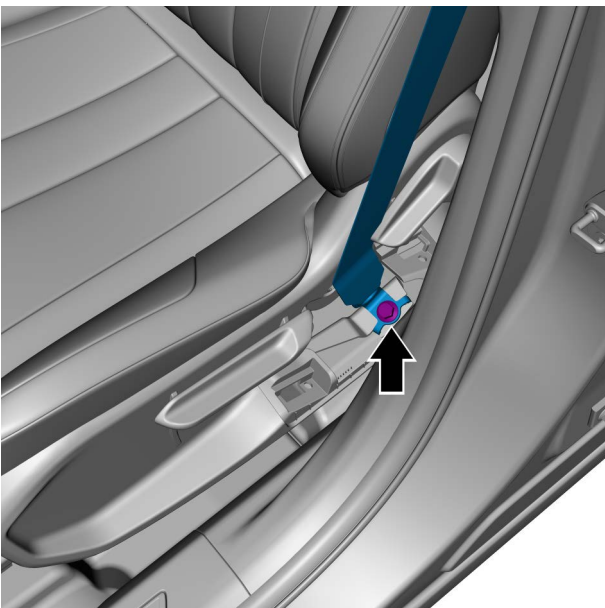
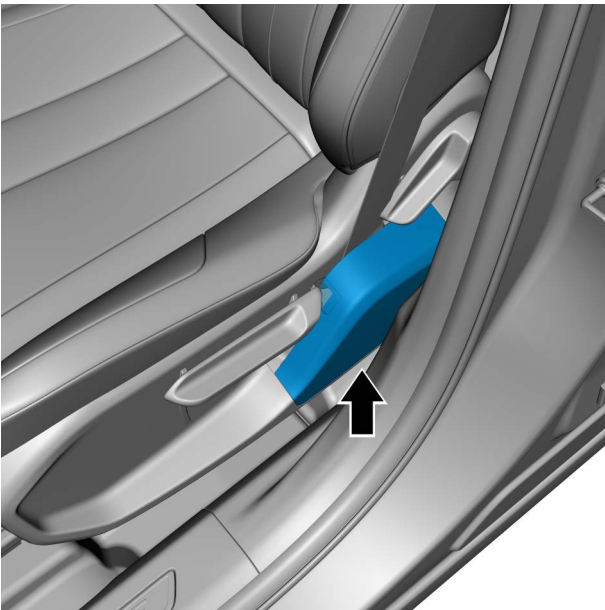
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

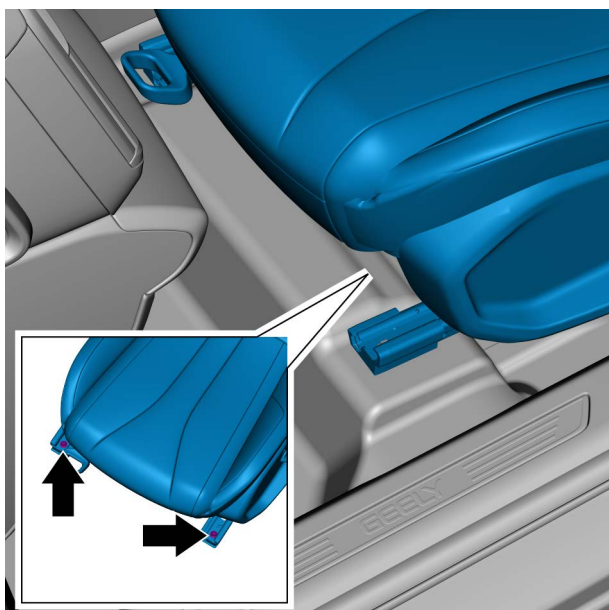
Caution

The removal and installation method for front passenger side seat assembly is similar to that of the driver seat assembly.

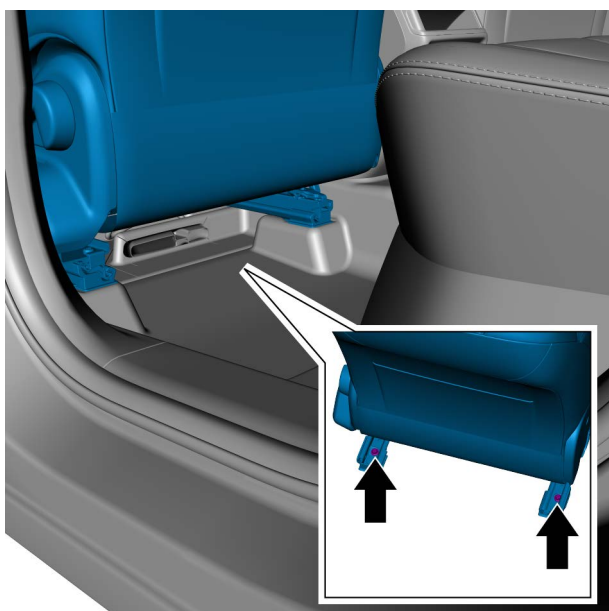
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left front seat belt outlet cover.



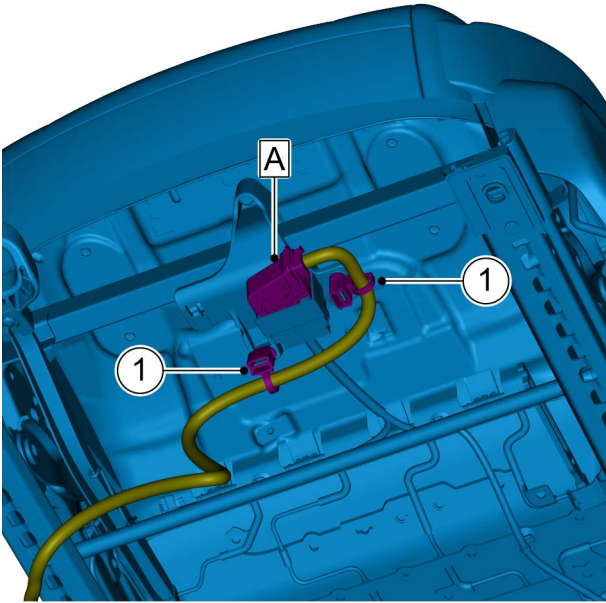
- 3 Remove the fixing bolt at seat end of seat belt pretensioner (front left side).



- 4 Move the seat backward and remove the 2 fixing bolts on the front side of the driver seat assembly.



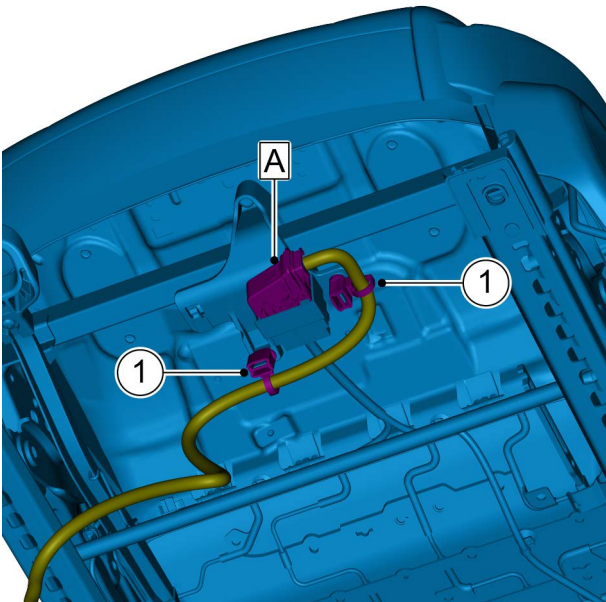
- 5 Move the seat forward and remove the 2 fixing bolts on the rear side of the driver seat assembly.

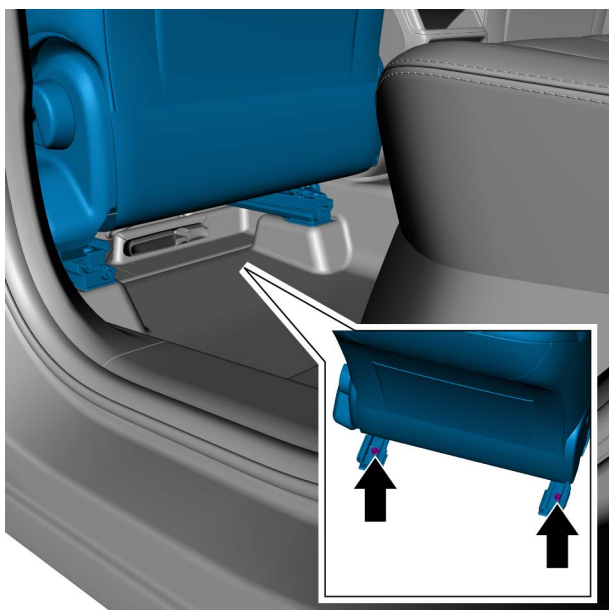


- 6 Flip the seat backward to disconnect the driver seat harness connector A.
- 7 Remove the 2 harness clips 1 on the driver seat assembly and remove the driver seat assembly.

Installation Procedure

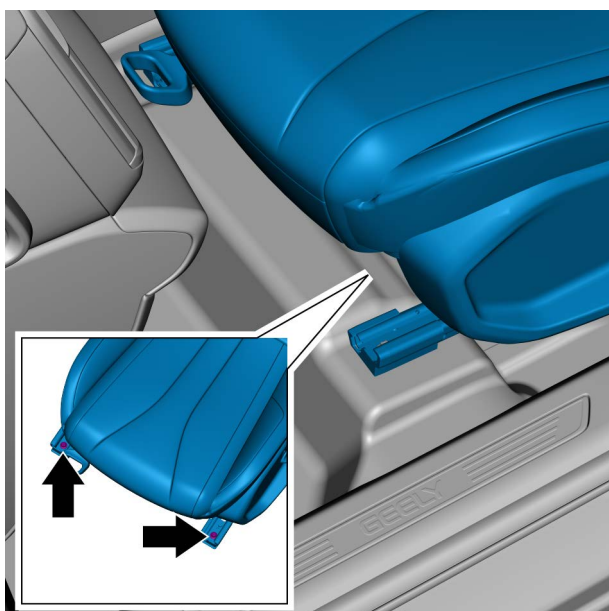
- 1 Connect the driver seat harness connector A.
- 2 Install the 2 harness clips 1 on the driver seat assembly.





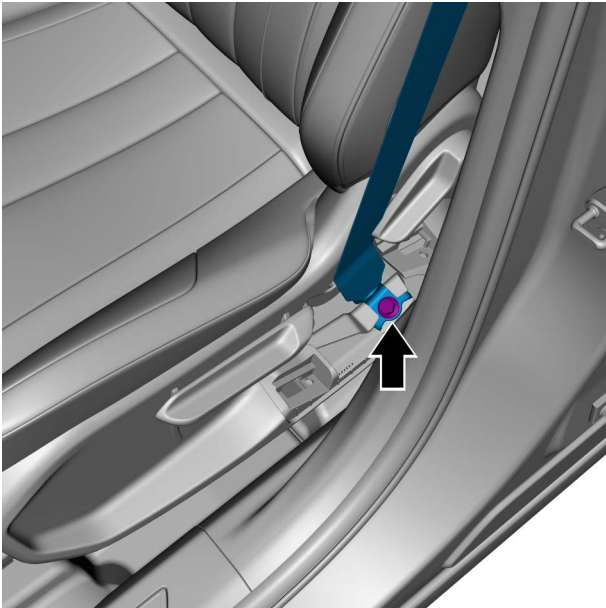
- 3 Move the seat forward and install the 2 fixing bolts on the rear side of the driver seat assembly.

Torque: 40N·m

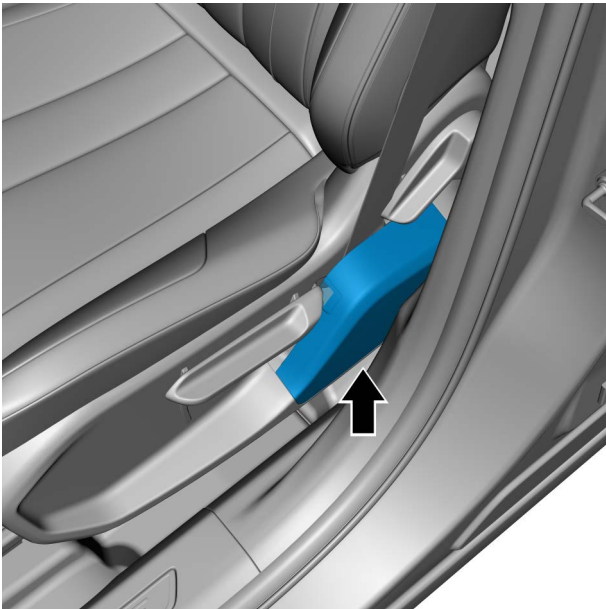


- 4 Move the seat backward and install the 2 fixing bolts on the front side of the driver seat assembly.

Torque: 40N·m



- 5 Install the fixing bolt at seat end of seat belt pretensioner (front left side).
Torque: 40N·m



- 6 Install the left front seat belt outlet cover.

- 7 Connect the negative cable of battery.

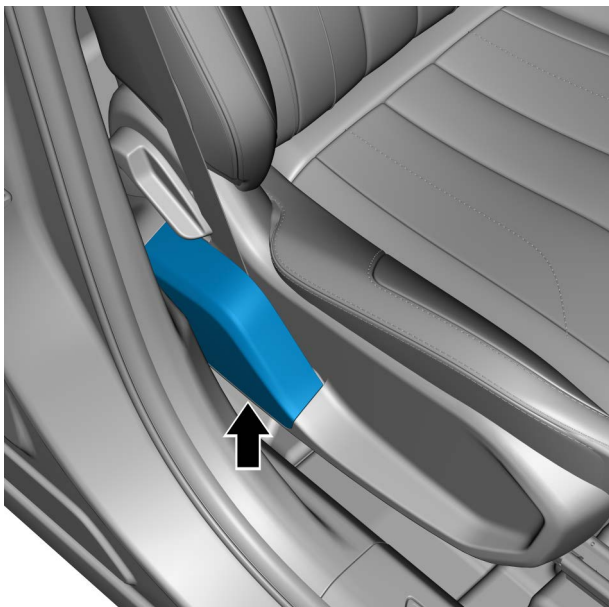
13.7.3.2 Replacement of passenger seat assembly

Removal Procedure

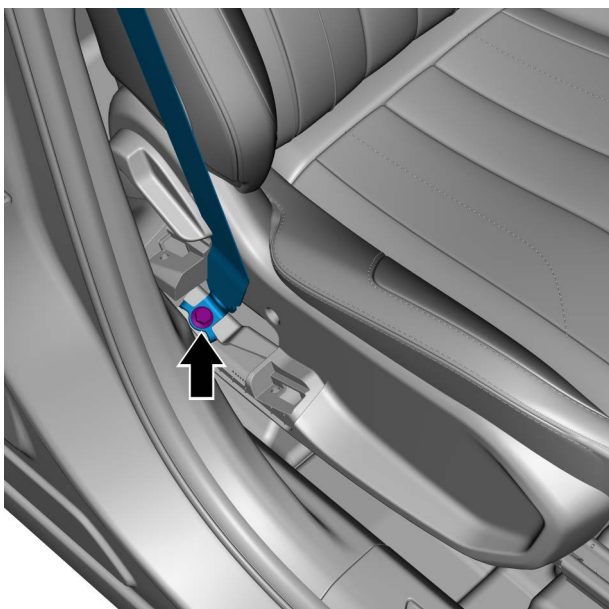
Warning !

Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#)

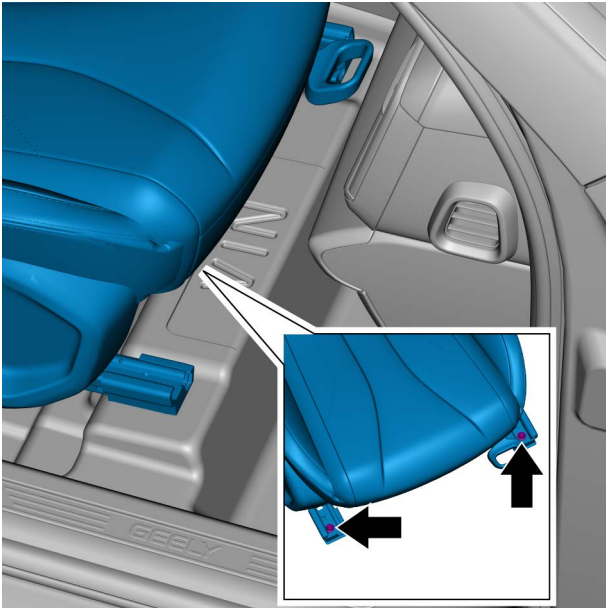
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable.](#)



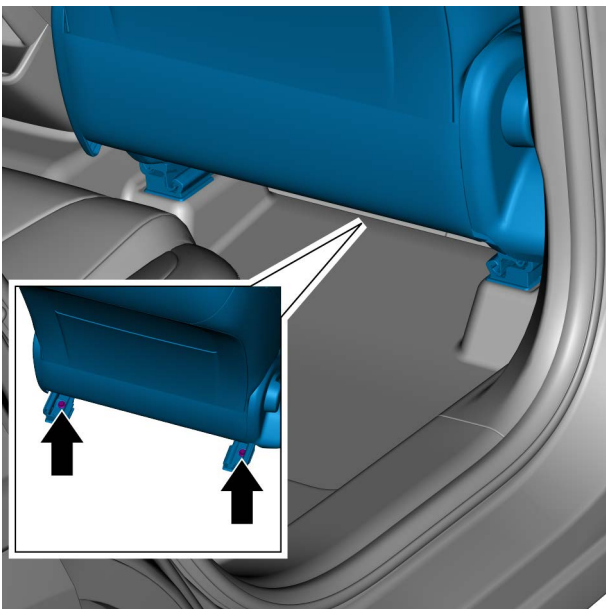
2 Remove the right front seat belt outlet cover.



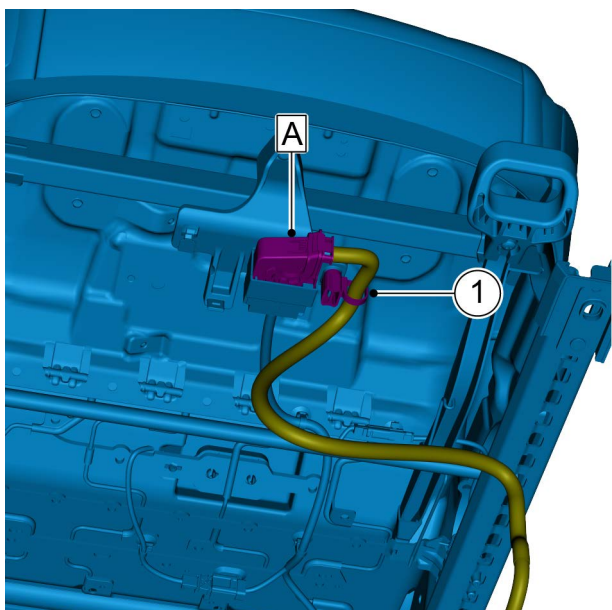
3 Remove the fixing bolt at seat end of seat belt pretensioner (front right side).



- 4 Move the seat backward and remove the 2 fixing bolts on the front side of the passenger seat assembly.



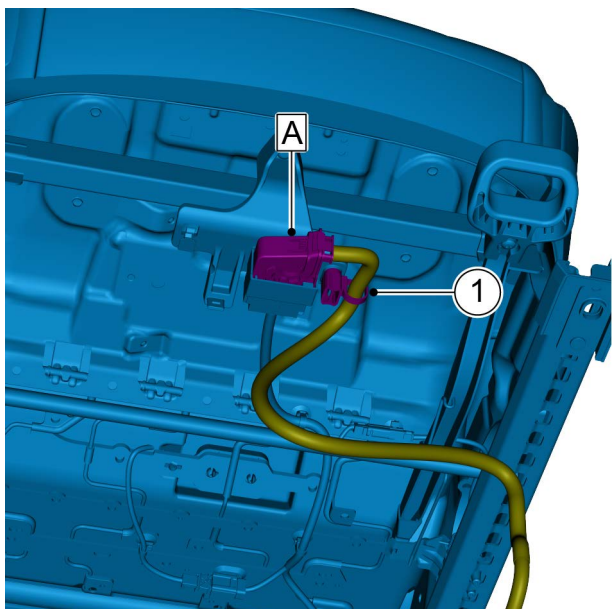
- 5 Move the seat forward and remove the 2 fixing bolts on the rear side of the passenger seat assembly.

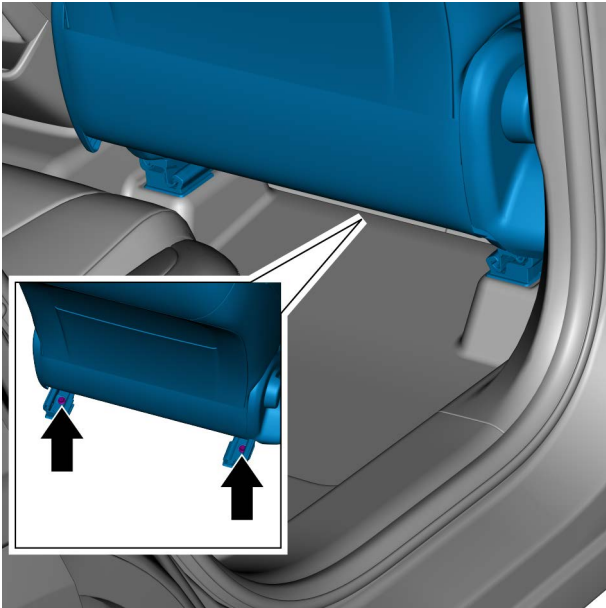


- 6 Flip the seat backward to disconnect the passenger seat harness connector A.
- 7 Remove harness clip 1 on the passenger seat assembly and remove the passenger seat assembly.

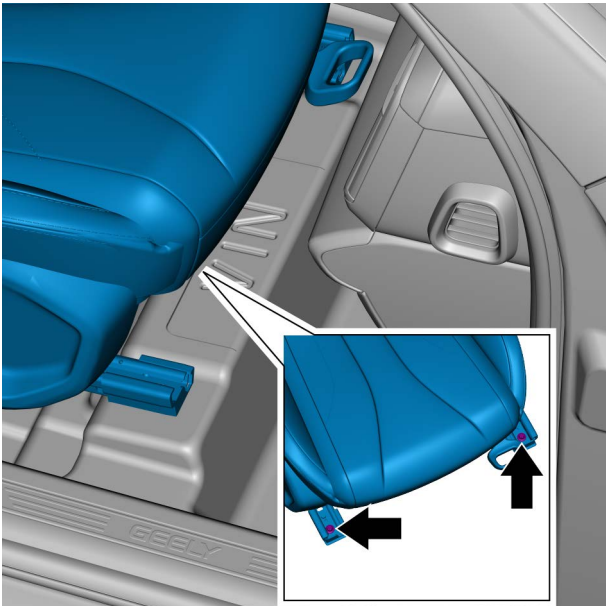
Installation Procedure

- 1 Connect the passenger seat harness connector A.
- 2 Install the harness clip 1 on the passenger seat assembly.

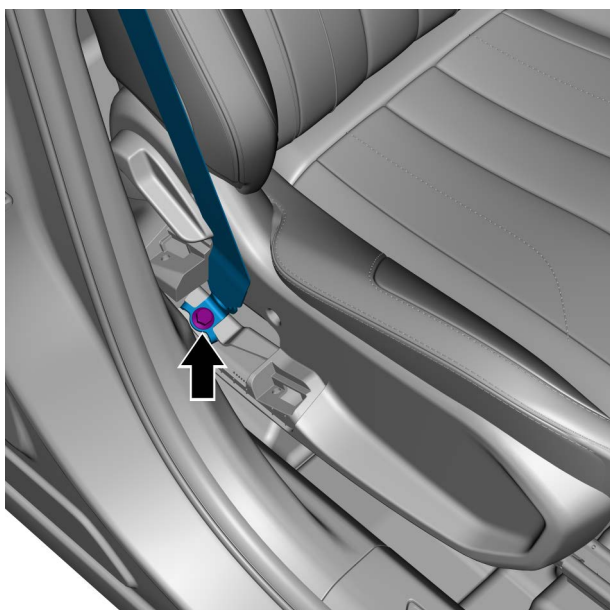




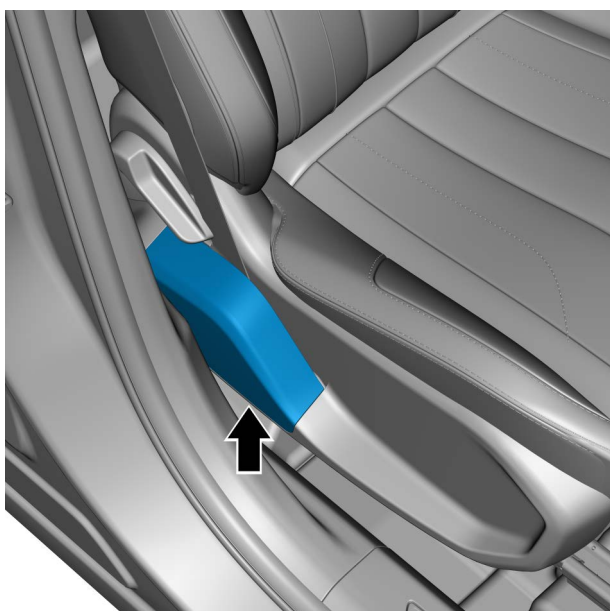
- 3 Move the seat forward and install the 2 fixing bolts on the rear side of the passenger seat assembly.
Torque: 40N·m



- 4 Move the seat backward and install the 2 fixing bolts on the front side of the passenger seat assembly.
Torque: 40N·m



- 5 Install the fixing bolt at seat end of seat belt pretensioner (front right side).
Torque: 40N·m

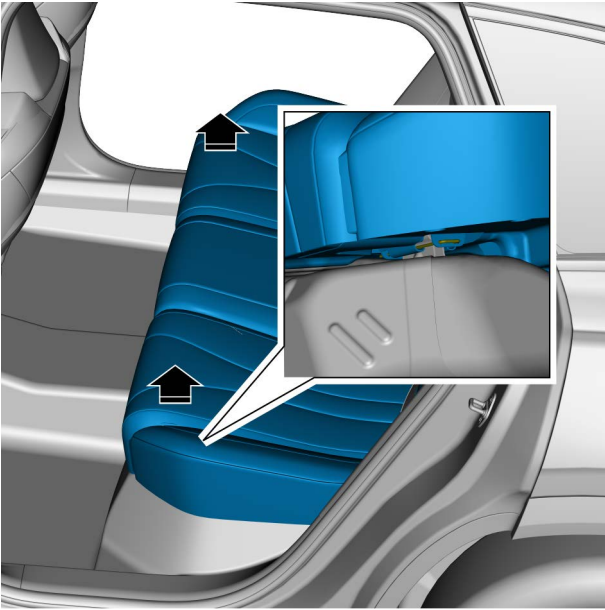


- 6 Install the right front seat belt outlet cover.

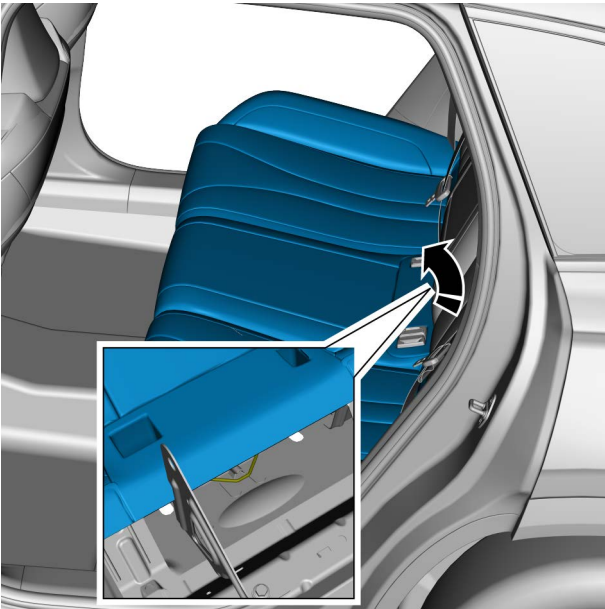
- 7 Connect the negative cable of battery.

13.7.3.3 Replacement of rear seat cushion assembly

Removal Procedure

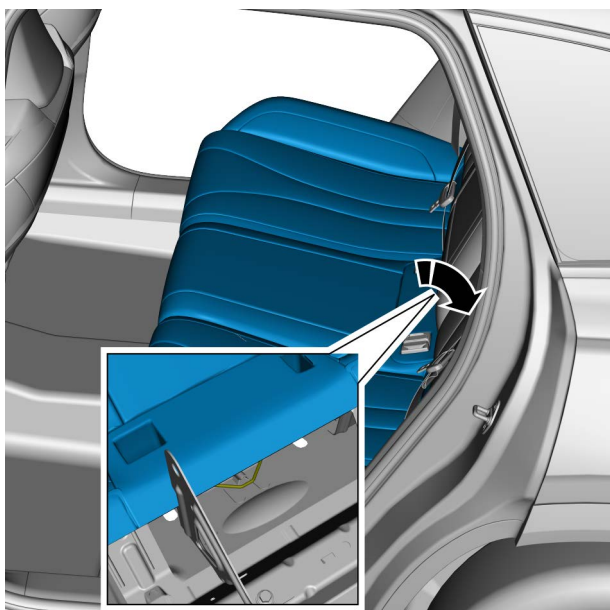


- 1 Lift both ends of the rear seat cushion assembly to disengage the seat fixing mechanism.

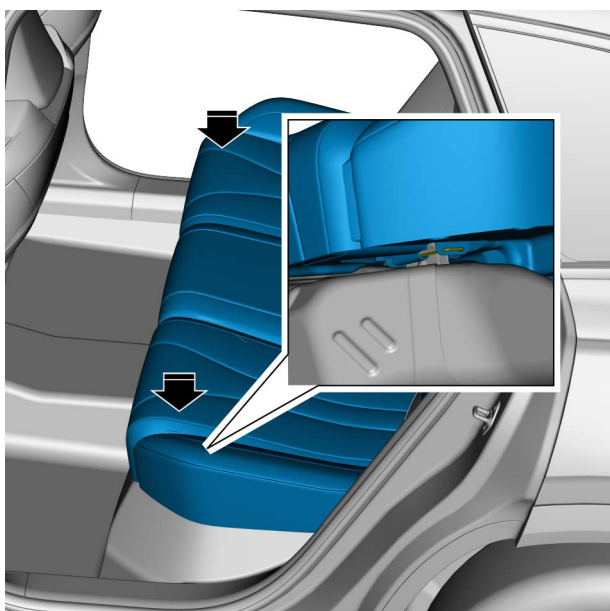


- 2 Press the middle rear end of the rear seat cushion assembly and push it backward to disengage the fixing hook and remove the rear seat cushion assembly.

Installation Procedure



- 1 Snap the rear end of the rear seat cushion assembly into the seat cushion fixing hook.



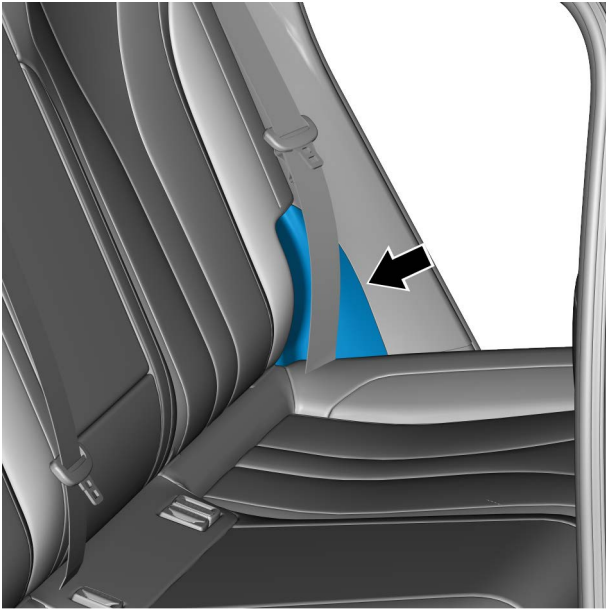
- 2 Press the rear seat cushion assembly into the seat cushion fixing mechanism.

Caution

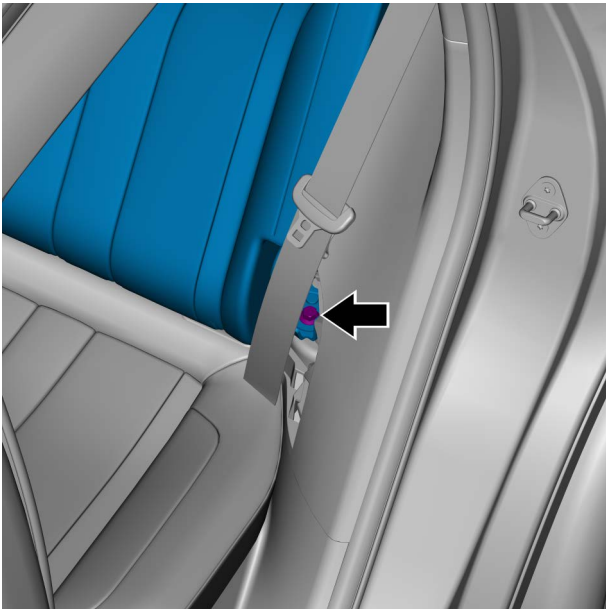
Press the seat cushion into the seat cushion locking mechanism until a "click" sound is heard.

13.7.3.4 Replacement of rear seat left backrest assembly

Removal Procedure

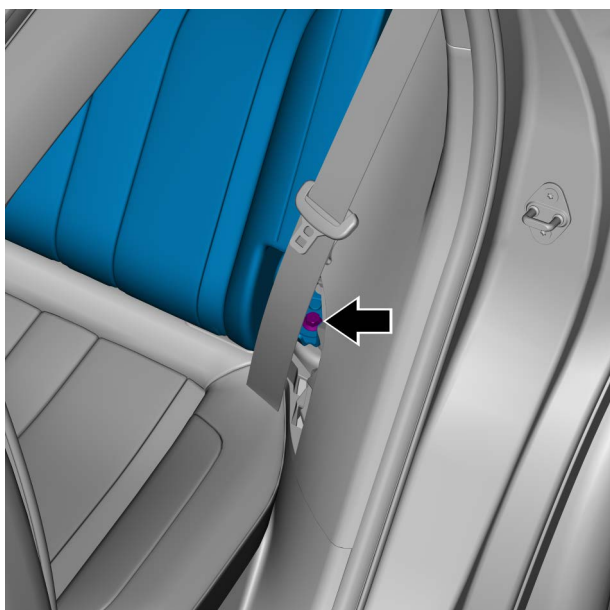


- 1 Remove the left C-pillar lower trim panel cover.

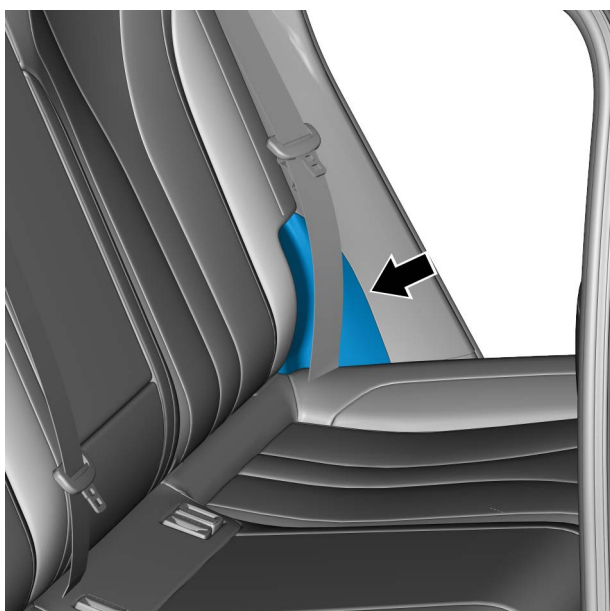


- 2 Remove the rear seat left backrest assembly fixing bolt and remove the rear seat left backrest assembly.

Installation Procedure



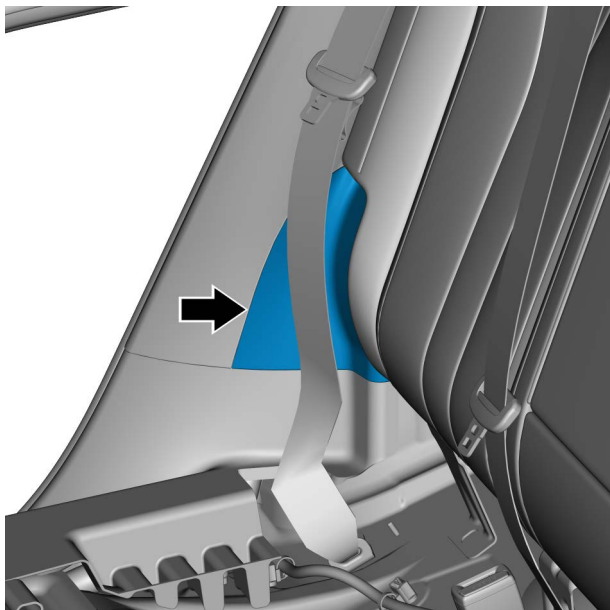
- 1 Install the rear seat left backrest assembly fixing bolts.
Torque: 48N·m



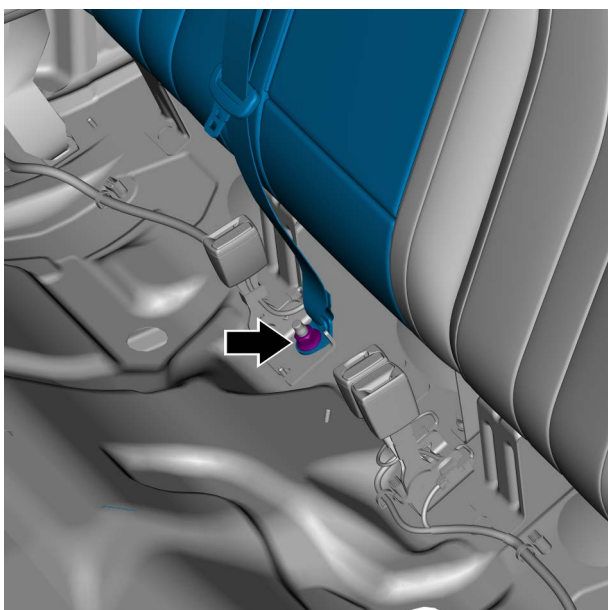
- 2 Install the left C-pillar lower trim panel cover.

13.7.3.5 Replacement of rear seat right backrest assembly

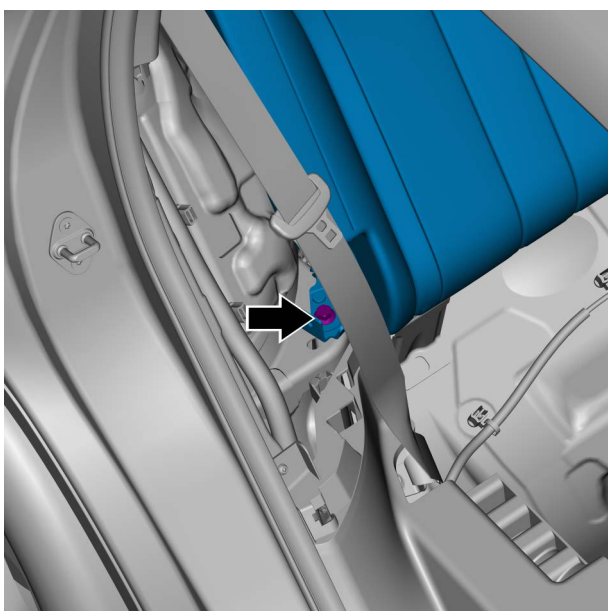
Removal Procedure



- 1 Remove the rear seat cushion assembly, refer to [Replacement of rear seat cushion assembly](#).
- 2 Remove the right C-pillar lower trim panel cover.

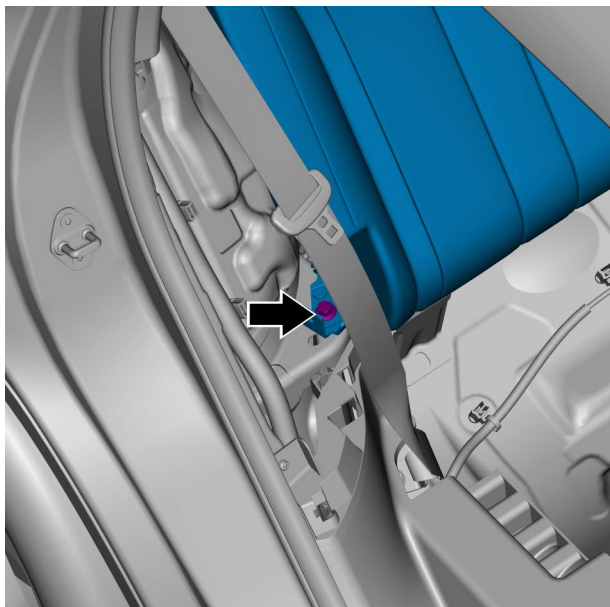


- 3 Remove the seat belt pretensioner (second row seat middle) fixing nut.

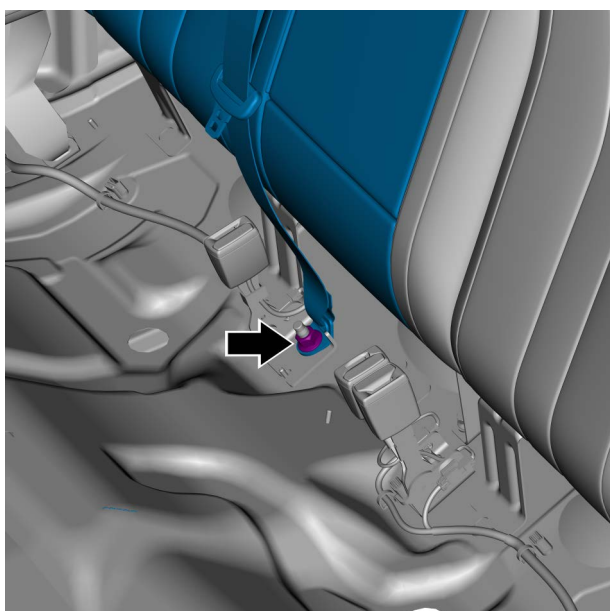


- 4 Remove the rear seat right backrest assembly fixing bolt and remove the rear seat right backrest assembly.

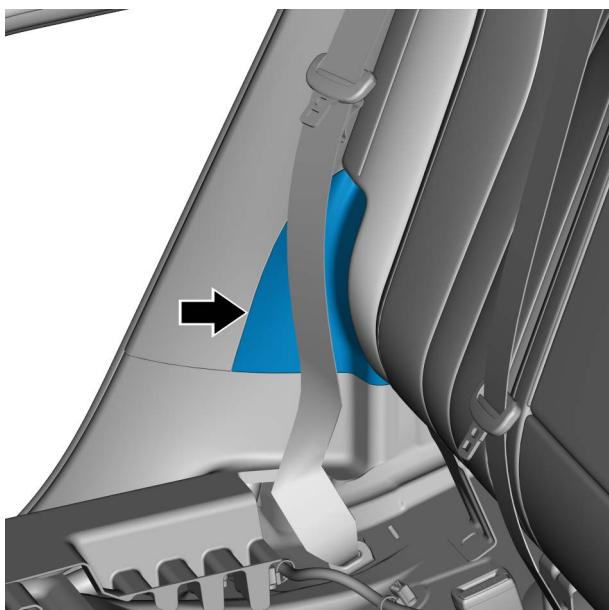
Installation Procedure



- 1 Install the rear seat right backrest assembly fixing bolts.
Torque: 48N·m



- 2 Install the seat belt pretensioner (second row seat middle) fixing nut.
Torque: 48N·m



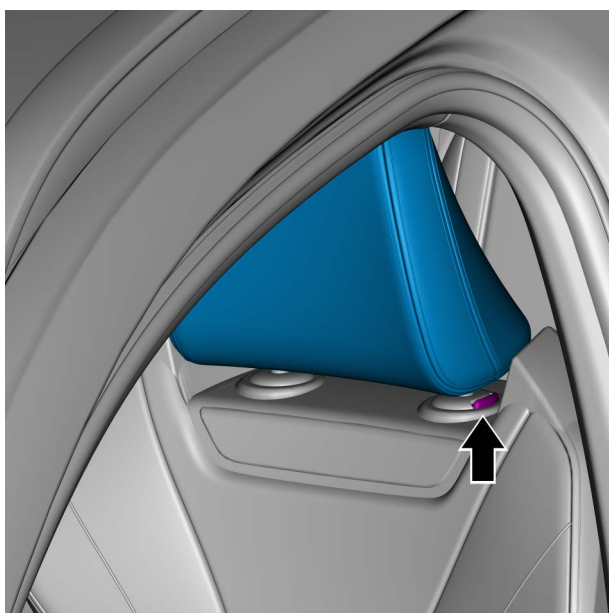
- 3 Install the right C-pillar lower trim panel cover.

- 4 Install the rear seat cushion assembly.

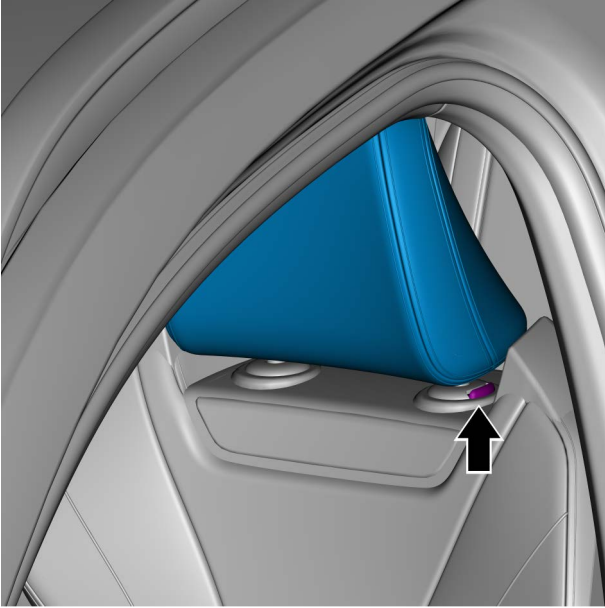
13.7.3.6 Replacement of left front seat headrest

Removal Procedure

- 1 Press the headrest adjustment button to lift the left front seat headrest.



Installation Procedure



- 1 Press the headrest adjustment button to insert the left front seat headrest into the guide sleeve.

13.7.3.7 Replacement of left rear headrest

Removal Procedure

- 1 Press the headrest adjustment button to lift the left rear headrest.



Installation Procedure

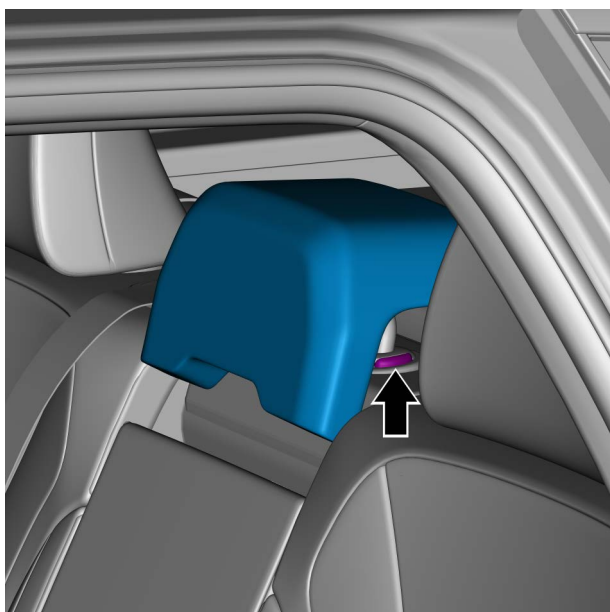


- 1 Press the headrest adjustment button to insert the left rear headrest into the guide sleeve.

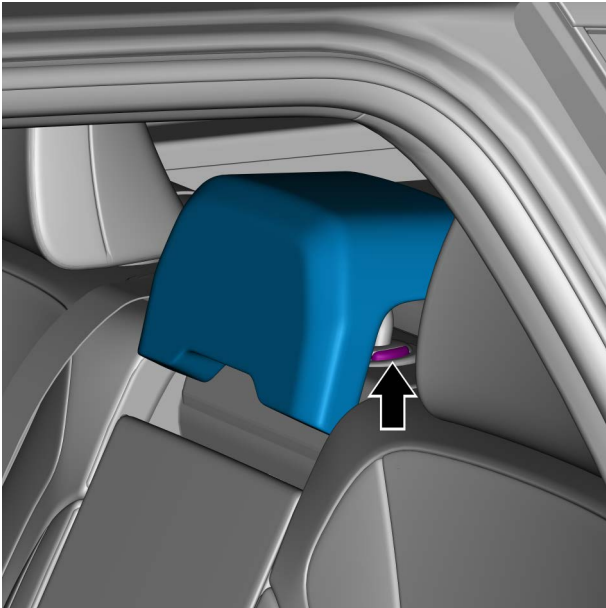
13.7.3.8 Replacement of rear middle headrest

Removal Procedure

- 1 Press the headrest adjustment button to lift the rear middle headrest.



Installation Procedure



- 1 Press the headrest adjustment button to insert the rear middle headrest into the guide sleeve.

13.7.3.9 Replacement of left front seat right shield

Removal Procedure

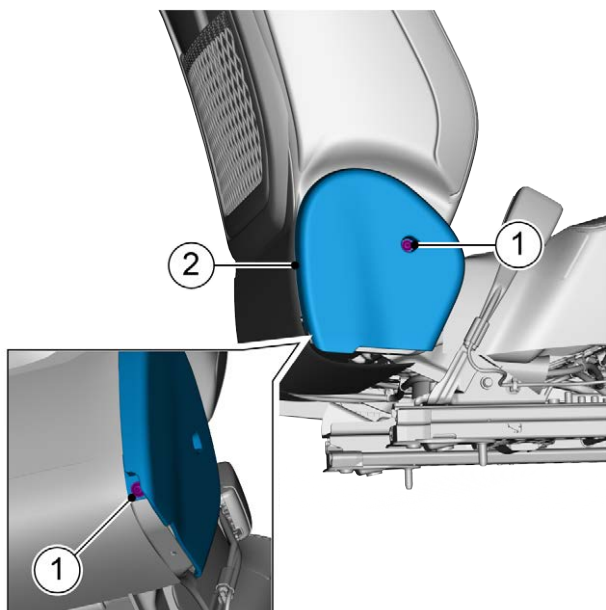
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

Caution

The removal and installation method for right front seat left shield is similar to that of the left front seat right shield.

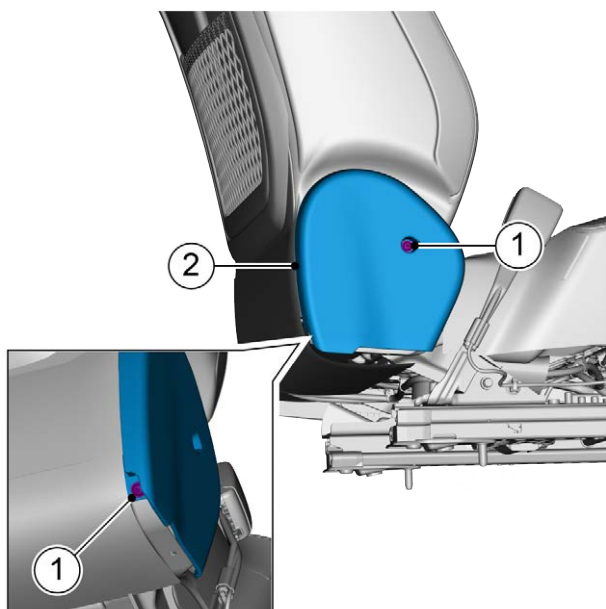
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the driver seat assembly, refer to [Replacement of driver seat assembly](#).



- 3 Remove 1 fixing screw 1 of the left front seat right shield 2.
- 4 Remove the left front seat right shield 2.

Installation Procedure

- 1 Install the left front seat right shield 2 and tighten the screw 1.
Torque: 2N·m



- 2 Install the driver seat assembly.
- 3 Connect the negative cable of battery.

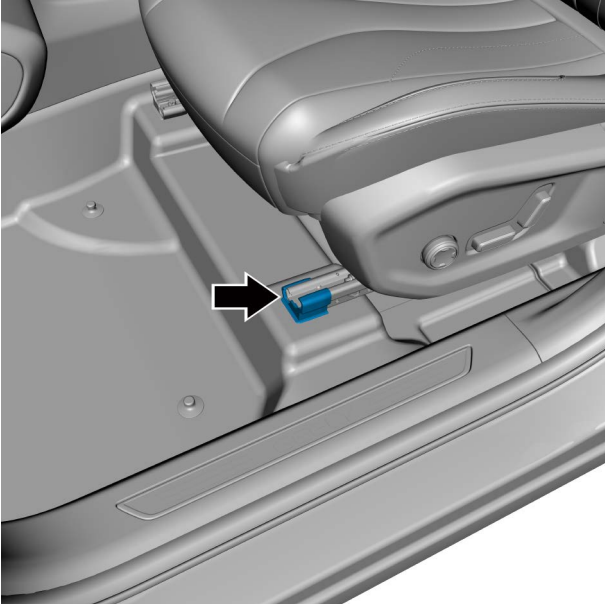
13.7.3.10 Replacement of front seat rail left trim cover

Removal Procedure

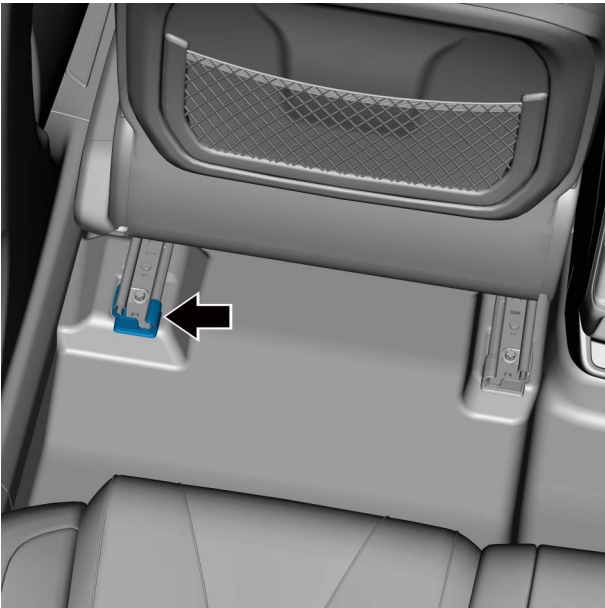
Caution

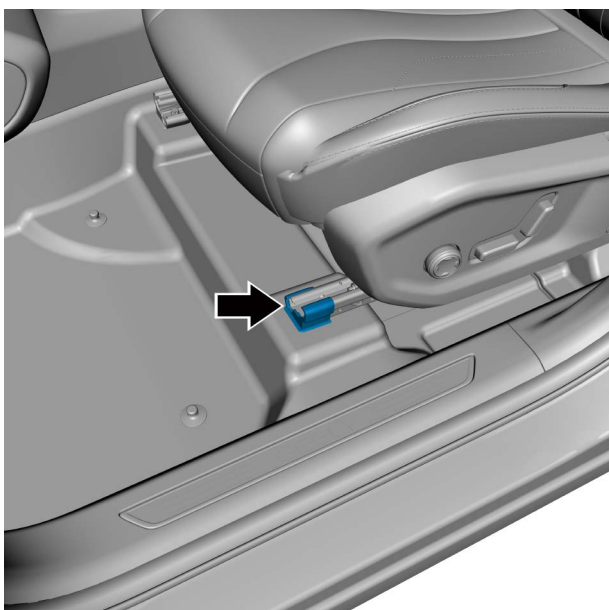
The removal and installation method for front seat rail right trim cover is similar to that of the front seat rail left trim cover.

- 1 Move the seat backward to the limit position.
- 2 Remove the front seat rail left front trim cover.

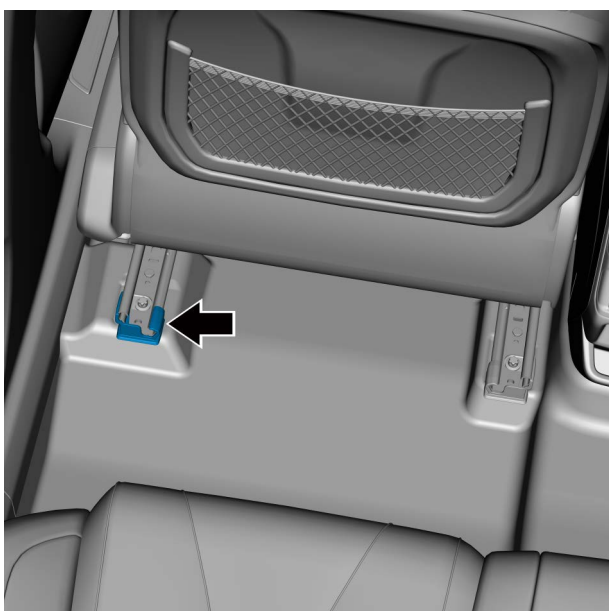


- 3 Move the seat forward to the limit position.
- 4 Remove the front seat rail left rear trim cover.

**Installation Procedure**



- 1 Move the seat backward to the limit position.
- 2 Install the front seat rail left front trim cover.



- 3 Move the seat forward to the limit position.
- 4 Install the front seat rail left rear trim cover.

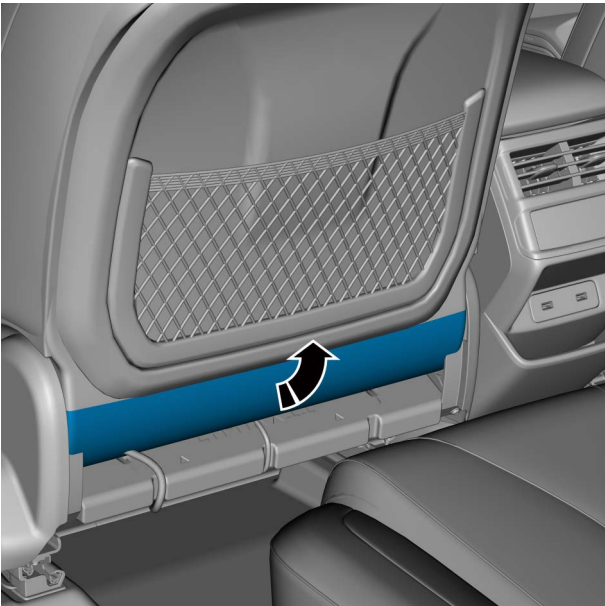
- 5 Reposition the seat.

13.7.3.11 Replacement of front seat back panel

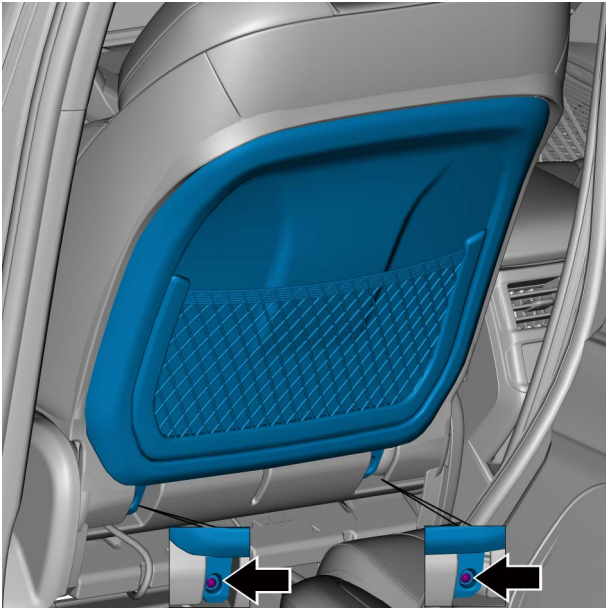
Removal Procedure



1 Lift up the covering parts.



3 Lift up the covering parts.



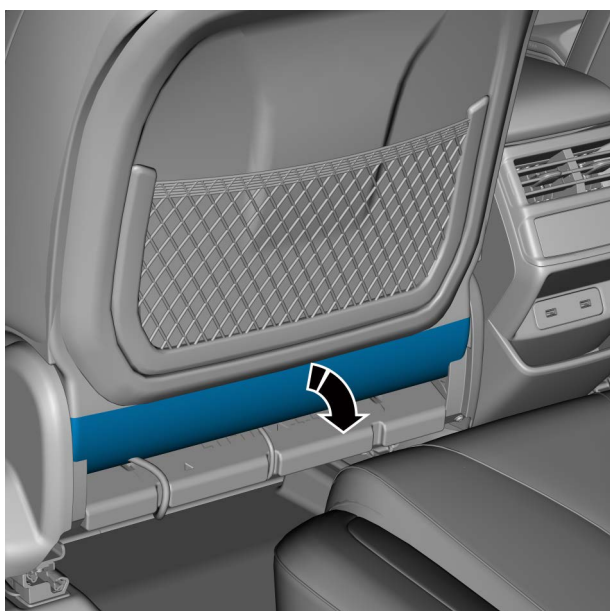
- 2 Remove the 2 fixing screws of the front seat back panel and take off the front seat back panel.

Installation Procedure



- 1 Install the front seat back panel and tighten the 2 fixing screws.

Torque: 2N·m



- 2 Put down the covering parts.



3 Put down the covering parts.

4 Reposition the seat.

13.8 Instrument Panel, Instrument and Console

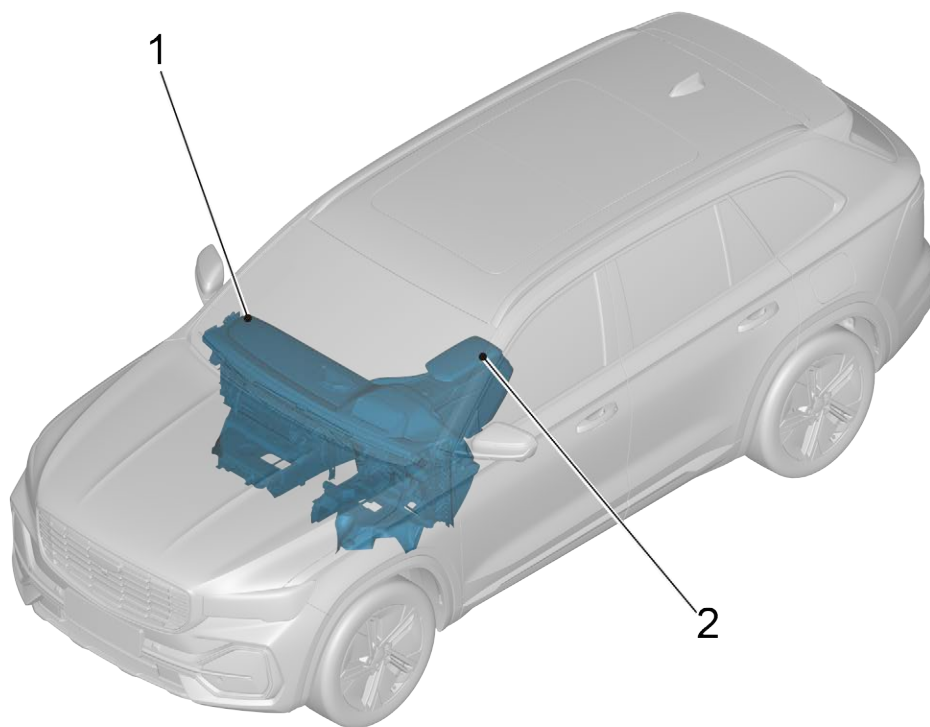
13.8.1 Specification

13.8.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Instrument panel left lower shield assembly fixing screw	ST4.8×19	2.2-2.8
Left A/C air outlet panel assembly fixing screw	ST4.8×19	2.2-2.8
Left clad trim panel assembly fixing screw	ST4.8×19	2.2-2.8
Steering column lower cowl fixing screw	PF5×16	1.3-1.7
Right clad trim panel assembly fixing screw	ST4.8×19	2.2-2.8
Glove box fame assembly fixing screw	ST4.8×19	2.2-2.8
Glove box fame assembly fixing bolt	M5×16	3.2-4.8
Console right trim panel assembly fixing screw	ST4.8×19	3-4
Console right outer handle assembly fixing bolt	M5×16	5-7
Gear shift panel assembly fixing screw	ST4.8×19	2.5-3.5
Console body assembly fixing bolt	M6×25	8.5-11.5
Console body assembly fixing screw	M5×25	2.5-3.5
Instrument panel middle lower shield assembly fixing screw	ST4.8×19	2.2-2.8
Instrument panel body assembly fixing bolt	M5×16	3.7-5.3
Instrument panel cross beam assembly fixing bolt	M8×40	20-28
Instrument panel cross beam assembly fixing bolt	M8	20-28
Instrument panel cross beam assembly fixing bolt	M6×16	8.5-11.5

13.8.2 Part position

13.8.2.1 Part position



1. Instrument panel assembly

2. Console assembly

13.8.3 Removal and Installation

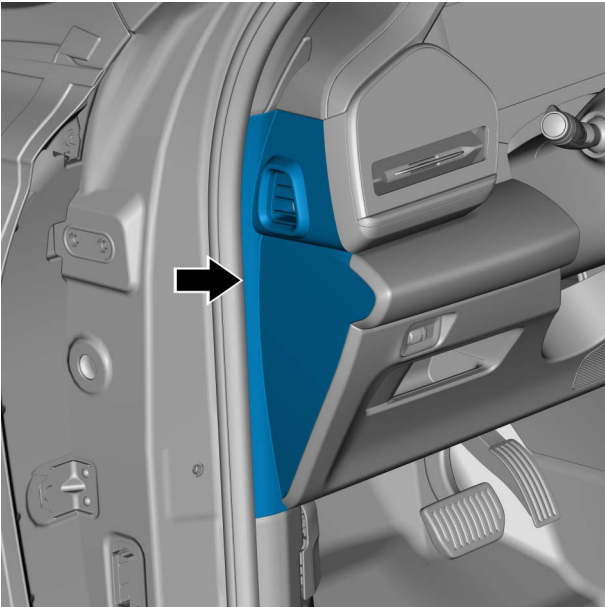
13.8.3.1 Replacement of instrument panel front left side end cover assembly

Removal Procedure

Caution

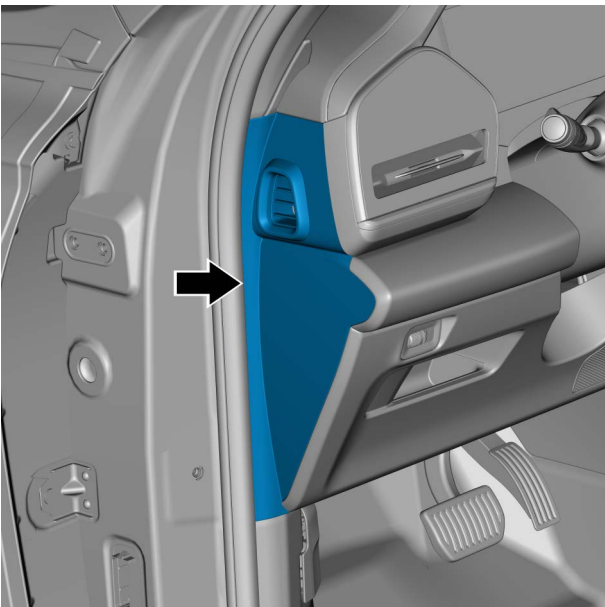
The removal and installation methods for left and right instrument panel side end cover assemblies are similar.

- 1 Remove the instrument panel front left side end cover and remove the instrument panel front left side end cover.



Installation Procedure

- 1 Install the instrument panel front left side end cover.



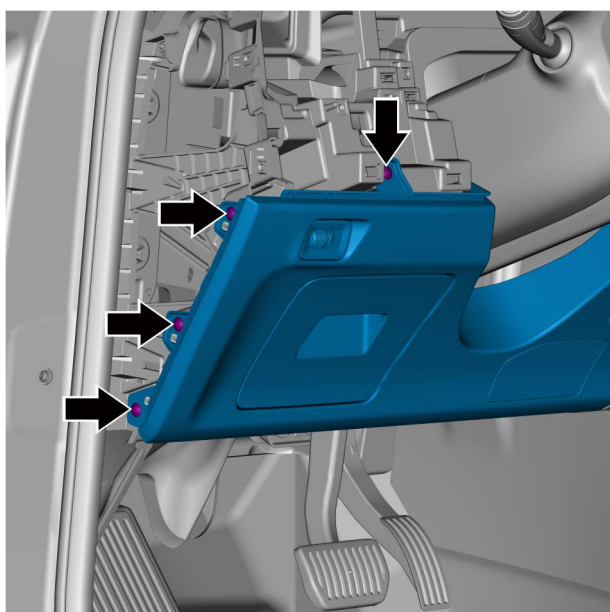
13.8.3.2 Replacement of instrument panel left lower shield assembly

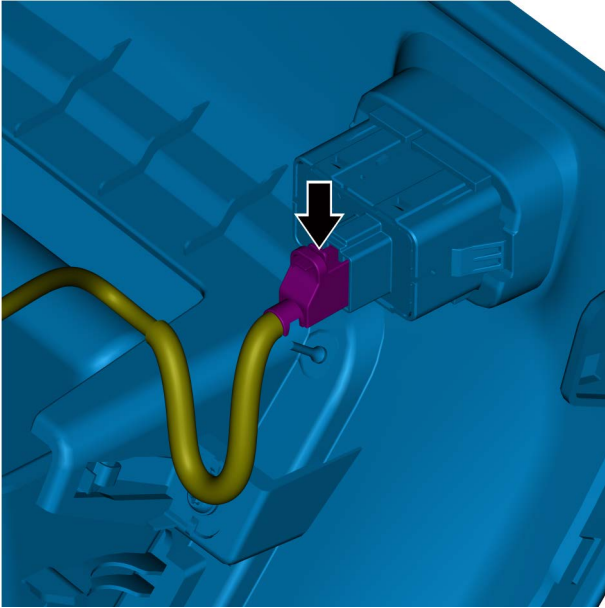
Removal Procedure

Warning !

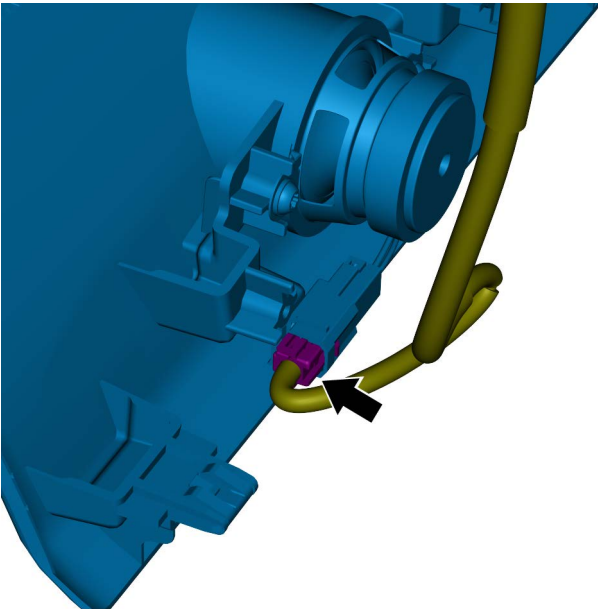
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the instrument panel front left side end cover assembly, refer to [Replacement of instrument panel front left side end cover assembly](#).
- 3 Remove the instrument panel front right side end cover assembly, refer to [Replacement of instrument panel front left side end cover assembly](#).
- 4 Remove the left A/C air outlet panel assembly, refer to [Replacement of left A/C air outlet panel assembly](#).
- 5 Remove left clad trim panel assembly, refer to [Replacement of left clad trim panel assembly](#).
- 6 Remove the left front door sill trim panel assembly, refer to [Replacement of left front door sill trim panel assembly](#).
- 7 Remove the right clad trim panel assembly, refer to [Replacement of right clad trim panel assembly](#).
- 8 Remove the 4 fixing screws from the instrument panel left lower shield assembly.



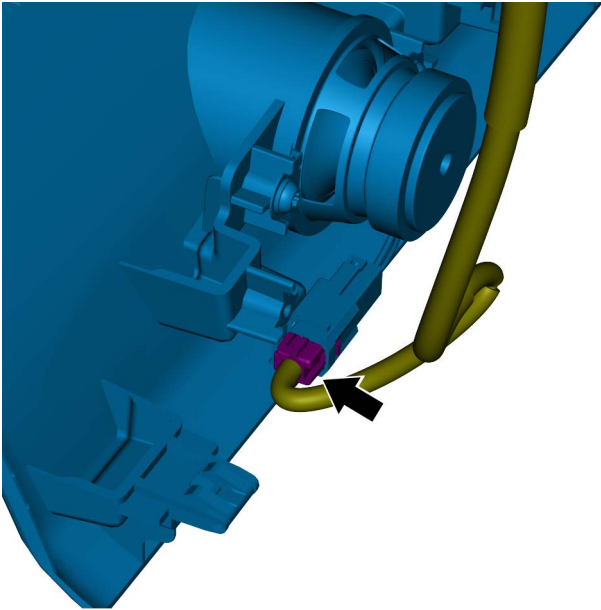


- 9 Disconnect the instrument panel switch unit harness connector.

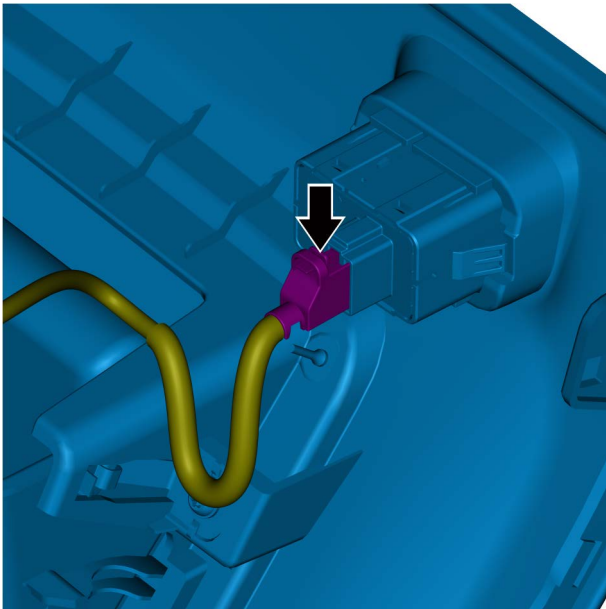


- 10 Disconnect the harness connector of vehicle wireless control module speaker and take off the instrument panel left lower shield assembly.

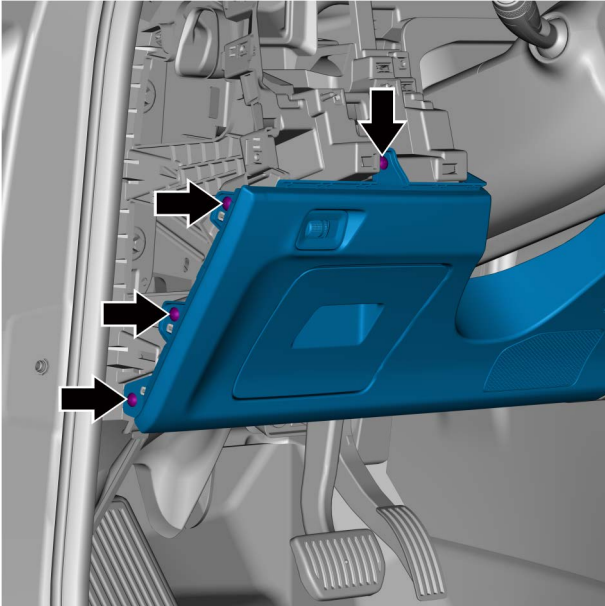
Installation Procedure



- 1 Connect the vehicle wireless control module speaker harness connector.



- 2 Connect the instrument panel switch unit harness connector.



- 3 Install the 4 fixing screws of the instrument panel left lower shield assembly.
Torque: 2.5N·m

- 4 Install the right clad trim panel assembly.
- 5 Install the left front door sill trim panel assembly.
- 6 Install the left clad trim panel assembly.
- 7 Install the left side A/C air outlet panel assembly.
- 8 Install the instrument panel front right side end cover assembly.
- 9 Install the instrument panel front left side end cover assembly.
- 10 Connect the negative cable of battery.

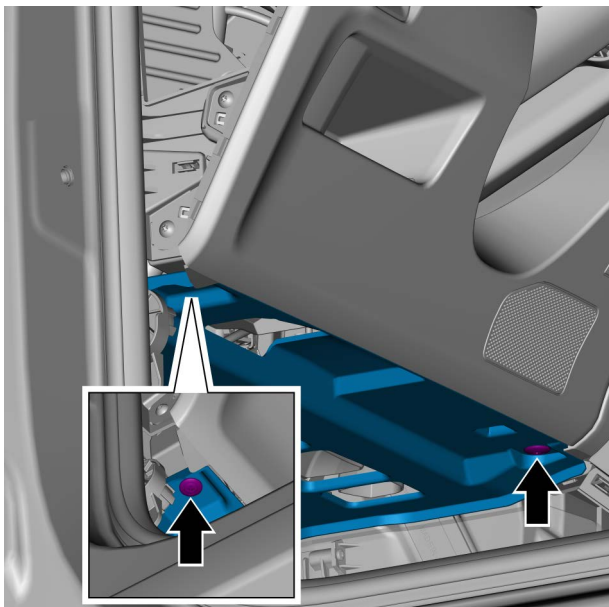
13.8.3.3 Replacement of left lower toe board assembly

Removal Procedure

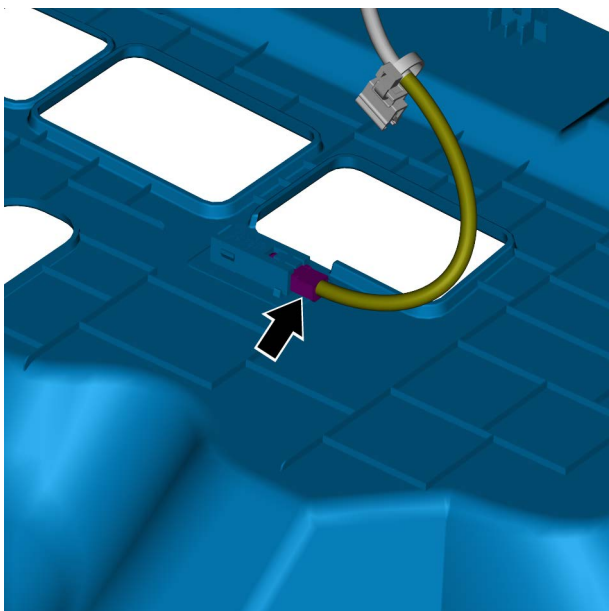
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the instrument panel front left side end cover assembly, refer to [Replacement of instrument panel front left side end cover assembly](#).
- 3 Remove the left front door sill trim panel assembly, refer to [Replacement of left front door sill trim panel assembly](#).
- 4 Remove the driver side extension trim panel assembly, refer to [Replacement of driver side extension trim panel assembly](#).

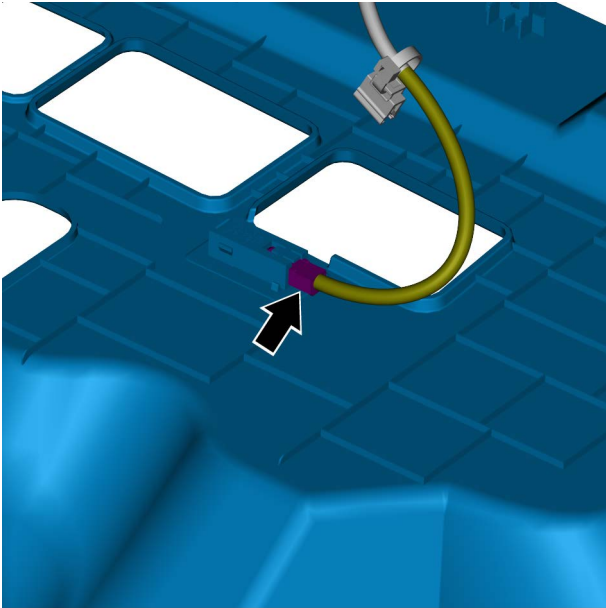


- 5 Remove the 2 J-clips from the left lower toe board assembly.

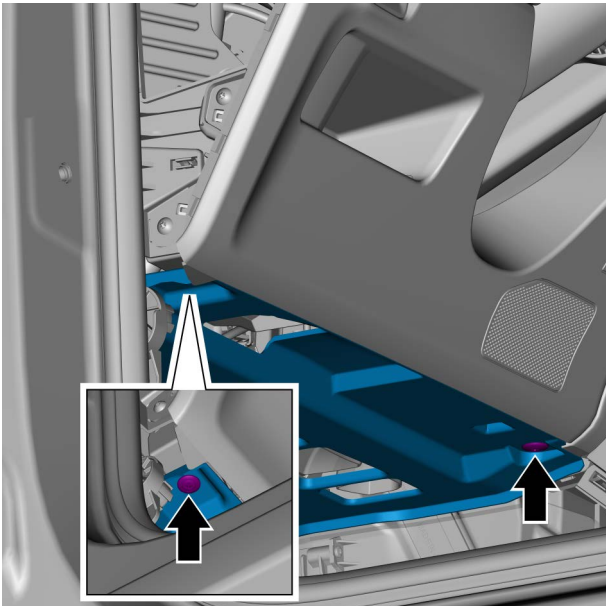


- 6 Disconnect the footwell multicolor illumination harness connector and remove the left lower toe board assembly.

Installation Procedure



- 1 Connect the footwell multicolor illumination harness connector.



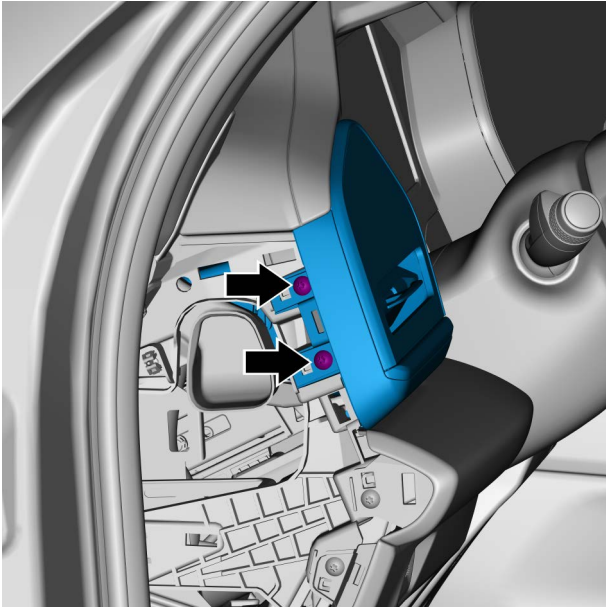
- 2 Install the 2 J-clips of the left lower toe board assembly.

- 3 Install the driver side extension trim panel assembly.
- 4 Install the left front door sill trim panel assembly.
- 5 Install the instrument panel front left side end cover assembly.
- 6 Connect the negative cable of battery.

13.8.3.4 Replacement of left A/C air outlet panel assembly

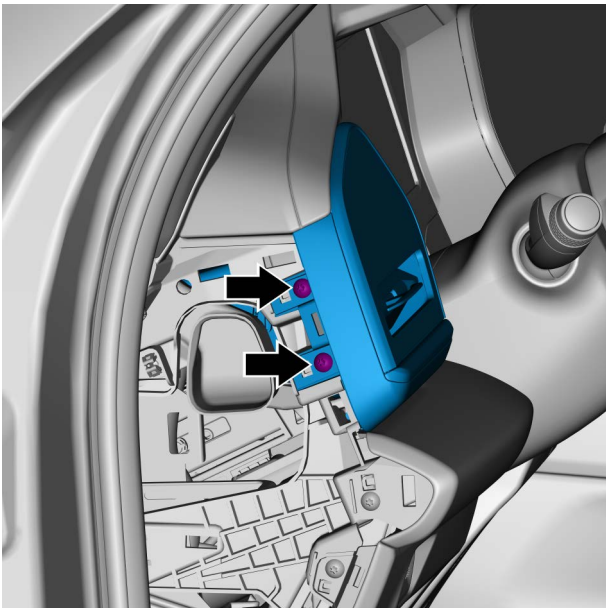
Removal Procedure

- 1 Remove the instrument panel front left side end cover assembly, refer to [Replacement of instrument panel front left side end cover assembly](#).
- 2 Remove the 2 fixing screws of left A/C air outlet panel assembly and take off to left A/C air outlet panel assembly.



Installation Procedure

- 1 Install the 2 fixing screws of left A/C air outlet panel assembly.
Torque: 2.5N·m

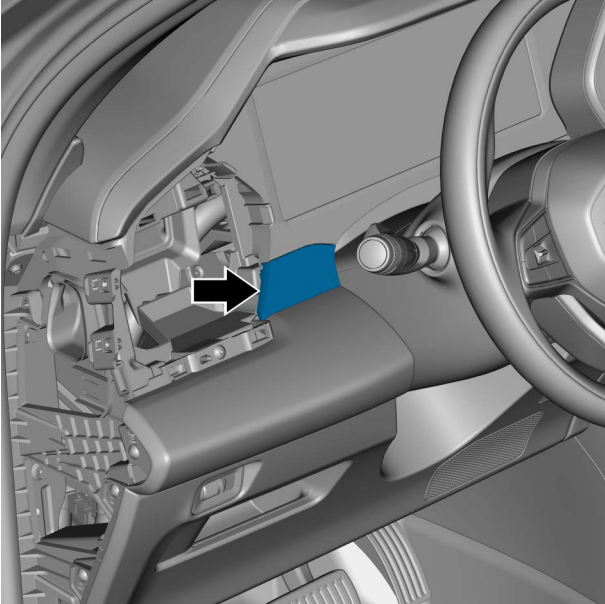


- 2 Install the instrument panel front left side end cover assembly.

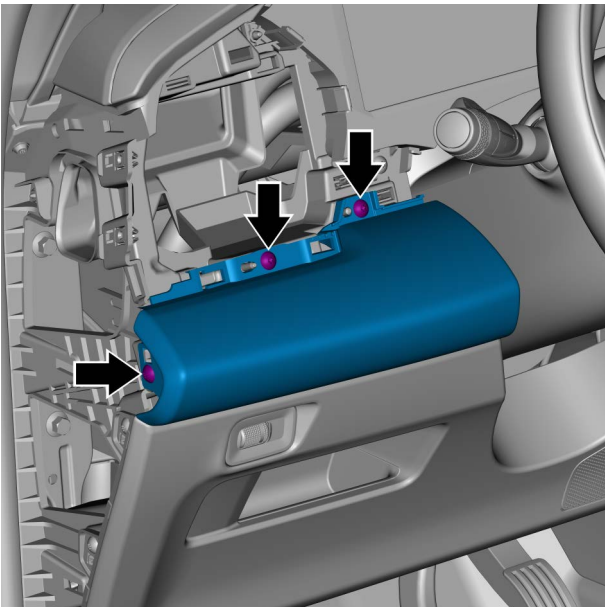
13.8.3.5 Replacement of left clad trim panel assembly

Removal Procedure

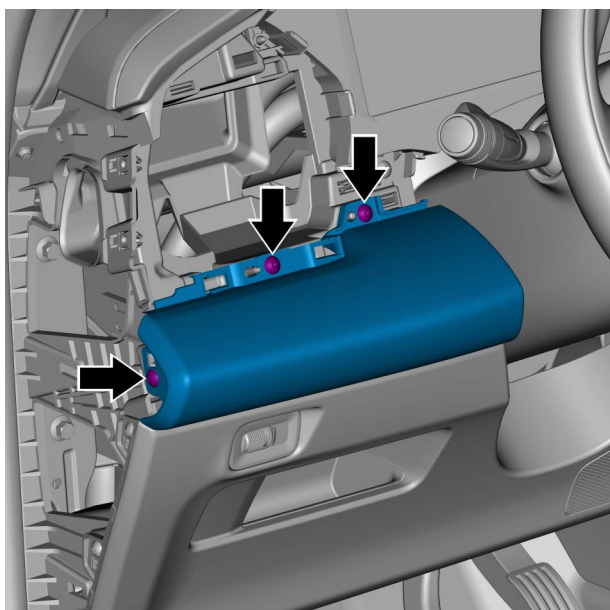
- 1 Remove the instrument panel front left side end cover assembly, refer to [Replacement of instrument panel front left side end cover assembly](#).
- 2 Remove the left A/C air outlet panel assembly, refer to [Replacement of left A/C air outlet panel assembly](#).
- 3 Remove the combination instrument hood left cover panel assembly.



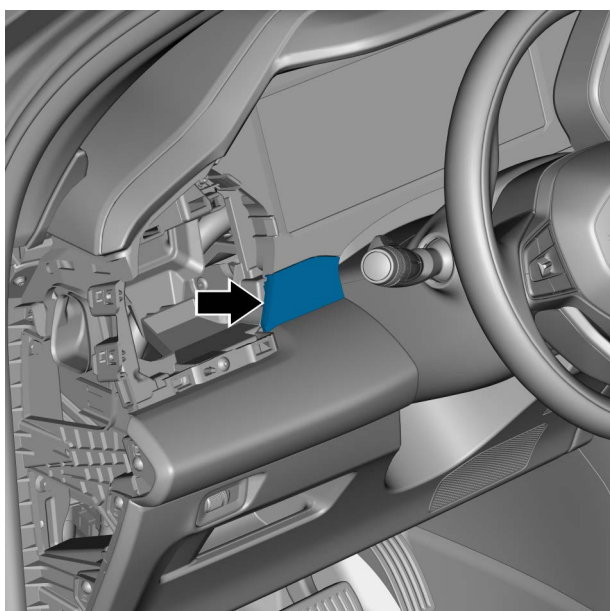
- 4 Remove the 3 fixing screws of the left clad trim panel assembly and take off the left clad trim panel assembly.



Installation Procedure



- 1 Install the 3 fixing screws of left clad trim panel assembly.
Torque: 2.5N·m

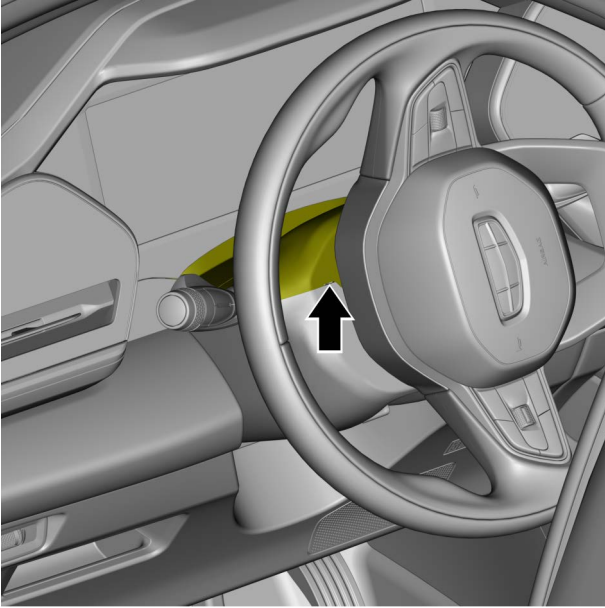


- 2 Install the combination instrument hood left cover panel assembly.

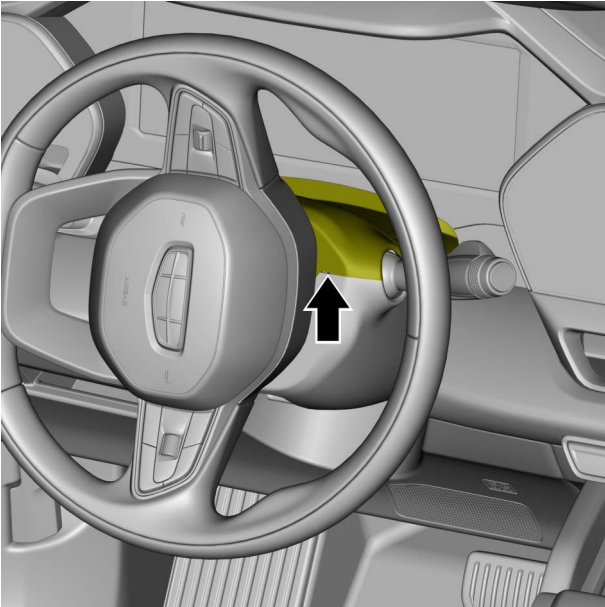
- 3 Install the left side A/C air outlet panel assembly.
- 4 Install the instrument panel front left side end cover assembly.

13.8.3.6 Replacement of steering column lower cowl

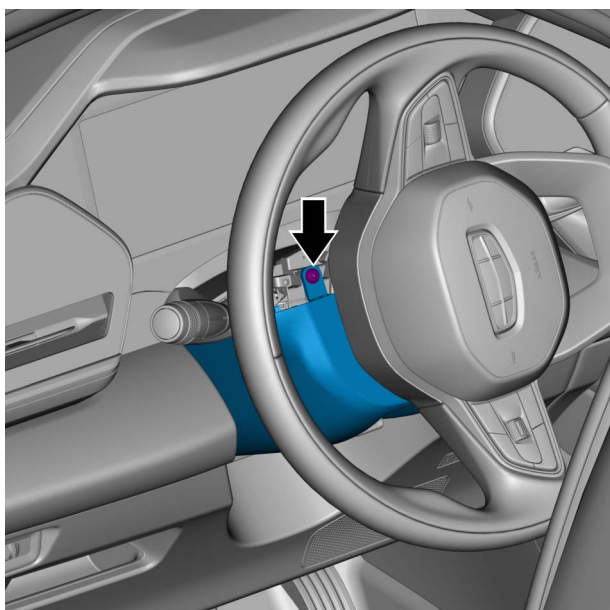
Removal Procedure



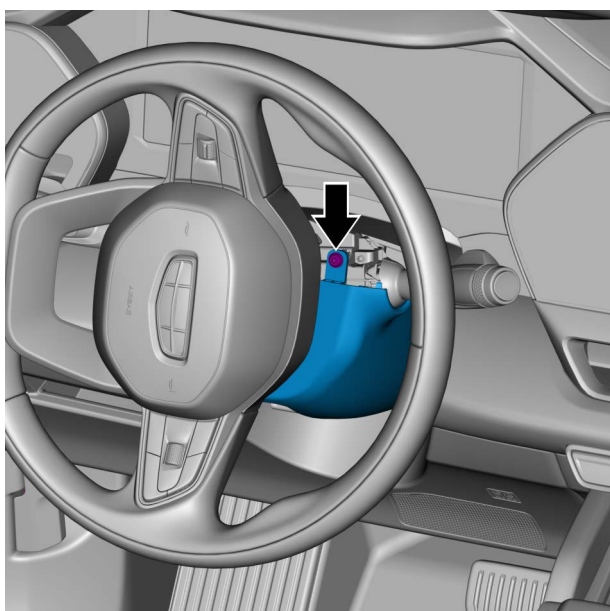
- 1 Adjust the steering wheel to a suitable position and separate the left steering column upper cowl from the steering column lower cowl.



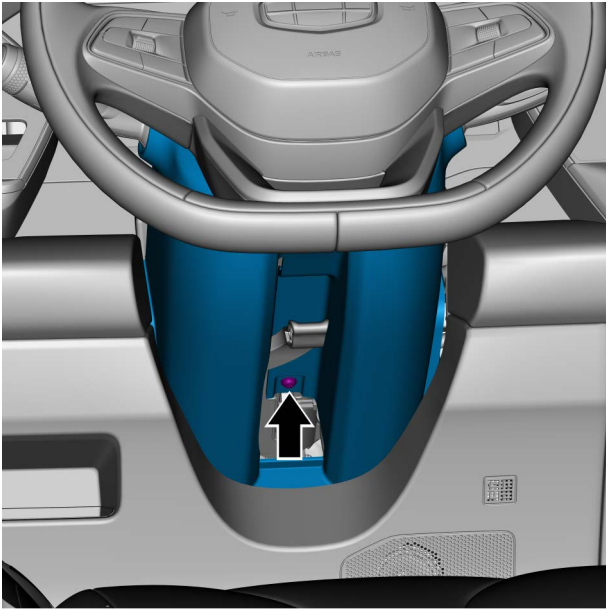
- 2 Adjust the steering wheel to a suitable position and separate the right steering column upper cowl from the steering column lower cowl.



- 3 Adjust the steering wheel to the proper position and remove the left fixing screw of the steering column lower cowl assembly.

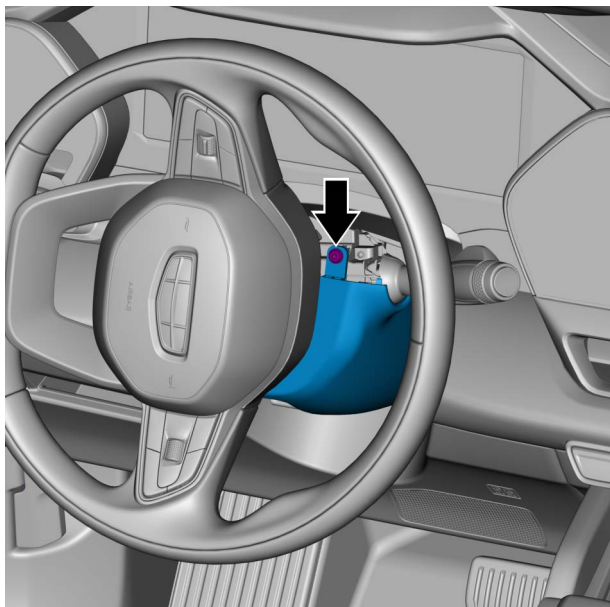


- 4 Adjust the steering wheel to the proper position and remove the right fixing screw of the steering column lower cowl assembly.

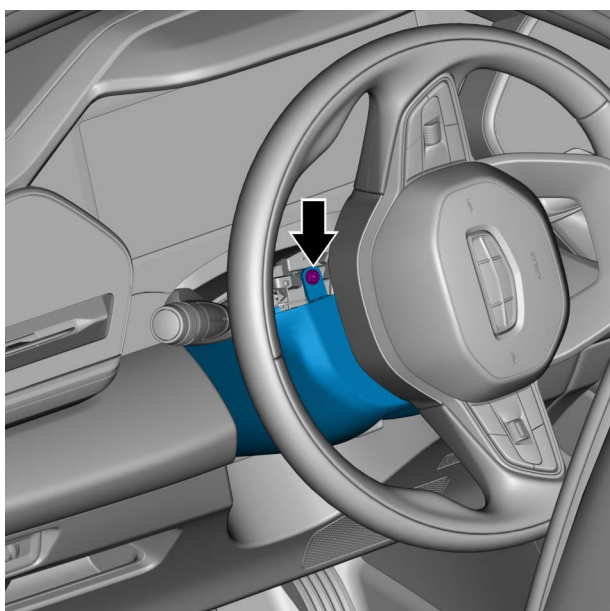


- 5 Remove the fixing screws under the steering column lower cowl and take off the steering column lower cowl assembly.

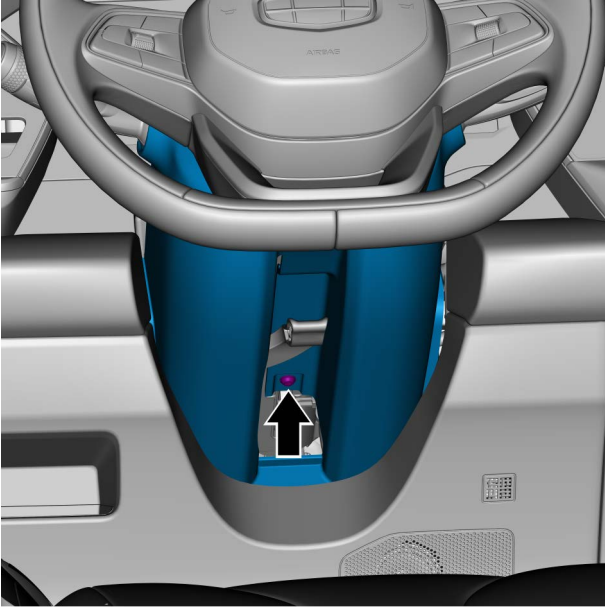
Installation Procedure



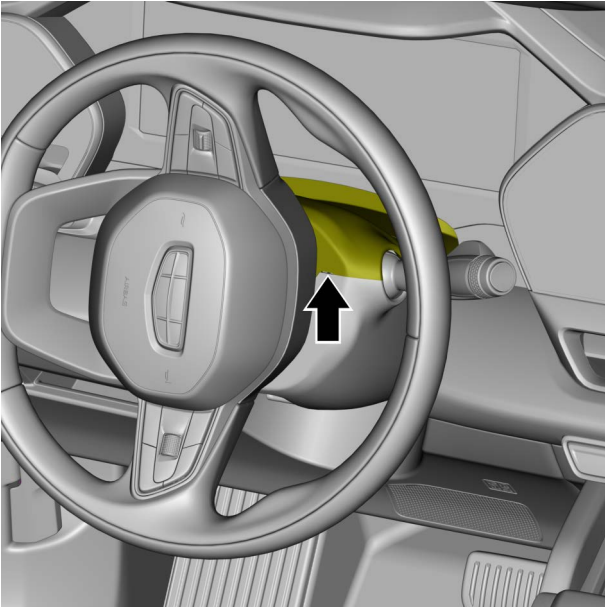
- 1 Adjust the steering wheel to the proper position and install the right fixing screw of the steering column lower cowl assembly.
Torque: 1.5N·m



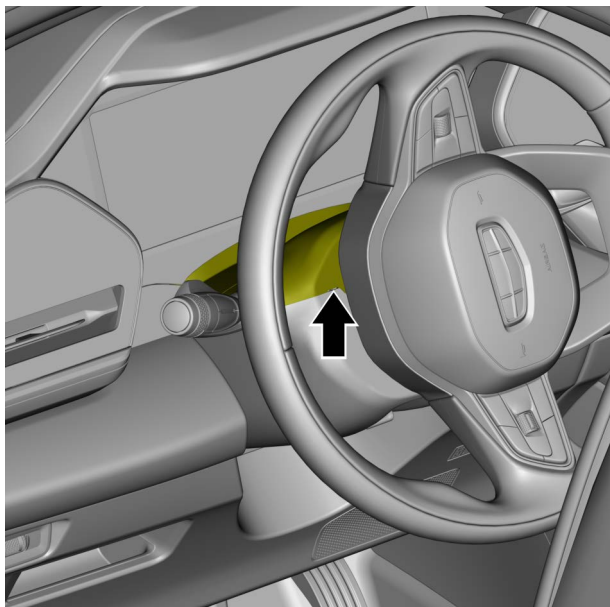
- 2 Adjust the steering wheel to the proper position and install the left fixing screw of the steering column lower cowl assembly.
Torque: 1.5N·m



- 3 Install the fixing screws under the steering column lower cowl.
Torque: 1.5N·m



- 4 Adjust the steering wheel to the proper position and install the right steering column upper cowl.



- 5 Adjust the steering wheel to the proper position and install the left steering column upper cowl.

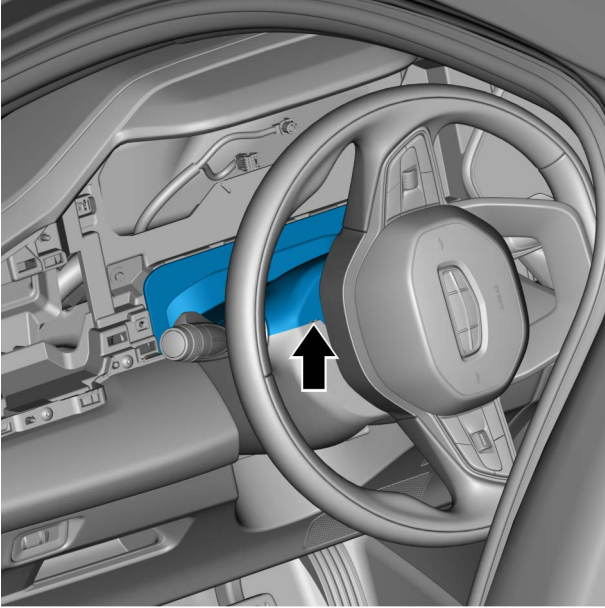
13.8.3.7 Replacement of steering column upper cowl assembly

Removal Procedure

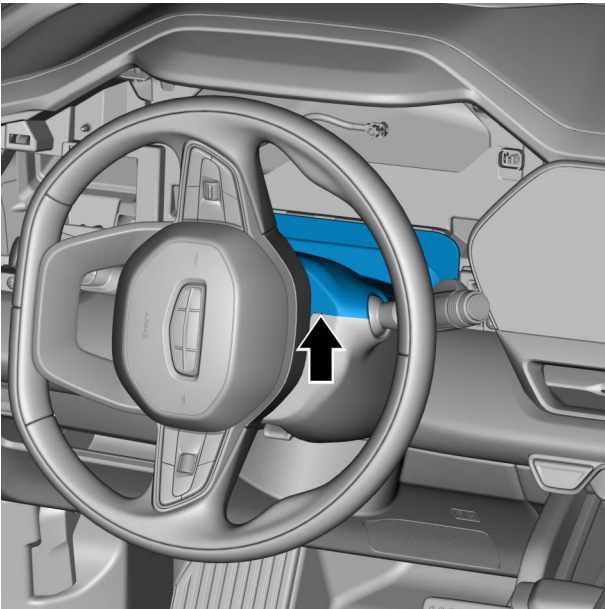
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the instrument panel front left side end cover assembly, refer to [Replacement of instrument panel front left side end cover assembly](#).
- 3 Remove the left A/C air outlet panel assembly, refer to [Replacement of left A/C air outlet panel assembly](#).
- 4 Remove the driver information screen, refer to [Replacement of driver information screen](#).

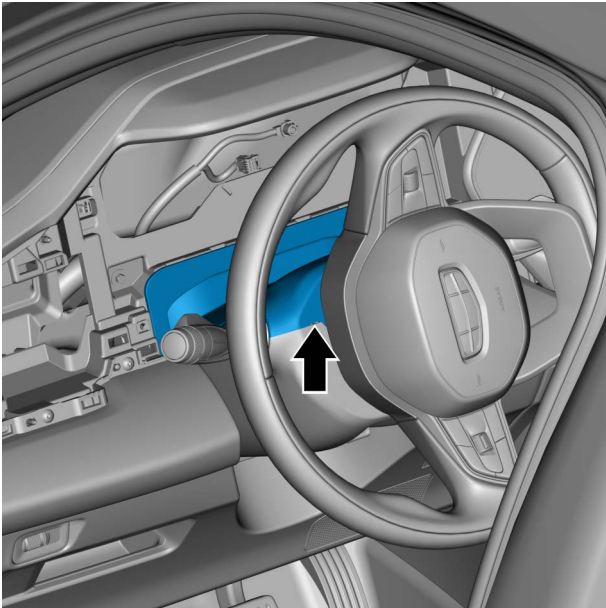


- 5 Adjust the steering wheel to the longest and lowest positions and separate the left steering column upper cowl from the steering column lower cowl.

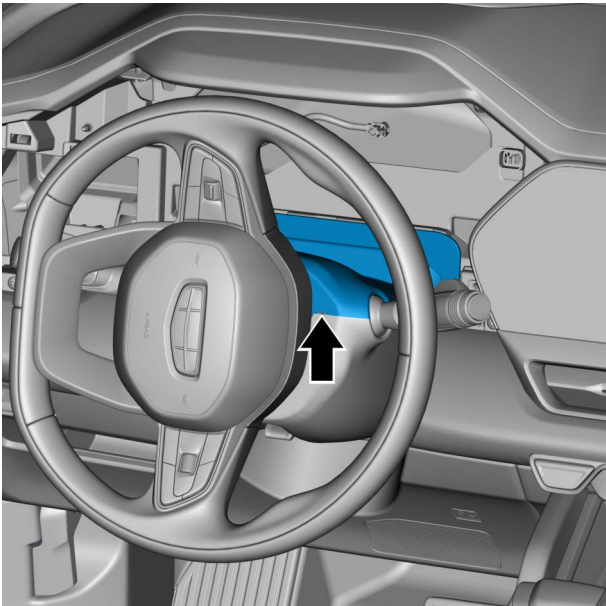


- 6 Adjust the steering wheel to a suitable position and separate the right steering column upper cowl from the steering column lower cowl.
- 7 Disassemble and separate the steering column upper cowl assembly from the instrument panel frame and remove it.

Installation Procedure



- 1 Adjust the steering wheel to the proper position and install the left steering column upper cowl.



- 2 Adjust the steering wheel to the proper position and install the right steering column upper cowl.

- 3 Install the driver information screen.
- 4 Install the left side A/C air outlet panel assembly.
- 5 Install the instrument panel front left side end cover assembly.
- 6 Connect the negative cable of battery.

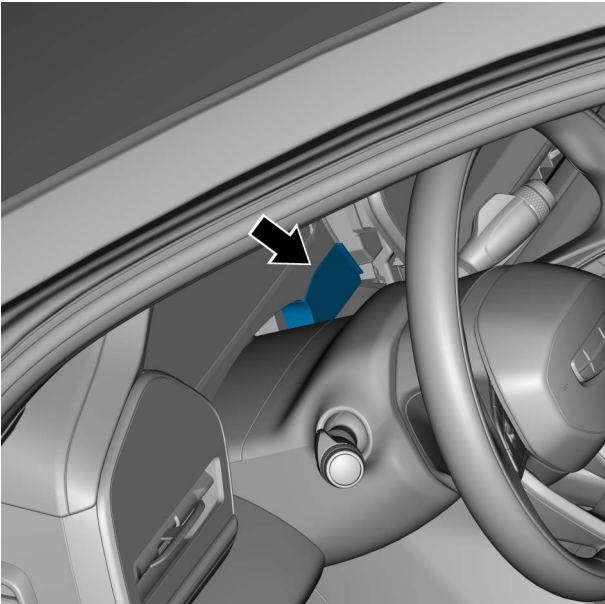
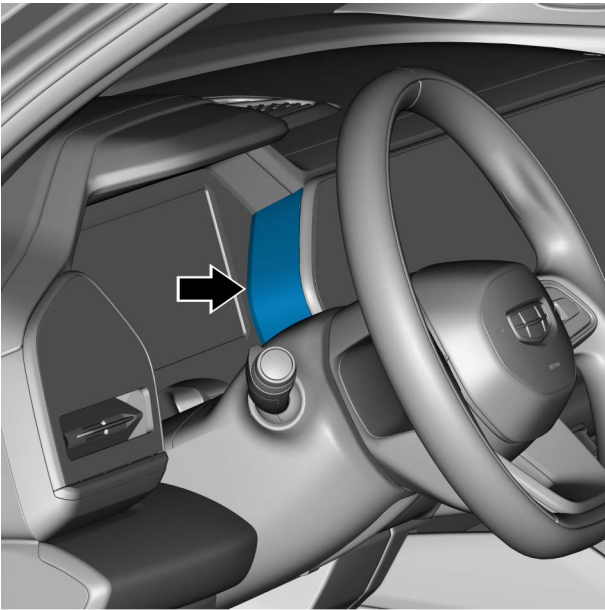
13.8.3.8 Replacement of right clad trim panel assembly

Removal Procedure

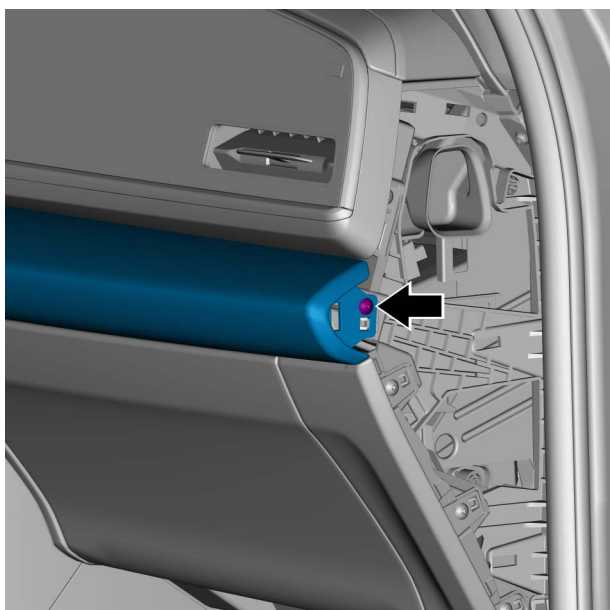
Warning !

Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#)

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the instrument panel front right side end cover assembly, refer to [Replacement of instrument panel front left side end cover assembly](#).
- 3 Remove the center console display trim cover.



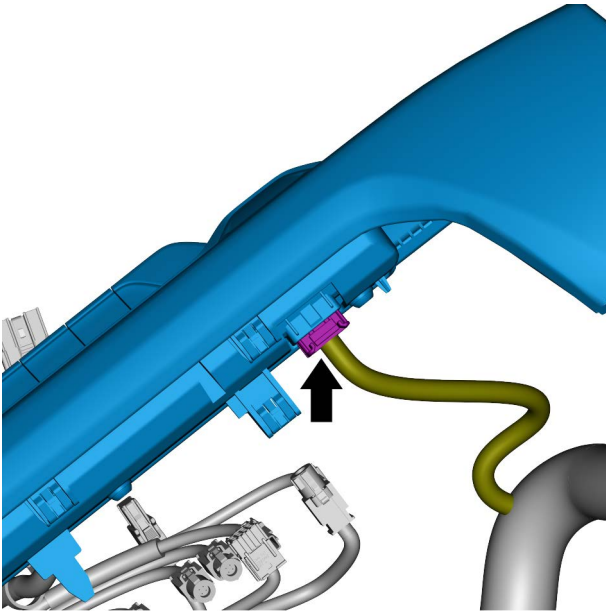
- 4 Remove the combination instrument hood right cover panel assembly.



- 5 Remove the fixing screws on the right side of the right clad trim panel assembly.

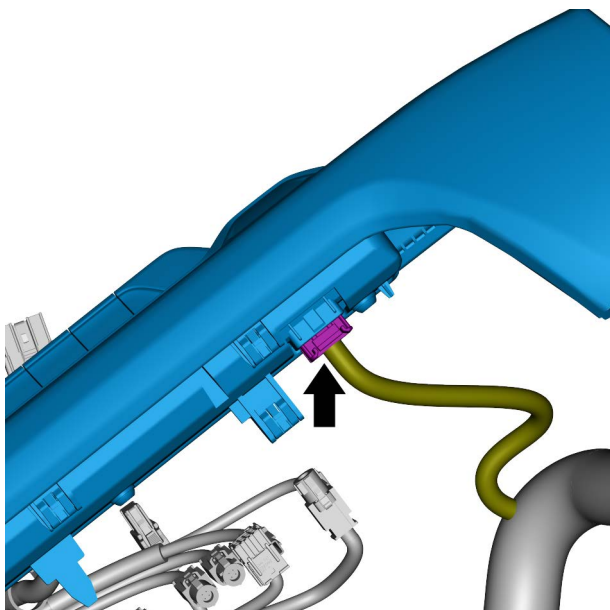


- 6 Remove the fixing screws on the left side of the right clad trim panel assembly.



- 7 Disconnect the center console switch module harness connector and remove the right clad trim panel assembly.

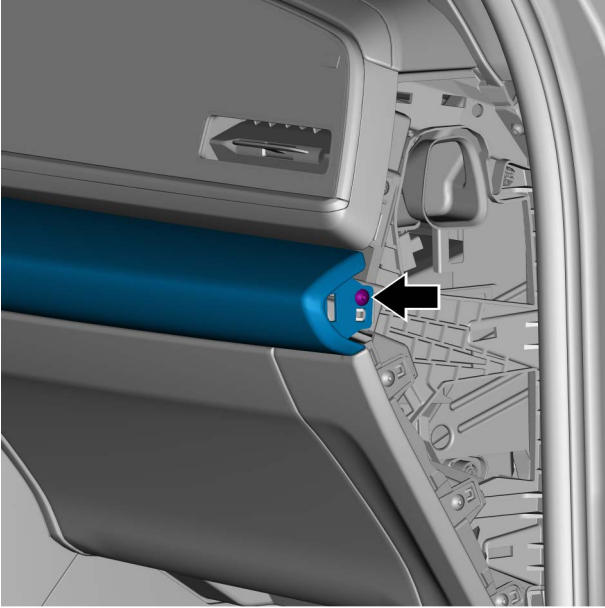
Installation Procedure



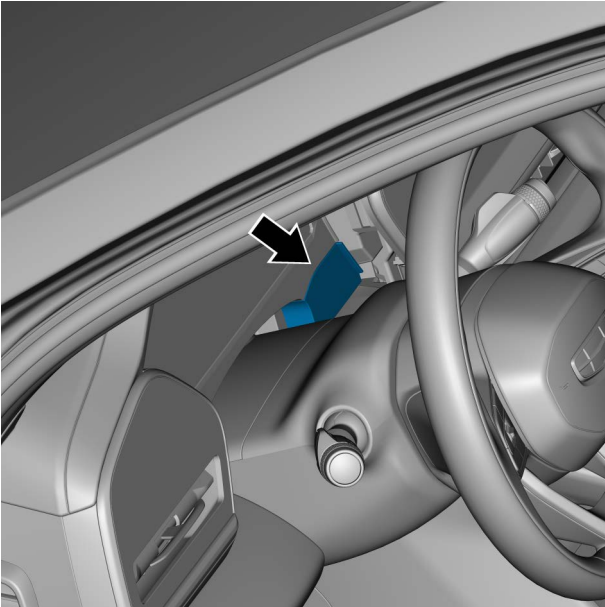
- 1 Connect the center console switch module harness connector.



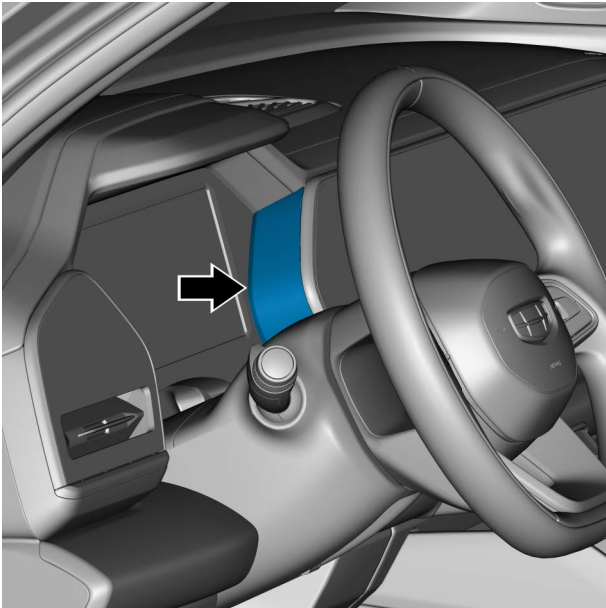
- 2 Install the fixing screws on the left side of the right clad trim panel assembly.
Torque: 2.5N·m



- 3 Install the fixing screws on the right side of the right clad trim panel assembly.
Torque: 2.5N·m



- 4 Install the combination instrument hood right cover panel assembly.



- 5 Install the center console display trim cover.

- 6 Install the instrument panel front right side end cover assembly.
- 7 Connect the negative cable of battery.

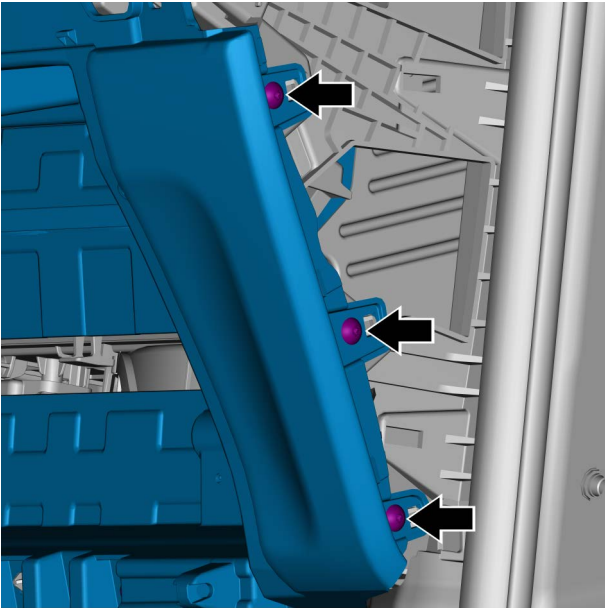
13.8.3.9 Replacement of glove box frame

Removal Procedure

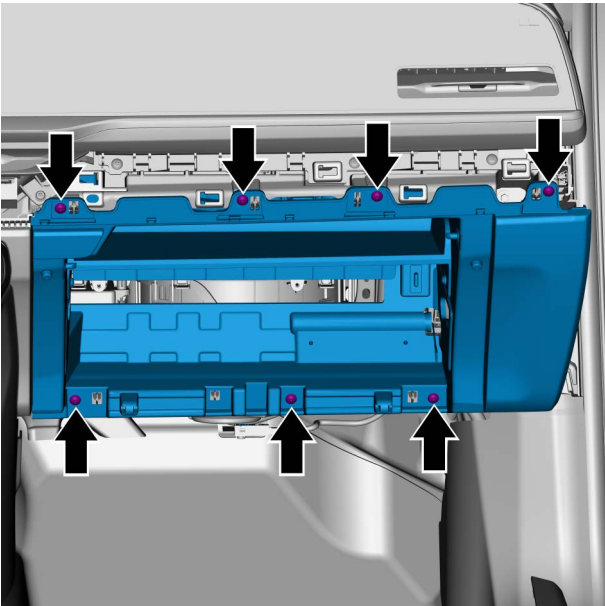
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

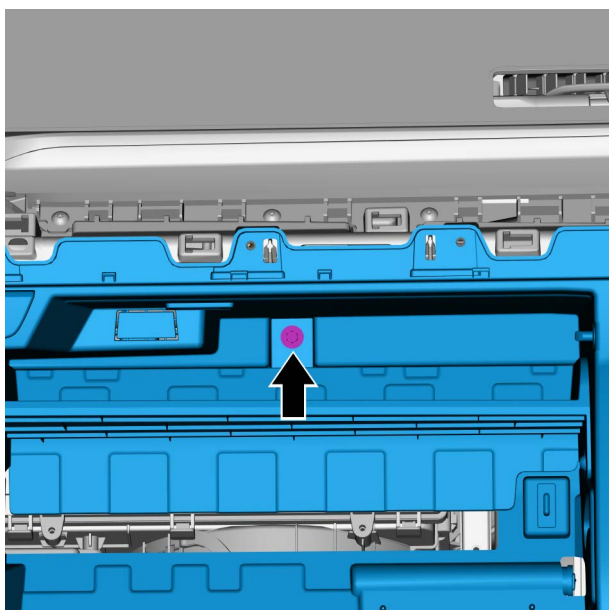
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the instrument panel front right side end cover assembly, refer to [Replacement of instrument panel front left side end cover assembly](#).
- 3 Remove the right lower toe board assembly, refer to [Replacement of right lower toe board assembly](#).
- 4 Remove the right clad trim panel assembly, refer to [Replacement of right clad trim panel assembly](#).



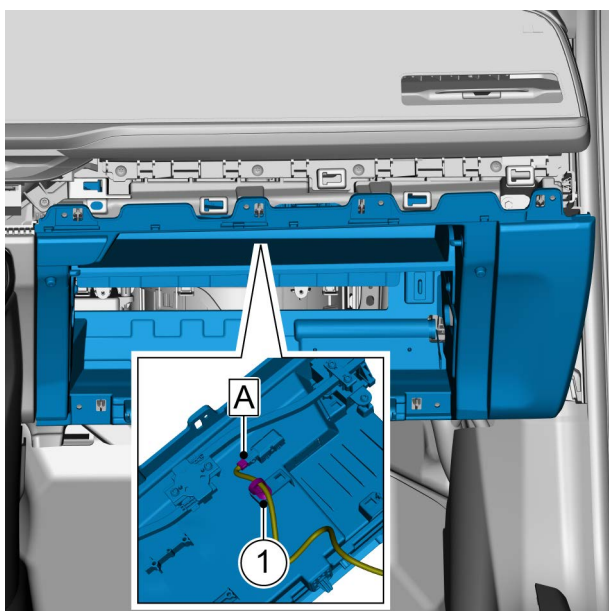
- 5 Remove the 3 fixing screws on the right side of the glove box frame.



- 6 Remove the 7 fixing screws of the glove box frame.

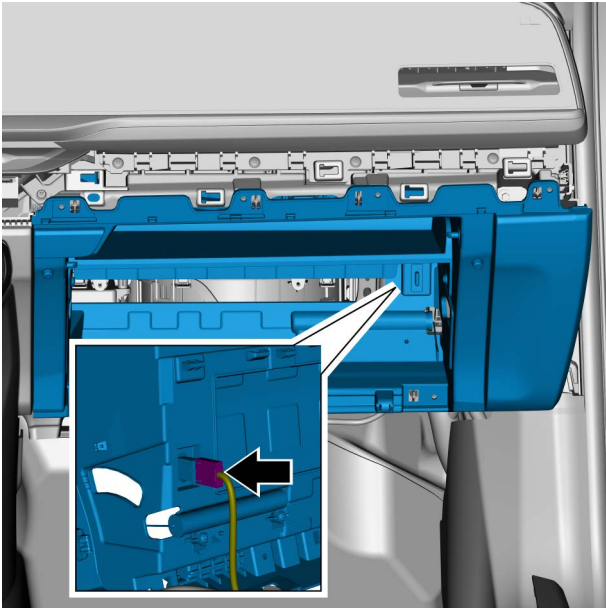


7 Remove the glove box frame fixing bolts.



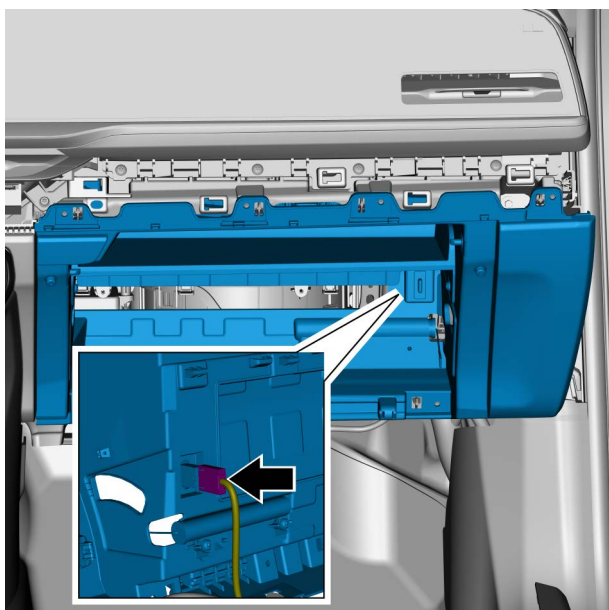
8 Disconnect the floor console illumination harness connector A.

9 Remove the instrument harness fixing clips 1.

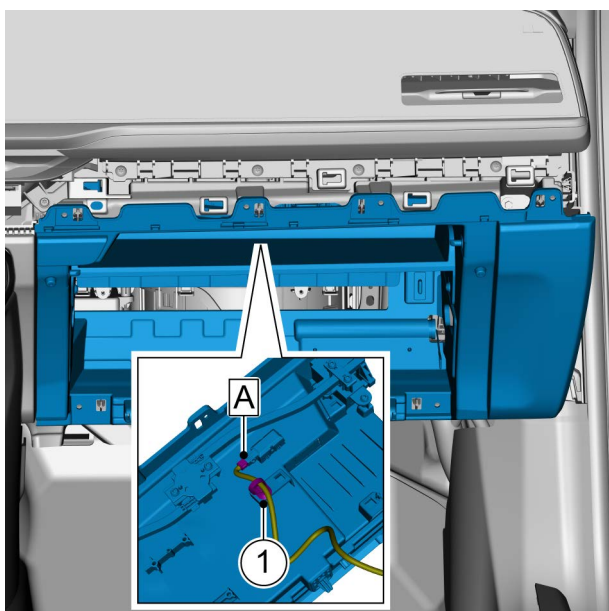


- 10 Disconnect the glovebox lid switch harness connector and remove the glove box frame.

Installation Procedure

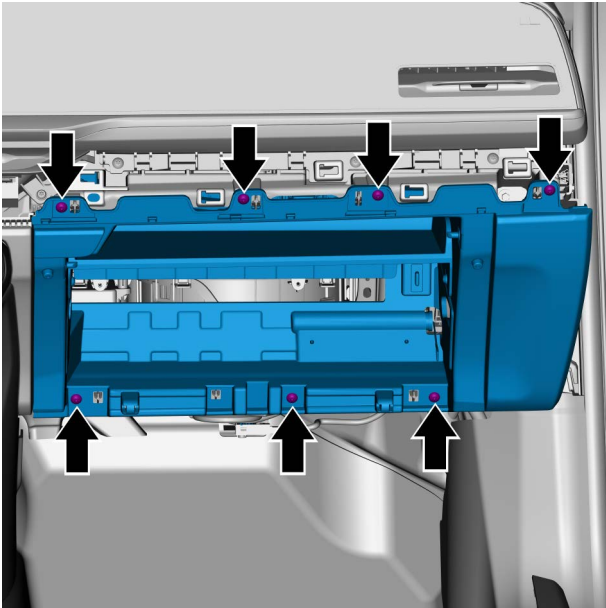


1 Connect the glovebox lid switch harness connector.

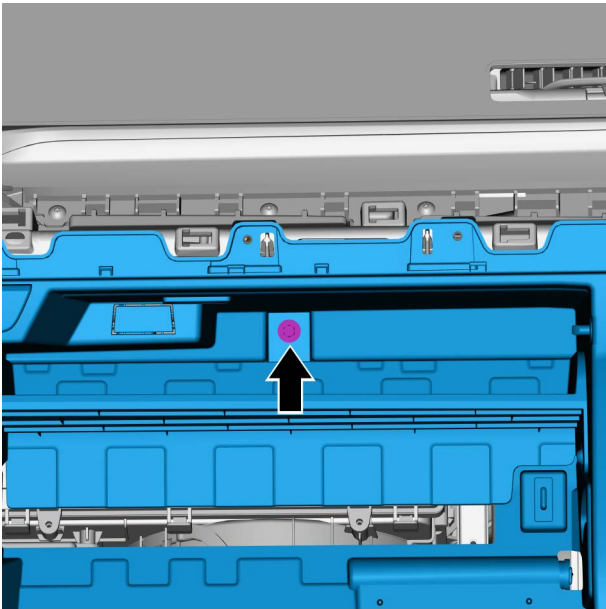


2 Connect the floor console illumination harness connector A.

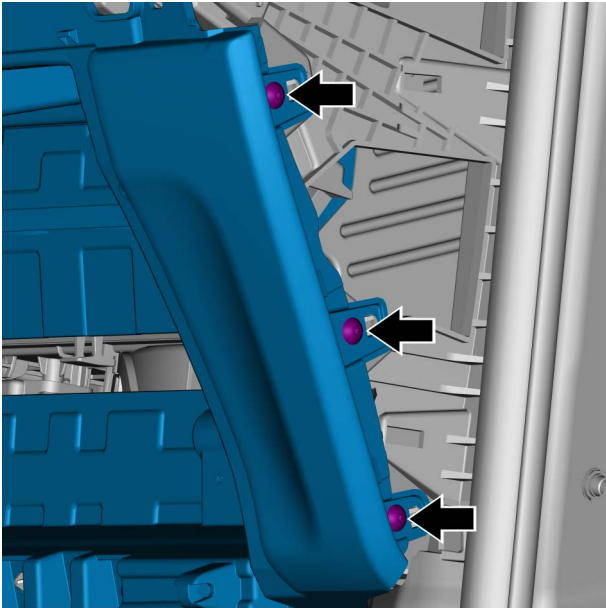
3 Install the instrument harness fixing clip 1.



- 4 Install the 7 fixing screws of the glove box frame.
Torque: 2.5N·m



- 5 Install the glove box frame fixing bolts.
Torque: 4N·m



- 6 Install the 3 fixing screws on the right side of the glove box fame.
Torque: 2.5N·m

- 7 Install the right clad trim panel assembly.
- 8 Install the right lower toe board assembly.
- 9 Install the instrument panel front right side end cover assembly.
- 10 Connect the negative cable of battery.

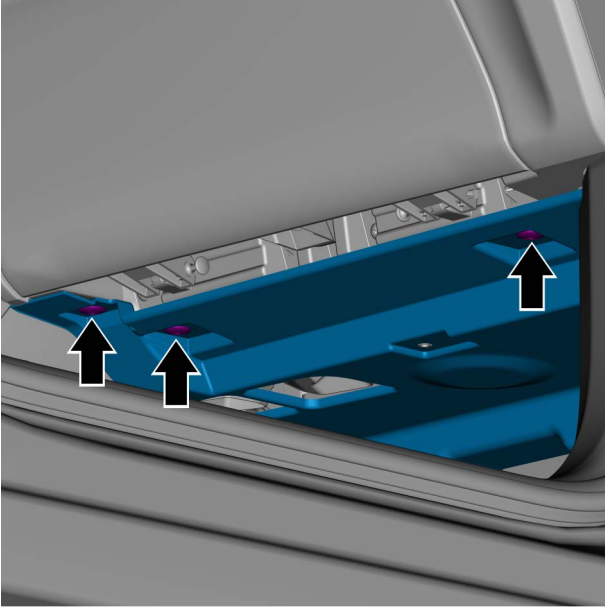
13.8.3.10 Replacement of right lower right toe board assembly

Removal Procedure

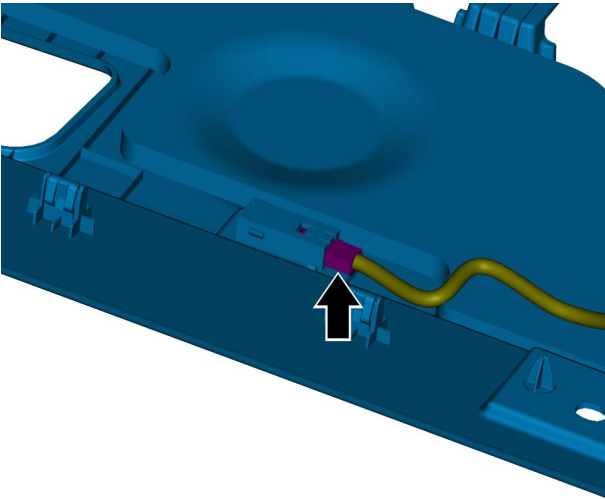
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the front passenger side extension trim panel assembly, refer to [Replacement of front passenger side extension trim panel assembly](#).
- 3 Remove the instrument panel front right side end cover assembly, refer to [Replacement of instrument panel front left side end cover assembly](#).
- 4 Remove the right front door sill trim panel assembly, refer to [Replacement of right front door sill trim panel assembly](#).

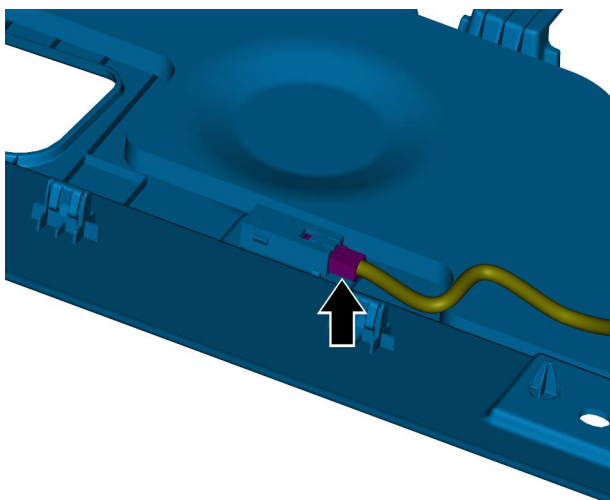


- 5 Remove the 3 J-clips from the right lower toe board assembly.

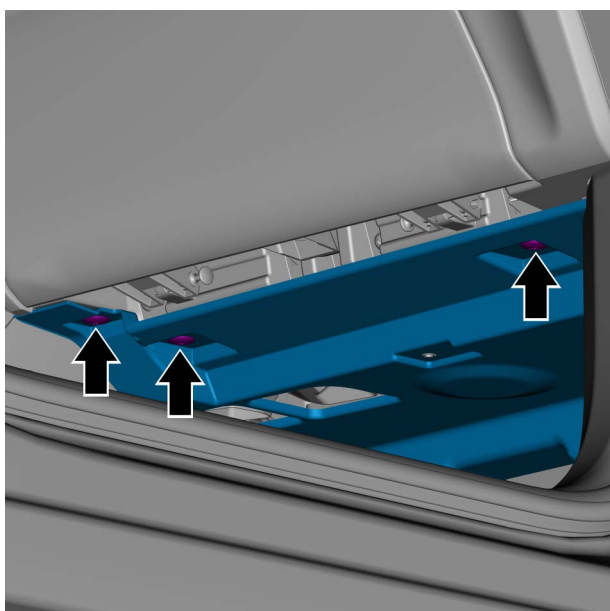


- 6 Disconnect the footwell illumination lamp harness connector and remove the right lower toe board assembly.

Installation Procedure



- 1 Connect the footwell illumination lamp harness connector.



- 2 Install the 3 J-clips from the right lower toe board assembly.

- 3 Install the right front door sill trim panel assembly.
- 4 Install the instrument panel front right side end cover assembly.
- 5 Install the front passenger side extension trim panel assembly.
- 6 Connect the negative cable of battery.

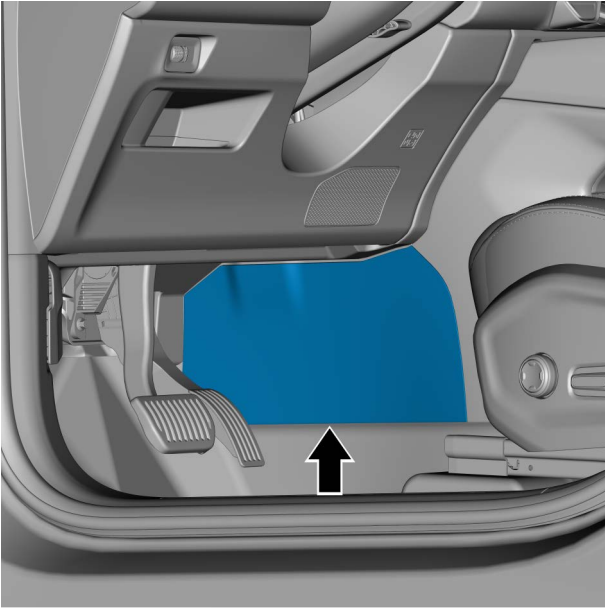
13.8.3.11 Replacement of driver side extension trim panel assembly

Removal Procedure

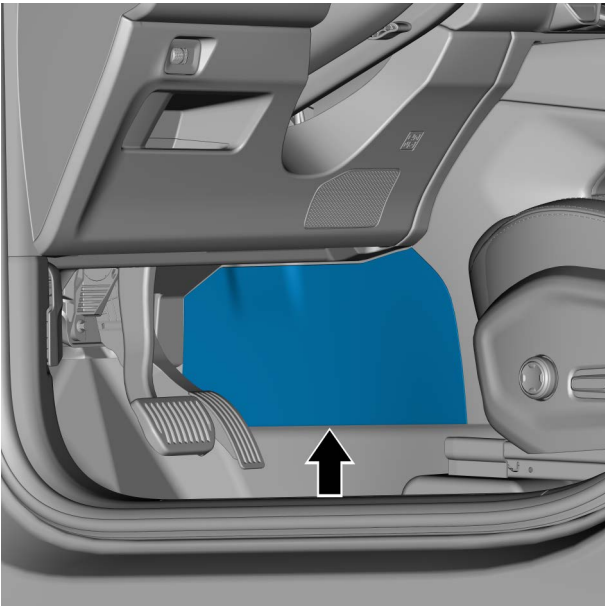
Caution

The removal and installation methods of left and right extension trim panel assemblies are similar.

- 1 Remove the driver side extension trim panel assembly.

**Installation Procedure**

- 1 Install the driver side extension trim panel assembly.

**13.8.3.12 Replacement of console rear panel assembly (type I)****Removal Procedure**

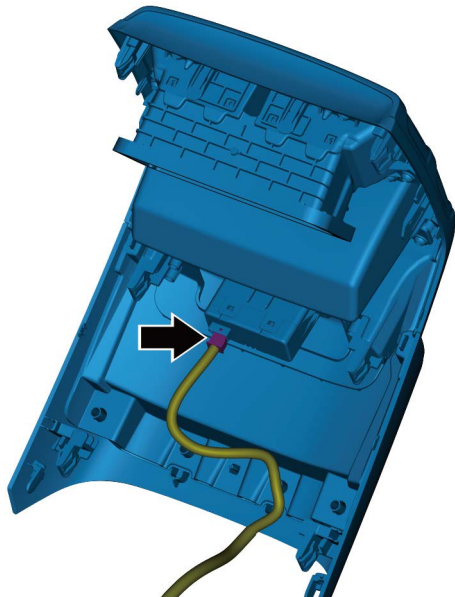
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

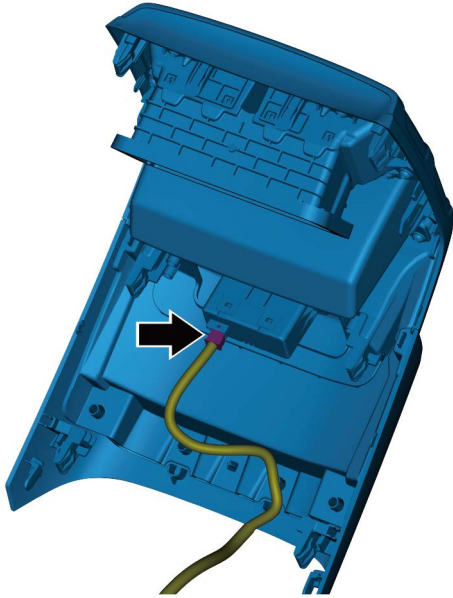
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the console rear panel assembly.



- 3 Disconnect the USB charging hub harness connector and remove the console rear panel assembly.



Installation Procedure



- 1 Connect the USB charging hub harness connector.



- 2 Install the console rear panel assembly.

- 3 Connect the negative cable of battery.

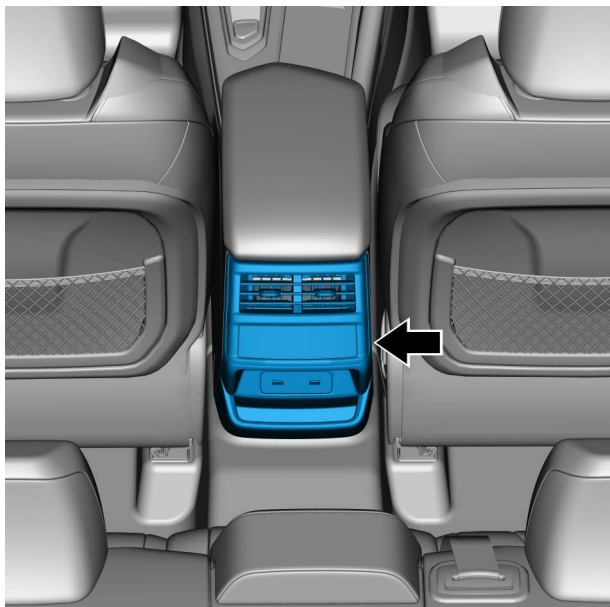
13.8.3.13 Replacement of console rear panel assembly (type II)

Removal Procedure

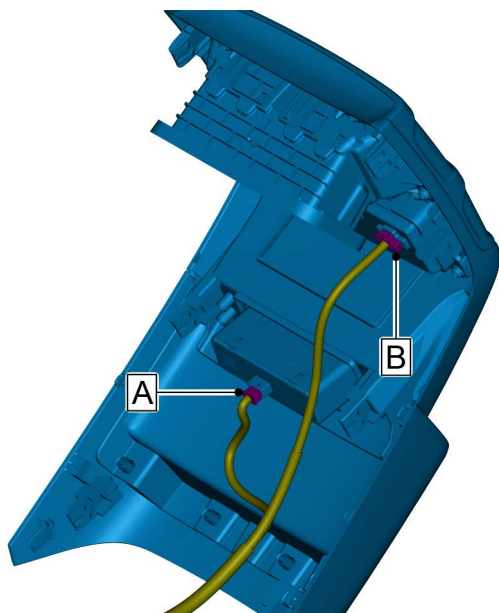
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

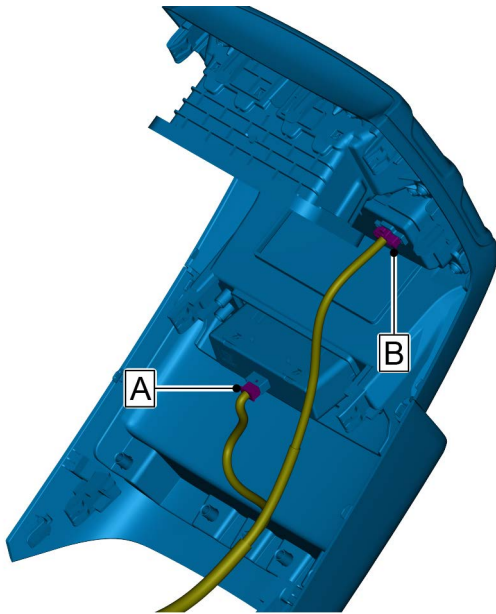


- 2 Use a suitable tool to remove the console rear panel assembly.

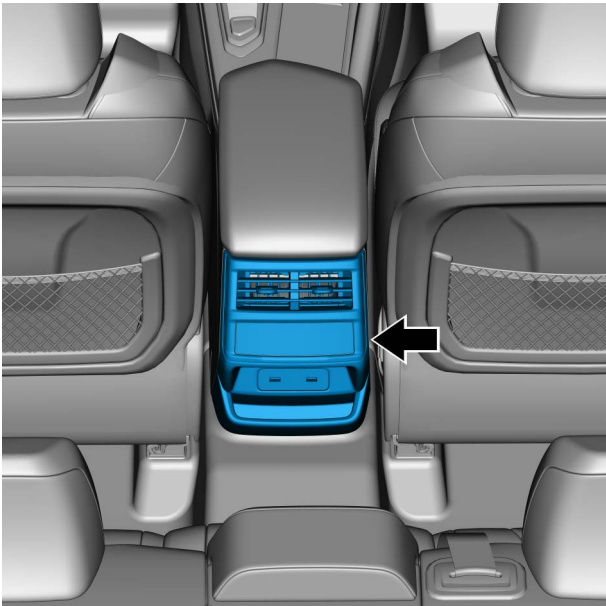


- 3 Disconnect the USB charging hub harness connector A and the rear console switch module harness connector B and remove the console rear panel assembly.

Installation Procedure



- 1 Connect the USB charging hub harness connector A and the rear console switch module harness connector B.



- 2 Install the console rear panel assembly.

- 3 Connect the negative cable of battery.

13.8.3.14 Replacement of console right trim panel assembly

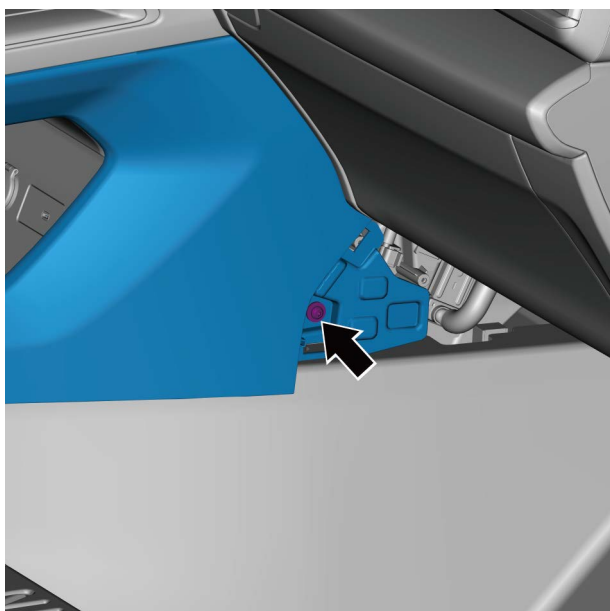
Removal Procedure

Warning !

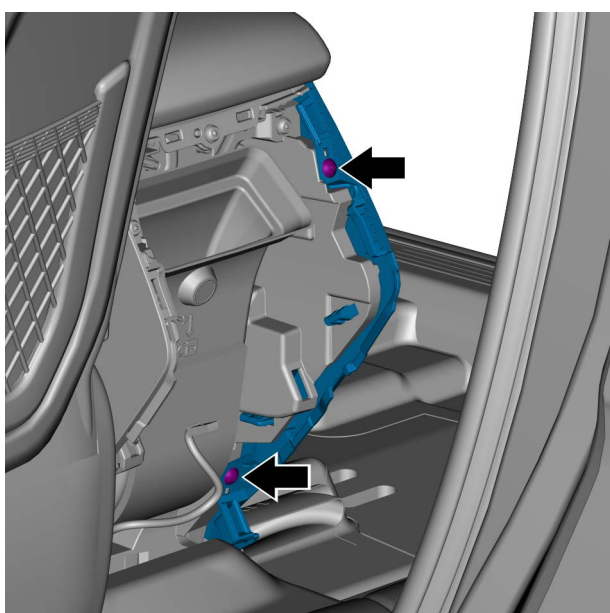
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the passenger seat assembly, refer to [Replacement of passenger seat assembly](#).

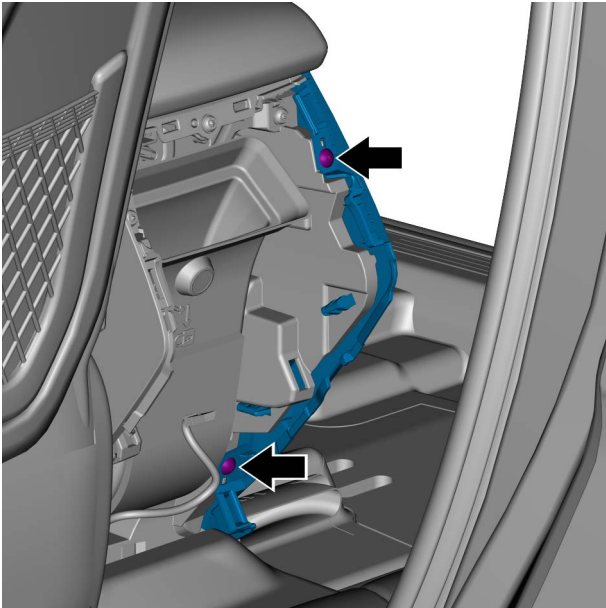
- 3 Remove the passenger side extension trim panel, refer to [Replacement of driver side extension trim panel assembly](#).
- 4 Remove the console rear panel assembly, refer to [Replacement of console rear panel assembly \(type I\)](#) and [Replacement of console rear panel assembly \(type II\)](#).
- 5 Remove the fixing screw at the front end of the console right trim panel assembly.



- 6 Remove the 2 fixing screws at the rear end of the console right trim panel assembly, and take off the console right trim panel assembly.

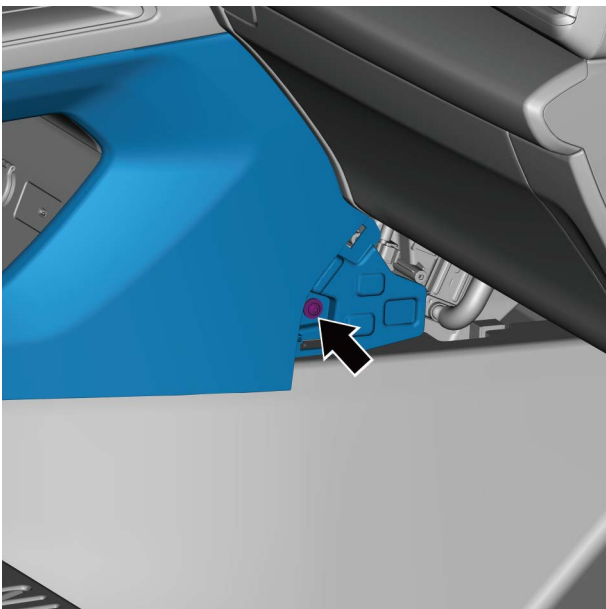


Installation Procedure



- 1 Install the 2 fixing screws at the rear end of the console right trim panel assembly.

Torque: 2.5N·m



- 2 Install the fixing screw at the front end of the console right trim panel assembly.

Torque: 3.5N·m

- 3 Install the console rear panel assembly.
- 4 Install the front passenger side extension trim panel.
- 5 Install the passenger seat assembly.
- 6 Connect the negative cable of battery.

13.8.3.15 Replacement of console right outer handle assembly

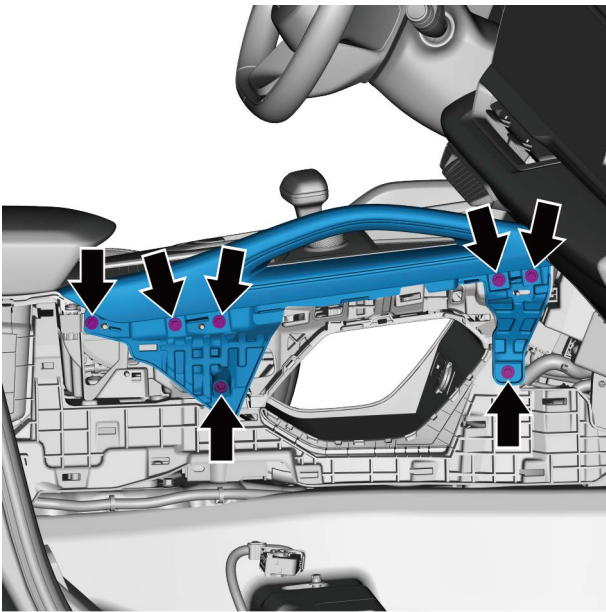
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

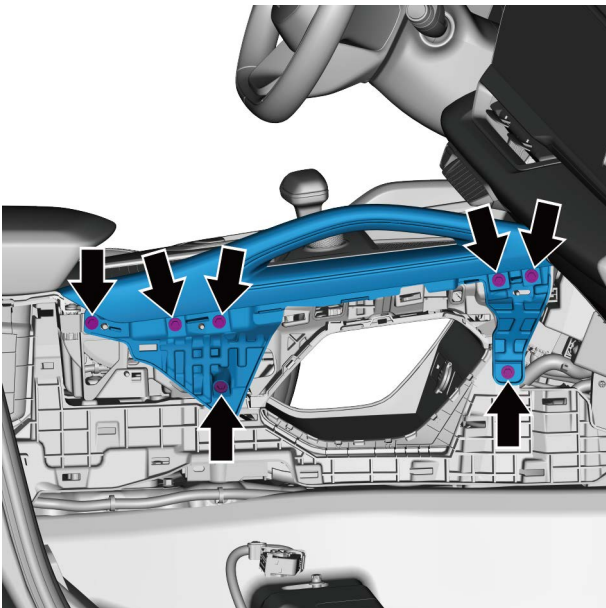
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

- 2 Remove the passenger seat assembly, refer to [Replacement of passenger seat assembly](#).
- 3 Remove the passenger side extension trim panel, refer to [Replacement of driver side extension trim panel assembly](#).
- 4 Remove the console rear panel assembly, refer to [Replacement of console rear panel assembly \(type I\)](#) and [Replacement of console rear panel assembly \(type II\)](#).
- 5 Remove the console right trim panel assembly, refer to [Replacement of console right trim panel assembly](#).
- 6 Remove the 7 fixing bolts of console right outer handle assembly and remove the console right outer handle assembly.



Installation Procedure

- 1 Install the 7 fixing bolts for the console right outer handle assembly.
Torque: 6N·m



- 2 Install the console right trim panel assembly.
- 3 Install the console rear panel assembly.

- 4 Install the front passenger side extension trim panel.
- 5 Install the passenger seat assembly.
- 6 Connect the negative cable of battery.

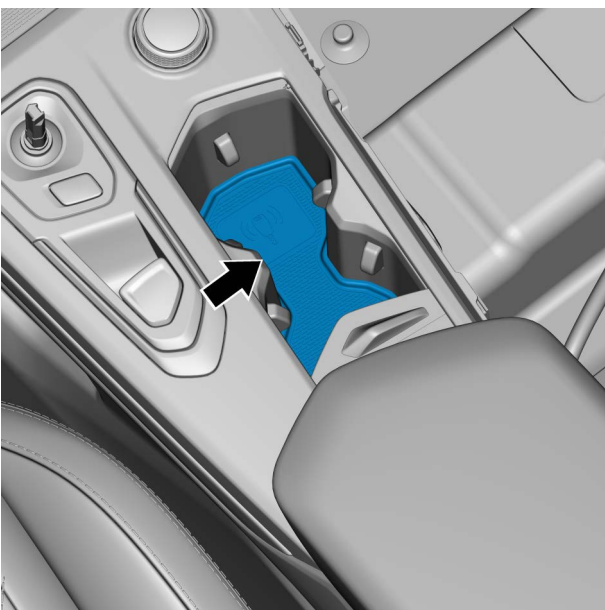
13.8.3.16 Replacement of gear shift panel assembly

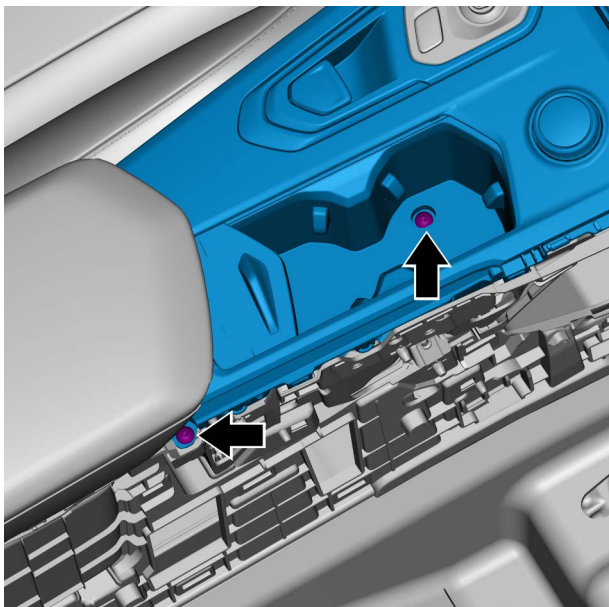
Removal Procedure

Warning !

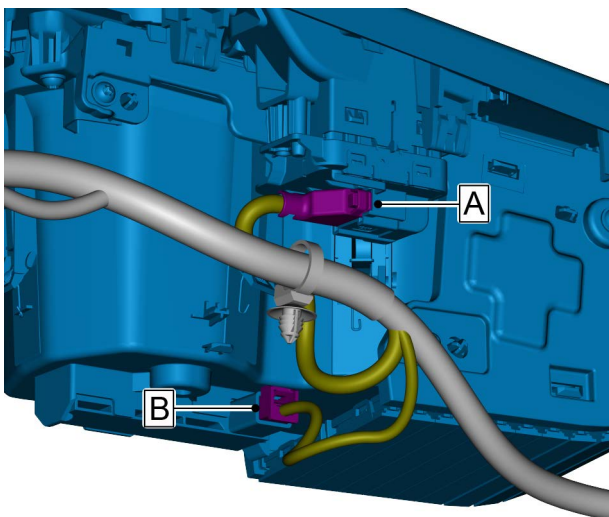
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the passenger seat assembly, refer to [Replacement of passenger seat assembly](#).
- 3 Remove the passenger side extension trim panel, refer to [Replacement of driver side extension trim panel assembly](#).
- 4 Remove the console rear panel assembly, refer to [Replacement of console rear panel assembly \(type II\)](#).
- 5 Remove the console right trim panel assembly, refer to [Replacement of console right trim panel assembly](#).
- 6 Remove console right outer handle assembly, refer to [Replacement of console right outer handle assembly](#).
- 7 Remove the gear selector lever, refer to [Replacement of gear selector lever](#).
- 8 Remove the gear shift trim panel storage box pad.

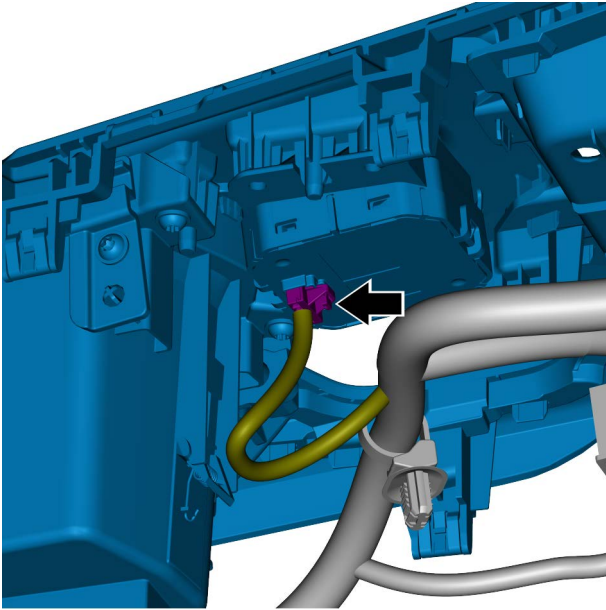




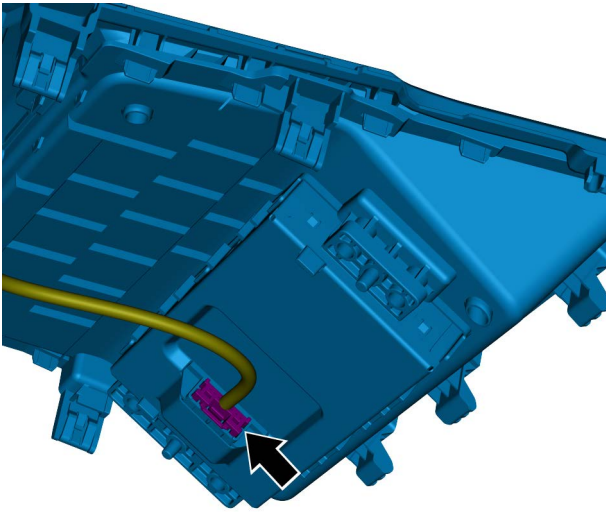
9 Remove the 2 fixing screws of the gear shift panel assembly.



10 Disconnect the parking brake switch harness connector A and keyless vehicle antenna (under cup holder) harness connector B.

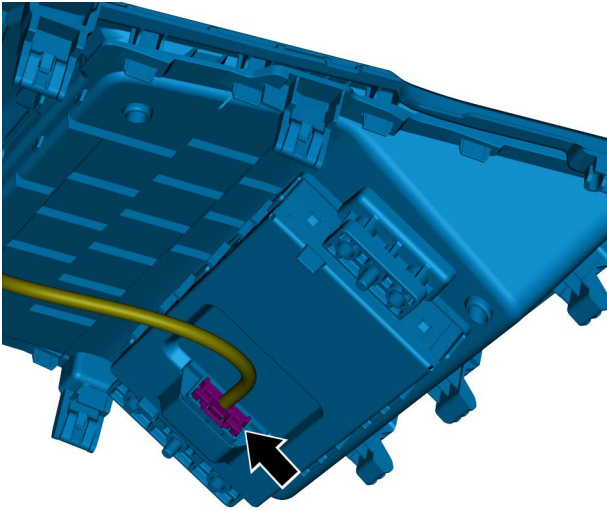


- 11 Disconnect the drive mode switch module harness connector.

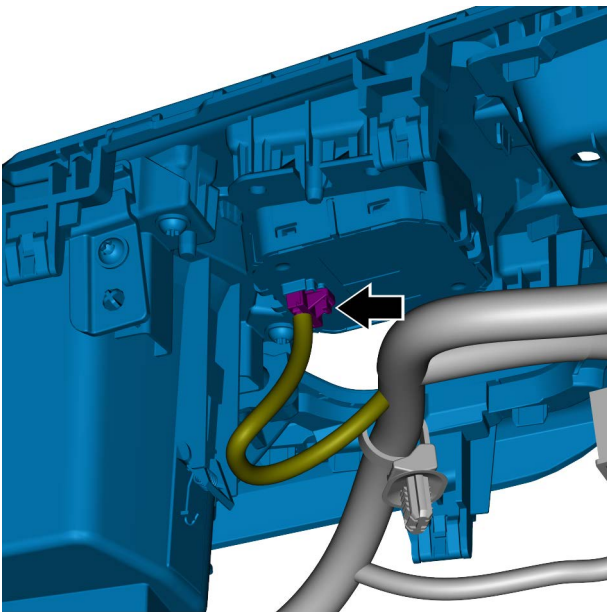


- 12 Disconnect the wireless phone charger harness connector and remove the gear shift panel assembly.

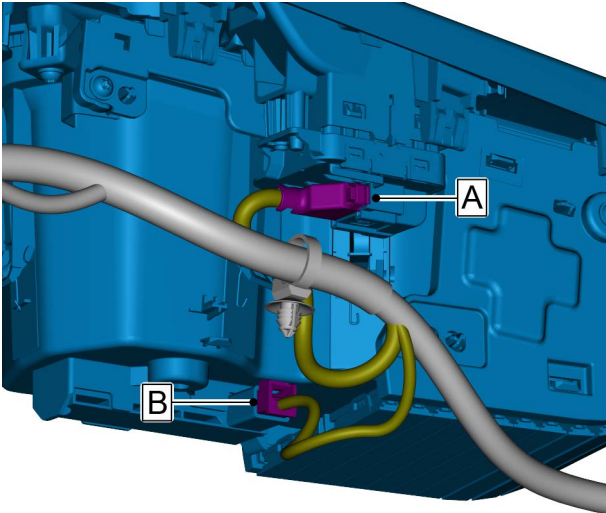
Installation Procedure



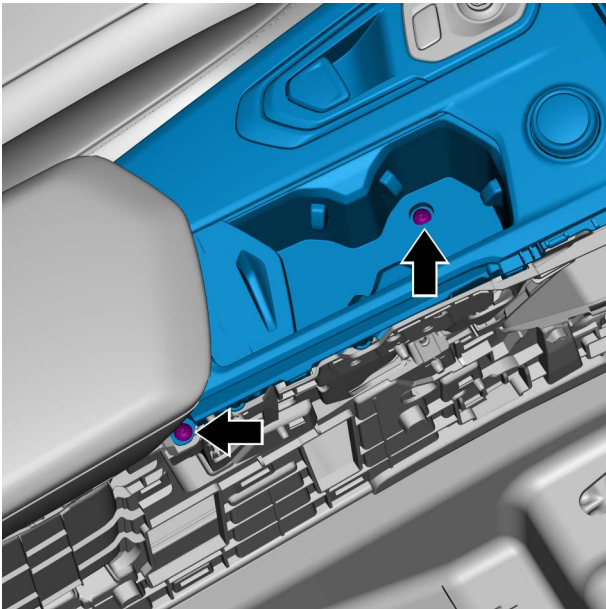
- 1 Connect the wireless phone charger harness connector.



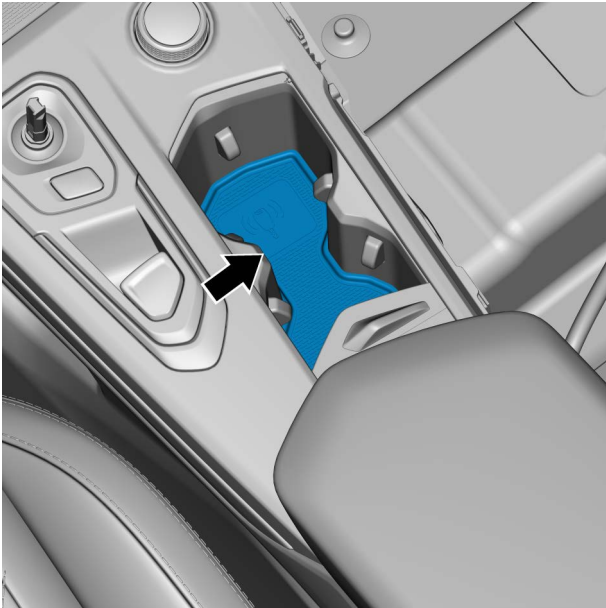
- 2 Connect the drive mode switch module harness connector.



- 3 Connect the parking brake switch harness connector A and keyless vehicle antenna (under cup holder) harness connector B.



- 4 Install the 2 fixing screws of the gear shift panel assembly.
Torque: 3N·m



- 5 Install the gear shift trim panel storage box pad.

- 6 Install the gear selector lever.
- 7 Install the console right outer handle assembly.
- 8 Install the console right trim panel assembly.
- 9 Install the console rear panel assembly.
- 10 Install the front passenger side extension trim panel.
- 11 Install the passenger seat assembly.
- 12 Connect the negative cable of battery.

13.8.3.17 Replacement of console body assembly

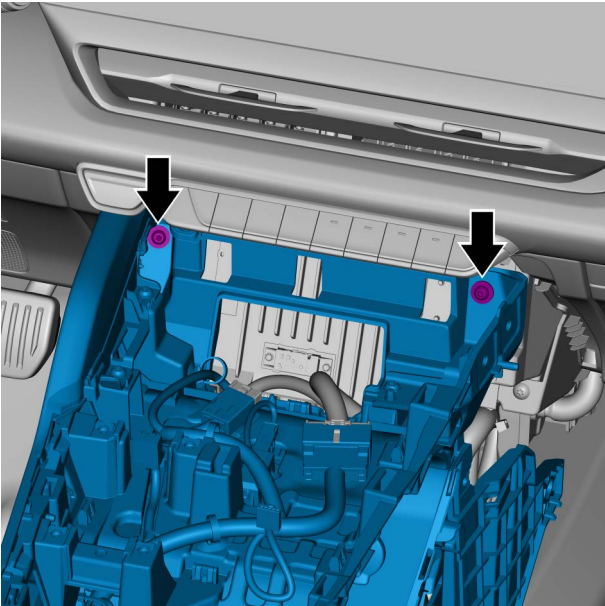
Removal Procedure

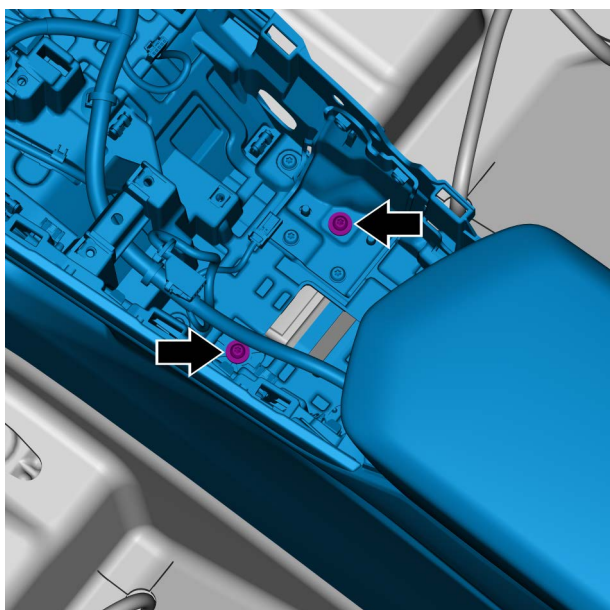
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

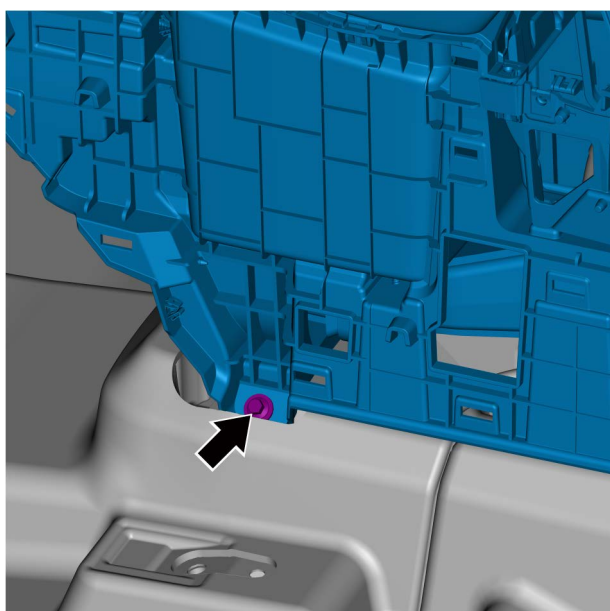
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the passenger seat assembly, refer to [Replacement of passenger seat assembly](#).
- 3 Remove the driver side extension trim panel, refer to [Replacement of driver side extension trim panel assembly](#).
- 4 Remove the passenger side extension trim panel, refer to [Replacement of driver side extension trim panel assembly](#).
- 5 Remove the console rear panel assembly, refer to [Replacement of console rear panel assembly \(type I\)](#) and [Replacement of console rear panel assembly \(type II\)](#).

- 6 Remove the console right trim panel assembly, refer to [Replacement of console right trim panel assembly](#).
- 7 Remove console right outer handle assembly, refer to [Replacement of console right outer handle assembly](#).
- 8 Remove the gear selector lever, refer to [Replacement of gear selector lever](#).
- 9 Remove the gear shift panel assembly, refer to [Replacement of gear shift panel assembly](#).
- 10 Remove the electronic gear selector module, refer to [Replacement of electronic gear selector module](#).
- 11 Remove the USB port, refer to [Replacement of USB port \(type I\)](#) and [Replacement of USB port \(type II\)](#).
- 12 Remove the 12V socket (center console), refer to [Replacement of 12V socket \(center console\)](#).
- 13 Remove the 2 fixing screws on the front end of the console body assembly.

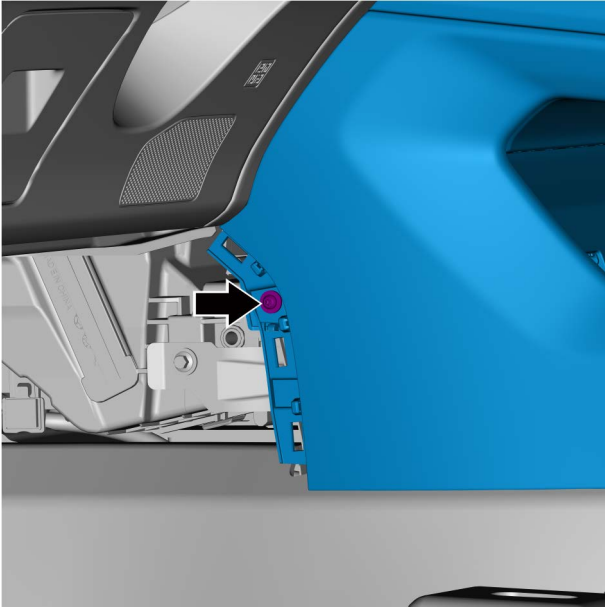




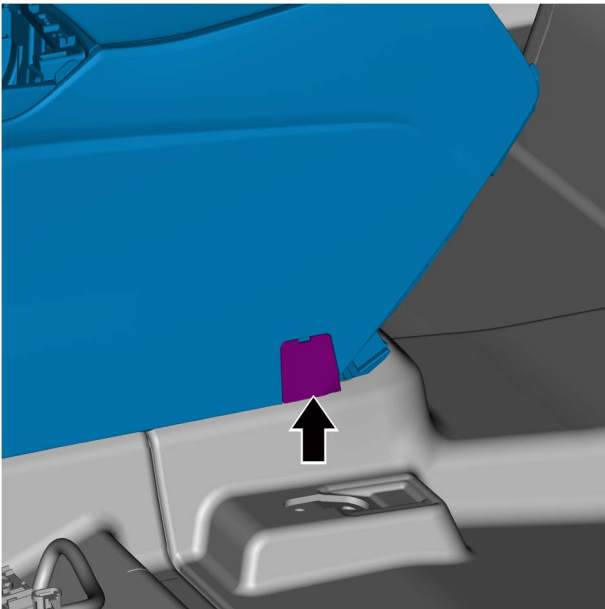
- 14 Remove the 2 fixing screws in the middle of the console body assembly.



- 15 Remove the console body assembly rear right side fixing screw.



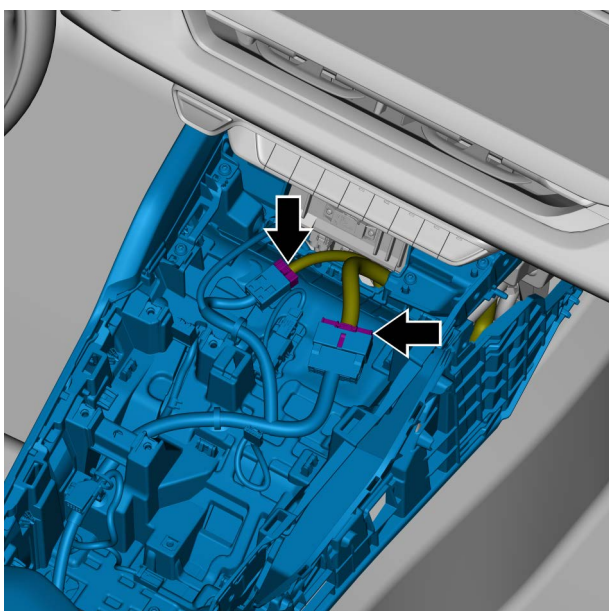
- 16 Remove the console body assembly left front lower fixing screw.



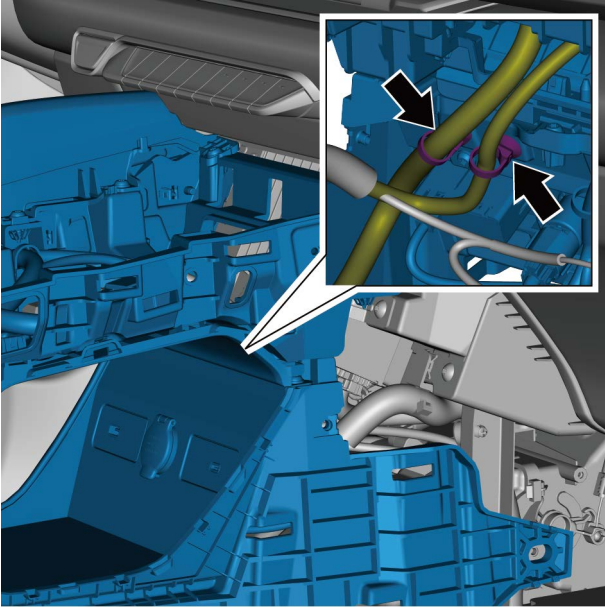
- 17 Remove the driver side bolt plug cover.



18 Remove the console body assembly rear left fixing screw.

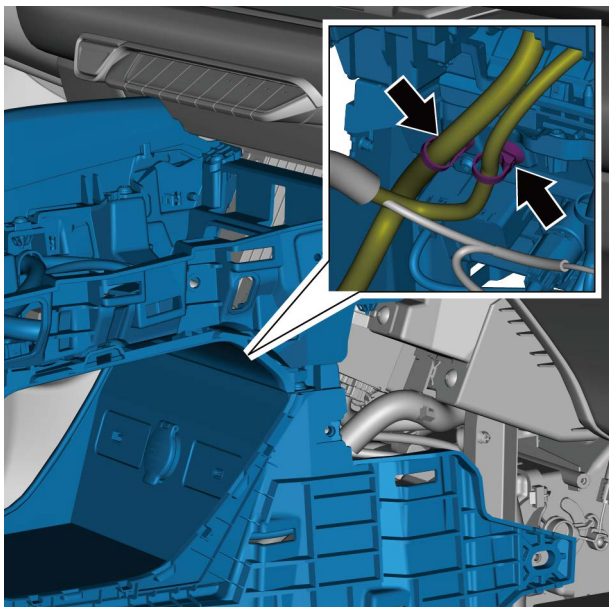


19 Disconnect the 2 harness connectors of the console harness.

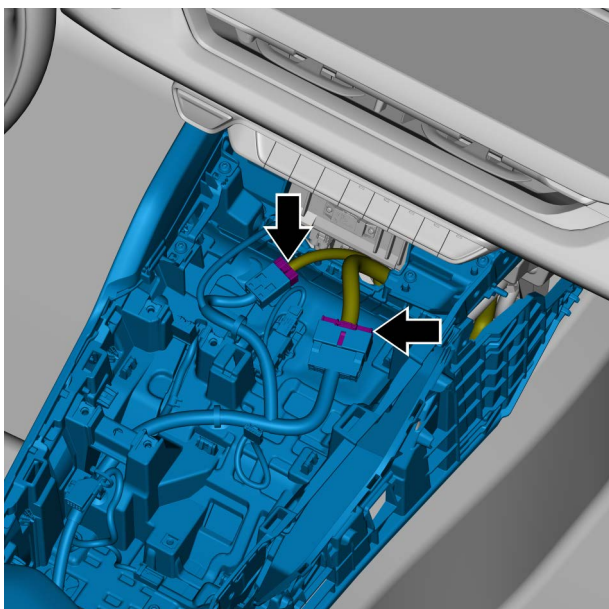


- 20 Remove the 2 harness clips on the front end of the console body assembly.

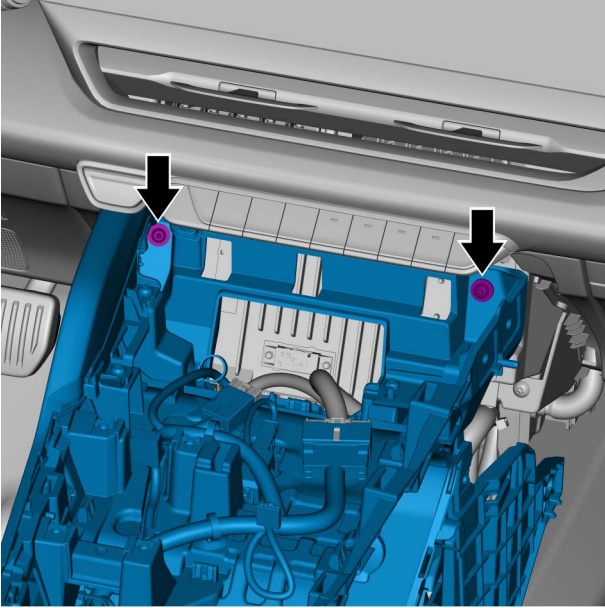
Installation Procedure



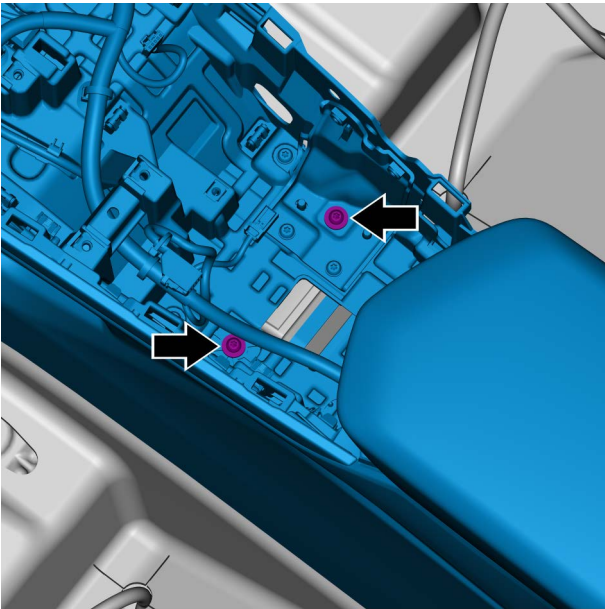
- 1 Install the 2 harness clips at the front end of the console body assembly.



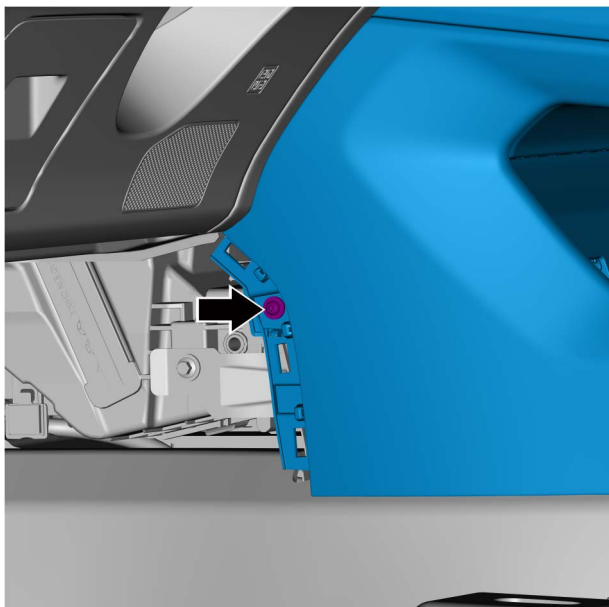
- 2 Connect the 2 harness connectors of the console harness.



- 3 Install the 2 fixing screws on the front end of the console body assembly.
Torque: 3.5N·m

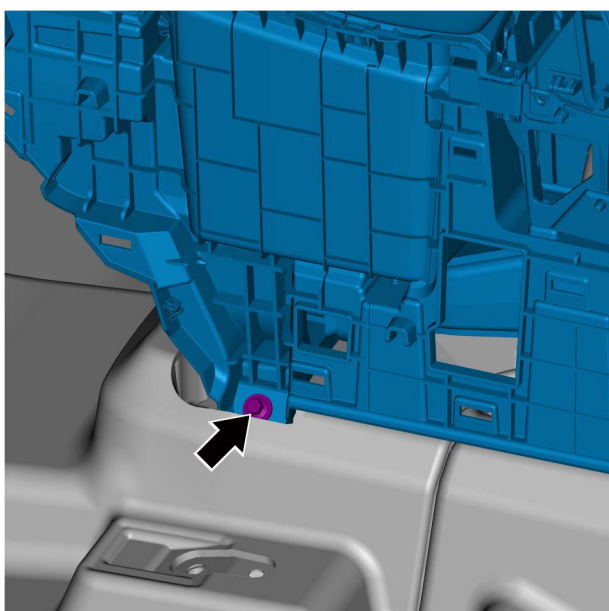


- 4 Install the 2 fixing screws in the middle of the console body assembly.
Torque: 3.5N·m



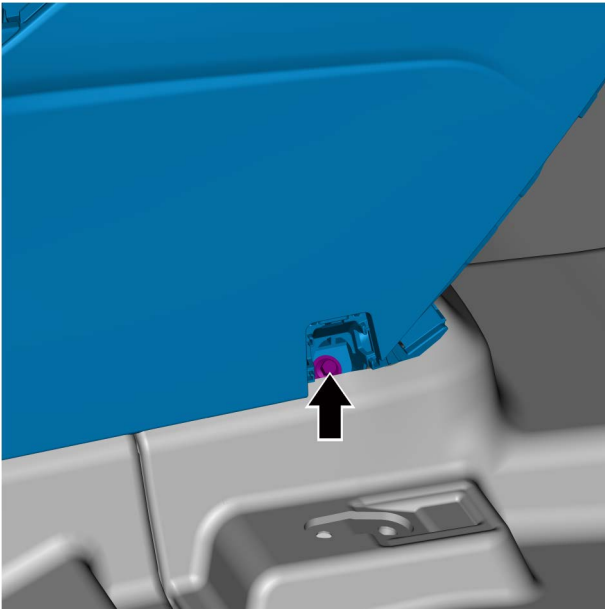
- 5 Install the console body assembly left front lower fixing screw.

Torque: 3.5N·m

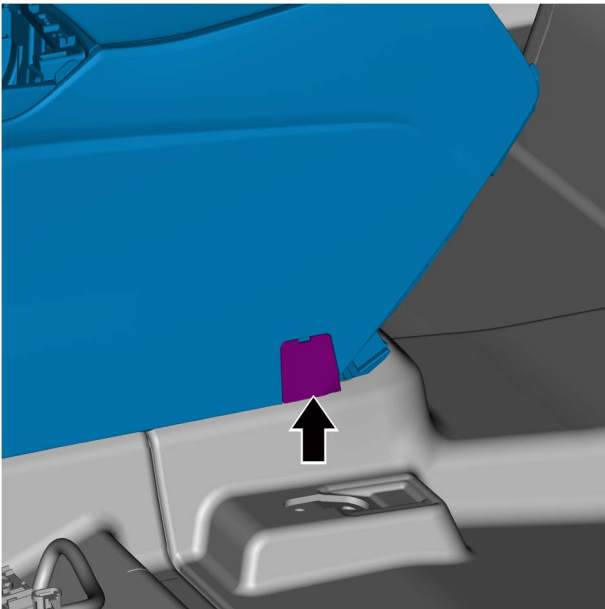


- 6 Install the console body assembly rear right side fixing screw.

Torque: 10N·m



- 7 Install the console body assembly rear left fixing screw.
Torque: 10N·m



- 8 Install the driver side bolt plug cover.

- 9 Install the USB port.
- 10 Install the 12V socket (center console).
- 11 Install the electronic gear selector module.
- 12 Install the gear shift panel assembly.
- 13 Install the gear selector lever.
- 14 Install the console right outer handle assembly.
- 15 Install the console right trim panel assembly.
- 16 Install the console rear panel assembly.
- 17 Install the front passenger side extension trim panel.
- 18 Install the driver side extension trim panel.
- 19 Install the passenger seat assembly.
- 20 Connect the negative cable of battery.

13.8.3.18 Replacement of instrument panel middle lower shield assembly

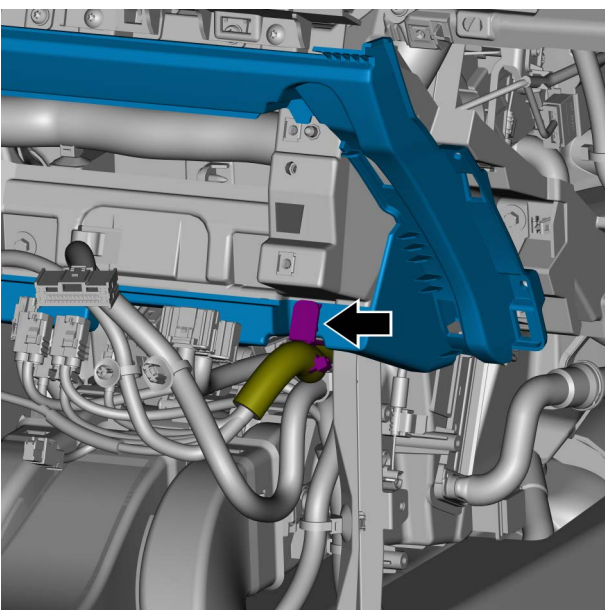
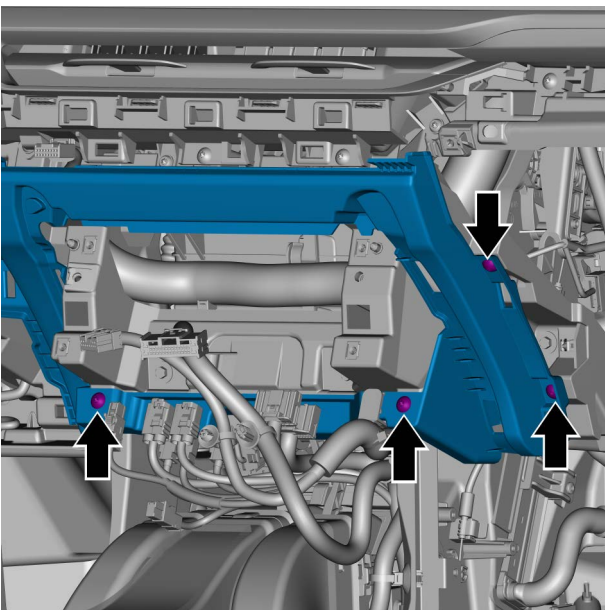
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

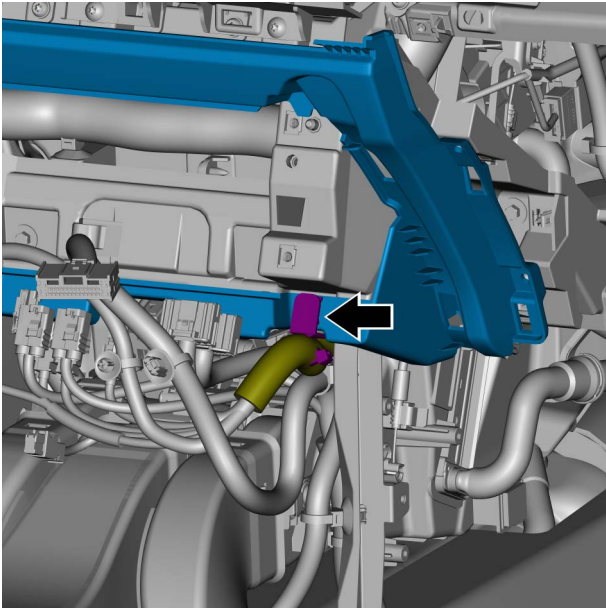
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the instrument panel front left side end cover assembly, refer to [Replacement of instrument panel front left side end cover assembly](#).
- 3 Remove the instrument panel front right side end cover assembly, refer to [Replacement of instrument panel front left side end cover assembly](#).
- 4 Remove the left A/C air outlet panel assembly, refer to [Replacement of left A/C air outlet panel assembly](#).
- 5 Remove left clad trim panel assembly, refer to [Replacement of left clad trim panel assembly](#).
- 6 Remove the right clad trim panel assembly, refer to [Replacement of right clad trim panel assembly](#).
- 7 Remove the instrument panel left lower shield assembly, refer to [Replacement of instrument panel left lower shield assembly](#).
- 8 Remove the right lower toe board assembly, refer to [Replacement of right lower toe board assembly](#).
- 9 Remove the glove box frame assembly, refer to [Replacement of glove box frame assembly](#).
- 10 Remove the passenger seat assembly, refer to [Replacement of passenger seat assembly](#).
- 11 Remove the driver side extension trim panel assembly, refer to [Replacement of driver side extension trim panel assembly](#).
- 12 Remove the front passenger side extension trim panel assembly, refer to [Replacement of front passenger side extension trim panel assembly](#).
- 13 Remove the console rear panel assembly, refer to [Replacement of console rear panel assembly \(type I\)](#) and [Replacement of console rear panel assembly \(type II\)](#).
- 14 Remove the console right trim panel assembly, refer to [Replacement of console right trim panel assembly](#).

- 15 Remove console right outer handle assembly, refer to [Replacement of console right outer handle assembly](#).
- 16 Remove the gear selector lever, refer to [Replacement of gear selector lever](#).
- 17 Remove the gear shift panel assembly, refer to [Replacement of gear shift panel assembly](#).
- 18 Remove the electronic gear selector module, refer to [Replacement of electronic gear selector module](#).
- 19 Remove console body assembly, refer to [Replacement of console body assembly](#).
- 20 Remove the infotainment head unit, refer to [Replacement of infotainment head unit](#).
- 21 Remove the 4 fixing screws of the instrument panel middle lower shield assembly.

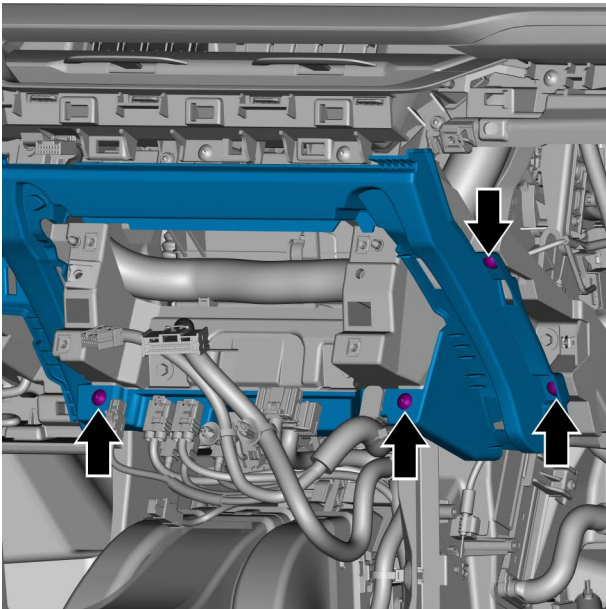


- 22 Remove the harness clips from the instrument panel middle lower shield assembly and remove the instrument panel middle lower shield assembly.

Installation Procedure



- 1 Install the harness clips on the instrument panel middle lower shield assembly.



- 2 Install the 4 fixing screws of the instrument panel middle lower shield assembly.
Torque: 2.5N·m

- 3 Install the infotainment head unit.
- 4 Install the console body assembly.
- 5 Install the electronic gear selector module.
- 6 Install the gear shift panel assembly.
- 7 Install the gear selector lever.
- 8 Install the console right outer handle assembly.
- 9 Install the console right trim panel assembly.
- 10 Install the console rear panel assembly.
- 11 Install the front passenger side extension trim panel.
- 12 Install the driver side extension trim panel.
- 13 Install the passenger seat assembly.
- 14 Install the glove box fame assembly.

- 15 Install the right lower toe board assembly.
- 16 Install the left lower shield assembly of the instrument panel.
- 17 Install the right clad trim panel assembly.
- 18 Install the left clad trim panel assembly.
- 19 Install the left side A/C air outlet panel assembly.
- 20 Install the instrument panel front right side end cover assembly.
- 21 Install the instrument panel front left side end cover assembly.
- 22 Connect the negative cable of battery.

13.8.3.19 Replacement of instrument panel body assembly

Removal Procedure

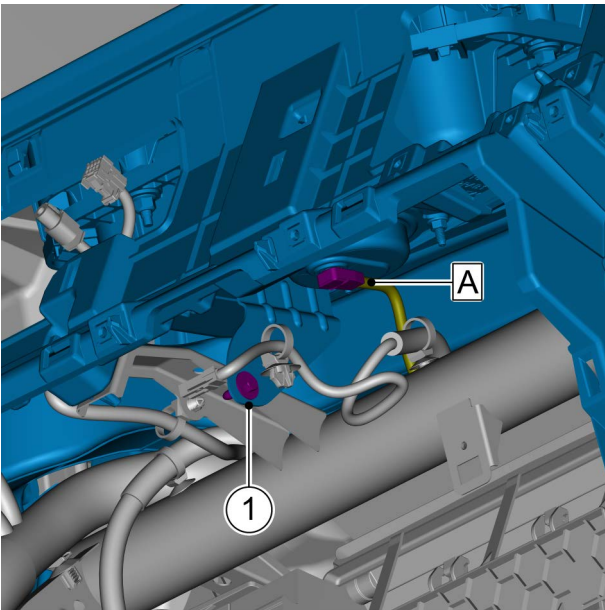
Warning !

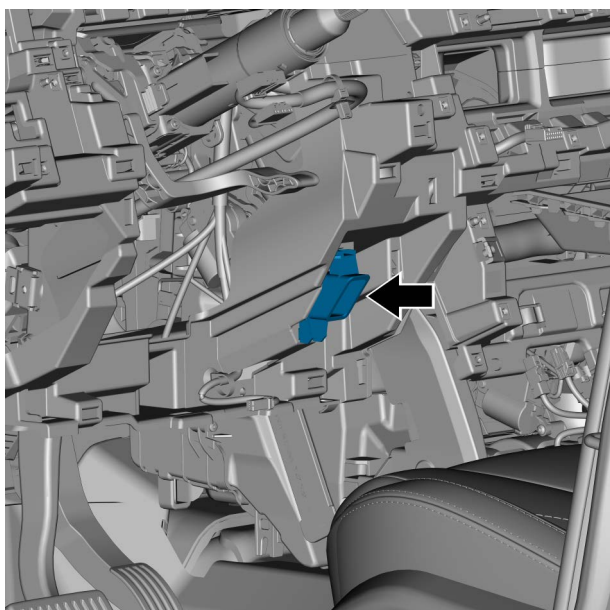
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the instrument panel front left side end cover assembly, refer to [Replacement of instrument panel front left side end cover assembly](#).
- 3 Remove the instrument panel front right side end cover assembly, refer to [Replacement of instrument panel front left side end cover assembly](#).
- 4 Remove the left A/C air outlet panel assembly, refer to [Replacement of left A/C air outlet panel assembly](#).
- 5 Remove left clad trim panel assembly, refer to [Replacement of left clad trim panel assembly](#).
- 6 Remove the right clad trim panel assembly, refer to [Replacement of right clad trim panel assembly](#).
- 7 Remove the left and right front door sill trim panel assemblies, refer to [Replacement of left front door sill trim panel assembly](#).
- 8 Remove the driver side extension trim panel assembly, refer to [Replacement of driver side extension trim panel assembly](#).
- 9 Remove the front passenger side extension trim panel assembly, refer to [Replacement of front passenger side extension trim panel assembly](#).

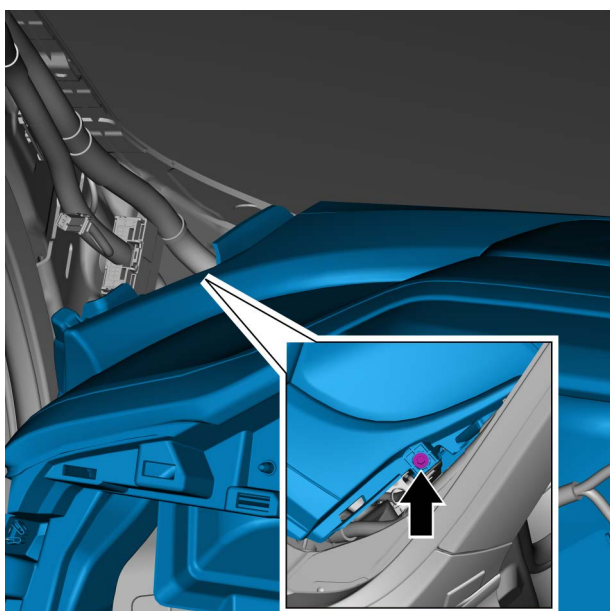
- 10 Remove the left lower toe board assembly, refer to [Replacement of left lower toe board assembly](#).
- 11 Remove the right lower toe board assembly, refer to [Replacement of right lower toe board assembly](#).
- 12 Remove the instrument panel left lower shield assembly, refer to [Replacement of instrument panel left lower shield assembly](#).
- 13 Remove the glove box frame, refer to [Replacement of glove box frame](#).
- 14 Remove the center console display, Refer to [Replacement of center console display](#).
- 15 Remove the instrument panel middle air outlet assembly, refer to [Replacement of instrument panel middle air outlet assembly](#).
- 16 Remove instrument panel right air outlet assembly, refer to [Replacement of instrument panel right air outlet assembly](#).
- 17 Remove the driver information module, refer to [Replacement of driver information module](#).
- 18 Remove the driver information screen, refer to [Replacement of driver information screen](#).
- 19 Remove the front airbag (driver), refer to [Replacement of front airbag \(driver\)](#).
- 20 Remove the steering wheel assembly, refer to [Replacement of steering wheel assembly](#).
- 21 Remove the steering column upper cowl, refer to [Replacement of steering column upper cowl assembly](#).
- 22 Remove the steering column lower cowl, refer to [Replacement of steering column lower cowl](#).
- 23 Remove the steering wheel module, refer to [Replacement of steering wheel module](#).
- 24 Remove the passenger seat assembly, refer to [Replacement of passenger seat assembly](#).
- 25 Remove the console rear panel assembly, refer to [Replacement of console rear panel assembly \(type I\)](#) and [Replacement of console rear panel assembly \(type II\)](#).
- 26 Remove the console right trim panel assembly, refer to [Replacement of console right trim panel assembly](#).
- 27 Remove console right outer handle assembly, refer to [Replacement of console right outer handle assembly](#).

- 28 Remove the gear selector lever, refer to [Replacement of gear selector lever](#).
- 29 Remove the gear shift panel assembly, refer to [Replacement of gear shift panel assembly](#).
- 30 Remove the electronic gear selector module, refer to [Replacement of electronic gear selector module](#).
- 31 Remove console body assembly, refer to [Replacement of console body assembly](#).
- 32 Remove the infotainment head unit, refer to [Replacement of infotainment head unit](#).
- 33 Remove the instrument panel middle lower shield assembly, refer to [Replacement of instrument panel middle lower shield assembly](#).
- 34 Remove the left and right A-pillar upper trim panel assemblies, refer to [Replacement of left A-pillar upper trim panel assembly](#).
- 35 Disconnect the harness connector A of front airbag (passenger).
- 36 Remove the front airbag (passenger) bracket fixing bolt 1.

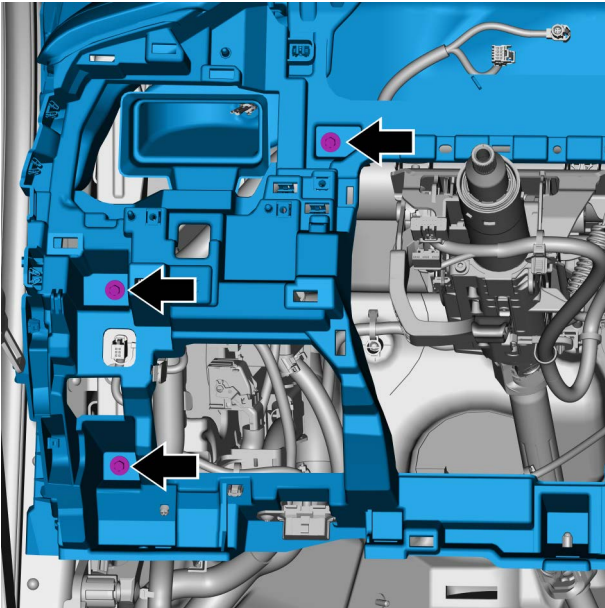




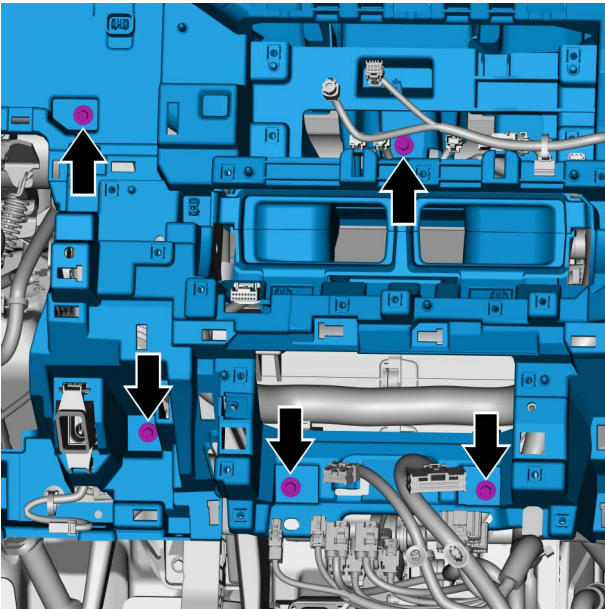
37 Remove the interior temperature sensor bracket.



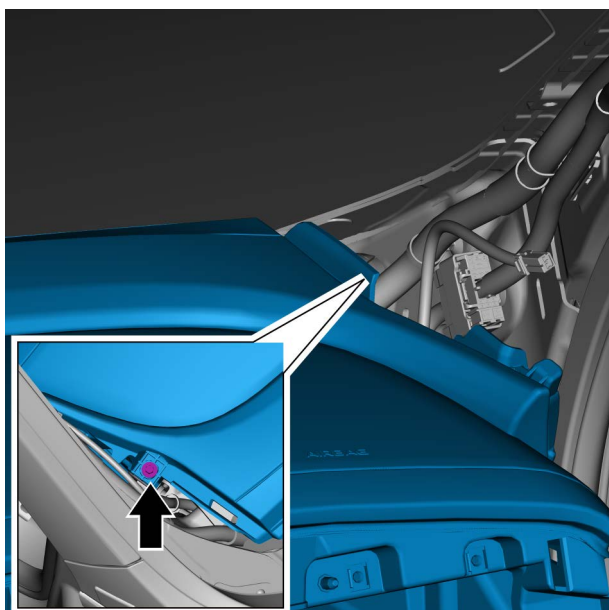
38 Remove the fixing bolt at the upper left corner of the instrument panel body assembly.



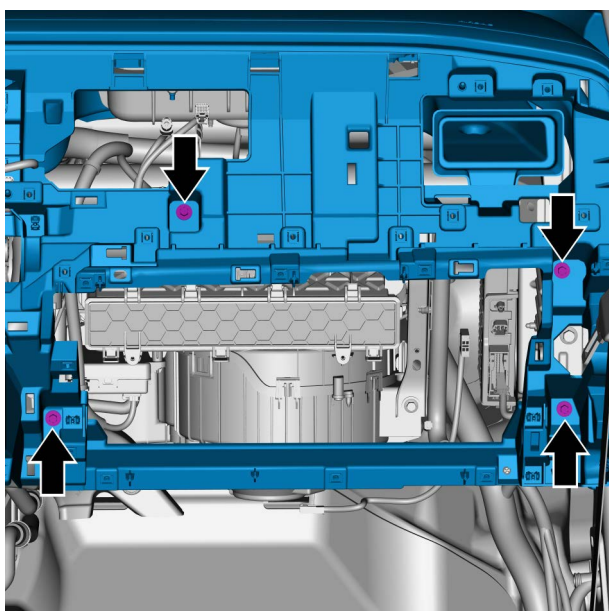
- 39 Remove the 3 fixing bolts at the left side of the instrument panel body assembly.



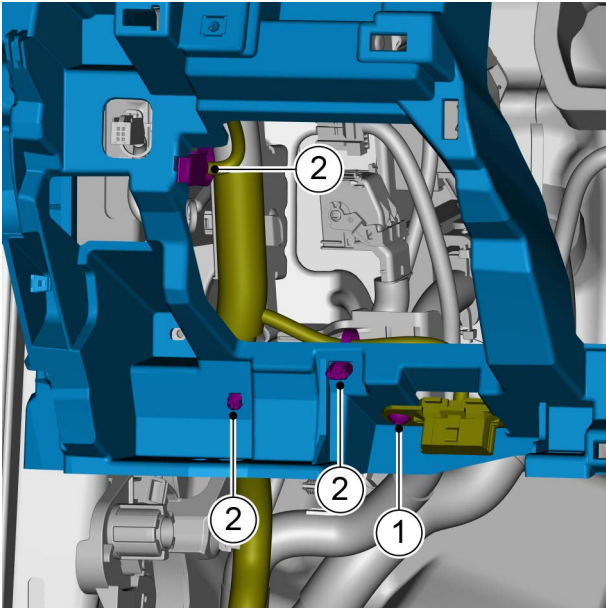
- 40 Remove the 5 fixing bolts in the middle of the instrument panel body assembly.



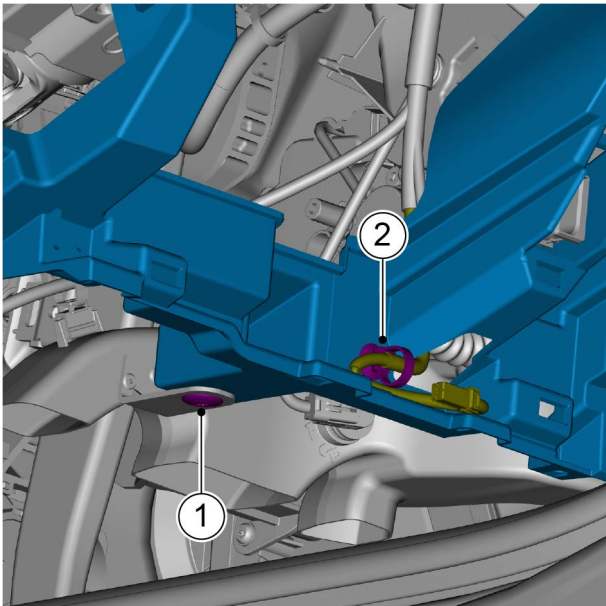
41 Remove the fixing bolt at the upper right corner of the instrument panel body assembly.



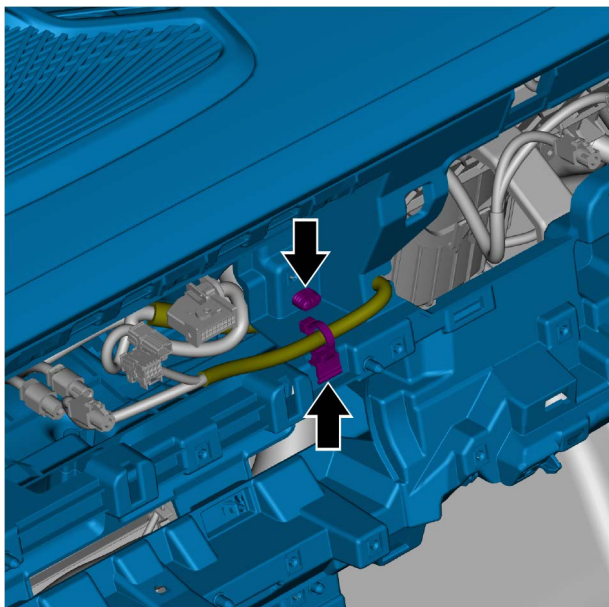
42 Remove the 4 fixing bolts at the right side of the instrument panel body assembly.



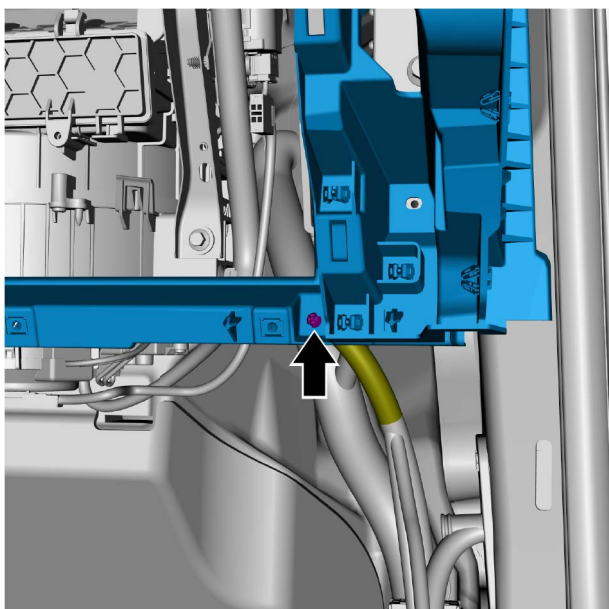
- 43 Remove the diagnostic interface fixing screw 1 and the 3 instrument harness fixing clips 2.



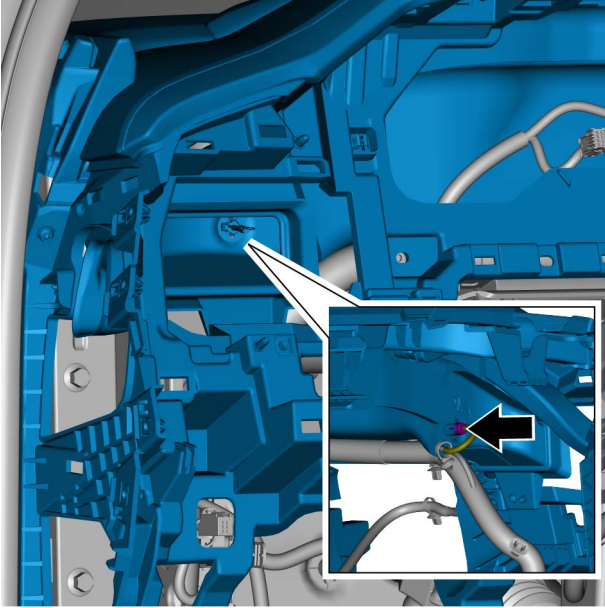
- 44 Remove the left foot air channel assembly J-clip 1 and instrument harness fixing clips 2.



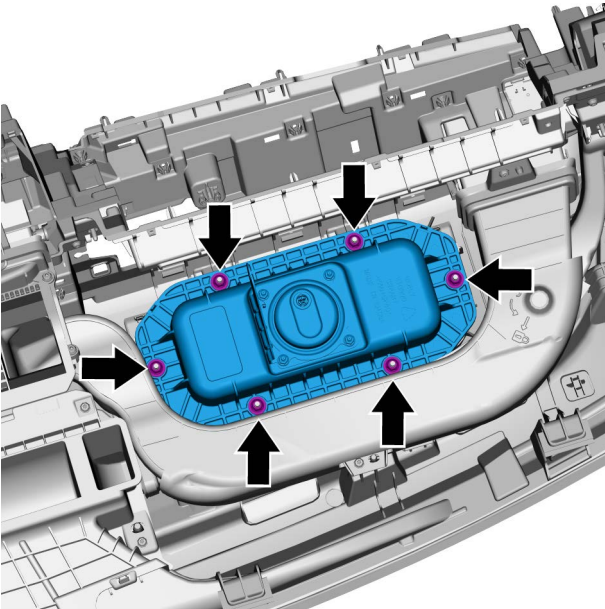
45 Remove the 2 instrument panel harness fixing clips in the middle of the instrument panel body assembly.



46 Remove the instrument harness fixing clips at the right lower end of the instrument panel body assembly.

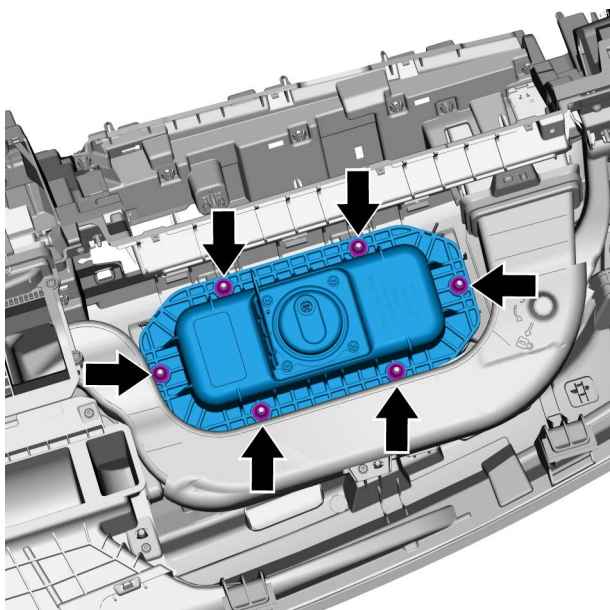


- 47 Disconnect the temperature sensor harness connector and take off the instrument panel body assembly.

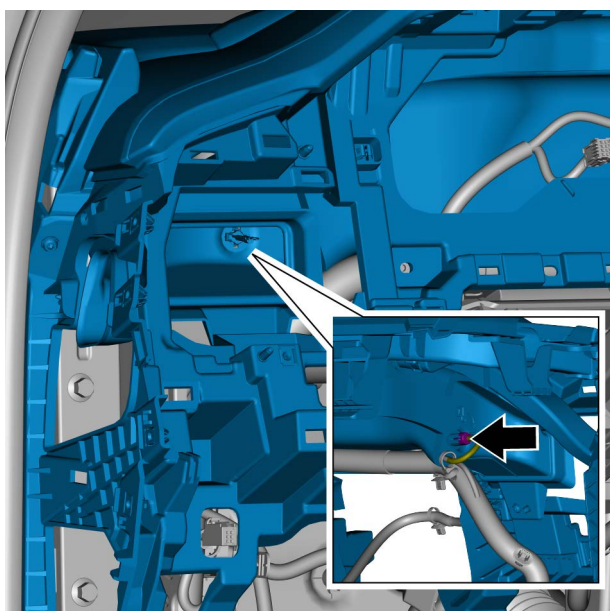


- 48 Remove the 6 fixing nuts of front airbag (passenger).

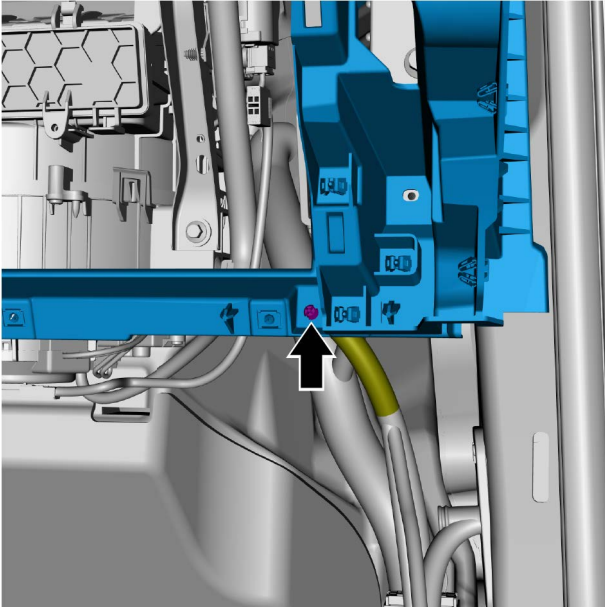
Installation Procedure



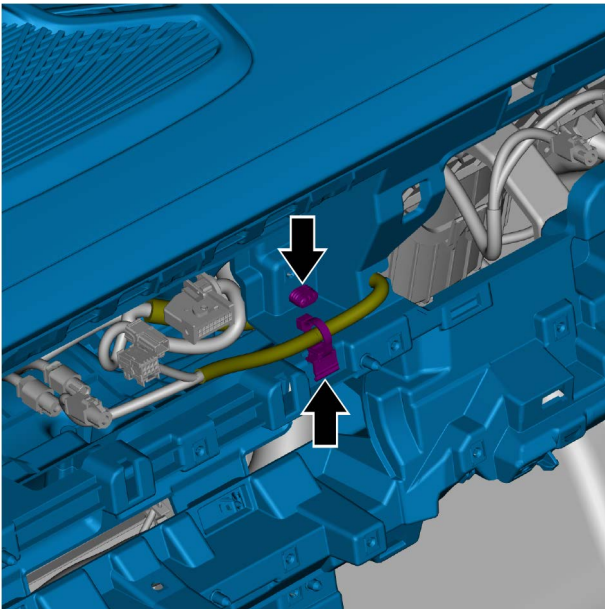
- 1 Install the 6 fixing nuts of front airbag (passenger).
Torque: 4.5N·m



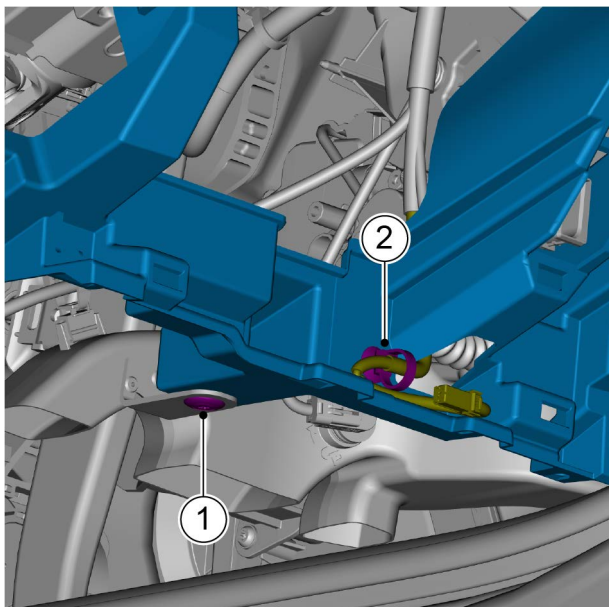
- 2 Install the instrument panel body assembly and connect the temperature sensor harness connector.



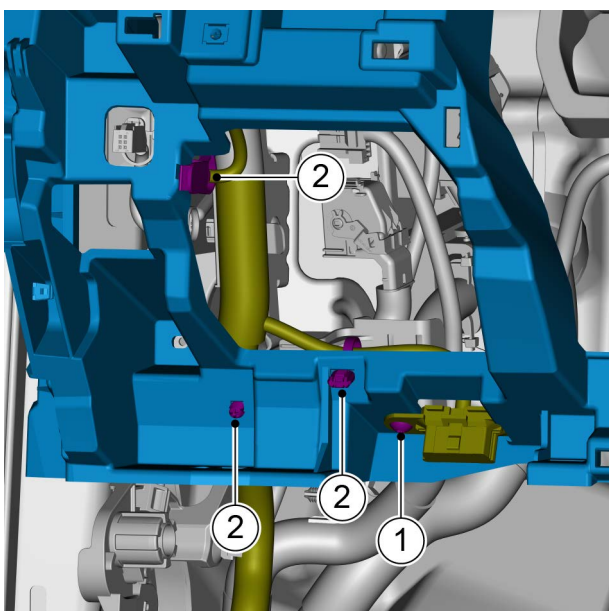
- 3 Install the instrument harness fixing clips at the right lower end of the instrument panel body assembly.



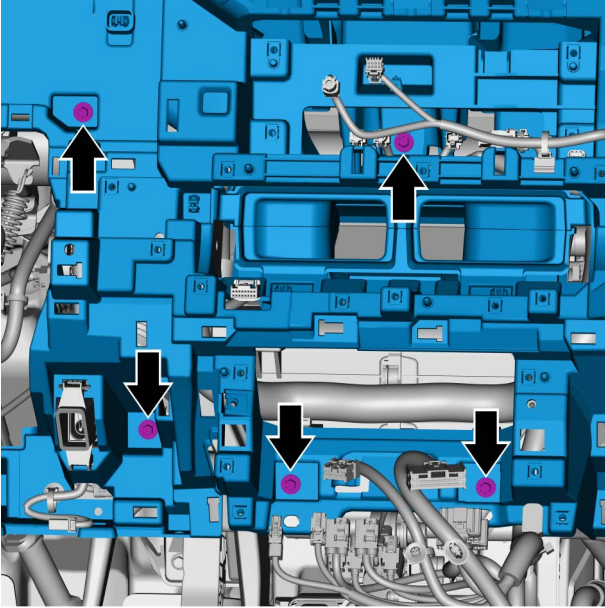
- 4 Install the 2 instrument panel harness fixing clips in the middle of the instrument panel body assembly.



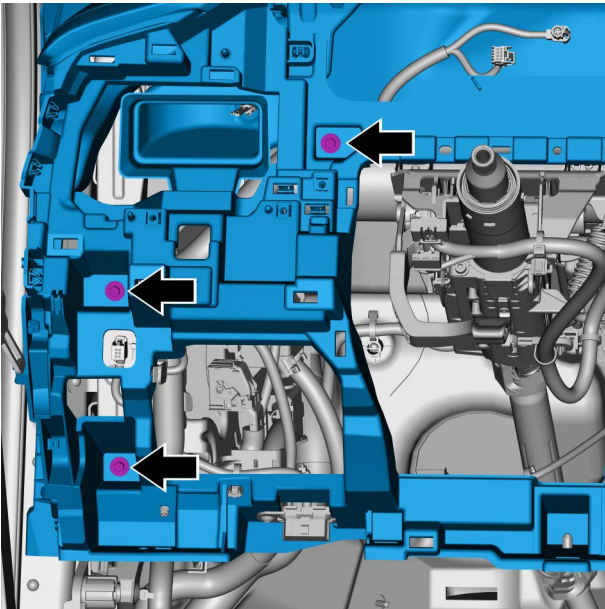
- 5 Install the left foot air channel assembly J-clip 1 and instrument harness fixing clips 2.



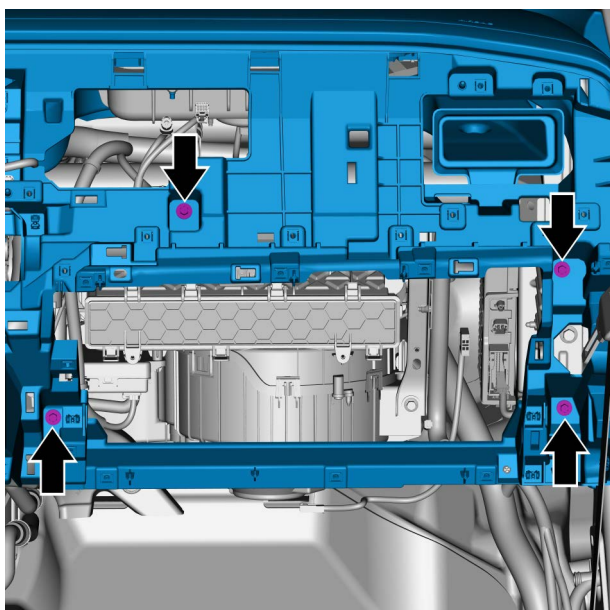
- 6 Install the diagnostic interface fixing screw 1 and the 3 instrument harness fixing clips 2.
Torque: 2.5N·m



- 7 Install the 5 fixing bolts in the middle of the instrument panel body assembly.
Torque: 4.5N·m

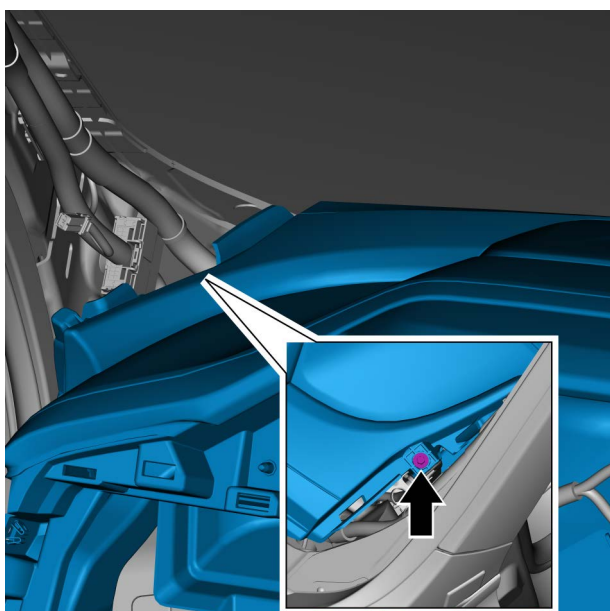


- 8 Install the 3 fixing bolts at the left side of the instrument panel body assembly.
Torque: 4.5N·m



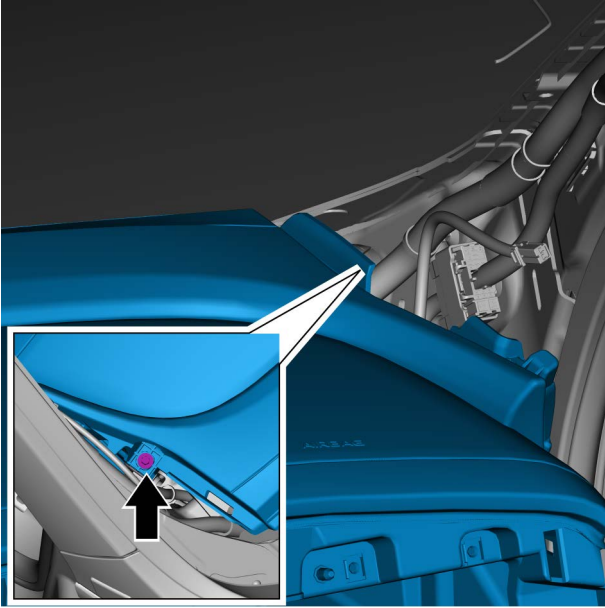
- 9 Install the 4 fixing bolts at the right side of the instrument panel body assembly.

Torque: 4.5N·m

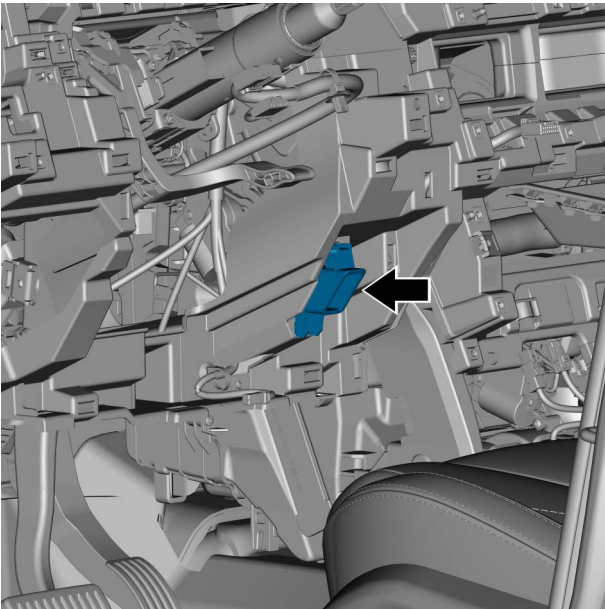


- 10 Install the fixing bolt at the upper left corner of the instrument panel body assembly.

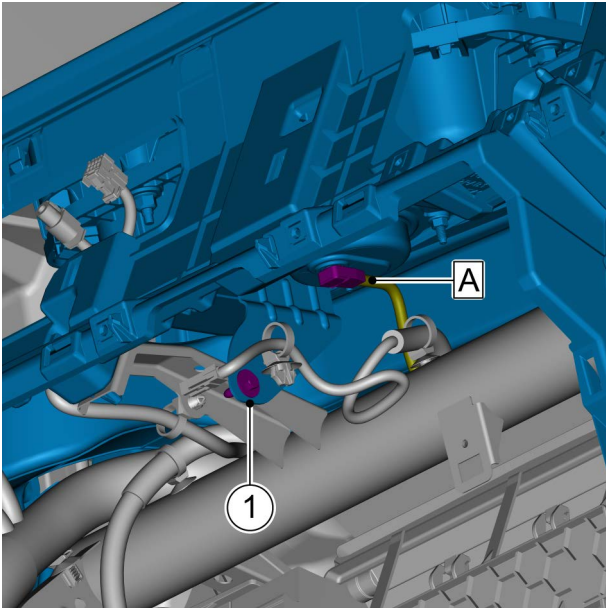
Torque: 4.5N·m



- 11 Install the fixing bolt at the upper right corner of the instrument panel body assembly.
Torque: 4.5N·m



- 12 Install the interior temperature sensor bracket.



- 13 Connect the front airbag (passenger) harness connector A.
- 14 Install the front airbag (passenger) bracket fixing bolt 1.
Torque: 4.5N·m

- 15 Install the left and right A-pillar upper trim panel assembly.
- 16 Install the instrument panel middle lower shield assembly.
- 17 Install the infotainment head unit.
- 18 Install the steering wheel module.
- 19 Install the lower cowl of the steering column.
- 20 Install the steering column upper cowl assembly.
- 21 Install the steering wheel assembly.
- 22 Install front airbag (driver).
- 23 Install the driver information screen.
- 24 Install the driver information module.
- 25 Install the instrument panel right air outlet assembly.
- 26 Install the instrument panel middle air outlet assembly.
- 27 Install the center console display.
- 28 Install the glove box fame assembly.
- 29 Install the left lower shield assembly of the instrument panel.
- 30 Install the console body assembly.
- 31 Install the electronic gear selector module.
- 32 Install the gear shift panel assembly.
- 33 Install the gear selector lever.
- 34 Install the console right outer handle assembly.
- 35 Install the console right trim panel assembly.
- 36 Install the console rear panel assembly.
- 37 Install the passenger seat assembly.
- 38 Install the right lower toe board assembly.

- 39 Install the left lower toe board assembly.
- 40 Install the front passenger side extension trim panel.
- 41 Install the driver side extension trim panel.
- 42 Install the left and right front door sill trim panel assemblies
- 43 Install the right clad trim panel assembly.
- 44 Install the left clad trim panel assembly.
- 45 Install the left side A/C air outlet panel assembly.
- 46 Install the instrument panel front right side end cover assembly.
- 47 Install the instrument panel front left side end cover assembly.
- 48 Connect the negative cable of battery.

13.8.3.20 Replacement of instrument panel cross beam assembly

Removal Procedure

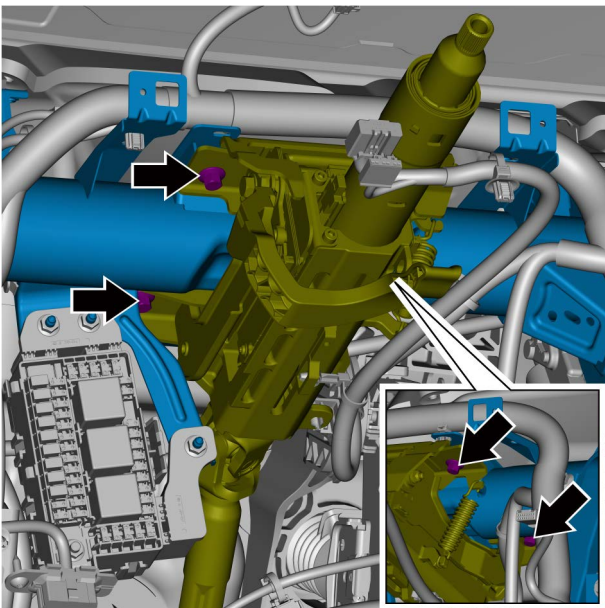
Warning !

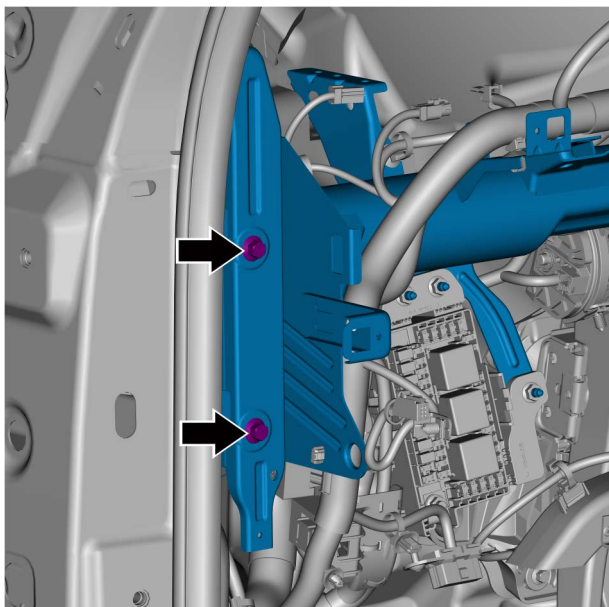
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the instrument panel front left side end cover assembly, refer to [Replacement of instrument panel front left side end cover assembly](#).
- 3 Remove the instrument panel front right side end cover assembly, refer to [Replacement of instrument panel front left side end cover assembly](#).
- 4 Remove the left A/C air outlet panel assembly, refer to [Replacement of left A/C air outlet panel assembly](#).
- 5 Remove left clad trim panel assembly, refer to [Replacement of left clad trim panel assembly](#).
- 6 Remove the right clad trim panel assembly, refer to [Replacement of right clad trim panel assembly](#).
- 7 Remove the left and right front door sill trim panel assemblies, refer to [Replacement of left front door sill trim panel assembly](#).
- 8 Remove the driver side extension trim panel assembly, refer to [Replacement of driver side extension trim panel assembly](#).

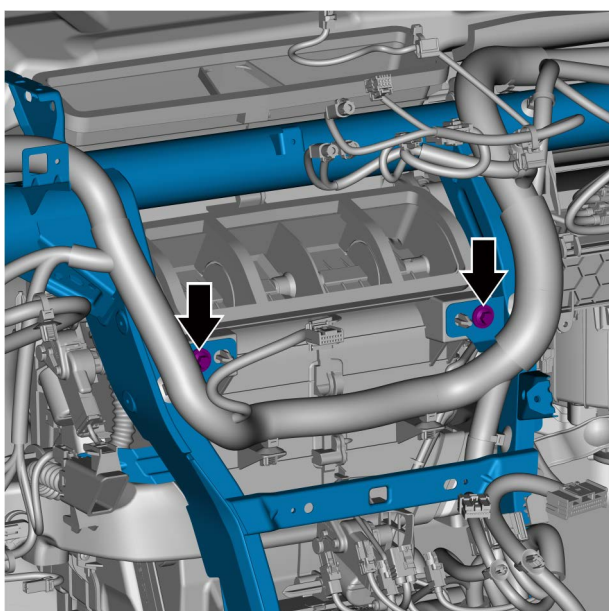
- 9 Remove the front passenger side extension trim panel assembly, refer to [Replacement of front passenger side extension trim panel assembly](#).
- 10 Remove the left lower toe board assembly, refer to [Replacement of left lower toe board assembly](#).
- 11 Remove the right lower toe board assembly, refer to [Replacement of right lower toe board assembly](#).
- 12 Remove the instrument panel left lower shield assembly, refer to [Replacement of instrument panel left lower shield assembly](#).
- 13 Remove the glove box frame assembly, refer to [Replacement of glove box frame assembly](#).
- 14 Remove the center console display, Refer to [Replacement of center console display](#).
- 15 Remove the instrument panel middle air outlet assembly, refer to [Replacement of instrument panel middle air outlet assembly](#).
- 16 Remove instrument panel right air outlet assembly, refer to [Replacement of instrument panel right air outlet assembly](#).
- 17 Remove the driver information module, refer to [Replacement of driver information module](#).
- 18 Remove the driver information screen, refer to [Replacement of driver information screen](#).
- 19 Remove the front airbag (driver), refer to [Replacement of front airbag \(driver\)](#).
- 20 Remove the steering wheel assembly, refer to [Replacement of steering wheel assembly](#).
- 21 Remove the steering column upper cowl, refer to [Replacement of steering column upper cowl assembly](#).
- 22 Remove the steering column lower cowl, refer to [Replacement of steering column lower cowl](#).
- 23 Remove the steering wheel module, refer to [Replacement of steering wheel module](#).
- 24 Remove the passenger seat assembly, refer to [Replacement of passenger seat assembly](#).
- 25 Remove the console rear panel assembly, refer to [Replacement of console rear panel assembly \(type I\)](#) and [Replacement of console rear panel assembly \(type II\)](#).
- 26 Remove the console right trim panel assembly, refer to [Replacement of console right trim panel assembly](#).

- 27 Remove console right outer handle assembly, refer to [Replacement of console right outer handle assembly](#).
- 28 Remove the gear selector lever, refer to [Replacement of gear selector lever](#).
- 29 Remove the gear shift panel assembly, refer to [Replacement of gear shift panel assembly](#).
- 30 Remove the electronic gear selector module, refer to [Replacement of electronic gear selector module](#).
- 31 Remove console body assembly, refer to [Replacement of console body assembly](#).
- 32 Remove the infotainment head unit, refer to [Replacement of infotainment head unit](#).
- 33 Remove the instrument panel middle lower shield assembly, refer to [Replacement of instrument panel middle lower shield assembly](#).
- 34 Remove the left and right A-pillar upper trim panel assemblies, refer to [Replacement of left A-pillar upper trim panel assembly](#).
- 35 Remove the instrument panel body assembly, refer to [Replacement of instrument panel body assembly](#).
- 36 Remove the ventilation cover plate assembly, refer to [Replacement of ventilation cover plate assembly](#).
- 37 Remove the front wiper motor, refer to [Replacement of front wiper motor](#).
- 38 Remove the front section of the console face air channel, refer to [Replacement of console face air channel front section](#).
- 39 Remove the 4 fixing bolts of mechanical steering column assembly.

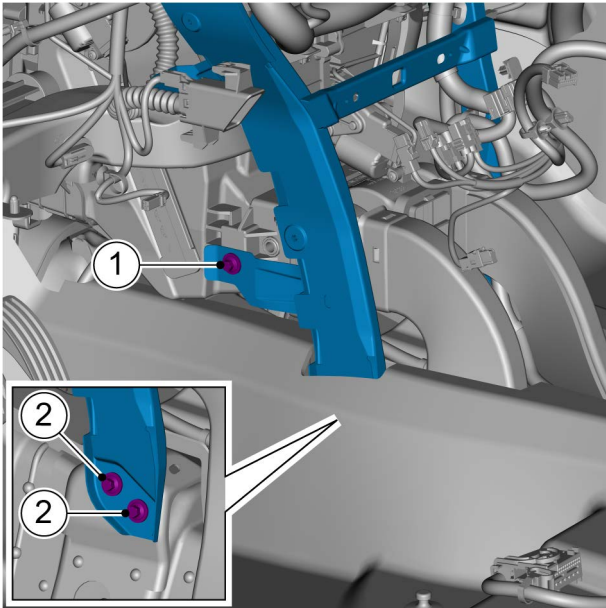




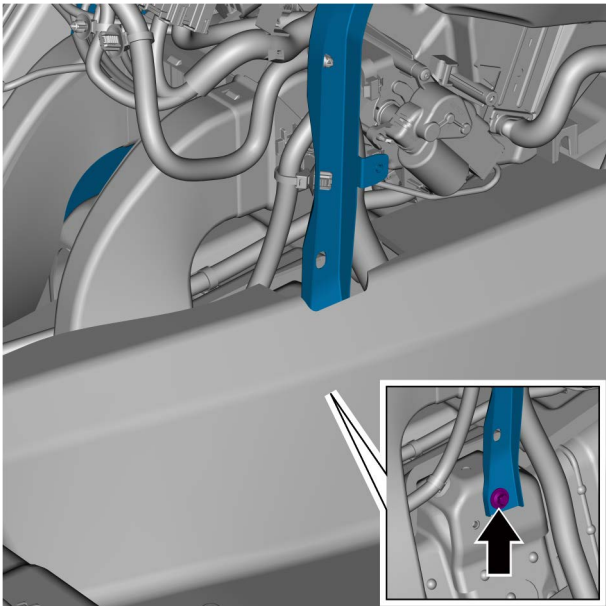
40 Remove the 2 fixing bolts on the left side of the instrument panel cross beam assembly.



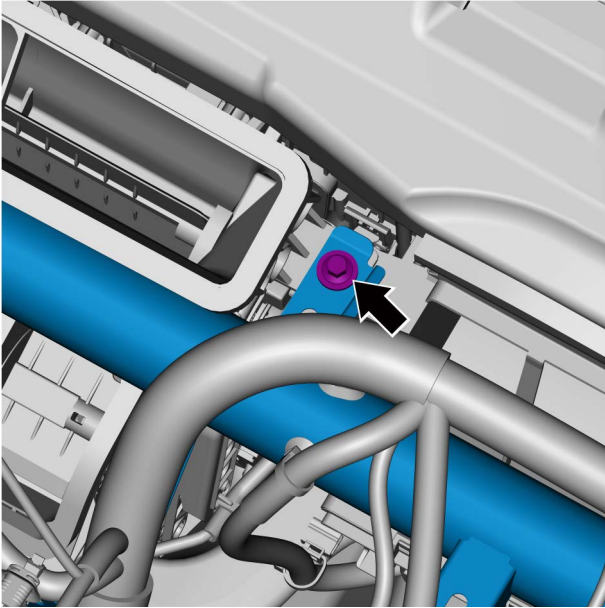
41 Remove the 2 fixing bolts in the middle of the instrument panel cross beam assembly.



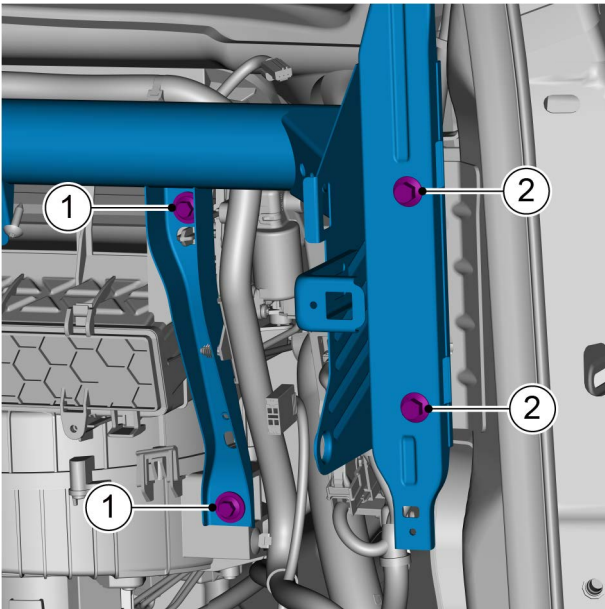
- 42 Lift the left front floor carpet and remove the left lower fixing bolt 1 and 2 fixing bolts 2 in the middle of the instrument panel cross beam assembly.



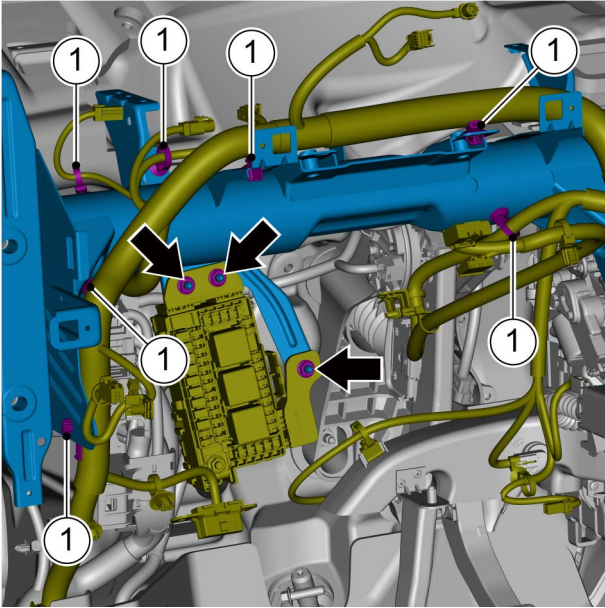
- 43 Lift the right front floor carpet and remove the right lower fixing bolt in the middle of the instrument panel cross beam assembly.



44 Remove the upper middle fixing bolt from the instrument panel cross beam assembly.

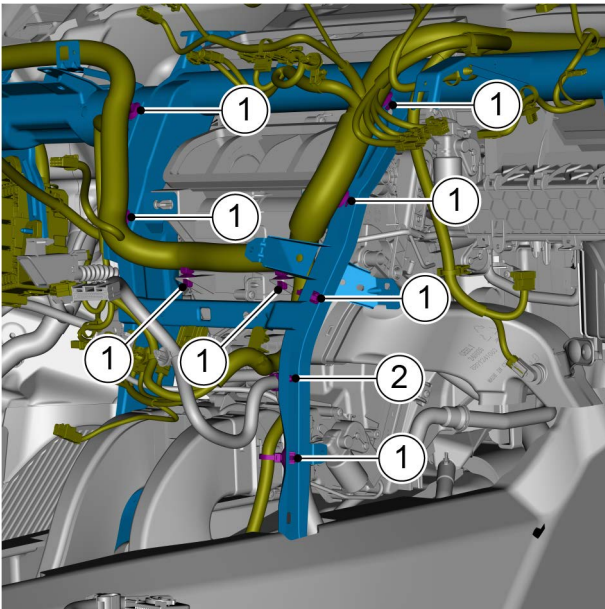


45 Remove 2 fixing bolts 1 and 2 fixing bolts 2 on the right side of the instrument panel cross beam assembly.

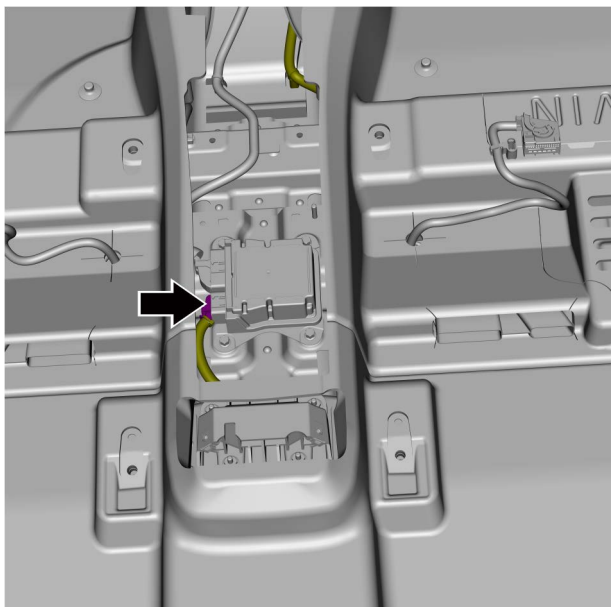


46 Remove the 7 instrument harness fixing clips 1 on the left side of the instrument panel cross beam assembly.

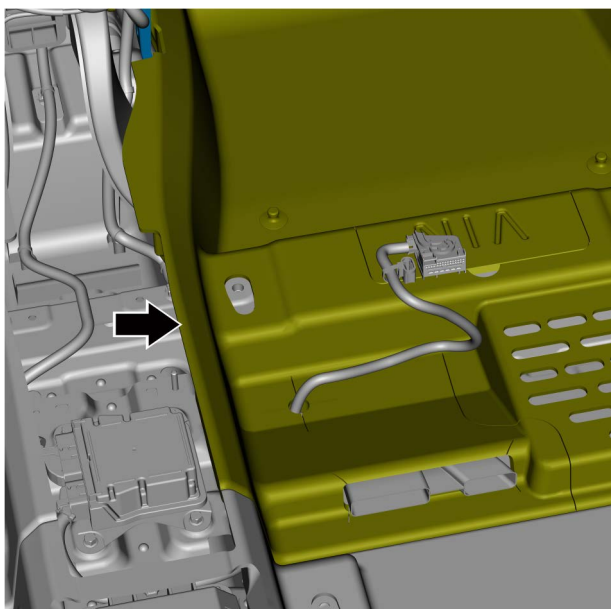
47 Remove the 3 fixing nuts from interior fuse box.



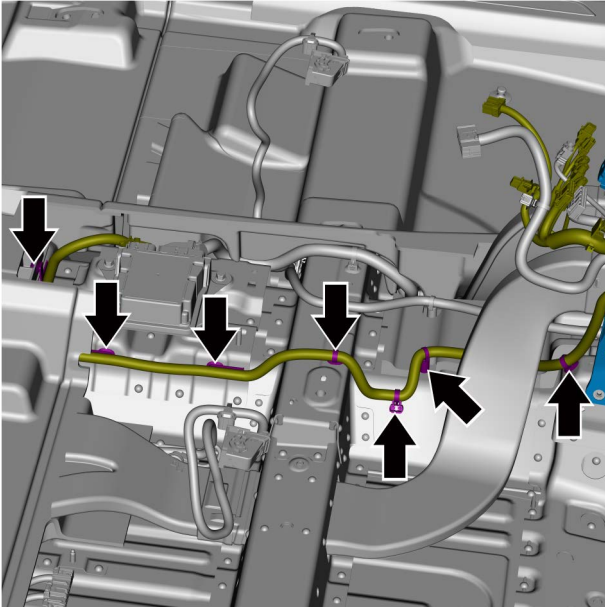
48 Remove the 8 instrument harness fixing clips 1 and the floor harness fixing clips 2 in the middle of the instrument panel cross beam assembly.



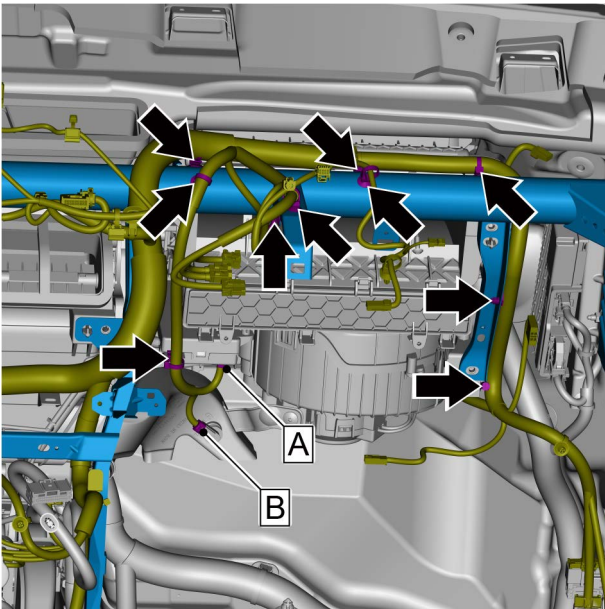
49 Disconnect the harness connector of supplement restraint system module.



50 Lift the right front floor front carpet assembly.



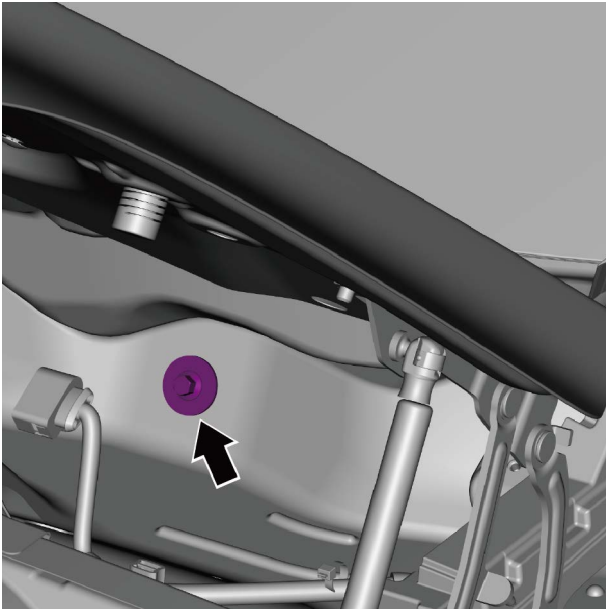
51 Remove the 7 fixing clips from the instrument harness.



52 Remove the 10 instrument harness fixing clips on the right side of the instrument panel cross beam assembly.

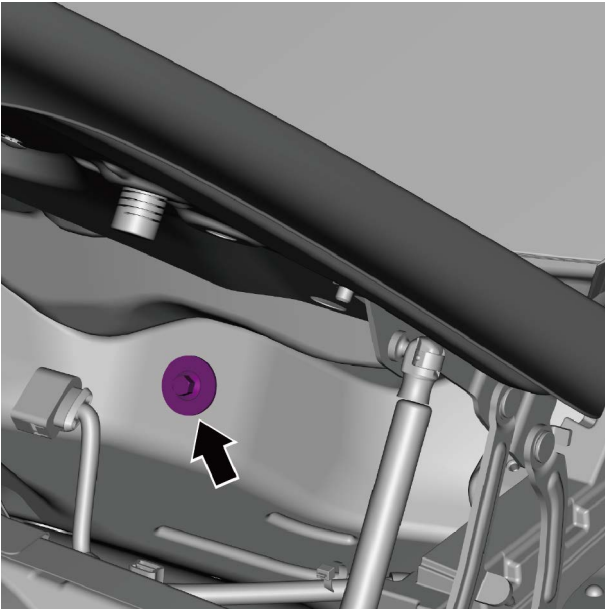
53 Disconnect the temperature control module harness connector A.

54 Disconnect the temperature sensor harness connector B.

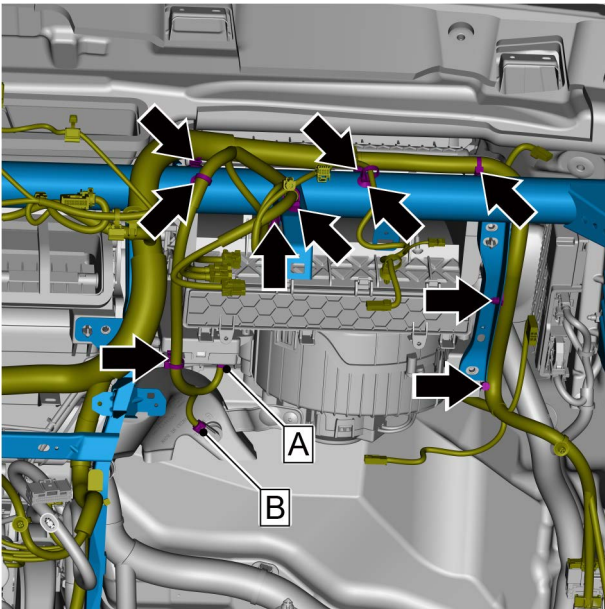


- 55 Remove the fixing bolt at the upper part of instrument panel cross beam assembly front wall and remove the instrument panel cross beam assembly.

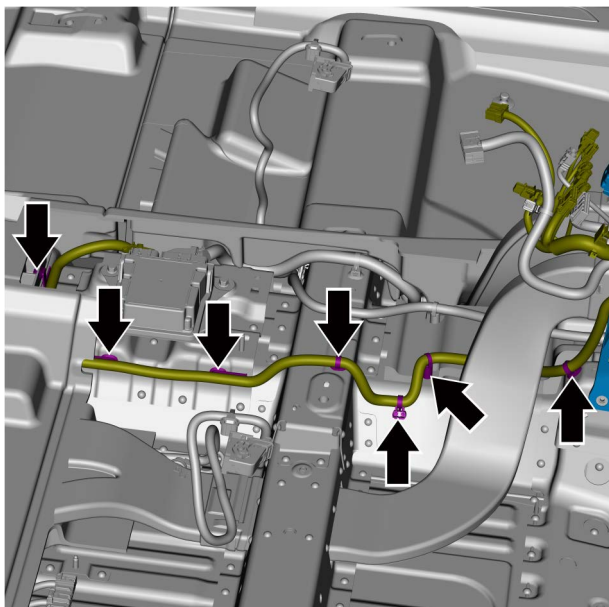
Installation Procedure



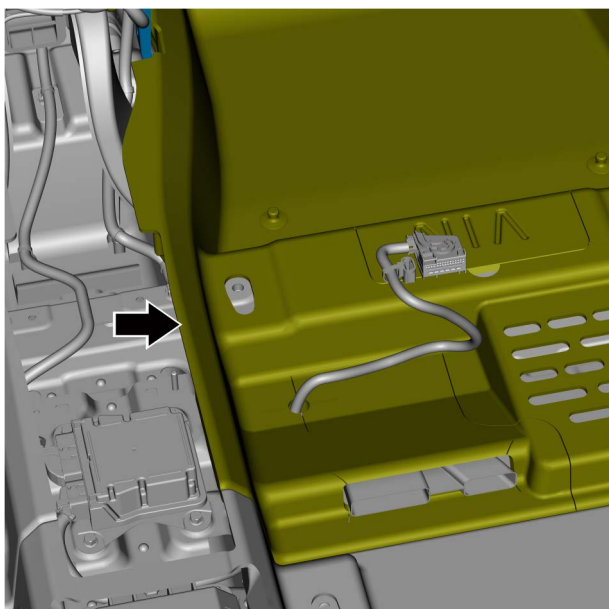
- 1 Install the fixing bolt at the upper part of instrument panel cross beam assembly front wall.
Torque: 24 N m



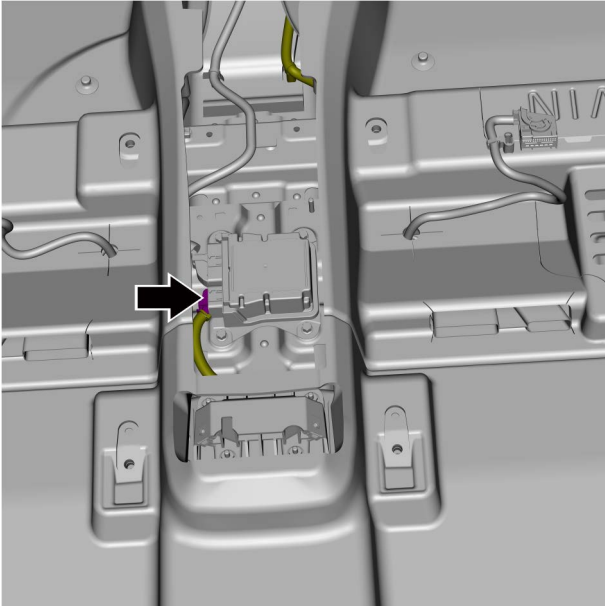
- 2 Connect the temperature control module harness connector A.
- 3 Connect the temperature sensor harness connector B.
- 4 Install the 10 instrument harness fixing clips on the right side of the instrument panel cross beam assembly.



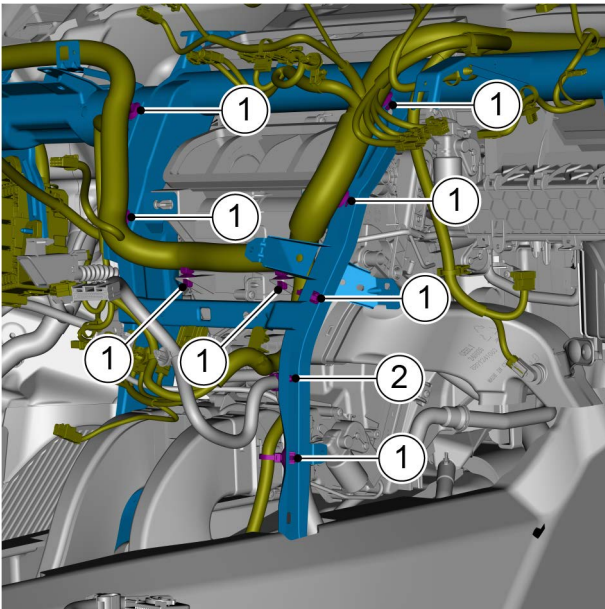
5 Install the 7 fixing clips from the instrument harness.



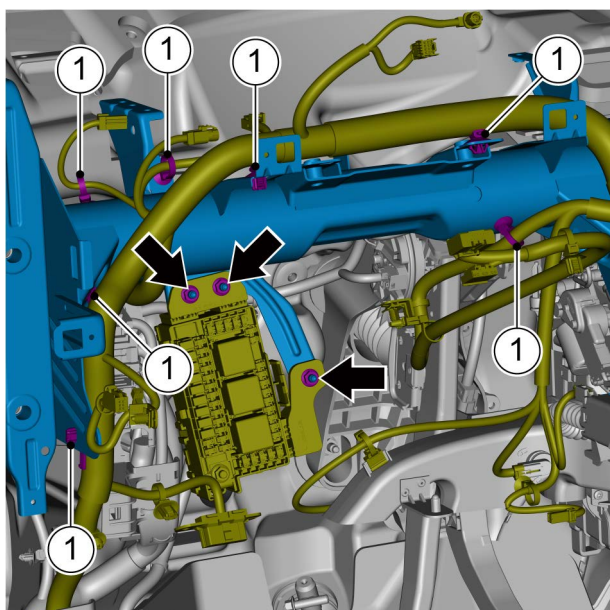
6 Reset the left front floor carpet assembly.



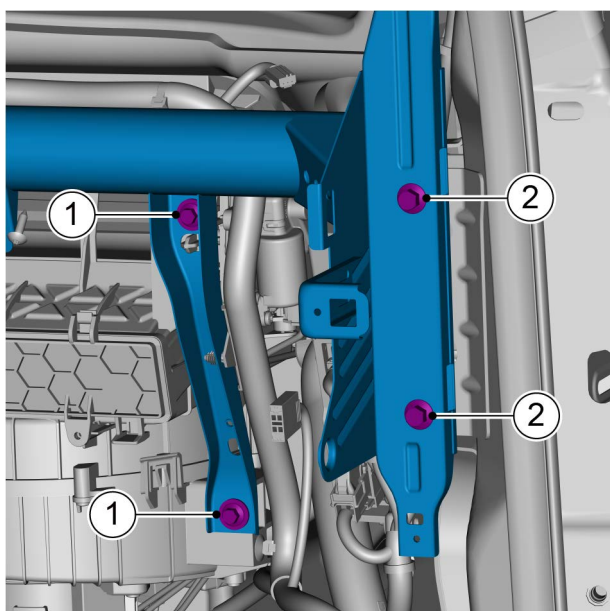
- 7 Connect the harness connectors of the supplement restraint system module.



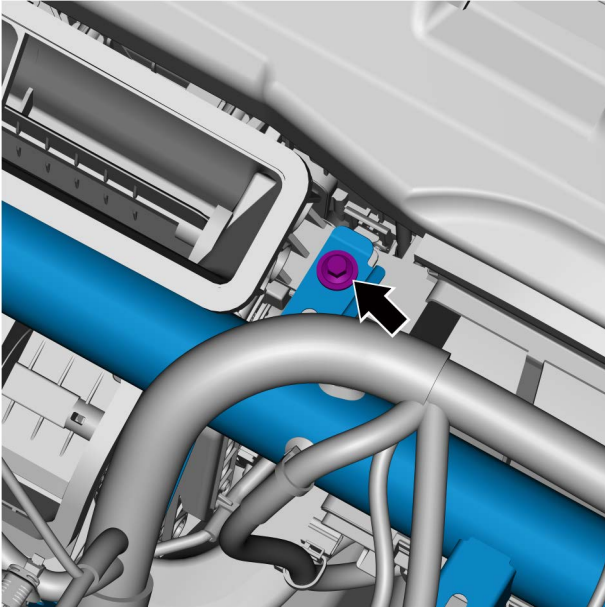
- 8 Install the 8 instrument harness fixing clips 1 and the floor harness fixing clips 2 in the middle of the instrument panel cross beam assembly.



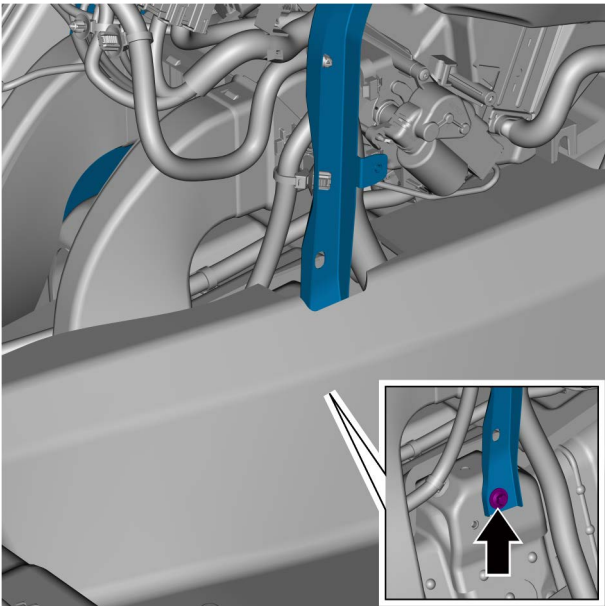
- 9 Install the 7 instrument harness fixing clips 1 on the left side of the instrument panel cross beam assembly.
- 10 Install the 3 fixing nuts of interior fuse box.



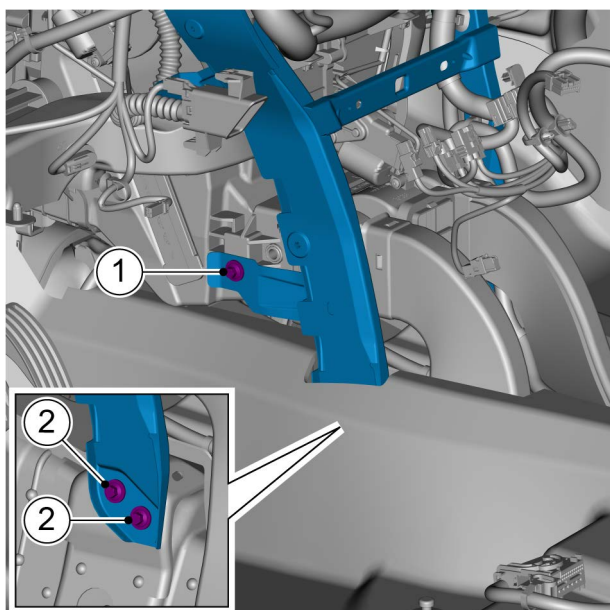
- 11 Install 2 fixing bolts 1 and 2 fixing bolts 2 on the right side of the instrument panel cross beam assembly.
 Bolt 1 torque: 6 N·m
 Bolt 2 torque: 24 N·m



- 12 Install the upper middle fixing bolt from the instrument panel cross beam assembly.
Torque: 6N·m



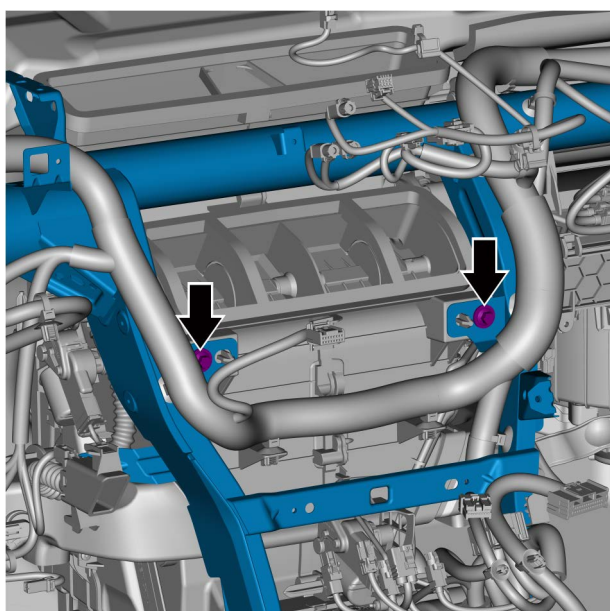
- 13 Lift the right front floor carpet and install the right lower fixing bolt in the middle of the instrument panel cross beam assembly.
Torque: 10N·m



- 14 Lift the left front floor carpet and install the left lower fixing bolt 1 and 2 fixing bolts 2 in the middle of the instrument panel cross beam assembly.

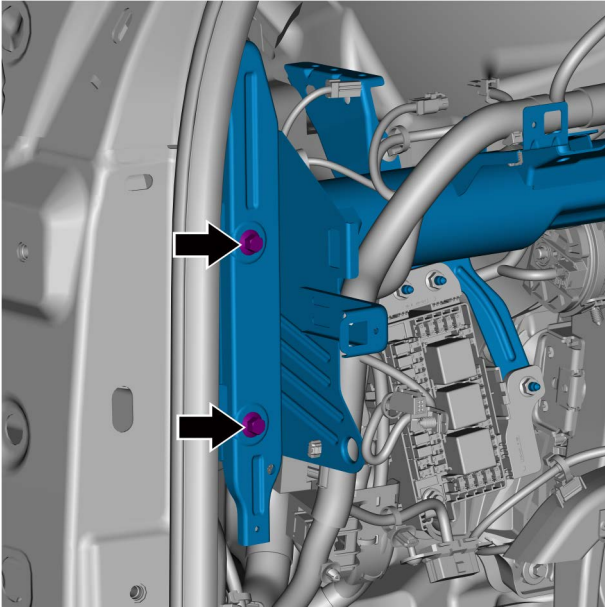
Bolt 1 torque: 6 N·m

Bolt 2 torque: 10 N·m

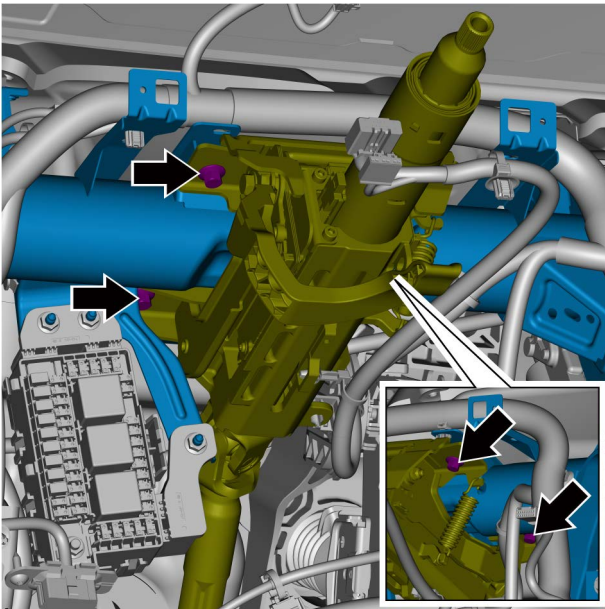


- 15 Install the 2 fixing bolts in the middle of the instrument panel cross beam assembly.

Torque: 6N·m



- 16 Install the 2 fixing bolts on the left side of the instrument panel cross beam assembly.
Torque: 24N·m



- 17 Install the 4 fixing bolts of mechanical steering column assembly.
Torque: 24N·m

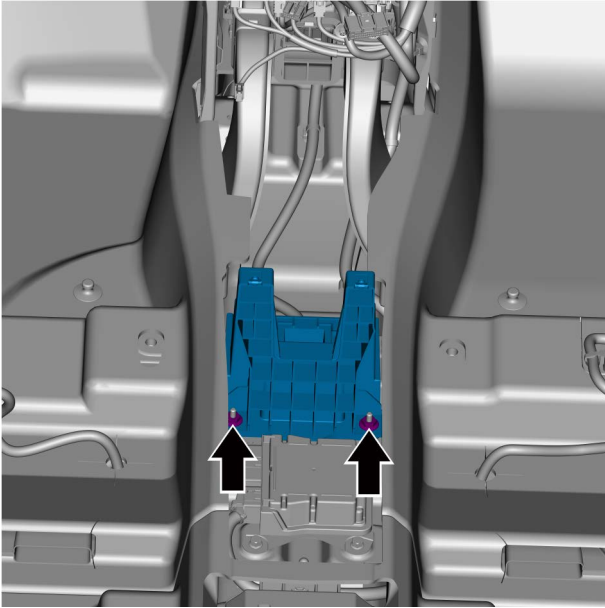
- 18 Install the front section of the console face air channel.
19 Install the front wiper motor.
20 Install the ventilation cover plate assembly.
21 Install the instrument panel body assembly.
22 Install the left and right A-pillar upper trim panel assembly.
23 Install the instrument panel middle lower shield assembly.
24 Install the infotainment head unit.
25 Install the console body assembly.
26 Install the electronic gear selector module.
27 Install the gear shift panel assembly.
28 Install the gear selector lever.

- 29 Install the console right outer handle assembly.
- 30 Install the console right trim panel assembly.
- 31 Install the console rear panel assembly.
- 32 Install the passenger seat assembly.
- 33 Install the steering wheel module.
- 34 Install the lower cowl of the steering column.
- 35 Install the steering column upper cowl assembly.
- 36 Install the steering wheel assembly.
- 37 Install the driver airbag.
- 38 Install the driver information screen.
- 39 Install the driver information module.
- 40 Install the instrument panel right air outlet assembly.
- 41 Install the instrument panel middle air outlet assembly.
- 42 Install the center console display.
- 43 Install the glove box fame assembly.
- 44 Install the left lower shield assembly of the instrument panel.
- 45 Install the right lower toe board assembly.
- 46 Install the left lower toe board assembly.
- 47 Install the front passenger side extension trim panel.
- 48 Install the driver side extension trim panel.
- 49 Install the left and right front door sill trim panel assemblies
- 50 Install the right clad trim panel assembly.
- 51 Install the left clad trim panel assembly.
- 52 Install the left side A/C air outlet panel assembly.
- 53 Install the instrument panel front right side end cover assembly.
- 54 Install the instrument panel front left side end cover assembly.
- 55 Connect the negative cable of battery.

13.8.3.21 Replacement of console middle mounting bracket assembly

Removal Procedure

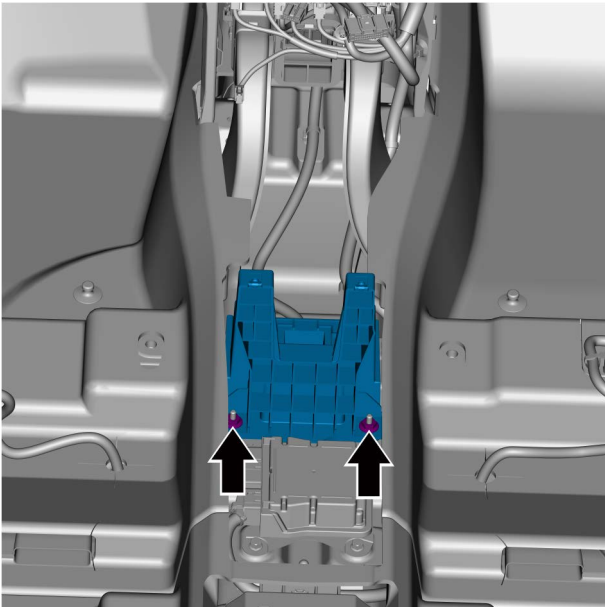
- 1 Remove console body assembly, refer to [Replacement of console body assembly](#).
- 2 Remove the front section of the console air channel assembly, refer to [Replacement of console air channel assembly front section](#).



- 3 Remove the 2 fixing nuts of the console middle mounting bracket assembly.
- 4 Remove the console middle mounting bracket assembly.

Installation Procedure

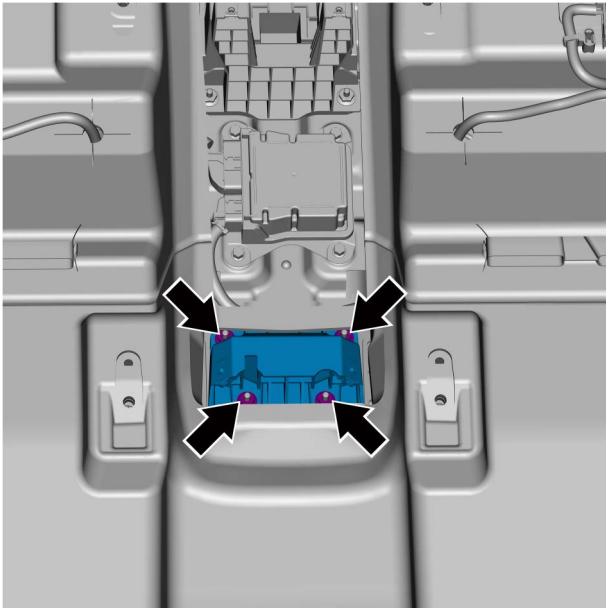
- 1 Install the console middle mounting bracket assembly and tighten the nuts.
Torque: 10N·m



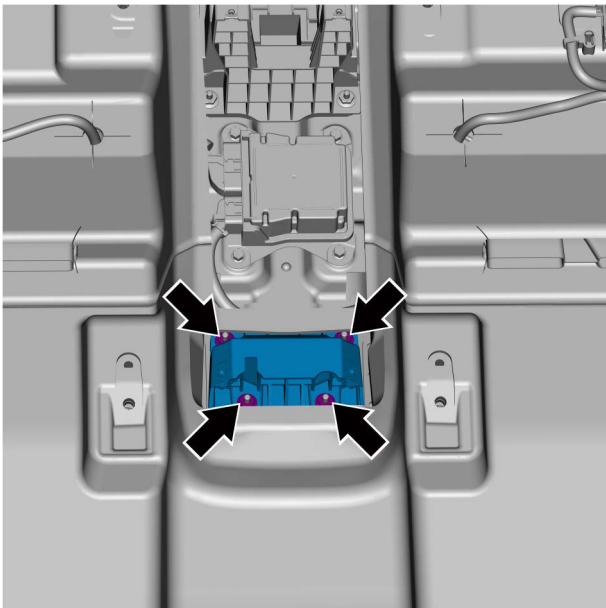
- 2 Install the front section of console air channel assembly.
- 3 Install the console body assembly.

13.8.3.22 Replacement of console rear mounting bracket assembly

Removal Procedure



- 1 Remove console body assembly, refer to [Replacement of console body assembly](#).
- 2 Remove the 4 fixing nuts of the console rear mounting bracket assembly.
- 3 Remove the console rear mounting bracket assembly.



Installation Procedure

- 1 Install the console rear mounting bracket assembly and tighten the nuts.
Torque: 10N·m

- 2 Install the console body assembly.

13.8.3.23 Replacement of console left upper trim panel

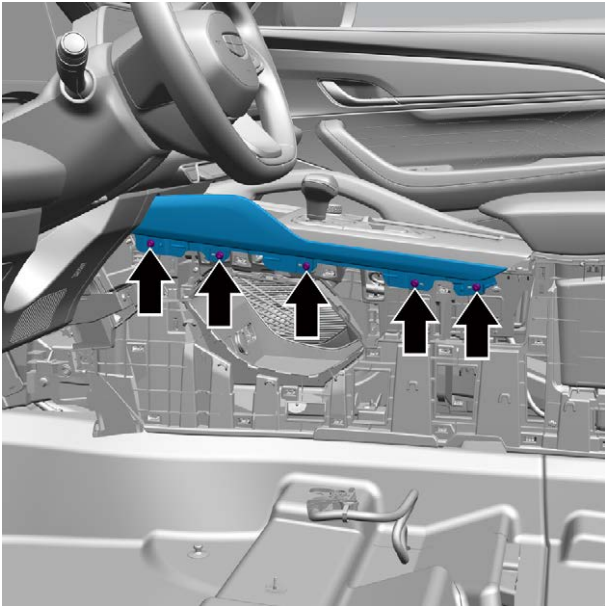
Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

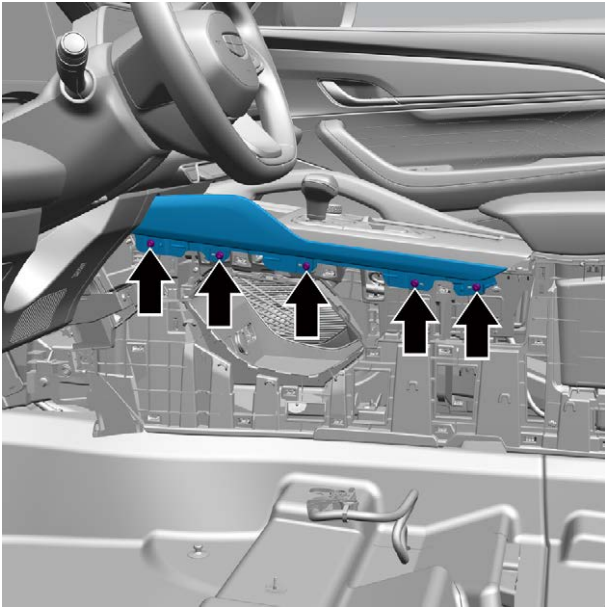
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

- 2 Remove the driver seat assembly, refer to [Replacement of driver seat assembly](#).
- 3 Remove the driver side extension trim panel assembly, refer to [Replacement of driver side extension trim panel assembly](#).
- 4 Remove the console rear panel assembly, refer to [Replacement of console rear panel assembly \(type I\)](#) and [Replacement of console rear panel assembly \(type II\)](#).
- 5 Remove the console left trim panel, refer to [Replacement of console right trim panel assembly](#).
- 6 Remove the 5 fixing screw of console left upper trim panel.



- 7 Remove the console left upper trim panel.

Installation Procedure



- 1 Install the console left upper trim panel and tighten the 5 fixing screws.
Torque: 2.5N·m

- 2 Install the console left trim panel.
- 3 Install the console rear panel assembly.
- 4 Install the driver side extension trim panel assembly.
- 5 Install the driver seat assembly.
- 6 Connect the negative cable of battery.

13.8.3.24 Replacement of console armrest

Removal Procedure

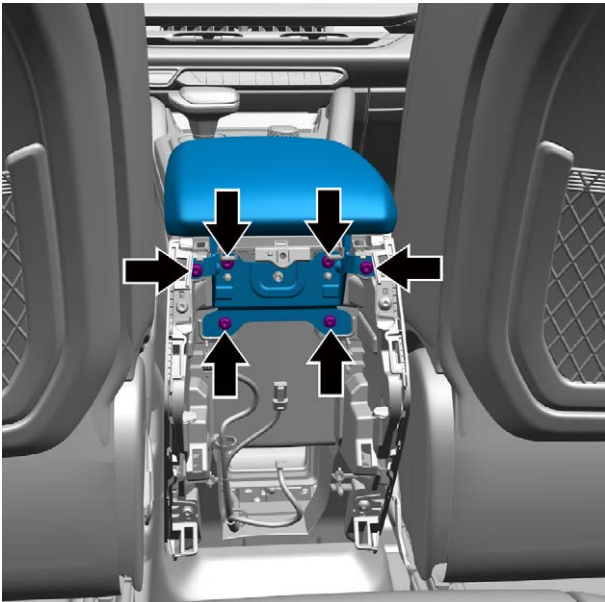
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the console rear panel assembly, refer to [Replacement of console rear panel assembly \(type I\)](#) and [Replacement of console rear panel assembly \(type II\)](#).
- 3 Remove the rear section of console face air channel, refer to [Replacement of console face air channel rear section](#).

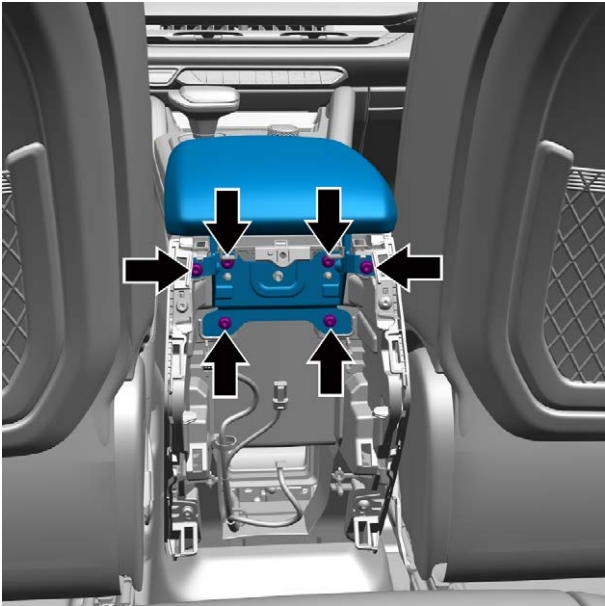


- 4 Remove the 1 fastening screw of the console armrest hinge cover.
- 5 Remove the console armrest hinge cover.



- 6 Remove the 6 fixing screws of console armrest.
- 7 Remove the console armrest backward.

Installation Procedure



- 1 Install the console armrest.
- 2 Tighten the 6 fixing screws of the console armrest.
Torque: 2.5N·m



- 3 Install the console armrest hinge cover and tighten the 1 fixing screws.

- 4 Install the rear section of the console face air channel.
- 5 Install the console rear panel assembly.
- 6 Connect the negative cable of battery.

13.8.3.25 Replacement of console armrest trim panel

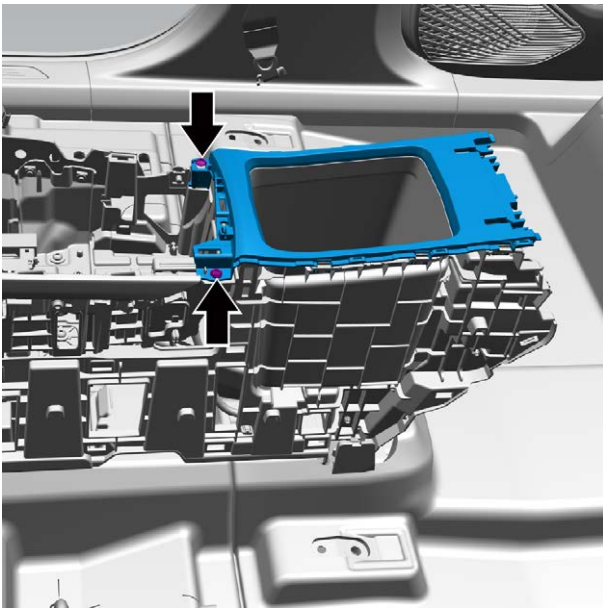
Removal Procedure

Warning !

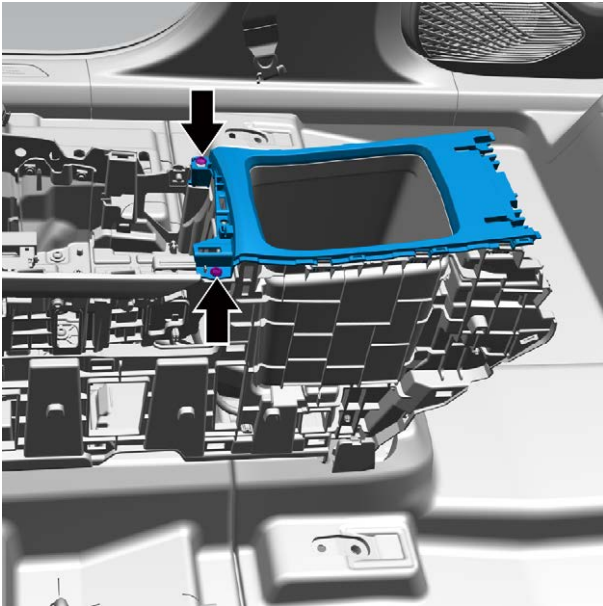
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

- 2 Remove the driver seat assembly, refer to [Replacement of driver seat assembly](#).
- 3 Remove the passenger seat assembly, refer to [Replacement of driver seat assembly](#).
- 3 Remove the driver side extension trim panel assembly, refer to [Replacement of driver side extension trim panel assembly](#).
- 4 Remove the console rear panel assembly, refer to [Replacement of console rear panel assembly \(type I\)](#) and [Replacement of console rear panel assembly \(type II\)](#).
- 5 Remove the console left and right trim panel assembly, refer to [Replacement of console right trim panel assembly](#).
- 6 Remove the rear section of console face air channel, refer to [Replacement of console face air channel rear section](#).
- 7 Remove the gearshift panel assembly, refer to [Replacement of gearshift panel assembly](#).
- 8 Remove the 2 fastening screws of the console armrest trim panel.
- 9 Remove the console armrest trim panel.



Installation Procedure



- 1 Install the console armrest trim panel.
- 2 Tighten the 2 fixing screws of console armrest trim panel.
Torque: 2.5N·m

- 3 Install the gearshift panel assembly.
- 4 Install the rear section of the console face air channel.
- 5 Install the console left and right trim panel assembly.
- 6 Install the console rear panel assembly.
- 7 Install the driver side extension trim panel assembly.
- 8 Install the driver seat assembly and passenger seat assembly.
- 9 Connect the negative cable of battery.

13.8.3.26 Replacement of console frame body cover plate

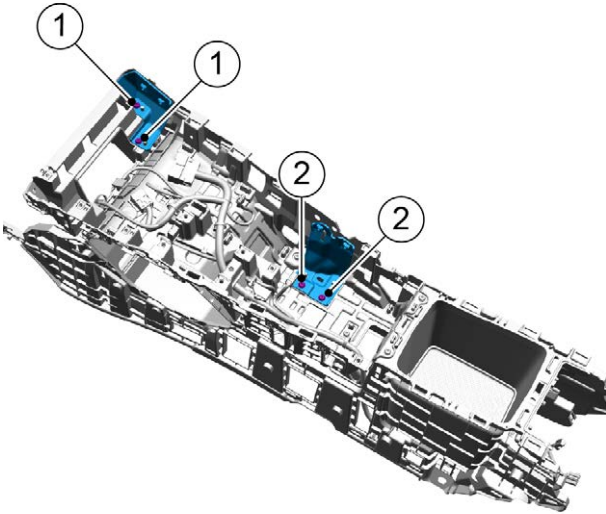
Removal Procedure

Warning !

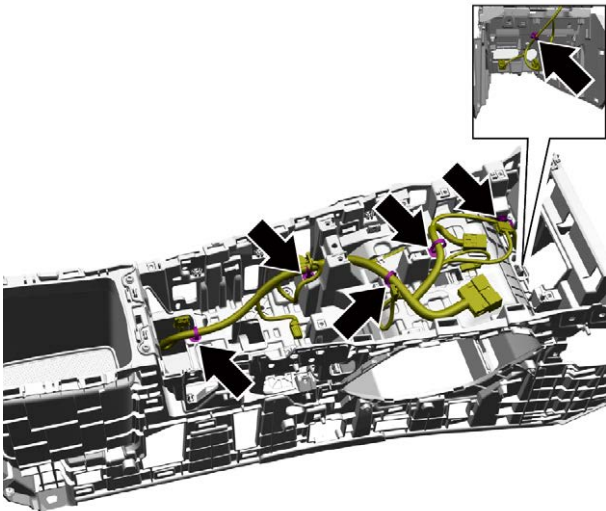
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the console assembly, refer to [Replacement of console assembly](#).
- 3 Remove the console rear panel assembly, refer to [Replacement of console rear panel assembly \(type I\)](#) and [Replacement of console rear panel assembly \(type II\)](#).
- 4 Remove the rear section of console face air channel, refer to [Replacement of console face air channel rear section](#).
- 5 Remove the console armrest, refer to [Replacement of console armrest](#).

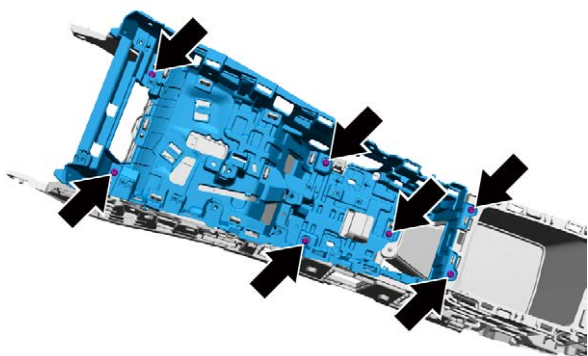
- 6 Remove the console armrest trim panel, refer to [Replacement of console armrest trim panel](#).
- 7 Remove 2 fixing screws 1 of the front sheet metal bracket and remove the front sheet metal bracket.
- 8 Remove 2 fixing screws 2 of the rear sheet metal bracket and remove the rear sheet metal bracket.



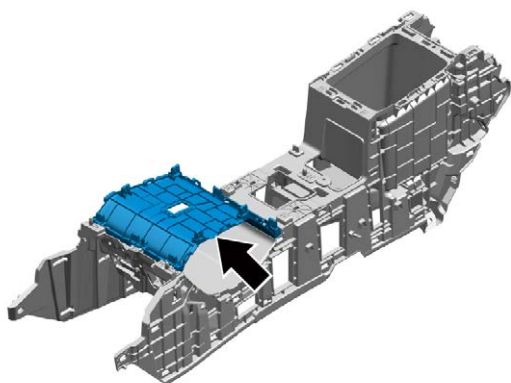
- 9 Remove the 6 harness clips of the console assembly harness.



- 10 Remove the 7 fixing screws of the console frame body and take off the console frame body.

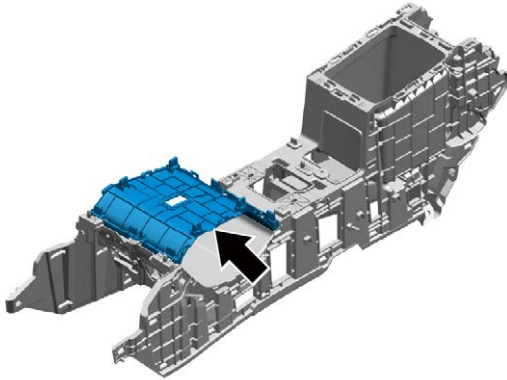


- 11 Remove the console frame body cover plate.



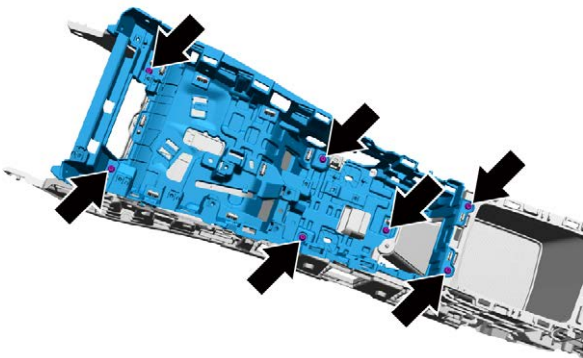
Installation Procedure

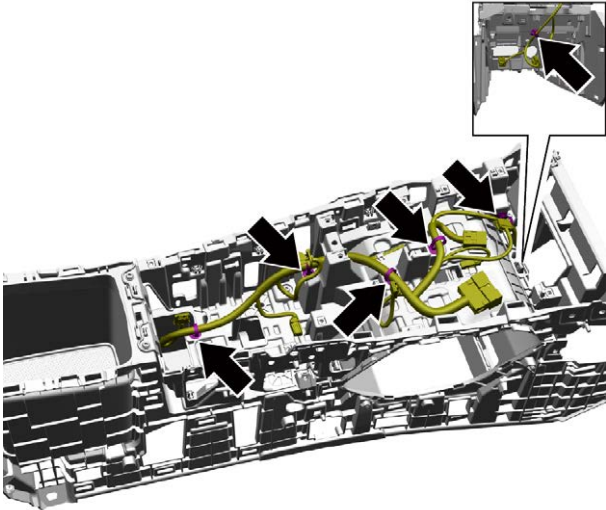
- 1 Install the console frame body cover plate.



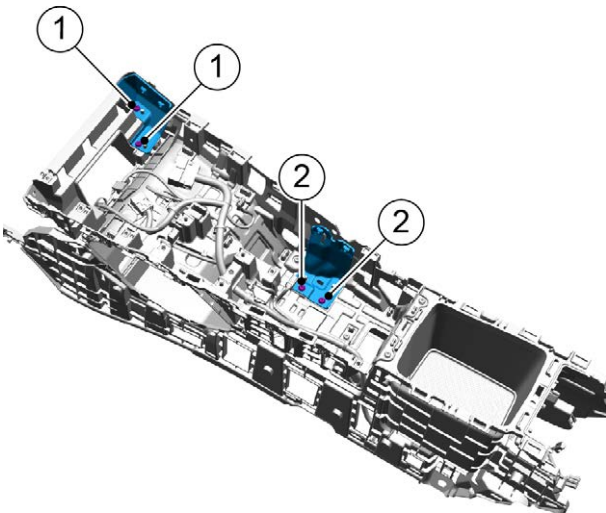
- 2 Install the console frame body and tighten the 7 fixing screws.

Torque: 2.5N·m





- 3 Install the 6 harness clips of the console assembly harness.



- 4 Install the front sheet metal bracket and tighten the 2 fixing screws 1.
Torque: 2.5N·m
- 5 Install the rear sheet metal bracket and tighten the 2 fixing screws 2.
Torque: 2.5N·m

- 6 Install the console armrest trim panel.
- 7 Install the console armrest.
- 8 Install the rear section of the console face air channel.
- 9 Install the console rear panel assembly.
- 10 Install the console assembly.
- 11 Connect the negative cable of battery.

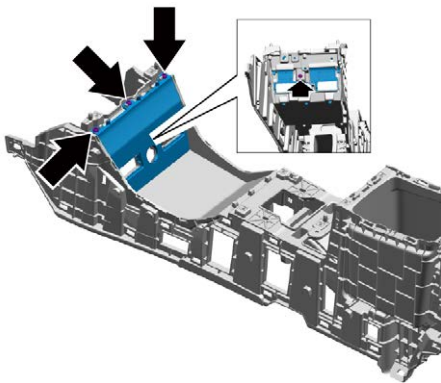
13.8.3.27 Replacement of USB cover plate

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)".

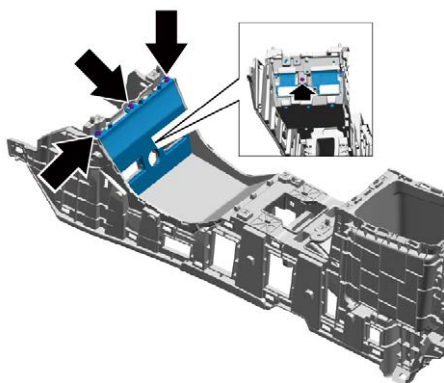
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the console assembly, refer to [Replacement of console assembly](#).
- 4 Remove the console rear panel assembly, refer to [Replacement of console rear panel assembly \(type I\)](#) and [Replacement of console rear panel assembly \(type II\)](#).
- 5 Remove the rear section of console face air channel, refer to [Replacement of console face air channel rear section](#).
- 6 Remove the console armrest, refer to [Replacement of console armrest](#).
- 7 Remove the console armrest trim panel, refer to [Replacement of console armrest trim panel](#).
- 8 Remove the console frame body cover plate, refer to [Replacement of console frame body cover plate](#).
- 9 Remove the 4 fixing screws for the USB cover plate.
- 10 Remove the USB cover plate.



Installation Procedure

- 1 Install the USB cover plate and tighten the 4 fixing screws.

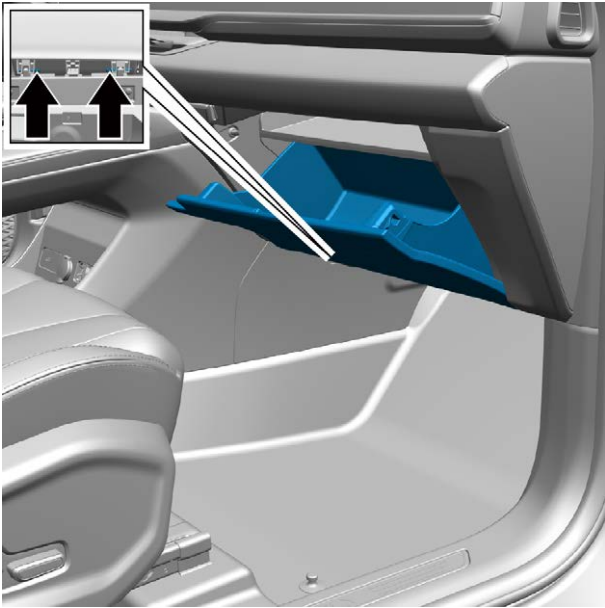
Torque: 2.5N·m



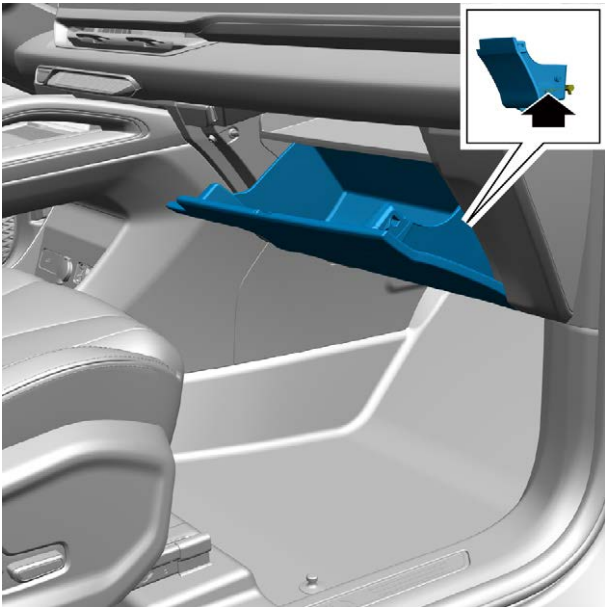
- 2 Install the console frame body cover plate.
- 3 Install the 6 harness clips of the console assembly harness.
- 4 Install the console armrest trim panel.
- 5 Install the console armrest.
- 6 Install the rear section of the console face air channel.
- 7 Install the console rear panel assembly.
- 8 Install the console assembly.
- 9 Connect the negative cable of battery.

13.8.3.28 Replacement of glove box

Removal Procedure



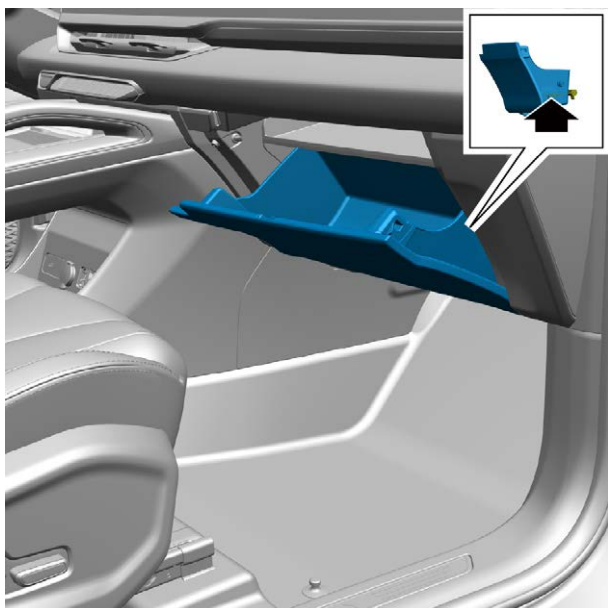
1 Remove the 2 glove box pin shafts.



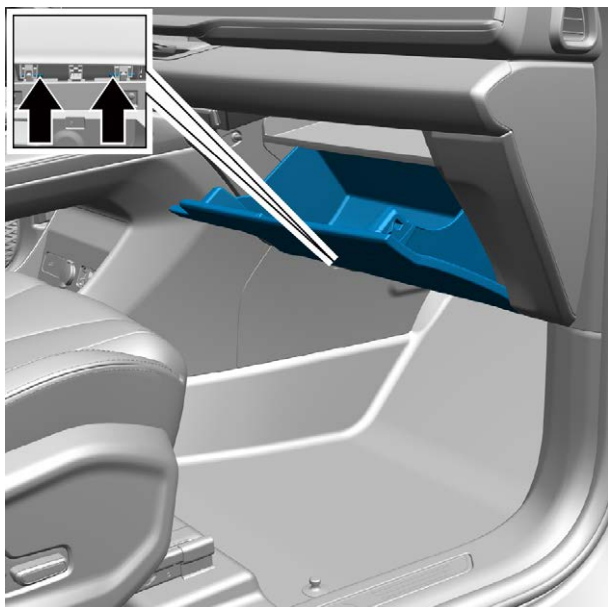
2 Disconnect the glove box damper from the glove box.

3 Remove the glove box.

Installation Procedure



- 1 Install the glove box.
- 2 Connect the glove box damper and the glove box.

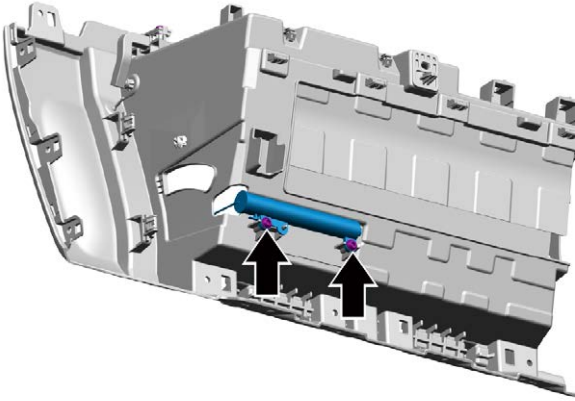


- 3 Install the 2 glove box pin shafts.

13.8.3.29 Replacement of glove box damper

Removal Procedure

- 1 Remove the glove box, refer to [Replacement of glove box](#).
- 2 Remove the 2 fixing screws of the glove box damper.

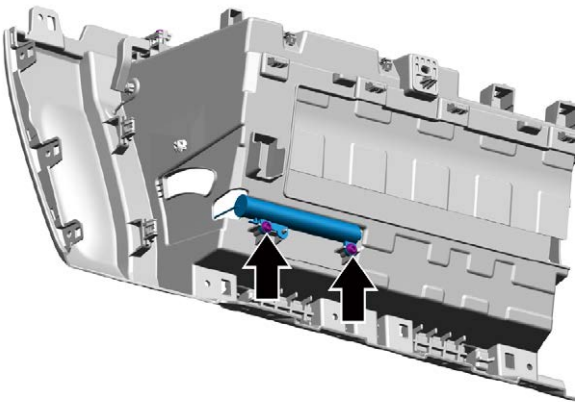


- 3 Remove the glove box damper.

Installation Procedure

- 1 Install the glove box damper and tighten the 2 fixing screws.

Torque: 2.5 N m



- 2 Install the glove box.

13.9 Interior trim

13.9.1 Specification

13.9.1.1 Fastener specification

Fastener part	Model	Torque range (N·m)
Left front door interior trim panel assembly fixing screw	PF5×20	1.7-2.3
Left rear door interior trim panel assembly fixing screw	PF5×20	1.7-2.3
Left rear door sill interior trim panel assembly fixing screw	PF5×16	1.3-1.7
Left luggage compartment side shield assembly fixing screw	PF5×16	1.3-1.7
Left B-pillar upper trim panel assembly fixing bolt	M6×16	3-4
Left C-pillar upper trim panel assembly fixing bolt	M6×16	3-4
Left C-pillar upper trim panel assembly fixing screw	PF5×16	1.3-1.7
Left D-pillar upper trim panel assembly fixing screw	PF5×16	1.3-1.7
Front safety handle assembly fixing screw	M5×30	3.2-4.8
Left sunvisor assembly fixing bolt	M6×25	3.2-4.8
Trunk door left upper interior trim panel assembly fixing screw	PF5×16	1.3-1.7

13.9.2 Removal and Installation

13.9.2.1 Replacement of left front door interior trim panel assembly

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

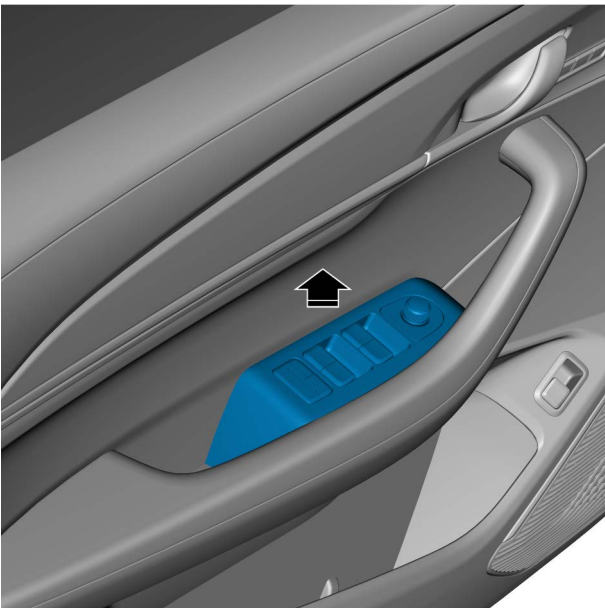
Caution

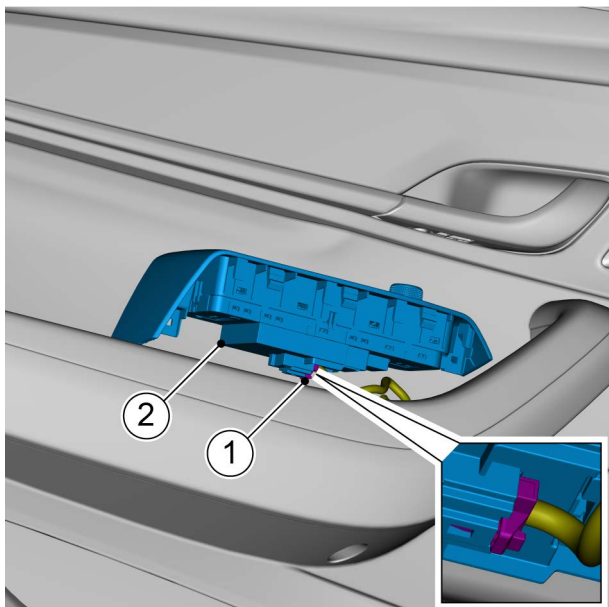
The removal and installation methods of left and right front door interior trim panel assemblies are similar.

Caution

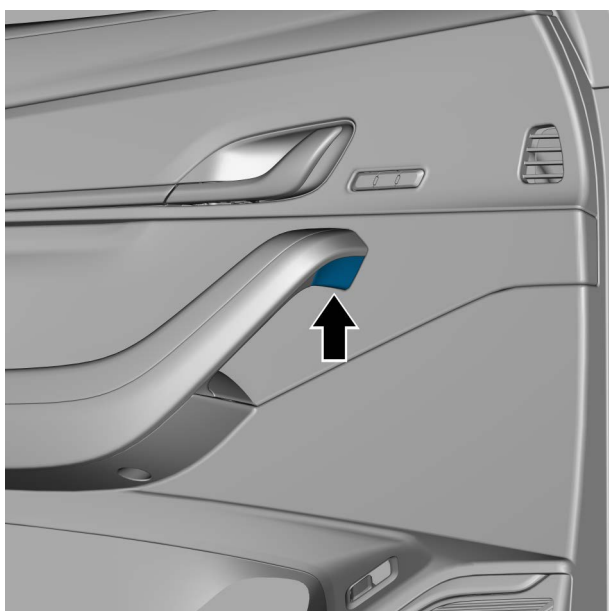
Please use the special tools for vehicle body repair to remove the trim panel, otherwise it is easy to scratch the edge of the interior trim panel.

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the driver door switch cluster panel assembly.

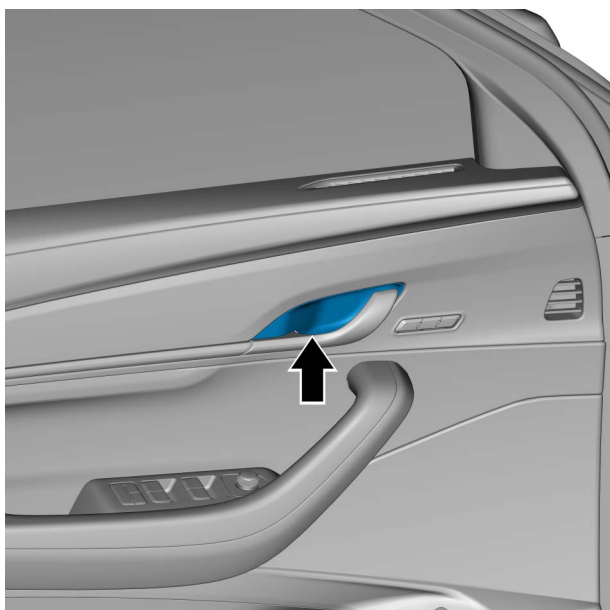




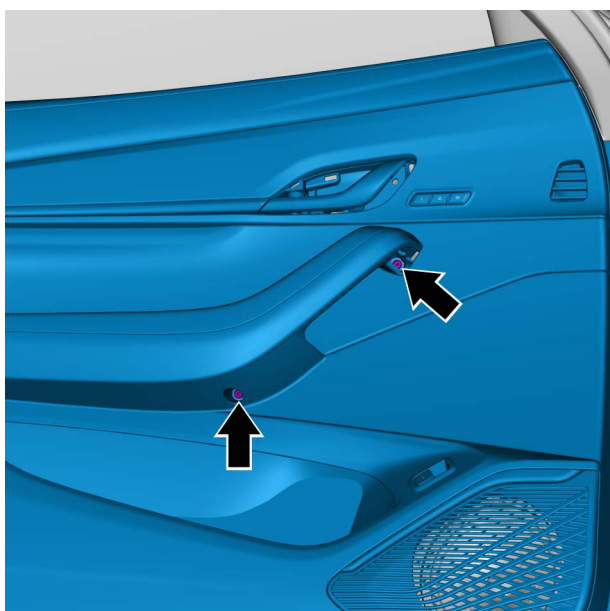
- 3 Disconnect the driver door switch cluster harness connector 1 and remove the driver door switch cluster panel assembly 2.



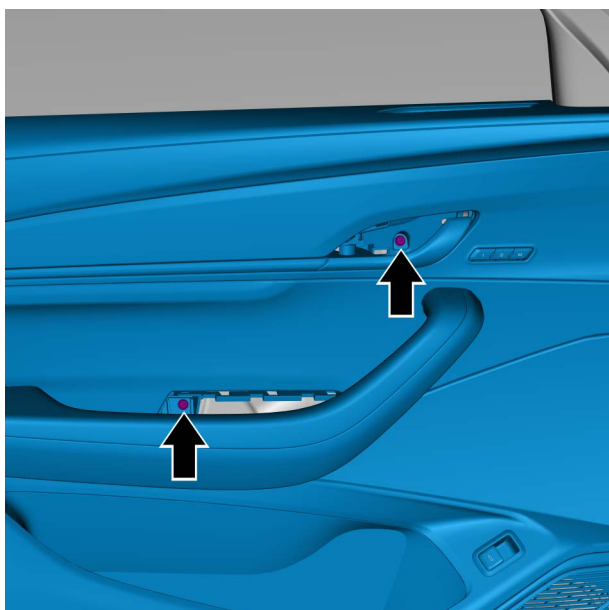
- 4 Remove the left front door tilt handle screw plug cover.



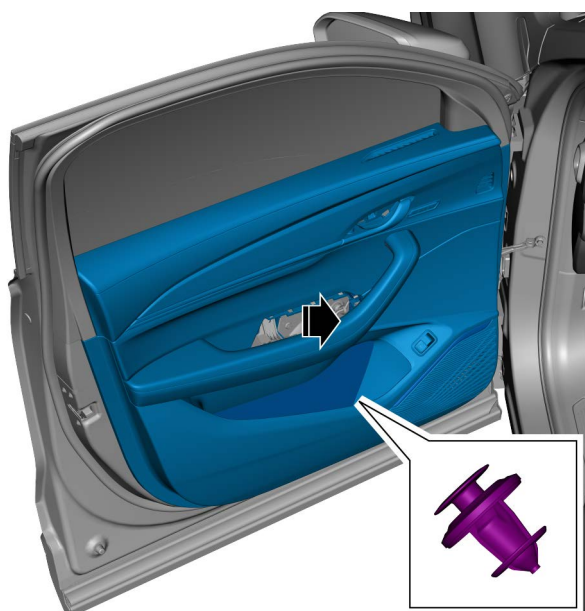
5 Remove the left front door inner release handle cover.



6 Remove the 2 fixing screws at the left front door tilt handle.



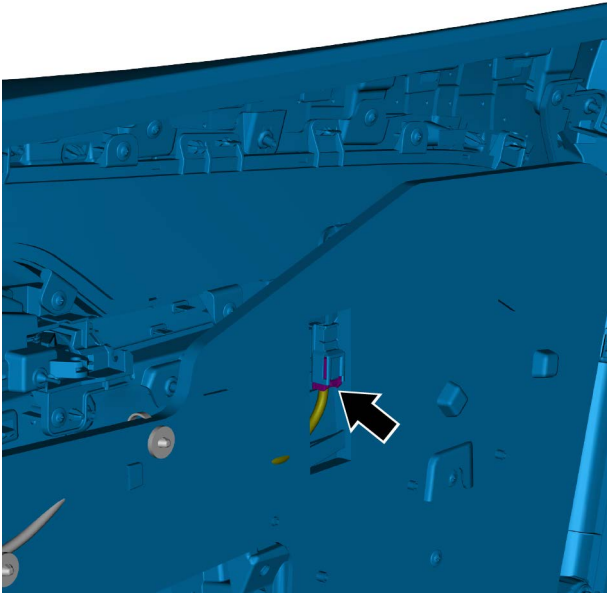
- 7 Remove the fixing screw at the left front door inner release handle and the fixing screw at the left front door handle.



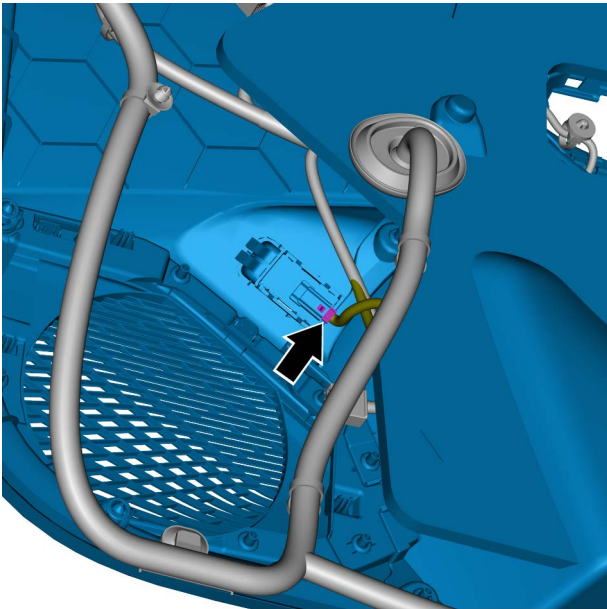
- 8 Disengage the clip fixing the left front door inner trim panel assembly and separate the left front door inner trim panel assembly from the door.

Caution

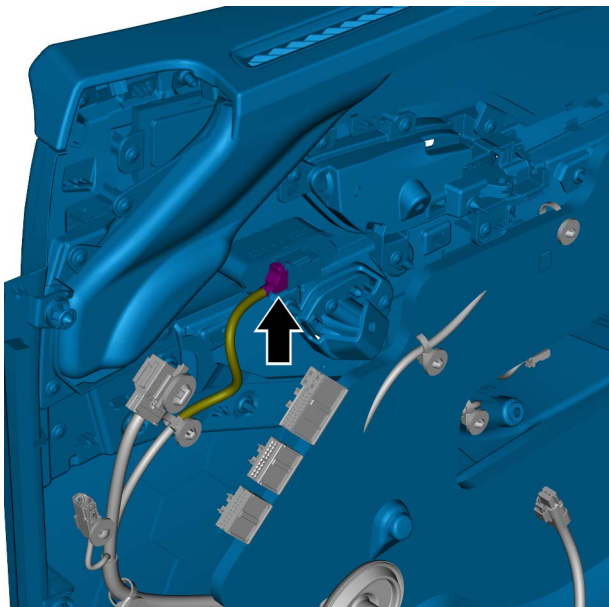
When removing the door inner trim panel, lift it upward and then remove it.



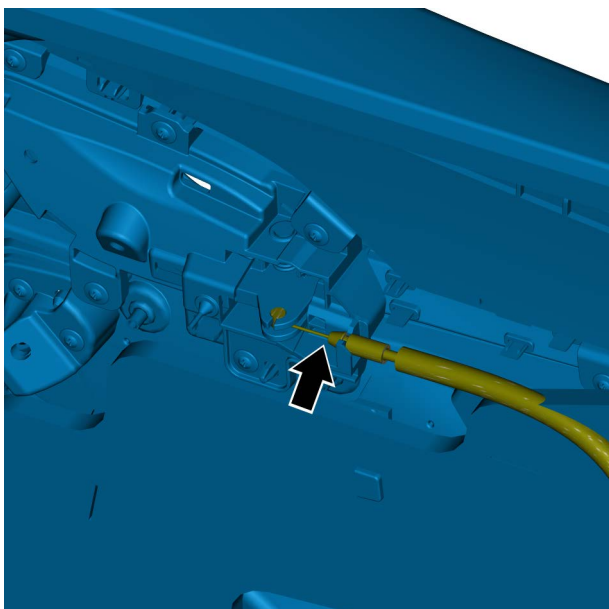
- 9 Disconnect the left front door ambient lamp harness connector.



- 10 Disconnect the tailgate opening switch harness connector.

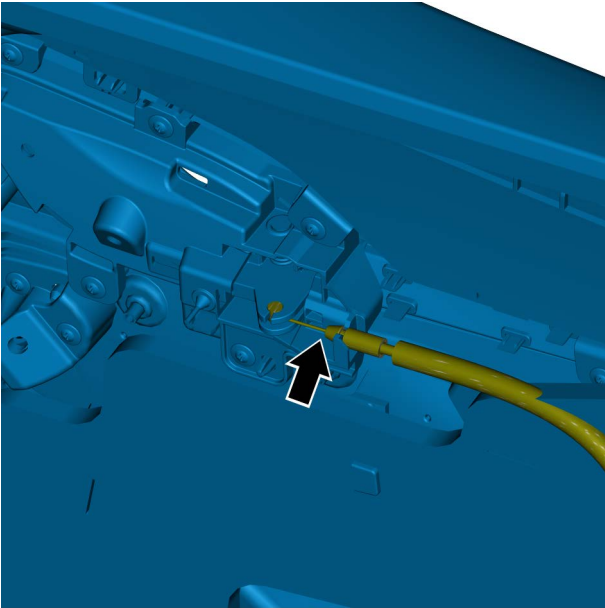


- 11 Disconnect the memory switch personal settings unit harness connector.

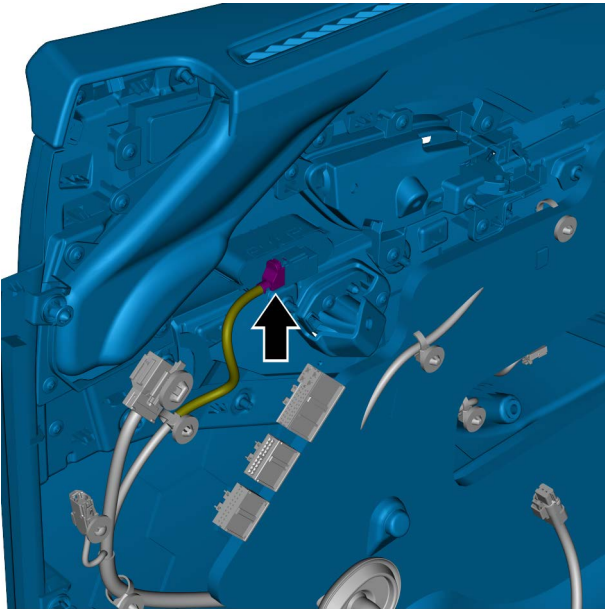


- 12 Remove the left front door inner release cable and take off the left front door interior trim panel assembly.

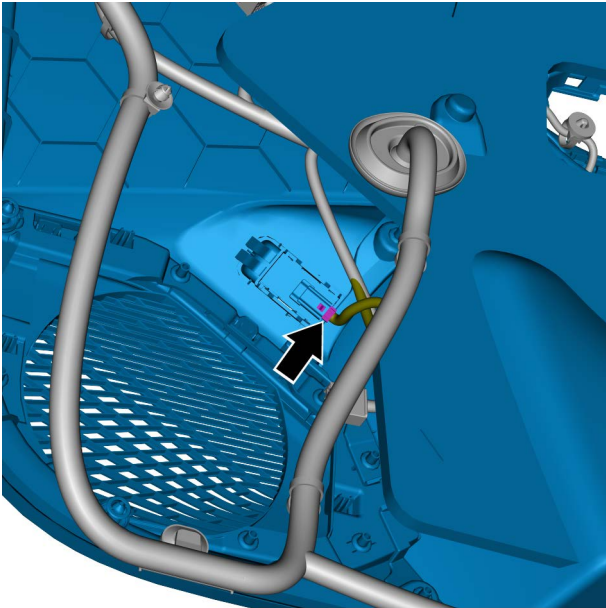
Installation Procedure



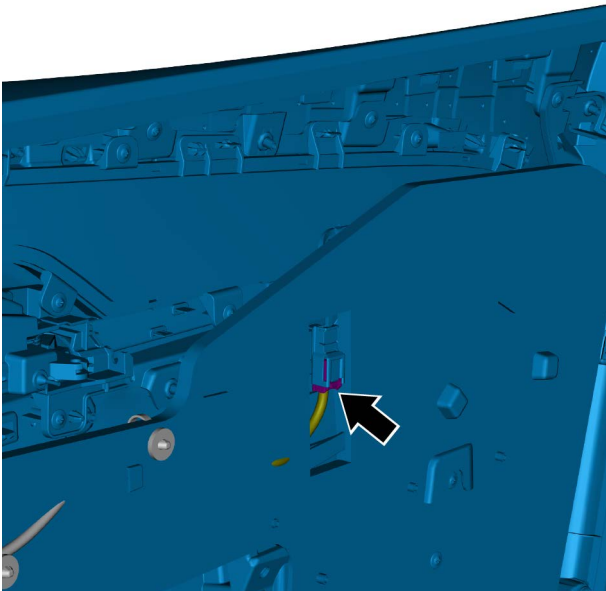
- 1 Install the left front door inner release cable.



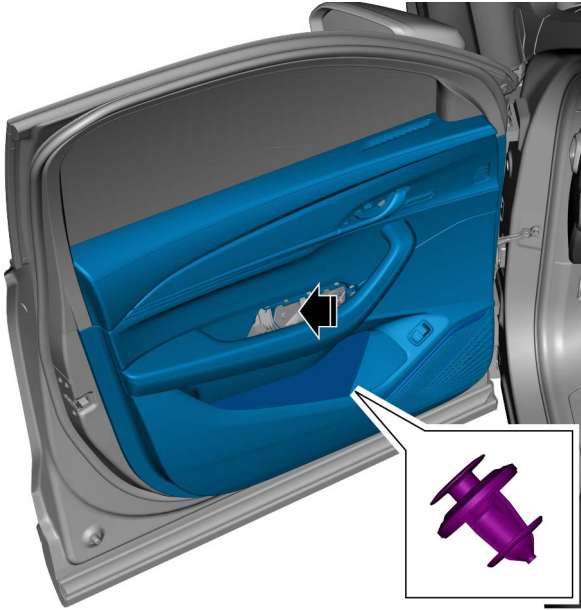
- 2 Connect the memory switch personal settings unit harness connector.



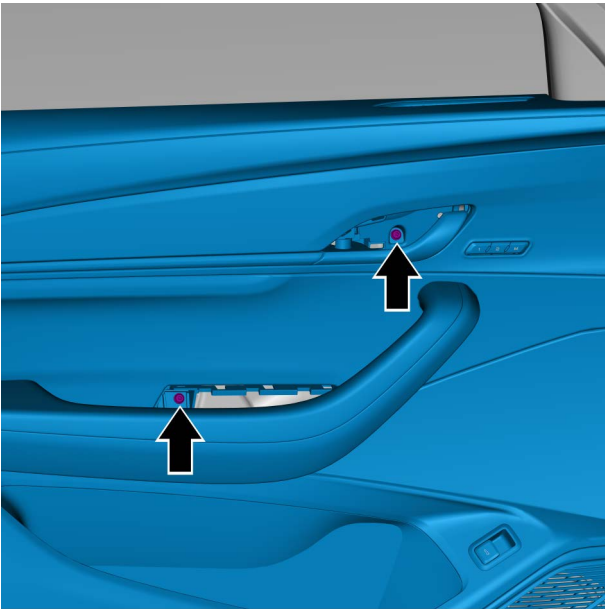
3 Connect the tailgate opening switch harness connector.



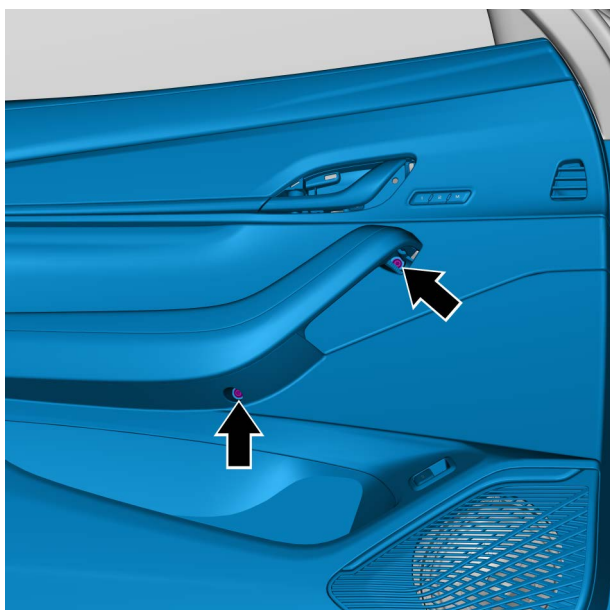
4 Connect the left front door ambient lamp harness connector.



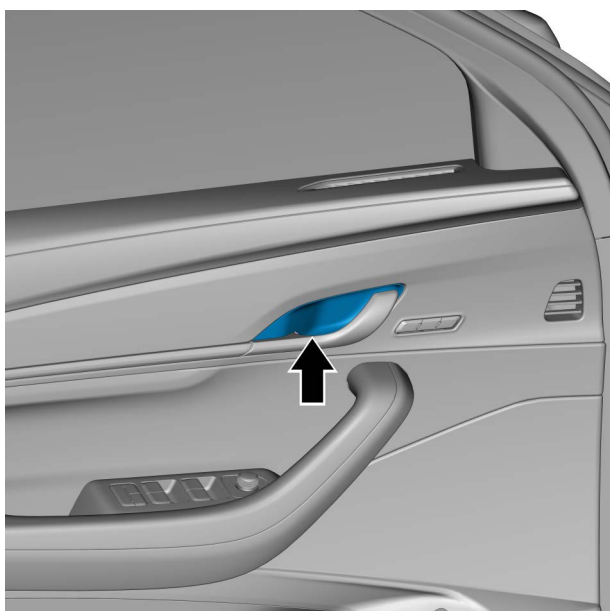
- 5 Install the left front door interior trim panel assembly and fasten the clips around the left front door interior trim panel assembly.



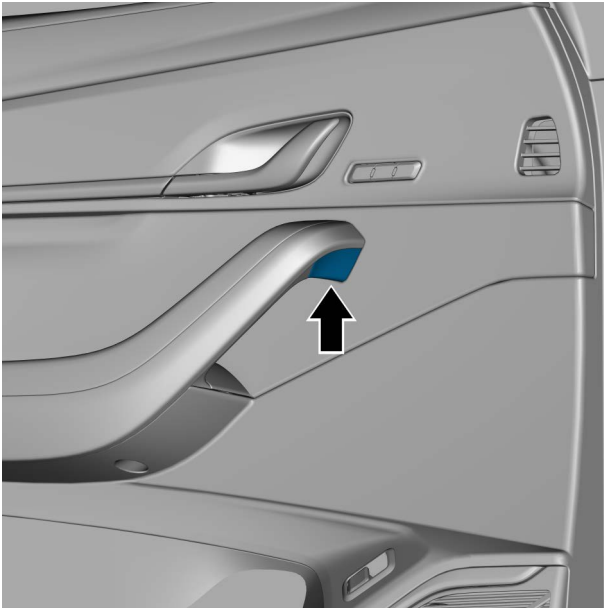
- 6 Install the fixing screw at the left front door inner release handle and the fixing screw at the left front door handle.
Torque: 2.0N·m



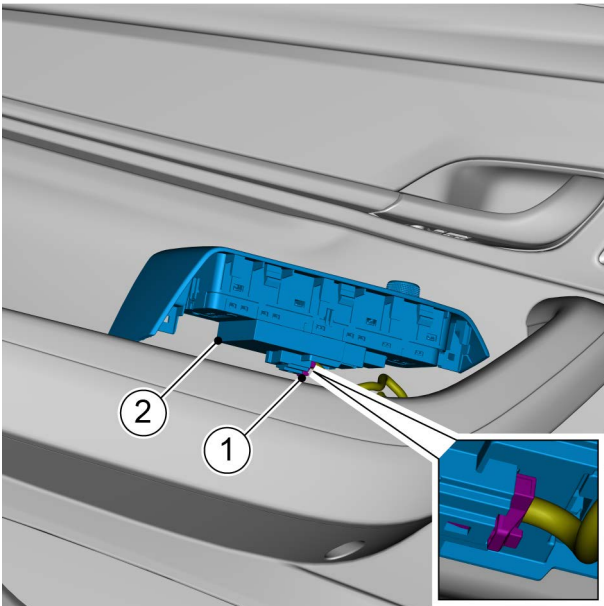
- 7 Install the 2 fixing screws at the left front door tilt handle.
Torque: 2.0N·m



- 8 Install the left front door inner release handle cover.



- 9 Install the left front door tilt handle screw plug cover.



- 10 Connect the driver door switch cluster harness connector 1 and install the driver door switch cluster panel assembly 2.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".

- 11 Connect the negative cable of battery.

13.9.2.2 Replacement of left rear door interior trim panel assembly

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

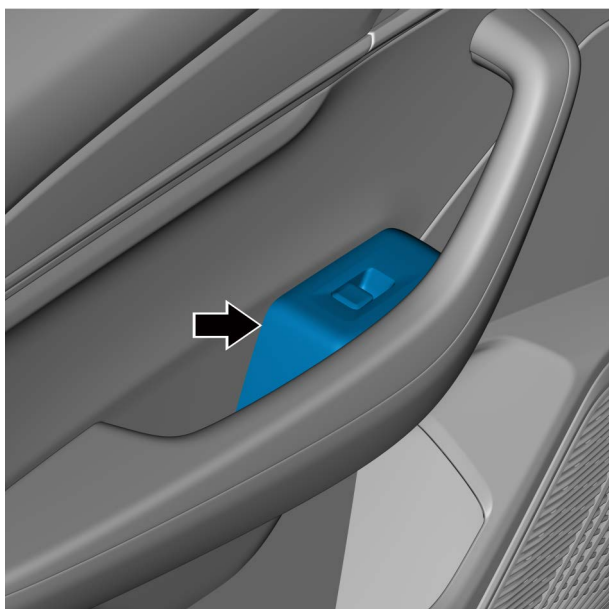
Caution

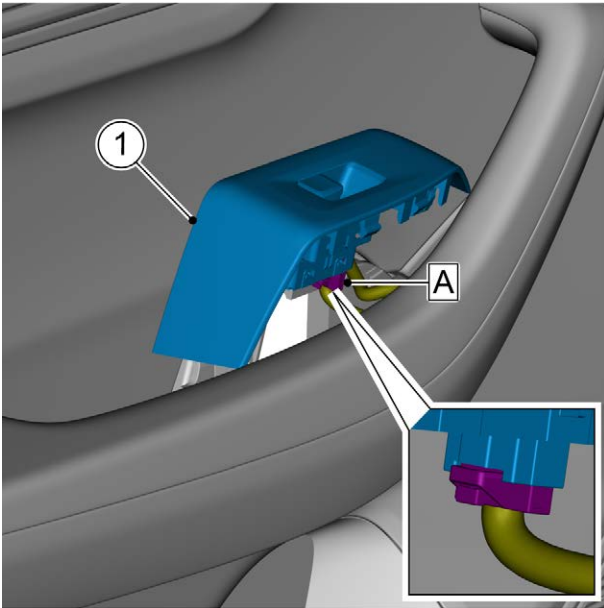
The removal and installation methods of left and right rear door interior trim panel assemblies are similar.

Caution

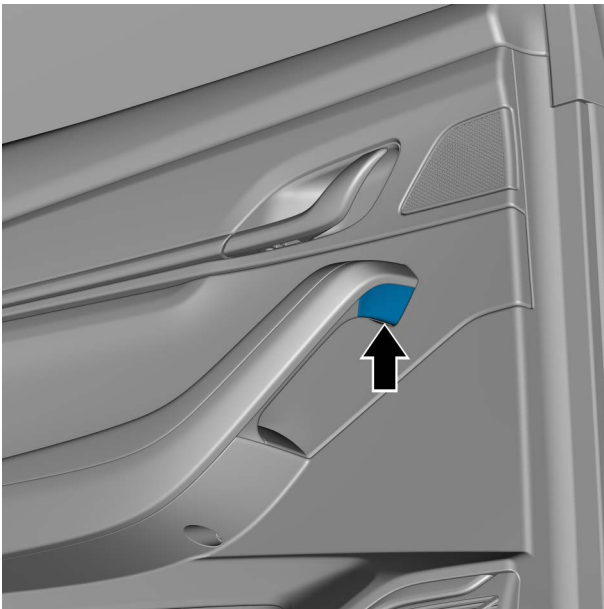
Please use the special tools for vehicle body repair to remove the trim panel, otherwise it is easy to scratch the edge of the interior trim panel.

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the window control switch (left rear) panel assembly.

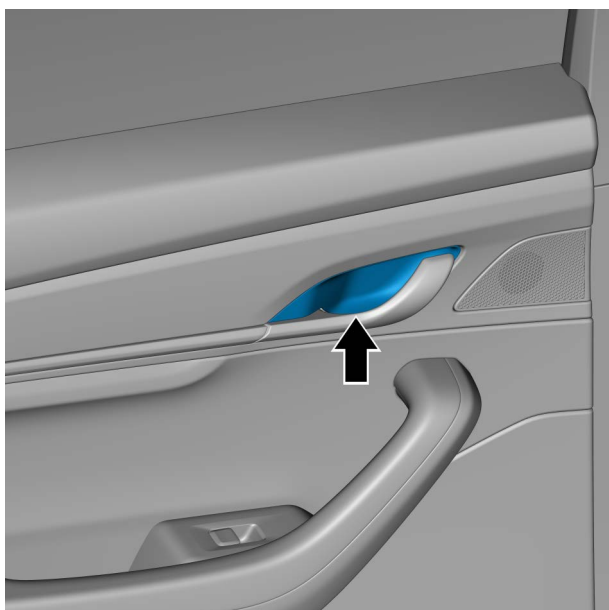




- 3 Disconnect the window control switch (left rear) harness connector A and remove the window control switch (left rear) panel assembly 1.



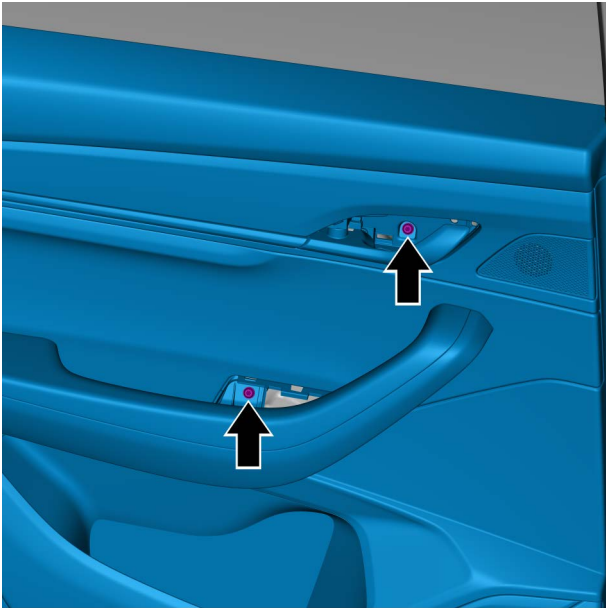
- 4 Remove the left rear door tilt handle screw plug cover.



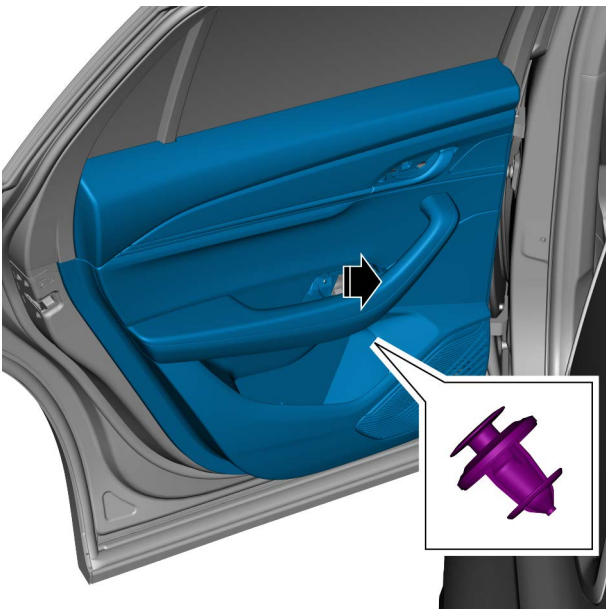
5 Remove the left rear door inner release handle cover.



6 Remove the 2 fixing screws at the left rear door tilt handle.



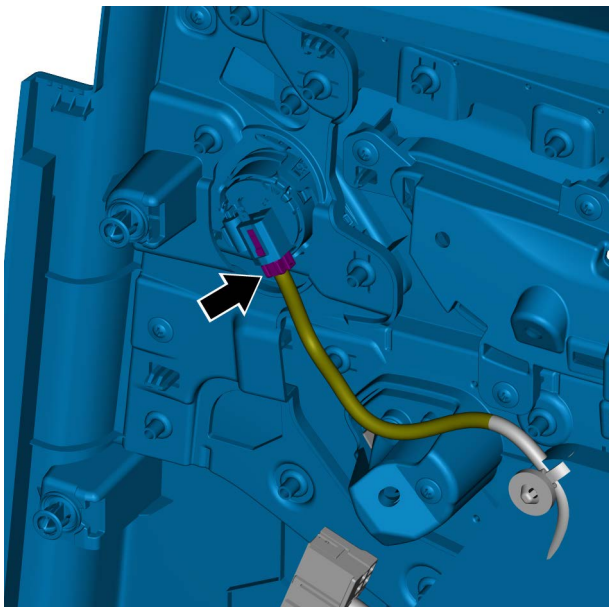
- 7 Remove the fixing screws at the left rear door inner release handle and the fixing screw at the left front door handle.



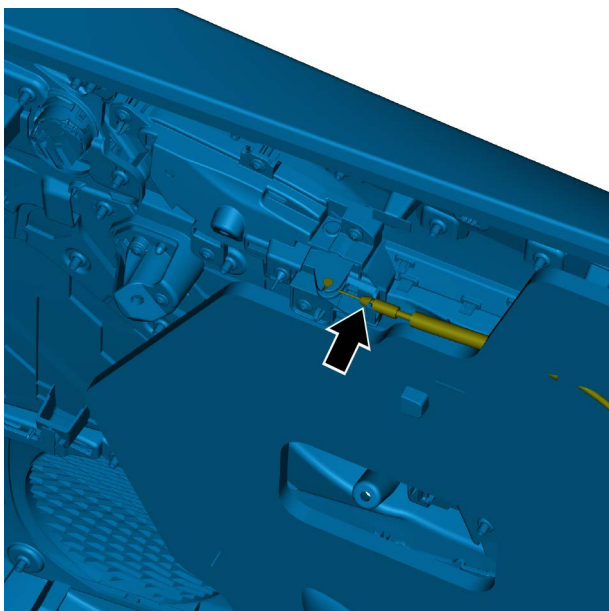
- 8 Disengage the clip fixing the left rear door interior trim panel assembly and separate the left rear door interior trim panel assembly from the door.

Caution

When removing the door inner trim panel, lift it upward and then remove it.

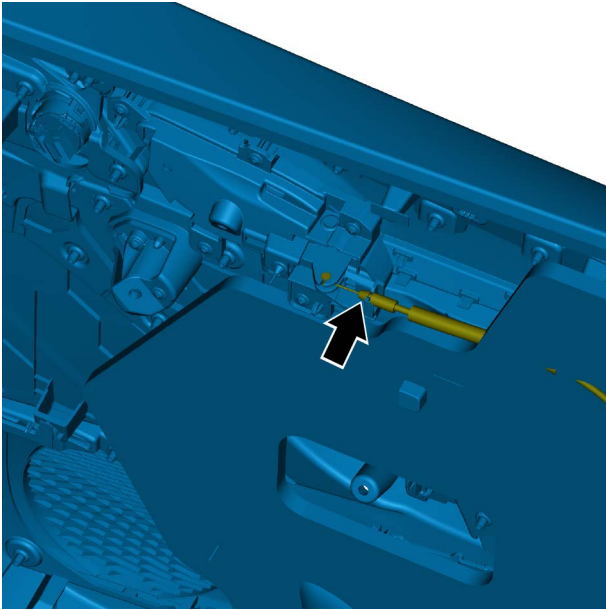


9 Disconnect the door tweeter harness connector.

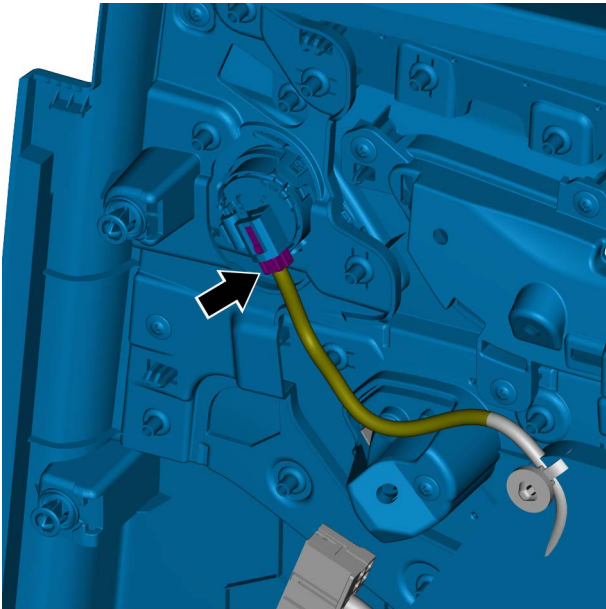


10 Remove the left rear door inner release cable and take off the left rear door interior trim panel assembly.

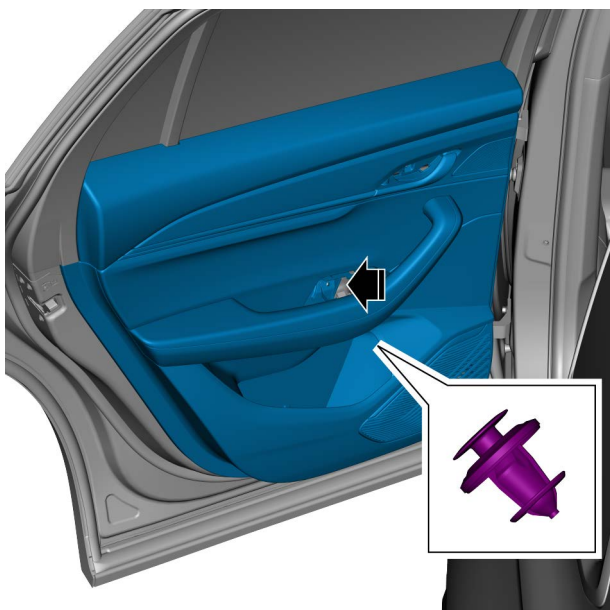
Installation Procedure



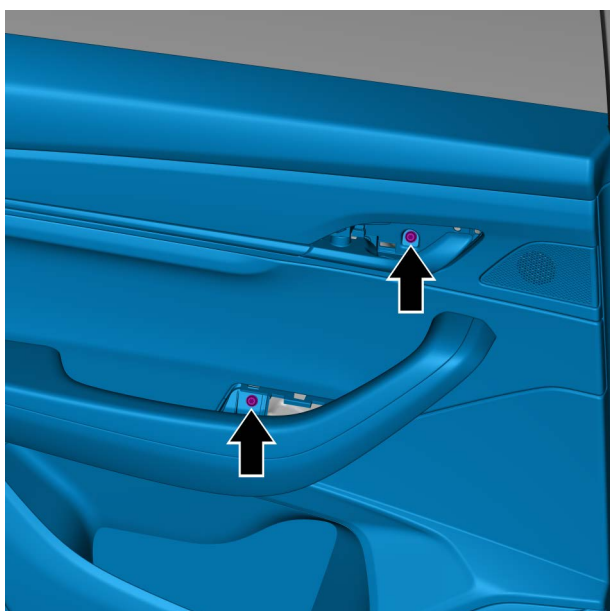
- 1 Install the left rear door inner release cable.



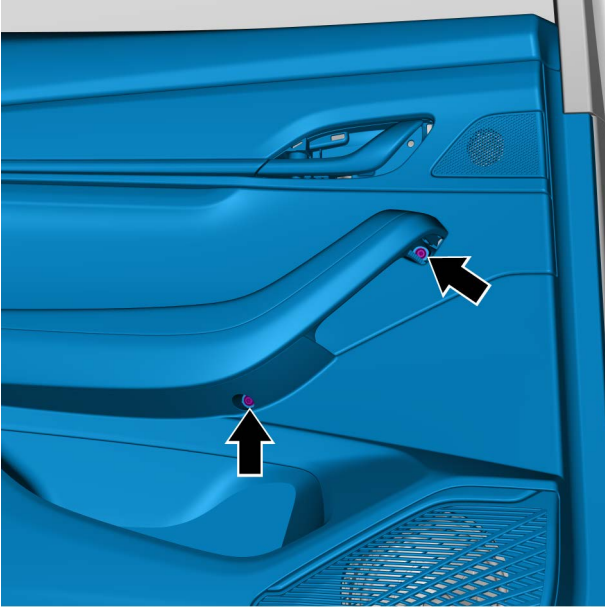
- 2 Connect the door tweeter harness connector.



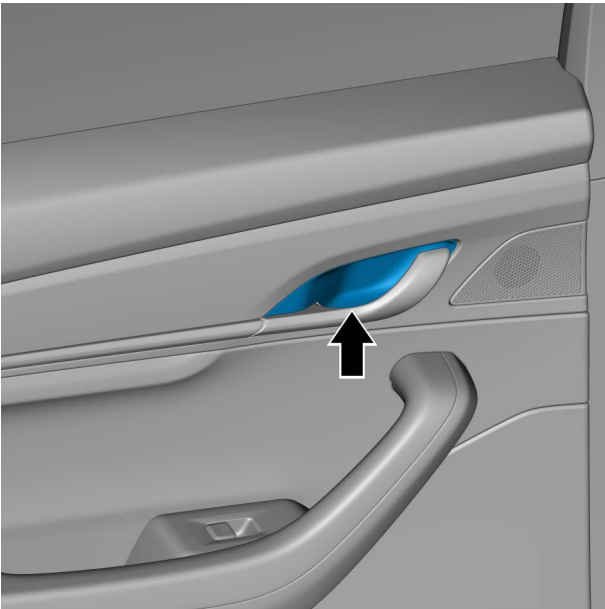
- 3 Install the left rear door interior trim panel assembly and fasten the clips around the left rear door interior trim panel assembly.



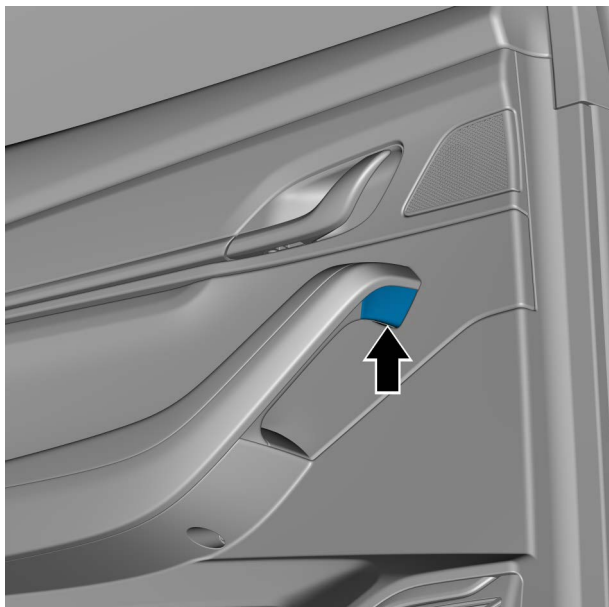
- 4 Install the fixing screws at the left rear door inner release handle and the fixing screws at the left front door handle.
Torque: 2.0N·m



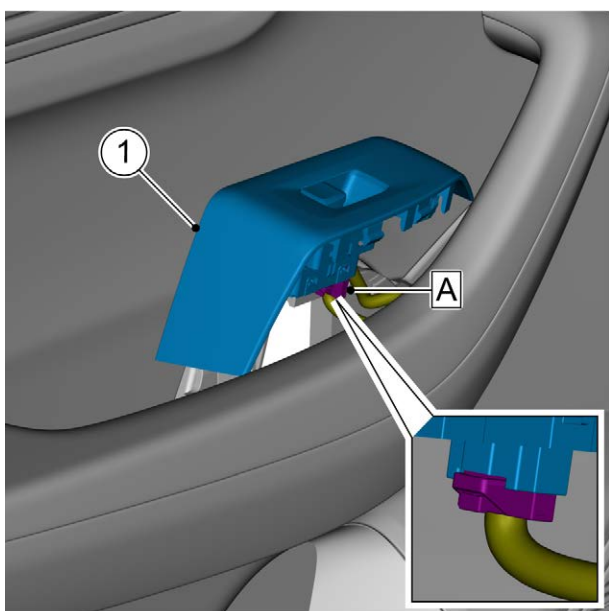
- 5 Install the 2 fixing screws at the left rear door tilt handle.
Torque: 2.0N·m



- 6 Install the left rear door inner release handle cover.



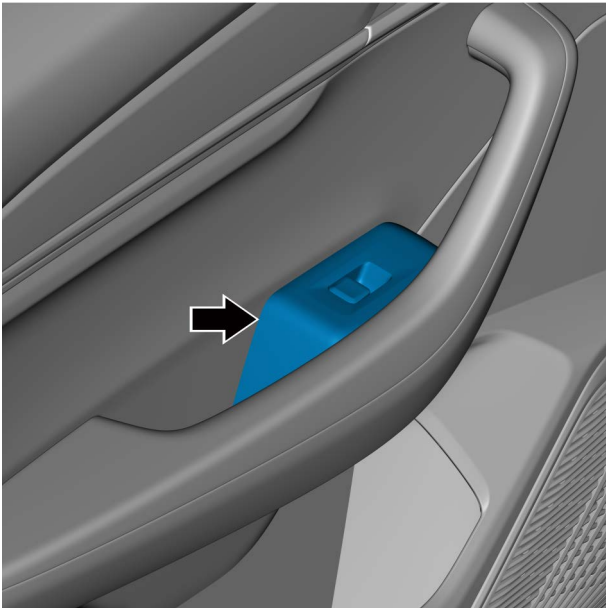
7 Install the left rear door tilt handle screw plug cover.



8 Connect the window control switch (left rear) harness connector A and install the window control switch (left rear) panel assembly 1.

Caution

Firmly plug in the harness according to the principle of "plugging, sounding and confirming".



- 9 Install the window control switch (left rear) panel assembly.

- 10 Connect the negative cable of battery.

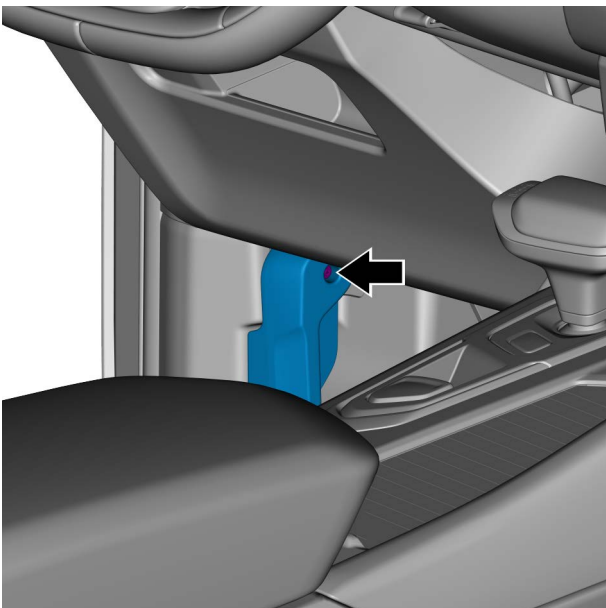
13.9.2.3 Replacement of left front door sill trim panel assembly

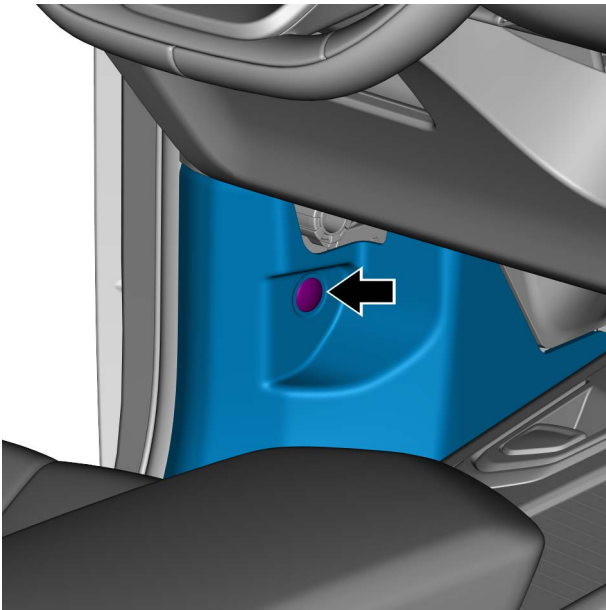
Removal Procedure

Caution

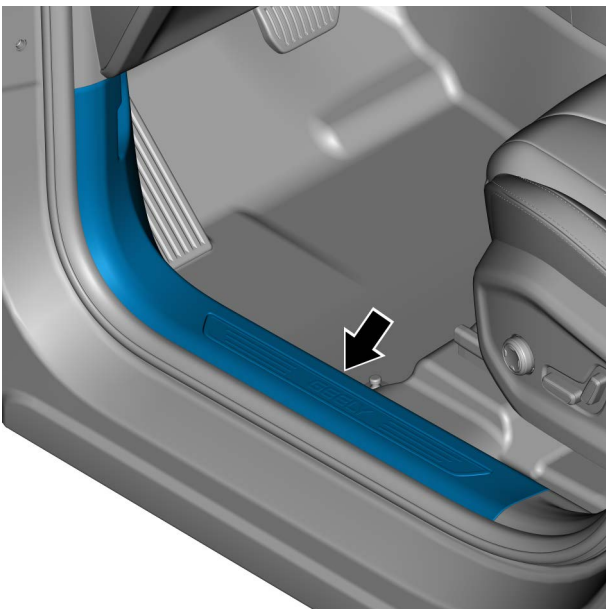
Please use the special tools for vehicle body repair to remove the trim panel, otherwise it is easy to scratch the edge of the interior trim panel.

- 1 Remove the instrument panel front left side end cover assembly, refer to [Replacement of instrument panel front left side end cover assembly](#).
- 2 Remove the fixing bolts of engine hood latch release handle body.



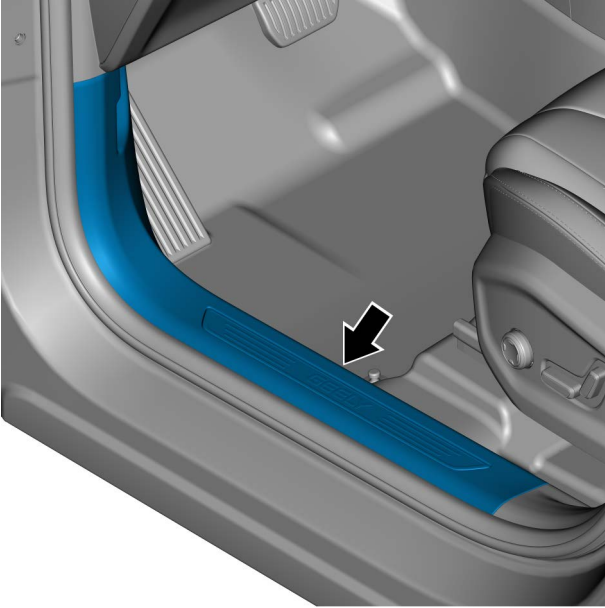


- 3 Remove the fixing clips of left front door sill trim panel assembly.

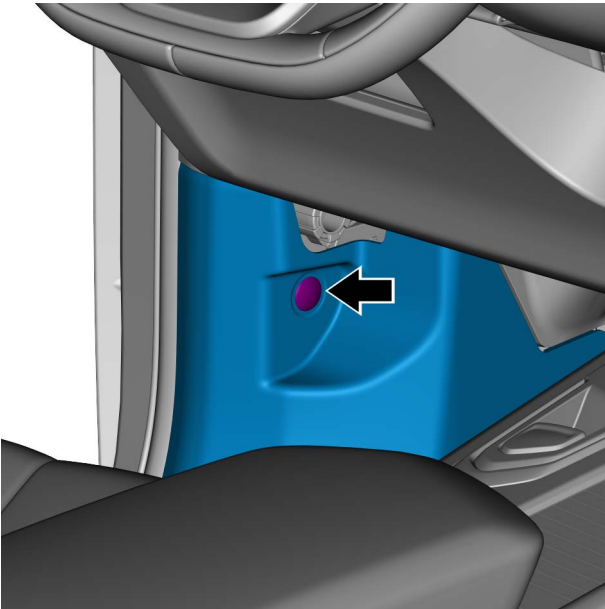


- 4 Remove the left front door sill trim panel assembly and remove the left front door sill trim panel assembly.

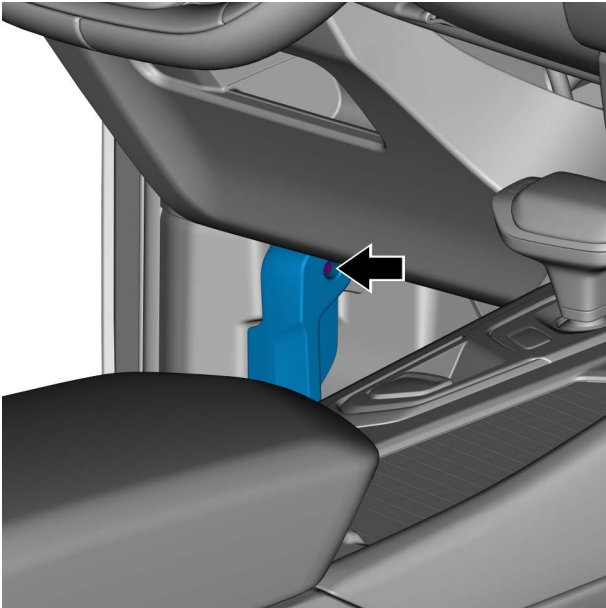
Installation Procedure



- 1 Install the left front door sill trim panel assembly.



- 2 Install the fixing clips of left front door sill trim panel assembly.



- 3 Install the fixing bolts of engine hood latch release handle body.
Torque: 2.9N·m

- 4 Install the instrument panel front left side end cover assembly.

13.9.2.4 Replacement of right front door sill trim panel assembly

Removal Procedure

Caution

Please use the special tools for vehicle body repair to remove the trim panel, otherwise it is easy to scratch the edge of the interior trim panel.

- 1 Remove the instrument panel front right side end cover assembly, refer to [Replacement of instrument panel front left side end cover assembly](#).
- 2 Remove the right front door sill trim panel assembly and remove the right front door sill trim panel assembly.



Installation Procedure



- 1 Install the right front door sill trim panel assembly.

- 2 Install the instrument panel front right side end cover assembly.

13.9.2.5 Replacement of left rear door sill interior trim panel assembly

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

Caution

The removal and installation methods of left and right rear door sill interior trim panel assemblies are similar.

Caution

Please use the special tools for vehicle body repair to remove the trim panel, otherwise it is easy to scratch the edge of the interior trim panel.

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the rear seat cushion assembly, refer to [Replacement of rear seat cushion assembly](#).
- 3 Remove the rear seat left backrest assembly, refer to [Replacement of rear seat left backrest assembly](#).
- 4 Remove the luggage compartment door sill trim panel assembly, refer to [Replacement of luggage compartment door sill trim panel assembly](#).

- 5 Remove the left upper trim panel of luggage compartment, refer to [Replacement of luggage compartment left upper trim panel](#).
- 6 Remove the luggage compartment light, refer to [Replacement of luggage compartment light](#).
- 7 Remove the 12V socket (luggage compartment), refer to [Replacement of 12V socket \(luggage compartment\)](#).
- 8 Remove the left luggage compartment side shield assembly, refer to [Replacement of left luggage compartment side shield assembly](#).
- 9 Remove the fixing screws of left rear door sill interior trim panel assembly and remove the left rear door sill trim panel assembly.



Installation Procedure

- 1 Install the fixing screws of left rear door sill interior trim panel assembly.
Torque: 1.5N·m



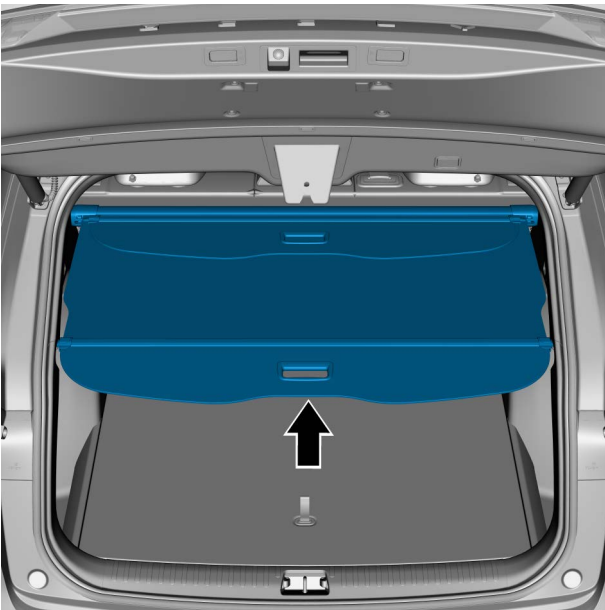
- 2 Install the left luggage compartment side shield assembly.

- 3 Install the 12V socket (luggage compartment).
- 4 Install the boot lamp.
- 5 Install the left upper trim panel of luggage compartment.
- 6 Install the luggage compartment door sill trim panel assembly.
- 7 Install the rear seat left backrest assembly.
- 8 Install the rear seat cushion assembly.
- 9 Connect the negative cable of battery.

13.9.2.6 Replacement of trunk shade

Removal Procedure

- 1 Remove the trunk shade and take it off.



Installation Procedure

- 1 Install the trunk shade.



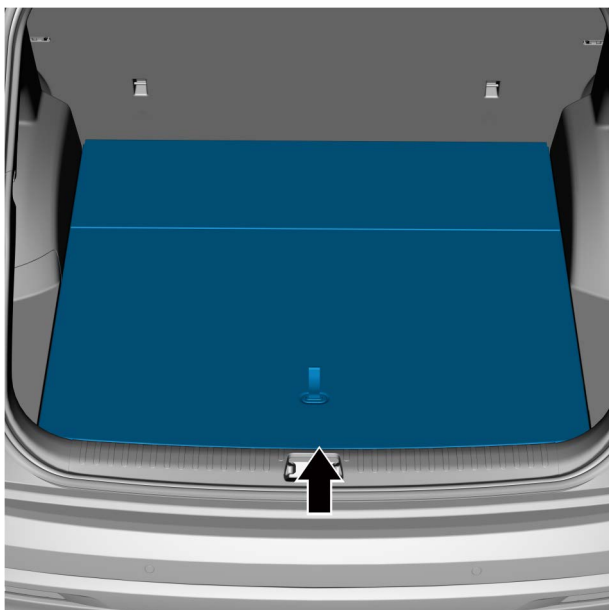
13.9.2.7 Replacement of tailgate sill trim panel assembly

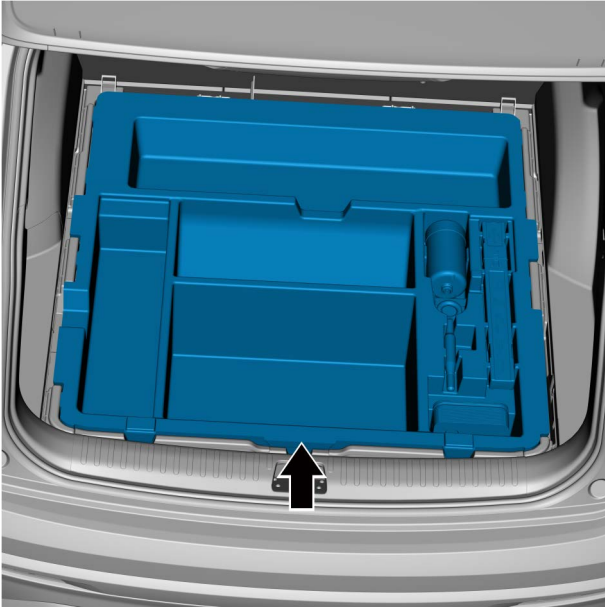
Removal Procedure

Caution

Please use the special tools for vehicle body repair to remove the trim panel, otherwise it is easy to scratch the edge of the interior trim panel.

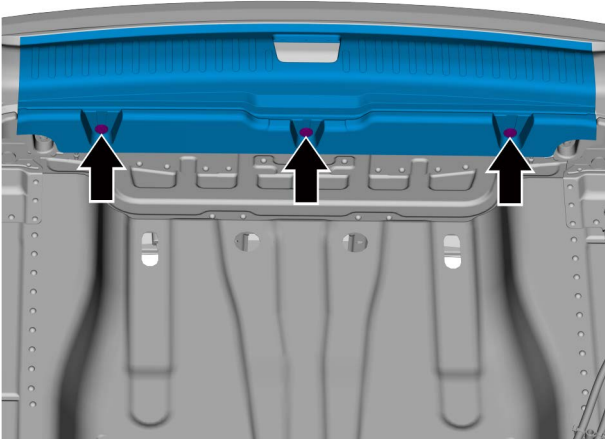
- 1 Remove the trunk shade, refer to [Replacement of trunk shade](#).
- 2 Remove the luggage compartment carpet assembly.





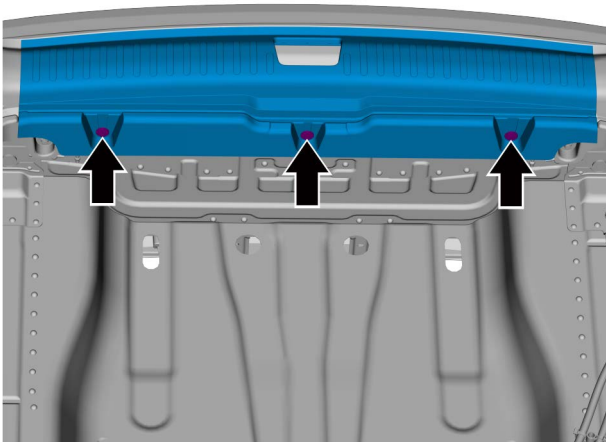
3 Remove the luggage compartment storage box.

4 Remove the 3 G-clips of tailgate sill trim panel assembly and take off the tailgate sill trim panel assembly.

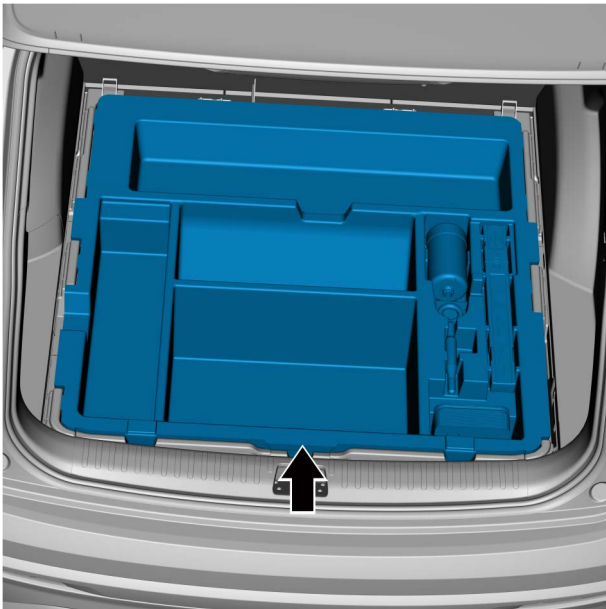


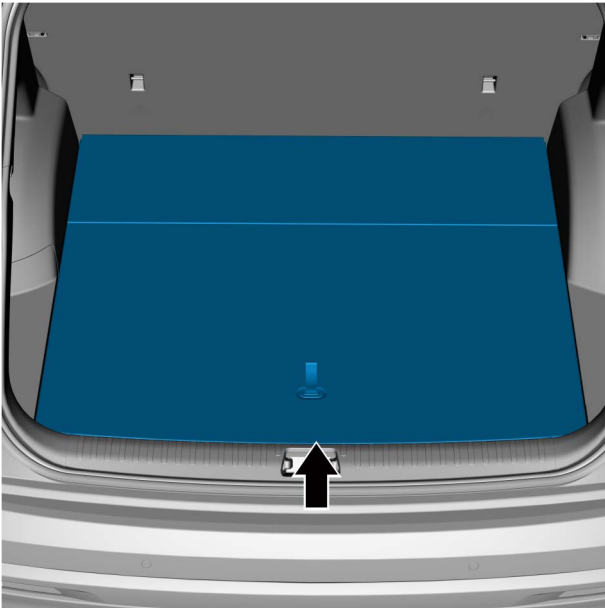
Installation Procedure

- 1 Install the 3 G-clips of the tailgate sill trim panel assembly.



- 2 Install the luggage compartment storage box.





- 3 Install the luggage compartment carpet assembly.

- 4 Install the trunk shade.

13.9.2.8 Replacement of luggage compartment left upper trim panel

Removal Procedure

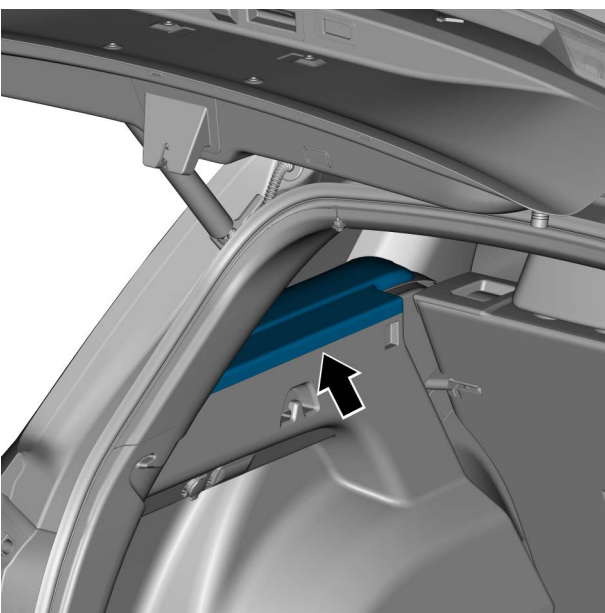
Caution

The removal and installation methods of left and right luggage compartment upper trim panel covers are similar.

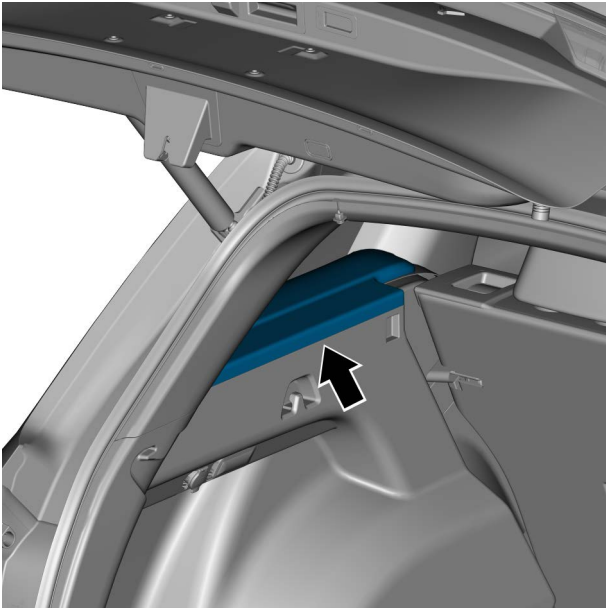
Caution

Please use the special tools for vehicle body repair to remove the trim panel, otherwise it is easy to scratch the edge of the interior trim panel.

- 1 Remove the luggage compartment left upper trim panel and take off the luggage compartment left upper trim panel.



Installation Procedure



- 1 Install the left upper trim panel of luggage compartment.

13.9.2.9 Replacement of luggage compartment left trim panel assembly

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

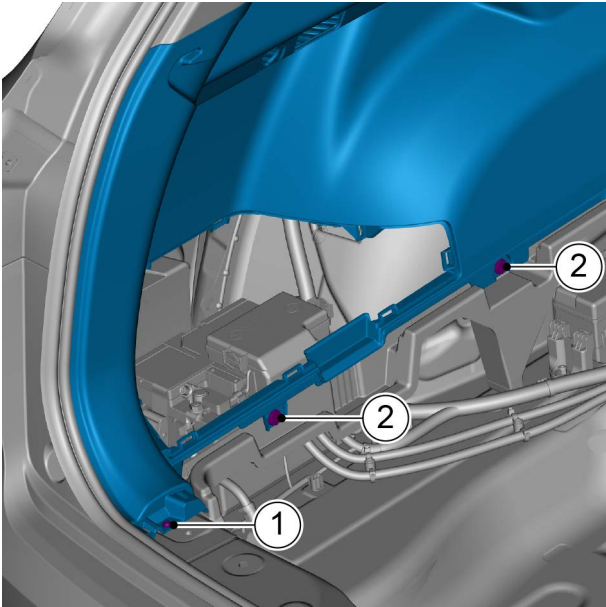
Caution

The removal and installation methods of left and right luggage compartment shield assemblies are similar.

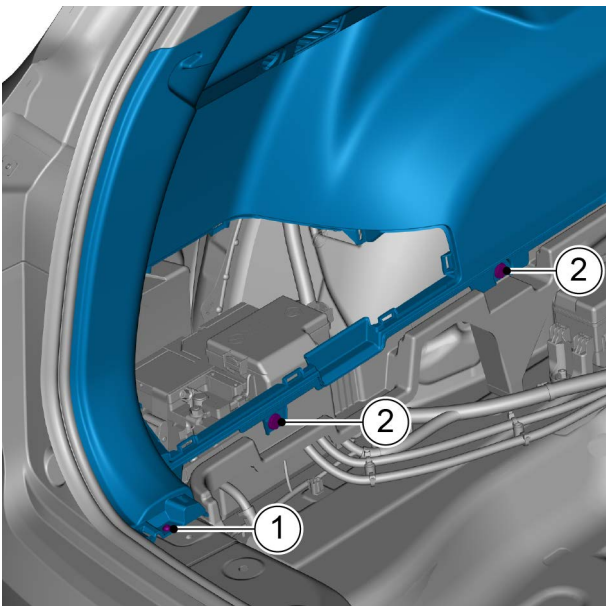
Caution

Please use the special tools for vehicle body repair to remove the trim panel, otherwise it is easy to scratch the edge of the interior trim panel.

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left luggage compartment trim panel access covers, refer to [Replacement of left luggage compartment trim panel access cover](#).
- 3 Remove the rear seat cushion assembly, refer to [Replacement of rear seat cushion assembly](#).
- 4 Remove the rear seat left backrest assembly, refer to [Replacement of rear seat left backrest assembly](#).
- 5 Remove the luggage compartment door sill trim panel assembly, refer to [Replacement of luggage compartment door sill trim panel assembly](#).



- 6 Remove the left upper trim panel of luggage compartment, refer to [Replacement of luggage compartment left upper trim panel](#).
- 7 Remove the luggage compartment light, refer to [Replacement of luggage compartment light](#).
- 8 Remove the 12V socket (luggage compartment), refer to [Replacement of 12V socket \(luggage compartment\)](#).
- 9 Remove the fixing screw 1 of luggage compartment left trim panel assembly.
- 10 Remove the 2 G-clips 2 of luggage compartment left trim panel assembly and take off the luggage compartment left trim panel assembly.



Installation Procedure

- 1 Install the 2 G-clips 2 of the luggage compartment left trim panel assembly.
- 2 Install the fixing screw 1 of luggage compartment left trim panel assembly.
Torque: 1.5N·m

- 3 Install the 12V socket (luggage compartment).
- 4 Install the boot lamp.
- 5 Install the left upper trim panel of luggage compartment.
- 6 Install the luggage compartment door sill trim panel assembly.

- 7 Install the rear seat left backrest assembly.
- 8 Install the rear seat cushion assembly.
- 9 Install the left luggage compartment trim panel access cover.
- 10 Connect the negative cable of battery.

13.9.2.10 Replacement of left A-pillar upper trim panel assembly

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

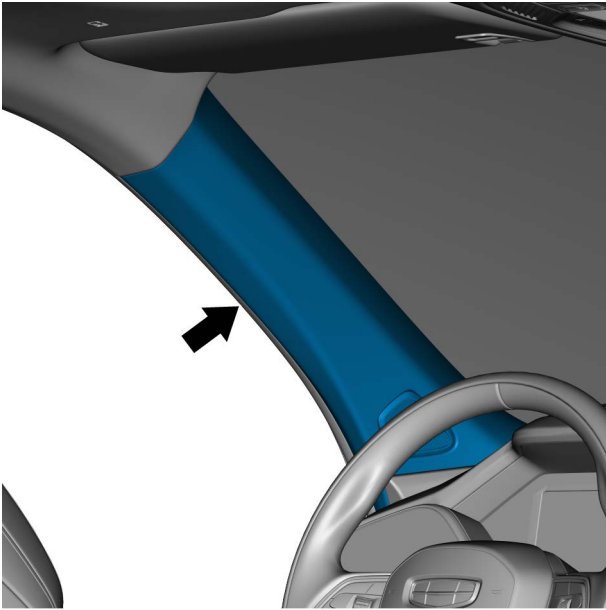
Caution

The removal and installation methods of left and right A-pillar upper trim panel assemblies are similar.

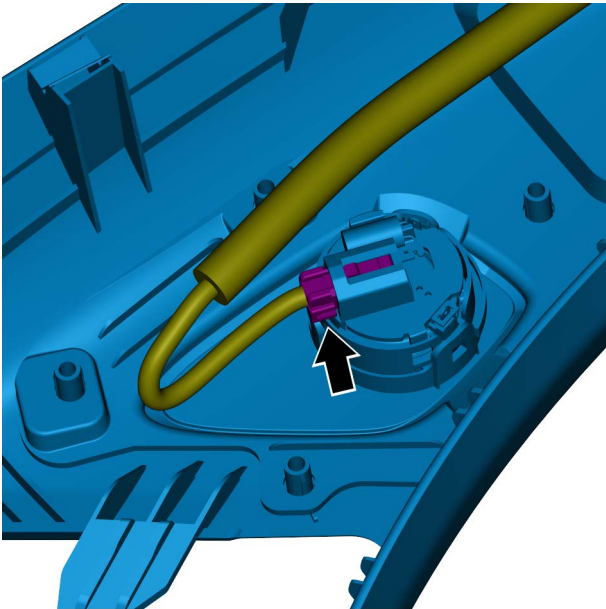
Caution

Please use the special vehicle body repair tools to remove the pillar trim panel, otherwise it is easy to scratch panel edge of the pillar trim panel.

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

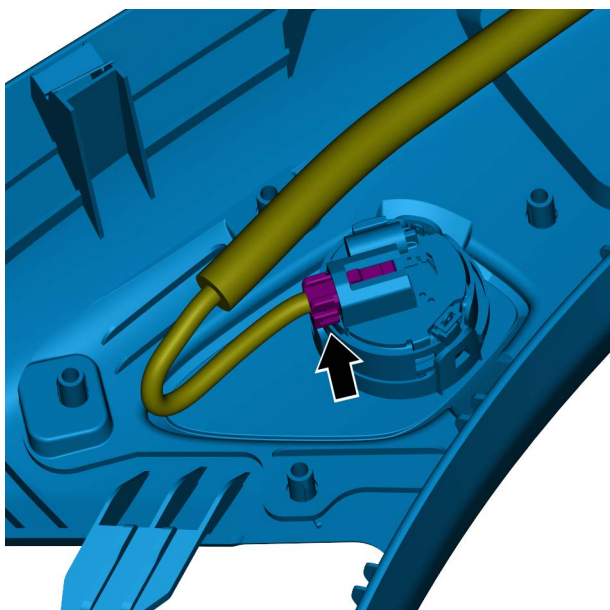


2 Remove the left A-pillar upper trim panel assembly.

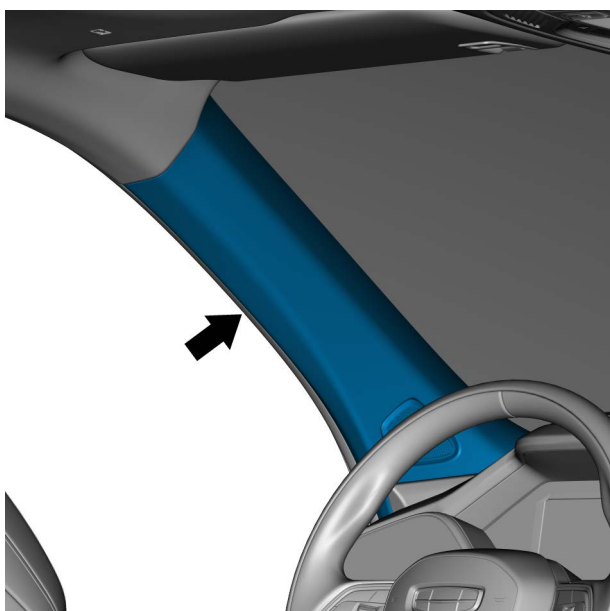


3 Disconnect the door tweeter harness connector and remove the left A-pillar upper trim panel assembly.

Installation Procedure



1 Connect the door tweeter harness connector.



2 Install the left A-pillar upper trim panel assembly.

3 Connect the negative cable of battery.

13.9.2.11 Replacement of left B-pillar lower trim panel assembly

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#)

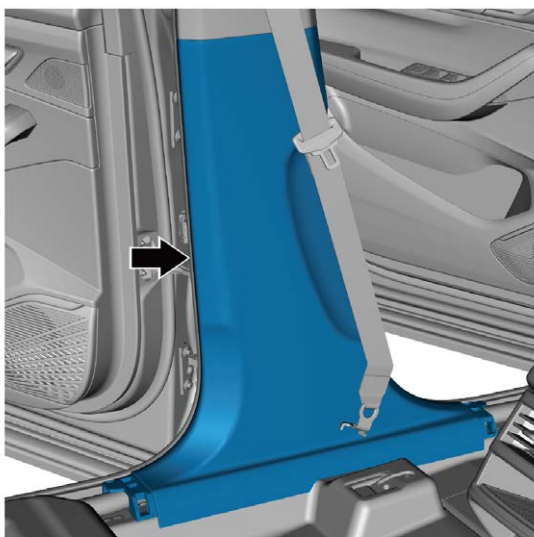
Caution

The removal and installation methods of left and right B-pillar lower trim panel assemblies are similar.

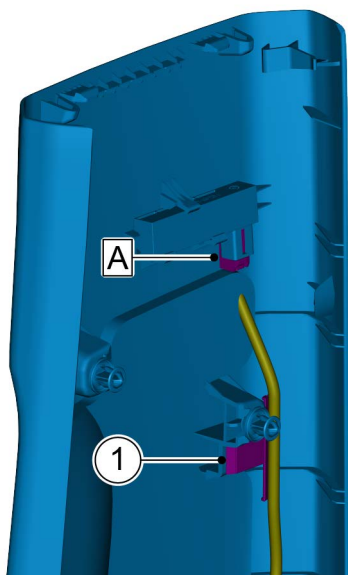
Caution

Please use the special vehicle body repair tools to remove the pillar trim panel, otherwise it is easy to scratch panel edge of the pillar trim panel.

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left front door sill trim panel assembly, refer to [Replacement of left front door sill trim panel assembly](#).
- 3 Remove the rear seat cushion assembly, refer to [Replacement of rear seat cushion assembly](#).
- 4 Remove the rear seat left backrest assembly, refer to [Replacement of rear seat left backrest assembly](#).
- 5 Remove the luggage compartment door sill trim panel assembly, refer to [Replacement of luggage compartment door sill trim panel assembly](#).
- 6 Remove the left upper trim panel of luggage compartment, refer to [Replacement of luggage compartment left upper trim panel](#).
- 7 Remove the luggage compartment light, refer to [Replacement of luggage compartment light](#).
- 8 Remove the 12V socket (luggage compartment), refer to [Replacement of 12V socket \(luggage compartment\)](#).
- 9 Remove the left luggage compartment side shield assembly, refer to [Replacement of left luggage compartment side shield assembly](#).
- 10 Remove the left rear door sill interior trim panel assembly, refer to [Replacement of left rear door sill interior trim panel assembly](#).

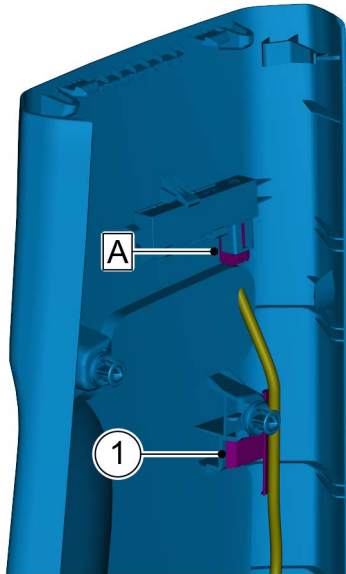


- 11 Remove the lower trim panel assembly of the right B-pillar.

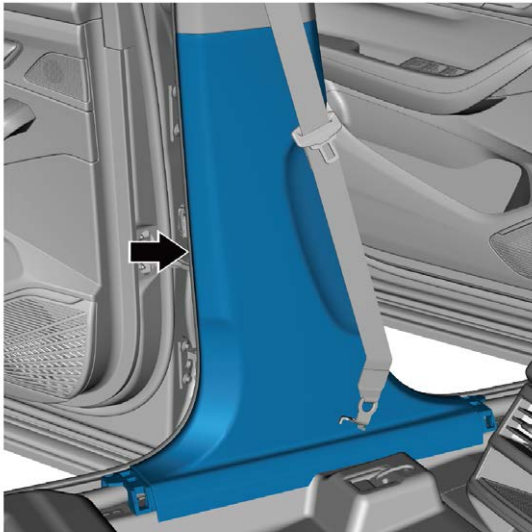


- 12 Disconnect the keyless vehicle antenna (left) harness connector A.
- 13 Remove the harness clip 1 of floor harness and remove the left B-pillar lower trim panel assembly.

Installation Procedure



- 1 Connect the keyless vehicle antenna (left) harness connector A.
- 2 Install the harness clip 1 of floor harness.



- 3 Install the left B-pillar lower trim panel assembly.

- 4 Install the left rear door sill interior trim panel assembly.
- 5 Install the left luggage compartment side shield assembly.
- 6 Install the 12V socket (luggage compartment).
- 7 Install the boot lamp.
- 8 Install the left upper trim panel of luggage compartment.
- 9 Install the luggage compartment door sill trim panel assembly.
- 10 Install the rear seat left backrest assembly.
- 11 Install the rear seat cushion assembly.
- 12 Install the left front door sill trim panel assembly.
- 13 Connect the negative cable of battery.

13.9.2.12 Replacement of left B-pillar upper trim panel assembly

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

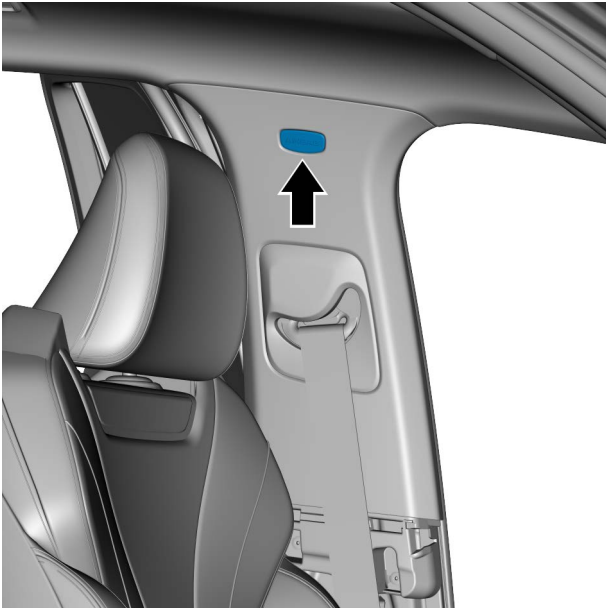
Caution

The removal and installation methods of left and right B-pillar upper trim panel assemblies are similar.

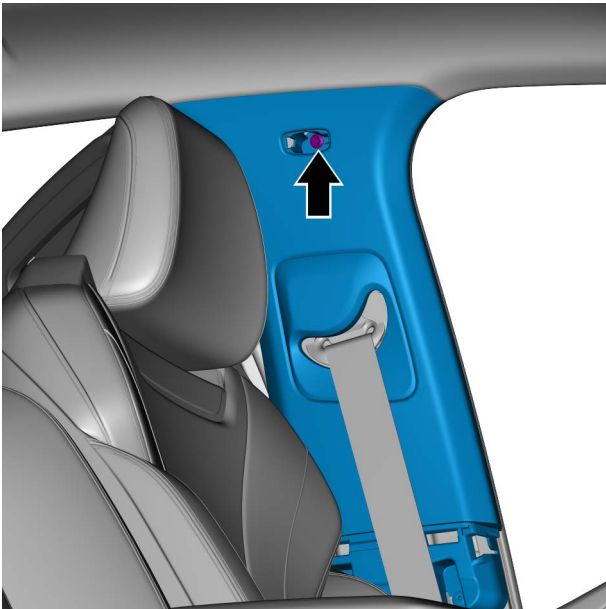
Caution

Please use the special vehicle body repair tools to remove the pillar trim panel, otherwise it is easy to scratch panel edge of the pillar trim panel.

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left front door sill trim panel assembly, refer to [Replacement of left front door sill trim panel assembly](#).
- 3 Remove the rear seat cushion assembly, refer to [Replacement of rear seat cushion assembly](#).
- 4 Remove the rear seat left backrest assembly, refer to [Replacement of rear seat left backrest assembly](#).
- 5 Remove the luggage compartment door sill trim panel assembly, refer to [Replacement of luggage compartment door sill trim panel assembly](#).
- 6 Remove the left upper trim panel of luggage compartment, refer to [Replacement of luggage compartment left upper trim panel](#).
- 7 Remove the luggage compartment light, refer to [Replacement of luggage compartment light](#).
- 8 Remove the 12V socket (luggage compartment), refer to [Replacement of 12V socket \(luggage compartment\)](#).
- 9 Remove the left luggage compartment side shield assembly, refer to [Replacement of left luggage compartment side shield assembly](#).
- 10 Remove the left rear door sill interior trim panel assembly, refer to [Replacement of left rear door sill interior trim panel assembly](#).
- 11 Remove the left B-pillar lower trim panel assembly, refer to [Replacement of left B-pillar lower trim panel assembly](#).



12 Remove the left airbag high configuration marking cover.



13 Remove the fixing bolt of left B-pillar upper trim panel assembly and remove the left B-pillar upper trim panel assembly.

Installation Procedure



- 1 Install the fixing bolt of left B-pillar upper trim panel assembly.

Torque: 3.5N·m



- 2 Install the left airbag high configuration marking cover.

- 3 Install the left B-pillar lower trim panel assembly.
- 4 Install the left rear door sill interior trim panel assembly.
- 5 Install the left luggage compartment side shield assembly.
- 6 Install the 12V socket (luggage compartment).
- 7 Install the boot lamp.
- 8 Install the left upper trim panel of luggage compartment.
- 9 Install the luggage compartment door sill trim panel assembly.
- 10 Install the rear seat left backrest assembly.
- 11 Install the rear seat cushion assembly.

- 12 Install the left front door sill trim panel assembly.
- 13 Connect the negative cable of battery.

13.9.2.13 Replacement of left C-pillar upper trim panel assembly

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

Caution

The removal and installation methods of left and right C-pillar upper trim panel assemblies are similar.

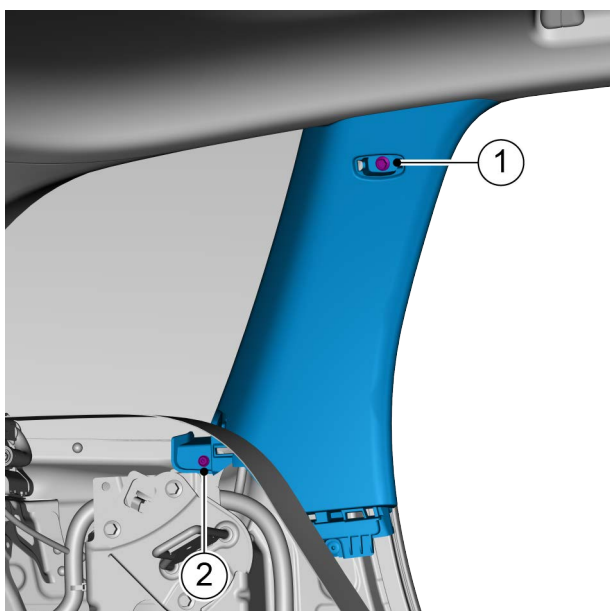
Caution

Please use the special vehicle body repair tools to remove the pillar trim panel, otherwise it is easy to scratch panel edge of the pillar trim panel.

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the rear seat cushion assembly, refer to [Replacement of rear seat cushion assembly](#).
- 3 Remove the rear seat left backrest assembly, refer to [Replacement of rear seat left backrest assembly](#).
- 4 Remove the luggage compartment door sill trim panel assembly, refer to [Replacement of luggage compartment door sill trim panel assembly](#).
- 5 Remove the left upper trim panel of luggage compartment, refer to [Replacement of luggage compartment left upper trim panel](#).
- 6 Remove the luggage compartment light, refer to [Replacement of luggage compartment light](#).
- 7 Remove the 12V socket (luggage compartment), refer to [Replacement of 12V socket \(luggage compartment\)](#).
- 8 Remove the left luggage compartment side shield assembly, refer to [Replacement of left luggage compartment side shield assembly](#).

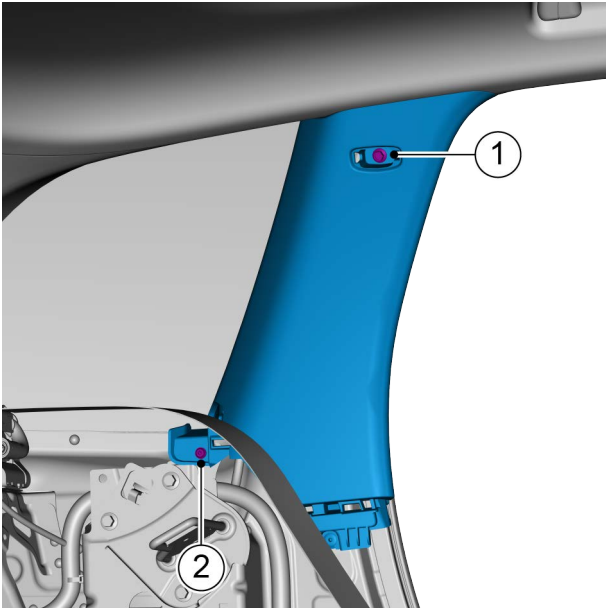


9 Remove the left airbag high configuration marking cover.



10 Remove the fixing bolt 1 and fixing screw 2 of left C-pillar upper trim panel assembly and remove the left C-pillar upper trim panel assembly.

Installation Procedure



- 1 Install the fixing bolt 1 and fixing screw 2 of left C-pillar upper trim panel assembly.
Screw torque: 1.5N·m
Bolt torque: 3.5 N·m



- 2 Install the left airbag high configuration marking cover.

- 3 Install the left luggage compartment side shield assembly.
- 4 Install the 12V socket (luggage compartment).
- 5 Install the boot lamp.
- 6 Install the left upper trim panel of luggage compartment.
- 7 Install the luggage compartment door sill trim panel assembly.
- 8 Install the rear seat left backrest assembly.
- 9 Install the rear seat cushion assembly.
- 10 Connect the negative cable of battery.

13.9.2.14 Replacement of left D-pillar upper trim panel assembly

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#)

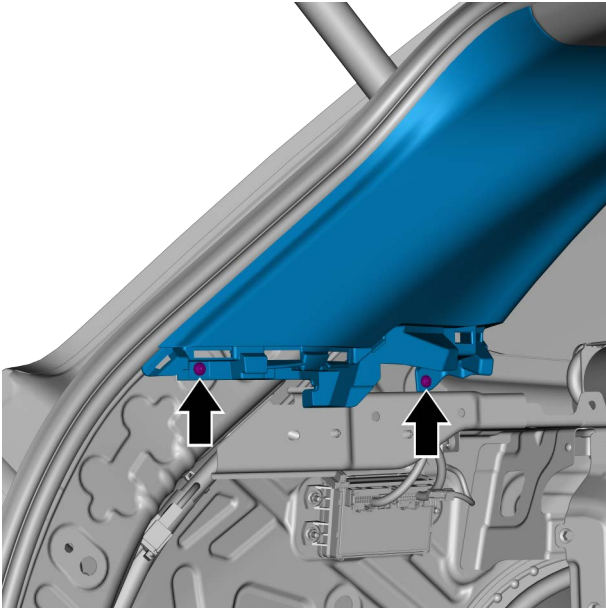
Caution

The removal and installation methods of left and right D-pillar upper trim panel assemblies are similar.

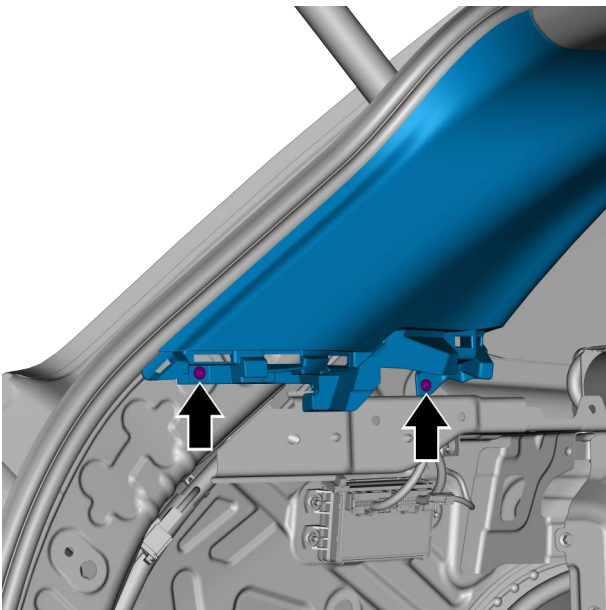
Caution

Please use the special vehicle body repair tools to remove the pillar trim panel, otherwise it is easy to scratch panel edge of the pillar trim panel.

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the rear seat cushion assembly, refer to [Replacement of rear seat cushion assembly](#).
- 3 Remove the rear seat left backrest assembly, refer to [Replacement of rear seat left backrest assembly](#).
- 4 Remove the luggage compartment door sill trim panel assembly, refer to [Replacement of luggage compartment door sill trim panel assembly](#).
- 5 Remove the left upper trim panel of luggage compartment, refer to [Replacement of luggage compartment left upper trim panel](#).
- 6 Remove the luggage compartment light, refer to [Replacement of luggage compartment light](#).
- 7 Remove the 12V socket (luggage compartment), refer to [Replacement of 12V socket \(luggage compartment\)](#).
- 8 Remove the left luggage compartment side shield assembly, refer to [Replacement of left luggage compartment side shield assembly](#).



- 9 Remove the left C-pillar upper trim panel assembly, refer to [Replacement of left C-pillar upper trim panel assembly](#).
- 10 Remove the 2 fixing screws of left C-pillar upper trim panel assembly and remove the left C-pillar upper trim panel assembly.



Installation Procedure

- 1 Install the 2 fixing screws of left D-pillar upper trim panel assembly.

Torque: 1.5N·m

- 2 Install the left C-pillar upper trim panel assembly.
- 3 Install the left luggage compartment side shield assembly.
- 4 Install the 12V socket (luggage compartment).
- 5 Install the boot lamp.
- 6 Install the left upper trim panel of luggage compartment.
- 7 Install the luggage compartment door sill trim panel.
- 8 Install the rear seat left backrest assembly.

- 9 Install the rear seat cushion assembly.
- 10 Connect the negative cable of battery.

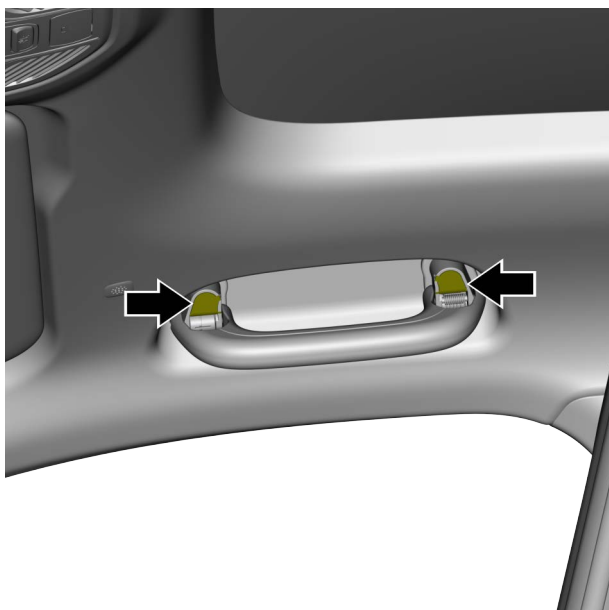
13.9.2.15 Replacement of front safety handle assembly

Removal Procedure

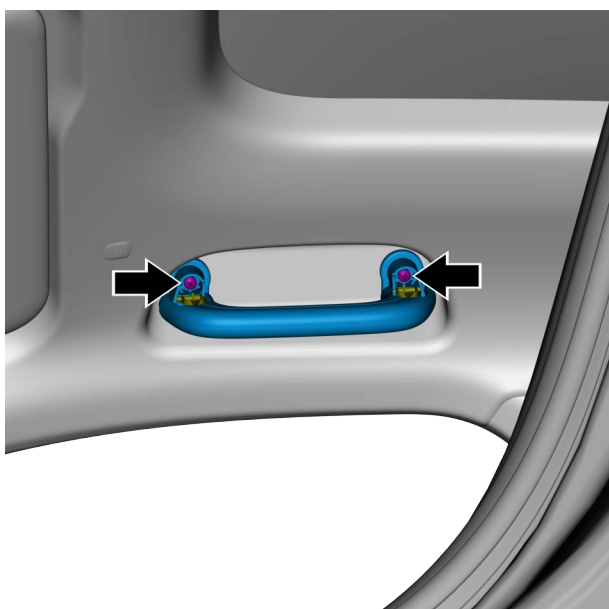
Caution

The removal and installation methods of seat handle assembly are similar.

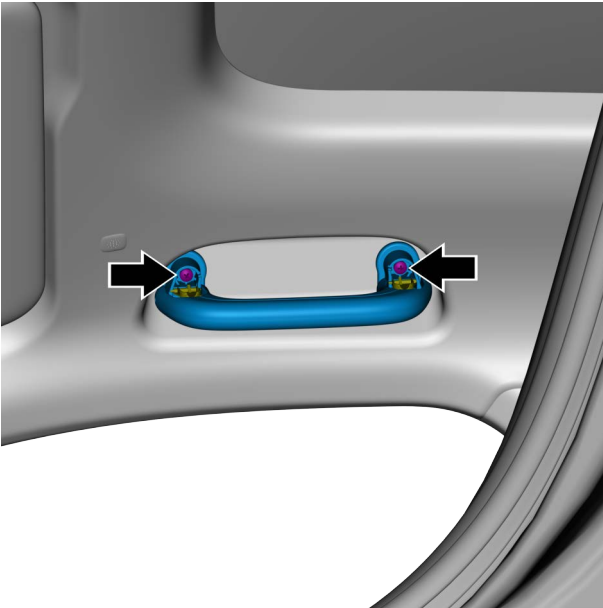
- 1 Pry off the front safety handle assembly bolt trim cover.



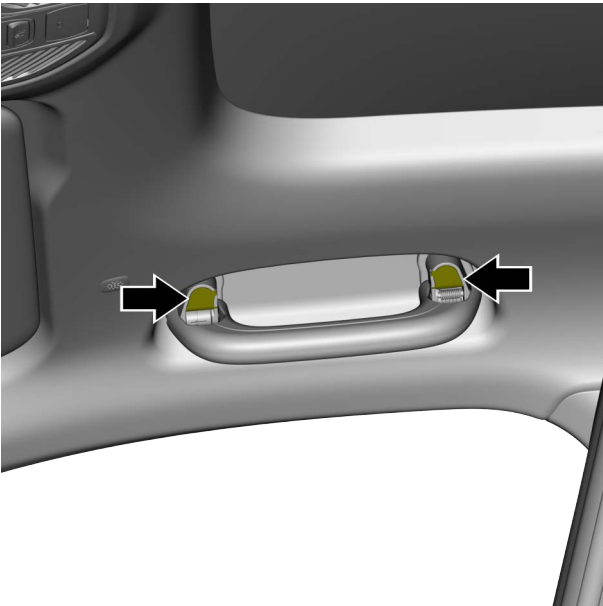
- 2 Remove the 2 fixing screws of the front safety handle assembly and take off the front safety handle assembly.



Installation Procedure



- 1 Install the 2 fixing screws of front safety handle assembly.
Torque: 4N·m



- 2 Cover the front safety handle assembly bolt trim cover.

13.9.2.16 Replacement of left sun visor assembly

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

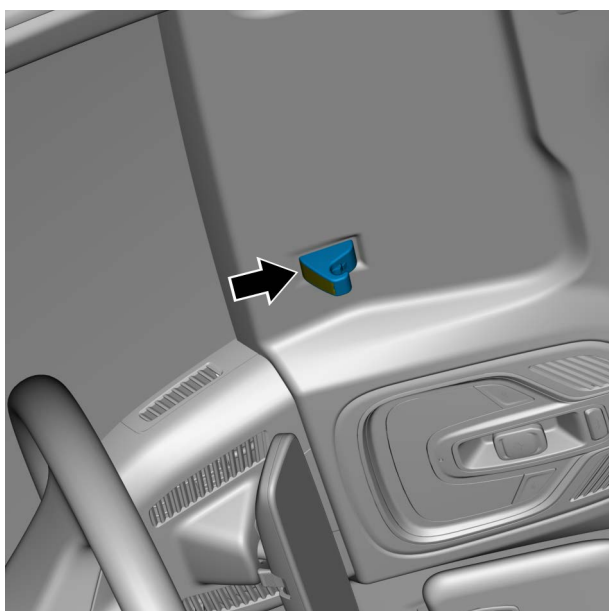
Caution

The removal and installation methods of left and right sun visor assemblies are similar.

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).



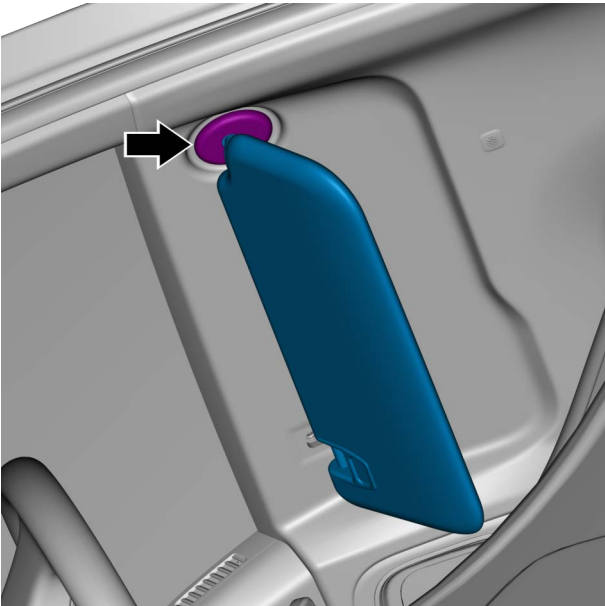
- 2 Disengage the left sun visor assembly from the sun visor hook.



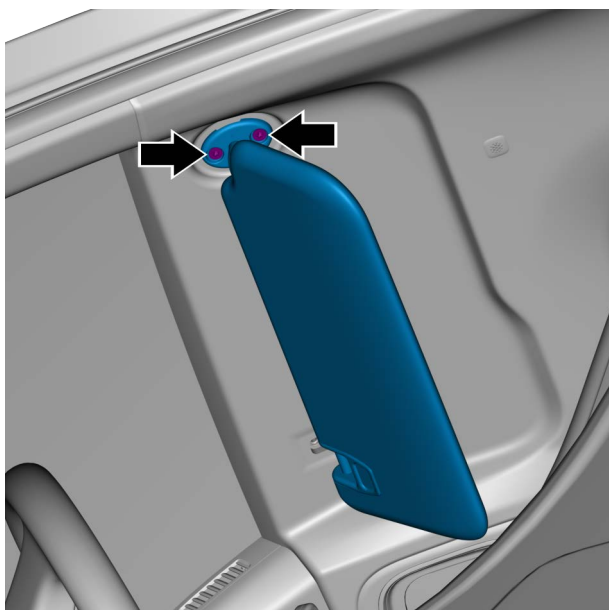
- 3 Pry off the sun visor hook screw cover.



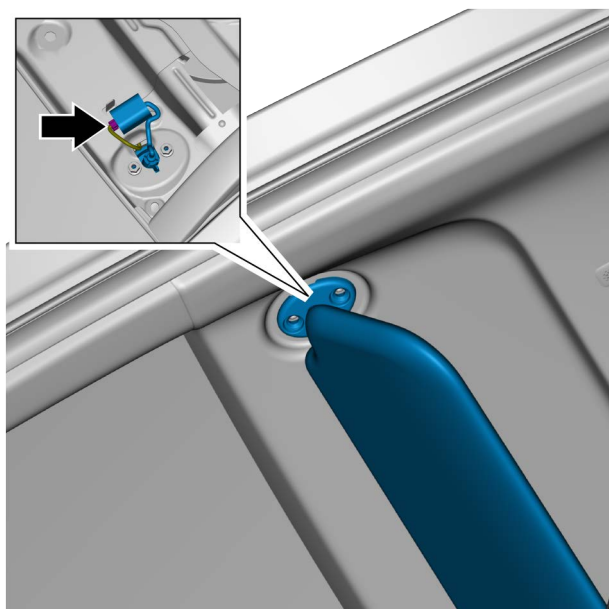
4 Remove the sun visor hook fixing screw.



5 Remove the left sun visor assembly screw plug cover.

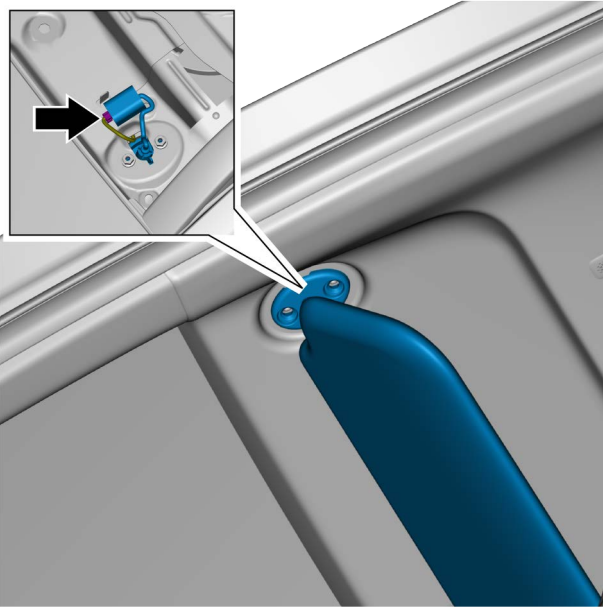


6 Remove the 2 fixing screws of the left sun visor assembly.

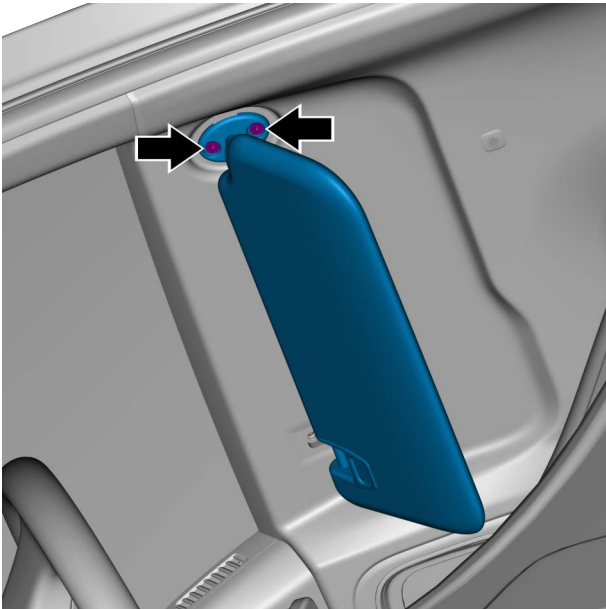


7 Disconnect the harness connector of the left sun visor light and remove the left sun visor assembly.

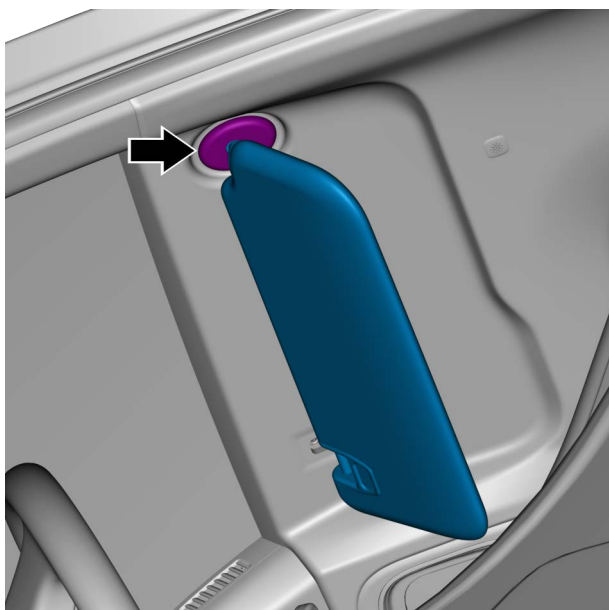
Installation Procedure



- 1 Connect the harness connector of the left sun visor light.



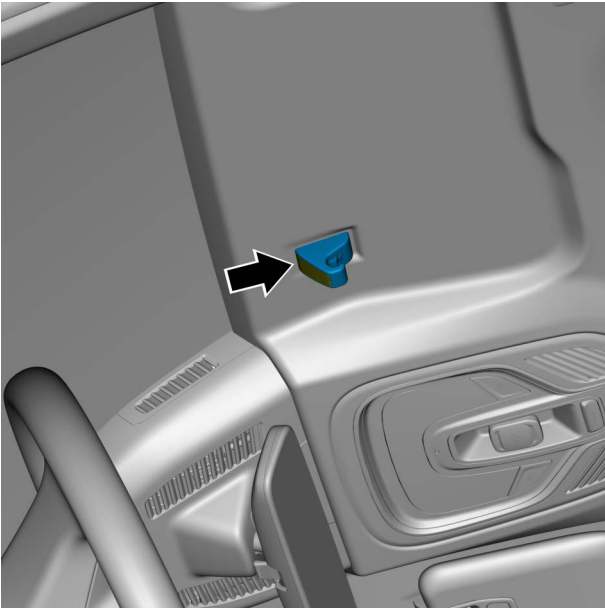
- 2 Install the 2 fixing screws of the left sun visor assembly.
Torque: 4N·m



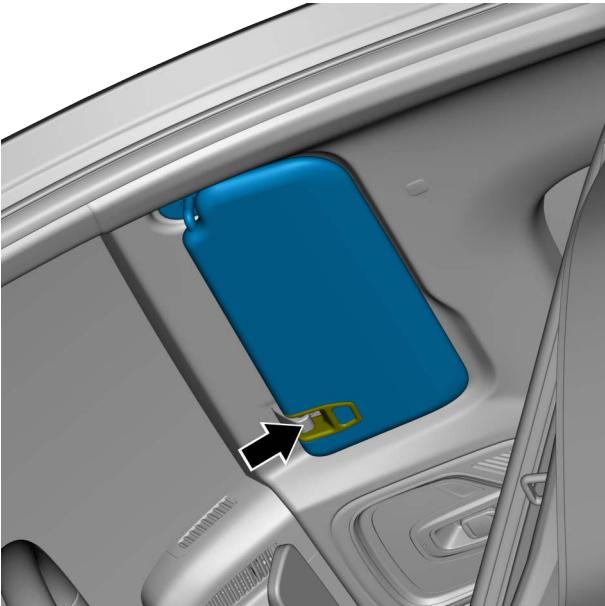
3 Install the left sun visor assembly screw plug cover.



4 Install the sun visor hook fixing screw.
Torque: 2N·m



- 5 Install the sun visor hook screw cover.



- 6 Snap the left sun visor assembly into the sun visor hook and make sure it is installed in place.

- 7 Connect the negative cable of battery.

13.9.2.17 Replacement of roof assembly

Removal Procedure

Warning !

Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#)

Caution

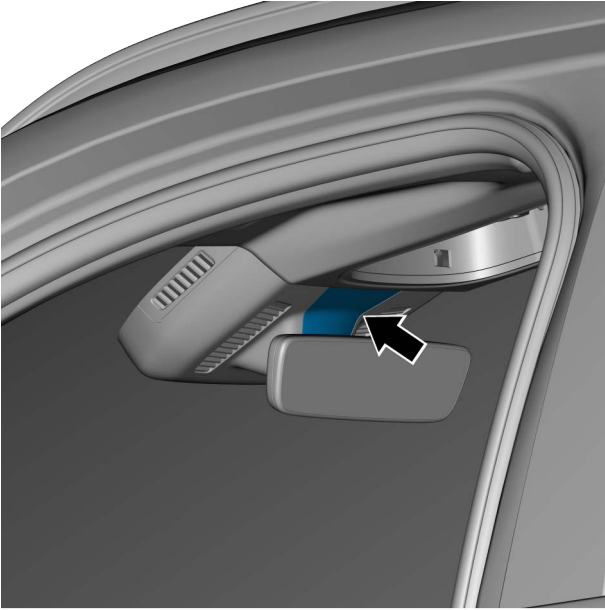
Please use the special tools for vehicle body repair to remove the trim panel, otherwise it is easy to scratch the edge of the trim panel.

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).

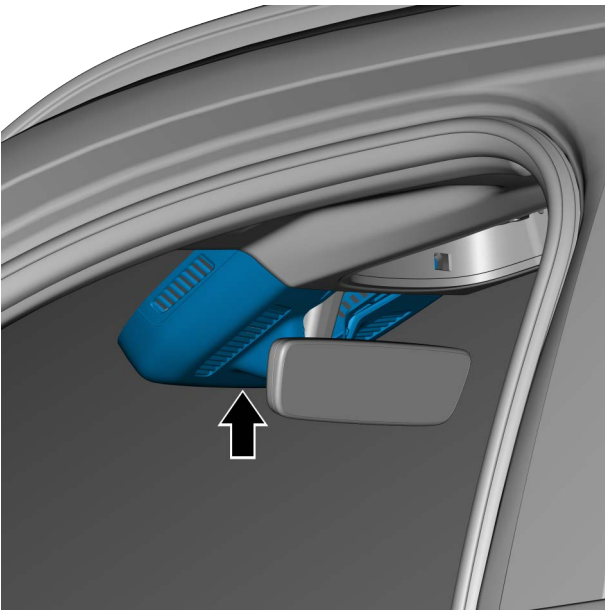
- 2 Remove the left and right A-pillar upper trim panel assemblies, refer to [Replacement of left A-pillar upper trim panel assembly](#).
- 3 Remove the left front door sill trim panel assembly, refer to [Replacement of left front door sill trim panel assembly](#).
- 4 Remove the right front door sill trim panel assembly, refer to [Replacement of right front door sill trim panel assembly](#).
- 5 Remove the rear seat cushion assembly, refer to [Replacement of rear seat cushion assembly](#).
- 6 Remove the rear seat left backrest assembly, refer to [Replacement of rear seat left backrest assembly](#).
- 7 Remove the rear seat right backrest assembly, refer to [Replacement of rear seat right backrest assembly](#).
- 8 Remove the left upper trim panel of luggage compartment, refer to [Replacement of luggage compartment left upper trim panel](#).
- 9 Remove the left and right luggage compartment side shield assemblies, refer to [Replacement of left luggage compartment side shield assembly](#).
- 10 Remove the left and right C-pillar upper trim panel assemblies, refer to [Replacement of left C-pillar upper trim panel assembly](#).
- 11 Remove the left and right D-pillar upper trim panel assemblies, refer to [Replacement of left D-pillar upper trim panel assembly](#).
- 12 Remove the left and right rear door sill interior trim panel assemblies, refer to [Replacement of left rear door sill interior trim panel assembly](#).
- 13 Remove the left and right B-pillar lower trim panel assembly, refer to [Replacement of left B-pillar lower trim panel assembly](#).
- 14 Remove the left and right B-pillar upper trim panel assembly, refer to [Replacement of left B-pillar upper trim panel assembly](#).
- 15 Remove the front safety handle assembly, refer to [Replacement of front safety handle assembly](#).
- 16 Remove the left and right rear safety handle assemblies, refer to [Replacement of front safety handle assembly](#).
- 17 Remove the left and right sun visor assemblies, refer to [Replacement of left sun visor assembly](#).

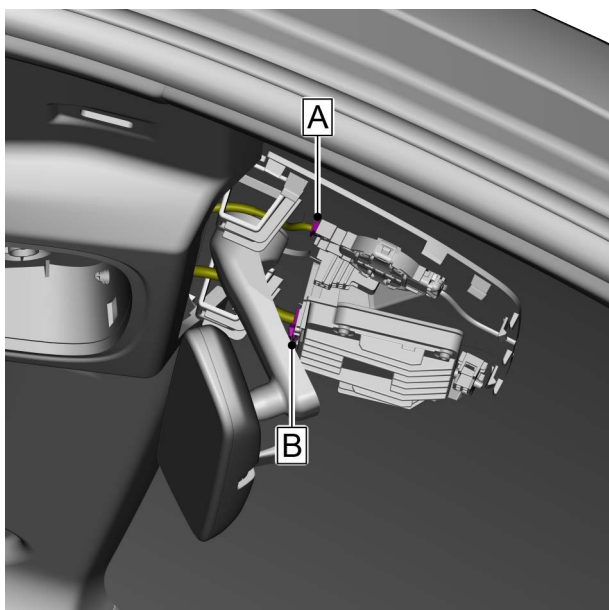
- 18 Remove the overhead console unit, refer to [Replacement of overhead console unit \(type I\)](#) and [Replacement of overhead console unit \(type II\)](#).

- 19 Remove the rain and light sensor front trim cover.

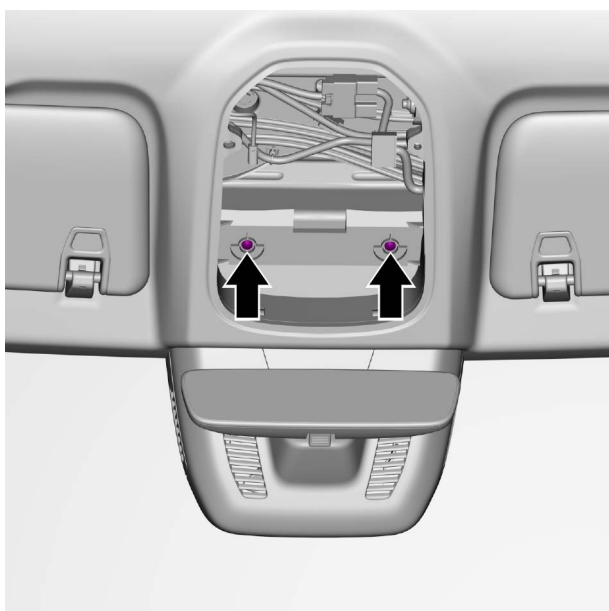


- 20 Remove the rain and light sensor rear trim cover.

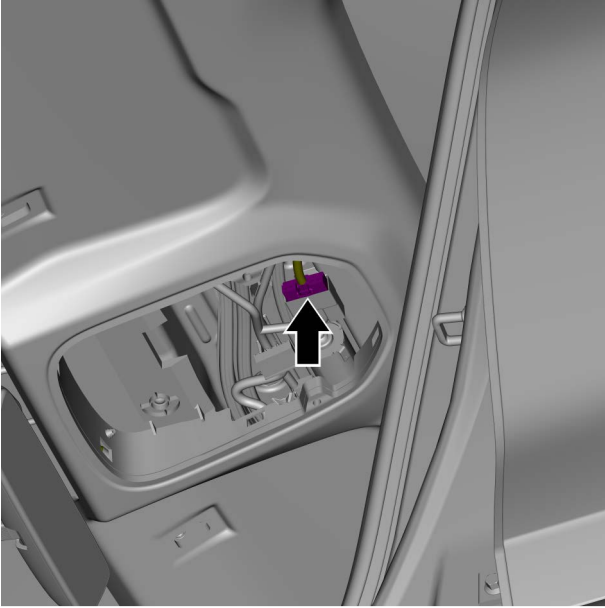




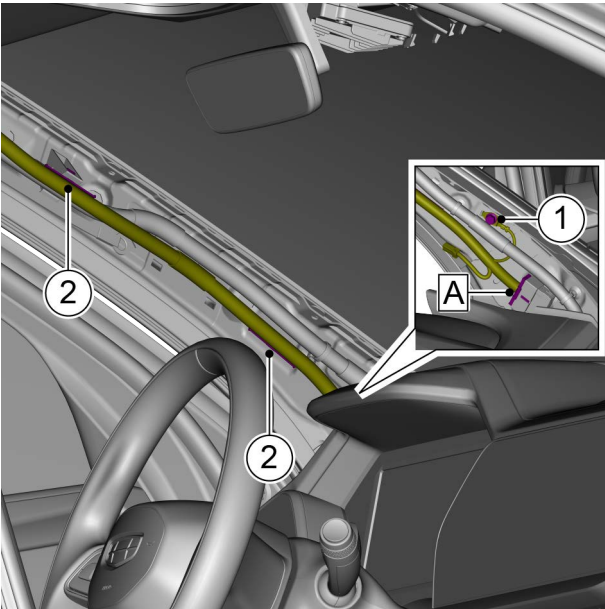
- 21 Disconnect the rain and light sensor harness connector A from the forward looking camera harness.



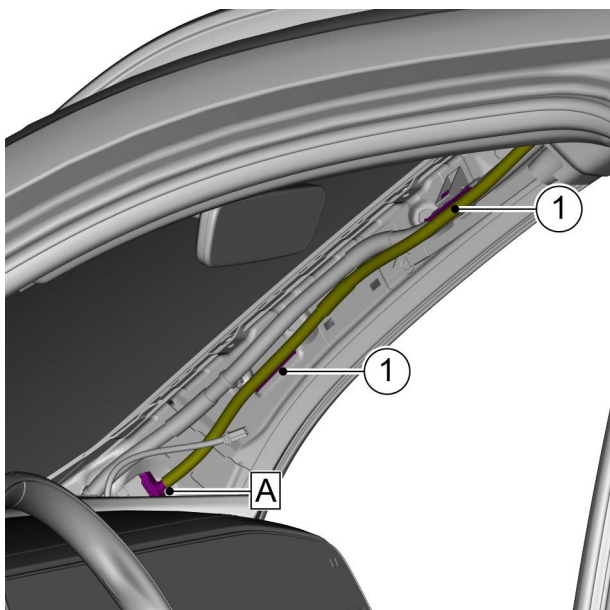
- 22 Remove the 2 fixing screws of the roof assembly.



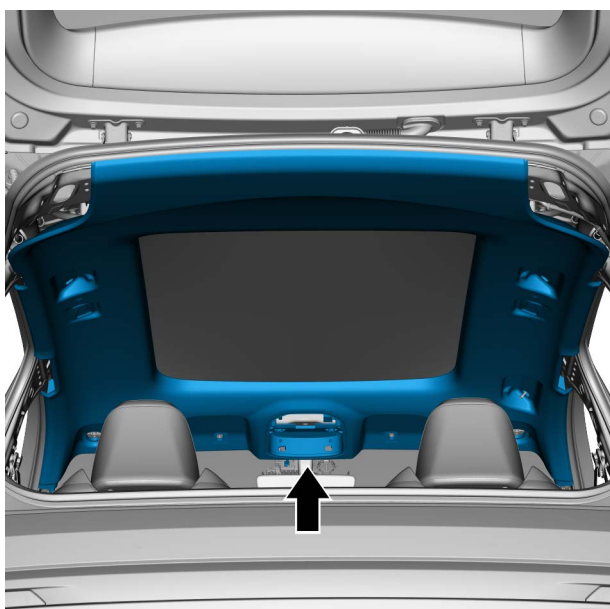
- 23 Disconnect the sunroof module (panoramic sunroof) harness connector.



- 24 Disconnect the harness connector A of roof harness.
25 Remove the harness fixing bolt 1 and harness clip 2 of roof harness.

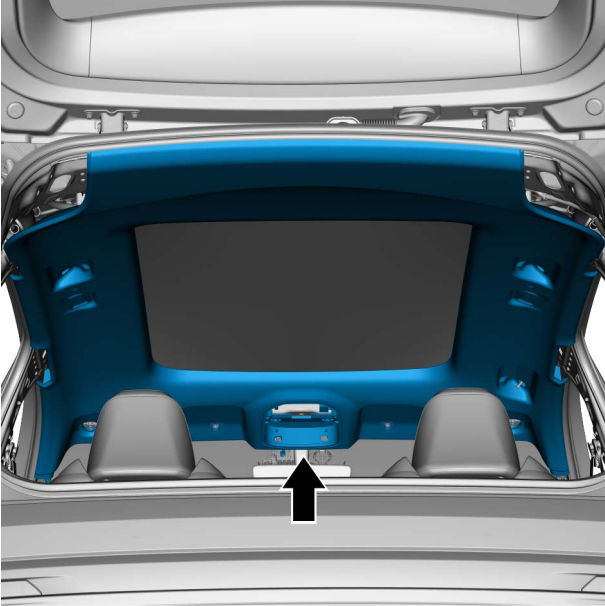


- 26 Disconnect the harness connector A of roof harness.
- 27 Remove the 2 harness clips 1 of the roof harness.

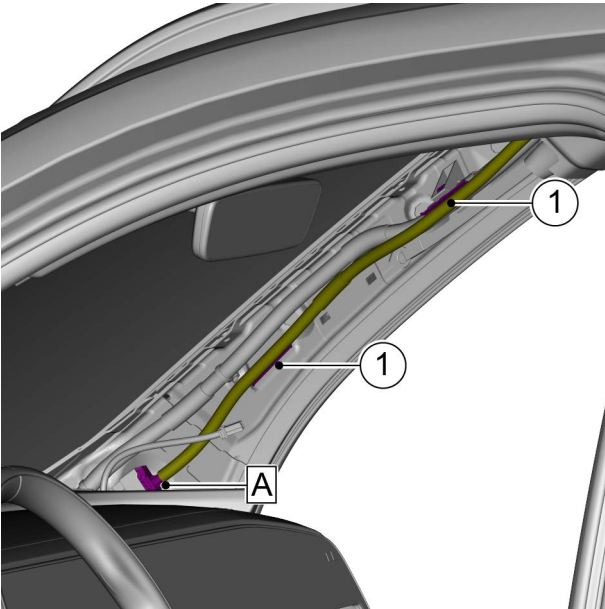


- 28 Remove the roof assembly.

Installation Procedure

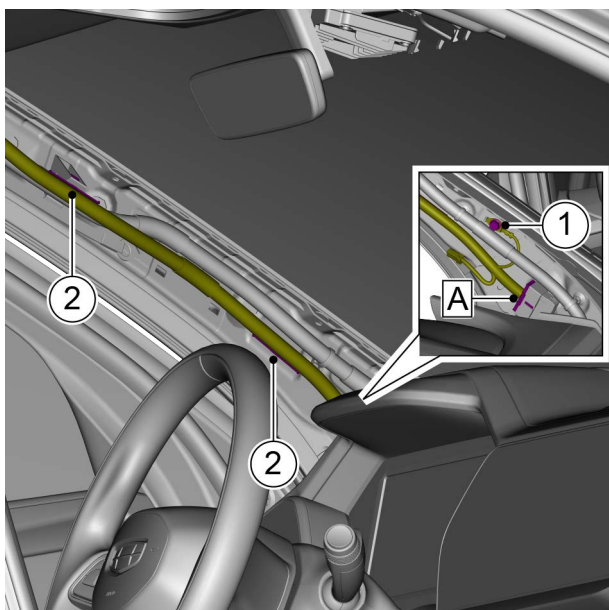


1 Install the roof assembly.



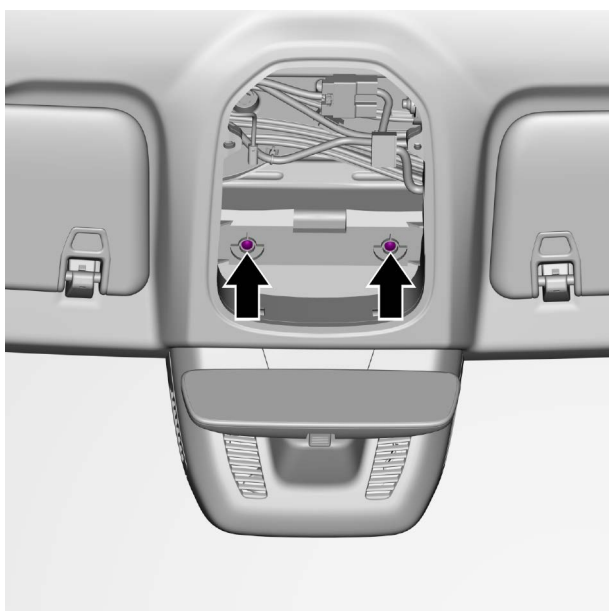
2 Connect the harness connector A of roof harness.

3 Install the 2 harness clips 1 of the roof harness.

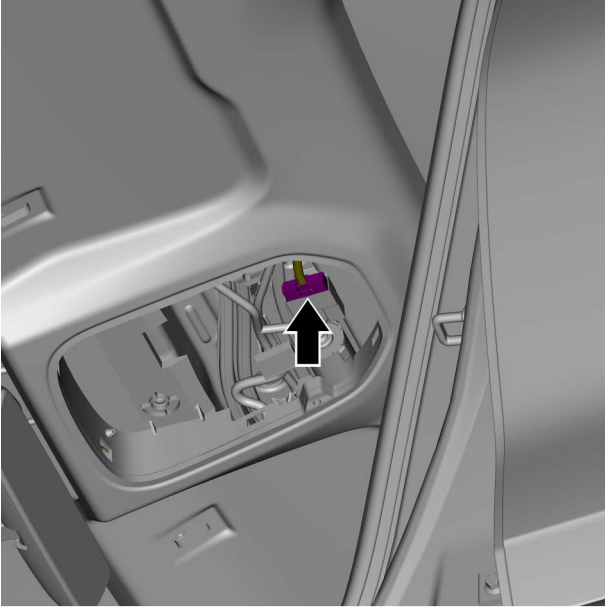


- 4 Connect the harness connector A of roof harness.
- 5 Install the harness fixing bolt 1 and harness clip 2 of roof harness.

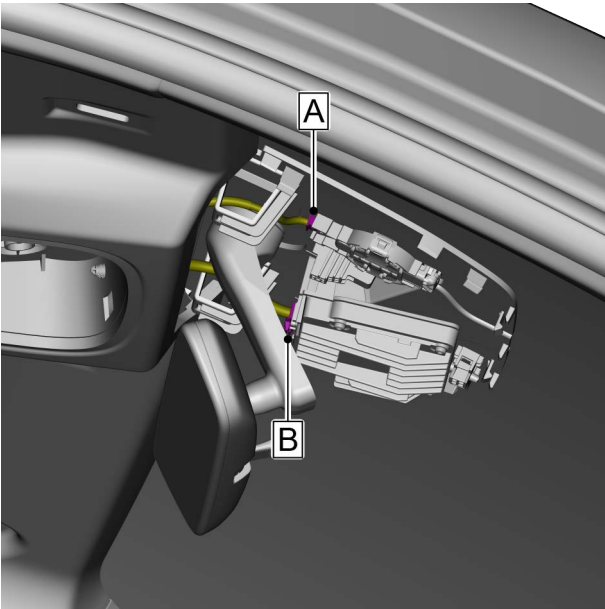
Torque: 10N·m



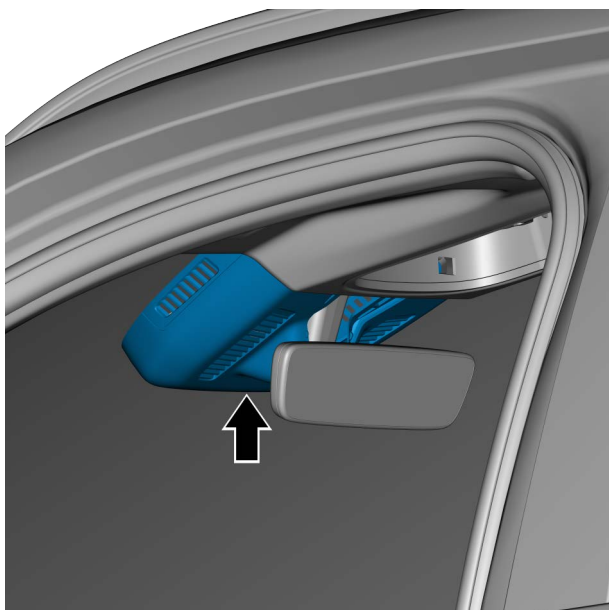
- 6 Install the 2 fixing screws of the roof assembly.



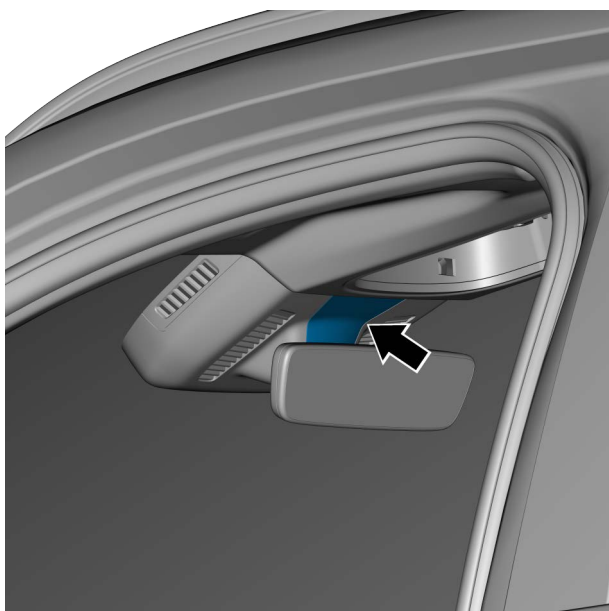
- 7 Connect the sunroof module (panoramic sunroof) harness connector.



- 8 Connect the rain and light sensor harness connector A from the forward looking camera harness.



9 Install the rain and light sensor rear trim cover.



10 Install the rain and light sensor front trim cover.

- 11 Install the overhead console unit.
- 12 Install the left and right sun visor assemblies.
- 13 Install the left and right rear safety handle assemblies.
- 14 Install the front safety handle assembly.
- 15 Install the left and right B-pillar upper trim panel assembly.
- 16 Install the left and right pillar B lower trim panel assembly.
- 17 Install the left and right rear door sill interior trim panel assemblies.
- 18 Install the left and right D-pillar upper trim panel assemblies.
- 19 Install the left and right C-pillar upper trim panel assembly.

- 20 Install the left and right luggage compartment side shield assemblies.
- 21 Install the left and right luggage compartment upper trim panel covers.
- 22 Install the rear seat right backrest assembly.
- 23 Install the rear seat left backrest assembly.
- 24 Install the rear seat cushion assembly.
- 25 Install the right front door sill trim panel assembly.
- 26 Install the left front door sill trim panel assembly.
- 27 Install the left and right A-pillar upper trim panel assembly.
- 28 Connect the negative cable of battery.

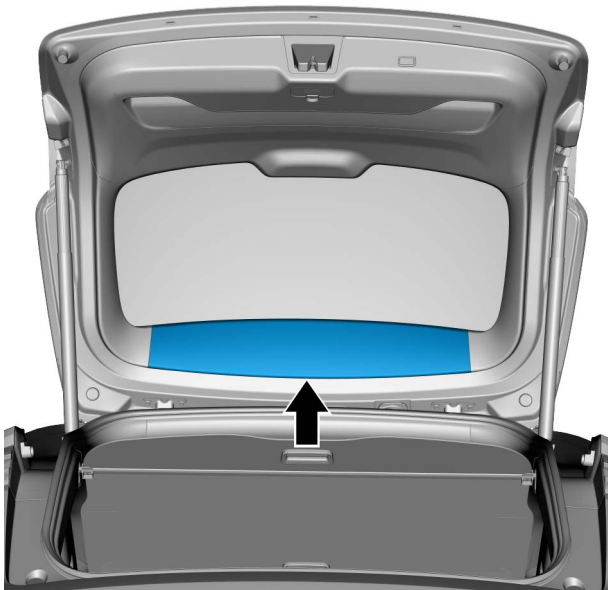
13.9.2.18 Replacement of trunk door middle upper interior trim panel assembly

Removal Procedure

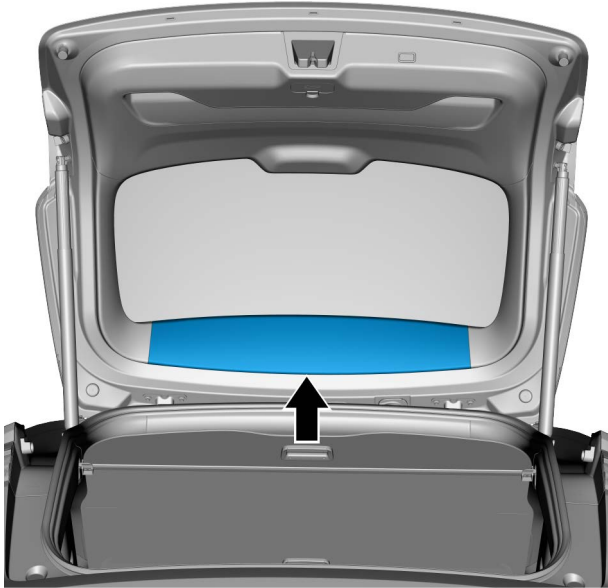
Caution

Please use the special tools for vehicle body repair to remove the trim panel, otherwise it is easy to scratch the edge of the trim panel.

- 1 Remove the trunk door middle upper interior trim panel assembly and remove it.



Installation Procedure



- 1 Install the tail gate middle upper interior trim panel assembly.

13.9.2.19 Replacement of trunk door left upper interior trim panel assembly

- 1 Refer to [Replacement of trunk door lower interior trim panel assembly](#).

13.9.2.20 Replacement of trunk door lower interior trim panel assembly

Removal Procedure

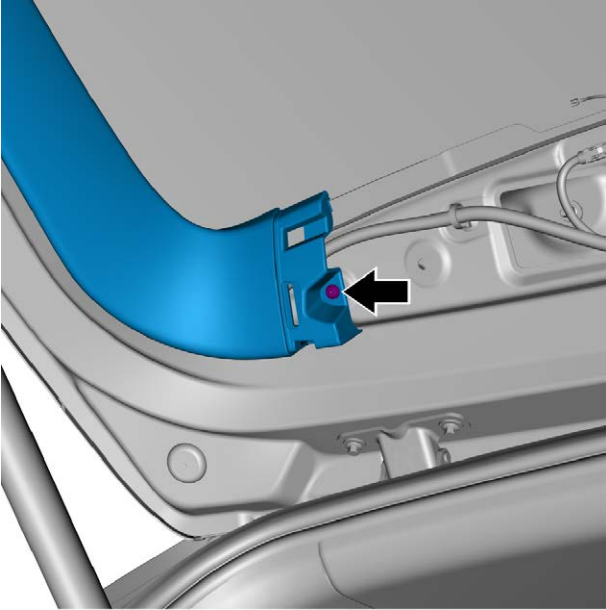
Warning !

Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#)

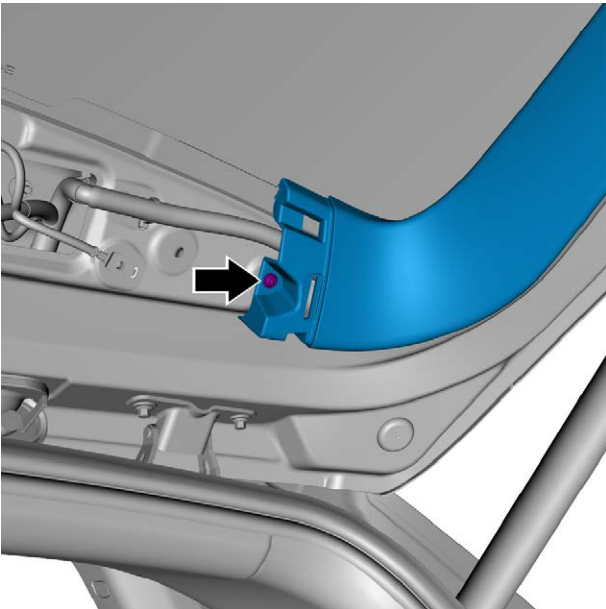
Caution

Please use the special tools for vehicle body repair to remove the trim panel, otherwise it is easy to scratch the edge of the trim panel.

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the trunk door middle upper interior trim panel assembly, refer to [Replacement of trunk door middle upper interior trim panel assembly](#).

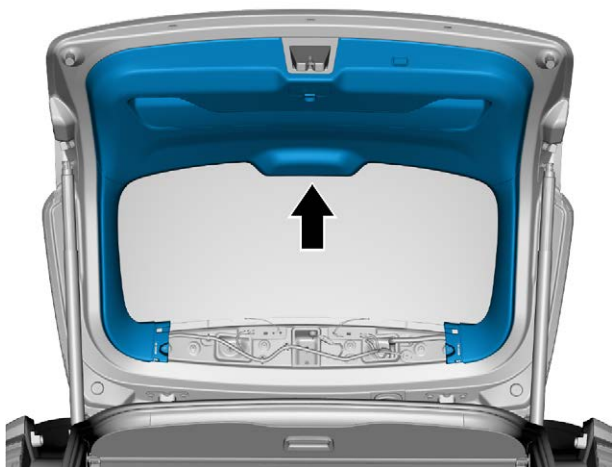


- 3 Remove the fixing screws of trunk door left upper interior trim panel assembly.

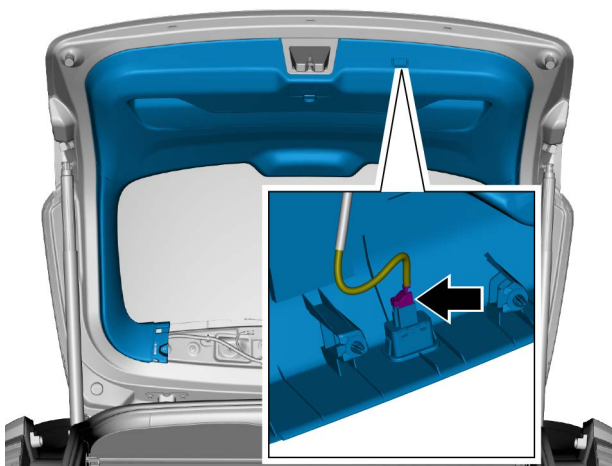


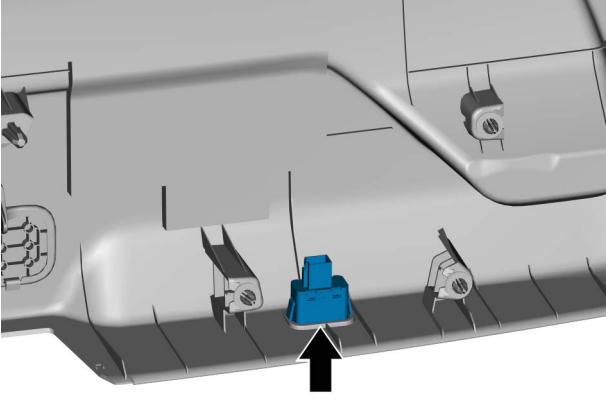
- 4 Remove the fixing screws of trunk door right upper interior trim panel assembly.

- 5 Remove the trunk door left and right upper interior trim panels and the trunk door lower interior trim panel assembly.

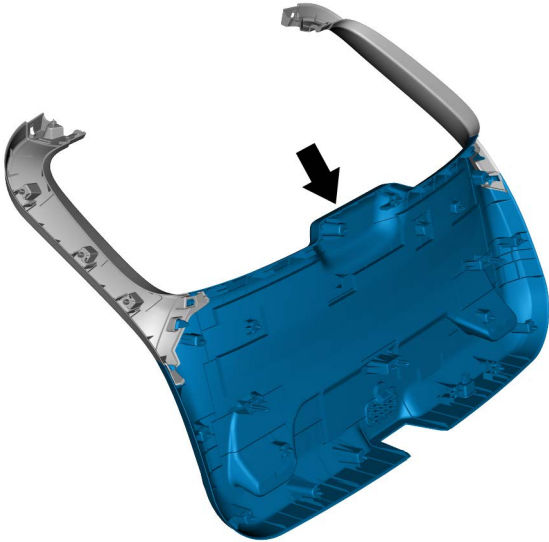


- 6 Disconnect the tailgate closing and vehicle locking switch harness connector.



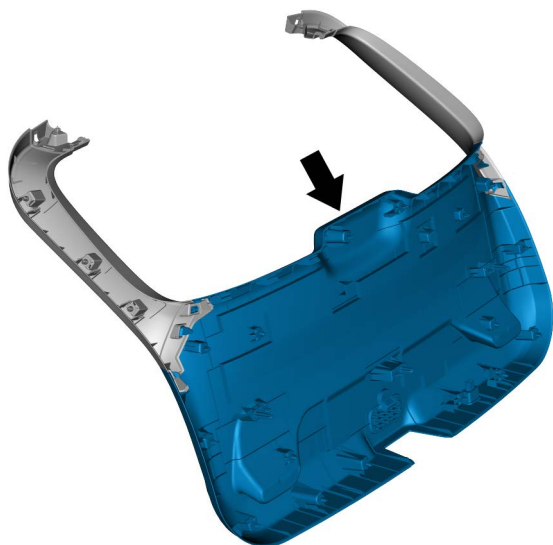


- 7 Disassemble the tailgate closing and vehicle locking switch and remove it.

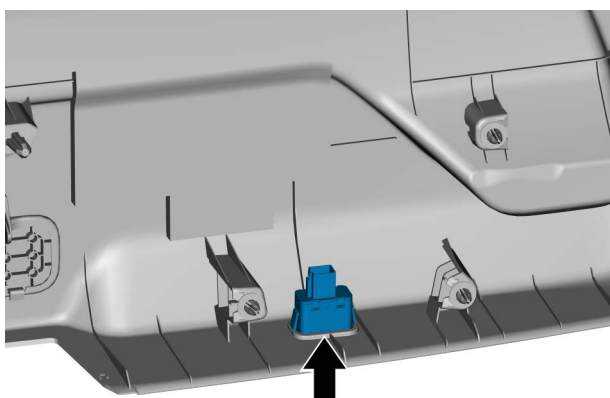


- 8 Separate the trunk door left and right upper interior trim panel assemblies from the trunk door lower interior trim panel assembly.

Installation Procedure

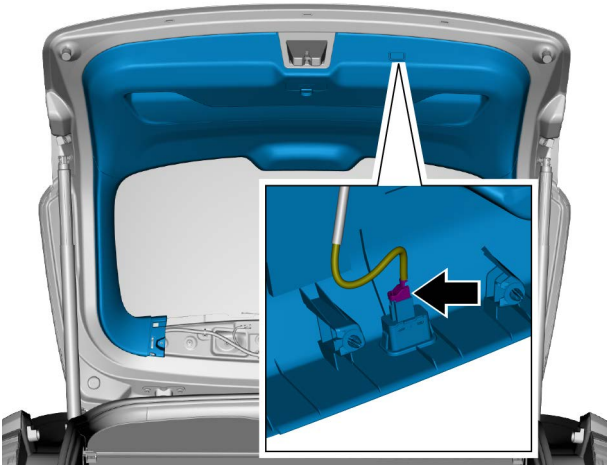


- 1 Assemble the trunk door left and right upper interior trim panel assemblies with the trunk door lower interior trim panel assembly.

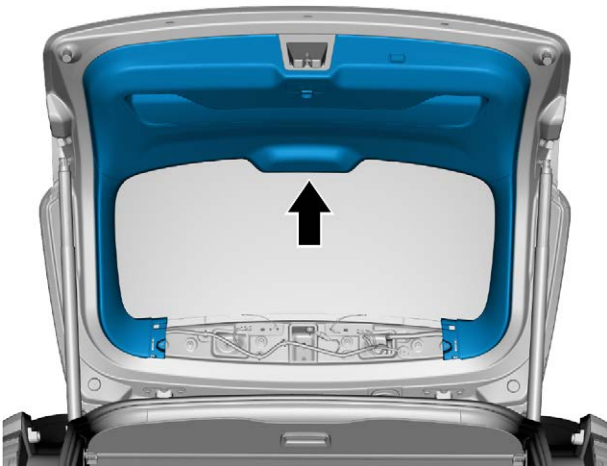


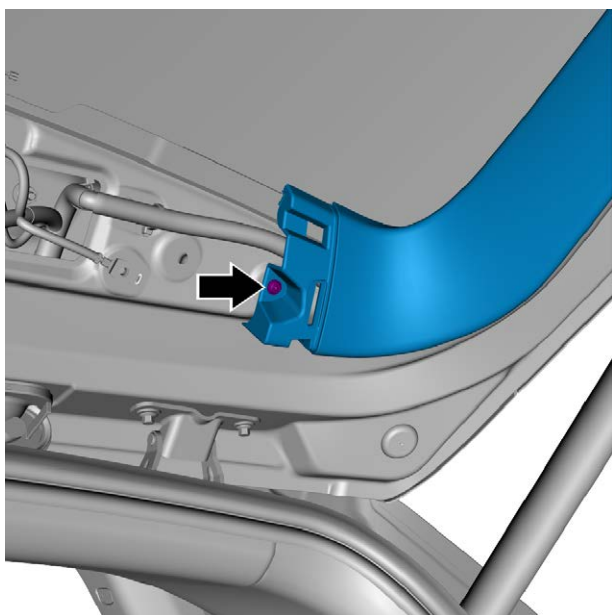
- 2 Install the tailgate closing and vehicle locking switch.

- 3 Connect the tailgate closing and vehicle locking switch harness connector.



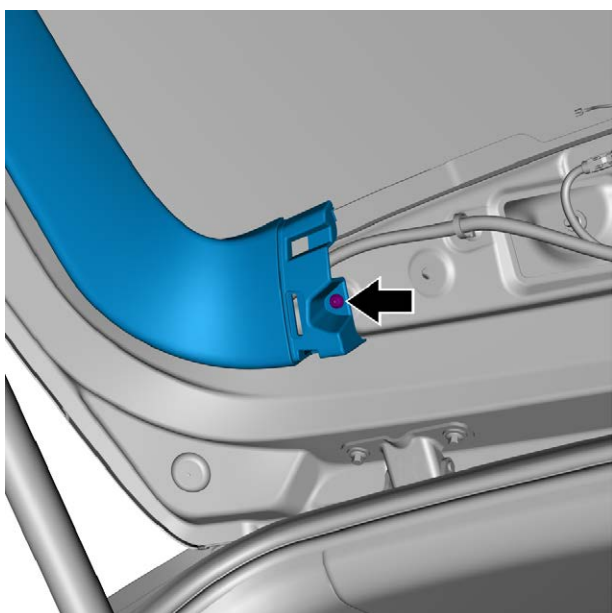
- 4 Install the trunk door left and right upper interior trim panels and the trunk door lower interior trim panel assembly.





- 5 Install the fixing screws of trunk door right upper interior trim panel assembly.

Torque: 1.5N·m



- 6 Install the fixing screws of trunk door left upper interior trim panel assembly.

Torque: 1.5N·m

- 7 Install the tail gate middle upper interior trim panel assembly.

- 8 Connect the negative cable of battery.

13.9.2.21 Replacement of left front floor front carpet assembly

Removal Procedure

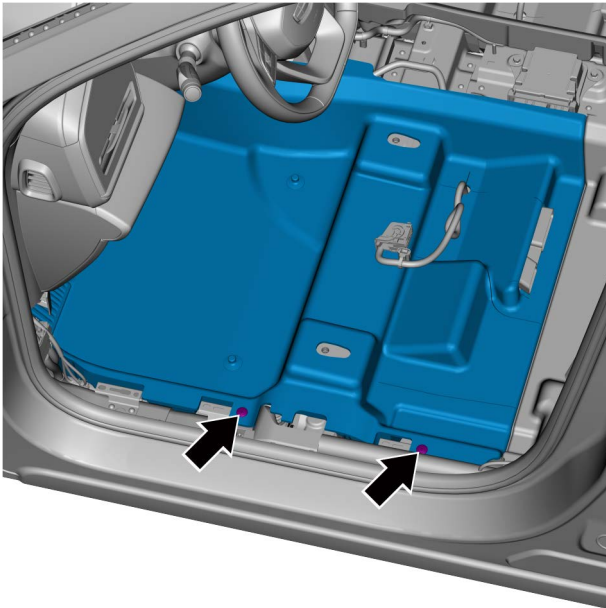
Warning !

Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#)

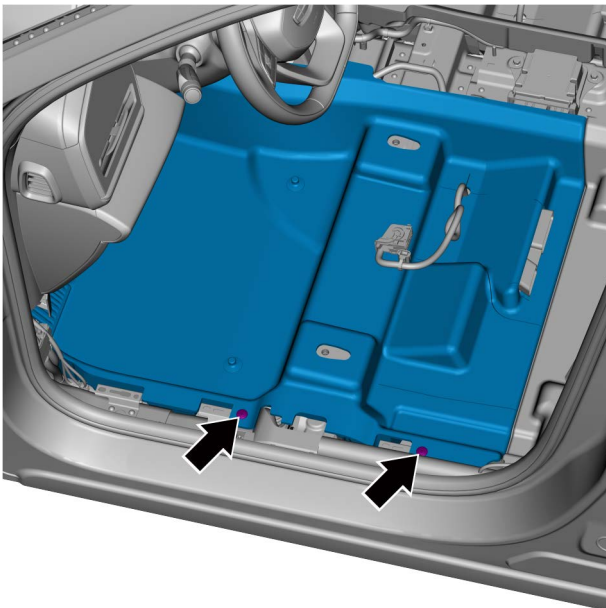
Caution

The removal and installation methods of left and right front floor carpet assemblies are similar.

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the driver seat assembly, refer to [Replacement of driver seat assembly](#).
- 3 Remove console body assembly, refer to [Replacement of console body assembly](#).
- 4 Remove the rear seat cushion assembly, refer to [Replacement of rear seat cushion assembly](#).
- 5 Remove the rear seat left backrest assembly, refer to [Replacement of rear seat left backrest assembly](#).
- 6 Remove the luggage compartment door sill trim panel assembly, refer to [Replacement of luggage compartment door sill trim panel assembly](#).
- 7 Remove the left upper trim panel of luggage compartment, refer to [Replacement of luggage compartment left upper trim panel](#).
- 8 Remove the luggage compartment light, refer to [Replacement of luggage compartment light](#).
- 9 Remove the 12V socket (luggage compartment), refer to [Replacement of 12V socket \(luggage compartment\)](#).
- 10 Remove the left luggage compartment side shield assembly, refer to [Replacement of left luggage compartment side shield assembly](#).
- 11 Remove the left rear door sill interior trim panel assembly, refer to [Replacement of left rear door sill interior trim panel assembly](#).
- 12 Remove the left front door sill trim panel assembly, refer to [Replacement of left front door sill trim panel assembly](#).



- 13 Remove the left B-pillar lower trim panel assembly, refer to [Replacement of left B-pillar lower trim panel assembly](#).
- 14 Remove the 2 J-clips connecting the left front floor front carpet assembly and remove the right front floor front carpet assembly.



Installation Procedure

- 1 Install the 2 J-clips of the right front floor front carpet assembly.
- 2 Install the left B-pillar lower trim panel assembly.
- 3 Install the left front door sill trim panel assembly.
- 4 Install the left rear door sill interior trim panel assembly.
- 5 Install the left luggage compartment side shield assembly.
- 6 Install the 12V socket (luggage compartment).
- 7 Install the boot lamp.
- 8 Install the left upper trim panel of luggage compartment.
- 9 Install the luggage compartment door sill trim panel assembly.

- 10 Install the rear seat left backrest assembly.
- 11 Install the rear seat cushion assembly.
- 12 Install the console body assembly.
- 13 Install the driver seat assembly.
- 14 Connect the negative cable of battery.

13.9.2.22 Replacement of front floor rear carpet

Removal Procedure

Caution

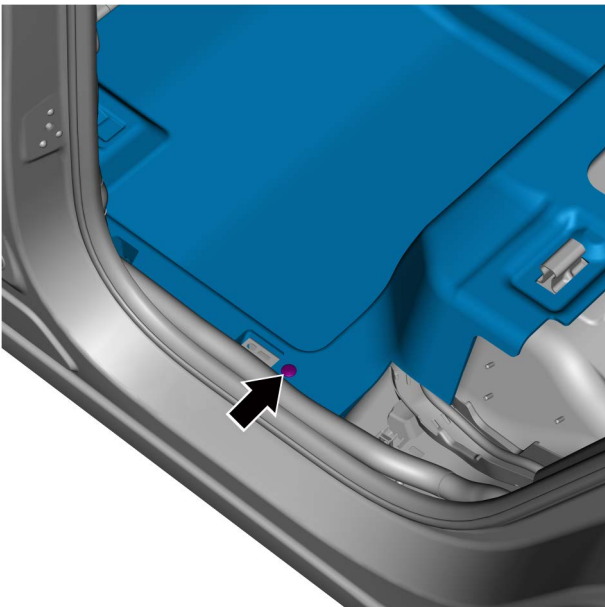
Please use the special vehicle body repair tools to remove the pillar trim panel, otherwise it is easy to scratch panel edge of the pillar trim panel.

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the driver seat assembly, refer to [Replacement of driver seat assembly](#).
- 3 Remove the passenger seat assembly, refer to [Replacement of passenger seat assembly](#).
- 4 Remove console body assembly, refer to [Replacement of console body assembly](#).
- 5 Remove the rear seat cushion assembly, refer to [Replacement of rear seat cushion assembly](#).
- 6 Remove the rear seat left backrest assembly, refer to [Replacement of rear seat left backrest assembly](#).
- 7 Remove the luggage compartment door sill trim panel assembly, refer to [Replacement of luggage compartment door sill trim panel assembly](#).
- 8 Remove the left and right luggage compartment upper trim panel covers, refer to [Replacement of luggage compartment left upper trim panel](#).
- 9 Remove the luggage compartment light, refer to [Replacement of luggage compartment light](#).
- 10 Remove the 12V socket (luggage compartment), refer to [Replacement of 12V socket \(luggage compartment\)](#).
- 11 Remove the left and right luggage compartment side shield assemblies, refer to [Replacement of left luggage compartment side shield assembly](#).
- 12 Remove the left and right rear door sill interior trim panel assemblies, refer to [Replacement of left rear door sill interior trim panel assembly](#).

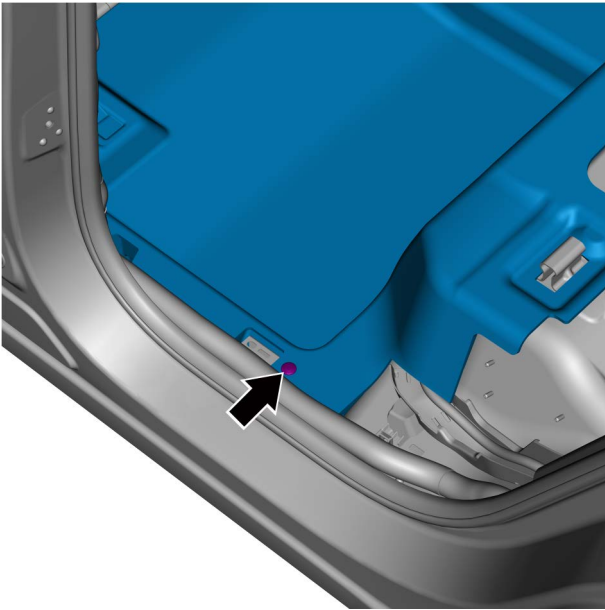
- 13 Remove the left front door sill trim panel assembly, refer to [Replacement of left front door sill trim panel assembly](#).
- 14 Remove the right front door sill trim panel assembly, refer to [Replacement of right front door sill trim panel assembly](#).
- 15 Remove the left and right B-pillar lower trim panel assembly, refer to [Replacement of left B-pillar lower trim panel assembly](#).
- 16 Remove the J-clips on the left side of front floor rear carpet.



- 17 Remove the J-clips on the right side of front floor rear carpet and remove the front floor rear carpet.



Installation Procedure



- 1 Install the J-clips on the right side of front floor rear carpet.



- 2 Install the J-clips on the left side of front floor rear carpet.

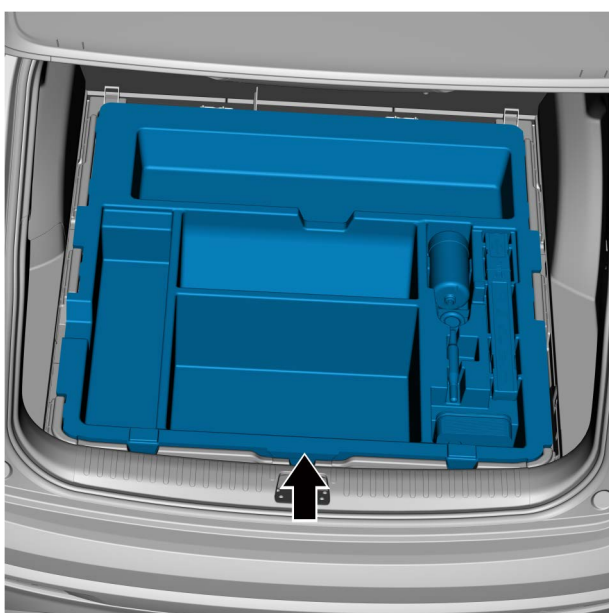
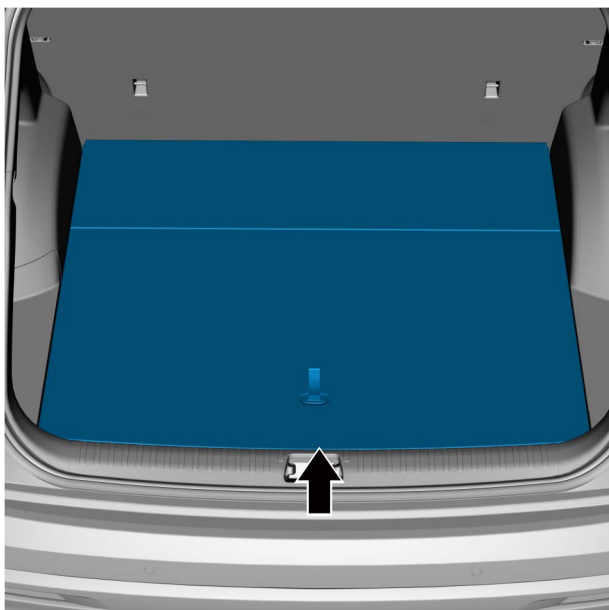
- 3 Install the left and right pillar B lower trim panel assembly.
- 4 Install the right front door sill trim panel assembly.
- 5 Install the left front door sill trim panel assembly.
- 6 Install the left and right rear door sill interior trim panel assemblies.
- 7 Install the left and right luggage compartment side shield assemblies.
- 8 Install the 12V socket (luggage compartment).
- 9 Install the boot lamp.
- 10 Install the left and right luggage compartment upper trim panel covers.
- 11 Install the luggage compartment door sill trim panel assembly.

- 12 Install the rear seat left backrest assembly.
- 13 Install the rear seat cushion assembly.
- 14 Install the console body assembly.
- 15 Install the driver seat assembly.
- 16 Connect the negative cable of battery.

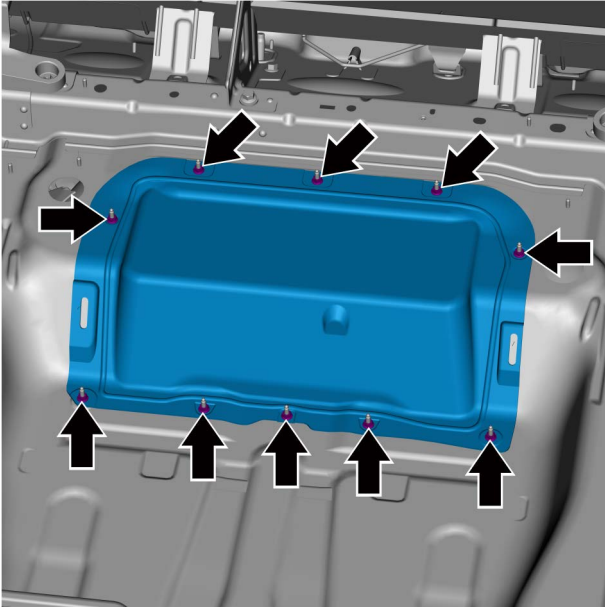
13.9.2.23 Replacement of battery access cover

Removal Procedure

- 1 Remove the trunk shade, refer to [Replacement of trunk shade](#).
- 2 Remove the luggage compartment carpet assembly.

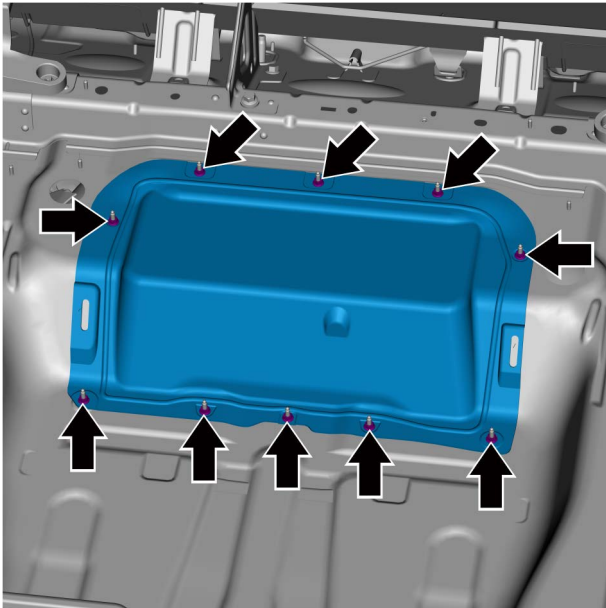


- 3 Remove the luggage compartment storage box.

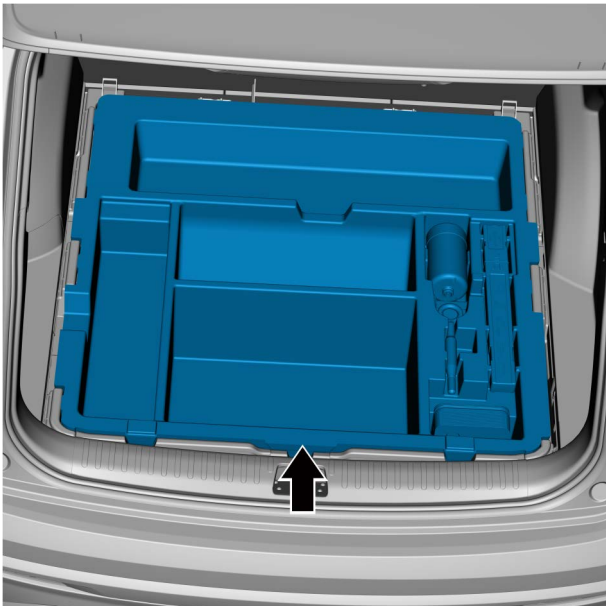


- 4 Remove the 10 fixing nuts of the battery pack access cover.
- 5 Remove the battery pack access cover.

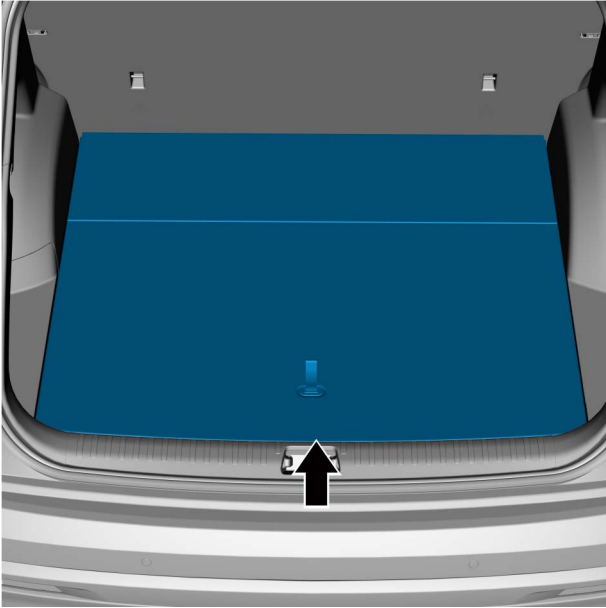
Installation Procedure



- 1 Install the battery pack access cover and tighten the 10 nuts.
Torque: 6N·m



- 2 Install the luggage compartment storage box.



3 Install the luggage compartment carpet assembly.

4 Install the trunk shade.

13.10 Exterior Trim

13.10.1 Specification

13.10.1.1 Fastener specification

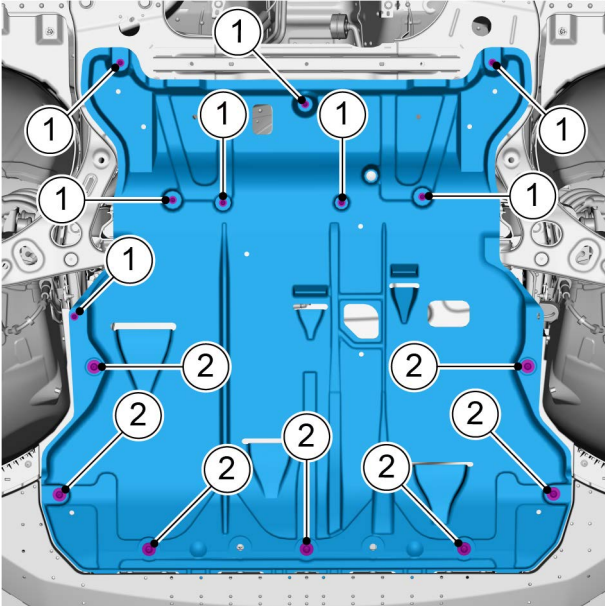
Fastener part	Model	Torque range (N·m)
Fixing screw of engine bottom shield	PF5×20	1.3-1.7
Fixing bolt of engine bottom shield	M6×20	3-4
Fixing screw of left front wheel arch splash guard assembly	PF5×16	1.7-2.3
Fixing screw of left rear wheel arch splash guard assembly	PF5×16	1.7-2.3
Fixing bolt of body bottom left shield	M6×18	3-4
Fixing nut of body bottom left plastic shield	T5×11	1.7-2.3
Fixing nut of body bottom right plastic shield	T5×11	1.7-2.3
Fixing bolt of left rear lower shield	M6×18	3-4
Fixing nut of left rear lower plastic shield	T5×11	1.7-2.3
Fixing nut of fuel tank lower plastic shield	T5×11	1.7-2.3
Fixing nut of left rear suspension plastic shield	T5×11	1.7-2.3
Fixing bolt of ventilation cover assembly	M6×16	3.2-4.8
Fixing screw of left front fender flare	PF5×16	1.7-2.3
Fixing screw of left rear fender flare	PF5×16	1.7-2.3
Fixing screw of left rear fender flare front section	PF4×12	2.12-2.88
Fixing nut of spoiler assembly	M6×7.8	8-10
Fixing nut of left luggage rack	M6×7.8	8-10

13.10.2 Removal and Installation

13.10.2.1 Replacement of engine bottom shield

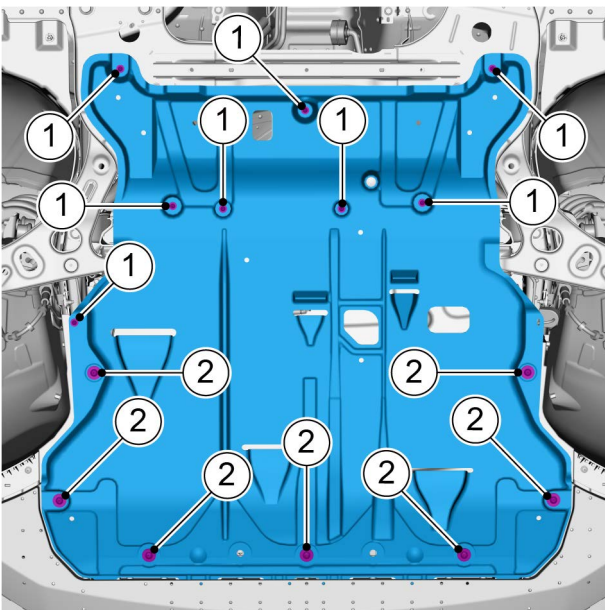
Removal Procedure

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the 8 fixing screws 1 and 7 fixing screws 2 of the engine bottom shield.
- 3 Remove the engine bottom shield.



Installation Procedure

- 1 Install the 7 fixing screws 2 and 8 fixing screws 1 of engine bottom shield.
Screw 2 torque: 1.5N·m
Bolt 1 torque: 3.5 N·m



- 2 Lower the vehicle.

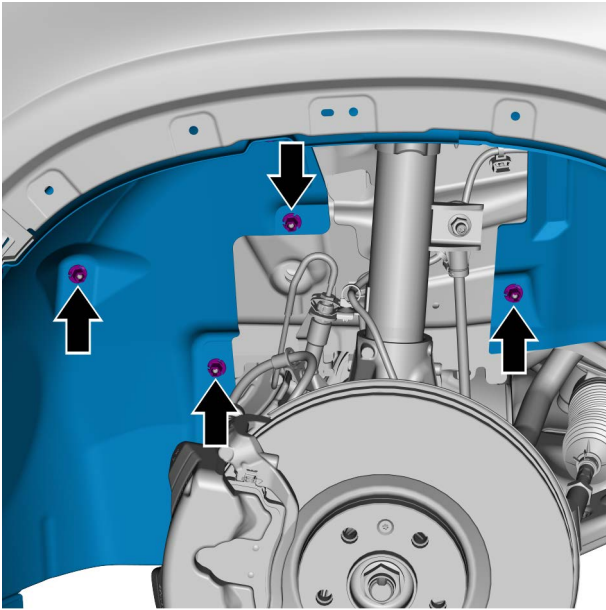
13.10.2.2 Replacement of left front wheel arch splash guard assembly

Removal Procedure

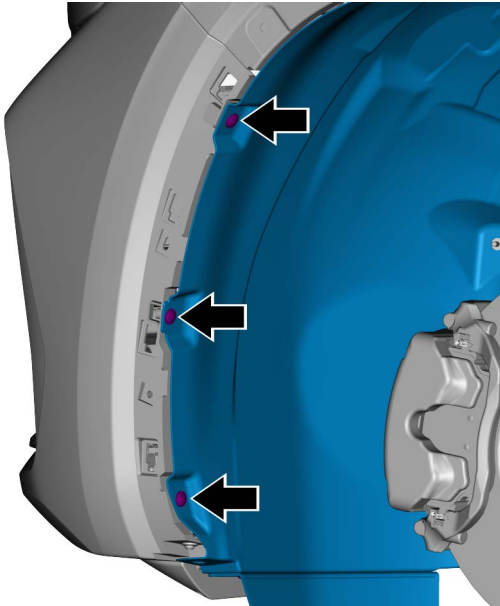
Caution

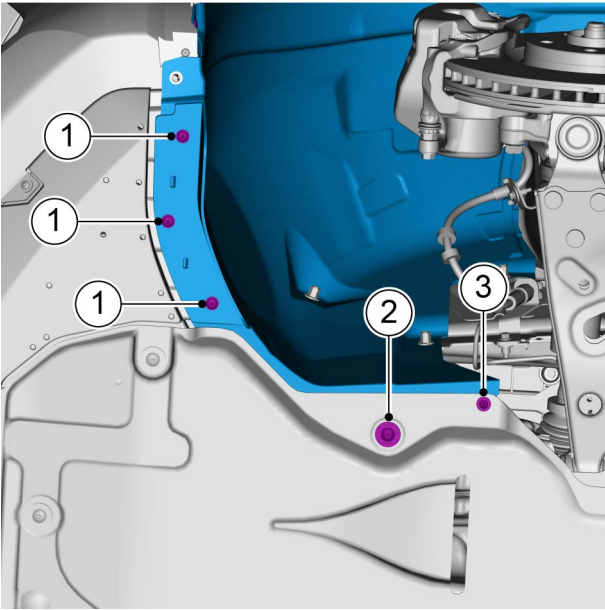
The removal and installation methods of left and right front wheel arch splash guards are similar.

- 1 Remove the left front wheels, refer to [Replacement of wheel assembly](#).
- 2 Remove the left front fender flare, refer to [Replacement of left front fender flare](#).
- 3 Remove the 4 plastic fixing nuts in the center of the left front wheel arch splash guard assembly.

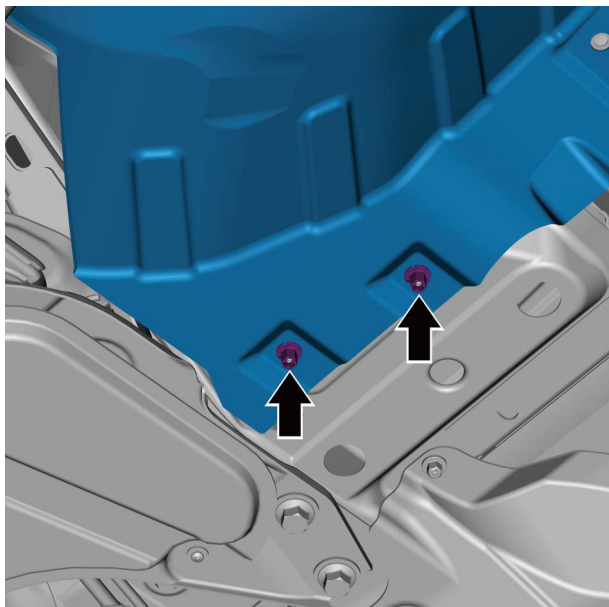


- 4 Remove the 3 fixing screws at the front end of the left front wheel arch splash guard assembly.

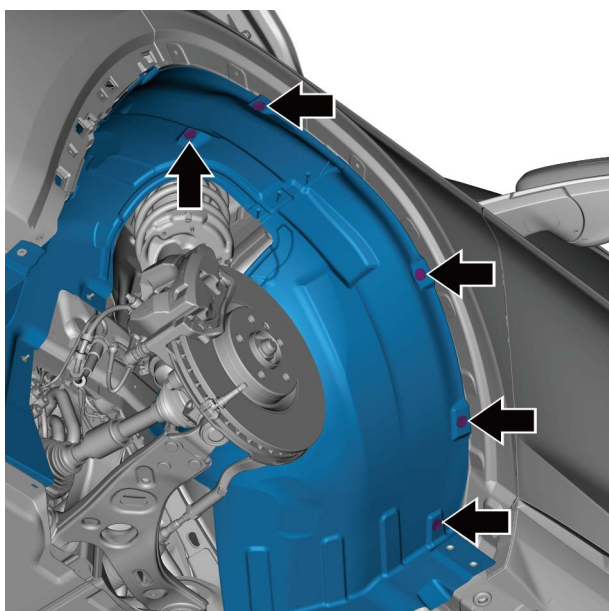




- 5 Remove the 3 fixing screws 1 and fixing screws 3 at the front bottom of the left front wheel arch splash guard assembly.
- 6 Remove the fixing bolt 2 at the front bottom of the left front wheel arch splash guard assembly.

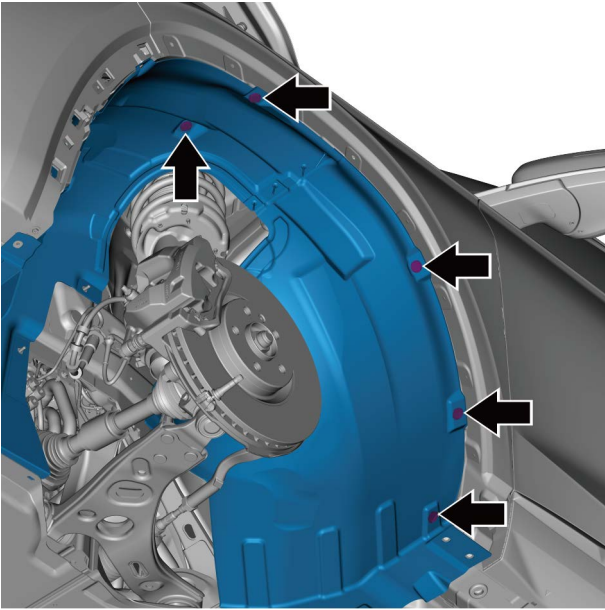


- 7 Remove the 2 plastic fixing nuts at the rear bottom of the left front wheel arch splash guard assembly.

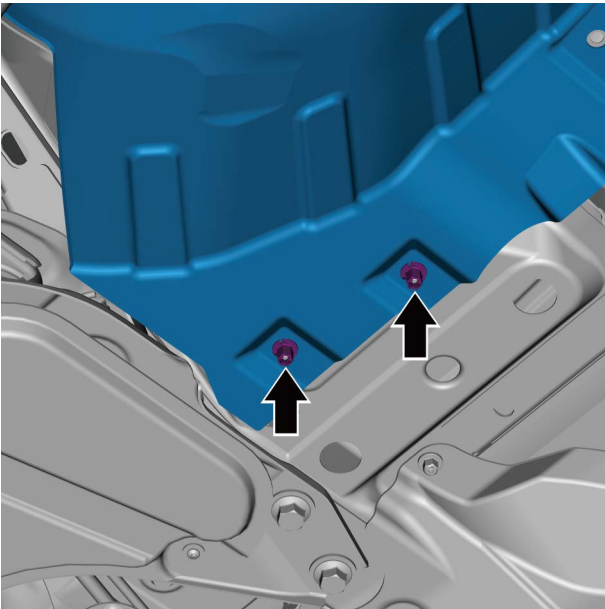


- 8 Remove the 5 G-clips at the rear of the left front wheel arch splash guard assembly and take off the left front wheel arch splash guard assembly.

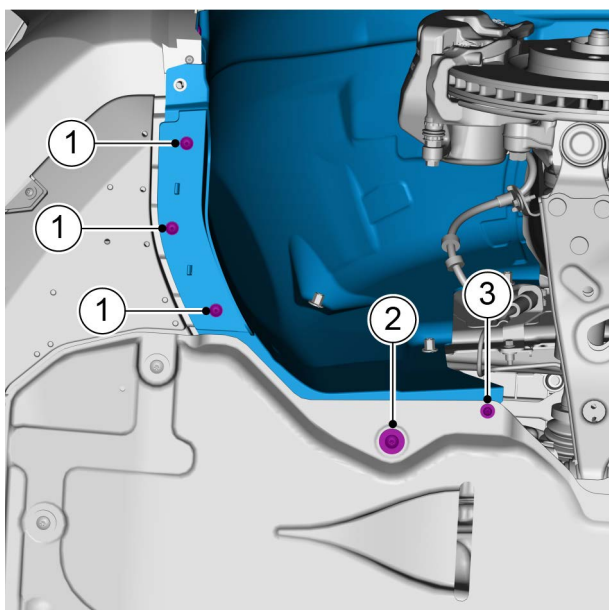
Installation Procedure



- 1 Install the 5 G-clips at the rear end of the left front wheel arch splash guard assembly.



- 2 Install the 2 plastic fixing nuts at the rear bottom of the left front wheel arch splash guard assembly.

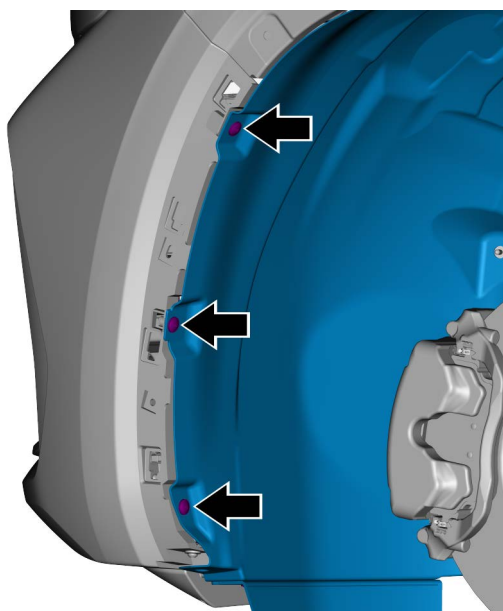


- 3 Install the 3 fixing screws 1 and fixing screws 3 at the front bottom of the left front wheel arch splash guard assembly.

Torque: 1.5N·m

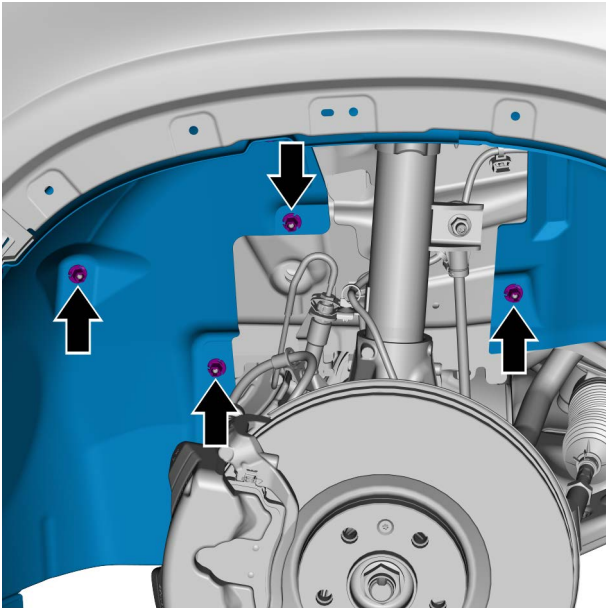
- 4 Install the fixing bolt 2 at the front bottom of the left front wheel arch splash guard assembly.

Torque: 3.5N·m



- 5 Install the 3 fixing screws at the front end of the left front wheel arch splash guard assembly.

Torque: 1.5N·m



- 6 Install the 4 plastic fixing nuts in the center of the left front wheel arch splash guard assembly.

- 7 Install the left front fender flare.
- 8 Install the left front wheel.

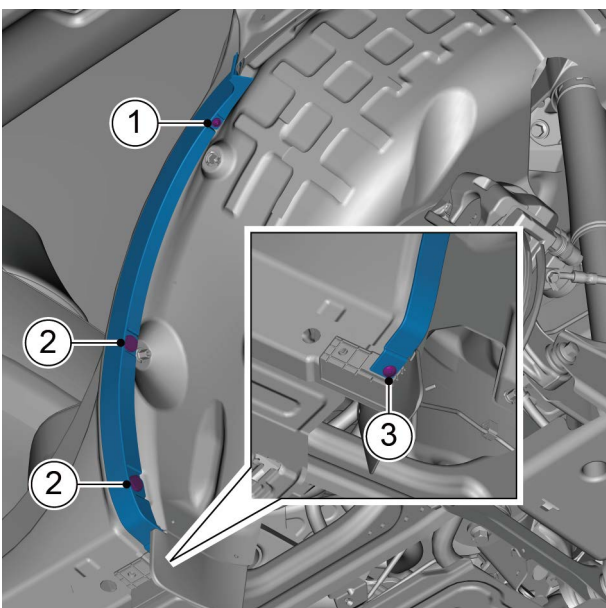
13.10.2.3 Replacement of left rear wheel arch splash guard assembly

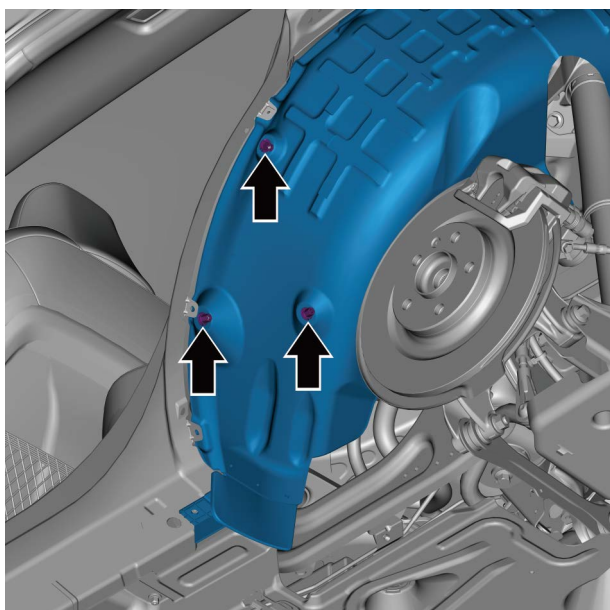
Removal Procedure

Caution

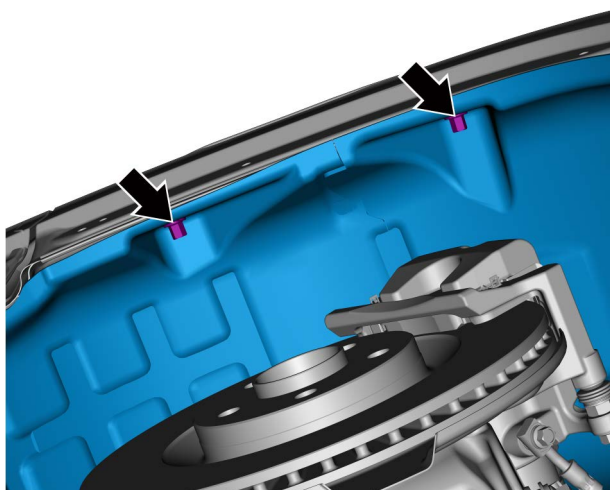
The removal and installation methods of left and right rear wheel arch splash guard assemblies are similar.

- 1 Remove the left rear wheels, refer to [Replacement of wheel assembly](#).
- 2 Remove the left rear fender flare, refer to [Replacement of left rear fender flare](#).
- 3 Remove the fixing screw 1 and fixing screw 3 of left rear fender flare II.
- 4 Remove the 2 G-clips 2 of left rear fender flare.

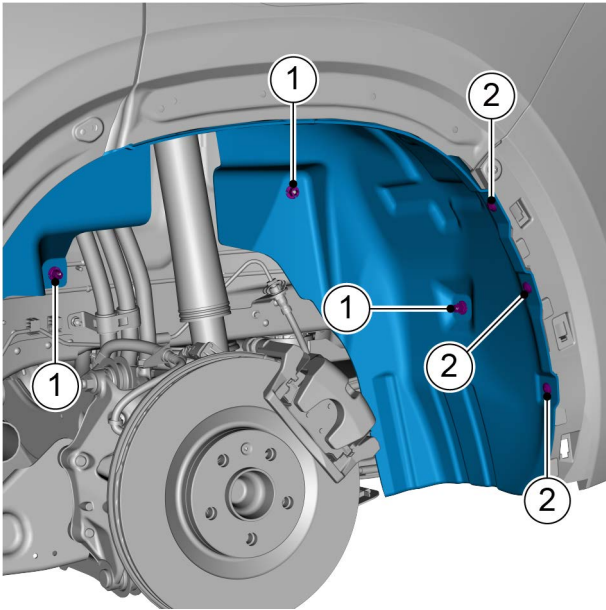




- 5 Remove the 3 nuts of left rear wheel arch splash guard assembly.

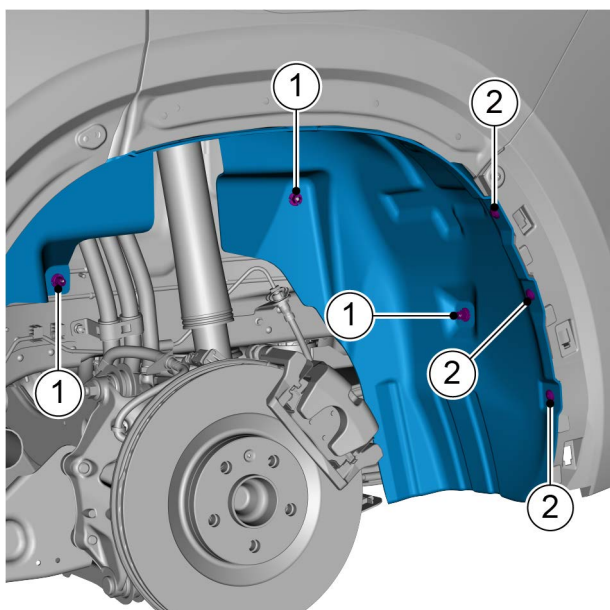


- 6 Remove the 2 plastic nuts of the left rear wheel arch splash guard assembly.



- 7 Remove the 3 plastic nuts 1 and 3 fixing screws 2 of left rear wheel arch splash guard assembly and take off the left rear wheel arch splash guard assembly.

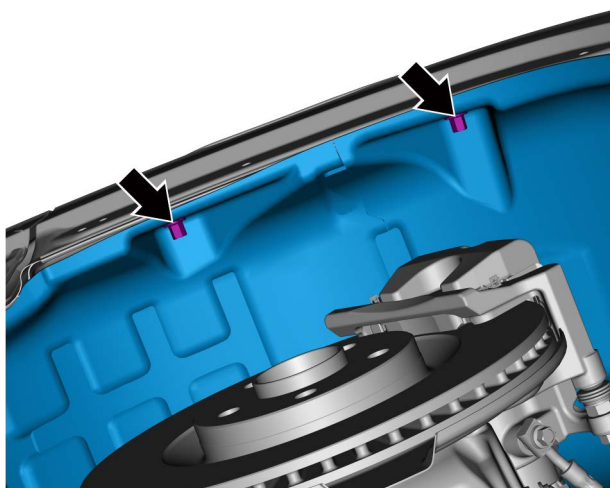
Installation Procedure

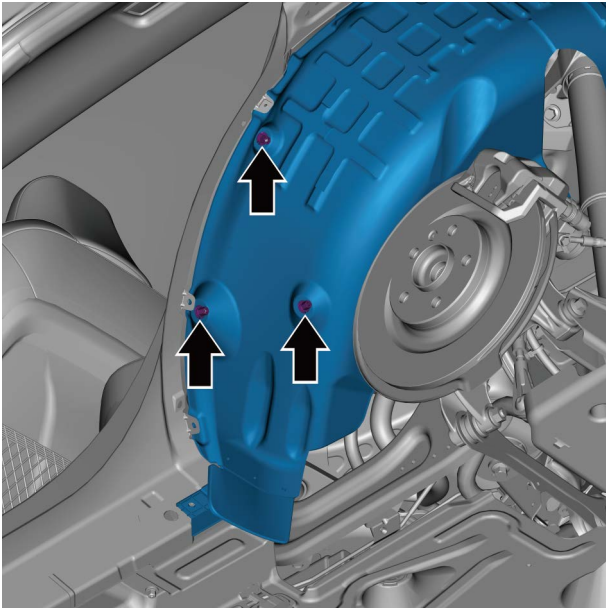


- 1 Install the 3 plastic nuts 1 and 3 fixing screws 2 of the left rear wheel arch splash guard assembly.

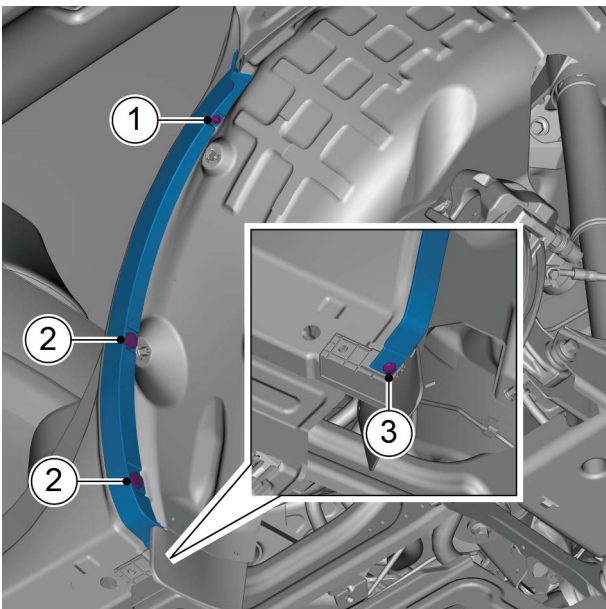
Torque: 2N·m

- 2 Install the 2 plastic nuts of the left rear wheel arch splash guard assembly.





- 3 Install the 3 nuts 1 and fixing screws 2 of the left rear wheel arch splash guard assembly.
Torque: 2N·m

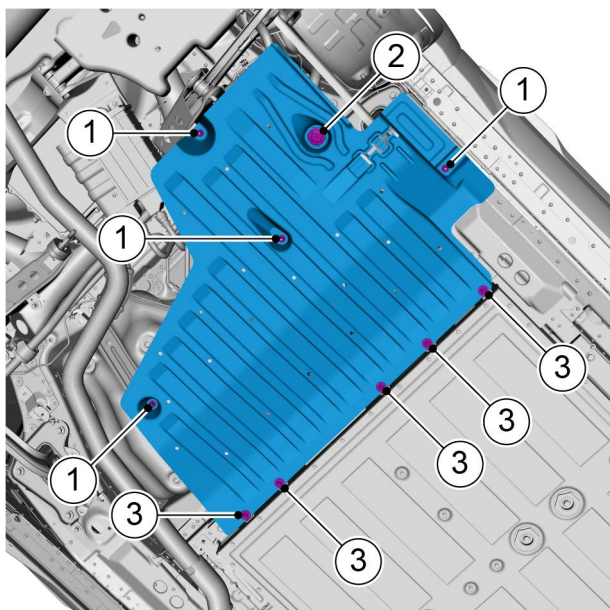


- 4 Install the fixing screw 1 and fixing screw 3 of left rear fender flare II.
Screw 1 torque: 1.5N·m
Screw 3 torque: 2N·m
- 5 Install the 2 G-clips 2 of left rear fender flare.

- 6 Install the left rear fender flare.
- 7 Install the left rear wheel.

13.10.2.4 Replacement of fuel tank right bottom shield

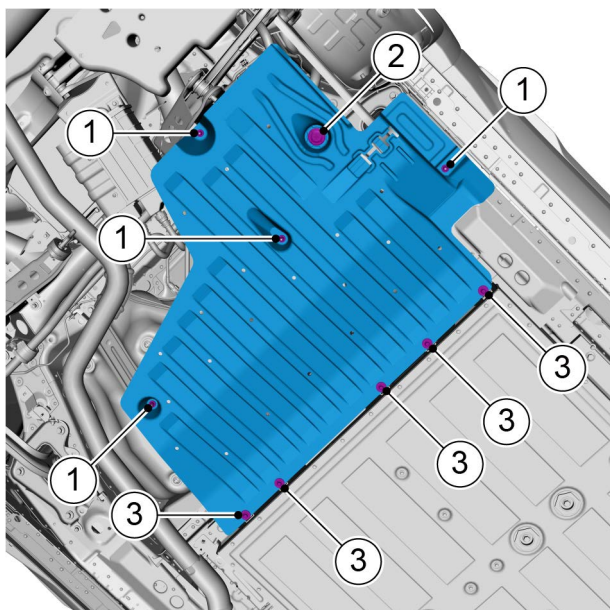
Removal Procedure



- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the plastic fixing nut 1 and fixing clips 2 of fuel tank right bottom shield, and take off the fuel tank right bottom shield.

Installation Procedure

- 1 Install the plastic fixing nuts 1 and fixing clips 2 of fuel tank right bottom shield.
Torque: 2 N m



- 2 Lower the vehicle.

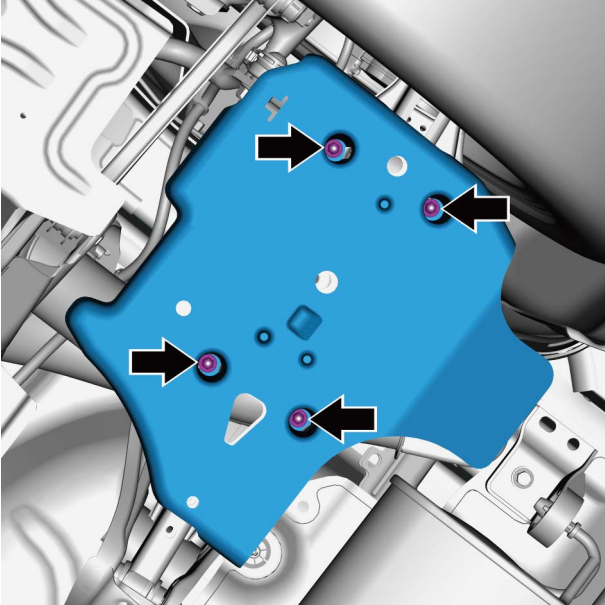
13.10.2.5 Replacement of left rear suspension

Removal Procedure

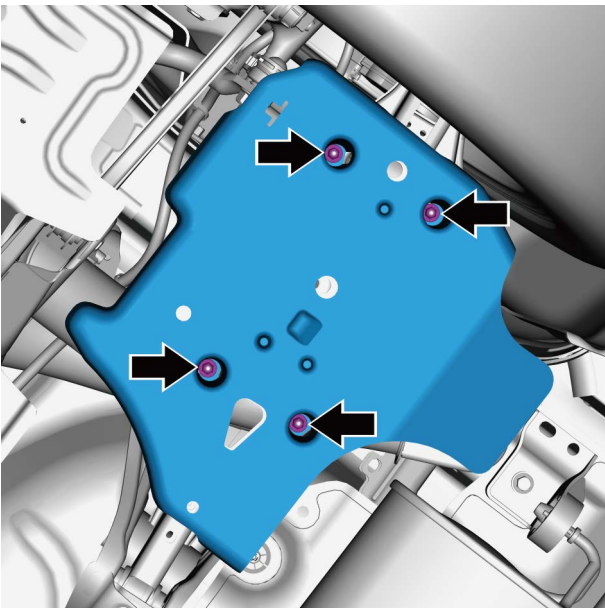
Caution

The removal and installation methods of left and right rear suspensions are similar.

- 1 Lift the vehicle, see [Vehicle Lifting and Raising](#).
- 2 Remove the 4 fixing nuts of left rear suspension and remove the left rear suspension.

**Installation Procedure**

- 1 Install the 4 fixing nuts of left rear suspension.
Torque: 2N·m



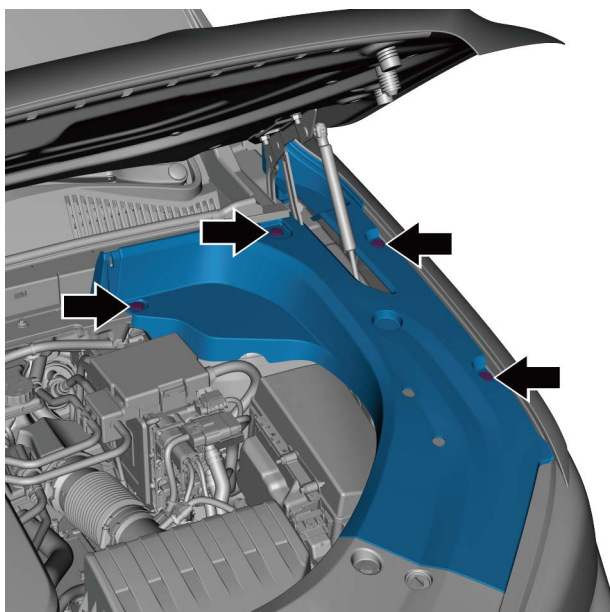
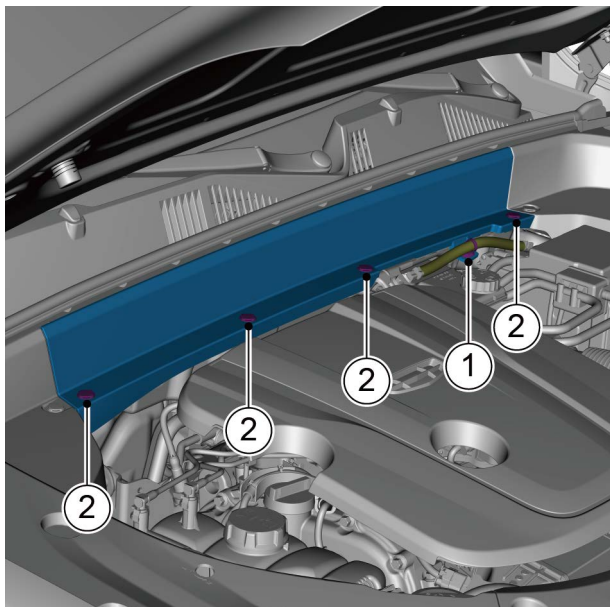
- 2 Lower the vehicle.

13.10.2.6 Replacement of left engine compartment trim panel**Removal Procedure**

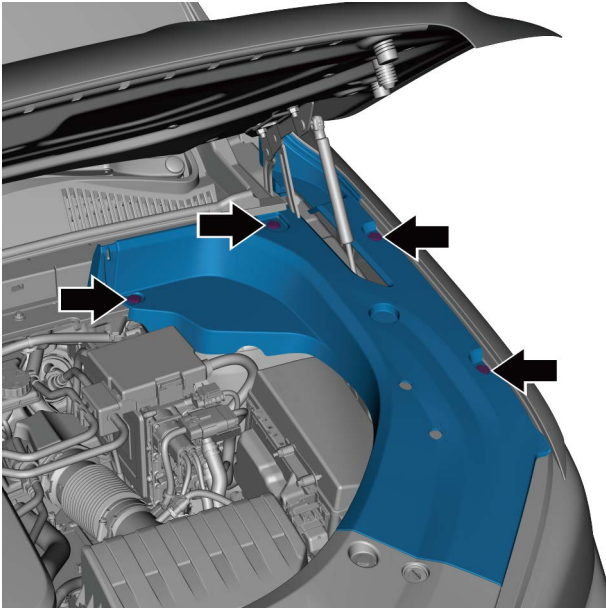
Caution

The removal and installation methods of left and right engine compartment trim panels are similar.

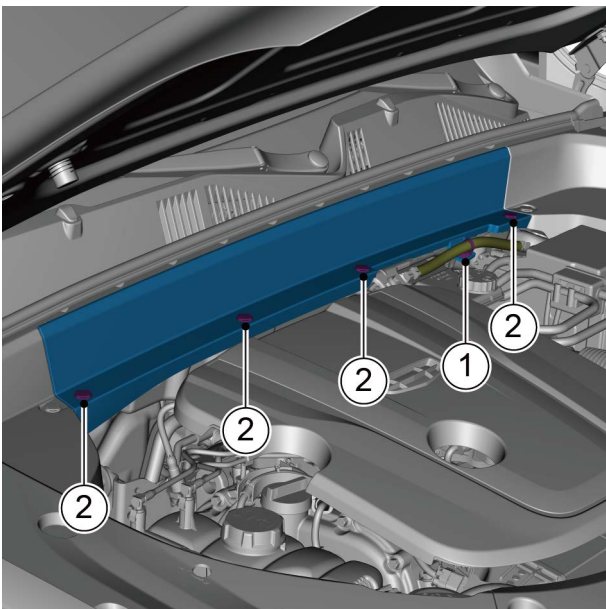
- 1 Open the engine hood.
- 2 Remove the DCDC ground harness fixing clips 1 on the rear engine compartment trim panel.
- 3 Remove the 4 fixing clips 2 on the rear engine compartment trim panel.
- 4 Remove the 4 fixing clips of left engine compartment trim panel and take off the left engine compartment trim panel.



Installation Procedure



- 1 Install the 4 fixing clips on the left engine compartment trim panel.



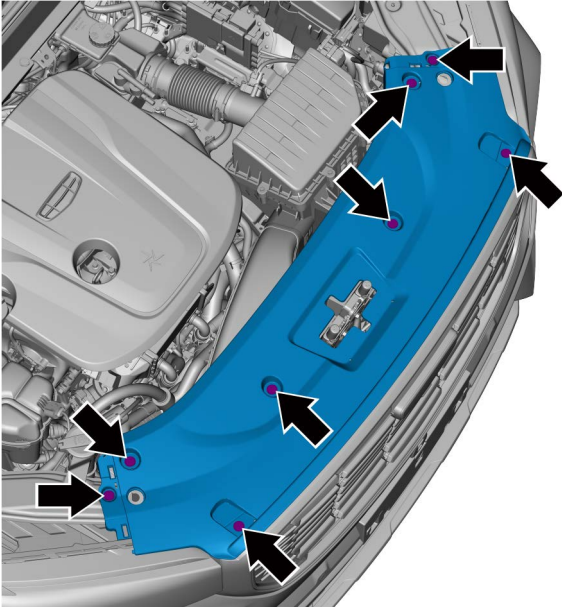
- 2 Install the DCDC ground harness fixing clips 1 on the rear engine compartment trim panel.
- 3 Install the 4 fixing clips 2 on the rear engine compartment trim panel.

- 4 Close the engine hood.

13.10.2.7 Replacement of engine compartment trim panel

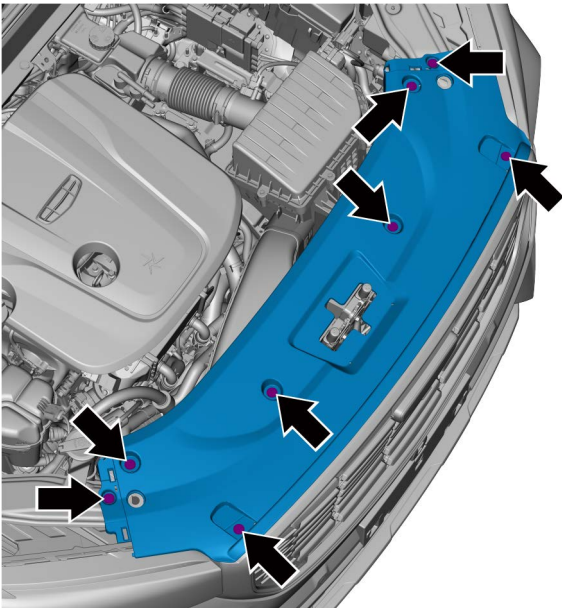
Removal Procedure

- 1 Open the engine hood.
- 2 Remove the left and right engine compartment trim panel, refer to [Replacement of left engine compartment trim panel](#).
- 3 Remove the 8 fixing clips of engine compartment trim panel and take off the engine compartment trim panel.



Installation Procedure

- 1 Install the 8 fixing clips of engine compartment trim panel.

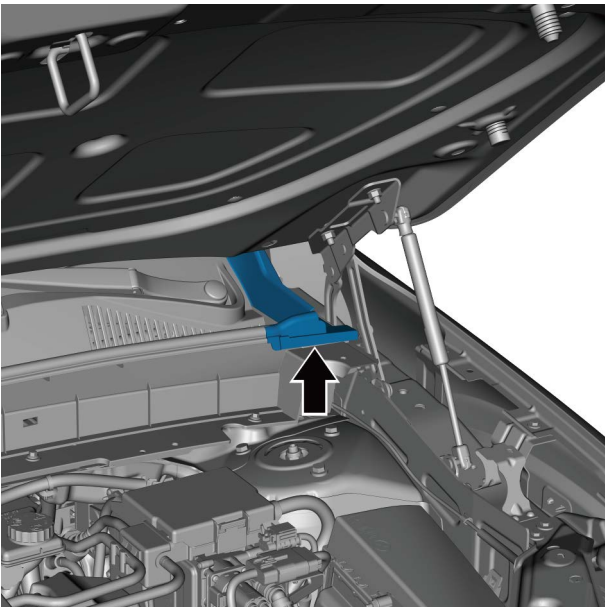
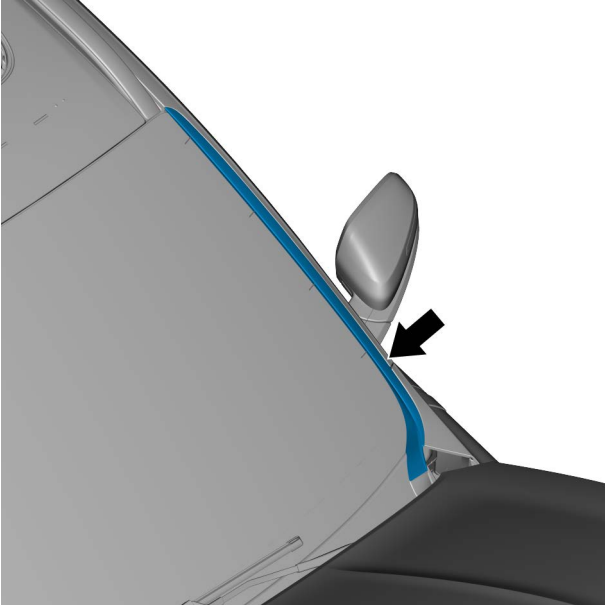


- 2 Install the left and right engine compartment trim panel.
- 3 Close the engine hood.

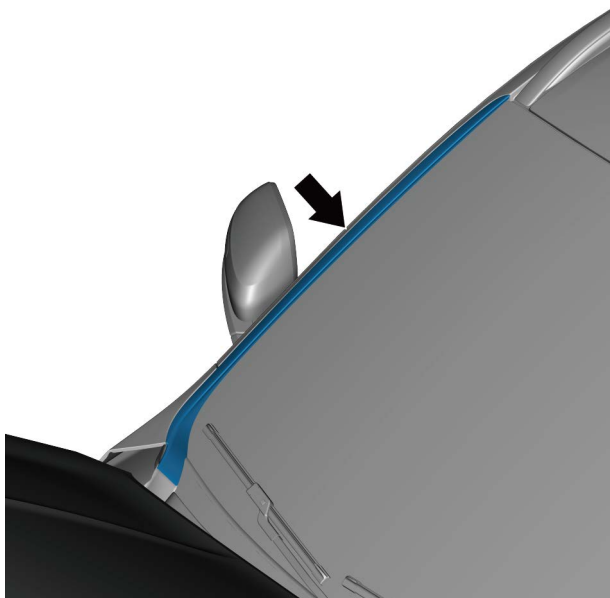
13.10.2.8 Replacement of ventilation cover plate as sembly

Removal Procedure

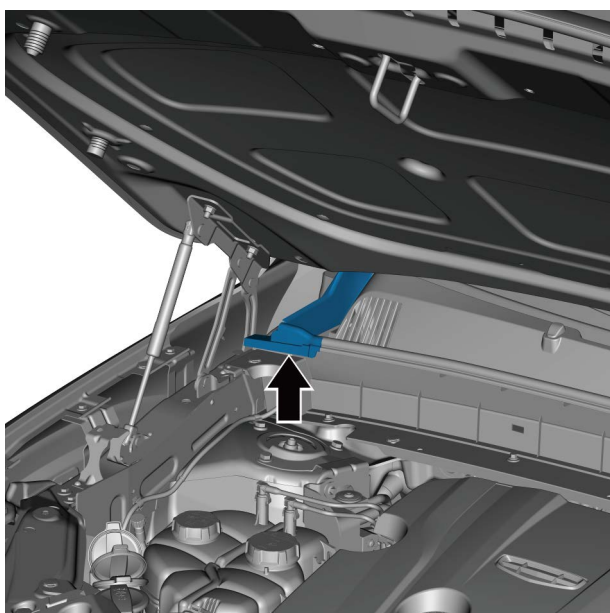
- 1 Remove the left and right engine compartment trim panel, refer to [Replacement of left engine compartment trim panel](#).
- 2 Remove the front wiper arm, refer to [Replacement of front wiper arm](#).
- 3 Remove the front washer nozzle assembly, refer to [Replacement of front washer nozzle assembly](#).
- 4 Remove the left front windshield trim strip.



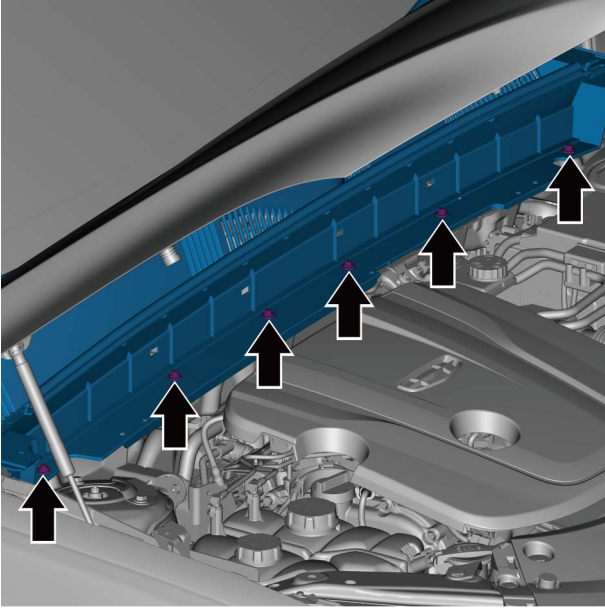
- 5 Remove the engine hood left trim panel.



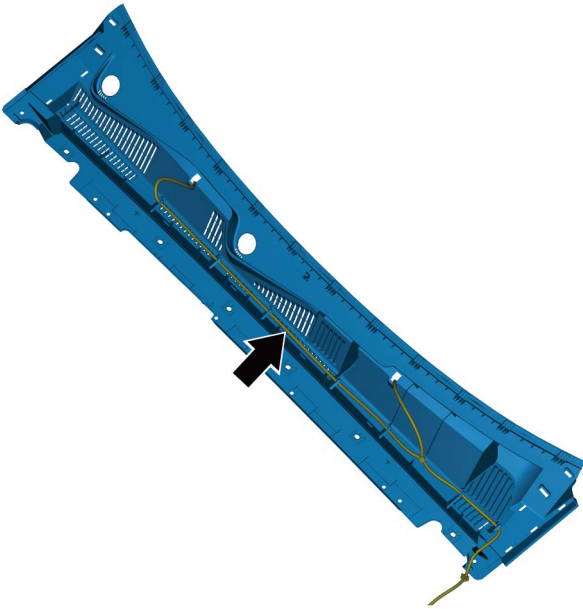
6 Remove the right front windshield trim strip.



7 Remove the engine hood right trim panel.



- 8 Remove the 6 fixing bolts of the ventilation cover plate assembly.

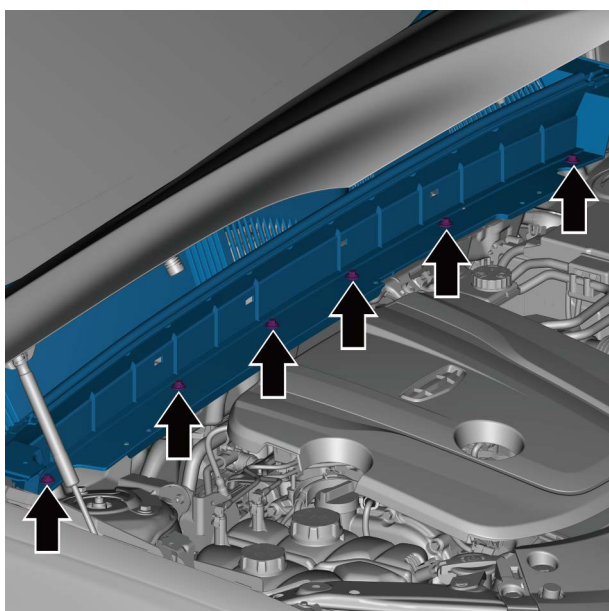


- 9 Disconnect the front washer hose from the ventilation cover plate assembly and remove the ventilation cover plate assembly.

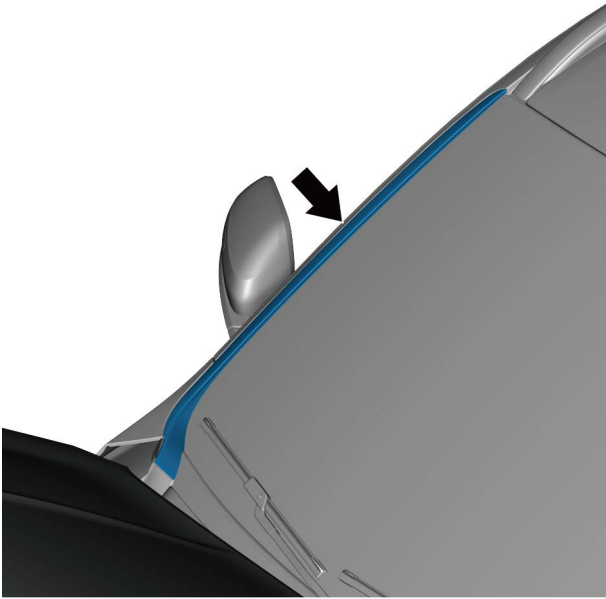
Installation Procedure



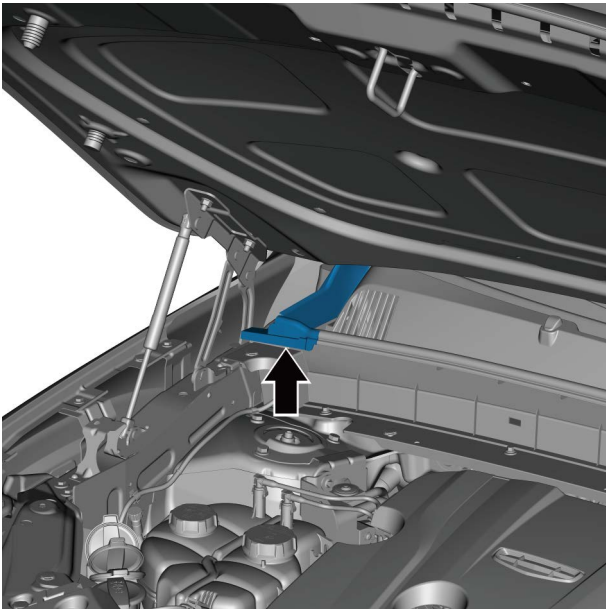
- 1 Install the front washer hose on the ventilation cover plate assembly.



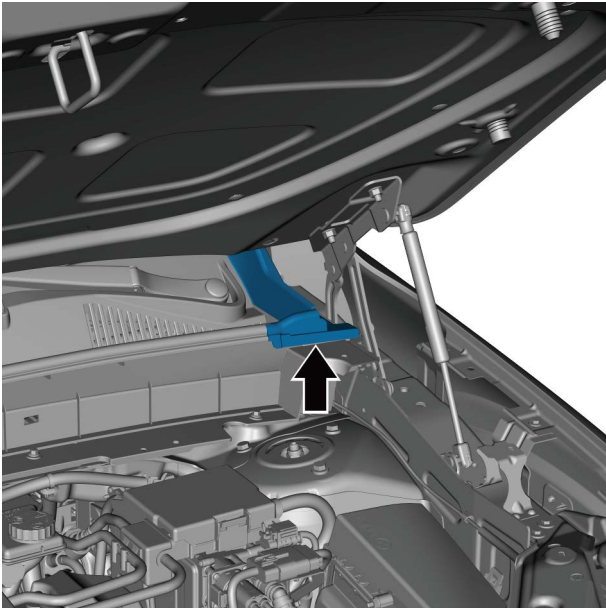
- 2 Install the 6 fixing bolts of the ventilation cover plate assembly.
Torque: 4N·m



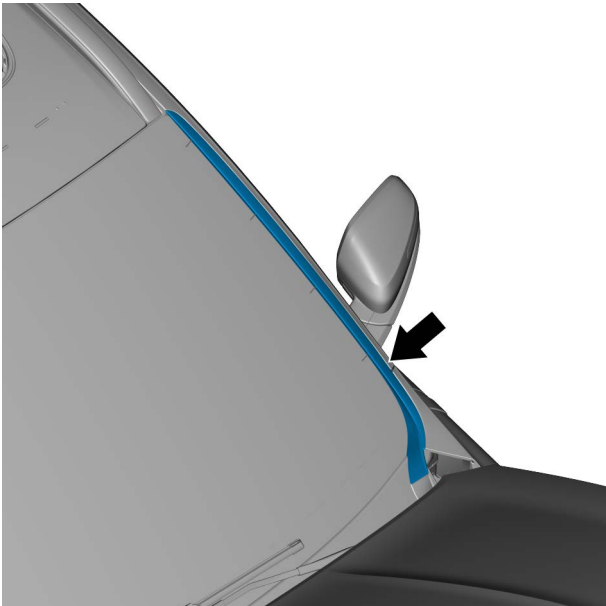
3 Install the right front windshield trim strip.



4 Install the engine hood right trim panel.



- 5 Install the engine hood left trim panel.



- 6 Install the left front windshield trim strip.

- 7 Install the front washer nozzle.
- 8 Install the front wiper arm.
- 9 Install the left and right engine compartment trim panel.

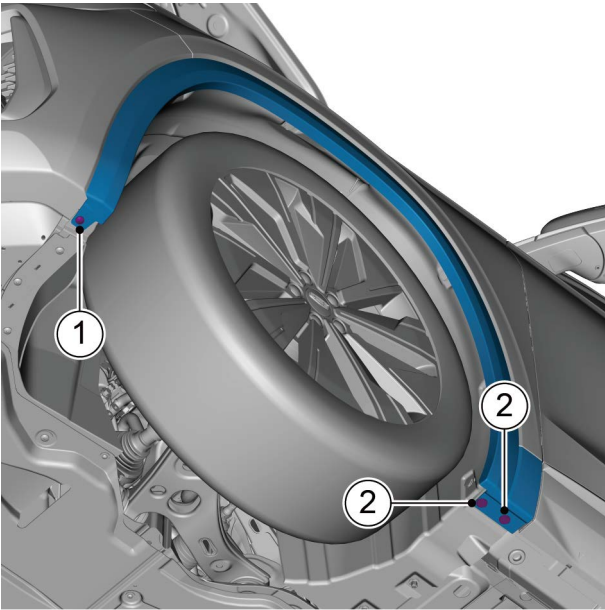
13.10.2.9 Replacement of left front fender flare

Removal Procedure

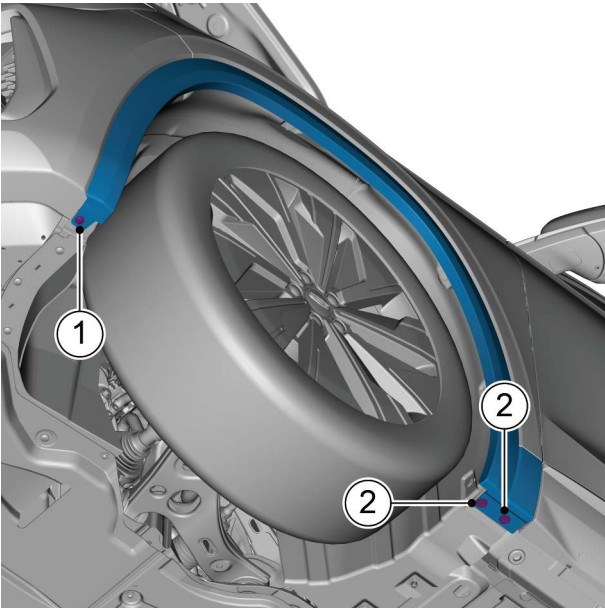
Caution

The removal and installation methods of left and right front fender flares are similar.

- 1 Remove the left front fender flare fixing screw 1 and 2 fixing clips 2 and take them off.

**Installation Procedure**

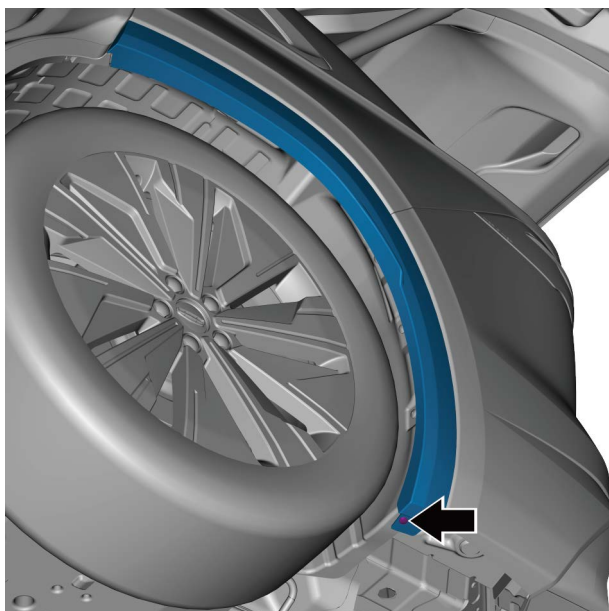
- 1 Install the left front fender flare fixing screw 1 and 2 fixing clips 2.
Torque: 2N·m

**13.10.2.10 Replacement of left rear fender flare****Removal Procedure**

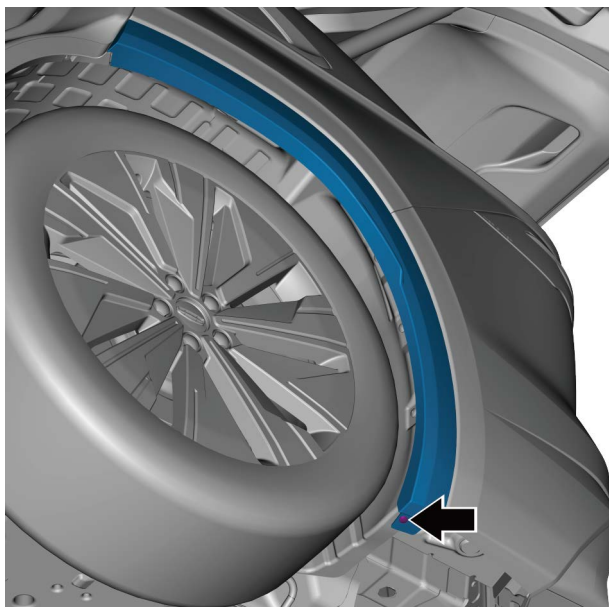
Caution

The removal and installation methods of left and right rear fender flares are similar.

- 1 Remove the fixing screws of left rear fender flare and take them off.

**Installation Procedure**

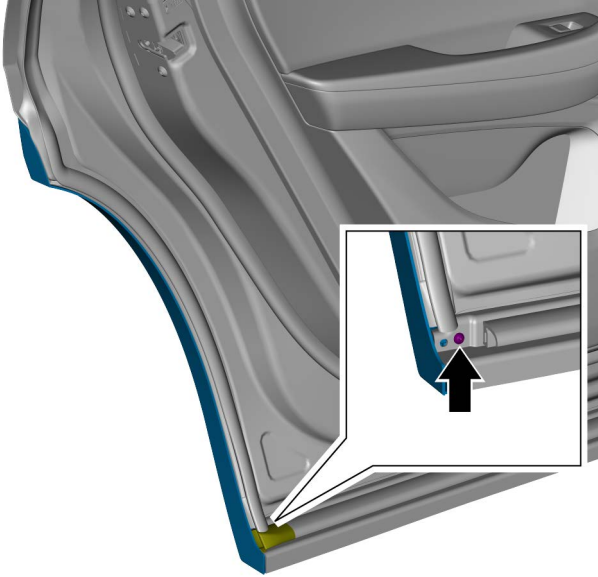
- 1 Install the fixing screws of left rear fender flare.
Torque: 2N·m

**13.10.2.11 Replacement of left rear fender flare front section****Removal Procedure**

Caution

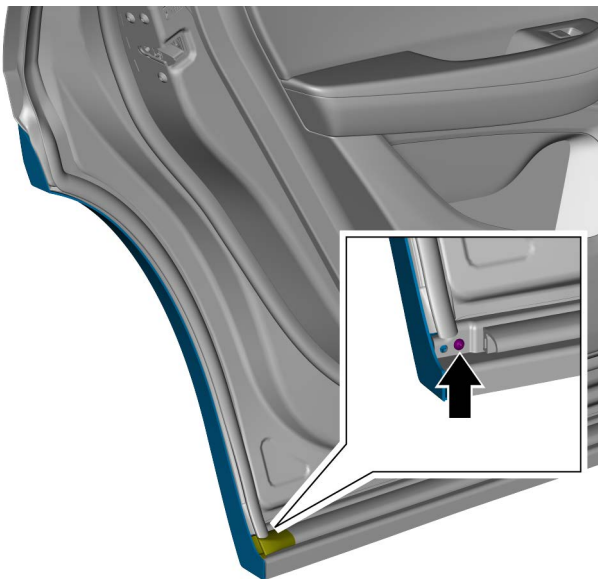
The removal and installation methods of the front sections of left and right rear fender flares are similar.

- 1 Remove the fixing screws of left rear fender flare front section and take off the left rear fender flare front section.

**Installation Procedure**

- 1 Install the fixing screws of left rear fender flare front section.

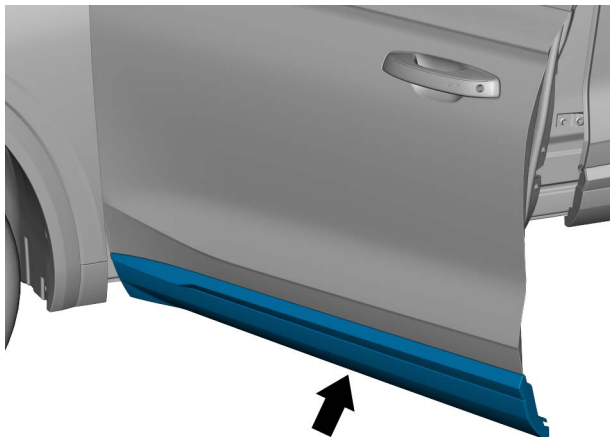
Torque: 2.5N·m

**13.10.2.12 Replacement of left front door lower trim panel assembly****Removal Procedure**

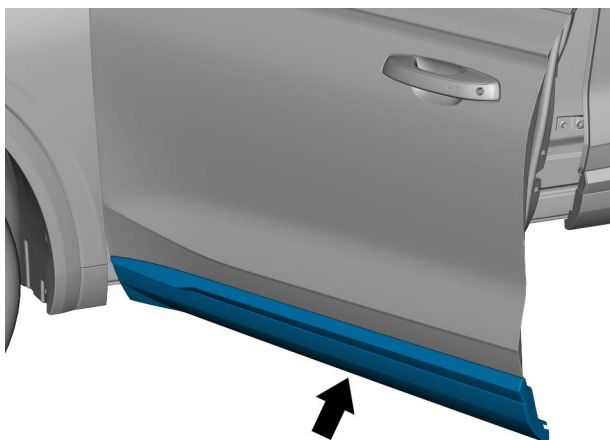
Caution

The removal and installation methods of left and right front door lower trim panel assemblies are similar.

- 1 Remove the left front door lower trim panel assembly and take it off.

**Installation Procedure**

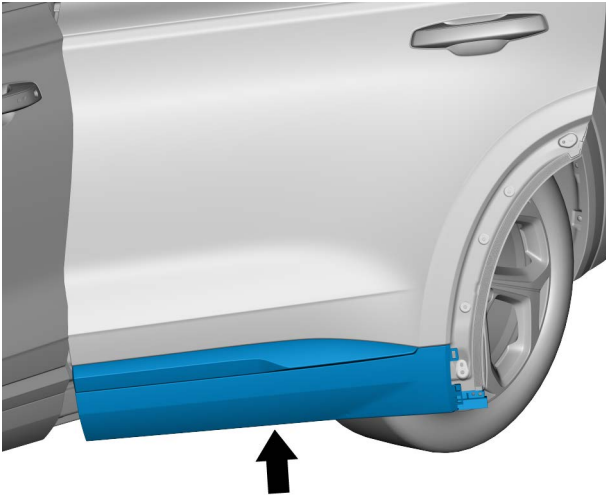
- 1 Install the left front door lower trim panel assembly.

**13.10.2.13 Replacement of left rear door lower trim panel assembly****Removal Procedure**

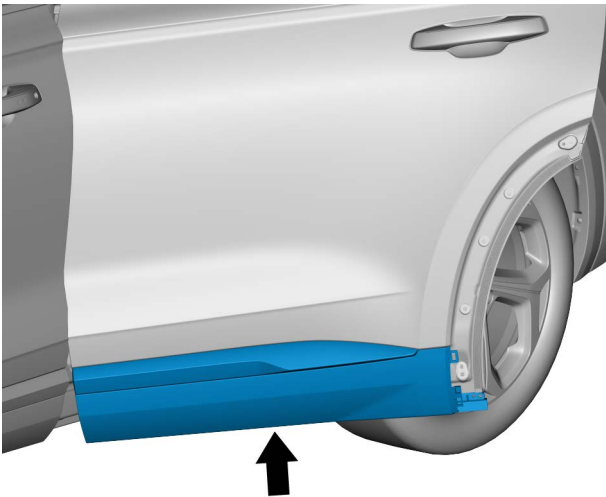
Caution

The removal and installation methods of left and right rear door lower trim panel assemblies are similar.

- 1 Remove the left rear fender flare front section, refer to [Replacement of left rear fender flare front section](#).
- 2 Remove the left rear door lower trim panel assembly and take it off.

**Installation Procedure**

- 1 Install the left rear door lower trim panel assembly and remove it.



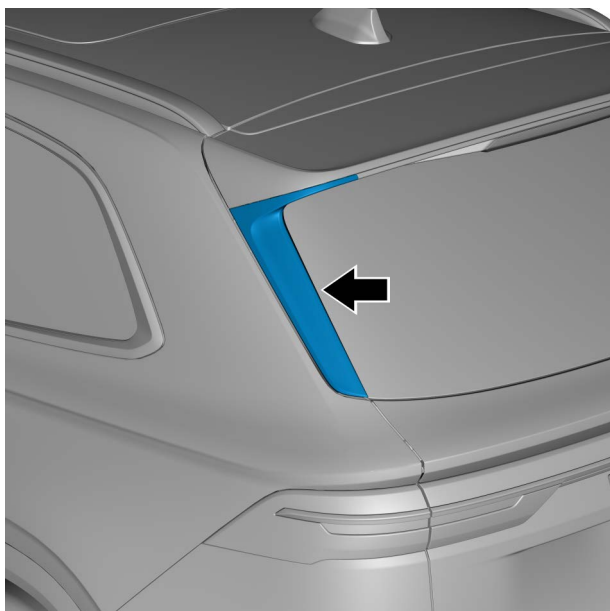
- 2 Install the left rear fender flare front section.

13.10.2.14 Replacement of rear windshield left spoiler assembly**Removal Procedure**

Caution

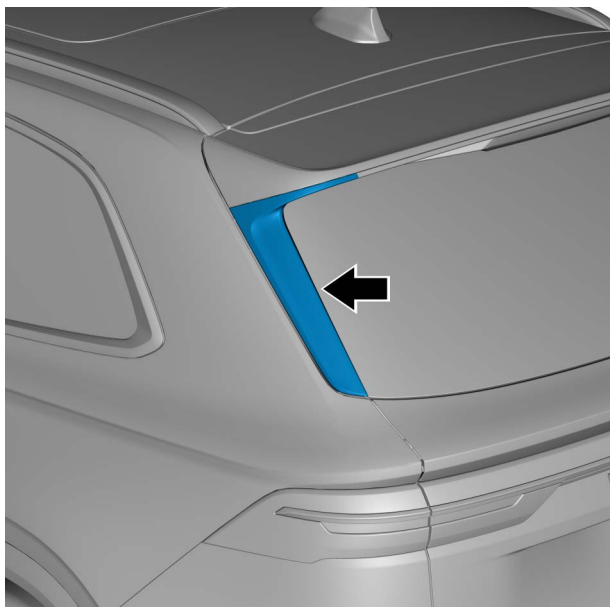
The removal and installation methods of left and right rear windshield spoiler assemblies are similar.

- 1 Disassemble the rear windshield left spoiler assembly and remove it.



Installation Procedure

- 1 Install the rear windshield left spoiler assembly.



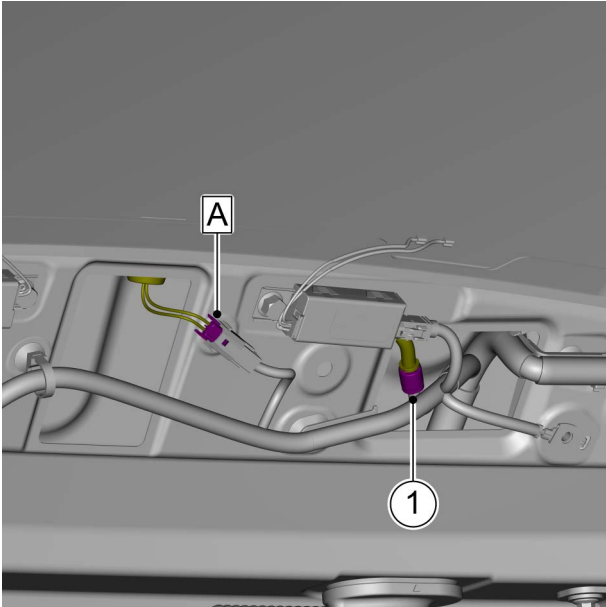
13.10.2.15 Replacement of spoiler assembly

Removal Procedure

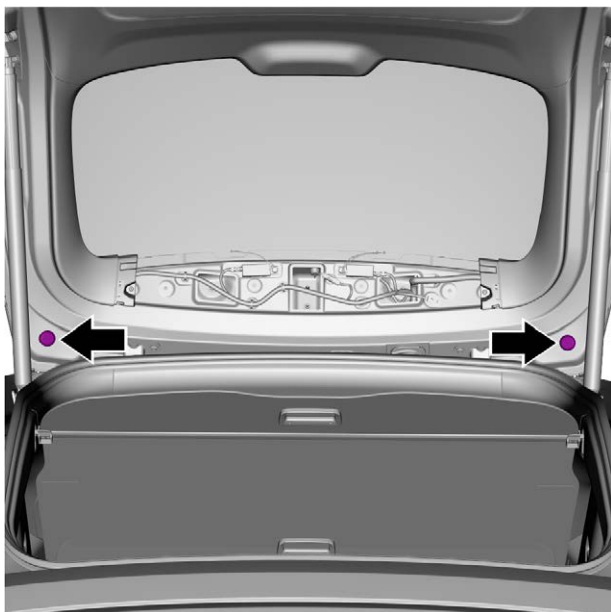
Warning !

Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions S](#)"

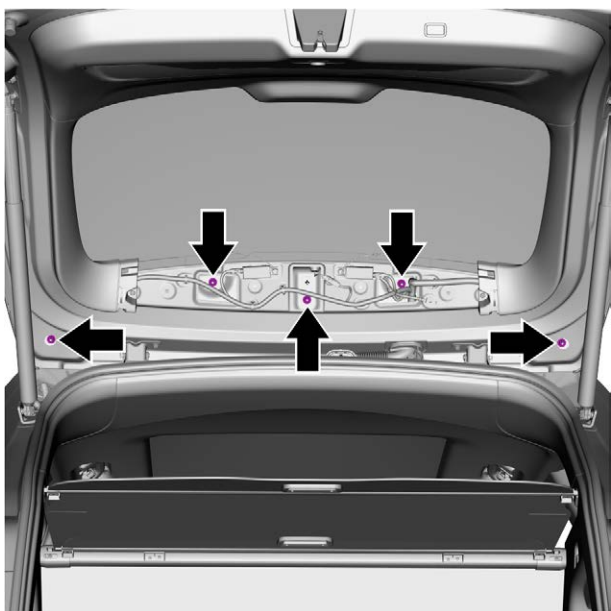
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).



- 2 Remove the rear windshield left spoiler assembly, refer to [Replacement of rear windshield left spoiler assembly](#).
- 3 Remove the trunk door middle upper interior trim panel assembly, refer to [Replacement of trunk door middle upper interior trim panel assembly](#).
- 4 Disconnect the rear window brake lamp harness connector A.
- 5 Remove the rear washer hose assembly 1.

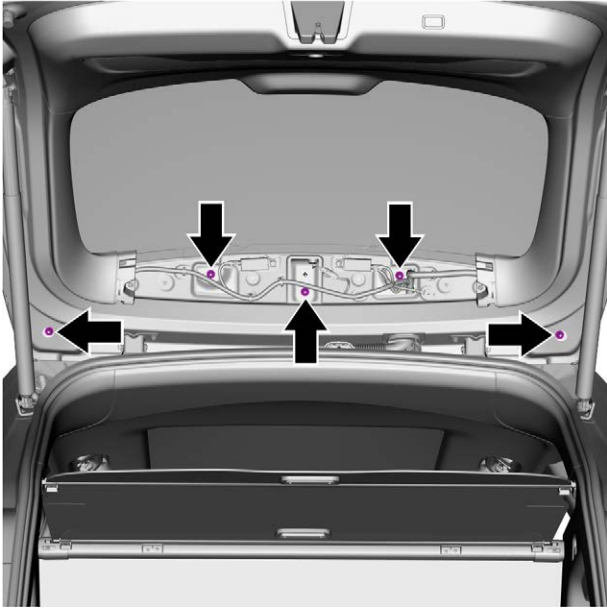


6 Remove the 2 plastic plugs.

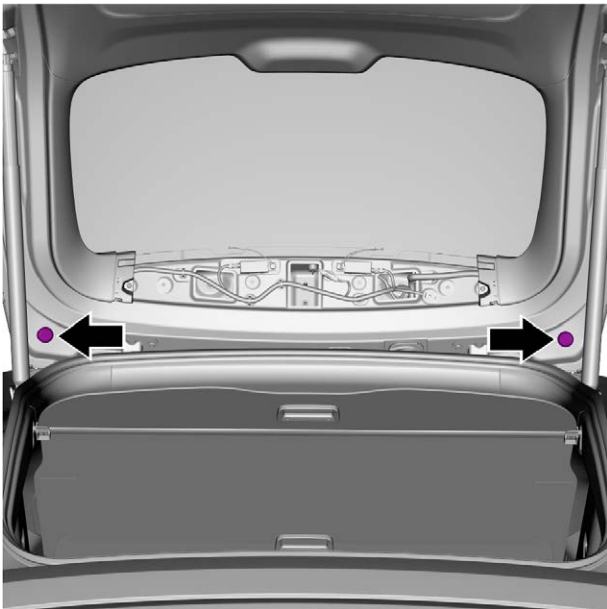


7 Remove the 5 fixing nuts of spoiler assembly and remove the spoiler assembly.

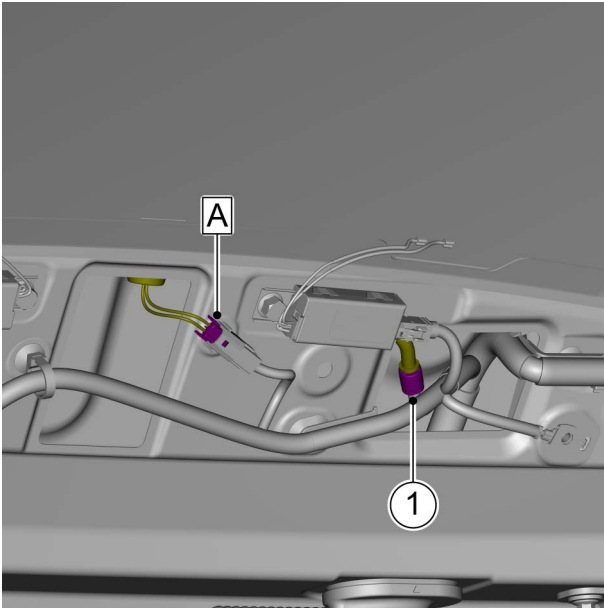
Installation Procedure



- 1 Install the 5 fixing nuts of spoiler assembly.
Torque: 9N·m



- 2 Install the 2 plastic plugs.



- 3 Connect the rear window brake lamp harness connector A.
- 4 Install the rear washer hose assembly 1.

- 5 Install the tail gate middle upper interior trim panel assembly.
- 6 Install the rear windshield left spoiler assembly.
- 7 Connect the negative cable of battery.

13.10.2.16 Replacement of left luggage rack

Removal Procedure

Warning !

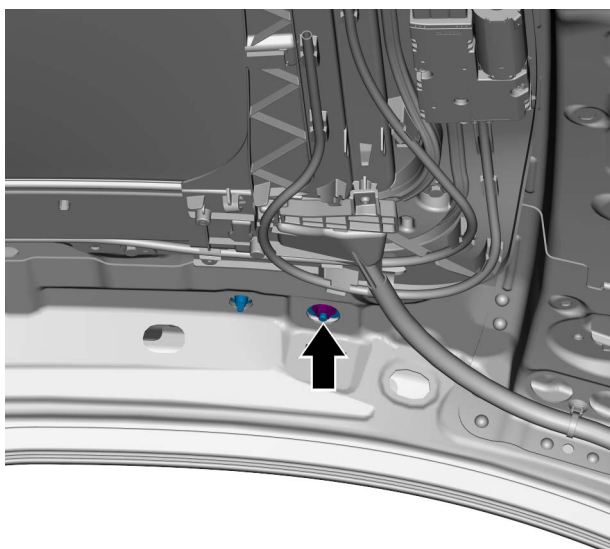
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

Caution

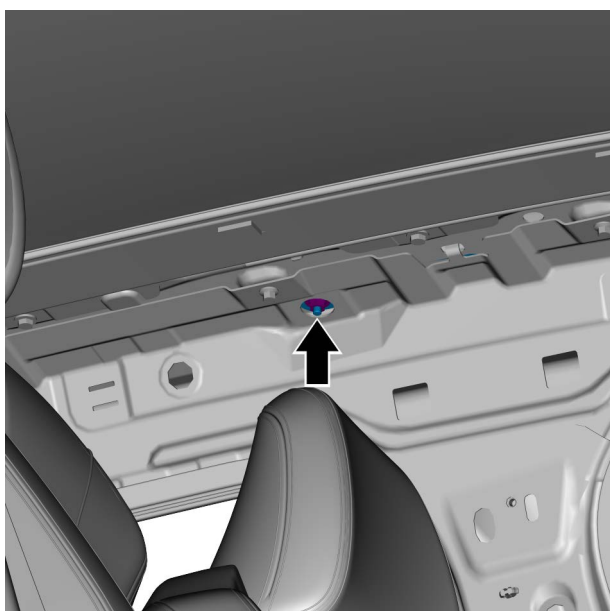
The removal and installation methods of left and right luggage racks are similar.

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left and right A-pillar upper trim panel assemblies, refer to [Replacement of left A-pillar upper trim panel assembly](#).
- 3 Remove the left front door sill trim panel assembly, refer to [Replacement of left front door sill trim panel assembly](#).
- 4 Remove the right front door sill trim panel assembly, refer to [Replacement of right front door sill trim panel assembly](#).
- 5 Remove the rear seat cushion assembly, refer to [Replacement of seat cushion assembly](#).
- 6 Remove the rear seat left backrest assembly, refer to [Replacement of rear seat left backrest assembly](#).

- 7 Remove the rear seat right backrest assembly, refer to [Replacement of rear seat right backrest assembly](#).
- 8 Remove the left upper trim panel of luggage compartment, refer to [Replacement of luggage compartment left upper trim panel](#).
- 9 Remove the left and right luggage compartment side shield assemblies, refer to [Replacement of left luggage compartment side shield assembly](#).
- 10 Remove the left and right C-pillar upper trim panel assemblies, refer to [Replacement of left C-pillar upper trim panel assembly](#).
- 11 Remove the left and right D-pillar upper trim panel assemblies, refer to [Replacement of left D-pillar upper trim panel assembly](#).
- 12 Remove the left and right rear door sill interior trim panel assemblies, refer to [Replacement of left rear door sill interior trim panel assembly](#).
- 13 Remove the left and right B-pillar lower trim panel assembly, refer to [Replacement of left B-pillar lower trim panel assembly](#).
- 14 Remove the left and right B-pillar upper trim panel assembly, refer to [Replacement of left B-pillar upper trim panel assembly](#).
- 15 Remove the front safety handle assembly, refer to [Replacement of front safety handle assembly](#).
- 16 Remove the left and right rear safety handle assemblies, refer to [Replacement of front safety handle assembly](#).
- 17 Remove the left and right sun visor assemblies, refer to [Replacement of left sun visor assembly](#).
- 18 Remove the overhead console unit, refer to [Replacement of overhead console unit \(type I\)](#) and [Replacement of overhead console unit \(type II\)](#).
- 19 Remove the roof assembly, refer to [Replacement of roof assembly](#).
- 20 Remove the inflatable curtain (left side), refer to [Replacement of inflatable curtain \(left side\)](#).

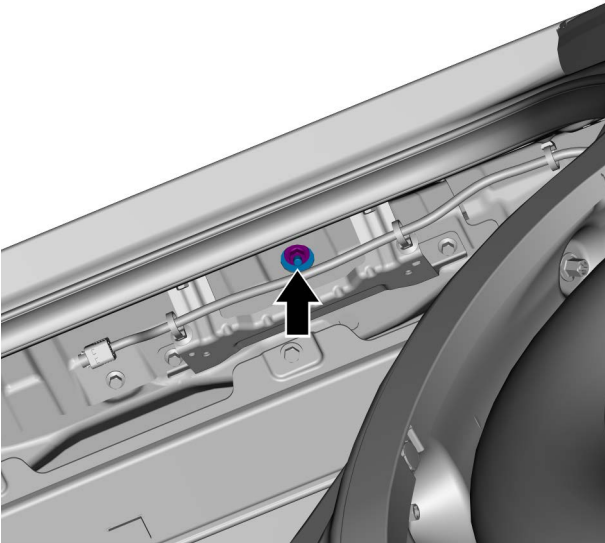


21 Remove the fixing bolt at left luggage rack A-pillar end.

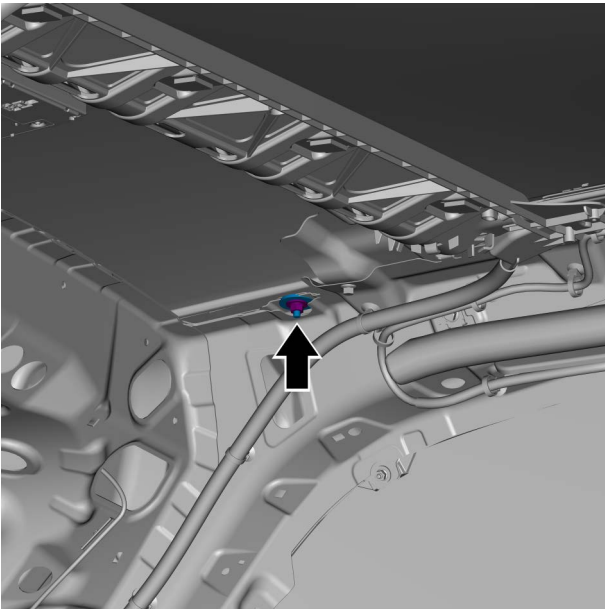


22 Remove the fixing nut at left luggage rack B-pillar end.

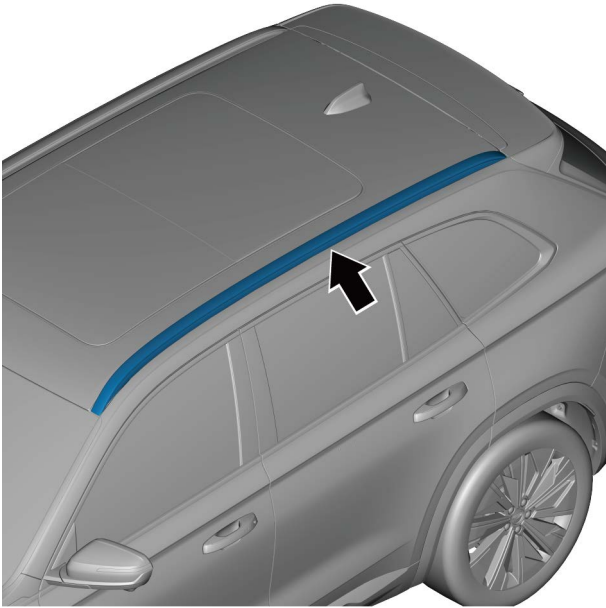
- 23 Remove the fixing nut at left luggage rack C-pillar end.



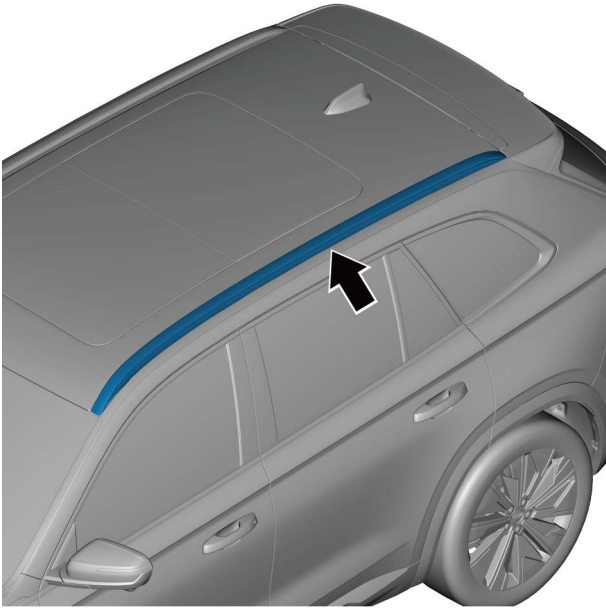
- 24 Remove the fixing nut at left luggage rack D-pillar end.



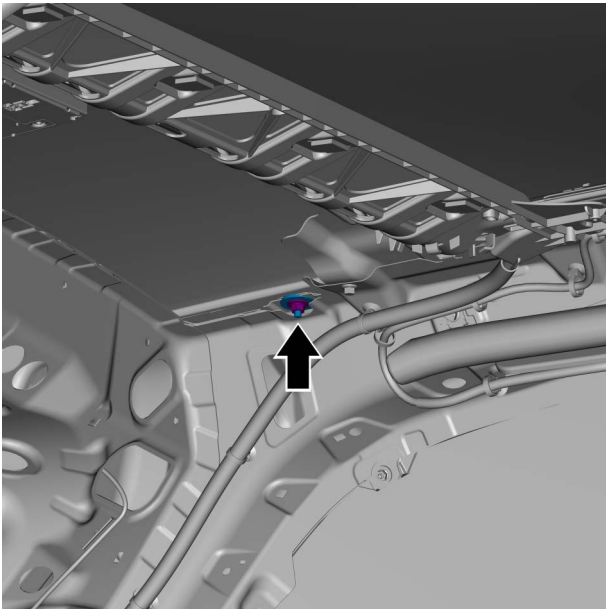
25 Remove the left luggage rack.



Installation Procedure

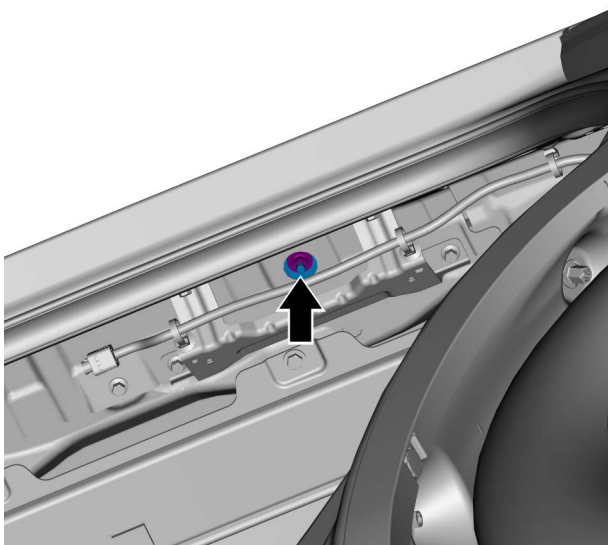


1 Install the left luggage rack.

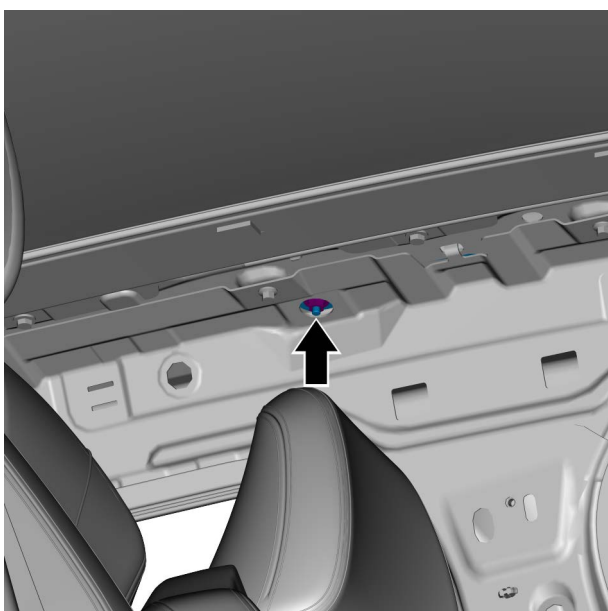


2 Install the fixing nut at left luggage rack D-pillar end.

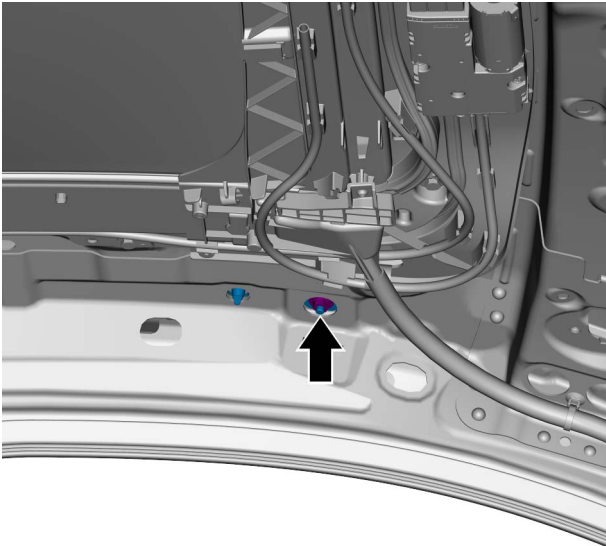
Torque: 9N·m



- 3 Install the fixing nut at left luggage rack C-pillar end.
Torque: 9N·m



- 4 Install the fixing nut at left luggage rack B-pillar end.
Torque: 9N·m



- 5 Install the fixing bolt at left luggage rack A-pillar end.
Torque: 9N·m

- 6 Install the inflatable curtain (left side).
- 7 Install the roof assembly.
- 8 Install the overhead console unit.
- 9 Install the left and right sun visor assemblies.
- 10 Install the left and right rear safety handle assemblies.
- 11 Install the front safety handle assembly.
- 12 Install the left and right B-pillar upper trim panel assembly.
- 13 Install the left and right pillar B lower trim panel assembly.
- 14 Install the left and right rear door sill interior trim panel assemblies.
- 15 Install the left and right D-pillar upper trim panel assemblies.
- 16 Install the left and right C-pillar upper trim panel assembly.
- 17 Install the left and right luggage compartment side shield assemblies.
- 18 Install the left and right luggage compartment upper trim panel covers.
- 19 Install the rear seat right backrest assembly.
- 20 Install the rear seat left backrest assembly.
- 21 Install the rear seat cushion assembly.
- 22 Install the right front door sill trim panel assembly.
- 23 Install the left front door sill trim panel assembly.

- 24 Install the left and right A-pillar upper trim panel assembly.
- 25 Connect the negative cable of battery.

13.10.2.17 Replacement of left front door B-pillar trim panel

Removal Procedure

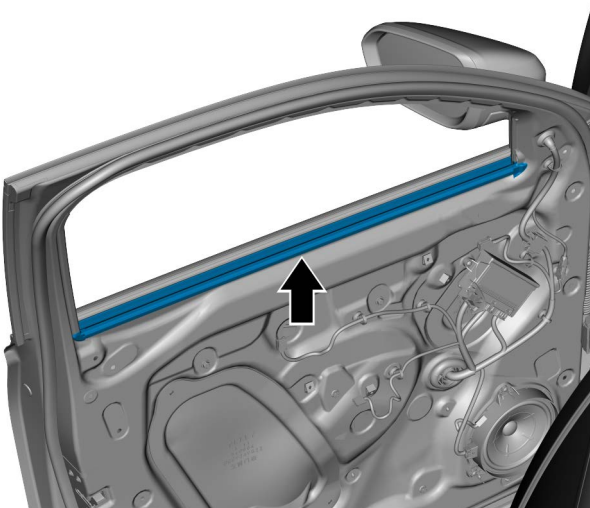
Warning !

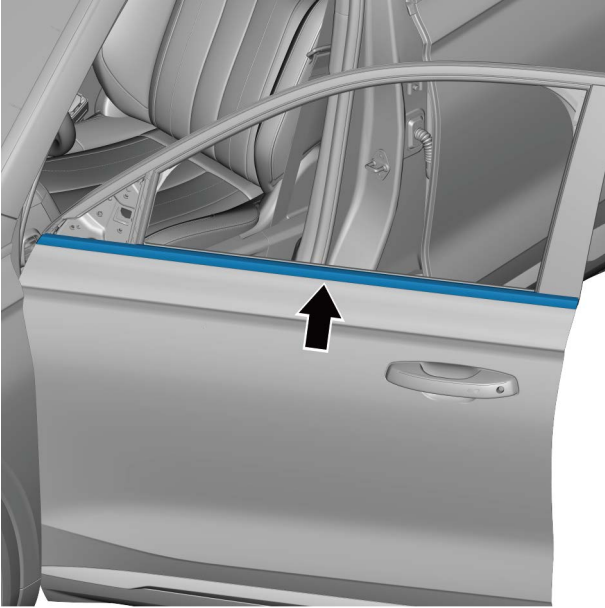
Refer to "Warnings regarding battery disconnection" in "[Warnings and Precautions](#)"

Caution

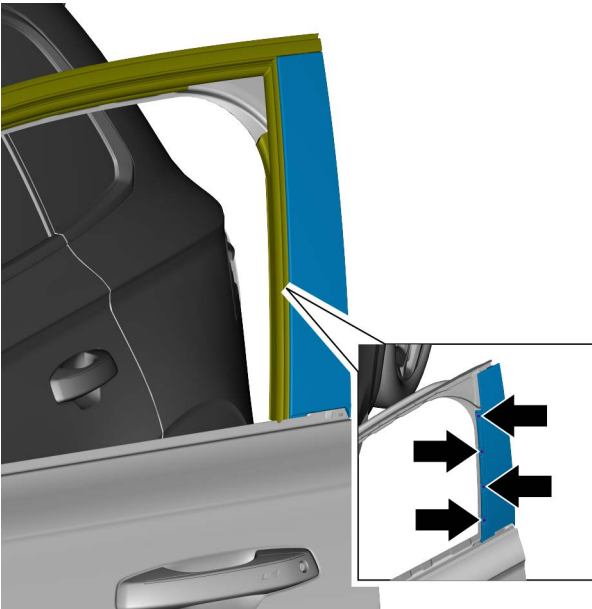
The removal and installation methods of left and right front door B-pillar trim panels are similar.

- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left front door interior trim panel assembly, refer to [Replacement of left front door interior trim panel assembly](#).
- 3 Remove the left front door window assembly, refer to [Replacement of left front door window assembly](#).
- 4 Remove exterior rearview mirror (left), refer to [Replacement of exterior rearview mirror \(left\)](#).
- 5 Remove the inner belt line moulding of left front door.



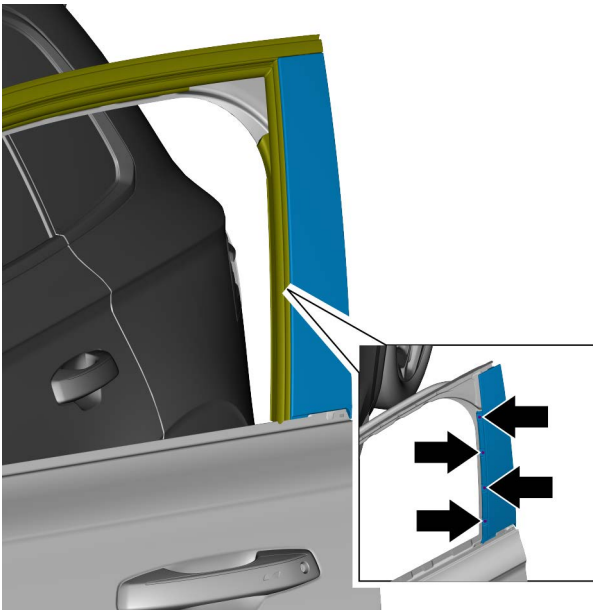


- 6 Remove the left front door outer belt line moulding.

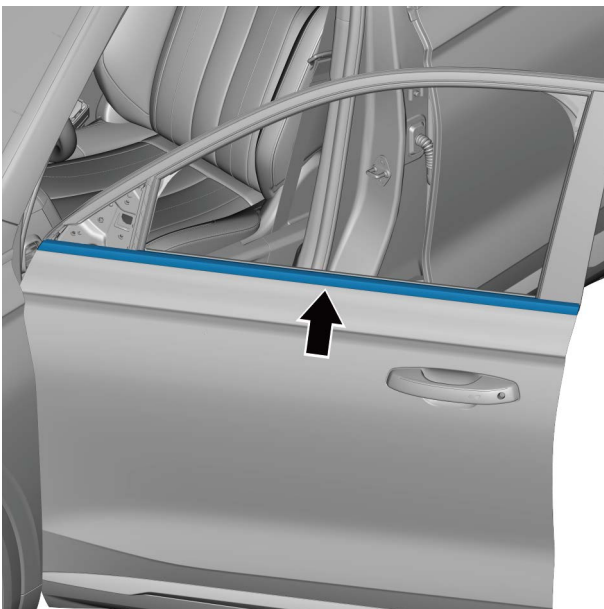


- 7 Peel open part of the left front door window guide slot, remove the 4 J-clips from the left front door B-pillar trim panel, and remove the left front door B-pillar trim panel.

Installation Procedure

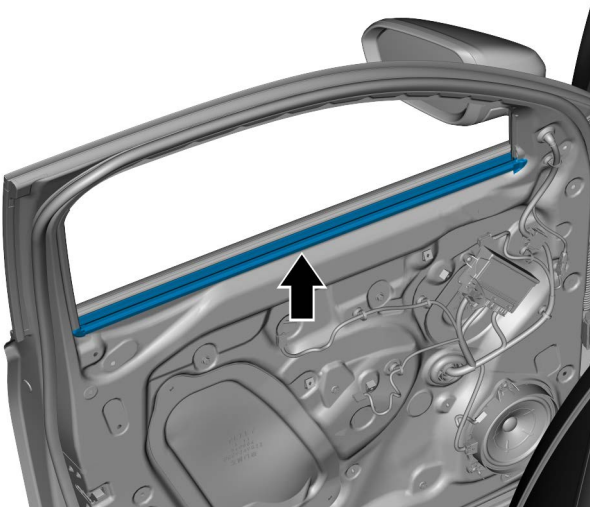


- 1 Install the 4 J-clips of left front door B-pillar trim panel and part of the left front door window guide slot.



- 2 Install the left front door outer belt line moulding.

- 3 Install the inner belt line moulding of left front door.



- 4 Install the exterior rearview mirror (left).
- 5 Install the left door window assembly.
- 6 Install the assembly-interior trim panel left front door.
- 7 Connect the negative cable of battery.

13.10.2.18 Replacement of left rear door B-pillar trim panel

Removal Procedure

Warning !

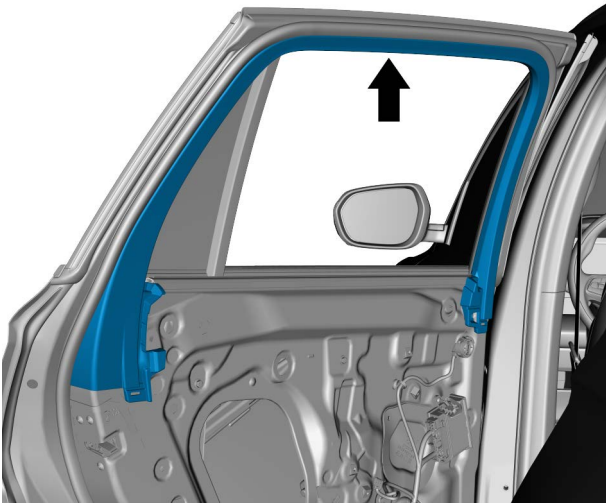
Refer to "Warnings regarding battery disconnection" in ["Warnings and Precautions"](#)

Caution

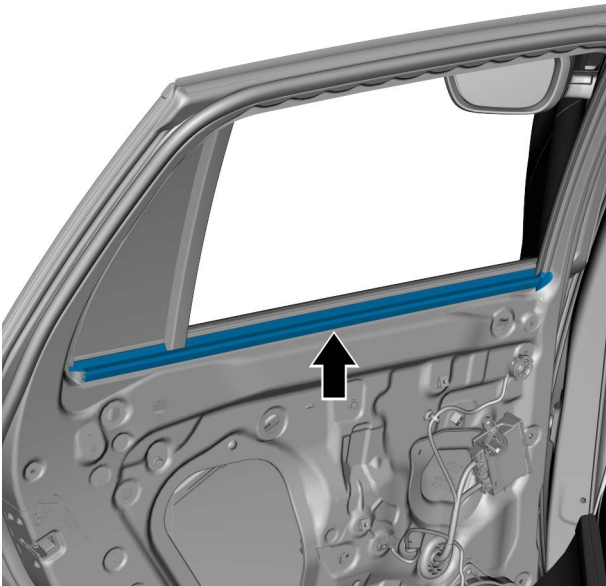
The removal and installation methods of left and right rear door B-pillar trim panels are similar.

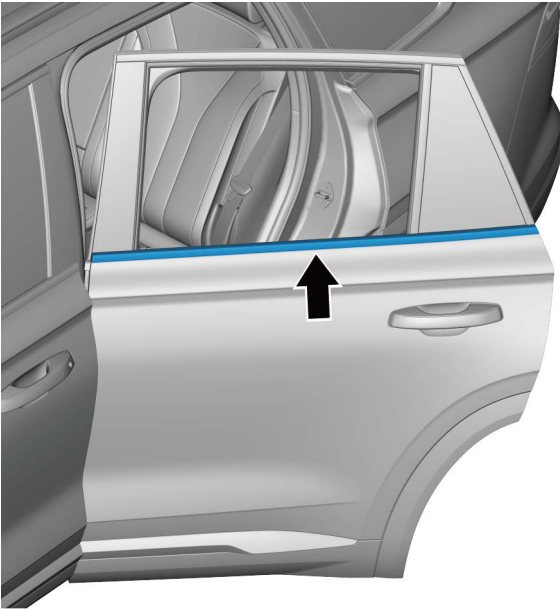
- 1 Disconnect the negative cable of battery, refer to [Procedures for disconnecting and connecting battery cable](#).
- 2 Remove the left rear door interior trim panel assembly, refer to [Replacement of left rear door interior trim panel assembly](#).
- 3 Remove the left rear door window assembly, refer to [Replacement of left rear door window assembly](#).

- 4 Remove the left rear door frame trim strip assembly.

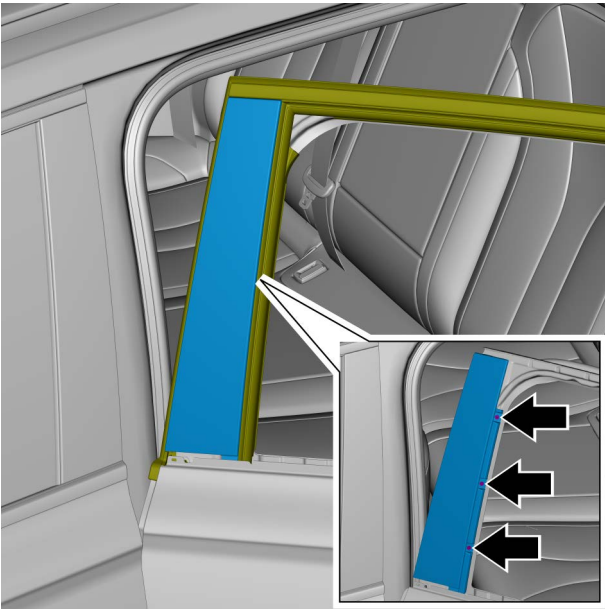


- 5 Remove the inner belt line mouldings of left rear doors.



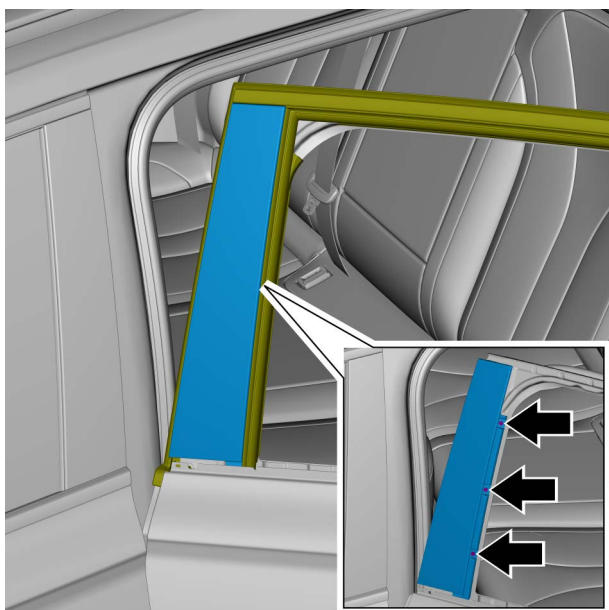


- 6 Remove the outer belt line mouldings of left rear doors.

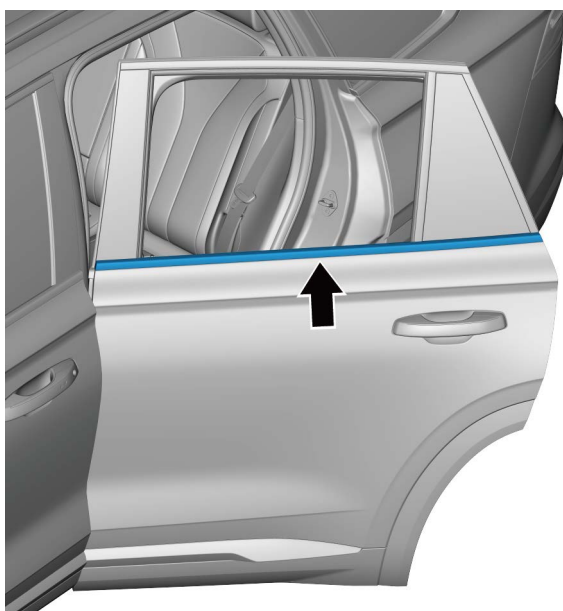


- 7 Peel open part of the left rear door window guide slot, remove the 3 J-clips from the left rear door B-pillar trim panel, and remove the left rear door B-pillar trim panel.

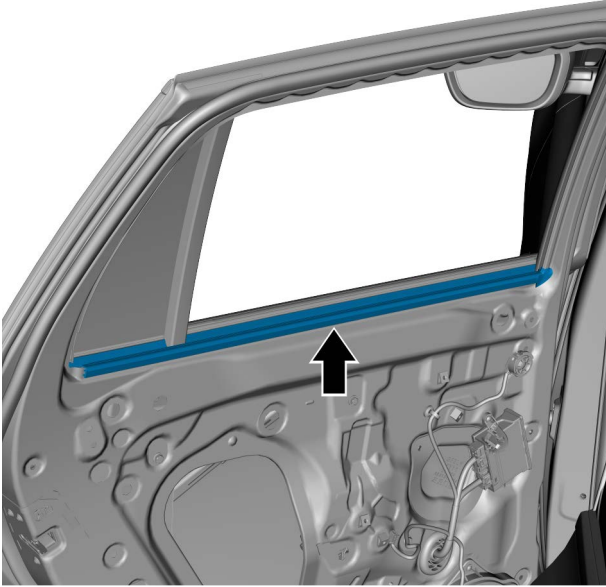
Installation Procedure



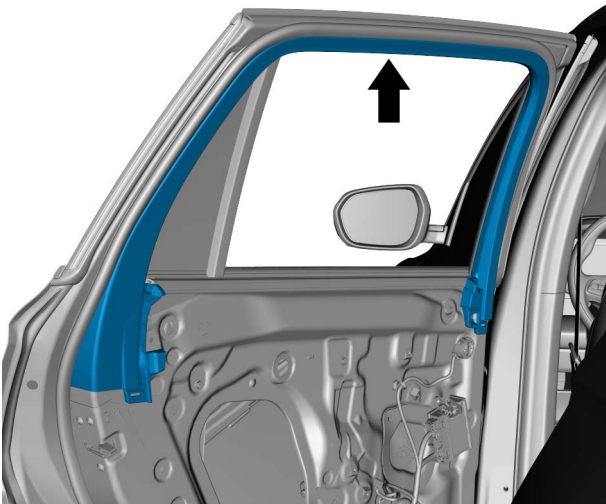
- 1 Install the 3 J-clips of left rear door B-pillar trim panel and part of the left rear door window guide slot.



- 2 Install the outer belt line mouldings of left rear doors.



- 3 Install the inner belt line moulding of left rear door.



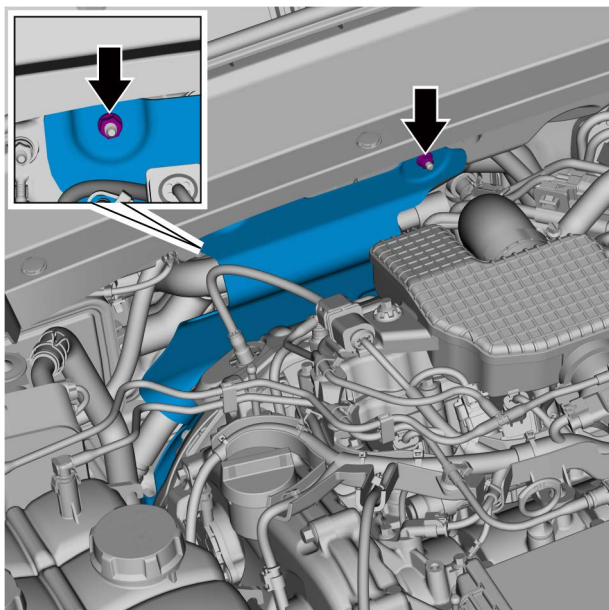
- 4 Install the left rear door window frame trim strip assembly.

- 5 Install the left rear doors window assembly.
- 6 Install the left rear door interior trim panel assembly.
- 7 Connect the negative cable of battery.

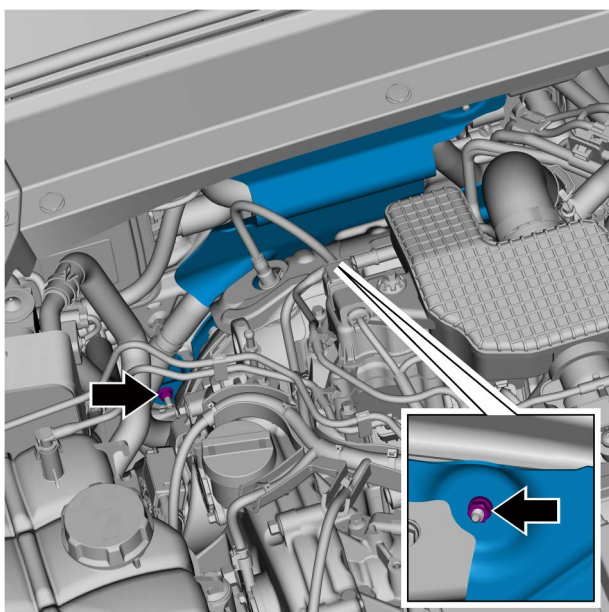
13.10.2.19 Replacement of heat shield

Removal Procedure

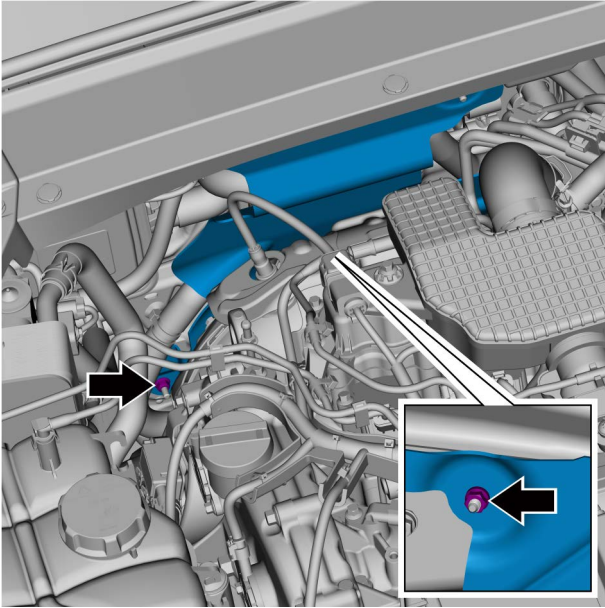
- 1 Remove the engine trim cover assembly, refer to [Replacement of engine trim cover assembly](#).
- 2 Remove the 2 fixing nuts of heat shield.



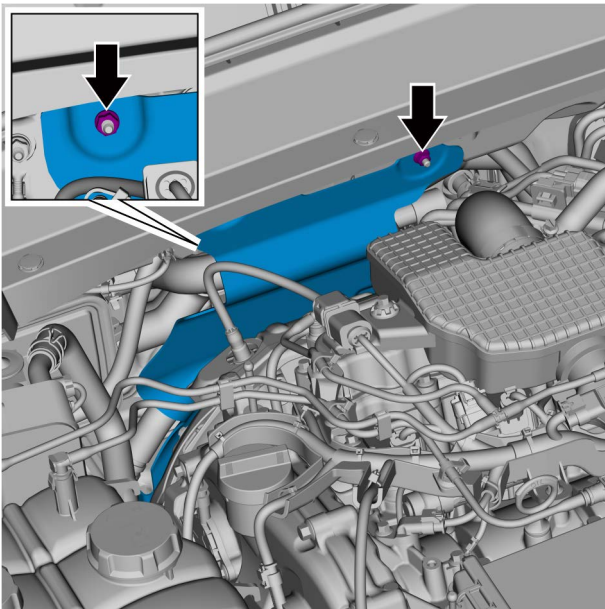
- 3 Remove the 2 fixing nuts of heat shield and take off heat shield.



Installation Procedure



- 1 Install the heat shield and tighten the 2 fixing nuts.
Torque: 10N·m



- 2 Install and tighten the 2 fixing nuts of heat shield.
Torque: 10N·m

- 3 Install the engine trim cover assembly.

13.11 Plastic panel information and maintenance

13.11.1 Instructions and operations

13.11.1.1 Instructions and operations

At present, the materials used to cover the surface of the interior and exterior trim parts are mainly modified PP, ABS, PC +ABS, PVC (artificial leather material), all of which are thermoplastics and their modified materials. The non-surface covering parts of internal and external trim parts also use POM, PA, HDPE materials, etc. Thermoset plastics are rarely used for interior and exterior trim parts, only the ashtray will use phenolic plastics.

Thermosetting plastics are mainly used as structural parts in electronic appliances and safety components. Thermoplastic parts should best be repaired by using hot soldering iron plastic material filling welder, but are usually repaired by replacement. To repair parts made of thermosetting plastics, epoxy resin or other harder two-component repair materials can be used. This chapter only briefly introduces their repair methods, and repairs are not recommended.

Classification of plastics: thermosetting plastics are plastics that can be cured or have insoluble (molten) properties under heat or other conditions, such as phenolic plastics, epoxy plastics, and so on. Thermoplastic plastic refers to plastics that can be repeatedly heated to soften and cooled to harden within a specific temperature range, such as polyethylene, polytetrafluoroethylene and so on. Thermoplastics and thermosetting plastics can be both hard and soft plastics.

13.11.2 Removal and Installation

13.11.2.1 Precautions for plastic part repair

- 1 Apply protective cream to exposed skin to prevent irritation.
- 2 Wear rubber gloves.
- 3 Wear safety glasses when using compressed air and sanding.
- 4 Immediately remove any mixture that comes in contact with the skin, because the mixture cures quickly.
- 5 Wear a dust mask and safety glasses when grinding or sanding.
- 6 Clean the skin with cold water to reduce the slight irritation of resin dust on the skin.
- 7 Do not stick maintenance materials to clothes.
- 8 Use maintenance materials in a well-ventilated environment, as the dust particulate from maintenance materials is toxic.
- 9 Close all service material containers after use. Dust or moisture will pollute the repair materials and reduce the repair effect.

13.11.2.2 Maintenance of thermosetting plastic dent

- 1 Clean and dry parts to be repaired.
- 2 Heat the pit area with a hot air blower until the pit is flattened with suitable tools.
- 3 Sand the pit area with sandpaper/emery paper.
- 4 Then wash the repaired area with detergent and let it dry for 5min.
- 5 Apply a thin layer of adhesive and let dry for 10min.
- 6 Fill the uneven surface with adhesive and smooth it with a spatula.
- 7 Accelerate the curing process with an infrared lamp, set the temperature to 60-70°C (140-158°F) and heat for 15min.
- 8 Sand the pit area with sandpaper.
- 9 Remove dust and debris.
- 10 Apply a thin layer of adhesive and let dry for 10min.
- 11 Restore the paint surface according to the paint repair procedure on the surface of plastic parts.

13.11.2.3 Maintenance of thermosetting plastic scratch

- 1 Clean and dry parts to be repaired.
- 2 Use sandpaper to remove protruding material.
- 3 Then wash the repaired area with detergent and let it dry for 5min.
- 4 Apply a layer of adhesive and let dry for 10min.
- 5 Fill the uneven surface with adhesive and smooth it with a spatula.
- 6 Accelerate the curing process with an infrared lamp, set the temperature to 60-70°C (140-158°F) and heat for 15min.
- 7 Sand the pit area with sandpaper.
- 8 Remove dust/abrasive debris.
- 9 Apply a thin layer of adhesive and let dry for 10min.
- 10 Restore the paint surface according to the paint repair procedure on the surface of plastic parts.

13.11.2.4 Maintenance of thermosetting plastic scratch (below 100mm)

- 1 Clean and dry parts to be repaired.
- 2 Use sandpaper to remove protruding material.
- 3 Then wash the repaired area with detergent and let it dry for 5min.
- 4 Apply a layer of adhesive and let dry for 10min.
- 5 Fill the uneven surface with adhesive and smooth it with a spatula.
- 6 Accelerate the curing process with an infrared lamp, set the temperature to 60-70°C (140-158°F) and heat for 15min.
- 7 Sand the pit area with sandpaper.
- 8 Remove dust/abrasive debris.
- 9 Apply a thin layer of adhesive and let dry for 10min.
- 10 Restore the paint surface according to the paint repair procedure on the surface of plastic parts.

13.12 Collision Repair

13.12.1 Specification

13.12.1.1 Collision repair materials

In a vehicle body collision accident, the structure deformation, steel plate cracking, welding failure, and other phenomena will be generally caused. Sometimes it also causes local damage of the power synthesis box, chassis, and other assembly parts.

When performing body collision repairs, adhesives, sealants, anti-loosening agents, surface protection materials, anti-corrosion materials, and chemical materials may be used, so please strictly follow the purpose, scope of use, and use specifications in the product manual. In the process of body repair, the repair materials with the same function should be selected according to the functional requirements of the part materials. The following table lists the repair materials that may be used in the process of automobile body repair, and is only for reference in the process of body repair.

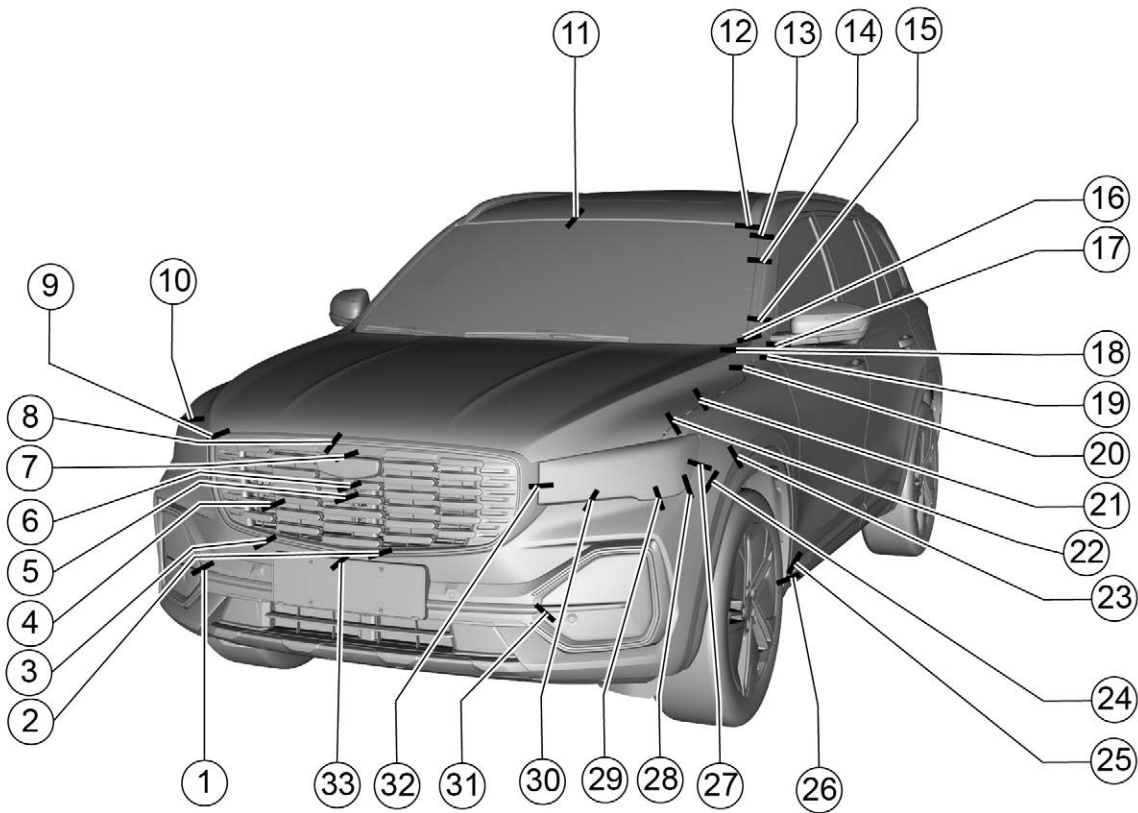
Product	Base material	Purpose	Recommended model
Automotive sealant	Single -component polyurethane	Bond of body skin, interior/ exterior trims, body structure, etc. The sealant should have a strong adhesive force and cohesion force and have good adhesion with metal, various paints, etc.	Tianshan Kesaixin: 1922, 1923
Weld sealant	Single -component polyurethane	Room temperature solidified adhesive for sealing body welding seams. Room temperature solidified adhesive for fine hem sealing of door, engine hood, and luggage compartment (trunk).	China Auto Parts & Accessories Corporation: C8802
Stone-impact resistant primer layer	Rubber & Resin	Room temperature solidified anti-collision adhesive for chassis protection, forming a permanent anti-aging, elastic, corrosion resistant, protective coating at the bottom of the car and the wheel cover, no crack at low temperature. This kind of product can substitute PVC coating, with excellent functions such as rust-proof, sound insulation, anti-stone, anti-oxidation, coating protective.	China Auto Parts & Accessories Corporation: C312DW

Product	Base material	Purpose	Recommended model
Windshield sealant	Single -component polyurethane	<p>Room temperature solidified polyurethane adhesive, used for direct bonding and sealing of automobile window glasses.</p> <p>The sealant has a good adhesive performance. It can react with the moisture in the air, solidify and form excellent properties such as high strength, aging resistance, vibration and fatigue resistance, low-temperature resistance, and non-corrosion.</p>	<p>China Auto Parts & Accessories Industry Corporation: C8802</p> <p>Tianshan Kesaixin: 1956, 1924</p>
Pressure-sensitive adhesive tape	Acrylic tape	<p>Used for the bond of anti-scratch panel, nameplate, shield, mud apron, door protection, various trim strips, etc.</p> <p>This adhesive tape should have excellent weather resistance and endurance.</p>	3M 4229P, 4215, 4221L
Cleaning agent	-	Used for the cleaning of all surfaces contacted with primer paint and adhesives.	-
Primer	-	Before applying windshield sealant, a kind of primer should be applied to the body and glasses to make the windshield and body bond more firmly.	-

Product	Base material	Purpose	Recommended model
Heat-sensitive adhesive tape	Acrylic tape	It is mainly used in the rubber sealing strip system of automobiles. This type of tape should have a strong bonding force and strong sealing performance, to avoid gap and corrosion problems caused by a weak bond.	3M, 4237P
Adhesive tape primer	-	Depending on the material of the bonding surface, different primers are used. The bonding surface must be clean and thoroughly dried before using a brush to apply the primer evenly on the surface to be adhered, let the surface dry and then paste the tape. The adhesive tape has a strong bonding property.	3M C - 100, K - 500/520, N - 200

13.12.1.2 Body surface clearance

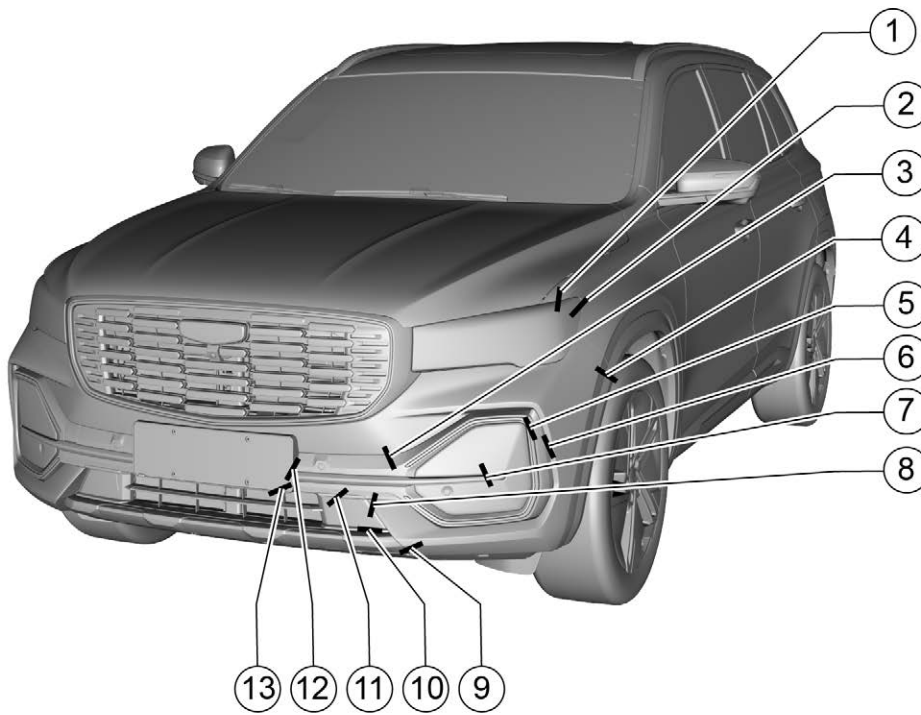
- To adjust or check the clearance dimensions, a plastic clearance adjustment gauge should be used.
- The clearance dimensions are always in mm/inch.



Code	Part name benchmark	Relevant Part Name	Specifications				
			Gap (G)	Surface gap (F)	Uniformity (//)	Symmetry (S)	Alignment (A)
1	Front bumper	Towing hook cover plate	0.5±0.5	-0.5±0.5	/	/	/
2	Front grill	Bright strip of grille	0.5±0.5 (circumference)	N/A	/	/	/
3	Front bumper	Front grill	0.35±0.5	N/A	/	/	/
4	Front grill	Vertical strip of grille	0.5±0.5	N/A	/	/	/
5	Grille	Marker	0.5±0.3 (full circle)	N/A	/	/	/

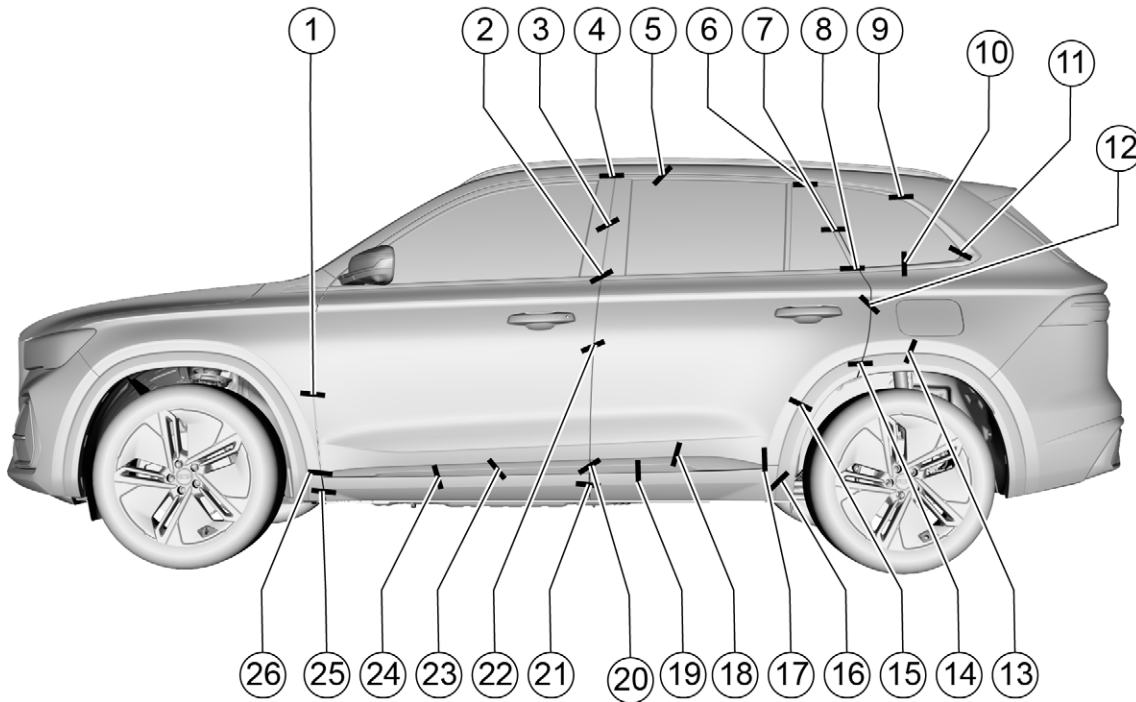
Code	Part name benchmark	Relevant Part Name	Specifications				
			Gap (G)	Surface gap (F)	Uniformity (//)	Symmetry (S)	Alignment (A)
6	Camera	Camera cover	0.2±0.2 (circumference)	N/A	/	/	/
7	Camera cover	Front grille (high/low configuration)	0.5±0.5 (circumference)	N/A	/	/	/
8	Front grill	Machine cover	5.5±1.0	N/A	/	/	/
9	Front grill	Machine cover	5.5→5.8±1.2	N/A	/	/	/
10	Headlamp	Machine cover	±1.2	N/A	/	/	/
11	Roof	Front windshield	2.5±1.0	-2.0±1.2	1.2	/	/
12	Luggage rack	Front windshield	4.0±1.2	N/A	/	/	/
13	Side wall	Front windshield side trim strip (A-pillar trim strip)	/	-1.0→-0.8 ±1.2	1.2	/	/
14	Side wall	Front windshield side trim strip (A-pillar trim strip)	/	-1.0±1.2	1.2	/	/
15	Side wall A-pillar	Fender	2.0±1.0	0±1.0	/	/	/
16	Fender	Front windshield trim strip	/	-1.0±1.2	/	/	/
17	Front door outer belt line moulding	Fender trim strip	3.5±1.0	0±1.0	1.0	/	/
18	Fender	Engine hood (upper rear end)	3.0±0.8	0±0.8	0.5	0.8	/

Code	Part name benchmark	Relevant Part Name	Specifications				
			Gap (G)	Surface gap (F)	Uniformity (//)	Symmetry (S)	Alignment (A)
19	Fender	Fender trim strip	0.5±0.5	N/A	/	/	/
20	Fender	Cover (corner)	3.0±0.8	-0.3±0.8	0.5	0.8	/
21	Fender	Engine hood (Y-direction slit)	3.0±0.8	-1.0±0.8	0.8	0.8	/
22			3.0±0.8	-0.7~-1.0±0.8	0.5	0.8	/
23	Fender	Front fender flare	0(0, +0.5)	N/A	/	/	/
24	Fender	Front bumper	0(+0.1,+0.5)	-0.3±0.5	0.5	/	/
25	Fender	Front fender flare rear trim panel	0(0, +0.5)	N/A	/	/	/
26	Front fender flare	Front fender flare rear trim panel	0.5±0.5	N/A	/	/	/
27	Fender	Headlamp	1.2±1.0	0.7→2.1±1.0	1.0	/	/
28	Upper body of front bumper	Headlamp	1.2±1.0	2.8→2.4±1.0	1.0	/	/
29	Upper body of front bumper	Headlamp	(1.5→1.2) ±1.0	N/A	/	/	/
30	Upper body of front bumper	Headlamp	1.5±1.0	N/A	/	/	/
31	Radar cover/radar	Front bumper	0.2(-0.1, +0.2)	N/A	/	/	/
32	Front grill	Headlamp	2.0±1.2	N/A	/	/	/
33	Front license plate mounting plate	Front bumper	0 (0,+0.5)	N/A	/	/	/



Code	Part name benchmark	Relevant Part Name	Specifications				
			Gap (G)	Surface gap (F)	Uniformity (//)	Symmetry (S)	Alignment (A)
1	Fender	Headlamp	5.9→7.8±1.0	N/A	/	/	/
2			7.8→1.2±1.0				
3	Front fender flare	Front bumper	0(0,+0.5)	N/A	/	/	/
4	Front fog lamp cover panel	Front bumper	0.5±0.5 (full circle)	N/A	/	/	/
5	Front fog lamp cover trim strip	Front fog lamp cover panel	0.55±0.5	N/A	/	/	/

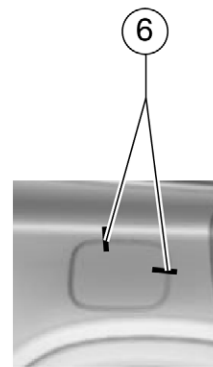
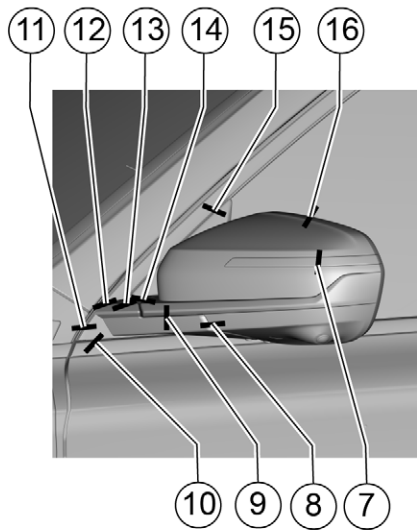
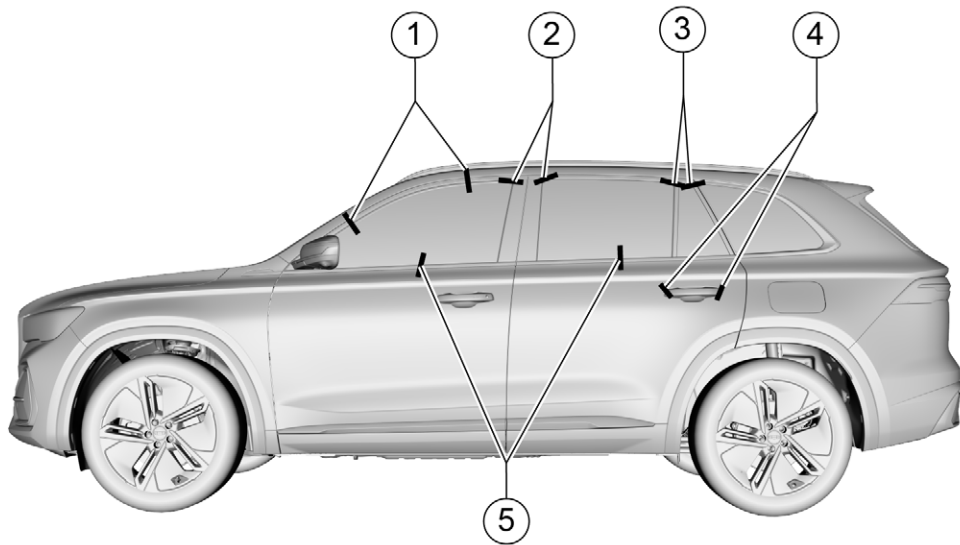
Code	Part name benchmark	Relevant Part Name	Specifications				
			Gap (G)	Surface gap (F)	Uniformity (//)	Symmetry (S)	Alignment (A)
6	Front fog lamp cover trim strip	Front bumper	0.5±0.5	N/A	/	/	/
7	Front fog lamp cover trim strip	Front fog lamp cover panel	0.5±0.5 (circumference)	N/A	/	/	/
8	Front bumper lower grille	Front bumper body	0.5±0.5 (full circle)	N/A	/	/	/
9	Front bumper lower trim panel	Front bumper body	0.5+0.7-0.5 (full circle)	N/A	/	/	/
10	Front bumper lower trim panel	Front bumper lower grille	0.5±0.5	N/A	/	/	/
11	Front bumper lower trim strip	Front bumper lower grille	0.5±0.5	N/A	/	/	/
12	Front license plate mounting plate	Front fog lamp cover panel	0.5±0.5	N/A	/	/	/
13	Front license plate mounting plate	Front bumper lower trim strip	0.5±0.5	N/A	/	/	/



Code	Part name benchmark	Relevant Part Name	Specifications				
			Gap (G)	Surface gap (F)	Uniformity (//)	Symmetry (S)	Alignment (A)
1	Front doors	Fender	3.3±0.5	0±0.5	/	/	/
2	Rear door outer belt line moulding	Front door outer belt line moulding	3.8±1.0	0±1.0	1.0	/	1.0
3	Rear door window frame cover	Front door window frame cover	3.8±1.0	0.1±1.0	1.0	/	/
4	Rear door glass guide slot	Front door glass guide slot	3.8±1.0	0±1.0	1.0	/	/

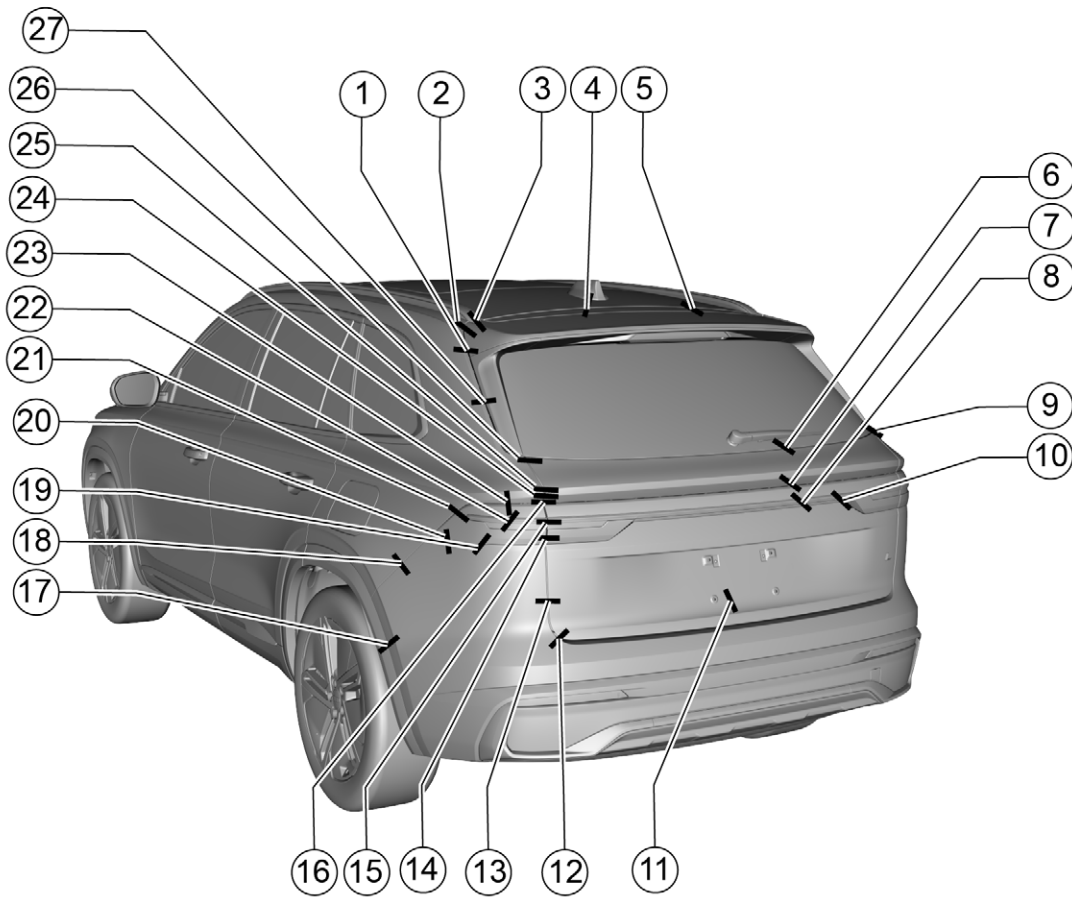
Code	Part name benchmark	Relevant Part Name	Specifications				
			Gap (G)	Surface gap (F)	Uniformity (//)	Symmetry (S)	Alignment (A)
5	Side wall	Rear door glass guide slot	5.9±1.5	-2.7±1.5	1.5	/	/
6	Side wall corner windows	Rear door glass guide slot	4.5±1.0	0±1.0	1.0	/	/
7	Side wall corner windows	Rear door corner window	5.0±1.0	1.0±1.0	1.0	/	/
8	Side wall corner windows	Rear door outer belt line moulding	3.5±1.0	0±1.0	1.0	/	1.0
9	Side wall	Side wall corner windows	(6.0→4.0) ±1.2	N/A	/	/	/
10			0.8±0.8	N/A	/	/	/
11			(4.0→0.8) ±1.2	N/A	/	/	/
12	Side wall	Rear doors	3.3±0.5	0±0.5	/	/	/
13	Side wall	Rear fender flare	0(0, 0.5)	N/A	/	/	/
14	Rear fender flare rear section	Rear fender flare front section	3.5±1.0	0±0.8	1.0	/	/
15	Rear fender flare	Rear doors	0(0, 0.5)	N/A	/	/	/
16	Rear door lower trim panel	Rear fender flare	0(0,+0.5)	N/A	/	/	/
17	Rear door lower trim panel	Rear door outer panel	0(0,+0.5)	N/A	/	/	/
18	Rear door lower trim panel trim strip	Rear door lower trim panel	0.7±0.5	N/A	/	/	/
19	Rear door lower trim panel	Rear door outer panel	0.5±0.5	N/A	/	/	/

Code	Part name benchmark	Relevant Part Name	Specifications				
			Gap (G)	Surface gap (F)	Uniformity (//)	Symmetry (S)	Alignment (A)
20	Rear door lower trim panel trim strip	Front door lower trim panel trim strip	4.0±1.0	0±1.0	1.0	/	/
21	Rear door lower trim panel	Front door lower trim panel	4.0±1.0	0±0.8	/	/	/
22	Rear doors	Front doors	3.8±0.5	0±0.5	/	/	/
23	Front door lower trim panel	Front door outer panel	0.5±0.5	N/A	/	/	/
24	Front door lower trim panel trim strip	Front door lower trim panel	0.7±0.5	N/A	/	/	/
25	Front door lower trim panel	Front fender flare lower trim part	3.5±0.8	0±0.8	/	/	/
26				N/A	/	/	/



Code	Part name benchmark	Relevant Part Name	Specifications				
			Gap (G)	Surface gap (F)	Uniformity (//)	Symmetry (S)	Alignment (A)
1	Side wall	Front door glass guide slot	5.9±1.5	-2.4→-3.3 ±1.5	1.5	/	/
				-3.3→-2.7 ±1.5			
2	Front/rear door window frame cover	Front/rear door glass guide slot	0.4±0.4	±0.7	/	/	/
3	Rear door corner window	Rear door glass guide slot	0.5(-0.5,+0.7)	±1.0	/	/	/
4	Outer door handle	Door outer panel	1.9 → 2.1 ±0.5	/	/	/	/

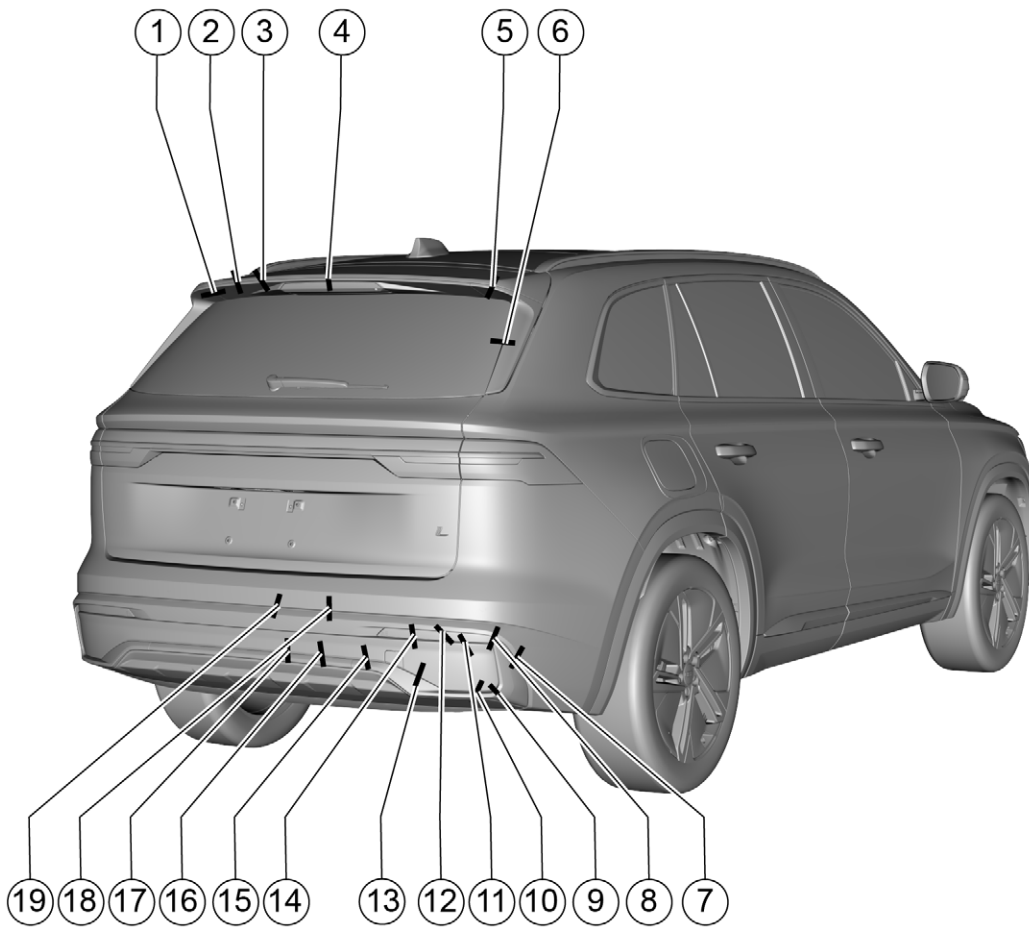
Code	Part name benchmark	Relevant Part Name	Specifications				
			Gap (G)	Surface gap (F)	Uniformity (//)	Symmetry (S)	Alignment (A)
			2.5 → 1.9±0.5				
5	Front/rear door outer belt line moulding bright strip	Door outer panel	0.8±0.8	N/A	/	/	/
6	Side wall	Fuel filler cap	2.0±0.5	-0.3±0.5	/	/	/
7	Rearview mirror trim strip	Rearview mirror housing	0.3±0.3	N/A	/	/	/
8	Rearview mirror base	Rearview mirror lower cover panel	1.0±0.5	0±0.5	/	/	/
9	Rearview mirror lower cover panel	Rearview mirror base	1.0±0.5	N/A	/	/	/
10	Rearview mirror base	Front door belt line moulding	1.0±0.8	N/A	/	/	/
11	Fender	Rearview mirror base	5.9±1.5	2.3→3.2±1.5	/	/	/
12	Rearview mirror trim strip	Front door glass guide slot	0.8±0.8	N/A	/	/	1.0
13	Rearview mirror trim strip	Rearview mirror base	0.5±0.5	-0.5(-0.5,0)	/	/	/
14	Rearview mirror base	Rearview mirror lower cover panel	1.2±0.5	0±0.5	0.5	/	/
15	Front door upper trim strip	Rearview mirror base	1.2±0.7	0.3→0.5±0.7	0.7	/	/
16	Rearview mirror housing	Rearview mirror cover	0.15±0.15	-0.5(-0.5,0)	/	/	/



Code	Part name benchmark	Relevant Part Name	Specifications				
			Gap (G)	Surface gap (F)	Uniformity (//)	Symmetry (S)	Alignment (A)
1	Side wall	Spoiler	3.9±1.2	±1.2	1.2	/	/
2			4.2±1.2				
3	Spoiler upper body	Luggage rack rubber strip	(>7.0)±1.5	N/A	/	/	/
4	Tailgate	Spoiler	1.0±1.0	-1.0±1.0	1.0	/	/
5	Roof	Tailgate	5.3±0.8	-1.0±1.2	1.5	/	/
6	Rear windshield	Tailgate	2.5±1.5	N/A	/	/	/

Code	Part name benchmark	Relevant Part Name	Specifications				
			Gap (G)	Surface gap (F)	Uniformity (//)	Symmetry (S)	Alignment (A)
7	Tailgate	Rear combination lamp B (upper)	1.1±0.8	N/A	/	/	/
8	Tailgate	Rear combination lamp B (lower)	1.1±1.0	N/A	/	/	/
9	Spoiler	Side wall	0.7	N/A	/	/	1.0
10	Light B trim strip	Rear combination light B	0.8±0.5	N/A	/	/	/
11	Rear bumper upper body	Tailgate	5.6±1.2	N/A	/	/	/
12	Rear bumper upper body	Tailgate	(4.0~5.5)±0.9	N/A	/	/	/
13			4.0±0.9	-2±1.2	1.2		
14	Rear combination lamp A	Rear combination light B	4.0±1.5	-1.0±1.5	1.5	/	/
15	Tail light A trim strip	Tail light B trim strip	4.0±1.5	±1.5	1.5	1.5	/
16	Rear combination lamp A	Rear combination light B	4.0±1.5	-0.8±1.5	1.5	/	
17	Rear fender flare	Rear bumper	0 (0,+0.5)	N/A	/	/	/
18	Side wall	Rear bumper	0(+0.1,+0.5)	-0.3±0.5	0.5	/	/
19	Rear combination lamp A	Rear bumper upper body	1.2±1.0	N/A	/	/	/
20				±1.0	1.0		
21	Side wall	Rear combination lamp A	1.1±0.8	±0.8	/	/	/
22	Tail light A	Tail light A trim strip	0.8±0.5	N/A	/	/	/
23	Side wall	Rear combination lamp A	1.1±0.8	N/A	/	/	/
24	Side wall	Tailgate	3.8±0.7	-1.0±0.8	0.8	1.0	/

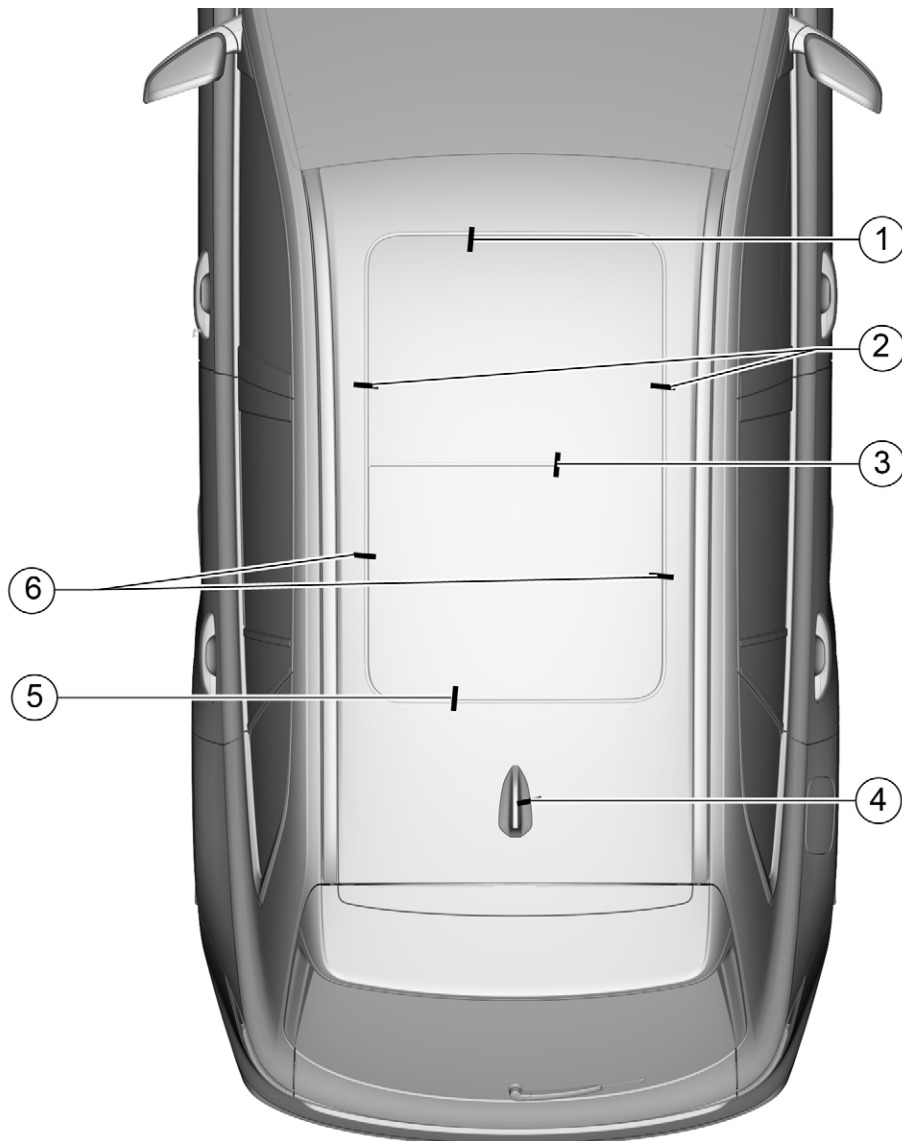
Code	Part name benchmark	Relevant Part Name	Specifications				
			Gap (G)	Surface gap (F)	Uniformity (//)	Symmetry (S)	Alignment (A)
25			4.0±0.7	-1.0±0.8	0.8		
26			3.8±0.7	-1.0~-1.8±0.8	0.8		
27	Side wall	Rear spoiler assembly	3.9±1.2	N/A	/	/	/



Code	Part name benchmark	Relevant Part Name	Specifications				
			Gap (G)	Surface gap (F)	Uniformity (//)	Symmetry (S)	Alignment (A)
1	Tailgate side trim part	Spoiler lower body	0.5±0.5	0±0.5	/	/	/
2	Rear windshield	Spoiler	2.0±1.5	N/A	/	/	/

Code	Part name benchmark	Relevant Part Name	Specifications				
			Gap (G)	Surface gap (F)	Uniformity (//)	Symmetry (S)	Alignment (A)
3	Spoiler upper body	Spoiler lower body	0.3±0.3	N/A	/	/	/
4	High-mounted brake lamp	Spoiler	1.0±0.8 (full circle)	-0.5±0.8	0.8	/	/
5	Tailgate side trim part	Spoiler upper body	0.3±0.3	N/A	/	/	/
6	Rear windshield side trim part	Rear windshield	2.0±1.5	N/A	/	/	/
7	Rear bumper upper body	Rear bumper side sport trim strip	0.7±0.7	N/A	/	/	/
8	Rear fog lamp	Rear bumper side sport trim strip	1.0±0.8	N/A	/	/	/
9	Rear bumper side sport trim strip	Rear bumper lower trim panel	0.5±0.5	N/A	/	/	/
10	Rear bumper side sport trim strip	Rear bumper lower trim panel	0.6±0.5	N/A	/	/	/
11	Rear fog lamp	Rear bumper upper body	1.0±0.8	N/A	/	/	/
12	Towing hook cover plate	Rear bumper assembly	0.5±0.5 (full circle)	-0.5±0.5	/	/	/
13				N/A	/	/	/
14	Rear fog lamp	Rear bumper lower trim panel	1.0±0.8	N/A	/	/	/
15	Rear bumper side sport trim strip	Rear bumper middle sport trim strip	0.7±0.7	0±0.5	/	/	/
16	Rear bumper middle sport trim strip	Rear bumper lower trim panel	0.5±0.5	N/A	/	/	/

Code	Part name benchmark	Relevant Part Name	Specifications				
			Gap (G)	Surface gap (F)	Uniformity (//)	Symmetry (S)	Alignment (A)
17	Rear bumper middle sport trim strip	Rear bumper lower trim panel	0.56±0.5	N/A	/	/	/
18	Radar cover/radar	Rear bumper	0.2±0.2	N/A	/	/	/
19	Rear bumper upper body	Rear bumper lower trim panel	0.5±0.5	N/A	/	/	/



Code	Part name benchmark	Relevant Part Name	Specifications				
			Gap (G)	Surface gap (F)	Uniformity (//)	Symmetry (S)	Alignment (A)
1	Roof	Sunroof glass A	10.2±2.0	-1.0±1.5	1.5	/	/
2			10.2±2.0	-1.0→1.0 ±1.5	/		
3	Sunroof B	Sunroof A	9.8±2.0	1.0±1.5	1.5	/	/
4	Antenna	Roof	0+0.5/+0.1	N/A	/	/	/
5	Roof	Sunroof B	10.2±2.0	1.0±1.5	1.5	/	/
6			10.2±2.0	1.0→0±1.5	/		

13.12.2 Instructions and operations

13.12.2.1 Safety precautions

The following safety precautions must be strictly observed during the maintenance and operation of body sheet metal:

1. When welding, cutting and polishing body sheet metal, protective suit, goggles, gloves and work shoes must be worn.
2. The welding area must be well ventilated.
3. Before welding, the battery must be disconnected and the wiring terminal must be covered.
4. If sparks may be generated when working near the battery, the battery must be removed.
5. Before removing the components of the complete vehicle, the vehicle must be fixed on the vehicle lifting frame to avoid the change of gravity of the complete vehicle center, thus affecting operational safety.
6. Directly connect the grounding wire of the welding set to the part to be welded. Make sure that there is no conductive part between the grounding point and the welding point during operation.
7. The grounding wire or welding electrode cannot be connected with the electronic control unit and the wire.
8. Unprotected vehicle cannot be parked in the body maintenance area, because shattering sparks may cause the fire and damage lacquer surface and glass.
9. Any component of the A/C system containing refrigerant cannot be welded, brazed or soldered. Any other components in the vehicle that may cause the A/C system component temperature to rise shall not be welded, because they may cause the A/C system to explode. If welding must be conducted near the refrigerant hose, the refrigerant must be recycled, because the invisible ultraviolet ray generated during welding penetrating the refrigerant hosepipe may cause the refrigerant to decay.
10. The battery grounding line must be disconnected during the supplementary restraint system operation or the body calibration. The environment temperature around the airbag component should not exceed 100°C (212°F).

13.12.2.2 Status of parts and components

Before a repaired car or part is sent to the paint shop for painting, the surface must be leveled, caulked, and the surface must be sandpapered. This preparation process is done by sheet metal workers. Body and floor parts are mainly formed by cold stamping from sheet steel; therefore, damaged parts should be restored to their shape by the same method. If the

damaged parts cannot be restored to their original shape, the damaged parts should be disassembled and replaced according to the integrity of the parts after correcting their adjoining parts. Do not cut the parts monolithically; after cutting and welding they will affect the rigidity of the whole vehicle, driving safety and ease of maintenance.

13.12.2.3 Description of welding types

The commonly used types of welding are spot welding, gas shielded welding, and brazing. During spot welding, the number of welded joints must not be reduced. When spot welding cannot be performed with the usual spot welding equipment, plug welding can be performed by gas shielded welding after drilling. In the case of spot welding, if a three-layer plate is joined and only the outer plate is replaced, the weld joints shall be placed on the original weld joints. When spot welding is adopted, it is possible to generate single row welds, double row welds, and double row offset welds. When gas shielded welding is adopted, lap welds, continuous welds, and continuous (interrupted) welds can be generated. Brazing is often used to weld and repair areas with low tensile strength and relatively small component thickness.

13.12.2.4 Anti-corrosion treatment

1. Recognized materials must be used to restore the standard anti-corrosion later after repair.
2. Both sides of all welds must be coated with the primer before sealing.
3. Sheet metal coated with primer must be coated with sealant.
4. Lap plates, metal edges, butt welds and welds must be sealed with sealant.
5. The bottom plate must be coated with long-term bottom plate protection agent.
6. After surface coating spraying, empty cavity protection materials must be used to treat the empty cavities within repair area.
7. Clean the outlet after the empty cavity protection materials dry.

13.12.2.5 Scrapped components environmentally friendly disposal approach

1. After the maintenance or repair of an automobile, the waste materials must be collected by type.
2. Sort waste materials and check for reusability.

13.13 Paint/Coating

13.13.1 Specification

13.13.1.1 Specification

Refer to technical specifications provided by the supplier of materials.

13.13.2 Instructions and operations

13.13.2.1 Paint coating description

Paint is a kind of mixed liquid and can be coated on multiple substrates. The paint forms a solid paint film after drying, thus realizing the targets of substrate protection and attractive appearance. The following four paints have already been painted when vehicles leave the factory to provide good anti-corrosion performance and gloss.

1. Electrophoresis primer
2. Middle paint
3. Color paint
4. Celluloid paint (transparent outer coating)

Main effects of electrophoresis primer:

1. Rust-proof
2. Improvement of working adhesion
3. Improvement of limited filling

Main effects of middle paint:

1. Filling
2. Isolation/tightness
3. Foiling color paint

Main effects of color paint:

1. Adding color
2. Providing gloss

Main effects of celluloid paint:

Celluloid paint is at the outermost layer of the whole lacquer and have the following main effects:

1. Including anti-ultraviolet ray materials to resist the ultraviolet ray in sunshine.
2. Resists corrosion of painted surfaces by environmental dust (acid rain).
3. Allowing the lacquer to have friction resistance performance.
4. Providing better gloss for the lacquer.

Paint spraying is required to restore the repaired parts; spraying process specified by the manufacturer must be strictly complied with during repair. Please refer to [Paint spraying process for rigid surface](#).

13.13.2.2 Routine vehicle paint maintenance

Please follow the following principles during the routine vehicle paint maintenance:

1. Please notice not to touch body paint with oily hands or scrub the paint with oily cloth during the vehicle repair and maintenance. Do not place the oily tools or the cleaning cloth with organic solvent on the body to avoid chemical reactions.
2. Do not carry out the secondary painting if there is no clear scratch to avoid improper paint color or poor combination.
3. Vehicles parking for a long time should be parked in a garage or well-ventilated areas. Vehicles should be covered with a dedicated body cover in winter. Vehicles parking for a short time should be parked in cool places.
4. Avoid severe impacts, collisions and scratches of the body paint film. Damaged, sunken or fallen paint should be repaired timely, better in the maintenance stations authorized by Geely.
5. High-quality detergent should be applied for body decoration cleaning. Do not scrub the body heavily during waxing and avoid paint layer penetration and exposure of original body. Special and highly corrosive traces (such as asphalt, bird droppings, insects, etc.) should be removed in time. For this purpose, dedicated detergent must be used. Do not use a knife to scrape the traces or use gasoline to eliminate them to avoid paint damages.
6. Before, during and after vehicle utilization, it is required to clean dust on the body timely and reduce the dust adhesion due to static electricity of the body as possible.
7. Flush the body timely after rain. The rain stains on the body after rain will gradually decrease but the concentration of acid materials in rainwater gradually increases. If the body is not flushed with clean water timely, the surface coating will be damaged after a long term.
8. Wait until the power synthesis box cools down and then wash the vehicle. Do not wash the vehicle under burning sun or at high temperature to prevent traces of detergent after drying up. The dedicated detergent must be used when customers wash vehicles by themselves, but do not use the high alkaline washing powder, suds or detergents to avoid washing away the grease in paint and accelerating the paint aging. When your vehicle is washed in a car washing station, please pay attention to prevent the washer from using the dewaxing detergent and avoid paint damages. Especially the vehicles running in coastal or heavily polluted areas should be flushed once per day.

9. Clean and soft cloth or sponge should be used to wipe and wash the vehicle. Prevent metal filings and sand inside and do not dry cloth, towel or sponge to polish the vehicle to avoid scratches. During the scrubbing process, scrub the vehicle from top to bottom along the direction of water flow and do not make circles or scrub it horizontally.
10. Wax the paint surface from time to time and regularly (once a quarter) go to Geely authorized repair station for maintenance, to timely restore the gloss of body paint. In addition, you can also paste the car paint protection film. 3M paint protection film (rhinoceros skin) is a colorless and transparent paint protection film with super toughness. It can be used to protect the body bumper, engine hoods, front and rear doors, rearview mirrors and other baked paint surface, to protect the car paint surface from scratches or paint peeling due to slight impact.

13.13.2.3 Warnings and notice in performing paint mixing and painting operations

Warning !

Diffuse solvents during paint mixing and spraying operations can cause serious respiratory illness. Paint, equipment and safety devices must be operated in strict accordance with the instructions of the manufacturer of the paint, equipment and safety devices. Wear special labor protection equipment such as gas masks, anti-static clothing, protective goggles and gloves to prevent injury when performing this procedure.

Caution

Do not mix paint systems or alternative products from different manufacturers. Mixing incompatible products can produce the following phenomena:

1. Primer peeling.
2. Poor inter-coat bonding.
3. Insufficient curing.
4. Reduced gloss.
5. Poor color accuracy.
6. Coating damage (pits, bubbles, orange peel tarnish).

13.13.2.4 Cautions during finishing varnish maintenance and repair

Caution

1. Avoid washing the vehicle under direct sunlight.
2. Avoid using the strong soap and chemical detergent.
3. Use brushless automatic vehicle cleaning equipment.
4. Avoid using products containing acid or alkali.
5. Do not use the brush or broom to remove snow or ice.
6. After cleaning thoroughly, the remaining rinse water should be wiped dry immediately, and do not let it dry in air on the surface. It is recommended to wipe dry with soft chamois leather.
7. Only when the defect on the surface can be eliminated by the method of polishing, can the vehicle be polished.
8. If the surface condition is not serious, the maintenance part should be narrowed as much as possible.
9. Avoid removing too much clear paint or it will cause premature paint damage.
10. Use electric polishing equipment in strict accordance with the requirements of polishing manufacturers. Do not use wax or silicone products to cover vortex blot (the user will not be satisfied with the blot reappearing soon).

13.13.2.5 Notices for anti-corrosion treatment

Caution

1. When sound-proof or anti-corrosion materials are sprayed, preventive measures must be taken to avoid spraying into component openings (such as door locks, vehicle window lift slots, vehicle window regulators, and seat belt retractors) and any moving, rotating parts, especially the parking brake cable. After spraying the material, ensure that all vent holes on the body are open.
2. When repairing the bodywork with an open flame, the foam sound insulation must be removed from the repair area. When reinstalling the soundproofing material, avoid inhaling dust that is harmful to the body.
3. When the procedure is performed, it is needed to wear dedicated protective glasses and gloves to prevent injury.
4. When the vehicle leaves the factory, the body metal plates have been treated with electrophoretic coating primer. After parts are repaired and/or replaced, all exposed metal surfaces must be treated with a rust-proof primer.
5. If the original coating or anti-corrosion material is damaged during welding or heating operation, it needs clean and anti-corrosion treatment.
6. When collision repairs are conducted, the metal will be exposed, and these surfaces must be re-sprayed with dedicated anti-corrosion materials.
7. The sealant is to prevent water and dust from entering the vehicle, as well as prevent corrosion. The original sealing joints are obvious and if these are damaged, they should be corrected by resealing. The joints of newly replaced panels should be resealed. The sealant used must remain flexible after curing and painting. Open joints sealed with sealant should be filled with a high consistency filler. Follow the instructions for the selected material.
8. The sound insulation material can control the general noise level in the vehicle. When the sound insulation layer is damaged due to maintenance operations or replacement of new panels, the same material must be used.

13.13.3 Diagnostic information and procedure

13.13.3.1 Common paint defects and treatment

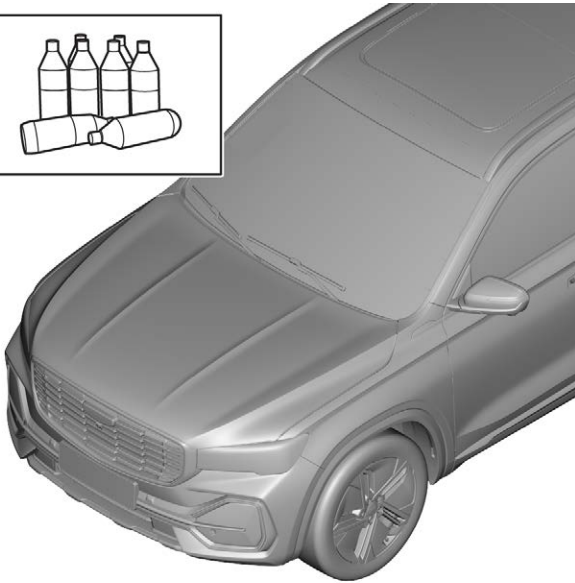
Caution The black boxes in the table indicate the treatment of the defect.

Name	Causes	Treatment method
Powder	<ol style="list-style-type: none"> 1. The painting film is subject to strong erosion . such as strong ultraviolet light. 2. The proportion of paint is wrong during construction. 3. The coating has poor light and weather resistance. 4. Vehicles are not cleaned regularly or cleaned thoroughly. 5. The selected vehicle cleaner is not suitable or the polishing paste is coarse. 	<ol style="list-style-type: none"> 1. Polishing and refining treatment. □ 2. Conventional grind and polishing treatment □ 3. Deep grind and polishing refurbishment treatment □ 4. Repair locally with painting. ■
Plastic paint peeling	<ol style="list-style-type: none"> 1. The adhesive force of coating and substrate is too poor or the upper coating is too hard compared with the lower coating. 2. The coating film is too thick and the paint film is subject to erosion of steam, acid, and alkali of the air. 3. The recoatability of the lower coating is bad, or with improper processing. There are missing of pinholes and grinning on the upper coating. 	<ol style="list-style-type: none"> 1. Polishing and refining treatment. □ 2. Conventional grind and polishing treatment □ 3. Deep grind and polishing refurbishment treatment □ 4. Repair locally with painting. ■
Crack- ing	<ol style="list-style-type: none"> 1. The primer base has not been fully blended before spraying. 2. The surface coating is too thickly sprayed. 3. The intermediate coating is too thickly sprayed. 	<ol style="list-style-type: none"> 1. Polishing and refining treatment. □ 2. Conventional grind and polishing treatment □ 3. Deep grind and polishing refurbishment treatment □ 4. Repair locally with painting. ■
Bird drop- pings erosion	<ol style="list-style-type: none"> 1. Bird droppings dripping erosion. 	<ol style="list-style-type: none"> 1. Polishing and refining treatment (mild erosion).■ 2. Conventional grind and polishing treatment (moderate erosion).■ 3. Deep grind and polishing refurbishment treatment □ 4. Local painting repair (severe erosion).■
Scratch	<ol style="list-style-type: none"> 1. The painting film hardness is low. 2. Being scratched by a hard object. 	<ol style="list-style-type: none"> 1. Polishing and refining treatment (minor abrasions).■ 2. Conventional grind and polishing treatment (coarse scratch). ■ 3. Deep grind and polishing refurbishment treatment □ 4. Localized paint repair (scratches).■
Corro- sion	<ol style="list-style-type: none"> 1. The painting film is thin on the edges. 2. Scratches cause corrosion. 3. Acid and alkali erosion. 	<ol style="list-style-type: none"> 1. Polishing and refining treatment. □ 2. Conventional grind and polishing treatment □ 3. Deep grind and polishing refurbishment treatment □ 4. Repair locally with painting (severe corrosion requires sheet metal repair before spraying repair). ■

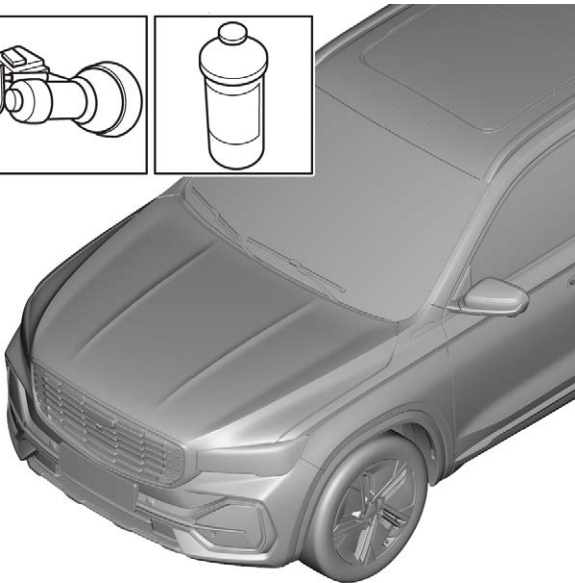
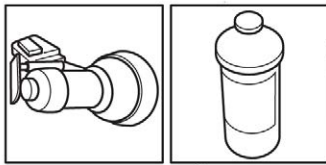
<p>Paint peeling</p>	<ol style="list-style-type: none"> 1. The adhesive force of coating and substrate is too poor or the upper coating is too hard compared with the lower coating. 2. The coating film is too thick and the paint film is subject to erosion of steam, acid, and alkali of the air. 3. The recoatability of the lower coating is bad, or with improper processing. 4. There are defects of pinholes and grinning on the upper coating. 	<ol style="list-style-type: none"> 1. Polishing and refining treatment. □ 2. Conventional grind and polishing treatment □ 3. Deep grind and polishing refurbishment treatment □ 4. Repair locally with painting (severe corrosion requires sheet metal repair before spraying repair). ■
<p>Acid rain erosion</p>	<ol style="list-style-type: none"> 1. Acid rain erosion. 	<ol style="list-style-type: none"> 1. Polishing and refining treatment (mild erosion).■ 2. Conventional grind and polishing treatment (moderate erosion).■ 3. Deep grind and polishing refurbishment treatment □ 4. Local painting repair (severe erosion).■
<p>Loss of gloss</p>	<ol style="list-style-type: none"> 1. The painting film is subject to severe erosion of acid, alkali, arc, seawater, and salt mist. 2. Under severe conditions, the painting film maintenance method is incorrect. 3. The painting is not durable enough. 4. The inappropriate proportion of the painting during the construction causes poor endurance of the painting film. 	<ol style="list-style-type: none"> 1. Polishing treatment (slight loss of gloss).■ 2. Conventional grind and polishing treatment(moderate loss of gloss).■ 3. Deep grind and polishing refurbishment treatment □ 4. Repair locally with painting (severe loss of gloss).■
<p>Bubbling</p>	<ol style="list-style-type: none"> 1. The painting film is exposed to the humid environment for a long time and infiltrated by steam, and when the temperature is high, the steam jacks up the bubbles. 2. The substrate is corroded by the substance infiltrated. 3. The painting film is subject to the erosion of gasoline, acid, and alkali. 	<ol style="list-style-type: none"> 1. Polishing and refining treatment. □ 2. Conventional grind and polishing treatment □ 3. Deep grind and polishing refurbishment treatment □ 4. Repair locally with painting (severe corrosion requires sheet metal repair before spraying repair). ■

13.13.4 Removal and Installation

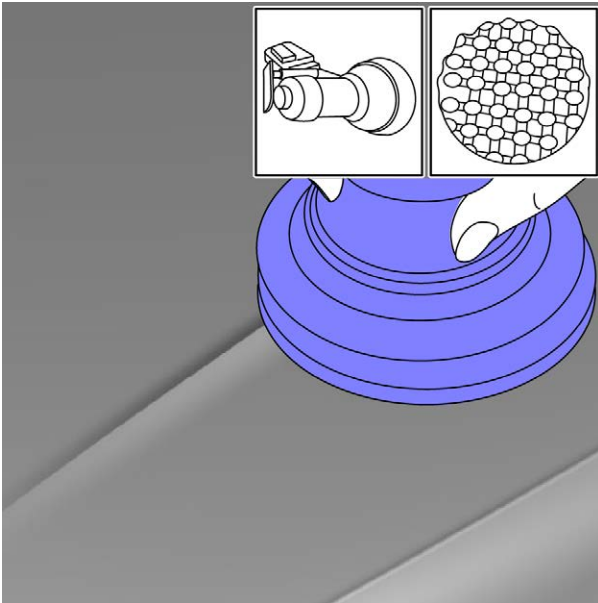
13.13.4.1 Common coating film defect treatment example



- 1 Clean the surface to be polished with degreasing material before polishing.



- 2 First, moisten the sponge sufficiently, and squeeze out the excess water. Apply a small amount of polishing wax to the paint surface to be polished, and adjust the speed of the polisher.



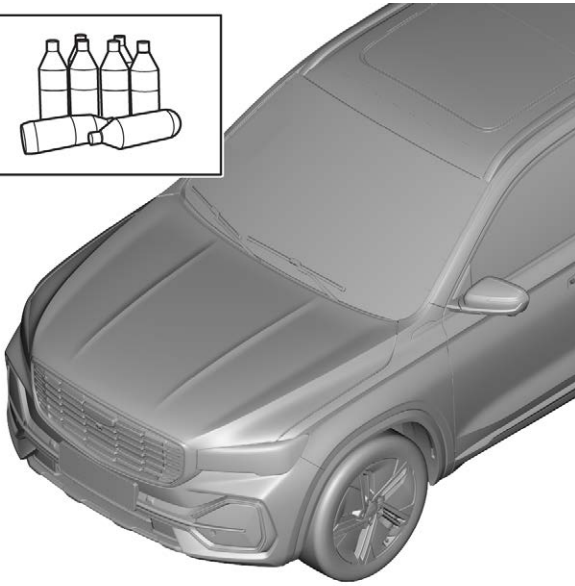
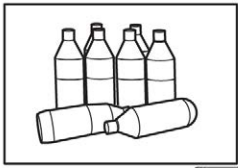
- 3 Put the sponge on the surface and then turn on the machine with a speed of 2500-3000r/min, and then press it gently for 3-5s to polish the surface.

Caution

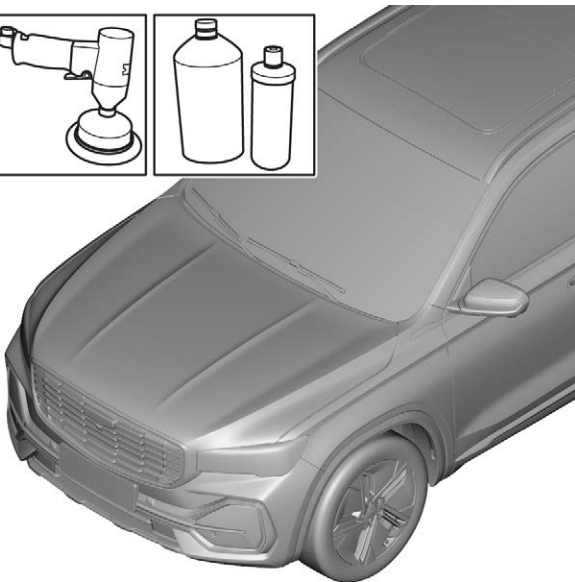
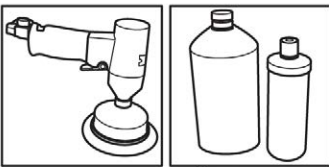
Hold the machine moving gently and steadily during operation. Don't take too long to avoid overheating and burning the paint.

- 4 Wipe off the excess wax with cloth.

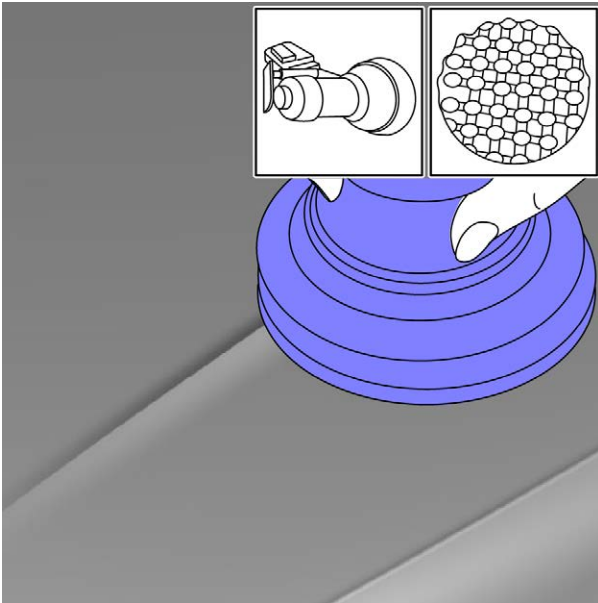
13.13.4.2 Conventional grind and polishing treatment example



- 1 Clean the surface to be polished with degreasing material before polishing.



- 2 Apply a proper amount of polishing paste to the paint surface to be polished and adjust the speed of the polishing machine.



- 3 Affix the wool ball to the lacquer surface before starting the machine, with the revolving speed being 2,500 - 3,000 r/min.

Caution

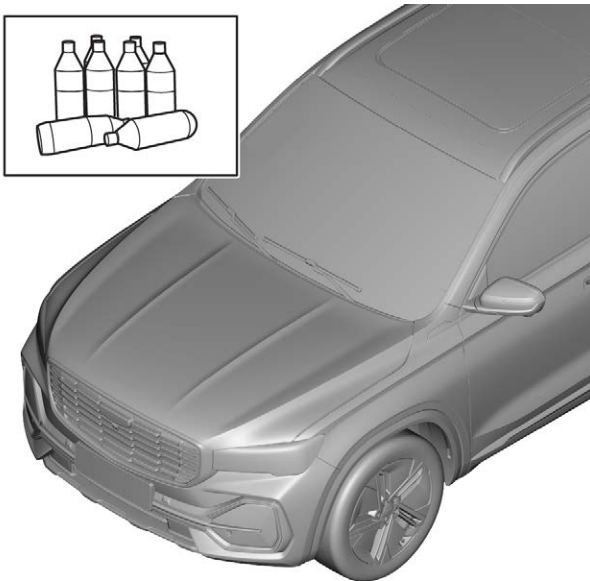
Keep the machine moving smoothly and gently and avoid excessive grinding. Ensure that the grinding time is as short as possible and the grinding area is as small as possible.

- 4 Fully moisten the sponge first, squeeze out the excessive water. Apply a small amount of glazing wax to the paint surface to be polished, attach the sponge onto the paint surface and then turn on the machine at a speed of 2500-3000 r/min, and then gently press for 3-5 s for glazing.

Caution

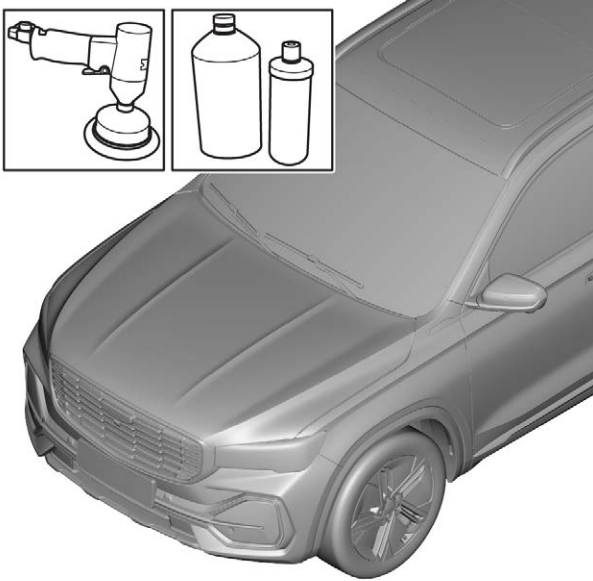
Hold the machine moving gently and steadily during operation. Don't take too long to avoid overheating and burning the paint.

13.13.4.3 Deep polishing treatment example

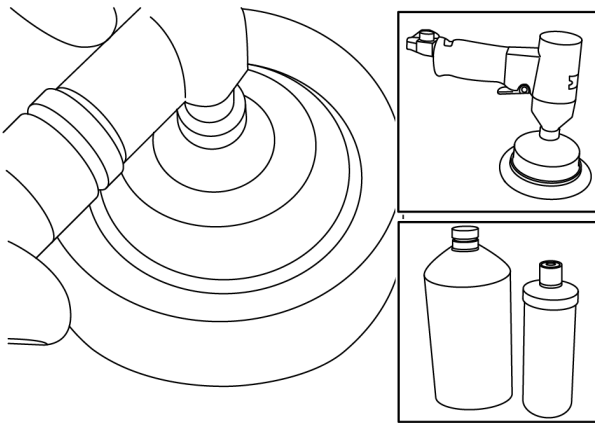


- 1 Grind the damaged paint surface with 2000# water abrasive paper, making it parallel and cling to the paint surface to be ground, and grind it round.

- 2 Clean up the surface and polish dust.



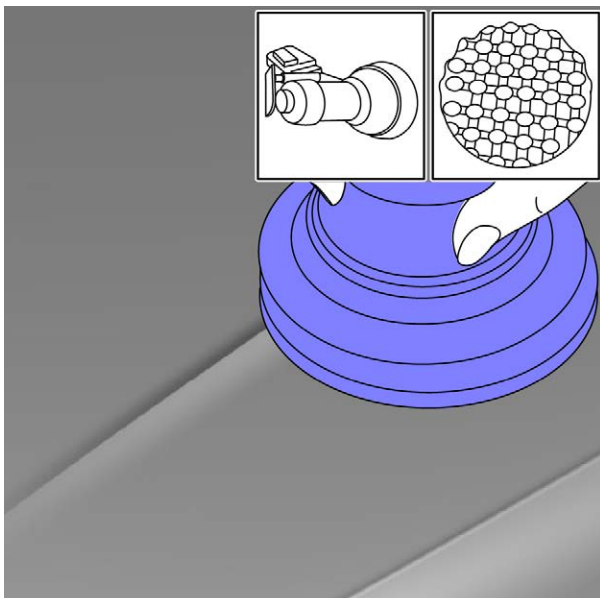
- 3 Apply a proper amount of polishing paste to the paint surface to be polished and adjust the speed of the polishing machine.



- 4 Affix the wool ball to the lacquer surface before starting the machine, with the revolving speed being 2,500 – 3,000 r/min.

Caution

Keep the machine moving smoothly and gently and avoid excessive grinding. Ensure that the grinding time is as short as possible (3-5s) and the grinding area is as small as possible.



- 5 Fully moisten the sponge first, squeeze out the excessive water. Apply a small amount of glazing wax to the paint surface to be polished, attach the sponge onto the paint surface and then turn on the machine at a speed of 2500-3000 r/min, and then gently press for 3-5s for glazing.

Caution

Hold the machine moving gently and steadily during operation. Don't take too long to avoid overheating and burning the paint.

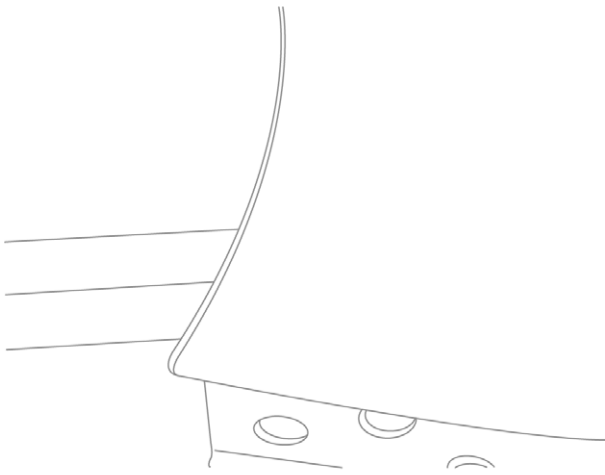
13.13.4.4 Rigid surface spray paint process

Fender is taken as an example to describe the partial spraying (paint touch-up) process

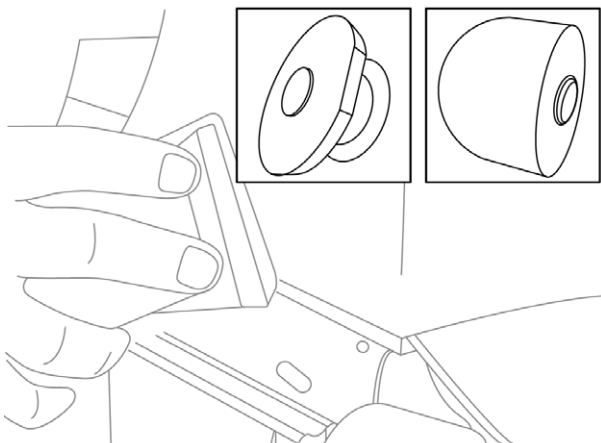
Caution

All paint repairs on rigid surfaces must meet Geely standards. Confirm the repair area and select the repair range. For example: partial repair, whole repair and complete vehicle repair. In case of the damage caused by a collision, perform the corresponding repair after the sheet metal repair according to the damage situation or spray paint after replacing the parts.

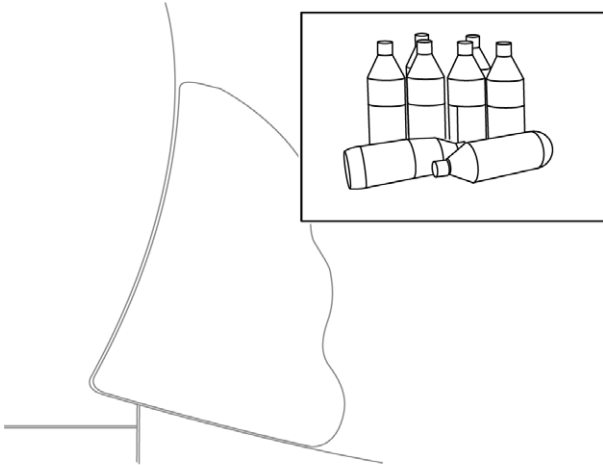
- 1 If the fenders has serious scratches, adopt the partial spraying (paint touch-up) process.



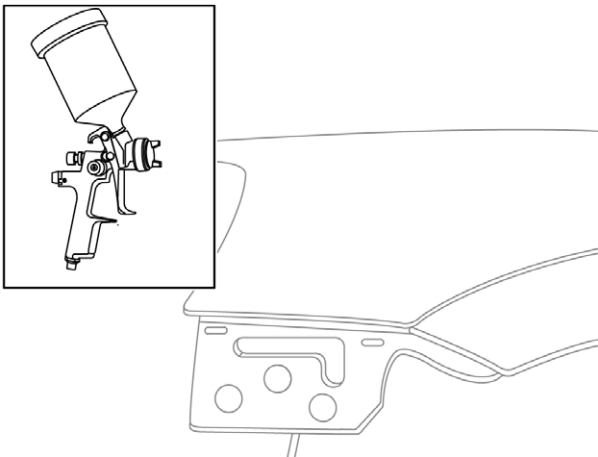
- 2 Use P500# wet (water) sandpaper to polish the damaged paint surface (round polishing).



- 3 After polishing, use degreaser to remove oil and clean.



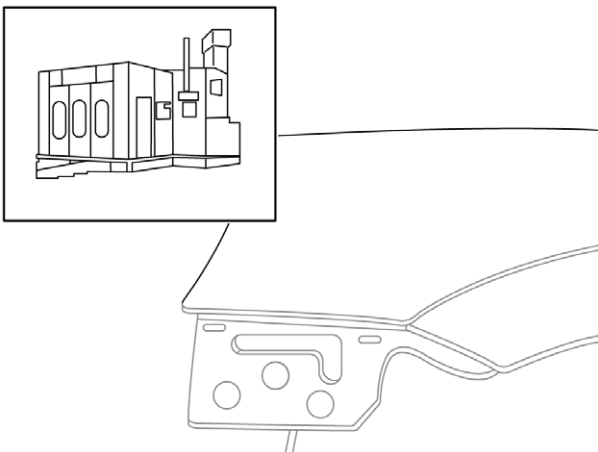
- 4 When spraying the middle coating, it is important to control the range of the spray primer. In addition, the edge position of the coating shall be gradual and not stepped.



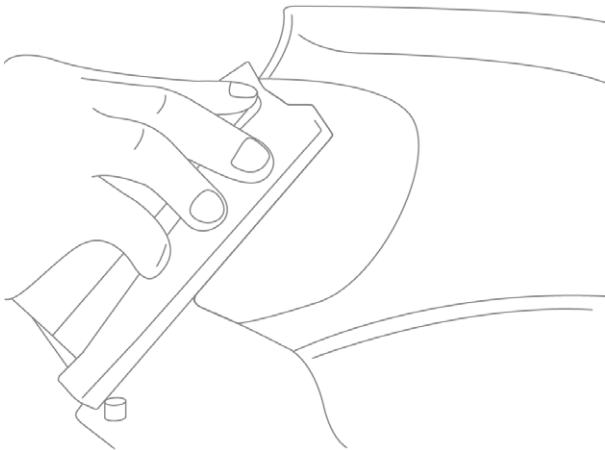
- 5 Flash drying for 4-5min, and then dry by baking for 20-30min with a paint room temperature of 70-80°C (158-176°F).

Caution

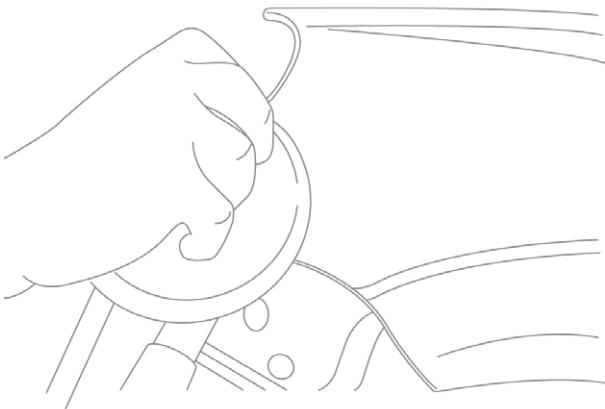
Hold the machine moving gently and steadily during operation. Don't take too long to avoid overheating and burning the paint.



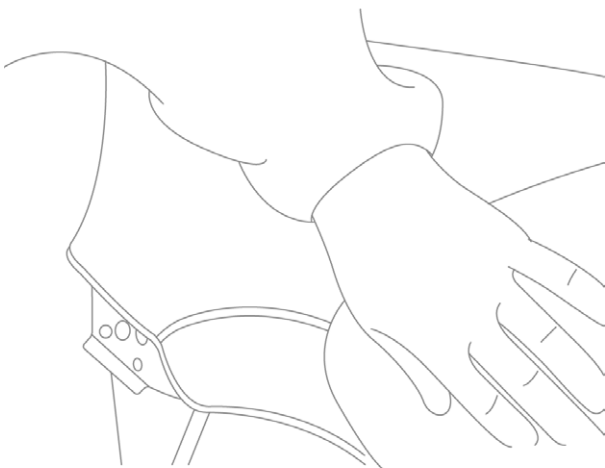
6 After drying, wet grinding with P800-1000# sandpaper.

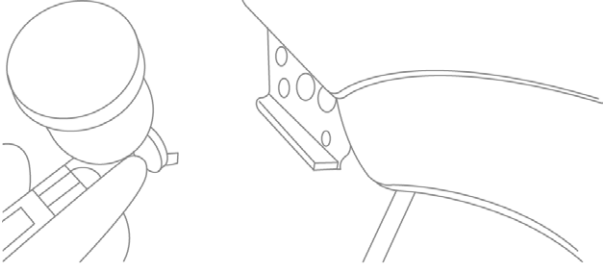


7 Grind with 2000# fine (water) sandpaper and expand the grinding range.



8 Use sticky gauze to remove dust before spraying after polishing.





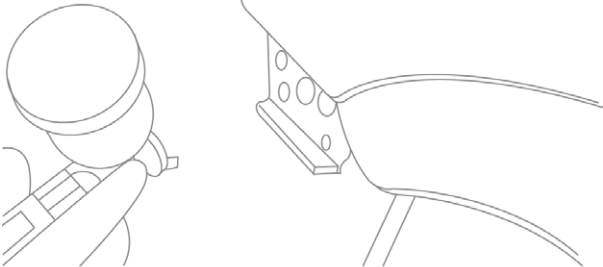
- 9 Spray the base color paint.

Air pressure 150-200 kPa (21.8-29.0 psi)

Spraying distance 20-30 cm (7.87-11.81 in)

Caution

For the purpose of color transition, the spraying range should be slightly wider than layer beneath it.



- 10 After flash drying for 2-3min, spray the second coat of base paint until the interface position is no longer obvious.

Air pressure 150-200 kPa (21.8-29.0 psi)

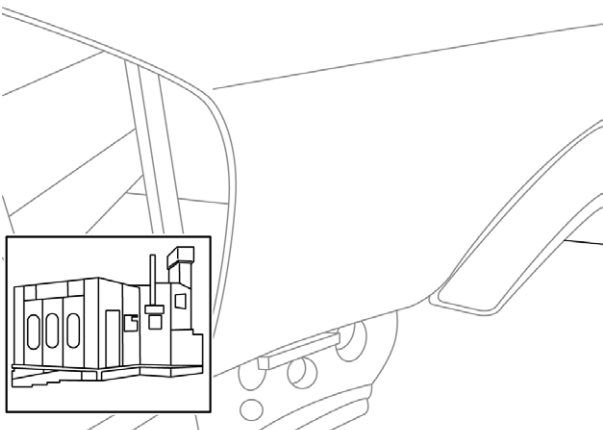
After flash drying for 2-3min, spray the second coat of base paint until the interface position is no longer obvious.

Air pressure 150-200 kPa (21.8-29.0 psi)

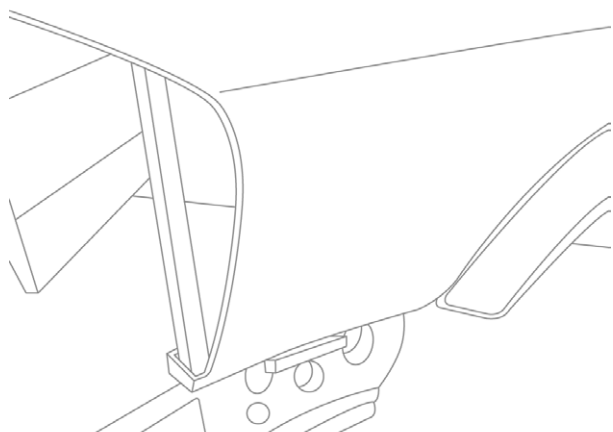
Spraying distance 20-30 cm (7.87-11.81 in)

- 11 Flash dry for 4-5 min and then dry for 20-30 min.

Temperature of paint room is 70-80°C (158-176°F)



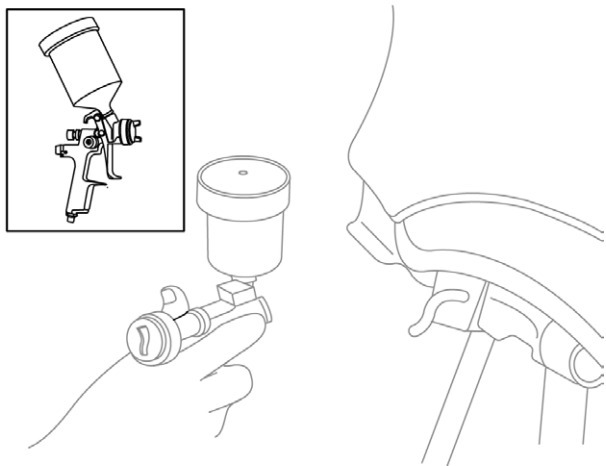
- 12 Use the sticky gauze to remove dust before spraying the lacquer after drying.



- 13 Spraying the clear lacquer and the spraying range completely covers the range of the base colour paint.

Air pressure 150-200 kPa (21.8-29.0 psi)

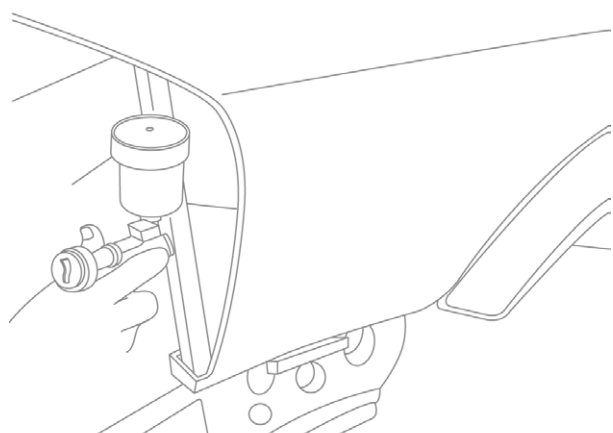
Spraying distance 20-30 cm (7.87-11.81 in)



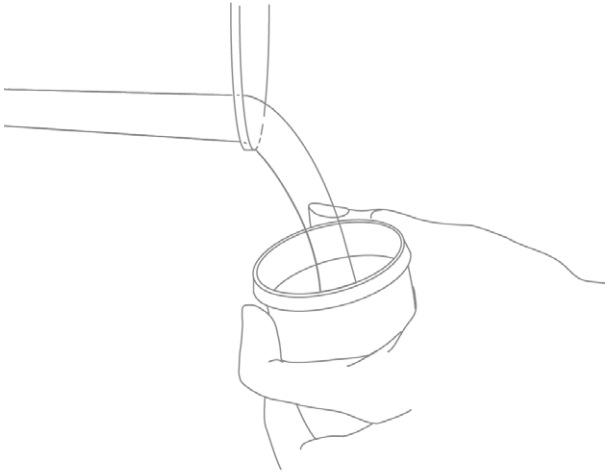
- 14 Flash dry for 2-3 min and spray the second clear lacquer. The spraying range completely covers the range of the first lacquer.

Air pressure 150-200 kPa (21.8-29.0 psi)

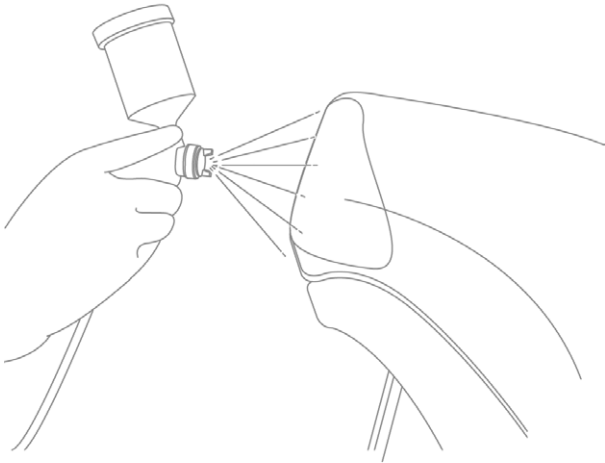
Spraying distance 20-30 cm (7.87-11.81 in)



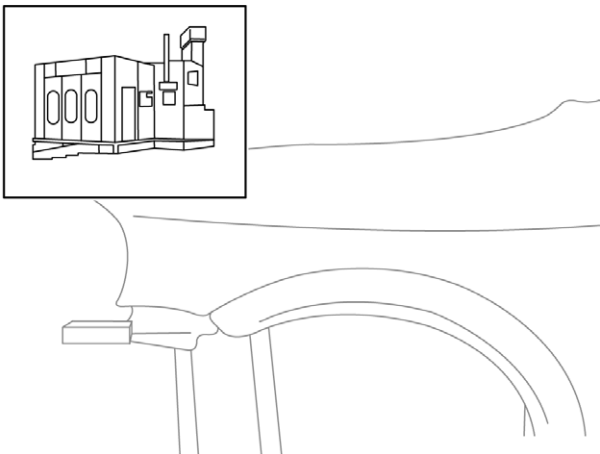
- 15 After finishing the clear lacquer spraying, immediately replace the saliva or add interface additives or thinners to the original clear lacquer.



- 16 Spray 2-3 times of the saliva or the diluted clear lacquer at the interface position.



- 17 Dry in the paint room for 20-30min.
Temperature of paint room is 70-80°C (158-176°F)



13.13.4.5 Painting of rigid surfaces after sheet metal repair

Spray paint procedure on the repaired rigid sheet metal surface is similar to rigid surface spray paint process. It's only added with the following steps after primer grinding and before spraying primer color paint:

- 1 Apply poly-putty base.
- 2 Grind poly-putty base.
- 3 Dust blowing, oil removing, cleaning.
- 4 Apply the filling putty.
- 5 Sanding the surface of old coating film.
- 6 Clean, oil removing, and cover areas not painted.

For specific operation steps: refer to [Paint spraying process for rigid surface](#).

13.13.4.6 Paint repair process of plastic part surface

There are three basic requirements for plastic surface paint repair

- 1 Paint has a certain adhesion to plastics without losing the mechanical properties.
- 2 The paint film should be flexible enough to make sure it will not break as the plastic distortion.
- 3 The original grain and rough texture of some plastic surface can be reflected.

Plastic surface paint repair process:

The plastic surface paint repair can refer to the above local spray paint process, and notice low temperature baking.

The baking conditions are 70-80 °C (158-176 °F), 20-30 min.

13.13.4.7 Color matching of the paint

Caution

- All paint operations must be carried out in the well-ventilated environment and the operating room equipped with an exhaust device
- Thorough reading the related information and the product specification before the color matching operation to the paint.
- Personal safety protection must be taken during the painting operation.
- Hands and face must be cleaned after the painting operation

Step 1	Confirm the color of the paint position to be touch up.
--------	---

- A. Confirm the color code of the paint position to be touch up.

Next Step

Step 2 Confirm the paint formula.

- A. Confirm the deployed data according to the color code of the paint position to be touch up.

Next Step

Step 3 Prepare the paint the primary color.

- A. Prepare and stir the primary color of the recorded date.

Next Step

Step 4 Metering the matching color.

- A. Put the measuring cup on the meter regulator. Refer to the color formula table, and confirm the color number and mix the required color master.

Next Step

Step 5 Trial application.

- A. Use a muddler to apply the matching paint to the test panel.

Note

Using a muddle well-dipped paint to apply a triangle on the test panel, and repeat applying until the base color of the test panel is covered.

Caution

If the sufficient curing time is not reserved and force drying is carried out, the air hole will appear on the test panel and the color ratio will be affected.

Next Step

Step 6 Color comparison.

- A. After the trial applying color is dried on the test panel, compare with the position of the paint position to be touch up of the original vehicle and confirm whether the color is consistent.

Note

When the paint dries, the relatively low-density pigment will move toward the surface. Therefore the color of the paint will be slightly different between the post-drying color and the just-applied color.

Caution

- Place the test board and the position of the paint position to be touch up of the original vehicle on the same level to make a comparison.
- At least 2 different light sources should be compared under different light sources before determining the color.
- A comparison should be made between direct angle, middle angle and indirect angle.

Yes

Carry out spraying/touching up paint.

No

Step 7	Micro-matching color.
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- A. Find out the difference between the color of the test panel and the actual vehicle paint. Add the amount of the primary color in the modulated paint for micro-matching color.

Note

A small amount of matching-color paint can be poured from multiple containers. Pour a different amount of color master into each container and make the color comparison respectively. Color master to be added is determined by the color on the test panel closest to the target color.

Next Step

Step 8	Trial application.
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- A. Use a muddler to apply the matching paint to the test panel.

Note

Using a muddle well-dipped paint to apply a triangle on the test panel, and repeat applying until the base color of the test panel is covered.

Caution

If the sufficient curing time is not reserved and force drying is carried out, the air hole will appear on the test panel and the color ratio will be affected.

Next Step

Step 9	Color comparison.
--------	-------------------

- A. After the trial applying color is dried on the test panel, compare with the position of the paint position to be touch up of the original vehicle and confirm whether the color is consistent.

Note

When the paint dries, the relatively low-density pigment will move toward the surface. Therefore the color of the paint will be slightly different between the post-drying color and the just-applied color.

Caution

- Place the test board and the position of the paint position to be touch up of the original vehicle on the same level to make a comparison.
- At least 2 different light sources should be compared under different light sources before determining the color.
- A comparison should be made between direct angle, middle angle and indirect angle.

No

Go to Step 7.

Yes

Step 10	Carry out spraying/touching up paint.
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