

# AWD System

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## What Is Real-time 4WD

Classification	Part-time 4WD	Full-time 4WD	Real-time 4WD
Characteristics	<ul style="list-style-type: none"> <li>◆ Manual 4WD/2WD switching</li> <li>◆ Rigid connection of front and rear axles</li> <li>◆ Part-time use</li> </ul>	<ul style="list-style-type: none"> <li>◆ No 4WD/2WD manual switching needed</li> <li>◆ Differential equipped between front and rear axles</li> <li>◆ Full-time use</li> </ul>	<ul style="list-style-type: none"> <li>◆ ECU controlled 4WD/2WD switching</li> <li>◆ Torque distribution controlled by torque manager</li> <li>◆ Real-time use</li> </ul>
Advantages	<ul style="list-style-type: none"> <li>◆ Simple structure and low cost</li> <li>◆ Strong off-road mobility</li> </ul>	<ul style="list-style-type: none"> <li>◆ All terrain 4WD</li> <li>◆ High road mobility</li> </ul>	<ul style="list-style-type: none"> <li>◆ Simple structure and light weight</li> <li>◆ Combining road and off-road mobility</li> </ul>
Disadvantages	<ul style="list-style-type: none"> <li>◆ Manual 4WD/2WD switching needed</li> </ul>	<ul style="list-style-type: none"> <li>◆ Complex structure and heavy weight</li> <li>◆ High fuel consumption</li> </ul>	<ul style="list-style-type: none"> <li>◆ Low off-road mobility</li> </ul>
Road mobility	★★★	★★★★★	★★★★
Off-road mobility	★★★★★	★★★★	★★★
Fuel consumption	★★	★	★★★
Remarks	Usually for vehicle model required high off-road mobility	Usually for luxurious vehicle or high-end SUV	Usually for city SUV

The four-wheel drive system of KX11 is real-time 4WD, also called intelligent 4WD.



## KX11 Real-time 4WD

- The drive system of KX11 is real-time 4WD, requiring no manual operation. The system can intelligently switch between two-wheel drive mode and all-wheel-drive mode according to vehicle operating conditions.
- When the vehicle runs on a better road, it will intelligently switch to the two wheel drive mode, to ensure the comfort and economical efficiency. When the vehicle runs on slippery roads, muddy roads, snow covered roads, sandy roads, and complex roads in the field, and when the vehicle starts, climbs, accelerates at medium and high speed, turns continuously, etc., the real-time 4WD system can respond quickly; it will switch between two wheel drive and four-wheel drive, intelligently distribute torque, ensure the traction of four wheels, achieve the best passability and safety, and ensure the stability and comfort of the vehicle.

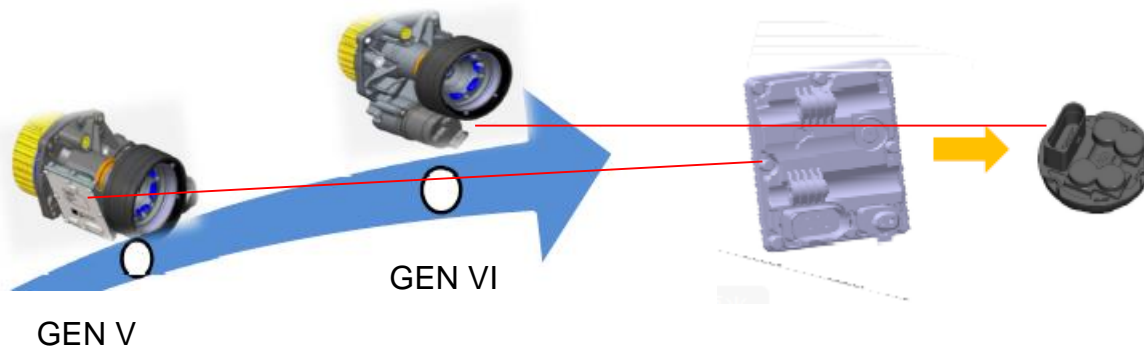


**KX11 model adopts BorgWarner's sixth-generation electro-hydraulic torque manager (BW LSC Gen VI).**

Model	KX11	FY11/NL-3B
AOC type	BW Gen VI	BW Gen V

**The KX11 four-wheel drive system Gen VI has the following advantages over the previous generation V:**

1. The weight reduction: About 0.7 kg reduction
2. The volume reduction: About 52% volume reduction
3. Adopts brushless motor to improve service life
4. Reduced vehicle layout complexity: eliminates the need for controller and motor wiring harnesses



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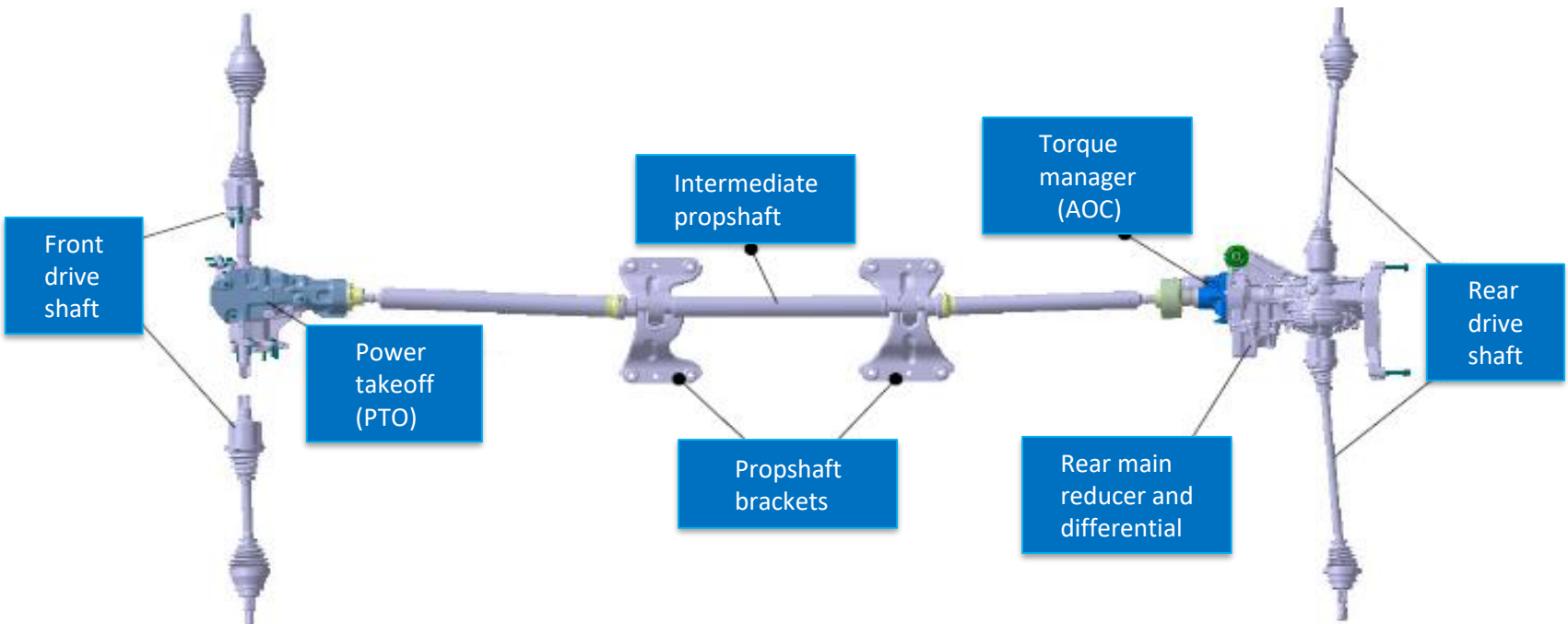
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Overview

▶ **Structure**

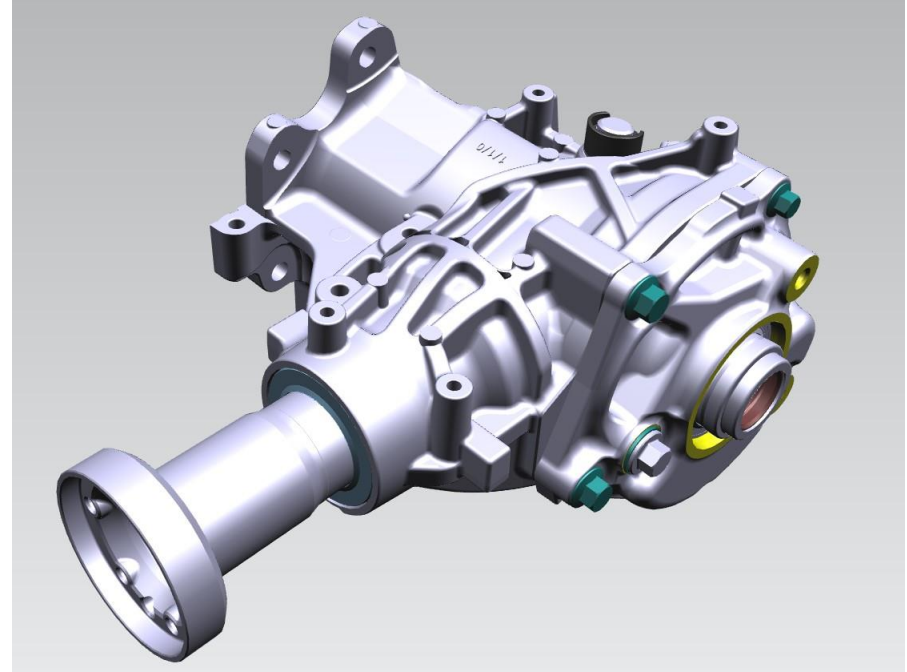
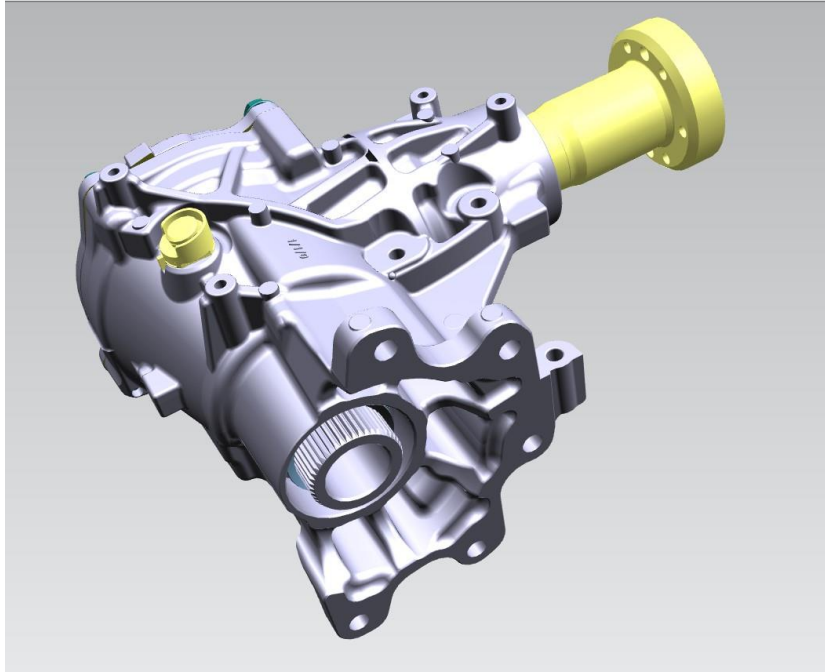
System maintenance and repair

# 4WD Composition



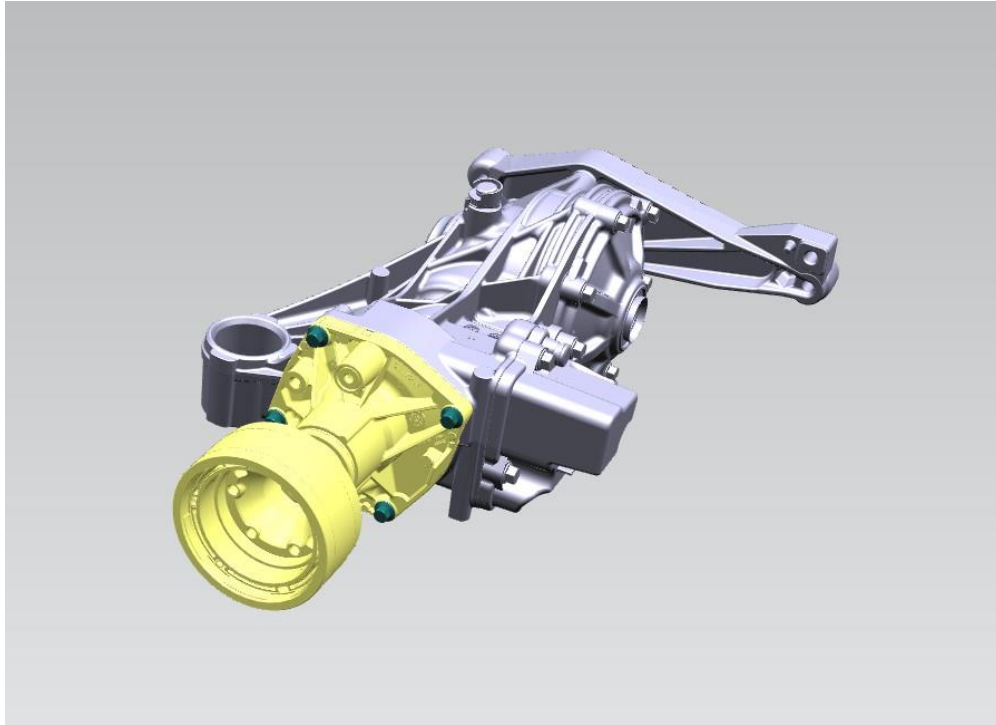
AOC Torque Capacity(Nm)		Front Rear Torque Ratio
Forward	Reverse	
1050	800	100:0~50:50

# PTO (Power Take Off)



Note: The PTO shall not tilt more than 45 ° under any circumstances.





Note: The rear differential shall not tilt more than 45 ° under any circumstances.

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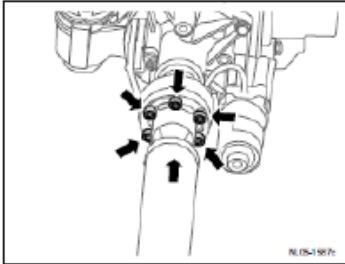


## Notes on 4WD Using

- If the all-wheel-drive system failure prompt appears on the instrument pack, please contact the Geely Service for maintenance as soon as possible. At this time, the driver shall not operate the vehicle until the alarm disappears, otherwise the torque manager will be burnt (though the clutch is disconnected, the friction between steel plate and friction plate caused by speed difference will further increase the temperature).
- If there is a text prompt of overheated AWD system on the instrument pack, it may be caused by the fact that the all-wheel-drive system is repeatedly activated and become overheated when the vehicle runs on highly sandy roads, slippery roads, or snow-covered roads. Then, it is necessary to stop operating the vehicle. In order to restore the four wheel drive function in the shortest time, please select the Auto Hold or engage the shift lever in the P/N gear and wait for the all-wheel-drive system to cool down. Wait for at least 15 minutes, and then restart the vehicle after the system returns to normal state.
- In case of failure to get out of trouble after two overheating prompts, please stop all attempts but seek rescue.
- **If the vehicle is equipped with an all wheel-drive system, no two-wheeled trailers are allowed under any circumstances.**
- Fluids such as torque manager, power take-off, rear final drive, etc. require no maintenance.
- Please do not add a fender apron outside the all-wheel-drive system at will to avoid poor heat dissipation, causing overheating and further abnormalities.

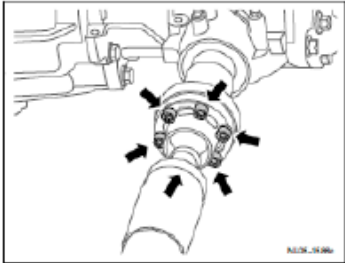


## Disassembly and assembly procedure of propshaft

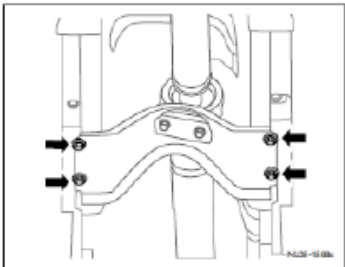


**The disassembly steps are shown on the left:**

- Remove the connecting bolts of the drive shaft and the power take-off
- Remove the connecting bolts of the drive shaft and the rear main reducer
- Remove drive shaft and bracket connecting bolts

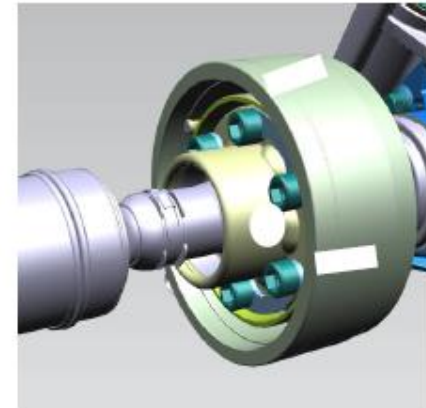


**The installation steps are reversed.**



### Notes:

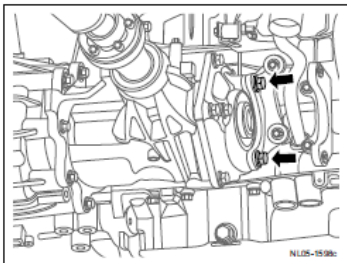
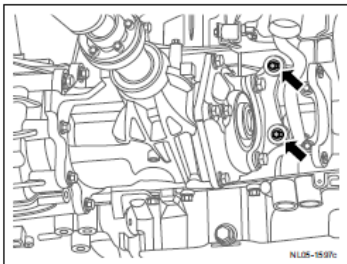
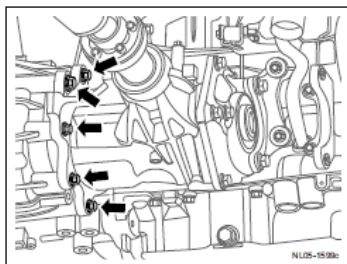
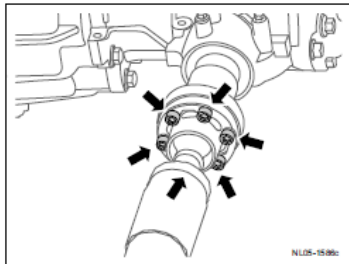
- The propshaft connected to power take-off and rear main reduction bolts should be tightened diagonally
- During installation, the white spot on the rear end of the propshaft should be within the two white lines on the rear main reduction flange.





# Maintenance and repair

## Disassembly and assembly procedure of PTO



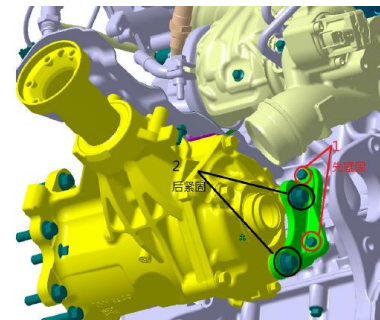
**The disassembly steps are shown on the left:**

- Remove the connecting bolts of the propshaft and the power take-off
- Remove the connecting bolts of the power take-off bracket and engine
- Remove the connecting bolts of power take-off and brackets
- Remove the connecting bolts of power take-off and engine

**The installation steps are reversed.**

### Notes:

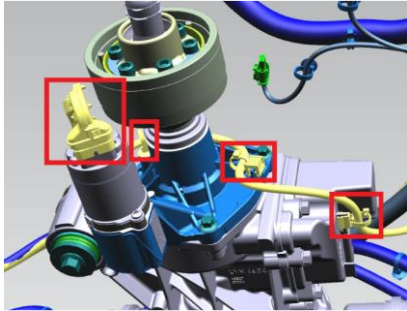
- Under no circumstances should the power take-off be tilted more than  $45^\circ$
- Before assembling the new power take-off, apply the specified type of grease to the spline position
- The three kinds of bolts around the power take-off are one-time-use parts and must be replaced with new parts after disassembly; all three bolts are tightened by the torque angle method
- During installation, the connecting bolts of the power take-off bracket and the engine must be tightened first, then tighten the power take-off bracket and the power take-off link bolts





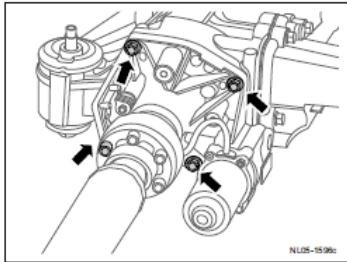
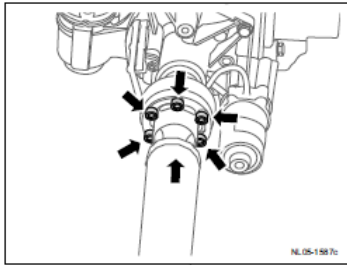
# Maintenance and repair

## Disassembly and assembly procedure of AOC



The disassembly steps are shown on the left:

- Remove the connector and wiring harness
- Remove the bolts connecting the propshaft to the torque manager flange
- Remove the 4 bolts connecting the torque manager to the rear main reducer
- Remove the torque manager (Be careful that there will be some lubricating oil flow out)



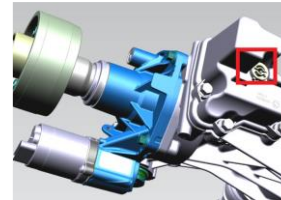
The installation steps are reversed.

### Notes:

- The bolts connecting the propshaft and AOC should be tightened diagonally
- After the torque manager is assembled, refill some oil (habot 311)
- During installation, the white spot on the rear end of the propshaft should be within the two white lines on the rear main reduction flange
- After replacing the AOC, do “bleeding” by the following methods:

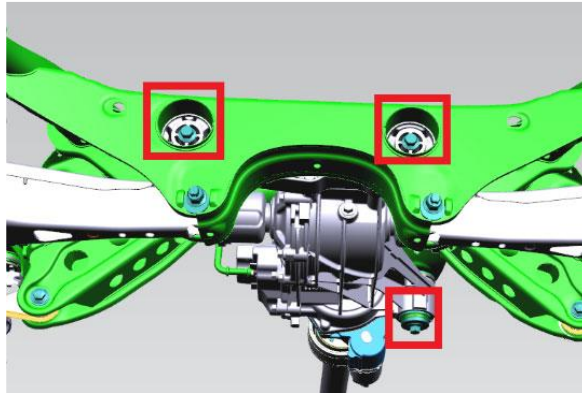
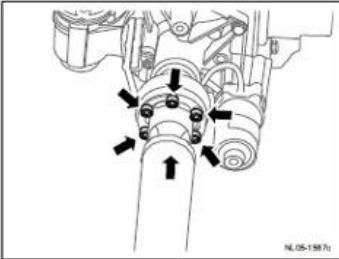
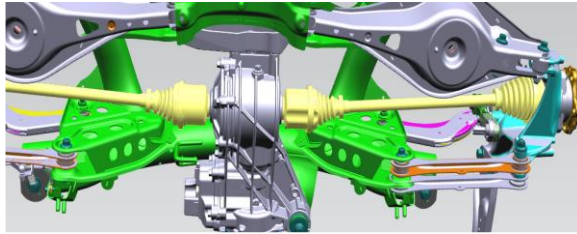
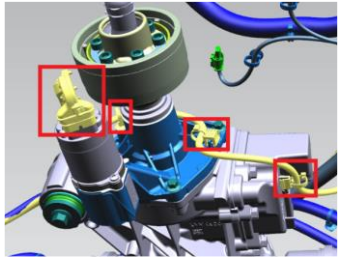
Do “bleeding” automatically

Start the vehicle, keep the speed above 20Km/h and drive straight, hold the accelerator pedal driving for 10 minutes, then stop and turn off the engine; repeat the above operation 4-5 times





## Disassembly and assembly procedure of Rear main reducer and differential



**The disassembly steps are shown on the left:**

- Remove the connector and wiring harness
- Remove the bolts connecting the propshaft to the torque manager flange
- Remove the 3 bolts connecting the main reducer to the rear subframe

**The installation steps are reversed.**

**Notes:**

- Protect the drive half shaft sheath from scratches
- The rear final drive must not tilt more than  $45^\circ$  under any circumstances

# Maintenance and repair



Parts Name	Whether contain oil	Oil Specification	Capacity	Oil replace mileage interval	Maintenance method
PTO	Yes	75W-90	0.45L	No need to replace	Lifetime maintenance free
Final gear and differential assembly	Yes	75W-90	0.45L	No need to replace	Lifetime maintenance free
AOC	Yes	Habot 311 (OIL-ACTIVE ON DEMAND COUPLING)	0.59L	No need to replace	Lifetime maintenance free
Propshaft	No	/	/	/	Lifetime maintenance free
Drive shaft	No	/	/	/	Lifetime maintenance free





# Diagnosis – Read data stream

Geely Diagnostic System

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Home KX11, 2021 X

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吉利汽车  
GEELY AUTO

Diagnostics Software



VIN: LB37852D2MS006189

Model/Year/Chassis: KX11, 2021, 006189

Connection: Virtual #1

12.1 V Active

Network

Fault Tracing

Components

Service Functions

ECUs Other

ID	Name
	DEM
4/82	Differential Electronic Module (DEM)

DTCs Documents Wiring Diagrams Parameters Activations Diagnostic Sequences

Parameters Selected

- Parameter
- Accelerator pedal position - DEM
  - Ambient air temperature - DEM
  - AWD error message - DEM
  - Brake pedal - DEM
  - Calculated propulsion torque - DEM
  - Differential clutch, status - DEM
  - Differential Electronic Module (DEM) voltage - DEM
  - Engine speed - DEM
  - Gear active - DEM
  - Global real time - DEM
  - Internal temperature - DEM
  - Parking brake - DEM
  - Pump current - DEM



# Diagnosis – DTC

Geely Diagnostic System



Home KX11, 2021 X

Diagnostics Software

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VIN: LB37852D2MS006189  
Model/Year/Chassis: KX11, 2021, 006189

Connection: Virtual #1  
12.1 V Active

Network

Fault Tracing

Components

Service Functions

ECUs Other

ID	Name
	DEM

4/82 Differential Electronic Module (DEM)

DTCs Documents Wiring Diagrams Parameters Activations Diagnostic Sequences

Confirmed Unconfirmed All DTCs

DTC

- DEM-P060647 Control module processor. System Internal Failures. Watchdog or safety µC failure.
- DEM-P06B845 Internal Control Module Non-Volatile Random Access Memory (NVRAM) Error. System Internal Failures. Program memory failure.
- DEM-P118854 Calibration Memory. System Programming Failures. Missing calibration.
- DEM-P18890A Oil Pressure Pump Performance. General electrical failure.
- DEM-P188911 Oil Pressure Pump Performance. General Electrical Failures. Circuit short to ground.
- DEM-P188912 Oil Pressure Pump Performance. General Electrical Failures. Circuit short to battery.
- DEM-P188913 Oil Pressure Pump Performance. General Electrical Failures. Circuit open.
- DEM-P188918 Oil Pressure Pump Performance. General Electrical Failures. Circuit current below threshold.
- DEM-P188919 Oil Pressure Pump Performance. General Electrical Failures. Circuit current above threshold.
- DEM-P188971 Oil Pressure Pump Performance. Mechanical Failures. Actuator stuck.
- DEM-U006488 Propulsion CAN. Bus Signal / Message Failures. Bus off.
- DEM-U03004A Internal Control Module Software Incompatibility. System Internal Failures. Incorrect component installed.



## Happy Life, Geely Drive

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