

**CENNTRO**

# Repair Manual

AVANTIER





# Foreword

- This Manual is the repair manual of AVANTIER.
- Reading and mastering this Manual is very important for carrying out the correct repair and maintenance. This Manual should be stored in a place convenient for quick reference.
- All data, diagrams, tables, and descriptions in this Manual are based on the product information available at the time of preparation of this Manual. Therefore, please note that the vehicle shown may be different from the actual vehicle being repaired.
- CENNTRO reserves all rights to this Manual. The specifications and contents in this Manual are subject to change without notice, and CENNTRO does not assume any legal obligations and responsibilities.
- Without the written permission of CENNTRO, no unit or individual may use any form or method to duplicate, copy or transmit this Manual on the network in any form for any purpose.

## **Warning:**

**This Manual is only for professional technicians. CENNTRO will not be responsible for any damage to the customer's vehicle or injury to himself or others around caused by non-professional personnel or individuals who have not yet obtained qualifications who refer to this Manual without permission or do not use appropriate equipment and tools to repair and maintain the vehicle.**

**To avoid dangerous operation and damage to the vehicle, the following instructions must be observed:**

- Read this Manual thoroughly.
- Before maintenance, be sure to wear protective tools correctly to avoid personal injury.
- If parts need to be replaced, the genuine CENNTRO parts or specified parts must be used. Do not use inferior parts.
- "Warning" and "Caution" in this Manual must be carefully observed, so as to effectively avoid personal injury and vehicle damage caused by operation errors during repair and maintenance.



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# Introduction

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## How to use this manual

### General information

This manual is divided into chapters and sections for subsystem descriptions, with description of specific systems concentrated in the relevant chapters. Each chapter briefly describes a specific part of the automotive component.

This manual consists of: general information, drive motor/transmission, drive shaft, suspension system, brake system, steering system, heating/air conditioning/ventilation, safety and restraint system, body and EE and body system.

The first page of this manual contains the table of contents of all chapters. Each specific chapter generally contains the following contents: warnings and precautions, system overview, description of working principles of components, special tools and equipment, fastener torque list, system circuit diagram, diagnostic information and steps, matching learning, inspection and adjustment, removal and installation.

### Description of chapters and sections

#### Warnings and precautions

The warnings and precautions in the section are explained before each maintenance section.

Warning: Indicating that property damage, personal injury or death may result if not avoided.

Caution: if it is not avoided, it may cause damage to the vehicle and equipment and reduce the service life.

#### System overview

The introduction of system overview is divided into two parts, the system component diagram and the system schematic diagram. The system component diagram mainly introduces the view information of main components in this chapter, and the corresponding disassembly and maintenance information of the component diagram can be found in this chapter. The system schematic diagram mainly provides a brief introduction to the information related to the direction of complex signals or the flow direction of liquids in this chapter.

#### Description of components

The schematic diagrams of components are mainly for the electronic components, such as sensors, actuators, ECUs and other electronic components of the function, control strategy and principle.

#### Special tools and equipment

The summary of tools used in this section mainly introduces the general tools and special tools. The list of special tools provides all the special tools required for each maintenance, and the list contains the part numbers of special tools.

#### Fastener torque list

The fastener torques in this section are summarized and the list can be used for a quick review of fastener torques.

#### System circuit diagram

This section mainly introduces the circuit diagram of the electrical devices and modules involved in the system.

#### Diagnostic information and steps

The main contents include: data flow, fault symptom table, diagnosis process, module terminal list, and fault code diagnosis.

#### Matching learning

It mainly introduces the method of module matching and learning, the matching sequence and the matching conditions of the module.

#### Check and adjustment

Mainly introduce the inspection and adjustment methods of parts and components.

**Removal and refitting**

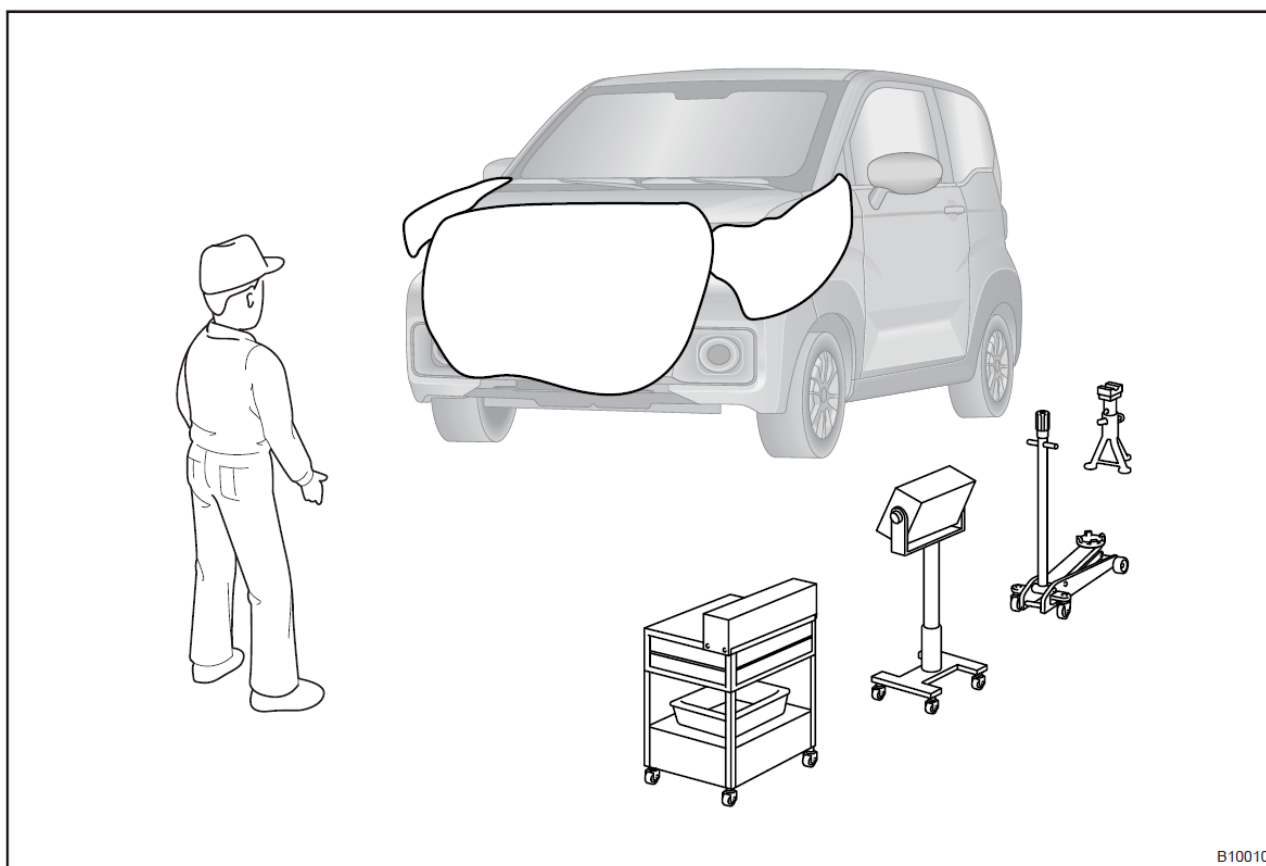
This section describes the removal, installation, disassembly, and related precautions of each component.

**Reference direction of views**

- The left and right sides of the vehicle appear to be identified in the driver's seat position facing forward.

## Preparation before vehicle inspection

### Schematic diagram of vehicle inspection



B10010

No.	Item	Content
1	Dress	<ul style="list-style-type: none"> <li>• Be sure to wear clean work clothes.</li> <li>• Must wear a hat and safety shoes.</li> </ul>
2	Vehicle protection	<ul style="list-style-type: none"> <li>• Before starting work, prepare the radiator grille cover, fender cover, seat cover and floor mat.</li> </ul>
3	Safe operation	<ul style="list-style-type: none"> <li>• When working with two or more people, be sure to check the safety of each other.</li> <li>• Always wear appropriate safety equipment when repairing parts that are at high temperature and high pressure, in rotating, moving or vibrating, and take extra care to avoid injuring yourself or others.</li> <li>• When jacking up the vehicle, be sure to use the safety base to support the specified parts.</li> <li>• When lifting the vehicle, use appropriate safety equipment.</li> </ul>
4	Preparation of tools and measuring instruments	<ul style="list-style-type: none"> <li>• Before starting the operation, prepare the tool table, special tools, gauges, oil and replacement parts.</li> </ul>

No.	Item	Content
5	Removal and installation, disassembly and assembly operations	<ul style="list-style-type: none"> <li>• Diagnose the fault after fully understanding the correct service procedures and the fault to be repaired.</li> <li>• Before removing the parts, check the general condition of the assembly to check the deformation or damage.</li> <li>• For more complex assemblies, make records. For example, note the total number of electrical connections, bolts, or hoses that were removed.</li> <li>• Place assembly marks to ensure that each component is reassembled to its original position. If necessary, hoses and their connectors can be temporarily labeled.</li> <li>• If necessary, clean the removed parts, thoroughly inspect them, and then proceed with assembly.</li> </ul>
6	Removed parts	<ul style="list-style-type: none"> <li>• Place the removed parts in a separate box to prevent confusion or contamination with new parts.</li> <li>• For non-reusable parts (such as liner, O-ring and self-locking nut, etc.), replace them with new ones according to the instructions in this manual.</li> <li>• If requested by the customer, retain the removed parts for customer inspection.</li> </ul>

## Lifting the vehicle

### Jacking up and supporting the vehicle

#### Caution

##### Precautions for the use of rocker lift

- Follow the safety procedures described in the instruction manual.
- When using a lift, keep the vehicle stable to prevent the vehicle from tilting during operation. Stabilize the vehicle by adjusting the length of the lift arm and the vehicle position.

Be careful when jacking up and supporting the vehicle; Be sure to jack up and support the vehicle in the correct position. Sometimes illustrations of similar models are used; In this case, some details may be slightly different from the actual model.

### Flat-bed lift

#### Caution

##### Precautions for the use of flat-bed lifts

- Follow the safety procedures described in the instruction manual.
- Use flat-bed lift additional support blocks (rubber lifting blocks) on the surface of the plate.

## Precautions for maintenance

### Use of fasteners

#### Caution

Use of incorrect fasteners may result in damage to components. Failure to observe the following instructions may result in injury or death.

- Recycling of all fasteners (nuts and bolts, etc.) during maintenance and repair operations is important for reassembly.

### Dismantling parts

When repairing the fault, try to confirm the cause of the fault. The parts or sub-assemblies that need to

be removed and replaced should be identified before the operation begins. After removing the parts, plug all holes and ports to prevent foreign matters from entering.

### Dismantling parts and components

If the disassembly procedure is complex and several parts need to be disassembled, make sure that the disassembly method does not affect the performance or appearance of the parts. Identify the individual parts for reassembly.

### Check the installation

When installing the new parts or resetting the old parts after removal, check whether foreign matters enter the new parts or the old parts to avoid unnecessary damage to the vehicle.

### Placement of parts

Carefully place all disassembled parts in order to facilitate reassembly. Always place and mark the parts that are to be replaced separately from the reusable parts.

### Cleaning the parts

#### ⚠ Warning

When using compressed air to blow out dust or other particles, eyes may be injured, so always wear safety goggles during this operation.

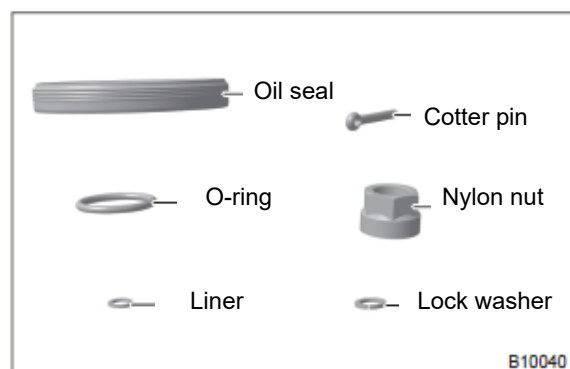
Carefully clean the parts that will be reused thoroughly.

### Reassembling parts and components

When reassembling parts, standard values (tightening torque, clearance, etc.) must be strictly applied.

If the following parts need to be replaced, replace them with new parts.

- Oil seal
- Liner
- O-ring
- Lock washer
- Cotter pin
- Nylon nut



### Lubrication and sealing

Use sealants and liners based on the location.

If the sealant is applied, install the components before the sealant dries to prevent leakage.

Apply lubricating oil to the movable parts and friction parts of the components.

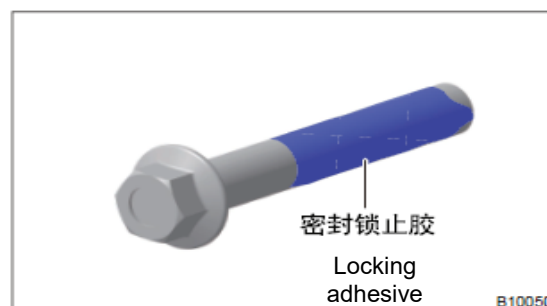
When reassembling, apply the approved lubricating oil or grease to the designated area (such as oil seal).

### Adjustment

Use suitable gauges and testers for the adjustment.

#### Precoated parts

Precoated parts refers to bolts and nuts that are coated with locking adhesive in the factory. If the precoated parts are retightened, loosened or moved in any way, they must be re-applied with the specified adhesive.



## Rubber parts and rubber hoses

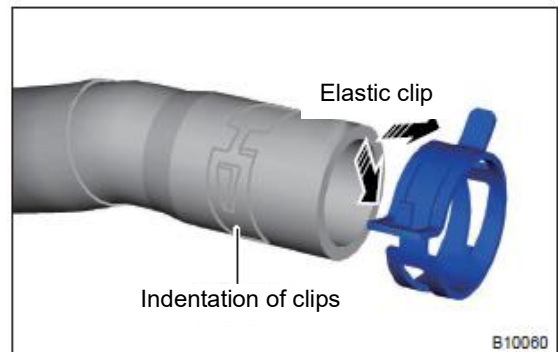
Avoid gasoline or engine oil dripping on rubber parts or rubber hoses.

### Hose clamp

Before removing the hose, observe the position of the clip so that it can be reinstalled in the same position.

Replace the deformed or dented clips with new parts. When reusing the hose, secure the clip to the hose in the area of the clip indentation.

For spring clips, push the tab in the direction of the arrow as shown in the illustration after installation to widen the tab slightly.



### Bench vise

When using the bench vise, install a guard plate at the jaws of the bench vise to prevent damage to the parts.



## Vehicle Information

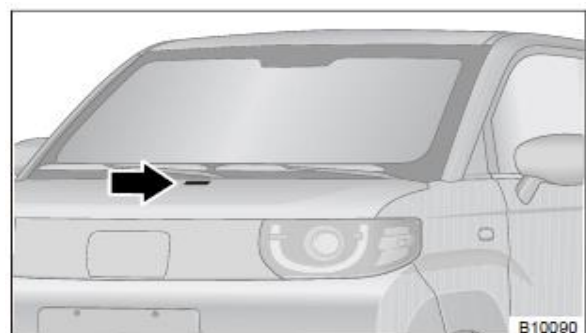
### Vehicle Information

The vehicle identification number (VIN) is the legal identification of the vehicle. This is the main identification number of the vehicle, which is used for owner registration.

1. The VIN plate is located on the lower left side of the dashboard on the driver's side (as shown by the arrow).



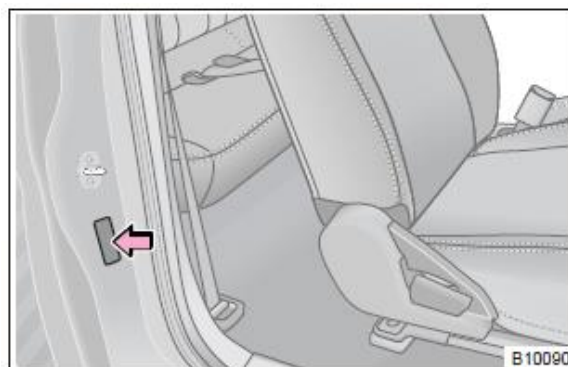
2. The vehicle identification number is engraved in the middle of the front compartment gutter channel panel. Open the engine hood to see it.



## Vehicle parameter label

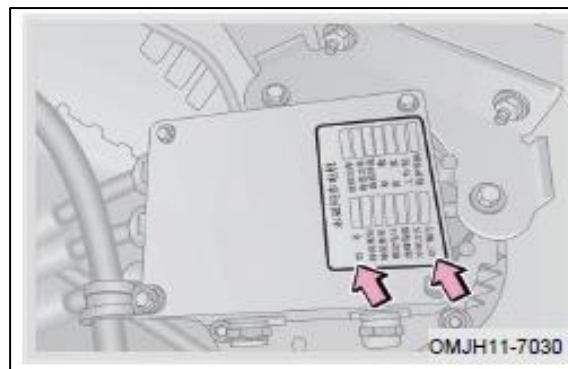


The vehicle product nameplate is located at the position shown in the figure on the right-side wall outer panel.








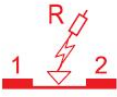





























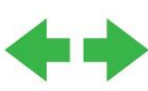







### Motor model and production number

The motor model number and production number are stamped on the motor as shown in the figure.



**Symbol**

The following symbols are combination instrument display symbols, as well as some internationally-accepted standard symbols.

 1	 2	 3	 4	 5
 6	 7	 8	 9	 10
<b>READY</b> 11	<b>RVM</b> 12	 13	 14	 15
 <b>BATTERY</b> 16	 17	 18	 19	 20
 21	 22	 23	 24	 25
 26	 27	 28	 29	 30
 31	 32	 33	 34	<b>ECO+</b> 35
 36	 37	 38	 39	 40
 41	 42	 43	 44	 45
 46				

1	Charging line connection indicator lamp	24	Electronic Parking Brake (EPB) fault warning light
2	Motor and controller overheating warning lamp	25	Cruise Control System (CCS) status indicator
3	Fault warning light of electric drive system	26	Fault warning light of anti-lock braking system (ABS)
4	Fault warning light of power battery	27	Power limit indicator lamp
5	Abnormal power battery temperature warning lamp	28	High beam indicator lamp
6	Insulation fault warning light	29	Low beam indicator lamp
7	Fault warning light of the vehicle system	30	AUTO HOLD indicator lamp/e-AUTO HOLD indicator lamp
8	ESC OFF indicator/C-ESC OFF indicator light	31	Indicator of daytime running lamp ON
9	Electronic Stability Control (ESC) indicator light/Acceleration Slip Regulation (C-ESC) indicator light	32	Abnormal tire pressure warning lamp
10	Hill Descent Control (HDC) status indicator lamp/Electronic Hill Descent Control (e-HDC) status indicator	33	Indicator lamp of position lamp ON
11	Long endurance mode indicator lamp	34	Indicator lamp of rear fog lamp
12	T-BOX fault indicator lamp	35	Long endurance mode indicator lamp
13	New energy characteristic indicator light	36	Electric brake force distribution (EBD) fault warning light/brake fluid low fluid level warning light
14	Road speed limit sign recognition indicator lamp	37	Fault warning light of intelligent braking system
15	Indicator lamp of vehicle maintenance reminder	38	Automatic high and low beam switching indicator lamp
16	Power battery maintenance indicator	39	Indicator lamp of turn signal lamp
17	Fault warning light of brake lamp	40	Front collision warning indicator/Autonomous Emergency Braking (AEB) indicator
18	Fault warning light of airbag	41	Front collision warning indicator/Autonomous Emergency Braking (AEB) fault indicator
19	Indicator lamp of Lane Departure Warning (LDW)	42	Adaptive Cruise Control (ACC) status indicator
20	Indicator lamp of battery charging/discharging indicator/low voltage battery power	43	Fault warning light of Adaptive Cruise Control (ACC)
21	Fault indicator light of Electric Power Steering (EPS)	44	Driver seat belt unfastened warning indicator
22	Indicator lamp of blind spot monitoring function off	45	Power battery low battery indicator
23	Electronic Parking Brake (EPB) indicator light	46	Power battery cut-out warning light

## Circuit diagnostic Information

### Circuit diagnostic Information

- Connect the bluetooth end of the tester to the OBD (diagnostic interface), switch on the start button and try to use the tester. If a communication fault is shown on the display, the vehicle is faulty or the tester is faulty.
- If the communication is normal when the tester is connected to another vehicle, check the OBD (diagnostic Interface) of the previous vehicle.
- If the tester still does not communicate when connected to another vehicle, the tester itself may be faulty

### Troubleshooting of the BCM Control System

- This vehicle uses the BCM control system. Most of the troubleshooting procedures only involve checking the circuits of the BCM control system one by one. Adequate knowledge of the system and basic electrical knowledge is sufficient to perform effective troubleshooting, accurate diagnosis, and necessary maintenance.

### Fault diagnosis and troubleshooting

#### a. Diagnostic basis and troubleshooting methods.

Type of program	Detailed information	Troubleshooting methods
Diagnosis based on DTC	Diagnostic procedures are based on DTC	Use the troubleshooting method to identify the faulty parts according to the DTC detection conditions. Use the tester to check the relevant parts and troubleshoot possible faults one by one.
Symptom-based diagnosis (no DTCs stored)	The diagnostic procedures are based on the symptom of the problem	Use the troubleshooting method to identify the faulty parts according to the fault symptom. Use the tester to check the relevant parts and troubleshoot possible faults one by one.

#### b. Troubleshooting steps.

Steps	Description
1	Get detailed information in the event of an electrical failure.
2	Work on the affected system and, if necessary, carry out a test drive Confirm the fault parameters.
3	Collect appropriate diagnostic data, including: <ul style="list-style-type: none"> <li>• Electrical Circuit Diagram</li> <li>• Schematic diagram of system</li> <li>• The corresponding sections of the service manual include diagnostics made based on the knowledge of system operation and customer feedback.</li> </ul>
4	Check the system for adhesion, loose connectors, or damaged wiring harnesses. Determine the relevant circuit and components, and diagnose according to the circuit diagram and harness layout diagram.
5	Repair the circuit and replace the parts as necessary.
6	Operate the system in various modes. Verify that the system is working properly under all conditions. During the diagnosis or maintenance procedure, ensure that no other new faults are inadvertently caused.

### Circuit simulation test

Unscheduled faults and other faults that cannot be detected by a test drive can be detected by circuit simulation testing. Simulating the conditions/environment when the fault occurs can effectively determine the possible vehicle fault.

The simulation test is classified into the following 7 categories:

- Vibration testing of vehicles.
- Heat sensitive testing.
- Frozen test.
- Leakage testing.
- Load testing.
- Pressure drop test.

**Note:**

It is very important to listen carefully to the customer's description of the fault to simulate the conditions when the symptom occurs.

**Vehicle vibration test**

The vehicle may break down when driving on uneven roads. In this case, check the conditions related to vibration. Check the following parts of the vehicle:


- a. Connectors and wiring harnesses.
  - Check which connectors and wiring harnesses may affect the electrical system that is being inspected. While monitoring the system for the malfunction that is being simulated, gently vibrate or wiggle each connector and the harness. This test may reveal loose or poor electrical connection.

**Note:**

- When a connector is exposed to moisture, a corrosive film may form on its terminals. This condition may not be found by visual inspection when the connector is not disconnected. If the intermittent fault occurs, it may be caused by corrosion. It is recommended to inspect and clean the terminals of the system-related connectors after disconnecting the connectors.
- b. Transducers and relays.
    - Gently vibrate sensors and relays in the system under inspection. This test may find sensors or relays that are loose or that are not installed properly.
  - c. Rear of dashboard.
    - Improperly clamped harnesses can cause the harnesses to twist together when installing accessories. Vehicle vibration can cause excessive wrapping of the wiring harness near the bracket or mounting screws.
    - When the vehicle vibrates, the unclamped or loose wire harnesses will be caught by the seat parts (such as the sliding guide rail), If the wire harness passes under the installation area, checking whether the wire harness is damaged or seized.

**Thermal sensitivity test**

Users may be concerned about the condition of the vehicle in hot weather or after a short period of parking. In this case, a heat sensitivity test is required. Use a heat gun or similar tool to heat the parts for testing.

 **Caution**

- Do not heat parts to temperatures above 60°C (140°F).
- If a failure occurs during the heat test of a component, replace it if necessary or properly insulate it.

**Freezing test**

If the failure of the vehicle disappears after the end of winter, the cause may be related to the freezing of some parts of the wire harness/electrical system. Check this situation in the following two ways:

1. Leave the vehicle outdoors overnight. Make sure that the temperature is low enough to reproduce the problem. Carry out quick and thorough diagnosis of potentially affected parts in the morning.
2. Place the suspect part in the refrigerator and wait until it freezes up. Reinstall the component to the vehicle and check if the problem reoccurs. If the problem occurs, repair or replace the parts.

**Leakage test**

- Failure may occur only in high humidity or rain or snow. At this point, the problem may be caused by water entering the electrical parts. Leaks can be checked by spraying water on the vehicle (similar to a car wash).

**Load test**

The fault occurs only when the electrical equipment is turned on. Turn on the electrical equipment

(including air conditioner, defroster, radio, fog lamp, etc.) one by one and determine the relationship between the electrical equipment and the fault. The fault is determined by load testing.

### **Depressurization test**

- A voltage drop test is often used to find out what may be affecting the proper operation of electrical components or circuits.
- Use the digital multimeter to check the circuit.
- If the resistance of a single wire harness is very low ( $0\ \Omega$  or close to  $0\ \Omega$ ) as measured by the digital multimeter, the harness or the circuit is OK.
- Unwanted resistance in a circuit can be caused by a poor ground, loose connections, corroded switch contacts, a loose harness connector or adapter.

### **Precautions for inspecting control modules and electrical components**

- Before electrical operation, switch the start button to STOP, disconnect the negative battery cable, and wait for 2 minutes to allow the standby power supply of the airbag module to run out (if equipped with an airbag module).
- Disconnecting the battery cable will delete the clock, audio, and DTC records. Therefore, these records must be verified prior to disconnecting the cable.
- Do not connect the reverse battery terminal electrode.
- Only install parts that meet the vehicle specifications.

Before replacing the control module, check the input and output of the parts and the function of the parts

- When disconnecting a component:
  - Do not use excessive force when disconnecting the connector.
  - If the connector is installed through the fastening bolt, loosen the mounting bolt and disconnect the connector by hand.
- When connecting the parts:
  - Before installing the connector, make sure that the terminals are not bent or damaged, and then connect them correctly.
  - When installing the connector by tightening the bolts, tighten the mounting bolts until the painted parts of the connector are flush with the surface.
- Do not drop or strike the control module to avoid excessive shock.
- Take care to avoid condensation on the control module due to rapid temperature changes, and avoid water droplets or raindrops. If moisture is found on the control module, dry it completely before installing it on the vehicle.
- Be careful not to get the fluid on the control module connector.
- Avoid using volatile fluids to clean the control module.
- When using the digital multimeter, be careful not to allow the test probes to touch each other and cause a short circuit. Avoid damage to battery due to short circuit of power transistor in control module.

### **Check the fuse.**

- Check and confirm that the fuse wire is not disconnected.
- If the fuse wire is disconnected, verify that the circuit is not short-circuited.
- When replacing a fuse, be sure to use a fuse with the same amperage.

### **How to check the connector**

- Check that many electrical faults are caused by faulty electrical connections or harnesses, and may also be caused by sticking components or relay. Check that the connectors are properly connected before determining whether the fault is caused by a component or harness assembly.

### **Check the connector with the digital multimeter**

- Connector damage and poor connections are caused by not properly probing the connector during circuit inspection.
- The probe of the digital multimeter may not be properly connected to the connector socket. Properly probe a connector, use a "T" pin and follow the procedure below. For the best connection, hold the "T" pin with a spring clip.
  - a. Probe from the harness side:
    - If the connector has a rear cover, remove the rear cover before probing the terminal.

- 
- Unscrew the fixing bolt as shown by the arrow, and take out the water outlet hose 1. Failure to do so may damage the seal between the harness and the connector.
  - b. Probing from the terminal side:
    - Female terminal: Do not insert any object larger than the male terminal into the cathode connector.
    - Male terminal: Use a "T"-shaped pin to carefully probe the contact surface of each terminal. Do not bend the terminals.

**Check if the tension of the terminal contact spring is appropriate**

- Contact tabs at a terminal may produce an intermittent signal in the circuit.
- If an intermittent open circuit occurs, follow these steps to check for contact tabs at the disconnected wiring harness and female terminal.
  - Use the male terminal that matches the female terminal.
  - Disconnect the suspected faulty connector and fix the terminal side upwards.
  - When fixing the harness of the male terminal, try to insert the male terminal into the female terminal.
  - Move the connector and check if the male terminal can be inserted easily.

**Note:**

If the male terminal is easily inserted into the female terminal, replace the female terminal.





## Maintenance

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## Maintenance items

### Maintenance schedule


The first maintenance happens at 3 months or 3,000 km (1,860 miles) (whichever comes first) and the regular maintenance interval is 6 months or 5,000 km (3,100 miles) (Whichever comes first), please go to the Avantier NEV special service station for maintenance according to the specified mileage (remarks: ★ Inspection/maintenance items under each maintenance mileage).

Working procedure	Maintenance items	Technical standards	Mileage		
			Every 5,000 km (3,100 miles)	Every 10,000 km (6,200 miles)	Every 15,000 km (9,300 miles)
1	Check the appearance of the vehicle and record the mileage in detail		★	★	★
2	Check the low beam.	Lights are normal.	★	★	★
3	Check the high beam.	Lights are normal.	★	★	★
4	Check the front left turn signal lamp.	Lights are normal.	★	★	★
5	Check the right front turn signal lamp	Lights are normal.	★	★	★
6	Checking the front position lamp	Lights are normal.	★	★	★
7	Check the cornering lamp/daytime running lamp	Lights are normal.	★	★	★
8	Check the loudspeaker	The loudspeaker sound is normal	★	★	★
9	Check the brake lamp	Lights are normal.	★	★	★
10	Check the left rear turn signal lamp.	Lights are normal.	★	★	★
11	Check the right rear turn signal lamp.	Lights are normal.	★	★	★
12	Checking the rear position lamp	Lights are normal.	★	★	★
13	Check the reversing lamp	Lights are normal.	★	★	★
14	Check the rear fog lamp	Lights are normal.	★	★	★
15	Check the license plate lamp	Lights are normal.	★	★	★
16	Check the steering wheel	The steering wheel free travel and height adjustment are normal	★	★	★
17	Check the A/C button.	The keys are flexible	★	★	★
18	Check the status of the air outlet	The air outlet is in good condition, and the cold and hot conversion is normal		★	★
19	Check all indicators of the instrument.	Instructions are correct and intact	★	★	★
20	Check the parking switch	Instructions are correct and intact	★	★	★
21	Check the shift handle maneuverability	Gearshift is OK	★	★	★
22	Check the brake pedal and accelerator pedal	The pedal is normal	★	★	★
23	Check the wiper blades and the nozzle	It works normally, without abnormal noise		★	★
24	Check the dashboard each key.	The button returns normally, and the light display is normal		★	★


Maintenance

25	Check the sound system and loudspeaker	The function is normal		★	★
26	Check the dome light	The button returns normally, and the light display is normal		★	★
27	Check the central control door lock	Central control is normal	★	★	★
28	Check the electric window regulator of each door.	The button is normal, and the window rises and falls		★	★
29	Check the sunvisor	The function is normal		★	★
30	Check the glove box	The function is normal		★	★
31	Check the driver's seat and seat belt, door switch and door hinge	Open normally, without abnormal noise	★	★	★
32	Check the front passenger seat and seat belt, door switch and door hinge	Open normally, without abnormal noise		★	★
33	Check the rear door window regulator switch, door switch and door hinge	Open normally, without abnormal noise		★	★
34	Check rear seat and seat belts.	Open normally, without abnormal noise		★	★
35	Check the liftgate lock hinge and on-board tools	Open normally, without abnormal noise	★	★	★
36	Check the voltage of low-voltage battery and connecting wire	The voltage is normal, without corrosion, and the wiring is in good condition	★	★	★
37	Check that the on-board charger works normally.	Check whether it operates properly	★	★	★
38	Cleaning and maintenance of cooling system fan	Open normally, without abnormal noise	★	★	★
39	Check the windshield washer fluid	Supplement it as necessary		★	★
40	Check and measure the coolant	Measure the freezing point in winter, and replenish or replace it if necessary	★	★	★
41	Check the retarder oil.	Replenish or replace it as necessary	★	★	★
42	Check the brake fluid level.	Replenish or replace it as necessary	★	★	★
43	Check the A/C pipeline.	If there is any leakage	★	★	★
44	Check the cooling pipeline	If there is any leakage	★	★	★
45	Check the shock absorber	Whether there is oil leakage or failure		★	★
46	Check the brake lining	Whether the wear is normal		★	★
47	Check the torque of the chassis bolts	Tighten the connecting bolts		★	★
48	Check the tire pressure, appearance, and tread pattern depth	Whether it is damaged or not	★	★	★

49	Tire transposition			★	
50	Tighten the tire nuts	Whether there is any looseness	★	★	★
51	Check the chassis-related pipelines for oil leakage	No leakage	★	★	★
52	Check the drive shaft and steering pull rod	Whether there is any looseness	★	★	★
53	Check the drive shaft universal joint sheath	Whether it is damaged or not	★	★	★
54	Check the steering tie rod universal joint assembly protective sleeve.	Whether it is damaged or not	★	★	★
55	Check the steering knuckle ball joint protective sleeve and clearance	Check whether the sheath is damaged, whether the clearance is normal, and whether there is oil leakage	★	★	★
56	Check the appearance of the power battery housing and connector	Whether there is any bump mark, deformation and crack	★	★	★
57	Check the fixing of MCU and DCDC.	Whether there is any looseness	★	★	★
58	Check all high-voltage connectors	Whether it is plugged tightly	★	★	★
59	Check the electric power steering.	Check whether it operates properly	★	★	★
60	Check the electronic water pump.	Check whether it operates properly	★	★	★
61	Check the vacuum pump.	Whether there is oil leakage or abnormal noise	★	★	★
62	Check the speed reducer	Check whether there is oil leakage on the joint surface with the drive motor assembly.	★	★	★

 **Caution**

- If the power battery shell and connector are seriously deformed or cracked during inspection, immediately notify the professional and technical personnel of Ruiteng New Energy to unpack and check.
- If there is any damage to the parts during inspection, please notify the customer in time for repair and replacement.
- Replace the brake fluid and coolant (including the drive motor cooling system and the power battery cooling system) every 2 years or 40,000 km (24,800 miles).
- Replace the transmission oil every 1 year or 10,000 km (6,200 miles).
- It is recommended that the customer check and adjust the four-wheel alignment at the first maintenance, and then check and adjust it every 20,000 km (12,400 miles).

 **Warning**

- Only use the fluid recommended by the CENNTRO, using other fluids may damage relevant systems of the vehicle.

## **Inspection items**

### **Exterior inspection**

#### **Wiper and washer**

1. Check whether the wiper blade is deformed.
2. Check whether the wiper nozzle sprays water.

#### **Tire pressure**

1. Check if the tire pressure is normal (including the spare tire).

#### **Tire bolt**

1. Check the torque of tire bolts.
2. Check whether the tire bolts are loose or missing.

### **Interior inspection**

#### **Loudspeaker**

1. Check whether the loudspeaker sounds normally.

#### **Vehicle lights**

1. Check whether the headlamp (low beam/high beam), turn signal lamp, daytime running lamp, position lamp, brake lamp and reversing lamp are lit normally.
2. Check whether the brightness of headlamps (low beam/high beam), turn signal lamp, daytime running lamp, position lamp, brake lamp and reversing lamp are normal;

#### **Seat**

1. When the seat belt is stationary, pull out the seat belt repeatedly and quickly.

#### **Seat belt**

1. When the seat belt is stationary, pull out the seat belt repeatedly and quickly. If the buckle fails to lock the seat belt at once, replace the seat belt assembly.
2. Engage the seat belt buckle tab, and manually pull the seat belt repeatedly to check the engagement of the buckle tab. If the buckle fails to lock the seat belt at once, replace the seat belt assembly.

#### **Note:**

When inspecting a vehicle that has been involved in a collision, always check the seat belts.

3. If the seat belt is cracked, torn or worn, replace the seat belt assembly.

#### **Windshield**

1. Check the windshield for abnormalities such as scratches, dents or cracks, and if any, replace the windshield.

#### **Brake pedal**

1. Check whether the free stroke of the brake pedal is normal.
2. Check that when the brake pedal is stepped down, it is smooth without blockage and returns to normal.

#### **Check the accelerator pedal**

1. Check and confirm that the accelerator pedal is operating smoothly. That is, check and confirm that the pedal resistance of the pedal is uniform or the pedal does not get stuck in a specific position.

### **Engine compartment inspection**

#### **Storage battery**

1. Check whether the appearance of the battery is normal.

2. Check whether the battery voltage (without starting the vehicle) is normal.

**Windshield washer fluid**

1. Check whether the fluid level of the windshield washer fluid is normal.

**Coolant**

1. Check whether the coolant level is normal.

**Brake fluid**

1. Check whether the level of the brake fluid is normal.

**Transmission oil**

1. Check whether the oil level of the transmission oil is normal.
2. Check whether the oil quality of the transmission oil is normal (e.g. turbidity, whitening and other abnormal conditions), and replace it if not.

## **Environmental protection and health**

### **Brake fluid**

The brake fluid is corrosive, do not directly touch with hands, if the brake fluid splashed on the hands or eyes, should be immediately rinsed with water, if you feel unwell, seek medical attention immediately.

### **Coolant**

The coolant (glycol) may produce vapor when heated. Avoid inhaling this vapor. Antifreeze absorbed through the skin may reach toxic or harmful levels.

### **Lubricating oil and grease**

Avoid long-term contact with lubricating oil and grease. Lubricating oil and grease are irritating to the eyes and skin. It can cause the loss of natural oil of the skin, resulting in dryness, inflammation and dermatitis.

Safety rules for health protection:

1. Wear protective clothing, including impervious gloves.
2. Open wounds should be treated with first aid in the first place.
3. After the operation is completed, wash with soap and water. After cleaning, apply an emollient containing lanolin to replenish the natural oil lost on the skin.
4. Do not use gasoline, kerosene, diesel fuel, thinner or solvents to clean the skin.
5. If skin lesions occur, seek medical attention immediately.
6. As far as possible before the work, remove the grease on the parts.
7. When there is a possibility of contact with eyes, protective glasses, such as goggles or face shields, should be worn, and in addition, eye flushing equipment should be provided.

### **HVAC refrigerant**

HVAC refrigerant is highly combustible, so handle them away from fire sources, and skin contact may cause frostbite

Safety rules for health protection:

1. When operating, be sure to follow the instructions provided by the manufacturer, and wear appropriate protective gloves and goggle.
2. In case of skin or eye contact with refrigerant, immediately flush the affected area with water. The eyes should be flushed with an appropriate flushing solution and should not be rubbed. Seek medical assistance as needed.
3. Do not expose the refrigerant bottle to sunlight or heat sources.
4. When filling, do not put the refrigerant bottles upright and keep their valves downward.
5. Do not expose the refrigerant bottle to frost or snow.
6. Do not drop the refrigerant bottle.
7. Under no circumstances shall the refrigerant be vented to the atmosphere.
8. Do not mix different refrigerants together.



## High-voltage power system

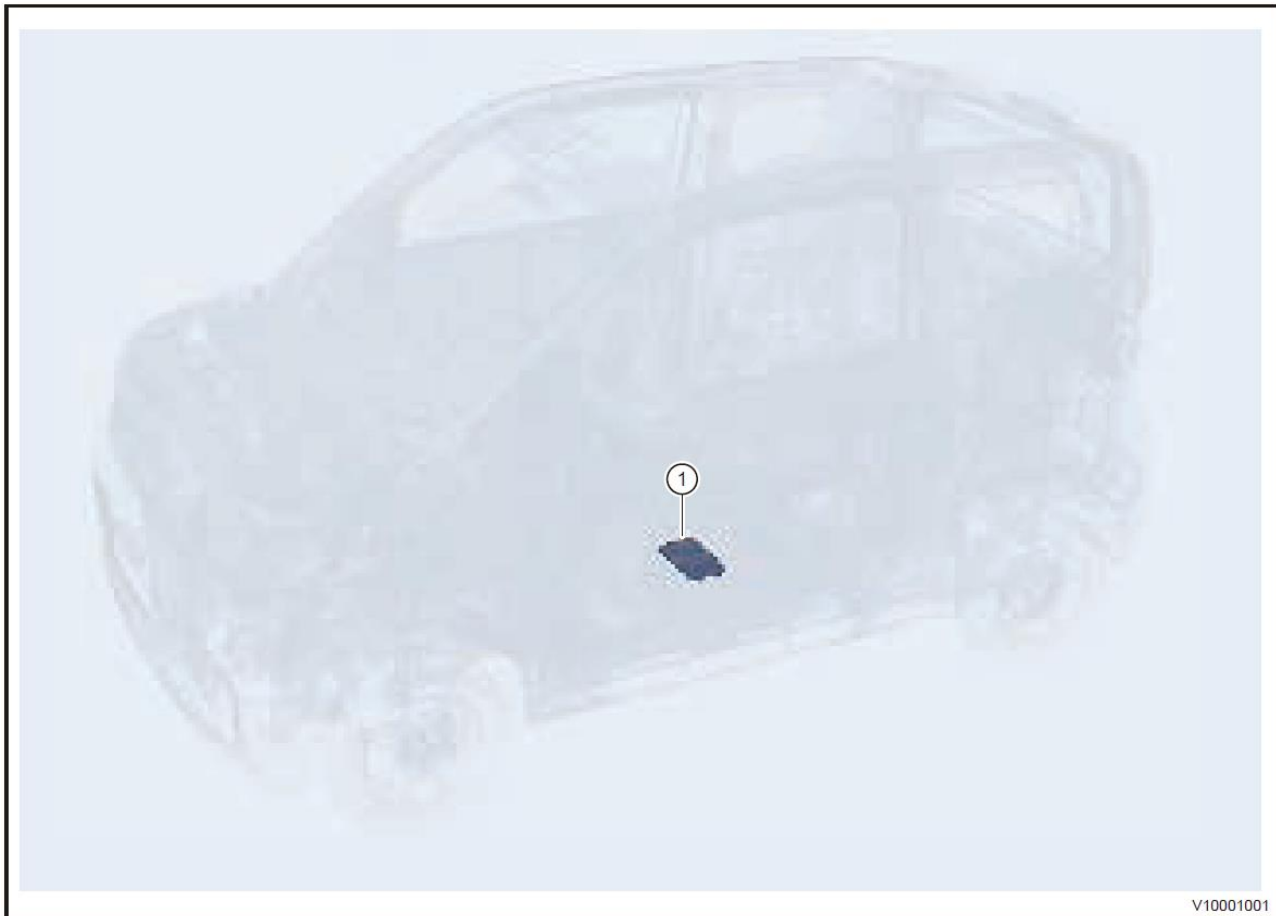
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## Vehicle Control Unit (VCU)

### General information

#### Description



1	Vehicle controller assembly	-	-
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The VCU collects analog input signals, collects digital signals, performs low-side/high-side drive control on actuators, provides power for accessory sensors, performs CAN communication with other controllers and other functions, identifies driver intention, complete vehicle power-on and power-off control, vehicle high-voltage management, vehicle mode management, charging management, energy management, component management, fault diagnosis and safe driving, etc.

#### Ignition switch functional logic

Ignition switch functional logic

The igniter is divided into four gears, namely LOCK, ACC and ON.

1. When the key is inserted into the igniter, the gear at this time is LOCK, and the vehicle is locked and the steering wheel is locked in this gear;
2. Turn the key to the right into the ACC gear, part of the power of the vehicle is switched on at this time.
3. Continue to turn the key to the right into the ON gear, all low-voltage power supplies of the vehicle are switched on at this time, and each controller of the vehicle will run the self-inspection program.
4. When the gear signal is in neutral, these two signals are trigger signals. VCU confirms that it is in the start request state at this time, and Ready is completed.
5. Turn the key to the left successively to power the vehicle off, and the key can be pulled out only when it stays in the LOCK position.

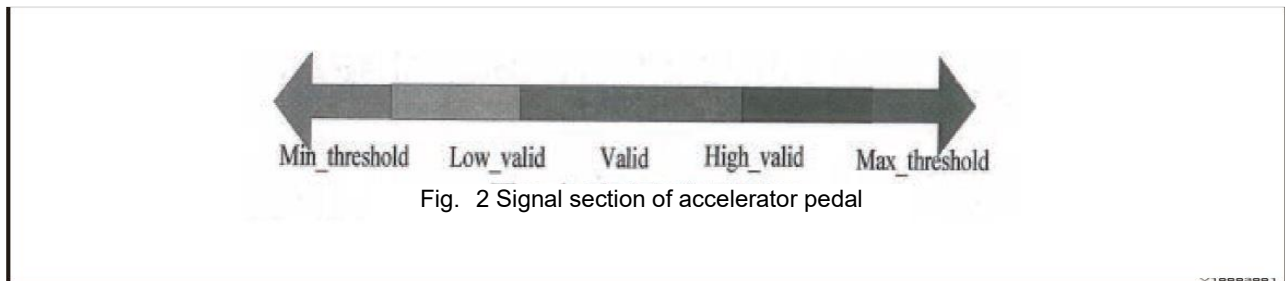
#### Gear position signal logic

In the fault-free mode, the larger the throttle opening, the larger the torque output. At the end of the throttle, the output power is the maximum peak power. The target gear is calculated according to the speed and throttle opening

1. Start conditions (shifting to D gear)
  - a. When the vehicle is in N gear, apply the brake and shift the gearshift lever to the D gear at the same time.
  - b. When the vehicle is in R gear, apply the brake and shift the gearshift lever to N gear at the same time, and then shift the gearshift handle to D gear (the vehicle speed during mode switching is  $\leq 2$  km/h (1 mph)).
2. Shift to N gear: apply the brake and shift the gearshift lever to N gear at the same time.
3. Reverse gear conditions (shifting to R gear)
  - a. When the vehicle is in N gear, apply the brake and shift the gearshift lever to R gear at the same time;
  - b. When the vehicle is in D gear, apply the brake and shift the gearshift lever to N gear at the same time, and then shift the gearshift handle to R gear (the vehicle speed during mode switching is  $\leq 2$  km/h (1 mph)).

### Accelerator pedal signaling logic

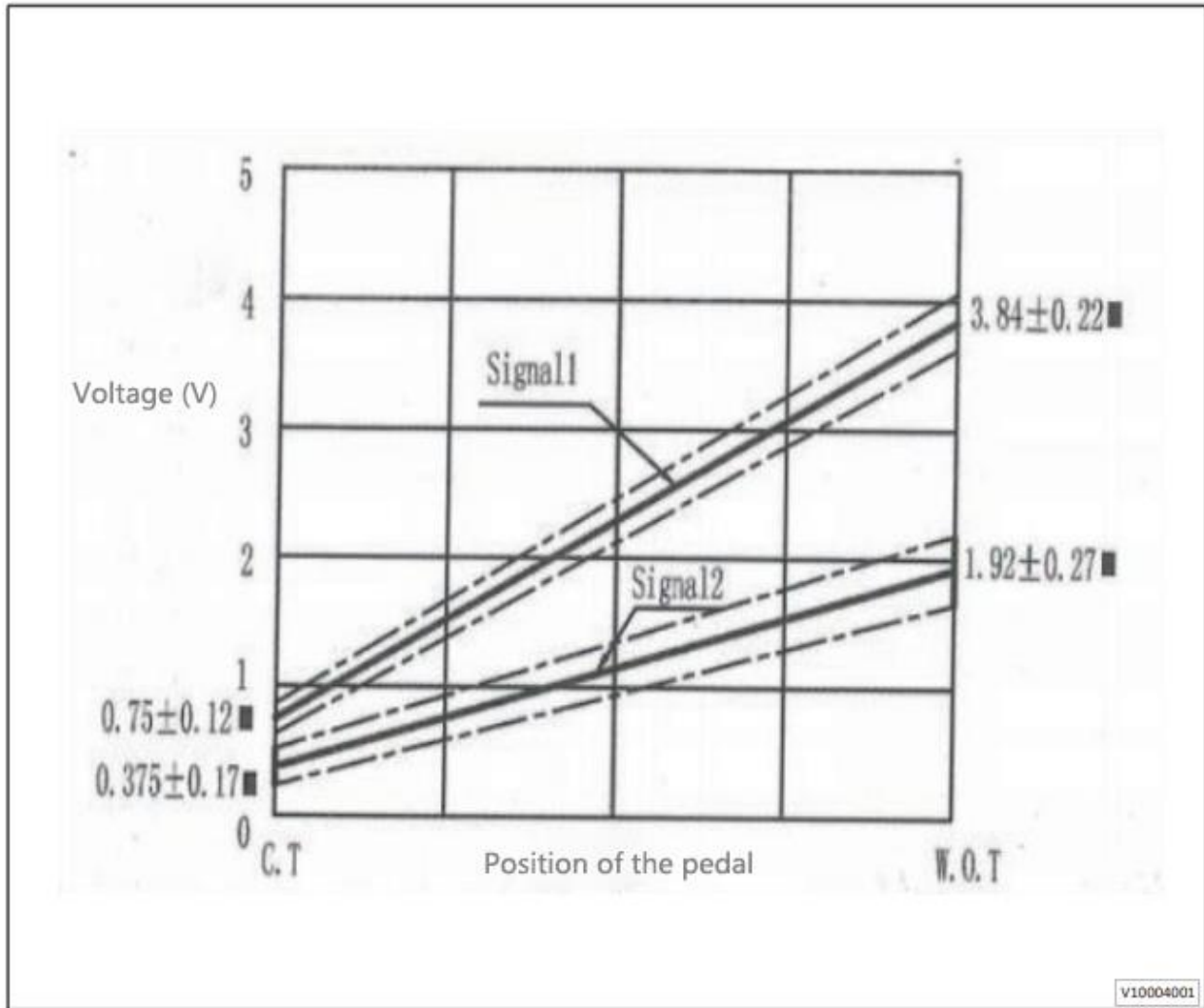
The accelerator pedal has two signals for redundancy design. thrhigh, thtlow, thrmin, and thrmax divide signal values into five ranges, in which MIN\_threshod, low\_valid, high\_valid, and max\_threshod are data thresholds.



1. The range of valid representation is the range of valid signals required for normal operation.
2. The data range between low\_valid and MIN\_threshod is the value higher than the rms value that can be measured by the sensor but has no actual physical meaning.
3. The data range between high\_valid and max\_thresho is the value higher than the rms value that the sensor can measure but has no actual physical significance.

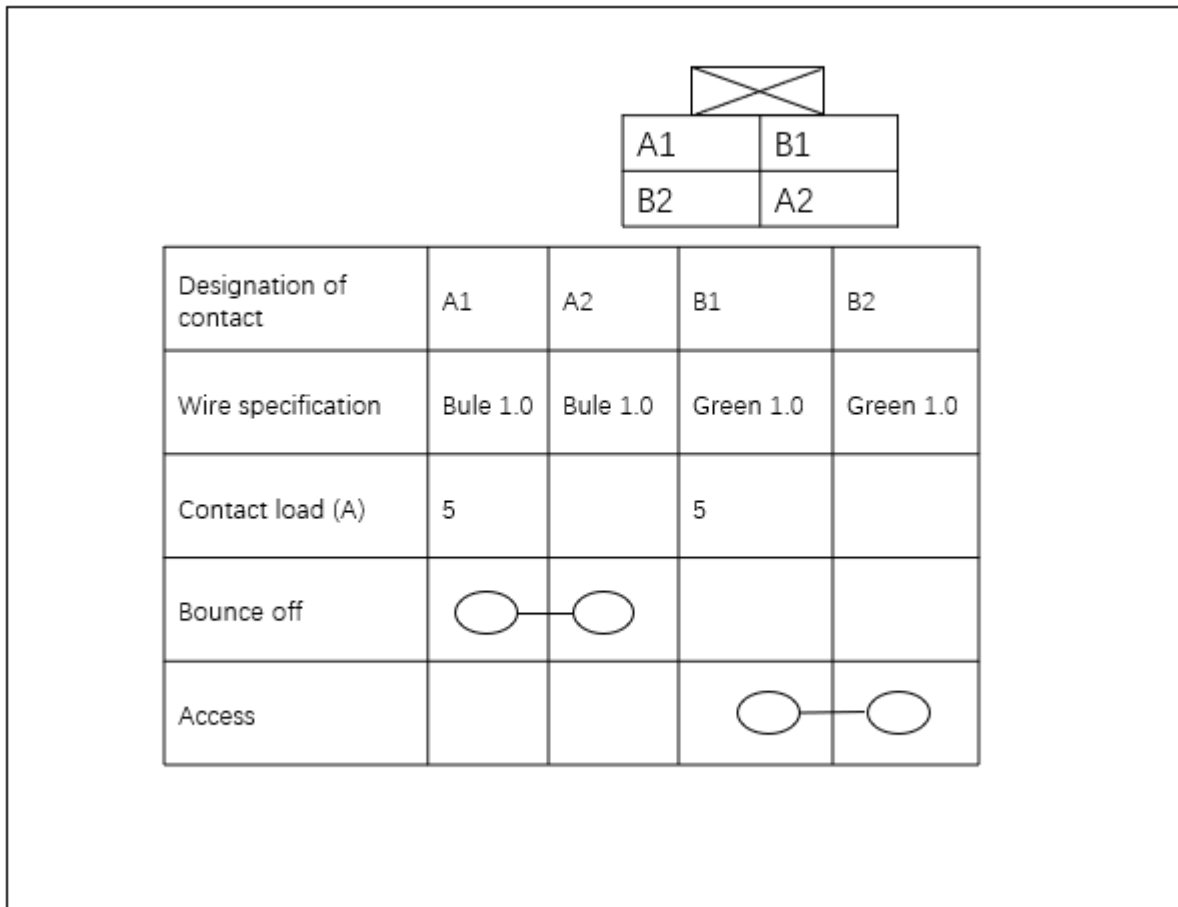
For example, when the absolute value of the synchronization difference between accelerator pedal 1 and accelerator pedal sensor 2 ( $S1/2 - S2$ ) is greater than or equal to 0.07 V. It is judged to be the synchronization fault of the accelerator pedal. When the synchronization difference is less than 0.07V, clear the fault code.

The electric signal curve of the accelerator pedal is shown in the figure below



**Brake pedal signal control strategy**

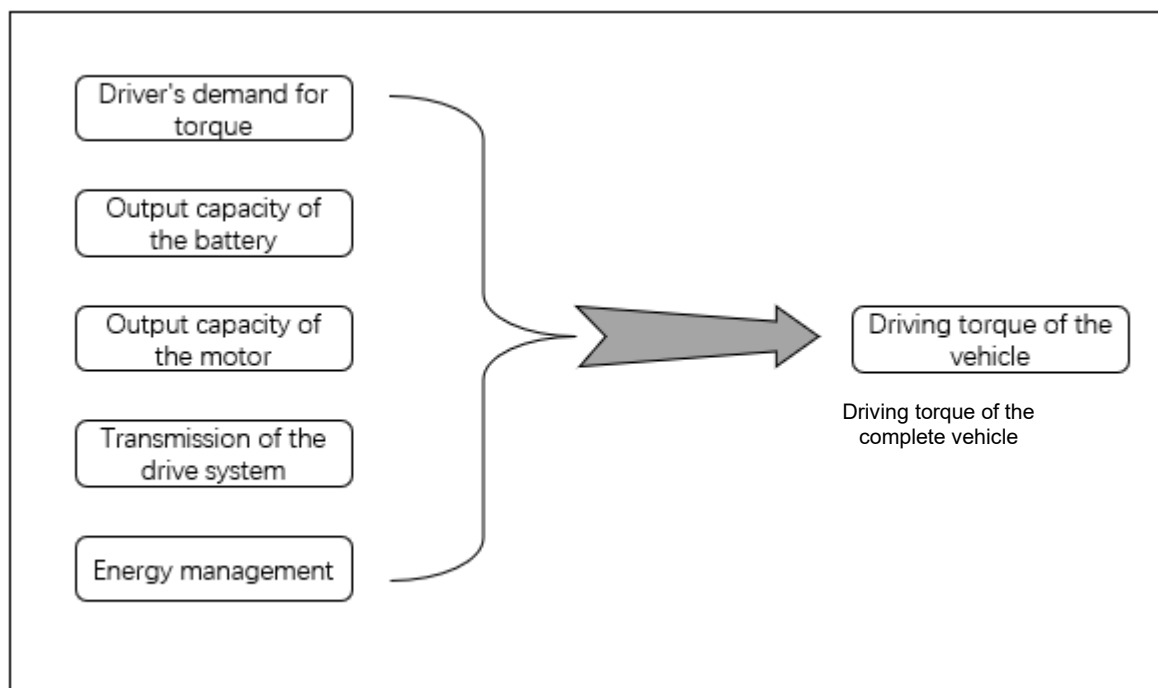
When the pedal is depressed, A1 and A2 are connected, and B1 and B2 are disconnected; When the pedal is not depressed, A1 and A2 are disconnected, and B1 and B2 are connected.



**Strategy of torque control**

The vehicle torque demand management integrates the driver's demand for the vehicle torque through the accelerator pedal and brake pedal, combines the output capacity of the battery and the output capacity transmitted to the system, and obtains the required torque of the vehicle after comprehensive calculation. The content mainly includes the following parts: calculation of driver torque capacity, calculation of battery output power, calculation of transmission system boundary capacity and other constraint boundary calculation. The torque control modes include forward driving mode and regenerative braking mode

reverse drive mode, and zero torque mode.



### Braking energy recovery

If the vehicle speed reaches the specified speed during driving, when the accelerator pedal is released or the brake pedal is depressed, the VCU recovers energy according to the state of the vehicle (the two is in parallel). During coasting energy recovery, release the accelerator pedal and VCU judges the energy recovery condition to give a negative torque for coasting energy recovery or depress the brake pedal. When the brake signal is valid and the opening of the accelerator pedal is 0, VCU judges the Energy Recovery Condition and braking energy recovery in combination with the maximum allowable electric power of the battery and the maximum torque of the motor at this time. If the ABS is triggered, the energy recovery will be deactivated and the emergency braking will be given priority.

### Specification

Technical parameters

Name	Parameter
Nominal voltage	12 V
Range of normal operating voltage	9~16 V
Operating temperature	-40~+85° C(-40~+185°F)
Storage temperature	-40~+105° C(-40~+221°F)
Degree of protection provided by the enclosure	IP67
Quiescent current	<1 mA

**Diagnosis and testing****Fault (DTC) table**

<b>DTC code</b>	<b>Name of fault code</b>
P1E0116	Battery voltage below lower limit
P1E0117	Battery voltage above upper limit
P1E0616	Accelerator pedal 1 power supply voltage lower than the normal range
P1E0617	Accelerator pedal 1 power supply voltage higher than the normal range
P1E0716	Accelerator pedal 2 power supply voltage lower than the normal range
P1E0717	Accelerator pedal 2 power supply voltage higher than the normal range
P1E0821	Accelerator pedal 1 opening input lower than the minimum value
P1E0822	Accelerator pedal 1 opening input higher than the maximum value.
P1E0921	Accelerator pedal 2 opening input lower than the minimum value
P1E0922	Accelerator pedal 2 opening input higher than the maximum
P1E1A28	Opening difference between accelerator pedal 1 and 2 too large
P1E1F16	Pressure sensor 5 V power supply voltage is below the normal range
P1E1F17	Pressure sensor 5 V power supply voltage is higher than the normal range
P1E2992	Failure of vacuum pump system
P1E2021	Pressure sensor signal lower than the minimum value
P1E2022	Pressure sensor signal is higher than the maximum value
B302B71	MCU hard-wire wake-up drive feedback fault
B301171	DCDC hard-wire wake-up drive feedback fault
B301371	Fault of PTC glow plug relay drive feedback (PTC1)
B301671	Low-voltage main relay drive feedback fault
B302A71	Fan relay drive fault (high speed, low speed)
P1E1031	Failure of shifter
P1C2486	Brake failure two-way brake switch failure
P1E1063	Timeout of pre-charging relay closure
P1E1163	Timeout of main positive relay closure
P1E1263	MCU status jump timeout
P1E1363	Fast restart timeout
P1E1463	Busbar overcurrent timeout
P1E1563	Main positive relay disconnect timeout



DTC code	Name of fault code
P1E1663	MCU discharge timeout
P1E2A94	Collision fault

DTC code	Name of fault code
P1E2B00	Out-of-package high voltage loop interlock fault
U007388	VCU judges the CAN bus off.
U029287	The VCU judges communication failure with MCU
U011187	The VCU judges that the communication with BMS is lost
U012187	The VCU judges that the communication with ABS is lost
U029887	The VCU judges that communication with DCDC is lost
U051086	Invalid vehicle speed signal
U019887	The VCU judges that the communication with TBOX is lost
U031887	Loss of communication with ICM
U016487	VCU judges that the communication with EAC is lost
U029087	The VCU judges that the communication with the OBC is lost
U014087	The VCU judges that the communication with BCM is lost
U016887	The VCU judges that the communication with ABM is lost
P1C2586	Fault of single brake switch

## On-board maintenance

### Vehicle control unit assembly

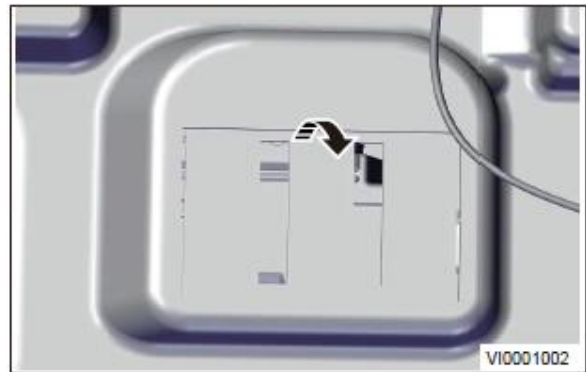
#### Removal

##### Warning

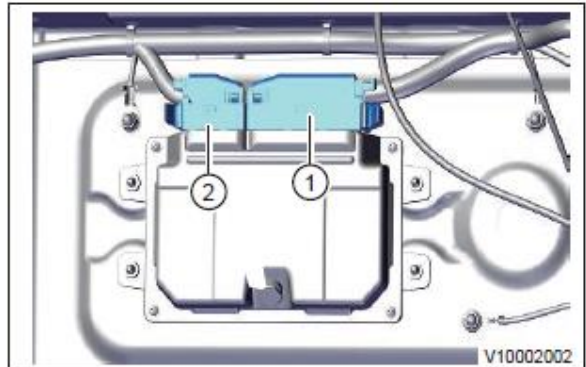
- When removing the vehicle controller assembly, be sure to wear the labour protection articles to avoid accidents.
- When removing the vehicle control unit assembly, pay attention to using the appropriate force and be careful when operating.
- When removing the VCU assembly, avoid scratching the interiors.

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Move the driver's seat to the frontmost position.
4. Remove the vehicle controller assembly.

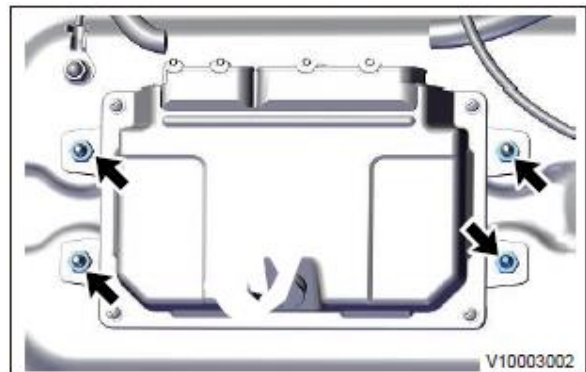
- a. Lift the front floor carpet assembly service cover in the direction of the arrow.



- b. Disconnect the connector (1) of the vehicle controller assembly.



- c. Remove 4 fixing bolts (as shown by the arrow) from the vehicle controller assembly. Tightening torque:  $10 \pm 1\text{N}\cdot\text{m}$  ( $7 \pm 0.7\text{ ft}\cdot\text{lbs.}$ )



- d. Remove the VCU.

### Installation

1. The installation sequence is reverse to the removal.

## High-voltage power system

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## Conversion & Distribution Unit (CDU)

### General information

#### Description



S10001001

1	Conversion & Distribution Unit (CDU) assembly
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Its main function is to control the power battery to charge the low voltage 12 V battery during driving, so as to ensure that the low voltage electrical equipment can work normally during normal driving. At the same time, it can also realize the feedback of its own state and load state.

Description of functions

Charging DC CDU assembly:

#### OBC part

1. The electric energy of the public grid is converted to the DC power required by the on-board energy storing device to charge the on-board energy storing device.
2. Be able to rely on data provided by the Battery Management System (BMS). Dynamic adjustment of charging current or voltage parameters achieve constant voltage, constant current and constant power charging modes.

#### Functional requirements:

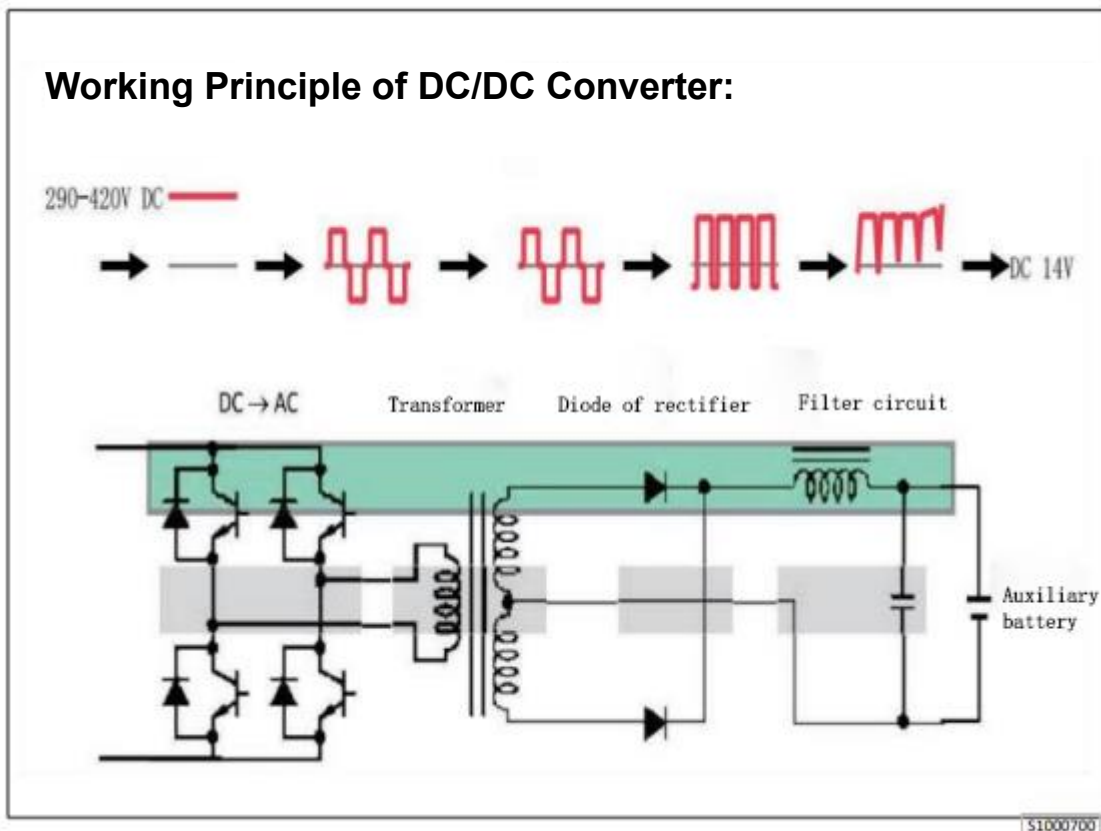
The charger is 2 KW, with complete safety measures; Input over-and-undervoltage protection function, output over-and-undervoltage protection function, output China VI/short circuit protection function, missing item protection, output anti-reverse connection function, over-temperature protection, input and output terminal interlock function, power-off protection function.

#### DC/DC part

1. Convert the power battery high-voltage direct current to the voltage required by the low-voltage electrical equipment in the vehicle (such as instruments and lights), and charge the low-voltage energy storage battery.
2. According to the data provided by the power battery management system and the vehicle controller,

the output voltage or output current parameters can be dynamically adjusted within a certain range.

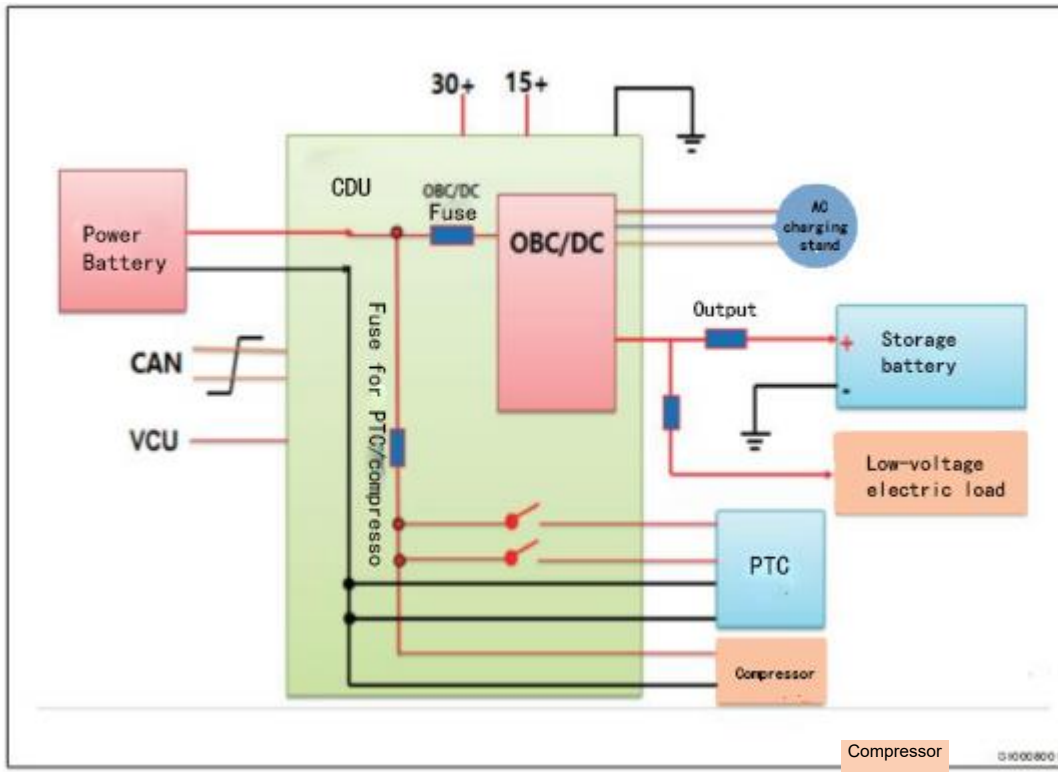
### Schematic diagram



### PDU part

1. Distribute the power battery high voltage DC to the compressor, PTC power supply, and protect it by fuse.

**Schematic diagram of CDU assembly**



**Specification**

**CDU assembly**

Item	Type and parameters	Unit
Quiescent current	<1	mA
Insulation resistance	≥20	MΩ
Protection rating	IP67	

**Tools**

**General tools**

Tool name	Illustration
Multimeter	<p>RCH001002</p>
Diagnostic scan tool	<p>001</p>

**Definitions of terminals**

**AC input Interface terminals**



Terminal No.	Definitions of terminals
1	Live line
2	Ground wire
3	Zero line
4	High-voltage interlock input
5	High voltage interlock output



## Power battery interface terminal



S10003001

Terminal No.	Definitions of terminals
1	High-voltage positive
2	High-voltage negative
3	High-voltage interlock input
4	High voltage interlock output

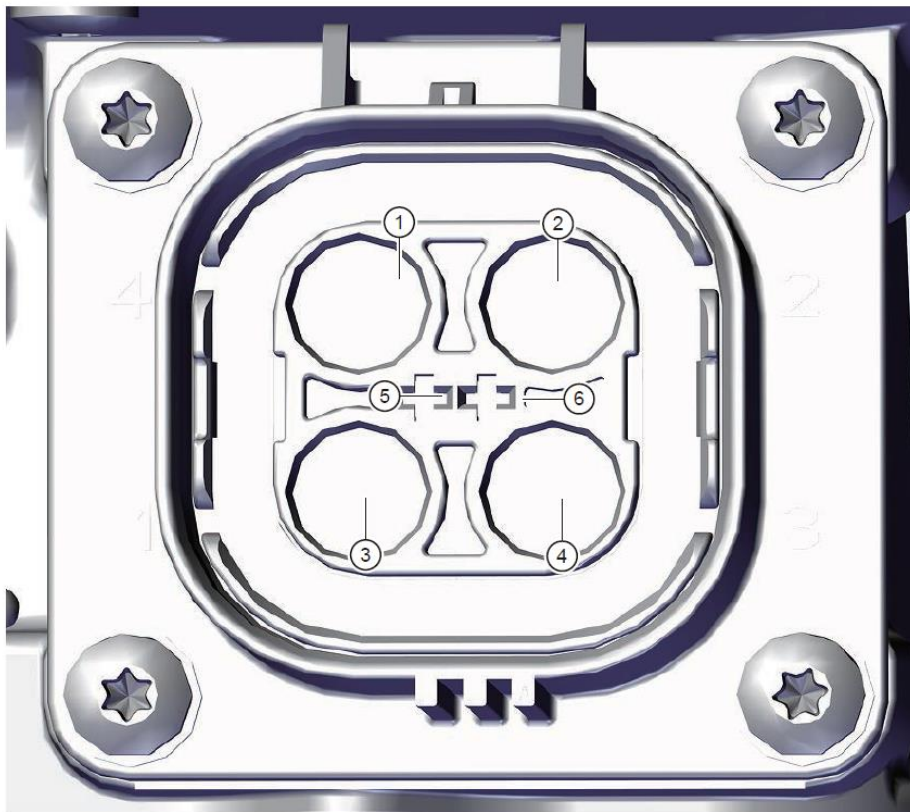
**Compressor interface terminal**



S10004001

Terminal No.	Definitions of terminals
1	Compressor +
2	Compressor -
3	High-voltage interlock input
4	High voltage interlock output

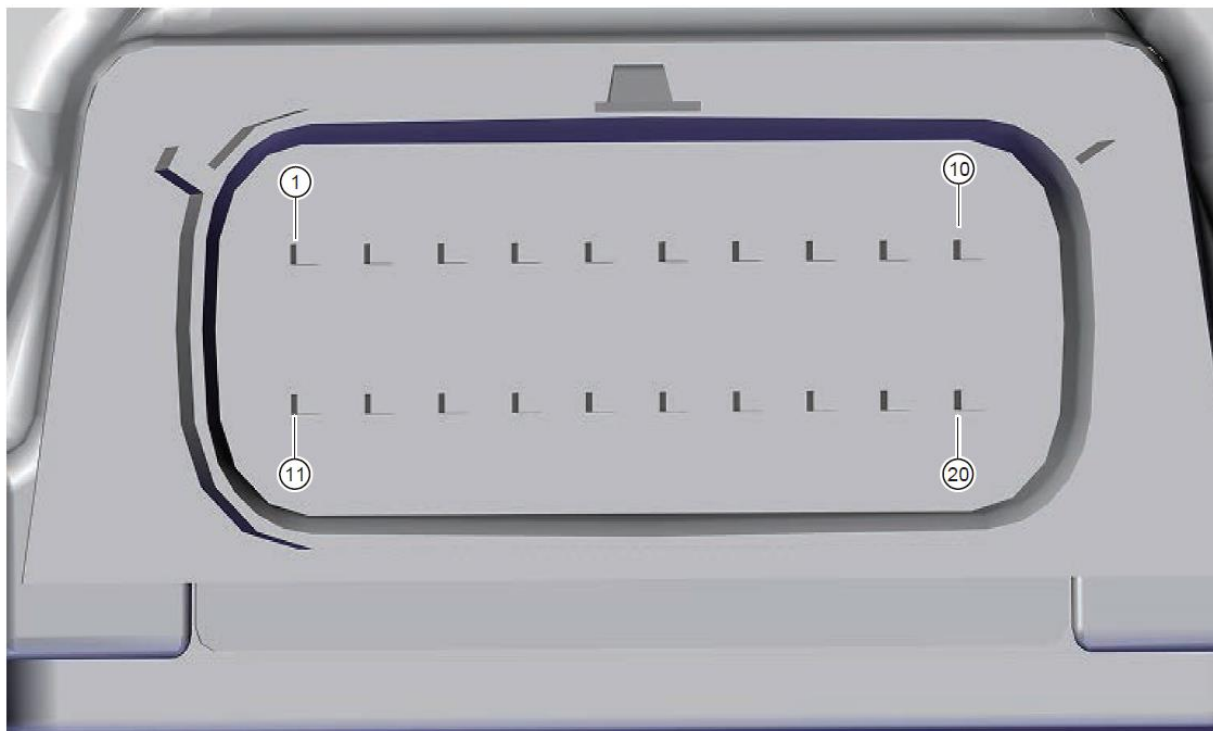
## PTC interface terminal



S10005001

Terminal No.	Definitions of terminals
1	PTC1 power supply negative
2	PTC1 power supply positive
3	PTC2 power supply negative
4	PTC2 power supply positive
5	High-voltage interlock input
6	High voltage interlock output

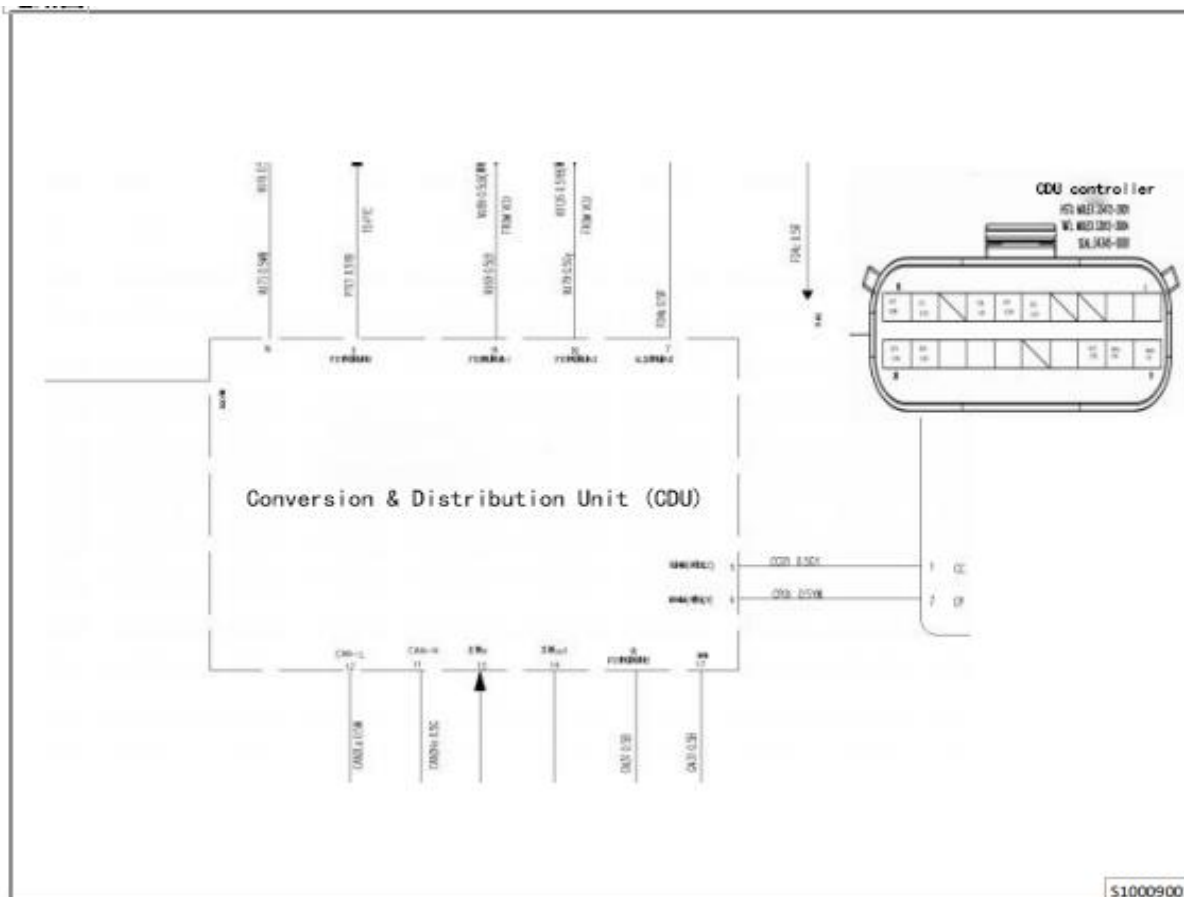
**Low-voltage interface terminal**



S10006001

Terminal No.	Definitions of terminals	Terminal No.	Definitions of terminals
1	/	11	PTC1 relay control negative
2	/	12	PTC2 relay control negative
3	/	13	PTC2 relay control positive
4	/	14	/
5	/	15	/
6	/	16	/
7	CAN_H	17	/
8	CAN_L	18	/
9	Interlocked entry	19	/
10	Interlocked out	20	/

**Electric circuit diagram**



**Diagnosis and testing**

**Fault (DTC) table**

DTC code	Name of fault code
U013100	BMS message receiving timeout
P148117	Charger AC input overvoltage
P148116	AC input under-voltage of charger
P148217	DC output over-voltage of charger
P148216	DC output undervoltage of the charger
P148219	DC output over-current fault of charger
P14024B	Charger over-temperature shutdown protection
P170217	DCDC input overvoltage fault at high-voltage side
P170216	DCDC input undervoltage fault at high-voltage side
P170117	DCDC output overvoltage fault at low-voltage output side
P170116	DCDC output undervoltage fault at low-voltage output side

DTC code	Name of fault code
P178619	DCDC output short circuit fault at low-voltage output side
P178713	DCDC low-voltage output side hardware open circuited
P178819	DC/DC output over-current
P17834B	DCDC over-temperature shutdown protection
P148900	OBC hardware failure
P178900	DCDC hardware failure
U012200	DCDC message lost fault

**On-board maintenance**

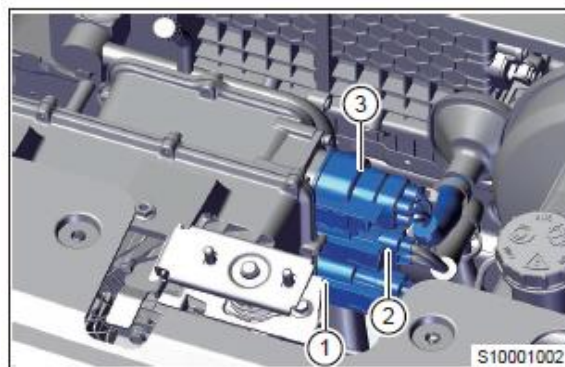
**Power supply CDU control**

**⚠ Warning**

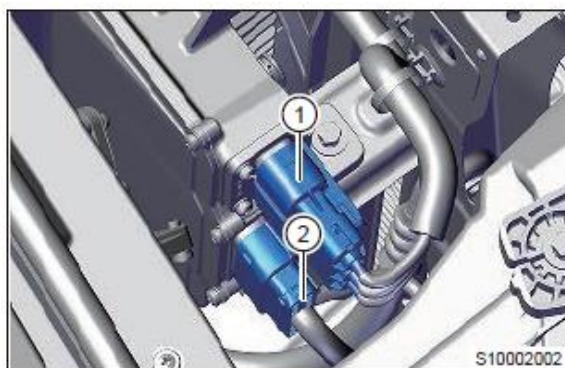
- For Avantier vehicle maintenance personnel, they must receive professional training, be familiar with electrical safety knowledge and electric shock first aid methods, and have a high degree of safety awareness.
- When the vehicle is powered on, the high-voltage power supply of the vehicle will be cut off, and the high-voltage battery will be damaged.
- Strictly abide by the relevant national laws and regulations on high voltage system operation.
- Check and repair the vehicle in strict accordance with CENNTRO's relevant maintenance standards, and set up relevant warning signs.

**Removal**

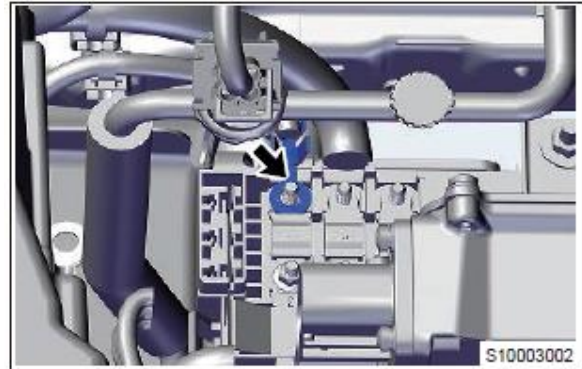
- Turn off all electrical equipment and the start button.
- Open the engine hood.
- Disconnect the negative cable of battery.
- Remove the CDU assembly.
  - Disconnect the power battery, compressor and PTC connector (1) (2) (3).



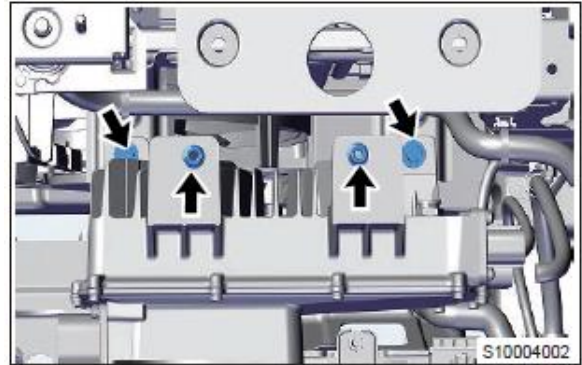
- Disconnect the AC and low-voltage plug-in connector (1) and (2).



- c. Loosen one fixing bolt (as shown by the arrow) connecting the DC output to the 12 V battery positive wire.



- d. Remove the four bolts (arrows) fixing the CDU assembly.



- e. Remove the CDU assembly and ground wire of the body system.  
f. Remove the CDU assembly.

### Installation

1. The installation sequence is reverse to the removal.





# High-voltage power system

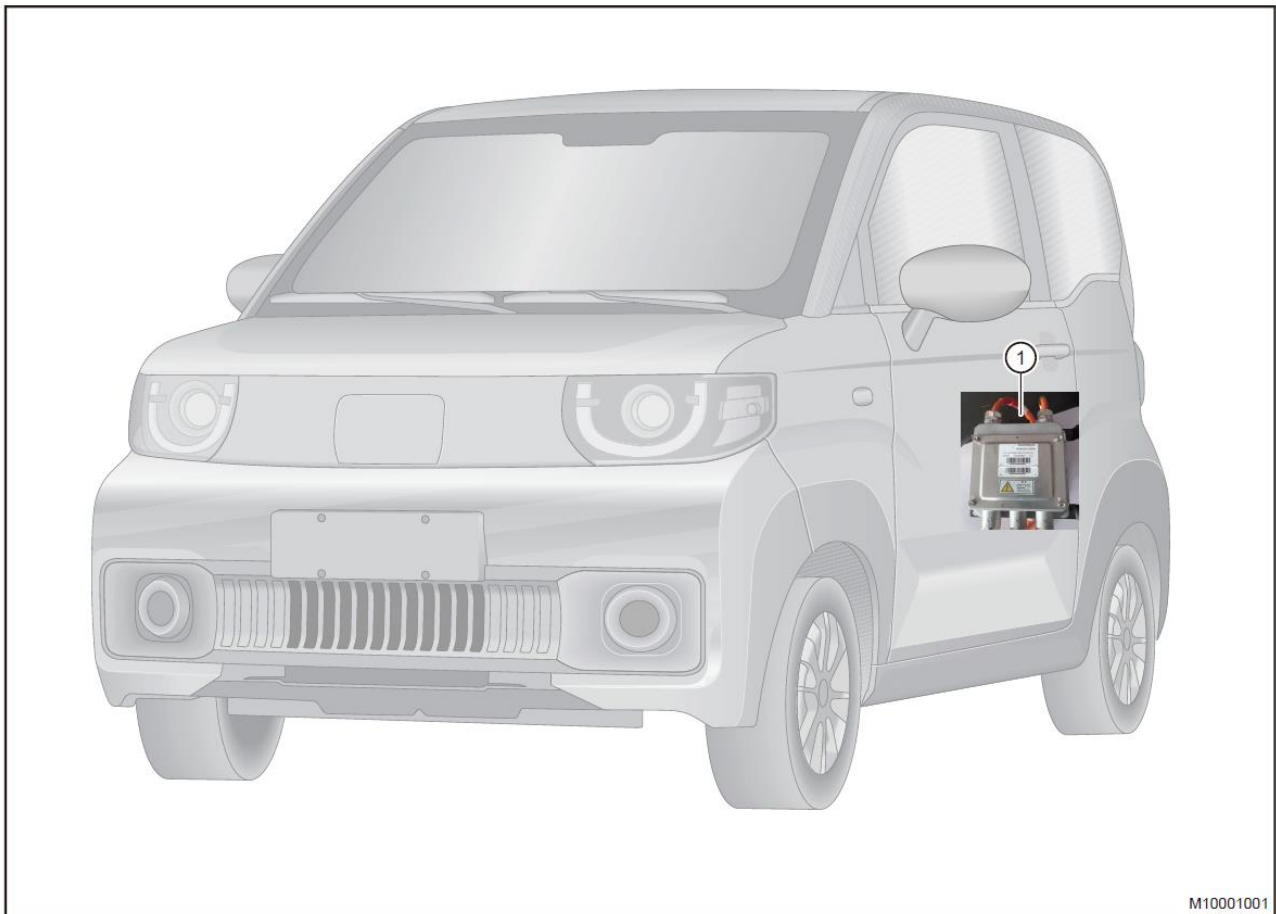
Motor controller	51	Tools	53
General information	51	Definitions of terminals	53
Description	51	Diagnosis and testing	55
Description of functions	51	Fault (DTC) table	55
Schematic diagram of the system	52	On-board maintenance	56
Specification	52	Motor controller	56



## Motor controller

### General information

### Description



M10001001

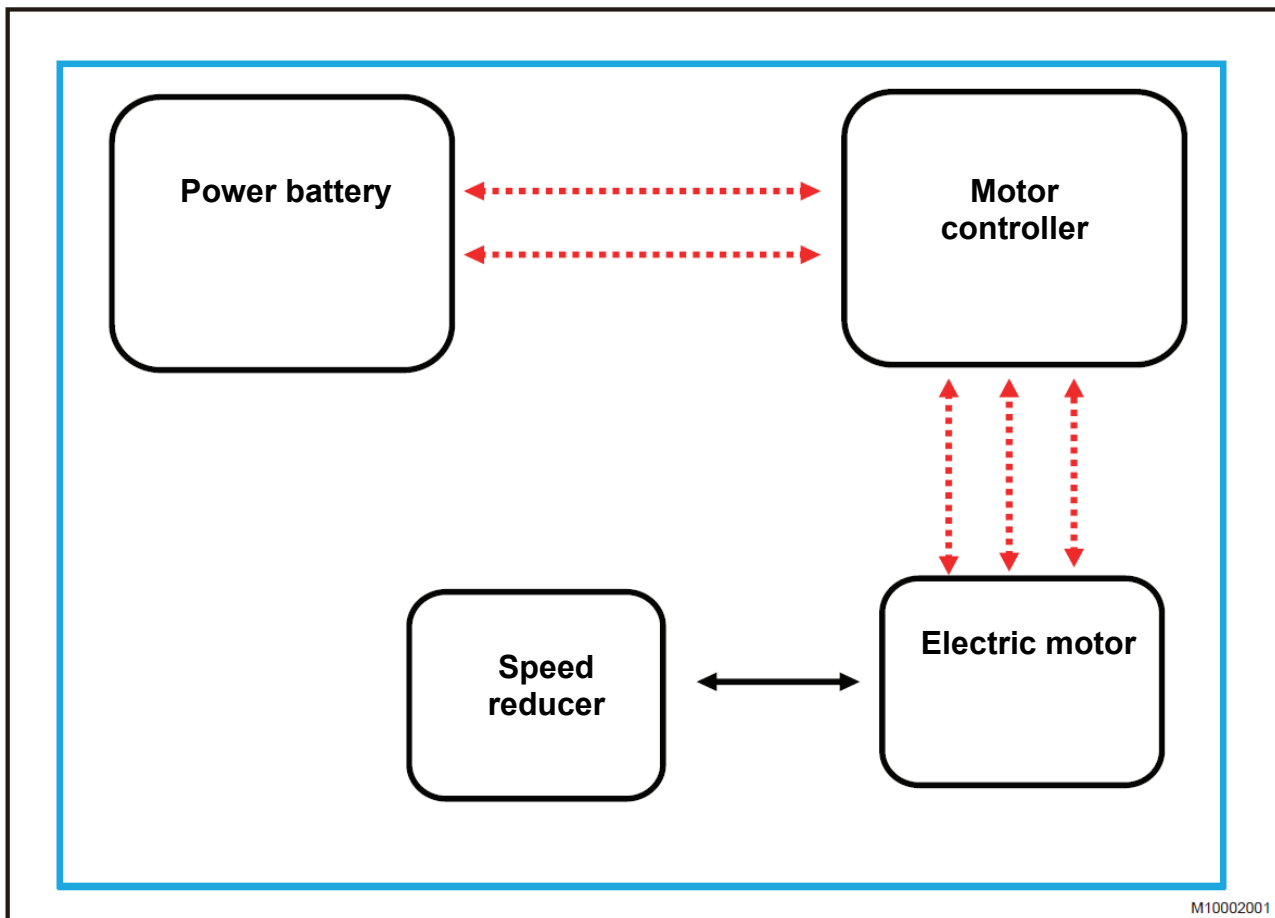
1	Motor controller
---	------------------

### Description of functions

1. The motor controller assembly controls the motor to work in accordance with the set direction, speed, angle and response time through active operation.
2. The motor controller converts the electric energy stored in the energy storing device assembly into the electric energy required by the drive motor to control the vehicle according to the gear, accelerator pedal, brake and other commands.

**Schematic diagram of the system**

Schematic diagram of the system



M10002001

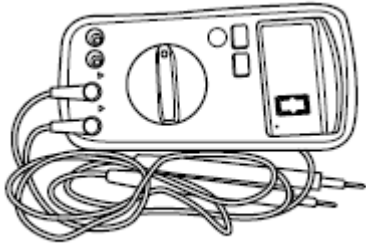
**Specification**

Specification of motor controller assembly

Item	Type and parameters	Unit
Rated capacity	16	KVA
Max. capacity	41	KVA
Rated voltage	96	VDC
Range of operating voltage	60–140	VDC
Control power supply	12	V
Protection rating	IP67	

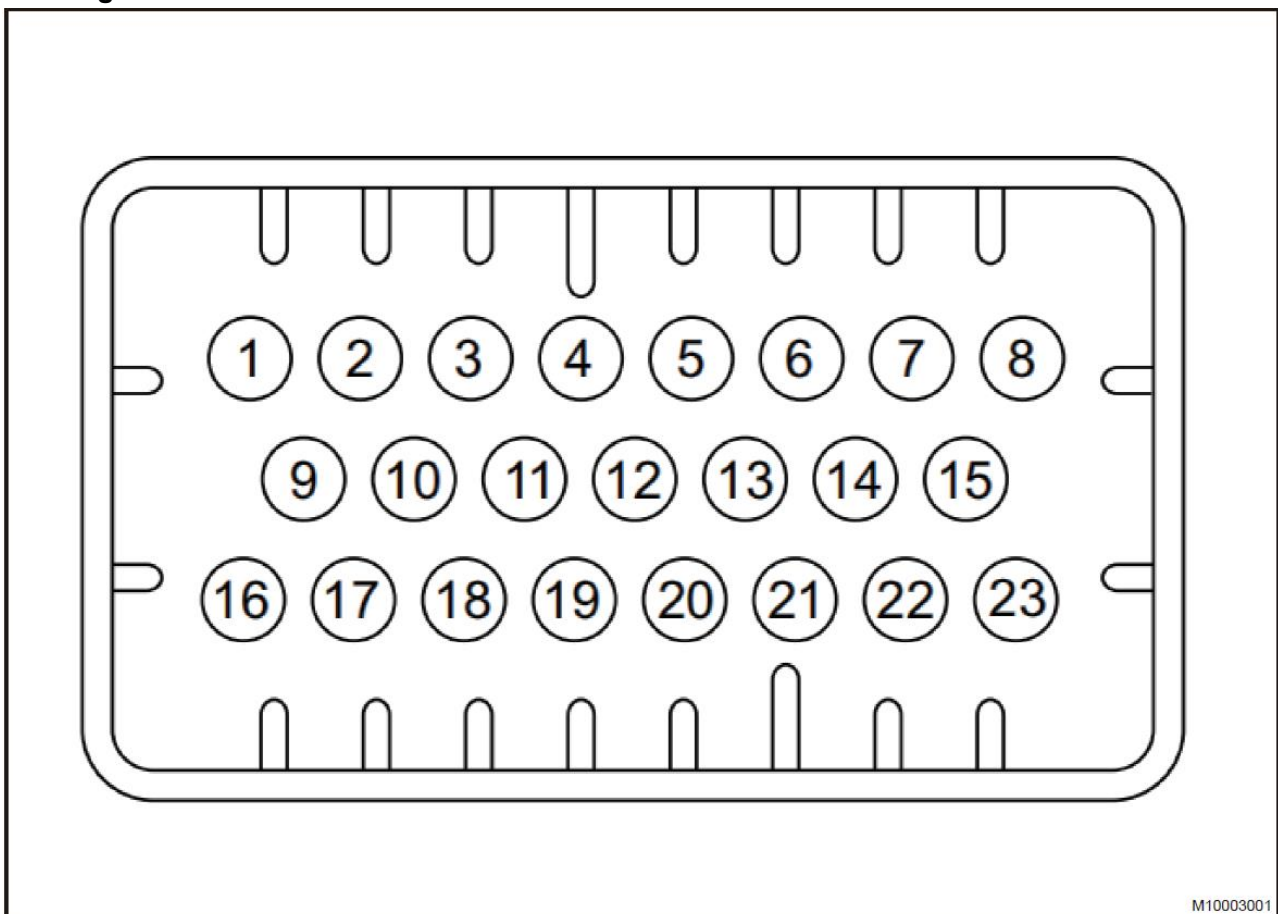
**Tools**

General tools

Tool name	Illustration
Multimeter	 <p style="text-align: right;">RCH001002</p>

**Definitions of terminals**

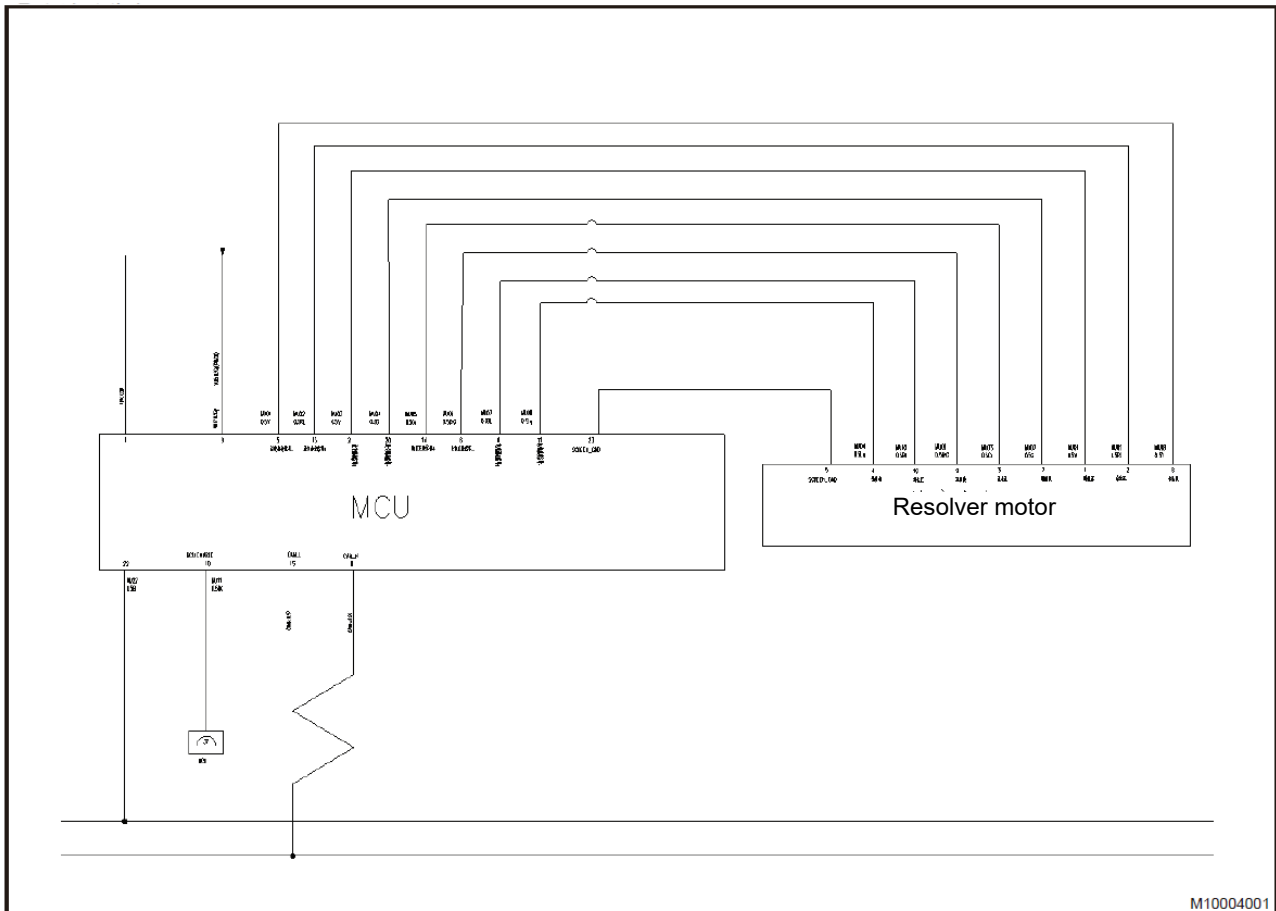
**MCU signal connector**



Terminal No.	Definitions of terminals	Terminal No.	Definitions of terminals
1	12+	13	Resolver cosine signal +
2	N/A	14	Resolver sine signal +

Terminal No.	Definitions of terminals	Terminal No.	Definitions of terminals
3	N/A	15	CAN low
4	Motor temperature signal +	16	N/A
5	Resolver cosine signal -	17	N/A
6	Resolver sine single -	18	N/A
7	N/A	19	N/A
8	CAN-High	20	Resolver excitation signal -
9	ON gear signal	21	Resolver excitation signal +
10	N/A	22	Power supply negative
11	Motor temperature signal-	23	External power supply 12 V+(optional)
12	N/A		

Schematic diagram of electric circuit



M10004001

**Diagnosis and testing****Fault (DTC) table**

<b>DTC code</b>	<b>Name of fault code</b>
P056017	Busbar overvoltage software fault
P056016	Busbar undervoltage software fault
P056317	busbar overvoltage alarm
P056216	Under-voltage alarm of busbar
P1C0016	KL30 power supply voltage undervoltage
P0A5F19	Software overcurrent fault (phase current overcurrent fault)
P10051C	Phase current sampling zero drift fault
P100517	Hardware overvoltage fault of busbar voltage
P100722	Fault of motor overspeed
P100622	High speed alarm of motor
P0A2F4B	Motor over-temperature fault
P0A3C4B	IGBT over-temperature fault (NTC)
P10024B	High temperature alarm of motor
P10034B	IGBT over-temperature alarm (NTC)
P0A5D96	Output phase loss
P0A3F01	Abnormal resolver fault.
P0A2A13	Fault of the motor temperature sensor
U011087	CAN communication fault
P100116	Active discharge fault
P100446	EEPROM fault
P1C0997	Stall protection
P0A5D19	Hardware over-current fault
P1C1213	Alarm of abnormal temperature sensor of motor controller
P1C0017	KL30 power supply overvoltage fault
P0A4422	Motor overload
U007300	The bus enters the BUS_OFF
P150D00	Power tube straight-through fault
P150E00	MCU feedback torque and torque command verification error fault
P150F1C	MCU indicates the phase current sampling circuit fault

DTC code	Name of fault code
P15111C	Fault of the bus voltage detection circuit
P151200	Open the cover fault

## On-board maintenance

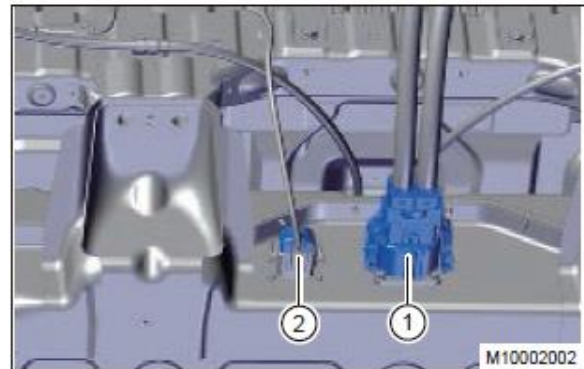
### Motor controller

#### Warning

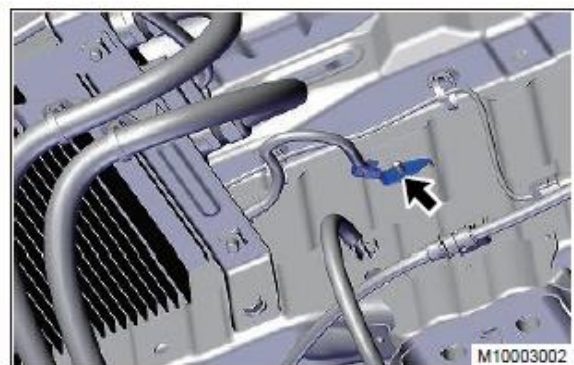
- For Avantier vehicle maintenance personnel, they must receive professional training, be familiar with electrical safety knowledge and electric shock first aid methods, and have a high degree of safety awareness,
- When the vehicle is powered on, the high-voltage power supply of the vehicle will be cut off, and the high-voltage battery will be damaged.
- Strictly abide by the relevant national laws and regulations on high voltage system operation.
- Check and repair the vehicle in strict accordance with CENNTRO's relevant maintenance standards, and set up relevant warning signs.

### Removal

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Lifting the vehicle with the lift
4. Remove the battery assembly.
  - a. Disconnect the high-voltage and low-voltage connectors (1) and (2) connected to the motor controller and power battery.

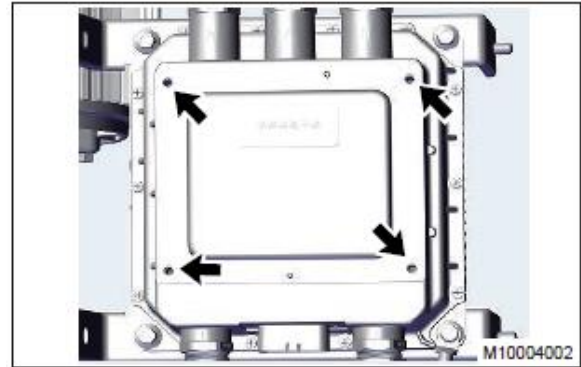


- b. Remove the ground wire (as shown by the arrow) connected to the body system.

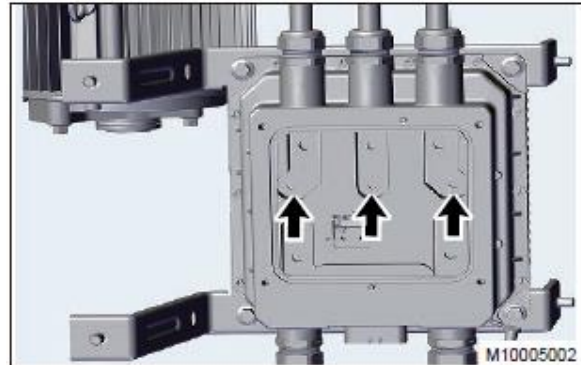




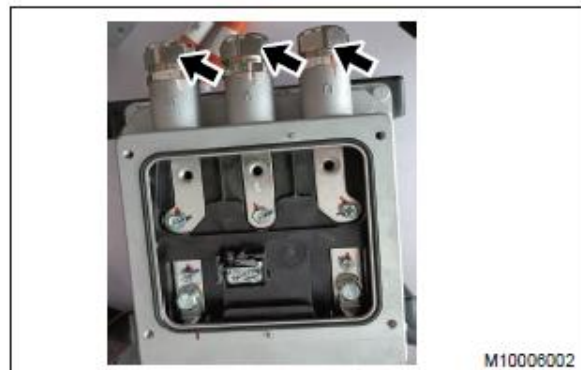
- c. Remove the cover 4 bolts (arrows).



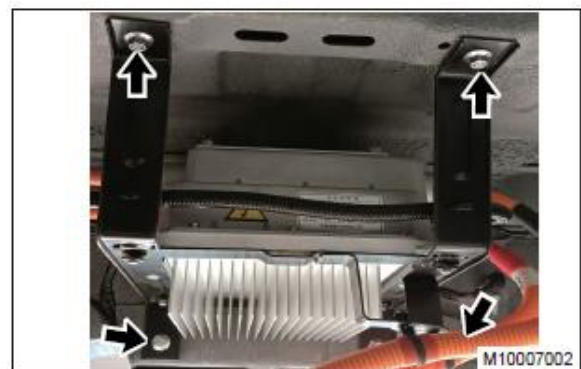
- d. Unscrew the fixing bolts as shown by the arrow, and remove the U-, V- and W-phase wire fixing bolts.



- e. Unscrew the U, V and W three-phase wire harness locknuts (as shown by arrows) with an open-ended spanner, and pull out the wire.



- f. Remove the four fixing bolts (as shown by the arrow) between the motor controller bracket and body system.



- g. Remove the motor controller.

## Installation

1. The installation sequence is reverse to the removal.



# High-voltage power system

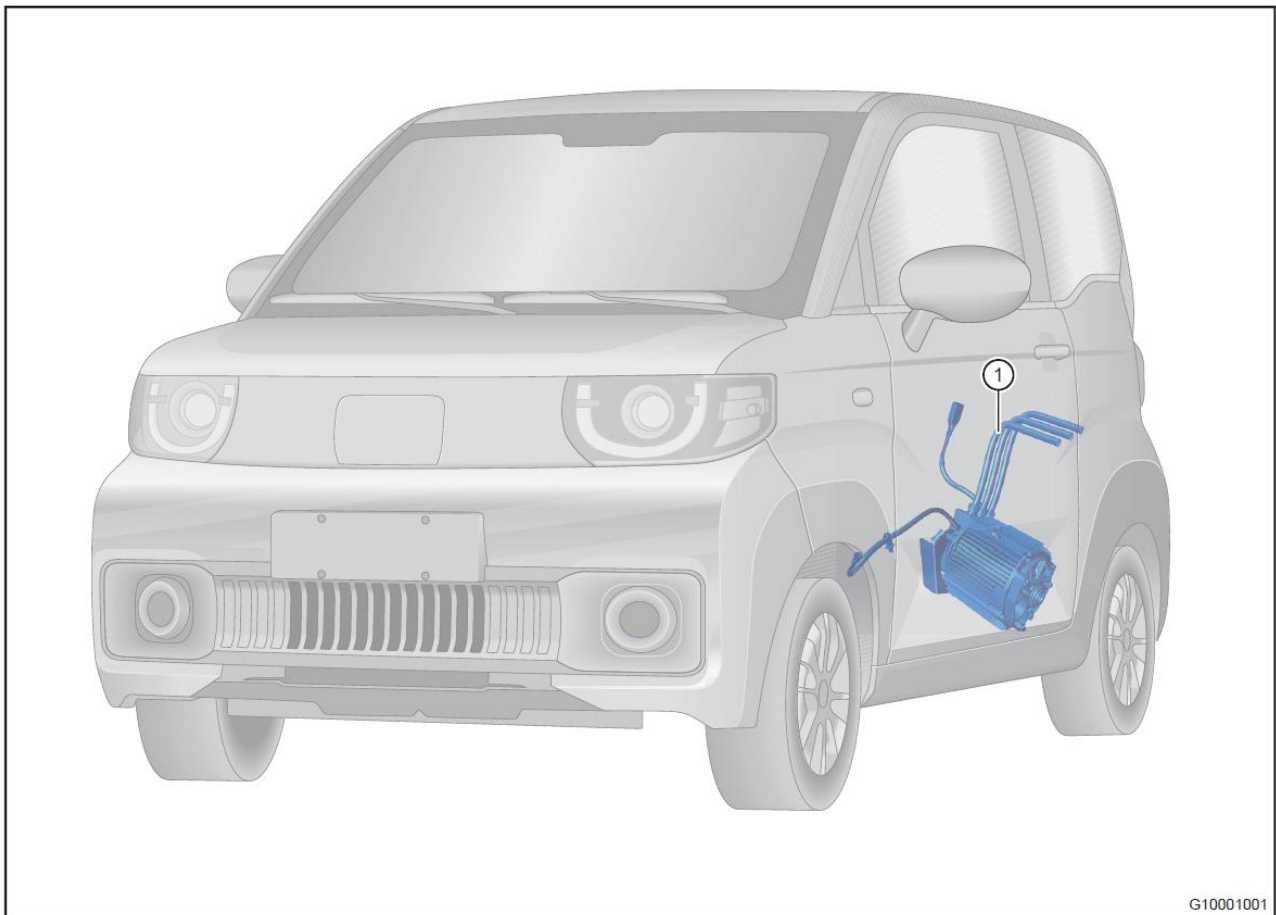
Drive motor	61	Specification	62
General information	61	Tools	63
Description	61	Definitions of terminals	64
Overview	61	On-board maintenance	65
Principle of the resolver position sensor	62	Drive motor	65



## Drive motor

### General information

### Description



G10001001

1	Drive motor assembly
---	----------------------

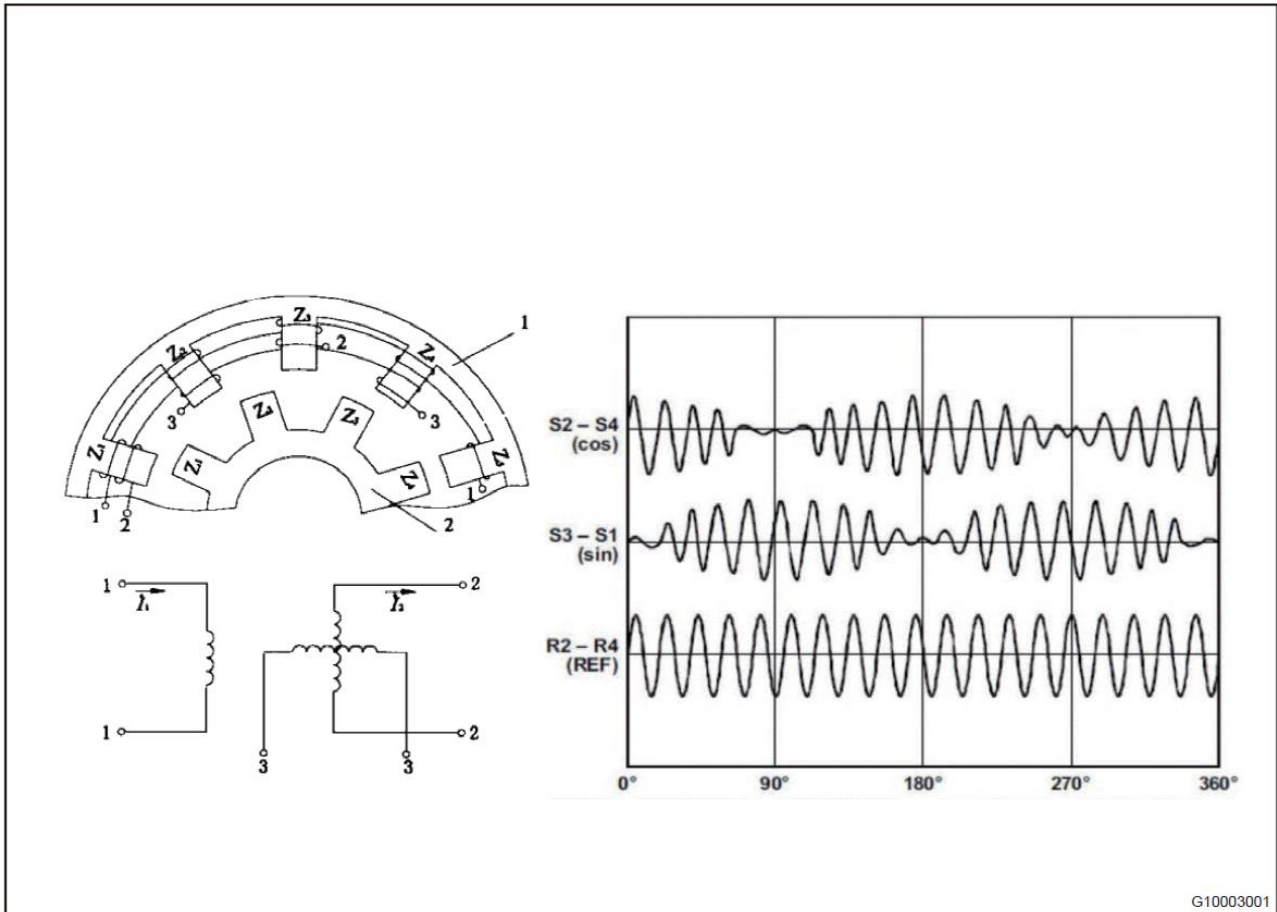
### Overview

- The drive motor is a 3-phase permanent magnet synchronous motor, which is used as the driving device of the vehicle and is installed at the rear of vehicle. This type of motor has the characteristics of simple structure, small volume, light weight, high efficiency and so on.
- The drive motor has a built-in resolver to detect the rotational speed and position of the rotor to achieve vector control of the drive motor.
- Under the control of the motor controller, the drive motor can work in a wide range of speeds to meet the operating conditions of the vehicle.
- The cooling method of drive motor is natural air cooling.

### Function of energy recovery

During braking and coasting of the vehicle, the vehicle controller works in the power generation state drive motor, recovers the kinetic energy into electric energy and stores it in the battery to reduce energy consumption.

**Principle of the resolver position sensor**



The resolver is composed of stator and rotor. The stator winding (EXC) is used as the primary side of the transformer to receive the excitation voltage (about 7 V). The excitation frequency is usually 400 Hz, 3 KHz, 5 KHz, 10 KHz, etc. The rotor winding (sine SIN, cosine COS) is used as the secondary side of the transformer. The induced voltage is obtained through electromagnetic coupling. The angle can be obtained by decoding the voltage.)

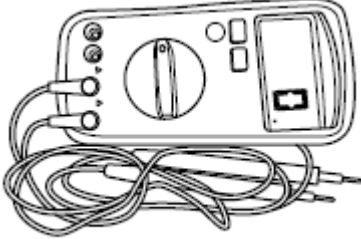
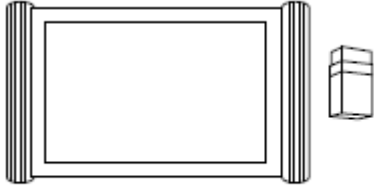
**Specification**

Specification of drive motor assembly

Item	Type and parameters
Sustained power	14 kW
Sustained torque	25 N • m (18 ft-lbs.)
Peak torque	85 N • m (63 ft-lbs.)
Peak power	20 kW
Rated rotational speed	4775 r/min
Protection rating	IP67
Peak speed of rotation	7500 r/min

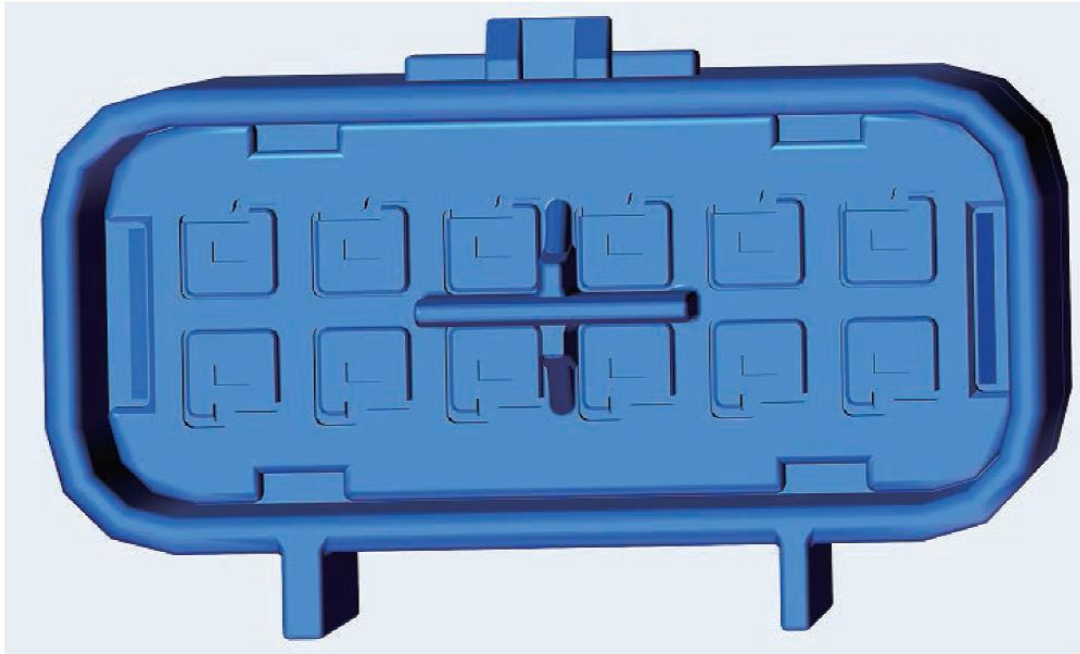
**Tools**

## General tools

Tool name	Illustration
Multimeter	 <p>RCH001002</p>
Diagnostic scan tool	 <p>RCH0002002</p>

**Definitions of terminals**

Definition of drive motor terminals



G10002001

Terminal No.	Definitions of terminals	Terminal No.	Definitions of terminals
1	Excitation positive	7	Excitation negative
2	Cosine positive	8	Cosine negative
3	Sine positive	9	Sine negative
4	Thermo-sensitive negative	10	Thermo-sensitive positive
5	Shielded earthing	11	
6		12	

**High-voltage terminals**

Definition of high-voltage terminal	Rated current	Minimum current	Maximum current
+	120A	/	320A
-	120A	/	320A
U	125A	/	350A



Definition of high-voltage terminal	Rated current	Minimum current	Maximum current
V	125A	/	350A
W	125A	/	350A

## On-board maintenance

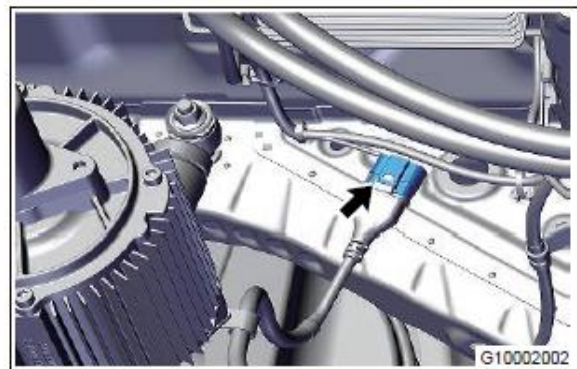
### Drive motor

#### Warning

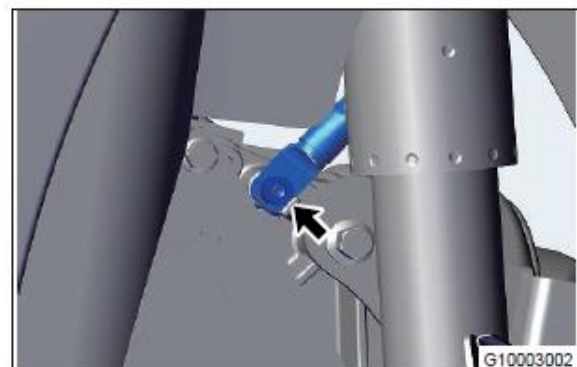
- For Avantier vehicle maintenance personnel, they must receive professional training, be familiar with electrical safety knowledge and electric shock first aid methods, and have a high degree of safety awareness,
- When the vehicle is powered on, the high-voltage power supply of the vehicle will be cut off, and the high-voltage battery will be damaged.
- Strictly abide by the relevant national laws and regulations on high voltage system operation.
- Check and repair the vehicle in strict accordance with CENNTRO's relevant maintenance standards, and set up relevant warning signs.

### Removal

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Lifting the vehicle with the lift.
4. Drain the transmission gear oil.
5. Remove the drive motor assembly.
  - a. Remove the three-phase wire harnesses of the motor control end.
  - b. Disconnect the motor phaser wire harness connector (as shown by the arrow).

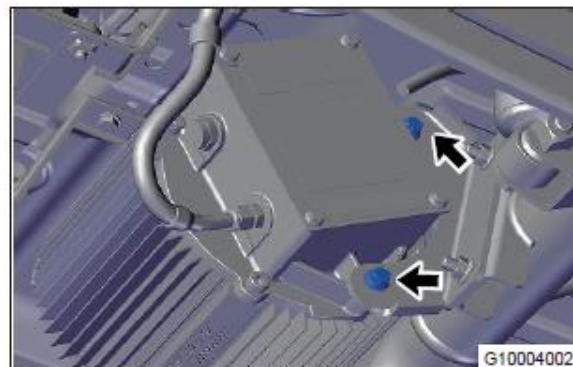


- c. Remove the ground wire (as shown by the arrow).

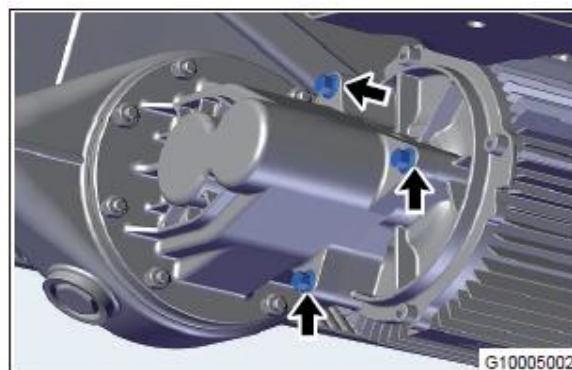


- d. Support the drive motor with a hydraulic jack.

- e. Loosen the 2 fixing bolts between the motor bracket and the rear axle with a wrench (as shown by the arrow).



- f. Remove the 3 fixing bolts (as shown by the arrow) between the drive motor and transmission.



- g. Remove the drive motor assembly.

### Installation

- 1. The installation sequence is reverse to the removal.

## High-voltage power system

Power battery	69	General tools	74
Warnings and precautions	69	Diagnosis and test	75
Warnings and precautions	69	Fault (DTC) table	75
General information	71	Failure to connect the high-voltage power	76
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Schematic diagram of the system	72	On-board maintenance	78
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## Power battery

### Warnings and precautions

#### Warnings and precautions

##### Warning about energy storing device assembly

**⚠ Warning**


- The electric vehicle contains a set of closed high-voltage lithium-ion energy storing device assembly.
- If the energy storing device assembly is improperly exposed, there may be a risk of severe combustion and electric shock, which may cause serious injury or death and environmental pollution.

##### Warning about high-voltage safety precautions

**⚠ Warning**


- The rated voltage of the high-voltage energy storing device assembly of this vehicle is 96 V for 120 km (74 miles) and 89.6 V for 170 km (105 miles) (natural cooling). Please do not touch the high-voltage components with bare hands without disconnecting the high-voltage power.
- The high-voltage components of the vehicle include: power battery, charging DC power distribution unit (CDU), high-voltage wire harness, motor controller (MCU), drive motor, electric compressor (EAC), and high-voltage electric heater (PTC).
- The surface temperature of the drive motor assembly, motor controller assembly and vacuum pump is high after the vehicle has been running for a while; If the air conditioner is used, the surface temperature of the electric compressor and the radiator is high; The OBC DCDC converter assembly surface temperature is high during the vehicle charging process. Under these circumstances, do not touch the above components with bare hands.
- Do not disassemble the high-voltage electrical components in the vehicle, unplug or disconnect the high-voltage connectors and cables on the vehicle without permission, 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 their identification.

## Warning about the vehicle in case of a collision

 Warning

- If the vehicle is involved in a collision (including front, rear, left, right of body system and ground impacts):
- Even if the vehicle is still drivable, stop safely, turn off the parking brake switch, turn off the start button, and do not touch the body system metal.
- In any case, it is prohibited for any personnel to maintain the vehicle until the power is completely off.
- Check the vehicle high-voltage components and wiring harness are broken, exposed (The position of the high-pressure parts can be determined by means of the high-pressure parts layout diagram). In order to avoid personal injury, please do not touch the high-voltage wire harness, connectors and other high-voltage components. It is forbidden to touch the damaged and exposed wire harness to avoid the risk of high-voltage electric shock. In particular, if the vehicle floor is scraped against the ground, the high-voltage wiring harness distributed on the floor should be carefully checked for damage. If it is necessary to contact any high-voltage cables or components, please wear insulated protective clothing (including insulated gloves, insulated shoes and insulated clothing) with a voltage resistance of 1000 V or more.
- Do not touch the vehicle if you cannot estimate the extent of the damage. Keep away from the vehicle, immediately contact the professional and technical personnel of the authorized dealer to check and repair the vehicle, and be sure to inform the emergency personnel who come to deal with the accident at the first time that the vehicle is an electric vehicle. No one else is allowed to approach, touch or move the vehicle.
- If the driver and passenger are trapped and cannot disconnect the high-voltage DC bus, please try to cut the vehicle after the confirmation of the professional. Before cutting, use a large amount of fire water to wash the battery part and the ground to wash away or dilute the leaked electrolyte, to prevent sparks from igniting the electrolyte and causing fire. Do not touch the high-voltage cable (the surface of the high-voltage cable is yellow or orange) and the energy storing device assembly during cutting.
- It is strictly forbidden to disassemble high-voltage wiring harnesses and parts when unauthorized. The sheaths of the high-voltage wiring harnesses are in yellow or orange.
- The electrolyte leakage or damage of the energy storing device assembly may cause a fire. If it happens, please contact the authorized dealer immediately. Do not touch the leaking electrolyte with your hands. If your skin or eyes accidentally come into contact with the electrolyte, please immediately rinse with plenty of water and seek medical attention immediately to avoid injury.
- If there is smoke or fire in the vehicle, please leave the vehicle immediately and be sure to use plenty of water to put out the fire. Failure to do so could result in serious injury or death.
- If you need a trailer, be sure to lift the rear wheels off the ground. Because if the rear wheels touch the ground during towing, the drive motor may generate electricity, damage the high-voltage components of the vehicle and even cause a fire.
- If the vehicle needs to be repaired or painted after impact, it must be done at an authorized dealer of the vehicle and must not be disassembled without permission. Before painting, remove the energy storing device assembly, high-voltage wire harness, motor controller and other high-voltage components. Exposure of the energy storing device assembly to the high temperature of the spray booth may affect the life of the energy storing device. In addition, if the energy storing device assembly on the vehicle is not removed, it may bring potential safety hazards to maintenance personnel who have not received professional training for electric vehicle maintenance.
- After the vehicle breaks down or has an accident, please immediately place the reflective tripod at a place about 100 m (328 ft) behind the vehicle, or at a place about 150 m (492 ft) behind the vehicle on the highway to warn the passing vehicles or pedestrians.

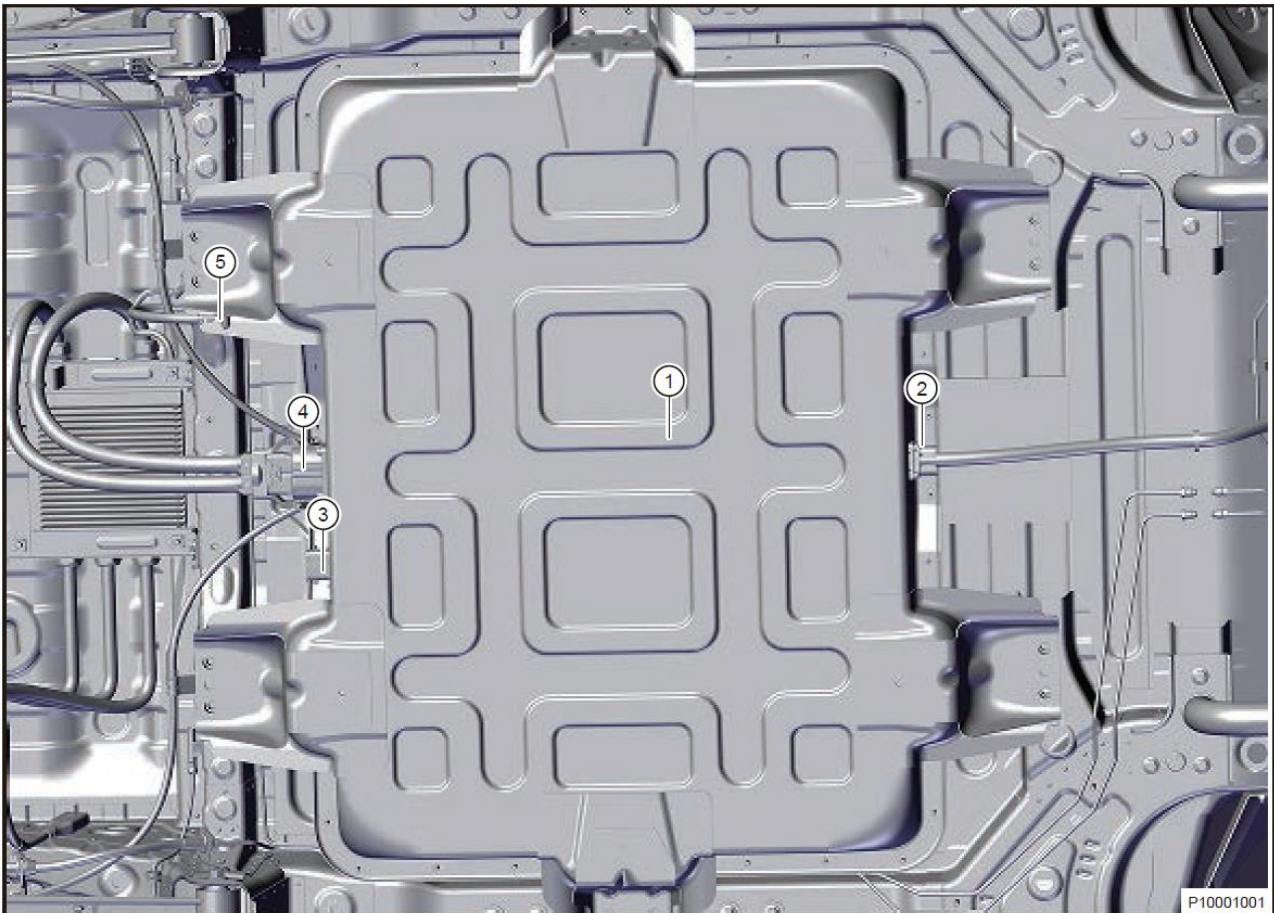
## Precautions for the storage of energy storing device assembly

 Caution

- When storing the energy storing device assembly, please observe the following points in order to avoid damage to the energy storing device assembly:
- Do not place the energy storing device assembly or battery module upside down during transportation or maintenance, otherwise it may cause damage to the energy storing device assembly.
- The energy storing device assembly should be stored in a ventilated, clean and dry room with a temperature of 5°C–40°C (41 - 104 °F). Avoid direct sunlight, the distance from the heat source should not be less than 2 m (7 ft).
- During storage of the energy storing device assembly, the remaining SOC should be kept in the range of 40% – 60%.
- The energy storing device assembly shall not be placed upside down or horizontally, and shall be protected from mechanical shocking or heavy pressure.

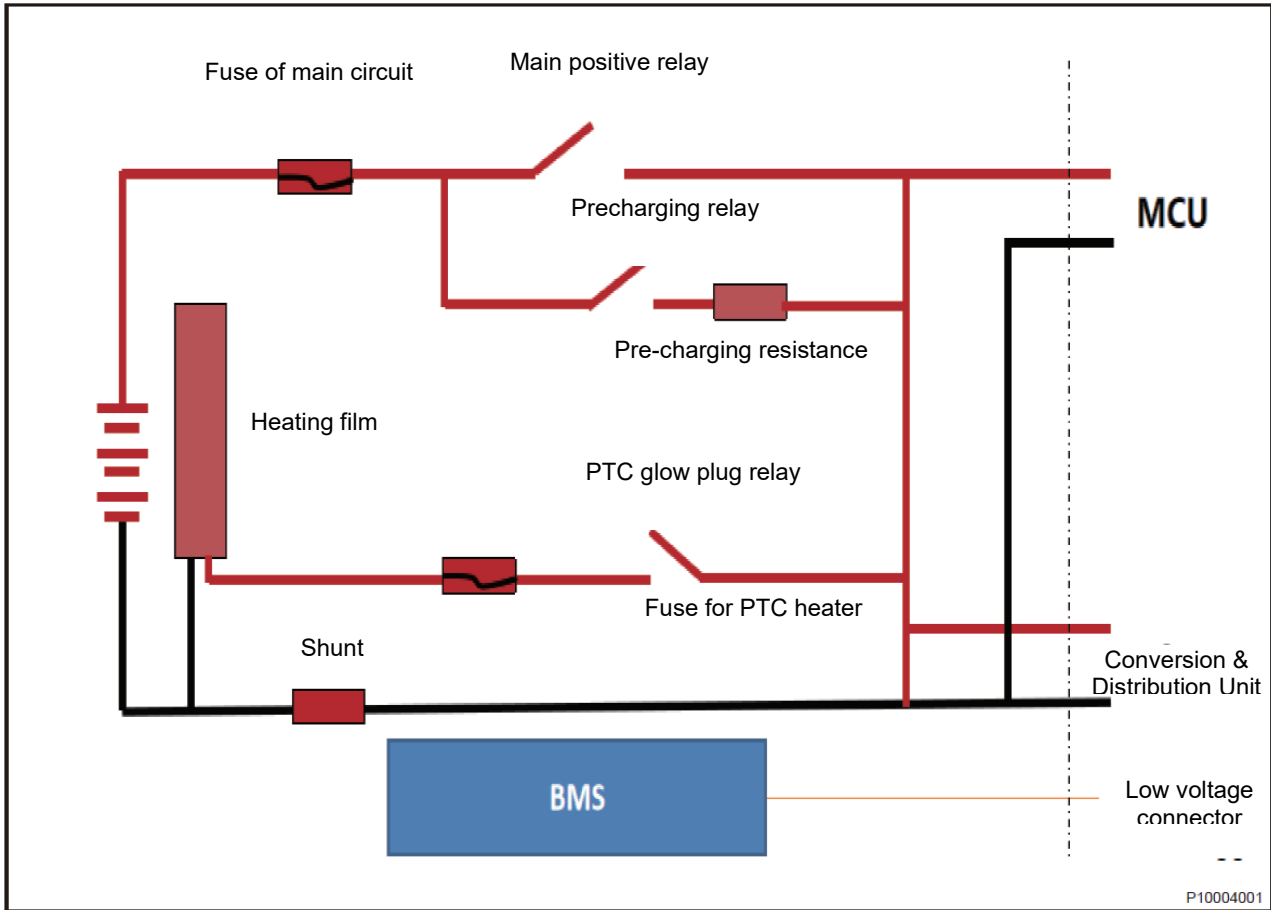
## General information

### Description



1	Power battery assembly	2	CDU connector
3	Low voltage connector	4	Power line connector of motor controller
5	Ground wire		

**Schematic diagram of the system**



**Specification**

Torque specifications

Name	Specification	Torque
Fixing bolt of upper battery cover	M5×16	5±0.5 N·m (3.7±0.4 ft-lbs.)
Fixing bolt of wire harness	M5×12	5±0.5 N·m (3.7±0.4 ft-lbs.)

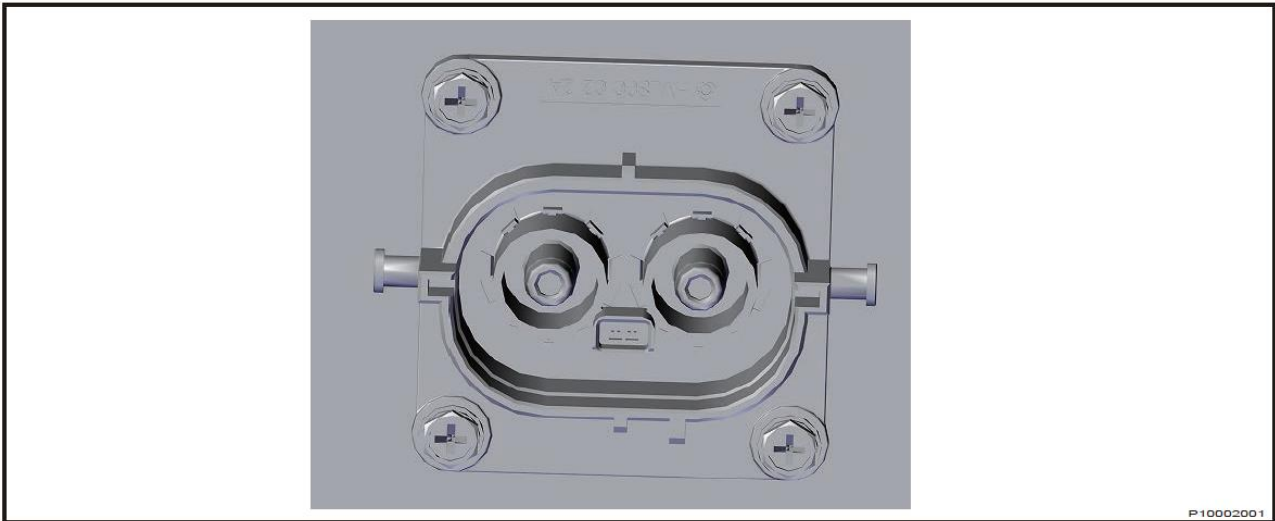
Specification of energy storing device assembly

Item	Type and parameters
Type of cooling	Natural cooling
Rated capacity of battery pack	156 Ah
Rated voltage of battery pack	89.6 V
Type of battery	Li-ion battery
Arrangement position	Underneath the chassis



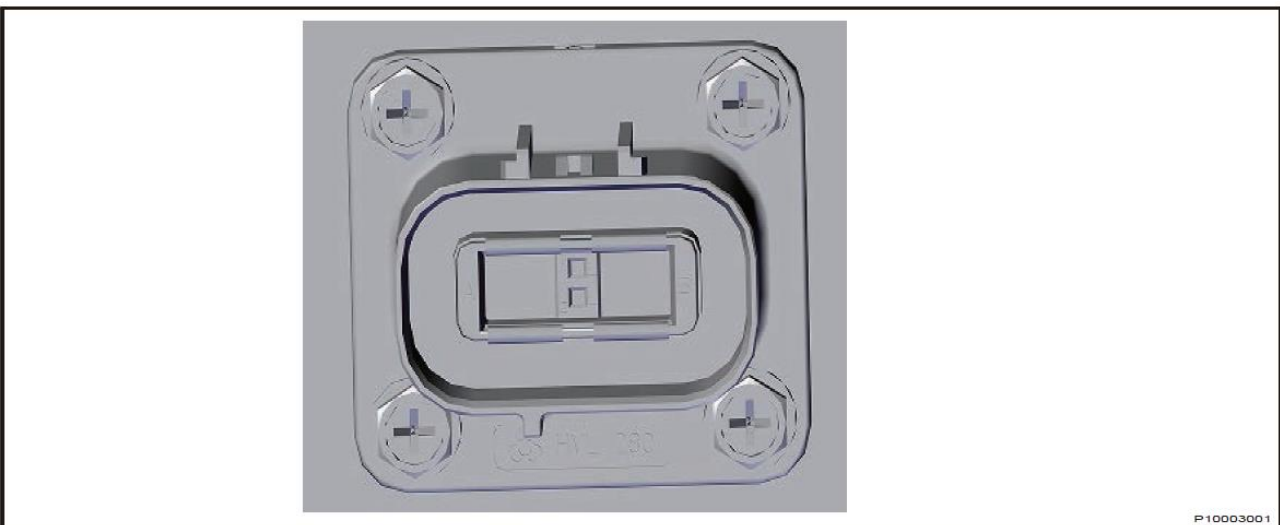
**Definitions of terminals**

High-voltage output terminals



Terminal No.	Function	Rated current
A	Positive	150A
B	Negative	150A
1	Loop interlock	20 mA
2	Loop interlock	20 mA

CDU connector

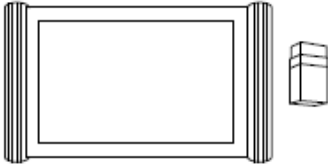
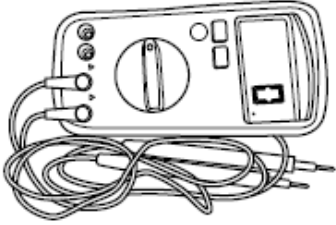





Terminal No.	Function	Rated current
A	Positive	40A
B	Negative	40A

Terminal No.	Function	Rated current
1	Loop interlock	20 mA
2	Loop interlock	20 mA

**Tools**

**General tools**

Tool name	Illustration
Diagnostic scan tool	 <p>RCH0002002</p>
Multimeter	 <p>RCH001002</p>
Electric measuring pen	 <p>Electric measuring pen RCH0003002</p>

Tool name	Illustration
Insulation meter	 <p>RCH0004002</p>
Disassembly and assembly platform of high voltage battery	 <p>RCH0005002</p>

**Diagnosis and test****Fault (DTC) table**

<b>DTC code</b>	<b>Name of fault code</b>
P120900	General fault of low SOC (discharge)
P140A00	Serious fault of high SOC (charging)
P141B00	SOC jumping fault (charging and discharging)
P130100	Serious undervoltage alarm of discharging cell
P110100	General alarm of discharging unit undervoltage
P140100	Serious undervoltage alarm of the charging unit
P130800	PACK voltage too low (discharge)
P120800	PACK voltage is generally too low (discharge)
P128500	General alarm of high temperature difference (charging)
P128700	PACK voltage is generally too high (discharge)
P130500	General alarm of large temperature difference (discharge)
P138200	Severe high temperature alarm (charging)
P130C00	Power accumulator battery pack mismatch alarm (charge/discharge)
P118200	Slight high temperature alarm (charging)
P130200	Severe high temperature alarm (discharge)
P120200	General alarm of high temperature (discharge)

<b>DTC code</b>	<b>Name of fault code</b>
P120300	General alarm of low temperature (discharge)
P138300	Severe low temperature alarm (charging)
P130300	Severe low temperature alarm (discharge)
P130600	Severe over-current alarm (discharge)
P120600	General alarm of overcurrent (discharge)
P101600	BMS power supply voltage is high
P101500	BMS power supply is low
P101700	Hardware failure of BMS
P128400	General alarm of single cell voltage difference (charging)
P110400	General alarm of single cell voltage difference (discharge)
P138000	Serious overvoltage alarm of single cell (charging)
P129000	Serious overvoltage alarm of single cell (discharge)
P149000	General alarm of overvoltage of single cell (discharge)
P148700	PACK voltage seriously too high (charging)
P129700	PACK voltage seriously too high (discharge)

DTC code	Name of fault code
P13 86 00	Serious charging overcurrent alarm (charging)
P12 96 00	General feedback overcurrent alarm (discharge)
P12 86 00	General charging over-current alarm (charging)
P10 0B 00	Current sampling abnormality
P14 0F 00	Thermal runaway alarm (charge/discharge)
P10 10 00	Battery heating failure (charging)
P14 13 00	Serious alarm of discharge insulation (discharge)
P12 13 00	General alarm for insulation
U02 59 00	BMS communication abnormality-external and VCU.
P13 1A 00	Battery pack total voltage sampling circuit fault
P13 18 00	BMS communication failure-internal
P13 11 00	Battery high-voltage circuit main fuse diagnosis, main positive opened abnormally
P13 12 00	High voltage loop interlock fault
P14 1C 00	Main circuit positive electrode in adhesion state
P14 19 00	Pre-charging failure
P14 20 00	The battery pack high-voltage heating relay is stuck
P13 0D 00	The battery cell voltage acquisition is abnormal

DTC code	Name of fault code
P13 0E 00	Abnormal battery cell temperature collection
P10 22 00	Type of onboard energy storing device overcharging
U01 11 87	BMS communication abnormality-external and OBC
P1385-00	Serious alarm of excessive temperature difference
P1414-00	Diagnosis of slow charging exception
U027388	Vehicle CAN BUS OFF
P11 24 00	On-load cut-off of main positive relay
P13 13 00	Serious alarm of charging insulation

### Failure to connect the high-voltage power

The main reasons for failure to connect the high-voltage power

- The battery voltage is low.
- Battery failure (battery management system failure, low battery, high power battery pressure difference, abnormal temperature, relay adhesion, etc.).
- Vehicle controller failure
- Failure of motor drive system
- Pre-charge failure
- Insulation fault
- CAN communication failure
- High voltage interlock fault
- Low-voltage wire harness fault

- DCDC fault

#### Diagnostic procedure

##### Caution

Before performing this diagnostic step, observe the scan tool data list and analyze the accuracy of each item of data, which will help to quickly troubleshoot the fault!

**1** Turn the ignition switch to the ON position

Whether the instrument display is normal and whether the malfunction lamp is on.

Yes

Connect the diagnostic tester to read the fault code.

No

**2** The diagnostic tester reads whether the VCU receives the ignition switch and brake pedal signals.

No

Check the ignition switch circuit, and check the brake pedal switch.

Yes

**3** Connect the diagnostic instrument, perform the high-voltage power-up operation, and read the vehicle pre-charge and related contact status.

According to the fault code and parameter prompts of the diagnostic tester, determine the fault type and take the corresponding measures for maintenance.

#### The vehicle does not run after applying high voltage

Main reasons for the vehicle not moving after high voltage is enabled

- Gear position switch fault.
- The accelerator pedal is faulty
- Brake light switch fault
- Handbrake switch fault
- Vehicle controller failure
- Brake vacuum pump failure
- Motor fault (revolver, temperature anomaly, etc.)
- Battery failure (SOC too low, communication, etc.)

#### Diagnostic procedure

##### Caution

Before performing this diagnostic step, observe the scan tool data list and analyze the accuracy of each item of data, which will help to quickly troubleshoot the fault!

**1** High-voltage power switched on to the system

Check if the instrument malfunction lamp is on and if the instrument gear is normal.

No

Check the gear switch and circuit

Yes

**2** Check if the hand brake lamp goes out after the hand brake is released.

No → Check and adjust the hand brake switch

Yes

**3** Do not depress the brake pedal to see if the brake lamp is on

Yes → Check, adjust or replace the hand brake switch

**4** Connect the diagnostic instrument, perform the high-voltage power-up operation, and read the vehicle pre-charge and related contact status.

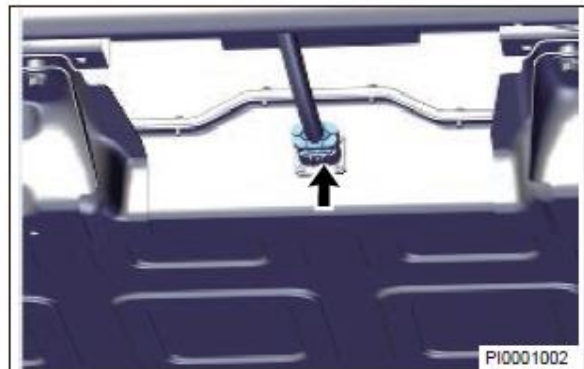
→ According to the fault code and parameter prompts of the diagnostic tester, determine the fault type and take the corresponding measures for maintenance.

### On-board maintenance

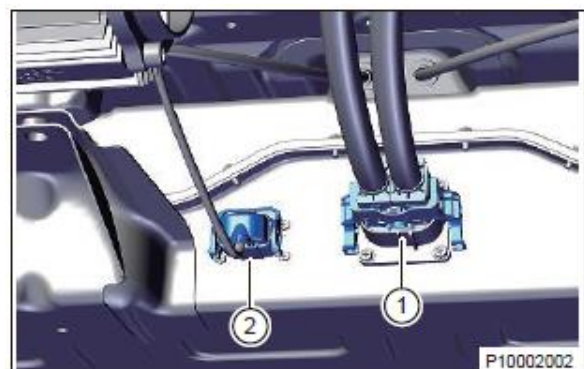
#### Power battery assembly

##### Removal

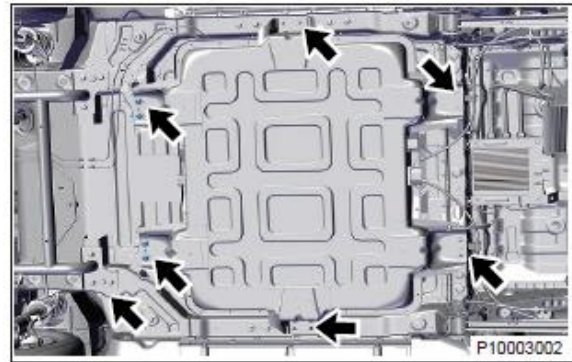
1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Lifting the vehicle with the lift
4. Remove the battery assembly.
  - a. Disconnect the CDU connector (as shown by the arrow).



- b. Disconnect the motor controller (1) and low-voltage connectors (2).



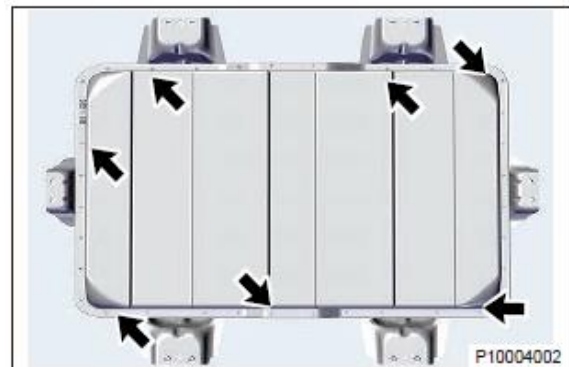
- c. Remove 12 fixing bolts (as shown by the arrow) from power battery.



- d. Hold the battery assembly with the bracket and remove the battery.

### Disassembly and assembly of the left front door

1. Open and remove the upper cover.  
Tightening torque:  $5\pm 0.5\text{N}\cdot\text{m}$  ( $3.7\pm 0.4\text{ ft}\cdot\text{lbs.}$ )



2. Open and remove the upper cover.

### Inspection

#### ⚠ Caution

- When the work is interrupted or at rest, the work in hand must be completed.
- Before production, wear labor protection equipment: labor protection shoes, anti-static clothing, protective gloves, electrostatic bracelet.
- Check the equipment, tools and materials used.

### Heating film detection

1. Move the module to be tested to the test area, and use the insulation meter to test the module insulation.



2. Use a multimeter to check the total voltage of the battery module.



3. Take the heating film inspection tooling, connect it with the heating film connector, and use the insulation meter to test the heating film insulation.



4. Use a multimeter to manually measure the battery pre-charge resistance, PTC resistance, working current, quiescent current, grounding impedance, battery pack voltage, etc.



5. Use insulation meter to measure the insulation resistance of battery pack high voltage plug-in.



6. Use the insulation withstand voltage meter to test the withstand voltage.



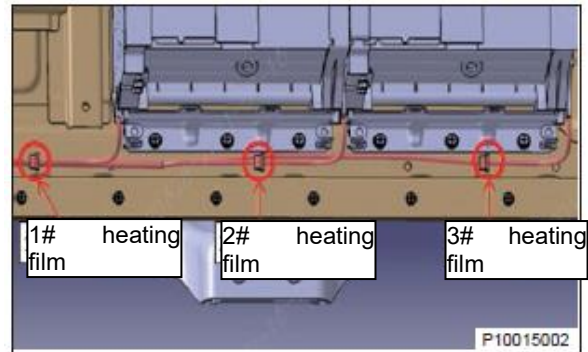


7. Read the battery cell information, working status, and verify the relay function through the upper computer.



### Wiring harness connection

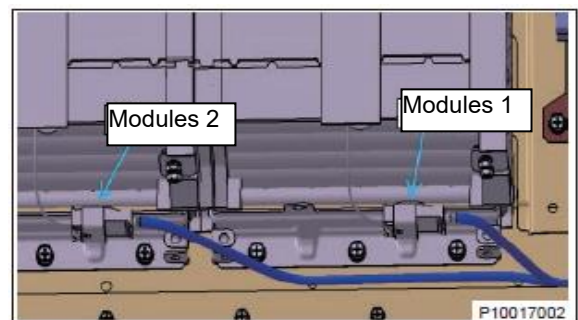
1. Connect the main heating wire harness and the module heating film wire harness.



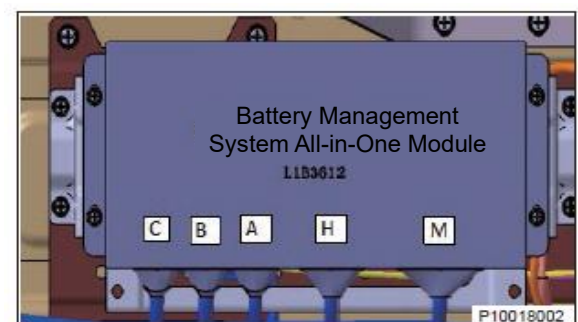
2. Connect the interlocking wire between the all-in-one machine harness assembly and the CDU connector harness assembly, and stick the Teflon tape at the sheet metal as shown in the figure.



3. Connect the acquisition port of the all-in-one wire harness assembly module to the corresponding module.



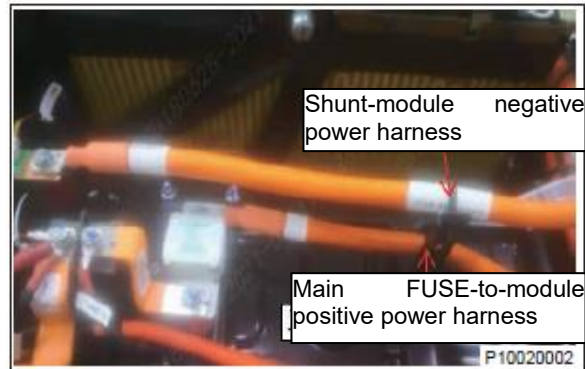
4. After the all-in-one harness assembly is connected to the module, connect it to the all-in-one module in turn according to M, H, A, B and C.



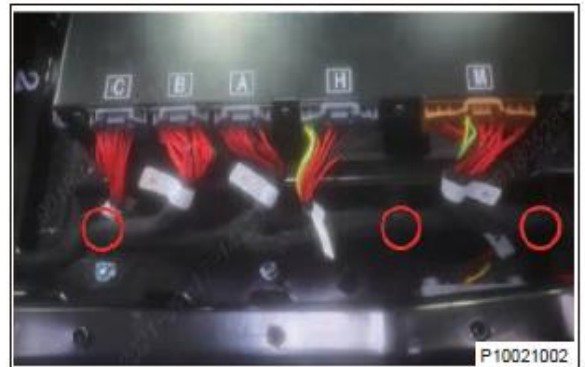
5. Connect the positive power harness between the module and the main FUSE-to-module and the negative power harness of the shunt-module with bolts. Pre-tighten first and then tighten them with a torque wrench.  
Tightening torque:  $5\pm 0.5\text{N}\cdot\text{m}$  (3.7±0.4 ft-lbs.)



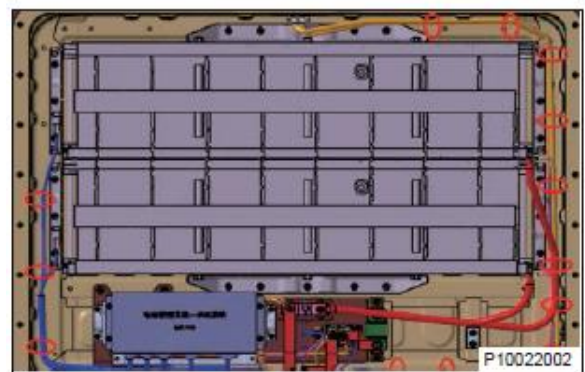
6. Fix the main FUSE-to-module positive power harness and shunt-module negative power harness to the power harness bracket with the hole strap.



7. Fix the all-in-one module harness to the hole shown in the figure of BMS mounting bracket with the round hole strap.



8. Fix the wire harness at the position as shown in the figure with the strap.

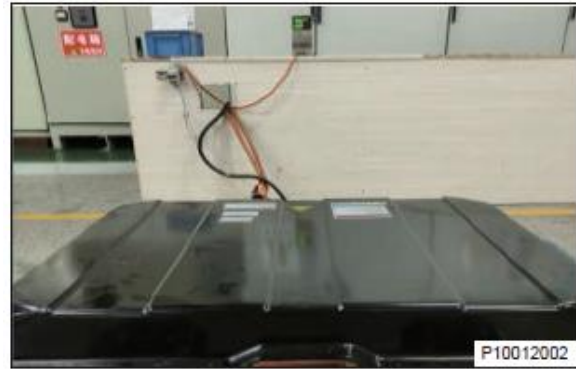


**⚠ Caution**

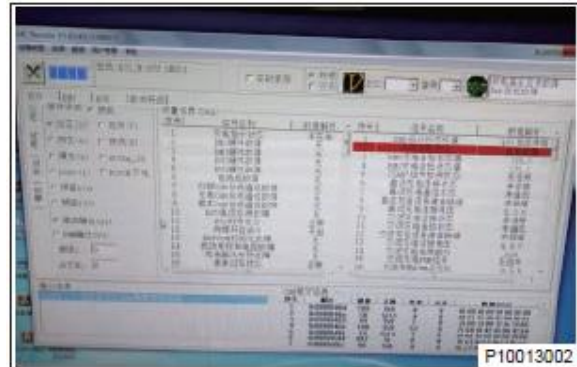
- Connect the connectors correctly and firmly by plug, ring then pull;
- Paste the Teflon tape on the CDU connector harness assembly and the module interference bracket;
- Pay attention to the direction of the harness and the consistency of the fixing points;
- Bolts shall be pre-tightened without thread slippage and thread damage;
- When fixing the high-voltage harness, observe whether the aluminum plate on the rear of the positive and negative poles of the module falls off.

## Charge and discharge test

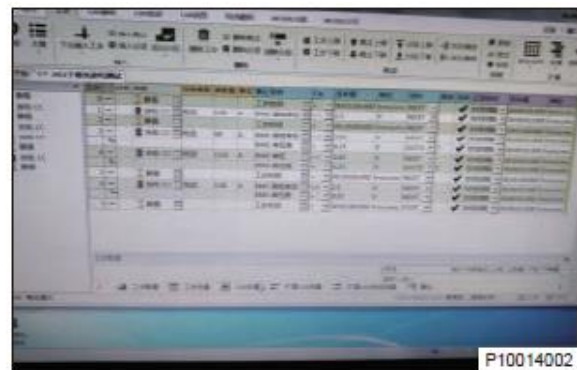
1. Connect the discharge plug and the 28 PIN plug to the corresponding positions of the battery pack, and turn on the 12 V power supply to supply power to the battery pack BMS.



2. Turn on the upper computer, click DAC acquisition, check the monomer information to confirm that it is normal, and then close the main positive relay.



3. Open the channel software, set the parameters, run the configuration, scan the battery pack bar code, and start the charge and discharge test, observe whether the monomer information is abnormal during the test. If there is any abnormality, immediately stop the test, and analyze and troubleshoot the fault information.



4. After the test, generate the test file according to the equipment, record the test data to the factory inspection report, save the charge and discharge data, and upload it to the server.

### ⚠ Caution

- The low-voltage communication harnesses are connected correctly;
- Check whether the single cell information is normal;
- Carry out charging and discharging tests according to the capacity test procedure;
- Record test results, organize and archive test data.

## Installation

1. The installation sequence is reverse to the removal.



## High-voltage power system

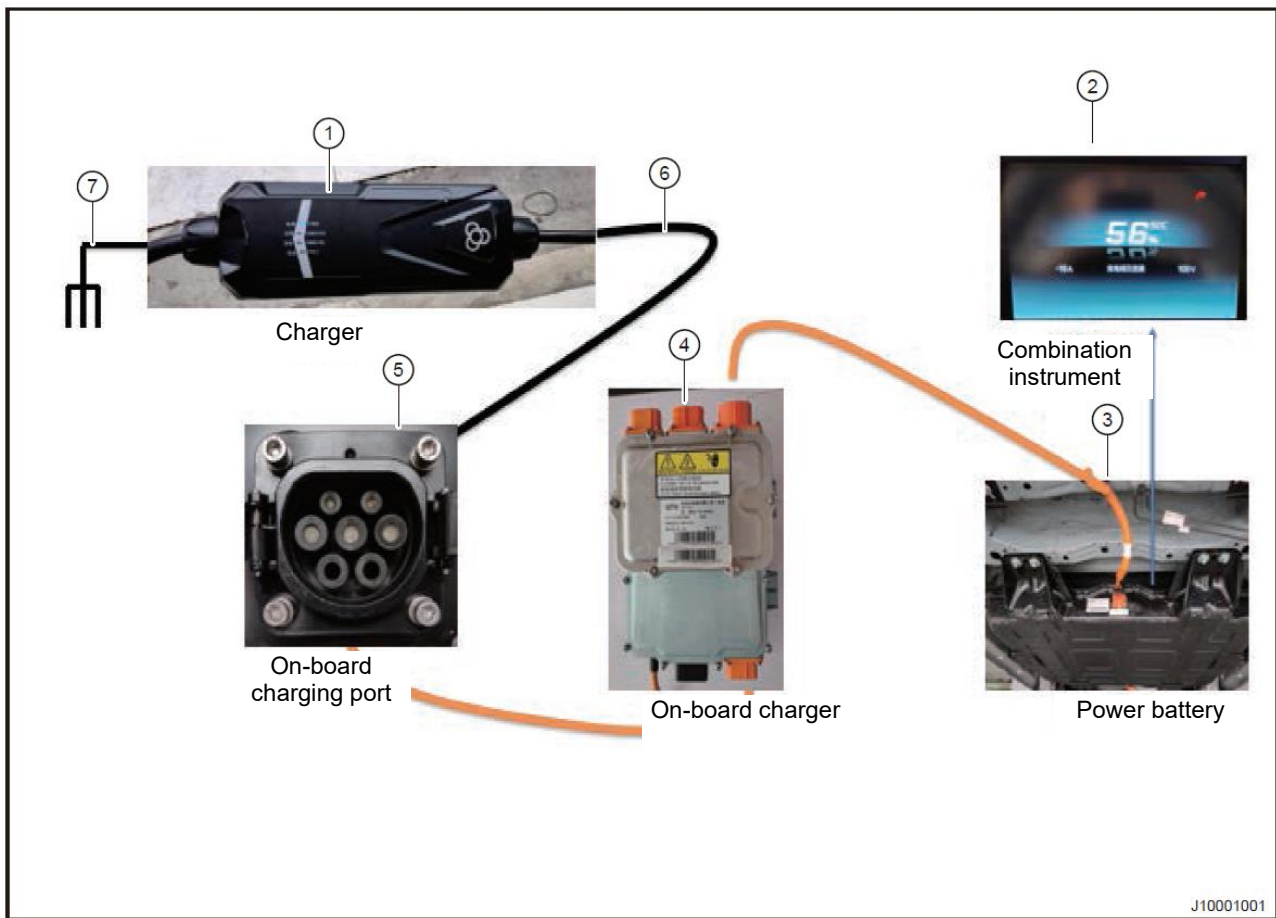
AC slow charging	87	General tools	90
General information	87	Diagnosis and test	90
Description	87	Description of diagnosis	90
Schematic diagram of the system	88	Visual check	91
Specification	88	On-board maintenance	94
Definitions of terminals	89	Power battery assembly	94
Tools	90		



## AC slow charging

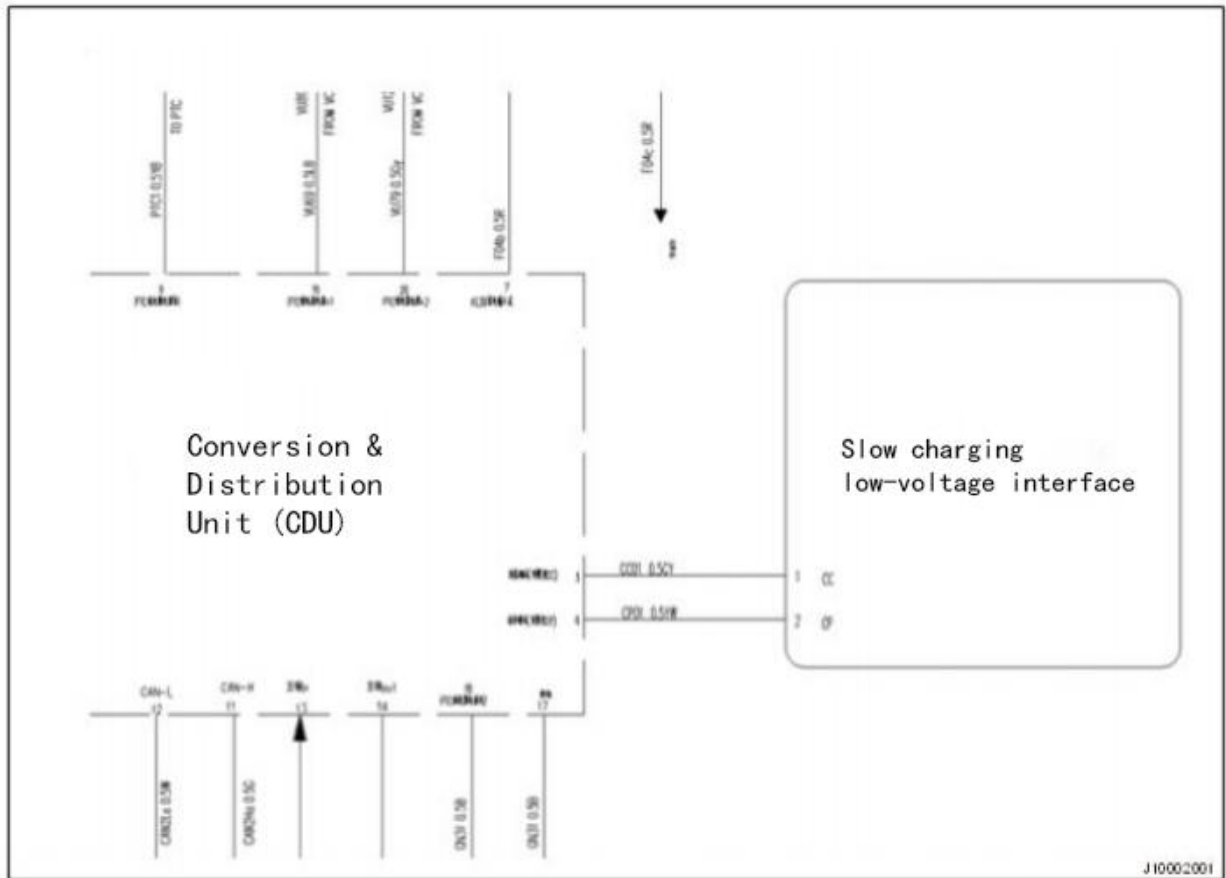
### General information

### Description



1	Charger	5	Charging port
2	Combination instrument	6	Connecting harnesses
3	Power battery	7	Grounding wire
4	Charger		

**Schematic diagram of the system**



**Specification**

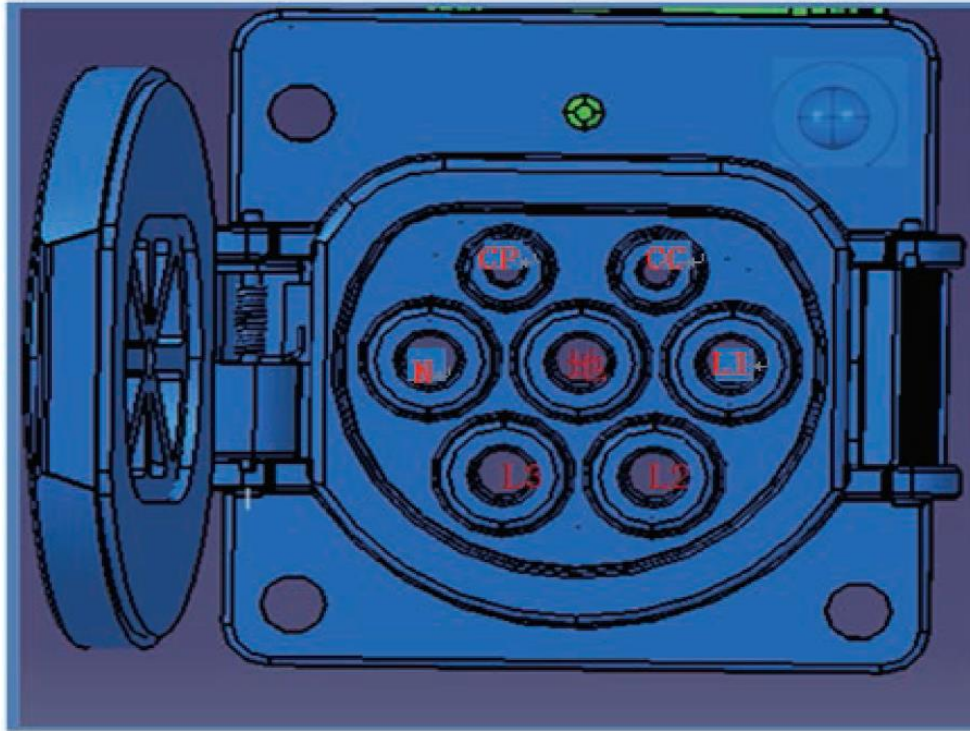
Torque specifications

Name	Specification	Torque
Fixing bolt of the charging port		5±0.5 N·m (3.7±0.4 ft-lbs.)



## Definitions of terminals

## High-voltage output terminal

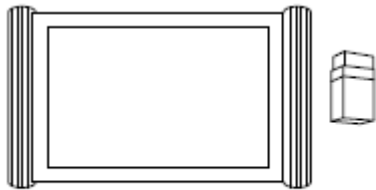
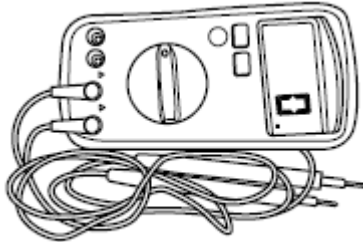




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Terminal No.	Function	Remarks
CP	CP signal	
CC	CC signal	
N	Zero line	
L1	Live line	
	Ground wire	
L2	\	Suspended.
L3	\	Suspended.

**Tools**

**General tools**

Tool name	Illustration
Diagnostic scan tool	 <p style="text-align: right;">RCH0002002</p>
Multimeter	 <p style="text-align: right;">RCH001002</p>
Electric measuring pen	 <p style="text-align: center;">Electric measuring pen</p> <p style="text-align: right;">RCH0003002</p>
Insulation meter	 <p style="text-align: right;">RCH0004002</p>

**Diagnosis and test**

**Description of diagnosis**

Refer to description and operation and system operation before you diagnose a problem with the AC slow charging system. Understand and get familiar with the working principle of the AC slow charging system before starting the system diagnosis, this will help to determine the correct troubleshooting steps when a fault occurs, and more importantly, it will help to determine whether the condition described by the customer is normal. Any fault diagnosis of the AC slow charging system should start with a visual inspection and guide the maintenance personnel to take the next logical step to perform the fault diagnosis. Understanding and correctly using the diagnostic process can shorten the diagnostic time and avoid misjudgment of the fault location.

**Visual check**

- Check the after-sale devices that may affect the operation of the AC charging system to ensure that they cannot affect the operation of the AC charging system.
- Check the system components that can be easily accessible or visible to ensure that there is no obvious damage to the components or conditions that could cause the failure to occur.

**Connection status of vehicle interface and resistance value of RC**

Table of CC signal status				
State	RC	R4	S3	Charging port connection status
The charging cable capacity is 10 A	1.5K $\Omega$ /0.5W		Closed.	Vehicle interfaces are fully connected
	1.5K $\Omega$ /0.5W	1.8K $\Omega$ /0.5W	Open	The interface of the vehicle is in semi-connected state
The charging cable capacity is 16 A	680 $\Omega$ /0.5W		Closed.	The interface of the vehicle is in fully connected state
	680 $\Omega$ /0.5W	2.7K $\Omega$ /0.5W	Open	The interface of the vehicle is in semi-connected state
The charging cable capacity is 32 A	220 $\Omega$ /0.5W		Closed.	The interface of the vehicle is in fully connected state
	220 $\Omega$ /0.5W	3.3K $\Omega$ /0.5W	Open	The interface of the vehicle is in semi-connected state
The charging cable capacity is 63 A	100 $\Omega$ /0.5W		Closed.	The interface of the vehicle is in fully connected state
	100 $\Omega$ /0.5W	3.3K $\Omega$ /0.5W	Open	The interface of the vehicle is in semi-connected state

**DTC diagnostic information and procedures**

## DTC diagnosis process

	Description	Possible cause of the failure
DTC	Charger AC input over-voltage fault	<ul style="list-style-type: none"> <li>• Charging port for internal harness</li> <li>• On-board charger DCDC converter assembly</li> </ul>
DTC	Charger AC input under-voltage fault	
DTC	Charger AC input power failure	

Before performing the following procedure, verify that the battery voltage is not less than 12 V.

- Set the start button to "ON" position.
- Connect the diagnostic tester (with the latest software version).
- Start the vehicle, and read the DTC again. If a fault code is detected, refer to the fault code diagnostic procedure.
- If no DTCs are detected, the fault is intermittent.

**Note:**

When carrying out diagnosis and testing circuits, always refer to the circuit diagrams and component information for the specific circuit.

<b>1</b>	Visual check
----------	--------------

- Check whether the AC charging equipment is normal.
- Check the OBC DCDC converter assembly and internal wiring harness charging port for damage, deformation, smudging, looseness and other signs.
- Check the OBC DCDC converter assembly and internal wiring harness charging port connector for signs of looseness, false connection, pin withdrawal, corrosion, etc.
- Confirm whether the above checks are normal.

Abnormal

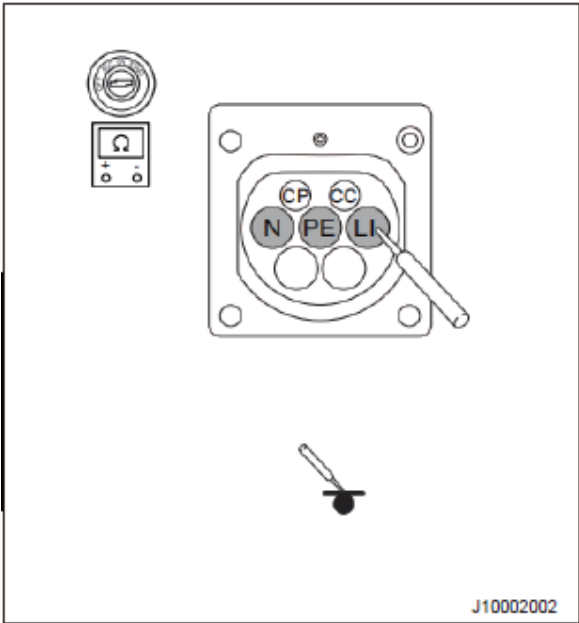
Repair or replace the faulty part

Normal

**2** Check the high-voltage circuit of the charging port of the internal wiring harness for insulation failure

- (a) Place the start button in the OFF position.
- (b) Disconnect the negative cable of battery.
- (c) Disconnect the harness connector of the on-board charger DCDC converter assembly.
- (d) Adjust the gear of the high voltage insulation tester to 500 V.
- (e) Use the high voltage insulation tester to measure each terminal according to the following table.

Connection of high voltage insulation tester	Condition	Specified state
Terminal (LI) - body system ground	Always	20 MΩ or higher.
Terminal (N) - body system ground	Always	20 MΩ or higher.
Terminal (PE) - body system ground	Always	20 MΩ or higher.



- (f) Confirm whether the measured value conforms to the standard.

Abnormal → Replace the internal harness charge port and go to Step 6

Normal

**3** Check the high-voltage circuit of the charging port of the internal harness for open circuit

- (a) Place the start button in the OFF position.
  - (b) Disconnect the negative cable of battery.
  - (c) Disconnect the harness connector of the on-board charger DCDC converter assembly.
  - (d) Check the resistance between terminals with a multimeter.
- Specified state: less than 1 Ω

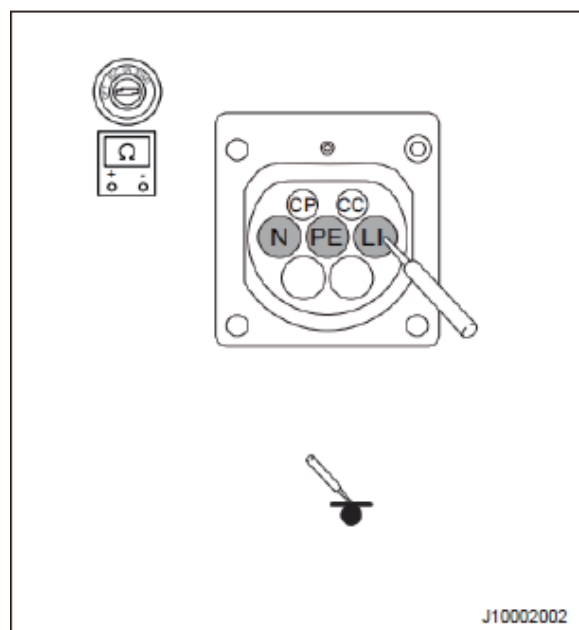
Abnormal → Replace the internal harness charge port and go to Step 6

Normal

**4** Check whether the high voltage circuit of the charging port of the internal wiring harness is shorted to each other.

- (a) Place the start button in the OFF position.
- (b) Disconnect the negative cable of battery.
- (c) Disconnect the harness connector of the on-board charger DCDC converter assembly.
- (d) Check the resistance between terminals with a multimeter.

Connection of high voltage insulation tester	Condition	Specified state
Terminals (LI) - Terminal (N)	Always	20 MΩ or higher.
Terminal (LI) - Terminal (Ground)	Always	20 MΩ or higher.
Terminal (N) - Terminal (Ground)	Always	20 MΩ or higher.



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- (e) Confirm whether the measured value conforms to the standard.

Abnormal → Replace the internal harness charge port (see) and go to Step 6

Normal

**5** Replace the on-board charger DCDC converter assembly

- (a) Replace the on-board charger DCDC converter assembly (see).
- (b) Confirm whether it is normal or not

Abnormal → Diagnose according to the output fault code

Normal

**6** Re-confirm the fault code

- (a) Connect the diagnostic tester and clear the fault code.
- (b) Operate the vehicle according to the specified procedure, and the operation mode must meet the conditions for corresponding fault diagnosis.
- (c) Read out the fault information and confirm that the fault has been eliminated.

Normal → Execute the test run and confirm that the fault has been eliminated

	Description	Possible cause of the failure
DTC	Charger PFC undervoltage fault	<ul style="list-style-type: none"> <li>• On-board charger DCDC converter assembly</li> </ul>
DTC	Charger PFC over-voltage fault	
DTC	SCI1 communication failure	
DTC	SCI2 communication failure	

Before performing the following procedure, verify that the battery voltage is not less than 12 V.

- Set the start button to "ON" position.
- Connect the diagnostic tester (with the latest software version).
- Start the vehicle, and read the DTC again. If a fault code is detected, refer to the fault code diagnostic procedure.
- If no DTCs are detected, the fault is intermittent.

**Note:**

When carrying out diagnosis and testing circuits, always refer to the circuit diagrams and component information for the specific circuit.

**1** Preliminary examination

- (a) Check whether the OBC DCDC converter assembly is damaged, deformed, smudged, loosened or otherwise.
- (b) Check the OBC DCDC converter assembly connector for signs of looseness, false connection, pin withdrawal, corrosion, etc.
- (c) Confirm whether the above checks are normal.

Abnormal → Repair or replace the faulty part

Normal

**2** Replace the on-board charger DCDC converter assembly

- (a) Replace the on-board charger DCDC converter assembly (see).
- (b) Confirm whether it is normal or not

Abnormal → Diagnose according to the output fault code

Normal

**3** Re-confirm the fault code

- (a) Connect the diagnostic tester and clear the fault code.
- (b) Operate the vehicle according to the specified procedure, and the operation mode must meet the conditions for corresponding fault diagnosis.
- (c) Read out the fault information and confirm that the fault has been eliminated.

Normal → Execute the test run and confirm that the fault has been eliminated

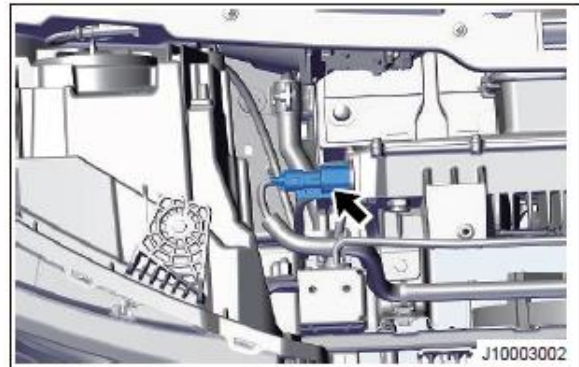
**On-board maintenance**

**Power battery assembly**

**Removal**

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Disconnect the negative cable of battery.
4. Remove the charging port.

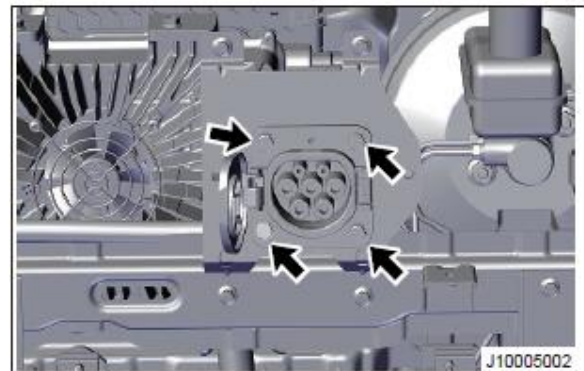
- a. Disconnect the charger connector (as shown by the arrow).



- b. Disconnect the loudspeaker plug-in (1) of the pedestrian warning system.



- c. Remove the 4 fixing bolts of the charging port (as shown by the arrow).



- d. Remove the charging port.

### Installation

1. The installation sequence is reverse to the removal.





## Electronic shifter

Electronic shifter	99	In state of motion:	99
Functional description	99	Troubleshooting:	99
Control strategy	99	On-board maintenance	100
In stationary state:	99	Gearshift module	100



## Electronic shifter

### Functional description

According to the shifter signal and the working condition of the complete vehicle, judge the various gears that should be in R/N/D.

### Control strategy

This shifter is a 360° rotation infinite structure (turn the D position to the right, the shifter will always send a D signal; turn R position to the left, the shifter will always send a R signal); After the KL15 is powered on, the shifter synchronizes with the VCU gear according to the VCU feedback signal. Logic state 1 (high level) indicates voltage:  $0.75 \times VCC(V_{batt} - 0.7)V$ , logic state 0 indicates voltage:  $\leq 1.75V$ , SW1/SW2/SW3 is shifter output coding signal (GSM provides high level and floating state, VCU default low level state), FB1/FB2 is VCU feedback signal (GSM default high level state, VCU provides low power and floating state), the output definition is shown in the following table:

Logical position	SW1	SW2	SW3	FB1	FB2
R gear	1	0	0	1	0
Gear N	0	1	0	0	0
D gear	0	0	1	0	1
Initialization	0	0	0	/	/

**Gear synchronization:** After KL15 is powered on, VCU must send a valid signal within 350 ms (TBD) (about 300 ms for normal wake-up of VCU). If GSM does not receive the gear signal of VCU after 350 ms, GSM will send it out in N gear by default. After the VCU sends out the gear normally, GSM will synchronize with the VCU gear according to the signal fed back by the VCU within 200 ms (VCU fault judgment time)

**Gearshift:** rotate the knob to shift the gear. If the dwell time exceeds 50 ms, a new gear request (coded signal) will be sent. If the feedback signal from VCU indicates that the target gear has been entered within 80 ms (TBD), the new gear signal will be output; if it's more than 80 ms, and the VCU does not shift, the shifter will still send the original gear signal.

#### In stationary state:

When the vehicle speed is in the range of  $-2 \text{ km/h (1 mph)} \leq V \leq 2 \text{ km/h (1 mph)}$ , the vehicle is considered to be stationary.

When the vehicle changes from the stationary state to the moving state, it is carried out according to the gear switching relationship of the moving state.

When the vehicle key is in the ON position, it does not respond to the N→R/D shift operation;

Note: the vehicle is stationary:

1. When the vehicle is in READY state and the charging cable connection signal is detected, the vehicle will be READY, and the gear will be processed as N gear, and the instrument and shifter will display N gear;
2. Turn OFF in non-N gear, and turn ON/READY again. The gear will be processed as N gear, and the instrument and shifter will display N.

#### In state of motion:

When the speed is not within the range of  $-2 \text{ km/h (1 mph)} \leq V \leq 2 \text{ km/h (1 mph)}$ , the vehicle is considered to be in motion.

When the vehicle changes from the moving state to the stationary state, follow the gear switching relationship of the stationary state.

Note: The vehicle is in motion:

1. When the charging cable connection signal is detected, keep the original gear unchanged, and the instrument and shifter will display the original gear.

#### Troubleshooting:


1. Abnormal power-on and power-off of GSM: After KL15 is powered on, abnormal power-on and power-off of GSM occurs, and VCU (in normal working state) does not receive the valid gear sent by GSM within 200 ms (TBD), then VCU judges GSM fault, and VCU maintains the current gear; After 200 ms, the VCU receives the valid gear from GSM again, and the VCU needs to eliminate the GSM fault.

2. Abnormal power-on and power-off of VCU (i.e. GSM does not receive VCU feedback signals): After KL15 is powered on, abnormal power-on and power off of VCU occurs, and GSM maintains the current gear until VCU sends out a gear, and GSM will synchronize with VCU gear;
3. Gear signal fault & timeout fault (more than 80 ms, GSM does not receive VCU feedback signal):
  - a. High-voltage state: when the gear is in D/R, keep the original gear unchanged (when the handbrake signal is detected or the driver's door is open and the gear is in D/R, perform zero torque processing);
  - b. Non-high voltage state: handle with N gear.

## On-board maintenance

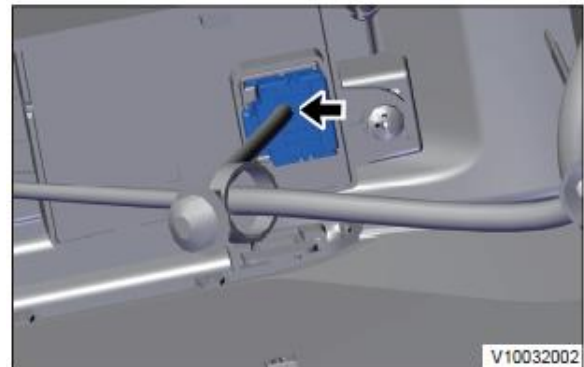
### Gearshift module

#### Removal

 Caution

- When removing the module, be sure to wear the labour protection articles to avoid accidents.
- When removing the module, pay attention to using the appropriate force and be careful when operating.

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Remove the console.
4. Disconnect the module connector (as shown by the arrow).



#### Installation

1. The installation sequence is reverse to the removal.

## Steering

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## Steering column

### General information

#### Electronic steering column

##### Operating principle

When the driver turns the steering wheel, the torque sensor installed on the steering column will detect the torque acting on the steering wheel and transmit it to the steering power assist control unit. According to the steering torque, vehicle speed (provided by the CAN line of the complete vehicle), steering wheel angle, steering wheel speed and other information as well as the characteristic curve stored in the control unit, the control unit calculates the necessary power assist torque and controls the motor to work according to a specific algorithm. The electric motor drives the column to provide steering power, thus driving the steering rack to work.

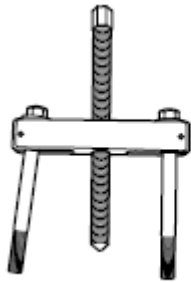


##### Specification

##### Torque specifications

Description	Torque
Steering wheel assembly fixing nut	30 ± 3 N·m (22±2 ft-lbs.)
Connecting fixing bolt of pipe column upper and lower bracket rain gauge cross beam	25 ± 3 N·m (18±2 ft-lbs.)
Yoke lock bolt	35 ± 3 N·m (26±2 ft-lbs.)
Bolt of intermediate shaft	35 ± 3 N·m (26±2 ft-lbs.)
Connecting bolt of steering wheel and column	35 ± 3 N·m (26±2 ft-lbs.)

**Tools**

**Special tools**

Tool name	Illustration
Steering wheel extractor	 <p>RCH001406</p>
One-inch fine-brush	 <p>SR0180002</p>
Ordinary syringe	 <p>SR0190002</p>

**Lubricated parts**

Lubricated parts	Model of grease
Steering column maintenance	FGR301-D-B1 Precise grease
	Runjie - premium grease
	Silicone grease
	Lithium-based grease
	Ordinary grease



## Diagnosis and test

### Table of fault symptoms

#### Note:

Use the following table in order to help diagnose the cause of the problem. Examine each suspect area in sequence. If necessary, repair or replace the faulty parts or make adjustments.

Symptoms	Suspicious parts
Excessive free play of steering wheel	The suspension or steering components are loose or worn
	Wear or looseness of front hub bearing
	Looseness of steering gear bracket
	Incorrect gear clearance
	Wear or looseness of the steering drive shaft
Side slip	Tire pressure
	Brake drag
	Wheel alignment error
	Wear or damage to steering column
	Steering or suspension components are loose or worn
Deviation	Tire pressure too high or too low
	Different degrees of tire wear (with diameter difference)
	Wheel alignment error

### Calibration and self-learning

#### EPS angle calibration and soft stop learning (for four-wheel alignment diagnostic tester off-line calibration)

1. Start up the vehicle;
2. Turn the steering wheel to the left and right for more than  $\pm 45^\circ$  at a speed of  $< 200^\circ/\text{s}$
3. Four-wheel alignment on the vehicle;
4. Turn off the vehicle and power it on again within 3 seconds (+15 on);
5. Fix the steering wheel horizontally;
6. Connect the diagnostic tester, enter the corner calibration interface and confirm the completion of calibration directly according to the prompts of the diagnostic tester;
7. The calibration is completed;
8. (After adjusting the four-wheel alignment) drive out of the four-wheel alignment station, turn the disc left and right to the limit position in situ and keep the manual force of not less than 10 N·m (7 ft-lbs.) for more than 1 S to ensure that it returns to the middle position after hitting the limit position;
9. The software completes the learning of soft stop.

#### Caution

Step ② If the steering speed of the second step is too fast or the steering angle is not enough, it cannot be calibrated; Step ④ If the fourth step is not re-energized within 3 seconds, it cannot be calibrated; Step ⑧ If the steering direction does not reach the limit position (turning to the impact position), it will lead to the advance of the first soft stop learning, leading to the stop of power assistance without turning to the limit position.

## Adjustment of toe-in and steering wheel rotation angle

### Note:

Because the manufacturing error affects the steering wheel alignment and steering performance, the following requirements are made for the four-wheel alignment toe-in and steering wheel alignment:

1. Before positioning the upper four wheels, first turn the steering wheel left and right, and manually adjust the steering wheel to the maximum left and right angle difference of no more than  $10^\circ$ .
2. Center the steering wheel, and install the aligner. The aligner indicates that the steering wheel angle is  $\leq 0.3^\circ$ .
3. According to the toe-in deviation measured by the instrument (front wheel toe-in:  $0^\circ \pm 5$  unilateral, subject to the suspension assembly adjustment book), adjust the tie rods on both sides of the steering gear, and tighten the tie rod lock nut after the adjustment is in place (the difference between the number of threads leaking from the left and right tie rods of the steering gear shall not be greater than 2; if it is greater than 2 threads, adjust the number of threads to the same, align the steering wheel again, and adjust the toe-in value again) to complete the front wheel toe-in adjustment,
4. Tighten the steering wheel mounting nut to  $35 \pm 3 \text{ N}\cdot\text{m}$  ( $26 \pm 2 \text{ ft}\cdot\text{lbs.}$ ).
5. Before the removal of steering wheel aligner, use special equipment to calibrate the zero position of steering angle sensor, and then clear the DTC of EPS module.

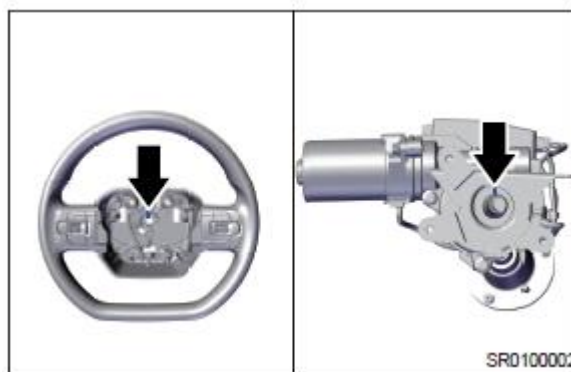
### ⚠ Caution

- The symmetry standard of the steering wheel is  $\pm 10^\circ$ . If the maximum left and right angles of the vehicle's steering wheel differ by more than  $10^\circ$  during the inspection, loosen the steering wheel nut, pull out the steering wheel and adjust it to within  $10^\circ$  of the maximum left and right angles, and then rework and adjust it according to steps 1 and 5.
- If the steering wheel needs to be disassembled or refitted for maintenance or other reasons, the four-wheel alignment and the zero position calibration of the steering angle sensor must be performed again.

## On-board maintenance

### Assembly of steering wheel and electric steering column

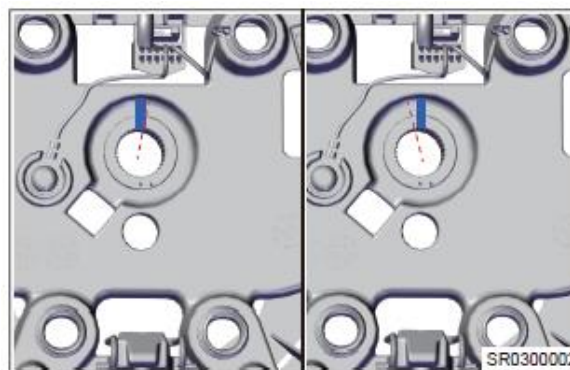
1. Align the steering wheel reticle mark with the column reticle mark for assembly, and then drive the steering wheel left and right to the limit position, and check the steering wheel angle. The error of the angle on both sides is required to be  $\leq 10^\circ$ . If the deviation is  $> 10^\circ$ , adjust one tooth and check.
2. Align the steering wheel marking with the column marking for assembly.



3. Turn the steering wheel left and right to the limit position, compare the difference of steering angle stroke.



4. If the visual error is within 10°-20°, pull out the steering wheel and turn it one tooth to the other side of the steering wheel mark.



### Note:

The scale of steering wheel and column can only assist in assembly, but cannot be used for final positioning. The final positioning shall be based on checking the left and right travel as the acceptance standard.

## Steering wheel assembly

### Removal

#### ⚠ Warning

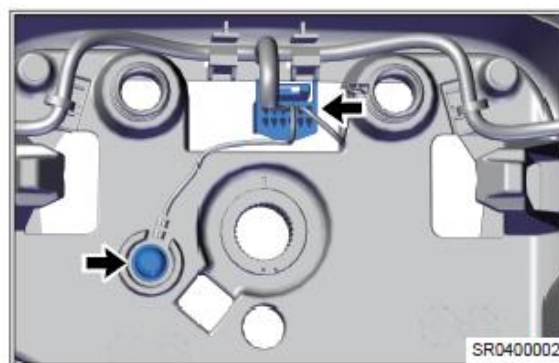
- Before removing the steering wheel, please read the precautions for SRS airbag.

1. Set the steering wheel to the straight-ahead position.
2. Turn off all electrical equipment and the start button.
3. Disconnect the negative cable of battery.

#### ⚠ Caution

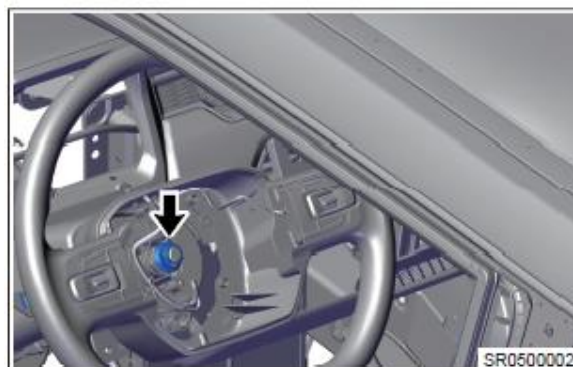
- After disconnecting the battery negative cable, wait at least 90 seconds to prevent the airbag and belt pretensioner from activating.

4. Remove the driver's airbag assembly
5. Remove the steering wheel assembly.
  - a. Disconnect the steering wheel function key connector and 1 fixing screw (as shown by the arrow).



- b. Fix the steering wheel assembly, and make assembly marks on the steering wheel assembly and steering column assembly, and then remove the steering wheel assembly fixing nut (as shown by the arrow).

Tightening torque: 35 ± 3 N·m (26±2 ft-lbs.)



- c. As shown in the figure, tighten the steering wheel remover with a wrench to loosen the connection between the steering wheel assembly and the steering column assembly.



- d. Remove the steering wheel assembly.

**⚠ Caution**

- Take out the steering wheel assembly carefully to avoid damaging the airbag connector and the loudspeaker connector on the spiral cable.

**Check**

1. Check the steering wheel assembly for damage or deformation, and if necessary, replace the steering wheel assembly.
2. Check the inner spline of steering wheel assembly for damage, and if necessary, replace the steering wheel assembly.

**Installation**

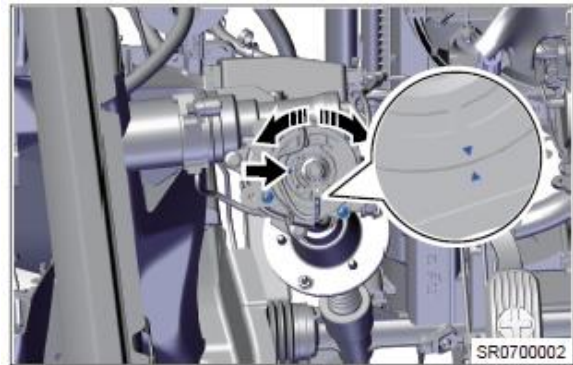
**⚠ Caution**

- Before installing the steering wheel assembly, check and make sure the front wheel is directly in front.
- After installing the steering wheel assembly, it needs to be calibrated for the corner sensor.

1. Adjust the spiral cable to the correct position (as shown by the arrow).

**Note:**

When realigning the center, turn the inner ring of the spiral cable clockwise to the end, and then rotate in the opposite direction to align, while the transparent neutral window appears a yellow ball. Failure to follow instructions will affect the normal operation of the airbag system and may cause injury to the driver.



2. Put the airbag connector, loudspeaker connector through the steering wheel assembly hole, and then connect to steering wheel shortcut key connector. Then align the steering wheel assembly with the assembly mark on the steering column assembly and install it.

3. Other installation steps are reverse to the removal steps.

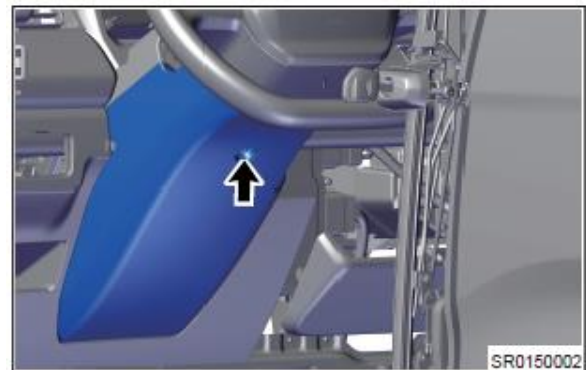
**⚠ Caution**

- Tighten the fixing nut of the steering wheel assembly to the specified torque.
- Install each connector in place.
- Check and confirm the airbag system operates normally after maintenance.

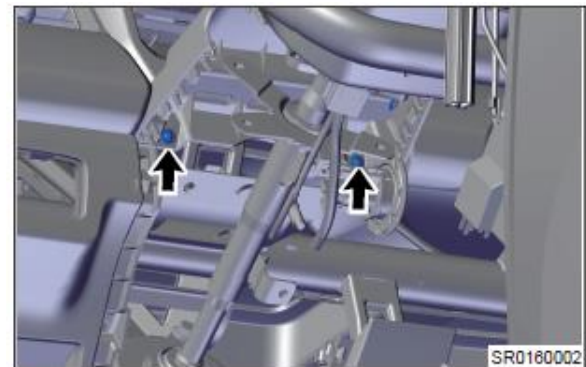
### Combination switch protective cover

#### Removal

1. Set the steering wheel to the straight-ahead position.
2. Turn off all electrical equipment and the start button.
3. Disconnect the negative cable of battery.
4. Remove the combination switch cover.
  - a. Remove the lower fixing screw of the combination switch cover (as shown by the arrow).
5. Take down the lower shield.



6. Remove the combination switch cover.
  - a. Remove 2 fixing screws (as shown by the arrow) of the combination switch upper cover.
7. Take down the upper shield.



**⚠ Caution**

- During disassembly, proceed with caution to prevent damage to the components.

#### Check

1. Check whether the upper and lower shields of combination switch are damaged or deformed, and replace them when necessary.
2. Check whether the clips of upper and lower shields are normal, and replace the upper and lower shields if necessary.

#### Installation

1. The installation steps are reverse to the removal.

**⚠ Caution**

- Tighten the self-tapping screw in place.
- During installation, be careful to avoid damaging parts.

## Steering column assembly

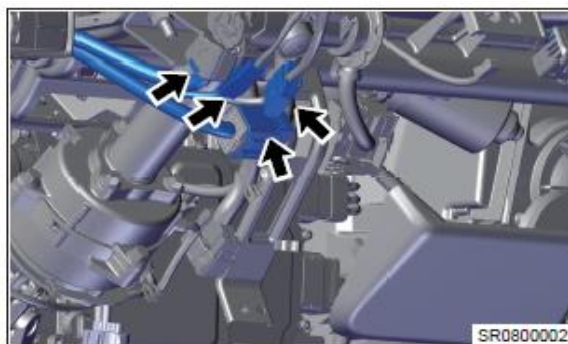
### Removal

#### ⚠ Caution

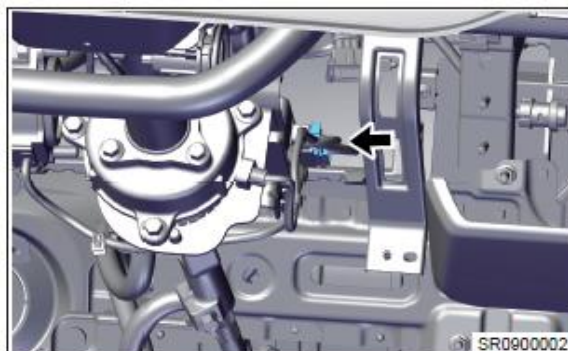
- Be sure to wear the necessary labour protection articles when repairing to avoid accidents.

1. Set the steering wheel to the straight-ahead position.
2. Turn off all electrical equipment and the start button.
3. Disconnect the negative cable of battery.
4. Remove the driver's airbag assembly
5. Remove the steering wheel assembly.
6. Remove the combination switch cover assembly.
7. Disassemble the spiral cable.
8. Remove the combination switch assembly.
9. Remove the left lower guard board assembly.
10. Remove the connecting bolts between steering column assembly and steering gear input shaft.
11. Remove the steering column & intermediate shaft assembly.

- a. Disconnect the connector (the arrow) of airbag and the steering switch on the steering column.



- b. Disconnect the connector of EPS (as shown by arrow).



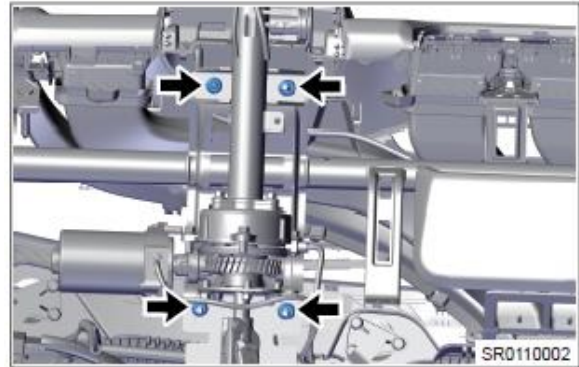
- c. Remove 1 fixing bolt (as shown by the arrow) of intermediate shaft.

Tightening torque:  $35 \pm 3 \text{ N}\cdot\text{m}$  ( $26 \pm 2 \text{ ft}\cdot\text{lbs.}$ )



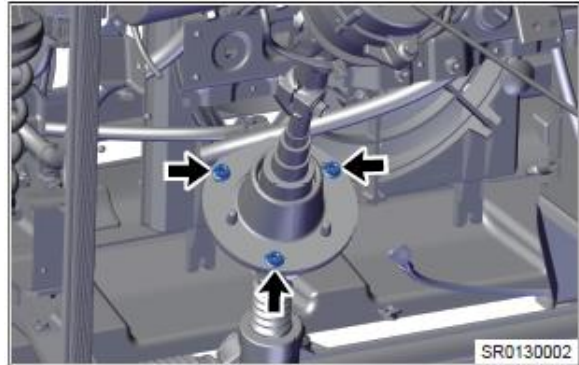
- d. Remove the four fixing bolts (as shown by the arrow) of the steering column and the instrument cross member.

Tightening torque:  $25 \pm 3$  N·m ( $18 \pm 2$  ft-lbs.)



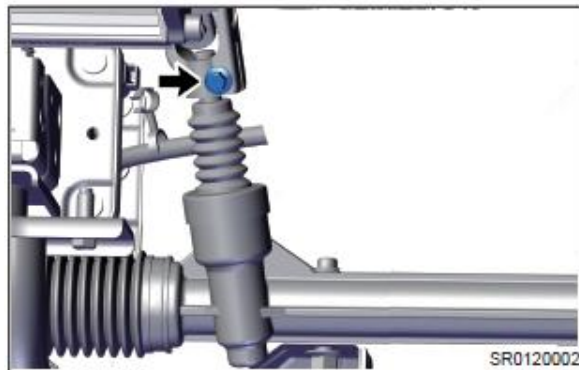
- e. Take out the steering column assembly.  
f. Remove the 3 fixing nuts of the column lower half shaft dust cover.

Tightening torque:  $7 \pm 1$  N·m ( $5 \pm 0.7$  ft-lbs.)



- g. Remove the 1 fixing bolt (as shown by the arrow) between the dust cover of the lower half shaft of the column and the yoke.

Tightening torque:  $35 \pm 3$  N·m ( $26 \pm 2$  ft-lbs.)



- h. Take out the lower half shaft of the column.

**⚠ Caution**

- Wear gloves during the entire removal process to prevent hands from directly contacting the pipe string that can cause rust.
- When taking the column, it is not allowed to take the handle position, but can take the column position; The tubular string shall not be bumped or hit during the process of taking, handling and assembling the pipe string to prevent the tubular string from collapse.
- Do not touch the interior trim when removing the steering column with the countershaft assembly, so as not to scratch the interior trim.

**Installation**

1. The installation sequence is reverse to the removal.

<p><b>⚠ Caution</b></p> <ul style="list-style-type: none"> <li>• Wear gloves during the entire assembly process to prevent hands from directly contacting the string that can cause rust.</li> <li>• When taking the column, it is not allowed to take the handle position, but can take the column position; The column shall not be bumped or hit during the process of taking, handling and assembling to prevent collapse of the column.</li> <li>• Before tightening the upper bracket bolts, do not loosen the column adjusting handle to prevent the bracket from overturning and being assembled in place.</li> <li>• After the column is assembled, the adjusting handle shall be locked, and shall not be opened to move to the subsequent station, so as to prevent personal injury or breakage of the handle due to collision with the handle during the operation.</li> <li>• Do not touch the interior trim when installing the steering column with the countershaft assembly, so as not to scratch the interior trim.</li> </ul>
--

2. After assembling, perform the calibration of motor position sensor.

**Maintenance of steering column**

**Normal care and maintenance**

**Removal**

<p><b>⚠ Caution</b></p> <ul style="list-style-type: none"> <li>• Be sure to wear the necessary labour protection articles when repairing to avoid accidents.</li> </ul>
---

1. First confirm the amount of grease at the lower lip of the dust cover, and grease at the lip cannot be seen by naked eyes.

Tightening torque: 7 ± 1 N·m (5±0.7 ft-lbs.)



2. For the dust cover with less grease, unscrew 3 hexagon flange nuts on the dust cover, and then move the dust cover to the lowest position of the shaft tube.



3. Use a clean cloth or towel to wipe the sundries on the axle tube, and there should be no water and impurities on the axle tube.



- Use a fine-bristle brush to evenly coat the exposed section of the shaft tube with grease (as much as possible).



- Then slowly rotate the dust cover upwards to the top of the axle tube, and then slowly rotate it downwards to make the inner hole of the dust cover and the axle tube be covered with grease.



### Installation

- The installation sequence is reverse to the removal.

### General maintenance methods

- 1 ordinary syringe (needle tube)
- Put a proper amount of grease into a plastic bag, and squeeze the grease into the prepared needle tube through the opening at the corner of the plastic bag (such as a cake decorating bags).



- The dust cover does not need to be removed. Pinch the mouth of the dust cover with your hand to expose an opening, insert the syringe head into the opening of the dust cover, rotate it around the lip of the dust cover for more than half a circle, inject grease into the dust cover while rotating, and inject as much grease as possible into the dust cover.



4. After applying the grease, hold the dust cover mouth by hand and rotate it and pull it up and down for several times, or rotate the steering wheel back and forth for 2 circles to evenly apply the grease on the dust cover lip to achieve the purpose of full grease.



## Steering

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## Electric Power Steering (EPS)

### General information

#### Description

This vehicle adopts the electronic steering system, which can reduce the working load of the driver when operating the steering wheel, improve the operation convenience and driving safety.

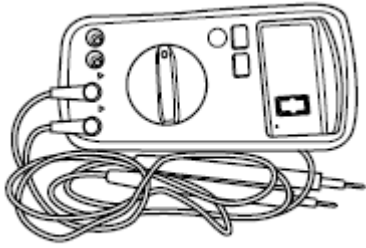
#### Fault Code (DTC) Table

DTC code	Definition of DTC
C113D1C	Abnormal power supply voltage of the torque sensor
C111F02	Torque auxiliary signal out of the design range
C112B02	Torque master signal out of the design range
C112C62	Mismatch between main and auxiliary torque signals
C110854	Rotation angle zero position is not calibrated
C11031C	The motor voltage is abnormal
C110319	The motor current is abnormal
C111307	Failure of booster motor drive circuit
C110306	The difference between actual current and target current of booster motor is too large.
C111D13	Failure of ECU relay
C110349	The controller signal conditioning circuit fails
U012187	ABS node loss
C113F54	Software calibration error - terminal not calibrated
C113781	Invalid steering angle value received
U007300	CAN bus offline
C100016	Low power voltage
C100017	High power voltage
C131400	Abnormal power supply of hella sensor
C131100	Loss of T1 signal
C131101	Abnormal T1 signal
C131500	Loss of T2 signal
C131501	Abnormal T2 signal
C131300	The sum of T1 and T2 is out of range by 100% ± 5%
C131200	Loss of P signal
C131201	Abnormal P-signal
C131202	Loss of S signal
C131203	Abnormal S-signal

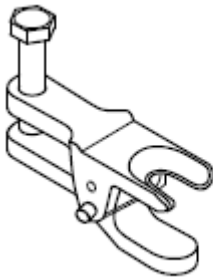
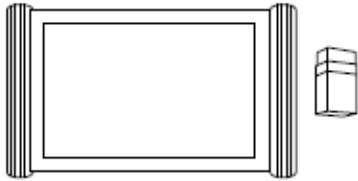
<b>DTC code</b>	<b>Definition of DTC</b>
C131204	Angle credibility too low (P/S signal mismatch)
C131205	Steering wheel angle beyond the theoretical range of travel
C131700	Angle not in the middle learning
C134100	Motor not connected
C134400	Fault of H-bridge peripheral circuit
C134401	Abnormal voltage sampling circuit of motor terminal
C134200	Motor current sampling circuit fault
C134300	Excessive motor current
C134500	Abnormal high-current output of the motor
C134501	Abnormal low-current output of the motor
C134600	Reverse power assist of motor
C135200	Relay adhesion
C135300	The relay cannot be closed
C135502	Power-on pre-charging fault
C135503	Calibration parameter integrity check error
C135504	Error in flash access
C135505	Motor current sampling neutral drift
C135506	Inconsistency between memory data and mirror data
C135100	Short circuit of H-axle drive
C135600	H-axle drive over-temperature
C135700	Undervoltage of H-axle drive
U180187	Ready signal message \$ lost
U180181	Ready signal message \$ invalid
U120287	Vehicle speed signal message \$ lost
U120281	Vehicle speed signal message \$ invalid
C135508	Excessive temperature of ECU

## Tools

## General tools

Tool name	Illustration
Digital multimeter	 <p style="text-align: right;">002</p>

## Special tools

Tool name	Illustration
Ball-pin separator	 <p style="text-align: right;">RCH0024006</p>
X-431 PAD diagnostic instrument	 <p style="text-align: right;">001</p>

## On-board maintenance

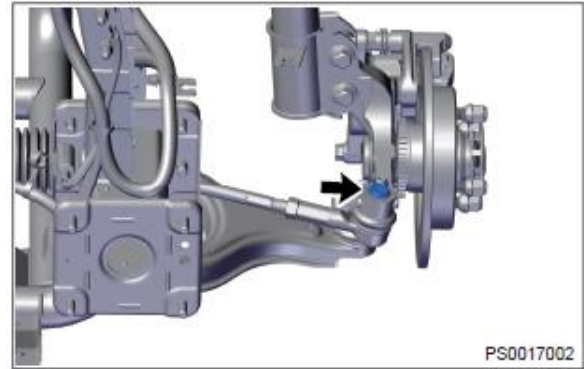
## Ball pin assembly

## Removal

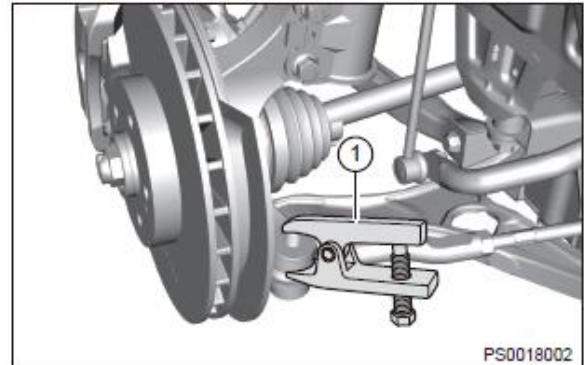
1. Set the steering wheel to the straight-ahead position.
2. Turn off all electrical equipment and the start button.
3. Disconnect the negative cable of battery.
4. Remove the left front wheel.
5. Remove the ball pin assembly.

## Steering

- a. Remove the left steering tie rod ball pin assembly and the left front steering knuckle assembly lock nut (as shown by the arrow).  
Tightening torque:  $45 \pm 5 \text{ N}\cdot\text{m}$  ( $33 \pm 4 \text{ ft}\cdot\text{lbs.}$ )



- b. Install the ball pin separator (1) and separate the steering tie rod ball pin from the steering knuckle assembly.



- c. Take down the ball pin assembly.

### Check

1. Check whether the tie rod ball pin is loose. If necessary, replace the ball stud assembly.
2. Check whether the rubber sleeve of tie rod ball pin is damaged. If damaged, replace the ball stud assembly.

### Installation

1. The installation sequence is reverse to the removal sequence

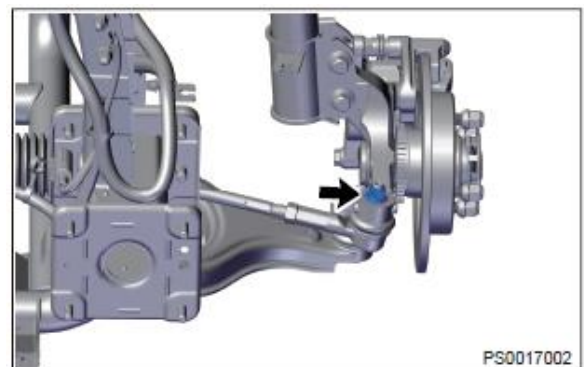
#### ⚠ Caution

- After installing the tie rod ball pin assembly, perform the wheel alignment procedure.

## Steering gear assembly

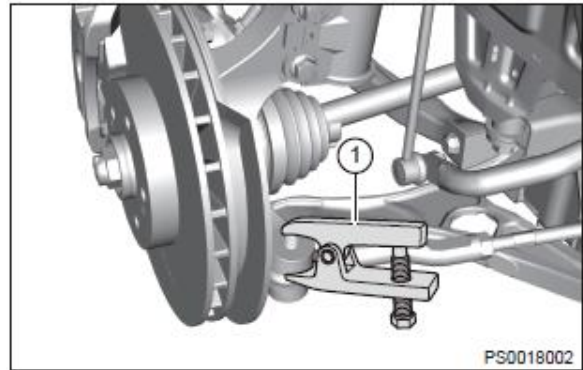
### Removal

1. Place the front wheel in the straight-ahead position.
2. Turn off all electrical equipment and the start button.
3. Disconnect the negative cable of battery.
4. Remove the left and right front wheels.
5. Remove the tie rod ball pin.
  - a. Remove the connecting nut between the left steering tie rod ball pin assembly and the left front steering knuckle assembly (as shown by the arrowhead).  
Tightening torque:  $45 \pm 5 \text{ N}\cdot\text{m}$  ( $33 \pm 4 \text{ ft}\cdot\text{lbs.}$ )



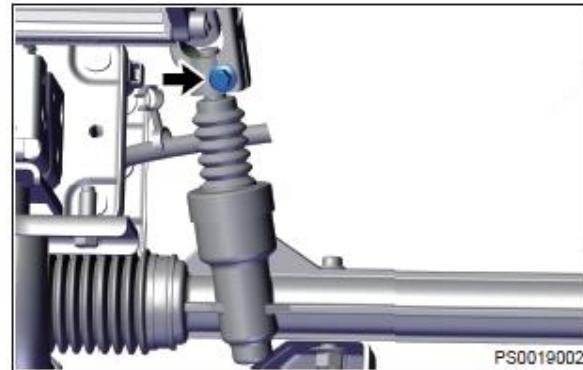


- b. Install the ball pin separator (1) and separate the steering tie rod ball pin from the steering knuckle assembly.



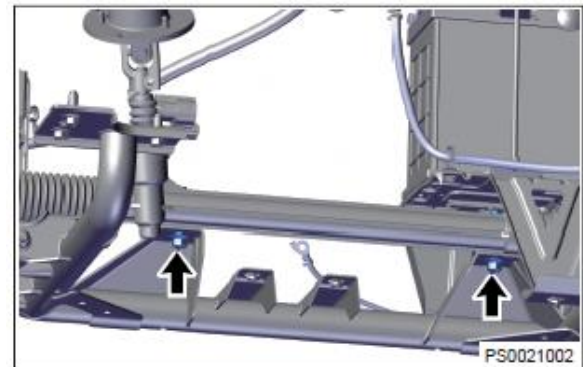
6. Remove the connecting bolt between steering column & intermediate shaft assembly and steering gear input shaft (as shown by the arrow).

Tightening torque:  $49 \pm 3 \text{ N}\cdot\text{m}$  ( $36 \pm 2 \text{ ft}\cdot\text{lbs.}$ )



7. Remove the two fixing bolts (arrows) fixing the steering gear assembly on the subframe. (Refer to "Suspension" for removal and refitting the subframe)

Tightening torque:  $125 + 10 \text{ N}\cdot\text{m}$  ( $92 \pm 7 \text{ ft}\cdot\text{lbs.}$ )



8. Remove the steering gear assembly.

### Check

1. Check whether the steering gear dust cover is damaged and whether the clamp is loose. If necessary, it must be replaced, otherwise it is easy to allow water and dust to enter and cause premature damage to the parts.
2. Check if the steering gear is damaged. If necessary, replace the steering gear assembly.

### Installation

1. The installation sequence is reverse to the removal.

#### Caution

- The assembly must be reliable when installing the connecting bolts between the lower universal joint of the steering column and the steering gear input shaft.
- After the steering gear assembly is installed, perform the front wheel alignment procedure.



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## Chassis

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Specification	125	Rear axle assembly	130
Torque specifications	125		



## Axle

### Warnings and precautions

#### Warnings

1. Please wear the necessary labour protection articles to avoid accidents.
2. Please pay attention to whether the safety lock of the hoist is locked when repairing chassis parts.

#### Notes

1. It is not allowed to weld and straighten the bearing parts of the wheel suspension and the guide parts of the wheel.
2. Be sure to replace the self-locking nut and rusted nut when removing the chassis parts to ensure the safety.

### Specification

#### Torque specifications

Description	Torque
Connecting bolt of front subframe welding assembly and body system	70 ±5 N·m (52±4 ft-lbs.)
Connecting bolts and nuts of front shock absorber assembly and front steering knuckle assembly	125±10 N·m (92±7 ft-lbs.)
Connecting nut of front shock absorber assembly and body system	25 ± 3 N·m (18±2 ft-lbs.)
Connecting bolt of front tie rod assembly and front subframe welding assembly	45± 5 N·m (33±4 ft-lbs.)
Connecting bolt and nut of front lower control arm assembly and front steering knuckle	70 ± 5 N·m (52±4 ft-lbs.)
Connecting bolt of rear subframe assembly and body system	125 ± 10 N·m (92±7 ft-lbs.)
Connecting bolts and nuts of rear trailing arm assembly with rear axle	125 ± 10 N·m (92±7 ft-lbs.)
Connecting bolts and nuts of rear trailing arm assembly with body system	125 ± 10 N·m (92±7 ft-lbs.)
Connecting bolt of rear shock absorber assembly and rear axle	85 ± 5 N·m (63±4 ft-lbs.)
Rear shock absorber assembly and connecting bolt of body system	125 ± 10 N·m (92±7 ft-lbs.)
Rod assembly and connecting bolt of body system	125 ± 10 N·m (92±7 ft-lbs.)

### On-board maintenance

#### Front steering knuckle

##### Removal

##### Note:

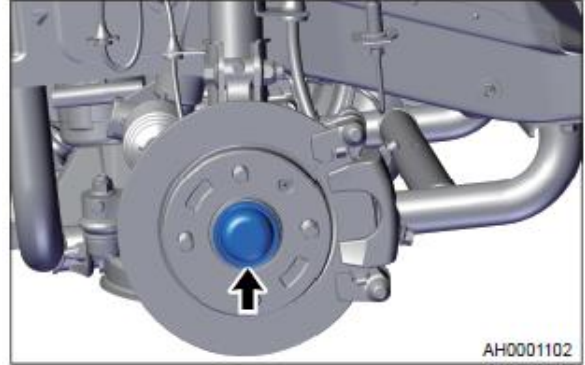
- The procedure for the right side is the same as for the left side.
- The following is the operating procedure for the left side.

##### Caution

- Please wear the necessary labour protection articles to avoid accidents.

- Check if the safety lock of the lifter is locked during service for chassis.
- Do not weld or calibrate the load-bearing parts of the wheel suspension and the guide parts of the wheel.
- When removing the chassis components, be sure to replace the self-locking nuts and rusted nuts to ensure safety.

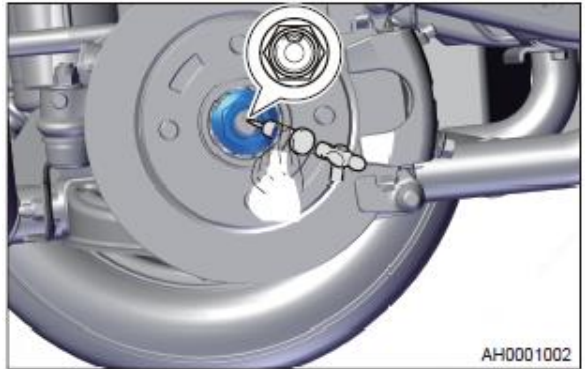
1. Turn off all electrical equipment and the start button.
2. Remove the left front wheel.
3. Remove the steering knuckle lock nut.
  - a. Use a tool to pry open the front cover of the front steering knuckle (as shown by the arrow)



- b. Use a nut punch and a hammer to loosen the locked part of the nut.

**Note:**

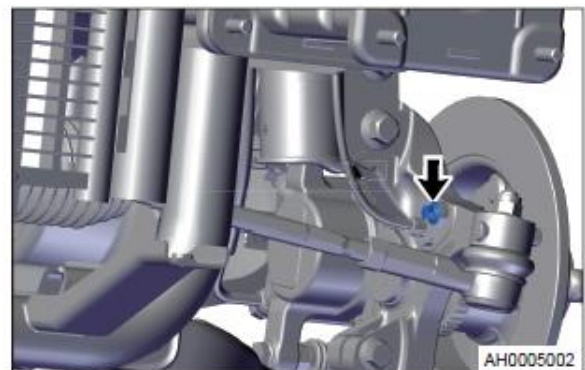
- Loosen the locking part of the nut completely; otherwise, the thread of the half shaft assembly will be damaged.



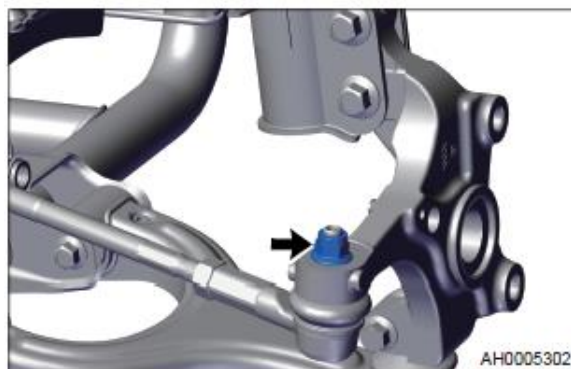
- c. While applying the brake firmly, remove the front axle half shaft assembly lock nut and gasket (as shown by the arrow).



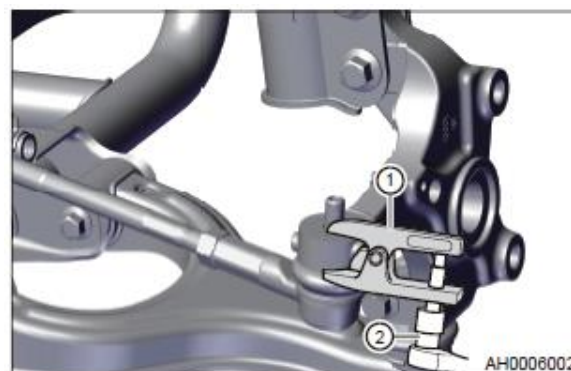
4. Remove the left front brake caliper assembly.
5. Remove the left front disc brake.
6. Remove the left front steering knuckle assembly.
  - a. Remove the connecting bolts (as shown by the arrow) between the left front wheel speed transducer and the left front steering knuckle assembly, and carefully disconnect the left front wheel speed transducer assembly.



- b. Remove the self-locking nut (as shown by the arrow) between the left steering tie rod assembly ball pin and the left front steering knuckle.



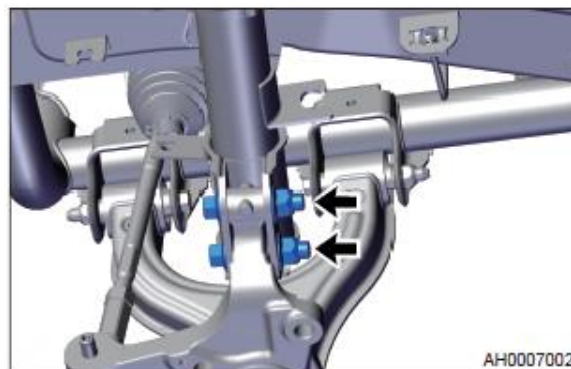
- c. Install the ball pin separator (1), and tighten the bolt of the ball pin separator with the wrench (2) to separate the steering tie rod ball pin from the steering knuckle.



- d. Remove the connecting bolt and nut between the left front control arm assembly ball pin and the left front steering knuckle assembly (as shown by the arrow).



- e. Remove 2 connecting bolts and nuts (as shown by the arrow) between the left front shock absorber assembly and the left front steering knuckle.



- f. Remove the left front steering knuckle assembly.

### Installation

1. The installation sequence is reverse to the removal.

#### ⚠ Caution

- Be sure to tighten the connecting bolts and nuts to the specified torque
- After installation, check the wheel alignment, and adjust the wheel alignment to the standard range if necessary.

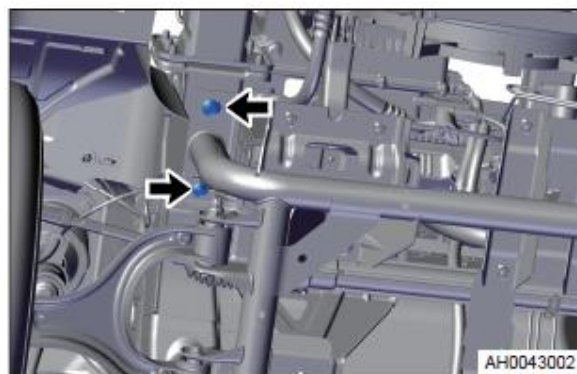
## Front subframe assembly

### Removal

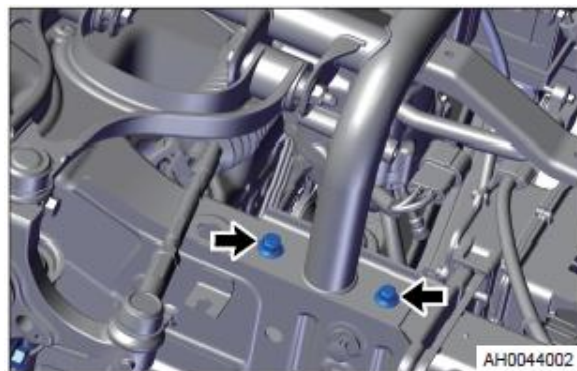
#### ⚠ Caution

- Please wear the necessary labour protection articles to avoid accidents.
- Check if the safety lock of the lifter is locked during service for chassis.
- Do not weld or calibrate the load-bearing parts of the wheel suspension and the guide parts of the wheel.
- When removing the chassis components, be sure to replace the self-locking nuts and rusted nuts to ensure safety.

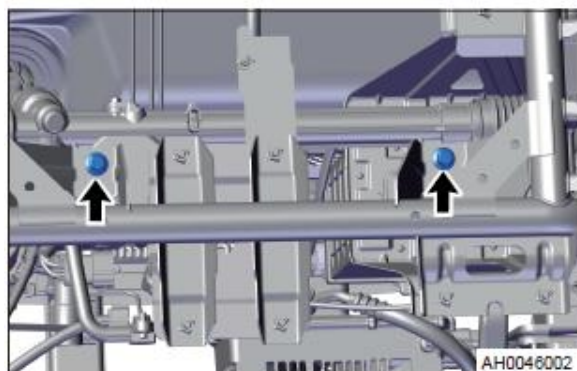
1. Remove the front wheel.
2. Remove the connecting bolts between A/C pump bracket and subframe.
3. Remove the connecting bolts between battery bracket and subframe.
4. Remove the left and right control arm assembly referring to suspension system.
5. Remove the front subframe welding assembly.
  - a. Securely support with a pallet jack.
  - b. Remove the 2 fixing bolts (as shown by the arrow) connecting the left front end of the subframe bracket and the body system



- c. Remove 2 fixing bolts (as shown by the arrow) connecting the right front end of the subframe bracket and the body system



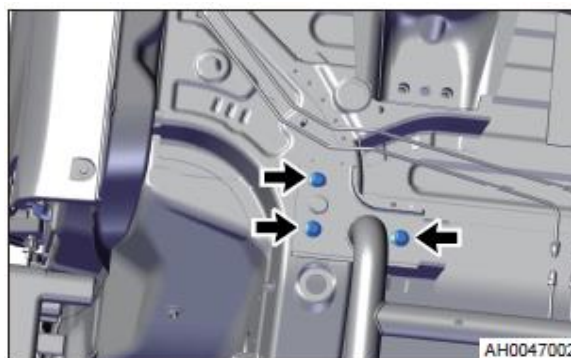
- d. Remove the tow connecting bolts (as shown by the arrow) of the front subframe welding assembly and the steering gear assembly.



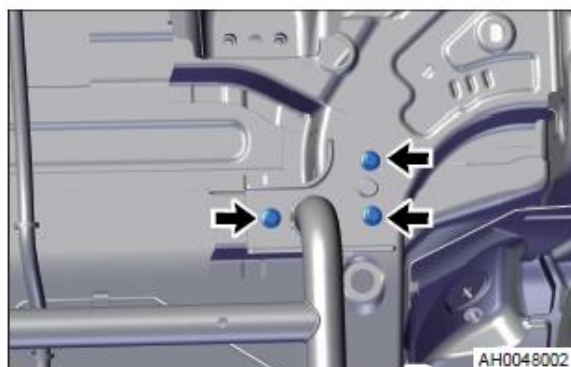




- e. Remove the 3 fixing bolts (as shown by the arrow) connecting the left rear end of subframe and the body system



- f. Remove the 3 fixing bolts (as shown by the arrow) connecting the right rear end of subframe with the body system.



- g. Remove the front subframe welding assembly.

### Installation

1. The installation sequence is reverse to the removal.

#### ⚠ Caution

- Be sure to tighten the connecting bolts and nuts to the specified torque
- After installation, check the wheel alignment. If necessary, adjust the wheel alignment to the standard range if necessary.

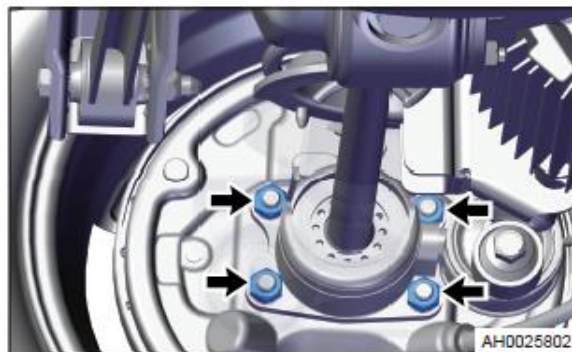
### Rear wheel hub bearing assy

#### Removal

Note:

- The procedure for the right side is the same as for the left side.
  - The following is the operating procedure for the left side.
1. Turn off all electrical equipment and the start button.
  2. Disconnect the negative cable of the battery.
  3. Drain the gear oil.
  4. Remove the left rear wheel.
  5. Remove the left rear disc brake.
  6. Remove the left rear brake lining.
  7. Remove the left rear bearing assembly.

- a. Remove 4 fixing bolts (as shown by the arrow) from the rear brake bottom plate and rear axle assembly.



- b. Extract the half shaft assembly.
- c. Remove the rear bearing assembly.

### Installation

1. The installation sequence is reverse to the removal.

#### ⚠ Caution

- Be sure to tighten the bolts to the specified torque

### Rear axle assembly

#### Removal

#### ⚠ Caution

- Please wear the necessary labour protection articles to avoid accidents.
- Please check if safety lock of the lifter is locked during the chassis repair.
- Do not weld or calibrate the load-bearing parts of the wheel suspension and the guide parts of the wheel.
- When removing the chassis components, be sure to replace the self-locking nuts and rusted nuts to ensure safety.

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Drain out the gear oil.
4. Remove the rear wheel.
5. Remove the rear disc brake.
6. Remove the rear wheel hub shaft assembly.
7. Remove the rear drive motor.
8. Remove the tie rod assembly.
9. Remove the rear shock absorber assembly.
10. Remove the rear axle assembly.
  - a. Install a pallet jack and support the rear axle.
  - b. Slowly lower the pallet jack and remove the rear coil spring and the rear coil spring cushion.
  - c. Remove the rear axle assembly.

### Installation

1. The installation sequence is reverse to the removal.

#### ⚠ Caution

- Be sure to tighten the bolts to the specified torque
- After refitting, bounce the vehicle up and down for several times to stabilize the rear suspension
- After installation, check the wheel alignment, and adjust the wheel alignment to the standard range if necessary.

## Chassis

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## Suspension

### Warnings and precautions

#### Warnings

1. Please wear the necessary labour protection articles to avoid accidents.
2. When removing and installing chassis parts, make sure that the safety lock of the lift is locked.
3. Welding or trimming of load-carrying parts and guide parts of suspension is prohibited.

#### Notes

1. When removing and installing chassis parts, replace the self-locking nuts and corroded and rusted nuts to ensure vehicle safety.
2. Operate carefully while removing and installing the coil spring to avoid personal injury from the spring ejection.

### Specification

#### Torque specifications

Description	Torque
Connecting bolt of front subframe welding assembly and body system	70 ± 5 N·m (52±4 ft-lbs.)
Connecting bolts and nuts of front strut assembly and front steering knuckle assembly	125±10 N·m (92±7 ft-lbs.)
Connecting nuts of front strut assembly and body system	25 ± 3 N·m (18±2 ft-lbs.)
Connecting bolt of front tie rod assembly and front subframe welding assembly	45± 5 N·m (33±4 ft-lbs.)
Connecting bolt and nut of front lower control arm assembly and front steering knuckle	70 ± 5 N·m (52±4 ft-lbs.)
Connecting bolt of rear subframe assembly and body system	125 ± 10 N·m (92±7 ft-lbs.)
Connecting bolts and nuts of rear trailing arm assembly with rear axle	125 ± 10 N·m (92±7 ft-lbs.)
Connecting bolts and nuts of rear trailing arm assembly with body system	125 ± 10 N·m (92±7 ft-lbs.)
Connecting bolt of rear shock absorber assembly and rear axle	85 ± 5 N·m (63±4 ft-lbs.)
Rear shock absorber assembly and connecting bolt of body system	85 ± 10 N·m (63±7 ft-lbs.)
Rod assembly and connecting bolt of body system	125 ± 10 N·m (92±7 ft-lbs.)

## On-board maintenance

### Front strut assembly

#### Check

1. Check the front strut assembly.
  - a. Park the vehicle in a stable place, bounce the vehicle up and down, and check whether the vehicle sways up and down when the body system bounces. Continuing rocking it up and down, the strut assembly may be damaged and should be replaced,
2. Check the front strut assembly for leakage.
  - a. Due to the frequent operation of the strut assembly during the operation of the vehicle, the shock absorber the oil to form oil gas and adhere to the dust cover due to the increase of temperature. This phenomenon is normal, and it is not necessary to replace the shock absorber assembly.
  - b. The shock absorber itself is designed to have a very small oil film on the surface of the piston rod. These oil films will be scraped off by the dustproof sheet on the shock absorber oil seal during the compression of the shock absorber. At the same time, a very small amount of oil will accumulate on the upper part of the oil seal. Because of its high permeability, the oil accumulated in the upper part of the oil seal slowly diffuses from the upper part of the shock absorber to the lower part, forming a thin oil film. In the event that:
    - The oil film is between the dust cover and the spring seat.
    - The circumferential oil stains shown are relatively even.

The above conditions are oil stains formed by volatilization, which can be judged as slight oil leakage, which is a normal phenomenon. It is not necessary to replace the shock absorber assembly.

- c. In the event that:
  - The circumferential oil stains are uneven.
  - The oil trace reaches the lower connection position.

The above conditions indicate that the shock absorber assembly has oil leakage, and it should be replaced.
- d. If it is impossible to accurately determine whether the shock absorber assembly leaks oil from the appearance. Carry out a test drive by wiping the surface of the shock absorber in question clean of any oil. Drive the vehicle under normal road conditions for 5 to 10 minutes and check it. If any oil stains are found on the surface of the shock absorber assembly, it indicates that there is oil leakage and should be replaced.

#### Removal

##### Note:

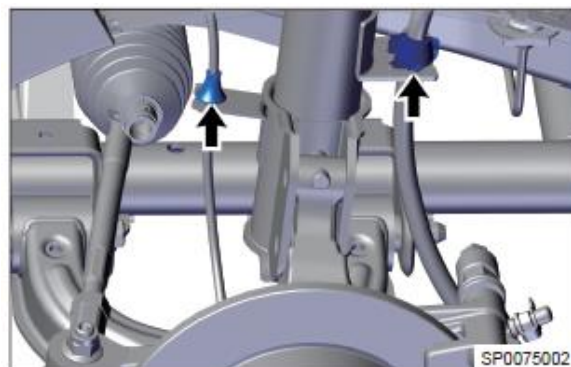
- The procedure for the right side is the same as for the left side.
- The following is the operating procedure for the left side.

##### Warning

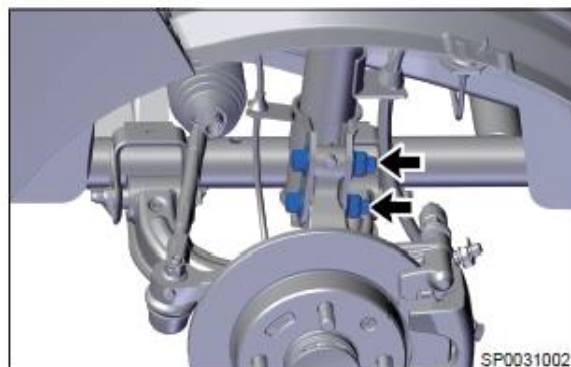
- Please wear the necessary labour protection articles to avoid accidents.
- When removing and refitting chassis components, make sure that the safety lock of the lift is locked.
- Do not weld or trim the load parts and guide parts of the suspension.
- When removing and installing chassis parts, be sure to replace the self-locking nuts and corroded and rusty nuts to ensure vehicle safety.
- Operate carefully while removing and installing the coil spring to avoid personal injury from the spring ejection.

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Remove the left front wheel.
4. Remove the left front strut assembly.

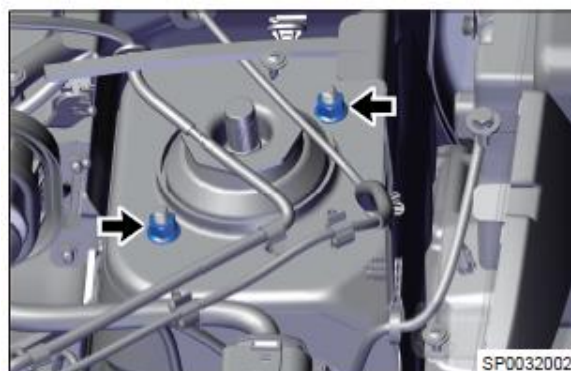
- a. Disconnect the left front wheel speed transducer harness (as shown by the arrow) and left front brake hose assembly (as shown by the arrow) from the left front strut assembly.



- b. Remove 2 connecting bolts and nuts (arrows) between the left front sliding column assembly and the left front steering knuckle assembly.



- c. Remove the two connecting bolts (as shown by the arrow) of front strut assembly and body system.



- d. Unscrew the front strut assembly.

## Disassembly

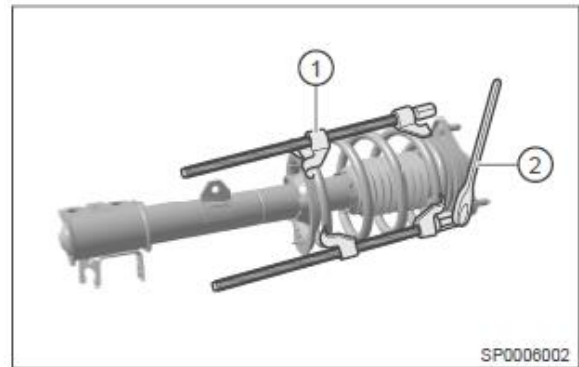
### Note:

- The procedure for the right side is the same as for the left side.
  - The following is the operating procedure for the left side.
1. Remove the front shock absorber cap.
    - a. Remove the front shock absorber cover cap from the left front shock absorber assembly (as shown by the arrow).



2. Remove front shock absorber assembly lock nut.

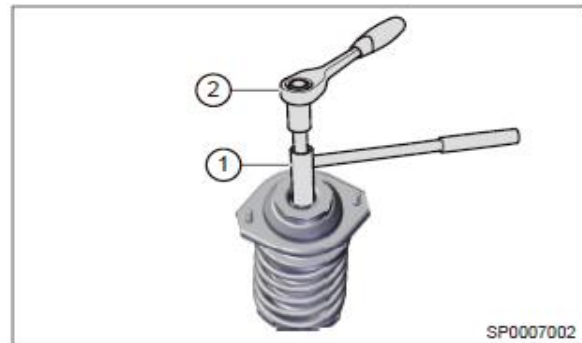
- a. Install the spring compressor (I), and tighten the end studs of the spring compressor with the wrench (II) to compress the front coil spring.



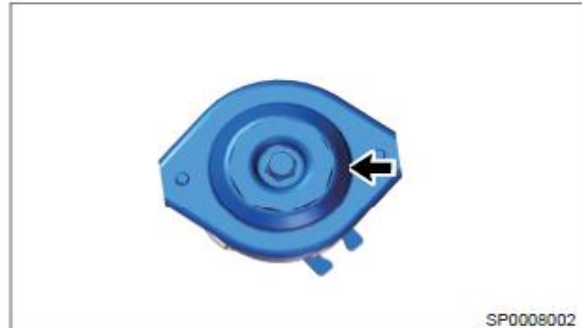
**⚠ Warning**

- When removing the front coil spring, compress the spring to the extent that the lock nut can rotate, and do not overcompress the spring to avoid causing spring damage and personal injury.

- b. Use the shock absorber nut extractor (1) to fix the left front shock absorber assembly rod end, and then use the wrench (2) to remove the left front shock absorber assembly locking nut.



3. Remove the front strut upper connecting plate & vibration isolator assembly.
  - a. Remove the front strut upper connecting plate & vibration isolator assembly from the upper part of the left front shock absorber assembly (as shown by the arrow).



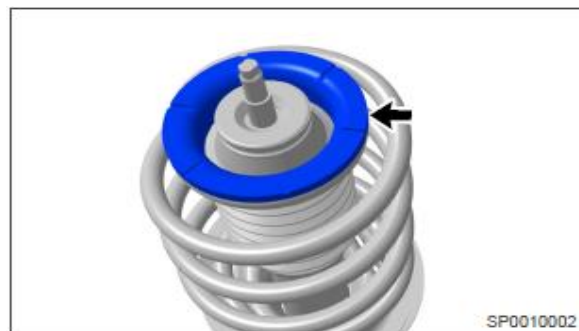
4. Remove the bearing assembly.
  - a. Remove the bearing assembly from the upper part of the left front shock absorber assembly (as shown by the arrow).



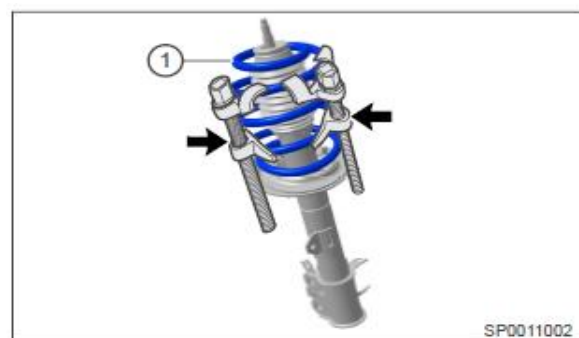
5. Remove the front spring upper tray.



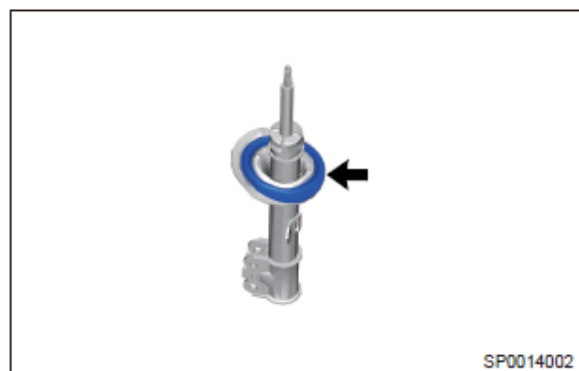
- a. Remove the front spring upper tray from the upper part of the left front shock absorber assembly (as shown by the arrow).



6. Remove the front coil spring.
  - a. Remove the front coil spring (1) with spring compressor (as shown by the arrow) from the left front shock absorber assembly



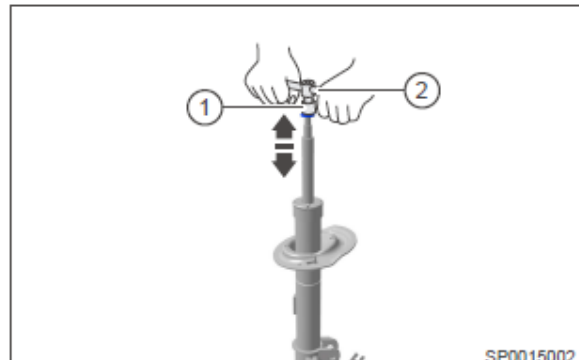
- b. Loosen the spring compressor slowly, and carefully remove the front coil spring.
7. Remove the front dust cover.
  - a. Remove the front dust cover from the upper part of the left front shock absorber assembly
8. Remove the front buffer block.
  - a. Disconnect the front buffer block from the left front shock absorber assembly and remove it.
9. Remove the front spring lower cushion.
  - a. Remove the front spring lower cushion (as shown by the arrow) from the lower end of left front shock absorber assembly strut.



### Check

1. Check the front shock absorber assembly.

#### Manual check

- a. First install the lock nut (1) on the upper end of front shock absorber assembly strut, and then install the T-type wrench (2) or similar tool.
 

SP0015002
- b. Compress and extend the front shock absorber assembly strut for several times in the direction indicated by the arrow in the figure. Check and confirm that there is no abnormal resistance or abnormal sound during operation. If there is any abnormality, replace the front shock absorber assembly with a new one.
2. Check other parts of front shock absorber assembly.

- a. Check whether the front shock absorber cap, front spring upper cushion, front dust cover, front buffer block and front spring lower cushion are cracked, worn or deformed. Replace it if necessary.
- b. Check the front coil spring for wear, fracture and deformation. Replace it if necessary.

**Assembling**

1. Reassembly is in the reverse order of disassembly.

## Installation

1. The installation sequence is reverse to the removal.

### ⚠ Caution

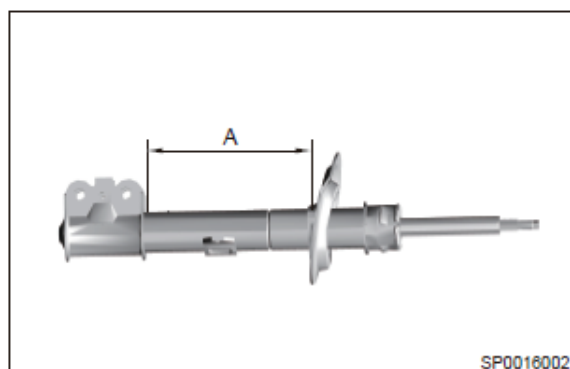
- Be sure to tighten the connecting bolt and nut to the specified torque.
- After installation, check the wheel alignment. If necessary, adjust the wheel alignment to the standard range if necessary.

## Scrapping

### ⚠ Warning

- The shock absorber assembly is filled with nitrogen gas and oil under high pressure. Before handling, make sure to wear goggles to relieve the pressure inside the shock absorber assembly to avoid personal injury.

1. Scrap the front shock absorber assembly.
  - a. Fully extend the front shock absorber assembly strut, and tilt it into the bench vise
  - b. Use a drill bit or similar tool to slowly drill holes in area A as shown in the figure to exhaust the air in the front shock absorber assembly.



SP0016002

### ⚠ Warning

- The exhaust gas from the shock absorber is colorless and harmless, but be careful when drilling, there may be iron filings flying out.

- c. Dispose of the front shock absorber assembly properly after exhausting the air

### Note:

Please recycle the scrapped front and shock absorber assembly according to the local environmental regulations.

## Front control arm assembly

### Removal

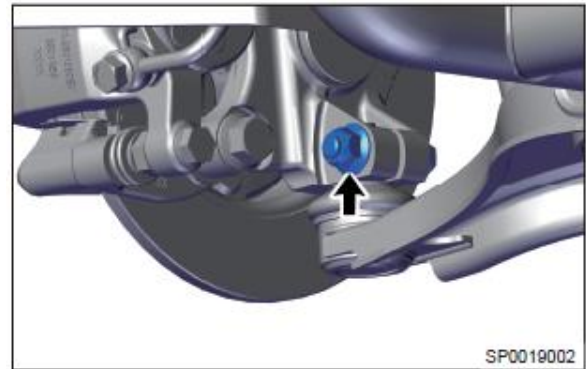
### ⚠ Warning

- Please wear the necessary labour protection articles to avoid accidents.
- Check if the safety lock of the lifter is locked during service for chassis.
- Do not weld or trim the load parts and guide parts of the suspension.
- When removing the chassis components, be sure to replace the self-locking nuts and rusted nuts to ensure safety.

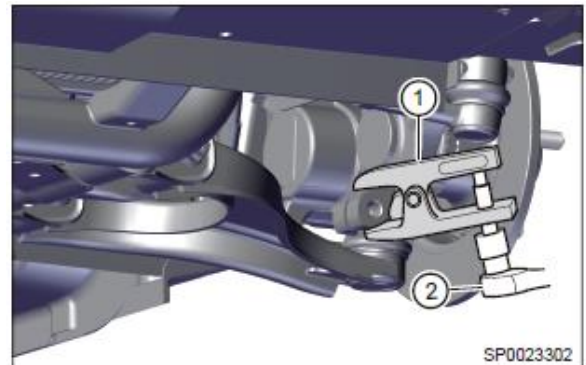
### Note:

- The procedure for the right side is the same as for the left side.
- The following is the operating procedure for the left side.
  1. Remove the left front wheel.
  2. Remove the left front control arm assembly.

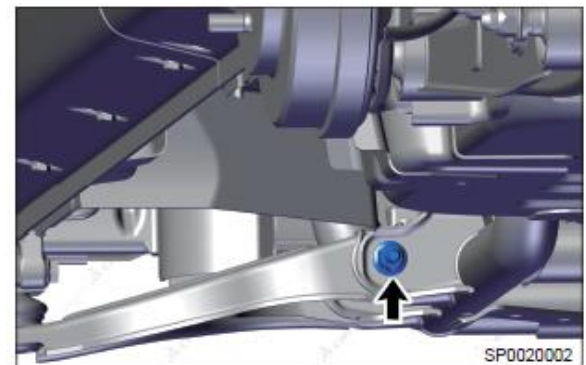
- a. Remove the connecting bolt and nut between the left front control arm assembly ball pin and the left front steering knuckle assembly (as shown by the arrow).



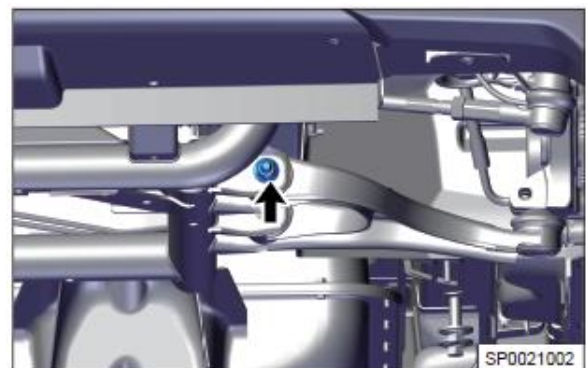
- b. Use the ball joint release tool (1) to turn the wrench (2) to separate the front control arm ball pin from the steering knuckle.



- c. Remove the connecting bolt (as shown by the arrow) between the front part of left front control arm assembly and front subframe welding assembly.



- d. Remove the connecting bolt (as shown by the arrow) and nut between the rear part of the left front control arm assembly and the front subframe welding assembly.



- e. Remove the left front control arm assembly with ball stud.

### Installation

1. The installation sequence is reverse to the removal.

#### ⚠ Caution

- Be sure to tighten the connecting bolts and nuts to the specified torque
- Ensure the ball pin assembly moves freely without seizure after installation.
- After installation, check the wheel alignment. If necessary, adjust the wheel alignment to the standard range if necessary.

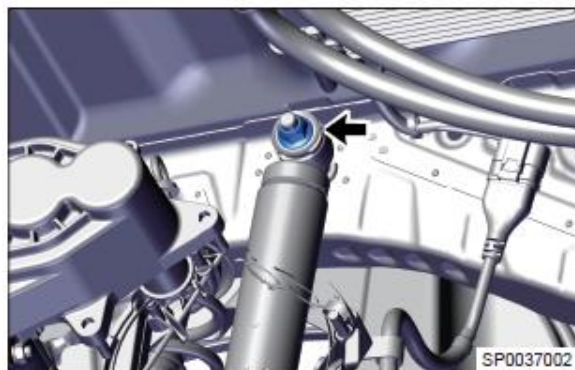
## Rear shock absorber assembly

### Removal

#### ⚠ Caution

- Please wear the necessary labour protection articles to avoid accidents.
- Check if the safety lock of the lifter is locked during service for chassis.
- Do not weld or trim the load parts and guide parts of the suspension.
- When removing the chassis components, be sure to replace the self-locking nuts and rusted nuts to ensure safety.

1. Remove the left rear wheel.
2. Remove the left rear shock absorber assembly.
  - a. Remove a connecting nut (as shown by the arrow) between the lifting ring bushing on the left rear shock absorber assembly and the body system.



- b. Remove the connecting bolt (as shown by the arrow) between the lower ring bushing of the left rear shock absorber assembly and the rear axle.



- c. Remove the left rear shock absorber assembly.

### Assembling

1. Reassembly is in the reverse order of disassembly.

### Installation

1. The installation sequence is reverse to the removal.

#### ⚠ Caution

- Be sure to tighten the connecting bolts and nuts to the specified torque
- After refitting, bounce the vehicle up and down for several times to stabilize the rear suspension

## Rear helical spring

### Removal

#### Note:

- The procedure for the right side is the same as for the left side.
- The following is the operating procedure for the left side.

**⚠ Caution**

- Please wear the necessary labour protection articles to avoid accidents.
- Check if the safety lock of the lifter is locked during service for chassis.
- Do not weld or trim the load parts and guide parts of the suspension.
- When removing the chassis components, be sure to replace the self-locking nuts and rusted nuts to ensure safety.

1. Remove the rear wheel.
2. Refer to the steps of removing the rear axle.
3. Remove the rear coil spring.
  - a. Remove the rear coil spring upper cushion and lower cushion (as shown by the arrow).

**Check**

1. Check the rear coil spring assembly.
  - a. Check whether the rear coil spring is worn, cracked or permanently deformed by fatigue Replace it if necessary.
  - b. Check the upper soft pad of the rear coil spring and the lower soft pad of the rear coil spring for dirt, wear, rupture, deformation or damage. Replace it if necessary.

**Installation**

1. The installation sequence is reverse to the removal.
  - Be sure to tighten the connecting bolts and nuts to specified torque
  - After refitting, lower the vehicle and bounce the vehicle up and down several times to stabilize the rear suspension;

**Rear trailing arm assembly**

**Removal**

**Note:**

- The operation procedure on the right side is the same as that on the left side, and the following is the operation procedure on the left side.

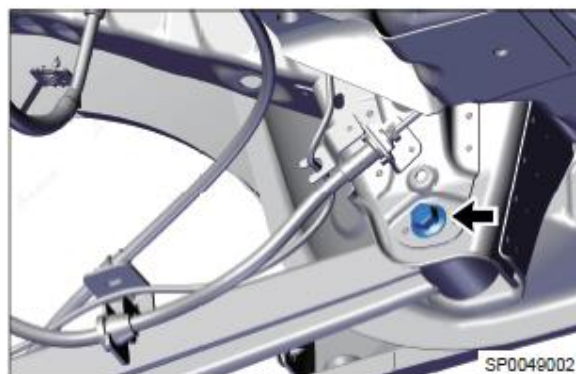
**⚠ Caution**

- Please wear the necessary labour protection articles to avoid accidents.
- Check if the safety lock of the lifter is locked during service for chassis.
- Do not weld or trim the load parts and guide parts of the suspension.
- When removing and installing chassis parts, be sure to replace the self-locking nuts and corroded and rusty nuts to ensure vehicle safety.

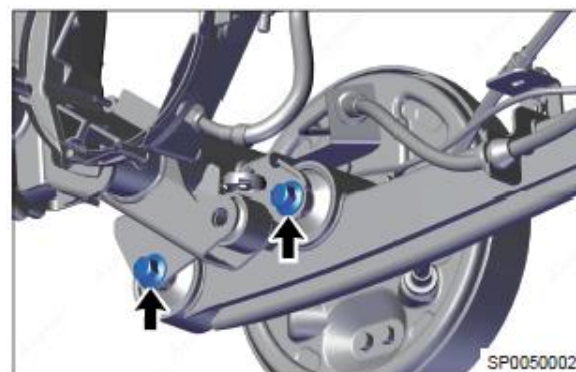
1. Remove the left rear wheel.
2. Remove the rear trailing arm assembly.
  - a. Disconnect the brake hose (as shown by the arrow) from the rear trailing arm.



- b. Remove the connecting bolt (as shown by the arrow) between the rear trailing arm assembly and the body system



- c. Remove the 2 connecting bolts (as shown by the arrow) between rear trailing arm assembly and rear axle.



- d. Unscrew the rear trailing arm assembly.

### Installation

1. The installation sequence is reverse to the removal.

#### ⚠ Caution

- Be sure to tighten the connecting bolts and nuts to the specified torque
- After installation, check the wheel alignment. If necessary, adjust the wheel alignment to the standard range if necessary.

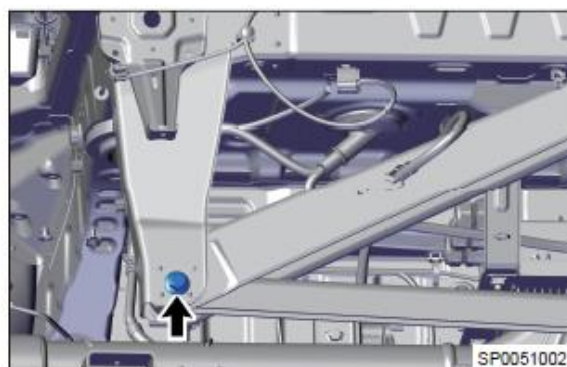
### Rear tie rod assy

#### Removal

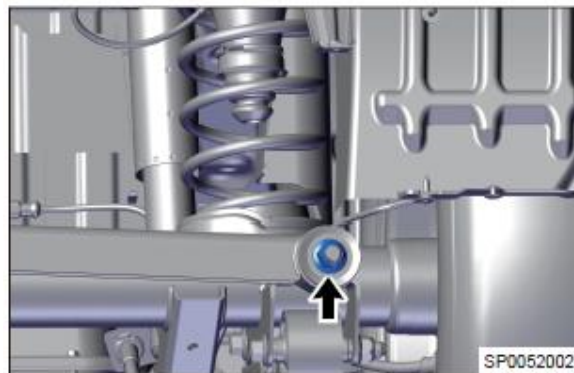
#### ⚠ Caution

- Please wear the necessary labour protection articles to avoid accidents.
- Check if the safety lock of the lifter is locked during service for chassis.
- Do not weld or trim the load parts and guide parts of the suspension.
- When removing and installing chassis parts, be sure to replace the self-locking nuts and corroded and rusty nuts to ensure vehicle safety.

1. Remove the rear tie rod assembly.
- a. Remove the connecting bolts between the rear tie rod and the body system



- b. Remove the connecting nut between the rear tie rod and the rear axle



- c. Remove the rear tie rod assembly.

**Installation**

- 1. The installation sequence is reverse to the removal.

<p><b>⚠ Caution</b></p> <ul style="list-style-type: none"> <li>• Be sure to tighten the connecting bolts and nuts to the specified torque</li> <li>• After installation, check the wheel alignment. If necessary, adjust the wheel alignment to the standard range if necessary.</li> </ul>
---

**Wheel alignment**

**Description**

<p><b>⚠ Caution</b></p> <ul style="list-style-type: none"> <li>• Ensure that the wheel alignment procedure is carried out in accordance with the operating instructions for the wheel aligner.</li> <li>• The four-wheel aligner shall be regularly maintained and serviced.</li> </ul>
---

In general, the wheel alignment shall include the following five parameters:

- 1. Check the camber angle of front wheel;
- 2. Check the kingpin caster angle;
- 3. Check the kingpin inclination angle;
- 4. Check the camber angle of rear wheels;
- 5. Check the toe-in of rear wheels;

After removal, installation, or replacement of the following components, check and perform the wheel alignment procedures:

- Front control arm assembly;
- Front steering knuckle;
- Front shock absorber assembly;
- Steering gears and steering tie rod
- Front subframe welding assembly;
- Rear axle assembly;

**Specification**

Four-wheel alignment parameters standard

Four-wheel alignment parameters of Avantier in full loaded state			
Unladen status	Test item	Left wheel	Right wheel
Front wheel	Toe-in	0±5'	0±5'



	Camber angle	0.33° ±45'	0.33° ±45'
	Kingpin caster angle	4.2° ±45'	4.2° ±45'
	Kingpin inclination angle	9° ± 60'	9° ± 60'
Rear wheel	Toe-in	0±20'	0±20'
	Camber angle	0±45'	0±45'
Side slip		≤ ± 5m/km(26ft/mile)	

### Table of fault symptoms

#### Note:

Use the following table in order to help diagnose the cause of the problem. Check each suspect area in sequence, and repair or replace the faulty parts or make adjustments as necessary.

Symptoms	Suspicious parts
Vehicle deviation	Front wheel alignment (error)
	Rear wheel alignment (error)
Wheel wobble	Front wheel alignment (error)
	Rear wheel alignment (error)
Abnormal wear of tire	Tires (Worn or improperly inflated)
	Front wheel alignment (error)
	Rear wheel alignment (error)

### Pre-wheel alignment inspection

1. The vehicle shall be in the unladen condition.
2. Use a lift to support the vehicle and lift it to the appropriate height.
3. Check whether the clearance of wheel hub bearing is too large, and replace the wheel hub bearing if necessary.
4. Check whether the suspension parts, steering tie rod and ball pin are worn, deformed or damaged. If necessary, replace the faulty parts.
5. Check whether the shock absorber assembly works normally.
6. Check if the tire pressure is within the specified range and adjust the tire pressure to the specified pressure if necessary.

Item	Front wheel	Rear wheel
Cold tire pressure (no-load)	230 ± 10 kPa (2.3±0.1 bar)	230 ± 10 kPa (2.3±0.1 bar)

7. Check the wheel rim and tire.
  - a. Visually check the wheel rim and tire for scratches, wear or damage.
  - b. Carry out the wheel dynamic balancing procedure.

### Front wheel camber

1. Incorrect front wheel camber angle will cause abnormal tire wear, and check and adjust the front wheel camber angle if necessary.
2. Under normal circumstances, there is no need to adjust the camber angle after the independent suspension and the wheel steering knuckle are assembled; If it is found that the wheel camber angle deviates from the tolerance range due to other reasons, it can be adjusted by independently suspension the connecting bolt of the steering knuckle,
3. Specified value of front wheel camber angle:

Item	Specified value
Front wheel camber	0.33° ±45'

### Check

1. Before adjustment, first check (visual inspection) whether the driving system components are deformed or damaged, and replace the deformed or damaged components if necessary.
2. Install the wheel alignment gauge to the front wheel, and perform the inspection procedure according to the operation instructions of the wheel alignment gauge.

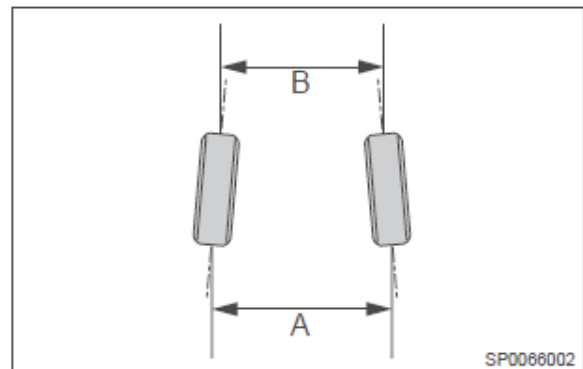
### Front wheel toe-in

1. Improper front wheel toe-in will cause wheel direction deviation and abnormal tire wear; Check and adjust the front wheel toe-in, if necessary.
2. If it is found that the front wheel toe-in deviates from the tolerance range due to other reasons, the length of the steering tie rod can be adjusted to reach the specified value,
3. Specified value of the front wheel toe-in:

Item	Specified value
Front wheel toe-in	0±5'(single side)

### Check

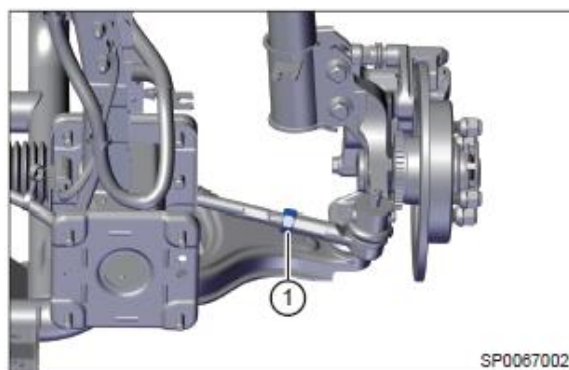
1. Check with the four-wheel aligner (refer to the specific operation instructions of four-wheel aligner to perform the inspection procedure).
2. Manual check:
  - a. Place the vehicle on the level road, check whether the front tire pressure is within the specified range and adjust the front tire pressure to the specified value if necessary.
  - b. Make a mark on the center of the front of both front wheels, and measure the distance A between the marks with a tape measure.
  - c. Push the vehicle to make the wheel rotate 180 degrees. When the mark rotates to the rear of the wheel, use a tape measure to measure the distance B between the two marks.
  - d. Calculation method: front wheel toe-in =  $A - B \div 1000$



### Regulation

1. According to the needs of the tester, make preparations for the wheel alignment before adjustment

- Loosen lock nut (1) of steering tie rod, and rotate tie rod to adjust its length as required until front wheel toe-in reaches specified value.



- Tighten the lock nut of the steering tie rod, reinstall the elastic snap ring of sheath, and check whether the lock nut is tightened in place and the sheath is in correct position.

**⚠ Caution**

- If the elastic snap ring of the sheath has insufficient elasticity, replace the sheath.

- After the front beam is adjusted, check whether the steering wheel is eccentric. If necessary, release the steering wheel locking nut, adjust the steering wheel to the horizontal position, and then tighten the steering wheel locking nut to the specified torque.

### Kingpin caster angle and kingpin inclination

- The kingpin caster angle and kingpin inclination angle can only be checked by using the four-wheel alignment instrument.
- The kingpin caster angle and kingpin inclination angle are guaranteed by the structural design and cannot be adjusted.
- If the measured value is not within the standard range, check whether the other parts of the steering knuckle are deformed or damaged; In addition, check whether the connecting parts of the steering knuckle are deformed or damaged.
- In case of deformation or damage, replace the corresponding parts.
- Specified value of kingpin caster angle and kingpin inclination:

Item	Specified value
Kingpin caster angle	$4.2^{\circ} \pm 45'$
Kingpin inclination angle	$9^{\circ} \pm 60'$

### Rear wheel camber

- The rear wheel camber angle and rear wheel toe-in are guaranteed by the structural design and cannot be adjusted. If the measured value is not within the standard range, check the rear suspension components for deformation or damage, and replace them if necessary. If the rear axle assembly is deformed due to a very large impact force and the rear wheel alignment parameters change beyond the specified range, the rear axle assembly must be replaced.
- Specified value of the rear wheel camber:

Item	Specified value
Rear wheel camber	$0 \pm 45'$

### Rear wheel toe-in

- Incorrect the rear wheel toe-in will cause wheel direction deviation and abnormal tire wear; Check and adjust the rear wheel toe-in, if necessary. If it is found that the rear wheel toe-in deviates from the tolerance range due to other reasons, the eccentric adjusting bolt and eccentric adjusting shim of the rear lower control arm assembly and rear subframe welding assembly can be adjusted to the specified value,

If the rear wheel toe-in does not meet the specified value, check the rear suspension and the wheel for damage or deformation; If necessary, replace the damaged or deformed parts.

Specified value of the rear wheel toe-in

Chassis

Item	Specified value
Rear wheel toe-in	0±20'

**Four-wheel alignment sequence**

1. The vehicle is installed on the positioning frame;
2. The adjustment sequence is to adjust the rear wheel first and then the front wheel;
3. For a single wheel, adjust the kingpin caster and camber angle first, and then adjust the toe-in angle.

---

## Chassis

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## Tires and wheels

### Warnings and precautions

#### Notes

1. Use tires of the same size and type as the standard tires, as these tires have excellent reliability and grip. The use of non-standard tires may cause the vehicle to malfunction, which may lead to accidents and even cause casualties.
2. Clean the contact surface between the rim and the tire before installing the new tire.
3. When installing the wheel nut, first pre-tighten the nut by hand, and then tighten it to the specified torque with a torque wrench.
4. It is forbidden to apply grease on wheel nuts.
5. Some bad driving habits may shorten the service life of the tire:
  - a. Rapid acceleration;
  - b. Depress the brake pedal suddenly and forcefully;
  - c. High-speed driving;
  - d. Extremely fast turning;
  - e. Crash into a curb or other obstacles;
  - f. The tire pressure is too high or too low when the vehicle is running;

#### Tire identification (the aluminum rim is optional)

1. The tire type, size, load index and speed rating are stamped on the sidewall in the form of letter and number codes as shown in the figure.

- a. 12-inch steel rings: 145/70 R12.



- b. 12-inch aluminum ring: 145/70 R12.



### Specification

#### Torque specifications

Description	Torque
Wheel mounting nut	120 ± 10 N·m (89±7 ft-lbs.)

**Basic parameters****Tire model**

Description	Model
Tire model	145/70 R12

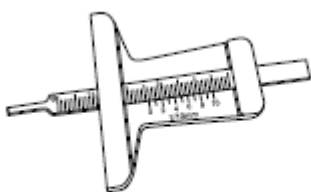
**Type of wheel hub**

Description	Model
Type of wheel rim	12×4.5B

**Tire pressure in cold state (unloaded)**

Description	Tire pressure
Front tires	230 (unloaded) kPa (2.3 bar) 250 (full-load) kPa (2.5 bar)
Rear tires	230 (unloaded) kPa (2.3 bar) 250 (full-load) kPa (2.5 bar)

**Tools****General tools**

Tool name	Illustration
Tire depth gauge	 RCH0094006

**Diagnosis and test****Table of fault symptoms****Note:**

Use the following table to help diagnose the cause of the problem, check each suspect area in sequence, and repair or replace the faulty component or make adjustments as necessary.

Symptoms	Suspicious parts
One-sided wear of tire	Wheel alignment (error)
Wear on both sides of tire	Tire pressure (insufficient)
Wear on the center of tire	Tire pressure (excessive)
Serrated wear	Wheel alignment (error)
Severe local wear of tire	Brake (excessive force)



Symptoms	Suspicious parts
Scratches on the sidewall	Sharp objects on the road surface (scratching)
Excessive tire noise	Tire pressure (error)
	Tires (worn)

## On-board maintenance

### Wheels

#### Removal

1. Remove the wheel.
  - a. Park the vehicle on a smooth ground and apply the parking brake.
  - b. Use a wheel wrench to unscrew the wheel mounting nuts.
  - c. Firmly support and lifting the vehicle to the proper height.
  - d. Remove the 4 wheel mounting nuts with a wheel wrench.



- e. Remove the wheel.

#### ⚠ Warning

- When removing and refitting wheel, be sure to strictly refer to the section "Tire Pressure Monitoring".

#### Check

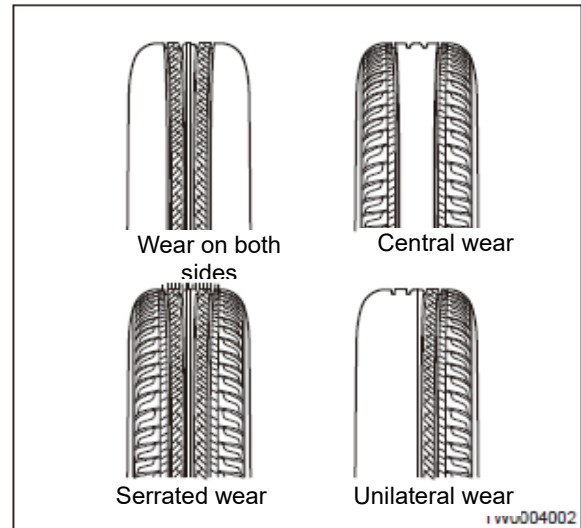
#### ⚠ Caution

- When installing non-standard tires and rims, be sure to refer to instructions.
- Use tires of the same size and type as the standard tires.

1. As shown in the figure, check the tire for scratches or damage.
2. As shown in the figure, check whether the wheel rim is scratched or damaged



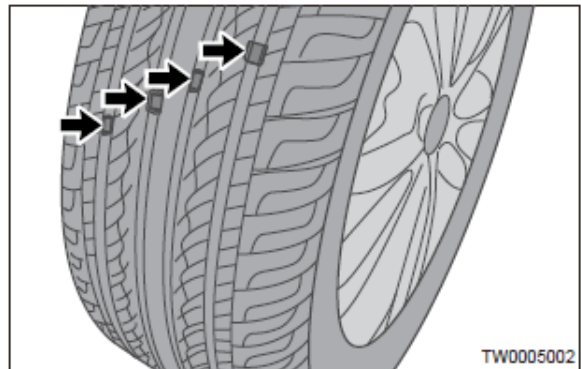
3. As shown in the figure, check whether the tire is abnormally worn.



4. Use a tire depth gauge to measure the tread depth of the tire, and if the depth is less than 1.6mm, replace the tire.



5. Check the tire wear indicator strip (as shown by the arrow), and replace the tire when it is worn to the indicator mark.



6. Use the tire pressure gauge to check whether the tire pressure of all tires is normal, and if necessary, inflate the tire to the specified tire pressure.
7. Check the valve for air leakage.

**Installation**

1. Install the wheel.
  - a. Anti-corrosion and anti-rust treatment shall be carried out on the contact surface between the wheel and the disc brake.
  - b. Install the wheel and pre-tighten the wheel mounting nuts by hand.
  - c. Use a torque wrench to evenly tighten the wheel mounting nuts to the specified torque in the order shown in the figure.

Tightening torque: 120 ± 10 N·m (89±7 ft-lbs.)



## Replace the tires

### Removal and refitting

#### ⚠ Warning

The speed rating of the newly replaced tire must comply with the specified value for safe operation; Otherwise, there may be a flat tire.

1. Remove the wheel.
2. Remove the tire with the tire removal device according to the instructions.



#### ⚠ Caution

- When removing and refitting tires, be sure to strictly refer to the section "Tire Pressure Monitoring".
  - Before assembling the valve nozzles, check whether the valve holes on the wheel are smooth and burr free. Then coat the rubber surface of the valve nozzles with glycerin or soak the valve nozzles in glycerin. Pull or press the positioning ring of the valve nozzles to make it pass through the valve holes and install it in place (glycerin is allowed to be replaced by fatty soap water).
  - The four running tires installed on the same vehicle must be of the same manufacturer, and mixed installation is not allowed.
  - Before assembling the tire, apply glycerin or soapy water to the circumference of the bead part of the tire.
  - When assembling the wheel assembly with TPMS, align the dynamic balance test mark (light point) of the tire with the valve core (TPMS) position of the rim.
  - When there is a key mark on the rim, align the tire dynamic balance test mark with the key mark on the rim.
  - When there is no key point mark on the rim, align the dynamic balance test mark of the tire with the valve nozzle position.
3. Adjust the tire pressure to the specified value.

#### ⚠ Caution

- Before four-wheel positioning work, check the four-wheel driving fetal air pressure and adjust the air pressure: front wheel (230±10)kPa (2.3±0.1 bar), rear wheel (230±10)kPa (2.3±0.1 bar).
  - Use the standard tire of the same specification and model to replace it.
4. Check the contact surfaces of valve, tire and rim for air leakage.
  5. Use the dynamic balancing machine to adjust the wheel balance.
  6. Install the wheel.

Tightening torque: 120 ± 10 N·m (89±7 ft-lbs.)

#### ⚠ Caution

- When removing the tires, avoid scratching the tires and rims.
- When installing a tire, clean the contact surface between the tire and the rim.

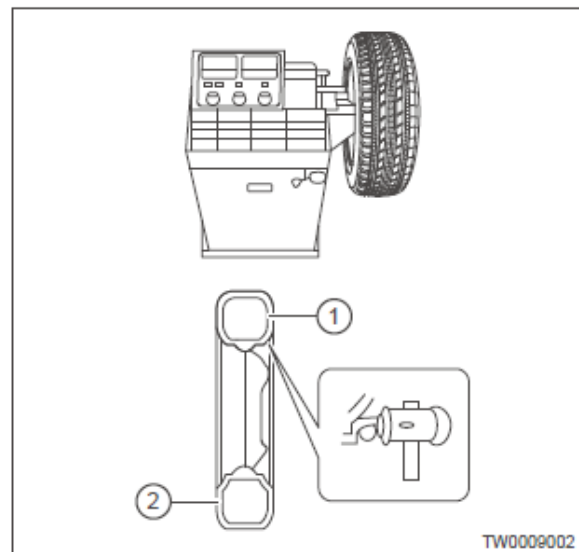
## Wheel balancing

### Operation steps

#### ⚠ Caution

- Before adjusting the wheel balance, calibrate the dynamic balancing machine.
- Remove the impurities in the tire tread and the original balance block to ensure that the wheel is balanced.

1. Remove the wheel.
2. Adjust the tire pressure to the specified value.
3. Install the wheel with the balance weight removed onto the balancing machine. Install the balance shaft with the wheel mounting face inward, select a suitable cone, and lock the wheel with a locking device (the vertebrae must be aligned with the center hole, otherwise the data may be inaccurate).
4. Turn on the power supply of the balancing machine, and input the measured distance between the rim and the balancing machine, rim width, rim diameter and other parameters.
5. Lower the wheel protector and automatically enter the balance test program (some balancing machines need to press the start button). When the measurement is completed, the unbalanced mass on both sides of the tire will be automatically displayed on the balancing machine, and the wheels will automatically brake until they stop. Please do not open the protective cover before stopping, so as to avoid danger.
6. As shown in the figure, according to the measurement results, assemble the balance weights with corresponding mass at the outer side (1) and inner side (2) of the rim edge.



7. After assembling, check again until the balancing machine shows zero.
8. After dynamic balancing, remove the wheel.

#### Caution

- When installing the balance weight, the wheel dynamic balance requirements of the motor vehicle with the maximum design speed greater than 100 km/h (62 mph), the allowable residual dynamic unbalance mass:  $\leq 8$  g (0.28 oz) on the side of clamp-type balance weight,  $\leq 10$  g (0.4 oz) on the side of pasted balance weights.
- Installation of snap-on balance weights: each wheel side is allowed to use a maximum of one. During the assembly process, avoid hitting the balance block too hard. If you feel that the balance block is hit too hard, replace it in time. The replaced balance block is not allowed to be used again.
- Installation of the adhesive counterweight: before pasting, wipe the part of pasting on the aluminum ring with alcohol cotton to ensure that there is no oil stain, dust, etc., tear off the plastic adhesive tape on the back of adhesive counterweight, align which with the pasting position on the step reference plane, and paste it evenly hard with both hands. When the room temperature is lower than 25°C (77 °F), the stick-on balance weight shall be heated and the oven temperature shall be 25 - 38°C (77-100 °F),

## Wheel transposition

### Operation steps

#### Description

1. The front and rear tires operate under different loads and perform different steering, driving and braking functions. As a result, their wear rates are not the same, thus forming irregular wear patterns. The regular tire rotation can reduce these effects.

2. Tire rotation has the following advantages:

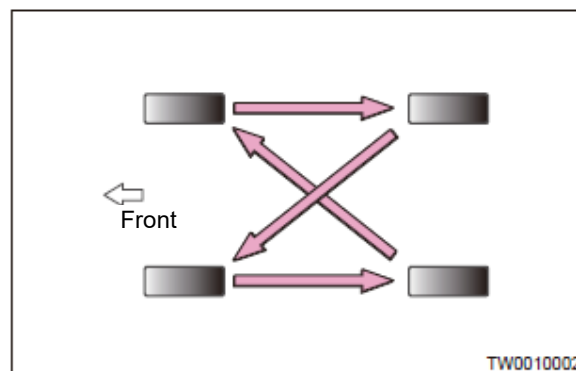
- Increase the service life of the tread;
- Maintain traction levels;
- Maintain stable and quiet driving;

**⚠ Caution**

- It is recommended that the vehicle be rotated once every 10,000 km (6,200 miles). However, the most appropriate tire transposition time varies according to the driver's driving habits and road conditions.

**Method of transposition:**

1. Tire transposition can be carried out by the method shown in the figure.





## Brake

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## Anti-lock brake System (ABS)

### Overview

#### I. Notes

The ABS is a safety-related component. Therefore, when performing maintenance diagnosis on it, in addition to observing general safety and precautions, the following diagnostic precautions must also be observed.

1. The ABS system must be serviced by a technician who has received professional training and mastered maintenance skills, and only the original parts are allowed to be replaced.
2. Before diagnosing the ABS system, if the basic brake system has faults, they must be eliminated first, such as:
  - Noise from brake system.
  - The brake pedal is too hard.
  - The brake pedal or the vehicle vibrates during normal braking.
  - Braking deviation.
  - Parking brake system fault.
3. ABS assembly (referring to ABS electronic control unit and hydraulic modulator assembly, excluding brake line, sensor and other auxiliary devices) can only be replaced as a whole, and cannot be disassembled for inspection or partially replaced/interchanged. Bosch does not provide separate spare parts, and does not guarantee the disassembled ABS assembly, and does not assume any responsibility for the adverse consequences caused by the disassembly, inspection or partial replacement/interchange of the ABS hydraulic modulator.
4. The following two situations indicate that the ABS system detects the fault:
  - Turn on the ignition switch, the system self-test is completed, and the warning lamp remains on.
  - The warning lamp is always on during driving. At this time, the driver can perform conventional braking, but the applied braking force should be reduced as much as possible to prevent wheel lockup. After the warning lamp is on, drive carefully and immediately go to the authorized service station for maintenance to prevent more faults from occurring, which may lead to traffic accidents.
5. Connect the ABS and sensor wire harnesses need pay attention to the following points:
  - Before unplugging the ABS harness and sensor harness, the ignition switch must be disconnected.
  - Ensuring the connectors are dry and clean, and avoiding any foreign objects entering.
  - The ABS harness must be installed in the horizontal and vertical directions to avoid damage to the connector.
6. When connecting the ABS brake line, make sure it is connected correctly. The ABS ECU cannot judge whether the brake line is properly connected. Incorrect connections can lead to serious accidents. When connecting the brake line, the markings on the ABS assembly must be observed:
  - MC1: connect the brake line 1 of the brake master cylinder;
  - MC2: connect the brake line 2 of the brake master cylinder;
  - FL: connect the brake line of the left front wheel braking cylinder;
  - FR: connect the brake line of the front right wheel braking cylinder;
  - RL: connect the brake line of the left rear wheel braking cylinder;
  - RR: connect the brake line of the right rear wheel braking cylinder
7. The ABS will produce noise in the following situations:
  - After the ignition lock is turned on, a short "buzzing" sound will be generated, which is the sound of ABS self-inspection, it is normal phenomenon.
  - When ABS is working normally, there will be sound, which is mainly reflected in the following aspects:
    - a. Sound of motor, solenoid valve and return pump action in the ABS hydraulic unit.
    - b. Sound caused by brake pedal bouncing.
    - c. The impact sound between the suspension and the body system caused by emergency braking

#### II. Preliminary inspection


Before diagnosing the ABS system, first check the easily accessible components that may cause the ABS system to malfunction. Visual inspection and visual inspection procedures can quickly identify the malfunction, so that no further diagnosis is required.

1. Make sure that only tires and hubs of the recommended size are installed on the vehicle. The tread pattern and depth of coaxial tires must be the same. Please refer to the vehicle manual for specific tire models.

2. Check the ABS hydraulic regulator, brake line and connections for leakage.
3. Check the fuse of ABS system to ensure that the fuse is not burnt and the model is correct. The ABS system has three fuses, which are:
  - Pump motor fuse (40 A)
  - Solenoid valve fuse (25 A)
  - Electronic control unit fuse (5 A) (according to the actual circuit diagram)
4. Check the battery voltage and check whether the battery terminal is corroded or loose. The normal operating voltage range of the ABS system is 10 V – 16 V.
5. Check whether the ground point of ABS ground wire is loose and whether the ground position is changed.
6. ABS ground wire must have good tightness to prevent water and moisture from penetrating into the connector of ABS ECU through the hole in the wire harness under the action of capillary (siphon) effect, thus causing functional failure.

Take measures: the exposed end of the wire harness is coated with sealant and the heat shrinkable tube is used.

7. Perform a visual and visual inspection of the following electrical components:
  - Check whether the harness and connectors of the ABS system related components are properly connected, and whether they are pinched or cuts.
  - Check if the harness is routed too close to high voltage or high current devices, such as high voltage electrical components, generator/starter, stereo amplifier added in aftersales services, etc.

 Caution
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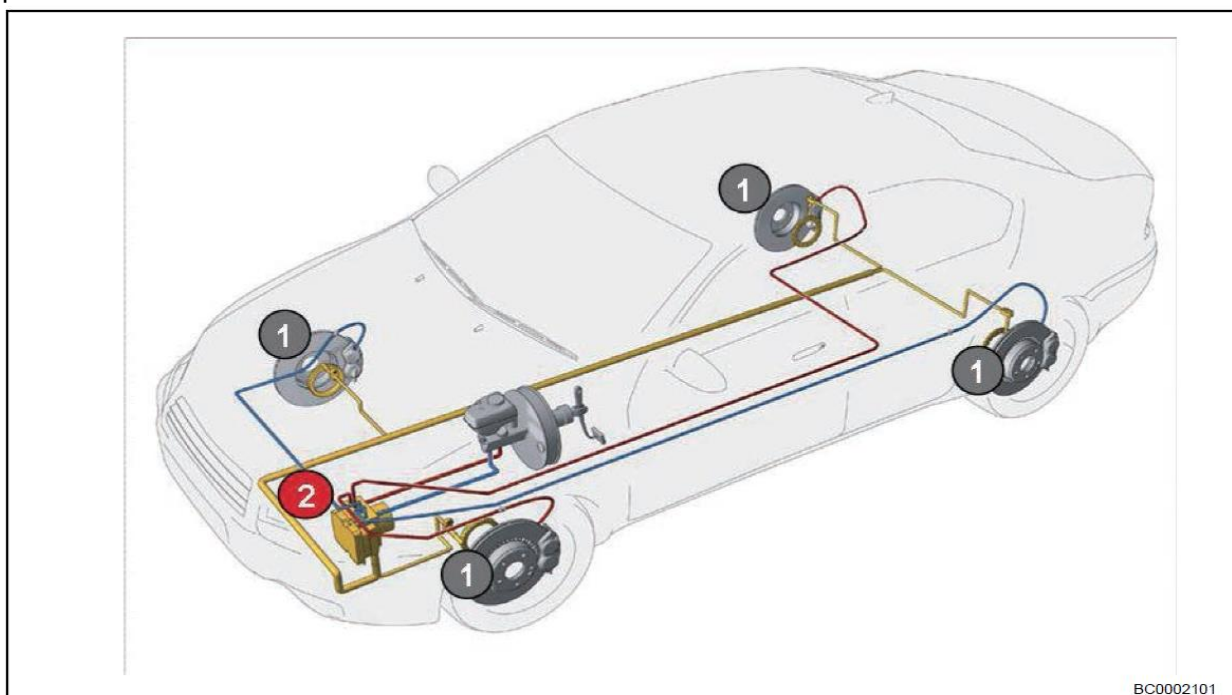
High-voltage or high-current devices may cause induced noise in the circuit, which can interfere with the normal operation of the circuit.
--

- ABS components are very sensitive to electromagnetic interference (EMI). If an intermittent problem is suspected, inspect for incorrect installation of immobilizer systems, lamps, or mobile phones added in aftersales services.
8. ABS is an active safety system. Its main role is to maximize the use of ground adhesion to maintain the vehicle's maneuverability and driving stability. However, ABS cannot completely prevent the vehicle from slipping when the physical limit is exceeded or driving at high speed on slippery roads.
  9. If ABS noise is too loud, it may be caused by the following reasons:
    - ABS assembly and ABS bracket are loosely fixed.
    - The ABS bracket and the body system are loosely fixed.
    - The plastic gasket on the ABS bracket is missing or damaged.
    - Brake line is deformed, bumped or interfered.
    - Brake line bracket clips are damaged.

## ABS 9 system Introduction

### I. Composition of ABS 9 System

As shown in the figure below, ABS 9 consists of a hydraulic module with an electronic control unit, wheel speed transducer.



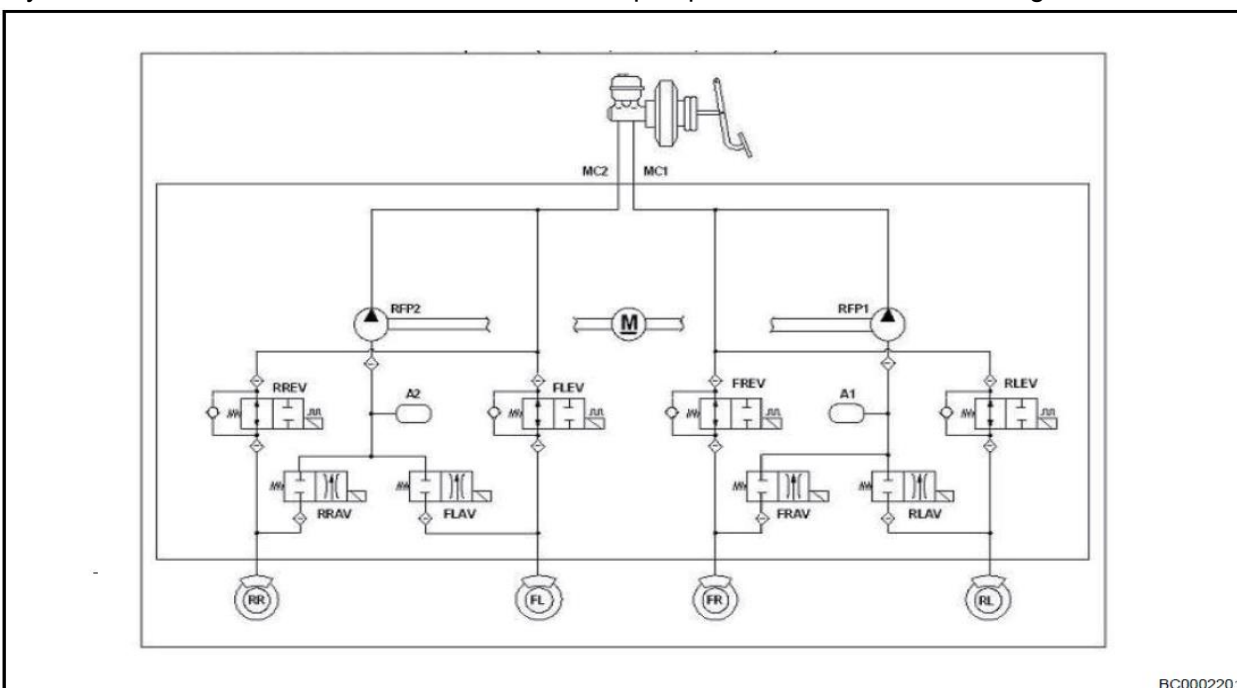
BC0002101

1. Wheel speed transducer
2. ABS hydraulic control module with electronic control unit

Note: This figure is for reference only. For the specific location of components, please refer to the vehicle maintenance manual

### II. Avantier ABS 9 hydraulic diagram

The brake system of this vehicle adopts the X-type arrangement as shown in the figure below. The ABS 9 hydraulic modulator consists of a motor, two return pumps, two accumulators and eight solenoid valves.



BC0002201

The English abbreviations in the figure are as follows:

Description	Meaning	Description	Meaning
MC1	Brake master cylinder primary circuit	RR	Rear right wheel
MC2	Brake master cylinder secondary circuit	FLEV	Left front wheel oil inlet valve
M	Motor	FLAV	Left front wheel oil outlet valve
RP1	Return pump 1	FREV	Right front wheel oil inlet valve
RP2	Return pump 2	FEAV	Right front wheel oil outlet valve
A1	Accumulator 1	RLEV	Left rear wheel oil inlet valve
A2	Accumulator 2	RLAV	Left rear wheel oil outlet valve
FL	Left front wheel	RREV	Right rear wheel oil inlet valve
FR	Right front wheel	RRAV	Right rear wheel oil outlet valve
RL	Rear left wheel		

### III. Avantier ABS 9 ECU interface circuit

#### Definition of Avantier pins

Pin	Function	Pin	Function
1	Power end of motor (positive)	20	Undefined
2	Wheel speed output (right front, not used)	21	Undefined
3	EBD warning lamp (not used)	22	Undefined
4	Signal terminal for wheel speed transducer (front right)	23	Undefined
5	Undefined	24	Undefined
6	Diagnostic K-line (not used)	25	Power end of valve relay
7	Undefined	26	CAN1P (high)
8	Diagnostic K-line (not used)	27	ABS warning lamp (not used)
9	Undefined	28	Power end of ECU (ignition power line)
10	Undefined	29	Signal terminal of wheel speed transducer (rear right)
11	Undefined	30	Brake lamp switch
12	Undefined	31	Power supply terminal of wheel speed transducer (left rear)
13	Ground strap of the motor	32	Undefined
14	CAN1M (low)	33	Vehicle speed output (not used)
15	Indirect type tire pressure reset switch	34	Undefined
16	Power supply terminal for wheel speed transducer (front right)	35	Undefined
17	Power supply side of wheel speed transducer (right rear)	36	Undefined
18	Signal terminal of wheel speed transducer (left rear)	37	Undefined

19	Power supply terminal for wheel speed transducer (left front)	38	ECU ground wire (negative)
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**Fault Code (DTC) Table**

<b>DTC code</b>	<b>Definition of code</b>
C0010-04	Internal failure of the left front valve input control
C0011-04	Internal failure of left front valve output control
C0014-04	Internal failure of right front valve input control
C0015-04	Internal failure of right front valve output control
C0018-04	Internal failure of left rear valve input control
C0019-04	Internal failure of left rear valve output control
C001C-04	Internal failure of right rear valve input control
C001D-04	Rear right valve output control
C0020-01	Fault of return pump power supply voltage

<b>DTC code</b>	<b>Definition of code</b>
C0020-04	Control of ABS pump motor
C0020-09	Return pump circuit faults
C0020-49	Fault of return pump working for a long time
C0031-00	No type information of left front wheel speed transducer
C0031-09	Failure of left front wheel speed transducer element
C0031-11	Front left wheel speed transducer current short circuited to ground
C0031-12	Left front wheel speed current short circuited to battery
C0031-13	Left front wheel speed transducer current open circuited or short circuited to ground/open circuited to power supply
C0031-29	Invalid left front wheel speed transducer signal
C0034-00	No type information for right front wheel speed transducer
C0034-09	Failure of right front wheel speed transducer element
C0034-11	Front right wheel speed transducer current short circuited to ground
C0034-12	Front right wheel speed current short circuited to power supply
C0034-13	Right front wheel speed transducer current open circuited or shorted to ground/open circuited to power supply
C0034-29	Invalid right front wheel speed transducer signal
C0037-00	Rear left wheel speed transducer has no type information
C0037-09	Failure of left rear wheel speed transducer element
C0037-11	Rear left wheel speed transducer current short circuited to battery
C0037-12	Rear left wheel speed transducer current short circuited to battery
C0037-13	Rear left wheel speed transducer current open circuited or short circuited to ground/open circuited to power supply
C0037-29	Invalid signal of left rear wheel speed transducer
C003A-00	Rear right wheel speed transducer has no type information
C003A-09	Right rear wheel speed transducer element fails

C003A-11	Right rear wheel speed transducer current short circuited to power supply
C003A-12	Right rear wheel speed transducer current short circuited to power supply
C003A-13	Right rear wheel speed transducer current open circuited or shorted to ground/open circuited to power supply
C003A-29	Right rear wheel speed transducer signals invalid
C0040-64	Brake pedal switch
C006B-00	The system is working too long
C1000-16	Current value of ECU power supply voltage lower than threshold
C1000-17	Current value of ECU power supply voltage above threshold
C1001-04	Internal fault of ECU system
C1002-49	Internal electronic fault of CAN hardware

<b>DTC code</b>	<b>Definition of code</b>
C1003-04	Internal fault of valve relay system
C1004-00	There is no type information for main valve
C1005-08	Hand brake switch bus signal/message invalid
C1007-29	Invalid signal of reverse switch
C1008-00	General WSS has no type information
C1009-00	No type information of ECU related hardware
C1099-04	General fault of WSS
U1300-55	Software configuration error (not written)
U0005-00	High-speed CANH fault
U0007-00	High-speed CANL fault
U0073-88	Control module communication Bus Off
C13F0-00	Tire pressure monitoring system EEPROM access exceeds the limit
C13F1-00	Tire pressure monitoring system third party access exceeds limit
C13F200	Tire pressure monitoring system operation time exceeds the limit
C13F300	Tire pressure monitoring system EEPROM access error
C13F400	Tire pressure monitoring system library error
C13F401	Tire pressure monitoring system is faulty
C13F402	Tire pressure monitoring system calibration error
C13F403	Tire pressure monitoring system implementation error
C13F500	Input signal error of tire pressure monitoring system
C13F600	EEPROM access error related to tire pressure monitoring system read and diagnosis
C13F601	Tire pressure monitoring system write diagnosis related EEPROM access error
C13F700	Low efficiency error of tire pressure monitoring system

C13F800	Incorrect tire size of tire pressure monitoring system
C13F900	Incomplete calibration error of tire pressure monitoring system
C13FA00	Press and hold the TPMS key incorrectly
C13FB00	Tire pressure monitoring system warning
C13FB01	Left front wheel over-voltage alarm
C13FB02	Right front wheel over-voltage alarm
C13FB03	Rear left wheel speed transducer signal
C13FB04	Rear right wheel speed transducer signal
C0031-37	Left front wheel speed transducer signal frequency too high
C0034-37	Right front wheel speed transducer signal frequency too high

DTC code	Definition of code
C0037-37	Left rear wheel speed transducer signal frequency too high
C003A-37	Right rear wheel speed transducer signal frequency too high
U0100-87	Lost communication with VCU
U0401-81	Invalid data received from VCU
U0155-87	ICM communication timed out
U0423-81	Data corruption of ICM data
U1424-81	Invalid data related to VCU
U0595-81	Data corruption of MCU
U0595-87	Communication timeout of MCU
U1433-81	Invalid speed signal of MCU
U1434-81	Invalid MCU torque signal

## Specification

### Standard parameters

Description	Data
Model of brake fluid	DOT4
No. of teeth of front axle ring gear	48
No. of teeth of rear axle ring gear	48

### On-board maintenance

#### Bleed the brake system

##### Warning

- When bleeding the brake system, wear safety glasses. If brake fluid spills in the eyes or on the skin, rinse immediately and thoroughly with water.
- The brake fluid has a corrosive effect on the paint surface of the body, do not drop the brake fluid on the paint surface.

##### Caution

- The brake fluid shall comply with the model (DOT4) specified by CENNTRO, and the brake fluid shall not be mixed with brake fluids of other models.
- The brake fluid is highly absorbent, be sure to keep in original sealed container.
- In order to prevent dust and other foreign matters from entering the brake fluid storage tank, wipe off the reservoir cap before loosening.

The hydraulic unit can be vented manually, and one of the following three venting procedures can be selected for maintenance:

1. Venting with filling unit (venting pressure 200 kPa (2 bar))
2. By use of manual pedal;
3. By combined use of manual pedal and charging unit.

Venting with venting/filling unit (venting pressure 200 kPa (2 bar))

1. Connect the venting/filling unit to the fluid reservoir and confirm that the brake fluid is sufficient to open the switch and set the pressure to 200 kPa (2 bar)
2. Open the bleeder screw at the wheel cylinder until the bubbles are exhausted, the sequence: rear left, front left, front right, rear right
3. Check the pedal travel
4. If unsuccessful, repeat bleeding on each wheel.
5. Check the brake fluid level to ensure it is between the maximum and minimum values

Bleeding of manual pedal


1. Top up the reservoir (to the filter neck)
2. Repeat the following sequence for each wheel cylinder: rear left, front left, front right, rear right.
3. Open the bleeder screw
4. Step on the brake pedal back and forth
5. Close the bleeder screw
6. Release the brake pedal
7. Check the pedal travel.
8. If unsuccessful, repeat bleeding.
9. Check the brake fluid to make sure it is between the maximum and minimum marks

Combination of manual pedal bleeding and 2 bar bleeding

1. Connect the venting/filling unit to the fluid reservoir and confirm that the brake fluid is sufficient to open the switch and set the pressure to 2 bar
2. Open the bleeder screw at the wheel cylinder until the bubbles are exhausted, the sequence: rear left, front left, front right, rear right
3. Repeat pressing the pedal
4. Check the pedal travel.
5. If unsuccessful, repeat bleeding on each wheel.
6. Check the brake fluid level to make sure it is between the maximum and minimum values

### EPB/ESP control module assembly

#### Removal

 Caution

- When repairing the EPB/ESP system, the high-pressure brake fluid in the accumulator should be first released completely to prevent the high-pressure brake fluid from splashing and hurting people.
- Operation steps: first turn off the start button, and then repeatedly step on and release the brake pedal until the brake pedal becomes very hard.
- Do not open the start button until the EPB/ESP system is completely installed to prevent the hydraulic pump from being energized for operation.

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Drain the brake fluid.



**Note:**

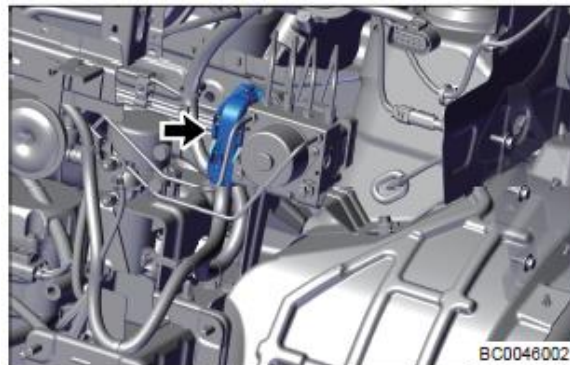
Emptied brake fluid should be properly stored in containers and should not be discarded at will.

<p><b>⚠ Caution</b></p>
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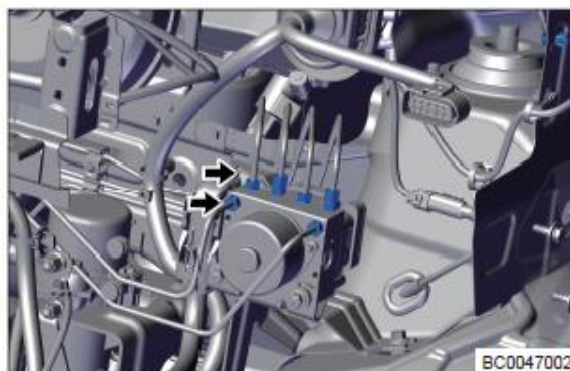
- |   |
|---|
| <ul style="list-style-type: none"> <li>• If the brake fluid comes into contact with any painted surface, clean it immediately.</li> </ul> |
|---|

4. Remove the EPB/ESP control module assembly.

- a. Press the locking position of the EPB/ESP control module assembly connector, pull the connector locking bracket downward and disconnect the EPB/ESP control module assembly connector (as shown by the arrow).



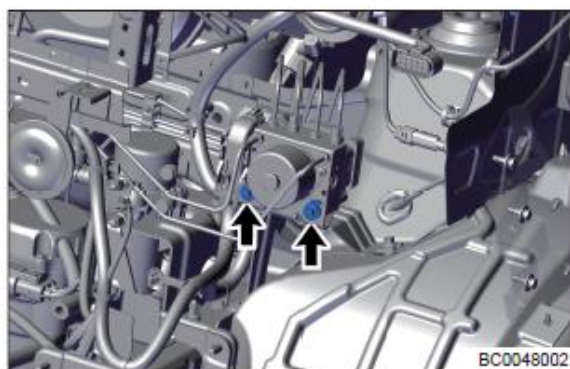
- b. Carefully disconnect the 6 brake pipes connecting bolts (as shown by the arrow) with the fixed wrench.



<p><b>⚠ Caution</b></p>
-------------------------

- |   |
|---|
| <ul style="list-style-type: none"> <li>• Prevent foreign matters entering into the threaded holes of the EPB/ESP control module assembly when dismantling brake lines.</li> <li>• After disconnecting the brake line, take sealing measures to prevent foreign matter from entering.</li> </ul> |
|---|

- c. Remove the fixing bolt between EPB/ESP control module assembly and mounting bracket (as shown by the arrow).



- d. Remove the EPB/ESP control module assembly.

**Installation**

1. The installation sequence is reverse to the removal.

<p><b>⚠ Caution</b></p>
-------------------------

- |   |
|---|
| <ul style="list-style-type: none"> <li>• EPB/ESP control module assembly contains the hydraulic control module and electronic control module. Both as a whole cannot be repaired or replaced separately.</li> <li>• Check vibration pad for aging or damage. If necessary, replace it.</li> <li>• When installing fixing bolt and screws, be sure to tighten them to the specified torque.</li> <li>• After refitting, perform the ABS bleeding procedure to the brake system.</li> </ul> |
|---|

- Use the diagnostic instrument to enter the Anti-lock Brake System (ABS), record and clear the fault code, and then drive the vehicle for a road test to confirm that the EPB/ESP system works normally and the brake pedal feels good.
- The yaw rate sensor must be calibrated after replacing the ESP assembly.
- After replacing the ESP assembly, perform the "Assembly Inspection" menu on it with a scan tool, otherwise the fault will be illuminated.

**Front-wheel speed transducer (take left front wheel as an example)**

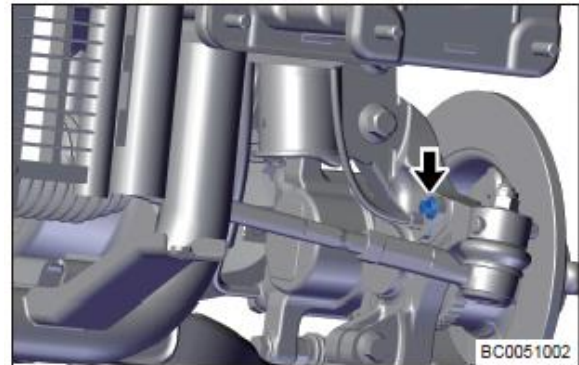
**Removal**

**⚠ Caution**

- Do not make the wheel speed transducer contaminated with oil or other foreign matters, otherwise, the wheel speed signal generated by the wheel speed transducer may be inaccurate, and even make the system unable to work normally,

**Note:**

- The procedure for the right side is the same as for the left side.
  - The following is the operating procedure for the left side.
1. Turn off all electrical equipment and the start button.
  2. Disconnect the negative cable of the battery.
  3. Remove the left front wheel.
  4. Remove the left front wheel speed transducer.
    - a. Remove the fixing bolts (as shown by the arrow) between the left front wheel speed transducer and the left front steering knuckle assembly, and carefully disconnect the left front wheel speed transducer assembly.



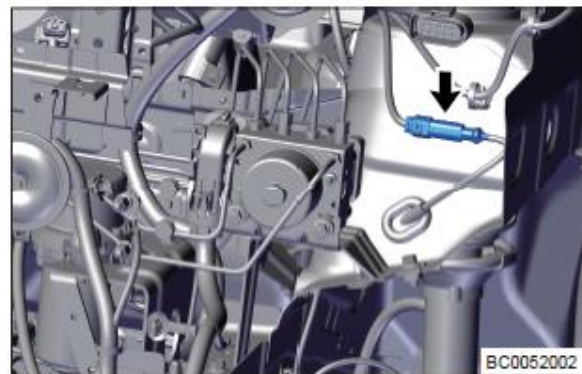
**⚠ Caution**

- Keep the sensor head and the sensor mounting hole away from foreign objects.

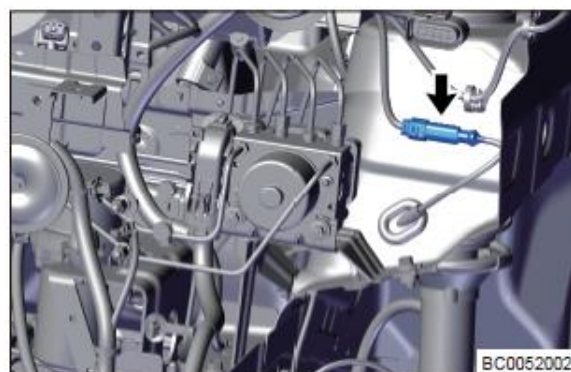
- a. Disconnect the clip of left front wheel speed transducer wire harness (as shown by the arrow) from the left front shock absorber assembly and mounting bracket, and disconnect the retaining clip of the left front wheel speed transducer wire harness (1) from the body system.

**Note:**

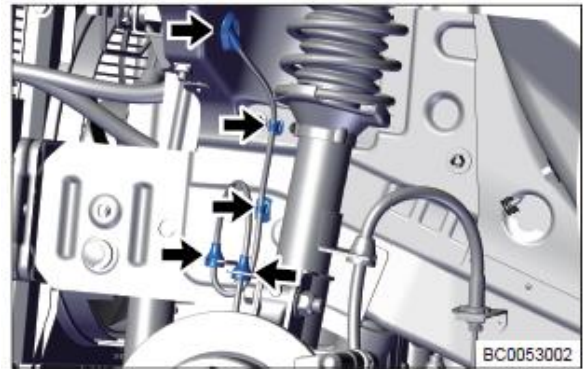
Observe the direction in which the sensor harness is routed to prevent incorrect installation.



- b. Disconnect the left front wheel speed transducer harness connector (as shown by arrow).



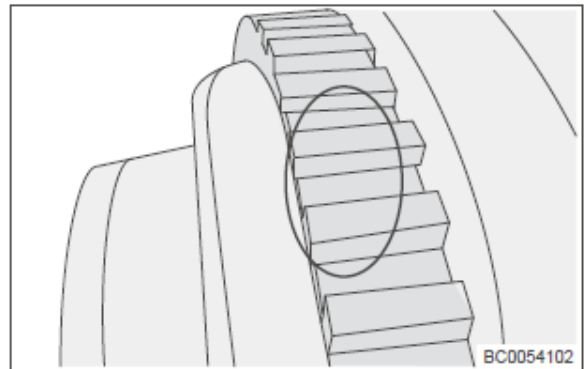
- c. Disconnect the harness plug of the left front wheel speed transducer (as shown by the arrow) from the body system.



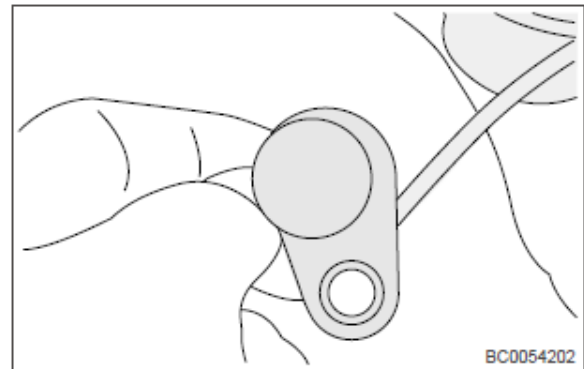
- d. Remove the left front wheel speed transducer.

**Check**

- 1. Check the front wheel speed transducer.
  - a. Check the surface of the front wheel speed transducer for cracks, dents, or nicks.
  - b. Check whether the front wheel speed transducer connector or harness is scratched, broken or damaged.
  - c. If any of the above conditions occur, replace with a new front wheel speed transducer.
  - d. Check whether the wheel speed transducer is installed correctly.
  - e. Read the data stream of the wheel speed transducer with a diagnostic tester, and record whether the wheel speed and acceleration display of each wheel are consistent and whether the speed display is accurate during vehicle traveling.

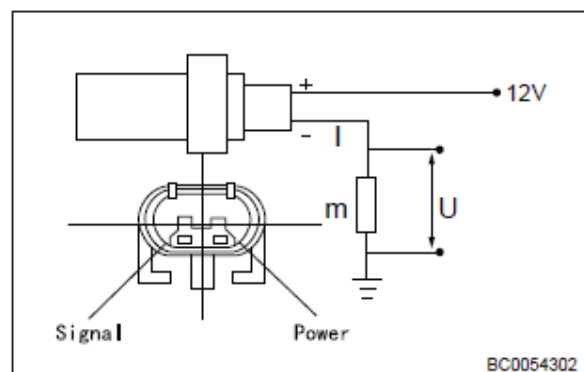


- f. If the wheel speed display is inconsistent, check the corresponding wheel speed transducer signal ring gear for missing teeth, dirt, demagnetization, and eccentricity;

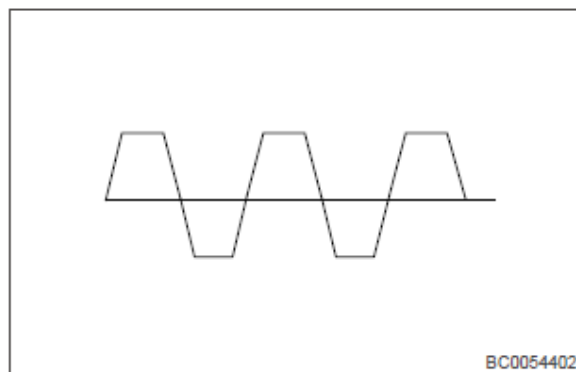


2. Simple test of wheel speed transducer

- a. Connect the sensor power supply terminal to 12 V, connect the sensor signal in series with 75 Ω resistor to ground, rotate the wheel, and test the voltage signal of the resistor with an oscilloscope.



- b. With the rotation of the gear ring, U switches between high and low levels without obvious tooth missing.
- U low≈0.54 V
  - U high≈1.07 V



**⚠ Caution**

- The polarity must not be reversed during the test, otherwise it will cause damage.
  - The above is a simple method and is not a substitute for a complete functional test.
  - The test may be affected by the quality of the ring gear, installation error, etc.
- c. After performing any maintenance action on the wheel speed transducer, it is necessary to accelerate the vehicle to more than 40 km/h (25 mph) for EPB/ESP system dynamic self-test.
- d. If the fault cannot be eliminated after the dynamic self-test, replace the wheel speed transducer.
- e. After the completion of the repair, perform a completion inspection.

### Installation

1. The installation sequence is reverse to the removal.

**⚠ Caution**

- When installing the connecting bolt, be sure to tighten it to the specified torque.

### Rear-wheel speed transducer (take left rear wheel as an example)

#### Removal

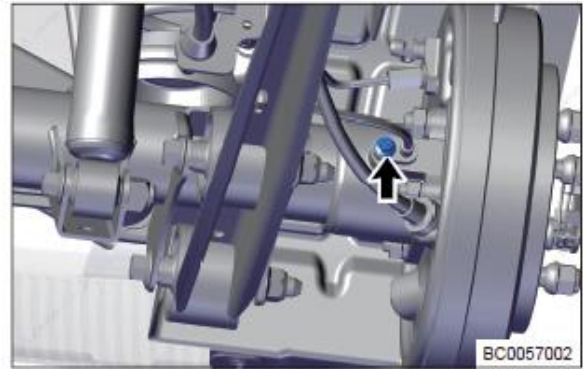
**⚠ Caution**

- Ensure the wheel speed transducer not be contaminated by oil dirt or other foreign materials, otherwise, the wheel speed signals from the wheel speed transducer will not be accurate, even causing the system failing to work normally.

#### Note:

- The procedure for the right side is the same as for the left side.
  - The following is the operating procedure for the left side.
1. Turn off all electrical equipment and the start button.
  2. Disconnect the negative cable of the battery.
  3. Remove the left rear wheel.
  4. Remove the left rear wheel speed transducer.

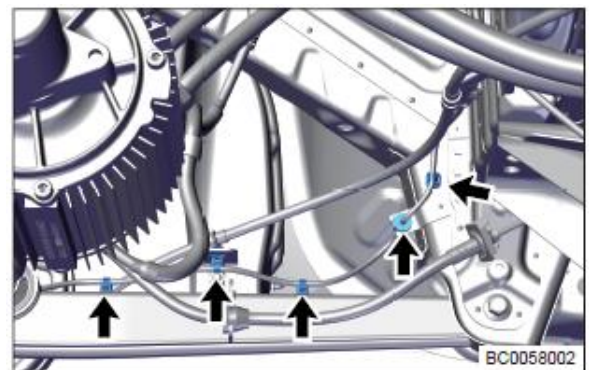
- a. Remove the left rear wheel speed transducer fixing bolt (as shown by the arrow), and disconnect harness connector (1) of EPB caliper.



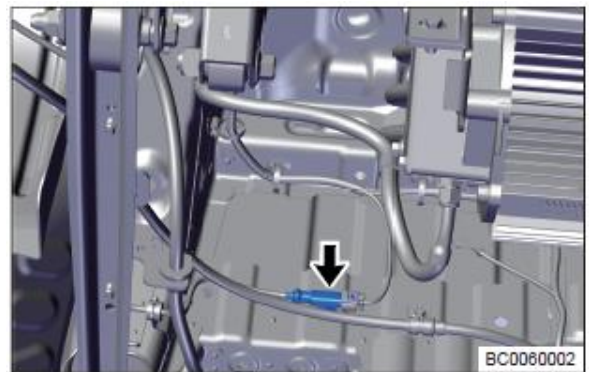
**⚠ Caution**

- Keep the sensor head and the sensor mounting hole away from foreign objects.

- b. Disconnect the rear wheel speed transducer harness connector (as shown by the arrow) from the mounting bracket.



- c. Remove the rear trunk floor carpet assembly
- d. Disconnect the connector of rear wheel speed transducer & caliper wire harness assembly (as shown by the arrowhead).

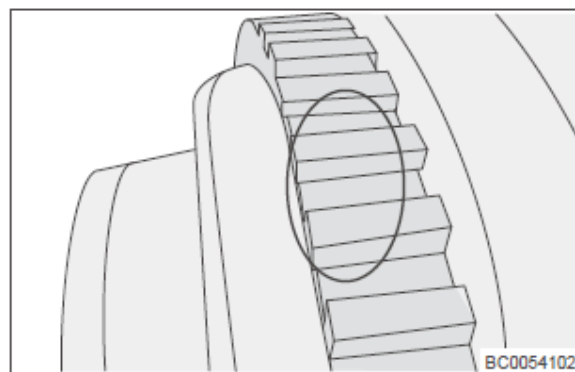


- e. Remove the left rear wheel speed transducer.

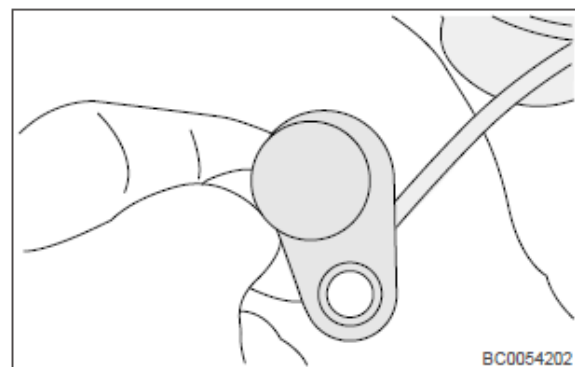
**Check**

1. Check the left rear wheel speed transducer.
  - a. Check the surface of the rear wheel speed transducer for cracks, dents, or nicks.
  - b. Check whether the rear wheel speed transducer connector or wire harness is scratched, cracked or damaged
  - c. If any of the above conditions occur, replace with a new rear wheel speed transducer.
  - d. Check whether the wheel speed transducer is installed correctly.

- e. Read the data stream of the wheel speed transducer with a diagnostic tester, and record whether the wheel speed and acceleration display of each wheel are consistent and whether the speed display is accurate during vehicle traveling.

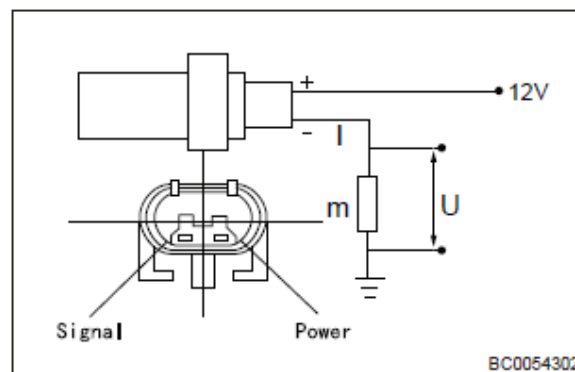


- f. If the wheel speed display is inconsistent, check the corresponding wheel speed transducer signal ring gear for missing teeth, dirt, demagnetization, and eccentricity;



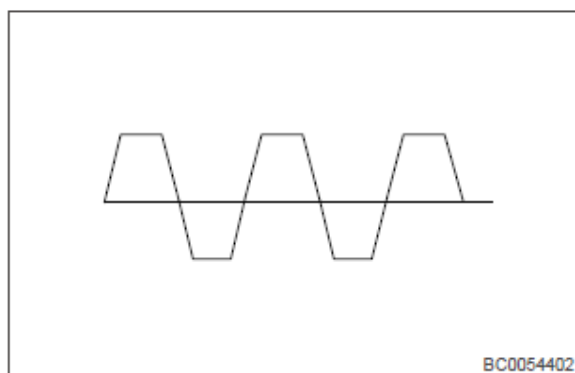
## 2. Simple test of wheel speed transducer

- a. Connect the sensor power supply terminal to 12 V, connect the sensor signal in series with 75  $\Omega$  resistor to ground, rotate the wheel, and test the voltage signal of the resistor with an oscilloscope.



- b. With the rotation of the gear ring, U switches between high and low levels without obvious tooth missing.

- $U_{\text{low}} \approx 0.54 \text{ V}$
- $U_{\text{high}} \approx 1.07 \text{ V}$



### ⚠ Caution

- The polarity must not be reversed during the test, otherwise it will cause damage.
- The above is a simple method and is not a substitute for a complete functional test.
- The test may be affected by the quality of the ring gear, installation error, etc.

- c. After performing any maintenance action on the wheel speed transducer, it is necessary to accelerate the vehicle to more than 40 km/h (25 mph) for EPB/ESP system dynamic self-test.
- d. If the fault cannot be eliminated after the dynamic self-test, replace the wheel speed transducer.
- e. After the completion of the repair, perform a completion inspection.

### Installation

1. The installation sequence is reverse to the removal.

**⚠ Caution**

- When installing the connecting bolt, be sure to tighten it to the specified torque.

### Steering angle sensor

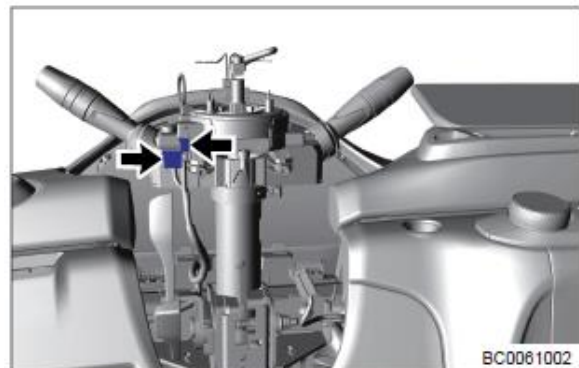
#### Removal

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.

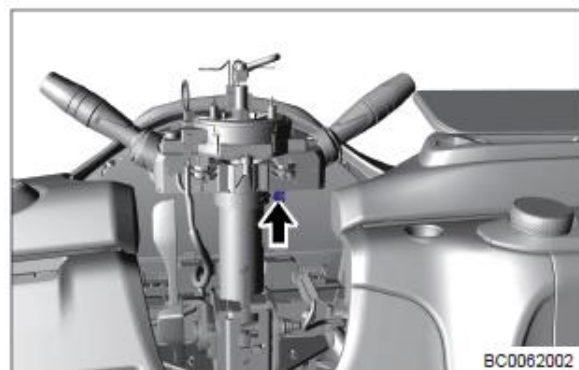
**⚠ Caution**

- After disconnecting the battery negative cable, wait at least 90 seconds to disable the Supplemental Restraint System (SRS).

3. Keep the front wheels facing straight ahead.
4. Remove the steering wheel assembly.
5. Remove the combination switch cover assembly.
6. Remove the steering angle sensor.
  - a. Disconnect harness connector of the spiral cable (as shown by the arrow).



- b. Disconnect the jaw (as shown by the arrow) between spiral cable and steering column and remove the spiral cable.




- c. Remove the steering angle sensor.

#### Installation

1. The installation sequence is reverse to the removal.
  - Be sure to install the spiral cable correctly according to the assembly marks on the spiral cable and steering column (slowly rotate the spiral cable clockwise until it cannot move, and then rotate it in the opposite direction until the yellow ball appears on the transparent neutral window and align with



the arrow mark), otherwise the spiral cable may be damaged;

 Caution

- Always install the spiral cable correctly in accordance with the specified operating instructions.
- Do not rotate the spiral cable more than the specified number of times in order to prevent the spiral cable breaking.
- When installing the spiral cable, be sure to fix its jaw in place.
- After installation, check and confirm that the loudspeaker works normally.
- After refitting, check the SRS warning lamp and make sure that the Supplemental Restraint System (SRS) works properly.
- Front wheel alignment needs to be adjusted.



## Brake

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## Brake

### On-board maintenance

#### On-vehicle inspection

##### Caution

- Use a well-sealed DOT4 brake fluid, or similar. Do not use an oily solution, as this may damage the seals of the brake system.
  - The brake fluid may damage the paint surface. If the brake fluid splashes on the painted surface, rinse it with water.
  - Do not use gasoline, kerosene, alcohol, transmission oil or any other oils containing mineral oil to clean the system components. This type of fluid will damage the rubber cap and seal.
  - The grease or other foreign matters on the outer surface of the brake caliper assembly, brake lining, disc brake and wheel hub must be removed during maintenance.
  - When operating the disc brake and brake caliper, be careful not to damage the disc brake and the brake caliper, and avoid scratching or cutting the brake shoe lining.
1. Check the condition of tires and wheels. Damaged or worn wheels and tires can cause misalignment, shaking, vibration and conditions similar to those during emergency braking.
  2. If noise is generated during braking, check the suspension parts. Bounce the vehicle up and down several times in order to check for any loose, worn or damaged suspension or steering component.
  3. Check the fluid level and condition of brake fluid
    - a. If the brake fluid level is too low, check the ESP control unit assembly, brake caliper, brake line, brake master cylinder assembly, brake fluid reservoir and other parts for leaking.
    - b. If the brake fluid shows signs of soiling, discharge a quantity of brake fluid for inspection. Replace it with new brake fluid if necessary.

#### Bleeding of brake

##### Bleeding of brake

1. Bleed the brake after replacing the related hydraulic parts of the brake.
2. There are two methods to bleed the brakes, and the specific operation steps are as follows:

Method 1: manual bleeding of the brakes

##### Caution

- Wear safety glasses when performing the bleed procedure on the brake system.
- Be careful when bleeding, as brake fluid may be ejected from the bleeder screw due to high pressure.

##### Warning

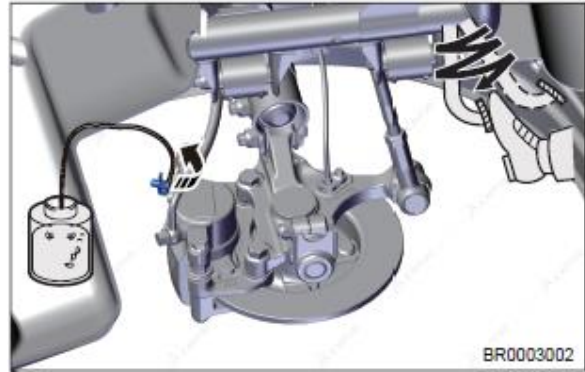
- To prevent dust and other foreign matters from falling into the brake fluid storage tank, wipe off the brake fluid storage tank before removing it.
- Use fresh, clear brake fluid, or equivalent, in a well-sealed container of the specified type.
- Do not allow the brake fluid to stick to the painted surface, such as body system. If the brake fluid leaks onto any painted surface, clean it off immediately.
- Do not step on the brake pedal repeatedly at any time while the bleeder screw is open during bleeding. Failure to do so will increase the air in the system and cause additional bleeding.
- When bleeding the brake system, do not drain the brake fluid in the brake fluid storage tank.

#### Note:

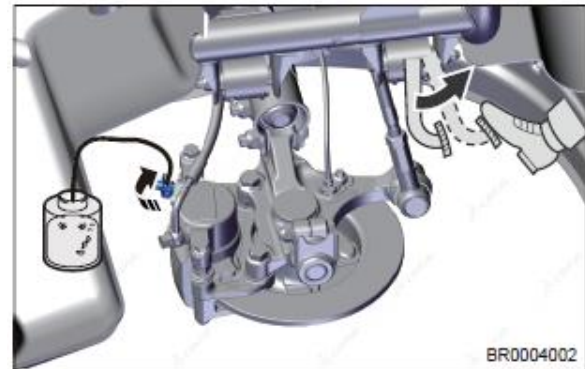
An assistant is needed to bleed the brake system.

1. Fill the brake fluid storage tank with brake fluid to the appropriate level.
2. Loosen the bleeder screw cap, connect a clear plastic hose to the bleeder screw, and dip the end of the hose into the container.

3. Have an assistant step on the brake pedal three to four times repeatedly, to a lower position, and hold the brake pedal, then release the bleeder screw



4. Tighten the bleeder screw and then loosen the brake pedal whenever the brake pedal is lowered rapidly.

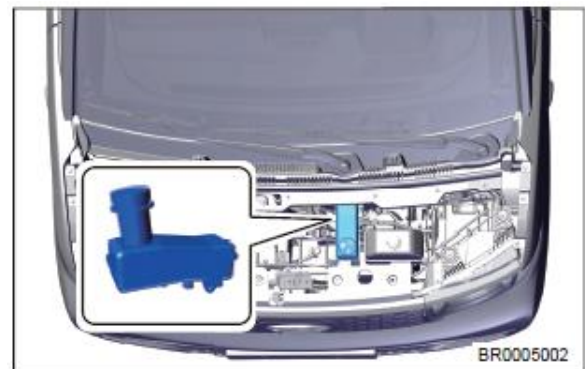


5. Repeat the above steps, and bleed the brake line of each wheel in the same way according to the sequence of left rear wheel, left front wheel, right front wheel and right rear wheel until the air in the brake system is exhausted.

Emptying sign: fresh brake fluid flows into the transparent container with no bubbles coming out.

**Note:**

Make sure that the brake fluid level in the brake fluid storage tank is always close to the "MAX" level during the bleeding of the brake system. Check the brake fluid level at any time during air bleeding, and add brake fluid if necessary.

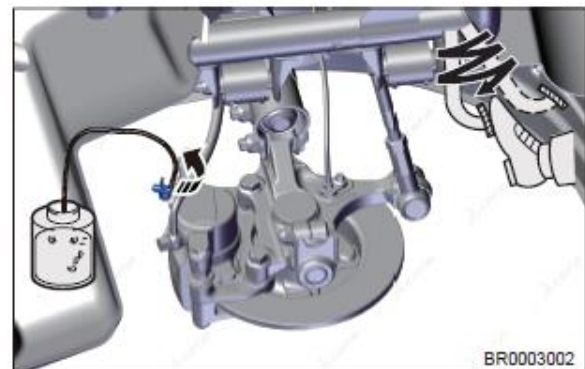


6. Check and adjust the brake fluid level to the "MAX" mark.
7. Check the brake pedal the braking effect. If the pedal braking effect is poor or the pedal is soft, there may still be air in the system. If necessary, bleed the braking system again.
8. Test the vehicle to verify that the brakes are working properly and the pedal feels good.

**Replacement of brake fluid**

Replacement of brake fluid

1. Drain the brake fluid.
  - a. Loosen the bleeder screw cap, attach a clear plastic hose to the bleeder screw, and immerse the end of the hose in the container.
  - b. Release the bleeder screw and step on the brake pedal continuously until the brake fluid does not flow out.



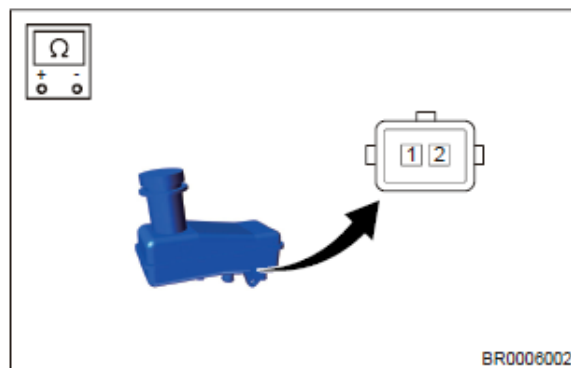
2. Add the brake fluid.
  - a. After confirming that the brake fluid has been drained, tighten the bleeder screw. Then, add new brake fluid to the brake fluid storage tank to the proper level.
3. Carry out the bleeding procedure.
  - a. After replacing the brake fluid, be sure to perform the bleeding procedure for the brake system to ensure that the brake system works normally.

### Brake fluid storage tank assembly

#### On-vehicle inspection

1. Check the brake fluid level warning switch.
  - a. Remove the charging port cover of the brake fluid storage tank.
  - b. Disconnect the wiring harness connector of the brake fluid level warning switch.
    - c. Use the ohm range of the digital multimeter to measure the continuity between the brake fluid the level warning switch terminals according to the conditions shown in the table.

Connect the tester	Condition	Specified state
Terminal 1 - Terminal 2	Float Up (Switch On)	$\infty$
Terminal 1 - Terminal 2	Float Down (Switch Off)	$\leq 1 \Omega$



#### Note:

- There is a float in the reservoir. The position of the float can be changed by raising or lowering the level of brake fluid.
  - If the result is not as specified, replace the brake fluid storage tank assembly.
- d. When the warning lamp is on, perform the unplugging of the liquid level sensor connector. If the warning lamp is still on, check the harness and the instrument. If the instrument alarm indicator goes out immediately, the liquid level sensor is faulty. (Prerequisite: The brake fluid is within the range of the scale mark).
  - e. Fill the brake fluid to the MAX.

#### Removal

1. Drain the brake fluid.

#### Note:

Emptied brake fluid should be properly stored in containers and should not be discarded at will.

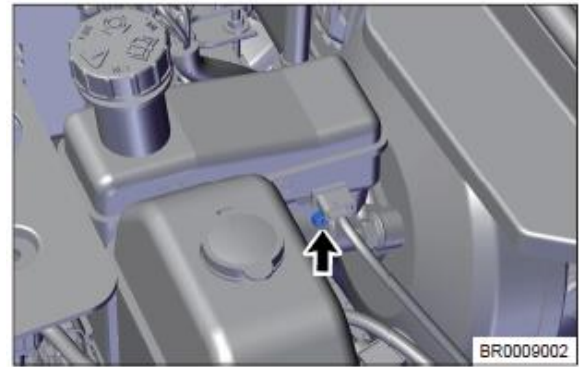
#### ⚠ Caution

- If the brake fluid comes into contact with any painted surface, clean it immediately.

2. Remove the brake fluid storage tank.
  - a. Disconnect the brake fluid level connector (as shown by arrow).



- b. Remove one fixing bolt (as shown by the arrow) of the brake fluid storage tank assembly.



- c. Remove the brake fluid storage tank assembly.

**Installation**

1. The installation sequence is reverse to the removal.

**Note:**

After installation, perform the bleeding procedure for the brake system and add the brake fluid to the proper position.

<p><b>⚠ Caution</b></p> <ul style="list-style-type: none"> <li>• The clutch hose can only be used once, and cannot be plugged and unplugged repeatedly after disassembly.</li> <li>• After the hose is bent, it is normal for part of the material between the two corrugations to turn "white".</li> </ul>
---

**Brake master cylinder assembly**

**Removal**

<p><b>⚠ Warning</b></p> <ul style="list-style-type: none"> <li>• To avoid damage to the brake master cylinder assembly and prevent the booster from absorbing other contaminants, remove the vacuum from the vacuum booster before removing the brake master cylinder.</li> <li>• Remove the vacuum by repeatedly stepping on the brake pedal until the brake pedal is firmly stepped on.</li> <li>• When disassembling the brake line, take sealing measures to prevent foreign matters from entering.</li> </ul>
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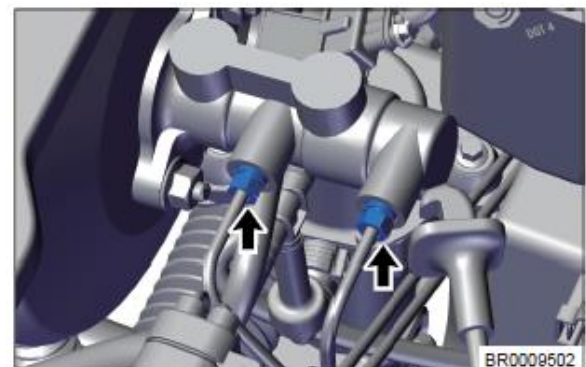
1. Drain the brake fluid.

**Note:**

Emptied brake fluid should be properly stored in containers and should not be discarded at will.

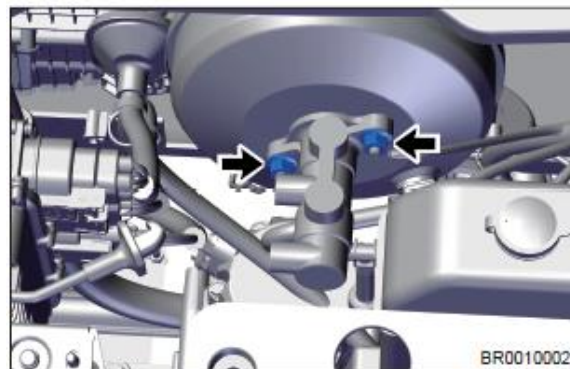
<p><b>⚠ Caution</b></p> <ul style="list-style-type: none"> <li>• If the brake fluid comes into contact with any painted surface, clean it immediately.</li> </ul>
---

2. Remove the brake fluid storage tank.
3. Remove the brake master cylinder assembly.
  - a. Release the 2 retaining plugs (as shown by the arrow) between the brake master cylinder assembly and the brake pipe





- b. Loosen the 2 retaining nuts and spacers (arrows) of the brake master cylinder assembly and vacuum booster.



- c. Remove the brake master cylinder assembly.

**⚠ Caution**

- The design of the brake master cylinder assembly and the piston makes it easy for the piston to fall. In order to prevent this, when operating the brake master cylinder assembly, make sure that the master cylinder is horizontal or the end face is downward (piston face is upward) to prevent the master cylinder piston from falling.
- Make sure that no foreign matter is stuck on the piston of brake master cylinder assembly. If any foreign objects are stuck, remove them with a clean cloth. Then, apply grease to the entire outer contact surface of the master cylinder piston.
- The master cylinder needs to be handled with care. Avoid any impact on the master cylinder, such as falling. A dropped master cylinder cannot be reused.
- Do not knock or pinch the master cylinder piston, and do not damage the master cylinder piston in any other way.

### Installation

1. The installation sequence is reverse to the removal.

**⚠ Caution**

- Be sure to tighten the fixing screw plug and nut to the specified torque during installation.
- After refitting, bleed the brake system and add a brake fluid to the proper position.
- After installation, check whether the distance between the brake master cylinder and the brake pedal is within the normal range.

Specified distance: 125 mm (5 in.)

### Vacuum booster with brake master cylinder assembly

#### Removal

1. Drain the brake fluid.

**Note:**

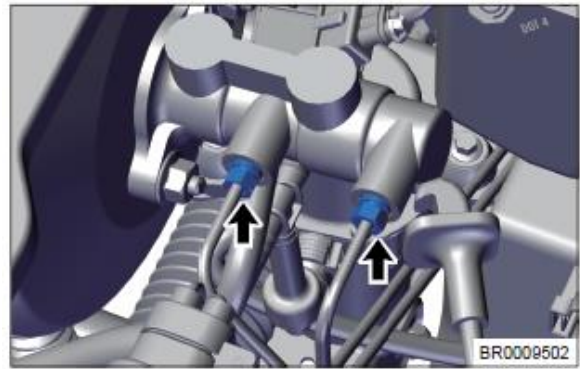
Emptied brake fluid should be properly stored in containers and should not be discarded at will.

**⚠ Caution**

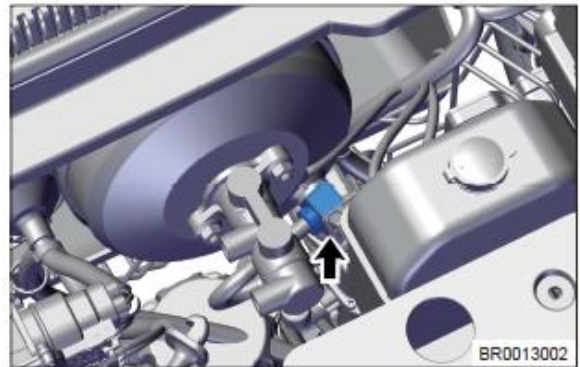
- If the brake fluid comes into contact with any painted surface, clean it immediately.

2. Disconnect the negative cable of the battery.
3. Remove the brake fluid storage tank assembly.
4. Remove the vacuum booster & brake master cylinder assembly.

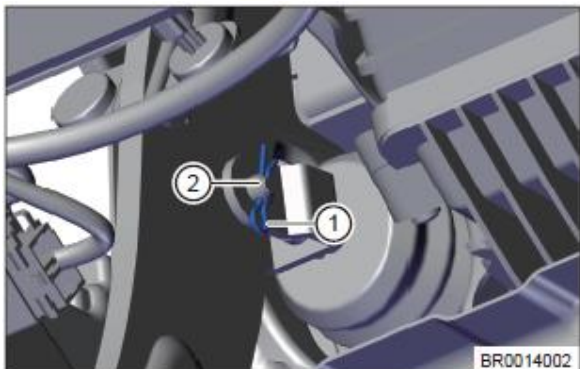
- a. Release the 2 retaining plugs (as shown by the arrow) between the brake master cylinder assembly and the brake pipe



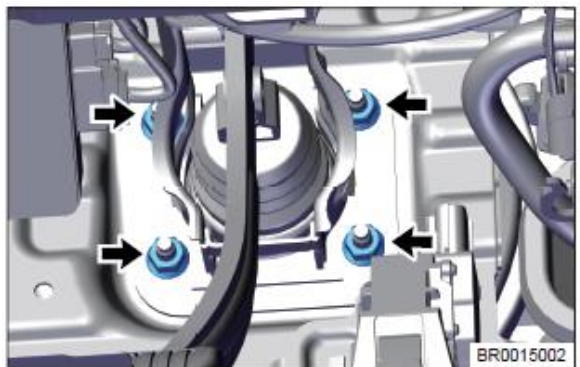
- b. Disconnect the vacuum pipe assembly with check valve (as shown by the arrow) from the vacuum booster assembly.



- c. Remove the locking pin (2) and pushrod pin (1) on the vacuum booster pushrod and disconnect the brake pedal.



- d. Remove the four fixing bolts (as shown by the arrow) of the vacuum booster assembly and the brake pedal assembly.



- e. Remove the brake pedal.  
 f. Remove the vacuum booster & brake master cylinder assembly from the front compartment.

**Installation**

1. The installation sequence is reverse to the removal.

<p><b>⚠ Caution</b></p> <ul style="list-style-type: none"> <li>• Be sure to tighten the fixing screw plug and nut to the specified torque during installation.</li> <li>• After refitting, bleed the brake system and add a brake fluid to the proper position.</li> <li>• After removing the vacuum booster with brake master cylinder assembly, check or adjust the brake switch assembly (refer to the installation of brake switch assembly).</li> </ul>
--

## Brake pedal assembly

### Removal

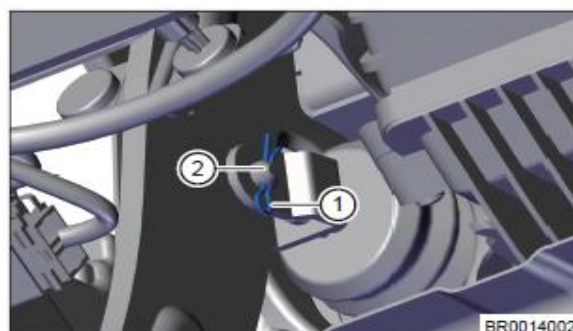
1. Remove the brake lamp switch assembly.
  - a. Disconnect harness connector (1) of the brake light switch assembly and the clip (2) securing it to the brake pedal.



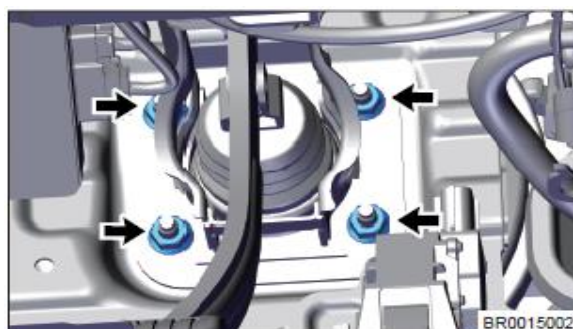
- b. Press the switch by hand and turn it counterclockwise so that the switch body corresponds exactly to the length of the pedal mounting hole, pull the brake switch assembly outwards along the opening of the pedal and remove the brake switch assembly.



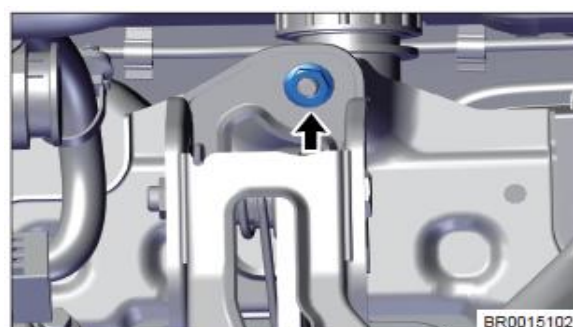
2. Remove the brake pedal assembly.
  - a. Remove the locking pin (2) and pushrod pin (1) on the vacuum booster pushrod and disconnect the brake pedal.



- b. Remove the four fixing bolts (as shown by the arrow) of vacuum booster assembly and brake pedal assembly.



- c. Remove one fixing bolt (as shown by the arrow) of brake pedal assembly and the body system.

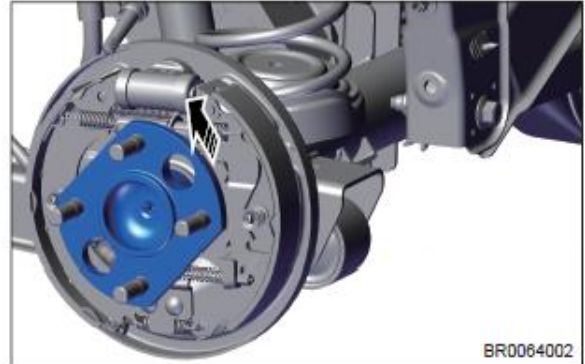


- d. Remove the brake pedal assembly from the driver's cab.

**Installation**

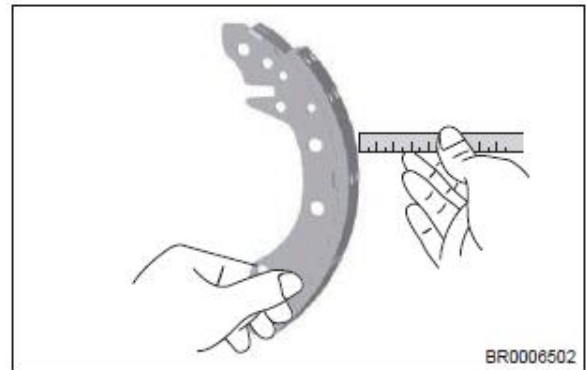
1. Install the brake pedal assembly (the installation sequence is reverse to the removal).
2. Install the brake switch assembly.
  - a. Before installing the brake switch on the vehicle, the ejector rod must be completely pulled out, if the switch ejector rod cannot be pulled along the axial direction, it is the longest stage of the ejector rod.

- b. Press the brake pedal to the bottom, and insert the brake switch body into the mounting hole of the pedal accurately corresponding to the mounting hole on the pedal, press the switch and rotate it clockwise to make the switch clip fit into the hole on the pedal (the brake pedal and the brake master cylinder have been installed before assembly).



- c. Slowly loosen the brake pedal to make the brake pedal return to the initial position automatically under the action of the return spring, and at the same time, adjust the brake switch rod to the appropriate gear automatically.

- d. Connect harness connector of the brake lamp switch assembly (as shown by the arrow).



- e. The installation is completed.

**⚠ Caution**

- After installation is completed, the brake pedal needs to be in full contact with the brake switch top lever (the top lever is compressed).
- When the brake pedal is depressed to the bottom and the pedal returns automatically, do not release the pedal, and let the pedal return to the initial position slowly to avoid sudden release of the pedal, which may cause the brake switch to trip due to large impact.
- Be sure to tighten the fixing nuts to the specified torque during installation.
- Refit the brake lamp connector (1) until a click is heard, and then push the lock clamp (A) to lock the connector.
- After installing the brake pedal, check whether the stroke of the brake pedal is within the normal range.

Normal range: ≥120 mm (4.7 in.)

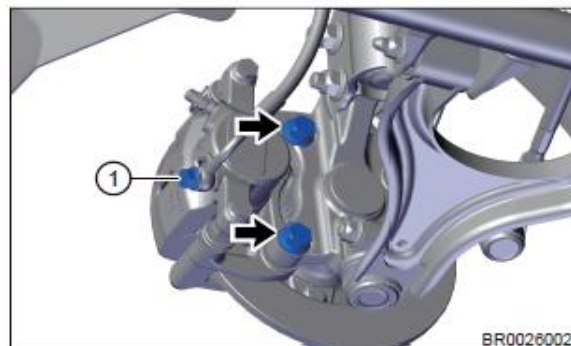
## Front disc brake assembly

### Removal

#### Note:

- The procedure for the right side is the same as for the left side.
- The following is the operating procedure for the left side.

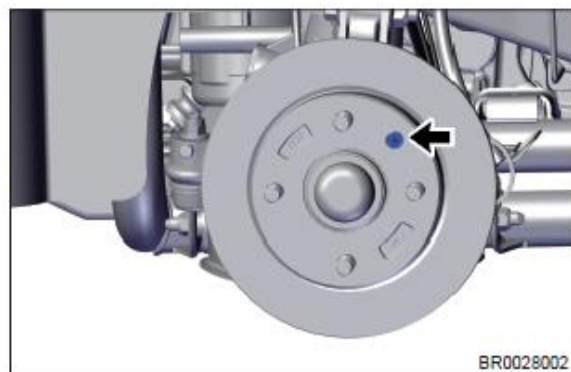
1. Remove the left front wheel.
2. Remove the left front brake caliper assembly.
  - a. Remove 2 connecting bolts (1) between the left front brake caliper assembly and the left front steering joint.
  - b. Remove the connecting screw plug (as shown by the arrow) between the left front brake caliper assembly and the left front brake hose assembly



#### ⚠ Caution

- While removing the brake hose, do not splash the brake fluid on clothes or skin as the brake fluid is corrosive.

- c. Remove the left front brake caliper assembly.
3. Remove the left front disc brake.
    - a. Remove 2 setscrews (as shown by the arrow) of the left front disc brake, and take down the left front disc brake



### Disassembly

#### Note:

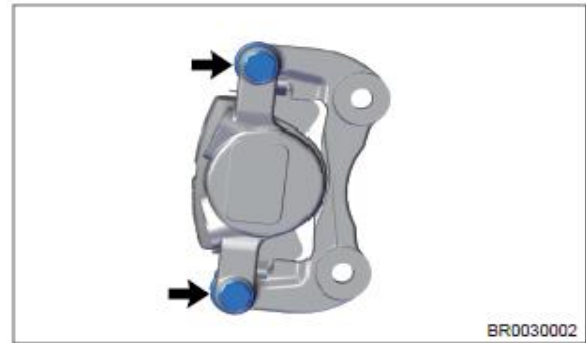
- The procedure for the right side is the same as for the left side.
- The following is the operating procedure for the left side.

1. Remove the bleeder screw (with bleeder screw cap).
  - a. Remove the bleeder screw (with bleeder screw cap) (as shown by the arrow) from the brake caliper assembly.



2. Remove the brake cylinder assembly.

- a. Remove 2 guide bolts (as shown by the arrow) from the brake caliper mounting bracket and brake cylinder assembly.



- b. Separate the brake cylinder assembly from the brake caliper fixing bracket.

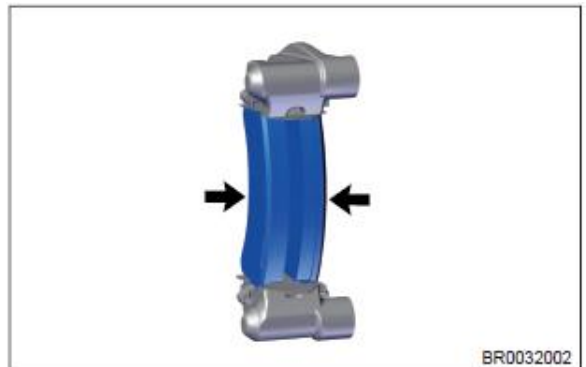
3. Remove the front brake caliper guide bolt guide pins (with dust covers).

- a. Remove 2 brake caliper guide bolt guide pins (with dust covers) (as shown by the arrow) from the brake caliper mounting bracket.



4. Remove the front brake lining.

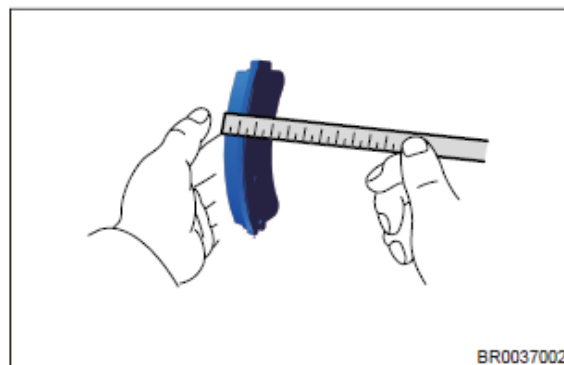
- a. Remove the inner brake lining and outer brake lining (as shown by the arrow) from the brake caliper mounting bracket.



**Check**

1. Check brake caliper fixing bracket and brake caliper guide pin assembly.
  - a. Clean the contact surfaces of the retaining of the brake caliper and brake lining support spacer with brake cleaner. Check for deformations, cracks, rust and the presence of foreign matter that is difficult to remove.
  - b. Check whether the rubber dust cover of brake caliper guide pin is deformed, cracked, worn and has foreign matters that are difficult to remove.
  - c. Install the brake caliper guide pin and brake caliper guide pin rubber dust cover onto the brake caliper fixing bracket, and push the brake caliper guide pin assembly by hand to ensure that it is flexible without seizure; otherwise, replace it;
2. Check the brake lining.
  - a. Visually check whether the brake lining is smooth, and check whether the friction plate is worn excessively. If the condition of the friction plate cannot be confirmed accurately by visual inspection alone, check it by physical means if necessary.

- b. Measure the minimum thickness of the brake lining. The brake lining must be replaced when the thinnest point of the usable material measured to the brake lining is 2 mm or less.



- c. When replacing the brake lining (inside and outside) with excessive wear, it may be necessary to replace the friction plate on the other side of the vehicle and the friction plate that has not been inspected in order to obtain good braking performance. If the brake lining does not need to be replaced, please ensure that the brake lining is reinstalled in the same location that it was removed.

3. Check the disc brake.

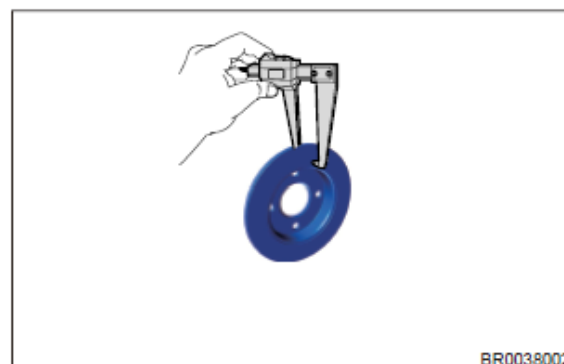
- a. Slight scratches or abrasions on the disc brake surfaces are acceptable. If there are signs of severe scratches or deformation, the disc brake must be replaced
- b. Excessive wear of the disc brake may result in poor engagement between the friction plate and the disc brake surface. If the disc brake projections are not removed before installing the new brake lining, abnormal wear of the disc brake may be resulted.
- c. When replacing the brake lining, it is normal for the surface of disc brake to be worn. If there are signs of cracking or burning points, the disc brake must be replaced.

4. Check the thickness of disc brake.

- a. Using a vernier caliper, measure the thickness of disc brake at the center of the brake lining contact surface as shown.

Standard thickness: 25 mm

Min. thickness: 23 mm



- b. If wear causes the thickness to fall below the minimum thickness, the disc brake shall be replaced.

**⚠ Caution**

- Machining the disc brake may cause the thickness of the disc brake to be less than the minimum thickness, so do not machine it.

## Assembling

### Note:

- The procedure for the right side is the same as for the left side.
- The following is the operating procedure for the left side.

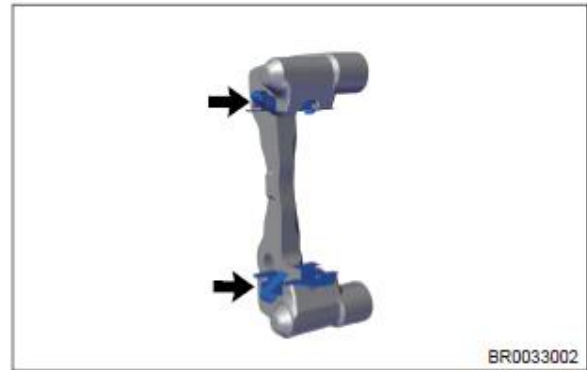
**⚠ Caution**

- When assembling the brake caliper assembly, be sure to keep your hands clean.
- When assembling the brake caliper assembly, be sure to use a clean and new brake fluid.
- Do not use old front disc brake piston seal rings.

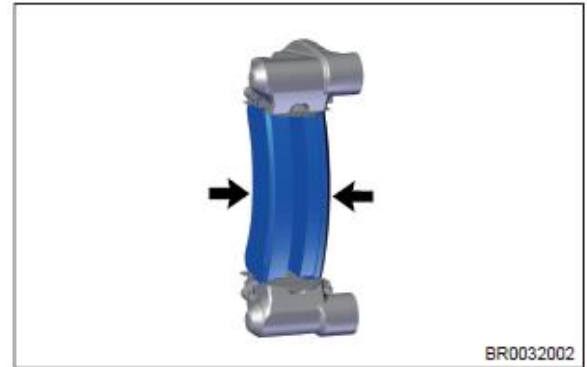
1. Install the brake lining support gasket.

## Brake

- a. Securely install the upper and lower support spacers (as shown by the arrows) onto the brake caliper fixing bracket.



2. Install the front brake lining.
  - a. Firmly install the inner brake lining and outer brake lining (as shown by the arrow) onto the brake caliper mounting bracket, and make sure they are clamped in place.



### Caution

- Make sure that the contact surface between the friction plate and the disc brake is free of oil dirt and grease.

3. Install the front brake caliper guide bolt guide pins (with dust covers).
  - a. Apply a small amount of grease to the contact surface between the guide bolt leader pin and leader pin rubber dust cover (as shown by the arrow), and install it firmly to the brake caliper mounting bracket.



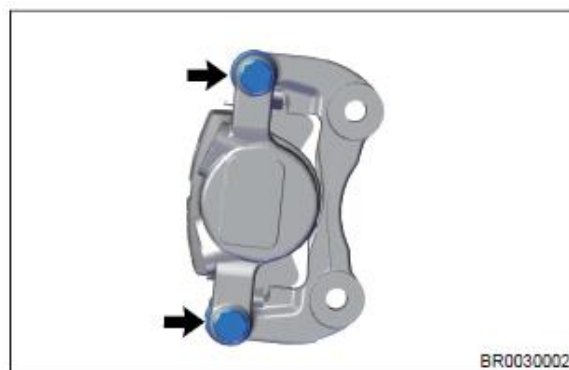
4. Install the brake cylinder assembly.
  - a. Slightly retract the brake cylinder piston with G-type caliper.





- b. Align the brake caliper guide bolt (as shown by the arrow) with the guide pin hole and install the brake cylinder assembly securely.

Tightening torque: 22 ~ 32 N·m (16 ~ 24 ft-lbs.)



5. Install the bleeder screw (with bleeder screw cap).

- a. Securely install the bleeder screw (with bleeder screw cap) (as shown by the arrow) to the front brake caliper assembly.

Tightening torque: 9 ~ 11 N·m (6.6 ~ 8 ft-lbs.)



## Installation

1. The installation sequence is reverse to the removal.

### ⚠ Caution

- Ensure the contact surface of the brake lining and disc brake is free from oil dirty and grease.
- Before installing the brake lining, the brake caliper piston shall be fully retracted into the brake caliper bore hole.
- After installing the brake lining and before moving the vehicle, step on the brake pedal several times to fix the brake lining to the disc brake to ensure safety.
- The brake lining shall be replaced in pairs, and cannot be replaced separately.
- Do not reversely install the inner brake lining and outer brake lining.
- After refitting, be sure to check the brake system for leakage. Repair or replace the faulty components as necessary.
- Make sure to perform the bleeding procedure of the brake system after installation.
- Make sure to add brake fluid to the proper position after installation.

## Front brake hose assembly

### Removal

#### ⚠ Caution

- Be sure to wear the necessary labour protection articles when repairing to avoid accidents.
- During removal and installation, avoid scratching the body system paint surface.

### Note:

- The procedure for the right side is the same as for the left side.
- The following is the operating procedure for the left side.

1. Remove the left front wheel.

2. Empty the brake fluid.

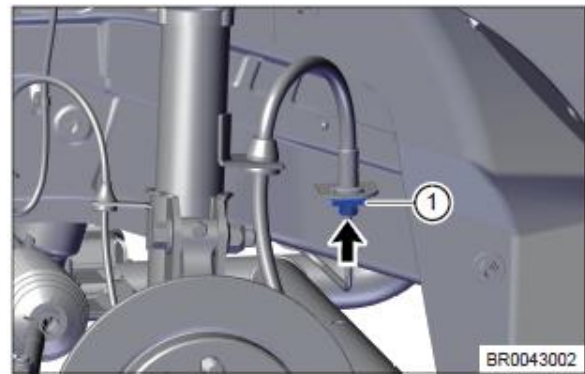
### Note:

Emptied brake fluid should be properly stored in containers and should not be discarded at will.

**⚠ Caution**

- If the brake fluid comes into contact with any painted surface, clean it immediately.

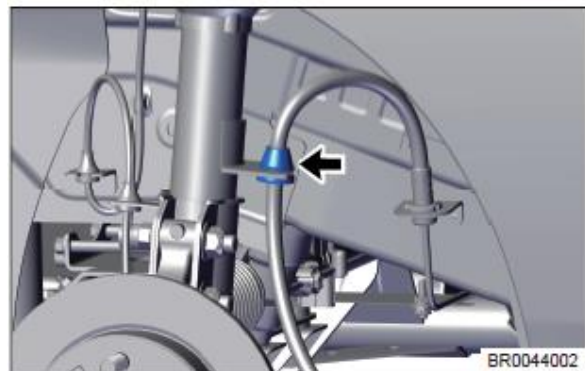
3. Remove the left front brake hose assembly.
  - a. Loosen the connecting bolt (as shown by the arrow) between the left front brake hose assembly and the left front brake pipe, and disconnect the fixing clip (1).



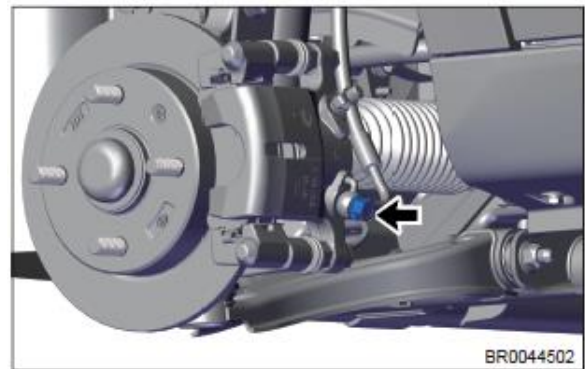
**⚠ Caution**

- Do not bend or damage the brake pipe.
- Do not allow foreign matter (such as dirt and dust) to enter the brake pipe from the connection part.
- After the brake lines are removed, they shall be sealed to prevent foreign objects from entering.

- b. Disconnect the fixing part of left front brake hose assembly (as shown by the arrow) from left front shock absorber assembly.



- c. Remove the connecting plug (as shown by the arrow) between left front brake caliper assembly and left front brake hose assembly.



**⚠ Caution**

- While removing the brake hose, do not splash the brake fluid on clothes or skin as the brake fluid is corrosive.

- d. Remove the left front brake hose assembly.

**Installation**

1. The installation sequence is reverse to the removal.

**⚠ Caution**

- Be sure to tighten the fixing plug to the specified torque during installation.
- After refitting, be sure to check the brake system for leakage. Repair or replace the faulty components as necessary.
- Make sure to perform the bleeding procedure of the brake system after installation.
- Make sure to add brake fluid to the proper position after installation.

## Rear drum brake assembly

### Removal

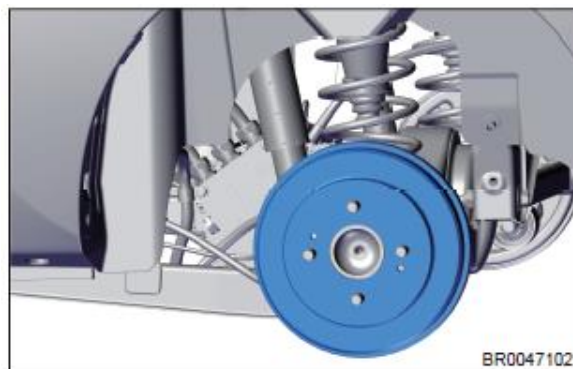
#### Note:

- The procedure for the right side is the same as for the left side.
- The following is the operating procedure for the left side.

#### ⚠ Caution

- Be sure to execute the "Enter the brake maintenance mode" by using the diagnosis equipment before disassembly.

1. Remove the left rear wheel.
2. Empty the brake fluid.
3. Remove the left rear drum brake.
  - a. Completely release the parking brake lever and remove the rear drum brake.

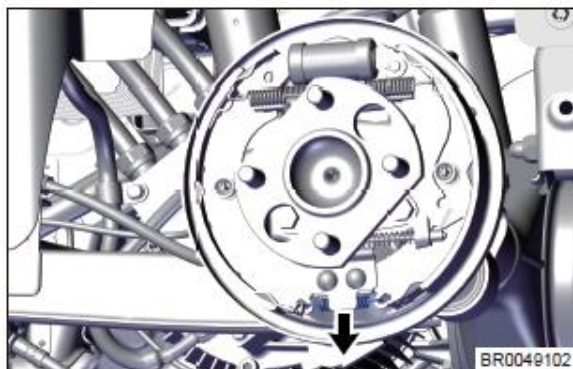


### Disassembly

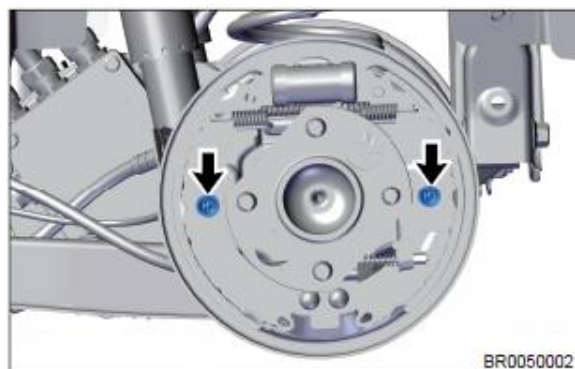
#### Note:

- The procedure for the right side is the same as for the left side.
- The following is the operating procedure for the left side.

1. Remove the brake shoe return spring (the lower side).
  - a. Carefully remove the brake shoe return spring (the lower side) using needle-nose pliers as shown in the illustration.

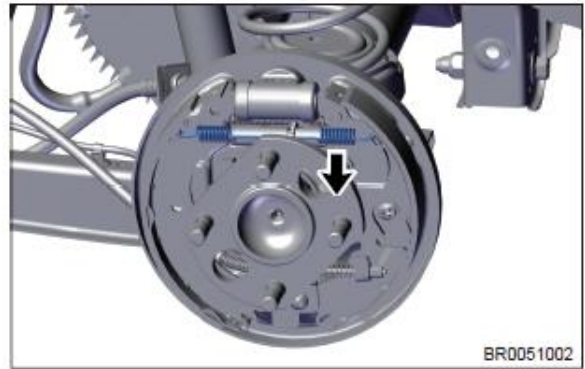


2. Remove the brake shoe limit spring assembly.
  - a. As shown in the figure, use long-nose pliers to press the brake shoe limit spring leaf, and rotate the brake shoe limit pin clockwise or counterclockwise to remove the brake shoe limit spring assemblies on both sides.



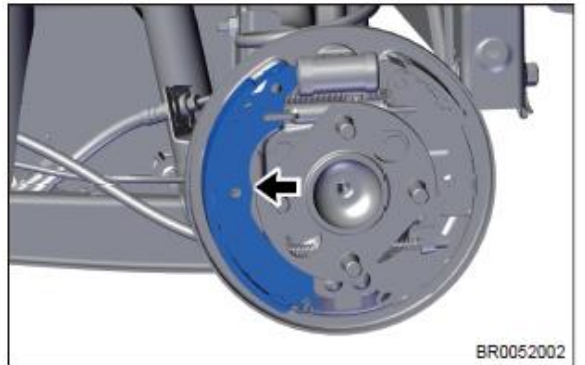
3. Remove the tension spring of automatic brake clearance adjustment.

- a. As shown in the figure, use long-nose pliers to carefully remove the automatic brake clearance adjusting tension spring.



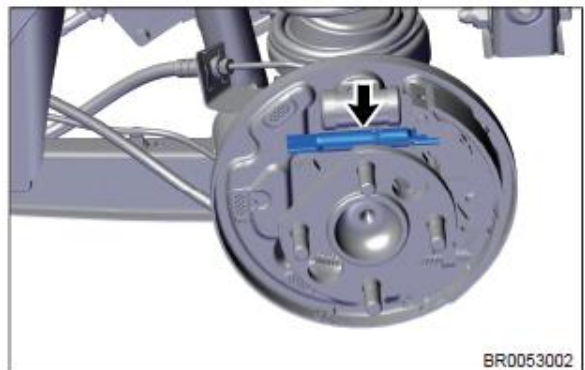
4. Remove the brake shoe return spring (the upper side).

- a. Carefully remove the brake shoe return spring (the upper side) using long-nose pliers as shown in the illustration.



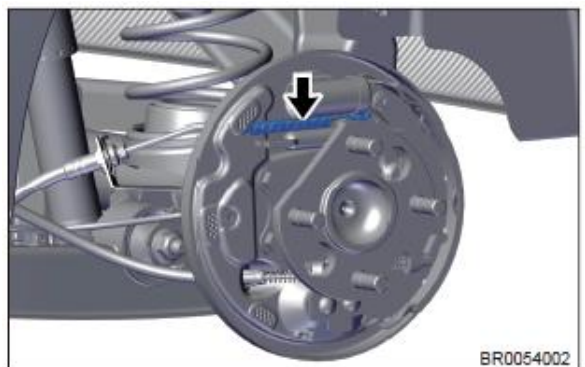
5. Remove the left brake shoe.

- a. As shown in the figure, disconnect the left brake shoe from the brake shoe adjusting device (as shown by the arrow).



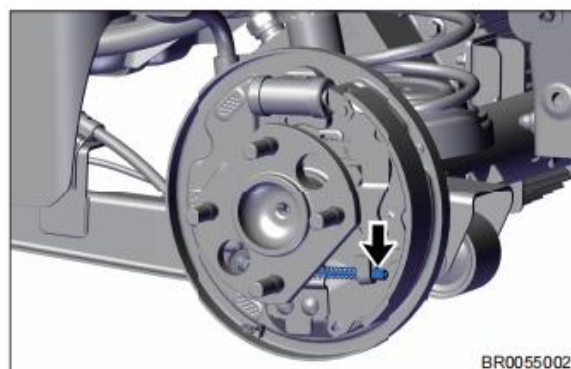
6. Remove the brake shoe adjusting device.

- a. As shown in the figure, detach the brake shoe adjusting device from the right brake shoe.

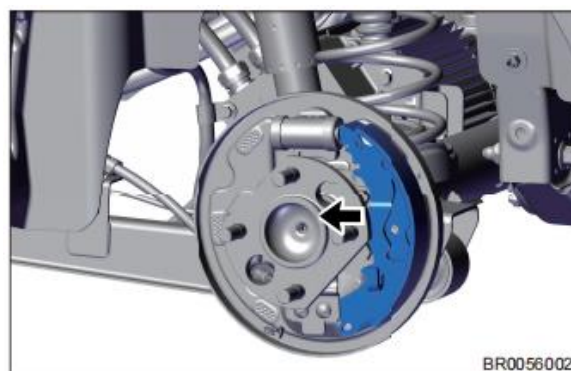


7. Remove the right brake shoe.

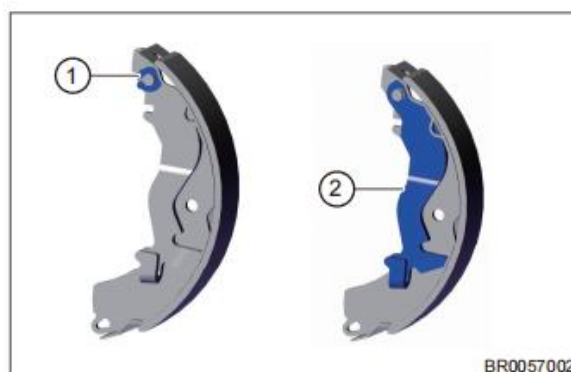
- a. As shown in the figure, use long-nose pliers to tighten the return spring at the end of parking brake rear cable (as shown by the arrow) and disengage it from the brake shoe link



- b. Remove the right brake shoe with the brake shoe link as shown in the illustration.



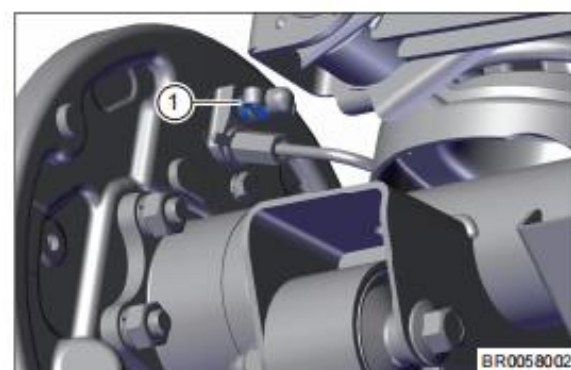
- c. Remove the U-clip (1) as shown in the illustration.



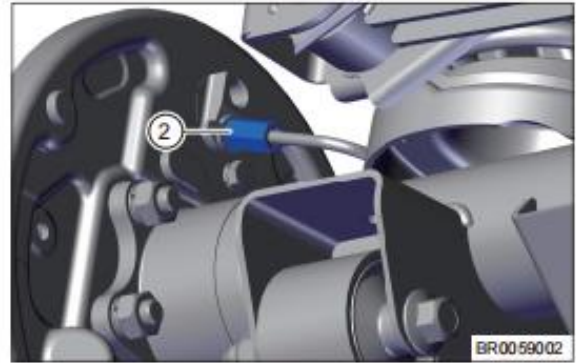
- d. Remove the brake shoe link (2) from the right-side brake shoe as shown in the illustration.

8. Remove the rear wheel braking cylinder.

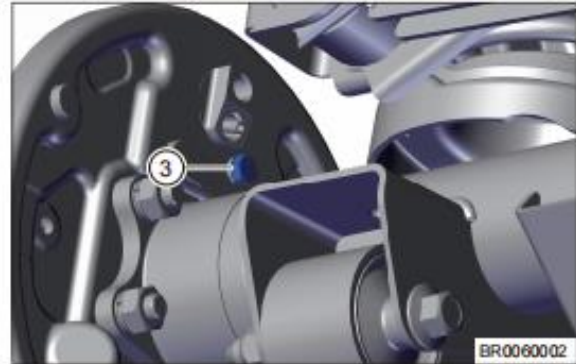
- a. Unscrew the bleeder screw cap and remove the bleeder screw (1) as shown in illustration.



- b. Loosen the connecting plug (2) of the rear wheel brake pipe as shown in the illustration.

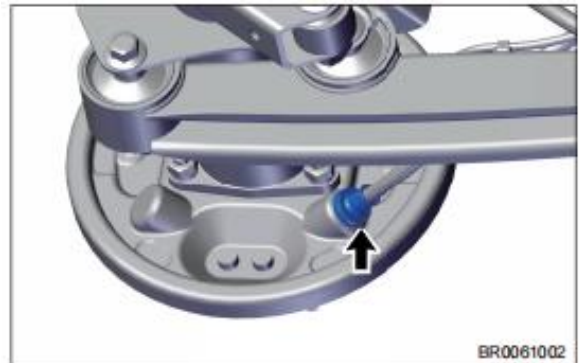


- c. As shown in the figure, remove the connecting bolts (3) between the rear wheel braking cylinder and the rear brake bottom plate.



- d. Remove the rear wheel braking cylinder.
- 9. Remove the rear brake bottom plate.

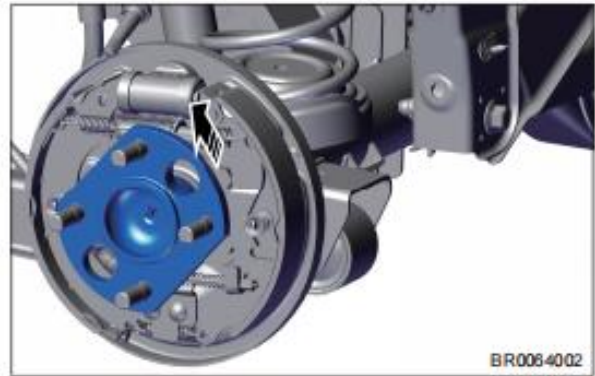
- a. As shown in the figure, use a pair of long-nose pliers to remove the fixing screw (as shown by the arrow) of the rear parking brake cable assembly, and then disconnect the rear parking brake cable from the rear brake bottom plate;



- b. As shown in the figure, remove the 4 connecting bolts (as shown by the arrow) between the rear brake bottom plate and the rear axle.



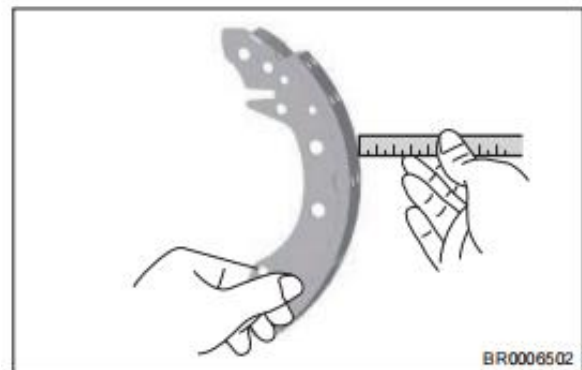
- c. Pull out the half shaft.



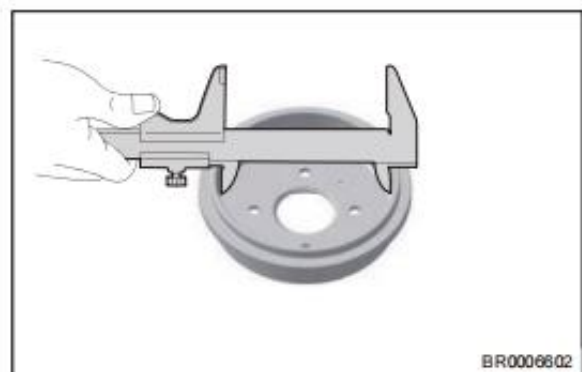
- d. Remove the rear brake bottom plate.

### Check

1. Check the thickness of disc brake.
  - a. Use a ruler to measure the thickness of the brake shoe as shown in the figure.

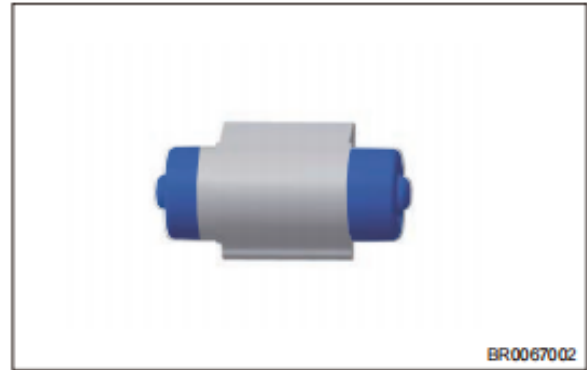


- b. If the brake shoe thickness is equal to or less than the minimum, the brake shoe shall be replaced.
2. Check the inner diameter of rear drum brake.
  - a. Use a vernier caliper or equivalent to measure the inside diameter of the rear drum brake.



- b. If rear drum brake inside diameter is greater than the maximum, replace the rear drum brake.
3. Check the wheel braking cylinder.

- a. As shown in the figure, check the dust boot on both sides of the rear wheel braking cylinder for oil leakage.



- b. If there is oil leakage, replace the rear wheel braking cylinder.

### Installation

#### Note:

- The procedure for the right side is the same as for the left side.
- The following is the operating procedure for the left side.

#### ⚠ Caution

- Be sure to tighten the fixing bolt and nuts to the specified torque during installation.
- After refitting, be sure to check the brake system for leakage. Repair or replace the faulty components as necessary.
- Make sure to perform the bleeding procedure of the brake system after installation.
- Make sure to add brake fluid to the proper position after installation.

### Rear brake hose assembly

#### Removal

#### Note:

- The procedure for the right side is the same as for the left side.
- The following is the operating procedure for the left side.

#### ⚠ Caution

- Be sure to wear the necessary labour protection articles when repairing to avoid accidents.
- During removal and installation, avoid scratching the body system paint surface.

1. Drain the brake fluid.

#### Note:

Emptied brake fluid should be properly stored in containers and should not be discarded at will.

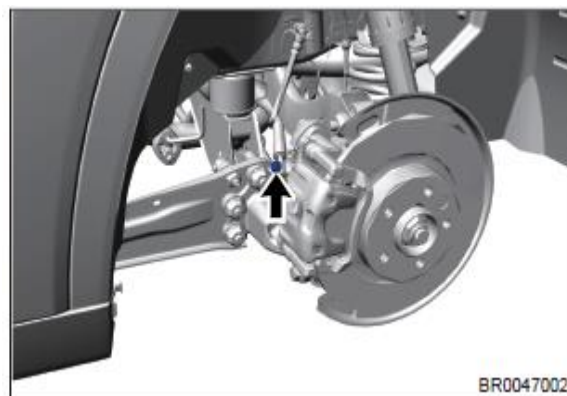
#### ⚠ Caution

- If the brake fluid comes into contact with any painted surface, clean it immediately.

2. Remove the left rear brake hose assembly.



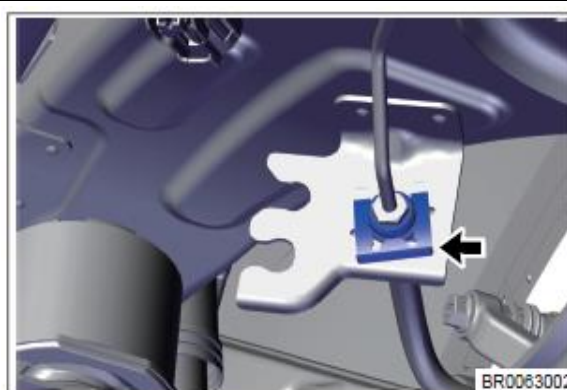
- a. Loosen the screw plug (1) connecting the rear part of the rear brake hose assembly and the brake pipe, and disconnect the fixing clip (as shown by the arrow).



**⚠ Caution**

While removing the brake hose, do not splash the brake fluid on clothes or skin as the brake fluid is corrosive.

- b. Loosen the connecting screw plug (1) between the front part of rear brake hose assembly and the brake pipe, and disconnect the fixing clip (as shown by the arrow).



**⚠ Caution**

- Do not bend or damage the brake pipe.
- Do not allow foreign matter (such as dirt and dust) to enter the brake pipe from the connection part.
- After the brake lines are removed, they shall be sealed to prevent foreign objects from entering.

- c. Remove the left rear brake hose assembly.

### Installation

1. The installation sequence is reverse to the removal.

**⚠ Caution**

- Be sure to tighten the fixing plug to the specified torque during installation.
- After refitting, be sure to check the brake system for leakage. Repair or replace the faulty components as necessary.
- Make sure to perform the bleeding procedure of the brake system after installation.
- Make sure to add brake fluid to the proper position after installation.



## Brake

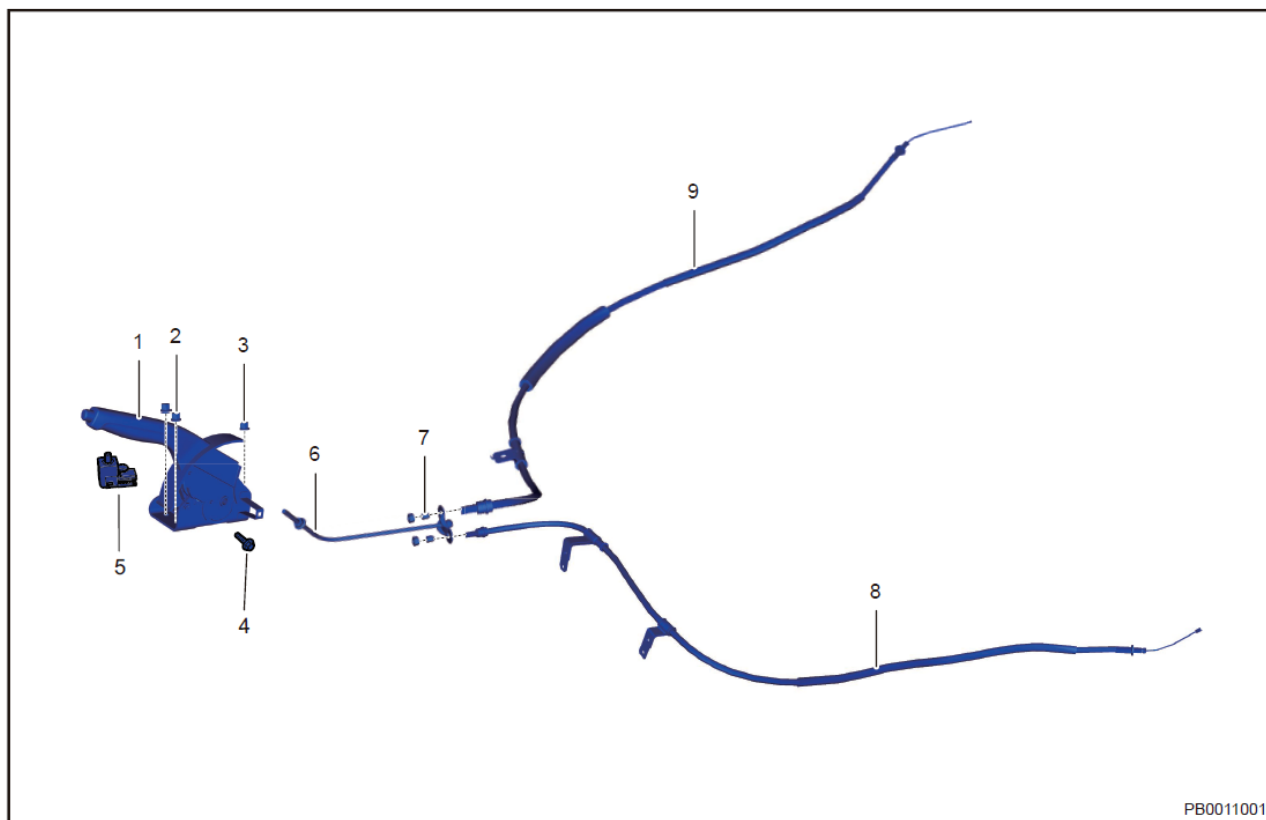
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General information	205	Adjustment procedure for parking	207
Description	205	Remove parking brake control	
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On-board maintenance	206		



## Mechanical parking brake system

### General information

### Description



PB0011001

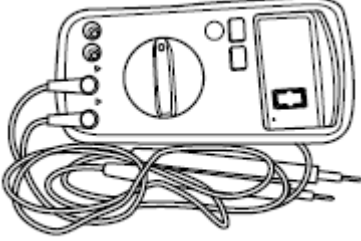

1	Hand brake control mechanism assembly	6	Hand brake front cable assembly
2	Handbrake fixing bolt - M8×16	7	Left-hand rear brake cable assembly
3	Adjusting nut of parking brake	8	Right-hand rear brake cable assembly
4	Fixing bolt of parking switch	9	Cable fixing bolt - M6×12
5	Parking brake switch	10	Cable fixing bolt - M8×16

### Functional description

The parking brake generates the parking brake pressure by transmitting the hand brake force to the two rear brakes through the hand brake cable. The rear brake assembly is a drum brake assembly, and the clearance is automatically adjusted, so there is no need to manually adjust the friction block after wear; After installing the parking brake cable, perform this adjustment.

## Tools


## General tools

Tool name	Illustration
Digital multimeter	 <p>002</p>
Vernier caliper	 <p>RCH001906</p>

## On-board maintenance

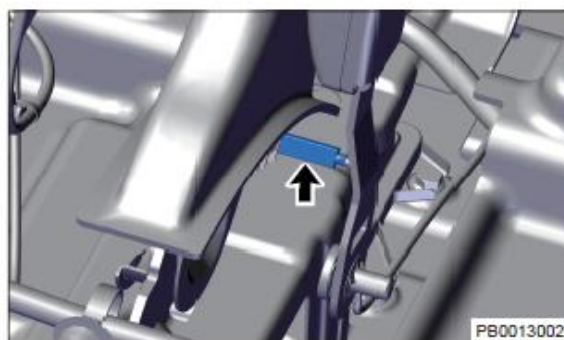
## Parking brake switch assembly

## Removal

 Caution

- Be sure to wear the necessary labour protection articles when repairing to avoid accidents.
- During removal and installation, avoid scratching the body system paint surface.

1. Fix the wheel assembly.
2. Remove the console body assembly.
3. Remove the parking brake switch assembly.
  - a. As shown in the figure, disconnect harness connector of parking brake switch assembly (as shown by arrow).



- b. Remove the fixing screw of the parking brake switch assembly (as shown by the arrow).



- c. Remove the parking brake switch assembly.

**Check**

1. Check the parking brake switch assembly.
  - a. Check whether the parking brake switch assembly is worn or cracked. Replace the parking brake switch assembly as necessary.
  - b. Check whether the parking brake switch assembly press spring is damaged or insufficient elasticity, and replace the parking brake switch assembly if necessary.

**Installation**

1. The installation sequence is reverse to the removal.

**Adjustment procedure for parking**

1. After adding brake fluid, under high pressure state on the vehicle, after releasing the hand brake, step on the brake pedal for 5 times in full stroke (hand brake to ensure release state), the purpose is to use hydraulic pressure to push out the piston, so that the drum brake is pressed to the brake pedal, eliminating the drum gap;
2. Then pull the parking brake control mechanism for at least 5 times with both hands in full stroke to release the stress of the parking system;
3. Then pull up the parking brake control mechanism to the 5th tooth, and use a  $3\pm 1$  N. m torque gun to tighten the front cable M6 nylon lock nut until the torque is tightened in place (until the torque is cut off, and a tightening sound occurs);
4. Install the auxiliary tool (with constant torque of  $20\pm 2$  N. m) onto the handle, apply force perpendicular to the wrench handle, slowly and uniformly pull up the torque wrench and count the number of teeth, as shown below:
  - 1 Pull up the parking brake with 6 teeth, and the torque wrench "click" sound is heard during the process of 6 teeth to 7 teeth, indicating that the parking brake has been tightened as required;
  - 2 Pull up the parking brake with 7 teeth, and the torque wrench "click" sound is heard. It indicates that the parking brake has been applied as required;
  - 3 Pull up the parking brake with 7 teeth, and the torque wrench "click" sound is heard during the process of 7 teeth to 8 teeth, indicating that the parking brake has been applied as required.

If the following phenomena occur, the handbrake needs to be readjusted:

- a. If the number of teeth pulled up is less than or equal to 6 teeth, it indicates that the adjustment is too tight, and then use a wrench to loosen the lock nut by 2 teeth.
- b. If the number of teeth pulled up is greater than or equal to 8 teeth, it indicates that the adjustment is too loose, and tighten the lock nut by 2 teeth with a wrench.

After the above adjustment, it is necessary to use the auxiliary tools again for inspection. If it is not qualified, it is necessary to continue to adjust until it is qualified.

Criteria for determining whether the parking system adjustment is qualified:

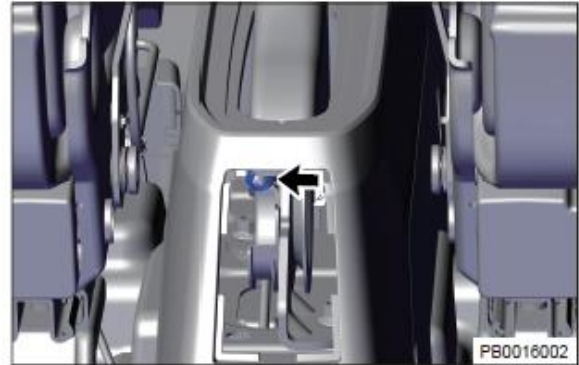
1. When the vehicle is on flat ground and the hand brake control mechanism is fully released, the hand brake has a certain idle stroke, and there should be no obvious blocking force when one person pushes the vehicle; When the 4 teeth are pulled up, there is obvious blocking force when one person pushes the vehicle, which is difficult to push; When pulling up 5 teeth, one person can't push the vehicle with force.
2. The vehicle shall be parked on a 20% slope with no load (carrying capacity  $\leq 2$  persons), and the driver shall step on the brake normally on the uphill and downhill (in both directions), and the number of parking teeth shall be within the range of  $7\pm 1$  teeth, that is, the parking system adjustment is qualified.

**Remove parking brake control mechanism assembly****⚠ Caution**

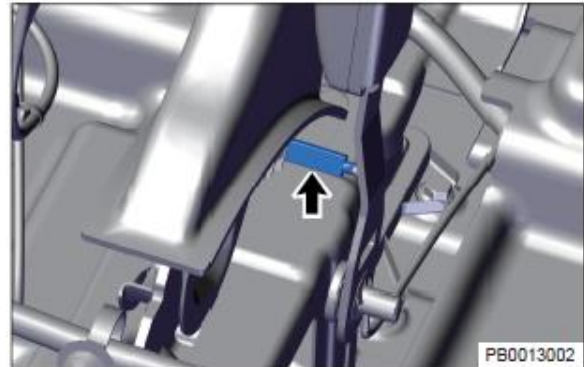
- Be sure to wear the necessary labour protection articles when repairing to avoid accidents.
- During removal and installation, avoid scratching the body system paint surface.

1. Fix the wheel assembly.
2. Remove the console body assembly.
3. Remove the harness connector on the parking brake switch assembly.
4. Remove the parking brake control mechanism assembly.

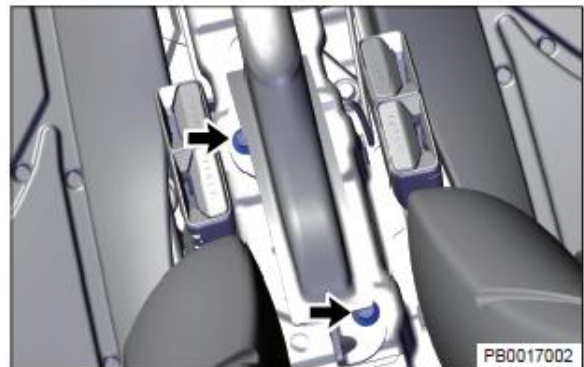
- a. Loosen the parking brake control mechanism completely.
- b. Loosen the lock nut (as shown by the arrow) of the parking brake control mechanism assembly, release the tension on the parking brake cable assembly, and remove the front cable assembly.



- c. Disconnect the parking brake switch connector (as shown by the arrow).




- d. Remove 2 fixing bolt (as shown by the arrow) between the parking brake control mechanism assembly and body system.



- e. Remove the parking brake control mechanism assembly.

**Installation**

- 1. The installation sequence is reverse to the removal.

 Caution
<ul style="list-style-type: none"><li>• Be sure to tighten the connecting nut to the specified torque.</li></ul>



## Rear cable assembly of parking brake

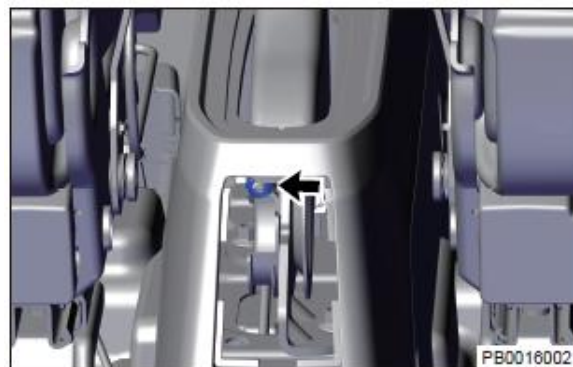
### Removal

#### ⚠ Caution

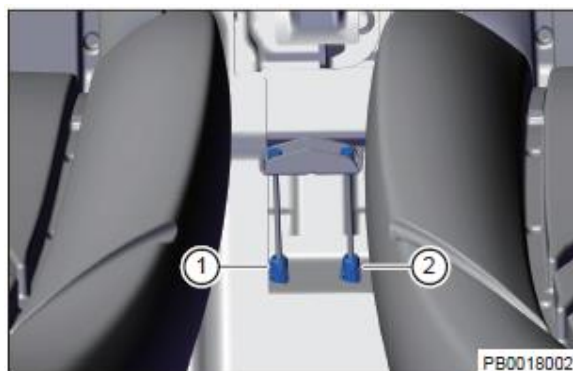
- Be sure to wear the necessary labour protection articles when repairing to avoid accidents.
- During removal and installation, avoid scratching the body system paint surface.

1. The operation procedure of the right-side cable is the same as that of the left side (take the left side as an example).
2. Remove the left rear wheel.
3. Remove the console body assembly.
4. Remove the left rear wheel hub and brake lining.
5. Remove the rear parking brake cable assembly.

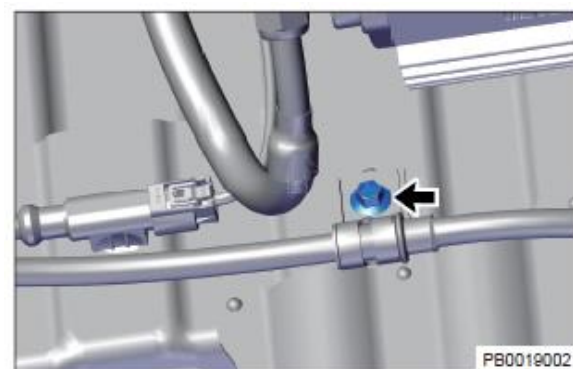
- a. Loosen the parking brake control mechanism completely.
- b. Loosen the lock nut (as shown by the arrow) of the parking brake control mechanism assembly to release the tension on the parking brake cable assembly.

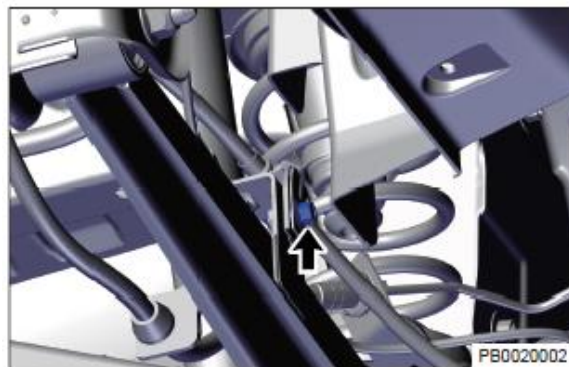


- c. Loosen the locking clips (1) (2) of the left and right parking brake cables respectively, and disengage the left and right cables.

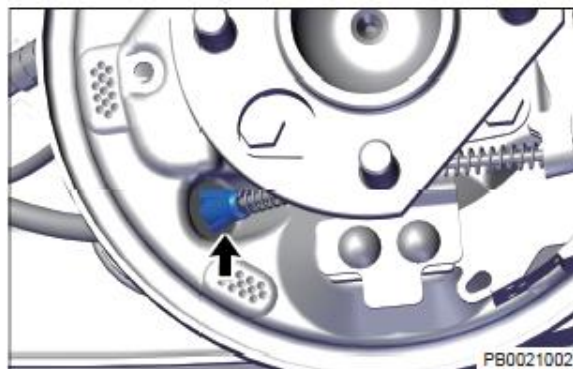


- d. Remove the bolts (as shown by the arrows) from the 2 fixing brackets of the left rear cable by lifting the vehicle to the proper position.

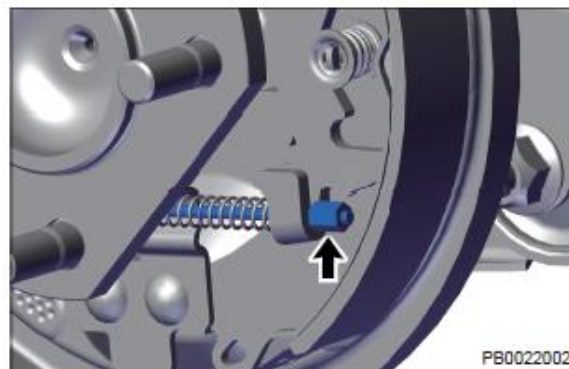




- e. Disconnect the quick-plug connector (as shown by the arrow) connecting the wire drawing and drum brake.




- f. Disconnect the left rear brake cable from the rear brake lining pull arm hook (as shown by the arrow).



- 6. Remove the rear parking brake cable assembly.

**Installation**

- 1. The installation sequence is reverse to the removal.

 <b>Caution</b>
<ul style="list-style-type: none"><li>• Be sure to tighten the connecting bolts and nuts to the specified torque</li></ul>

# HVAC

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## Warnings and precautions

### Caution

1. When cleaning the A/C pipeline after sale, it is necessary to disconnect the connector of the negative ion generator to avoid causing fire.
2. To prevent the battery from running out of power, if not necessary, please turn off the HVAC.
3. Do not insert anything into, stick to, or use spray around the vents; These items may cause the system to fail to function properly.
4. When you find that the air volume or speed of the air outlet is significantly reduced, please check whether the HVAC filter element is dirty and blocked. If it is dirty, please clean it or replace the HVAC filter element; It is recommended to check or replace the HVAC filter element once every 5,000 km (3,100 miles).
5. When you find that the cooling effect is significantly reduced, check whether the refrigerant of the HVAC is sufficient, and check whether the windward side of the condenser is blocked by dirt. If so, please add refrigerant or clean the surface of the condenser with dirt.
6. When the air quality outside the vehicle is relatively poor (large dust or air pollution), it is recommended that the air conditioner use the interior air circulation mode (when the key characters are displayed in blue, it means interior air circulation, and when the characters are displayed in white, it means outside air circulation).
7. When HVAC is not used for a long time, it is recommended to start it once a month and work for about 5 minutes. The purpose is to ensure the good sealing of the main shaft of the air conditioning compressor. At the same time, the electrolytic corrosion phenomenon of the internal parts of the compressor can be avoided, resulting in poor refrigeration effect of the HVAC.
8. When assembling the pipeline, confirm that the O-ring is installed in the groove first. If the O-ring is worn during assembly, replace the O-ring.
9. Nitrogen leak detection, pressure maintenance and vacuum pre-pumping must be carried out by nitrogen vacuum pre-pumping equipment before the refrigerant is filled.
10. After the nitrogen leak detection and pressure maintaining process is completed, the air conditioning pipe filling port cover should be turned on in time to avoid misoperation and contact with the valve core in the filling port, so that the HVAC can be connected to the atmosphere.
11. When filling refrigerant, install the charging gun head vertically on the charging port. After installation, do not shake the charging gun head from side to side to avoid touching the spool in the charging port.

## Functional description of HVAC



AC0000101

### On-off state

1. The air volume knob has the function of switching on and off, when the panel is in the state. The air volume knob has the function of switching on and off, when the panel is in the state. When the panel is in the state of 0, the panel is off; When the air volume knob is in the non-zero gear state, the panel boot button knob can be operated. After the air volume is turned off and turned on again, the AC/AC/ internal and external circulation memory keeps the last state before the last turn off. In the shutdown state, the analog electric operation is effectively executed to the corresponding position. When the internal and external circulation buttons are in the shutdown state, the analog electric operation is effectively implemented to the corresponding position. When the internal and external circulation buttons are in the shutdown state, the analog electric operation is effectively performed to the corresponding position. When the internal and external circulation motor are executed to the corresponding position according to the user's key operation state. When the indicator light shows the state of the internal and external circulation motor according to the user's key operation state, the indicator light shows the corresponding state.
2. The air blower is divided into OFF, 1-4 gears, and the terminal voltages of the blower with different voltages are output according to the knob position as shown in the following table:

### Internal/external circulation button

1. Operate the internal and external circulation button, and the motor will turn to the corresponding state.

### Mode knob

1. Turn the mode knob clockwise, the mode status is face blowing, face blowing and foot blowing, foot blowing and foot defrosting, defrosting status, and the damper motor will turn to the corresponding position respectively:
2. When the mode is set to defrost: AC is on, the external circulation is enabled, and when the defrost mode is exited, AC and the circulation returns to the state before defrosting; In the defrosting state, if the AC and circulation are operated, the state after operation will be maintained.
3. In the defrosting mode, the cooling and heating are in PTC gear, and the associated compressor speed is 1000 rpm. The cooling and heating are in the refrigeration gear, and the compressor speed follows the compressor control strategy.
4. Unless the A/C is manually turned off, the A/C works regardless of whether the temperature knob is in the cooling position (blue zone) or in the heating position (red zone). The PTC operates when the temperature knob is in the heating position (red zone).

## Control of compressor

### Description of functions

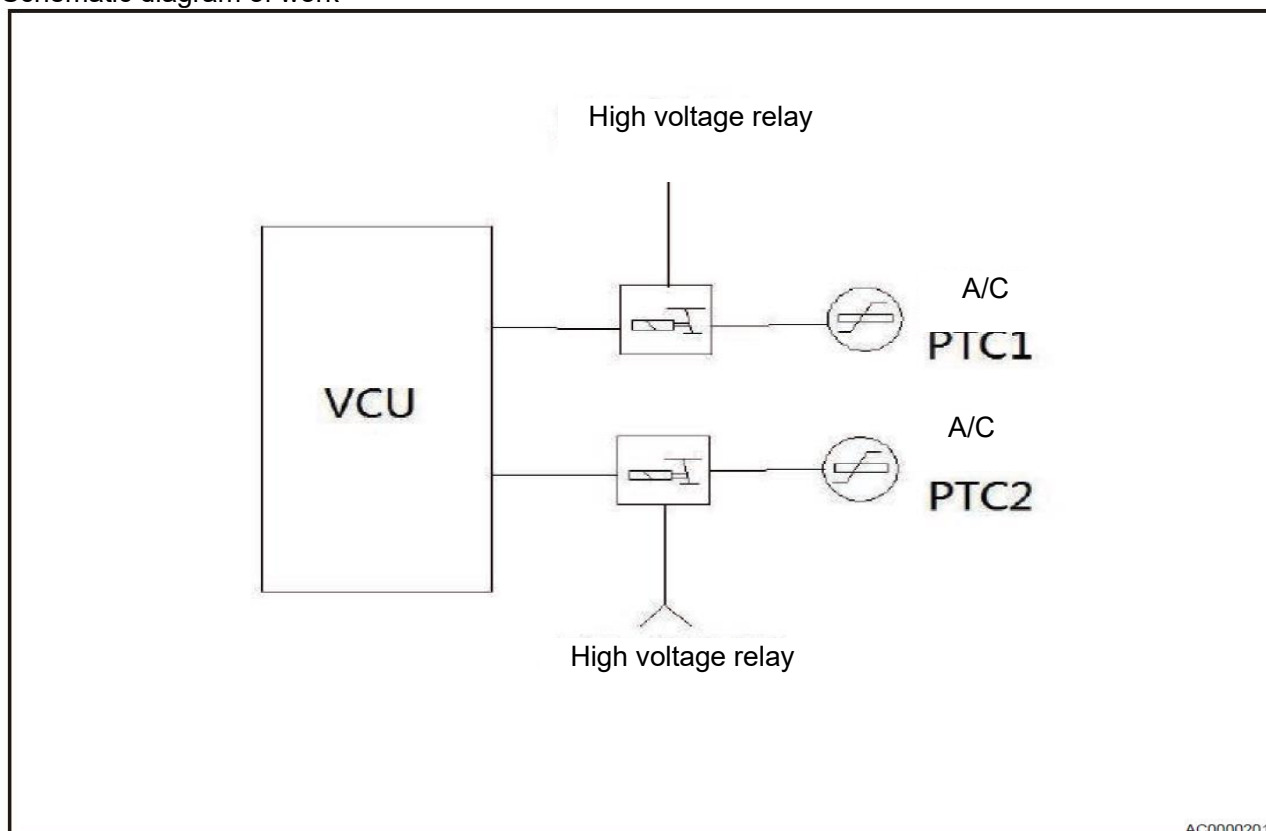
1. According to the driver's demands and the whole vehicle working conditions, control the A/C

### Control logic

1. The A/C panel sends a compressor request (A/C) signal when the following conditions are met:
  - a. There is a request to turn on the A/C.
  - b. Evaporator temperature  $\geq 1^{\circ}\text{C}$  ( $34^{\circ}\text{F}$ ) (the temperature between the evaporator temperature protection zones is  $1^{\circ}\text{C}$ - $5^{\circ}\text{C}$  ( $31$ - $41^{\circ}\text{F}$ ). When the evaporator temperature drops below  $1^{\circ}\text{C}$  ( $34^{\circ}\text{F}$ ) during the operation of the air conditioner, the air conditioner stops working, and the air conditioner is allowed to work only after the temperature of the rear evaporator rises to  $5^{\circ}\text{C}$  ( $41^{\circ}\text{F}$ .) Avantier user can adjust the air conditioner temperature through the cooling and heating rotary knob. The cooling and heating rotation is divided into 6 gears, 1–3 gears for cooling, and 4–6 gears for heating.
2. During the operation of the compressor, when the evaporator temperature  $T \leq 1^{\circ}\text{C}$  ( $34^{\circ}\text{F}$ ), shut down the compressor, and detect the evaporator temperature at the same time. When the evaporator temperature  $T \geq 5^{\circ}\text{C}$  ( $41^{\circ}\text{F}$ ) is detected, resume the compressor operation, and the speed is obtained according to the above algorithm: If the VCU detects that the working conditions of the compressor are not met during the EAC operation, the air conditioner will be turned off.
3. When the air conditioner is working, the VCU will synchronously control the fan to work according to the working condition of the air conditioner. After the A/C startup condition is met and VCU enables the A/C, VCU receives the medium voltage switch disconnection signal and turns on the low-speed fan; When the air conditioner is working, VCU will turn on the high-speed fan after receiving the medium-voltage switch closing signal. When the air conditioner is turned on and the fan is working at low speed, the high-speed fan will be turned on if the high-speed fan is turned on in combination with the fan control strategy.

## Control of PTC

Schematic diagram of work



**Control logic**

1. VCU will close the PTC relay (hardwire signal) when the following conditions are met after the high voltage of the complete vehicle.
  - a. There is PTC gear signal PTCSts (1st, 2nd and 3rd gears)
  - b. The PTC control relay has no fault.
2. PTC gear judgment conditions are as follows: (cooling and heating knob 4th gear and above for heating) (The A/C judges and sends gear signals).
  - a. If the cooling and heating knob is in the 4th gear, as long as the air volume is not 0, no matter which it is, the PTC heating request is the 1st gear heating;
  - b. If the cooling and heating knob is in the 5th gear, as long as the air volume is not 0, the PTC heating request is the 2nd gear heating;
  - c. If the hot and cold knob is in gear 2, as long as the air volume is not 0, the PTC requests that the heating gear be 3.



## General information

### System description

HVAC is a device that realizes the refrigeration, heating, ventilation and air purification of the air in the vehicle. It can provide a comfortable riding environment for passengers, reduce the fatigue strength of drivers, and improve driving safety. The HVAC is an integrated cooling and heating air conditioner, which adopts the control mode of variable displacement compressor + thermal expansion valve, and uses the environment-friendly refrigerant R134a\R1234yf (European Union) Refrigeration. It is composed of compressor, condenser, HVAC, rear evaporator, pipeline and other basic refrigeration components, and also includes pressure switch, O-ring and other accessories.

### Description of system components

#### Motor-driven compressor

This vehicle is designed with the electric compressor, the compressor controller is integrated with the compressor. Through the rotation of the motor itself, the scroll disk is compressed to complete the suction and discharge of refrigerant and provide power for the refrigeration cycle.

#### Condenser

The high-temperature and high-pressure refrigerant steam from the electric compressor flows into the condenser. The condenser is made of aluminum tubes capable of rapid heat transfer and cooling fins. The cooling fins condense the high-temperature and high-pressure refrigerant steam into medium-temperature and high-pressure liquid through heat dissipation.

#### HVAC pressure switch

The HVAC pressure switch is installed on the high-pressure pipe in order to monitor the refrigerant pressure and output the refrigerant pressure signal to the ECM. The ECM controls the compressor based on the signal that is transmitted by the HVAC pressure switch.

### Fault Code (DTC) Table

#### A/C compressor (EAC)

DTC code	Definition of DTC
B144019	Fault of phase current overcurrent protection
B144111	High temperature fault of internal module
B144216	Under-voltage fault of busbar
B144217	Busbar overvoltage fault
U007388	Can Bus off
B144411	Internal voltage fault of the controller
B144519	Busbar overcurrent protection
B144613	Frequency reduction due to over-temperature
B144714	Frequency reduction by overloading
U016487	Lost communication with VCU

#### A/C panel (CLM)

DTC code	Definition of DTC
C1200-16	Low battery voltage
B1600-14	Short circuit or open circuit of evaporation sensor

<b>DTC code</b>	<b>Definition of DTC</b>
B1601-15	Short circuit or open circuit of mode motor
B1602-71	Mode motor stalled
B1603-15	Short circuit or open circuit of hybrid motor
B1604-71	Hybrid motor stalled
B1605-71	Short circuit and open circuit of blower motor
B1606-71	Short circuit or open circuit of the PTC temperature sensor

## Specification

### Torque specifications

<b>Description</b>	<b>Torque</b>
Fixing bolt of expansion valve	9 ± 1.5 N·m (7±1 ft-lbs.)
Fixing bolt of pipe clamp	9 ± 1.5 N·m (7±1 ft-lbs.)
Fixing bolt of compressor	25±3 N·m (18±2 ft-lbs.)
Fixing bolts of compressor inlet and outlet port pipeline	25±3 N·m (18±2 ft-lbs.)
Fixing nut of condenser	9±1 N·m (7±0.7ft-lbs.)
Fixing bolt of A/C pipeline	9±1 N·m (7±0.7ft-lbs.)
HVAC retaining nut	5±1 N·m (4±0.7ft-lbs.)
Fixing bolt for HVAC	7±1 N·m (5±0.7ft-lbs.)
Self-tapping bolts on HVAC	5±1 N·m (4±0.7ft-lbs.)

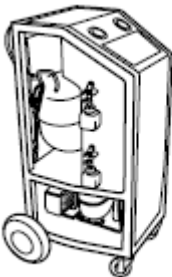
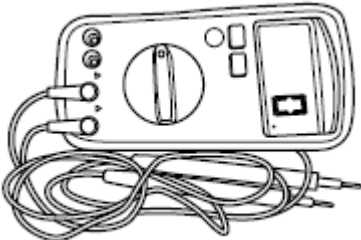
### Dosing of A/C fluid

<b>Model</b>	<b>Filling quantity</b>
R134a/R1234yf (European Union) Refrigerant	550 ±15 g (19.4±0.5 oz)

### Dosage of cooling oil

<b>Model</b>	<b>Filling quantity</b>
Replace the evaporator	20ml (0.7 oz)
Replace the compressor assembly.	Add according to the actual amount of oil poured out
Replace the condenser	20ml (0.7 oz)
Replacement of A/C pipeline	10ml (0.4 oz)

**Tools****General tools**

Tool name	Illustration
Refrigerant recycling/reuse equipment	 <p>RCH004606</p>
Digital multimeter	 <p>RCH000206</p>

## On-board maintenance

### On-vehicle inspection

#### On-vehicle inspection

##### Note:

The HVAC refrigerant lines and hoses are used to transfer the refrigerant between the HVAC components. Kinks or bends in the lines and hoses refrigerant will reduce the performance of the HVAC and reduce the flow of refrigerant in the system.

There is high pressure in the refrigerant when the A/C compressor assembly is operating. It must be ensured that the connection parts of the HVAC are sealed well. Check system piping at least once a year to ensure it is in good condition and properly routed. The lines and hoses refrigerant cannot be repaired and must be replaced if there are leaks or if damage exists.

1. Routine inspection
  - a. Check whether there is oil stain or dust on the connectors of the A/C pipeline. If this is the case, there may be a leak.
  - b. Check whether the condenser surface is dirty, and whether the radiating fin is deformed.
  - c. Check whether there is harsh noise when the compressor assembly is working normally.
  - d. Use your hands to feel that there should be obvious temperature difference between the intake pipeline and the exhaust pipeline of the compressor assembly. Under normal circumstances, the low-pressure pipeline is cooler and the high-pressure pipeline is hotter. Use hands to feel the temperature difference between the inlet and outlet pipes of the condenser. Under normal circumstances, the temperature of the inlet pipe is higher than that of the outlet pipe. Use hands to feel the temperature difference between the inlet and outlet pipes of the expansion valve. Under normal circumstances, the inlet pipe of the expansion valve is hotter and the outlet pipe of the expansion valve is cooler, and there is an obvious temperature difference between the two.
2. Check the refrigerant pressure with the pressure gauge assembly

Connect the assembly of the manifold pressure gauge. When the following conditions are met, read the gauge pressure. Test conditions:

The internal and external circulation switch is placed in the external circulation position.

Turn the temperature control knob to the coldest setting.

The blower speed control switch is set to the highest gear.

Turn on the A/C switch.

Observe the pressure value on the pressure gauge.

#### Noise inspection of compressor assembly

When checking for HVAC-related noises, it is important to first understand the conditions under which the noise is occurring. These conditions include: weather, speed, and other special conditions. Increased noise during air conditioning operation can often be misleading. For example, a sound that sounds like a bearing failure can be caused by a loose bolt, mounting bracket, or a loose compressor assembly.

##### Warning

- If the compressor assembly itself makes abnormal noise, replace the A/C compressor assembly.

1. Choose a quiet place for the test.
2. Reproduce customer feedback information as much as possible.
3. Turn on and off the A/C for several times to clearly identify the compressor assembly noise.
4. Check the condition of the compressor assembly belt.
5. Check the compressor assembly hub, belt pulley and bearing assembly. Ensure that the hub and pulley are properly aligned and that the pulley bearing is securely installed on the A/C compressor assembly.
6. Check whether the refrigerant pipeline is wrongly routed, damaged or interfered by abnormal noise. At the same time, check whether the refrigerant pipeline is knotted or bent, otherwise it will restrict the flow of refrigerant and cause noise.
7. Loosen all compressor assembly fastening bolts and retighten.
8. If the liquid refrigerant in the air conditioner suction line makes noise when it is slowly surge, replace the condenser and check the refrigeration oil level and refrigerant filling.
9. If slow surge still exists after replacing the condenser, replace the A/C compressor assembly

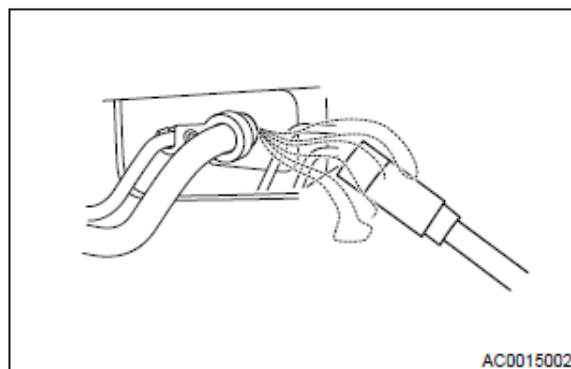
**⚠ Caution**

Do not run the engine when the vacuum pump is operating or when there is a vacuum in the HVAC. Otherwise, serious damage to the A/C compressor assembly may be caused.

**Refrigerant leak check****⚠ Warning**

- Do not use compressed air to perform pressure tests or leakage tests on HVAC of R134a\R1234yf (European Union) Refrigerant service equipment or vehicles; Mixtures of air and R134a\R1234yf (European Union) Refrigerant are flammable under high pressure; These mixtures are potentially hazardous and may cause fire or explosion that could result in vehicle damage, personal injury or death.
- Avoid inhalation of vapors or moisture from HVAC refrigerant and refrigerant oil
- Only use professional service equipment to discharge the R134a\R1234yf (European Union) Refrigerant system. In case of accidental discharge of the system, ventilate the workplace before maintenance.
- If the HVAC refrigerant filling quantity is empty or low, there may be a leak in the HVAC Check all A/C pipes, connectors and components for residual oil. Residual oil is an indicator of the location of the A/C leak.

1. Check the refrigerant for leaks
  - a. After refilling the refrigerant, use a gas leak detector to check whether the refrigerant gas leaks.
  - b. Perform the operation under the following conditions:
    - Turn off the compressor.
    - Ensure adequate ventilation (the gas leak detectors may react to volatile gases that are not refrigerant, such as gasoline vapors or exhaust gases).
    - Repeat the test 2 to 3 times.
    - Ensure that there is refrigerant in the refrigeration system still.
  - c. Use the air leakage detector near the A/C pipeline interface to check if the A/C pipeline leaks. If the gas leak detector makes a sound, it indicates that there is a leak. Repair or replace the leaking A/C lines as necessary.
  - d. Disconnect the HVAC pressure switch connectors and test for leaks at the HVAC pressure switch using the same method. Replace the HVAC pressure switch if necessary.
  - e. Insert the air leakage detector into the evaporator tank assembly, and check the evaporator for leakage with the same method. Clean or replace the evaporator core assembly if necessary.
  - f. Check the condenser for leakage with the same method. Clean or replace condenser assembly if necessary.

**Recovery, vacuuming and filling of the refrigerant****Recycling/emptying of refrigerant****⚠ Warning**

- HVAC is under high pressure, use extreme caution when servicing.
- The HVAC contains refrigerant under high pressure. Maintenance must be carried out by professional maintenance personnel. Otherwise, serious danger or fatal injury may occur due to incorrect service procedure.
- If the HVAC is accidentally depressurized, ventilate the workplace before maintenance. The release of large amounts of refrigerant in a closed workplace will reduce oxygen and may cause asphyxiation, resulting in serious or fatal injury.

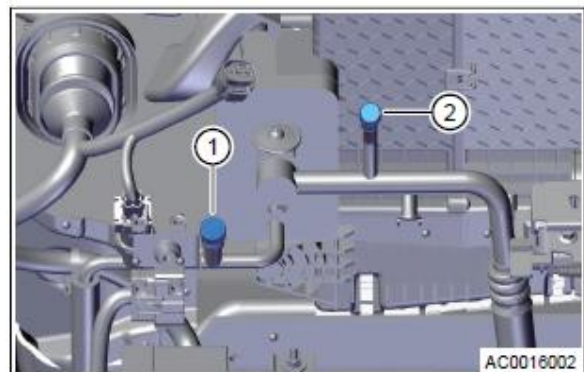
- Do not directly discharge the refrigerant in the HVAC of the vehicle into the atmosphere, so as to avoid causing environmental pollution.

**⚠ Caution**

R134a/R1234yf (European Union) Refrigerant special recycling equipment must be used for recycling.

- Do not approach an open flame.
- Make sure to handle the recovered refrigerant as required.
- Never add R-12 to a refrigerant that uses R134a/R1234yf (European Union) Refrigerant. These refrigerants are incompatible and can damage the HVAC.
- The compressor does not work when the vacuum pump is working or there is a vacuum in the HVAC. Otherwise, serious damage will occur to the A/C compressor assembly.

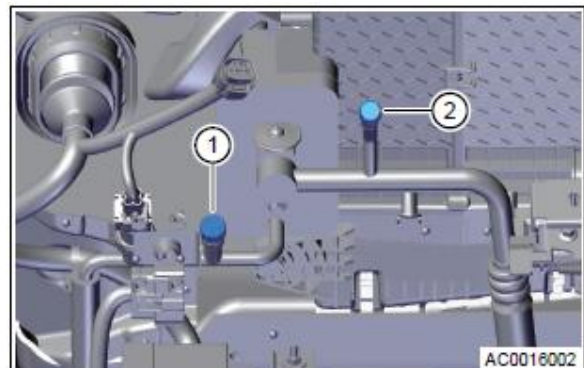
- Open the engine hood assembly and loosen the A/C high/low pressure pipe fitting caps.
- Connect the refrigerant recovery/reuse equipment to the A/C high and low-pressure pipe fitting caps.
  - Connect the blue connector to the A/C low-pressure pipe connector (1).
  - Connect the red connector to the A/C high-pressure pipe connector (2).



- Open the high-pressure and low-pressure valves of the refrigerant recovery/reuse equipment.
- Select the Recycle option on the device and let it start working.
- Check the low pressure value of the pressure gauge to ensure that the recovery is complete, and then turn off the equipment.
- Disconnect the connection part between the refrigerant recovery/reuse equipment and the A/C pipeline joint.
- Reinstall the cap to the refrigerant pipe fitting.

**Vacuumizing**

- Open the engine cover and loosen the A/C high/low pressure pipe fitting caps.
- Connect the refrigerant recovery/reuse equipment to the A/C high and low pressure pipe fitting caps.
  - Connect the blue connector to the A/C low-pressure pipe connector (1).
  - Connect the red connector to the A/C high-pressure pipe connector (2).



- Open the high-pressure and low-pressure valves of the refrigerant recovery/reuse equipment.
- Select the "Vacuum" option on the device, set the time to 15 minutes, then select OK and let it start working.
- Hold the pressure and wait for about 10 minutes after the operation, and check for a change in the vacuum degree of the HVAC. If there is a change, the HVAC may have a leak, then the HVAC shall

be inspected and repaired. If there is no change, perform the refrigerant filling procedure.

## Refill the refrigerant

### ⚠ Caution

- A small amount of refrigerant oil is removed from the HVAC when the refrigerant is recovered and drained. When refilling the HVAC, be sure to replenish the refrigerant oil that was lost during the recovery.
- Do not overfill the refrigerant. Otherwise, the compressor assembly pressure will be too high, which will cause the compressor assembly noise and HVAC failure.
- Before refilling the refrigerant, be sure to vacuumize.

1. Use a vacuum pump to perform the vacuum operation.
2. Add refrigerant oil after checking and confirming that there is no leakage in the HVAC.
3. After adding refrigerant oil, vacuumize for 3 minutes, and then fill in refrigerant.
4. Select the "Fill" option on the device, set the fill amount to the specified value, then select OK and let it start working.
5. Open the suction valve and close the exhaust valve, then open the filling valve to allow the refrigerant to flow into the system.
6. When the delivery of refrigerant has stopped, close the charging valve.
7. If the filled refrigerant is not delivered properly, turn on the A/C switch to make the A/C compressor assembly work.
8. Open the fill valve to transfer the remaining refrigerant to the A/C.

### ⚠ Warning

Do not open the vent (high-pressure) valve at this time. Failure to do so could result in personal injury or even death.

9. Perform the HVAC pressure test after the filling.
10. After the test is completed, remove the refrigerant filling connection pipe.
11. Reinstall the cap to the A/C pipe fitting.

## Recover, refill refrigerant oil

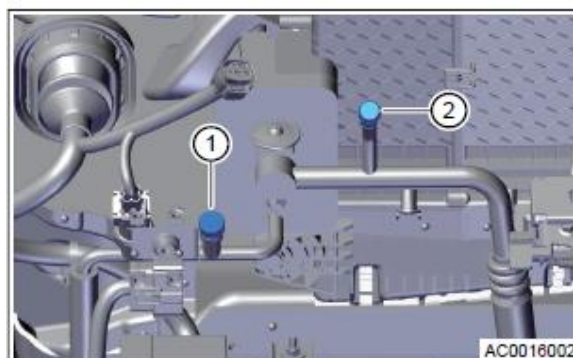
### Recycle refrigerant oil

#### ⚠ Caution

R134 a\R1234 yf (European Union) Refrigerant special service equipment must be used.

- Since HVAC are prone to leakage, be sure to keep the work area well ventilated.
- Make sure to handle the recovered refrigerant as required.
- The refrigerant oil must be added after replacement of HVAC parts or recovery of refrigerant.

1. Open the engine hood assembly and loosen the HVAC high/low pressure pipe fitting caps.
2. Connect the refrigerant recovery/reuse equipment to the A/C high and low-pressure pipe fitting caps.
  - a. Connect the blue connector to the A/C low-pressure pipe connector (1).
  - b. Connect the red connector to the A/C high-pressure pipe connector (2).



3. Open the high-pressure and low-pressure valves of the refrigerant recovery/reuse equipment.
4. Recycle the refrigerant oil according to the instructions on the device.

5. Record the amount of refrigerant oil recovered.
6. Disconnect the connection part between the refrigerant recovery/reuse equipment and the A/C pipeline joint.
7. Reinstall the connector cover on the refrigerant pipe connector.

**Fill the refrigerant oil**

1. Use a vacuum pump to perform the vacuum operation. Wait for about 10 minutes after the operation and check for a change in the HVAC. If there is a change, the HVAC may have a leak, then the HVAC shall be inspected and repaired. If there is no change, continue to perform the refrigerant oil filling procedure.
2. Open the suction valve and close the exhaust valve, then open the filling valve to allow the refrigerant oil to flow into the system.
3. Close the filling valve after the filling of refrigerant oil.
4. Perform the vacuuming operation again for 3 minutes.
5. After the operation is completed, continue to perform the refrigerant filling procedure.

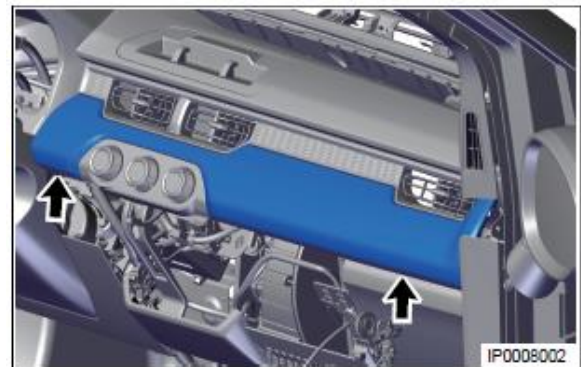
Item	Replace the A/C compressor assembly.	Replace the condenser	Replace the evaporation tank	Replace the pipeline
Filling capacity of refrigerant oil	Add according to the actual amount of oil poured out	20ml	20ml	10ml

**HVAC control panel assembly**

**Removal**

<p><b>⚠ Caution</b></p> <ul style="list-style-type: none"> <li>• Pay attention to the dashboard surface scratches when removing the center control mask and A/C panel.</li> </ul>
---

1. Turn off all electrical equipment and the start button.
2. Remove the instrument trim panel.
3. Remove the HVAC control panel assembly.
  - a. Use a rocker to pry out the fixing clip on the central control panel and take off the central control panel assembly (as shown by the arrow).





- b. Remove the HVAC control panel assembly.



- c. Disconnect the connector (as shown by the arrow) and remove the HVAC control panel assembly



- d. Remove the HVAC control panel assembly.

### Installation

#### ⚠ Caution

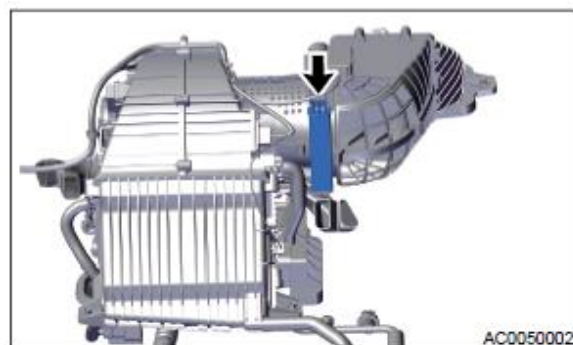
- Be careful not to scratch the panel and dashboard parts during installation.

1. The installation sequence is reverse to the removal.

### HVAC filter element

#### Removal

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Remove the HVAC filter element.
  - a. Disconnect 1 clip (as shown by the arrow) of the HVAC filter element protective cover, and remove the HVAC filter element protective cover.
  - b. Remove the HVAC filter element assembly.



### Installation

#### ⚠ Caution

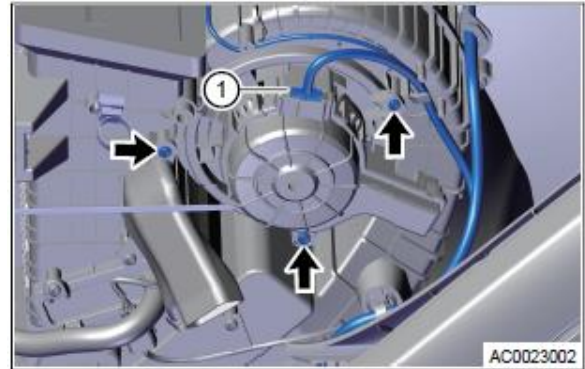
- If the HVAC filter element is too dirty or damaged, replace it with a new one.
- When installing the HVAC filter element, make the arrow mark on the HVAC filter element downward.

1. The installation sequence is reverse to the removal.

## Removal and refitting of air blower

### Removal

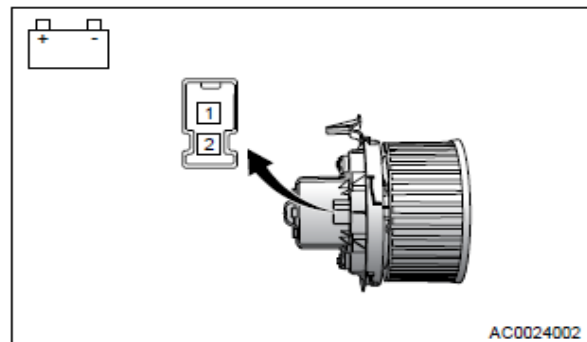
1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Remove the instrument panel assembly.
4. Remove the air blower assembly.
  - a. Disconnect the air blower assembly connector (1) and remove the three fixing bolts (arrows) of the air blower.



5. Remove the air blower assembly.

### Check

1. Remove the air blower assembly.
  - a. Connect the positive (+) battery lead to terminal 1 and the negative (-) lead to terminal 2, check and make sure the air blower motor runs smoothly.



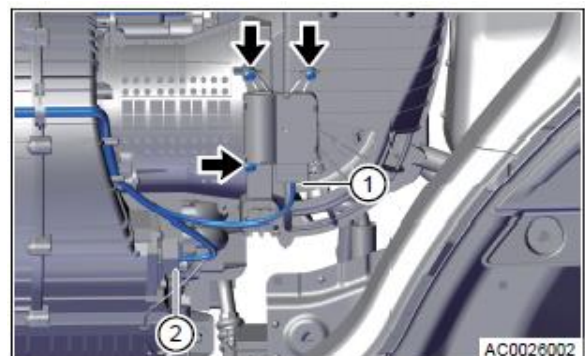
### Installation

1. Install in the reverse order.

## Recirculating air damper servo motor

### Removal

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative cable of the battery.
3. Remove the instrument panel assembly.
4. Remove the recirculating air damper servo motor.
  - a. Disconnect the recirculating air damper servo motor connector (1).
  - b. Remove 3 fixing bolts (as shown by the arrow) from recirculating air damper servo motor.



5. Remove the recirculating air damper servo motor.

### Installation

1. Complete the installation in the reverse order.

#### ⚠ Caution

- A small amount of grease should be applied to the contact surface of the inner and outer circulation damper motor paddle and inner and outer circulation damper assembly during installation to ensure its smooth operation.

### HVAC assembly

#### Removal

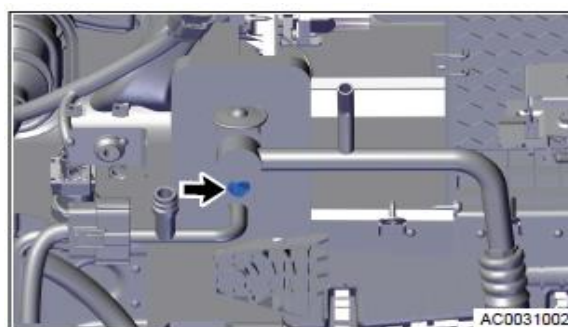
#### ⚠ Caution

Refrigerant must be recovered/charged with professional maintenance equipment for R134 a/R1234 yf (European Union) Refrigerant.

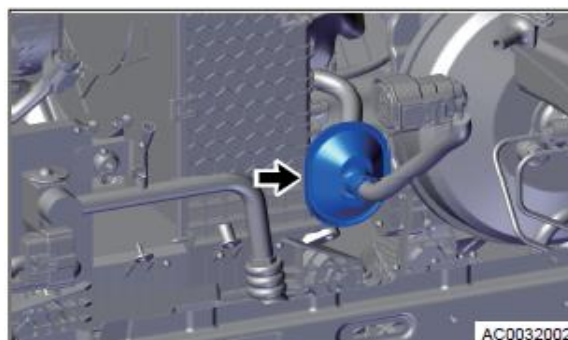
- Be careful when removing and installing hoses to avoid damaging them.
- Be sure to keep the work place well ventilated.
- The disconnected A/C pipeline and its mating parts shall be sealed to prevent foreign matters from entering.

1. Recycle the refrigerant in the HVAC (see the Replacement of refrigerant for details).
2. Turn off all electrical equipment and the ignition switch.
3. Disconnect the negative cable of battery.
4. Remove the driver's airbag. (Refer to "Removal and refitting of driver's airbag" in this chapter for details.)
5. Remove the steering wheel assembly (see Removal and refitting of steering wheel assembly for details).
6. Remove the console assembly (see Removal and refitting of console body assembly for details).
7. Remove the dashboard body assembly (see the removal and installation of dashboard body assembly for details).
8. Remove the dashboard cross beam assembly (see removal and installation of dashboard cross beam for details).
9. Remove the HVAC assembly.
  - a. Remove the fixing bolt (as shown by the arrow) from the A/C high/low pressure pipelines.

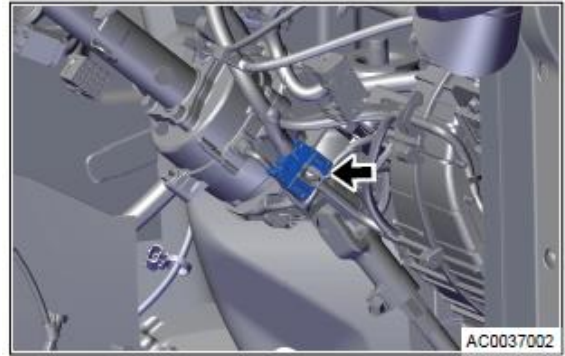
Tightening torque:  $9 \pm 1.5 \text{ N}\cdot\text{m}$  ( $7 \pm 1 \text{ ft}\cdot\text{lbs.}$ )



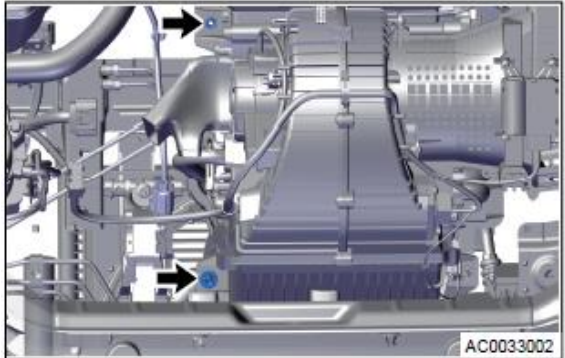
- b. Disconnect the connector from HVAC wire harness to on-board CDU, and disconnect the fixing rubber sleeve (as shown by the arrow) between HVAC wire harness and body system.



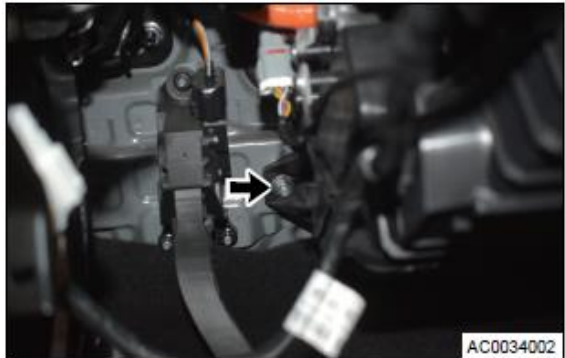
- c. Remove the HVAC connector (as shown by the arrow).



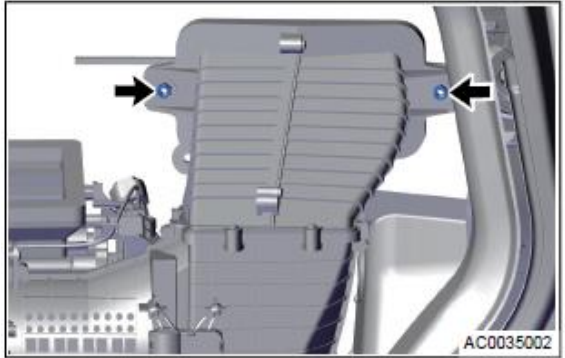
- d. Remove the fixing nuts on the left side of the HVAC (as shown by the arrow).



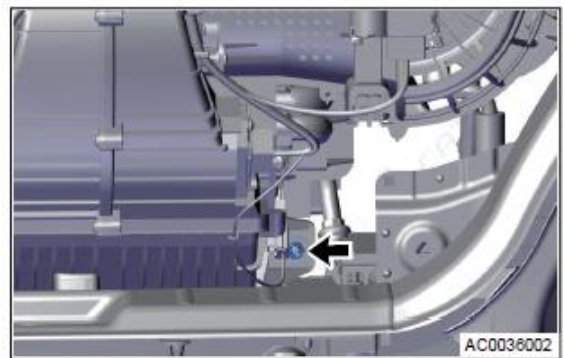
- e. Remove the fixing nuts on the left lower side of the HVAC (as shown by the arrow).



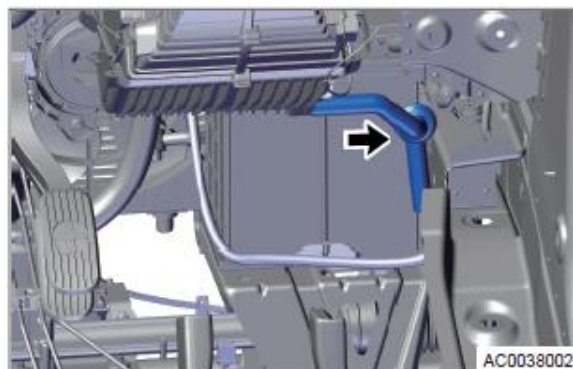
- f. Remove 2 fixing nuts on the right side of the HVAC (as shown by the arrow).



- g. Remove 1 fixing nut on the right lower side of the HVAC (as shown by the arrow).



- h. Disconnect the fixing rubber sleeve (as shown by the arrow) between HVAC water drain hose and body system.



- i. Carefully remove the HVAC assembly from the cab.

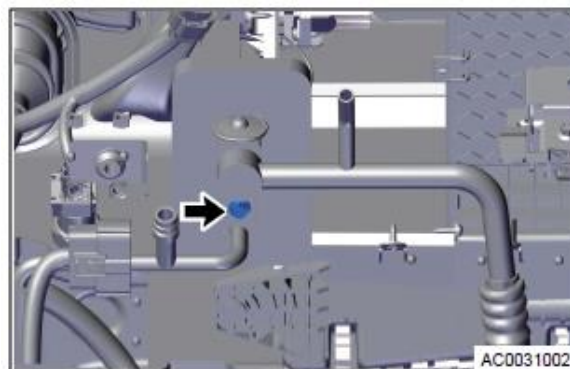
## HVAC high/low pressure line

### Removal

#### Warning

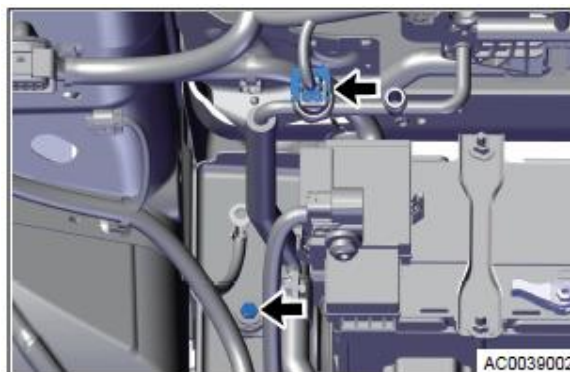
- Refrigerant must be recovered/charged with professional maintenance equipment for R134a/R1234yf (European Union) Refrigerant.
- Be sure to keep the work place well ventilated.
- The disconnected A/C pipeline and its mating parts shall be sealed to prevent foreign matters from entering.

1. Recycle the refrigerant in the HVAC (see the Replacement of refrigerant for details).
2. Turn off all electrical equipment and the ignition switch.
3. Disconnect the negative cable of battery.
4. Remove the front bumper assembly.
5. Remove the A/C high/low pressure pipelines.
  - a. Remove 1 fixing bolt of HVAC high/low pressure line (as shown by the arrow).



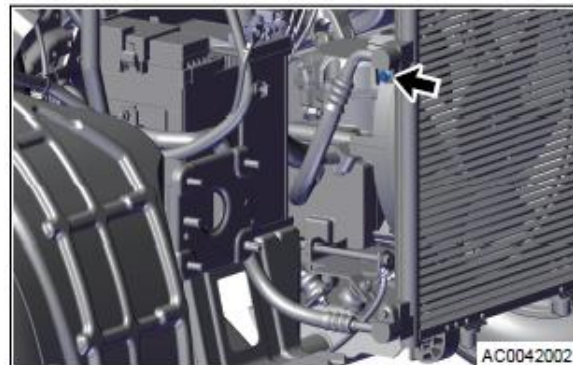
- b. Disconnect the HVAC pressure switch connector (as shown by the arrow) and remove the connecting bolt (as shown by the arrow) between the A/C high-pressure pipeline fixing bracket and the body system.

Tightening torque:  $9 \pm 1.5$  N·m ( $7 \pm 1$  ft-lbs.)



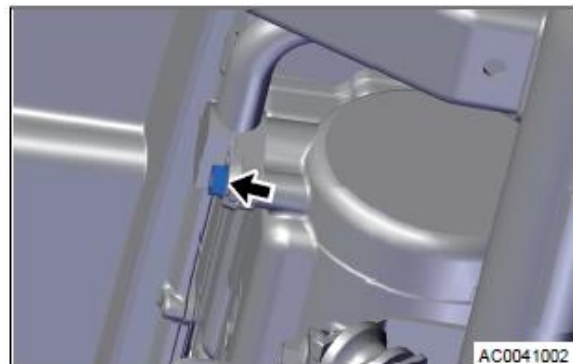
- c. Remove one fixing bolt (as shown by the arrow) of the A/C coaxial pipe assembly and condenser assembly.

Tightening torque:  $9 \pm 1.5 \text{ N}\cdot\text{m}$  ( $7 \pm 1 \text{ ft}\cdot\text{lbs.}$ )



- d. Remove one fixing bolt (as shown by the arrow) of the A/C coaxial pipe assembly and compressor assembly.

Tightening torque:  $25 \pm 3 \text{ N}\cdot\text{m}$  ( $18 \pm 2 \text{ ft}\cdot\text{lbs.}$ )



### Installation

**⚠ Caution**

- Tighten the fixing bolt and the fixing nut to the specified torque.
- When refitting the refrigerant pipeline, replace the O-ring seal of the refrigerant pipeline. Failure to do so may result in leakage of refrigerant.
- Lubricate the new rubber O-ring seal with clean refrigerant oil and install it to the refrigerant pipe joint.
- Only use the specified O-rings as they are made of special materials for the R134a\R1234yf (European Union) refrigerant system.
- Only use the recommended refrigerant oil for the vehicle A/C compressor assembly.
- Refill the HVAC and check the refrigerant for leaks.

1. The installation steps are reverse to the removal.

### Compressor-condenser pipeline assembly

#### Removal

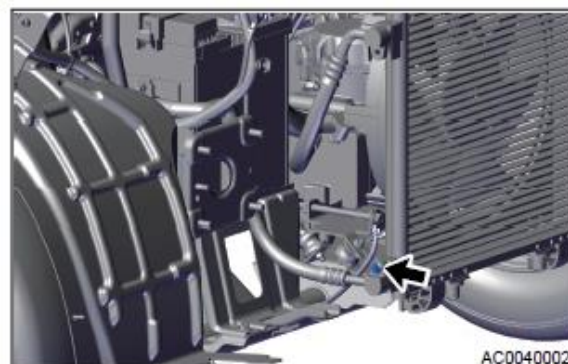
**⚠ Warning**

- Refrigerant must be recovered/charged with professional maintenance equipment for R134a\R1234yf (European Union) Refrigerant.
- Be sure to keep the work place well ventilated.
- The disconnected A/C pipeline and its mating parts shall be sealed to prevent foreign matters from entering.

1. Recycle the refrigerant in the HVAC (see the Replacement of refrigerant for details).
2. Turn off all electrical equipment and the ignition switch.
3. Disconnect the negative cable of battery.
4. Remove the front bumper assembly.
5. Remove the compressor-condenser pipeline assembly

- a. Remove the fixing nut of the compressor-condenser pipeline assembly (as shown by the arrow).

Tightening torque:  $9 \pm 1.5 \text{ N}\cdot\text{m}$  ( $7 \pm 1 \text{ ft}\cdot\text{lbs.}$ )



- b. Remove the fixing bolt of compressor-condenser pipeline assembly and compressor assembly (as shown by the arrow) and disconnect the compressor-condenser pipeline assembly from the compressor assembly.

Tightening torque:  $25 \pm 3 \text{ N}\cdot\text{m}$  ( $18 \pm 2 \text{ ft}\cdot\text{lbs.}$ )

- c. Remove the compressor-condenser pipeline assembly.



## Installation

### ⚠ Caution

- Tighten the fixing bolt and the fixing nut to the specified torque.
- When refitting the refrigerant pipeline, replace the O-ring seal of the refrigerant pipeline. Failure to do so may result in leakage of refrigerant.
- Lubricate the new rubber O-ring seal with clean refrigerant oil and install it to the refrigerant pipe joint.
- Only use the specified O-rings as they are made of special materials for the R134a\R1234yf (European Union) refrigerant system.
- Only use the recommended refrigerant oil for the vehicle A/C compressor assembly.
- Refill the HVAC and check the refrigerant for leaks.

1. The installation steps are reverse to the removal.

## Compressor assembly

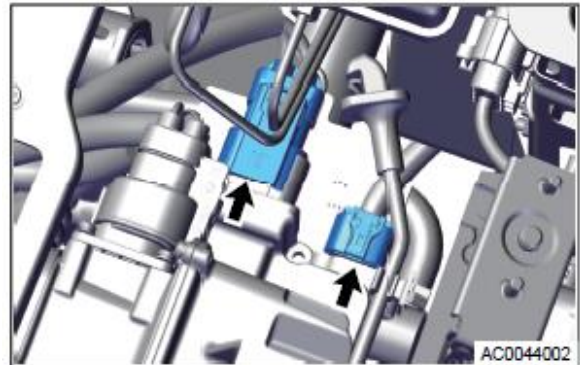
### Removal

### ⚠ Caution

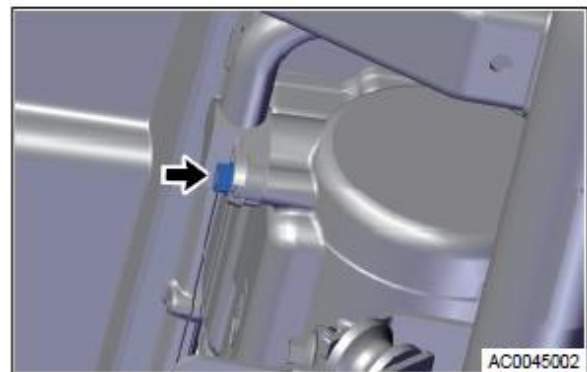
- Refrigerant must be recovered/charged with professional maintenance equipment for R134a\R1234yf (European Union) Refrigerant.
- Be sure to keep the work place well ventilated.
- The disconnected A/C pipeline and its mating parts shall be sealed to prevent foreign matters from entering.
- If there is an internal fault in the A/C compressor assembly, the A/C fluid lines must be replaced. Otherwise, serious damage may occur to the A/C compressor assembly after it is replaced.
- When replacing the compressor assembly, it is necessary to determine the amount of refrigerant oil removed from the new A/C compressor assembly.

1. Recycle the refrigerant in the HVAC (see the Replacement of refrigerant for details).
2. Turn off all electrical equipment and the ignition switch.

3. Disconnect the negative cable of battery.
4. Remove the on-board CDU charger.
5. Remove the electronic controller assembly.
6. Remove the compressor assembly.
  - a. Disconnect the harness connector of the compressor assembly (as shown by the arrow).



- b. Remove the bolt (indicated by the arrow) connecting the high and low-pressure lines on the air conditioning compressor, and disconnect the high and low-pressure lines.  
Tightening torque:  $25 \pm 3 \text{ N}\cdot\text{m}$  ( $18 \pm 2 \text{ ft}\cdot\text{lbs.}$ )



- c. Remove the 2 fixing bolts (as shown by the arrow) between the compressor assembly and the mounting bracket, and remove the A/C compressor assembly.  
Tightening torque:  $25 \pm 3 \text{ N}\cdot\text{m}$  ( $18 \pm 2 \text{ ft}\cdot\text{lbs.}$ )



- d. Remove the A/C compressor mounting bracket and 4 fixing bolts (as shown by the arrow) on the front subframe.  
Tightening torque:  $25 \pm 3 \text{ N}\cdot\text{m}$  ( $18 \pm 2 \text{ ft}\cdot\text{lbs.}$ )
- e. Unscrew the fixing bolts as shown by the arrow of the A/C compressor mounting bracket assembly.





## Installation

### Caution

- Tighten the fixing bolt and the fixing nut to the specified torque.
- When refitting the refrigerant pipeline, replace the O-ring seal of the refrigerant pipeline. Failure to do so may result in leakage of refrigerant.
- Lubricate the new rubber O-ring seal with clean refrigerant oil and install it to the refrigerant pipe joint.
- Only use the specified O-rings as they are made of special materials for the R134a\R1234yf (European Union) refrigerant system.
- Only use the recommended refrigerant oil for the vehicle A/C compressor assembly.
- Refill the HVAC and check the refrigerant for leaks.

The refitting is in the reverse order of removal.

## HVAC pressure switch

### Removal

1. Ignition switch OFF, unplug the harness plug-in of the pressure switch
2. Remove the pressure switch with tools. (If there is a small amount of leakage of refrigerant, pay attention to the protective measures.)

Tightening torque: 10~12 N·m (7~9 ft-lbs.)

### Installation

1. The installation sequence is reverse to the removal.

### Caution

- Fasten the fixing bolt to the specified torque.
- When refitting the refrigerant pipeline, replace the O-ring seal of the refrigerant pipeline. Failure to do so may result in leakage of refrigerant.
- Lubricate the new rubber O-ring seal with clean refrigerant oil and install it to the refrigerant pipe joint.
- Only use the specified O-rings as they are made of special materials for the R134a\R1234yf (European Union) refrigerant system.
- Only use the recommended refrigerant oil for the vehicle A/C compressor assembly.
- Remove a certain amount of refrigerant oil from the new A/C compressor assembly as required when refitting the new compressor assembly.
- Refill the HVAC and check the refrigerant for leaks.

## Condenser assembly (w/ receiver-drier)

### Removal

### Warning

- Refrigerant must be recovered/charged with professional maintenance equipment for R134a\R1234yf (European Union) Refrigerant.
- Be sure to keep the work place well ventilated.
- The disconnected A/C pipeline and its mating parts shall be sealed to prevent foreign matters from entering.

1. Recycle the refrigerant in the HVAC (see the Replacement of refrigerant for details).
2. Turn off all electrical equipment and the ignition switch.
3. Disconnect the negative cable of battery.

4. Remove the front bumper assembly (see removal and refitting of front bumper for details).
5. Remove the condenser assembly (with receiver-drier).
  - a. Remove the fixing bolts (arrows) fixing the high and low-pressure pipes on the condenser (right side) and disconnect the high and low-pressure pipes.

Tightening torque:  $9 \pm 1 \text{ N}\cdot\text{m}$  ( $7 \pm 0.7 \text{ ft}\cdot\text{lbs.}$ )



- b. Remove two fixing bolts (as shown by the arrow) of the radiator assembly and condenser assembly.

Tightening torque:  $5 \pm 1 \text{ N}\cdot\text{m}$  ( $4 \pm 0.7 \text{ ft}\cdot\text{lbs.}$ )



- c. Carefully remove the condenser assembly (with receiver-drier) from below.

**Check**

1. Check radiating fins of the condenser.
  - a. If the radiating fins of the condenser are dirty, clean them with water. The radiating fin is then blown dry with compressed air
  - b. If the condenser is radiating fin bent, straighten it with a screwdriver or pliers.

**⚠ Caution**  
Do not damage radiating fins of the condenser.

**Installation**

1. The installation sequence is reverse to the removal.

**⚠ Caution**

- Fasten the fixing bolt to the specified torque.
- When refitting the refrigerant pipeline, replace the O-ring seal of the refrigerant pipeline. Failure to do so may result in leakage of refrigerant.
- Lubricate the new rubber O-ring seal with clean refrigerant oil and install it to the refrigerant pipe joint.
- Only use the specified O-rings as they are made of special materials for the R134a\R1234yf (European Union) refrigerant system.
- Only use the recommended refrigerant oil for the vehicle A/C compressor assembly.
- Remove a certain amount of refrigerant oil from the new A/C compressor assembly as required when refitting the new compressor assembly.
- Refill the HVAC and check the refrigerant for leaks.

## Supplemental Restraint System (SRS)

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## Precautions for use of airbag

### Precautions for the use process

The airbag is a passive safety system. In order to ensure that the airbag can truly play a protective role in the event of a collision, the user should pay attention to the following precautions related to the use of the airbag:

- The driver and passengers must use the seat belts correctly. The correct use of seat belts can protect the body and reduce the injury of the body in accidents.
- Do not add any additional devices that hinder or damage the seat belt pretensioner or airbags.
- Do not place any objects on the steering wheel and dashboard the passenger side, otherwise these objects will cut the airbag or become projectiles and hurt people when the airbag is inflated.
- If the vehicle seat is equipped with a side airbag, it is prohibited to add or reversely install a seat cover.
- Children under 12 years are not allowed in the front seat. If the vehicle is equipped with a passenger airbag, do not use a rear-facing child seat on the front passenger seat.
- Only original spare parts are allowed to be installed.
- Only authorized personnel can remove the controller, harness and connector of the SRS system.
- If the airbag and seat belt pretensioner are initiated in an accident, the airbag controller and all wiring harnesses with airbag inserts must be replaced at the same time as the airbag and seatbelt replacement.
- The airbag manufacturer recommends to replace the airbag after 10 years of use.
- The SRS system on each vehicle has been matched and verified. It is forbidden to change the vehicle structure or SRS system. Adding or modifying the SRS system and wiring harness at will cause the SRS system to fail to work normally, which will cause the accidental initiation or failure of initiation of the airbag, and will cause injury.
- Assemble the harness: the harness must be straightened out, without distortion, wrinkle, etc., and must not contact with metal or non-metal sharp edges, and the connection with ACU, SIS and each airbag module must be tight without looseness.
- Power-on detection of system:
  1. After power-on, the ACU sends the airbag indicator light on signal via CAN for 6 s. After self-inspection, the ACU sends out the airbag indicator light off signal via CAN, and the alarm lamp goes out for 1 s, and then the alarm lamp enters normal working state;
  2. After the completion of (6 s normally on) + (1 s off), if there is no fault code in the system that requires the indicator to be lit, the indicator will be off. If the indicator light is always on, it indicates that ACU has a fault that needs to be read with a diagnostic tester. Check the connection situations of the corresponding components and the harness in accordance with the fault display of the diagnostic equipment. If the fault still cannot be eliminated, the corresponding adjustment work must be completed under the guidance of the quality department, the design department and the supplier until the indicator goes out.
  3. The diagnosis of airbag system requires that the vehicle is powered on and the airbag module is completely fastened.
- The installation and maintenance of all airbag parts should be carried out with the power off, and it is strictly prohibited to install, disassemble and re-operate it on the production line when the power is on. If it involves the replacement or repair of airbag components, be sure to cut off the power supply, and within 30 s after the vehicle is shut down or the fuse is removed (see the technical instructions for assembly and adjustment of wire harness system), the airbag controller will still retain enough power to detonate the airbag, so start the repair work 30 s after the airbag controller and battery are disconnected.
- After the vehicle is assembled, be sure to clear all error codes in the ACU; When assembling or replacing the ACU for the first time, if the airbag lamp is always on or flashes, it may not be configured or is in the process of configuration. The ACU does not have the ignition function, and the complete vehicle cannot be used normally.
- When the airbag is inflated, the airbag will not deploy in the event of an accident. If there is no space for the airbag to deploy, the accidental detonation of the airbag may cause injury to people or vehicles.
- To avoid diagnostic error codes, do not power on the airbag system until all airbag system

components are connected or before performing diagnostic checks.

- Do not use the airbag and ACU if they fall from a height of more than 1 meter and isolate them.
- The airbag and ACU should be handled gently, and it is strictly prohibited to knock or violently impact them.
- The installation, testing and disassembly of the airbag system must comply with the relevant requirements and specifications, and do not operate it arbitrarily.

**Note:**

After the system self-inspection, the airbag warning lamp should be off. If it is still on, it indicates that the airbag system is faulty, and the airbag will not be triggered normally, or will not be triggered at all, or will be triggered when it should not be triggered, thus causing serious casualties. In this case, you must contact the service station to check the airbag system as soon as possible.

**Replacement of airbag parts that deploy after an accident**

The parts of the SRS system shall be replaced immediately after the crash in which the airbag is deployed according to the provisions of this document. There may be powdery residue on the surface of the airbag after the airbag is detonated. These residues mainly consist of powders and chemical reaction products.

**Replacement of seat belt parts after an accident**

In the event of an accident, some seat belts also need to be replaced or recommended to be replaced after the airbag has exploded:

Seat belt	Whether it needs to be replaced
Used pretensioning seat belt in the event of an accident	It must be replaced
Pre-tensioning seat belts that must be or have been initiated	It must be replaced
In the event of an accident, a used ordinary emergency locking seat belt	It must be replaced
Height adjuster (in case of an accident, the seat belt is used)	It must be replaced

**Other parts inspection after accidents**

Specific checks must be carried out after any collision, regardless of airbag activation. The steering column must be dimensioned (and replaced if necessary), check the dashboard and steering column shroud for cracks or other damage, check the instrument panel support for distortion, bending, cracks or other damage, check the seat belts and mounting fixing points.

## General information

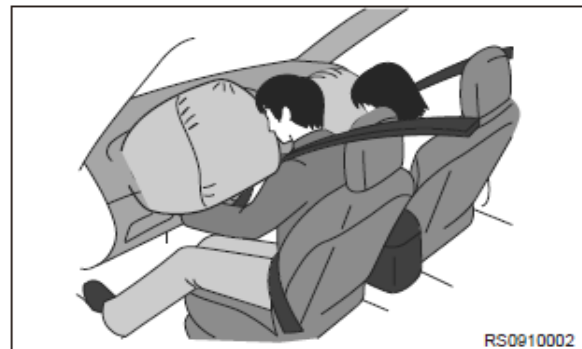
### System description

Airbag refers to the device that inflates the airbag to protect the occupant before the second collision occurs in the event of a crash. The airbag is an auxiliary device of the occupant restraint device of the seat belt, which is called the airbag system (Supplemental Restraint System, SRS). The airbag system is an integral airbag module composed of an airbag and an inflation mechanism (gas generator), an impact sensor system that senses a collision and sends a deployment command to the airbag module, and a wire harness that transmits a signal sent by the sensor.

### Description of system components

#### Airbag

The control module controls the ignition circuit, reasonably initiates the airbag, and quickly generates an air cushion between the occupant and the interior trim to protect the occupant in the vehicle.



#### Driver's front airbag

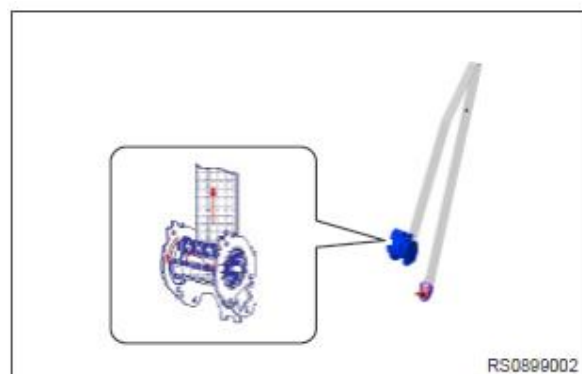
If the resistance is between 1.7  $\Omega$  and 3.8  $\Omega$ , it is strictly prohibited to use a multimeter to check its resistance!



#### Pretensioning seat belt

Intercept the passengers, lengthen the stress time of the passengers, and disperse the instantaneous force; Restrain the passengers in a certain space and reduce the possibility of passengers colliding with other devices in the vehicle.

- If the seat belt webbing cannot be pulled out, it is necessary to preliminarily determine whether the seat belt is locked due to the belt sensitive function of the seat belt.
- Judgment method: slowly retract the seat belt webbing with a distance of 15mm, and then slowly pull out the seat belt webbing. If the seat belt can be pulled out normally, there is no other problem. The seat belt is normal. If the seat belt webbing cannot be pulled out, the seat belt needs to be further

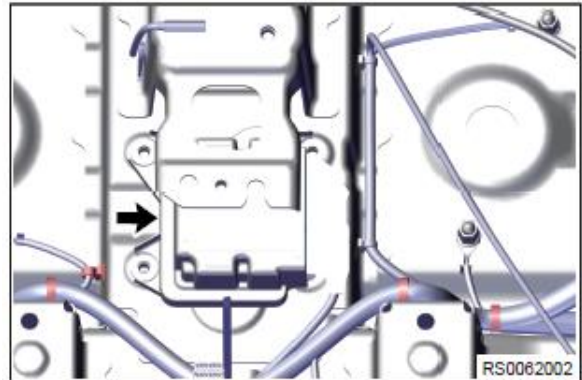


tested.

### SRS controller

Airbag controller is the core of the whole airbag system, on one hand, it receives and processes the collision signal obtained by the collision sensor; On the other hand, after the collision signal is processed by a point algorithm, a judgment is made on whether to send an ignition signal, and relevant instructions are sent according to the judgment result; At the same time, it needs to communicate with other units of the body system, etc.

- Replace the damaged airbag control module with a new one.
- During the entire service life of the airbag control module, the same airbag control module must always be installed on the vehicle on which it was originally installed, and it is not allowed to use it on other vehicles.
- After the airbag is deployed, the airbag control module must be replaced.
- The airbag control module and peripheral sensor have high-precision structure, so dispose these components carefully and discard them if they fall to the ground.
- When the airbag controller is in the diagnostic mode, the initiation function is disabled.
- Only three fixed points of the airbag controller can be connected to the vehicle structure. These contacts must be connected to the ground, so the central channel and the module cannot be covered by insulating materials (e.g. paint and other isolation coatings). The maximum impedance is 100 M $\Omega$ . The ECU must have a separate ground wire (the maximum distance between the ground point and the module is 10 cm (4 in.), and electromagnetic induction in this wire must be avoided).
- The ACU of this model adopts the software off-line configuration mode, and the two hardware settings have the maximum configurable range. The detailed configuration can be defined according to the vehicle configuration table, and the configuration can be selected in the system.



### Spiral cable:

It is used to connect the driver's airbag and ensure that the steering wheel has sufficient steering angle.

Wiring harnesses:

It is used to connect the components of the Supplemental Restraint System (SRS), and is generally yellow. The connector is provided with a safety mechanism.



- In order to meet the requirements of electromagnetic immunity and system stability, and avoid the risks related to occupant safety caused by this, the CAN adopts twisted pair, the collision sensor adopts twisted pair, and the airbag circuit harness adopts twisted pair. All twisted pairs are required to be at least 30 turns per meter, and the wire diameter is  $\geq 0.5 \text{ mm}^2$ .

**Fault Code (DTC) Table**

<b>DTC code</b>	<b>Definition of DTC</b>
C120016	Battery voltage is abnormal (undervoltage)
B111717	The supply voltage is high
B111716	The supply voltage is low
B10101B	Driver's front airbag resistance too high
B10101A	Driver's front airbag resistance too small
B101011	Driver's front airbag resistance short circuited to ground
B101012	Driver's front airbag resistance short circuited to power supply
B10C11B	Driver's knee airbag resistance too high/driver's side rear seat belt resistance too high
B10C11A	Driver's knee airbag resistance too low/driver's side rear seat belt resistance too low
B10C111	Driver's knee airbag short circuit to ground/driver's side rear seat belt short circuit to power supply
B10C112	Driver's knee airbag short circuit to power supply/driver's side rear seat belt short circuit to power supply
B10111B	Passenger's front airbag resistance too high
B10111A	Passenger's front airbag resistance too low
B101111	Passenger's front airbag short circuited to ground
B101112	Passenger's front airbag circuit short circuited to power supply
B10D11B	Passenger's knee airbag resistance too high/passenger's side rear seat belt resistance too high
B10D11A	Resistance of passenger knee airbag is too low/resistance of passenger side rear safety belt is too low
B10D111	Short circuit of passenger knee airbag to ground/short circuit of passenger side rear safety belt to ground
B10D112	Passenger's knee airbag short circuit to power supply/passenger's side rear seat belt short circuit to power supply
B10121B	Driver's seat belt resistance is too high
B10121A	Driver's side safety belt resistance too small
B101211	Driver's side safety belt short circuited to ground
B101212	Driver's safety belt short circuited to power supply
B10131B	Passenger's seat belt resistance is too high
B10131A	Passenger's side safety belt resistance too low
B101311	Passenger's side safety belt short circuited to power supply
B101312	Passenger safety belt shorted to power supply
B10141B	Driver's side lateral airbag resistance too high
B10141A	Driver's side lateral airbag resistance too low
B101411	Driver's side airbag circuit short circuited to ground
B101412	Driver's side lateral airbag short circuited to power supply
B10151B	Lateral airbag resistance too high at passenger's side
B10151A	Passenger side airbag resistance too small

Supplemental Restraint System (SRS)

<b>DTC code</b>	<b>Definition of DTC</b>
B101511	Passenger's side airbag circuit shorted to ground
B101512	Passenger airbag shorted to power supply

<b>DTC code</b>	<b>Definition of DTC</b>
B10171B	Driver's side curtain airbag resistance too high
B10171A	Driver's side curtain airbag resistance is too small
B101711	Driver's side curtain airbag short circuited to ground
B101712	Driver's side curtain airbag short circuited to ground
B10161B	Passenger side curtain airbag resistance too high
B10161A	Passenger side curtain airbag resistance too small
B101611	Passenger side curtain airbag short circuited to the ground
B101612	Passenger side curtain airbag short circuited to the ground
B10A11B	Driver's side rear side airbag resistance is too high
B10A11A	Driver's side rear side airbag resistance too low
B10A111	Driver's side rear row side airbag short circuited to ground
B10A112	Rear side airbag shorted to power supply at the driver's side
B10B11B	Passenger side rear side airbag resistance too high
B10B11A	Passenger side rear side airbag resistance too small
B10B111	Passenger rear airbag short circuited to ground
B10B112	Rear side airbag shorted to ground at the passenger's side
B103011	Alarm lamp failure - shorted to ground
B103012	Alarm lamp failure - shorted to power supply
B103111	Passenger's front airbag off indicator lamp short circuited to ground
B103112	Passenger's front airbag off indicator lamp shorted to power supply
U110286	Driver's side acceleration sensor communication failure
U110386	Passenger side acceleration sensor communication fault
U110486	Driver forward acceleration sensor communication failure
U110586	Passenger forward acceleration sensor communication failure
B100224	Driver side acceleration sensor not matching
B100324	Passenger side acceleration sensor not matching
B100424	Driver forward acceleration sensor not matching
B100524	Passenger forward acceleration sensor not matching.
B100212	Driver's side acceleration sensor shorted to power supply
B100312	Passenger side acceleration sensor shorted to power supply
B100412	Driver forward acceleration sensor shorted to power supply
B100512	Passenger forward acceleration sensor shorted to power supply
B100211	Driver's side acceleration sensor shorted to ground

## Supplemental Restraint System (SRS)

<b>DTC code</b>	<b>Definition of DTC</b>
B100311	Passenger side acceleration sensor shorted to ground
B100411	Driver forward acceleration sensor shorted to ground
B100511	Passenger forward acceleration sensor shorted to ground
B100296	Driver side acceleration sensor fault
B100396	Passenger side acceleration sensor fault
B100496	Driver forward acceleration sensor fault
B100596	Passenger forward acceleration sensor fault
B100049	ECU/Internal fault - replace ACU
B105000	C Front collision occurs - replace the ACU
B105100	Lateral collision at the driver side - replace the ACU
B105200	Lateral collision at the passenger side - replace the ACU
B103414	Short circuit for collision output 1 to ground
B103412	Collision output 1 short circuited to power supply
B103413	Collision output 2 short circuited to ground
B103411	Collision output 2 short circuited to power supply
B102012	Driver seat belt buckle switch shorted to power supply
B102011	Driver seat belt buckle switch short circuited to power supply
B102112	Passenger seat belt buckle switch shorted to power supply
B102111	Passenger seat belt buckle switch short circuited to ground
B102013	The Driver seat belt buckle switch status is uncertain
B102113	The passenger seat belt buckle switch status is uncertain
B102312	Driver position switch short circuited to power supply
B102311	Driver's position switch short circuited to ground
B102313	Driver's position switch status not determined
B102512	Passenger position switch short circuited to power supply
B102511	Passenger position switch short circuited to ground
B102513	The passenger position switch pair status is uncertain
B102212	The passenger airbag enable switch is short circuited to power supply
B102211	The passenger airbag enable switch is short circuited to ground
B102213	The passenger airbag enable switch status is uncertain
B100100	Loop configuration fault
B105600	The watchdog status continues to fail
U007300	CAN Bus Off

<b>DTC code</b>	<b>Definition of DTC</b>
B105300	Only the seat belt is initiated in a crash
B105400	Seatbelt ignition 6 times
U012987	Loss communication with ABS_1 2E9
U012687	Loss communication with SAM_1 0C4
U016087	Loss communication with VCU_3 460
U016187	Loss communication with VCU_1 403
U016287	Loss communication with MCU_1 410
U016387	Loss communication with GW_BCM_1 391
U016487	Loss communication with ABS_10 503
U016587	Loss of communication with TBOX_2 521

## On-board maintenance

### Driver airbag (DAB)

#### On-vehicle inspection

<p><b>Warning</b></p> <ul style="list-style-type: none"><li>• Be sure to follow proper procedures to remove and install the driver airbag assembly.</li><li>• The airbag assembly and airbag control module assembly should be handled with care, and should not be knocked or violently impacted.</li><li>• Refit the SRS connector until a click is heard, and then push the lock clamp to lock the connector.</li><li>• The removed airbag assembly should be kept properly with its front facing upwards, and there should be space left in the place where the airbag is stored to prevent accidental deployment of the airbag.</li></ul>
--

**Note:**

If the driver's airbag assembly contact strip is deformed, do not repair it. Be sure to replace it with a new driver's airbag assembly. There shall be no contact between the driver's airbag assembly and the steering wheel, and the clearance shall be consistent everywhere when a new driver's airbag assembly is installed on the steering wheel.

1. Check the driver's airbag assembly (the vehicle has not been in a collision and the airbag has not been deployed).
  - a. Perform the diagnostic system check.
  - b. When the driver airbag assembly is installed in the vehicle, perform a visual inspection: Inspect the outer surface of the driver airbag assembly and the groove area for cuts, cracks, or discoloration. If any of the above defects are found, replace the driver airbag assembly with a new one.



2. Check the driver's airbag assembly (the vehicle has been in a collision but the airbag has not been deployed).
  - a. Perform the diagnostic system check.
  - b. When removing the driver airbag assembly from the vehicle, perform a visual inspection. Check the harness for cuts and cracks, and the connector for cracks. Check if the steering wheel is deformed.

## Removal

### ⚠ Warning

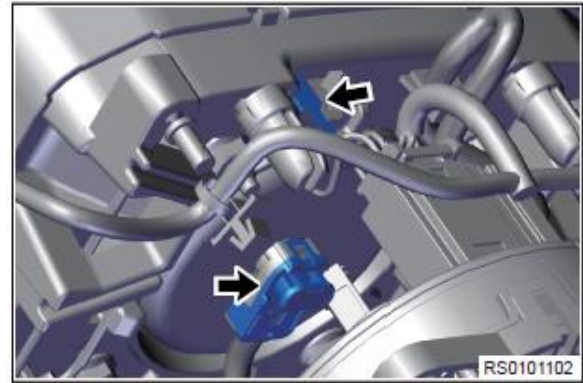
- After disconnecting the battery negative cable, wait at least 90 seconds to disable the Supplemental Restraint System (SRS).
- Do not pull the airbag harness when removing the driver airbag assembly.
- Do not damage the airbag harness when handling the airbag assembly harness connectors.
- The removed airbag assembly should be kept properly with its front facing upwards, and there should be space left in the place where the airbag is stored to prevent accidental deployment of the airbag.
- The driver's airbag (DAB) should be installed and repaired with the power off. It is strictly prohibited to install and disassemble the driver's airbag when the power is on, and any rework of the DAB on the production line is strictly prohibited. If it is necessary to replace or repair the DAB, be sure to cut off the power supply. Within 30 s after the vehicle is shut down or the fuse is removed (see the harness system assembly technical instructions), the airbag controller will still retain enough power to detonate the airbag. Therefore, the maintenance work should be started 30 s after the power supply of the airbag controller is cut off.
- In order to avoid the occurrence of diagnostic error codes, do not power on the airbag system until all airbag system components (including DAB) are connected or before performing diagnostic checks;
- Keep space in the place where the DAB is stored to prevent accidental detonation of the DAB. If there is no space left for deployment, the accidental detonation of DAB may cause injury to personnel or vehicle,
- If the DAB is dropped from a height of more than 1 meter, do not use it again and separate it.
- The DAB should be handled gently, and it is strictly prohibited to knock or violently impact.
- The DAB must be assembled, tested and disassembled in accordance with the relevant requirements and specifications, and shall not be operated at will.

1. Turn off all electrical equipment and the start button
2. Disconnect the negative battery cable
3. Remove the driver's airbag assembly

- a. Make the front wheels face right ahead.
- b. Using a round screwdriver, remove the DAB in sequence through the three removal holes in the steering wheel at the 3, 9 and 6 o'clock positions. Insert the screwdriver into the removal hole at the 3 o'clock position of the steering wheel along the removal direction, and push it inwards slightly after it is pressed against the circlip. A click sound is heard, indicating that the clip is disengaged and the corresponding side of the airbag will be bounced. Then remove the 9 o'clock direction in the same way as above. Finally remove the 6 o'clock position and gently lift the entire DAB module from the steering wheel with both hands.
- c. Remove the multi-function switch wire harness connector: remove the switch wire harness connector in the direction shown in the figure.



- d. Remove the loudspeaker connector: remove the loudspeaker connector in the direction shown in the figure.



### Installation

1. The installation sequence is reverse to the removal.

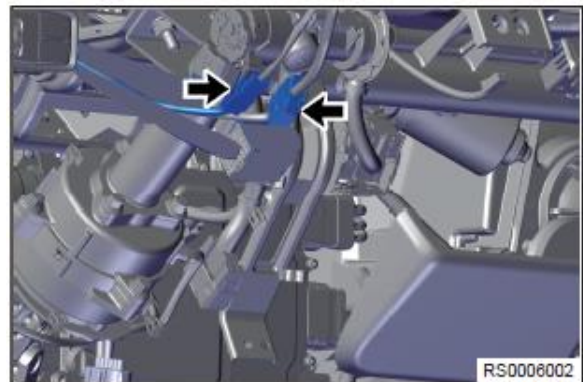
### Spiral cable

#### Removal

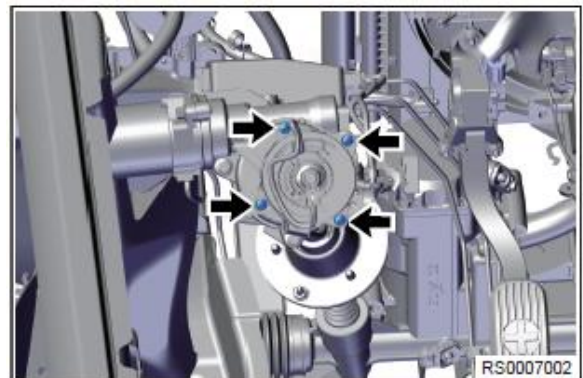
**⚠ Caution**

- After disconnecting the battery negative cable, wait at least 90 seconds to disable the Supplemental Restraint System (SRS).

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Keep the front wheels facing straight ahead.
4. Remove the steering wheel assembly.
5. Remove the combination switch cover assembly.
6. Remove the spiral cable.
  - a. Disconnect harness connector of the spiral cable (as shown by the arrow).



- b. Remove the four fixing bolts (arrows) fixing the spiral cable and combination switch assembly.





**Check****Note:**

- The airbag system connector has a built-in anti-activation mechanism. When the connector is disconnected, the mechanism disconnects the circuit by making the shorting spring plate contact with the terminal, thus cutting off the external power supply to prevent accidental activation of the airbag.
  - If you want to deactivate the anti-activation mechanism, insert a piece of paper as thick as the terminal between the terminal and the shorting spring plate to disconnect.
1. Check the spiral cable
    - a. Check and confirm that there are no scratches or cracks on the connector, or no cracks, dents or cracks on the cable.
    - b. If there are scratches, cracks, dents, or nicks on the connector or the spiral cable, replace it with a new spiral cable

**Installation****Note:**

Always fit the spiral cable correctly in accordance with the assembly markings on the spiral cable and steering column

(Slowly turn the spiral cable all the way in one direction, and then turn it in the opposite direction until the yellow ball appears in the transparent neutral window and aligns with the arrow mark), otherwise the spiral cable may be damaged.

**Caution**

- Always install the spiral cable correctly in accordance with the specified operating instructions.
- Do not rotate the spiral cable more than the specified number of times in order to prevent the spiral cable breaking.
- When installing the spiral cable, be sure to fix its jaw in place.
- After installation, check and confirm that the loudspeaker works normally.
- Check the ACU warning lamp after refitting, and make sure that the Supplemental Restraint System (SRS) works properly.

1. The installation sequence is reverse to the removal.

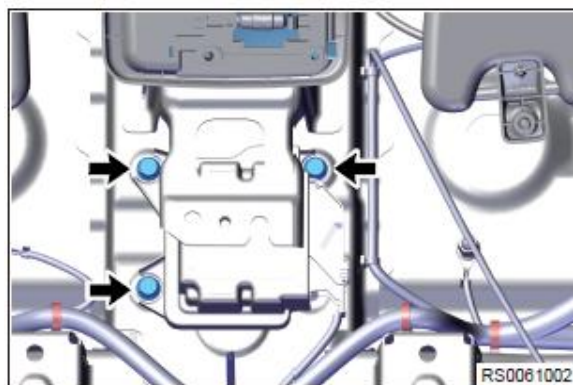
**SRS controller**

**Removal**

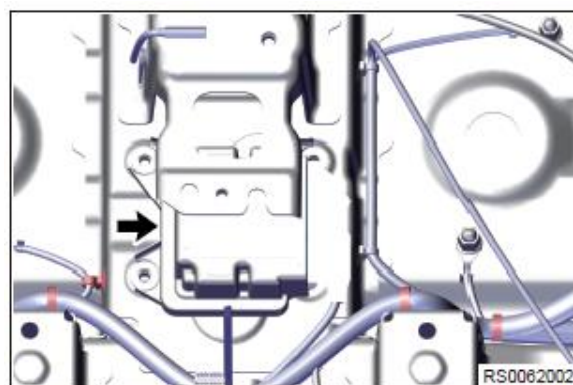
**⚠ Caution**

- Be sure to follow proper procedures to remove and install the SRS controller.
- Before assembling, make sure that the part number on the ACU label is consistent with the part number on the attached configuration card; The surface of parts shall be free from bump marks, and the labels and barcodes shall be complete and clear; After inspection, tear off a copy of the barcode and paste it on the onboard record card;
- Place the ACU module on the body system channel floor, at this time, the direction of the arrow on the label is required to face the front of the vehicle while aligning the three ACU mounting holes with the body system cam weld nut holes, pre-torque the bolts, and tighten the three bolts with tools to the specified torque requirements.
- Insert the harness connector into the ACU connector: rotate the fuse card from the initial position to the final locking position according to the installation rotation direction, and ensure that the fuse card crosses the limit block. Usually, a "click" sound is heard, indicating that the fuse card has been clamped in place. Before installation, make sure that the fuse clip is in the initial position, and the ACU connector has the error-proof function. If the configuration is wrong, it will not be inserted. Do not forcibly assemble it.
- Tear off a complete barcode and stick it on the on-board record card to trace the relevant information.
- The ACU ignition circuit consists of 2 loops and 4 loops, please confirm the configuration information of the whole vehicle before installation.
- The ACU should be handled with care, and no knocking or violent collision is allowed;
- There must be no other objects between the ACU mounting plane and the ACU, and the ACU must be installed directly on the body system sheet metal.
- When installing and tightening the bolts, ensure that the start button is in the OFF state, and do not install the ACU in the energized state.
- After the installation, confirm the installation direction of the air bag controller assembly and ensure that the arrow on the label faces the front of the vehicle. If it is installed reversely, the safety airbag controller assembly will not work normally.

1. Turn off all electrical equipment and the start button.
  2. Disconnect the negative battery cable and wait for 90 seconds.
  3. Remove the console assembly.
  4. Airbag controller assembly.
    - a. Remove the three bolts (as shown by the arrow) fixing the airbag controller.
- Tightening torque:  $9 \pm 1 \text{ N}\cdot\text{m}$  ( $7 \pm 0.7 \text{ ft}\cdot\text{lbs.}$ )



- b. Press the lower limit clip, disengage the harness connector, and remove the airbag controller assembly (as shown by arrow).



## Installation

### ⚠ Warning

- Before installing the fastening bolts, make sure that the airbag harness is not pressed or stuck, and adjust it if necessary before installing it in place.
- Be sure to tighten the fixing bolt to the specified torque during installation.
- Make sure that the vehicle is powered off during installation. Do not install the airbag controller assembly when the vehicle is powered on.
- Check the ACU warning lamp after refitting, and make sure that the Supplemental Restraint System (SRS) works properly.

1. Before assembling, confirm that the part number on the ACU label is consistent with the part number on the attached configuration card; The surface of parts shall be free from bump marks, and the labels and barcodes shall be complete and clear.
2. Place the ACU module on the channel bottom plate in the body system. At this time, the arrow direction on the label must be toward the vehicle head. At the same time, align the three mounting holes of ACU with the projection welding nut holes of the body system, pre-tighten the bolts respectively, and then tighten the three bolts to the specified torque with tools.
3. Insert the harness connector into the ACU connector: single-cavity connector, rotate the fuse card from the initial position to the final locking position according to the installation rotation direction, and ensure that the fuse card crosses the limit block. Usually, a "click" sound is heard, indicating that the fuse card has been clamped in place. Before installation, make sure that the fuse clip is in the initial position, and the ACU connector has the error-proof function. If the configuration is wrong, it will not be inserted, and do not forcibly assemble.

## Front seat belt assembly

### Removal

### ⚠ Warning

- When removing the front seat belt assembly, be sure to wear the labour protection articles to avoid accidents.
- When removing the front seat belt assembly, pay attention to using the appropriate force and be careful when operating.
- When removing the front seat belt assembly, do not scratch the interior trims.

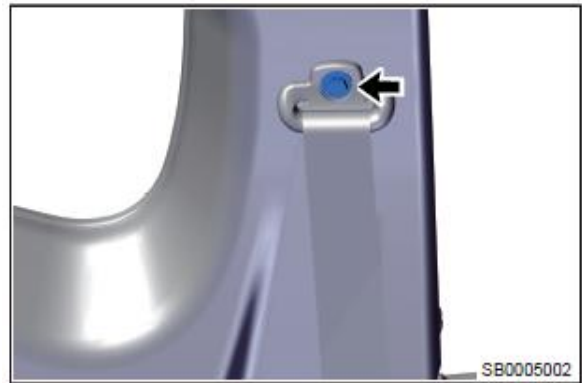
1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Remove the left B-pillar lower guard plate assembly.
4. Remove the front left seat belt assembly.
  - a. Remove the fixing bolt (as shown by the arrow) at the lower part of front seat belt assembly.

Tightening torque:  $50 \pm 5 \text{ N}\cdot\text{m}$  ( $37 \pm 4 \text{ ft}\cdot\text{lbs.}$ )

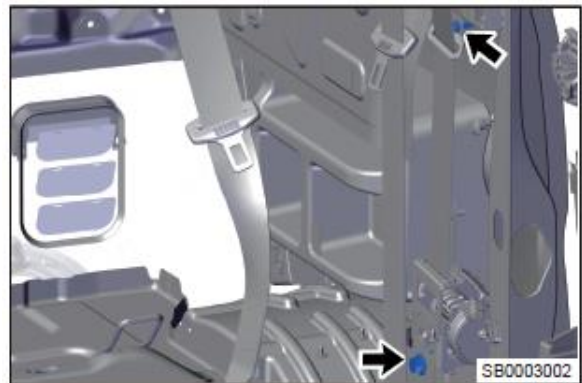


- b. Remove the left B-pillar upper guard board assembly.
- c. Remove 1 fixing bolt (as shown by the arrow) at the upper part of the front seat belt assembly.

Tightening torque:  $50 \pm 5 \text{ N}\cdot\text{m}$  ( $37 \pm 4 \text{ ft}\cdot\text{lbs.}$ )



- d. Remove the connector (2) on the seat belt retractor of front seat. (High-mounted safety belt)
- e. Tightening torque:  $50 \pm 5 \text{ N}\cdot\text{m}$  ( $37 \pm 4 \text{ ft}\cdot\text{lbs.}$ )
- f. Remove the left side front seat belt assembly.



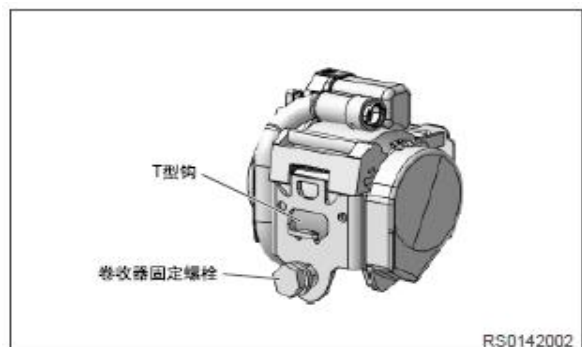
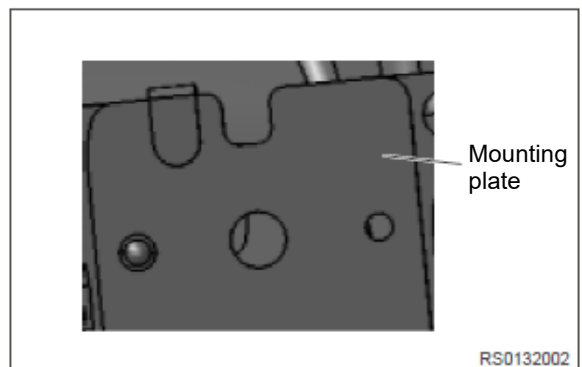
### Installation (pretensioning seat belt)

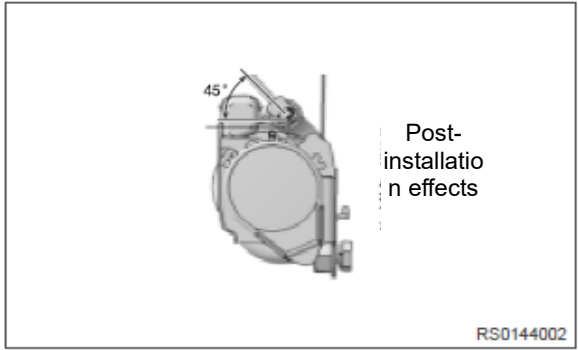
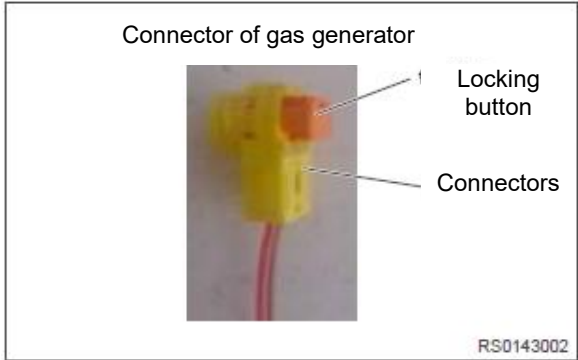
**⚠ Caution**

- When installing the front seat belt assembly, keep the seat belt assembly clean to avoid oil and check whether the seat belt assembly is damaged.
- When installing the front seat belt assembly, all the fixing bolt and fixing screws must be tightened to the specified torque.

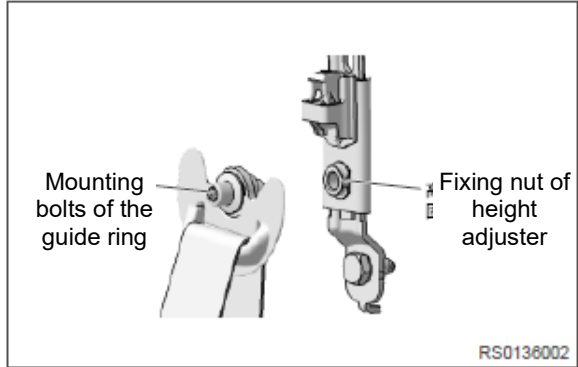
1. Install the pretensioning seat belt assembly.
  - a. Take the left front seat belt assembly in good condition, first insert the seat belt pretensioner connector in the interior wire harness into the gas generator connector of the retractor, and then press the locking button to ensure that the connector is in good condition and clamped in place (the connector angle is 45 degrees); Second, remove the fixing bolt attached to the retractor; Then hang the T-hook of the retractor into the groove of the retractor mounting plate of the B-pillar sheet metal; After that, pre-tighten the bolt removed from the retractor to the retractor Finally, tighten the bolt. (If the connector harness is too long or interferes with the strap, insert the harness into the B-pillar cavity to increase the clearance between the harness and the strap).

Tightening torque:  $50 \pm 5 \text{ N}\cdot\text{m}$  ( $37 \pm 4 \text{ ft}\cdot\text{lbs.}$ )

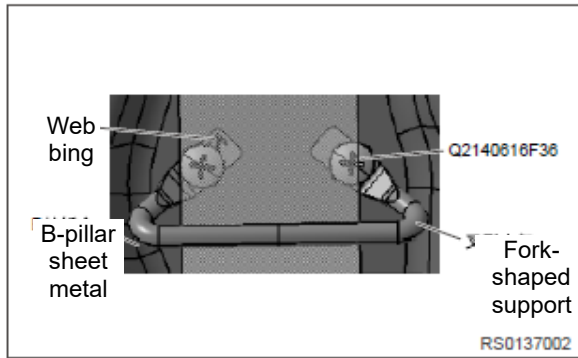




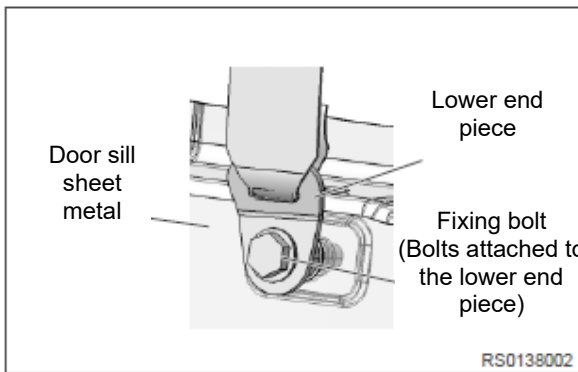
- b. After the installation of the retractor, pre-tighten the mounting bolts of the guide ring onto the fixing nuts of the height adjuster assembly, and finally tighten the bolts. (The webbing from the retractor to the guide ring should be smooth without folding or twisting.)  
Tightening torque:  $50 \pm 5 \text{ N}\cdot\text{m}$  ( $37 \pm 4 \text{ ft}\cdot\text{lbs.}$ )



- c. Take a good fork-shaped bracket, thread the webbing of the seat belt through the fork-shaped bracket, align the mounting hole of the fork-shaped bracket with the B-pillar sheet metal hole (note the mounting direction of the fork-shaped support, the arrow marked on the fork-shaped bracket faces the roof direction), take the cross recessed pan head screw (Q2140616F36) and pre-tighten it.  
Tightening torque:  $2.5 \pm 0.5 \text{ N}\cdot\text{m}$  ( $2 \pm 0.4 \text{ ft}\cdot\text{lbs.}$ )

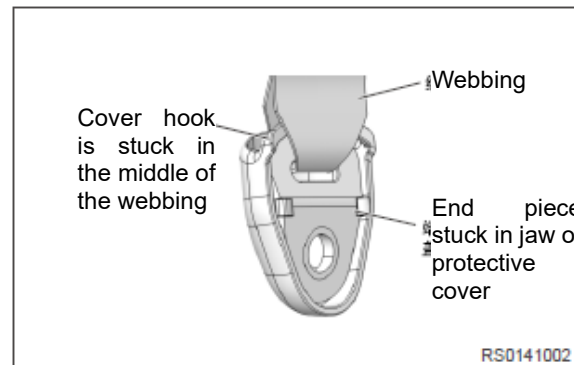
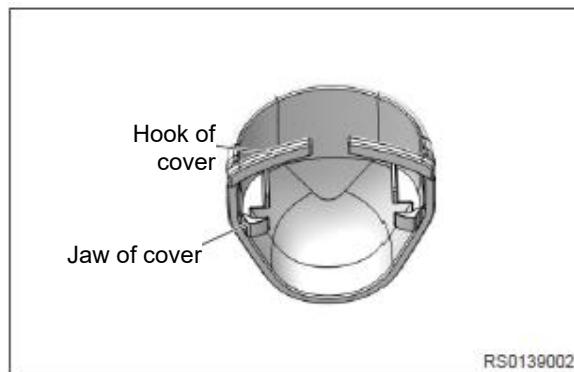


- d. After the above steps are completed, pass the lower fixing end piece, lock tongue and webbing of the safety belt through the B-pillar upper guard plate hole, After the B-pillar protective plate is assembled, pre-tighten the fixing bolt attached to the seat belt lower end piece into the corresponding mounting hole on the door sill sheet metal, and finally tighten the bolt (the webbing from the lower end piece to the guide ring should be smooth without folding or twisting).  
Tightening torque:  $50 \pm 5 \text{ N}\cdot\text{m}$  ( $37 \pm 4 \text{ ft}\cdot\text{lbs.}$ )



- e. After the assembly of the lower end piece of the safety belt, assemble the self-contained protective cover of the safety belt to the end piece, and the effect after assembly is shown in the figure; Tear off the accurate traceability barcode on the left front seat belt assembly and paste it on the corresponding position on the attached card after the final installation.

Tightening torque: 50±5 N·m (37 ± 4 ft-lbs.)



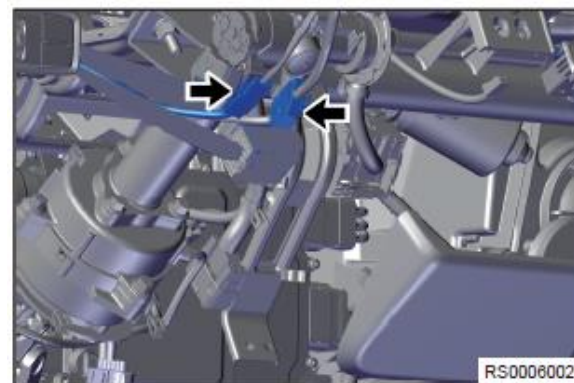
**Rear seat belt assembly (take the left side for example)**

**Removal**

**⚠ Warning**

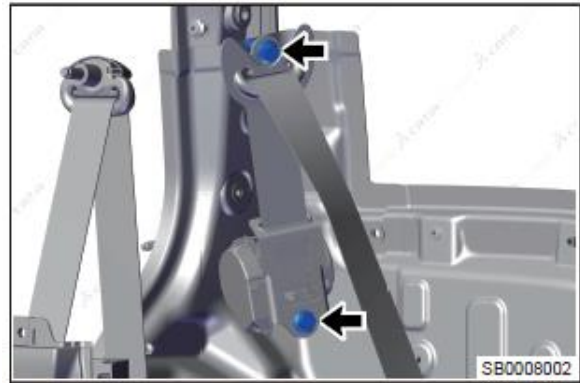
- When removing the second-row seat belt assembly, please be sure to wear the labour protection articles to avoid accidents.
- When dismantling the second-row seat belt assembly, pay attention to using the appropriate force and be careful during the operation.
- When removing the second-row seat belt assembly, avoid scratching the interiors.

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Remove the rear seat cushion assembly.
4. Remove the C-pillar upper guard plate assembly.
5. Remove the rear seat belt assembly.
  - a. Remove the fixing bolt (as shown by the arrow) at the lower part of rear seat belt assembly.



- b. Remove the fixing bolt on the left rear seat belt retractor (as shown by the arrow), and pull out the connector on the retractor (as shown by the figure).

Tightening torque:  $50 \pm 5 \text{ N}\cdot\text{m}$  ( $37 \pm 4 \text{ ft}\cdot\text{lbs.}$ )



- c. Unscrew the fixing bolts as shown by the arrow of the left rear seat belt assembly.

## Installation

### ⚠ Caution

- When installing the rear seat belt assembly, keep the seat belt assembly clean to avoid oil and check whether the seat belt assembly is damaged.
- When installing the rear seat belt assembly, all the fixing bolt and fixing screws must be tightened to the specified torque.
- After the refitting, connect the diagnostic scan tool to clear the DTC, and clear the DTC if any.
- Tighten the fixing bolts (2) (M6×20) of the front shock absorber with a 10 mm socket wrench.
- It is not allowed to replace the parts of the parts assembly without permission, such as bolts, washers, etc.
- If the part assembly falls down accidentally during taking and installation, please carefully check whether the plastic parts of the part assembly (such as retractor) have cracks. If there are cracks, please package and mark them, and then isolate them for scrap to prevent accidental injury.
- Before installing the seat belt, check whether the seat belt is in good condition; After assembly, pull out the webbing and lock the buckle to ensure that the webbing is pulled out smoothly and the buckle is locked and unlocked normally. During the assembly of the seat belt, ensure that no object (such as tools, etc.) scratches the webbing.

### ⚠ Warning

- The webbing from the lower end piece to the retractor shall be smooth, without folding or twisting.
- If the seat belts webbing cannot be pulled out on both sides of the rear seat, it is necessary to preliminarily determine whether the seat belts are locked due to the belt sensitive function of the seat belts.
- Judgment method: slowly retract the seat belt webbing with a distance of 15mm, and then slowly pull out the seat belt webbing. If the seat belt can be pulled out normally, there is no other problem. The seat belt is normal. If the seat belt webbing cannot be pulled out, the seat belt needs to be further tested.

1. The installation sequence is reverse to the removal.

## Front seat belt buckle assembly

### Removal

#### Note:

- The operating procedures of the front passenger seat belt buckle assembly are the same as those of the driver seat belt buckle assembly.
- The following is the operation procedure of the driver seat belt buckle assembly:

### ⚠ Caution

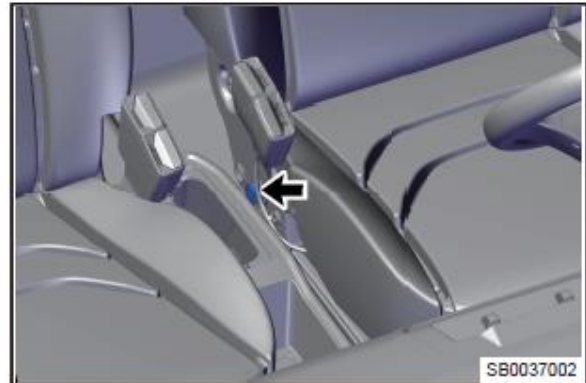
- When removing the front seat belt buckle assembly, please be sure to wear the labour protection articles to avoid accidents.
- When removing the front seat belt buckle assembly, avoid scratching the interiors.

- When removing the front seat belt buckle assembly, do not damage the harness and connector.

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative cable of the battery.
3. Remove the front seat assembly.
4. Remove the driver's seat belt buckle assembly

- a. Disconnect the harness connector of the left seat belt buckle at the bottom of the seat.
- b. Remove the fixing bolt (as shown by the arrow) on the seat belt buckle assembly, and remove the driver's seat belt buckle assembly.

Tightening torque:  $50 \pm 5 \text{ N}\cdot\text{m}$  ( $37 \pm 4 \text{ ft}\cdot\text{lbs.}$ )



## Installation

### Caution

- When installing the front seat belt buckle assembly, the fixing nuts must be tightened to specified torque.
- When installing the front seat belt buckle assembly, install the connectors in place.

1. The installation sequence is reverse to the removal.



## Body and EE

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## Vehicle Control Unit (VCU)

### System overview

#### Description

The body system controller, referred to as BCM for short, integrates and controls most of the electrical appliances of the vehicle, and is an important part of the body and EE system.

#### Description of functions

1. Tire pressure function (if the vehicle has tire pressure configuration): the tire pressure monitoring system is an active safety configuration, and the tire pressure monitoring system can monitor the tire pressure and temperature in real time and can display the tire pressure and temperature value through the instrument. When the tire pressure is too low or the temperature is too high, the tire pressure monitoring system will give an alarm to remind the driver that there is a traffic hazard.
2. Window anti-pinch function (if the vehicle has anti-pinch configuration): when the window is automatically raised or the remote control one-button window is raised, when the passenger is clamped by the automatically raised window due to negligence, the anti-pinch control module will control the window regulator motor to reverse before the motor reaches the set anti-pinch force, so that the window glass will drop a certain distance to prevent the passenger from being pinch.
3. The main features are as follows: turn signal lamp, lane change, hazard lamp, position lamp, parking lamp, low beam, accompanying me home, high beam, daytime running lamp, dome light, window, door status, central control lock, front wiper control, front washing control, reversing lamp control, key status signal, emergency brake double jump lamp alarm function, brake lamp control, remote control function;

### BCM Functional Test Report

#### Windshield wiper system

By monitoring the status of the wiper switch and combining the switch to control the work of the wiper motor and the spray pump, the BCM can realize various working modes of the wiper system: low speed operation of the front wiper, high speed operation of the front wiper, intermittent operation of the front wiper, closing of the front wiper, water spraying of the front windscreen, etc.

Logic description

#### Front wiper control

- BCM activates different modes of front wiper by toggling the manual switch to different positions: OFF mode, intermittent wiper mode, low-speed wiper mode and high-speed wiper mode (the switch is valid and must work at least for one cycle).
- The wiper operates in IGN-ON state, if in IGN-ACC or IGN-OFF gear and the wiper is not in the stop position, the wiper will work at low speed until it returns to the wiper stop position. At this time, the non-return state is detected again, and the wiper will not work again (only return once).
- During operation, when it is detected that the front wiper homing switch does not change for 5 seconds, it should be judged that the motor is stuck and the output should be turned off. At this time, the wiper can be restarted only when the ignition switch goes through the OFF-ON cycle or when the wiper switch is turned from OFF to other gears.

#### Point wiping and low-speed wiping modes

- With IGN-ON, when the wiper switch is in low speed mode or point wiping mode, BCM will drive the wiper motor to operate at low speed.
- When the low-speed wiper works: when the wiper switch is switched to the other working mode, the wiper will immediately work in other working modes.
- When the wiper switch is hit from low speed to OFF, the wiper will automatically work at low speed until it returns to the wiper stop position (whether IGN ON or not).

#### High-speed wiper mode

- When IGN-ON and the wiper switch is in high-speed mode, BCM will drive the wiper motor to operate at high speed.
- When the wiper works at high speed: when the wiper switch is switched to other working modes, the

wiper will work in other working modes immediately.

- When the wiper switch is hit from high speed to OFF and the wiper is not in the stop position, the wiper will automatically work at low speed until it returns to the wiper stop position (whether IGN ON or not).

**Intermittent wiper mode**

- When the wiper switch is turned to "Interval", BCM will activate the intermittent wiper mode;

Caution
<ol style="list-style-type: none"> <li>1. BCM detects the wiper stop position signal, and stops the wiper output after 20 ms.</li> <li>2. When the key is turned from IGN ON to OFF/ACC and the wiper is not at the stop position, the wiper will automatically work at a low speed until it returns to the wiper stop position.</li> </ol>

**Front wash control**

- Pre-cleaning operating conditions: IGN ON; The pre-washing input remains active for more than 0.3 ± 0.1 sec. The pre-washing operation is always output when the pre-washing input is activated.

The wiper is in the OFF position

- The wiper works at low speed for 3 cycles and 3±0.2 sec, and then works at low speed for 1 cycle;
- When the BCM is executing the washing action (including 3 cycles and 3 ± 0.2 sec), if the BCM receives the new washing operation request, it will immediately execute the new action.

The wiper is in low-speed wiper mode or high-speed wiper mode

- When the washer switch is activated and the wiper is in the low-speed wiper mode or the high-speed wiper mode, the wiper will continue to work in the low-speed wiper mode or high-speed wiper mode.

**Dome light control**

**Description of functions**

The interior lamp is used for lighting when the driver and passengers enter the vehicle or in the vehicle.

Logic description

**Dome light control**

- The control strategy is only feasible when the switch of dome light is in the DOOR position.
- If any door or trunk is opened and kept open (IGN in any gear), the dome light be on for 3 minutes ±10% (fade on and off)
- Within 3 minutes of dome light operation: another door is opened, and the dome light timer is reset - continue to light up for 3 minutes and then fade out.
- Within 3 minutes after the dome light works: the key is in the ON position and all doors are closed, and the dome light will fade out; When the key is in OFF or ACC, all doors will be closed. The dome light will fade out after 15 seconds; If the key is turned to IGN ON within the 15 seconds, the dome light will be extinguished immediately.
- If any door or trunk is closed and the ignition switch is turned from IGN ON to OFF, the dome light be on for 3 minutes;

**Remote control key signal and dome light control**

- IGN=OFF/ACC, when BCM receives a valid RF unlocking signal, the dome light will be on for 15 S (fade in and out). Within 15s when the dome light is working: turn the key to IGN ON, and the dome light will be extinguished immediately. After the whole vehicle is set, the dome light will be extinguished immediately.

Caution
<ol style="list-style-type: none"> <li>1. When any of the above conditions (door status, remote key signal) triggers the dome light on, another event is triggered or the same event is triggered again, and the timing of the dome light being on will be reset.</li> <li>2. Turn the key to ACC to OFF, and the BCM will trigger the dome light on for 3 minutes (fade on and off). Within 3 minutes of operation, when the key is turned to IGN ON and all doors are closed, the dome light will be extinguished immediately.</li> </ol>

**Collision signal and dome light control**

- When IGN-ON, regardless of the door status, if a valid network collision signal is received, BCM will trigger the dome light on for 30 minutes without fade-in process, including fade-out.
- I Within 30 minutes after the dome light is on: If the key is turned to OFF, the dome light will fade out immediately;

### Daytime running lamp control

#### Description of functions

When driving in the daytime, the daytime running lamp plays a warning effect.

#### Logic description

- Daytime running lamp working conditions: IGN = ON; BCM receives the position lamp sent by VCU, and the high and low beams are not activated.

Caution
1. When the daytime running lamp is working, the daytime running lamp on the corresponding side will be off when the left and right turn signal lamps are operated;
2. When the daytime running lamp is working, both the left and right daytime running lights will be off when the hazard warning flashers are on.

### Position lamp control

Function description: the position lamp mainly plays the role of width indication. The position lamps include front and rear position lamps.

#### Conditions of activation

- Activation conditions of front position lamp: IGN = ON or CAN signal 'ReadyLightSts = 1: Lamp ON'; The position lamp input is activated.
- When any of the following conditions is met, the position lamp will stop activating: the position lamp input is deactivated; Turn the key to OFF.

Caution
1. When the front position lamp is activated, BCM will send CAN signal to ICM, and ICM will light the corresponding indicator lamp.

### Rear fog lamp control

#### Description of functions

Rear fog lamp mainly plays a warning role in foggy weather and other weather.

#### Logic description

- Rear fog lamp working conditions: IGN-ON; The front fog lamp or low-beam lamp or high-beam lamp is activated under load; Activate the rear fog lamp switch.
- Activate the rear fog lamp switch again; Turn the key to IGN-OFF or ACC; The front fog lamp or the low beam lamp load is deactivated

Caution
When the rear fog lamp switch is activated, BCM sends a CAN signal to ICM

### High beam control

The main function of the high beam light is to illuminate the distance at night; The high beam switch is a self-locking switch, and the overtaking lamp is a self-resetting switch, both of which are connected to the same port of BCM.

#### High beam logic description

#### Function of high beam lamp

- High beam working conditions: 1 . IGN-ON; 2. The low beam switch is activated; 3. The high beam switch or overtaking lamp switch is activated.
- When any of the following conditions is met, the high beam will be deactivated: the 1. the low beam switch is deactivated 2. High beam switch and overtaking lamp switches are deactivated; 3. IGN-OFF or IGN-ACC.

Remarks
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The high and low beam switches in the light combination switch have a logical relationship in structure, that is, when the low beam switch is turned on, the high beam switch can be guaranteed to be grounded.

**Function of overtaking lamp**

- Overtaking lamp operating conditions: 1. IGN ON; 2. The overtaking lamp switch is activated.
- When any of the following conditions is met, the overtaking lamp will be deactivated: the 1. the low beam switch is activated, and the high beam switch is deactivated; 2. The overtaking lamp switch is deactivated; 3. IGN-OFF or IGN-ACC.

Caution

1. When the high beam lamp or overtaking lamp function is activated, the low beam lamp must be lit, BCM sends a CAN signal to ICM, and ICM lights up the corresponding high beam indicator lamp.
2. In case of IGN-ACC, activate the overtaking lamp switch, BCM cannot send a CAN signal to ICM.
3. When the key is turned to IGN-OFF within 2 minutes, the overtaking lamp switch activates the FMH function, and BCM sends the CAN signal to CAN.

**Low beam control**

**Description of functions**

The main function of the low beam light is to illuminate the near place at night. The low and high beam lamps must be lit at the same time for Avantier.

Logic description

- Low beam lamp activation conditions: IGN-ON; The low beam input is activated.
- When any of the following conditions is met, the low beam will stop activating: the low beam input is deactivated; Turn the key to IGN-OFF or IGN-ACC.

**Turn signal lamp and hazard warning lamp**

**Description of functions**

The turn signal lamp is mainly used for prompting when making turns or changing lanes. Hazard warning lamp is mainly used to turn on the warning function in case of emergency.

**Logic description**

**Function of turn signal lamp**

- When the BCM meets the following two conditions, the turn signal lamp will be turned on: 1. IGN=ON; 2. The left/right turn signal lamp switch is activated.

Caution

1. The turn signal lamp load shall flash at a frequency of  $75 \pm 5$  times per minute
2. When the turn signal lamp is activated, BCM sends CAN signals, and the pace is consistent with the working frequency of the turn signal lamp load; When the turn signal lamp input is deactivated, the left/right turn signal lamp should immediately stop working and stop sending the corresponding signal.
3. The turn signal lamp is equipped with a diagnostic function, which can diagnose the open circuit and short circuit fault of the turn signal lamp

- When the BCM meets the following two conditions, the turn signal lamp will be turned off: 1. Turn the key from IGN-ON to ACC or OFF; 2. The left/right turn signal lamp switch is deactivated.

**Function of emergency light**

- Emergency light activation condition: Activate the emergency light switch, and the emergency light will be on. When the emergency light is on, activate the emergency light switch again, and the emergency light will stop working.

**Reversing lamp control**

**Description of functions**

It will light up when reversing, and plays a role in reminding that the vehicle is reversing.

**Logic description**

- IGN-ON, after the vehicle is shifted to R gear, the VCU sends the reversing signal to BCM through CAN network, and the BCM receives the reversing signal to light up the reversing lamp;
- If any of the following conditions is met, BCM will turn off the reversing lamp: 1. The key is turned to OFF or ACC; 2. The network signal input of the reversing lamp is deactivated.

## Follow me home

### Description of functions

Mainly used for night parking, can turn on the low beam to illuminate the way home.

### Logic description

#### Function activation

- Follow-me home function is controlled by BCM, and lights up the low beam, front position lamp and license plate lamp for convenience;
- FMH function activation condition: the overtaking lamp switch will be activated within 2 minutes after the key is turned to OFF.
- Once the FMH function is activated, the low beam headlights, front position lamp and license plate lamp are on. BCM sends CAN signal to ICM, and ICM will illuminate the corresponding indicator lamp. When the switch is activated, ICM will illuminate the corresponding indicator lamp.

#### Function activation

- When the FMH function is activated: the default duration is 30 S. If the overtaking light switch is activated again for a short time, the duration of the FMH function will be increased by 30 S each time, not more than 8 times (after the first 30 S, the switch will be activated for 8 times, and 240 s is available at any time, and the maximum duration is  $8 \times 30 = 240$  s).
- The FMH function can be activated again within 2 minutes after the key is turned to OFF, regardless of whether it is manually turned off or automatically turned off after overtime.

#### The function is invalid

- When the FMH function is activated: if the overtaking lamp is activated for 2s, the FMH function will be manually deactivated - the low beam, side lamp and license plate lamp will be extinguished immediately,
- The FMH function is manually deactivated, and the FMH function can be activated again within 2 minutes after the key is turned off.

#### Stop of function

- When any of the following conditions is met, the FMH function will be stopped: 1. After the set FMH working time is reached; 2. turn the key to ACC or IGN ON; 3. the FMH switch is deactivated;
- The BCM will immediately turn off the low beam lamps.

## Function of the stop light

### Description of functions

The brake light function is sent by the brake light switch or VCU.

## Emergency braking double-tripping alarm function

### Description of functions

Mainly used for prompting in case of emergency braking.

### Logic description

- If the following conditions are met, the hazard warning lamp will be activated for at least 3 s (left/right turn signal lamp, indicator flashing): the vehicle acceleration exceeds  $-6$  m/s ( $20$  ft/s), and the vehicle speed exceeds  $50$  km/h ( $31$  mph) before decelerating; The key is in the ON position.
- When the hazard warning lights of this function are activated, the ICM will activate the left and right turn indicator lights to flash.
- If any of the following conditions is met, the function will be deactivated (the steering and hazard indicator lamps will be deactivated simultaneously): the accelerator pedal of the vehicle is activated; Turn the key to the OFF position.

Caution
1. When the hazard warning lamp of this function works, operate the hazard warning lamp switch, and this function will stop immediately;
2. During this operation, the BCM receives the collision signal and the function stops immediately;



## Door lock system

### Description of functions

The door lock system controls the door lock through the BCM internal relay, which realizes the following

**functions:**

- Centralized locking and unlocking;
- Remote control locking and unlocking;
- Tailgate unlocking and remote tailgate unlocking;
- Collision unlocking;
- High-speed lockout etc.

**Logic description**

**Function of central control lock**

- Activation conditions of central control locking: the unlocking and locking switch of the central control lock is activated, and the left front door unlocking status feedback signal is valid.
- Activation conditions of central control unlocking: the unlocking and locking switch of the central control lock is activated, and the left front door locking status feedback signal is valid.

Caution
<ol style="list-style-type: none"> <li>1. When the BCM receives the locking signal of the central control lock, if any door is open at this time, the BCM will execute the central locking once, and then the BCM will execute the central locking again after 1 second.</li> <li>2. When the vehicle is set, the central control unlocking switch function fails.</li> </ol>

**Unlocking of tailgate**

- In the set state, press and hold the remote tailgate opening button for 2 seconds to deactivate the set state and execute the tailgate opening motor; When the tailgate is opened, close the tailgate and enter the set state again.
- In the released state, if the driver's side door lock is locked at OFF position, press and hold the tailgate unlocking button for 2 seconds or the tailgate unlocking signal is valid, BCM will unlock the tailgate lock motor;
- In the released state, if the driver side door lock is in the locked state and not in the OFF position, the liftgate unlocking signal is valid and BCM will unlock the liftgate lock motor.
- In the OFF position, press and hold the liftgate unlocking button for 2 seconds or the liftgate unlocking signal is valid, and the liftgate lock motor will perform the unlocking action.
- In the released state, the driver side door lock is in the unlocked state; in the non-OFF position, the tailgate unlocking signal is valid, and the tailgate lock motor executes the unlocking action.

**Automatic unlocking**

- Automatic unlocking activation conditions: 1, the vehicle speed is 0 km/h; 2. Turn the key from ON to OFF; 3. It is detected that the left front door is locked.

**Unlocking by collision**

- Collision unlocking activation conditions: IGN-ON; The BCM receives a valid CAN network collision signal.

**High-speed lockout**

- Activation conditions of high-speed locking: 1. IGN ON; 2. The speed is 15 km/h (9 mph).

Caution
<p>After the first automatic locking, it is detected that the vehicle speed is lower than 5 km/h (3 mph), and at the same time, the door is manually unlocked and the door status changes. It will be locked again when the speed returns to 15 km/h (9 mph). If there is no above operation, the locking action will not be performed when the speed reaches 15 km/h (9 mph).</p>

**Remote unlocking/locking**

- BCM will perform a latching action if any of the following conditions are met:
  - IGN=OFF Both doors and the liftgate closed; The BCM receives the locking signal from the remote key.
  - IGN-OFF/IGN-ACC/Ignore; Both doors and the liftgate closed; The BCM receives the central control locking signal.
  - Note: 1. OFF, when BCM receives the locking signal of the remote key, if one door or other doors are open, 2. ON, when BCM receives the locking signal of the central control, if one door or other doors are open, BCM will perform central control locking once, and when the opened doors are closed, BCM will perform the central control locking again.
- BCM will perform the unlock action if the following two conditions are met: 1. IGN-OFF/IGN-



ACC/IGN-ON; 2. The BCM receives the unlock signal from the remote key.

Remarks
1. If the BCM receives unlocking or locking twice (central control locking or mechanical locking) within 1S, the second operation will be ignored.
2. The change time of BCM switch detection signal is 30 ms
3. When the BCM is powered on after power off, the BCM will not have unlocking or locking actions.
4. The time for BCM to receive the unlocking/locking response feedback from the remote key is $T=200\text{ ms}\pm 50\text{ ms}$ (the time T can be modified according to the response time of the door lock).

### Protective function of the lock

If there are more than 10 central control lock actions within 25 s, it is forbidden to operate the central control lock for 30 s. In the 30s of protection, if BCM receives the CAN signal "- CrashOutputSts  $\neq$  00", BCM will perform the central control unlocking described in the collision unlocking.

Remarks
1. After BCM receives the CAN signal "CrashOutputSts $\neq$ 00", BCM will perform the central control unlocking for 2 times with an interval of 1 second (AND door status is not closed).
2. After BCM receives the CAN signal "CrashOutputSts $\neq$ 00", it is forbidden to lock the vehicle; When the key is turned to OFF and then to ON, it is forbidden to cancel the locking.
3. Anti-jitter of BCM switch detection is $50\text{ ms} \pm 10\%$ .
4. Once any door status is changed, BCM must immediately send the door status CAN signal to the CAN network,

## Automobile safety system

### Description of functions

- Functional details:
- Set mode
- Secondary set mode
- Trunk opening mode
- Illegal entry mode
- Release mode
- Setting failure mode

### Logic description

#### Set mode

- Trigger condition of set mode: 1. IGN=OFF; 2. The left and right doors and the liftgate are closed; 3. The BCM receives the unlock signal from the remote key.
- When entering the anti-theft mode, BCM gives feedback: 1. The turn signal lamp flashes once and lights up; 2. Drive high and low bass loudspeaker 50ms; 3. Send a setting signal.

#### Setting failure mode

- After BCM receives the locking signal from the remote key, if any of the following conditions is met, BCM will enter the anti-theft failure mode: 1. IGN  $\neq$  OFF; 2. In the released mode, any one of the left and right doors and the liftgate is open.
- Enter the Set failure mode, and BCM needs to send the arming failure mode signal.

Caution
1. When entering the Set failure mode, if the trunk is not fully closed, the central control lock action will not be affected, and BCM will lock the central control for one time.
2. If the liftgate is closed and any door is not closed, BCM will lock the door by central control first and then unlock it by central control with an interval of 500 ms.
3. If the central control lock is in the lock protection state before BCM receives the remote key locking signal, the turn signal lamp will flash twice (flashing time: 500 ms at an interval of 1.5 S), the lock does not act and will not be set.

#### Secondary set mode

- Secondary set mode triggering conditions: 1. the vehicle is in the set mode; 2. BCM receives the unlocking signal from the remote key.
- When entering the set mode, BCM feedback: 1. turn signal lamp flashes twice; 2. Send the signal of set mode.

Caution
1. The function of secondary anti-theft automatic locking requires that there is no intrusion, BCM receives the unlocking signal from the remote key, but the doors on both sides and the liftgate do not

- |  |
|--|
| <p>act. The automatic locking is only effective when the remote key unlocking signal is received under the condition of vehicle armed.</p> <ol style="list-style-type: none"> <li>2. BCM receives the unlocking signal from the remote key. If any of the doors on both sides and the liftgate is opened, BCM will exit the anti-theft mode</li> <li>3. If the doors on both sides and the back door do not act, the BCM will automatically lock and enter the anti-theft state after 30 seconds.</li> </ol> |
|--|

**Trunk opening mode**

- In the set state, BCM receives the tailgate opening signal from the remote key, and BCM drives the trunk motor to open the trunk lock; When the tailgate switch signal is invalid and meets the setting conditions, the tailgate will enter the set state; When the tailgate is in the open state, it is always in the trunk open mode.
- In the released state, the liftgate unlocking switch signal is valid, and BCM drives the trunk lid motor to open the trunk lid lock,

**Illegal entry mode**

- Intrusion mode triggering conditions: when the vehicle is in the set mode, the BCM will enter the alarm state after the following conditions occur: 1. the door is opened; 2. turn the key to the OFF position; 3. Unauthorized opening of the trunk.
- After entering the intrusion mode, BCM feeds back the phenomenon within 33 seconds of 1 alarm cycle: 1. loudspeaker (high and low tone loudspeaker at the frequency of 500 ms ON and 500 ms OFF) works for 28±2 seconds and pauses for 5 seconds; 2. The left and right turn signal lamps flash for 28 seconds and pause for 5 seconds; 3. BCM sends illegal entry mode signal.
- If the intrusion ends, BCM will stop alarming after ending the current alarm cycle. If the same alarm source is triggered again after the alarm is ended, BCM will continue the remaining alarm cycle.

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|---|
| <p><b>Caution</b></p> <ol style="list-style-type: none"> <li>1. When the intrusion mode is triggered, the alarm will be triggered for a maximum of 8 cycles.</li> <li>2. After triggering the alarm for 8 cycles, the trigger source will be triggered again, and the tweeter and woofer and turn signal lamp cannot be activated.</li> <li>3. At the end of the alarm, if the doors on both sides and the liftgate are closed, BCM will enter the set mode.</li> <li>4. After 8 cycles of triggering the alarm, if the triggering alarm source reappears, the complete vehicle is in intrusion mode, but the audible and visual alarm stops.</li> <li>5. In case of continuous triggering of the same alarm source, a single trigger source can trigger up to 3 alarm cycles; After three alarm cycles, the alarm will not be triggered again.</li> <li>6. After the vehicle intrusion, the remote setting is successful, and the remote control is unlocked at this time, and the vehicle is released.</li> </ol> |
|---|

**Released mode**

- When the vehicle is in the anti-theft mode, BCM receives the remote control unlock signal; Central control unlocking; The turn signal lamp flashes twice;
- The vehicle is in the alarm mode; The BCM receives the remote key unlocking signal. Central control unlocking; The turn signal lamp flashes twice and sends the corresponding signal.

## Auxiliary system

### Collision signal

#### Description of functions

The purpose of the collision signal is to ensure that the door lock can be unlocked, the left and right turn signal lamp can be lit, and the loudspeaker can be sounded when the vehicle is impacted by an external collision.

## Power window control

### Description of functions

It is used to control the rising and falling of 2 power windows.

#### Logic description

1. When the ignition is in the ON position, all function of the windows can be operated.
2. The window can perform the following functions within 60 s after the ignition is turned off from ON position:
  - a. When the ignition is off the ON position, if the automatic function is being executed, stop it immediately;
  - b. Within the 60 s delay, the window can only perform the manual function;
  - c. Within 60 s of delay, if the doors on both sides are open, BCM will ignore all the window switch inputs;
  - d. If BCM enters the anti-theft mode within 60 s delay, BCM will ignore the input of all window switches.
3. The window switch includes window up and down, both of them have mechanical self-recovery function.
4. If the window switch operation duration is less than 50 ms, the window motor will not work.
5. During engine ignition, the window action is suspended; After the ignition is finished, the other window actions continue except for the automatic rising of the power window.
6. When BCM detects the resistance (due to the window rising to the top, falling to the bottom or other obstacles), the window will stop working.
7. If the window has not completed the action (i. e. has not been raised to the top or lowered to the bottom) within 8 seconds, the window action will be stopped.

## Long press to unlock the automatic window lowering

### Description of functions

1. When IGN=OFF and the remote key unlock signal is detected to be  $\geq 2$  s (CAN signal), BCM will lower the windows on both sides. The glass descending sequence is: left front door » right front door » with a time interval of 100 ms. In this process, release the button or open any door (excluding the liftgate), and the power window will stop working.
2. Open any door (excluding the liftgate), do not press and hold the lowering window.

## Remote control function

### Description of functions

BCM realizes the functions of remote release, remote vehicle search, remote on/off of low beam, one-key home, one-key welcome and so on by receiving the command from T-BOX.

Logic description

### Remote lockout control

When BCM receives the remote locking signal, BCM judges the status of ignition switch and the status of three doors (left and right doors and the liftgate). If the ignition switch is in the non-OFF position, the BCM will feed back the current ignition switch status message and will not respond to the remote command; If the ignition switch is at OFF and the three doors (left and right doors and liftgate) are closed, BCM will execute the fortification action (see Section 5.6 description of set mode for details), and feed back the three-door status message and alarm mode message (set status); If the ignition switch is changed to "BCM receives the remote vehicle search signal, BCM judges the ignition switch state; if the ignition switch is not in the OFF position, the current state message will be fed back and the remote command will not be responded; if the ignition switch is in the OFF state, BCM will perform the arming action (see the description of arming mode in Section 5.6 for details), and the alarm mode message (arming state) will be fed back."

**Remote vehicle searching control**

When BCM receives the remote vehicle searching signal, BCM judges the status of the ignition switch. If the ignition switch is in the non-OFF position, the BCM will feed back the current ignition switch status message and will not respond to the remote command; If the ignition switch is in the OFF position, BCM will drive the turn signal lamp to flash for 8 seconds, click "OK" for 8 seconds, and the treble/bass loudspeaker will be activated twice. Meanwhile, the working signal of turn signal lamp network and the working signal of loudspeaker network will be fed back.

**Remotely control the low beam**

When BCM receives the remote turn-on low beam signal, BCM will judge the status of ignition switch. If the ignition switch is in the non-OFF position, the feedback of the current ignition switch signal status will not respond to the remote command; If the ignition switch is in the OFF position, BCM will drive the low beam to light up; If no remote closing signal is received within 30 s, the BCM will turn off the low beam automatically.

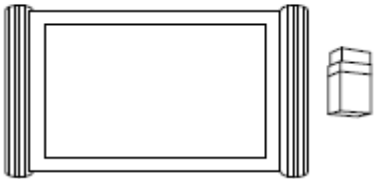
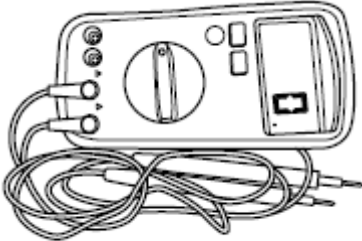
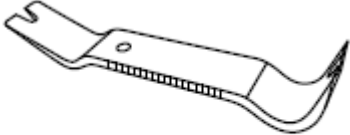
**Remote one-button home function**

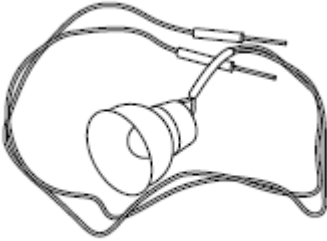

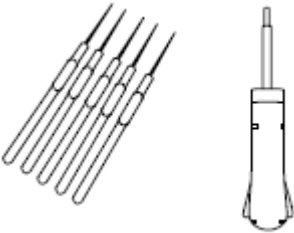
When BCM receives the remote locking signal and the remote turn-on low beam signal, BCM judges the status of the ignition switch. If the ignition switch is in the non-OFF position, the feedback of the current ignition switch status message will not respond to the remote command; If the ignition switch is in the OFF position, BCM will drive the low beam lamp to be on for 30 s.

**Remote one-button welcome function**

When BCM receives the remote locking signal and the remote turn-on low beam signal, BCM judges the status of the ignition switch. If the ignition switch is in the non-OFF position, the feedback of the current ignition switch status message will not respond to the remote command; If the ignition switch is in OFF position, BCM will drive the low beam lamp to light up for 30 s, and feed back the low beam lamp network working message and the left front door lock status; If there is no change in the door status of the vehicle during the 30 s timing process, BCM will perform the fortification action.

**Tools**

Tool name	Illustration
X-431 PAD Scanner	 <p style="text-align: right;">001</p>
Digital multimeter	 <p style="text-align: right;">002</p>
Rocker	 <p style="text-align: right;">RCH002506</p>

Bulb test light (21 W)	 <p>RCH008708</p>
<b>Tool name</b>	<b>Illustration</b>
Jumper	 <p>RCH008806</p>
Harness terminal tool	 <p>RCH008906</p>

### Torque specifications

Description	Torque
Fixing nut of body system controller bracket	$7 \pm 1 \text{ N}\cdot\text{m}$ (5±0.7 ft-lbs.)
Dashboard left lower protective plate assembly	$1.5 \pm 0.5 \text{ N}\cdot\text{m}$ (1.1±0.4 ft-lbs.)
Fixing nut of instrument electric box	$7 \pm 1 \text{ N}\cdot\text{m}$ (5±0.7 ft-lbs.)

## Diagnosis and test

### Content of diagnosis

#### Diagnostic aids

1. Connect data link connector (DLC) with X-431 3G diagnostic tester (latest software version) and communicate with vehicle electronic module through data network.
2. Confirm existence of fault(s), and perform diagnostic test and repair procedures.
3. The fact that a diagnostic trouble code (DTC) cannot be cleared indicates that there exists a fault currently.
4. Only digital multimeter can be used to measure the voltage of the electronic system.
5. Please refer to any technical service bulletins that may be applicable to this failure.
6. Visually check relevant harnesses and connectors.
7. Check and clean the ground points related to the latest DTC.
8. If a large number of fault codes are set, refer to the circuit diagram for the common ground circuit or power supply circuit that applies to the DTC.

#### Troubleshooting of intermittent DTCs

If the fault is intermittent, perform the following procedure:

- Check connector(s) for looseness.
- Look for any worn, punctured, pinched or partially broken harness.
- Monitor the data of the diagnostic tester (latest software version) related to this circuit
- When the circuit signal is interrupted during detection, shake the relevant harness and connector.
- If possible, try to reproduce the conditions when setting the DTC.
- During the shaking test, find the changed data or reset DTC.
- Look for broken, bent, protruding, or corroded terminals.
- Check the airbag components and installation parts for conditions that may cause incorrect signals, such as damage, foreign matters, etc.
- Check and clean all harness connectors and grounding parts related to DTC.
- If more than one fault code is set, use the circuit diagrams for any common ground or power circuits that are applicable to this DTC.
- Please refer to any technical service bulletins that may be applicable to this failure.

#### Inspection of ground connection

The ground point is very important for the proper operation of the circuit. The grounding point is often exposed to moisture, dirt or other corrosive environments. Corrosion (rust) may result in an increase in load resistance. This condition can change the way the circuit works. The circuit is very sensitive to a proper ground. Loose ground or corroded ground can severely affect the control circuit. Check the ground point as follows:

1. Remove the ground bolt or nut.
2. Check all contact surfaces for lackluster, dirt, rust, etc.
3. Clean if necessary to ensure good contact.
4. Reinstall the ground bolt or nut firmly.
5. Check if there are new accessories interfering with the ground circuit.
6. If more than one wire is pressed into a ground terminal, check whether it is pressed correctly. Ensure that all wiring harnesses are clean, securely fastened, and provide a good path to ground.

#### Fault diagnosis and maintenance process

Caution
When reading DTCs, some DTCs are irrelevant to the malfunction, and the functions indicated by these DTCs are normal with no affection to the use of the vehicle, such DTCs can be cleared.

1. Verify if the fault code is reproduced.
- If the fault recurs, check the suspected harness and electrical connector, and if the fault recurs,

proceed to the next step.

2. Check if there is any fault code
  - Read the presence of fault codes, if there are no fault codes, follow the diagnostic procedure based on the fault phenomenon, if there are fault codes, proceed to the next step.
3. Clear and read the fault code again.
  - Record and clear the DTC. Retest and read the fault code, if there is no fault code, then follow the diagnostic process based on the fault phenomenon, if there is a fault code and it is related to the fault phenomenon then go on to the next step.
4. Dispose of the fault phenomenon according to the fault code
5. After maintenance, retest according to the fault code strategy
  - If the fault is not eliminated, re-inspect it.
6. After the fault is eliminated, prevent the fault from recurring according to the cause of the fault
7. End the fault diagnosis

### Diagnose according to fault phenomenon

#### Caution

- If a BCM function fails, but there is no fault code, the diagnosis can be carried out according to the fault symptom.
- Check whether the BCM input/output signal is normal in combination with the control logic (see the working principle section). If the input/output is normal, it is judged to be a BCM fault, otherwise, check the input or output part.

1. Verify if the fault reappears
  - If the fault does not occur again, check the suspected harness and electrical connector, and if so, proceed to the next step
2. Check whether the power supply and grounding of the controller are normal
  - If it is not normal, align it with the circuit diagram, and repair the power supply and grounding of the controller.
3. According to the control logic, use the diagnostic tester to read whether the related data flow input part is normal.
  - If it is not normal, check the relevant input signal according to the circuit diagram, and if it is normal, go to the next step.
4. Execute the action test with the diagnostic tester and observe whether the diagnostic tester has corresponding action.
  - If it is normal, the output part has no fault; if it is not normal, proceed to the next step.
5. Check whether the actuator is normal.
  - Repair it if it's abnormal.
6. Replace BCM if all the diagnosis results are normal.

### Fault Code (DTC) Table

DTC code	Definition of code
B1000-16	Battery voltage below lower limit
B1000-17	Battery voltage above upper limit
B1001-18	Left turn signal lamp control current lower than the lower limit
B1001-19	Left turn signal lamp control current higher than the upper limit
B1002-18	The right turn signal lamp control current is lower than the lower limit
B1002-19	The right turn signal lamp control current is higher than the upper limit
B100A-16	Dome light control current is lower than the lower limit
B100A-17	The dome light control current is higher than the upper limit
B100C-18	Left front window current is lower than the lower limit
B100C-19	Left front window lifting current above upper limit

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B100C-71	Left front window lifting hardware fault
----------	--



<b>DTC code</b>	<b>Definition of code</b>
B100D-18	Left front window lowering current is lower than the lower limit
B100D-19	Left front window lowering current above upper limit
B100D-71	Left front window lowering hardware fault
B100E-18	Right front window up current is lower than the lower limit
B100E-19	Right front window lifting current above the upper limit
B100E-71	Right front window lifting hardware fault
B100F-18	Right front window lowering current is lower than the lower limit
B100F-19	Right front window lowering current above upper limit
B100F-71	Right front window lowering hardware fault
B101B-18	Central control unlocking current is lower than the lower limit
B101B-19	Central control unlocking current above upper limit
B101B-71	Central control unlocking hardware fault
B101C-18	Central control locking current is lower than the lower limit
B101C-19	Central control locking current above upper limit
B101C-71	Central control locking hardware fault
U0073-88	Bus Off
U0131-87	Lost communication with EPS
U0155-87	Lost communication with ICM
U0167-87	Loss of communication with the vehicle immobilizer
U1300-55	Software errors
B1022-71	The left front window lifting key on the driver side is faulty
B1023-71	Driver's right front window lifting button fault
B1014-18	Break_light_low
B1014-19	Break_light_high
B1017-18	Reversing_lamp_low
B1017-19	Reversing_lamp_high
B1018-18	Rearfog_low
B1018-19	Rearfog_high
B101D-18	Trunk release_low
B101D-19	Trunk release_High

## On-board maintenance

### Body system control module

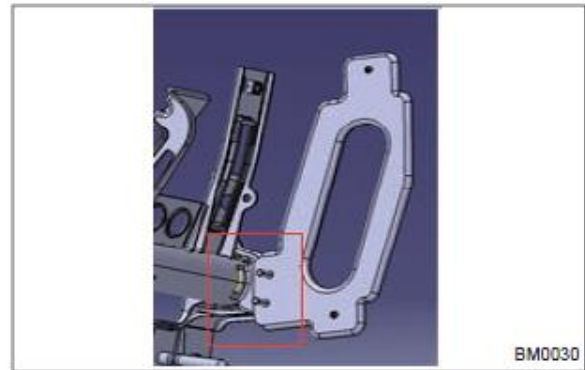
#### Removal

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Remove the instrument panel assembly.
4. Remove the body system control module.
  - a. Remove the 3 connectors of body system control module.
  - b. Remove the 2 fixing bolts between body system control module and body system controller bracket.
  - c. Remove body system control module.

#### Installation

1. Align the back side (the side with grooves) of the body system control module bracket to the instrument cross member, and fasten the 2 nuts.

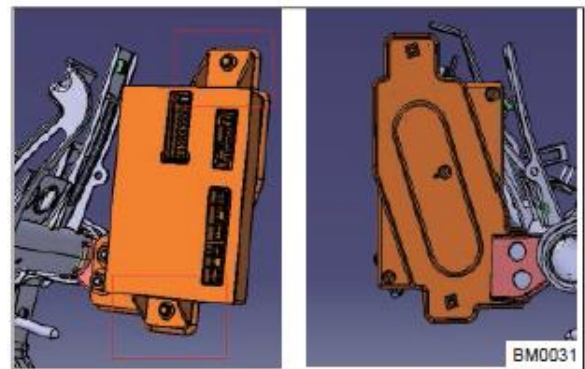
Torque:  $7\pm 1$  N·m ( $5\pm 0.7$ ft-lbs.)



Tip: The smooth surface of the body system controller bracket is in the same direction as that of the M6 bolt, as shown in the figure.

2. Align the body system controller with the body system controller bracket, and tighten it with 2 bolts.

Torque:  $7\pm 1$  N·m ( $5\pm 0.7$ ft-lbs.)



Tip: mistake proofing: align the long side hole to long side, short side hole to short side, as shown in the above figure.

3. Connect the wire harness and the body system controller.

---

## Body and EE

Instrument and control system	277	Inspection of ground connection	277
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## Instrument and control system

### Diagnosis and test

#### Diagnostic aids

1. Connect data link connector (DLC) with X-431 3G diagnostic tester (latest software version) and communicate with vehicle electronic module through data network.
2. Confirm existence of fault(s), and perform diagnostic test and repair procedures.
3. The fact that a diagnostic trouble code (DTC) cannot be cleared indicates that there exists a fault currently.
4. Only digital multimeter can be used to measure the voltage of the electronic system.
5. Please refer to any technical service bulletins that may be applicable to this failure.
6. Visually check relevant harnesses and connectors.
7. Check and clean the ground points related to the latest DTC.
8. If a large number of fault codes are set, refer to the circuit diagram for the common ground circuit or power supply circuit that applies to the DTC.

#### Troubleshooting of intermittent DTCs

If the fault is intermittent, perform the following procedure:

- Check connector(s) for looseness.
- Look for any worn, punctured, pinched or partially broken harness.
- Monitor the data of the diagnostic tester (latest software version) related to this circuit
- When the circuit signal is interrupted during detection, shake the relevant harness and connector.
- If possible, try to reproduce the conditions when setting the DTC.
- During the shaking test, find the changed data or reset DTC.
- Look for broken, bent, protruding, or corroded terminals.
- Check the airbag components and installation parts for conditions that may cause incorrect signals, such as damage, foreign matters, etc.
- Check and clean all harness connectors and grounding parts related to DTC.
- If more than one fault code is set, use the circuit diagrams for any common ground or power circuits that are applicable to this DTC.
- Please refer to any technical service bulletins that may be applicable to this failure.

#### Inspection of ground connection

The ground point is very important for the proper operation of the circuit. The grounding point is often exposed to moisture, dirt or other corrosive environments. Corrosion (rust) may result in an increase in load resistance. This condition can change the way the circuit works. The circuit is very sensitive to a proper ground. Loose ground or corroded ground can severely affect the control circuit. Check the ground point as follows:

1. Remove the ground bolt or nut.
2. Check all contact surfaces for lackluster, dirt, rust, etc.
3. Clean if necessary to ensure good contact.
4. Reinstall the ground bolt or nut firmly.
5. Check if there are new accessories interfering with the ground circuit.
6. If more than one wire is pressed into a ground terminal, check whether it is pressed correctly. Ensure that all wiring harnesses are clean, securely fastened, and provide a good path to ground.

#### Fault Code (DTC) Table

DTC code	Definition of code
B1100-16	Battery voltage below lower limit
B1100-17	Battery voltage above upper limit
U0073-88	BUS OFF

DTC code	Definition of code
U0100-87	Lost communication with BMS
U0101-87	Loss of communication with T-BOX
U0131-87	Lost communication with EPS
U0140-87	Lost communication with BCM
U0253-87	Lost communication with VCU
U0121-87	Loss of communication with ABS
U0331-87	Loss of communication with RADAR
U0292-87	Loss of communication with MCU
U0168-87	Loss of communication with ABS
B1100-71	KL30 open circuit

## On-board maintenance

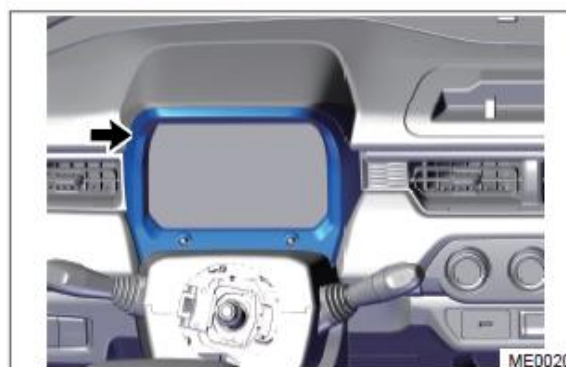
### Combination instrument

#### Removal

##### Warning

- When removing the combination instrument, be sure to wear the labour protection articles to avoid accidents.
- When disassembling the combination instrument, pay attention to using the appropriate force and be careful when operating.
- When removing the combination instrument, handle it gently to avoid the instrument pointer and dial deviating from the initial position or loosening due to bumping.

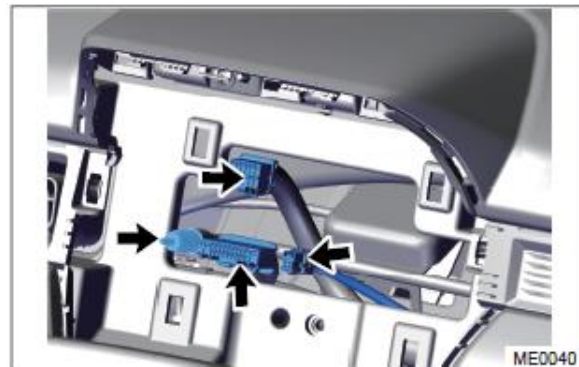
1. Turn off all electrical equipment and the start button
2. Disconnect the negative battery cable
3. Remove the front cover of combination instrument.



4. Remove the 2 retaining screws that secure the instrument.



5. Slightly shake the dashboard trim frame and pull it out along the direction perpendicular to the plane of instrument display.
6. Disconnect the four connectors of the instrument and take down the instrument.



### Installation

1. The installation sequence is reverse to the removal.





## Lighting system

On-board maintenance	283	Dome light assembly	286
Combination lamp switch assembly	283	Removal	286
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Installation	283	High-mounted brake lamp assembly	287
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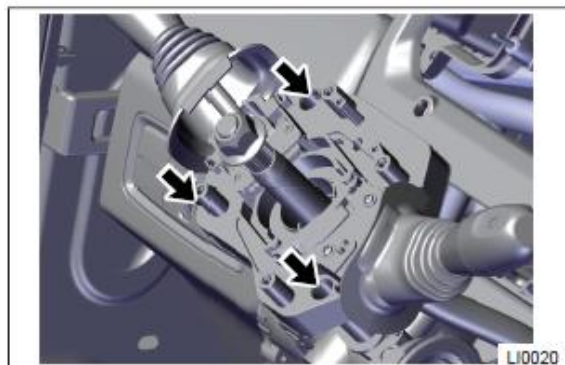


## On-board maintenance

### Combination lamp switch assembly

#### Removal

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Remove the driver's airbag.
4. Remove the steering wheel.
5. Remove the combination switch cover.
6. Remove the clock spring assembly.
7. Remove the combination switch assembly.
  - a. Remove the 3 setscrews of combination lamp switch.



- b. Disconnect the connector and take down the combination switch.

#### Installation

##### Caution

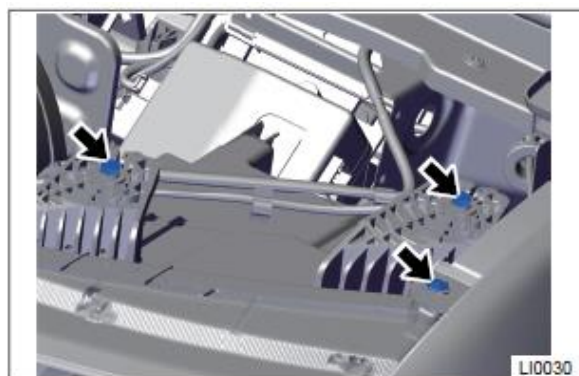
- Be sure to install the spiral cable correctly according to the specified operating instructions.
- After installation, check and confirm that the loudspeaker works normally.

1. The installation sequence is reverse to the removal.

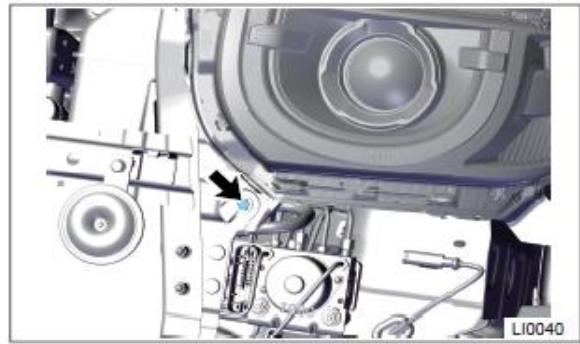
### Headlamp assembly

#### Removal

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Remove the front bumper assembly.
4. Remove the headlamp assembly.
  - a. Remove the two fixing bolts and one fixing screw above the headlamp.



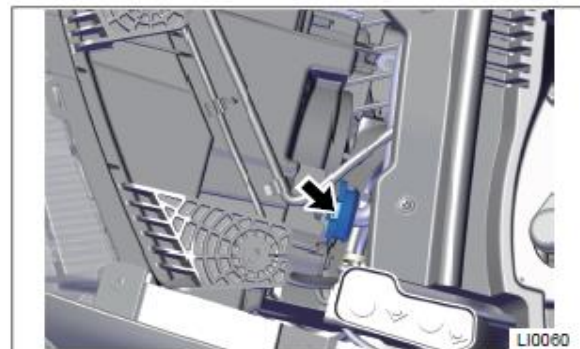
- b. Remove one fixing bolt under the headlamp.



- c. Remove one fixing bolt at the connection of the headlamp and bumper.



- d. Disconnect the headlamp connector, and take down the headlamp.



### Installation

- 1. The installation sequence is reverse to the removal.

### Warning lamp switch

#### Removal

- 1. Turn off all electrical equipment and the start button.
- 2. Disconnect the negative cable of the battery.
- 3. Remove the warning lamp switch.
  - a. Use the interior pry plate to carefully pry out the warning lamp assembly.



- b. Disconnect the harness connector on the warning lamp switch.
- c. Remove the warning lamp switch.

## Installation

1. The installation sequence is reverse to the removal.

## Headlamp regulating switch

### Removal

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Remove the headlamp regulating switch.
  - a. Use the interior pry plate to carefully pry out the headlamp regulating switch.



- b. Disconnect harness connector on the headlamp regulating switch.
- c. Remove the headlamp regulating switch.

### Installation

1. The installation sequence is reverse to the removal.

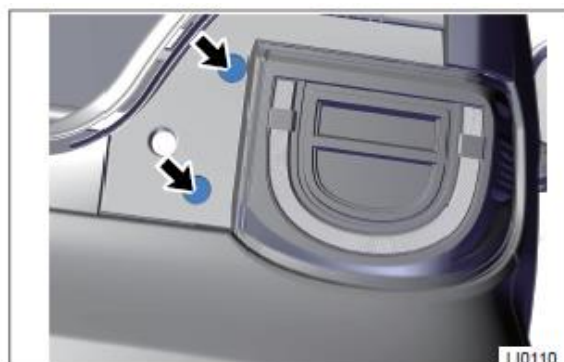
## Tail lamp assembly

### Removal

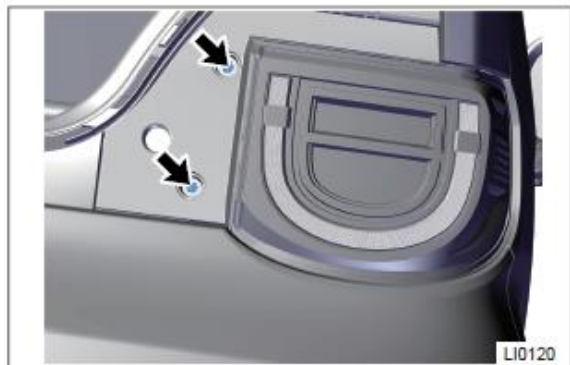
#### Tips

- The operation procedure of the right tail lamp assembly is the same as that of the left tail lamp assembly, and the right side is taken as an example.
- The following are the operation steps of the left tail lamp assembly.

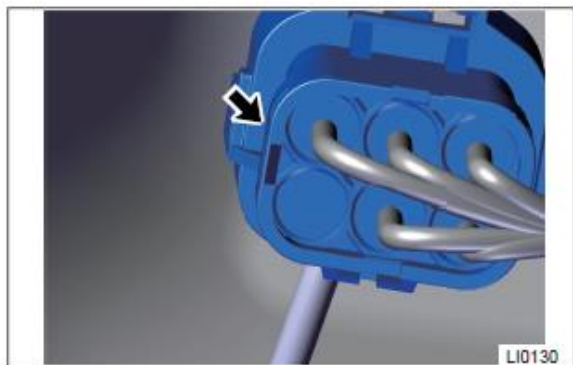
1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Remove the tail lamp assembly.
  - a. Use the screwdriver wrapped with adhesive tape to pry open the right tail lamp plug cap.



- b. Remove 2 fixing screws of right tail lamp assembly.



- c. Disconnect the right rear tail lamp connector.



- d. Remove the right tail lamp assembly.

**Installation**

Caution
<ul style="list-style-type: none"><li>• When refitting the tail lamp assembly, make sure that the clearance between it and the trunk and the rear bumper is appropriate. Make adjustments as necessary.</li></ul>

- 1. The installation sequence is reverse to the removal.

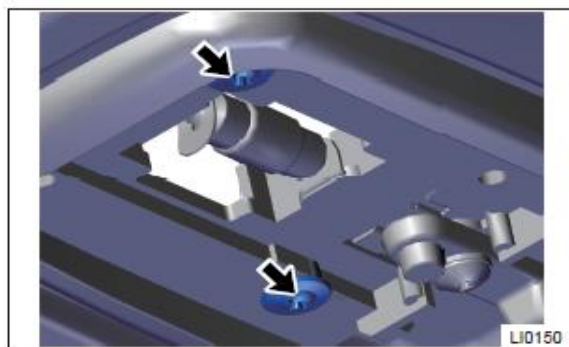
**Dome light assembly**

**Removal**

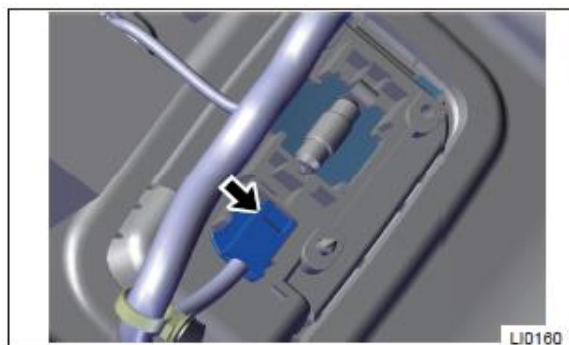
- 1. Turn off all electrical equipment and the start button.
- 2. Disconnect the negative cable of the battery.
- 3. Remove the front dome light assembly.
  - a. Take down the lamp cover of the dome light.



- b. Remove 2 fixing screws of front dome light assembly.



- c. Disconnect the connector plug on the indoor dome light and remove the indoor dome light assembly



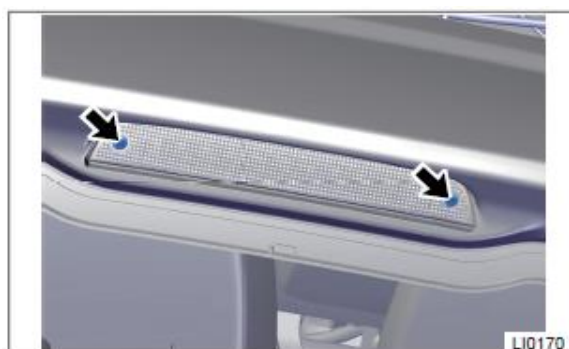
### Installation

1. The installation sequence is reverse to the removal.

### High-mounted brake lamp assembly

#### Removal

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Remove the high-mounted brake lamp assembly.
  - a. Remove the two setscrews of the high-mounted brake lamp.



- b. Disconnect the high-mounted brake lamp connector.



- c. Remove the high-mounted brake lamp assembly.

### Installation

1. The installation sequence is reverse to the removal.

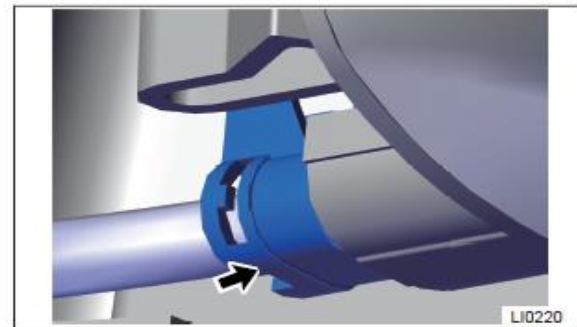
### Turn signal lamp

#### Removal

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Remove the turn signal lamp assembly.
  - a. Remove the turn signal lamp.



- b. Disconnect the connector.



- c. Remove the turn signal lamp assembly.

#### Installation

1. The installation sequence is reverse to the removal.

### License plate lamp

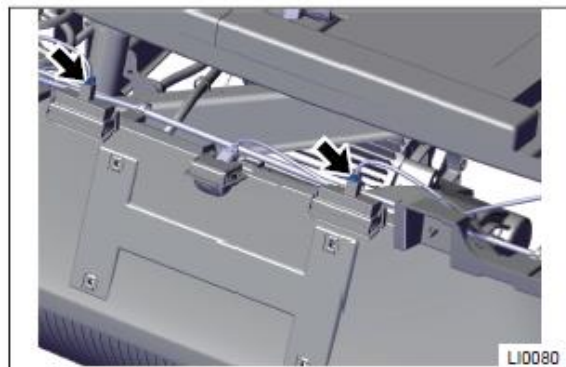
#### Removal

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Remove the license plate lamp assembly.
  - a. Pry down the license plate lamp with the rocker.





- b. Disconnect the connector.



- c. Remove the license plate lamp assembly.

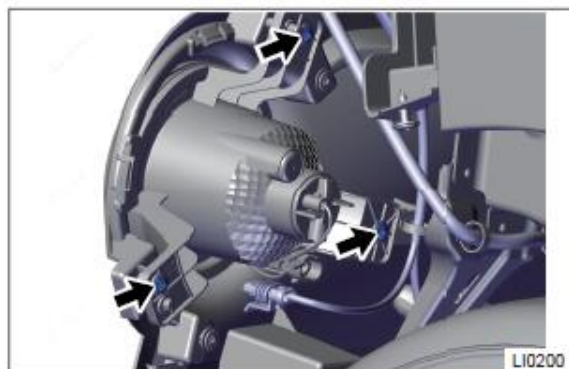
### Installation

1. The installation sequence is reverse to the removal.

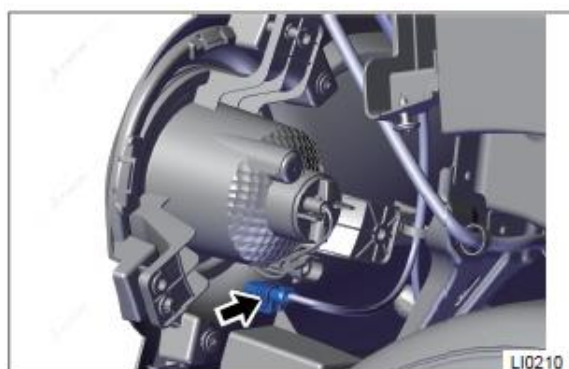
### Rear fog lamp

#### Removal

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Remove the rear bumper assembly.
4. Remove the rear fog lamp assembly.
  - a. Remove the three setscrews from the rear fog lamp



- b. Disconnect the connector.



- c. Remove the rear fog lamp assembly.

### Installation

1. The installation sequence is reverse to the removal.



## Windshield and window glass

Window	293	Electric window regulator of front door	295
On-board maintenance	293	Front windshield assembly	296
Door weather strip	293	Replace rear windshield glass assembly	298
Exterior door weather strip	293		
Door window glass assembly	294		



## Window

### On-board maintenance

#### Door weather strip

##### Removal

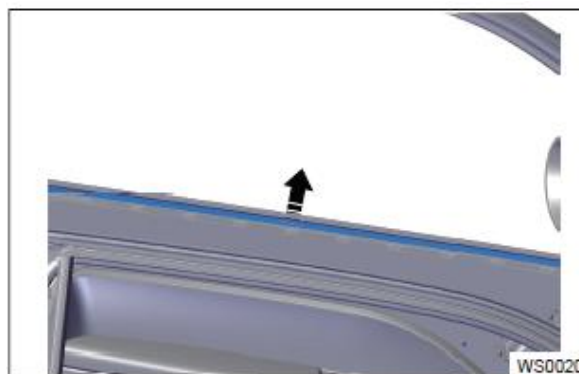
##### Note:

- The procedure for the right side is the same as for the left side.
- The following is the operating procedure for the left side.

##### ⚠ Caution

- When removing the door weatherstrip, please wear labor protection articles to avoid accidents.
- When removing the door weather strip, pay attention to using the appropriate force, and be careful when operating.
- When removing the door weather strip, avoid scratching the body system paint.

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Remove the left front door guard plate assembly.
4. Remove the inner weather strip of the left front door.
  - a. Remove the front door inner weatherstrip from the slot with the interior pry plate in the direction of arrow.



##### Installation

1. The installation sequence is reverse to the removal.

#### Exterior door weather strip

##### Removal

##### Note:

- The procedure for the right side is the same as for the left side.
- The following is the operating procedure for the left side.

##### Caution

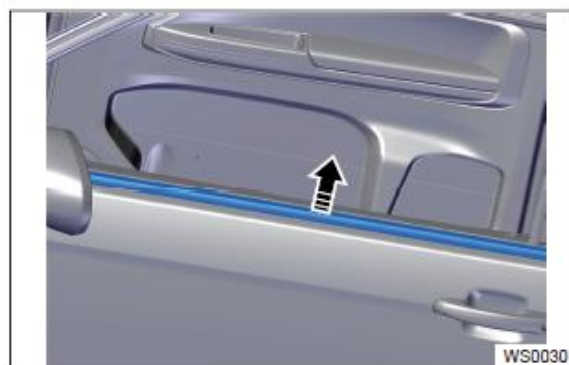
- When removing the weatherstrip outside the door, please wear labor protection articles to avoid accidents.
- When removing weatherstrip outside the door, pay attention to using the appropriate force, and be careful when operating.
- When removing the weatherstrip outside the door, avoid scratching the body system paintwork and window glass.

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Remove the left front door outer weather strip.

- a. Remove a fixing screw.



- b. Remove the left front door outer weather strip from the slot with an interior pry plate in the direction of the arrow.



### Installation

- 1. The installation sequence is reverse to the removal.

### Door window glass assembly

#### Removal

##### Note:

- The procedure for the right side is the same as for the left side.
- The following is the operating procedure for the left side.

##### Caution

- When removing the door glass assembly, please wear labor protection articles to avoid accidents.
- When removing the door glass assembly, pay attention to using the appropriate force and be careful when operating.
- When removing the door glass assembly, avoid the window glass falling and damaging.

- 1. Turn off all electrical equipment and the start button.
- 2. Disconnect the negative cable of the battery.
- 3. Remove the left front door inner guard plate assembly.
- 4. Remove the left front door window assembly.
  - a. Lower the left front door glass assembly to the appropriate position.

- b. Use the screwdriver wrapped with protective tape to remove the clips fixing the front door glass assembly (using the same method to remove the clip on the other side), remove the left front door glass assembly.



### Installation

1. The installation sequence is reverse to the removal.

### Electric window regulator of front door

#### Removal

##### Note:

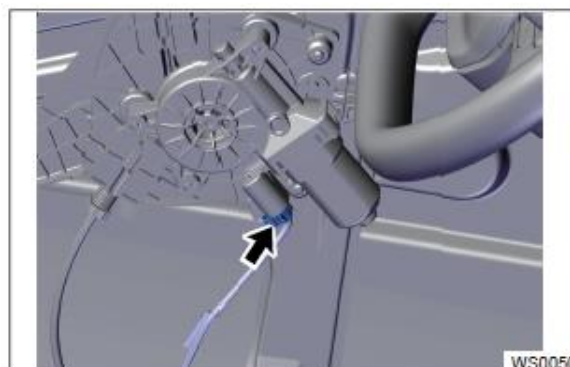
- The procedure for the right side is the same as for the left side.
- The following is the operating procedure for the left side.

##### ⚠ Caution

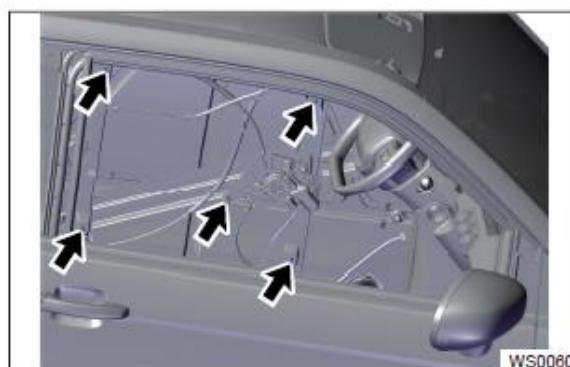
- When removing the door electric window regulator, please wear labor protection articles to avoid accidents.
- When dismantling the door electric window regulator, pay attention to using the appropriate force and be careful during the operation.

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Remove the left front door inner guard plate assembly.
4. Remove woofer assembly of left front door.
5. Remove the left front door window assembly.
6. Remove the left front door electric window regulator.

- a. Disconnect the left front door electric window regulator assembly from the left front door harness connector (as shown by the arrow).



- b. Remove the five fixing bolts (as shown by the arrow) from the left front door electric window regulator assembly.



- c. Remove the left front door electric window regulator assembly.

### Installation

1. The installation sequence is reverse to the removal.

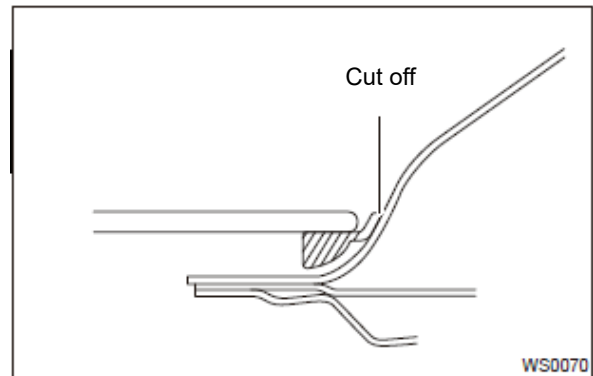
### Front windshield assembly

#### Removal

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Remove the front compartment trim cover assembly.
4. Remove the front wiper arm assembly.
5. Remove the front windshield lower trim panel assembly.
6. Remove the interior rearview mirror assembly.
7. Use a knife to cut through the adhesive.

<b>Caution</b>
----------------

When cutting through the adhesive, avoid not scratching the body system paint.
--



8. Stick protective tape on the outer surface of the body system to prevent scratches.

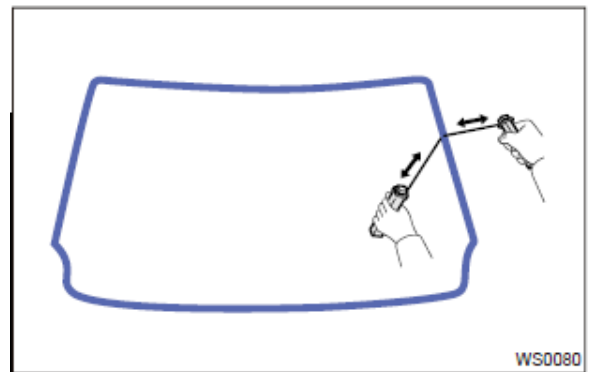
<b>Caution</b>
----------------

In order to prevent the dashboard upper body assembly from being scratched, a piece of plastic sheet can be placed between the piano wire and the dashboard upper body.
---

9. Pass the steel wire through the seam between the body system and the front windshield assembly, attach wood blocks or similar objects to both ends of the steel wire, pull the steel wire along the periphery of the front windshield glass assembly, cut the adhesive and remove the front windshield assembly.

<b>Caution</b>
----------------

- |  |
|--|
| <ul style="list-style-type: none"><li>• Two people are required to remove the front windshield glass assembly.</li><li>• When removing the front windshield glass assembly, avoid dropping the front windshield glass assembly.</li><li>• When cutting through the adhesive, leave as much as possible on the body system.</li><li>• When separating the front windshield assembly from the body system, be careful not to damage the paint and interior and exterior trims.</li></ul> |
|--|

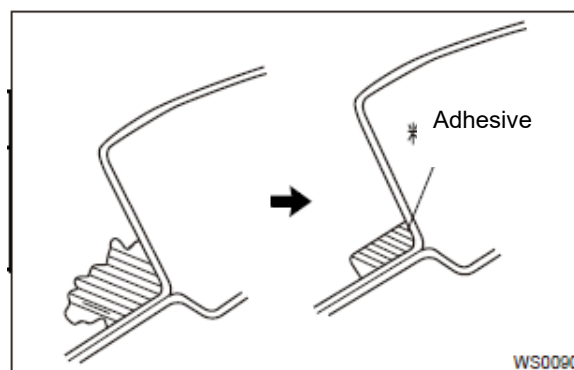




10. Clean the body system, as shown in the figure, and use a knife to cut off the excess adhesive on the contact surface of body system.

**⚠ Caution**

- When cutting the adhesive, avoid scratching the body system painting.
- When cutting the adhesive, leave as much adhesive as possible on the body system.



11. Clean the contact surface of body system with cleaning agent.

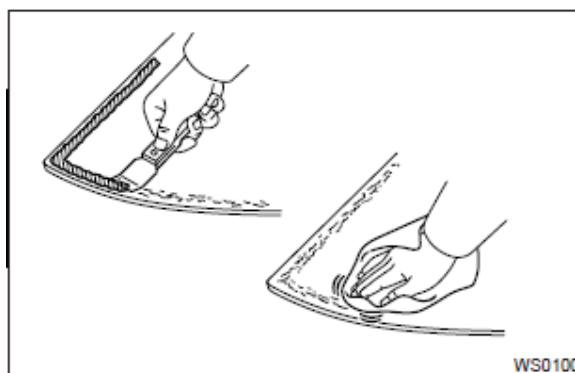
**⚠ Caution**

- Even if all adhesive has been removed, clean the body system.

12. Clean the removed glass, remove the adhesive on the glass with a scraper, and clean the outer edge of the glass with cleaning agent.

**⚠ Caution**

- After cleaning the glass, do not touch the glass.
- Clean the glass with glass cleaner, even if new glass is new.



### Installation

1. Check whether there are small cracks and bubbles around the windshield, whether there are scratches and other appearance defects on the surface, and whether the assembly parts are missing.  
Do not install the unqualified windshield glass to the vehicle.
2. Wipe the primer position of sheet metal with alcohol cloth, with the width of 18~20 mm
3. Apply sheet metal primer (A11-4105013A) to the installation position of sheet metal, and apply along the primer line of sheet metal, with a width of 9~11 mm (thread edge dimension 18 mm); The sheet metal primer shall not be exposed to air as much as possible before applying.
4. Use the cleaning agent (A11-4105017 accelerator) to clean the gluing area and the surrounding position of the glass, and ensure the cleaning width is 14~16 mm.
5. Apply sealant (A11-4105015 windshield primer) around the front windshield with a width of 12~14 mm; Apply glue (A11-4105011) along the glue line to ensure that the width of the glue is  $8 \pm 1$  mm, the height is  $11.5 \pm 1$  mm, and the height after compression is 5 mm. After assembly, there is no glue seepage or external liquid flowing.
6. Align the front windshield locating pins with the windshield mounting locating holes on the roof sheet metal, and then install the windshield.
7. Fine-tune the glass left and right to make the clearance between the glass and the side wall meet the requirements of DTS, and use the centering tooling if necessary.
8. Tap around the glass to assemble the glass in place (the height of the glass adhesive after compression is 5 mm) and stick the adhesive tape (the length of the adhesive tape is 150~200 mm (6~8 in.)) to prevent the glass from sliding.
9. Check the tightness of glass and repair it.
10. Install the front windshield lower trim plate assembly.
11. Install the wiper arm assembly.
12. Install the interior rearview mirror assembly.
13. Connect the negative cable of battery.

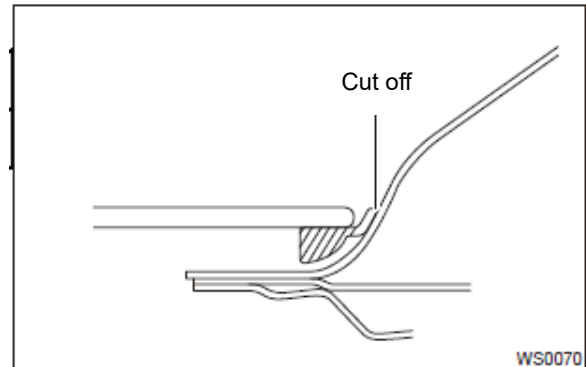
## Replace rear windshield glass assembly

### Removal

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Remove the rear door guard plate assembly.
4. Use a knife to cut through the adhesive.

#### Caution

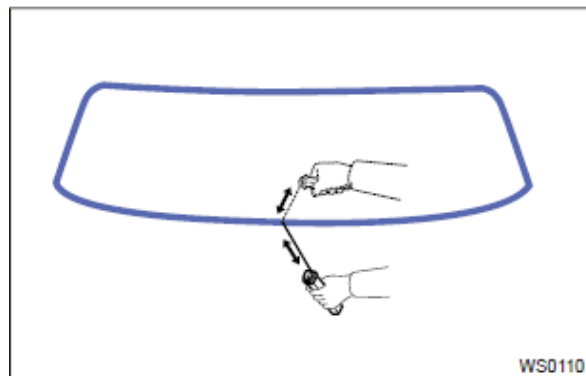
When cutting through the adhesive, avoid not scratching the body system paint.



5. Paste protective tape on the outer surface of the body system to prevent scratches, pass steel wire through the joint between body system and rear windshield assembly, attach wood block or similar object to both ends of steel wire, pull steel wire around rear windshield assembly, cut adhesive and remove rear windshield assembly.

#### Caution

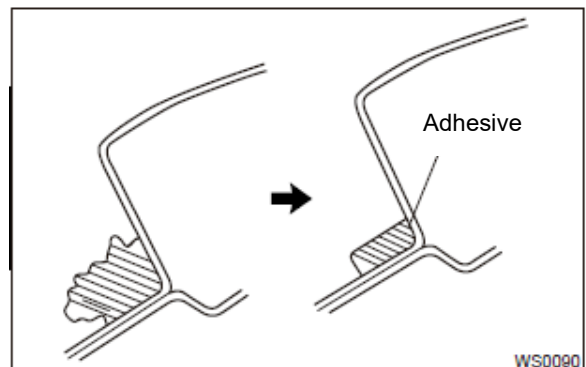
- Two people are required to remove the rear windshield glass assembly.
- When removing the rear windshield glass assembly, avoid dropping the rear windshield glass assembly.
- When cutting through the adhesive, leave as much as possible on the body system.
- When detaching the rear windshield assembly from the body system, be careful not to damage the paint or interior/exterior trims.



6. Clean the body system, as shown in the figure, use a knife to cut off the excess adhesive on the contact surface of body system.

#### ⚠ Caution

- When cutting the adhesive, avoid scratching the body system painting.
- When cutting the adhesive, leave as much adhesive as possible on the body system.



7. Clean the contact surface of body system with detergent.

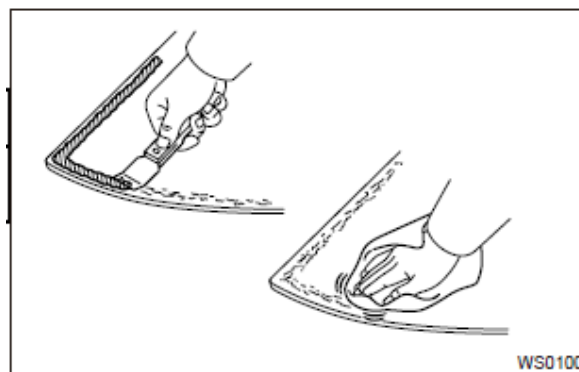
#### ⚠ Caution

- Even if all adhesive has been removed, clean the body system.

8. Clean the removed glass, clean the adhesive on the glass with a scraper, and clean the outer edge of the glass with detergent.

**⚠ Caution**

- After cleaning the glass, do not touch the glass.



### Installation

1. Check whether there are small cracks and bubbles around the windshield, whether there are scratches and other appearance defects on the surface, and whether the assembly parts are missing. Do not install the unqualified windshield glass to the vehicle.
2. Wipe the primer position of sheet metal with alcohol cloth, with the width of 18~20 mm
3. Apply sheet metal primer (A11-4105013A) to the installation position of sheet metal, and apply along the primer line of sheet metal, with a width of 9~11 mm (thread edge dimension 18 mm); The sheet metal primer shall not be exposed to air as much as possible before applying.
4. Use the cleaning agent (A11-4105017 accelerator) to clean the gluing area and the surrounding position of the glass, and ensure the cleaning width is 14~16 mm.
5. Apply sealant (A11-4105015 windshield primer) around the front windshield with a width of 12~14 mm; Apply glue (A11-4105011) along the glue line to ensure that the width of the glue is  $8 \pm 1$  mm, the height is  $11.5 \pm 1$  mm, and the height after compression is 5 mm. After assembly, there is no glue seepage or external liquid flowing.
6. Align the rear windshield locating pins with the windshield mounting locating holes on the roof sheet metal, and then install the windshield
7. Fine-tune the glass left and right to make the clearance between the glass and the side wall meet the requirements of DTS, and use the centering tooling if necessary.
8. Tap around the glass to assemble the glass in place (the height of the glass adhesive after compression is 5 mm) and stick the adhesive tape (the length of the adhesive tape is 150~200 mm (6~8 in.)) to prevent the glass from sliding.
9. The rear windshield is taped in 2 places on the left and right sides respectively (the length of the adhesive tapes is 150~200 mm (6~8 in.)); The rear windshield is taped in 2 places on the upper part (the length of the adhesive tapes is 150~200 mm (6~8 in.)).
10. Install the liftgate guard board.
11. Connect the battery negative cable.



## Body and EE

Pedestrian Warning System	303	On-board maintenance	303
System overview	303	Pedestrian warning device	
Function	303	assembly	303



## Pedestrian Warning System

### System overview

#### Function

1. Pedestrian warning device assembly: when the electric vehicle is running below a certain value, the warning sound emitted by the car warning tone system will remind pedestrians.
2. Operating speed range: when the vehicle is started and the speed is lower than 20 km/h (12 mph), give an appropriate warning sound to the personnel outside the vehicle.
3. Communication mode: support CAN communication.
4. Pause switch: support hard line on/off, soft on/off, this function is reserved.
5. D-gear pronunciation changes with vehicle speed, frequency conversion: when the vehicle is moving at a certain speed within the range of 5 km/h (3 mph), the frequency of the prompt tone changes with the change of vehicle speed.

### On-board maintenance

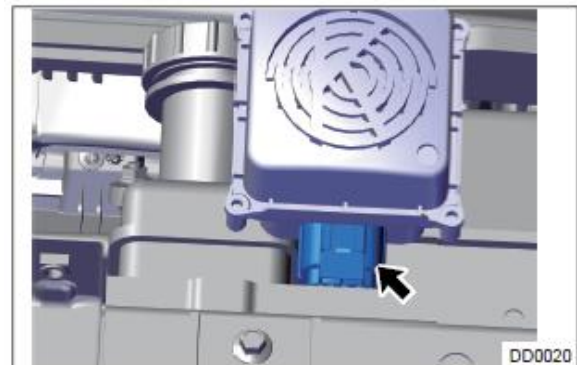
#### Pedestrian warning device assembly

##### Removal

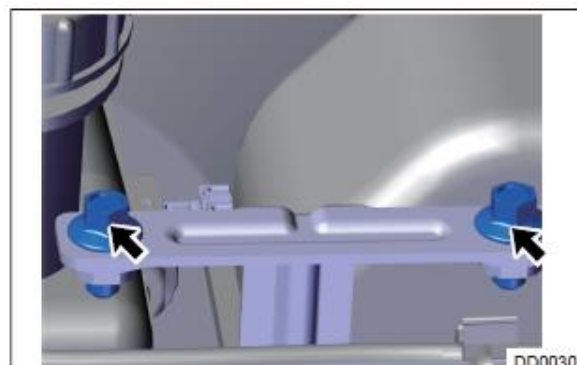
###### Caution

- When removing pedestrian warning device assembly, please wear labor protection articles to avoid accidents.
- When removing the pedestrian warning device assembly, be careful to prevent damage to components.
- When removing the pedestrian warning device assembly, avoid scratching interior trims and the body system paint.

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Remove the front bumper assembly.
4. Remove the pedestrian warning device assembly.
  - a. Disconnect the connector of the pedestrian reminder device assembly.



- b. Remove the two fixing bolts of the pedestrian warning device assembly, and take down the pedestrian warning device.



## Installation

Caution
---------

- |   |
|---|
| <ul style="list-style-type: none"><li>• When installing the pedestrian warning device assembly, be sure to tighten the fixing bolt to the specified torque.</li><li>• When installing the pedestrian warning device assembly, install all connectors in place.</li><li>• After installing the pedestrian reminder device assembly, check whether the pedestrian reminder device assembly can work normally.</li></ul> |
|---|

1. The installation sequence is reverse to the removal.



---

## Body and EE

Wiper and washer	307		309
On-board maintenance	307	Replace the front nozzle assembly	310
Replace the front wiper blade assembly	307	Replace the washer pump assembly.	310
Replace the front wiper arm assembly	307	Replace the washer fluid reservoir assembly.	311
Replace the front wiper motor.	308	Replace the front washing line assembly	312
Replace the wiper link assembly			



## Wiper and washer

### On-board maintenance

#### Replace the front wiper blade assembly

##### Removal

##### Note:

- The removal and assembling of main and auxiliary wiper blades are the same the following is an example of the main wiper blade.

##### Caution

- When removing the front wiper blade assembly, be sure to wear the labour protection articles to avoid accidents.
- Before dismantling the wiper blade assembly, pay attention to using the appropriate force and be careful during the operation.

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Pull the main wiper arm up.
4. Push it downwards gently to remove the front wiper blade.

##### Installation

1. Installation is in the reverse order of removal.

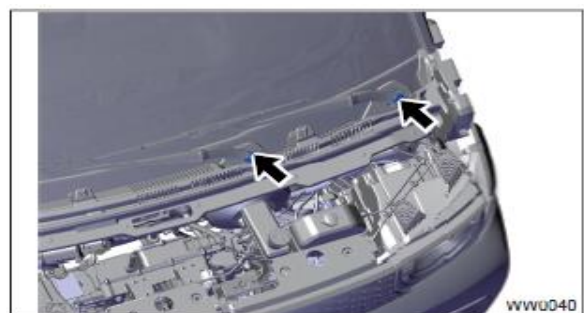
#### Replace the front wiper arm assembly

##### Removal

##### Caution

- When removing the front wiper arm assembly, be sure to wear the labour protection articles to avoid accidents.
- When dismantling the front wiper arm assembly, pay attention to using the appropriate force and be careful during the operation.
- Avoid scratching the front windshield assembly when removing the front wiper arm.

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Remove front wiper arm decorative cap with a rocker.



4. Remove 2 fixing nuts from front wiper arm assembly.



5. Press the wiper arm and remove the main wiper arm and auxiliary wiper arm assembly.

### Installation

#### Note:

When refitting the front wiper arm assembly, be sure to adjust the front wiper arm assembly to the proper position.

Caution
<ul style="list-style-type: none"><li>• During the installation of the front wiper arm assembly, be careful to avoid damaging other components.</li><li>• When refitting the front wiper arm assembly, be sure to tighten the fixing nuts to specified torque.</li><li>• After refitting the front wiper arm assembly, check whether the front wiper arm assembly works normally.</li></ul>

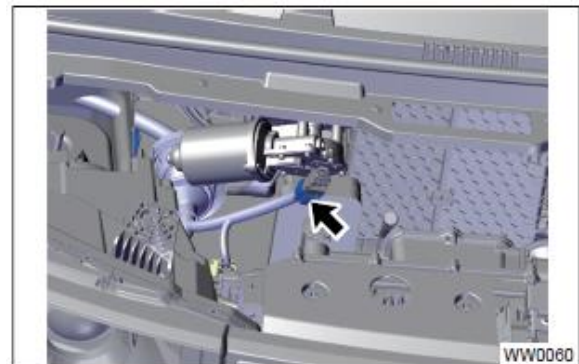
1. Installation is in the reverse order of removal.

### Replace the front wiper motor.

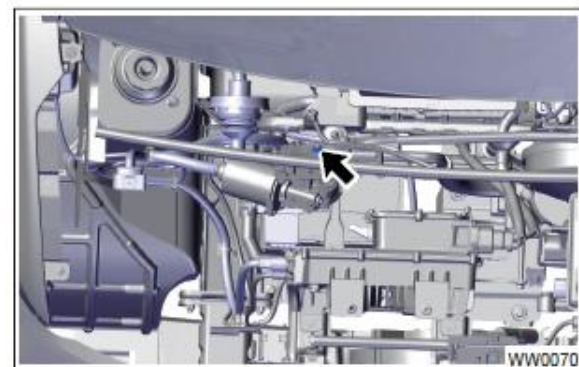
#### Removal

Caution
<ul style="list-style-type: none"><li>• When removing the front wiper motor, please wear labor protection articles to avoid accidents.</li><li>• When removing the front wiper motor, pay attention to using the appropriate force and be careful when operating.</li><li>• When removing the front wiper motor, avoid scratching the body system painting.</li></ul>

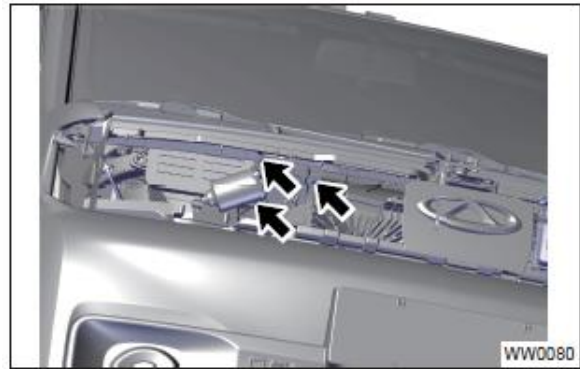
1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Remove the front windshield lower trim plate assembly.
4. Disconnect the connector on the wiper motor



5. Remove 1 fixing nut from the wiper motor connecting rod assembly.



- Remove 1 fixing nut and 2 bolts from the wiper motor.



- Take out the wiper motor.

### Installation

- Installation is in the reverse order of removal.

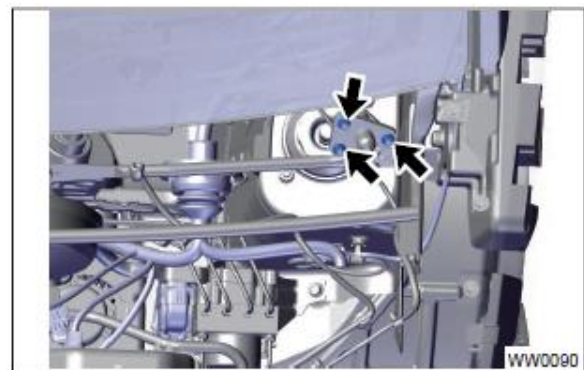
### Replace the wiper link assembly

#### Removal

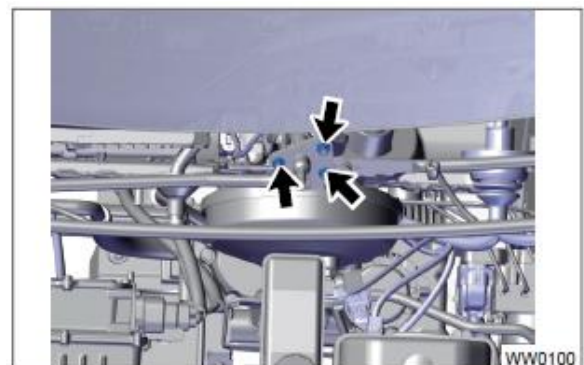
##### Caution

- When removing the wiper link assembly, be sure to wear the labour protection articles to avoid accidents.
- When removing the wiper linkage assembly, pay attention to using the appropriate force and be careful when operating
- When removing the wiper link assembly, avoid scratching the body system paint.

- Turn off all electrical equipment and the start button.
- Disconnect the negative cable of the battery.
- Remove the front wiper arm and wiper blade assembly.
- Remove the front windshield lower trim plate assembly.
- Remove the wiper motor.
- Remove the 3 fixing nuts on the left side of the linkage rod assembly



- Remove 3 fixing nuts on the right side of the connecting rod assembly and remove the wiper link.



### Installation

1. Installation is in the reverse order of removal.

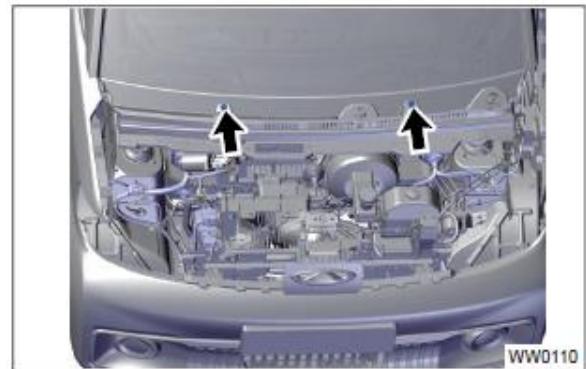
### Replace the front nozzle assembly

#### Removal

##### Warning

- When removing the front nozzle assembly, be sure to wear the labour protection articles to avoid accidents.
- When removing the front nozzle assembly, pay attention to using the appropriate force and be careful when operating.

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Remove the front wiper arm and wiper blade assembly.
4. Pry the nozzle down with a rocker.



5. Disconnect the washer pipe on the nozzle.



6. Take off the nozzle.

#### Installation

##### Caution

- When installing the front nozzle assembly, be careful to avoid damaging components.
- When installing the front nozzle assembly, refit the washing line connector in place.
- After refitting the front nozzle assembly, check whether the nozzle works normally.

1. Installation is in the reverse order of removal.

### Replace the washer pump assembly.

#### Removal

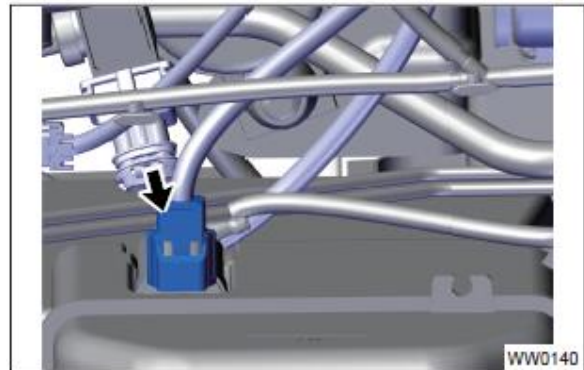
##### Caution

- When removing the washing pump assembly, be sure to wear the labour protection articles to avoid accidents.
- When disassembling the washing pump assembly, pay attention to using the appropriate force,

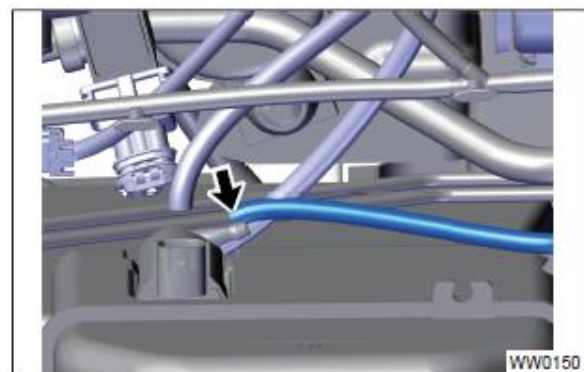
and be careful when operating

- When removing the washing pump assembly, do not scratch the body system paint.

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Disconnect the washing pump connector.



4. Disconnect the washing pipeline on the washing pump.



5. Take off the washing pump.

### Installation

#### Caution

- While installing the washing pump assembly, operate carefully to prevent damage to components.
- When installing the washing pump assembly, the washing line connector shall be installed in place.
- After installing the washing pump assembly, check whether the washer system can work normally.

1. Installation is in the reverse order of removal.

### Replace the washer fluid reservoir assembly.

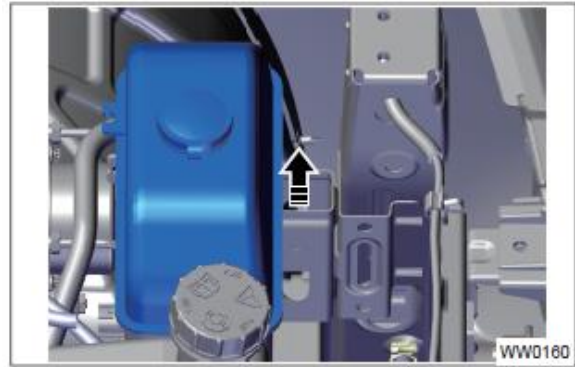
#### Removal

#### Caution

- When removing the washer bottle assembly, be sure to wear the labour protection articles to avoid accidents.
- When disassembling the washer bottle assembly, pay attention to using the appropriate force and be careful when operating.
- When removing the washer bottle assembly, do not scratch the body system paint.

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Disconnect the washer pump spray hose and connector.

4. Remove the washer bottle by pushing upwards in the direction of arrow.



### Installation

#### Caution

- When installing the washer bottle, operate carefully to avoid damage to parts.
- When installing the washer bottle assembly, tighten the fixing bolt to the specified torque.
- When installing the washer bottle assembly, install the washing line connector in place.

1. Installation is in the reverse order of removal.

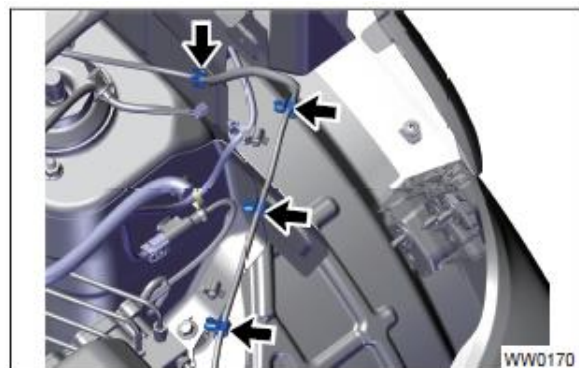
### Replace the front washing line assembly

#### Removal

#### Caution

- When removing the washing line assembly, be sure to wear the labour protection articles to avoid accidents.
- When disassembling and washing line assembly, pay attention to using the appropriate force, and be careful when operating.
- When removing the washing line assembly, do not scratch the body system paint.

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Remove the front nozzle assembly.
4. Disconnect the interface between the washing line and the washer pump and disconnect the fixing clip of washing line.
5. Remove the 4 fixing clips on the washing line and headlamp frame.



6. Take down the washer pipeline assembly.

### Installation

#### Caution

- While installing the washing line assembly, operate carefully to prevent damage to components.
- When installing the washing line assembly, install the washing line connector in place.
- After installing the washing line assembly, check whether the washer system can work normally.

1. Installation is in the reverse order of removal.



## Body and EE

Loudspeaker	315	Replace the loudspeaker	315
On-board maintenance	315		



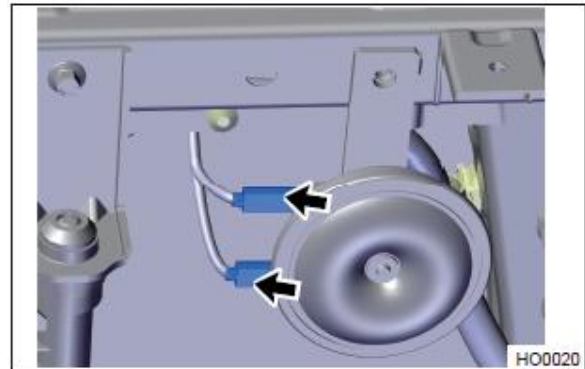
## Loudspeaker

### On-board maintenance

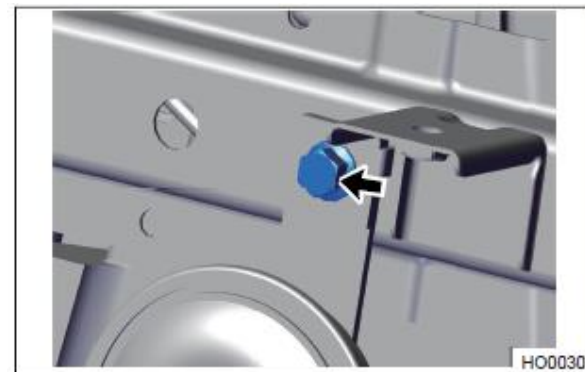
#### Replace the loudspeaker

##### Removal

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Remove the front bumper assembly.
4. Disconnect the loudspeaker harness connector.



5. Remove one fixing bolt of loudspeaker bracket, and take down the horn.



##### Installation

1. The installation sequence is reverse to the removal.



## Body and EE

Accessory power supply	319	USB power supply	319
On-board maintenance	319	Rear power supply	319



## Accessory power supply

### On-board maintenance

#### USB power supply

##### Removal

###### Caution

- When removing the USB power supply, please wear labor protection articles to avoid accidents.
- When removing the USB power supply, pay attention to using the appropriate force and be careful when operating.
- When removing the USB power supply, please avoid scratching the panel assembly.

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Remove the USB power supply.
  - a. Use a screwdriver wrapped with protective tape to pry open the USB power supply.



- b. Disconnect the USB power connector to remove the USB power supply.

##### Installation

###### Caution

- After installing the USB power supply assembly, check whether the USB power supply can work normally.

1. The installation sequence is reverse to the removal.

#### Rear power supply

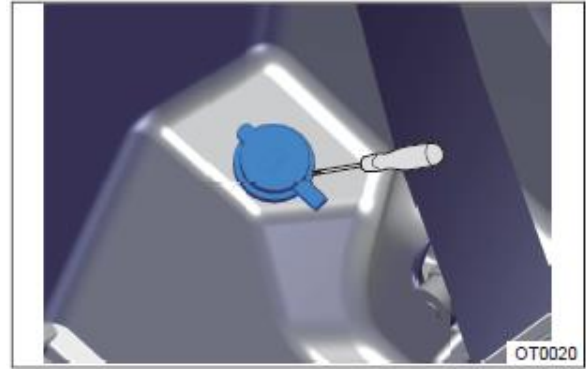
##### Removal

###### Caution

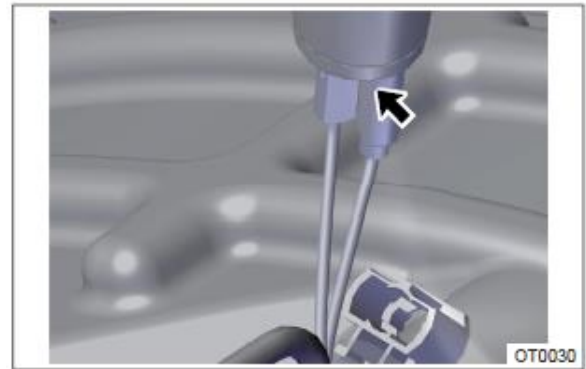
- When removing the rear power supply, be sure to wear the labour protection articles to avoid accidents.
- When removing the rear power supply, pay attention to using the appropriate force and be careful when operating.
- When removing the rear power supply, do not scratch the panel assembly.

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Remove the rear power supply.

- a. Use a screwdriver wrapped with protective tape, pry off the rear power supply.



- b. Disconnect the USB power connector (as shown by the arrow) to take down the rear power.



## Installation

### Caution

- After installing the rear power supply assembly, check if the rear power supply can work normally.

1. The installation sequence is reverse to the removal.



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## Body and EE

Parking radar system	323	DTCs	323
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Diagnosis and test	323	On-board maintenance	324
Diagnostic aids	323	Reverse radar probe	324
Troubleshooting of intermittent		Rear camera	325



## Parking radar system

### System overview

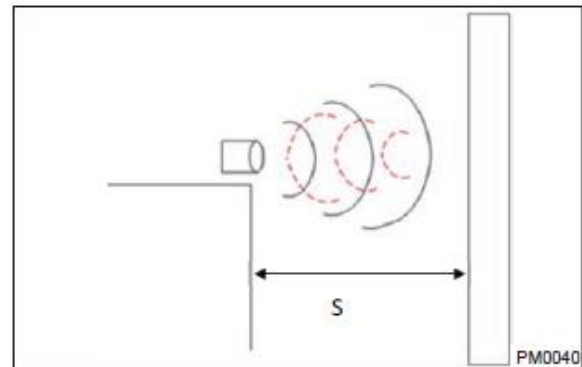
### Reversing radar system

### Schematic diagram of the system

The Avantier parking radar assist system adopts digital sensors to measure the distance by using the principle of ultrasonic technology, which can remind the driver of the distance between the rear of the vehicle and other objects, and give sound prompt and image display to reduce personal or vehicle damage caused by reversing.

### Mechanism of operation

The parking radar system is based on the principle of ultrasonic reflection to measure distance. After the probe of the parking radar emits ultrasonic wave and receives the obstacle echo, the controller calculates the obstacle distance ( $S=t \times 340 \div 2$ ) according to the ultrasonic ranging principle, and sends the data to the display terminal for display and alarm.



### System composition

The reversing radar system consists of a combination instrument, a main radar control module, and a probe (digital ultrasonic sensor). The probe adopts a split structure, and the probe body is the same as the probe body, and the hidden radar arrangement is adopted. The bracket is developed according to the radar arrangement position for probe fixing. The system related components include the ignition switch, reversing switch, instrument or DVD.

### Diagnosis and test

#### Diagnostic aids

1. Connect data link connector (DLC) with X-431 3G diagnostic tester (latest software version) and communicate with vehicle electronic module through data network.
2. Confirm existence of fault(s), and perform diagnostic test and repair procedures.
3. The fact that a diagnostic trouble code (DTC) cannot be cleared indicates that there exists a fault currently.
4. Only digital multimeter can be used to measure the voltage of the electronic system.
5. Please refer to any technical service bulletins that may be applicable to this failure.
6. Visually check relevant harnesses and connectors.
7. Check and clean all CD system grounds related to the latest DTCs.
8. If a large number of fault codes are set, refer to the circuit diagram for the common ground circuit or power supply circuit that applies to the DTC.

#### Troubleshooting of intermittent DTCs

If the fault is intermittent, perform the following procedure:

- Check connector(s) for looseness.
- Look for any worn, punctured, pinched or partially broken harness.
- Monitor the data of the diagnostic tester (latest software version) related to this circuit.
- When the circuit signal is interrupted during detection, shake the relevant harness and connector.
- If possible, try to reproduce the conditions when setting the DTC.

- During the shaking test, find the changed data or reset DTC.
- Look for broken, bent, protruding, or corroded terminals.
- Check the airbag components and installation parts for conditions that may cause incorrect signals, such as damage, foreign matters, etc.
- Check and clean all harness connectors and grounding parts related to DTC.
- If more than one fault code is set, use the circuit diagrams for any common ground or power circuits that are applicable to this DTC.
- Please refer to any technical service bulletins that may be applicable to this failure.

### Inspection of ground connection

The ground point is very important for the proper operation of the circuit. The grounding point is often exposed to moisture, dirt or other corrosive environments. Corrosion (rust) may result in an increase in load resistance. This condition can change the way the circuit works. The circuit is very sensitive to a proper ground. Loose ground or corroded ground can severely affect the control circuit. Check the ground point as follows:

1. Remove the ground bolt or nut.
2. Check all contact surfaces for lackluster, dirt, rust, etc.
3. Clean if necessary to ensure good contact.
4. Reinstall the ground bolt or nut firmly.
5. Check if there are new accessories interfering with the ground circuit.
6. If more than one wire is pressed into a ground terminal, check whether it is pressed correctly. Ensure that all wiring harnesses are clean, securely fastened, and provide a good path to ground.

### Fault Code (DTC) Table

DTC code	Definition of code
B1A01-25	Failure of left front sensor
B1A02-25	Fault of front left middle sensor
B1A03-25	Fault of front right middle sensor
B1A04-25	Fault of front right sensor
B1A05-25	Failure of left rear sensor
B1A06-25	Fault of rear left middle sensor
B1A07-25	Fault of rear right middle sensor
B1A08-25	Fault of rear right sensor
U0140-87	Loss communication with BCM module
U0129-87	Loss communication with ABS/ESP
U0073-88	Can Bus-off
U0168-87	Loss communication with VCU

### On-board maintenance

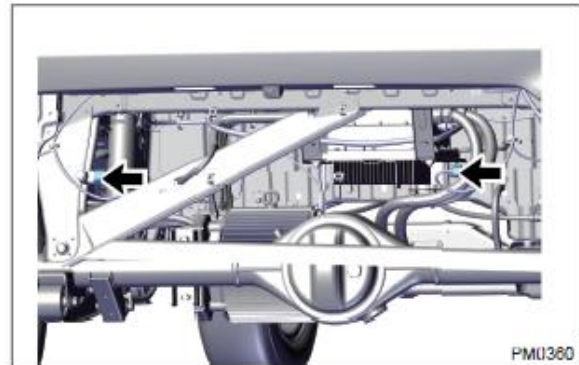
#### Reverse radar probe

##### Removal

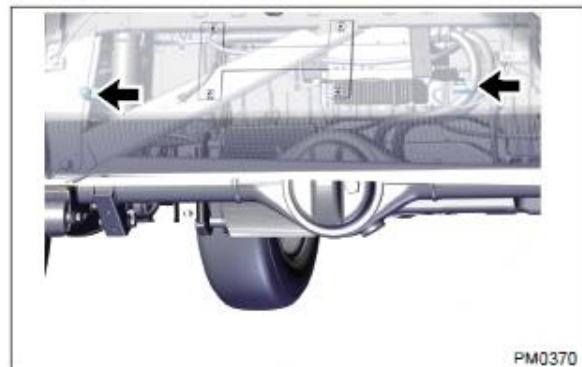
###### Warning

- When removing the reversing radar sensor, please wear labor protection articles to avoid accidents.
- When removing the reversing radar sensor, be careful to prevent damages to the reversing radar sensor.

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Lift the vehicle up.
4. Disconnect the reversing radar sensor connector.



5. Remove the reversing radar sensor from the rear bumper assembly slot.



## Installation

### Warning

When installing the reversing radar sensor, the protruding part at the end of the reversing radar sensor should be aligned with the slot on the rear bumper assembly and the reversing radar sensor should be firmly installed.

### Caution

- When installing the reversing radar sensor, install the connector in place.
- After installing the reversing radar sensor, check whether the reversing radar system is working properly.

1. The installation sequence is reverse to the removal.

## Rear camera

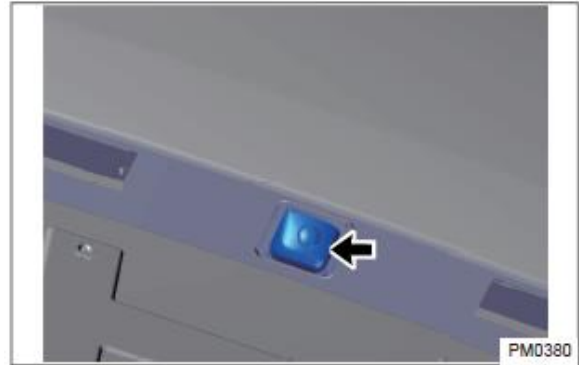
### Removal

#### Warning

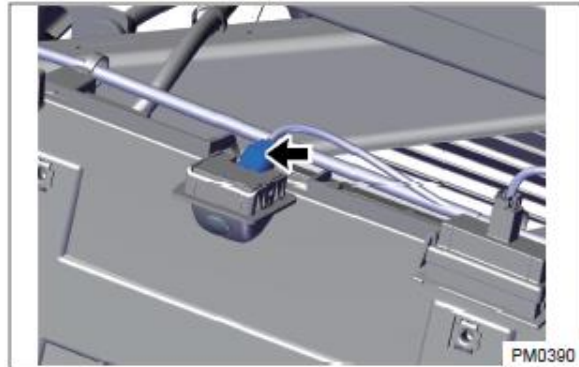
- When removing the rear camera, please wear labor protection articles to avoid accidents.
- When removing the rear camera, be careful to prevent damage to the rear camera.

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.

3. Tilt down the rear camera.



4. Disconnect the rear camera connector and remove the rear camera.



### Installation

1. The installation sequence is reverse to the removal.

---

## Body and EE

Wireless communication	329	Inspection of ground connection	329
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## Wireless communication

### Diagnosis and test

#### Diagnostic aids

1. Connect data link connector (DLC) with X-431 3G diagnostic tester (latest software version) and communicate with vehicle electronic module through data network.
2. Confirm existence of fault(s), and perform diagnostic test and repair procedures.
3. The fact that a diagnostic trouble code (DTC) cannot be cleared indicates that there exists a fault currently.
4. Only digital multimeter can be used to measure the voltage of the electronic system.
5. Please refer to any technical service bulletins that may be applicable to this failure.
6. Visually check relevant harnesses and connectors.
7. Check and clean all CD system grounds related to the latest DTCs.
8. If a large number of fault codes are set, refer to the circuit diagram for the common ground circuit or power supply circuit that applies to the DTC.

#### Troubleshooting of intermittent DTCs

If the fault is intermittent, perform the following procedure:

- Check connector(s) for looseness.
- Look for any worn, punctured, pinched or partially broken harness.
- Monitor the data of the diagnostic tester (latest software version) related to this circuit
- When the circuit signal is interrupted during detection, shake the relevant harness and connector.
- If possible, try to reproduce the conditions when setting the DTC.
- During the shaking test, find the changed data or reset DTC.
- Look for broken, bent, protruding, or corroded terminals.
- Check the airbag components and installation parts for conditions that may cause incorrect signals, such as damage, foreign matters, etc.
- Check and clean all harness connectors and grounding parts related to DTC.
- If more than one fault code is set, use the circuit diagrams for any common ground or power circuits that are applicable to this DTC.
- Please refer to any technical service bulletins that may be applicable to this failure.

#### Inspection of ground connection

The ground point is very important for the proper operation of the circuit. The grounding point is often exposed to moisture, dirt or other corrosive environments. Corrosion (rust) may result in an increase in load resistance. This condition can change the way the circuit works. The circuit is very sensitive to a proper ground. Loose ground or corroded ground can severely affect the control circuit. Check the ground point as follows:

1. Remove the ground bolt or nut.
2. Check all contact surfaces for lackluster, dirt, rust, etc.
3. Clean if necessary to ensure good contact.
4. Reinstall the ground bolt or nut firmly.
5. Check if there are new accessories interfering with the ground circuit.
6. If more than one wire is pressed into a ground terminal, check whether it is pressed correctly. Ensure that all wiring harnesses are clean, securely fastened, and provide a good path to ground.

#### Fault Code (DTC) Table

DTC code	Definition of code
B1100-16	Battery voltage below lower limit
B1100-17	Battery voltage above upper limit
U0074-88	CAN1 Bus OFF

DTC code	Definition of code
U0075-88	CAN2 Bus OFF
B1201-11	The GPS antenna is short-circuited to the ground
B1201-13	Open circuit of GPS antenna circuit
B1300-31	Built-in SIM card not connected
B1301-31	Abnormal WAN module
B1500-16	Internal battery is not connected
U0155-87	Loss communication with ICM module
U0168-87	Loss communication with VCU
U0140-87	Loss communication with BCM module
U0111-87	Loss communication with BMS module
U0298-87	Loss communication with OBC+DCM
U0292-87	Loss communication with MCU module
U0292-87	Loss communication with ICM module

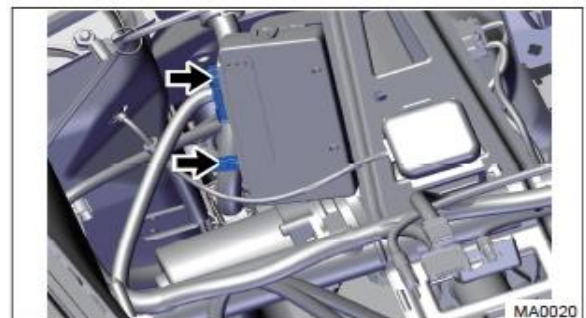
**On-board maintenance**

**Wireless communication module**

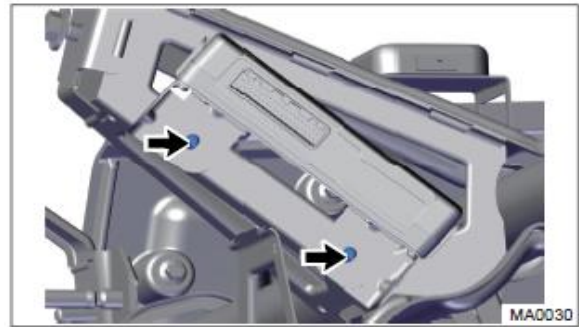
**Removal**

Warning
<ul style="list-style-type: none"> <li>• When removing the wireless communication module, please wear labor protection articles to avoid accidents.</li> <li>• When removing the wireless communication module, pay attention to using the appropriate force and be careful when operating.</li> </ul>

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Remove the instrument panel assembly.
4. Disconnect the two connectors.



Remove the 2 fixing screws.



6. Remove the wireless communication module with bracket assembly.
7. Disconnect the four screws of the wireless communication connection bracket.



### Installation

1. The installation sequence is reverse to the removal.



## Body and EE

On-board maintenance 335  
Exterior rearview mirror assembly  
335

Interior rearview mirror assembly  
335



## On-board maintenance

### Exterior rearview mirror assembly

#### Removal

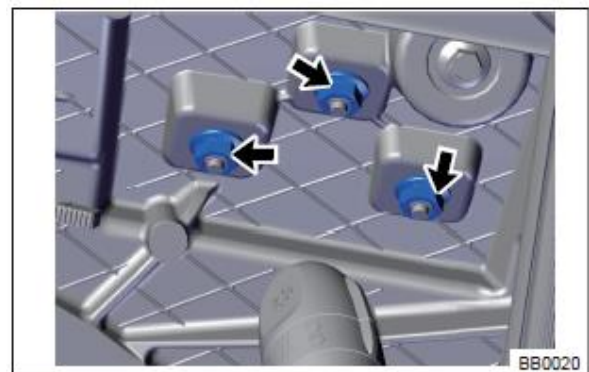
##### Note:

- The procedure for the right side is the same as for the left side.
- The following is the left-hand operation.

##### Caution

- When removing the exterior rearview mirror assembly, please wear labor protection articles to avoid accidents.
- When removing the exterior rearview mirror assembly, be careful to prevent damage to components.
- When removing the exterior rearview mirror assembly, avoid scratching interior trims and the body system paint.

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Remove the left front door guard plate assembly.
4. Remove the left front door panel assembly.
5. Remove the left exterior rearview mirror assembly.
  - a. Remove 3 fixing screws (as shown by the arrow) of left exterior rearview mirror.



- b. Remove the left exterior rearview mirror assembly.

#### Installation

1. The installation sequence is reverse to the removal.

### Interior rearview mirror assembly

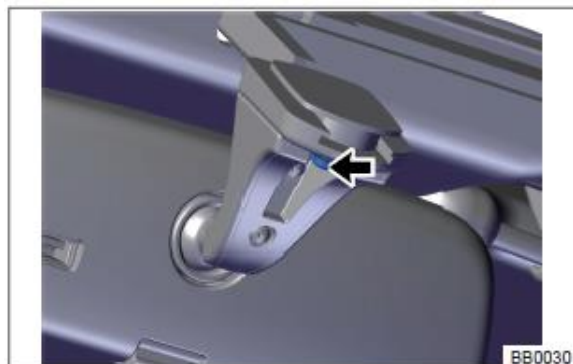
#### Removal

##### Caution

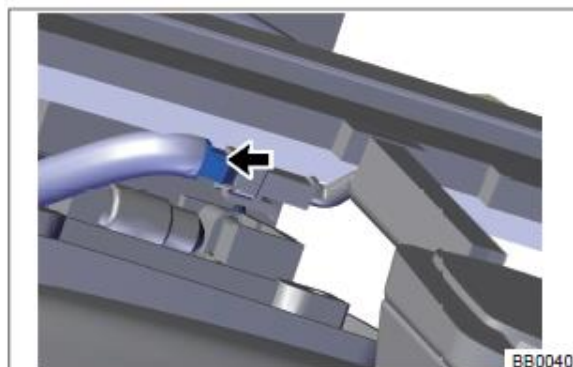
- When removing the interior rearview mirror assembly, pay attention to using the appropriate force and be careful when operating.
- When removing the interior rearview mirror assembly, avoid scratching the front windshield assembly.

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Remove the interior rearview mirror assembly.

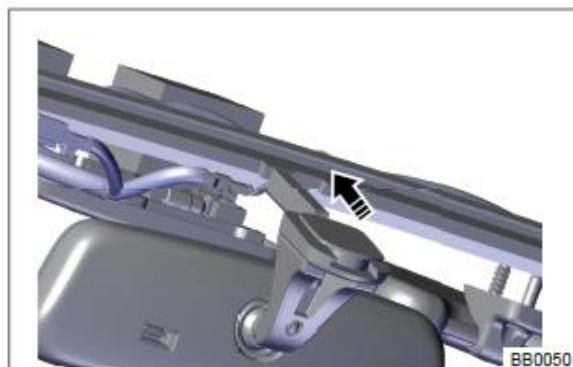
- a. Remove one retaining screw of the interior rearview mirror.



- b. Disconnect harness connector between the interior rearview mirror and the roof



- c. Remove the interior rearview mirror assembly in the direction of arrow.



**Installation**

Caution
<ul style="list-style-type: none"><li>• Before installation, check that the rearview mirror has no obvious appearance defects (such as scratches, lack of material, damage, etc.), and select the parts that have passed the inspection.</li><li>• The interior rearview mirror shall be able to be adjusted normally within the required range of vision; The lens assembly shall fit firmly with the lens holder assembly without looseness.</li></ul>

- 1. The installation sequence is reverse to the removal.

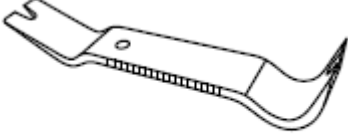


## Engine hood assembly and door

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Removal	340	Removal	346
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Front door inner guard plate assembly	342	Liftgate pneumatic spring assembly	348
Removal	342	Removal	348
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**General information****Tools****General tools**

Tool name	Illustration
Interior flexure plate	 <p>RCH0025006</p>

## On-board maintenance

### Engine hood assembly

#### Removal

**⚠ Caution**

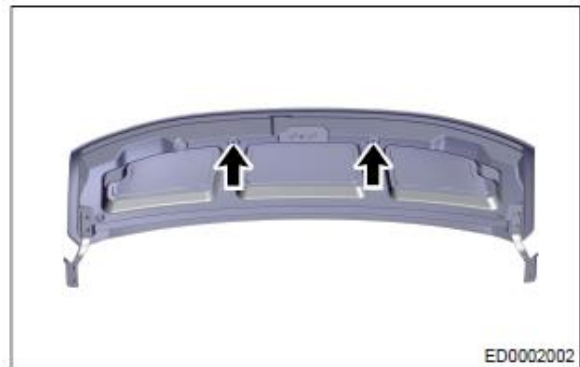
- When removing the engine hood assembly, please wear labor protection articles to avoid accidents.
- When removing the engine hood assembly, avoid damage to the body system or front windshield caused by the falling of engine hood during operation.

**Note:**

- While removing the engine hood assembly, one person is required to support the engine hood. Avoid accidents caused by falling or sudden closing of engine hood assembly during operation.

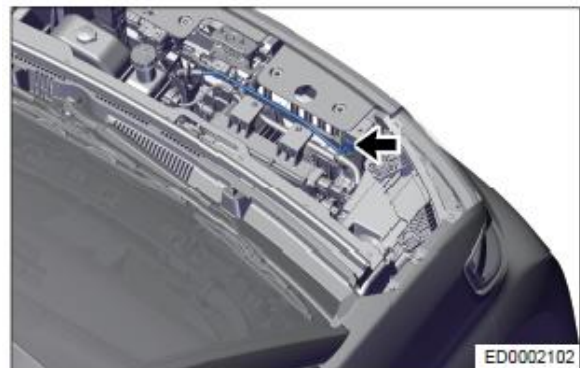
1. Remove engine hood assembly adjustable bumper block.

- a. Remove the adjustable buffer block of the engine hood assembly (as shown by the arrow) by rotating it counterclockwise.



2. Remove the engine hood support rod.

- a. Use a flat-blade knife to carefully tilt out the engine hood support rod (as shown by arrow).



3. Remove the engine hood assembly.

- a. Remove the 2 fixing nuts (as shown by the arrow) connecting the engine hood assembly and the engine hood left hinge assembly.

Tightening torque:  $22 \pm 1.0$  N·m ( $16 \pm 0.7$  ft-lbs.)



- b. Remove the 2 fixing nuts (as shown by the arrow) connecting the engine hood assembly and the engine hood right hinge assembly, and then remove the engine hood assembly.

Tightening torque:  $22 \pm 1.0 \text{ N}\cdot\text{m}$  ( $16 \pm 0.7 \text{ ft}\cdot\text{lbs.}$ )



### Installation

1. The installation sequence is reverse to the removal.

Check

2. Check whether the engine hood is worn or deformed during installation, and repair it if necessary.
3. Check whether the fixing bolt is assembled properly, and tighten it to the specified torque if necessary.
4. Check whether the clearance and alignment between the installation position of the engine hood assembly and each part are within the specified range, and make adjustments if necessary.

### Engine hood hinge assembly

#### Removal

##### Note:

- The procedure for the right side is the same as for the left side.
- The following is the operating procedure for the left side.

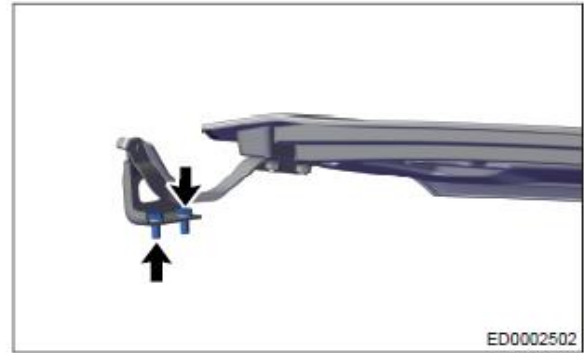
##### ⚠ Caution

- When removing the engine hood hinge assembly, be sure to wear the labour protection articles to avoid accidents.
- When removing the engine hood hinge assembly, avoid damage to the body system or front windshield caused by falling of engine hood during operation.
- While removing the engine hood hinge assembly, one person is required to support the engine hood. Avoid accidents caused by falling or sudden closing of engine hood during operation.

1. Remove the left hinge assembly of engine hood.
  - a. Remove the fender assembly.
  - b. Remove the tow fixing bolts (as shown by the arrow) connecting the left hinge assembly and the engine hood assembly.



- c. Remove the two fixing bolts (as shown by the arrow) connecting the engine hood left hinge assembly and the body system.



- d. Unscrew the engine hood left hinge assembly.

### Installation

1. The installation sequence is reverse to the removal.

### Front door inner guard plate assembly

#### Removal

##### Note:

- The operation procedure on the right side is the same as that on the left side, and the following is the operation procedure on the left side.

##### ⚠ Caution

- When removing the front door inner guard plate assembly, be sure to wear the labour protection articles to avoid accidents.
- When removing the front door inner guard plate assembly, avoid damaging the surface of front door inner guard plate.

1. Turn off all electrical equipment and set the start button to OFF position.
2. Disconnect the negative cable of the battery.
3. Remove the left front door inner guard plate assembly.

- a. Remove 1 fixing screw (as shown by the arrow) from the left front door inner guard plate assembly.



- b. Remove 1 fixing screw (as shown by the arrow) from the left front door inner guard plate assembly.



- c. Remove the screw plug cover of the handle box (as shown by the arrow).



- d. Remove the left door inner opening handle plug cap (as shown by the arrow).



- e. Remove the screw of the handle box (as shown by the arrow)



- f. Remove the fixing screw (as shown by the arrow) from the left door inner opening handle.



- g. Remove 2 fixing clips (as shown by the arrow) on the left front door inner guard plate assembly.



- h. Remove 2 fixing clips (as shown by the arrow) on the left front door inner guard plate assembly.



- i. Remove 3 fixing bolts (as shown by the arrow) on the left front door inner guard plate.



- j. Remove the cap of speed sensing door lock (as shown by the arrow).



- k. Use a rocker to carefully pry out the clips of the left front door panel, as shown in the figure, and remove the left front door panel in the direction of arrow.



- l. Disconnect the inside release handle cable (as shown by the arrow).





- m. Remove the front door inner guard plate assembly.

### Installation

1. The installation sequence is reverse to the removal.

#### Caution

- When installing the front door inner guard plate assembly, replace the damaged clip and install the front door inner guard plate assembly in place.
- When installing the front door inner guard plate assembly, refit the connector in place.
- After installing the front door inner guard plate assembly, make sure all functions can be used normally.

### Front door assembly

#### Removal

##### Note:

- The operation procedure on the right side is the same as that on the left side, and the following is the operation procedure on the left side.
- When removing the front door assembly, be sure to wear the labour protection articles to avoid any accident.
- When removing the front door assembly, avoid scratching the body system painting.

#### Caution

- While removing the front door assembly, one person is required to support the front door to avoid accidents in case the front door falls during the operation.

1. Turn off all electrical equipment and set the start button to OFF position.
2. Disconnect the negative cable of the battery.
3. Remove the left front door inner guard plate assembly.
4. Remove full-range speaker of left front door.
5. Remove the left front door weatherstrip.
6. Remove the front door window assembly.
7. Remove the front door electric window regulator.
8. Remove the left front door lock assembly.
9. Disconnect harness connector of left front door.
10. Remove the left front door assembly.
  - a. Remove the 2 fixing bolts connecting the door to the upper hinge.
  - b. Remove the 2 fixing bolts connecting the door to the lower hinge.
  - c. Remove the left front door assembly.

#### Installation

1. The installation sequence is reverse to the removal.

#### Caution

- When installing the front door inner guard plate, replace the damaged clip and install the front door inner guard plate in place.
- While removing the front door assembly, one person is required to support the front door to avoid accidents in case the front door falls during the operation.
- When installing the front door assembly, be sure to wear the labour protection articles to avoid accidents.

## Liftgate assembly

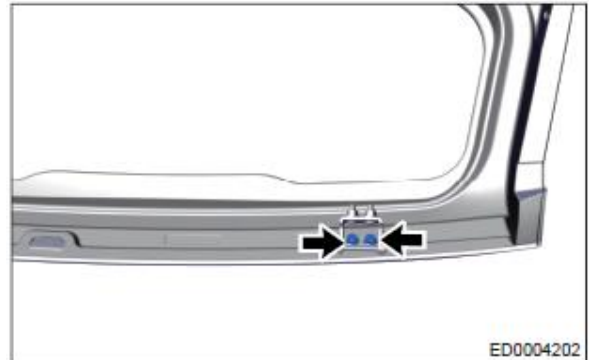
### Removal

#### ⚠ Caution

- When removing the liftgate assembly, be sure to wear labour protection articles.
- When removing the liftgate assembly, do not scratch the body system paint.
- While removing the liftgate assembly, one person is required to support the trunk lid. Avoid accidents caused by falling or sudden closing of trunk lid during operation.

1. Turn off all electrical equipment and set the start button to OFF position.
2. Disconnect the negative cable of the battery.
3. Remove the liftgate assembly.

- a. Remove the liftgate right hinge 2 fixing bolts (as shown by the arrow).



- b. Remove 2 fixing bolts (as shown by the arrow) of left hinge of liftgate.



- c. Use the screwdriver wrapped with protective tape to pry out the left pneumatic spring upper fixing clip (as shown by the arrow).



- d. Use the screwdriver wrapped with protective tape to pry out the upper fixing clip (as shown by the arrow) of the right pneumatic spring.



- e. Disconnect the liftgate harness connector and remove the liftgate assembly.

### Installation

1. The installation sequence is reverse to the removal.

#### ⚠ Caution

- When installing the liftgate assembly, be sure to wear the labour protection articles to avoid accidents.
- When refitting the liftgate assembly, do not scratch the body system paint.
- After installing the liftgate assembly, perform the calibration of the panoramic image.

### Liftgate switch assembly

#### Removal

#### ⚠ Caution

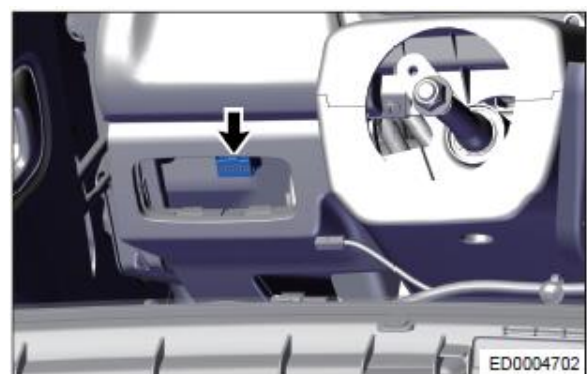
- When removing the liftgate switch assembly, please wear labor protection articles to avoid accidents.
- When removing the liftgate switch assembly, do not scratch the body system paint.

1. Turn off all electrical equipment and set the start button to OFF position.
2. Disconnect the negative cable of the battery.
3. Remove the liftgate switch assembly.

- a. Use the interior pry plate to carefully lift out the liftgate switch assembly (as shown by the arrow).



- b. Disconnect the harness connector on the liftgate switch assembly (as shown by the arrow).



- c. Remove the liftgate switch assembly.

### Installation

1. The installation sequence is reverse to the removal.

#### ⚠ Caution

- After installing the liftgate switch assembly, ensure the connector is installed in place.
- After installing the liftgate switch assembly, make sure it functions normally.

## Liftgate pneumatic spring assembly

### Removal

**⚠ Caution**

- When removing the liftgate pneumatic spring assembly, please wear labor protection articles to avoid accidents.
- When removing the liftgate pneumatic spring assembly, avoid scratching the body system paint.
- While removing the liftgate pneumatic spring assembly, one person is required to support the liftgate; Avoid accidents caused by falling or sudden closing of liftgate during operation.

1. Turn off all electrical equipment and set the start button to OFF position.
2. Disconnect the negative cable of the battery.
3. Remove the right liftgate pneumatic spring assembly.

- a. Use the screwdriver wrapped with adhesive tape to pry open the upper fixing clip of liftgate pneumatic spring.



- b. Use the screwdriver wrapped with adhesive tape to pry open the lower fixing clip of liftgate pneumatic spring.



- c. Remove the pneumatic spring assembly.

### Installation

1. The installation sequence is reverse to the removal.

**⚠ Caution**

- While installing the liftgate pneumatic spring assembly, one person is required to support the liftgate; Avoid accidents caused by falling or sudden closing of liftgate during operation.
- When removing the liftgate pneumatic spring assembly, please wear labor protection articles to avoid accidents.
- When refitting the liftgate pneumatic spring assembly, avoid damage to the body system or rear windshield caused by liftgate falling.

## Door lock system

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Installation	352	Liftgate lock catch assembly	355
Front door lock cylinder assembly	353	Removal	355
Removal	353	Installation	355
Installation	354		



## On-board maintenance

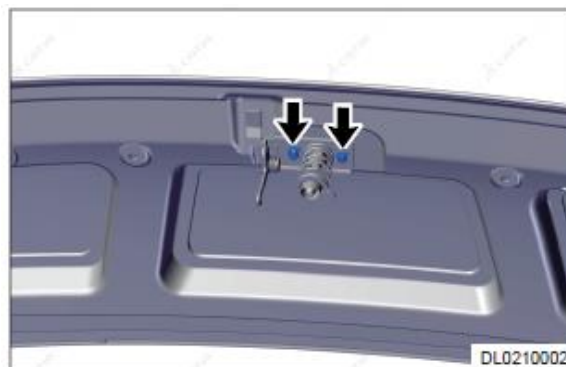
### Engine hood lock assembly

#### Removal

##### Warning

- When removing the engine hood lock assembly, be sure to wear the labour protection articles to avoid accidents.
- When removing the engine hood lock assembly, avoid damaging the body system paint.

1. Remove the engine hood lock assembly.
  - a. Remove 2 fixing bolts (as shown by the arrow) from engine hood lock assembly.



- b. Remove the engine hood lock assembly.

#### Installation

##### Caution

After installing the engine hood lock assembly, check whether the engine hood can work normally.

1. The installation sequence is reverse to the removal.

### Front door lock assembly

#### Removal

##### Warning

- When removing the front door lock assembly, please wear labor protection articles to avoid accidents.
- When removing the front door lock assembly, avoid scratching interior trims and the body system paint.

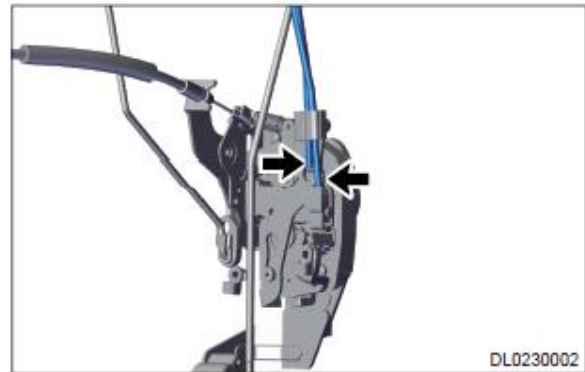
##### Note:

- The procedure for the right side is the same as for the left side.
- The following is the operating procedure for the left side.
  1. Turn off all electrical equipment and the ignition switch.
  2. Disconnect the negative cable of the battery.
  3. Remove the left front door inner guard plate assembly.
  4. Remove glass guide rail assembly of left front door.
  5. Remove the left front door lock assembly.

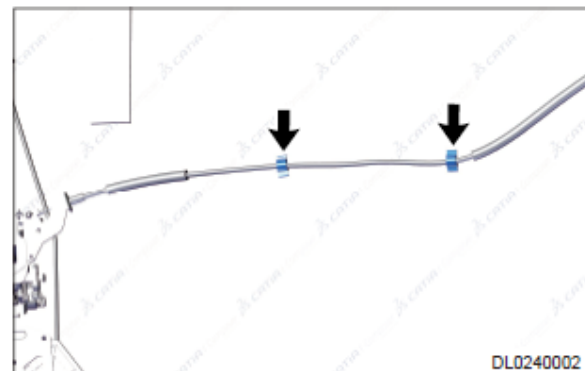
- a. Disconnect the clip (as shown by the arrow) between the left front door lock assembly and the front door lock cylinder rod.



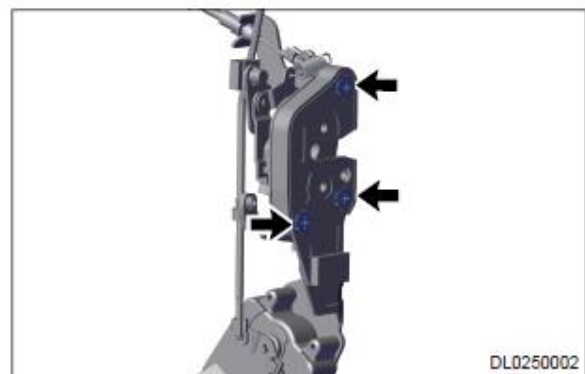
- b. Disengage the front door outer handle cable (as shown by the arrow) from the fixing slot on the front door handle base.



- c. Disconnect the front door inner handle cable clip (as shown by the arrow).



- d. Remove 3 fixing screws (as shown by the arrow) from the front door lock assembly, and remove the front door lock assembly.



## Installation

### Caution

- When installing the front door lock assembly, check whether the connector is installed correctly.
- When installing the front door lock assembly, make sure the clip and cable are in place.
- After installing the front door lock assembly, check whether the front door lock can work normally.

1. The installation sequence is reverse to the removal.



## Front door lock cylinder assembly

### Removal

#### Caution

- When removing the front door lock cylinder assembly, please wear labor protection articles to avoid accidents.
- When removing the front door lock cylinder assembly, avoid scratching the interior trims and the body system paint.

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative cable of the battery.
3. Remove the left front door inner guard plate assembly.
4. Remove glass guide rail assembly of left front door.
5. Remove the left front door lock cylinder assembly.

- a. Disconnect the clip (as shown by the arrow) connecting the front door lock assembly and the front door lock cylinder rod.



- b. Remove the front door outside handle cover plug (as shown by the arrow).



- c. Loosen 1 fixing screw (as shown by the arrow) on the front door lock cylinder assembly, and remove the front door lock cylinder assembly and front door handle cover.



- d. Insert a key into the small hole on the cover of the lock cover, carefully pry open the cover of the lock cover or use a screwdriver jaw with protective tape to remove the latch, and separate the cover of the front door lock cylinder assembly of the front door lock.

## Installation

### Caution

- When installing the front door lock cylinder assembly, make sure that the clip on the pull rod is installed properly.
- After installing the front door lock cylinder assembly, check whether the front door lock cylinder can work normally.

1. The installation sequence is reverse to the removal.

## Front door lock catch assembly

### Removal

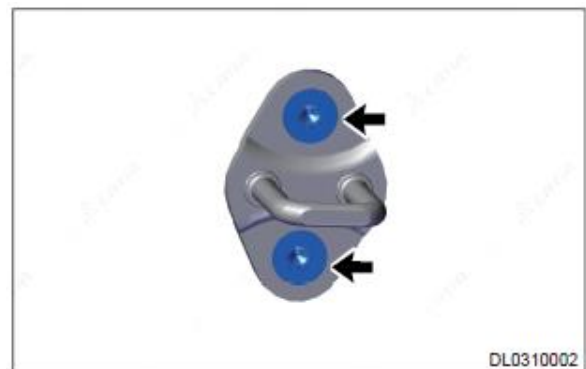
#### Note:

The operation procedure for the right side is the same as that for the left side, and the following is the operation procedure for the left side.

### Caution

- When removing the front door lock catch assembly, please wear labor protection articles to avoid accidents.
- When removing the front door lock catch assembly, avoid damaging the body system paint.

1. Remove 2 fixing screws (as shown by the arrow) from left front door lock catch assembly, and remove left front door lock catch assembly.



### Installation

1. The installation sequence is reverse to the removal.

## Liftgate lock assembly

### Removal

### Caution

- When removing the liftgate lock assembly, please wear labor protection articles to avoid accidents.
- When removing the liftgate lock assembly, avoid scratching interior trims and the body system paint.

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative cable of the battery.
3. Remove the liftgate trim panel.
4. Remove the liftgate lock assembly.

- a. Disconnect the connector on the liftgate lock assembly (as shown by arrow).



- b. Remove 2 fixing bolt (as shown by the arrow) from the liftgate lock assembly, and remove the liftgate lock assembly.



## Installation

### Caution

- When installing the liftgate lock assembly, check whether the connector is installed properly.
- After refitting the liftgate lock assembly, check whether the trunk lock can work normally.

1. The installation sequence is reverse to the removal.

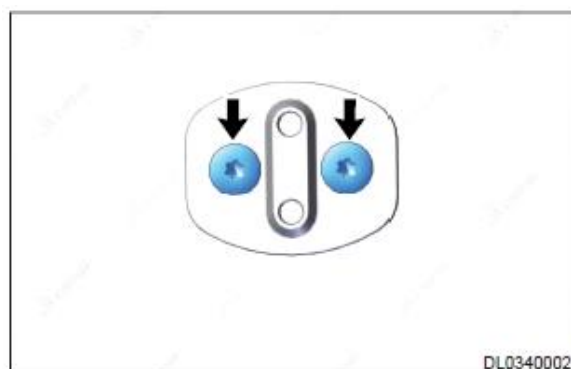
## Liftgate lock catch assembly

### Removal

### Caution

- When removing the liftgate lock catch assembly, please wear labor protection articles to avoid accidents.
- When removing the liftgate lock catch assembly, do not damage the body system paint.

1. Remove the liftgate cover scuff plate assembly.
2. Remove 2 fixing screws (as shown by the arrow) on the liftgate lock catch assembly, and remove the liftgate lock catch assembly.



### Installation

1. The installation sequence is reverse to the removal.

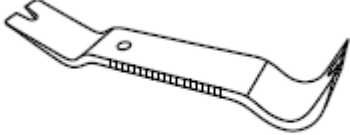


## Interiors

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Liftgate scuff plate assembly	360	C-pillar upper guard plate assembly	365
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A-pillar upper guard plate assembly	362	Roof assembly	369
Removal	362	Removal	369
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**General information****Tools****General tools**

Tool name	Illustration
Interior flexure plate	 <p>S00020</p>

## On-board maintenance

### Front scuff plate assembly

#### Removal

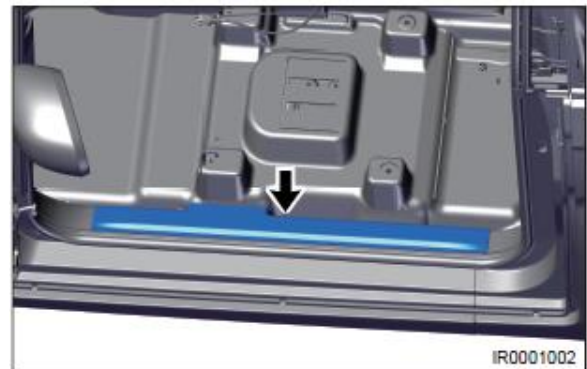
##### Note:

- The procedure for the right side is the same as for the left side.
- The following is the operating procedure for the left side.

##### ⚠ Caution

- When removing the front scuff plate assembly, please wear labor protection articles to avoid accidents.
- When removing the front scuff plate assembly, pay attention to using the appropriate force and be careful when operating.
- When removing the front scuff plate assembly, avoid scratching interior trims and the body system paint.

1. Remove the left front scuff plate assembly.
  - a. Use the rocker to pry open the fixed clip on the front door sill rubbing strip.



- b. Take down the left front scuff plate assembly.

#### Installation

1. The installation sequence is reverse to the removal.

##### ⚠ Caution

- When refitting the front scuff plate assembly, replace the damaged clip and install the front scuff plate assembly in place.
- After installing the front scuff plate assembly, it shall be installed in place between the B-pillar lower guard plate assembly and A-pillar lower guard plate assembly.

### Liftgate scuff plate assembly

#### Removal

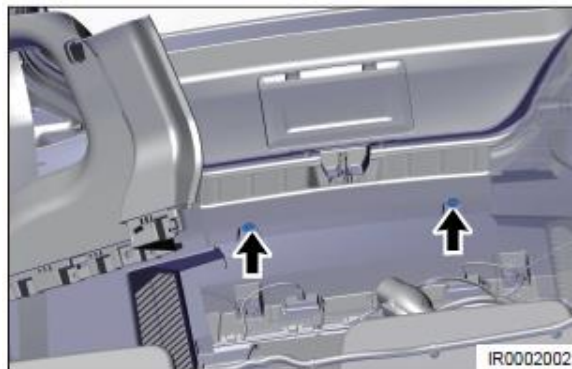
##### ⚠ Caution

- When removing the liftgate scuff plate assembly, please wear labor protection articles to avoid accidents.
- When removing the liftgate scuff plate assembly, pay attention to using the appropriate force, and be careful when operating.
- When removing the liftgate scuff plate assembly, avoid scratching interior trims and the body system paint.

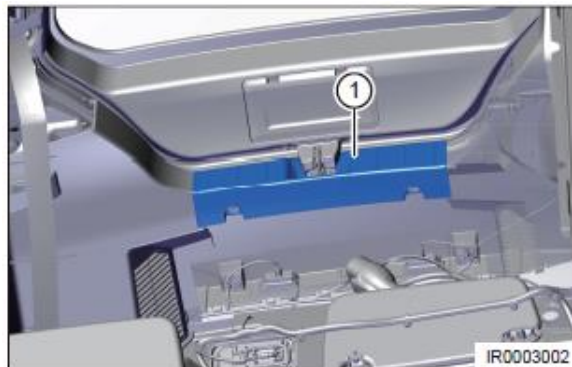
1. Remove the liftgate scuff plate assembly.



- a. Use the rocker to pry open 2 snap fasteners (arrows) on the liftgate scuff plate.



- b. Use the rocker to pry open the clip on the rear liftgate scuff plate assembly and remove the liftgate scuff plate assembly (1).



### Installation

1. The installation sequence is reverse to the removal.

#### ⚠ Caution

- When refitting the liftgate scuff plate assembly, replace the damaged clip and install the liftgate scuff plate assembly in place.

### Front door opening sealing strip

#### Removal

Note:

- The procedure for the right side is the same as for the left side.
- The following is the operating procedure for the left side.

#### ⚠ Caution

- When removing the front door opening sealing strip, please wear labor protection articles to avoid accidents.
- When removing the front door opening sealing strip, pay attention to using the appropriate force and be careful when operating.
- When removing the front door opening sealing strip, avoid damaging the front door opening sealing strip.

1. Remove the left front door opening sealing strip.
  - a. Remove the left front door opening sealing strip (1) by gently pulling it around from one corner of the front door opening sealing strip



## Installation

1. The installation sequence is reverse to the removal.

### Caution

- When installing the front door opening sealing strip, the front door opening sealing strip should have a certain clamping force with the body system, and should not fall off easily.
- When installing the front door opening sealing strip, use a rubber hammer to knock it evenly along the periphery to refit it in place, and the refitted surface shall be free of any defect, such as hammering mark, deformation, warpage, etc.
- After installing the front door opening sealing strip, do not disassemble or assemble it at will unless necessary, so as not to reduce the front door opening sealing strip the installation retention force.

## Liftgate opening sealing strip

### Removal

#### Caution

- When removing the liftgate opening sealing strip, please wear labor protection articles to avoid accidents.
- When removing the liftgate opening sealing strip, pay attention to using the appropriate force and be careful when operating.
- When removing the liftgate opening sealing strip, avoid damaging the liftgate opening sealing strip.

1. Remove the liftgate opening sealing strip.
  - a. Remove the liftgate opening sealing strip by gently pulling in all directions from the corner of the liftgate opening sealing strip.

### Installation

1. The installation sequence is reverse to the removal.

#### Caution

- When installing the liftgate opening sealing strip, the liftgate opening sealing strip should have a certain clamping force with the body system, and should not fall off easily.
- When installing the liftgate opening sealing strip, use a rubber hammer to knock it evenly along the periphery to refit it in place, and the refitted surface shall be free of any defect, such as hammering mark, deformation, warpage, etc.
- After installing the liftgate opening sealing strip, do not disassemble or assemble it at will unless necessary, so as not to reduce the liftgate opening sealing strip the installation retention force.

## A-pillar upper guard plate assembly

### Removal

#### Note:

- The procedure for the right side is the same as for the left side.
- The following is the operating procedure for the left side.

#### Caution

- When removing the A-pillar upper guard plate assembly, please wear labor protection articles to avoid accidents.
- When removing the A-pillar upper guard plate assembly, pay attention to using the appropriate force and be careful when operating.
- When removing the A-pillar upper guard plate assembly, avoid scratching interior trims and the body system paint.

1. Remove the left front door opening sealing strip.
2. Remove the left A-pillar upper guard plate assembly.
  - a. Use the interior pry plate to carefully pry out the A-pillar upper guard plate assembly (as shown by the arrow).



### Installation

1. The installation sequence is reverse to the removal.

#### ⚠ Caution

- When refitting the A-pillar upper guard plate assembly, replace the damaged clip and refit the A-pillar upper guard plate assembly in place.
- After installing the A-pillar upper guard plate assembly, it shall be installed in place between the dashboard and the inside roof lining.
- After refitting the A-pillar upper guard plate assembly, make sure that the A-pillar upper guard plate assembly and the front door opening sealing strip are tightly installed.

### A-pillar lower guard plate assembly

#### Removal

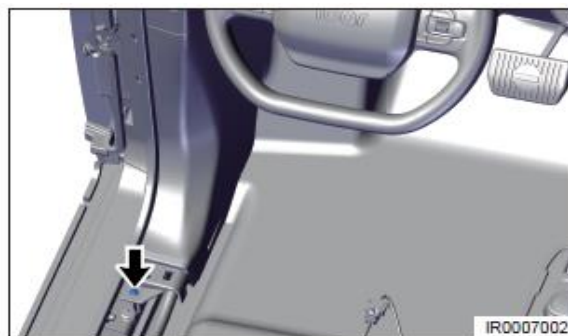
##### Note:

- The procedure for the right side is the same as for the left side.
- The following is the operating procedure for the left side.

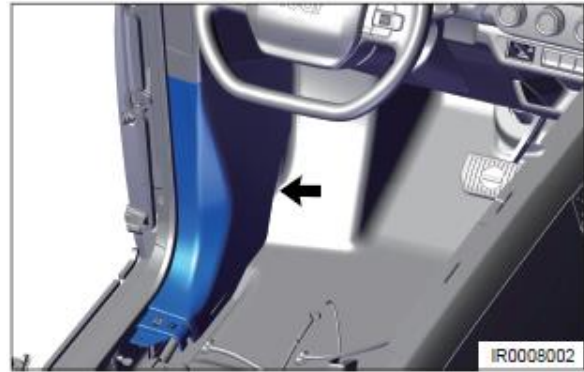
#### ⚠ Caution

- When removing the A-pillar lower guard plate assembly, please wear labor protection articles to avoid accidents.
- When removing the A-pillar lower guard plate assembly, pay attention to using the appropriate force and be careful when operating.
- When removing the A-pillar lower guard plate assembly, avoid scratching interior trims and the body system paint.

1. Remove the left front scuff plate assembly.
2. Remove the left A-pillar lower guard plate assembly.
  - a. Remove 1 fixing screw (as shown by the arrow) from the left A-pillar lower guard plate assembly.



- b. Remove the left A-pillar lower guard plate assembly with the interior pry plate.



### Installation

1. The installation sequence is reverse to the removal.

#### ⚠ Caution

- When refitting the A-pillar lower guard plate assembly, replace the damaged clip and refit the A-pillar lower guard plate assembly in place.
- After refitting the A-pillar lower guard plate assembly, make sure that the A-pillar lower guard plate assembly and the front door opening sealing strip are tightly installed.

### C-pillar lower guard plate assembly

#### Removal

Note:

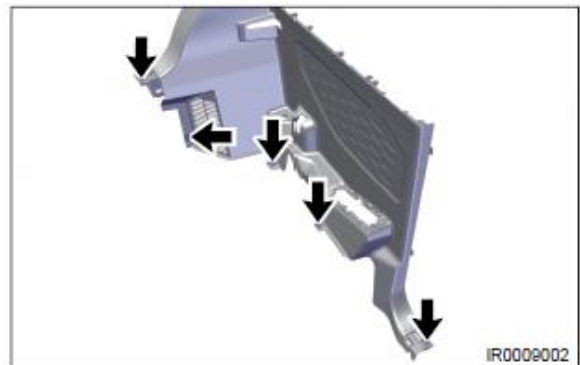
- The procedure for the right side is the same as for the left side.
- The following is the operating procedure for the left side.

#### ⚠ Caution

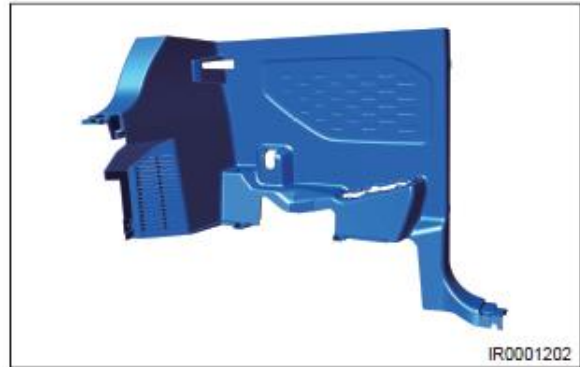
- When dismantling the C-pillar lower guard plate assembly, please wear labor protection articles to avoid accidents.
- When dismantling the C-pillar lower guard plate assembly, pay attention to using the appropriate force and be careful when operating.
- When removing the C-pillar lower guard plate assembly, avoid scratching the interior and the body system paint.

1. Remove the rear seat backrest assembly.
2. Remove the rear seat cushion assembly.
3. Remove the liftgate scuff plate assembly.
4. Remove left C-pillar lower guard plate assembly.
  - a. Use the cross screwdriver to remove 5 fixing screws (as shown by the arrow) from the C-pillar lower guard plate assembly.

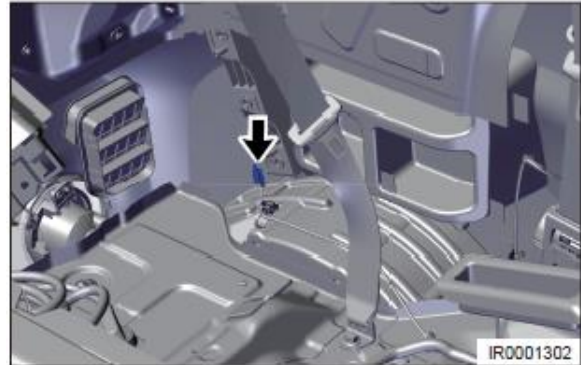
Tightening torque:  $1.5 \pm 0.5 \text{ N}\cdot\text{m}$  ( $1.1 \pm 0.4 \text{ ft}\cdot\text{lbs.}$ )



- b. Use a rocker to pry up the clips on the C-pillar lower guard plate assembly.



- c. Disconnect the standby power connector (as shown by the arrow), and remove the C-pillar lower guard board assembly.



## Installation

1. The installation sequence is reverse to the removal.

### ⚠ Caution

- When refitting the C-pillar lower guard plate assembly, replace the damaged clip and refit the C-pillar lower guard plate assembly in place.
- After installing the C-pillar lower guard plate assembly, it shall be installed in place between C-pillar upper guard plate assembly and rear scuff plate assembly.
- After installation of the C-pillar lower guard plate assembly, the C-pillar lower guard plate assembly shall be tightly installed between the rear door hole seal strip.

## C-pillar upper guard plate assembly

### Removal

#### Note:

- The procedure for the right side is the same as for the left side.
- The following is the operating procedure for the left side.

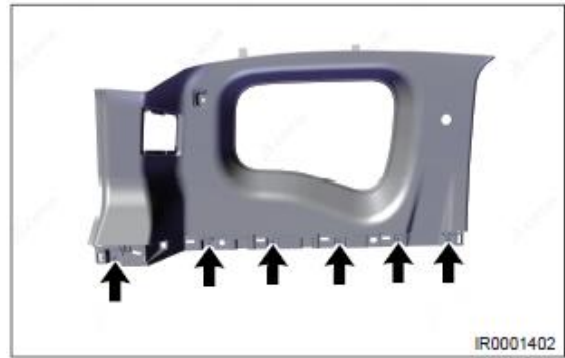
### ⚠ Caution

- When dismantling the C-pillar upper guard plate assembly, please wear labor protection articles to avoid accidents.
- When dismantling the C-pillar upper guard plate assembly, pay attention to using the appropriate force and be careful when operating.
- When removing the C-pillar upper guard plate assembly, avoid scratching interior trims and the body system paint.

1. Remove the left C-pillar lower guard plate assembly.
2. Remove the left C-pillar upper guard plate assembly.

Interior

- a. Remove the 6 fixing screws (as shown by the arrow) at the lower end of C-pillar upper guard plate assembly.  
Tightening torque:  $1.5 \pm 0.5 \text{ N}\cdot\text{m}$  ( $1.1 \pm 0.4 \text{ ft}\cdot\text{lbs.}$ )



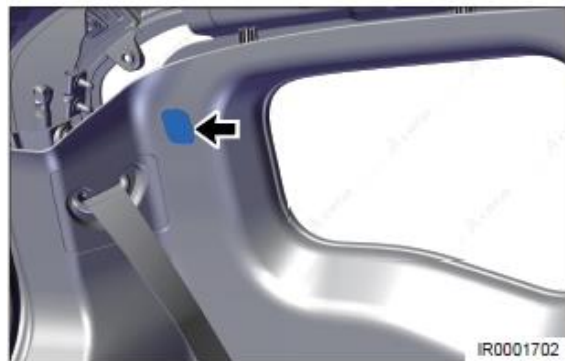
- b. Use the interior pry plate to carefully pry out the bolt protective cover (as shown by the arrow).



- c. Remove 1 fixing bolt (as shown by the arrow) from the seat belt.



- d. Use an interior pry plate to pry up the cap (as shown by the arrow) on the left C-pillar upper guard plate assembly.



- e. Remove 1 fixing screw (as shown by the arrow) on the left side C-pillar upper guard plate assembly.



- f. Remove the left C-pillar upper guard plate assembly.



### Installation

1. The installation sequence is reverse to the removal.

#### ⚠ Caution

- When refitting the C-pillar upper guard plate assembly, replace the damaged clip and refit the C-pillar upper guard plate assembly in place.
- After installing C-pillar upper guard plate assembly, it shall be installed in place between the coatrack assembly and the inside roof lining.
- After installing the C-pillar upper guard plate assembly, it should be tightly installed between the C-pillar upper guard plate assembly and the sealing strip of the rear door.

### Sunvisor assembly

#### Removal

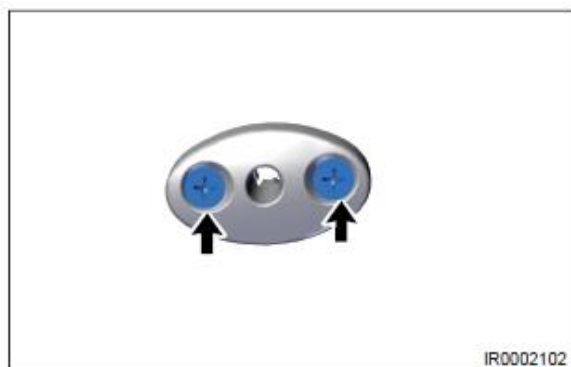
##### Note:

- The procedure for the right side is the same as for the left side.
- The following is the operating procedure for the left side.

#### ⚠ Caution

- When dismantling the sunvisor assembly, please wear labor protection articles to avoid accidents.
- When dismantling the sunvisor assembly, pay attention to using the appropriate force and be careful when operating.
- When removing the sunvisor assembly, avoid damaging interior trims and roof of the body system.

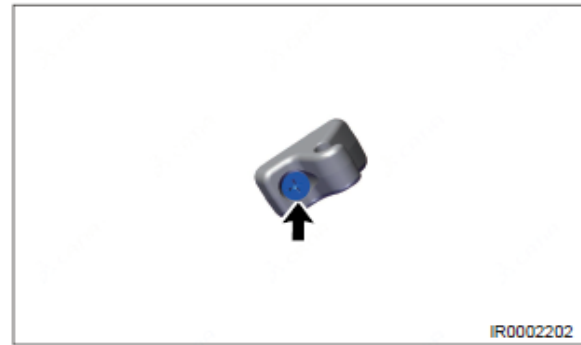
1. Remove the left sunvisor assembly.
- a. Disconnect the sunvisor assembly from one side of the mounting seat B; Remove the 2 fixing screws (as shown by the arrow) on the left front sunvisor with a cross screwdriver.



2. Remove the left sunvisor fixing base B.

- a. Remove 1 fixing screw (as shown by the arrow) from the sunvisor mounting B.

Tightening torque:  $2 \pm 0.5 \text{ N}\cdot\text{m}$  ( $1.5 \pm 0.4 \text{ ft}\cdot\text{lbs.}$ )



- b. Use a screwdriver wrapped with protective tape to pry off the left sunvisor mounting B.

**Installation**

1. The installation sequence is reverse to the removal.

**Assist grip assembly**

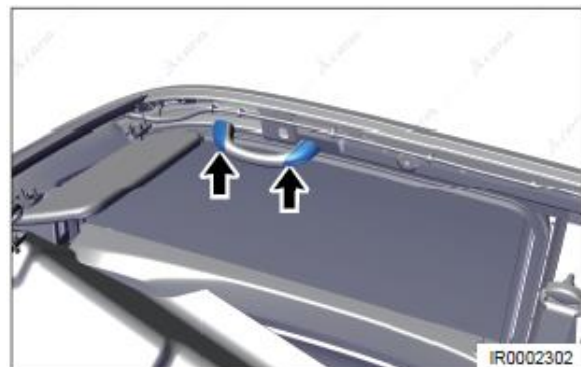
**Removal**

**Note:**

- The left rear/right rear operation procedure is the same as the right front operation.
- The following is the procedure for the right front side.

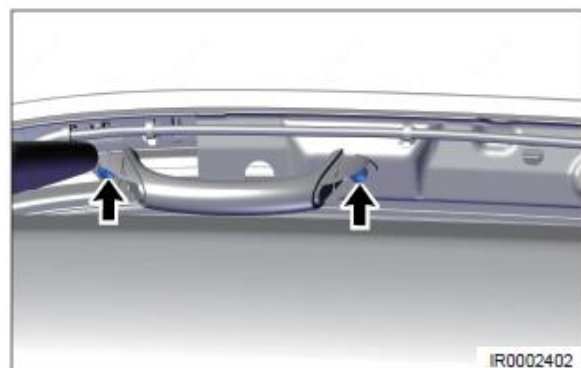
<p><b>⚠ Caution</b></p> <ul style="list-style-type: none"> <li>• When dismantling the assist grip assembly, please wear labor protection articles to avoid accidents.</li> <li>• When dismantling the assist grip assembly, pay attention to using the appropriate force and be careful when operating.</li> <li>• When removing the assist grip assembly, avoid damaging interior trims and roof of the body system.</li> </ul>
--

1. Remove the right front assist grip assembly
  - a. Use the rocker to pry up the armrest fixing screw plug cap (as shown by the arrow).



- b. Remove the 2 fixing screws (as shown by arrows) from the assist grip assembly and remove the right front assist grip assembly with a cross screwdriver.

Tightening torque:  $3 \pm 0.5 \text{ N}\cdot\text{m}$  ( $2 \pm 0.4 \text{ ft}\cdot\text{lbs.}$ )





## Installation

1. The installation sequence is reverse to the removal.

### ⚠ Caution

- When the assist grip is not in use, it should fit well with the roof, and the peripheral clearance should be uniform.
- The armrests return to normal, and there is no noise during operation;

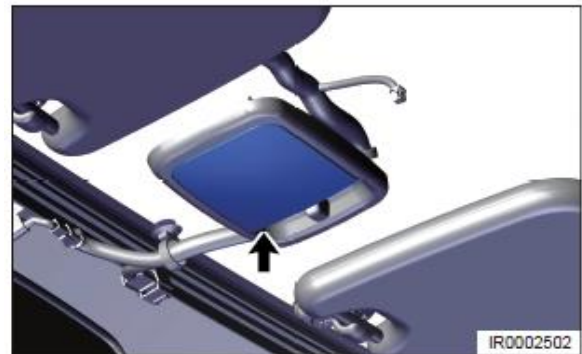
## Roof assembly

## Removal

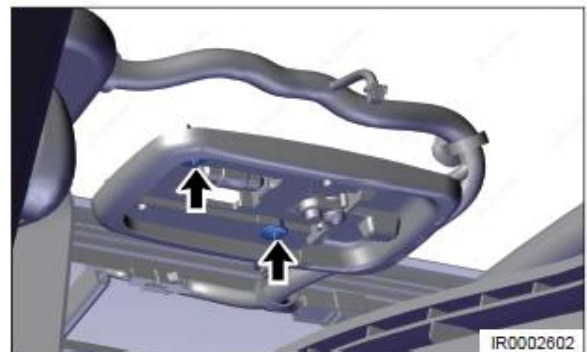
### ⚠ Caution

- When removing the roof assembly, please wear labor protection articles to avoid accidents.
- When removing the roof assembly, pay attention to using the appropriate force and be careful when operating.
- When removing the roof assembly, avoid damaging the interior trims and the body system paint.

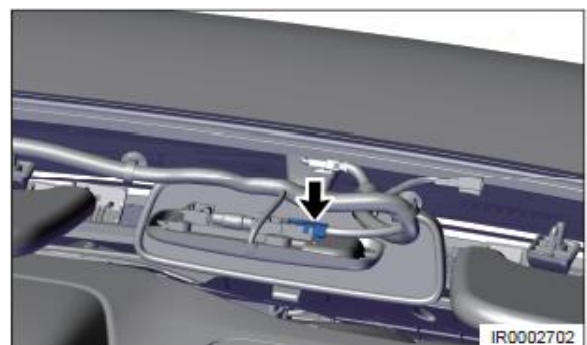
1. Turn off all electrical equipment and set the start button to the OFF position.
2. Disconnect the negative cable of the battery.
3. Remove the front interior dome light assembly.
  - a. Remove the dome light cover (as shown by the arrow) with the interior skid plate.



- b. Remove 2 fixing screws (as shown by the arrow) in the interior dome light.  
Tightening torque:  $2 \pm 0.5$  N·m ( $1.5 \pm 0.4$  ft-lbs.)



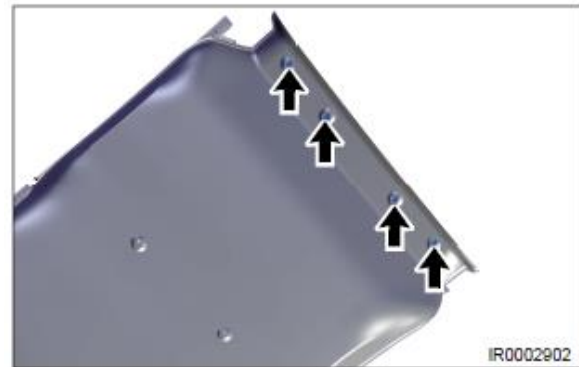
- c. Disconnect the indoor dome light connector (as shown by the arrow) and remove the indoor dome light



4. Remove the sunvisor assembly.
5. Remove the assist grip assembly.
6. Remove the front door opening sealing strip.
7. Remove the A-pillar upper guard plate assembly.
8. Remove the C-pillar upper guard plate assembly.
9. Remove the roof assembly.
  - a. Remove 2 fixing clips (as shown by the arrow) at the middle of the roof assembly.



- b. Remove the 4 retaining clips (as shown by the arrow) at the rear of the roof assembly



- c. Remove the roof assembly.

### Installation

1. The installation sequence is reverse to the removal.

#### ⚠ Caution

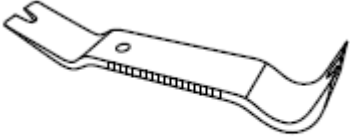
- When refitting the roof assembly, replace the damaged clip and refit the roof assembly in place.
- After installing the roof assembly, make sure that the roof assembly and the column upper guard board are installed tightly.
- After the roof assembly is installed, the roof assembly and door hole seals should be installed tightly.

## Exteriors

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**General information****Tools****General tools**

Tool name	Illustration
Interior flexure plate	 <p>RCH0025006</p>

## On-board maintenance

### Front bumper assembly

#### Removal

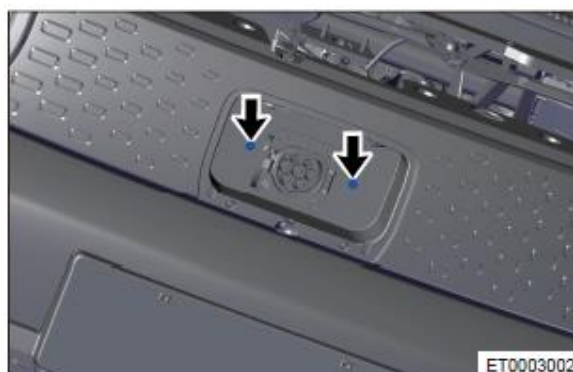
**⚠ Caution**

- When removing the front bumper assembly, be sure to wear the labour protection articles to avoid accidents.
- When removing the front bumper assembly, pay attention to using the appropriate force and be careful when operating.
- When removing the front bumper assembly, do not scratch the body system paint.

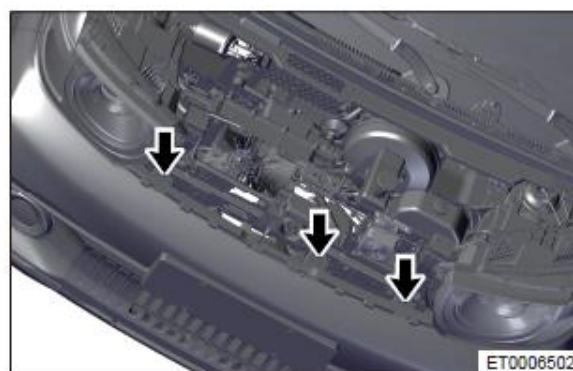
1. Turn off all electrical equipment and place the start button in OFF position.
2. Disconnect the negative cable of the battery.
3. Remove the front bumper assembly.
  - a. Remove the 4 fixing bolts (as shown by the arrow) on the upper part of the front bumper



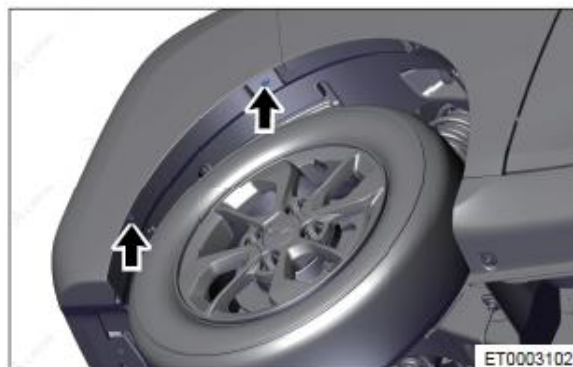
- b. Remove the 2 fixing bolts (as shown by the arrow) from the front bumper charging port.



- c. Remove the 3 fixing bolts inside the front bumper. (arrows).



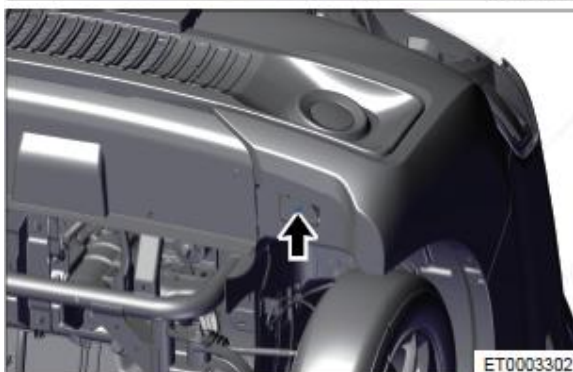
- d. Remove the left fixing screw of front bumper (as shown by the arrow).



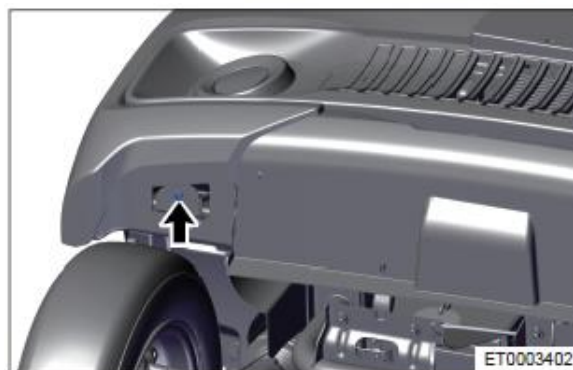
- e. Unscrew the fixing screws (arrows) of the front bumper on the right side.



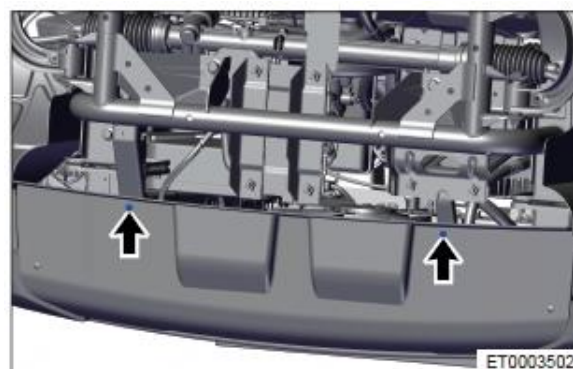
- f. Lift the vehicle and remove 1 fixing screw (as shown by the arrow) at the lower part of the front bumper.



- g. Remove 1 fixing screw (as shown by the arrow) from the lower part of the front bumper assembly.



- h. Remove the 2 fixing bolts (as shown by the arrow) at the lower part of front bumper assembly.



- i. Separate the jaw from the front bumper.



- j. Separate the jaw from the front bumper.



- k. Remove the front bumper assembly.

### Installation

1. The installation sequence is reverse to the removal.

#### ⚠ Caution

- When installing the front bumper assembly, be sure to wear the labour protection articles to avoid accidents.
- When refitting the front bumper assembly, do not scratch the body system paint.
- When installing the front bumper assembly, make sure the front bumper is installed correctly and the clearance between it and the body system is appropriate.

### Front bumper mounting bracket

#### Removal

##### Note:

- The procedure for the right side is the same as for the left side.
- The following is the operating procedure for the left side.

#### ⚠ Caution

- When removing the front bumper mounting bracket, be sure to wear the labour protection articles to avoid accidents.
- When removing the front bumper mounting bracket, avoid scratching the body system paint.

1. Turn off all electrical equipment and place the start button in OFF position.
2. Disconnect the negative cable of the battery.
3. Remove the front bumper assembly.
4. Remove the left front bumper mounting bracket.



- a. Remove 3 fixing bolts (as shown by the arrow) on the front bumper mounting bracket, and remove the left front bumper mounting bracket.



### Installation

1. The installation sequence is reverse to the removal.

#### ⚠ Caution

- When installing the front bumper mounting bracket, please be sure to wear labour protection articles to avoid accidents.
- When installing the front bumper mounting bracket, avoid scratching the body system paint.

### Front bumper cross beam assembly

#### Removal

#### ⚠ Caution

- When removing the front bumper cross beam assembly, be sure to wear the labour protection articles to avoid accidents.
- When removing the front bumper cross beam assembly, avoid scratching the body system paint.

1. Turn off all electrical equipment and place the start button in OFF position.
2. Disconnect the negative cable of the battery.
3. Remove the front bumper assembly.
4. Remove the front bumper cross beam assembly.
  - a. Remove 8 fixing nuts on the left and right sides of the front bumper cross beam assembly
  - b. Remove the front bumper cross beam assembly.

#### Installation

1. The installation sequence is reverse to the removal.

#### ⚠ Caution

- When installing the front bumper cross beam assembly, please be sure to wear labour protection articles to avoid accidents.
- When installing the front bumper cross beam assembly, avoid scratching the body system paint.
- After installing the front bumper cross beam assembly, loosening, shaking or deformation is not allowed.

## Front wheel house guard plate

### Removal

**⚠ Caution**

- The disassembly operation procedures are the same for both sides, the following will take the operation on the left side as an example.
- When removing the front wheel house guard plate, be sure to wear the labour protection articles to avoid accidents.
- When removing the front wheel house guard plate, avoid scratching the body system paint.

1. Remove the left front wheel house guard plate.

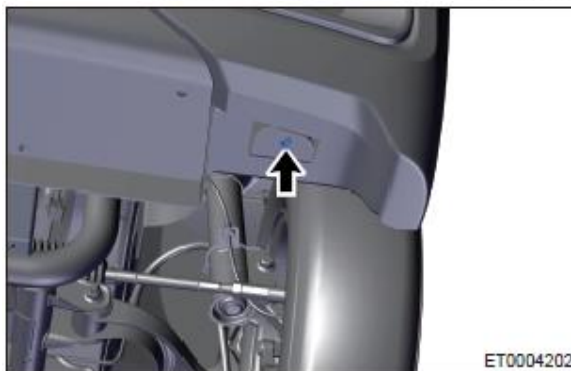
a. Remove 3 screws (as shown by the arrow) on the front wheel house guard plate.



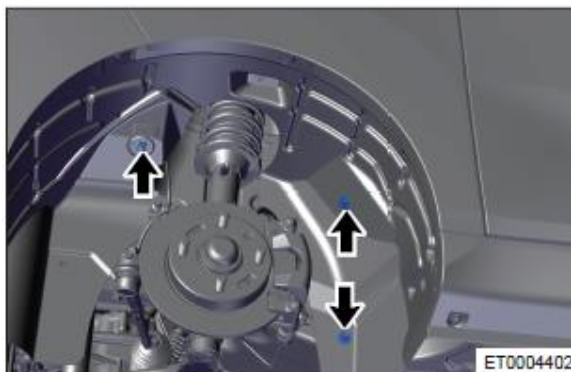
b. Remove 2 screws (as shown by the arrow) on the front wheel house guard plate.



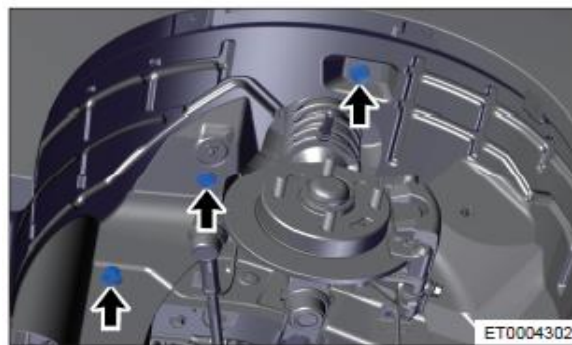
c. Remove 1 screw (as shown by the arrow) on the front wheel house guard plate.



d. Remove 3 plastic nuts (as shown by the arrow) on the front wheel house guard plate.



- e. Remove 3 clips (as shown by the arrow) on the front wheel house guard plate.



- f. Remove the front wheel house guard plate.

### Installation

1. The installation sequence is reverse to the removal.

#### ⚠ Caution

- When installing the front wheel house guard plate assembly, be sure to wear the labour protection articles to avoid accidents.
- When refitting the front wheel house guard plate assembly, do not scratch the body system paint.

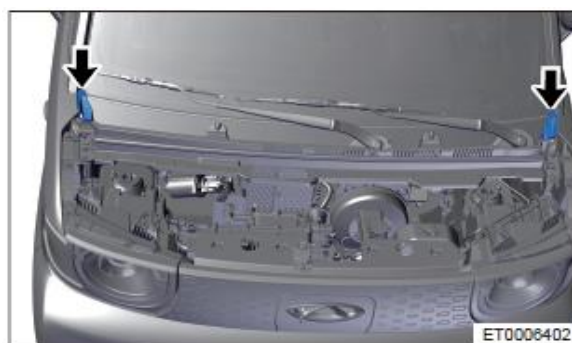
### Front windshield lower trim plate assembly

#### Removal

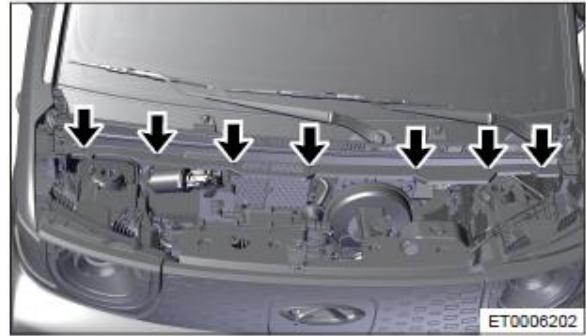
#### ⚠ Caution

- When removing the front windshield lower trim plate assembly, be sure to wear the labour protection articles to avoid accidents.
- When removing the front windshield lower trim plate assembly, do not scratch the body system paint.

1. Turn off all electrical equipment and the start button.
2. Remove the wiper arm assembly.
3. Remove the front windshield lower trim plate assembly.
  - a. Use the screwdriver wrapped with protective tape to pry up the jaw on the left plug of front windshield lower trim panel, and remove the left and right plugs of front windshield trim panel (as shown by the arrow).



b. Remove the 7 fixing screws (as shown by the arrow) from the front windshield lower trim plate assembly.



c. Disconnect the front wiper nozzle water pipe joint (as shown by the arrow), and take down the front windshield trim panel assembly.



### Installation

1. The installation sequence is reverse to the removal.

#### ⚠ Caution

- When refitting the front windshield lower trim plate assembly, please wear labor protection articles to avoid accidents.
- When refitting the front windshield lower trim plate assembly, do not scratch the body system paint.

### Rear bumper assembly

#### Removal

#### ⚠ Caution

- When removing the rear bumper assembly, be sure to wear the labour protection articles to avoid accidents.
- When removing the rear bumper assembly, pay attention to using the appropriate force and be careful when operating.
- When removing the rear bumper assembly, do not scratch the body system paint.

1. Turn off all electrical equipment and place the start button in OFF position.
2. Disconnect the negative cable of the battery.
3. Remove the tail lamp.
4. Remove the rear bumper assembly.

- a. Remove 2 fixing bolts (as shown by the arrow) from the rear bumper assembly.



- b. Remove 2 fixing screws (as shown by the arrow) on the right side of rear bumper assembly.



- c. Remove 2 fixing screws (as shown by the arrow) at the lower right side of the rear bumper.



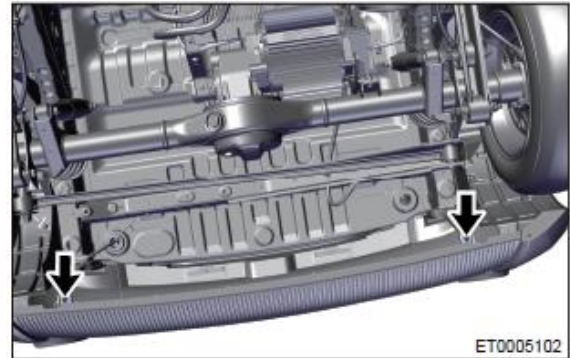
- d. Remove the 2 fixing screws (as shown by the arrow) on the left side of the rear bumper assembly.



- e. Remove 2 fixing screws (as shown by the arrow) at the left lower part of the rear bumper assembly.



f. Remove the 2 fixing bolts (as shown by the arrow) at the lower part of the rear bumper assembly



g. Separate the jaw from the rear bumper assembly (take the left side as an example).



h. Disconnect the connector on the rear bumper assembly and remove the rear bumper assembly.

### Installation

1. The installation sequence is reverse to the removal.

#### ⚠ Caution

- When installing the rear bumper assembly, be sure to wear the labour protection articles to avoid accidents.
- When refitting the rear bumper assembly, do not scratch the body system paint.
- When installing the rear bumper assembly, make sure the rear bumper is installed correctly and the clearance between it and the body system is appropriate.

### Rear wheel house guard plate

#### Removal

##### Note:

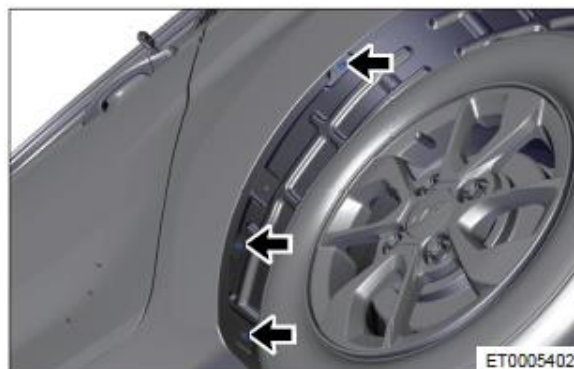
- The procedure for the right side is the same as for the left side.
- The following is the operating procedure for the left side.

#### ⚠ Caution

- When removing the rear wheel house guard plate, please wear labor protection articles to avoid accidents.
- When removing the rear wheel house guard plate, avoid scratching the body system paint.

1. Remove the rear wheel house guard plate assembly.

- a. Remove the 3 fixing screws (as shown by the arrow) on the rear wheel house guard plate.



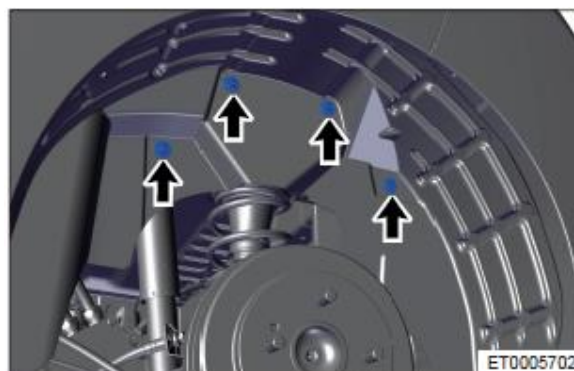
- b. Remove 2 fixing screws (as shown by the arrow) from the rear wheel house guard plate assembly.



- c. Remove 1 fixing screw (as shown by the arrow) from the rear wheel house guard plate assembly.



- d. Remove 4 plastic nuts (as shown by the arrow) on the rear wheel house guard plate assembly.



- e. Remove the rear wheel house guard plate assembly.

### Installation

1. The installation sequence is reverse to the removal.

#### ⚠ Caution

- When installing the left rear wheel house guard plate, be sure to wear the labour protection articles to avoid accidents.
- When refitting the left rear wheel house guard plate, avoid scratching the body system paint.

## D-pillar trim panel assembly

### Removal

#### Note:

- The procedure for the right side is the same as for the left side.
- The following is the operating procedure for the left side.

#### ⚠ Caution

- When removing the D-pillar trim panel assembly, be sure to wear the labour protection articles to avoid accidents.
- When removing the D-pillar trim panel assembly, avoid scratching the body system paint.

1. Remove the D-pillar trim panel assembly.
  - a. Remove 4 fixing bolts (as shown by the arrow) on the D-pillar trim panel assembly.



- b. Remove the 1 fixing bolt (as shown by the arrow) on the D-pillar trim panel assembly.



- c. Remove the D-pillar trim panel assembly.

### Installation

1. The installation sequence is reverse to the removal.

#### ⚠ Caution

- When installing the D-pillar trim panel assembly, please wear labor protection articles to avoid accidents.
- When installing the D-pillar trim panel assembly, avoid scratching the body system paint.

## Rear bumper mounting bracket

### Removal

#### Note:

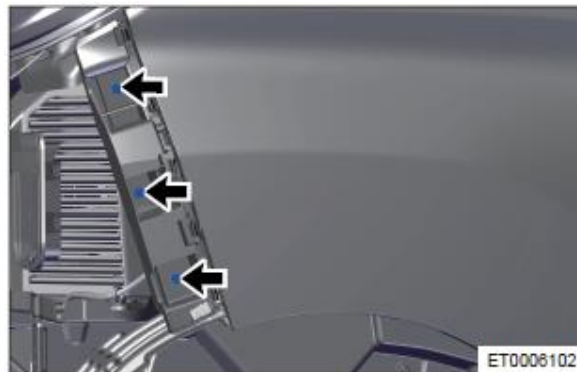
- The procedure for the right side is the same as for the left side.
- The following is the operating procedure for the left side.



**⚠ Caution**

- When removing the rear bumper mounting bracket, please wear labor protection articles to avoid accidents.
- When removing the rear bumper mounting bracket, avoid scratching the body system paint.

1. Turn off all electrical equipment and place the start button in OFF position.
2. Disconnect the negative cable of the battery.
3. Remove the rear bumper assembly.
4. Remove the left rear bumper mounting bracket.
  - a. Remove 3 fixing bolts (as shown by the arrow) on the rear bumper mounting bracket, and take down the left rear bumper mounting bracket.

**Installation**

1. The installation sequence is reverse to the removal.

**⚠ Caution**

- When installing the rear bumper mounting bracket, please wear labor protection articles to avoid accidents.
- When installing the rear bumper mounting bracket, avoid scratching the body system the paint.



---

## Dashboard

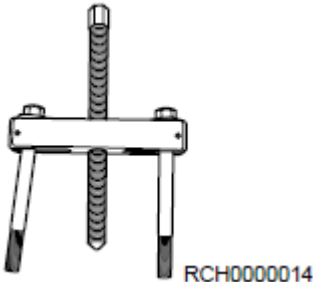
General information	389	Dashboard assembly	392
Tools	389	Removal	392
On-board maintenance	390	Installation	395
Console assembly	390	Dashboard cross beam assembly	395
Removal	390	Removal	395
Installation	391	Installation	396



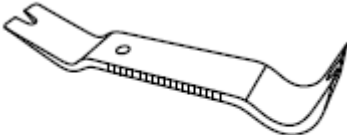
**General information**

**Tools**

**Special tools**

Tool name	Illustration
Steering wheel removal tool	

**General tools**

Tool name	Illustration
Interior flexure plate	

## On-board maintenance

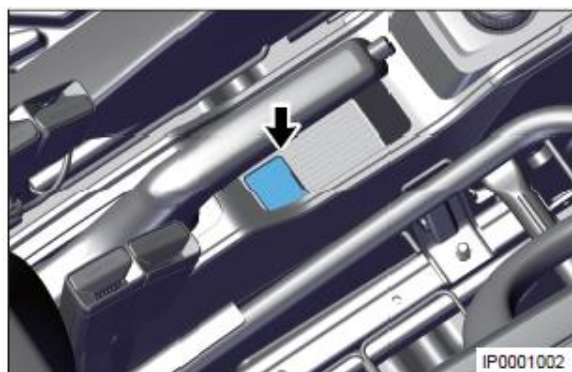
### Console assembly

#### Removal

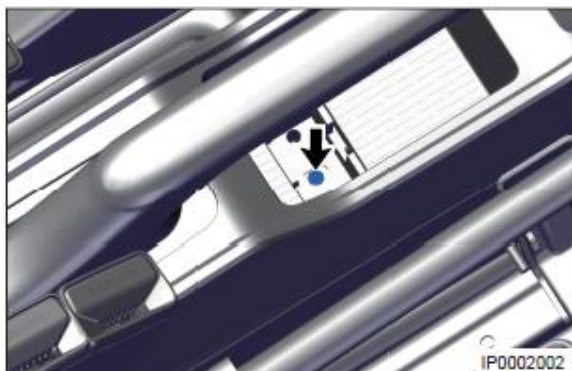
**⚠ Caution**

- When removing the console assembly, please wear labor protection articles to avoid accidents.
- When removing the console assembly, pay attention to using the appropriate force and be careful when operating.
- When removing the console assembly, avoid scratching interior trims and the body system paint.

1. Turn off all electrical equipment and the start button.
2. Disconnect the negative cable of the battery.
3. Remove the console assembly.
  - a. Use the interior pry plate to carefully pry out the plug cap (as shown by the arrow).



- b. Remove 1 fixing bolt (as shown by the arrow).



- c. Remove 1 fixing bolt (as shown by the arrow) on the left front side of the console.



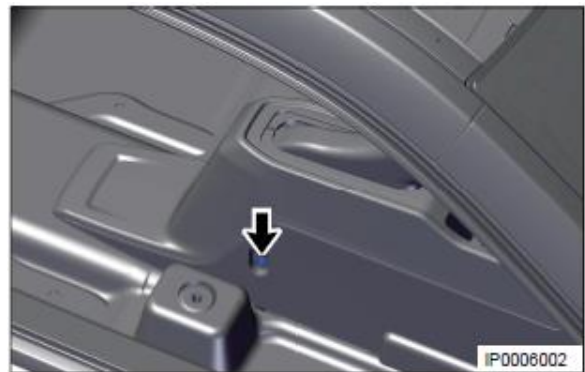
- d. Remove 1 fixing bolt (as shown by the arrow) on the left rear side of the console.



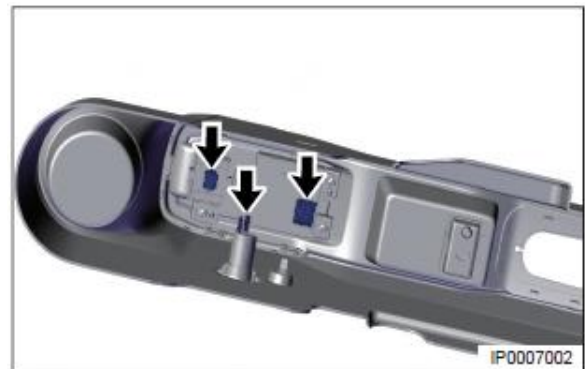
- e. Remove 1 fixing screw (as shown by the arrow) on the right front side of console.



- f. Remove 1 fixing screws (as shown by the arrow) at the right rear side of the console.



- g. Carefully lift up the console assembly and disconnect the 3 connectors (as shown by the arrow) on the console



- h. Remove the console assembly.

### Installation

1. Reassembly is in the reverse order of disassembly.

## Dashboard assembly

### Removal

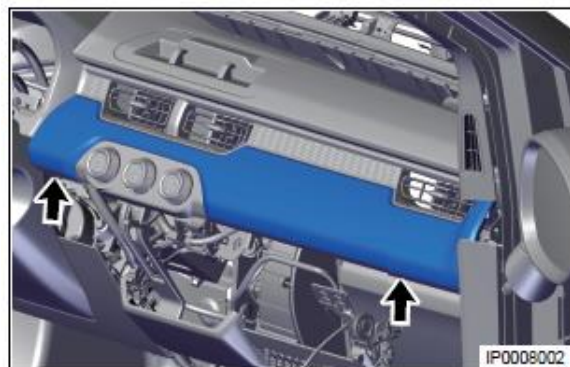
#### Note:

- When removing the console assembly, please wear labor protection articles to avoid accidents.
- When removing the dashboard assembly, all the parts related to the airbag shall be operated with the battery power disconnected. It is strictly prohibited to operate without disconnecting the power. Because the airbag control module will still retain enough power to detonate the airbag within 60 seconds after the vehicle is turned off or the fuse is removed, the accidental detonation of the airbag may cause personal injury or damage the vehicle.
- Do not expose the airbag components directly to hot air or open flame.
- The removed airbags should be kept properly. In case of accidental triggering, the airbag may cause personal injury.

#### ⚠ Caution

- When removing the dashboard assembly, please wear labor protection articles to avoid accidents.
- When removing the dashboard assembly, avoid scratching interior trims and the body system paint.

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative cable of the battery.
3. Remove the left side sealing strip assembly
4. Remove the right-side sealing strip assembly.
5. Remove the driver's airbag assembly
6. Remove the steering wheel assembly.
7. Remove the combination instrument assembly.
8. Remove the A-pillar upper guard plate assembly.
9. Remove the left lower guard board assembly of dashboard.
10. Remove the dashboard assembly.
  - a. Remove 1 fixing bolt on the right side of the dashboard (as shown by the arrow).

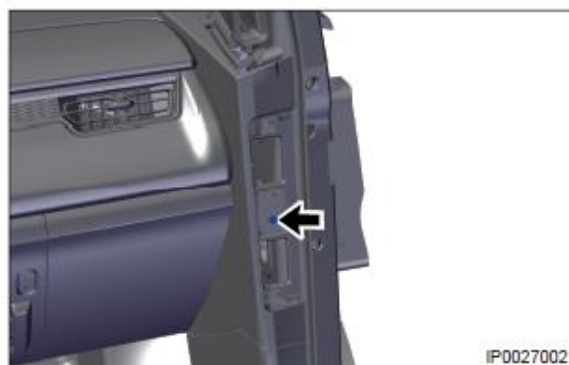


- b. Remove the dashboard bolt cover plate (as shown by the arrow) (the left side is removed in the same way).

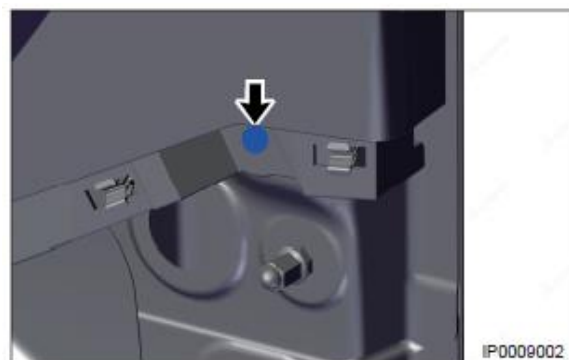




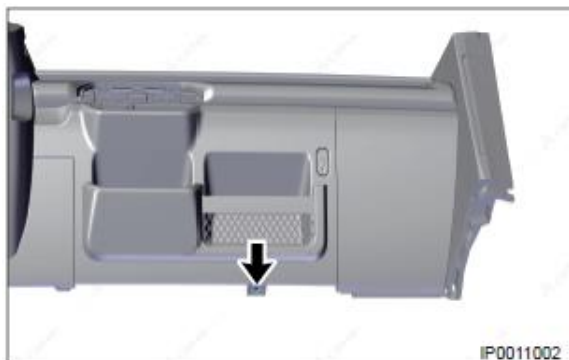
- c. Remove 1 fixing bolt on the right side of the dashboard (as shown by the arrow).



- d. Remove 1 fixing bolt on the right side of the dashboard (as shown by the arrow).



- e. Remove 1 fixing bolt on the right side of the dashboard (as shown by the arrow).



- f. Remove 1 fixing bolt on the left side of the dashboard (as shown by the arrow).

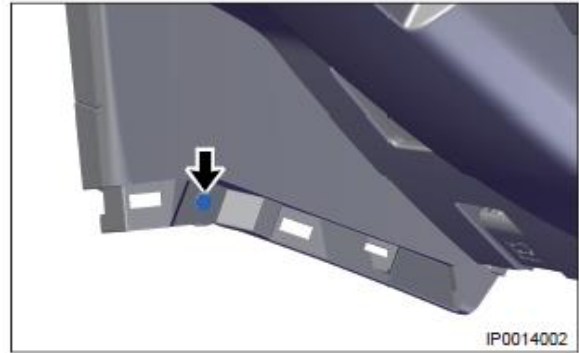


- g. Remove 1 fixing bolt on the left side of the dashboard (as shown by the arrow).

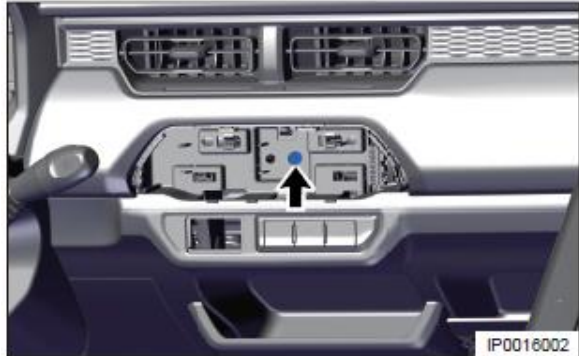


## Dashboard

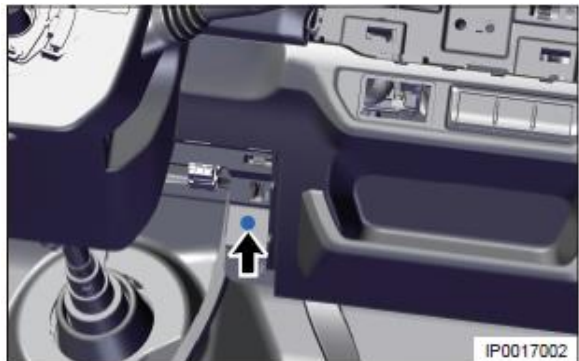
- h. Remove 1 fixing bolt on the left side of the dashboard (as shown by the arrow).



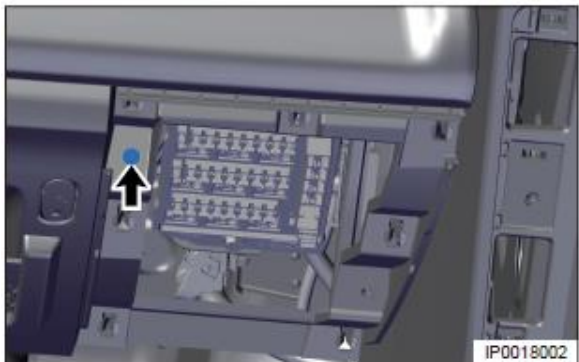
- i. Remove 1 fixing bolt at the rear side of dashboard (as shown by the arrow).



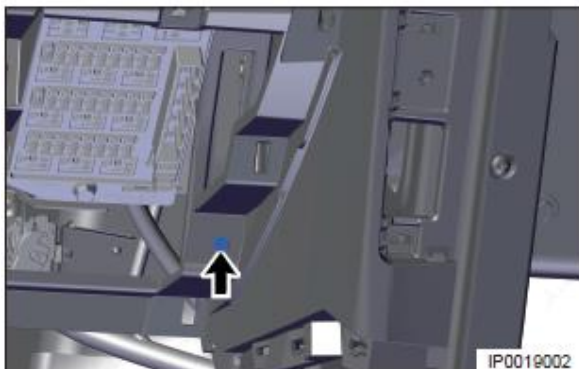
- j. Remove 1 fixing bolt at the middle lower side of dashboard (as shown by the arrow).



- k. Remove 1 fixing bolt (as shown by the arrow) next to the relay box on the right side of dashboard.



- l. Remove 1 fixing bolt (as shown by the arrow) next to the relay box on the right side of the dashboard.



m. Remove the dashboard assembly.

### Installation

1. The installation sequence is reverse to the removal.

### Dashboard cross beam assembly

#### Removal

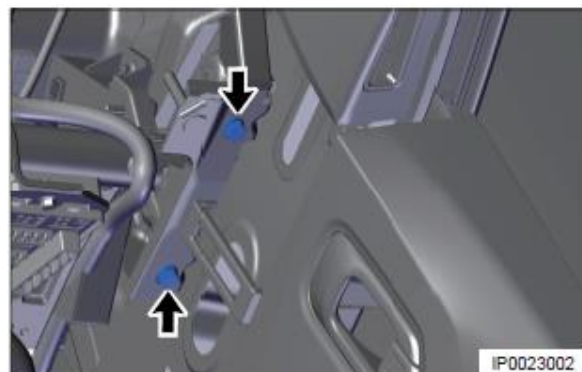
##### ⚠ Caution

- When removing the dashboard cross beam assembly, please wear labor protection articles to avoid accidents.
- When removing the dashboard cross beam assembly, avoid scratching interior trims and the body system paint.

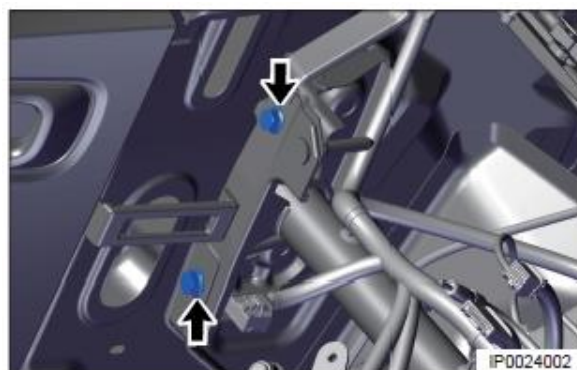
1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative cable of the battery.
3. Remove the dashboard assembly.
4. Remove the front windshield lower trim plate assembly.
5. Remove the electronic steering column assembly.
6. Remove the dashboard cross beam assembly.
  - a. Disconnect all instrument wiring harness retaining clips from the instrument crossmember.



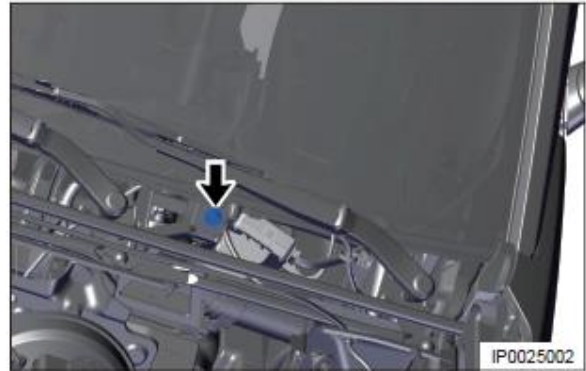
- b. Remove the 2 fixing bolts on the right side of the instrument cross member (as shown by the arrow).



- c. Remove the 2 fixing bolts on the left side of the instrument cross member (as shown by the arrow).



- d. Remove 1 fixing bolt (as shown by the arrow) under the front windshield lower trim panel outside the dashboard cross beam



- e. Remove the dashboard cross beam.

### Installation

1. The installation sequence is reverse to the removal.

**⚠ Caution**

- When refitting the dashboard cross beam assembly, be sure to tighten the fixing bolts to the specified torque.
- After refitting the dashboard cross beam assembly, check whether each electrical equipment can work normally.

---

## Seat and cargo compartment

On-board maintenance	399
Front seat assembly	399
Removal	399
Installation	400
Rear seat assembly	401
Removal	401
Installation	401



## On-board maintenance

### Front seat assembly

#### Removal

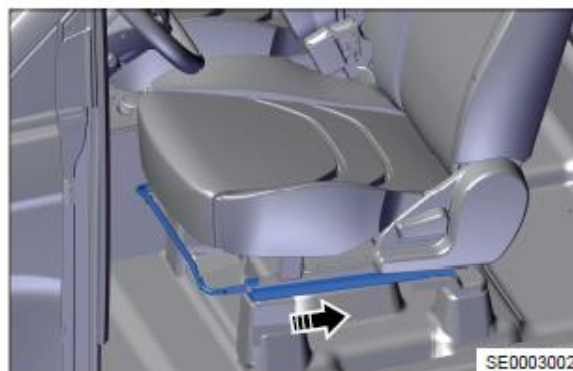
##### Note:

- The operation procedure of the front passenger seat assembly is the same as that of the driver seat assembly
- Remove the inside of the rear foot trim cover (as shown by the arrow).

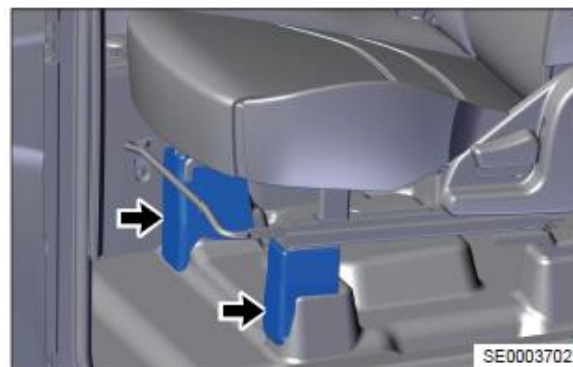
##### ⚠ Caution

- When removing the driver's seat assembly, please wear labor protection articles to avoid accidents.
- When removing the driver's seat assembly, pay attention to using the appropriate force and be careful when operating.
- When removing the driver's seat assembly, avoid scratching interior trims and body system paint.

1. Turn off all electrical equipment and the ignition switch.
2. Remove the driver's seat assembly
  - a. Slide the seat assembly to the rearward position.

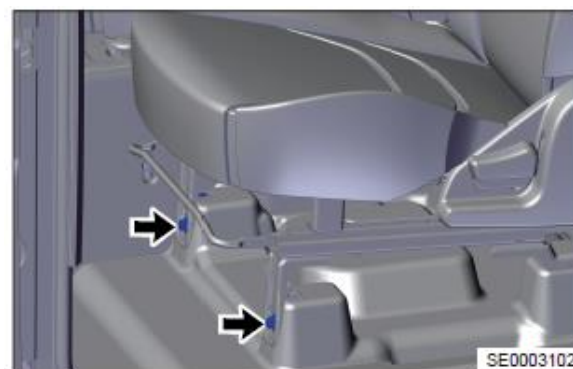


- b. Remove the inner side of front foot cover (as shown by the arrow).

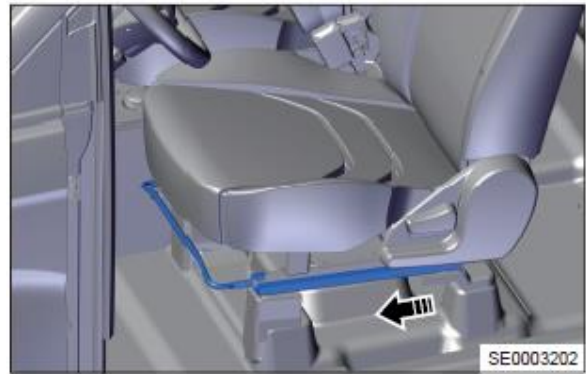


- c. Remove the 2 fixing bolts in front of the seat assembly (as shown by the arrow).

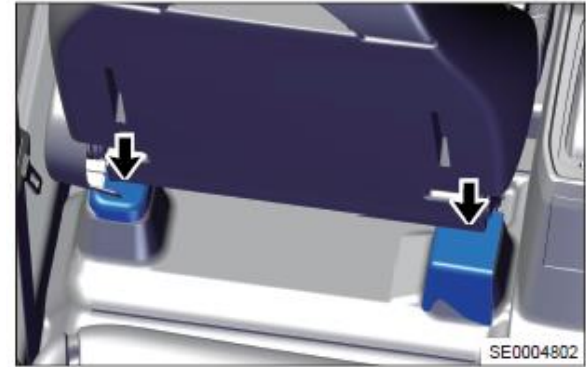
Tightening torque:  $50 \pm 5$  N·m ( $37 \pm 4$  ft-lbs.)



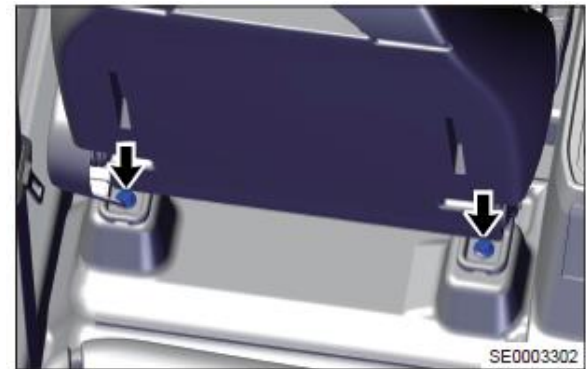
- d. Slide the seat assembly to the forwardmost position.



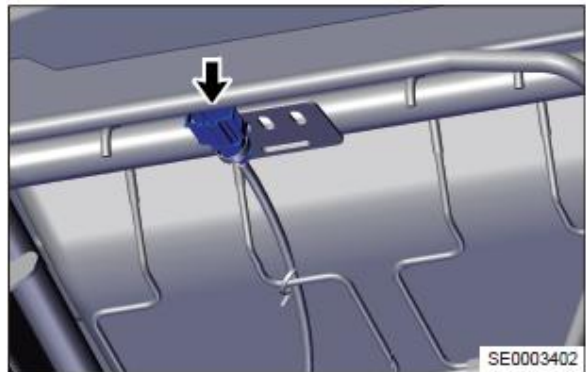
- e. Remove the inside of the rear foot trim cover (as shown by the arrow).



- f. Remove the 2 fixing bolts (as shown by the arrow) behind the seat assembly.  
Tightening torque:  $50 \pm 5$  N·m ( $37 \pm 4$  ft-lbs.)



- g. Disconnect the harness connector under the seat assembly (as shown by the arrows).



- h. Remove the driver's seat assembly.

### Installation

- 1. The installation sequence is reverse to the removal.

**⚠ Caution**

- When refitting the seat assembly, please wear labor protection articles to avoid accidents.
- When refitting the seat assembly, do not damage the body system paint.
- When installing the seat assembly, do not scratch or damage the carpet.



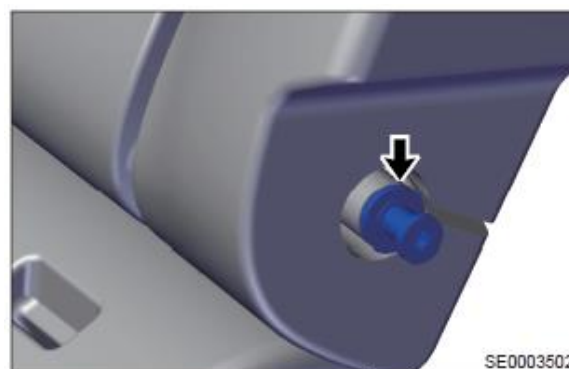
## Rear seat assembly

### Removal

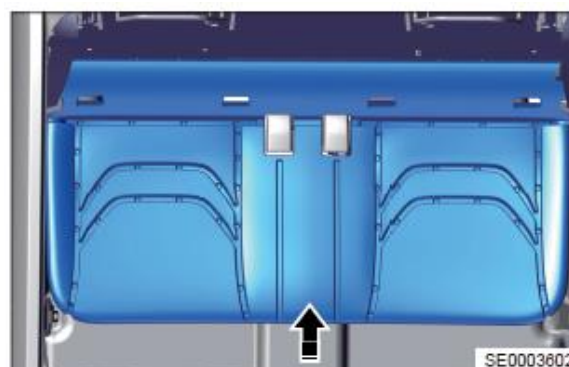
#### ⚠ Caution

- When dismantling the rear seat assembly, please wear labor protection articles to avoid accidents.
- When dismantling the rear seat assembly, pay attention to using the appropriate force and be careful when operating.
- When removing the rear seat assembly, avoid scratching interior trims and the body system paint.

1. Turn off all electrical equipment and set the start button to OFF position.
2. Disconnect the negative cable of the battery.
3. Remove the rear seat backrest assembly.
  - a. Lower down the seat back assembly.
  - b. Lift up the locking hook of body system backrest rotating shaft, meanwhile lift up the backrest rotating shaft to disengage from the locking hook of body system, take down the rear backrest, and move it out of the vehicle, (Repeat the above procedure for the other side).



4. Remove the rear seat cushion assembly.
  - a. Pull out the front end of the rear seat cushion from the fixed seat, and then take out the rear seat belt buckle from the seat cushion buckle hole. Remove the rear seat cushion and take it out of the vehicle.



### Installation

1. The installation sequence is reverse to the removal.

#### ⚠ Caution

- When installing the rear seat assembly, please wear labor protection articles to avoid accidents.
- When installing the rear seat assembly, do not damage the paint surface of body system.
- When installing the rear seat assembly, do not scratch or damage the carpet.

## Cargo compartment assembly (Avantier C)

### Removal

#### ⚠ Caution

- When removing the cargo compartment assembly, please wear labor protection articles to avoid accidents.
- When removing the cargo compartment assembly, pay attention to using the appropriate force and be careful when operating.
- When removing the cargo compartment assembly, avoid scratching interior trims and the body system paint.

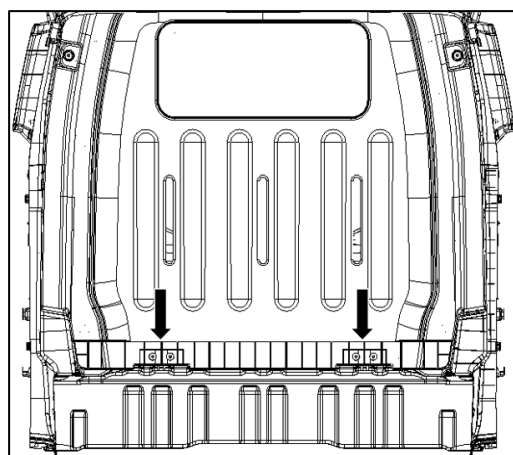
1. Turn off all electrical equipment and set the start button to OFF position.
2. Disconnect the negative cable of the battery.
3. Adjust the front seats to the forwardmost position and adjust the seat backrest to the minimum angle.



4. Use a 14 socket to remove the fixing point bolt from the safety belt. Bolt tightening torque:  $50\pm 5\text{N.m}$



5. Use an M8 socket to remove four M6 bolts securing the bracket under the cargo compartment. Bolt tightening torque:  $10\pm 2\text{N.m}$



6. Remove the cargo compartment from the rear of the seat.

**Installation**

1. The installation sequence is reverse to the removal.

 **Caution**

- When installing the cargo compartment assembly, please wear labor protection articles to avoid accidents.
- When installing the cargo compartment assembly, avoid damaging the body system paint.
- When installing the cargo compartment assembly, do not scratch or damage the carpet.



The logo features the word "CENNTRO" in a bold, blue, sans-serif font, centered within a white diamond shape. This diamond is set against a black background that has a white double-line border. Below this, a grey background also features a white double-line border that forms a diamond shape pointing downwards, mirroring the one above.

**CENNTRO**

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