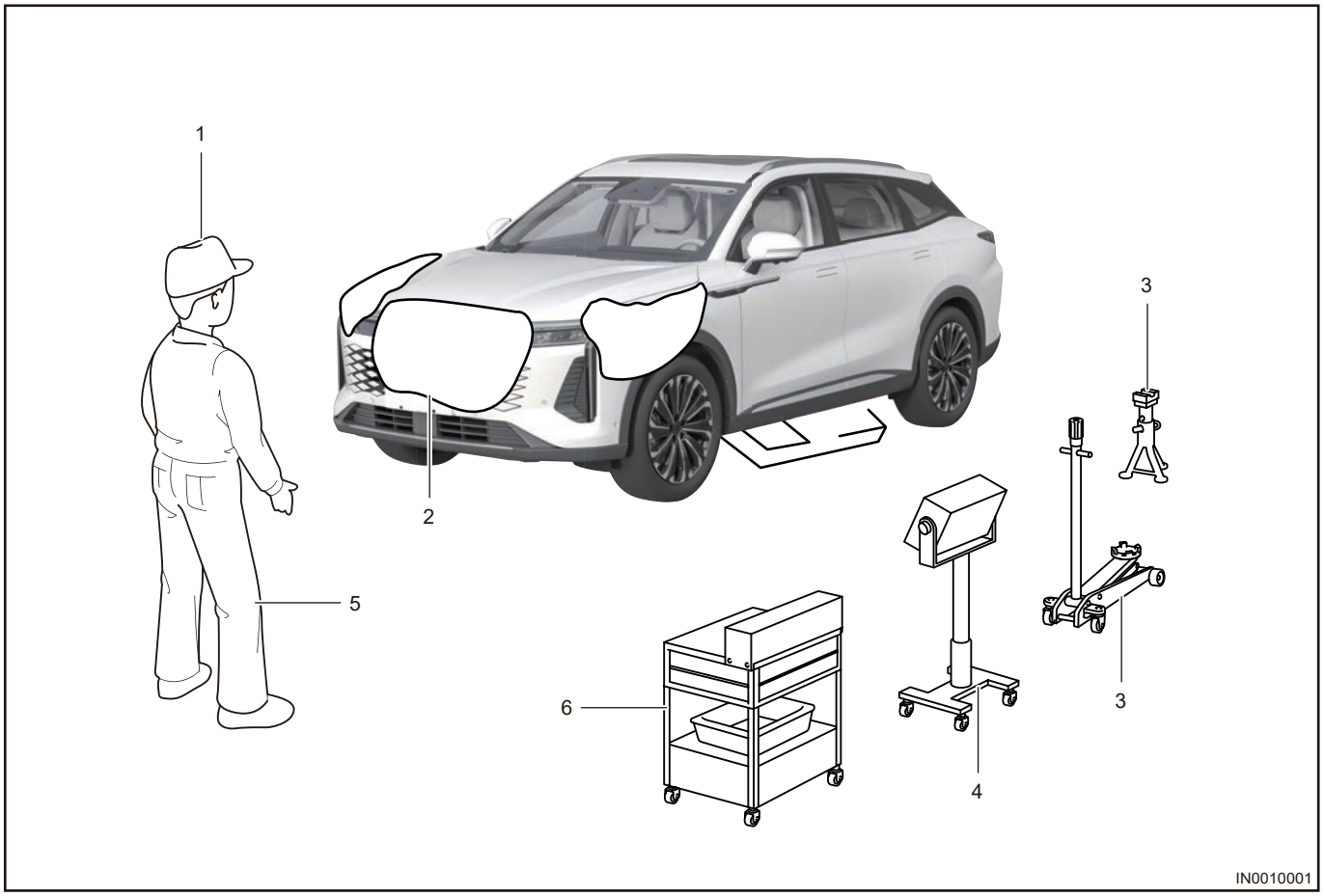
1.2 Vehicle Inspection

1 Preparation before Vehicle Inspection

1.1 Vehicle inspection schematic diagram



1	Attire	• Always wear a clean uniform. • A hat and safety shoes must be worn.
2	Vehicle Protection	• Before starting work, prepare radiator grille cover, wing cover, seat cover and floor mat.
3	Safety Operation	• When working with two or more persons, be sure to check safety each other. • When working with engine running, make sure to provide ventilation for exhausting gas in the workshop. • When repairing high temperature, high pressure, rotating, moving, or vibrating parts, be sure to wear appropriate safety equipment and take extra care not to injure yourself or others. • When jacking up vehicle, be sure to support specified location with a safety stand. • Use appropriate safety equipment to lift vehicle.
4	Preparation for Tools and Measuring Gauge	• Before starting work, prepare a tool stand, special tools, gauge, oil and replacement parts.

⚠ Caution

- **The engine oil and oil filter should be replaced more frequently if the vehicle is driven under severe conditions mentioned in the following examples*.**
- **It should be checked every 5,000 km or 6 months (whichever comes first) if the vehicle is driven under severe conditions mentioned in the following examples*.**
- **The lubricant should be replaced every 5,000 km or 6 months (whichever comes first) if the vehicle is driven in the following areas.**
  - **High humidity areas.**
  - **Mountainous areas.**
  - **Extremely cold and hot areas.**
  - **Drive on rough roads (bumpy roads, gravel roads, snow, etc.) for a long time.**
  - **Drive on mountain roads, uphill/downhill for a long time.**
  - **Drive the vehicle for a short distance frequently.**
  - **In many cases, drive in high temperature (higher than 32℃), heavy traffic urban road.**
  - **When used as a police car, taxi, commercial vehicle, trailer, etc.**
- **The air filter and air conditioning filter should be replaced more frequently if the vehicle is driven under severe conditions mentioned in the following examples*.**

***Examples of severe driving conditions:**

- **Drive in extremely cold and hot weather (only for engine oil, engine oil level, steering and suspension system).**
- **Drive the vehicle for a short distance frequently (only for engine oil, engine oil level, disc brake pads and discs /front and rear axle boots and axle shaft joint portions, brake lining and drums).**
- **Drive on dusty roads (only for air cleaner element, disc brake pads and discs/front and rear axle boots and axle shaft joint portions, brake lining and drums, air filter element for the climate control system).**
- **Drive on rough and/or muddy roads (only for disc brake pads and discs /front and rear axle boots and axle shaft joint portions, brake lining and drums, air filter element for the climate control system).**
- **Drive in areas where road salt or other corrosive materials are used (only for fuel system, lines and connections, disc brake pads and discs/front and rear axle boots and axle shaft joint portions, brake lining and drums,inspect brake lines and check operations of parking and service brake system, steering and suspension system).**
- **In the coastal areas (only for fuel system, lines and connections, disc brake pads and discs /front and rear axle boots and axle shaft joint portions, brake lining and drums, inspect brake lines and check operations of parking and service brake system, steering and suspension system).**

2 Inspection Items

2.1 Off-vehicle inspection

- Wiper and washer
  - (1) Check if wiper blade is deformed.
  - (2) Check if wiper nozzle sprays water.
- Tire pressure
  - (1) Check if tire pressure is normal.
- Tire bolt
  - (1) Check the tire bolt torque.
  - (2) Check tire bolt for looseness or missing.

2.2 On-vehicle inspection

- Horn

(1) Check if horn sounds normally.

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
			terminal is grounded 3. Crankcase line heater pin corresponding to ECU terminal is short to ground	
P121B00	Front Left Wheel Speed Sensor Signal Abnormal	ABS-ECU sends the front left wheel speed sensor fault flag bit	1. The front left wheel speed sensor is faulty	1. Check if there is a fault in the ABS-ECU fault memory
P121C00	Front Right Wheel Speed Sensor Signal Abnormal	ABS-ECU sends the front right wheel speed sensor fault flag bit	1. The front right wheel speed sensor is faulty	1. Check if there is a fault in the ABS-ECU fault memory
P121D00	Rear Left Wheel Speed Sensor Signal Abnormal	ABS-ECU sends the rear left wheel speed sensor fault flag bit	1. The rear left wheel speed sensor is faulty	1. Check if there is a fault in the ABS-ECU fault memory
P121E00	Rear Right Wheel Speed Sensor Signal Abnormal	ABS-ECU sends the rear right wheel speed sensor fault flag bit	1. The rear right wheel speed sensor is faulty	1. Check if there is a fault in the ABS-ECU fault memory
P063449	Brake Vacuum Pump Drive Chip Overheat	Drive channel self-diagnosis is malfunctioning	1. Short circuit to power supply in brake vacuum pump control circuit 2. Brake vacuum pump control pin corresponding to ECU terminal is short to power supply	1. Short circuit to power supply in brake vacuum pump control circuit 2. If there is a fault in the internal chip of ECU

4.7 DTC Diagnosis Procedure

■ Intake/exhaust phaser operation (slow, stuck) malfunctions

DTC	**P000A00**	**"A" Camshaft Position Slow Response Bank 1**
DTC	**P003C00**	**"A" Camshaft Profile Control Performance/Stuck Off Bank 1**
DTC	**P000B00**	**"B" Camshaft Position Slow Response Bank 1**
DTC	**P005A00**	**"B" Camshaft Profile Control Performance/Stuck Off Bank 1**
DTC	**P001100**	**"A" Camshaft Position - Timing Over-Advanced or System Performance Bank 1**
DTC	**P001400**	**"B" Camshaft Position - Timing Over-Advanced or System Performance Bank 1**
DTC	**P054A00**	**Exhaust VVT Actual Position Deviation Fault During Catalytic Converter Heating**

■ DTC Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

- Turn ENGINE START STOP switch to OFF.

OK

3	Check Engine Control Module (ECU)

(a) Remove Engine Control Module (ECU) from malfunctioning vehicle.
(b) Install a new engine control module to malfunctioning vehicle.

OK → Repair or replace new module

NG

4	Reconfirm DTCs

(a) Connect diagnostic tester and clear DTCs.
(b) Run the vehicle as specified procedure. The operating way should meet the conditions for corresponding fault diagnosis.
(c) Read the fault information and confirm that the fault has been solved.

OK → Conduct test and confirm malfunction has been repaired

■ Ambient temperature sensor circuit voltage too low / too high

DTC	P121B00	Front Left Wheel Speed Sensor Signal Abnormal
DTC	P121C00	Front Right Wheel Speed Sensor Signal Abnormal
DTC	P121D00	Rear Left Wheel Speed Sensor Signal Abnormal
DTC	P121E00	Rear Right Wheel Speed Sensor Signal Abnormal

■ DTC Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

- Turn ENGINE START STOP switch to OFF.
- Connect the diagnostic tester (the latest software).
- Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
- If DTC is not detected, malfunction is intermittent.

Hint:
When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.
Read brake control system DTCs and refer to brake control system diagnosis.

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P180047h	Drive Control Clutch Brake 1: Defects in Control Path	/	• Wire harness or connector failure • TCU fault	• Check wire harness or connector • Replace TCU
P180147h	Drive Control Clutch Brake 2: Defects in Control Path	/		

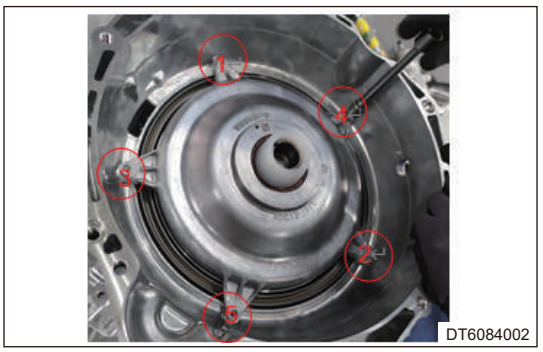
DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P180111h	Monitoring Clutch Motor 2: Short to GND	/	• Wire harness or connector failure • TCU power supply fault • Clutch motor fault • TCU fault	• Check wire harness or connector • Check TCU power supply • Replace clutch motor • Replace TCU
P180112h	Monitoring Clutch Motor 2: Short to Power Supply	/		
P180113h	Monitoring Clutch Motor 2: Open	/		
P180192h	Monitoring Clutch Motor 2 Phase: Performance or Incorrect Operation	/		

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P181192h	Clutch Cooling Motor Hall Monitoring	/	• Wire harness or connector failure • TCU power supply fault • Cooling motor fault • TCU fault	• Check wire harness or connector • Check TCU power supply • Replace cooling motor fault • Replace TCU
P180411h	Monitoring Cooling Motor: Short to GND	/	• Wire harness or connector failure • TCU power supply fault • Cooling motor fault • TCU fault	• Check wire harness or connector • Check TCU power supply • Replacement of Cooling Motor • Replace TCU
P180412h	Monitoring Cooling Motor: Short to Power Supply	/		
P180413h	Monitoring Cooling Motor: Open	/		
P180447h	Drive Control Clutch Cooling Brake: Defects in Control Path	/		

(6) Replace the clutch cover O-ring.

(7) Install clutch cover, tighten 5 fixing bolts on clutch cover in order shown in illustration.

Tightening torque: 5.5 ± 0.5 N·m



⚠ Caution

- **In the process of tightening, pay attention to ensure that clutch cover is in horizontal direction to avoid crushing needle bearing due to imbalanced bolt tightening force.**
- **Pay attention to whether the process of tightening bolts is not smooth due to the interference of roller bearings.**

⚠ Warning

- **During and after the installation of clutch cover, ensure that the oil seal lip is not flanged. If the oil seal lip is damaged, it will definitely cause oil leakage.**
- **Ensure that the O-ring is not damaged, otherwise, it may cause oil leakage.**

(8) .

■ Detection

Test Function After Assembly

(1) Manually rotate the clutch drive disc shaft input spline to ensure smooth rotation.

Inspection of Differential Oil Seal

(1) After the clutch is installed, please check the differential oil seal carefully. When disassembling clutch from vehicle, if any damage is found, please replace oil seal with differential oil seal assembly fixture.

Applying Grease to Shaft Spline

(1) Apply M- setra1-43N grease to drive disc spline.

Install transmission to the vehicle.

- Oil traces reach lower connecting positions.

Above conditions indicate that there may be leakage in shock absorber assembly, and it is necessary to replace the shock absorber assembly.

(3) If it is difficult to accurately judge shock absorber assembly for leakage from appearance. Perform road test after wiping off oil on the surface of malfunctioning shock absorber. Under normal road conditions, drive vehicle for 5 to 10 minutes and perform inspection. If there are oil traces at the shock absorber assembly surface, it indicates that oil leakage exists, and it is necessary to replace the shock absorber assembly.

■ Removal

Hint:

- Use same procedures for right and left sides.
- Procedures listed below are for left side.

⚠ Caution

- **Be sure to wear necessary safety equipment to prevent accidents.**
- **Make sure that safety lock of lifter has been locked, when removing and installing chassis parts.**
- **It is not allowed to weld or modify suspension loading parts and guide parts.**
- **When removing and installing chassis parts, replace self-locking nuts and rusted nuts for safety.**

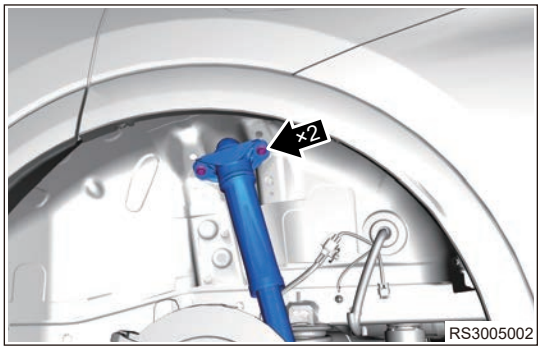
(1) Turn off all electrical equipment and ENGINE START STOP switch.

(2) Disconnect the negative battery cable.

(3) Remove the rear left wheel.

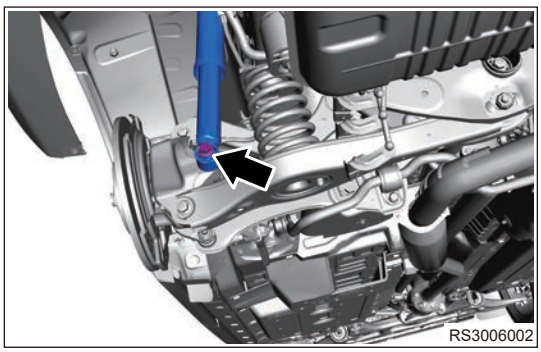
(4) Remove the rear left wheel house protector.

(5) Remove 2 coupling bolts (arrow) between upper part of rear left shock absorber assembly and body.



(6) Support the lower control arm with a transmission carrier.

(7) Remove coupling bolt and nut (arrow) between lower part of rear left shock absorber assembly and rear left steering knuckle assembly.



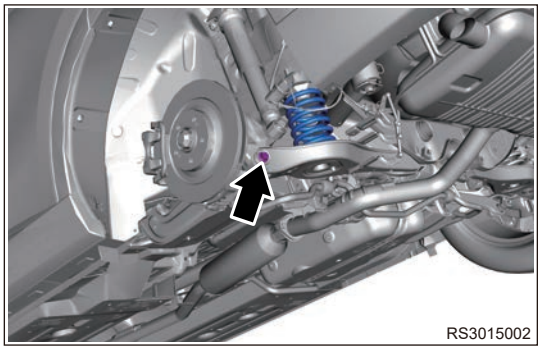
(8) Remove the rear left shock absorber assembly.

■ Disassembly

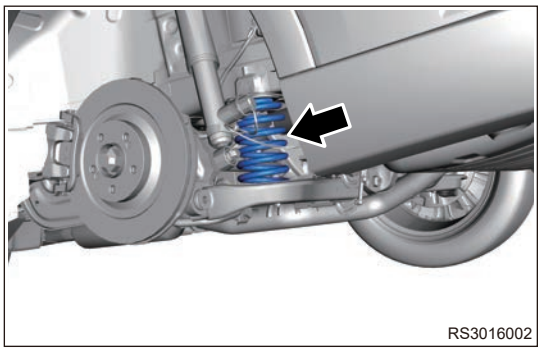
Hint:

- Use same procedures for right and left sides.
- Procedures listed below are for left side.

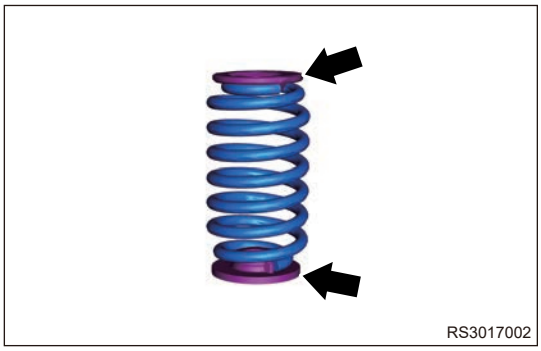
(5) Remove coupling bolt and nut between rear lower control arm assembly and rear steering knuckle assembly.


RS3015002

(6) Lower the transmission carrier slowly to an appropriate height and remove the rear coil spring carefully.


RS3016002

(7) Remove the rear coil spring upper and lower cushions.


RS3017002

■ **Inspection**

(1) Check rear coil spring for wear, cracks or permanent deformation due to excessive use. Replace it as necessary.

(2) Check rear coil spring upper cushion and lower cushion for dirty, wear, cracks, deformation or damage. Replace it as necessary.

(3) Check the free length of rear coil spring.

■ **Installation**

⚠ Caution

- **Be sure to tighten coupling bolts and nuts to specified torques.**
- **Align the protrusion of rear coil spring lower cushion with the positioning hole of rear lower control arm during installation.**
- **After installation, lower vehicle and bounce vehicle up and down several times to stabilize rear suspension.**
- **Check wheel alignment after installation is completed. Adjust wheel alignment to standard range as necessary.**

(1) Install the rear coil spring upper and lower cushions.

(2) Install coil spring and use transmission carrier to lift rear lower control arm to a proper height.

(3) Install coupling bolt and nut between rear lower control arm assembly and rear steering knuckle assembly.

DTC	DTC Definition	Detection Condition	Possible Causes	Maintenance Advice
U142281	EngineNet_ InvalidValue-Invalid Serial Data Received	/	Invalid signal received	
U162208	AWDNet_ InvalidValue	/	Invalid signal received	
C005129	Steering Wheel Position Sensor - Signal Invalid	/	• EMS fault • TCU fault • SAS fault or bus abnormal • YAS fault or uncalibrated • SAS fault or uncalibrated	
U162908	WorkingMode_ InvalidValue	/	Invalid signal received	
U142381	StartStopNet_ InvalidValue-Invalid Serial Data Received	/	Invalid signal received	
U024587	Lost Communication with IHU	/	Signal lost	
U054681	Invalid Data Received From IHU	/	Invalid signal received	
U116387	Lost Communication with FRM	/	Signal lost	• Check wire harness and connector • Check related module
U043381	Invalid Data Received From FRM	/	Invalid signal received	
U116187	Lost Communication With RLCR	/	Signal lost	
U143587	Invalid Data Received From RLCR	/	Invalid signal received	
U119787	Lost Communication With IDCU	/	Signal lost	
U143781	Invalid Data Received From IDCU	/	Invalid signal received	
U014287	Lost Communication With APA	/	Signal lost	

(3) Install and tighten coupling nut between front right brake pipe assembly and front right brake hose assembly.

Torque: 18 ± 2 N·m

(4) Install the rear right brake pipe I assembly.

(5) Install and tighten coupling nut between rear right brake pipe I assembly and integrated brake controller assembly.

Torque: 18 ± 2 N·m

(6) Install and tighten coupling nut between rear right brake pipe I assembly and two-way.

Torque: 18 ± 2 N·m

(7) Install the rear right brake pipe II assembly.

(8) Install and tighten coupling nut between rear right brake pipe II assembly and two-way.

Torque: 18 ± 2 N·m

(9) Install and tighten coupling nut between rear right brake pipe II assembly and rear right brake hose assembly.

Torque: 18 ± 2 N·m

(10) Install rear right wheel house protector assembly.

(11) Install the front left brake pipe assembly.

(12) Install and tighten coupling nut between front left brake pipe assembly and integrated brake controller assembly.

Torque: 18 ± 2 N·m

(13) Install and tighten coupling nut between front left brake pipe assembly and front left brake hose assembly.

Torque: 18 ± 2 N·m

(14) Install the rear left brake pipe I assembly.

(15) Install and tighten coupling nut between rear left brake pipe I assembly and integrated brake controller assembly.

Torque: 18 ± 2 N·m

(16) Install and tighten coupling nut between rear left brake pipe I assembly and two-way.

Torque: 18 ± 2 N·m

(17) Install the rear left brake pipe II assembly.

(18) Install and tighten coupling nut between rear left brake pipe II assembly and two-way.

Torque: 18 ± 2 N·m

(19) Install and tighten coupling nut between rear left brake pipe II assembly and rear left brake hose assembly.

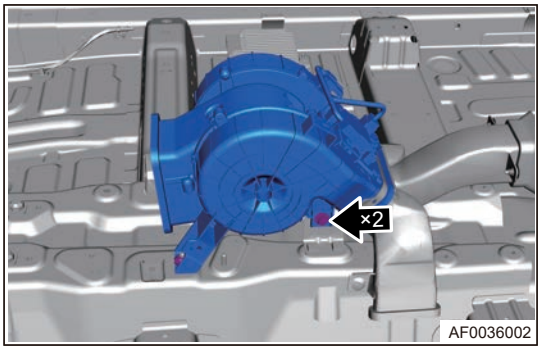
Torque: 18 ± 2 N·m

(20) Install the rear left wheel house protector assembly.

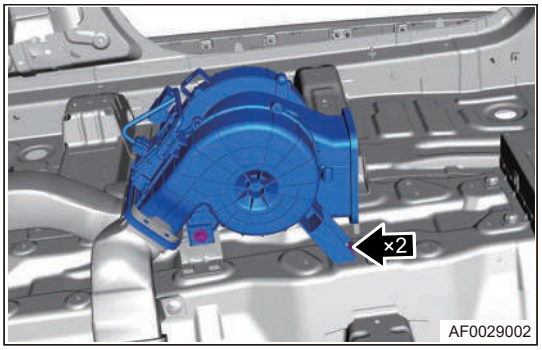
(21) Add standard amount of brake fluid and drain the air in system.

(22) Install four wheels.

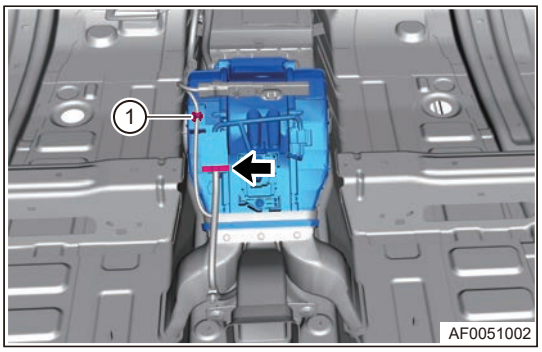
(4) Remove 1 fixing nut and 1 fixing bolt (arrow) from left side of rear blower assembly.



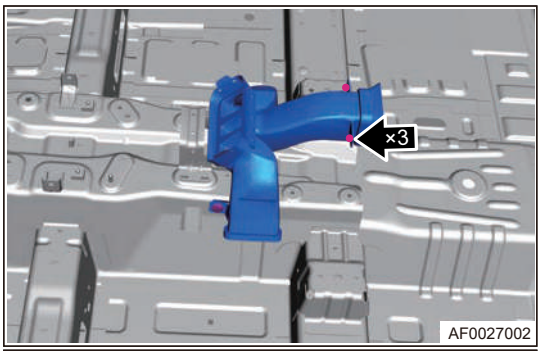
(5) Remove 1 fixing nut and 1 fixing bolt (arrow) from right side of rear blower assembly.

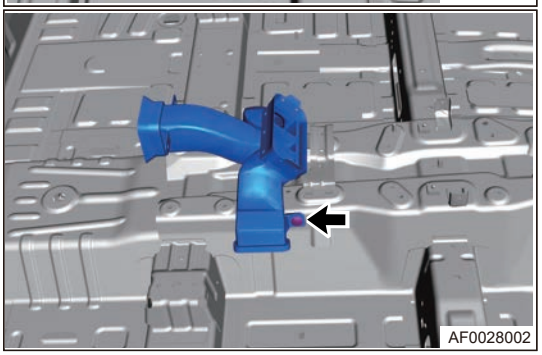


(6) Remove the rear blower wire harness connector (-arrow), wire harness clip (1), and rear blower assembly.



(7) Remove 4 plastic clips on the left and right sides of rear blower transition duct, and remove the rear blower transition duct (arrow).



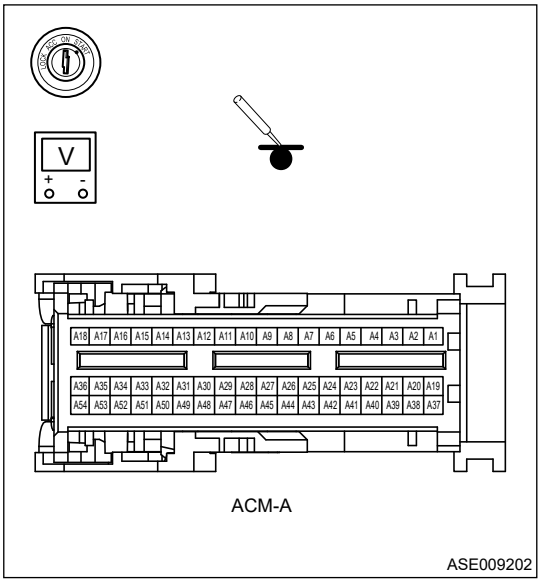


(a) Disconnect the airbag connector.

(b) Turn ENGINE START STOP switch to ON.

(c) Check voltage between connector terminal circuit and ground.

Multimeter Connection	Condition	Specified Condition
Airbag module (-front left collision sensor+) - Body ground	ENGINE START STOP switch ON	0 V
Airbag module (-front left collision sensor-) - Body ground	ENGINE START STOP switch ON	0 V



ACM-A

ASE009202

NG → **Repair or replace front left collision sensor wire harness**

OK

2	Check resistance between front left collision sensor circuit and ground

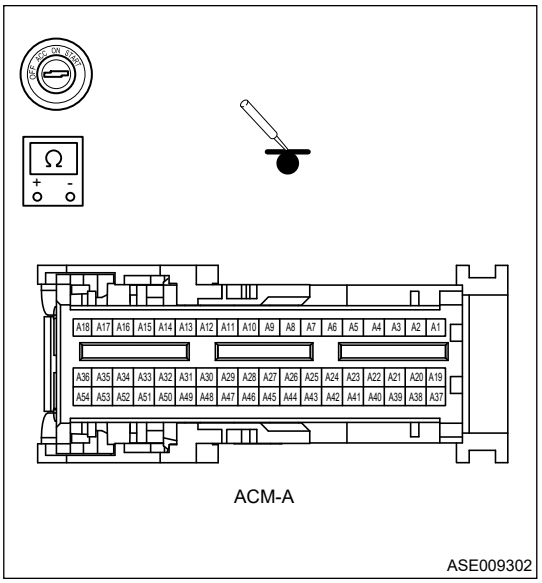
(a) Disconnect front left collision sensor connector.

(b) Disconnect the airbag connector.

(c) Turn ENGINE START STOP switch to OFF.

(d) Perform the resistance inspection.

Multimeter Connection	Condition	Specified Condition
Airbag module (-front left collision sensor+) - Body ground	ENGINE START STOP switch OFF	∞
Airbag module (-front left collision sensor-) - Body ground	ENGINE START STOP switch OFF	∞



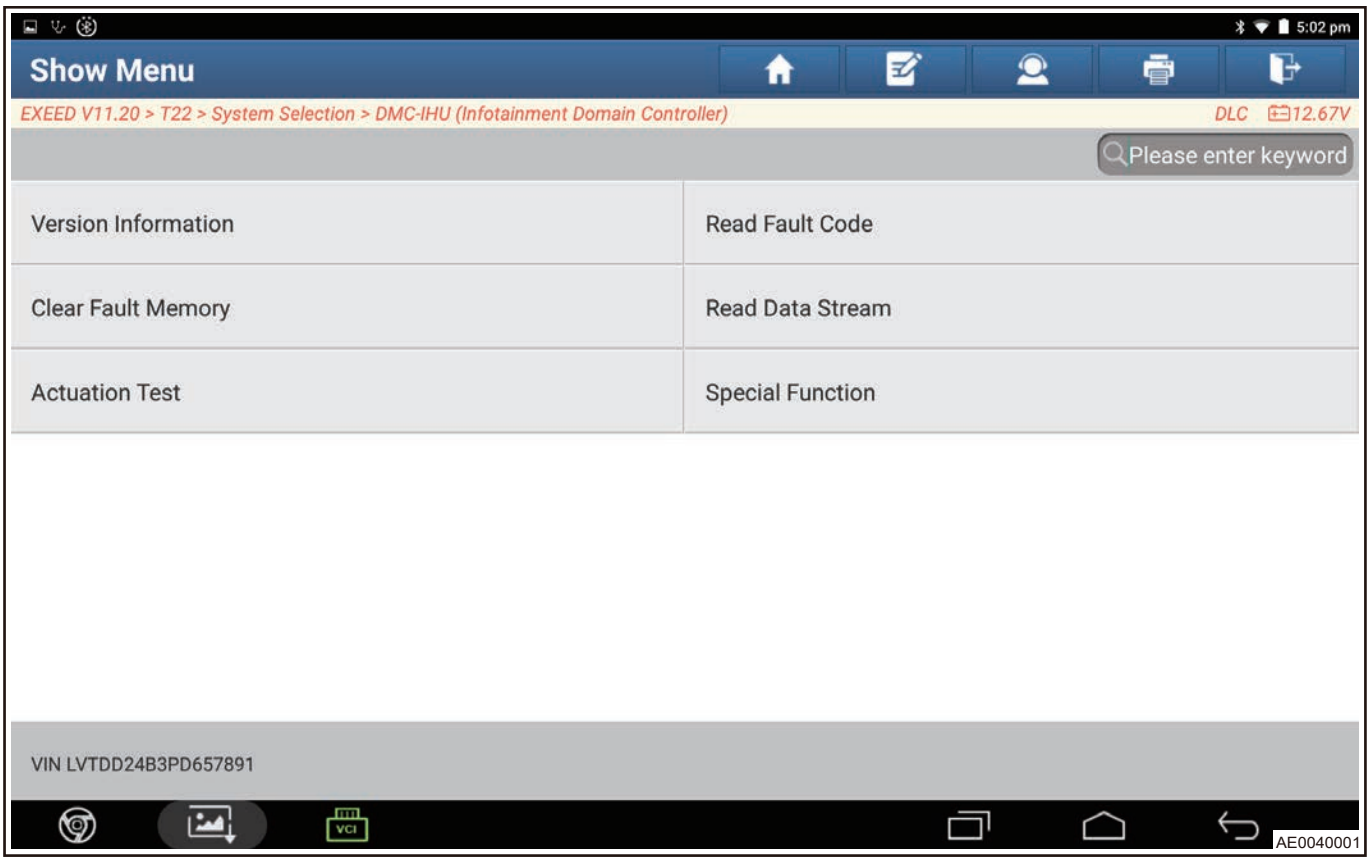
ACM-A

ASE009302

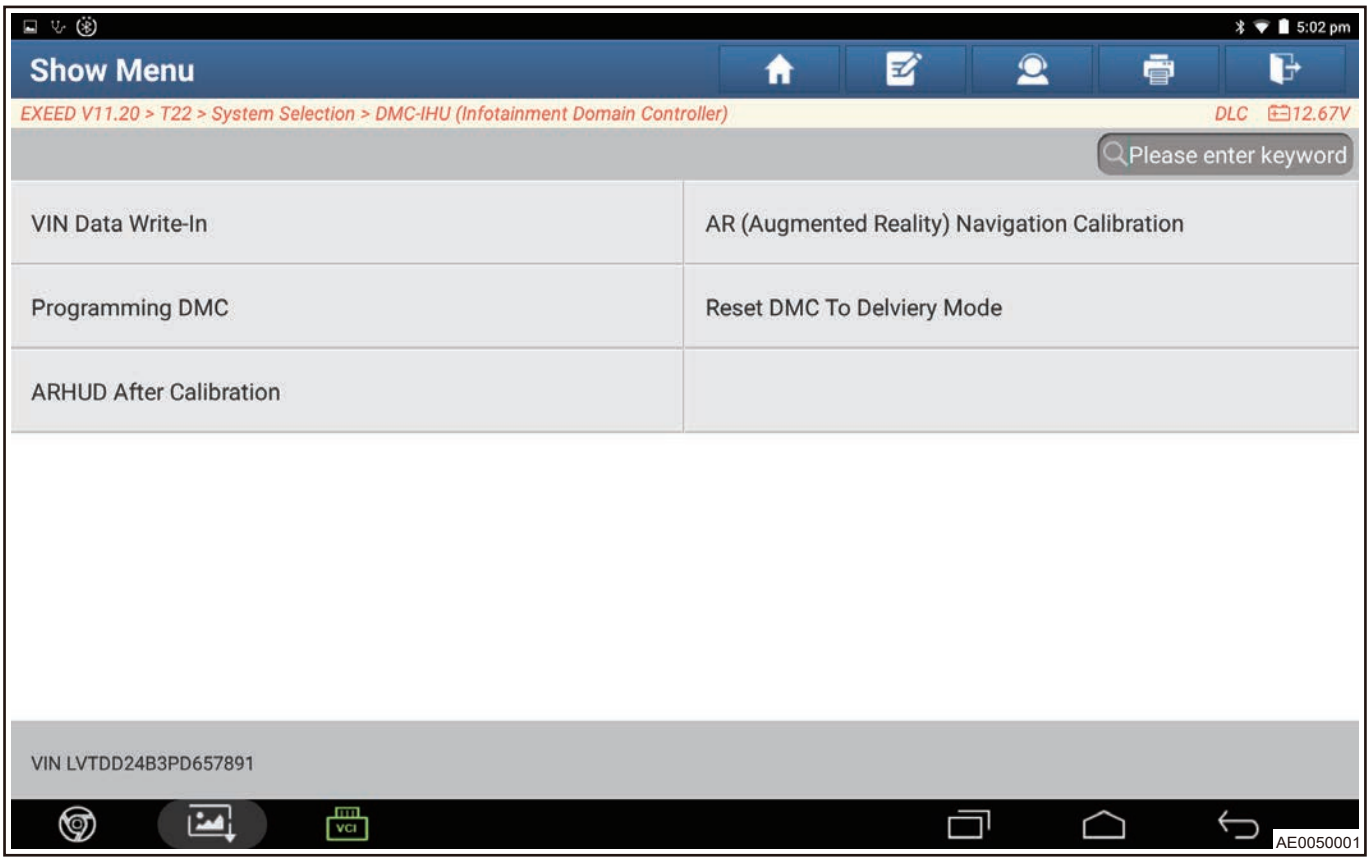
NG → **Repair or replace front left collision sensor wire harness**

OK

3	Check circuit between airbag controller and front left collision sensor



(6) Enter next screen and click “VIN Code Write-in”.



(7) Input VIN code, and click “OK”.

4.6 Backup Power Supply and Cigarette Lighter

■ Removal

⚠ Caution

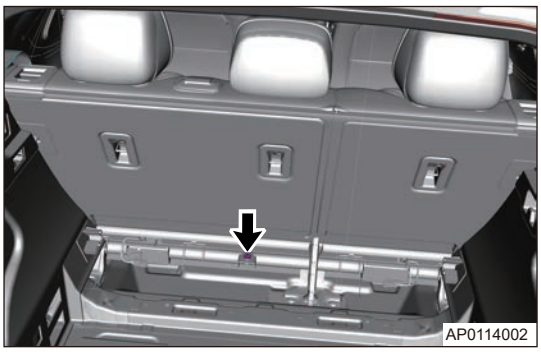
- **Be sure to wear safety equipment to prevent accidents, when removing wireless charging module assembly.**
- **Appropriate force should be applied, when removing wireless charging module assembly. Be careful not to operate roughly.**
- **Try to prevent auxiliary fascia console assembly from being scratched, when removing wireless charging module assembly.**

(1) Turn off all electrical equipment and ENGINE START STOP switch.

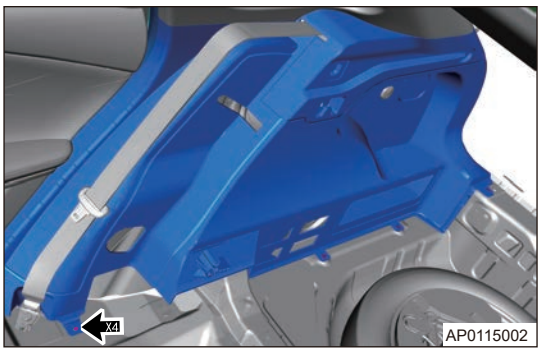
(2) Disconnect the negative battery cable.

(3) Loosen 2 screws (arrow) from back doorsill pressure plate assembly with a cross screwdriver.

(4) Remove the tool box, lower the seat cushion seatback, and remove the seat cushion bolt (arrow).



(5) Remove 4 screws (arrow) and right luggage compartment wheel house assembly.



4.2 Specifications

■ Torque Specifications

Description	Torque (N · m)
Front Wiper Arm Assembly Fixing Nut	24 ± 4
Wiper Motor and Link Rod Assembly Fixing Bolt	9 ± 1.5
Washer Fluid Reservoir Assembly Fixing Bolt	7 ± 1.5

4.3 Combination light switch assembly

■ Removal

(1) Turn off all electrical equipment and ENGINE START STOP switch.

(2) Disconnect the negative battery cable.

(3) Remove the driver airbag.

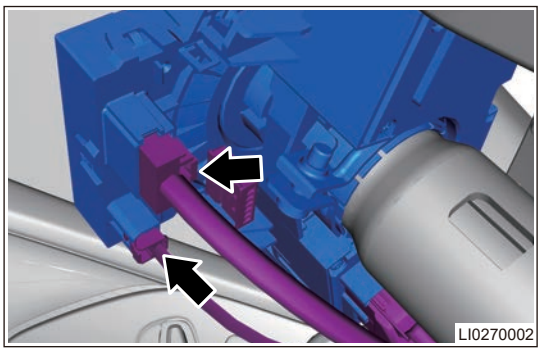
(4) Remove the steering wheel.

(5) Remove the combination switch cover.

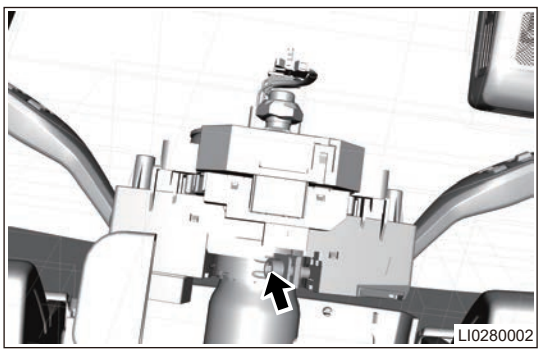
(6) Remove the spiral cable assembly.

(7) Remove the combination switch assembly.

1) Disconnect the combination switch connector.



2) Remove the fixing bolt, and remove the combination switch assembly.



■ Installation

⚠ Caution

- **Always install spiral cable correctly according to specified operating instructions.**
- **Check that horn operates normally after installation.**
- **Check SRS warning light after installation, and make sure that supplemental restraint system operates normally.**