1.1 SERVICE INFORMATION

1 How to Use This Manual

(1) General information

This manual includes all necessary procedures for service operations.

These procedures can be divided into following three categories:

- Diagnosis.
- Removal and installation, replacement, disassembly and assembly, inspection and adjustment.
- Inspection.

Following procedures are omitted from this manual. However, they must be performed.

- Use a transmission tray or lifter to perform operations.
- Clean all removed parts.
- Perform a visual check.

WARNING	This indicates that injuries to you or other people may happen.
CAUTION	This indicates that damage to repairing components may happen.
HINT	Provide additional information to help you with service operations.

(2) Service procedure

Illustrations for service procedures are used to identify components, show the assembling relevance of parts, and explain the visual check for parts. Removal and installation procedures are explained in words.

Service procedures include:

- Detailed removal and installation instruction
- Illustration
- Torque specifications
- Specifications

Sometimes, the illustrations of similar models are used. In this case, minor details may be different from actual vehicle.

(3) Diagnosis procedure

Diagnosis procedures are divided as below:

- Diagnostic Trouble Code (DTC)

  DTC is an important hint when troubleshooting is difficult to simulate. The malfunction can be diagnosed quickly and accurately by performing specified DTC diagnosis and check.

- Problem Symptoms Table

  Malfunction locations can be determined quickly by troubleshooting in accordance with symptom type.

(4) Specifications

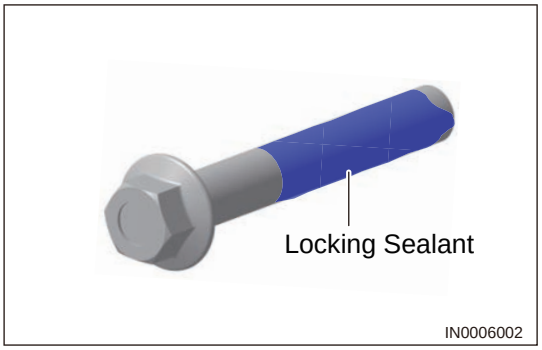
This manual categorizes specifications as below:

- Torque specifications
- Clearance specifications
- Capacity specifications

2 Preparation

(1) Preparation for vehicle service

Pre-coated parts are bolts and nuts that are coated with seal lock adhesive in the factory. If a pre-coated part is retightened, loosened, or moved in any way, be sure to reapply the specified adhesive.



(12) Rubber parts and rubber hoses

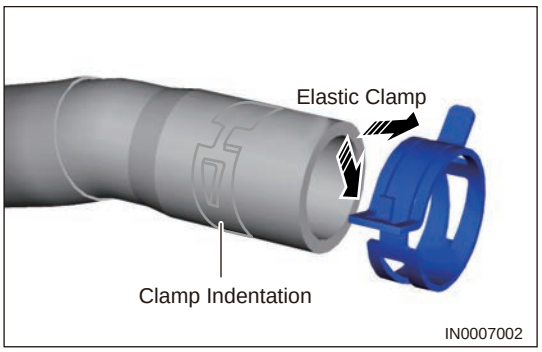
Avoid gasoline or oil dripping on rubber parts or rubber hoses.

(13) Hose clamp

Before removing a hose, observe the position of clamp so as to reinstall it to the same position.

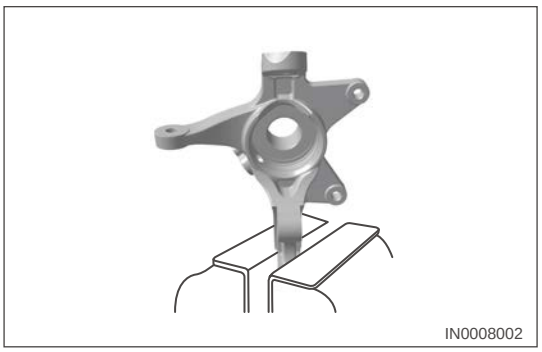
Replace deformed or dented clamps with new ones. When reusing a hose, fix the clamp on the clamp track portion of hose.

For elastic clamp, push tabs in direction of arrow as shown in illustration after installation to widen the tabs slightly.



(14) Vise

When using a vise, install protective plates on jaws of vise to prevent parts from being damaged.



(15) Dynamometer

When testing vehicle on dynamometer, pay attention to the following:

- Place a fan in front of vehicle. It is best to use a fan of which the power changes in proportion to vehicle speed.
- Connect an exhaust gas ventilator.

⚠ Caution
Exhaust gas may cause injury and death. There is odorless, colorless Carbon Oxide (CO) in the exhaust gas. People will faint and get poisoned after inhaling it.

- Cool the exhaust pipe with a fan.
- Keep the area around vehicle clean and tidy.
- Monitor engine coolant thermometer.

4 VEHICLE INFORMATION

(1) Vehicle Identification Number (VIN) on actual vehicle

DTC	P003A72	Turbocharger/Supercharger Boost Control "A" Position Exceeded Learning Limit
DTC	P003A73	Turbocharger/Supercharger Boost Control "A" Position Exceeded Learning Limit
DTC	P024437	Turbocharger/Supercharger Wastegate Actuator "A" Range/ Performance

■ 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.

1	**Check by-pass valve actuator conditions**

(a) Check for foreign matter near turbocharger closed position.
(b) Check if electronic waste gate is stuck.
(c) Push the turbocharger to closed position manually, read position voltage to check if it is out of the range of SPEC.

NG → **Clean up foreign matter or replace turbocharger assembly.**

OK

2	**Check by-pass valve actuator connector**

(a) Check if connector and wire harness are deteriorated.

NG → **Repair or replace wire harness.**

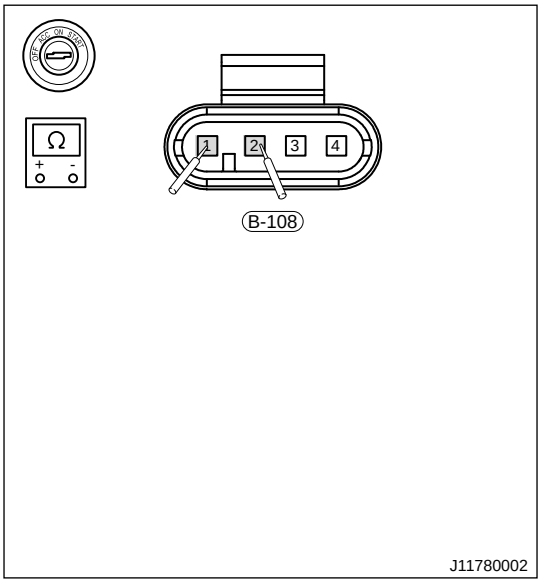
OK

3	**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**

(a) Using ohm band of multimeter, measure resistances of fuel level sensor B-108 (1, 2) with red and black probes respectively; Check if they are shorted to each other or opened.



NG → **Replace fuel level sensor assembly.**

OK →

4	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 →

5	Reconfirm DTCs

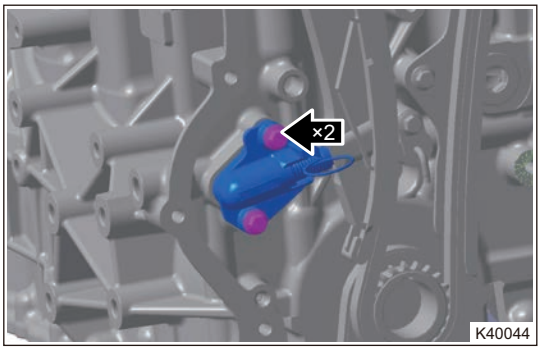
(a) Connect diagnostic tester and clear DTCs.
(b) Run the vehicle as specified procedure. The operating way should meet the conditions for corresponding fault diagnosis.
(c) Read the fault information and confirm that the fault has been solved.

OK → **Conduct test and confirm malfunction has been repaired**

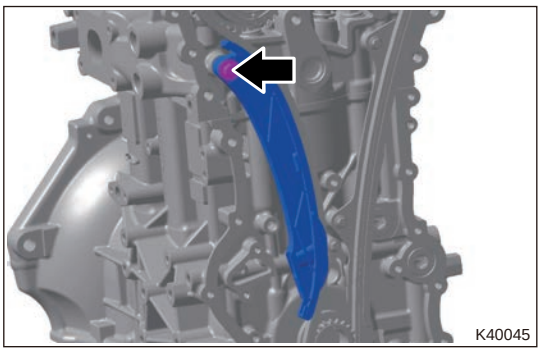
■ **Evaporation System Leakage Malfunction**

DTC	**P044200**	**EVAP System Leak Detected (Small Leak)**
DTC	**P045500**	**EVAP System Leak Detected (Large Leak)**

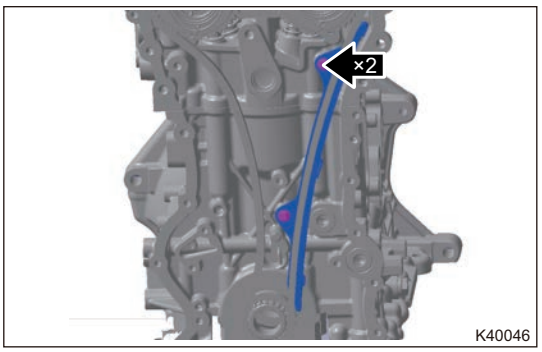
(20) Remove 2 fixing bolts and hydraulic tensioner assembly.



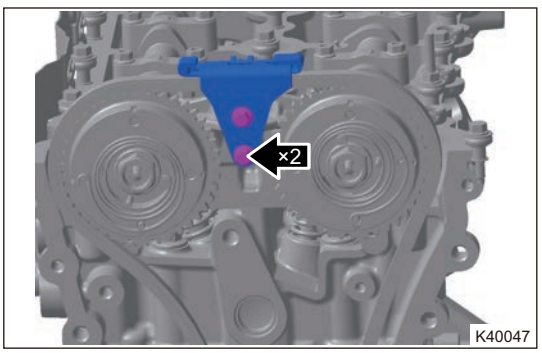
(21) Remove 1 fixing bolt and movable guide rail assembly.



(22) Remove 2 fixing bolts and fixing guide rail assembly.



(23) Remove 2 fixing bolts and upper chain guide rail assembly.

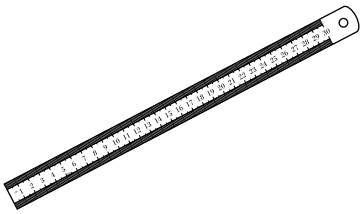


(24) Remove the engine timing chain.

4 On-vehicle Service

4.1 Tools

■ General Tools

Tool Name	Tool Drawing
Precision Straightedge	 S00044

4.2 Turbocharger Heat Insulator

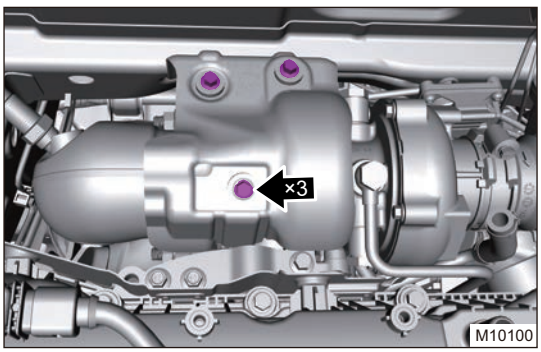
■ Removal

⚠ Warning

- **Before removing turbocharger heat insulator assembly, make sure that engine has stopped running and exhaust system has cooled down sufficiently, otherwise, there is a risk of scald injury.**
- **Be sure to wear safety equipment to prevent accidents, when removing turbocharger heat insulator assembly.**
- **Appropriate force should be applied, when removing the turbocharger heat insulator assembly. Be careful not to operate roughly.**

(1) Turn off all electrical equipment and ENGINE START STOP switch.
(2) Remove the engine compartment trim cover assembly.
(3) Remove the negative battery cable.

(4) Removal 3 fixing bolts from turbocharger heat insulator assembly.



(5) Remove the turbocharger heat insulator assembly carefully.

■ Installation

(1) Install 3 fixing bolts on turbocharger heat insulator assembly.

Torque: 8 + 3 N·m

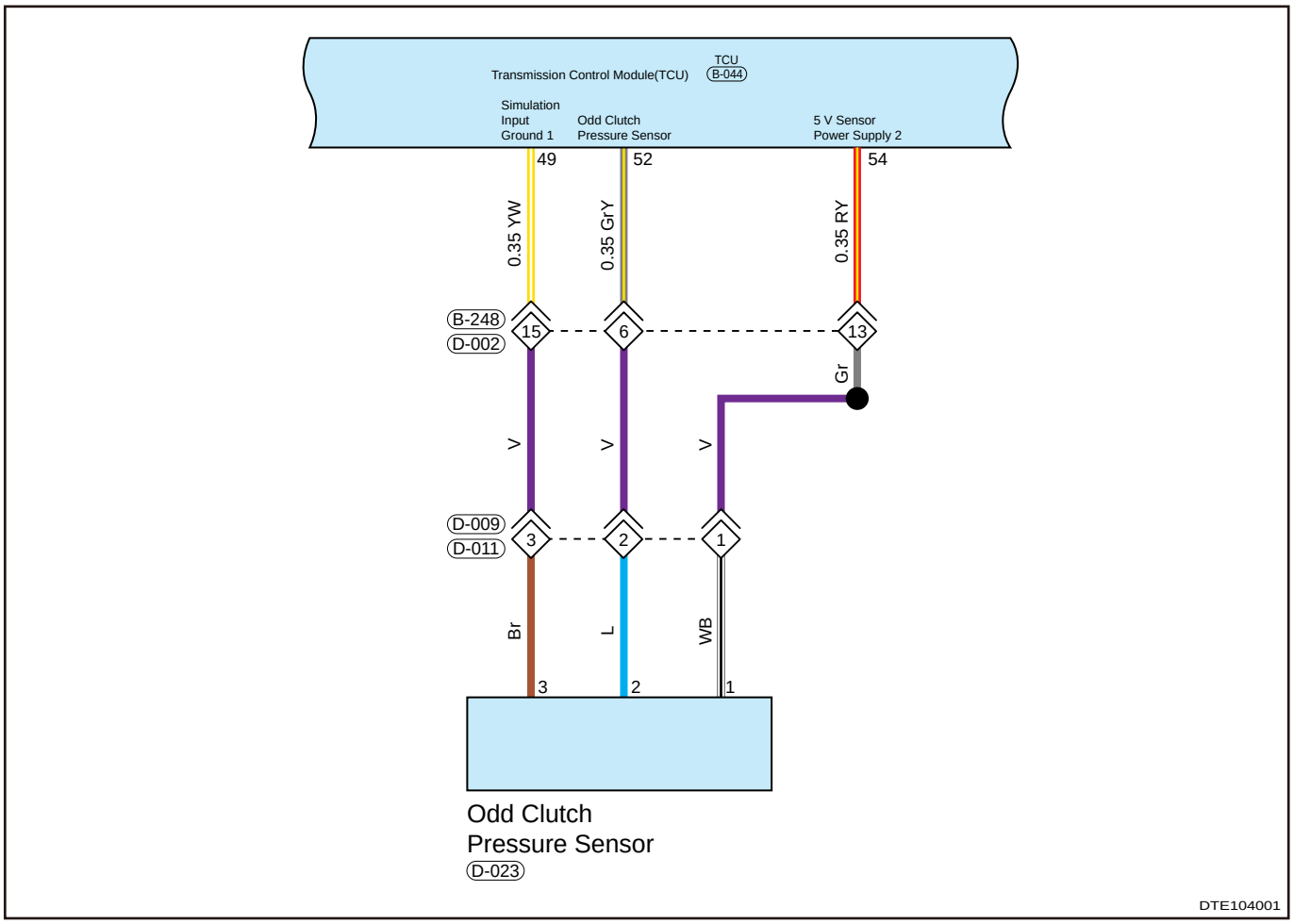
(2) Install the engine compartment trim cover assembly.

NG → Replace TCU module assembly

■ Odd Clutch Pressure Sensor DTCs

DTC	P084214	Odd Clutch Pressure Sensor Short to Ground or Open
DTC	P084312	Odd Clutch Pressure Sensor Short to Power Supply

Circuit Diagram



■ DTC Confirmation Procedure

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

- Turn ENGINE START STOP switch to ON.
- Connect diagnostic tester (the latest software) to Data Link Connector (DLC).
- Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
- If DTC cannot be cleared, malfunction is current.
- Only use a digital multimeter to measure voltage of electronic system.
- Refer to any Technical Bulletin that may apply to this malfunction.
- Visually check the related wire harness.
- Check and clean all Transmission Control Unit (TCU) ground related to latest DTC.
- If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

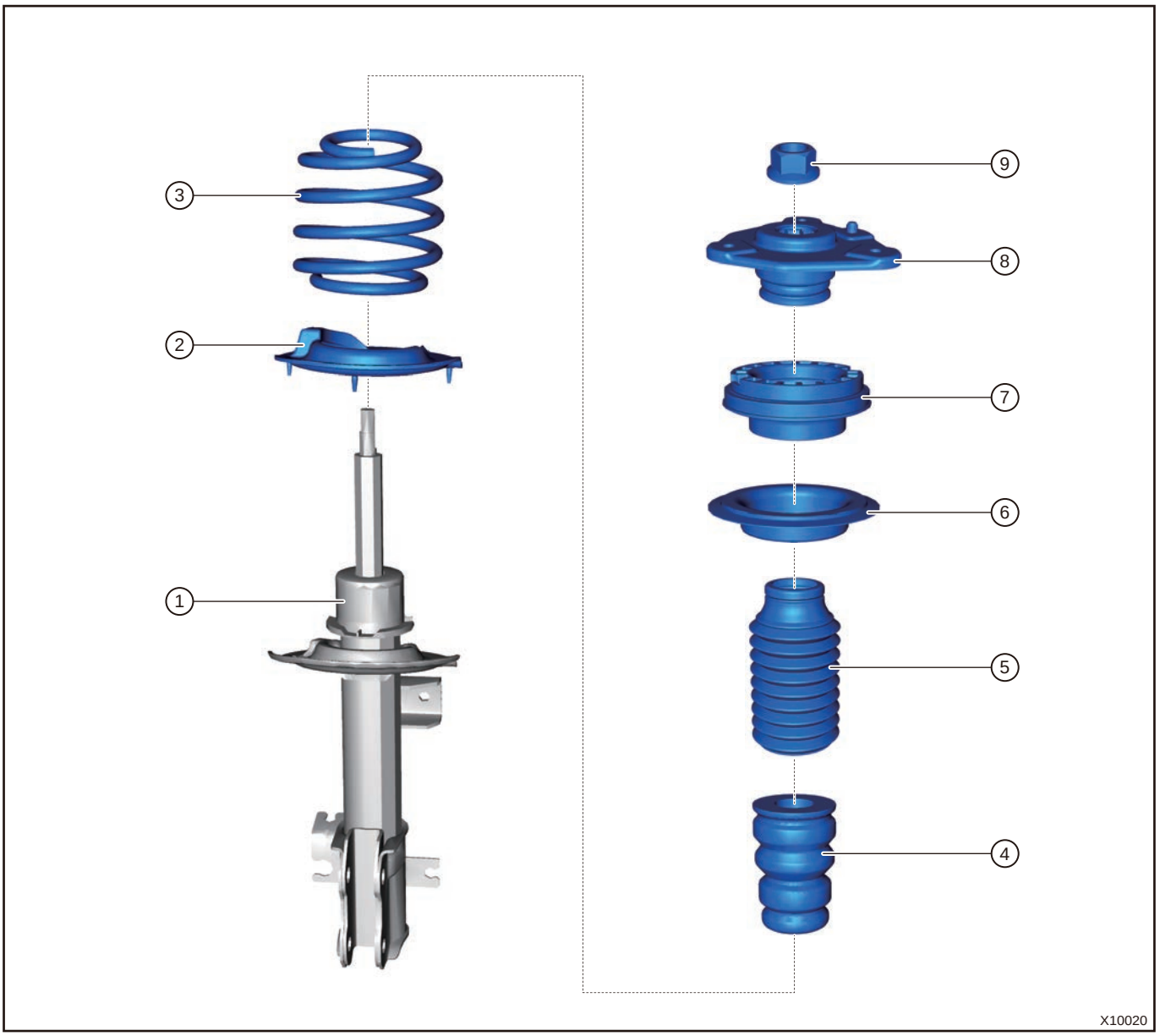
Hint:
When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

Symptom	Suspected Area
Abnormal tire wear	Rear tire (improperly inflated)
	Rear wheel alignment (incorrect)
	Rear shock absorber assembly (worn or deformed)
	Rear suspension components (worn or deformed)

6 On-vehicle Service

6.1 Front Shock Absorber Assembly

■ Description

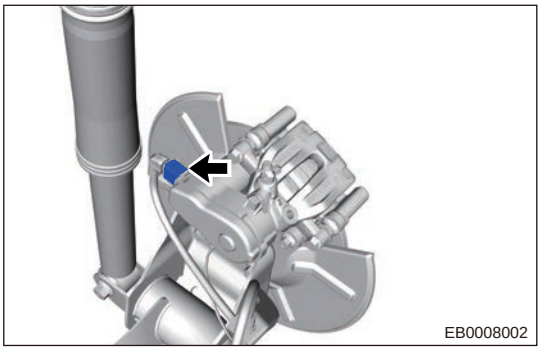


1	Front Shock Absorber Assembly	6	Upper Spring Cushion
2	Lower Spring Cushion	7	Bearing Assembly
3	Front Coil Spring	8	Upper Connecting Plate Assembly

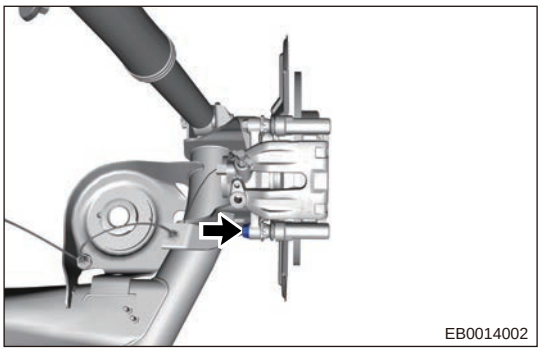
(1) Use diagnostic tester to enter parking brake maintenance mode.

(2) Remove the rear wheel brake lining.

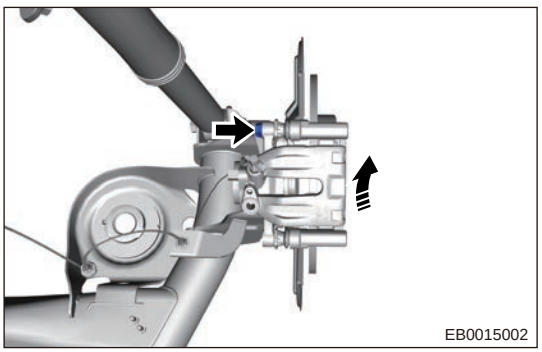
1) Disconnect the integrated caliper motor wire harness connector (arrow).



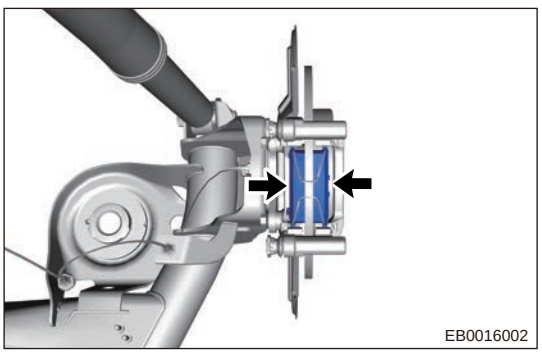
2) Remove the lower fixing bolt (arrow) from single guide pin.



3) Flip the parking caliper around another guide pin (-arrow) and use hook to lift the caliper.



4) Remove the brake lining (arrow) that needs to be replaced.



⚠ Caution

- **After removing EPB caliper set, it is strictly forbidden to depress brake pedal, otherwise the piston will rush out of cylinder hole and the brake fluid will come out and pollute brake disc and other parts.**
- **Move caliper equipped with spring diaphragm slowly during this process, spring may flick the brake lining and drop on the foot.**

■ **Maximum Defrosting Function**

No.	Function	Function Description	Note
1	The maximum defrost mode is associated with the state	Only front A/C is equipped with the maximum defrosting function. When pressing the maximum defrosting button, enter the maximum defrosting state. Maximum defrosting state correlation: 1. The mode is window, mode status sends Defrost; 2. A/C request ON; 3. Outer circulation; 4. Max airflow volume; 5. Others are not affected, and rear A/C function is not affected.	
2	Switching maximum defrosting mode	In maximum defrosting mode: If entering the maximum defrosting from LO/HI, operate the mode button, the mode enters manual mode, only the mode enters the modified position, and the rest maintains the previous state. If entering the maximum defrosting from automatic/manual, operate the mode button, mode, airflow volume, REC, AC enter manual mode, the mode enters the modified position, compressor, blower and circulation motor maintain the previous state; If entering the maximum defrosting from LO/HI, change the airflow volume, airflow volume enters manual mode, airflow volume is modified to the changed gear, and the rest maintains the previous state; if entering the maximum defrosting from automatic/manual, change the airflow volume, airflow volume is modified to the changed gear, compressor, mode motor and circulating motor maintain the previous state; 3. Press the maximum defrosting button again to exit the maximum defrosting and enter the previous state (A/C, airflow volume, circulation, mode), if the previous state is in OFF, it will return to AUTO; 4. Press Auto button to exit maximum defrosting and enter Auto state; 5. Press Power button to exit the maximum defrosting and enter OFF mode (if pressing Power button/operating airflow volume + button again, it will return to the previous non-maximum defrosting state); 7. Press A/C, the maximum defrosting will not exit, all maintain the previous state; 8. Perform circulation, the maximum defrosting will not exit, all maintain the previous state; 9. The set temperature, SYNC, PM2.5 can operate normally without affecting the maximum defrosting state.	
3	Impact of IGN to maximum defrosting	IGN ON→OFF→ON, the maximum defrosting is memorized at this time.	

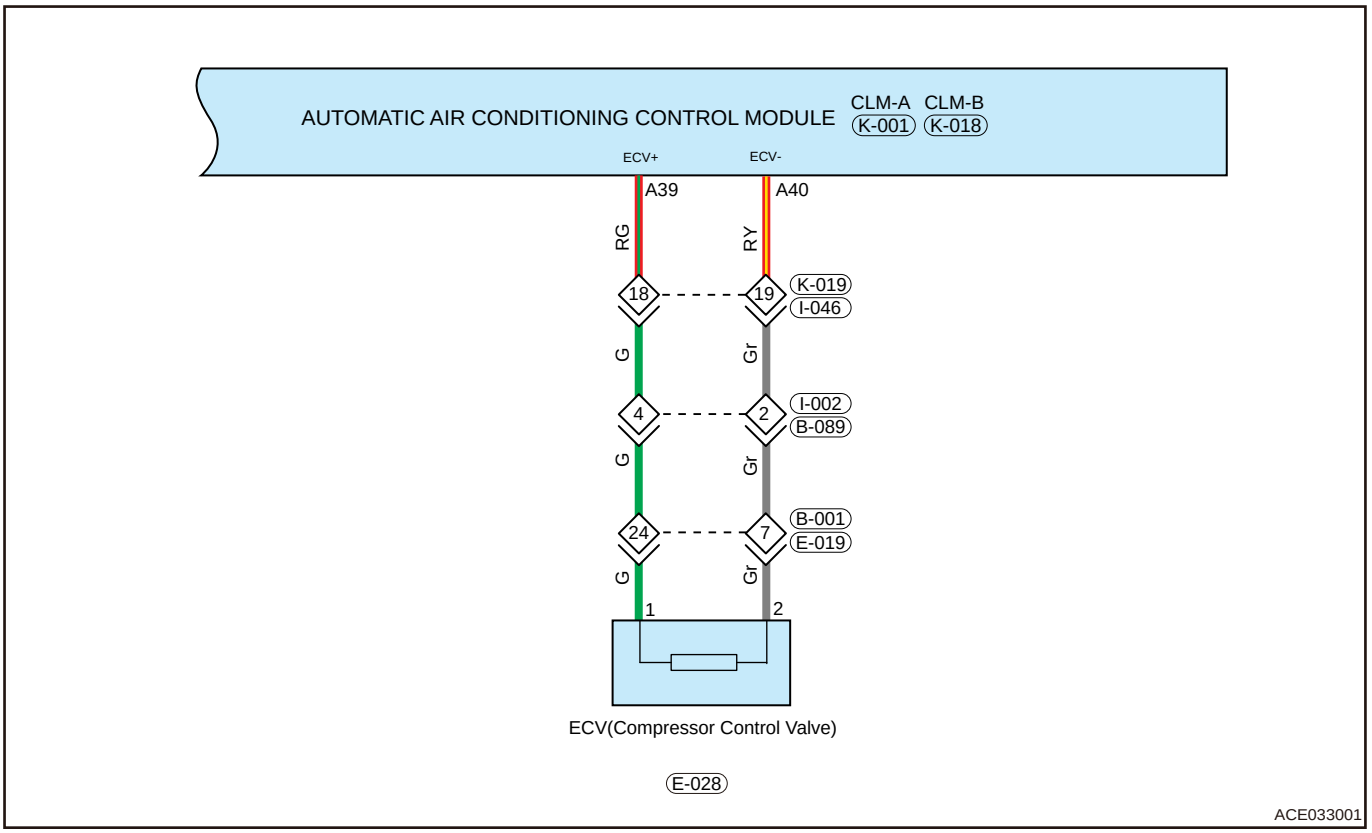
OK	Conduct test and confirm malfunction has been repaired.

■ **Compressor External Control Valve Malfunction**

DTC	B14F711	ECV Control Circuit Short to Ground
DTC	B14F715	ECV Control Circuit Short to Power Supply or Open

■ **Description**

Control schematic diagram



■ **DTC Confirmation Procedure**

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

1	**Check wire harness and connector.**

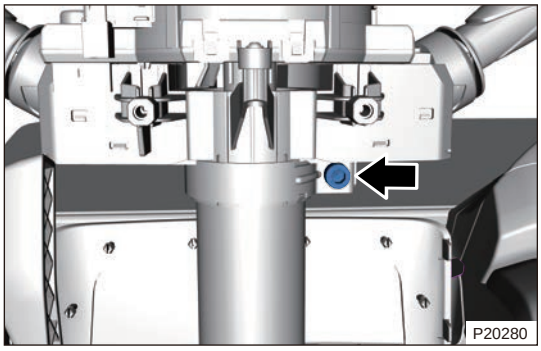
(a) Turn ENGINE START STOP switch to OFF.

(b) Check connector terminals for abdicated, bend or poor connection, etc.

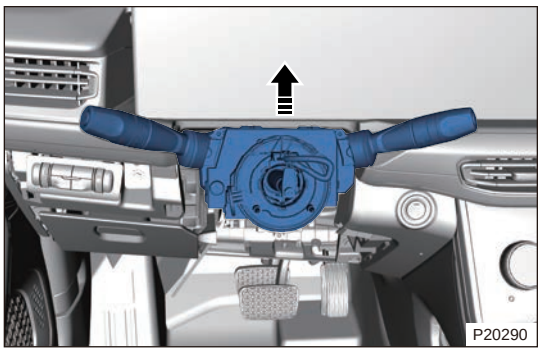
(c) Disconnect external control compressor solenoid valve connector E-028 and automatic A/C control module connector K-001.

NG	Repair or replace wire harness.

(8) Loose 1 fixing screw of SCM module. (6# inner hexagon wrench)



(9) Remove SCM module from steering column in direction of arrow.



■ Inspection

(1) Check whether any connector of spiral cable is damaged or exposed before assembly.

(2) Check whether there are cracks in plastic parts of spiral cable before assembly.

■ Installation

⚠ Caution

- **Always install 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.**

(1) Install SCM module with coil spring to steering column.

(2) Install and tighten fixing screw of coil spring.

Torque: 6 ± 0.5 N·m

(3) Connect spiral cable wire harness connector and angle sensor connector.

(4) Install the combination switch cover assembly.

⚠ Caution

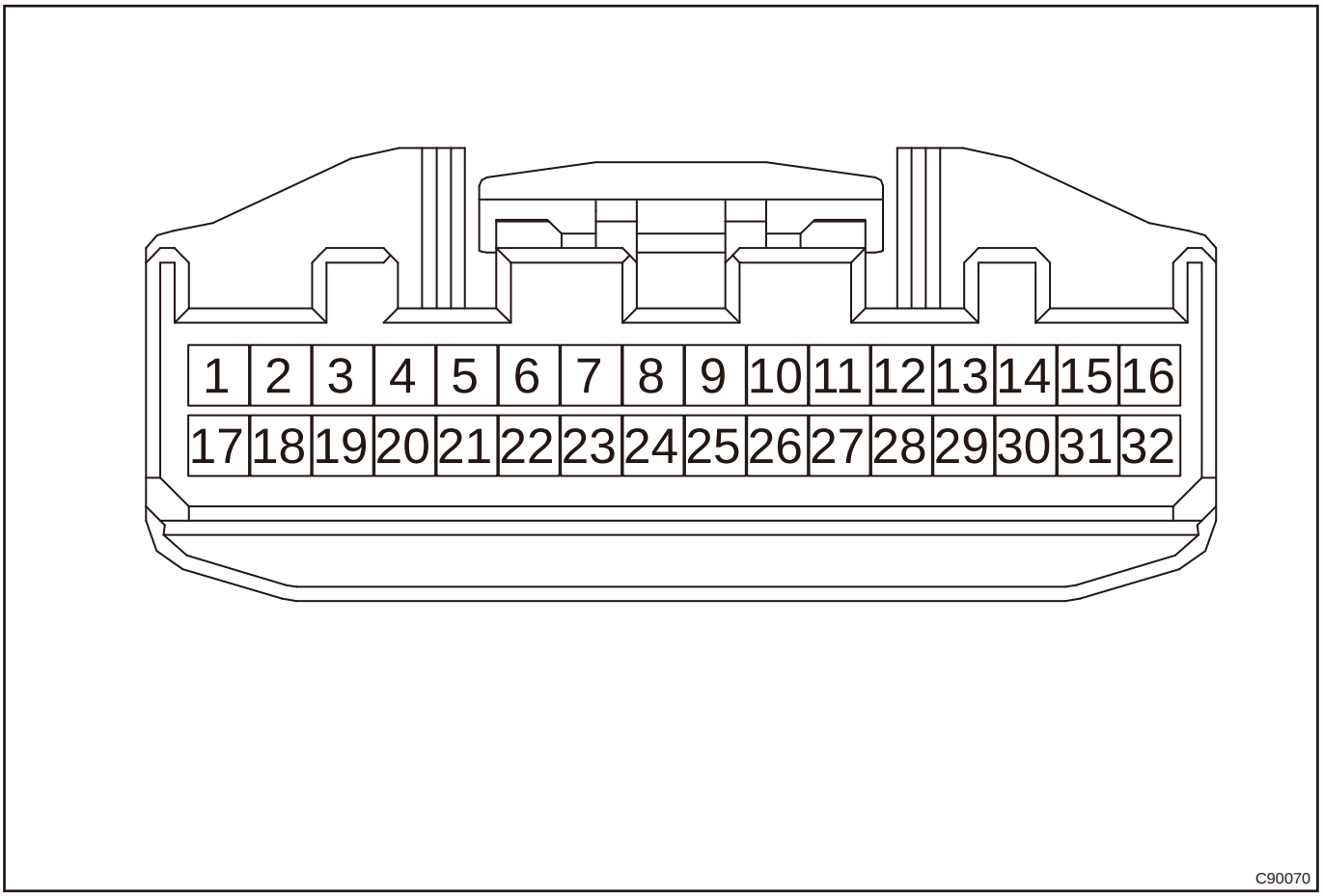
Remove the positioning pins after the SCM module with spiral cable assembly is installed.

(5) Install the steering wheel assembly.

(6) Install the driver airbag.

3.2 Module Terminal List

■ **Panoramic Control System (AVM) (With APA) Terminal List**



PIN	Description	PIN	Description
1	APA-LED	17	APA switch signal (low level)
2	PDC-LED	18	PDC switch signal (low level)
3	Signal ground (rear)	19	Signal power supply (rear)
4	Signal (rear right)	20	Signal (rear left)
5	Signal (rear left)	21	Signal (rear left center)
6	Signal (rear right center)	22	Signal (rear right)
7	Signal ground (front)	23	Signal power supply (front)
8	Signal (front right)	24	Signal (front left)
9	Signal (front left)	25	Signal (center left)
10	Signal (center right)	26	Signal (front right)
11	-	27	AVM switch signal (low level)

3) Execution action:

i. When back door button is pressed, PEPS sends three frames (0x404) RKECmd = 0x08 (luggage compartment stops). Then it sends three frames (0x404) RKECmd=0x00, the period is 40ms;

ii. After 1.5 seconds of pressing button continuously, first send three frames (0x404) RKECmd = 0x04 (luggage compartment unlocks). Then it sends three frames (0x404) RKECmd=0x00, period is 40ms;

iii. After detecting key releasing, first send three frames (0x404) RKECmd = 0x07 (Global stop). Then it sends three frames (0x404) RKECmd=0x00, period is 40ms;

iv. FOBID in 0x155 periodically indicates key ID (key index1/key index2/key index3). The FOB ID in 0x155 is updated to the key ID currently in use (key index1/key index2/key index3).

(4) Remote car location

1) Enabled conditions: PDU is in OFF or remote mode.

2) Trigger conditions: Operate the remote lock button twice continuously within 1.5 seconds (press twice continuously).

3) Execution action:

i. PEPS sends three frames (0x404), (0x404) RKECmd = 0x01 (full door locking). Then it sends three frames (0x404) RKECmd=0x00, the period is 40ms;

ii. When button is pressed for second time, first send three frames (0x404) RKECmd=0x09 (Vehicle search). Then it sends three frames (0x404) RKECmd=0x00, the period is 40ms.

iii. FOB ID in 0x155 periodically indicates key ID (key index1/key index2/key index3)

(5) Remote window up

1) Enabled conditions: PDU is in OFF or remote mode.

2) Trigger conditions: Long press remote lock button for more than 2 seconds (long press).

3) Execution action:

i. PEPS sends three frames (0x404), (0x404) RKECmd = 0x01 (full door locking). Then it sends three frames (0x404) RKECmd=0x00, the period is 40ms;

ii. Send three frames (0x404) RKECmd = 05 (Global closing) after 2 seconds. Then it sends three frames (0x404) RKECmd=0x00, period is 40ms;

iii. After detecting key releasing, first send three frames (0x404) RKECmd = 0x07 (Global stop). Then it sends three frames (0x404) RKECmd=0x00, period is 40ms;

iv. FOB ID in 0x155 periodically indicates key ID (key index1/key index2/key index3)

(6) Remote window down

1) Enabled conditions: PDU is in OFF or remote mode

2) Trigger conditions: Long press remote lock button for more than 2 seconds (long press)

3) Execution action:

i. PEPS sends three frames (0x404) RKECmd = 0x03 (full door unlocking). Then it sends three frames (0x404) RKECmd=0x00, the period is 40ms;

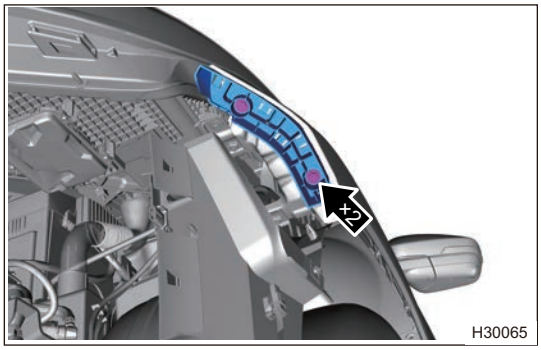
ii. Send three frames (0x404) RKECmd = 06 (Global opening) after 2 seconds. Then it sends three frames (0x404) RKECmd=0x00, period is 40ms;

iii. After detecting key releasing, first send three frames (0x404) RKECmd = 0x07 (Global stop). Then it sends three frames (0x404) RKECmd=0x00, period is 40ms;

iv. FOB ID in 0x155 periodically indicates key ID (key index1/key index2/key index3)

Key Strategy

(4) Remove 2 fixing bolts from front bumper mounting bracket.



(5) Remove the front bumper mounting bracket.

■ **Installation**

⚠ Caution

- **Try to prevent body paint surface from being scratched, when installing front bumper mounting bracket.**

(1) Install the front bumper mounting bracket to proper position on vehicle body.

(2) Install 2 fixing bolts to front bumper bracket.
Torque: 5 ± 1 N·m

(3) Install front bumper assembly.

(4) Connect the negative battery cable.

3.4 Replace Front Bumper Crossmember Assembly

■ **Removal**

⚠ Caution

- **Be sure to wear necessary safety equipment to prevent accidents, when removing front bumper crossmember assembly.**
- **Try to prevent body paint surface from being scratched, when removing front bumper crossmember assembly.**

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

(2) Disconnect the negative battery cable.

(3) Remove the front bumper assembly.

(4) Remove the upper energy absorbing block.