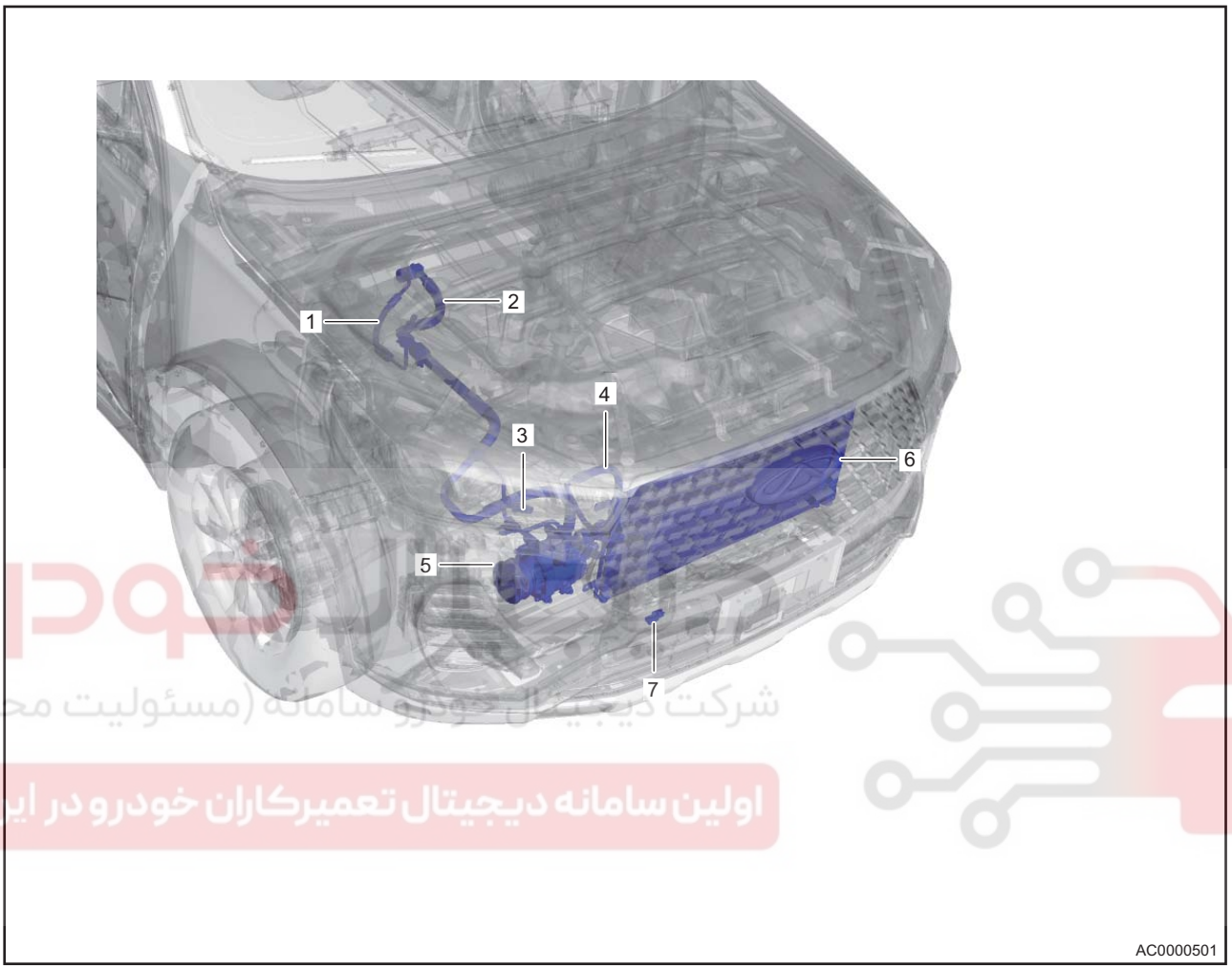
AIR CONDITIONING

GENERAL INFORMATION

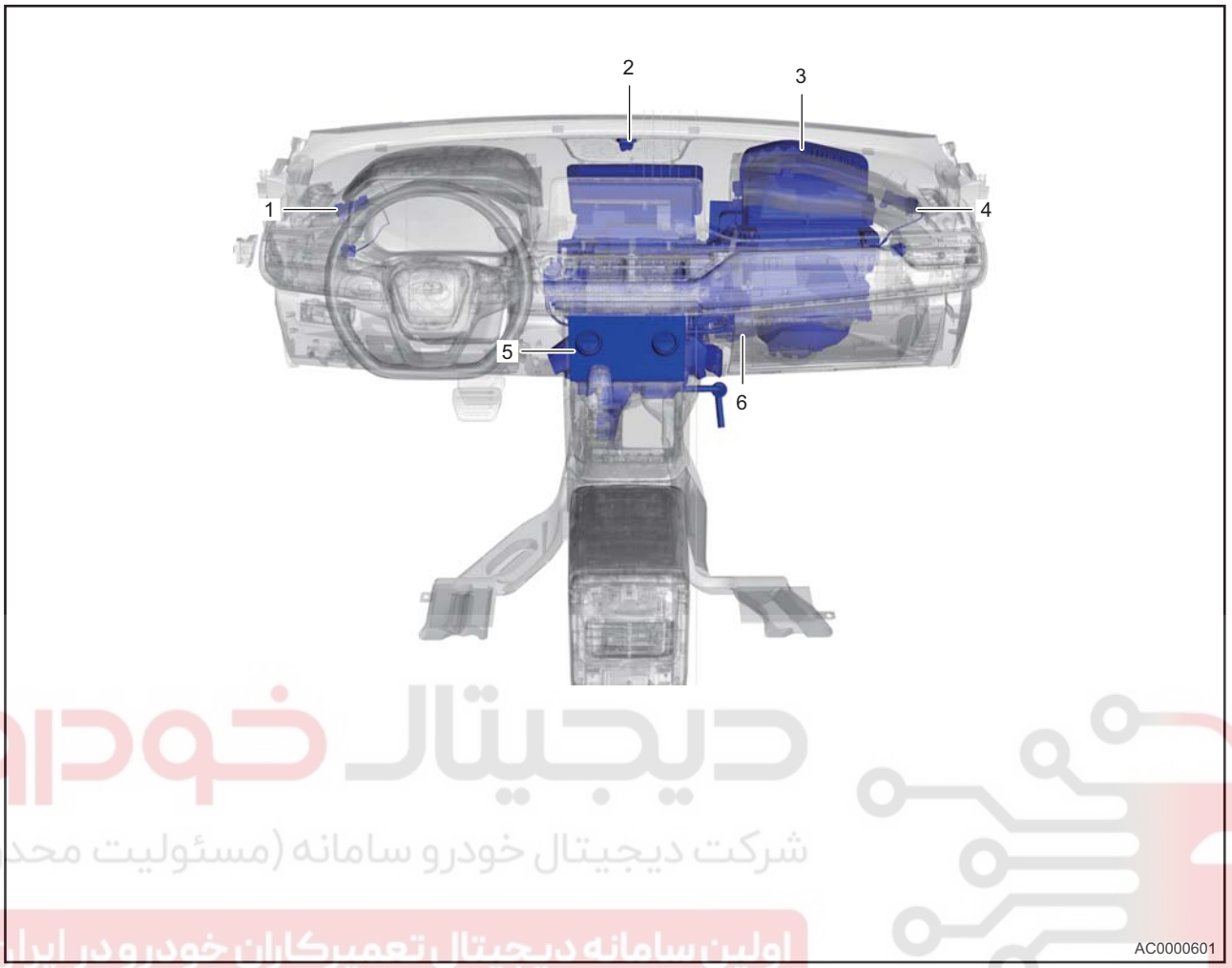
Description

Components Location - 1



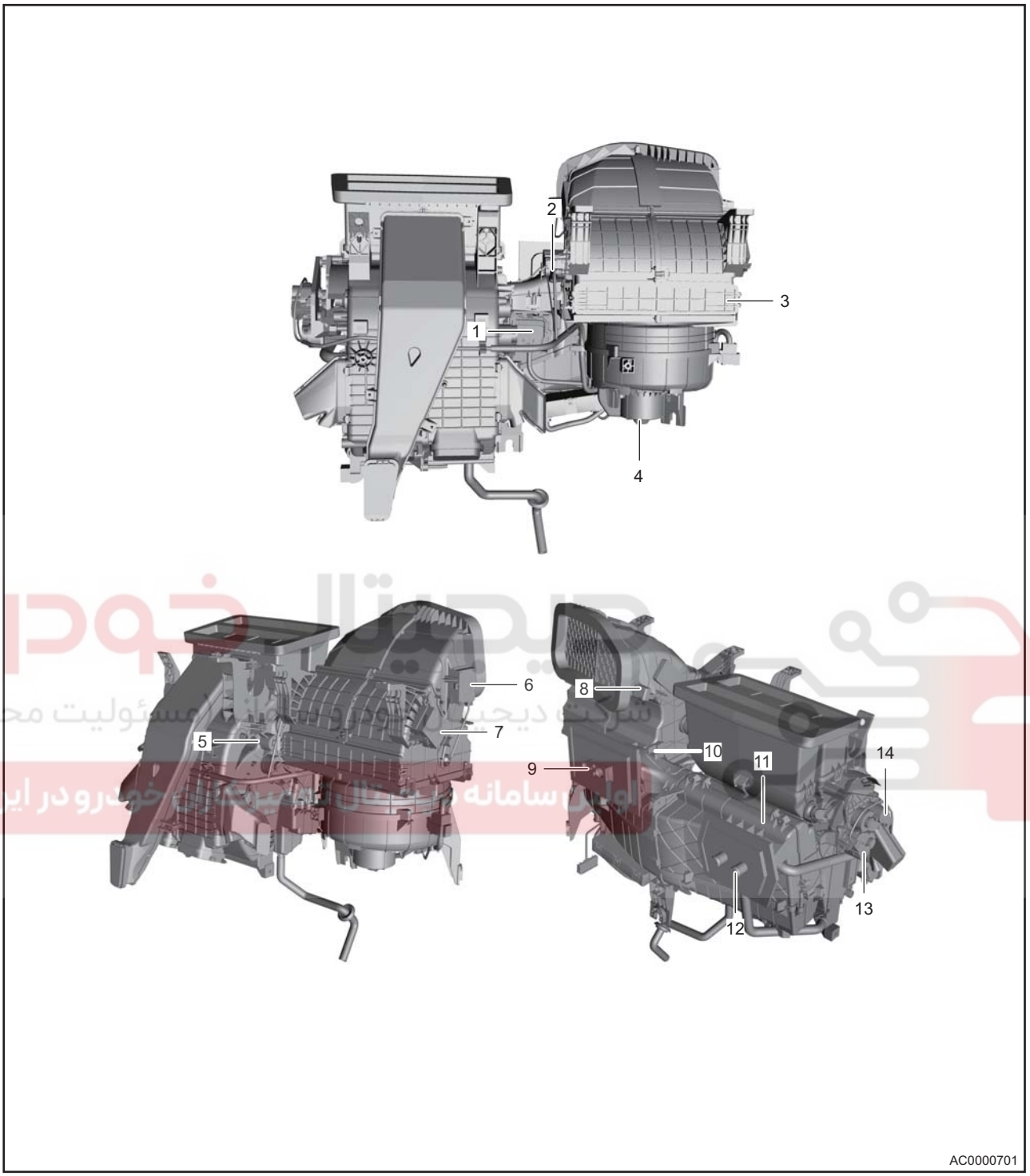
1 - Condenser - Evaporator Line	2 - Evaporator - Compressor Line
3 - A/C Pressure Switch	4 - Compressor - Condenser Line
5 - Compressor	6 - Condenser
7 - Outside Temperature Sensor	

Components Location - 2



1 - Left Anion Generator	2 - Solar Sensor
3 - HVAC Assembly	4 - Right Anion Generator
5 - A/C Control Panel	6 - Automatic A/C Control Module (Automatic A/C Model)

Components Location - 3

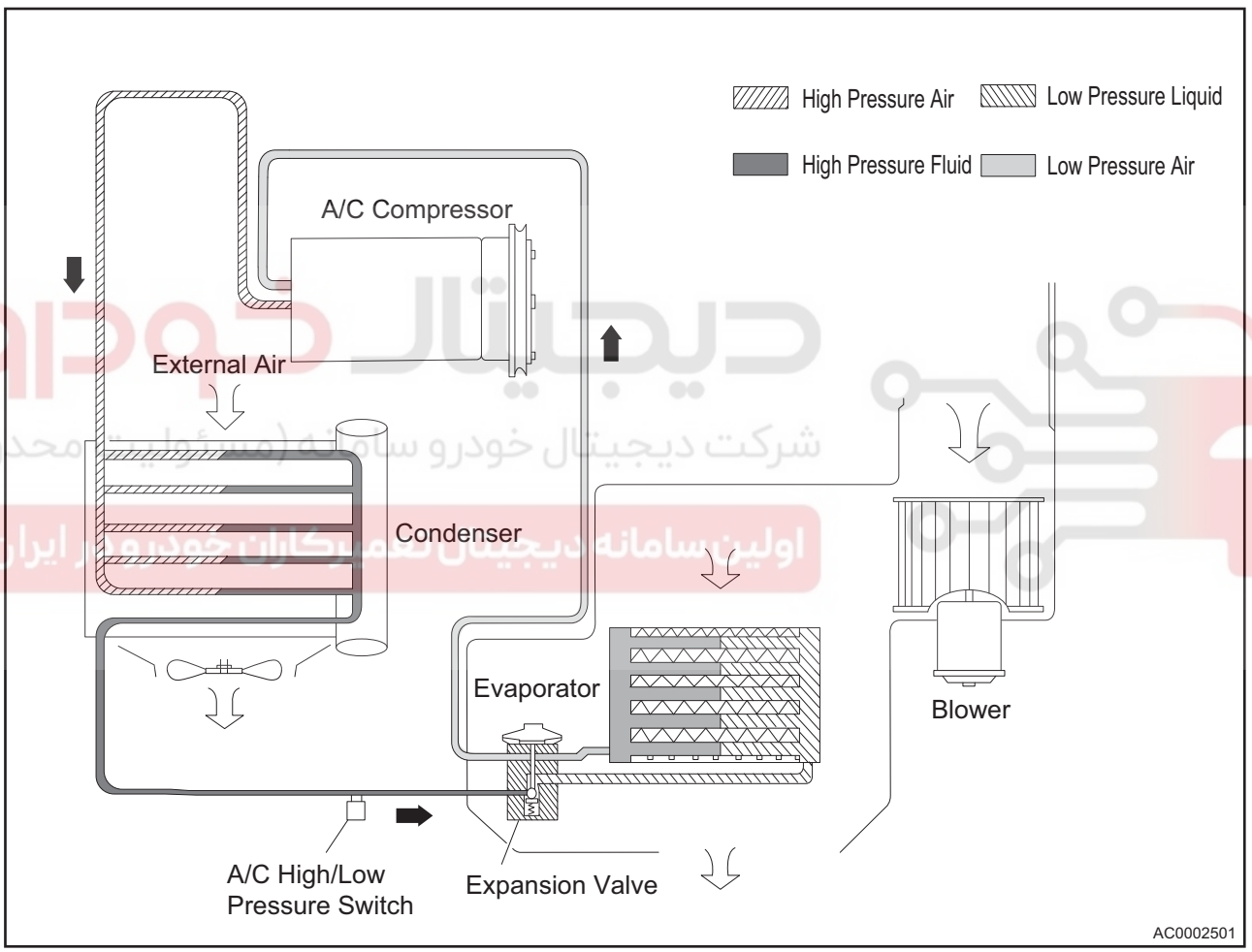


1 - Blower Speed Regulation Module	2 - Inner/Outer Circulation Motor
3 - A/C Element	4 - Blower Assembly
5 - Right Mix Damper Motor	6 - Outside PM2.5 Sensor
7 - Inside PM2.5 Sensor	8 - Air Quality Sensor
9 - Expansion Valve	10 - Evaporator Temperature Sensor
11 - Evaporator	12 - Heater Core
13 - Mode Damper Motor	14 - Left Mix Damper Motor (Automatic A/C Model)

System Composition

Air conditioning and distribution system: Air mixing and distributor part of HVAC, rear evaporator (not equipped on single-evaporator air conditioning), inner/outer circulation inlet, outlet and air filter. Control system: Automatic A/C control module, electric/automatic A/C control panel assembly, left/right mix damper motor, mode damper motor, inner/outer circulation motor, blower, blower speed regulation module, A/C pressure switch and evaporator temperature sensor as well as inside and outside PM2.5 sensors and air quality sensor for high-configuration automatic air conditioning.
Heating system: Heater core assembly, heating inlet hose, heating outlet hose and engine cooling circulation system.
Refrigerating system: Compressor assembly, condenser assembly, expansion valve, evaporator core assembly and A/C high and low pressure lines.

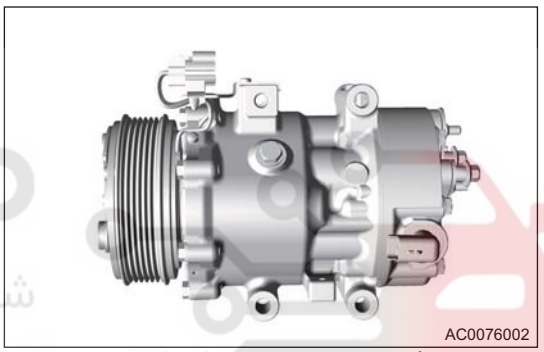
Operation



Outside fresh air enters air inlet filter assembly through cowl top opening at the right side of windshield base. Fresh air flows through evaporator core and heater core, and then enters vehicle through outlets on instrument panel and floor. Temperature can be adjusted by air volume knob on A/C control panel. Turn on the compressor assembly by pressing A/C switch. Refrigerant is compressed by compressor assembly and converted into high temperature/pressure gas, which is then condensed into high pressure liquid in the condenser. Then the liquid is filtered and dried by receiver drier and delivered to expansion valve and becomes low-pressure liquid through throttling and depressurization. Finally the liquid enters evaporator in vehicle and absorbs heat and evaporates, thus refrigeration is achieved. A/C heating is realized by engine coolant circulation system. Heater core is a main component of heating system. With engine running, engine coolant flows from engine water pump to heater core, and the heater core transmits the heat from engine coolant to the air that flows through heater core. At this time, A/C switch is off. The air flowing through heater core becomes hot wind through heat exchanging, thus providing heating. Temperature adjustment control mechanism can be controlled by rotating temperature adjustment knob. Mix damper closes when temperature adjustment knob is rotated counterclockwise to MAX COOL position. If airflow does not flow through heater core, the heat transmission will not occur.

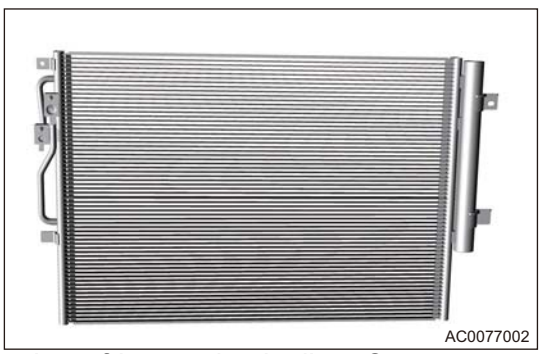
Operation Description

Compressor


AC0076002

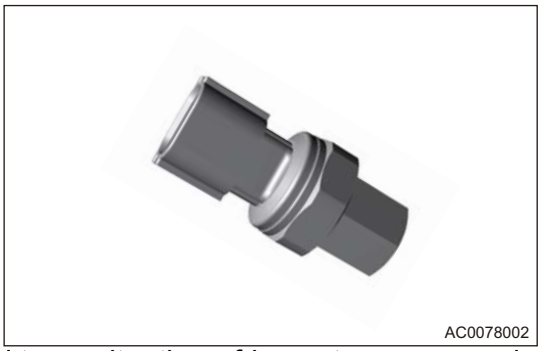
Compressor is an important element of refrigeration system. It compresses the low temperature/pressure refrigerant vapor from evaporator and makes it become high temperature/pressure refrigerant vapor. This model uses a variable capacity compressor. When refrigeration system is operating, the electromagnetic clutch of variable capacity compressor is always in the engaged status. It can change the piston displacement continuously and steadily within a certain range by external control valve according to the change of refrigeration load and engine speed, so as to realize the regulation of system flow.

Condenser


AC0077002

Condenser contains desiccant that is used to remove water from the refrigerant in pipeline. Compressor compresses the refrigerant into high temperature/pressure refrigerant gas, which is then discharged into the condenser, in which heat is released to the cooling medium air and condensed into high pressure liquid.

A/C Pressure Sensor


AC0078002

A/C pressure sensor is installed on high pressure pipe and used to monitor the refrigerant pressure and output the refrigerant pressure signal to ECM. ECM controls compressor based on the signal transmitted from A/C pressure sensor.

Solar Sensor


AC0079002

Solar sensor is installed on instrument panel and used to detect light intensity in the area where the vehicle is located and control the automatic mode of air conditioning.

Outside Temperature Sensor


AC0080002

Outside temperature sensor is installed at lower left of front impact beam and used to detect the outside temperature and control the automatic mode of air conditioning. The sensor sends signal to automatic A/C module. The resistance of outside temperature sensor changes with the change of ambient temperature. Resistance increases as temperature decreases. Resistance decreases as temperature increases.

Anion Generator

Anion generator is installed on air duct on both sides of instrument panel. The anion generator boosts the low voltage into positive high voltage and negative high voltage by booster circuit, and ionizes the air under the action of positive high voltage electric field and negative high voltage electric field to generate a large number of positive and negative ions.

A/C System Function Description

Blower Advanced ON Function

Conditions for blower advanced ON for 30 seconds:
1. Outside temperature is higher than 20°C
2. Battery voltage is more than 12.5 V
3. Vehicle fortifying is released

Stopping conditions for blower advanced ON function:
1. Blower turns on in advance and operates for more than 30 seconds
2. Any door is opened
3. Vehicle is in fortifying mode

Blower Delay OFF Function

Enabling conditions for blower delay OFF function:
1. A/C is turned on during the last driving
2. Battery voltage is more than 12.5 V
3. Blower starts to operate for 1 minute and then stops after vehicle enters fortifying mode for more than 5 minutes

PM2.5 Function

Inside air is repeatedly purified by an efficient A/C element. If the interior environment quality is poor, system will give corresponding prompts. Operate according to the prompts, press PM2.5 button, and the air purification function will be turned on.

Disabled conditions for purification function:
1. Outside temperature is less than 2°C, room temperature is less than 15°C, and engine coolant temperature is less than 70°C
2. Front defroster is turned on
3. Wiper is turned on for more than 30 seconds

Anion Function

Anion function and one-button purification function are turned on at the same time.

Purification process of anion: The activated charged anion has a strong adsorption and decomposition effect, which makes PM2.5 and other particles fall and settle down. At the same time, it decomposes harmful viruses and bacteria to make them lose vitality and become nourishing water molecules, so as to achieve the purpose of air purification.

Automatic Defogging Function

After the automatic defogging function is turned on, the air conditioning will automatically remove the fog from front windshield when a fogging risk is collected on front windshield to ensure the driving safety.

Specifications

Torque Specifications

Description	Torque (N·m)
A/C High/Low Pressure Line Clamp Fixing Bolt	9 ± 1
Expansion Valve Fixing Bolt	9 ± 1.5
HVAC Fixing Nut	7 ± 1
HVAC Fixing Bolt	7 ± 1
Inlet Air Duct Fixing Screw	1.2 ± 0.2
Inlet Air Duct Fixing Bolt	1.2 ± 0.2
Inner/Outer Damper Set Fixing Bolt	1.2 ± 0.2
Rear Duct Fixing Screw	1.2 ± 0.2
Heater Core Fixing Screw	1.2 ± 0.2
Heater Core Plate Fixing Screw	1.2 ± 0.2
Damper Set Fixing screw	1.2 ± 0.2
Damper Drive Set Fixing Screw	1.2 ± 0.2
Damper Drive Set Fixing Bolt	1.2 ± 0.2
Fixing Screw Between Evaporator Housing and Evaporator Case	1.2 ± 0.2
Rear Right Outlet Fixing Screw	1.2 ± 0.2
Rear Left Outlet Fixing Screw	1.2 ± 0.2
Evaporator Case Fixing Screw	1.2 ± 0.2
Damper Set Housing Fixing Screw	1.2 ± 0.2
Evaporator - Compressor Line Fixing Bolt	9 ± 1
Compressor Line Fixing Bolt	25 ± 3
Condenser - Evaporator Line Fixing Nut	9 ± 1
A/C High Pressure Line Clamp Fixing Bolt	9 ± 1
Compressor - Condenser Line Fixing Nut	9 ± 1
Compressor Fixing Bolt	25 ± 3
Condenser Assembly Fixing Bolt	5 ± 1
Anion Generator Fixing Screw	1.5 ± 0.5

Refrigerant Charging Specification

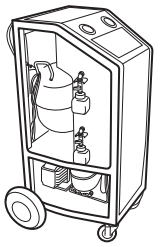
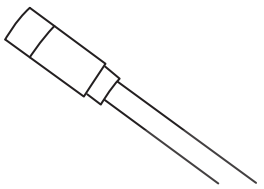
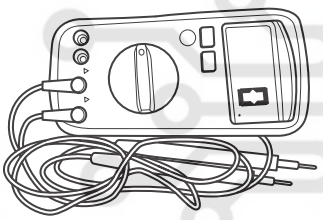
Description	Charging Capacity (g)
R134a Refrigerant	550 ± 15

Refrigerant Oil Charging Specifications

Description	Charging Capacity (ml)
Evaporator Replacement	20
Compressor Assembly Replacement	Supplement according to actual pouring amount
Condenser Replacement	20
A/C Line Replacement	10

Tools

General Tools

Tool Name	Tool Drawing
Gas Leak Detector	 RCH004606
Refrigerant Recycling Machine	 RCH009206
Digital Multimeter	 RCH0002006

ON-VEHICLE INSPECTION

Refrigerant System Inspection

Warning/Caution/Hint

- A/C refrigerant lines and hoses are used to transfer refrigerant among A/C system components. Any twist or bend in refrigerant lines and hoses will reduce performance of A/C system and refrigerant flow in system.
- There remains high pressure in refrigerant when A/C compressor assembly is operating. It is necessary to ensure that each connecting part in A/C system is sealed well. Check all system lines at least once a year to ensure that they are in good condition and properly routed. Refrigerant lines and hoses cannot be repaired and must be replaced if leakage or damage exists.

1. General inspection
   (a) Check if there exists any oil or dust in each joint of A/C line. If this occurs, there may exist leak.
   (b) Check if condenser surface is dirty and if fins are deformed.
   (c) Check if there are harsh noises while compressor assembly is operating normally.
   (d) Temperature difference should be noticeable by touching intake line and exhaust line of compressor assembly with hand. Normally, temperature of low pressure line is relatively low and that of high pressure line is relatively hot. Feel the temperature difference between condenser inlet pipe and outlet pipe, under normal conditions, temperature of inlet pipe is higher than that of outlet pipe. If you feel the temperature difference between expansion valve inlet and outlet line with hand, under normal conditions, temperature of expansion valve inlet line is relatively hot and that of outlet line is relatively cool, and the temperature difference between them is noticeable.
2. Using pressure gauge set, check the refrigerant pressure.
   (a) Connect the manifold pressure gauge set. After following conditions are met, read pressure values on pressure gauge. Measurement Condition:
   - Inner/outer circulation switch is in outer circulation position.
   - Engine runs at approximately 2000 rpm.
   - Adjust temperature knob to Max. Cool.
   - Set blower speed control switch to highest band.
   - Turn on A/C switch.

   Hint:
   - Observe the pressure value on pressure gauge, under normal condition, low pressure is 0.15-0.20 Mpa, high pressure is 1.3-1.7 Mpa.

Compressor Assembly Noise Inspection

Warning/Caution/Hint

Hint:

- When checking noise related to A/C system, you must first know the conditions under which the noise occurs. These conditions include: Weather, vehicle speed, engine speed, engine temperature and any other special conditions. Loud noises during A/C operation can often mislead someone. For example, some sounds, like a failed bearing, may be caused by loose bolts, mounting brackets or a loose compressor assembly.

Caution:

- A/C compressor assembly must be replaced if any abnormal noise is heard from compressor assembly.
- Noise may occur from drive belt at different engine speeds, and you may mistake it for a noise from A/C compressor assembly.

1. Select a quiet place for testing.
2. Duplicate customer's feedback information as much as possible.
3. Turn on and off A/C several times to identify compressor assembly noise clearly.
4. Check the condition of compressor assembly belt.
5. Check the hub, pulley, bearing assembly of compressor assembly. Make sure that hub and pulley are aligned correctly, and pulley bearing is securely installed to A/C compressor assembly.
6. Check if refrigerant line routes incorrectly, and if it is damaged or has an interference that could result in an abnormal noise. Also, check the refrigerant line for twist or bend, otherwise the refrigerant will be limited to flow, which will cause a noise.
7. Loosen all compressor assembly tightening bolts and retighten them.
8. If noise occurs when liquid refrigerant in A/C suction line is under a slugging condition, replace the condenser and check refrigerant oil level and charging condition for refrigerant.
9. If the slugging condition still exists after replacing condenser, replace the A/C compressor assembly.

   Caution:

   - DO NOT race engine when vacuum pump operates or vacuum exists in A/C system. Otherwise, A/C compressor assembly will be damaged seriously.

Refrigerant Leakage Inspection

Warning/Caution/Hint

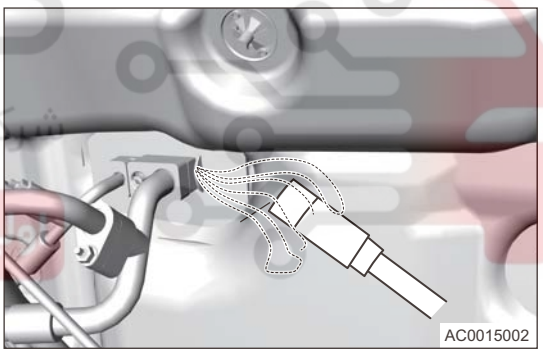
Warning:

- DO NOT perform a pressure test or a leakage test to R134a service device or vehicle A/C system with compressed air. Mixture of air and R134a is inflammable at high pressure. This mixture has potential danger, and it may cause a fire or explosion, resulting in vehicle damage, personal injury or death.
- Avoid inhaling vapor or moisture from the A/C refrigerant and refrigerant oil.
- Only use technical service device to discharge R134a system. If system discharges unexpectedly, ventilate work place before servicing.

Caution:

- If A/C refrigerant filling amount is empty or low, A/C system may have leak. Check all A/C lines, joints and parts for remaining oil. The remaining oil is indication mark of A/C system leaking position.

1. After recharging refrigerant, use gas leak detector to check refrigerant gas for leakage.
2. Perform operations under following conditions:
   (a) ENGINE START STOP switch is in OFF.
   (b) Ensure the ventilation is well (gas leak detector may react to volatile gases which are not from refrigerant, such as gasoline vapor or exhaust gas).
   (c) Repeat the test for 2 or 3 times.
   (d) Make sure that there is some refrigerant remaining in the refrigeration system.
3. Place gas leak detector near the joint of A/C line, and check the A/C line for leakage. If gas leak detector makes a sound, it indicates that a leakage exists. Repair or replace the leakage A/C line as necessary.



4. Disconnect A/C pressure sensor connector, and use same procedures to check A/C pressure sensor for leakage. Replace the A/C pressure sensor as necessary.
5. Insert gas leak detector into evaporator tank assembly, and use same procedures to check evaporator for leakage. Clean or replace the evaporator core assembly as necessary.
6. Use same procedures to check condenser for leakage. Clean or replace the condenser assembly as necessary.

DIAGNOSIS & TESTING

Problem Symptoms Table

Hint:

Use symptoms table below to help determine cause of problem. Check each suspected area in sequence. Repair, replace or adjust faulty components as necessary.

Symptom	Suspected Area
A/C no heating	Blower fuse (damaged)
	Blower relay (damaged)
	Blower speed regulation module (damaged)
	Blower motor (damaged)
	Mix damper control mechanism (stuck or damaged)
	Heating pipe (blocked or damaged)
	Heater core assembly (blocked or damaged)
	Wire harness or connector (open or short)
A/C no cooling	Leak in system
	Refrigerant (overcharged)
	A/C pressure switch (damaged)
	Evaporator temperature sensor (damaged)
	A/C switch (damaged)
	Compressor assembly fuse (damaged)
	Compressor assembly relay (damaged)
	Compressor assembly belt (loose)
	Compressor assembly (damaged)
	Condenser assembly (blocked or damaged)
	Expansion valve (blocked or frosted)
	Evaporator core assembly (blocked or damaged)
	Wire harness or connector (open or short)
A/C intermittent cooling	Moisture in system
A/C insufficient cooling	Leak in system
	Refrigerant (insufficient)
	Air in refrigerant
	Moisture in refrigerant
	Condenser (dirty or blocked)
	Expansion valve (dirty or blocked)
	A/C high/low pressure line (dirty or blocked)
Too much noise in system	Compressor assembly belt (slip)
	Compressor assembly clutch bearing (worn and excessive clearance)
	Compressor assembly belt (over tightened)
	Compressor assembly mounting bolt (loose)
	Cooling fan blade (distorted)
	Refrigerant oil (insufficient)
Pressure is too low for low pressure side and high pressure side, cooling performance is insufficient	A/C system (leaked)
	Refrigerant (insufficient)
Pressure is too low for low pressure side and high pressure side, frost exists on line from condenser to A/C unit	Condenser (dirty or blocked)

Symptom	Suspected Area
Vacuum occurs at low pressure side, and pressure at high pressure side is too low, frost exists on lines on both sides of condenser or expansion valve	Moisture in refrigerant (excessive)
	Expansion valve (dirty or blocked)
Frost exists on lines on both sides	A/C line (leaked)
	Condenser (dirty or blocked)
Pressure at low pressure side and pressure at high pressure side is too high	Expansion valve (faulty)
	Refrigerant oil (excessive)
Pressure at low pressure side is normal or slightly low, and pressure at high pressure side is too high	Condenser surface (dirty)
	Cooling fan (not operating)
	Air in refrigerant
Pressure at low pressure side is too low, and pressure at high pressure side is too high	A/C high pressure line (blocked)
	Expansion valve (faulty)

Diagnostic Tools

Digital Multimeter

When using digital multimeter:

- Troubleshoot electrical malfunctions and wire harness system.
- Look for basic malfunction.
- Measure voltage, current and resistance.

Ground Inspection

Groundings are very important to entire circuit system, which are normal or not can seriously affect the entire circuit system. Ground points are often exposed to moisture, dirt and other corrosive environments. Corrosion (rust) and oxidation may increase load resistance. This case will seriously affect normal operation of circuit. Check the ground points as follows:

1. Remove ground bolt or nut.
2. Check all contact surfaces for tarnish, dirt and rust, etc.
3. Clean as necessary to ensure that contact is in good condition.
4. Reinstall ground bolt or nut securely.
5. Check if add-on accessories interfere with ground circuit.
6. If several wire harnesses are crimped into one ground terminal, check for proper crimps. Make sure that all wire harnesses are clean and securely fastened while providing a good ground path.

Diagnostic Procedure

Hint

Use following procedures to troubleshoot the air conditioning system.

1	**Vehicle brought to workshop**

Result

Proceed to
NEXT

NEXT

2	**Check battery voltage**

Check if battery voltage is normal.

OK

Standard voltage: Not less than 12 V

Result

Proceed to
OK
NG

NG → **Check and repair battery**

OK

3	Customer problem analysis

Result

Proceed to
NEXT

NEXT

4	Read DTCs

Result

Proceed to
No DTC
Current DTC
History DTC

History DTC

5	Problem Repair (No DTC)

Result

Proceed to
NEXT

NEXT → **Go to step**

6	Troubleshoot according to Diagnostic Trouble Code (DTC) Chart

Result

Proceed to
NEXT

NEXT → **Go to step**

7	Troubleshoot according to Problem Symptoms Table

Result

Proceed to
NEXT

NEXT

8	Conduct test and confirm malfunction has been repaired

Result

Proceed to
NEXT

NEXT

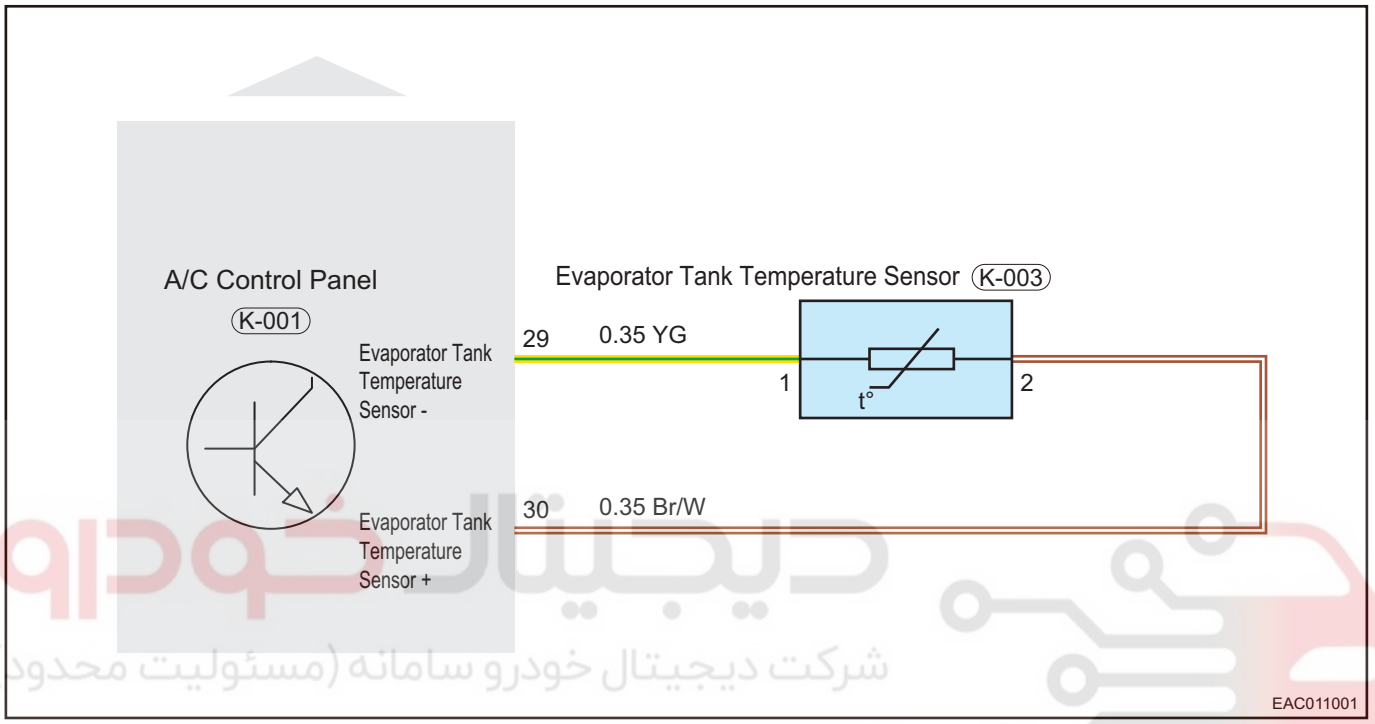
End

DTC	B1404-11	Filtered Evaporator Temperature Circuit Short to Ground
DTC	B1404-15	Filtered Evaporator Temperature Circuit Open
DTC	B1408-11	Blower Voltage Circuit Short to Ground or Open
DTC	B1408-12	Blower Voltage Circuit Short to Battery
DTC	B1409-11	Mode Motor Step Circuit Short to Ground
DTC	B1409-12	Mode Motor Step Circuit Open
DTC	B1410-11	Rec Motor Step Circuit Short to Ground
DTC	B1410-12	Rec Motor Step Circuit Open
DTC	B1412-11	Mix Flap Motor Step Circuit Short to Ground
DTC	B1412-12	Mix Flap Motor Step Circuit Open
DTC	U0140-87	Lost Communication with BCM
DTC	U0155-87	Lost Communication with ICM
DTC	U0245-87	Lost Communication with RRM
DTC	U0100-87	Lost Communication with EMS
DTC	U0129-87	Lost Communication with BSM
DTC	U0214-87	Lost Communication with PEPS

DTC	B1404-11	Filtered Evaporator Temperature Circuit Short to Ground

DTC	B1404-15	Filtered Evaporator Temperature Circuit Open

Circuit Diagram



Description

DTC	DTC Definition	DTC Detection Condition	Possible Cause
B1404-11	Filtered Evaporator Temperature Circuit Short to Ground	ENGINE START STOP switch ON	• Evaporator temperature sensor • Wire harness or connector
B1404-15	Filtered Evaporator Temperature Circuit Open		

Caution:
When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Diagnostic Procedure

1	Check wire harness and connector

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect evaporator tank temperature sensor K-003 and A/C control panel connector K-001.
(d) Check wire harness, connector and terminal for deformation, bend or damage.

Result

Proceed to
OK
NG

NG → **Repair or replace wire harness**

OK

2 Check evaporator tank temperature sensor

(a) Remove evaporator tank temperature sensor from malfunctioning vehicle.
(b) Install new evaporator tank temperature sensor to malfunctioning vehicle.
(c) Check if there are DTCs B1404-11 and B1404-15.

Result

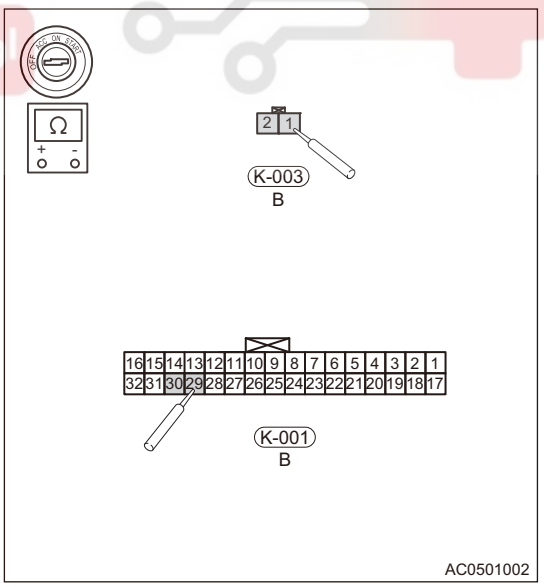
Proceed to
NG
OK

OK → **Replace evaporator tank temperature sensor**

NG

3 Check wire harness (automatic A/C control module - evaporator tank temperature sensor)

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect evaporator tank temperature sensor connector K-003 and A/C control panel connector K-001.
(d) Using a digital multimeter, measure the wire harness between evaporator tank temperature sensor connector K-003 and A/C control panel connector K-001 according to value(s) in table below.



Standard Condition

Multimeter Connection	Condition	Specified Condition
K-003 (2) - K-001 (30)	Always	Resistance ⩽ 1 Ω
K-003 (1) - K-001 (29)	Always	Resistance ⩽ 1 Ω

Result

Proceed to
OK
NG

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

OK

4	Reconfirm DTCs

(a) Connect all connectors.
(b) Connect the negative battery cable.
(c) Turn ENGINE START STOP switch to ON.
(d) Check if the same DTCs are output.

Result

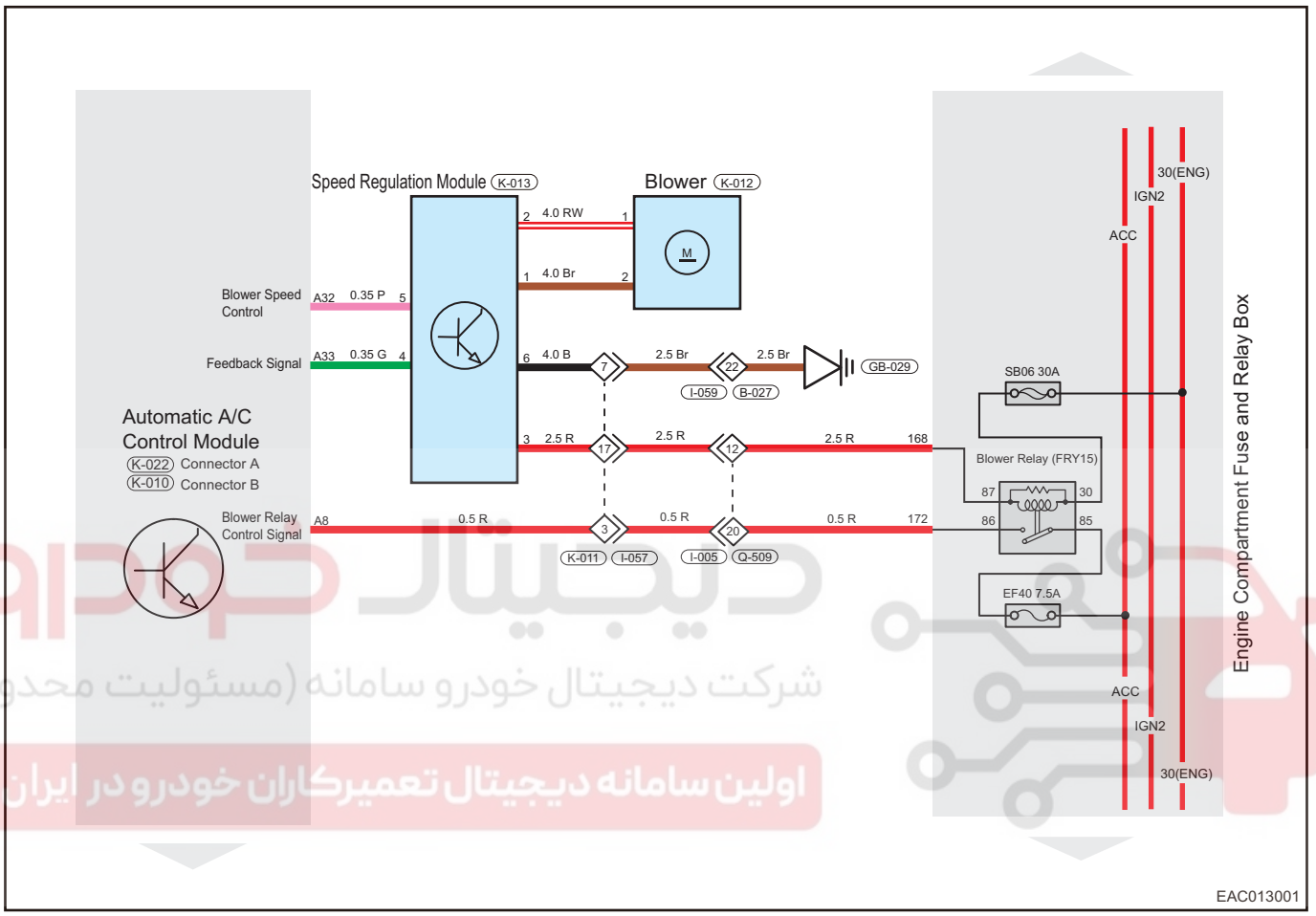
Proceed to
OK
NG

OK	System operates normally
NG	Replace automatic A/C control module

DTC	B1408-11	Blower Voltage Circuit Short to Ground or Open

DTC	B1408-12	Blower Voltage Circuit Short to Battery

Circuit Diagram



Description

DTC	DTC Definition	DTC Detection Condition	Possible Cause
B1408-11	Blower Voltage Circuit Short to Ground or Open	ENGINE START STOP switch ON	• Blower • Blower speed regulation module • Wire harness or connector
B1408-12	Blower Voltage Circuit Short to Battery		

Caution:
When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Diagnostic Procedure

1	Check wire harness and connector

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect blower connector K-012 and blower speed regulation module connector K-013.
(d) Check wire harness, connector and terminal for deformation, bend or damage.

Result

Proceed to
OK
NG

NG → **Repair or replace wire harness**

OK

2	Check blower

(a) Remove the blower from malfunctioning vehicle.
(b) Install a new blower to malfunctioning vehicle.
(c) Check if there are DTCs B1408-11 and B1408-12.

Result

Proceed to
NG
OK

OK → **Replace blower**

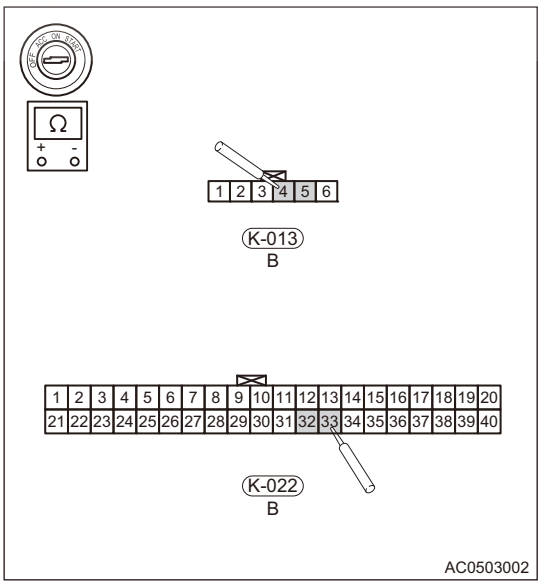
NG

3	Check wire harness connector

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect automatic A/C control module connector K-022 and speed regulation module connector K-013.
(d) Using a digital multimeter, measure the wire harness between speed regulation module connector K-013 and automatic A/C control module connector K-022 according to value(s) in table below.

Standard Condition

Multimeter Connection	Condition	Specified Condition
K-013 (5) - K-022 (32)	Always	Resistance ⩽ 1Ω
K-013 (4) - K-022 (33)	Always	Resistance ⩽ 1Ω



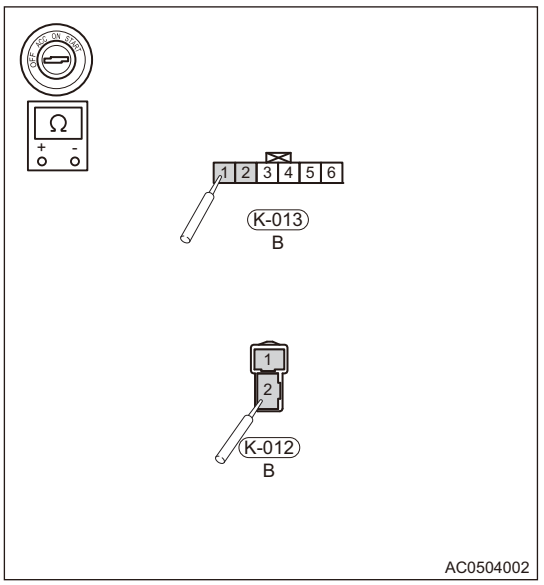
(e) Using a digital multimeter, measure the wire harness between blower connector K-012 and blower speed regulation module connector K-013 according to value(s) in table below.

Standard Condition

Multimeter Connection	Condition	Specified Condition
K-012 (1) - K-013 (2)	Always	Resistance ⩽ 1Ω
K-012 (2) - K-013 (1)		

Result

Proceed to
OK
NG



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

OK

4 Check ground circuit of blower speed regulation module

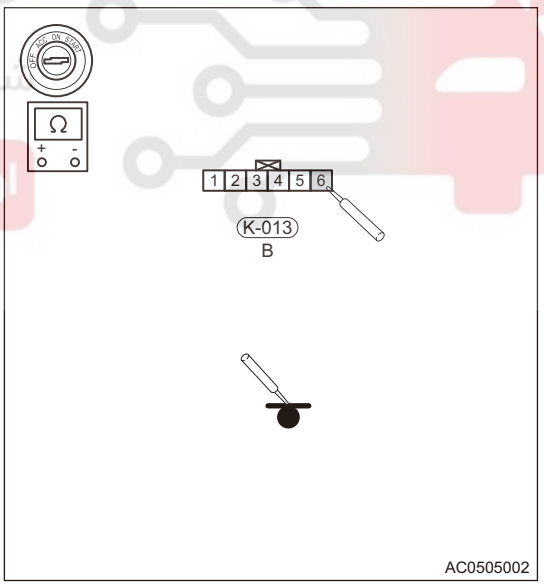
(a) Using a digital multimeter, measure the wire harness between blower speed regulation module connector K-013 and body ground according to value(s) in table below.

Standard Condition

Multimeter Connection	Condition	Specified Condition
K-013 (6) - Body ground	Always	Resistance ⩽ 1Ω

Result

Proceed to
OK
NG



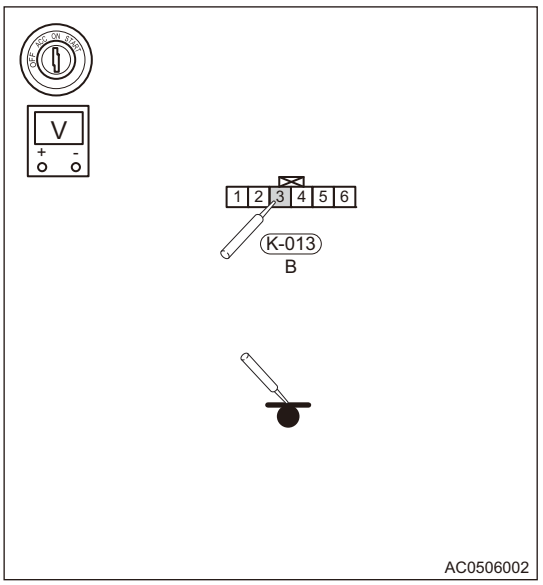
NG → **Repair or replace related wire harness**

OK

5 Check power circuit of blower speed regulation module

(a) Connect all connectors.
(b) Connect the negative battery terminal cable.
(c) Turn ENGINE START STOP switch to ON and turn blower on.

(d) Using a digital multimeter, measure the voltage between terminal 3 of blower speed regulation module connector K-013 and body ground according to value(s) in table below.



Standard Condition

Multimeter Connection	Condition	Specified Condition
K-013 (3) - Body ground	ENGINE START STOP switch ON	Not less than 12 V

Result

Proceed to
OK
NG

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

OK

6 Reconfirm DTCs

(a) Connect all connectors.
(b) Connect the negative battery cable.
(c) Turn ENGINE START STOP switch to ON.
(d) Use diagnostic tester to check if the same DTCs are output.

Result

Proceed to
OK
NG

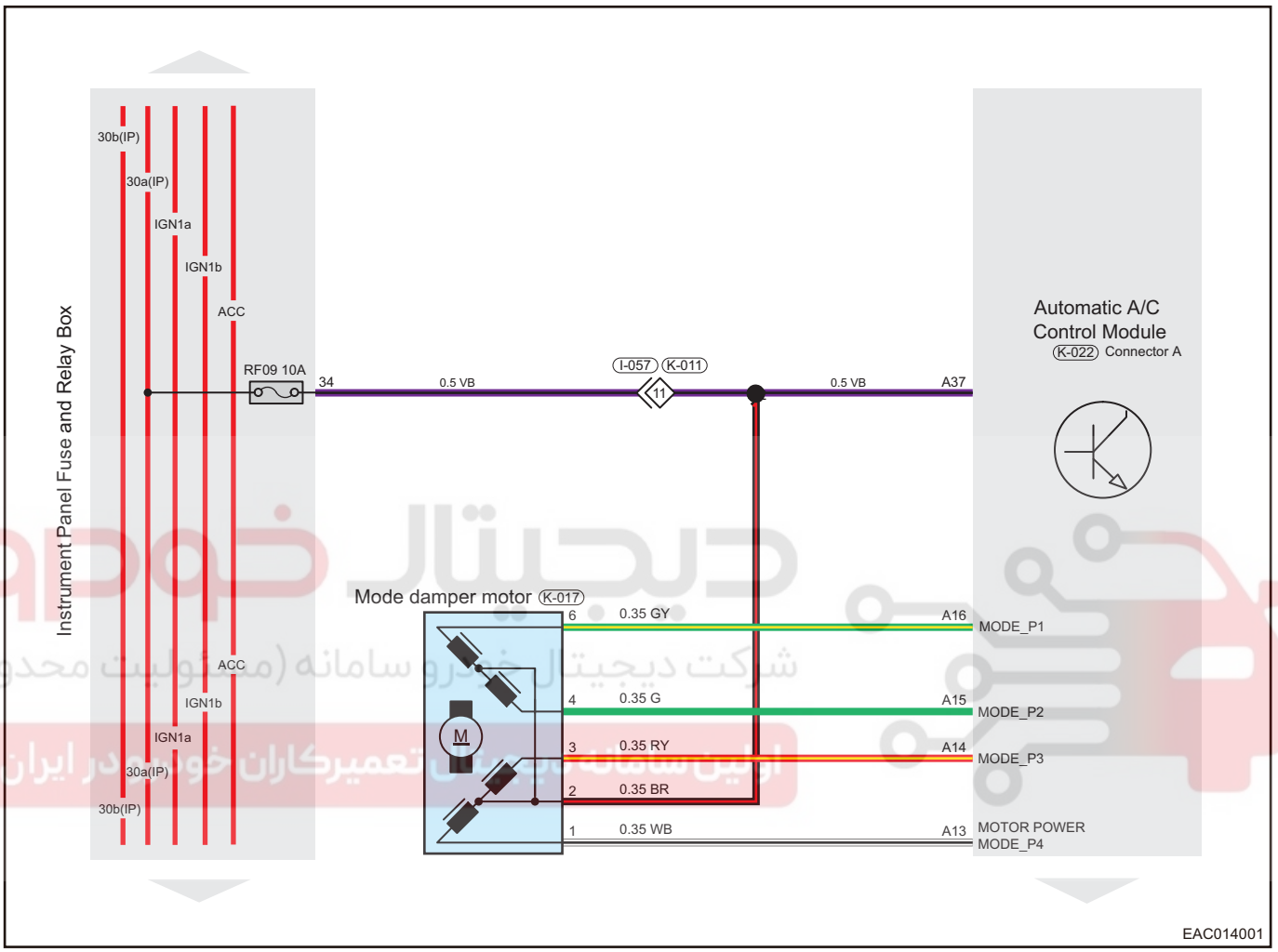
OK → **System operates normally**

NG → **Replace automatic A/C control module**

DTC	B1409-11	Mode Motor Step Circuit Short to Ground

DTC	B1409-12	Mode Motor Step Circuit Open

Circuit Diagram



Description

DTC	DTC Definition	DTC Detection Condition	Possible Cause
B1409-11	Mode Motor Step Circuit Short to Ground	ENGINE START STOP switch ON	• Mode damper motor • Automatic A/C control module • Wire harness or connector
B1409-12	Mode Motor Step Circuit Open		

Caution:
When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Diagnostic Procedure

1	Check wire harness and connector

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.

(c) Disconnect mode damper motor connector K-017 and automatic A/C control module connector K-022.
(d) Check wire harness, connector and terminal for deformation, bend or damage.

Result

Proceed to
OK
NG

NG → **Repair or replace wire harness**

OK

2	Check mode damper motor

(a) Remove the mode damper motor from malfunctioning vehicle.
(b) Install a new mode damper motor to malfunctioning vehicle.
(c) Check if there are DTCs B1409-11 and B1409-12.

Result

Proceed to
NG
OK

OK → **Replace inner/outer circulation motor**

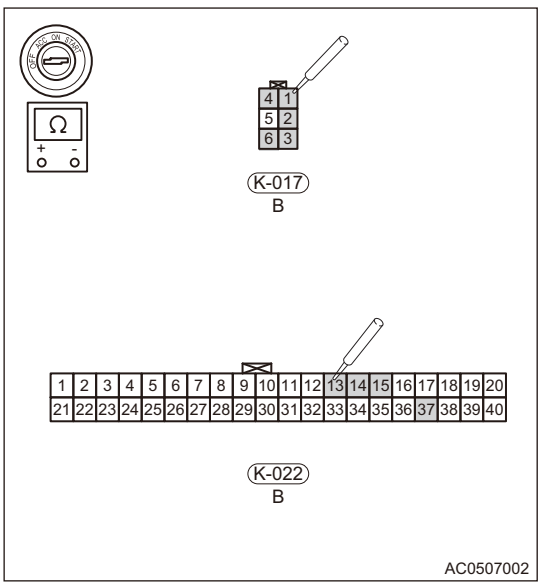
NG

3	Check wire harness connector between automatic A/C control module and mode damper motor

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect automatic A/C control module connector K-022 and mode damper motor connector K-017.
(d) Using a digital multimeter, measure the wire harness between mode damper motor connector K-017 and automatic A/C control module connector K-022 according to value(s) in table below.

Check for Open

Multimeter Connection	Condition	Specified Condition
K-017 (1) - K-022 (13)	Always	Resistance ⩽ 1Ω
K-017 (2) - K-022 (37)	Always	Resistance ⩽ 1Ω
K-017 (3) - K-022 (14)	Always	Resistance ⩽ 1Ω
K-017 (4) - K-022 (15)	Always	Resistance ⩽ 1Ω
K-017 (6) - K-022 (16)	Always	Resistance ⩽ 1Ω



39

Result

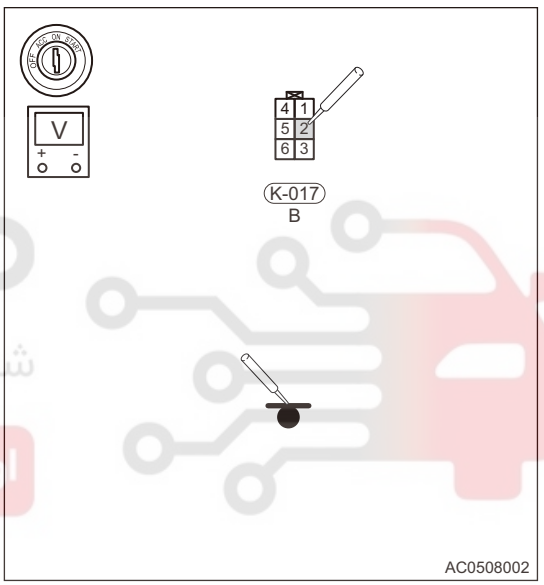
Proceed to
OK
NG

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

OK

4 Check power circuit of mode damper motor

(a) Disconnect mode damper motor connector K-017 and automatic A/C control module connector K-022.
(b) Connect the negative battery terminal cable.
(c) Turn ENGINE START STOP switch to ON and turn blower on.
(d) Using a digital multimeter, measure the voltage between terminal 2 of mode damper motor connector K-017 and body ground according to value(s) in table below.



Voltage Inspection

Multimeter Connection	Condition	Specified Condition
K-017 (2) - Body ground	ENGINE START STOP switch ON	Not less than 12 V

Result

Proceed to
OK
NG

NG → **Check wire harness connector fuse RF09 (10A) and meter relay box.**

OK

5 Reconfirm DTCs

(a) Connect all connectors.
(b) Connect the negative battery cable.
(c) Turn ENGINE START STOP switch to ON.
(d) Use diagnostic tester to check if the same DTCs are output.

Result

Proceed to
OK
NG

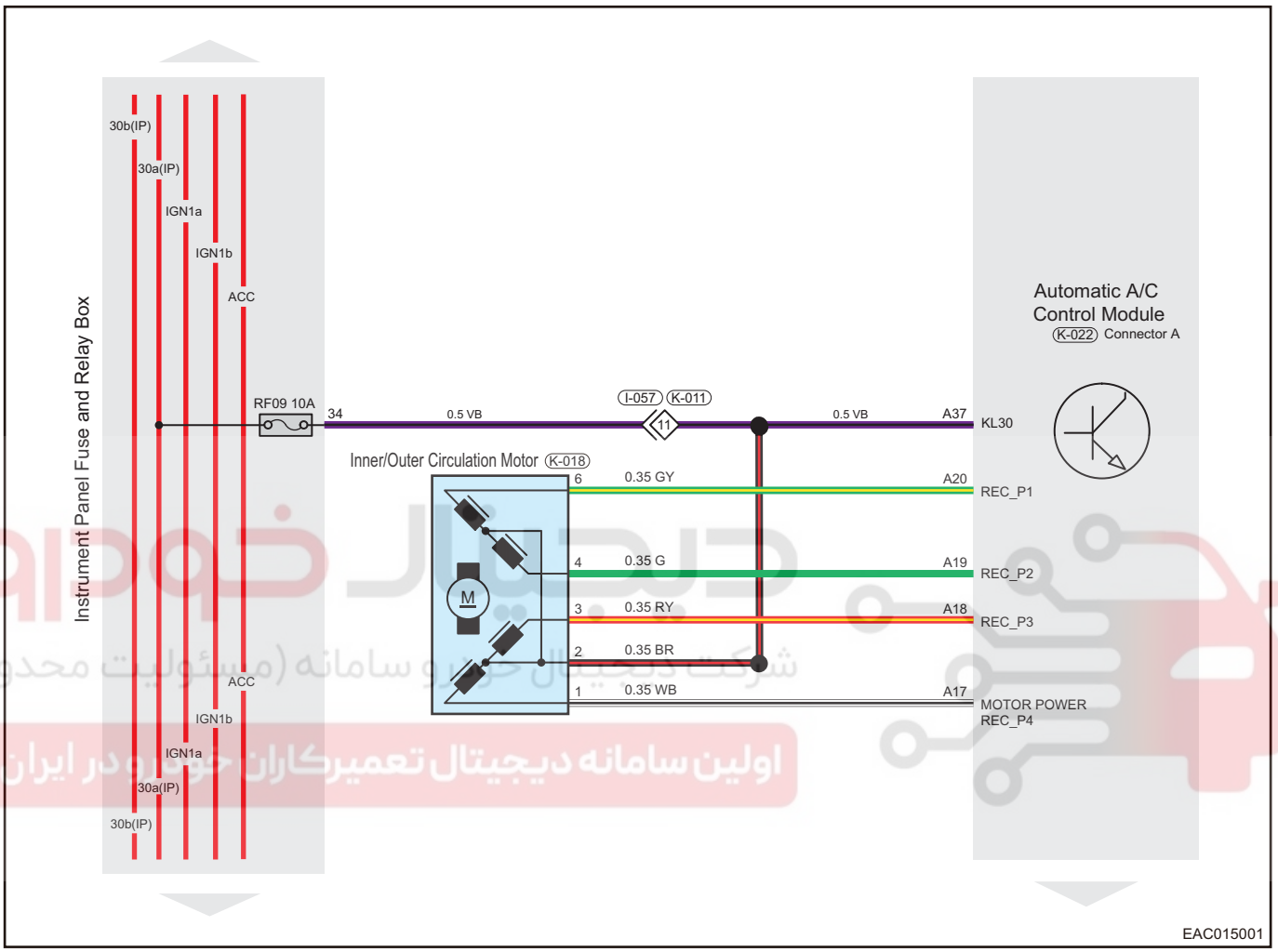
OK → **System operates normally**

NG → Replace automatic A/C control module

DTC	B1410-11	Rec Motor Step Circuit Short to Ground

DTC	B1410–12	Rec Motor Step Circuit Open

Circuit Diagram



Description

DTC	DTC Definition	DTC Detection Condition	Possible Cause
B1410-11	Rec Motor Step Circuit Short to Ground	ENGINE START STOP switch ON	• Inner/outer circulation motor • Automatic A/C control module • Wire harness or connector
B1410–12	Rec Motor Step Circuit Open		

Caution:
When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Diagnostic Procedure

1	Check wire harness and connector

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.

(c) Disconnect inner/outer circulation motor connector K-018 and automatic A/C control module connector K-022.
(d) Check wire harness, connector and terminal for deformation, bend or damage.

Result

Proceed to
OK
NG

NG → **Repair or replace wire harness**

OK

2	Check inner/outer circulation motor

(a) Remove the inner/outer circulation motor from malfunctioning vehicle.
(b) Install a new inner/outer circulation motor to malfunctioning vehicle.
(c) Check if there are DTCs B1410-11 and B1410-12.

Result

Proceed to
NG
OK

OK → **Replace inner/outer circulation motor**

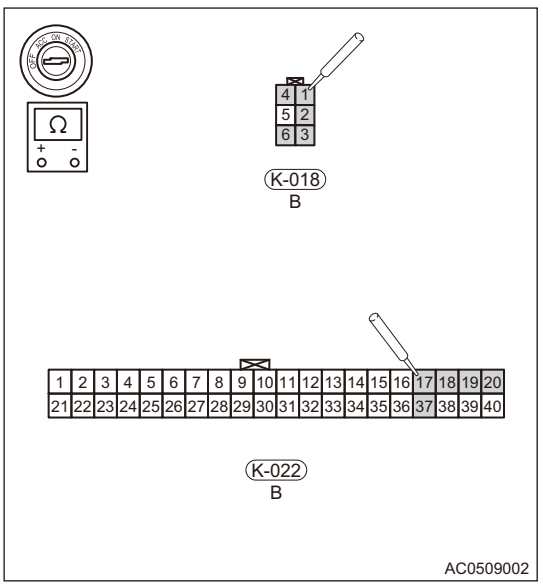
NG

3	Check wire harness connector between automatic A/C control module and inner/outer circulation motor

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect automatic A/C control module connector K-022 and inner/outer circulation motor connector K-018.
(d) Using a digital multimeter, measure the wire harness between inner/outer circulation motor connector K-018 and automatic A/C control module connector K-022 according to value(s) in table below.

Check for Open

Multimeter Connection	Condition	Specified Condition
K-018 (1) - K-022 (17)	Always	Resistance ⩽ 1Ω
K-018 (2) - K-022 (37)	Always	Resistance ⩽ 1Ω
K-018 (3) - K-022 (18)	Always	Resistance ⩽ 1Ω
K-018 (4) - K-022 (19)	Always	Resistance ⩽ 1Ω
K-018 (6) - K-022 (20)	Always	Resistance ⩽ 1Ω



39

Result

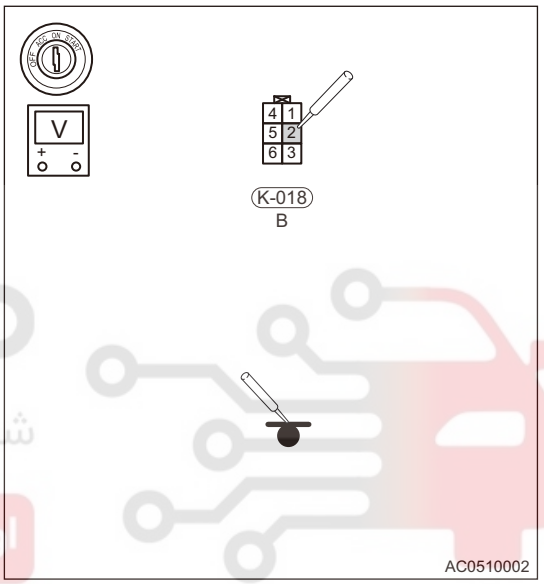
Proceed to
OK
NG

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

OK

4 Check power circuit of inner/outer circulation motor

(a) Connect the negative battery terminal cable.
(b) Turn ENGINE START STOP switch to ON.
(c) Using a digital multimeter, measure the voltage between terminal 2 of inner/outer circulation motor connector K-018 and body ground according to value(s) in table below.



Voltage Inspection

Multimeter Connection	Condition	Specified Condition
K-018 (2) - Body ground	ENGINE START STOP switch ON	Not less than 12 V

Result

Proceed to
OK
NG

NG → **Check wire harness connector fuse RF09 (10A) and meter relay box**

OK

5 Reconfirm DTCs

(a) Connect all connectors.
(b) Connect the negative battery cable.
(c) Turn ENGINE START STOP switch to ON.
(d) Use diagnostic tester to check if the same DTCs are output.

Result

Proceed to
OK
NG

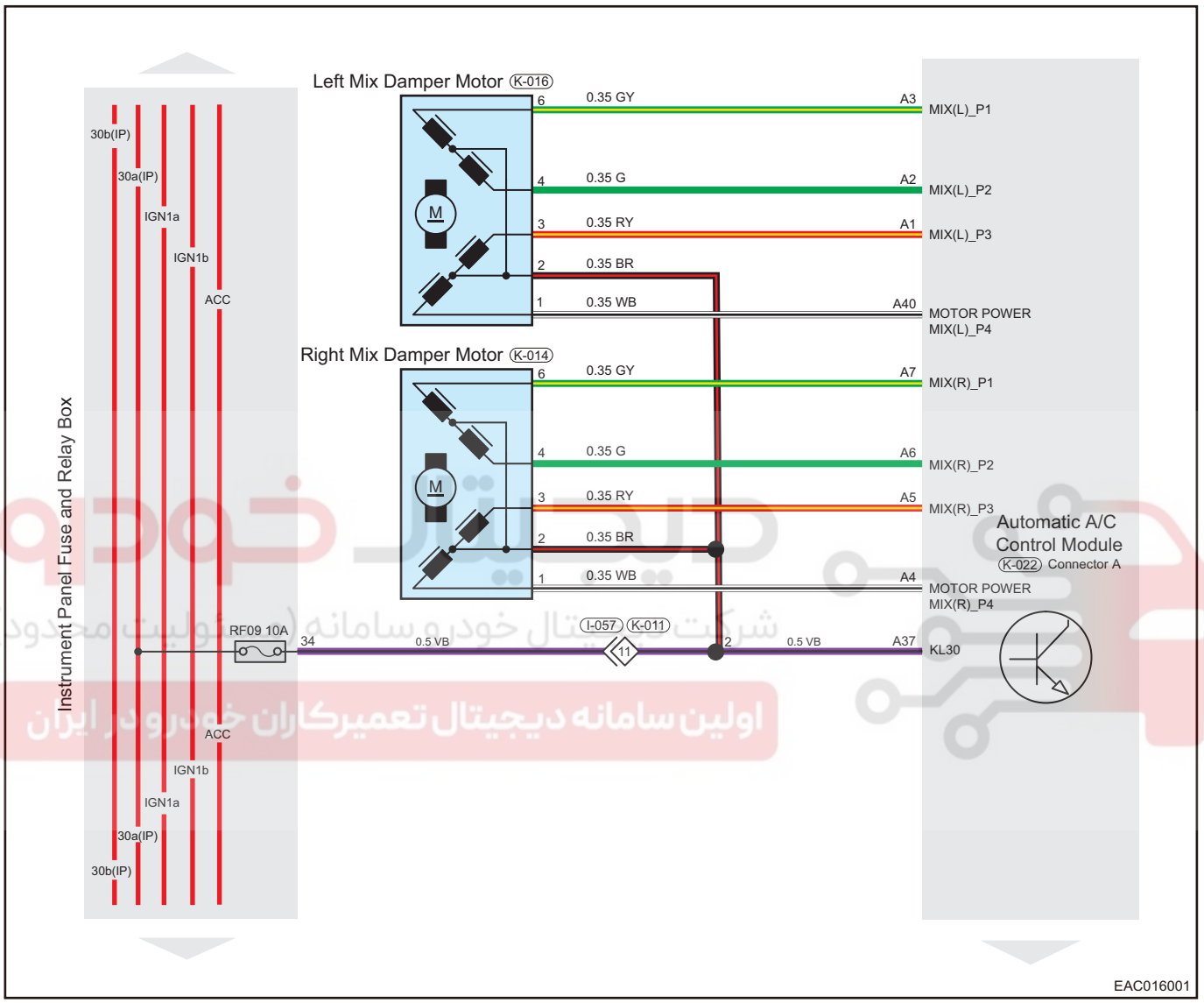
OK → **System operates normally**

NG → **Replace automatic A/C control module**

DTC	B1412-11	Mix Flap Motor Step Circuit Short to Ground

DTC	B1412–12	Mix Flap Motor Step Circuit Open

Circuit Diagram



Description

DTC	DTC Definition	DTC Detection Condition	Possible Cause
B1412–11	Mix Flap Motor Step Circuit Short to Ground	ENGINE START STOP switch ON	• Mix damper motor • Automatic A/C control module • Wire harness or connector
B1412–12	Mix Flap Motor Step Circuit Open		

Caution:
When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.
Take left mix damper motor as an example.

Diagnostic Procedure

1	Check wire harness and connector

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect left mix damper motor connector K-016 and automatic A/C control module connector K-022.
(d) Check wire harness, connector and terminal for deformation, bend or damage.

Result

Proceed to
OK
NG

NG → **Repair or replace wire harness**

OK

2	Check left mix damper motor

(a) Remove left mix damper motor from malfunctioning vehicle.
(b) Install a new left mix damper motor to malfunctioning vehicle.
(c) Check if there are DTCs B1412-11 and B1412-12.

Result

Proceed to
NG
OK

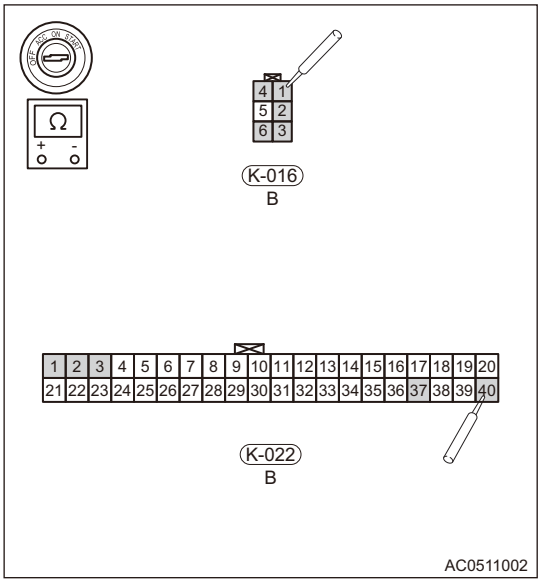
OK → **Replace mix damper motor**

NG

3	Check wire harness connector between automatic A/C control module and left mix damper motor

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect automatic A/C control module connector K-022 and left mix damper motor connector K-016.

(d) Using a digital multimeter, measure the wire harness between left mix damper motor connector K-016 and automatic A/C control module connector K-022 according to value(s) in table below.



Check for Open

Multimeter Connection	Condition	Specified Condition
K-016 (1) - K-022 (40)	Always	Resistance ⩽ 1Ω
K-016 (2) - K-022 (37)	Always	Resistance ⩽ 1Ω
K-016 (3) - K-022 (1)	Always	Resistance ⩽ 1Ω
K-016 (4) - K-022 (2)	Always	Resistance ⩽ 1Ω
K-016 (6) - K-022 (3)	Always	Resistance ⩽ 1Ω

Result

Proceed to
OK
NG

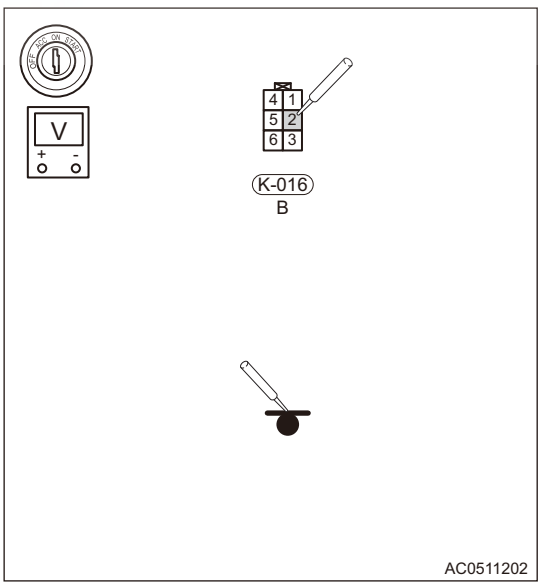
NG → **Repair or replace related wire harness**

OK

39

4	Check power circuit of left mix damper motor

(a) Connect the negative battery terminal cable.
(b) Turn ENGINE START STOP switch to ON.
(c) Using a digital multimeter, measure the voltage between terminal 2 of left mix damper motor connector K-016 and body ground according to value(s) in table below.



Voltage Inspection

Multimeter Connection	Condition	Specified Condition
K-016 (2) - Body ground	ENGINE START STOP switch ON	Not less than 12 V

Result

Proceed to
OK
NG

NG → **Check wire harness connector fuse RF09 (10A) and meter relay box**

OK

5	Reconfirm DTCs

(a) Connect all connectors.
(b) Connect the negative battery cable.
(c) Turn ENGINE START STOP switch to ON.
(d) Use diagnostic tester to check if the same DTCs are output.

Result

Proceed to
OK
NG

OK	System operates normally
NG	Replace automatic A/C control module

Instrument CAN Network DTCs

DTC	DTC Definition
U0140_87	Lost Communication with BCM
U0155_87	Lost Communication with ICM
U0245_87	Lost Communication with RRM
U0100_87	Lost Communication with EMS
U0129_87	Lost Communication with BSM
U0214_87	Lost Communication with PEPS

Refer to CAN Communication System for CAN network DTC.

ON-VEHICLE SERVICE

Refrigerant Recovering, Vacuum Pumping and Recharging

Refrigerant Recovering/Draining

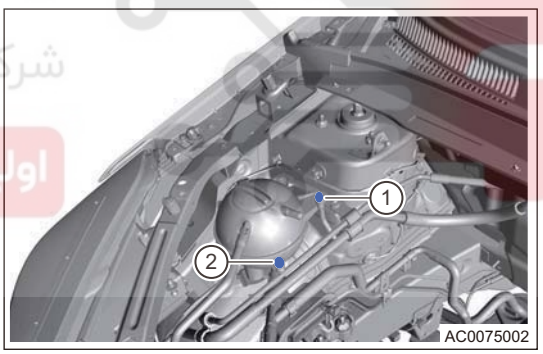
Warning/Caution/Hint

- Take extra care when servicing A/C system under high pressure.
- Because there is refrigerant under high pressure in A/C system. It must be serviced by professional technician. Otherwise, a wrong service procedure may cause a serious danger or fatal injury.
- If A/C system pressure is released unexpectedly, ventilate work area before servicing. In a closed work place, if a large amount of refrigerant is discharged, it may cause oxygen reduction and result in smothering, causing a serious or fatal injury.
- Never drain refrigerant in A/C system into the atmosphere directly, and avoid environmental contamination.

Caution:

- It is necessary to recover refrigerant with R134a refrigerant special recycling machine.
- DO NOT work near open flames.
- Always dispose of recovered refrigerant as specified.
- Never charge R-12 to refrigerant system which is designed to use R134a. This refrigerant is incompatible, which could damage the A/C system.
- DO NOT race engine when vacuum pump operates or vacuum exists in A/C system. Otherwise, A/C compressor assembly will be damaged seriously.

1. Open the engine hood and loosen the joint cover of A/C high/low pressure line.
2. Connect the refrigerant recycling machine to A/C high/low pressure line joint.
   (a) Connect the red connector to A/C high pressure line joint (1).
   (b) Connect the blue connector to A/C low pressure line joint (2).

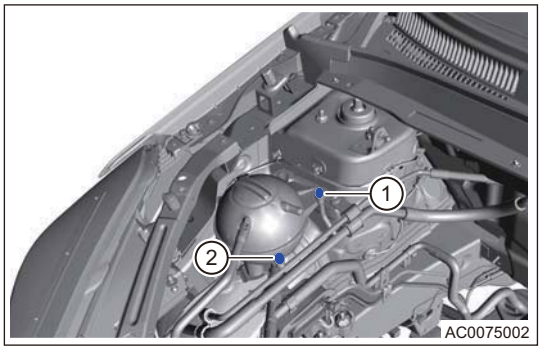


3. Open the high pressure valve and low pressure valve of refrigerant recycling machine.
4. Choose "recovering" item on machine and make it start to operate.
5. Check the low pressure value on pressure gauge to ensure that recycling is completed, and then turn off machine.
6. Disconnect the connection between refrigerant recycling machine and A/C line joint.
7. Reinstall the cover onto refrigerant line joint.

Vacuum Pumping

1. Open the engine hood and loosen the joint cover of A/C high/low pressure line.
2. Connect the refrigerant recycling machine to A/C high/low pressure line joint.

(a) Connect the red connector to A/C high pressure line joint (1).
(b) Connect the blue connector to A/C low pressure line joint (2).



3. Open the high pressure valve and low pressure valve of refrigerant recycling machine.
4. Choose "vacuum pumping" item on machine and the time setting is 15 minutes, then choose OK and make it start to operate.
5. Wait for 10 minutes after completing operation, check if there is any change in A/C system vacuum. If there is any change, the A/C system leakage may exist, you should check and repair the A/C system. If there is no change, proceed to perform refrigerant charging procedures.

Refrigerant Recharging

Warning/Caution/Hint

- A small amount of refrigerant oil in A/C system will be discharged when recovering and draining refrigerant. When filling A/C system, be sure to supplement refrigerant oil, as some amount of oil are lost during recovering.
- DO NOT fill excessive refrigerant. Otherwise, it will cause excessive pressure to compressor assembly, resulting in compressor assembly noise and A/C system failure.
- Always perform vacuum pumping before recharging refrigerant.

1. Perform vacuum pumping with a vacuum pump.
2. Add refrigerant oil after checking that there is no leakage in A/C system.
3. Perform vacuum pumping for 3 minutes again after adding refrigerant oil, then charge refrigerant.
4. Choose "charging" item on machine and set the amount of charging to specified value, then choose "OK" and make it start to operate.
5. Open the suction valve and close the discharging valve, and then open the charging valve to allow refrigerant to flow into the system.
6. When the delivery of refrigerant has stopped, close the charging valve.
7. If charged refrigerant is not delivered to specified position, start the engine to operate the A/C compressor assembly.
8. Open the charging valve to deliver the remaining refrigerant to A/C system.

   Warning:
   - At this time, do not open exhaust (high pressure) valve. Failure to do so may result in personal injury or even death.
9. Perform A/C system pressure test after charging.
10. Remove the connecting pipe for refrigerant charging after the test is completed.
11. Reinstall the cover onto A/C line joint.

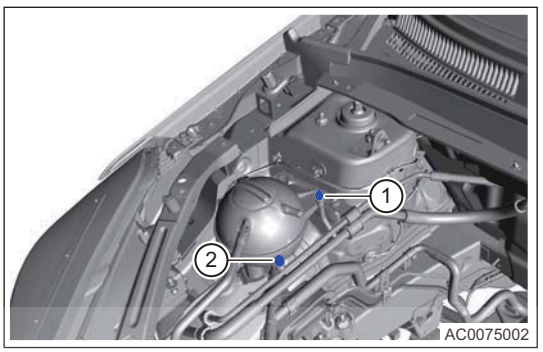
Refrigerant Oil Recovering and Charging

Refrigerant Oil Recovering

Warning/Caution/Hint

- Special service equipment for R134a refrigerant must be used.
- Always keep work area in good ventilation, because A/C system is easy to leak.
- Always dispose of recovered refrigerant as specified.
- Refrigerant oil must be charged after replacing A/C system components or recovering refrigerant.

1. Open the engine hood and loosen the joint cover of A/C high/low pressure line.
2. Connect the refrigerant recycling machine to A/C high/low pressure line joint.
   (a) Connect the red connector to A/C high pressure line joint (1).
   (b) Connect the blue connector to A/C low pressure line joint (2).



3. Open the high pressure valve and low pressure valve of refrigerant recycling machine.
4. Recover refrigerant oil according to instructions on the machine.
5. Record amount of recovered refrigerant oil.
6. Disconnect the connection between refrigerant recycling machine and A/C line joint.
7. Reinstall the joint cover onto refrigerant line joint.

Refrigerant Oil Charging

1. Perform vacuum pumping with a vacuum pump. Wait for 10 minutes after completing operation, check if there is any change in A/C system pressure. If there is any change, the A/C system leakage may exist, you should check and repair the A/C system. If there is no change, proceed to perform refrigerant oil charging procedures.
2. Open the suction valve and close the exhaust valve, and then open the charging valve to allow refrigerant oil to flow into the system.
3. Close the charging valve after refrigerant oil charging is completed.
4. Perform vacuum pumping again for 3 minutes.
5. Continue to perform refrigerant charging procedures after operation is completed.

Refrigerant Oil Charging Amount Specifications

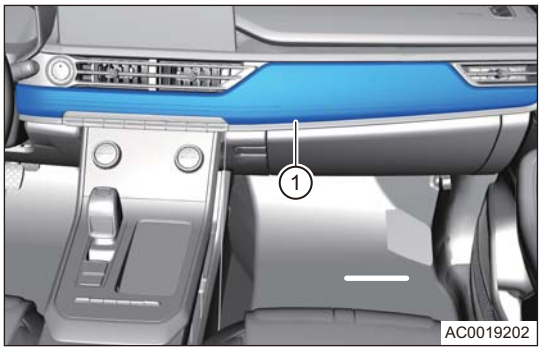
Item	A/C Compressor Assembly Replacement	Condenser Replacement	Evaporator Tank Replacement	Line Replacement
Refrigerant Oil Charging Amount	Supplement according to actual pouring amount	20 ml	20 ml	10 ml

A/C Control Panel Assembly

Removal

1. Turn off all electrical equipment and ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the A/C control panel.

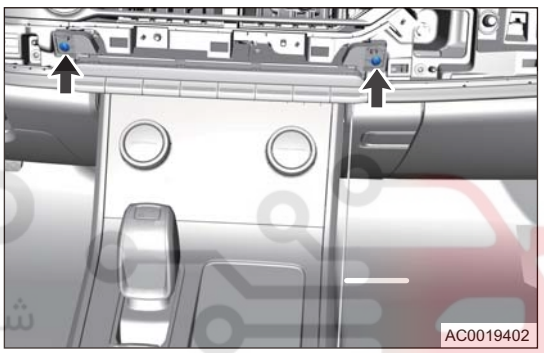
(a) Using an interior crow plate, pry off center control panel fixing clip and remove center control panel assembly (1).



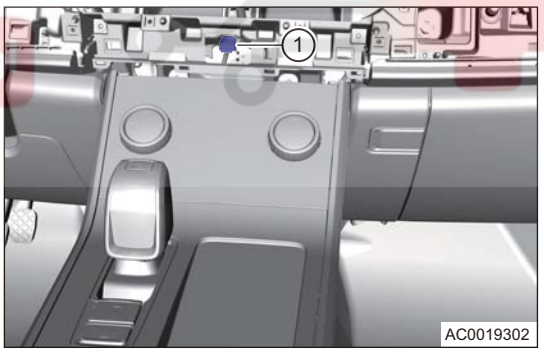
(b) Remove 2 fixing screws (arrow) from center console switch assembly.

Tightening torque

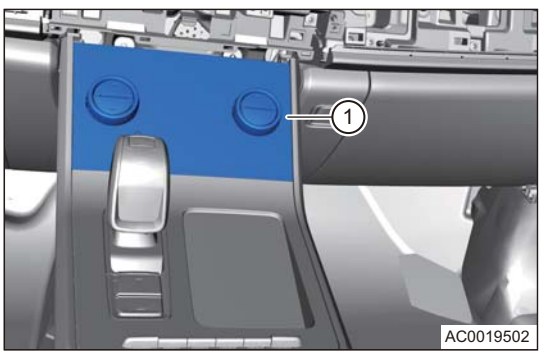
1.5 ± 0.5 N·m



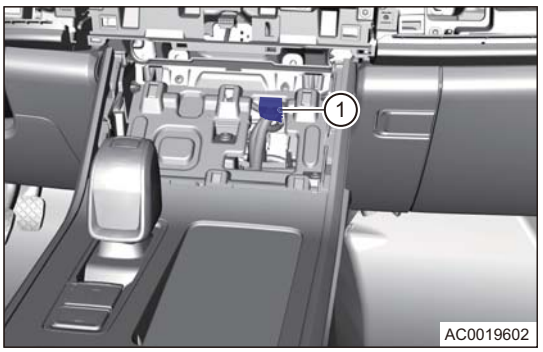
(c) Disconnect the center console switch assembly connector (1).



(d) Using an interior crow plate, carefully pry out electric A/C control panel assembly (1).



(e) Disconnect the A/C control panel connector (1).



Installation

1. Installation is in the reverse order of removal.

Caution:

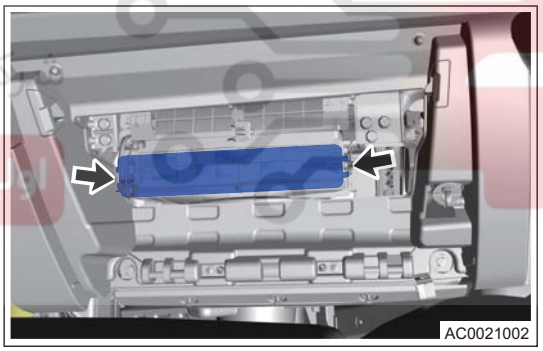
- Make sure that fixing clips on upper part of A/C control panel assembly are installed in place when installing.
- Make sure that dowel pin on upper part of A/C control panel assembly is aligned with positioning hole of instrument panel when installing.

A/C Element

Removal

1. Remove the glove box assembly (See page 58-13).
2. Remove the A/C element.

(a) Detach 2 clips (arrow) from A/C element protector cover, and remove A/C element protector cover.



(b) Remove the A/C element assembly.

Installation

1. Installation is in the reverse order of removal.

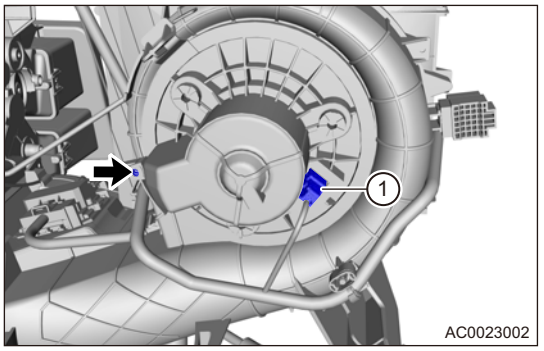
Warning:

When installing A/C element, make arrow mark on the element face downward.

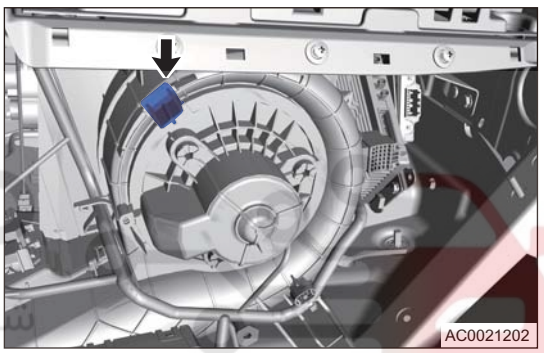
Front Blower Assembly

Removal

1. Turn off all electrical equipment and ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the blower assembly.
   (a) Disconnect blower assembly connector (1), and remove 1 fixing bolt (arrow) from blower.

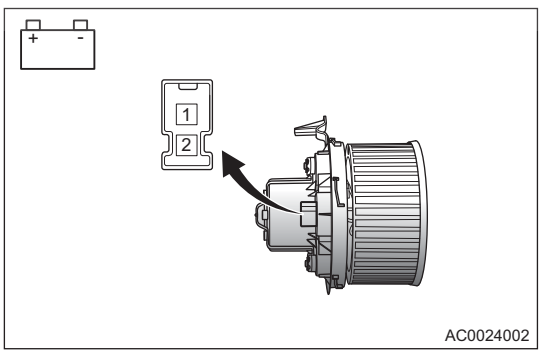


   (b) Detach blower fixing claw (arrow), and rotate blower counterclockwise to remove blower.



Inspection

1. Check the blower motor.
   (a) Remove the blower assembly.
   (b) Connect the positive (+) battery lead to terminal 1 and negative (-) battery lead to terminal 2. Check that the blower motor operates smoothly.



Installation

1. Installation is in the reverse order of removal.

Front Blower Speed Regulation Module

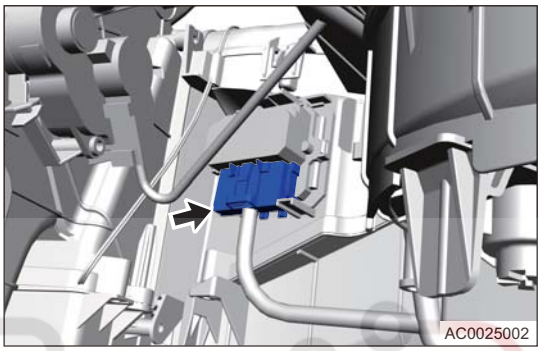
Removal

Warning/Caution/Hint

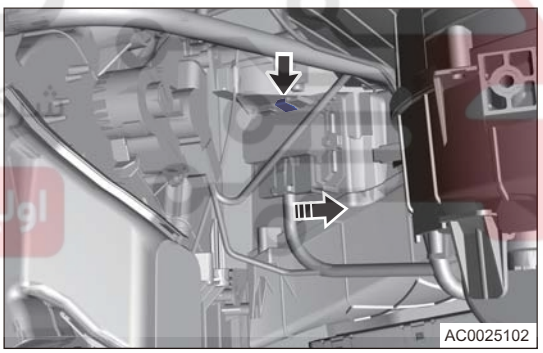
- During normal operation, blower speed regulation module may be very hot. Turn off blower and wait for a few minutes to cool it before diagnosing or servicing, in order to avoid burns.
- DO NOT operate blower assembly when removing the blower speed regulation module from vehicle. Failure to do so may result in damage to the blower assembly.

1. Turn off all electrical equipment and ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the glove box assembly (See page 58-13).
4. Remove the blower speed regulation module.

(a) Disconnect the blower speed regulation module connector (arrow).



(b) Detach blower speed regulation module fixing claw (arrow), and move blower speed regulation module to right side.



(c) Remove the blower speed regulation module assembly.

Installation

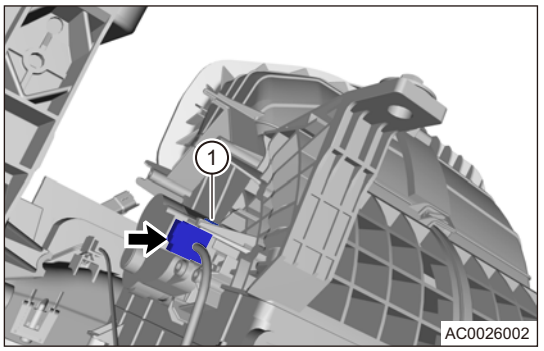
1. Installation is in the reverse order of removal.

Inner/Outer Circulation Damper Motor

Removal

1. Turn off all electrical equipment and ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the glove box assembly (See page 58-13).
4. Remove the inner/outer circulation damper motor.

   (a) Disconnect the inner/outer circulation damper motor connector (arrow).
   (b) Detach the fixing clip (1) from mode damper motor.
   (c) Rotate counterclockwise to remove the mode damper motor.



Installation

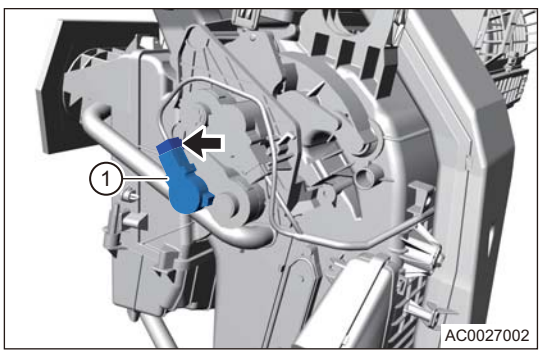
1. Installation is in the reverse order of removal.

   Caution:
   - When installing, apply a small amount of grease to contact surface of the inner/outer circulation damper motor lever and the inner/outer circulation damper set to ensure the motor operates smoothly.

Mode Damper Motor

Removal

1. Turn off all electrical equipment and ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the instrument panel left lower protector assembly.
4. Remove the mode damper motor.



   (a) Disconnect the mode damper motor connector (arrow).
   (b) Detach the fixing clip (1) from mode damper motor.
   (c) Rotate counterclockwise to remove the mode damper motor.

Installation

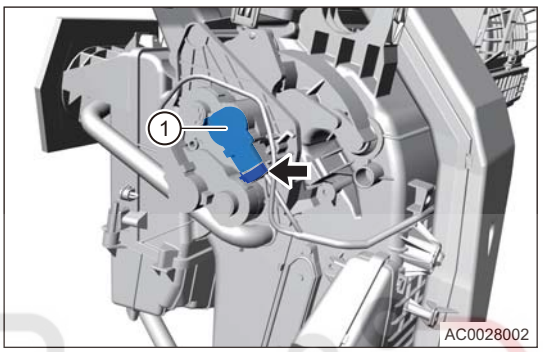
1. Installation is in the reverse order of removal.

Caution:
- When installing, apply a small amount of grease to contact surface of the mode damper motor lever and the mode damper set to ensure the motor operates smoothly.

Left Mix Damper Motor

Removal

1. Turn off all electrical equipment and ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the glove box assembly (See page 58-13).
4. Remove the left mix damper motor.
   (a) Disconnect the left mix damper motor connector (arrow).
   (b) Detach the mix damper motor fixing clip.
   (c) Rotate counterclockwise to remove left mix damper motor (1).



Installation

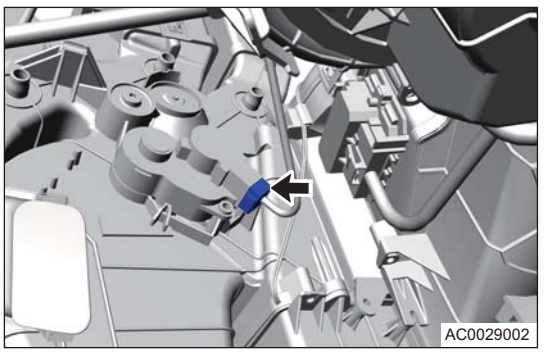
1. Installation is in the reverse order of removal.

Caution:
- When installing, apply a small amount of grease to contact surface of the left mix damper motor lever and the mix damper set to ensure the motor operates smoothly.

Right Mix Damper Motor

Removal

1. Turn off all electrical equipment and ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the glove box assembly (See page 58-13).
4. Remove the right mix damper motor.
   (a) Disconnect the right mix damper motor connector (arrow).



   (b) Detach the mix damper motor fixing clip.
   (c) Rotate counterclockwise to remove right mix damper motor.

Installation

1. Installation is in the reverse order of removal.

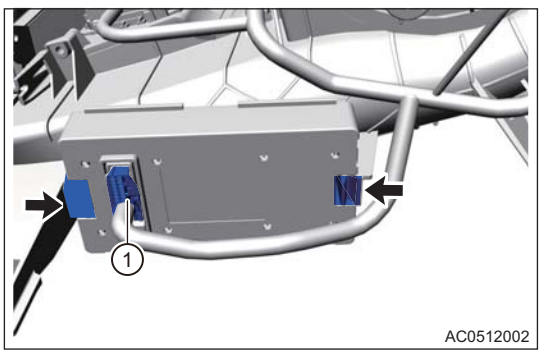
Caution:

- When installing, apply a small amount of grease to contact surface of the right mix damper motor lever and the mix damper set to ensure the motor operates smoothly.

Automatic A/C Control Module

Removal

1. Turn off all electrical equipment and ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the automatic A/C control module.
   (a) Disconnect the automatic A/C control module connector (1).
   (b) Loosen 2 fixing clips (arrow) and remove automatic A/C control module.



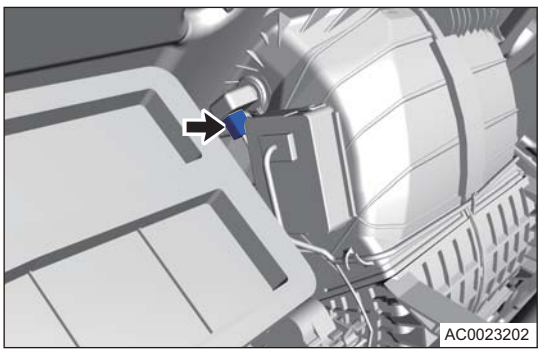
Installation

1. Installation is in the reverse order of removal.

Air Quality Sensor

Removal

1. Turn off all electrical equipment and ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the instrument panel assembly (See page 58-13).
4. Remove the air quality sensor.
   (a) Disconnect air quality sensor connector (arrow), and rotate counterclockwise to remove air quality sensor.



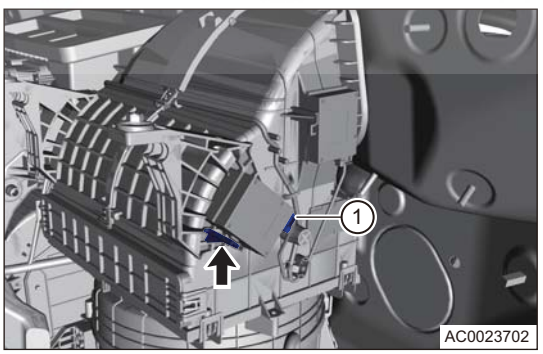
Installation

1. Installation is in the reverse order of removal.

Inside PM2.5 Sensor

Removal

1. Turn off all electrical equipment and ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the instrument panel assembly (See page 58-13).
4. Remove the inside PM2.5 sensor.
   (a) Disconnect the inside PM2.5 sensor (1).
   (b) Detach inside PM2.5 sensor fixing claw (arrow) and move inside PM2.5 sensor upward.



   (c) Remove the inside PM2.5 sensor.

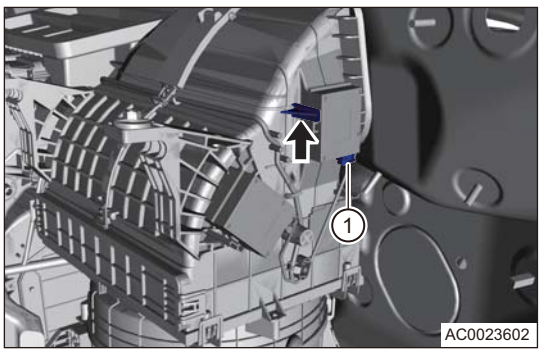
Installation

1. Installation is in the reverse order of removal.

Outside PM2.5 Sensor

Removal

1. Turn off all electrical equipment and ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the instrument panel assembly (See page 58-13).
4. Remove the outside PM2.5 sensor.
   (a) Disconnect the outside PM2.5 sensor (1).
   (b) Detach outside PM2.5 sensor fixing claw (arrow) and move outside PM2.5 sensor upward.



   (c) Remove the outside PM2.5 sensor.

Installation

1. Installation is in the reverse order of removal.

HVAC Assembly

Removal

WARNING

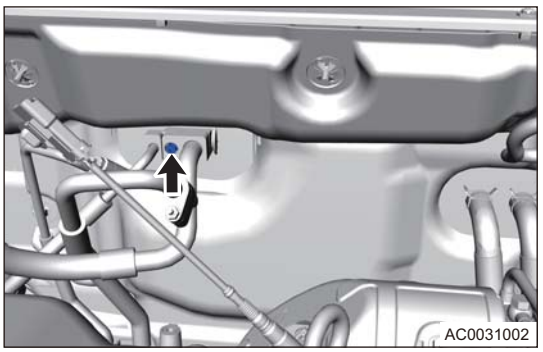
Caution:

- Special service equipment for R134a refrigerant must be used to recover/charge refrigerant.
- Be careful not to damage hoses during removal and installation.
- Always keep work area in good ventilation.
- Disconnected A/C line and connecting part should be sealed to prevent foreign matter from entering.

1. Recover the refrigerant from A/C system.
2. Turn off all electrical equipment and ENGINE START STOP switch.
3. Disconnect the negative battery cable.
4. Remove the driver airbag.
5. Remove the steering wheel assembly (See page 38-30).
6. Remove the auxiliary fascia console assembly.
7. Remove the instrument panel assembly (See page 58-13).
8. Remove the instrument panel crossmember assembly (See page 58-25).
9. Remove the HVAC assembly.

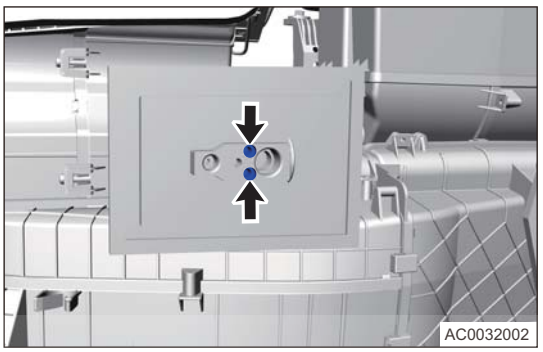
(a) Remove the A/C high/low pressure line fixing bolt (arrow).

Tightening torque
9 ± 1.5 N•m

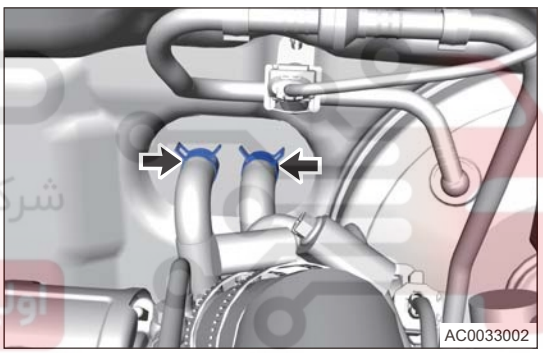


(b) Remove 2 fixing bolts (arrow) from expansion valve and remove expansion valve assembly.

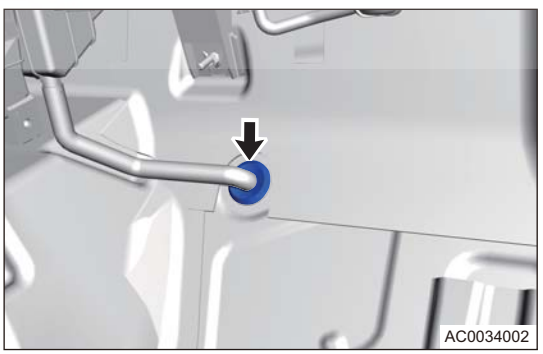
Tightening torque
9 ± 1.5 N•m



(c) Using snap spring pliers, disengage fixing clamps (arrow) from heating inlet and outlet hoses to detach the inlet and outlet hoses.

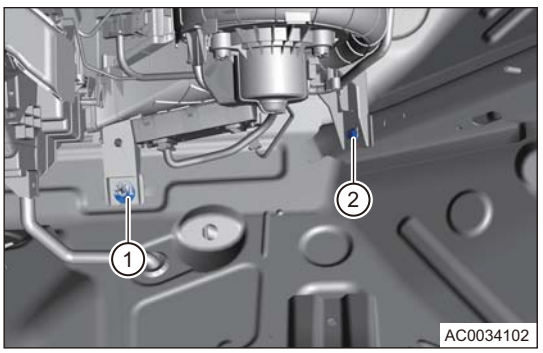


(d) Disengage outlet hose of HVAC and fixing bush rubber (arrow) of body.



(e) Remove HVAC fixing nut (1) and fixing bolt (2).

Tightening torque
7 ± 1 N·m

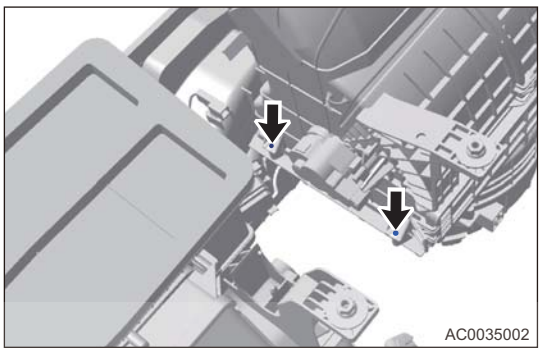


(f) Carefully remove HVAC assembly from cabin.

Disassembly

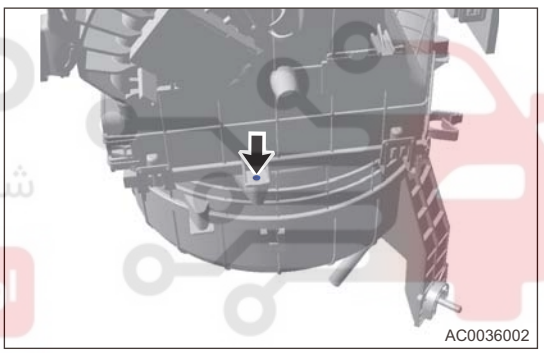
1. Remove the blower assembly.
2. Remove the blower speed regulation module.
3. Remove the inner/outer circulation damper motor.
4. Remove the left mix damper servo motor.
5. Remove the mode damper motor.
6. Remove the right mix damper motor (automatic A/C).
7. Remove the A/C element assembly.
8. Remove the inner/outer damper set.
   (a) Remove 2 fixing screws (arrow) from inlet air duct assembly.

   Tightening torque
   1.2 ± 0.2 N•m



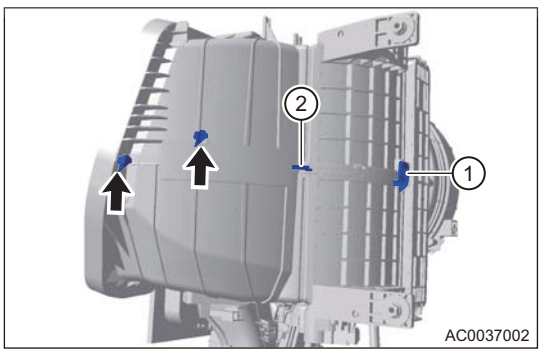
   (b) Remove 1 fixing bolt (arrow) from inlet air duct assembly.

   Tightening torque
   1.2 ± 0.2 N•m



   (c) Remove the inlet air duct assembly.
   (d) Remove 2 fixing bolts (arrow) from inner/outer damper set, and disengage 2 fixing clips.

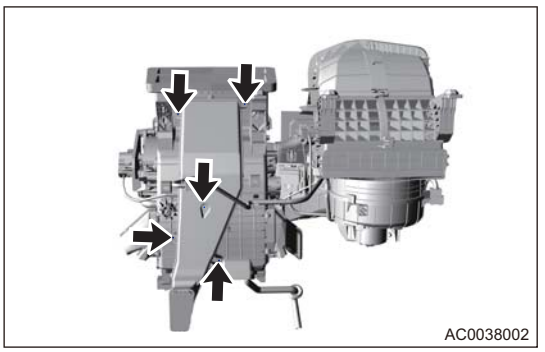
   Tightening torque
   1.2 ± 0.2 N•m



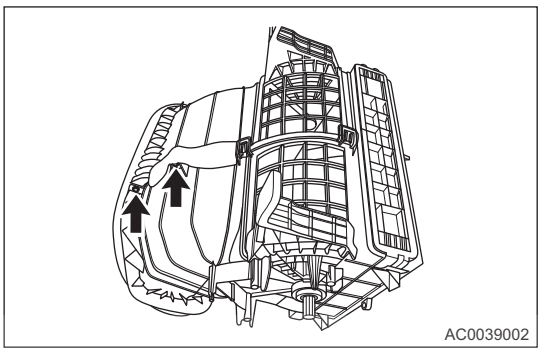
9. Remove the A/C wire harness assembly.

(a) Remove 5 fixing screws (arrow) from rear duct.

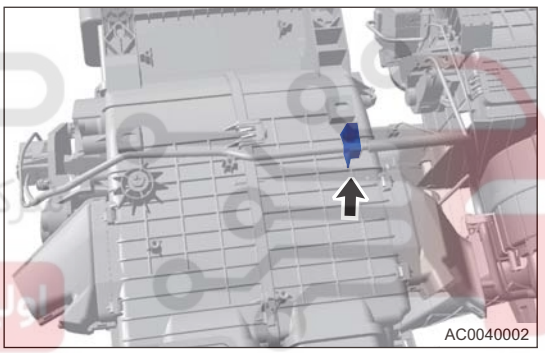
Tightening torque
1.2 ± 0.2 N•m


AC0038002

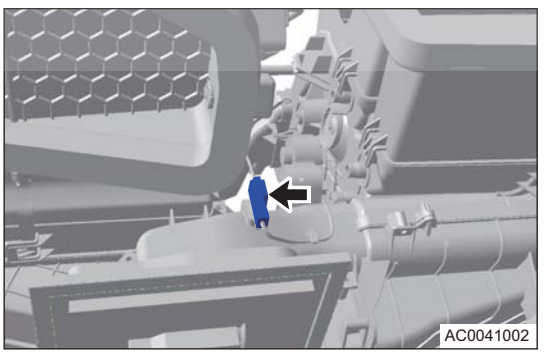
(b) Disengage 2 wire harness fixing clips (arrow).


AC0039002

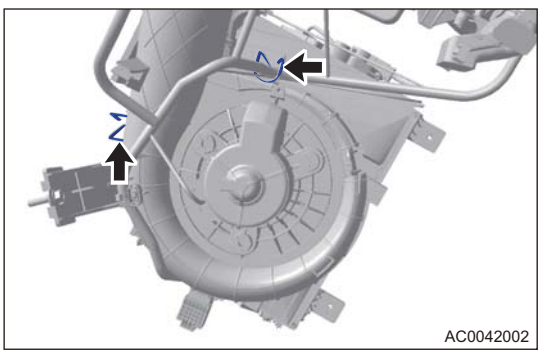
(c) Disengage 1 wire harness fixing clip (arrow).


AC0040002

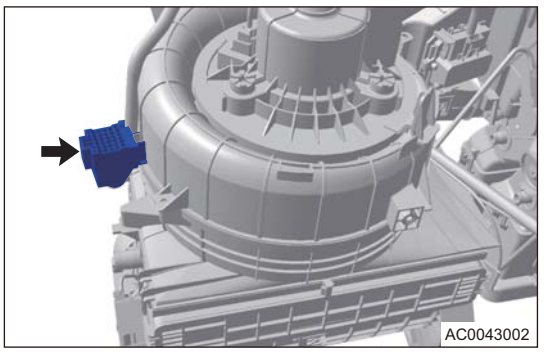
(d) Disconnect the evaporator tank temperature sensor (arrow).


AC0041002

(e) Disengage 2 fixing clips (arrow) of A/C wire harness from HVAC.


AC0042002

(f) Disengage the A/C wire harness connector (arrow) from HVAC.

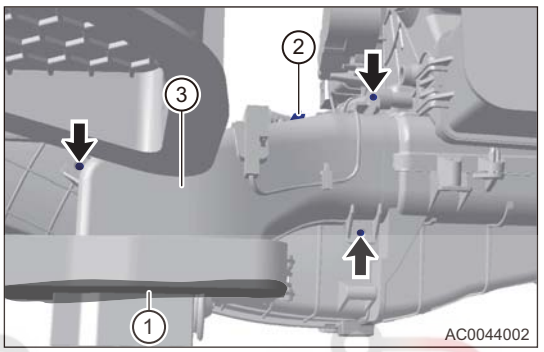


(g) Remove the electric A/C wire harness.

10. Remove the blower volute assembly.

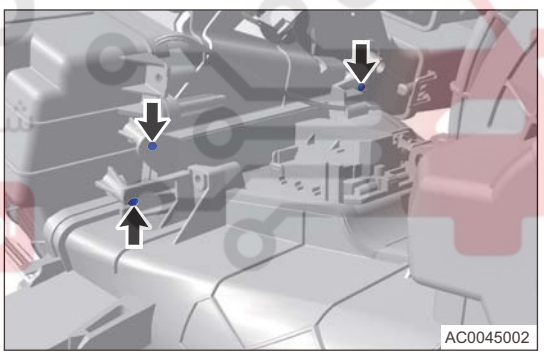
(a) Disengage fixing clip from evaporator tank temperature sensor. Remove the sponge (1) and 3 fixing screws (arrow), disengage fixing clip (2) and open case (3).

Tightening torque
1.2 ± 0.2 N•m



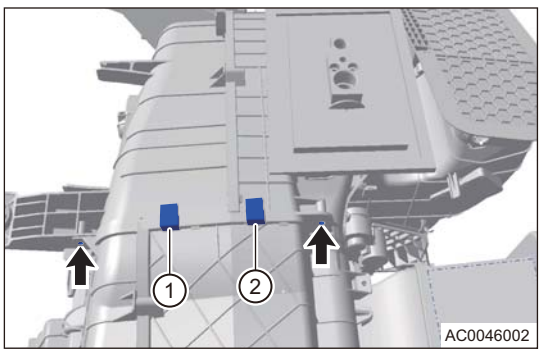
(b) Remove 3 fixing screws (arrow).

Tightening torque
1.2 ± 0.2 N•m



(c) Remove 2 fixing screws (arrow), disengage 2 fixing clips (1) and (2).

Tightening torque
1.2 ± 0.2 N•m

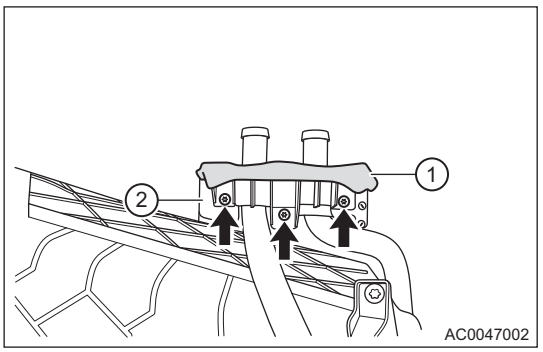


(d) Remove the blower volute assembly.

11. Remove the heater core assembly

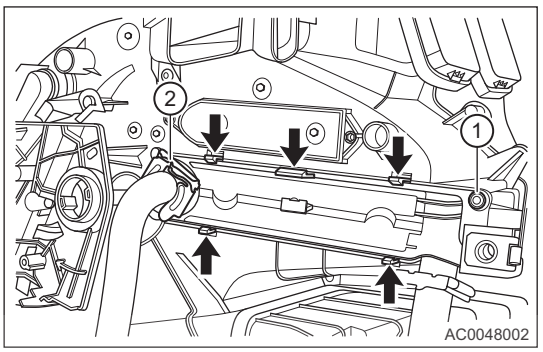
(a) Remove 3 fixing screws (arrow), disengage sponge (1) and open pressing plate (2).

Tightening torque
1.2 ± 0.2 N•m



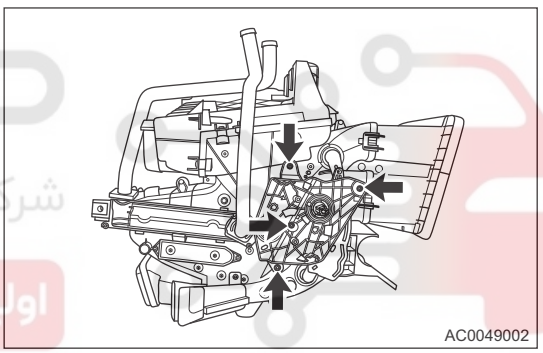
(b) Remove 2 screws (1) and (2) from heater core fixing panel, disengage 5 clips (arrow) from heater core fixing panel.

Tightening torque
1.2 ± 0.2 N•m



(c) Remove 4 fixing screws (arrow) and damper set pressing plate.

Tightening torque
1.2 ± 0.2 N•m

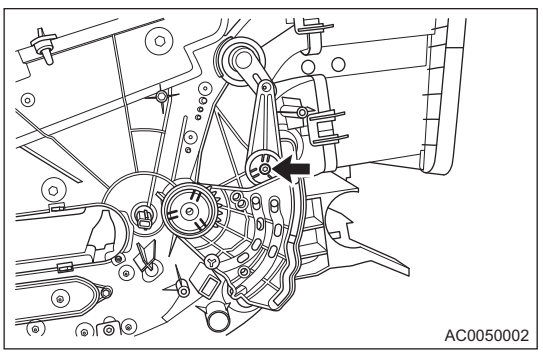


(d) Remove heater core assembly from evaporator tank.

12. Remove the damper drive set

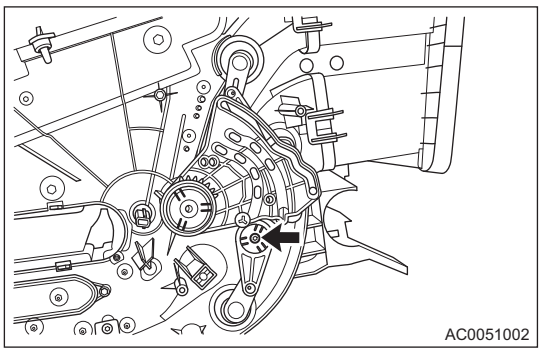
(a) Remove the fixing screw (arrow) from damper drive set.

Tightening torque
1.2 ± 0.2 N•m



(b) Remove the fixing bolt (arrow) from damper drive set.

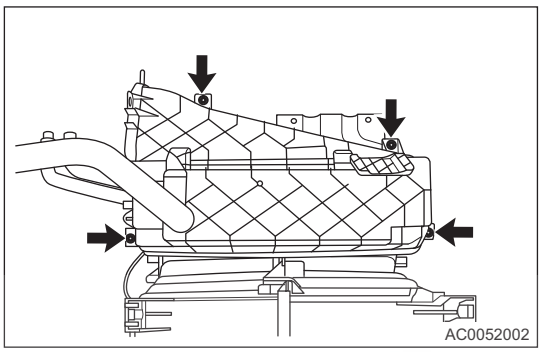
Tightening torque
1.2 ± 0.2 N•m


AC0051002

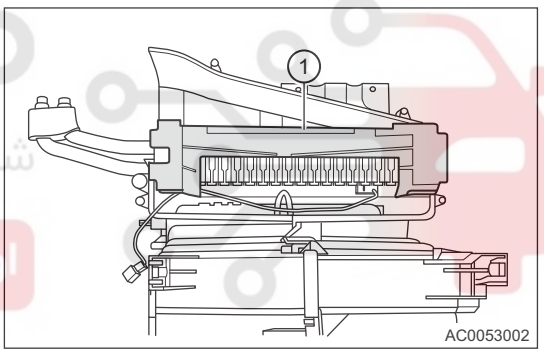
13. Remove the evaporator assembly.

(a) Remove 4 fixing screws (arrow) between evaporator housing and evaporator case.

Tightening torque
1.2 ± 0.2 N•m

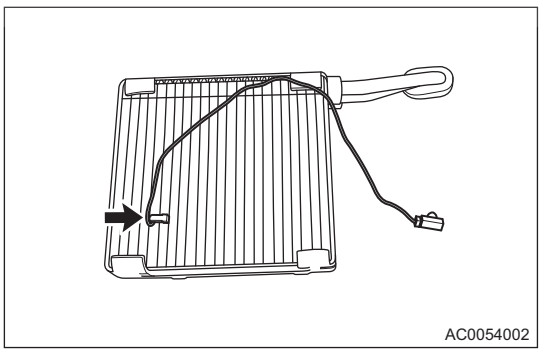

AC0052002

(b) Remove evaporator assembly (1) from evaporator tank.



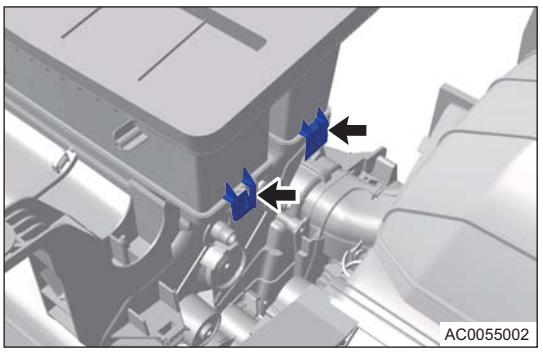
AC0053002

(c) Remove the evaporator tank temperature sensor (arrow) from evaporator assembly.

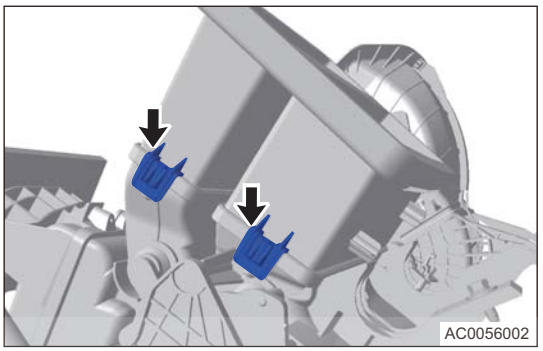

AC0054002

14. Remove the damper set

(a) Disengage 2 fixing clips (arrow) from outlet shield.

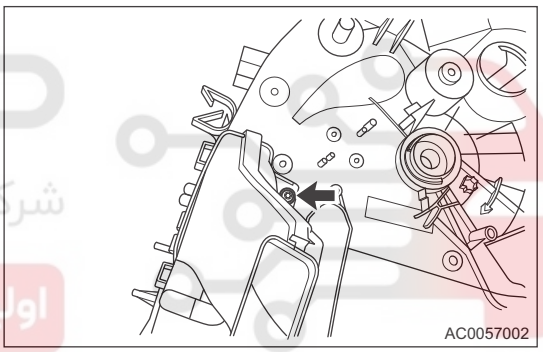


(b) Disengage 2 fixing clips (arrow) from outlet shield.



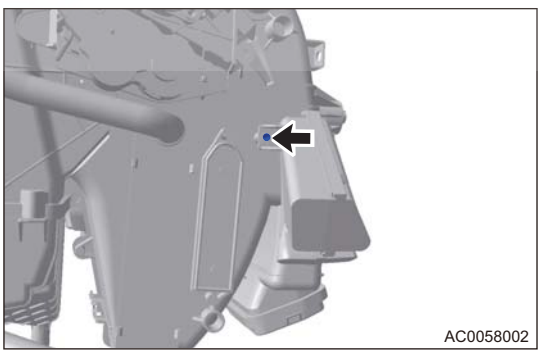
(c) Remove 1 fixing screw (arrow) and rear right outlet.

Tightening torque
1.2 ± 0.2 N•m



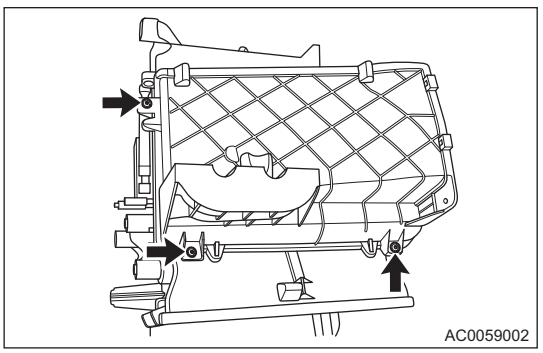
(d) Remove 1 fixing screw (arrow) and rear left outlet.

Tightening torque
1.2 ± 0.2 N•m



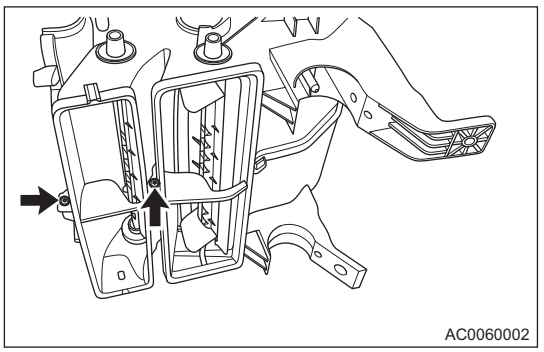
(e) Remove 3 fixing screws (arrow) from evaporator case.

Tightening torque
1.2 ± 0.2 N•m



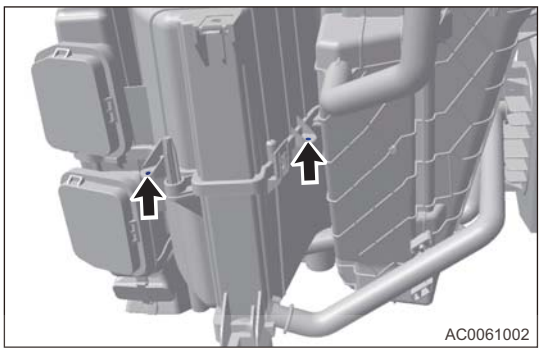
(f) Remove 2 fixing screws (arrow) from damper set housing.

Tightening torque
1.2 ± 0.2 N•m

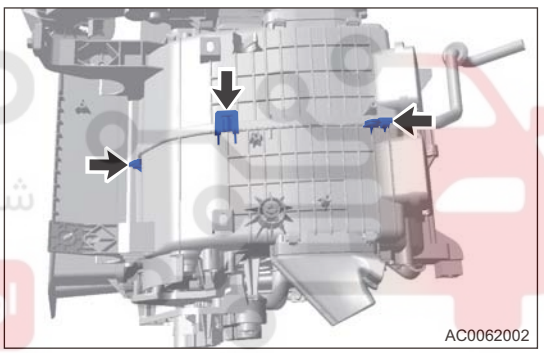

AC0060002

(g) Remove 2 fixing screws (arrow) from damper set housing.

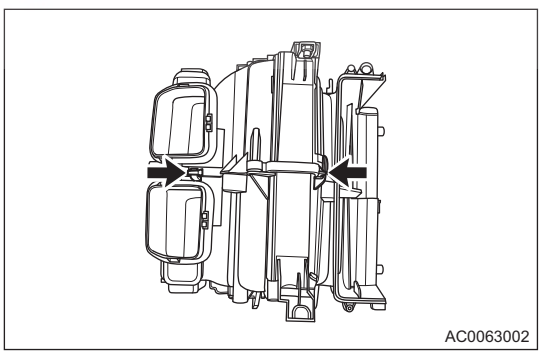
Tightening torque
1.2 ± 0.2 N•m


AC0061002

(h) Remove 3 fixing clips (arrow) from damper set housing.

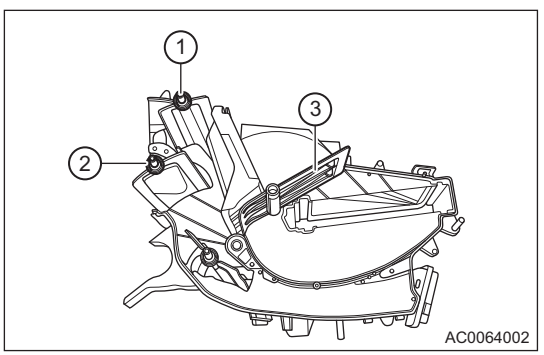

AC0062002

(i) Remove 2 fixing clips (arrow) from damper set housing.


AC0063002

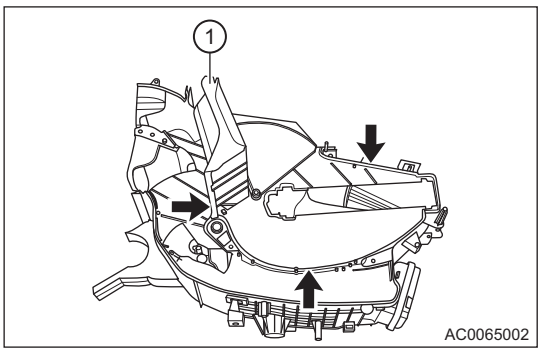
(j) Disengage the damper set housing.

(k) Remove defroster damper set (1), face damper set (2) and right inner damper set (3).

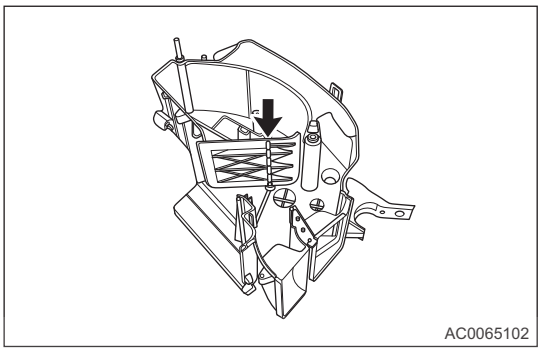


AC0064002

(l) Remove 3 locating plates (arrow) and air deflector (1) from damper housing.



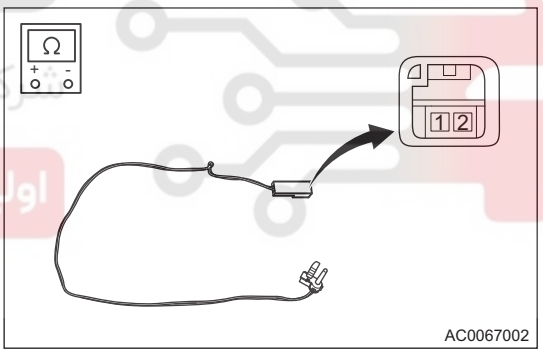
(m) Remove the right inner damper set (arrow).



Inspection

1. Check the evaporator temperature sensor.

(a) Using ohm band of digital multimeter, measure the resistance of evaporator temperature sensor according to the table below.



Multimeter Connection	Temperature (℃)	Standard Resistance (Ω)
Terminal 1 - Terminal 2	-5	7790
Terminal 1 - Terminal 2	0	6194
Terminal 1 - Terminal 2	5	4963
Terminal 1 - Terminal 2	10	4001
Terminal 1 - Terminal 2	15	3245
Terminal 1 - Terminal 2	20	2648

Hint:

- Resistance decreases as temperature increases.
- If result is not as specified, replace evaporator temperature sensor.

Caution:

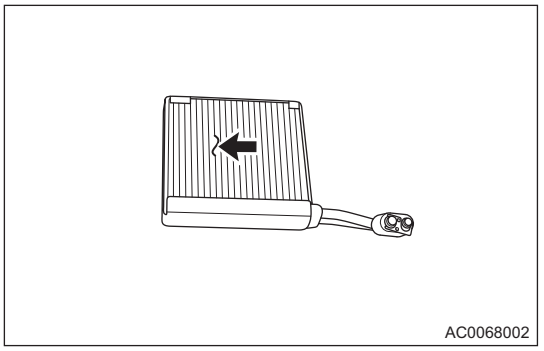
- Resistance value may change even if sensor is touched slightly. Make sure that connector of sensor is held firmly.
- During measurement, sensor temperature must be almost the same as the ambient temperature.

2. Check the evaporator core assembly

(a) Check if evaporator core assembly is cracked, damaged and leaked. If any problem is found, replace evaporator core assembly.

(b) Check fin for bends.

(1) If any fin is bent, carefully straighten it with a screwdriver or pliers.

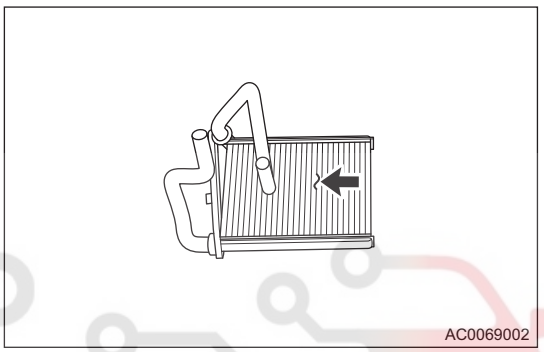


3. Check the heater core assembly

(a) Check if heater core assembly is cracked, damaged or leaked.

(b) Check fin for bends.

(1) If any fin is bent, carefully straighten it with a screwdriver or pliers.



4. Check the damper control mechanism assembly.

(a) Check if inner/outer circulation damper adjustment mechanism is stuck, deformed, damaged or if it has fallen out. Replace as necessary.

(b) Check if mode damper adjustment mechanism is stuck, deformed, damaged or if it has fallen out. Replace as necessary.

(c) Check if face/defrost damper set is stuck, deformed, damaged or if it has fallen out. Replace as necessary.

Assembly

1. Assembly is in the reverse order of disassembly.

Caution:

1. If evaporator core is reused, do not insert evaporator temperature sensor into its original position. Insert it to a location that is 1 fin to the right or left of its previous location.
2. During installation, apply a small amount of grease to contact surface of the inner/outer circulation damper adjustment mechanism to ensure that it can operate smoothly.
3. During installation, apply a small amount of grease to contact surface of the mix damper adjustment mechanism set to ensure that it can operate smoothly.
4. During installation, apply a small amount of grease to contact surface of the face damper adjustment mechanism to ensure that it can operate smoothly.
5. During installation, apply a small amount of grease to contact surface of the defrost damper adjustment mechanism to ensure that it can operate smoothly.
6. Always check that inner/outer circulation damper mechanism assembly operates normally after installation.
7. Always check that mix damper mechanism assembly operates normally after installation.
8. Always check that face damper mechanism assembly operates normally after installation.
9. Always check that defrost damper mechanism assembly operates normally after installation.
10. Tighten fixing bolts and nuts to specified torques.

11. It is necessary to replace refrigerant line O-ring seal when installing refrigerant line. Failure to do so may result in refrigerant leaks.
12. It is necessary to replace refrigerant line O-ring seal when installing refrigerant line. Failure to do so may result in refrigerant leaks.
13. Only use specified O-ring, as it is made of special materials for R134a system.
14. Only use recommended refrigerant oil which is applicable to A/C compressor assembly on vehicle.
15. Be sure to recharge refrigerant and check for refrigerant leakage after installation.
16. Be sure to recharge engine cooling system and check for coolant leakage after installation.

Installation

1. Installation is in the reverse order of removal.

A/C Pressure Switch

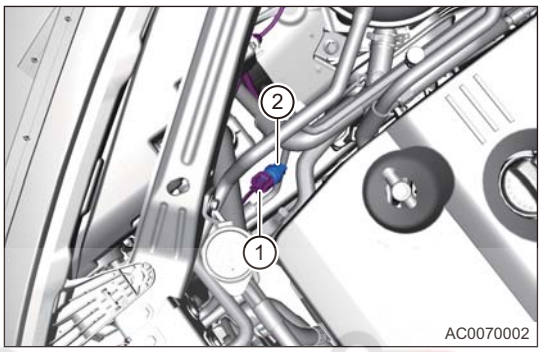
Removal

Warning/Caution/Hint

Warning:

Disconnected A/C line and connecting part should be sealed to prevent foreign matter from entering.

1. Recover the refrigerant from A/C system.
2. Turn off all electrical equipment and ENGINE START STOP switch.
3. Disconnect the negative battery cable.
4. Remove the A/C pressure switch.
   (a) Disconnect the A/C pressure switch connector (1).
   (b) Remove the A/C pressure switch (2).



Installation

1. Installation is in the reverse order of removal.

Warning:

- It is necessary to replace refrigerant line O-ring seal when installing refrigerant line. Failure to do so may result in refrigerant leaks.
- Lubricate new rubber O-ring with clean refrigerant oil and install it to refrigerant line joint.
- Only use specified O-ring, as it is made of special materials for R134a system.
- Perform recharging for A/C system and check for refrigerant leakage.

Condenser - Evaporator Line Assembly/Evaporator - Compressor Line Assembly

Removal

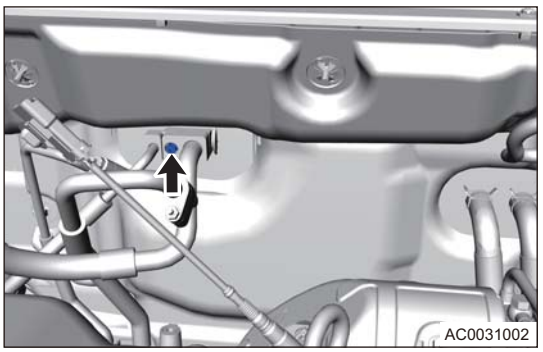
Warning/Caution/Hint

- Special service equipment for R134a refrigerant must be used to recover/charge refrigerant.
- Always keep work area in good ventilation.
- Disconnected A/C line and connecting part should be sealed to prevent foreign matter from entering.

1. Recover the refrigerant from A/C system.
2. Turn off all electrical equipment and ENGINE START STOP switch.
3. Disconnect the negative battery cable.
4. Remove the engine lower protector.
5. Remove the A/C pressure sensor.
6. Remove the front bumper.
7. Remove the right air deflector (See page 61-16).
8. Remove the condenser - evaporator line assembly/evaporator - compressor line assembly.

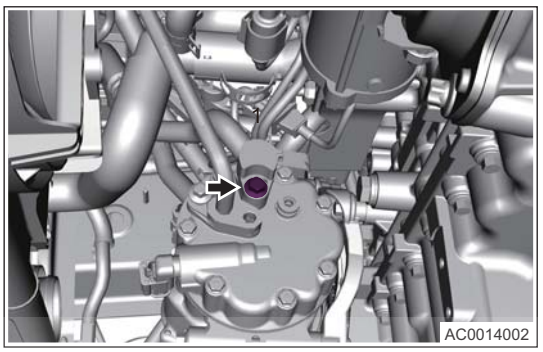
(a) Remove the evaporator - compressor line fixing bolt (arrow) at expansion valve.

Tightening torque
9 ± 1 N•m



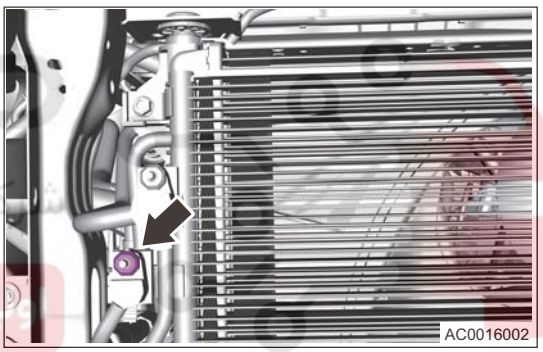
(b) Remove evaporator - compressor line assembly fixing bolt (arrow), and detach line.

Tightening torque
25 ± 3 N•m



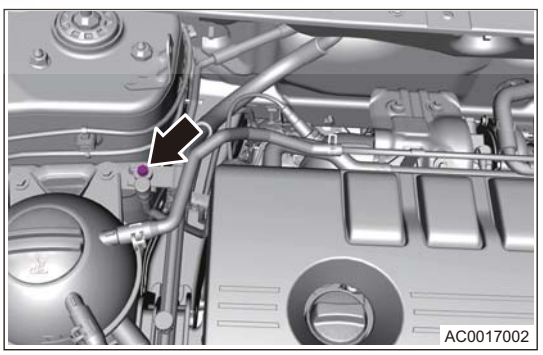
(c) Remove A/C condenser - evaporator line assembly fixing nut, and detach line.

Tightening torque
9 ± 1 N•m



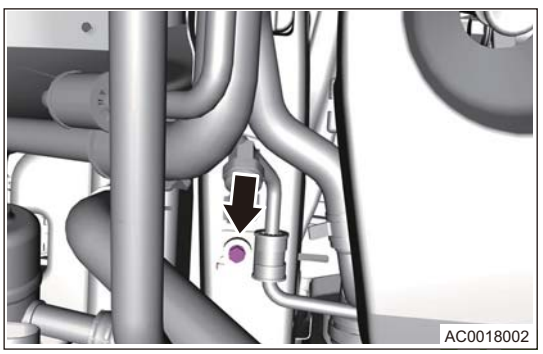
(d) Remove the A/C high/low pressure line clamp fixing bolt (arrow).

Tightening torque
9 ± 1 N•m



(e) Remove the A/C high pressure pipe clamp fixing bolt (arrow).

Tightening torque
9 ± 1 N•m



Installation

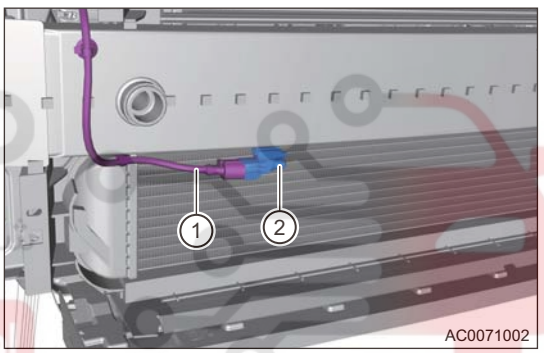
1. Installation is in the reverse order of removal.

   Caution:
   - Tighten fixing bolts and nuts to specified torques.
   - It is necessary to replace refrigerant line O-ring seal when installing refrigerant line. Failure to do so may result in refrigerant leaks.
   - Lubricate new rubber O-ring with clean refrigerant oil and install it to refrigerant line joint.
   - Only use specified O-ring, as it is made of special materials for R134a system.
   - Only use recommended refrigerant oil which is applicable to A/C compressor assembly on vehicle.
   - Perform recharging for A/C system and check for refrigerant leakage.

Outside Temperature Sensor

Removal

1. Turn off all electrical equipment and ENGINE START STOP switch.
2. Remove the front bumper.
3. Remove the outside temperature sensor.
   (a) Disconnect the outside temperature sensor connector (1).
   (b) Remove the outside temperature sensor (2).



Installation

1. Installation is in the reverse order of removal.

Compressor - Condenser Line

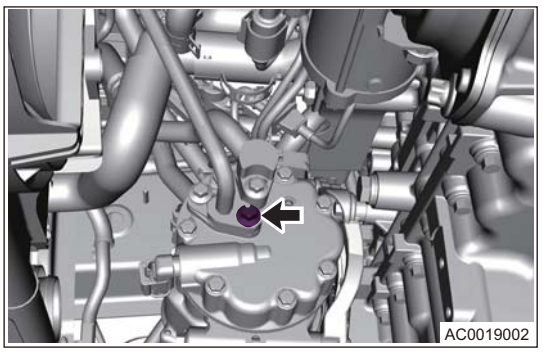
Removal

Warning/Caution/Hint
- Special service equipment for R134a refrigerant must be used to recover/charge refrigerant.
- Always keep work area in good ventilation.
- Disconnected A/C line and connecting part should be sealed to prevent foreign matter from entering.

1. Recover the refrigerant from A/C system.
2. Turn off all electrical equipment and ENGINE START STOP switch.
3. Disconnect the negative battery cable.
4. Remove the engine lower protector assembly.
5. Remove the front bumper assembly (See page 61-6).
6. Remove the right air deflector (See page 61-16).
7. Remove the compressor - condenser line.

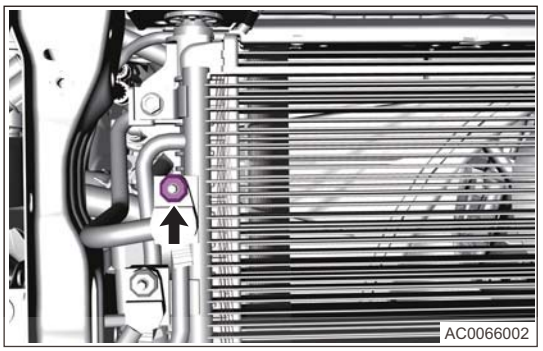
(a) Remove compressor - condenser line fixing bolt (arrow) at compressor, and disconnect line assembly.

Tightening torque
25 ± 3 N•m



(b) Remove fixing nut (arrow) from compressor - condenser line assembly, and detach line from condenser assembly.

Tightening torque
9 ± 1 N•m



(c) Remove the compressor to condenser line assembly.

Installation

1. Installation is in the reverse order of removal.

Caution:

- Tighten fixing bolts and nuts to specified torques.
- It is necessary to replace refrigerant line O-ring seal when installing refrigerant line. Failure to do so may result in refrigerant leaks.
- Lubricate new rubber O-ring with clean refrigerant oil and install it to refrigerant line joint.
- Only use specified O-ring, as it is made of special materials for R134a system.
- Only use recommended refrigerant oil which is applicable to A/C compressor assembly on vehicle.
- Perform recharging for A/C system and check for refrigerant leakage.

Compressor Assembly

Removal

Warning/Caution/Hint

Caution:

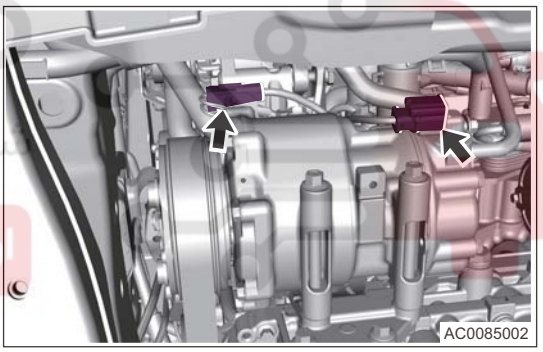
- Be sure to follow safety precautions before performing this procedure. Failure to do so may result in serious personal injury or even death.

Warning:

- Special service equipment for R134a refrigerant must be used to recover/charge refrigerant.
- Always keep work area in good ventilation.
- Disconnected A/C line and connecting part should be sealed to prevent foreign matter from entering.
- If A/C compressor assembly has an internal malfunction, it is necessary to replace the A/C fluid line. Failure to do so may result in serious damage to A/C compressor assembly after replacing.
- When replacing compressor assembly, it is necessary to measure the refrigerant oil amount removed from new A/C compressor assembly.

1. Recover the refrigerant from A/C system.
2. Turn off all electrical equipment and ENGINE START STOP switch.
3. Disconnect the negative battery cable.
4. Remove the engine lower protector assembly.
5. Remove the accessory drive belt (See page 06-19).
6. Remove the compressor assembly.

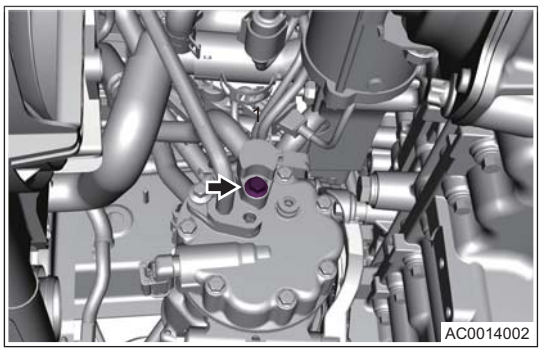
(a) Disconnect 2 compressor assembly connectors (arrow).



(b) Remove compressor low pressure line fixing bolt, and disconnect compressor low pressure line.

Tightening torque

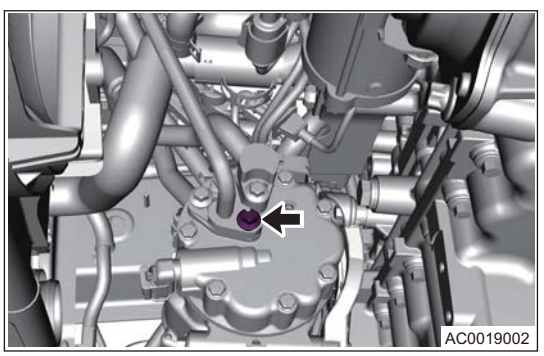
25 ± 3 N•m



(c) Remove compressor high pressure line fixing bolt, and disconnect compressor high pressure line.

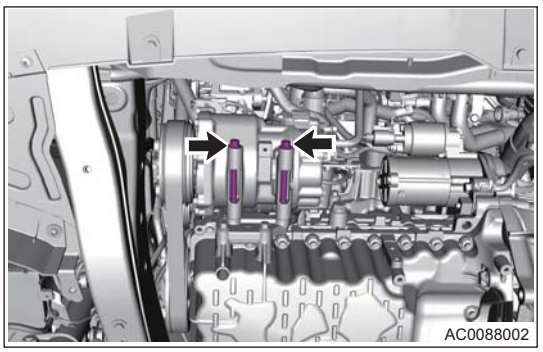
Tightening torque

25 ± 3 N•m



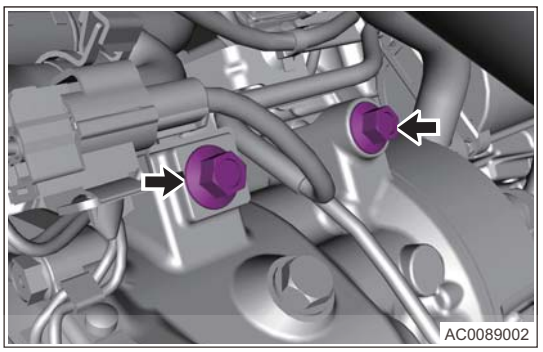
(d) Remove 2 fixing bolts (arrow) between lower part of compressor assembly and mounting bracket.

Tightening torque
25 ± 3 N•m



(e) Remove 2 fixing bolts (arrow) between upper part of compressor assembly and mounting bracket.

Tightening torque
25 ± 3 N•m



Installation

1. Installation is in the reverse order of removal.

Caution:
- Tighten fixing bolts and nuts to specified torques.
- It is necessary to replace refrigerant line O-ring seal when installing refrigerant line. Failure to do so may result in refrigerant leaks.
- Lubricate new rubber O-ring with clean refrigerant oil and install it to refrigerant line joint.
- Only use specified O-ring, as it is made of special materials for R134a system.
- Only use recommended refrigerant oil which is applicable to A/C compressor assembly on vehicle.
- When installing a new compressor assembly, always remove a certain amount of refrigerant oil from new A/C compressor assembly as specified.
- Perform recharging for A/C system and check for refrigerant leakage.

Condenser Assembly

Removal

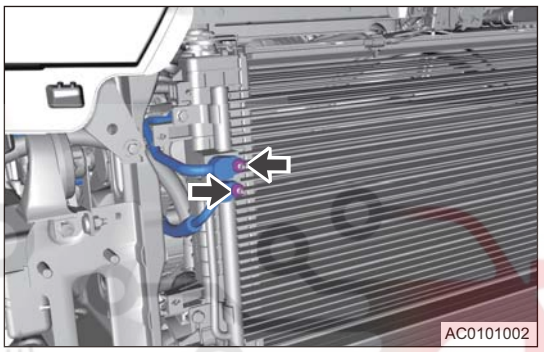
Warning/Caution/Hint

Warning:

- Be sure to follow safety precautions before performing this procedure. Failure to do so may result in serious personal injury or even death.
- Always keep work area in good ventilation.
- Disconnected A/C line and connecting part should be sealed to prevent foreign matter from entering.

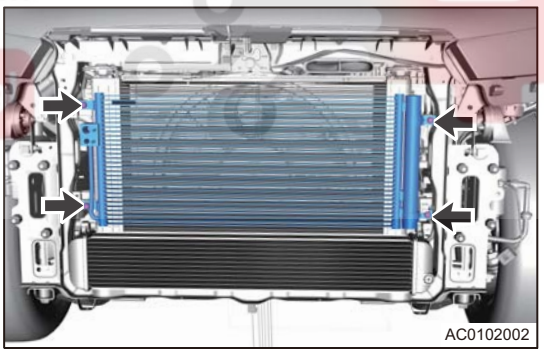
1. Recover the refrigerant from A/C system.
2. Turn off all electrical equipment and ENGINE START STOP switch.
3. Disconnect the negative battery cable.
4. Remove the front bumper assembly (See page 61-6).
5. Remove the left/right air deflector assembly (See page 61-16).
6. Remove the condenser assembly.
   (a) Remove 2 fixing nuts (arrow) of condenser A/C line, and disconnect A/C line.

   Tightening torque
   9 ± 1 N•m



   (b) Remove 4 fixing bolts (arrow) from condenser assembly, and remove condenser.

   Tightening torque
   5 ± 1 N·m



Inspection

1. Check the condenser fins.
   (a) If condenser fins are dirty, wash with water. And then dry fins with compressed air.
   Caution:
   - DO NOT damage condenser fins.

Installation

1. Installation is in the reverse order of removal.
   Caution:
   - Tighten fixing bolts and nuts to specified torques.
   - It is necessary to replace refrigerant line O-ring seal when installing refrigerant line. Failure to do so may result in refrigerant leaks.
   - Lubricate new rubber O-ring with clean refrigerant oil and install it to refrigerant line joint.
   - Only use specified O-ring, as it is made of special materials for R134a system.

- Only use recommended refrigerant oil which is applicable to A/C compressor assembly on vehicle.
- Perform recharging for A/C system and check for refrigerant leakage.

Anion Generator

Removal

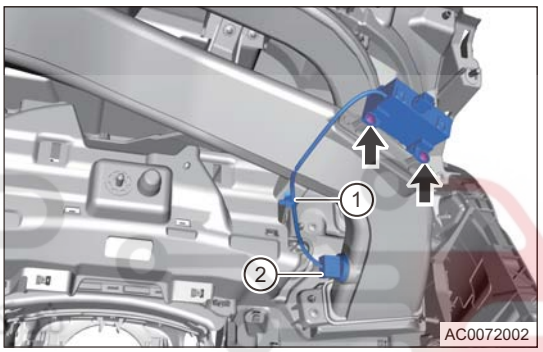
Warning/Caution/Hint

Hint:

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

1. Turn off all electrical equipment and ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the instrument panel assembly (See page 58-13).
4. Remove the anion generator.
   (a) Disconnect the anion emitter wire harness fixing clip (1).
   (b) Rotate and remove anion emitter (2).
   (c) Remove 2 anion generator fixing screws (arrow), and remove anion generator.

Tightening torque
1.5 ± 0.5 N·m



Inspection

1. Method 1: Use air ion concentration tester to measure the concentration directly in front of the anion generator.
2. Method 2: Take a transparent container with a cover, put smoke dust into it, and then put the anion generator into it, the dust will disappear after working for 1-8 seconds.

Installation

1. Installation is in the reverse order of removal.