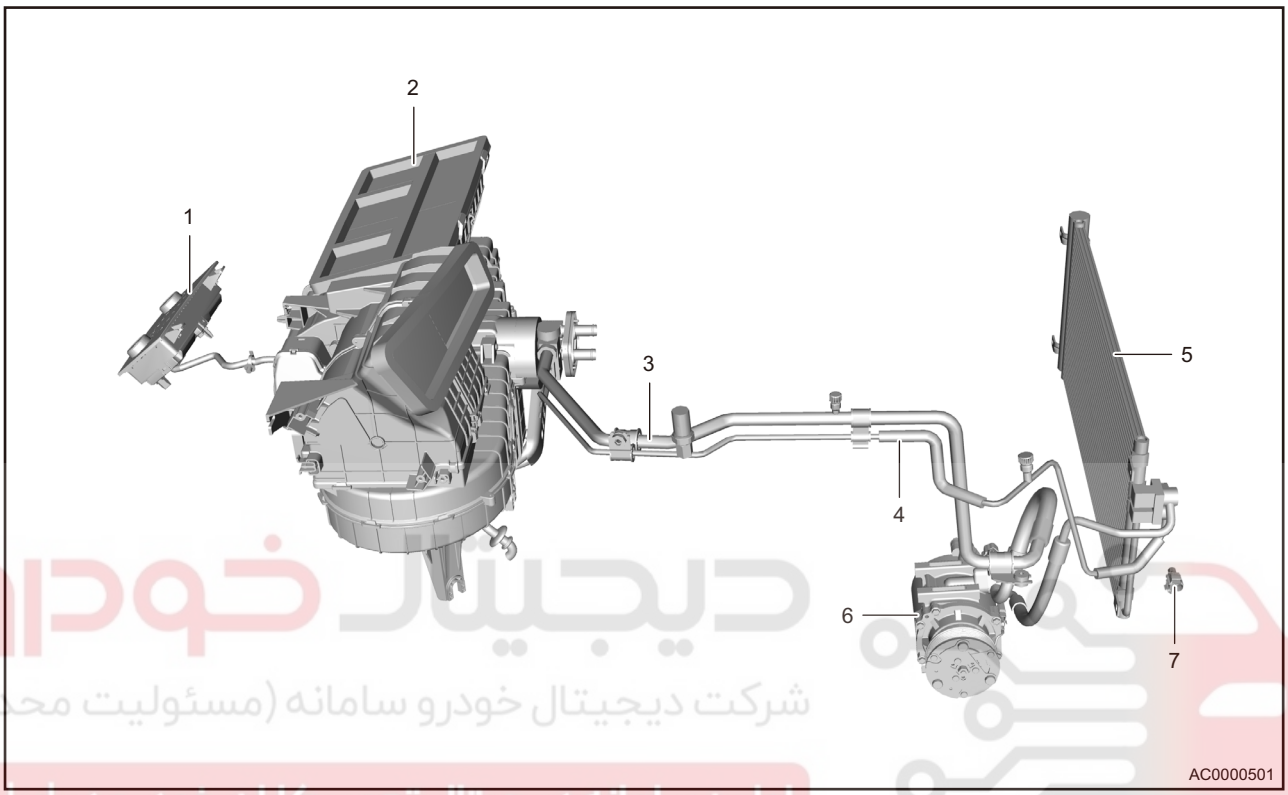
AIR CONDITIONING

GENERAL INFORMATION

Overview

Description

Electric A/C



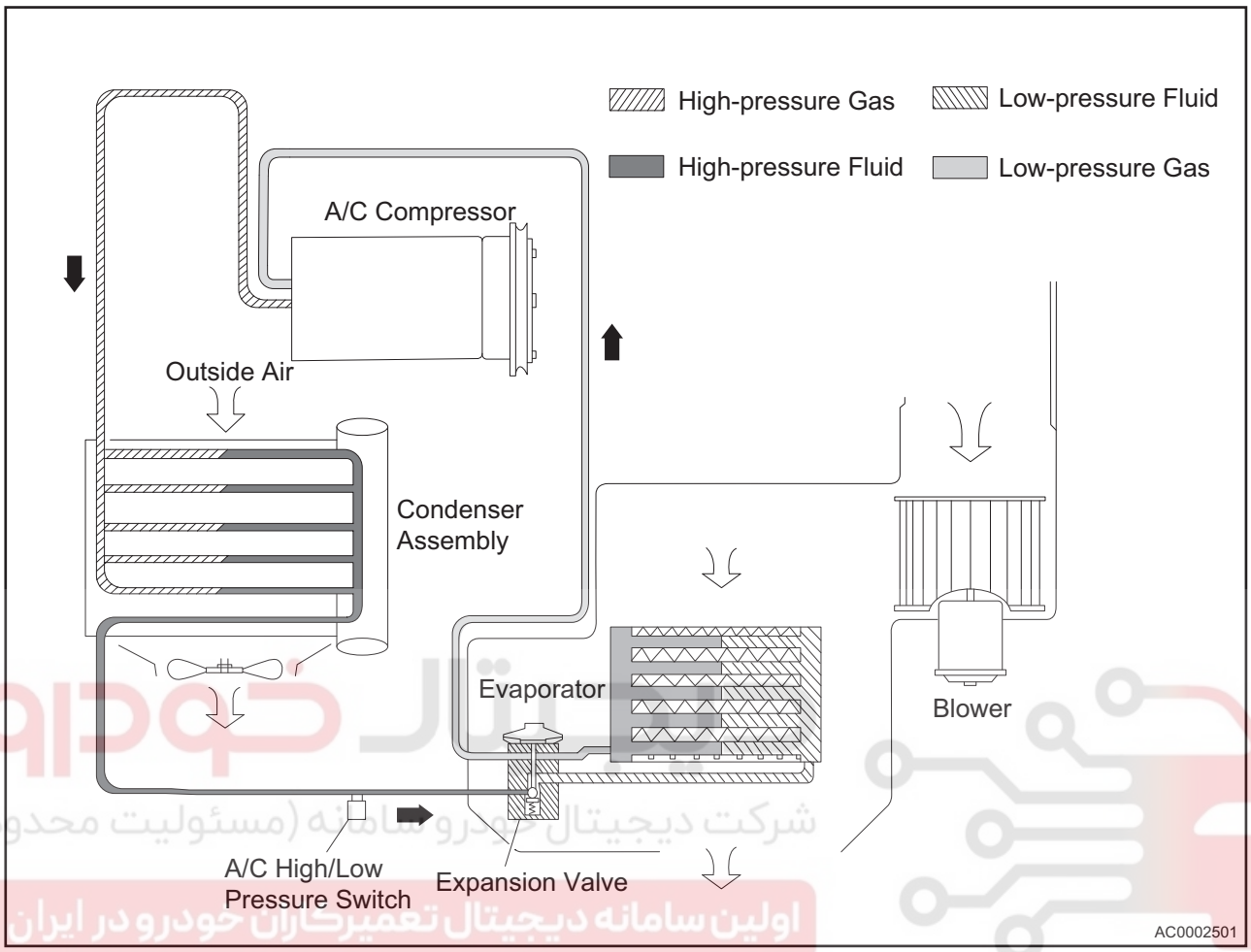
1 - Electric A/C Control Panel	2 - HVAC Assembly
3 - Compressor - Evaporator Tank Low Pressure Line Assembly	4 - Compressor - Condenser Line Assembly
5 - Condenser Assembly (w/ Receiver Drier)	6 - V-ribbed Belt A/C Compressor Assembly
7 - Outside Temperature Sensor	

System composition

Air conditioning and distribution system: air mixing and distributor part of HVAC, inner/outer circulation inlet, outlet and air filter. Control system: Electric A/C control panel assembly, mix damper motor, mode damper motor, inner/outer circulation motor, blower, blower speed regulation module, A/C pressure switch, evaporator temperature sensor.
Heating system: heater core assembly, heating inlet hose, heating outlet hose and engine cooling circulation system.
Refrigerating system: compressor assembly, condenser assembly (w/ receiver drier), expansion valve, evaporator core assembly and A/C high and low pressure line.

Operation

Electric A/C



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 operating temperature adjustment knob on A/C control panel. Turn on the compressor assembly by touching A/C switch on DVD A/C interface (for electric A/C, it can also use A/C button, airflow volume knob, front defroster button, MAX AC button on A/C control panel to turn on compressor assembly). 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 (integrated with condenser) 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.

Specifications

Torque Specifications

Description	Torque (N·m)
Expansion Valve Fixing Bolt	5 ± 1
Hose Clamp Fixing Bolt	7 ± 1
Compressor Fixing Bolt	25 ± 3
Compressor Intake and Exhaust Line Fixing Bolt	25 ± 3
Condenser Fixing Nut	5 ± 1
A/C Line Fixing Bolt	7 ± 1
HVAC Fixing Nut	5 ± 1
HVAC Fixing Bolt	5 ± 1

Refrigerant Charging Specification

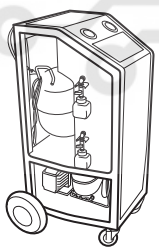
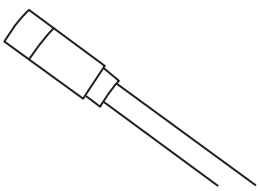
Description	Charging Capacity (g)
R134a Refrigerant	500 ± 15

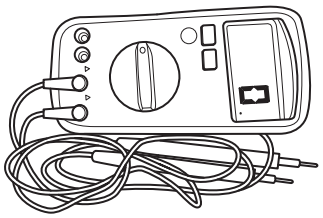
Refrigerant Oil Charging Specifications

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

Tool

General Tools

Gas Leak Detector	 046
Refrigerant Recycling Machine	 092

Digital Multimeter	 002

Electric A/C Control Logic

Power ON Definition

With A/C off, airflow volume knob, front defroster button, AC button or MAX AC button can be used to turn on A/C.
Turning on with airflow volume knob: It will operate according to state before turning off when the knob is turned clockwise or counterclockwise (if mode, circulation, temperature is operated when turning off, manual operation prioritized).
Turning on with front defroster button: Enters front defrost mode, airflow volume is in 4th position, AC ON, outer circulation.
Turning on with MAX AC button: Enters MAX cooling mode, airflow volume is highest, face mode, AC ON, inner circulation, temperature is Lo.
Turning on with AC button: It will operate according to the state before turning off and send AC request simultaneously.

Power OFF Definition

When A/C is operating, only use OFF button to turn off A/C. State after turning off: Outer circulation is performed forcibly, temperature is MAX. COLD, foot mode; Circulation and mode can be operated normally.

Front Defrost Function Definition

When front defroster button is valid, compressor request is valid, AC indicator comes on, outer circulation is linked forcibly and airflow volume is in 4th position. In front defrost state, pressing front defroster button again or operating other mode buttons will exit front defrost mode.

Temperature Adjustment Function

There is temperature level indicator on the outside of the knob, temperature adjustment range is 1-14. When turning the knob clockwise, each time turn it by one cell, the temperature will increases by 1 level and mix damper motor turn to hot position by 1 step; When turning the knob counterclockwise, each time turn it by one cell, the temperature will reduce by 1 level and mix damper motor turn to cold position by 1 step. When the temperature is HI, turn it clockwise again, the temperature does not change; When the temperature is Lo, turn it counterclockwise again, the temperature does not change. In face mode, when the temperature knob is close to MAX. HOT (HI) position, the airflow volume of rear face air duct will reduce gradually.

Inner/Outer Circulation Definition

The indicator goes off in outer circulation state, at this time, press inner/outer circulation button and the indicator comes on, DVD displays inner circulation and A/C enters inner circulation mode simultaneously. The indicator comes on in inner circulation state, at this time, press inner/outer circulation button and the indicator goes off, DVD displays outer circulation and A/C enters outer circulation mode simultaneously. Inner/outer circulation button is valid when key is in ON position and A/C is in OFF state.

Airflow Volume Adjustment Function

Airflow volume can be adjusted by airflow volume adjustment knob. Max. airflow volume is 7th level, each time the airflow volume adjustment knob is operated, the airflow volume will reduce by 1 level and indicator goes off by 1 (turn it counterclockwise) or increase by 1 level and indicator comes on by 1 (turn it clockwise). When airflow volume is in 7th level, clockwise turn the airflow volume adjustment knob again, the airflow volume does not change and airflow volume level indicator comes on by 7; When airflow volume is in 1st level, counterclockwise turn the airflow volume adjustment knob again, the airflow volume does not change and airflow volume level indicator comes on by 1.

Compressor Control Function

In ON state, after pressing AC button, AC state will be displayed directly without considering external environment. Press the AC button to require to turn on compressor, the indicator comes on; Press the AC button again to require to turn off compressor, the indicator goes off, and corresponding AC operating state will be displayed on DVD screen simultaneously; Engine starts, blower turns on, AC button is valid, compressor pulls in and evaporator temperature link is disconnected, external temperature is linked; Operate AC button to turn it on when A/C controller is in OFF state.

Mode Adjustment Function

When A/C is turned on, operate the mode button, the corresponding mode state will be displayed on DVD, mode motor turns to corresponding position and air is blown out from corresponding outlet; Mode button is valid when key is in ON position and A/C is in OFF state.

Rear Defrost Function

Operate the rear defroster button when ignition key is in ON position and controller is ON, control panel outputs low level signal, corresponding indicator is controlled by BCM, the indicator comes on when it is low level; Rear defroster button is valid when controller is OFF. Rear defroster button is invalid when ignition key is not in ON position (control panel is power off).

MAX Cooling Function

Operate the MAC AC button to enter MAX cooling function, at the same time, linked with face mode, airflow volume is highest, AC ON, inner circulation, temperature is Lo; A/C can be turned on by operating MAX AC button with A/C turned off.

DIAGNOSIS & TESTING

Diagnosis Content

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)

Diagnosis 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 contacting 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.

Diagnosis Procedure

HINT

Use following procedures to troubleshoot the brake control 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

31

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 7**

6 Troubleshoot according to Diagnostic Trouble Code (DTC) chart

Result

Proceed to
Next

Next → **Go to step 7**

7	Troubleshoot according to Problem Symptoms Table

Result

Proceed to
Next

Next

8	Conduct test and confirm malfunction has been repaired

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Result

Proceed to
Next

NEXT End

A/C System Function

1. Self-diagnosis function
   (a) Function definition requirement
      (1) Combination button of self-diagnosis: Operate MAX "AC + Foot/defroster button", long press combination button for 5 s. Enters self-diagnosis, A/C panel indicator indicates each fault status and exit after displaying fault for 6 s.

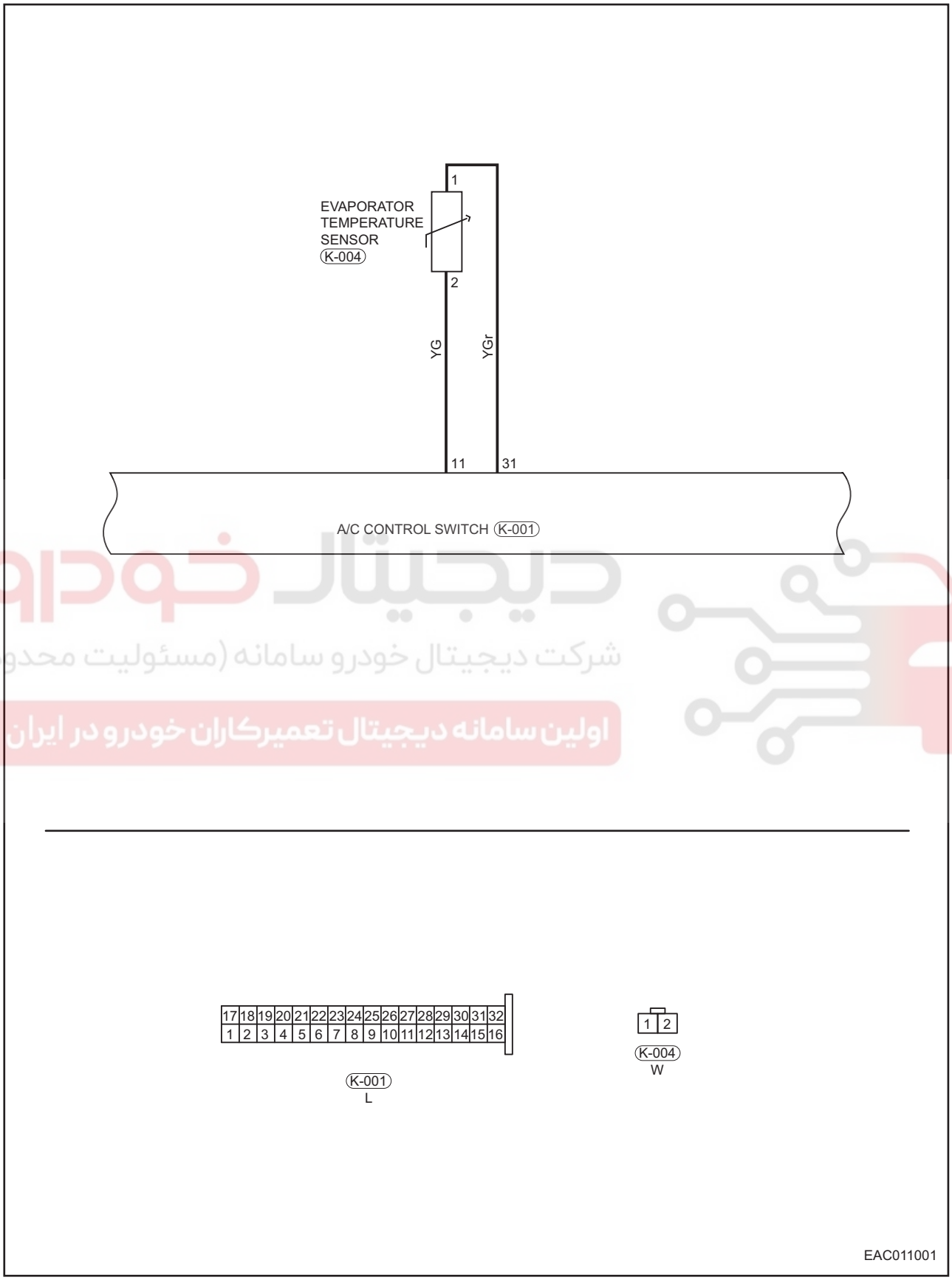
Self-diagnosis Diagnostic Trouble Code definition:

Symbols	Trouble Content
00	System is normal
01	Outside temperature sensor error (open or short) (reserve)
02	Inside temperature sensor error (open or short) (reserve)
03	Inside right temperature sensor error (open or short) (reserve)
04	Solar sensor error (open or short) (reserve)
05	Solar sensor (right) error (open or short) (reserve)
06	Humidity sensor error (reserve)
07	Air mass sensor error (reserve)
08	Evaporator temperature sensor error (open or short) (defroster indicator comes on)
09	Heater temperature sensor error (open or short) (reserve)
10	(Reserve)
11	Blower error (failure of adjustment) (face indicator comes on)
12	Circulation damper motor error (failure of adjustment)
13	Mode damper motor error (failure of adjustment, open, short) (foot indicator comes on)
14	Mode damper motor 2 error (failure of adjustment) (reserve)
15	Temperature mix damper motor error (failure of adjustment)
16	Right temperature mix damper motor error (failure of adjustment, open, short) (reserve)
17	(Reserve)
18	(Reserve)
19	(Reserve)
20	(Reserve)
21	Control panel CAN communication error (CAN communication interrupt) (AC indicator comes on)
22	Communication error with BCM (both AC indicator and face indicator come on)

DTC	B1404-11	Filtered Evaporator Temperature
DTC	B1404-13	Filtered Evaporator Temperature
DTC	B1408-29	Blower Voltage
DTC	B1408-31	Blower Voltage
DTC	B1409-11	Mode Motor Step
DTC	B1409-13	Mode Motor Step
DTC	B1410-11	Rec Motor Step
DTC	B1410-13	Rec Motor Step
DTC	B1412-11	Mix Flap Motor Step (Left Side)
DTC	B1412-13	Mix Flap Motor Step (Left Side)
DTC	U0140-87	Lost Communication With Body Control Module
DTC	U0155-87	Lost Communication With Instrument Cluster Module
DTC	U0100-87	Lost Communication With Engine Control System Module

DTC	B1404-11	Filtered Evaporator Temperature
DTC	B1404-13	Filtered Evaporator Temperature

Circuit Diagram



Description

DTC	DTC Definition	DTC Detection Condition	Possible Cause
B1404-11	Filtered Evaporator Temperature	ENGINE START STOP switch is in ON	• Evaporator temperature sensor • Wire harness or connector
B1404-13	Filtered Evaporator Temperature		

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

Diagnosis Procedure

1	Check wire harness and connector

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the evaporator tank temperature sensor K-004 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 whether there are DTC B1404-11 and B1404-11.

Result

Proceed to
OK
NG

NG → **Replace evaporator tank temperature sensor**

OK

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

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the evaporator tank temperature sensor connector K—004 and A/C control panel connector K-001.

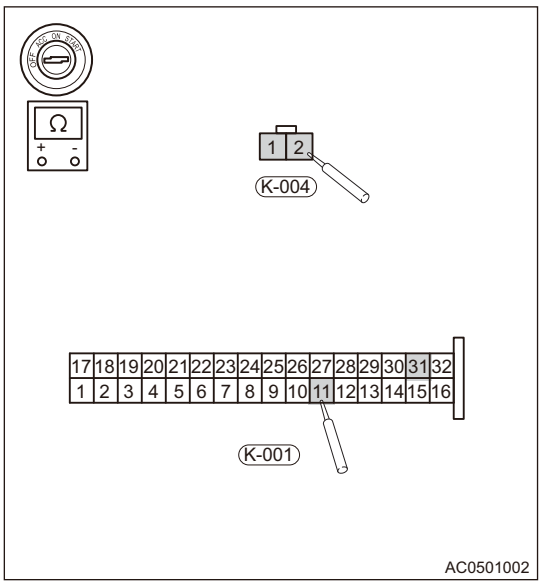
(d) Using a digital multimeter, measure the wire harness between evaporator tank temperature sensor connector K-004 and A/C control panel connector K-001 according to value(s) in table below.

Standard Condition

Multimeter Connection	Condition	Specified Condition
K-004 (2) - K-001 (11)	Always	Resistance ⩽ 1 Ω
K-004 (1) - K-001 (31)	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 same DTCs are output.

Result

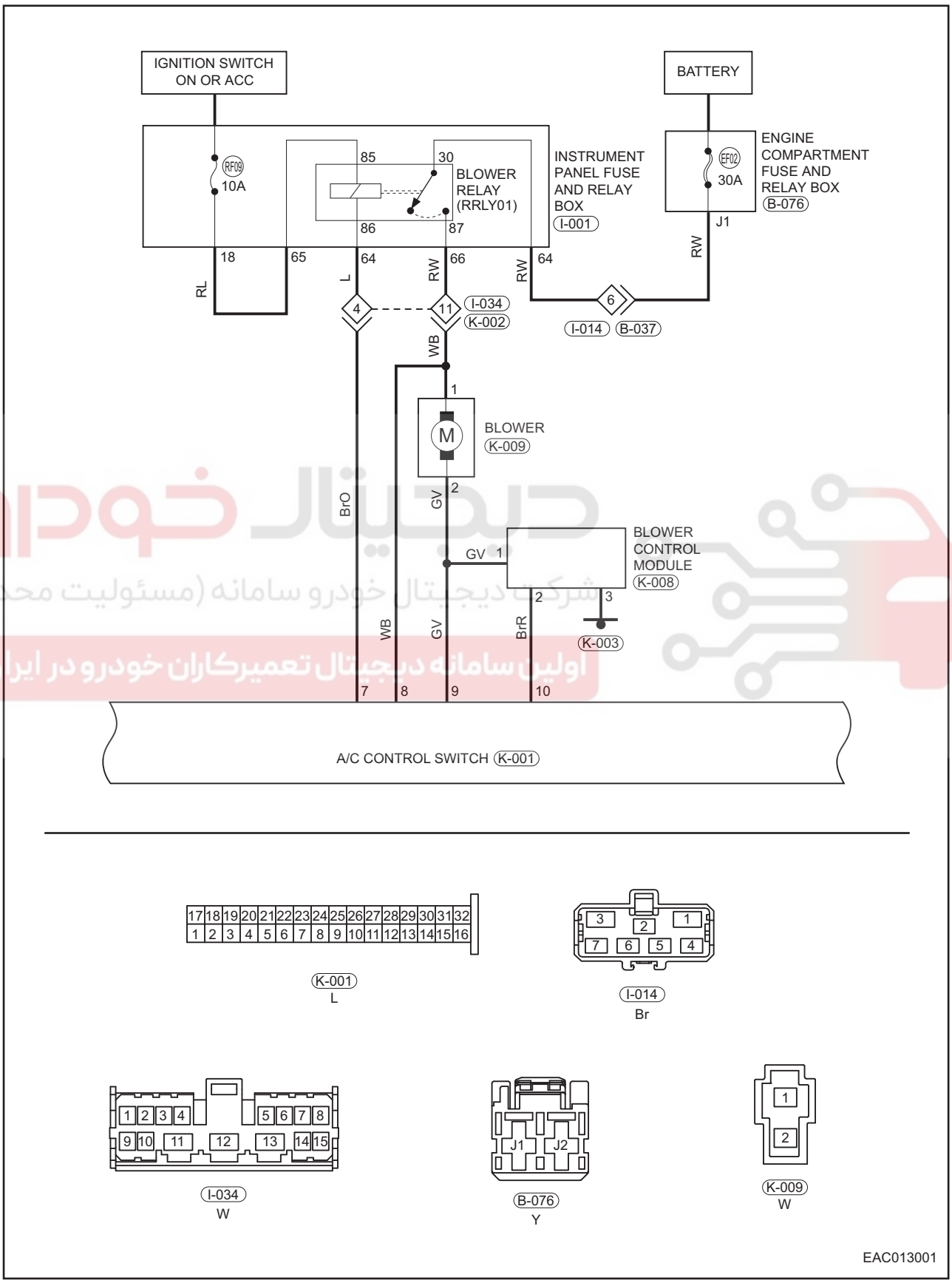
Proceed to
OK
NG

OK → **System operates normally**

NG → **Replace A/C control panel**

DTC	B1408-31	Blower Voltage

Circuit Diagram



Description

DTC	DTC Definition	DTC Detection Condition	Possible Cause
B1408-31	Blower Voltage	ENGINE START STOP switch is in ON	• Blower • Blower speed regulation module • Wire harness or connector

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

Diagnosis Procedure

1	Check wire harness and connector

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the blower connector K-009 and blower speed regulation module connector K-008.
(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 whether there are DTC B1408-31.

Result

Proceed to
OK
NG

NG → **Replace A/C control panel**

OK ↓

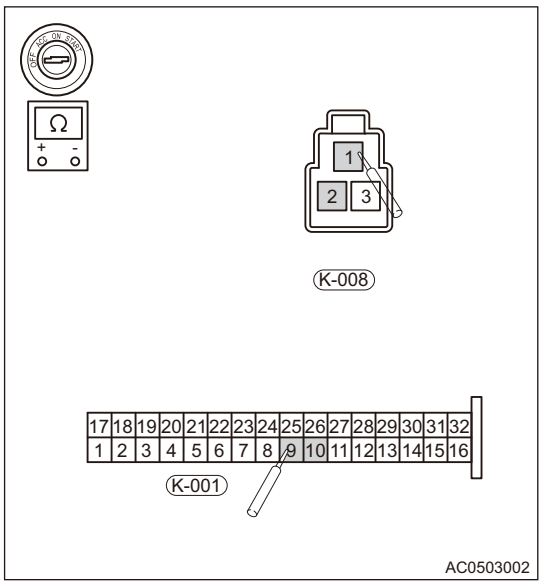
3	Check wire harness connector

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the A/C control panel connector K-001 and speed regulation module connector K-008.

(d) Using a digital multimeter, measure the wire harness between speed regulation module connector K-008 and A/C control panel connector K-001 according to value(s) in table below.

Standard Condition

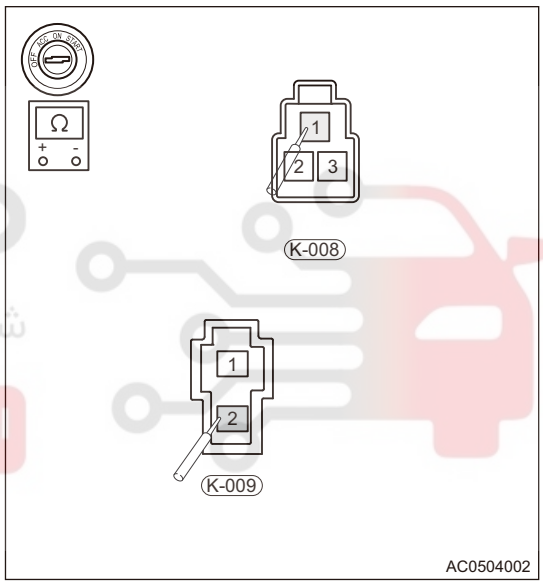
Multimeter Connection	Condition	Specified Condition
K-001 (9) - K-008 (1)	Always	Resistance ⩽ 1 Ω
K-001 (10) - K-008 (2)	Always	Resistance ⩽ 1 Ω



(e) Using a digital multimeter, measure the wire harness between blower connector K-009 and blower speed regulation module connector K-008 according to value(s) in table below.

Standard Condition

Multimeter Connection	Condition	Specified Condition
K-008 (1) - K-009 (2)	Always	Resistance ⩽ 1 Ω



Result

Proceed to
OK
NG

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

OK

4	Check the ground circuit of blower speed regulation module

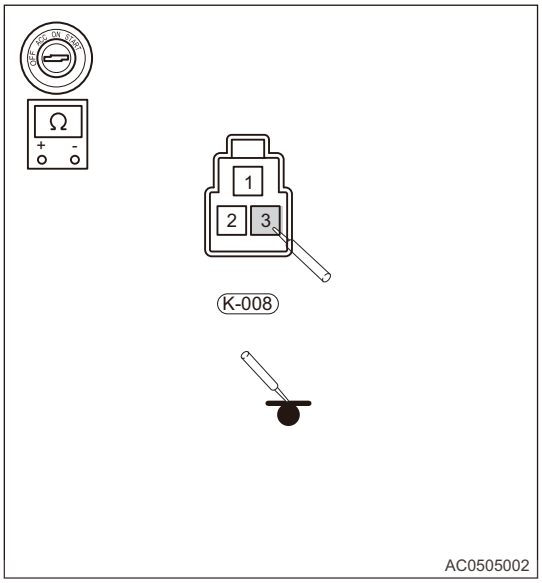
(a) Using a digital multimeter, measure the wire harness between blower speed regulation module connector K-008 and body ground according to value(s) in table below.

Standard Condition

Multimeter Connection	Condition	Specified Condition
K-008 (6) - Body ground	Always	Resistance ⩽ 1 Ω

Result

Proceed to
OK
NG



NG → Repair or replace related wire harness

OK →

5	Check power circuit of blower speed regulation module

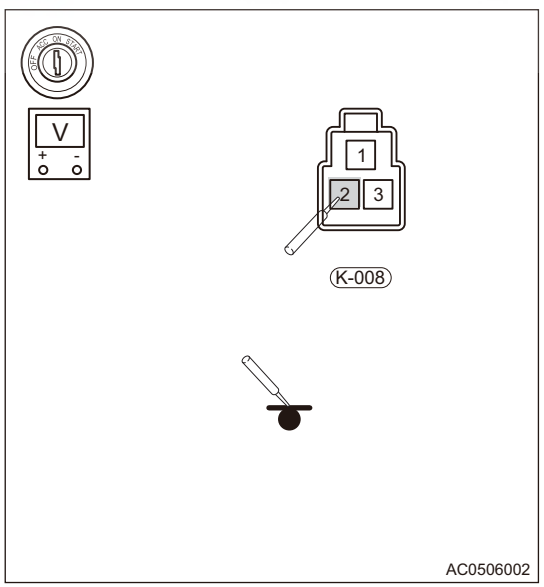
(a) Connect all connectors and disconnect A/C speed regulation module connector.
(b) Connect the negative battery cable.
(c) Turn ENGINE START STOP switch to ON, turn blower on.
(d) Using a digital multimeter, measure the voltage between terminal 2 of blower speed regulation module connector K-008 and body ground according to value(s) in table below.

Standard Condition

Multimeter Connection	Condition	Specified Condition
K-008 (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) Check if the same DTCs are still output using A/C self-diagnosis.

Result

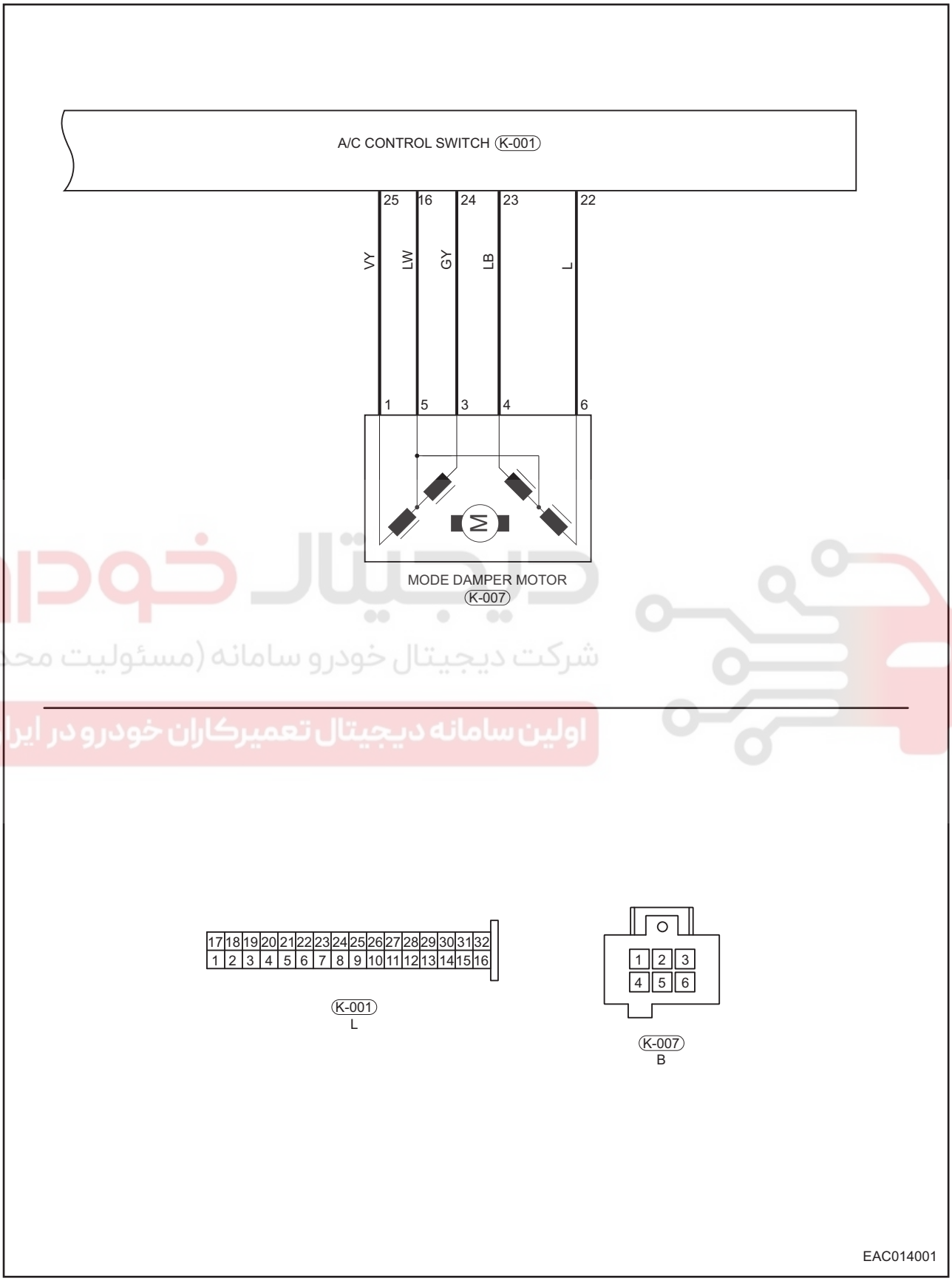
Proceed to
OK
NG

OK	System operates normally
NG	Replace A/C control panel

DTC	B1409-11	Mode Motor Step

DTC	B1409-13	Mode Motor Step

Circuit Diagram



Description

DTC	DTC Definition	DTC Detection Condition	Possible Cause
B1409-11	Mode Motor Step	ENGINE START STOP switch is in ON	• Mode damper motor • A/C control panel • Wire harness or connector
B1409-13	Mode Motor Step		

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

Diagnosis Procedure

1	Check wire harness and connector

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the mode damper motor connector K-007 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 mode damper motor

(a) Remove the mode damper motor from malfunctioning vehicle.
(b) Install a new mode damper motor to malfunctioning vehicle.
(c) Check whether there are DTC B1409-11 and B1409-13.

Result

Proceed to
OK
NG

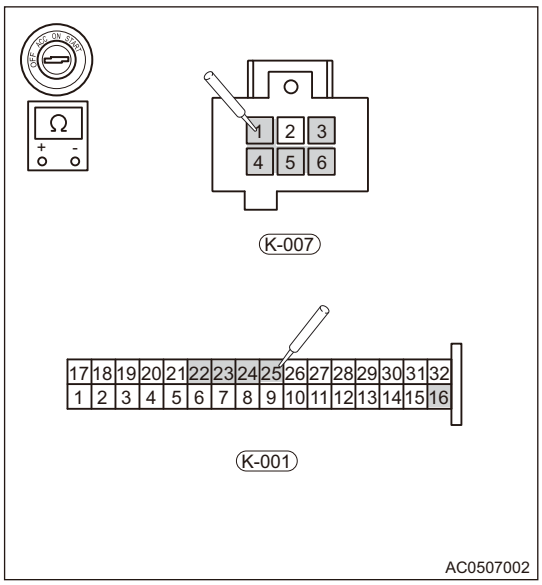
NG → **Replace mode damper motor**

OK ↓

3	Check A/C control panel to mode damper motor wire harness connector

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the A/C control panel connector K-001 and mode damper motor connector K-007.

(d) Using a digital multimeter, measure the wire harness between mode damper motor connector K-007 and A/C control panel connector K-001 according to value(s) in table below.



Check for Open

Multimeter Connection	Condition	Specified Condition
K-007 (1) - K-001 (25)	Always	Resistance ⩽ 1 Ω
K-007 (5) - K-001 (16)	Always	Resistance ⩽ 1 Ω
K-007 (3) - K-001 (24)	Always	Resistance ⩽ 1 Ω
K-007 (4) - K-001 (23)	Always	Resistance ⩽ 1 Ω
K-007 (6) - K-001 (22)	Always	Resistance ⩽ 1 Ω

Result

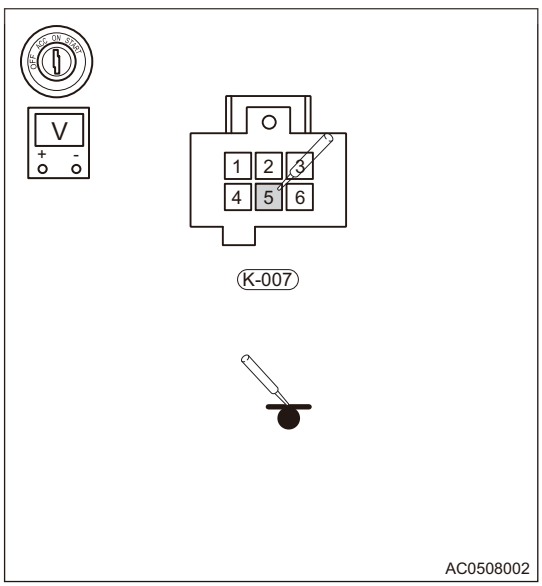
Proceed to
OK
NG

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

OK →

4 Check power circuit of mode damper motor

(a) Disconnect the mode damper motor connector K-007 and A/C control panel connector K-001.
(b) Connect the negative battery cable.
(c) Turn ENGINE START STOP switch to ON, turn blower on.
(d) Using a digital multimeter, measure the voltage between terminal 2 of mode damper motor connector K-007 and body ground according to value(s) in table below.



Voltage Inspection

Multimeter Connection	Condition	Specified Condition
K-007 (2) - 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

5	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 still output using A/C self-diagnosis.

Result

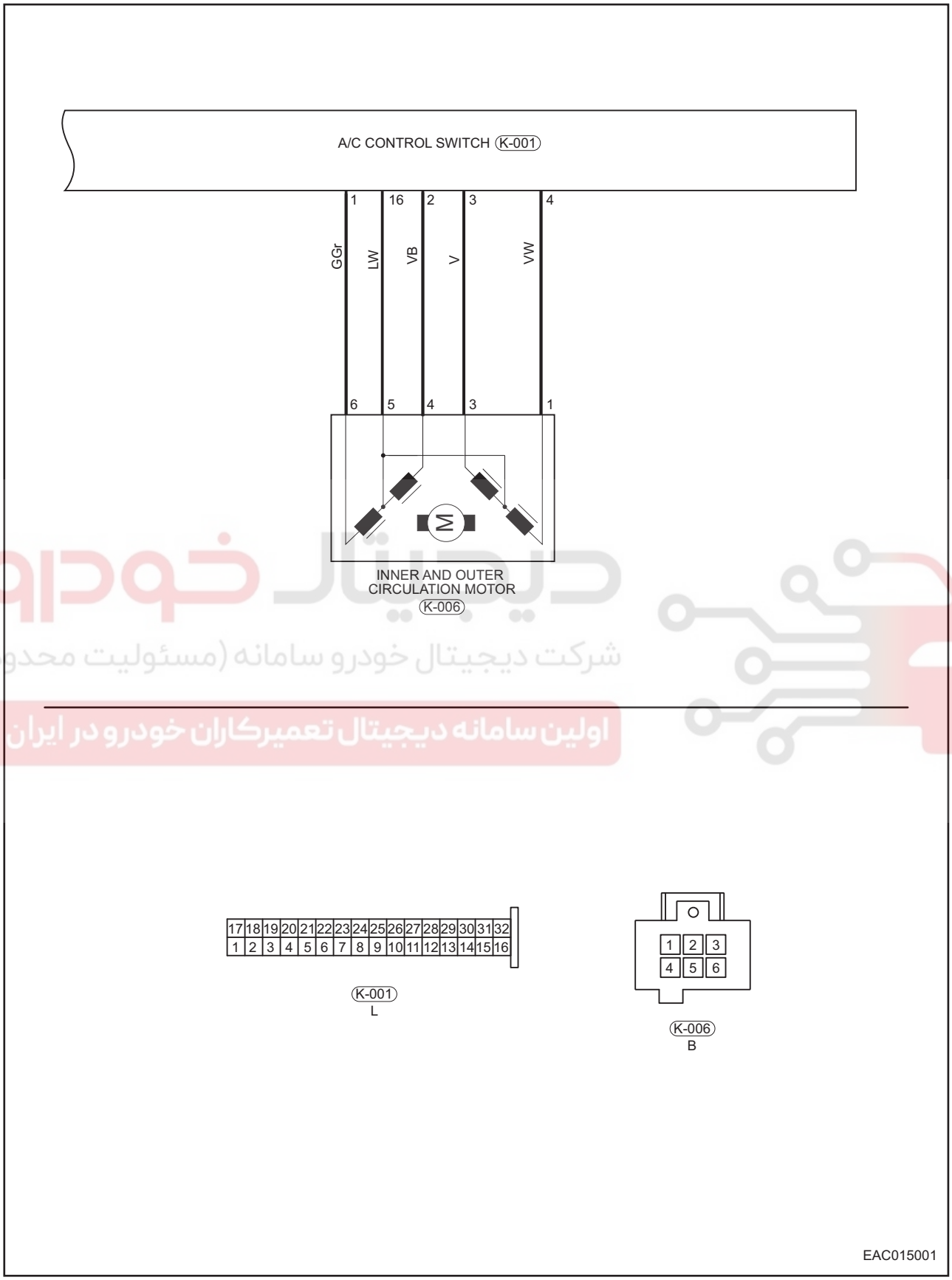
Proceed to
OK
NG

OK	System operates normally
NG	Replace A/C control panel

DTC	B1410-11	Rec Motor Step

DTC	B1410-13	Rec Motor Step

Circuit Diagram



Description

DTC	DTC Definition	DTC Detection Condition	Possible Cause
B1410-11	Rec Motor Step	ENGINE START STOP switch is in ON	• Mode damper motor • A/C control panel • Wire harness or connector
B1410-13	Rec Motor Step		

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

Diagnosis Procedure

1	Check wire harness and connector

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the inner/outer damper motor connector K-005 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 inner/outer damper motor

(a) Remove the inner/outer damper motor from malfunctioning vehicle.
(b) Install new inner/outer damper motor to malfunctioning vehicle.
(c) Check whether there are DTC B1410-11 and B1410-13.

Result

Proceed to
OK
NG

NG → **Replace inner/outer damper motor**

OK ↓

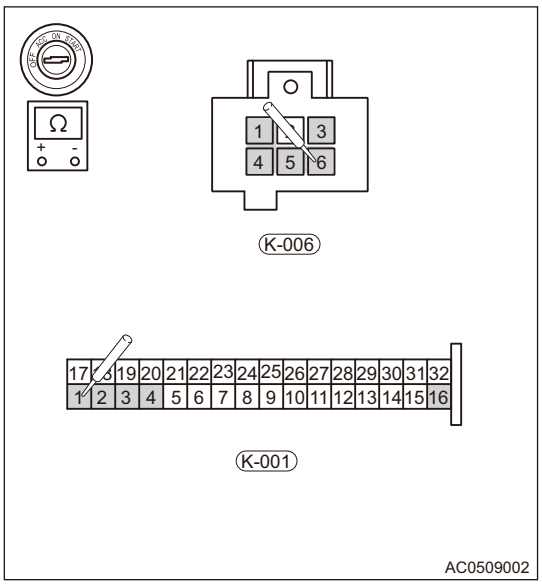
3	Check A/C control panel to inner/outer damper motor wire harness connector

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the A/C control panel connector K-001 and inner/outer damper motor connector K-006.

(d) Using a digital multimeter, measure the wire harness between inner/outer damper motor connector K-006 and A/C control panel connector K-001 according to value(s) in table below.

Check for Open

Multimeter Connection	Condition	Specified Condition
K-006 (1) - K-001 (4)	Always	Resistance ⩽ 1 Ω
K-005 (5) - K-001 (16)	Always	Resistance ⩽ 1 Ω
K-005 (3) - K-001 (3)	Always	Resistance ⩽ 1 Ω
K-005 (2) - K-001 (4)	Always	Resistance ⩽ 1 Ω
K-005 (6) - K-001 (1)	Always	Resistance ⩽ 1 Ω



Result

Proceed to
OK
NG

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

OK

4 Check power circuit of inner/outer damper motor

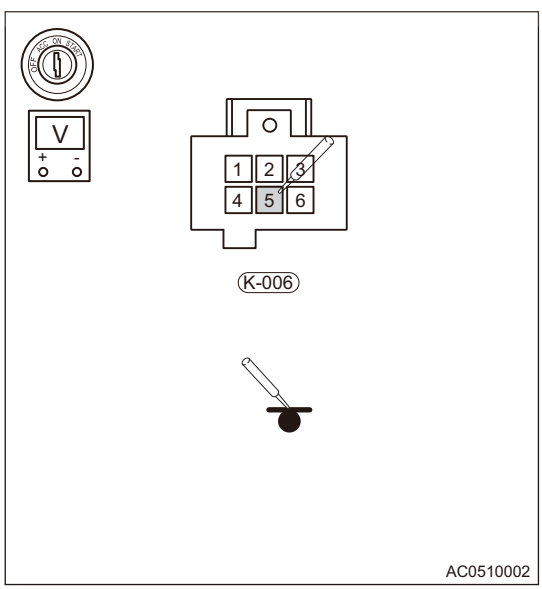
(a) Disconnect the inner/outer damper motor connector K-006 and A/C control panel connector K-001.
(b) Connect the negative battery cable.
(c) Turn ENGINE START STOP switch to ON, turn blower on.
(d) Using a digital multimeter, measure the voltage between terminal 2 of inner/outer damper motor connector K-006 and body ground according to value(s) in table below.

Voltage Inspection

Multimeter Connection	Condition	Specified Condition
K-006 (5) - 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

5	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 still output using A/C self-diagnosis.

Result

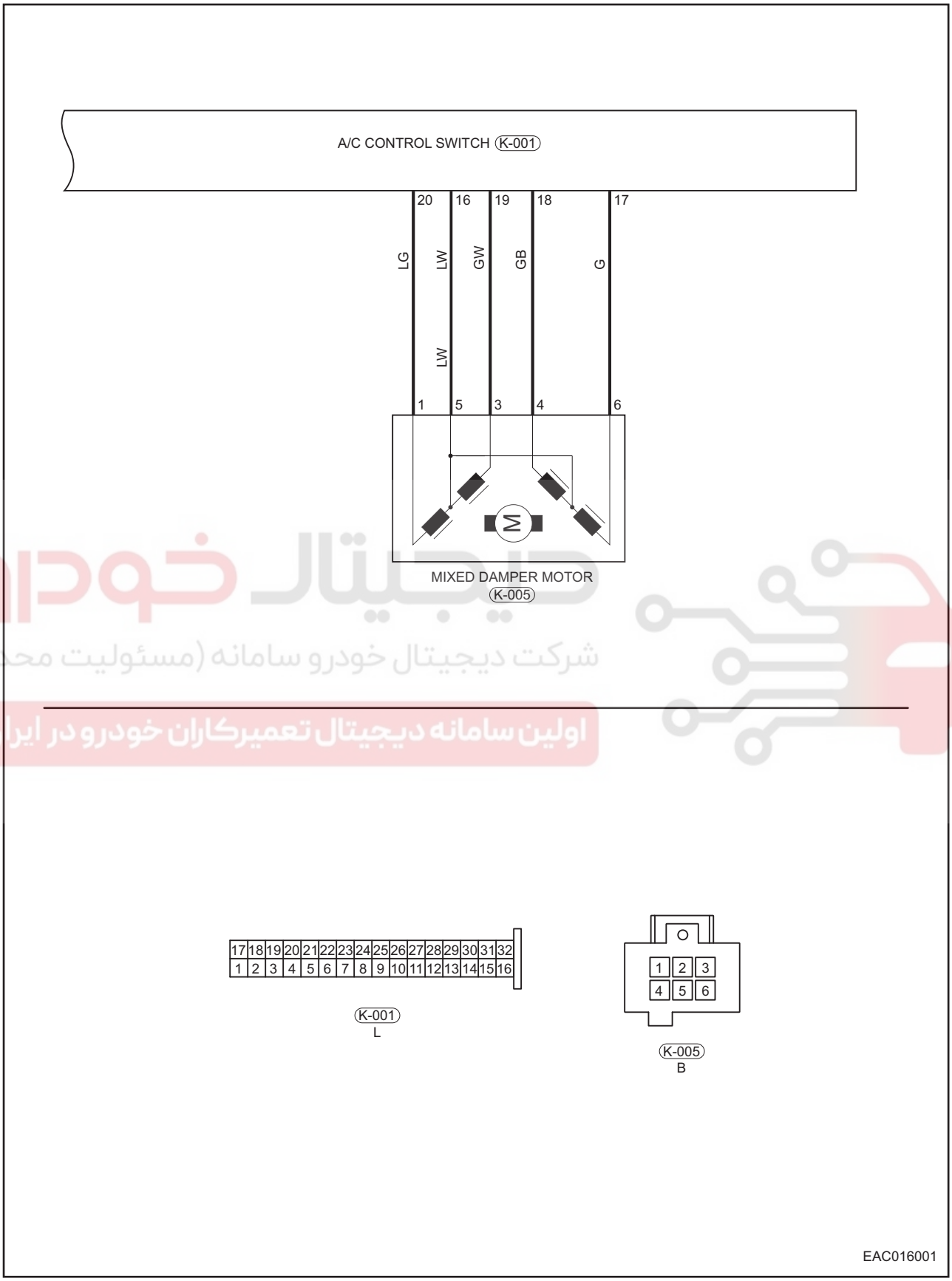
Proceed to
OK
NG

OK	System operates normally
NG	Replace A/C control panel

DTC	B1412-11	Mix Flap Motor Step (Left Side)

DTC	B1412-13	Mix Flap Motor Step (Left Side)

Circuit Diagram



Description

DTC	DTC Definition	DTC Detection Condition	Possible Cause
B1412-11	Mix Flap Motor Step (Left Side)	ENGINE START STOP switch is in ON	• Mode damper left motor • A/C control panel • Wire harness or connector
B1412-13	Mix Flap Motor Step (Left Side)		

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

Diagnosis Procedure

1	Check wire harness and connector

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the mix damper motor connector K-005 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 the mix damper motor

(a) Remove the mix damper motor from malfunctioning vehicle.
(b) Install new mix damper motor to malfunctioning vehicle.
(c) Check whether there are DTC B1412-11 and B1412-13.

Result

Proceed to
OK
NG

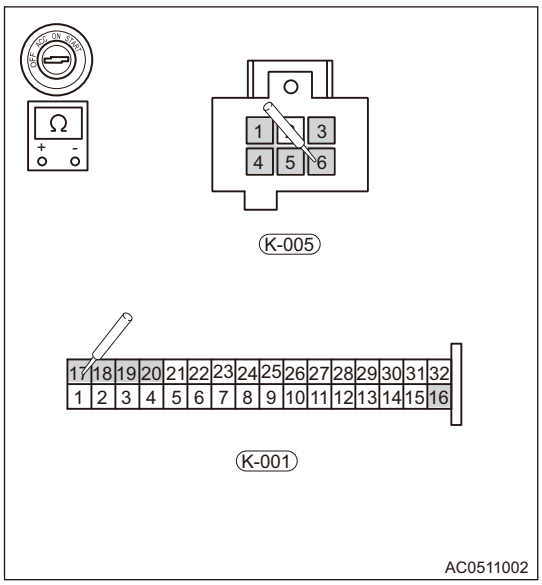
NG → **Replace the mix damper motor**

OK

3	Check A/C control panel to mix damper motor wire harness connector

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the A/C control panel connector K-001 and mix damper motor connector K-005.

(d) Using a digital multimeter, measure the wire harness between mix damper motor connector K-005 and A/C control panel connector K-001 according to value(s) in table below.



Check for Open

Multimeter Connection	Condition	Specified Condition
K-005 (1) - K-001 (40)	Always	Resistance ⩽ 1 Ω
K-005 (2) - K-001 (37)	Always	Resistance ⩽ 1 Ω
K-005 (3) - K-001 (1)	Always	Resistance ⩽ 1 Ω
K-005 (4) - K-001 (2)	Always	Resistance ⩽ 1 Ω
K-005 (6) - K-001 (3)	Always	Resistance ⩽ 1 Ω

Result

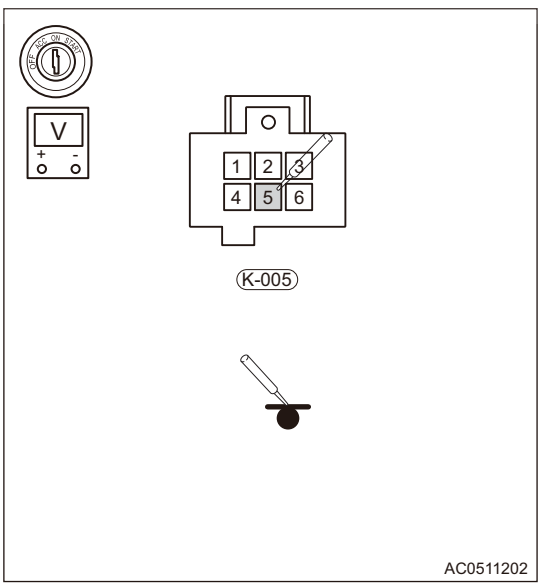
Proceed to
OK
NG

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

OK

4 Check power circuit of mix damper motor

(a) Disconnect the mix damper motor connector K-005 and A/C control panel connector K-001.
(b) Connect the negative battery cable.
(c) Turn ENGINE START STOP switch to ON, turn blower on.
(d) Using a digital multimeter, measure the voltage between terminal 2 of inner/outer damper motor connector K-005 and body ground according to value(s) in table below.



Voltage Inspection

Multimeter Connection	Condition	Specified Condition
K-005 (2) - 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

5	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 still output using A/C self-diagnosis.

Result

Proceed to
OK
NG

OK	System operates normally
NG	Replace A/C control panel

A/C CAN Network DTC

DTC	DTC Definition
U0140-87	Lost Communication With Body Control Module
U0155-87	Lost Communication With Instrument Cluster Module
U0151-87	Lost Communication With Air Bag Module

Refer to Chapter 33 CAN Communication System for CAN network DTCs.

On-vehicle Inspection

General 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.
  (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, normally, temperature of inlet pipe is higher than that of outlet pipe. 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.

1. Using pressure gauge set, check the refrigerant pressure.
   (a) Connect 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 for 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.

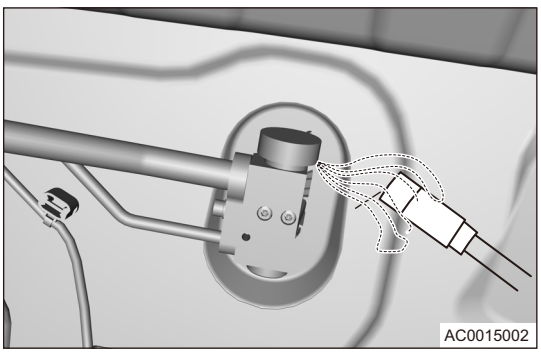
Caution:

- 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.

ON-VEHICLE SERVICE

Refrigerant Recovering, Vacuum Pumping and Recharging

Refrigerant Recovering/Draining

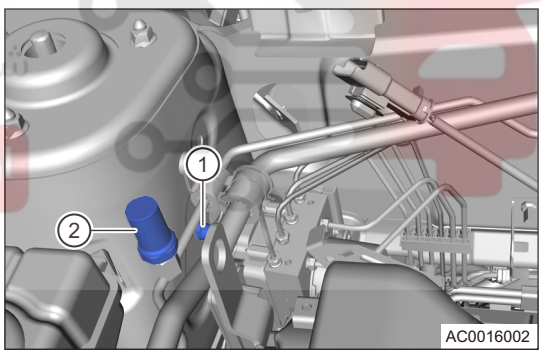
Warning / Caution / Hint:

- 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.

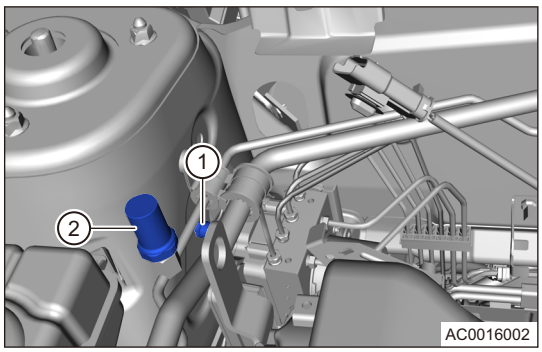
1. Open the engine hood and loosen the joint cover of A/C high/low pressure line.
2. Connect the refrigerant recycling machine to A/C high/low pressure line joint.
   (a) Connect the red connector to A/C high pressure line joint (1).
   (b) Connect the blue connector to A/C low pressure line joint (2).



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, the A/C system should be checked and repaired. 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. A small amount of refrigerant oil in A/C system will be discharged when recovering and draining refrigerant.
- 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.

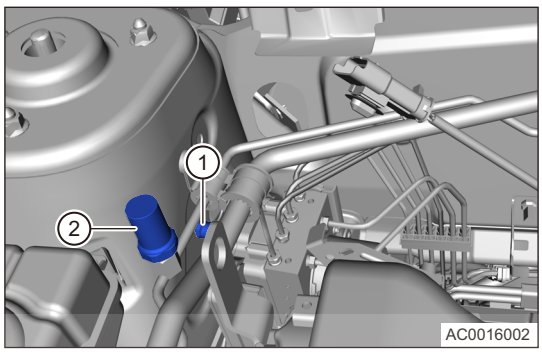
Refrigerant Oil Recovering and Charging

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, the A/C system should be checked and repaired. 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.

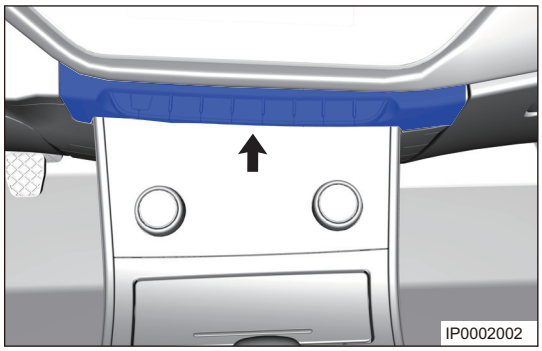
Refrigerant Oil Charging Amount Specifications

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

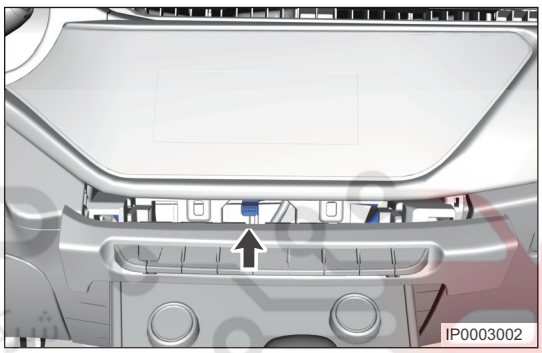
A/C Control Panel Assembly

Removal

1. Turn off all electrical equipment and the ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the center console switch assembly.
   1. Using an interior crow plate, pry off center console switch assembly (arrow).

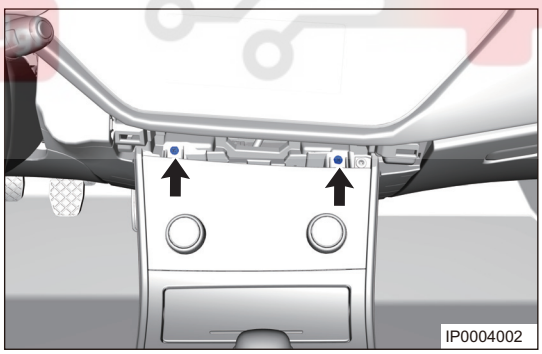


   2. Disconnect the center console switch assembly connector (arrow).

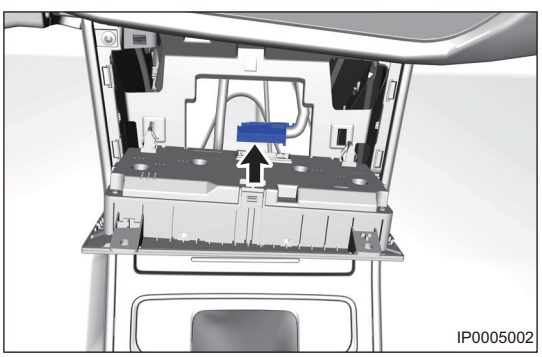


4. Remove the electric A/C control panel.
   1. Remove 2 fixing screws (arrow) from electric A/C control panel.

      Tightening torque
      1.5 ± 0.5 N·m



   2. Disconnect the electric A/C control panel connector (arrow).



Installation

1. Installation is in the reverse order of removal.

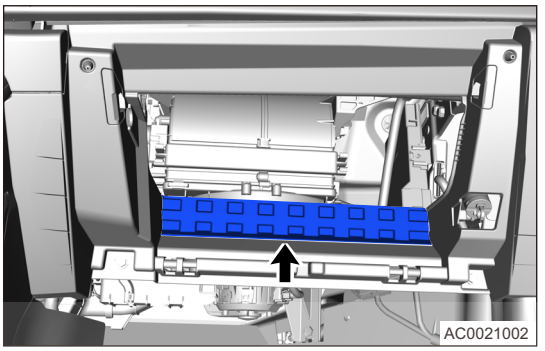
Caution:

- 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 48-11).
2. Remove the A/C element.
   (a) Detach two clips from A/C element protector cover, and remove A/C element protector cover.



   (b) Remove the A/C element assembly from air inlet position on upper side of blower.

Installation

1. Installation is in the reverse order of removal.

Caution:

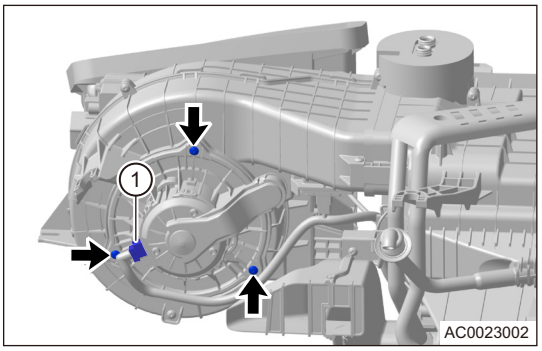
- Be sure to check A/C element for dirt when installing. Clean it as necessary.
- If A/C element is too dirty or damaged, replace it with a new one.
- Double effect filter is equipped on automatic A/C.

Blower Assembly

Removal

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

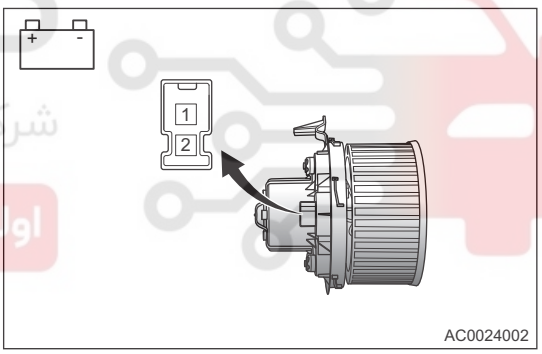
   Tightening torque
   5 ± 1 N·m



   (b) Remove the blower assembly.

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.
   Caution:
   - Tighten fixing bolts to specified torques.

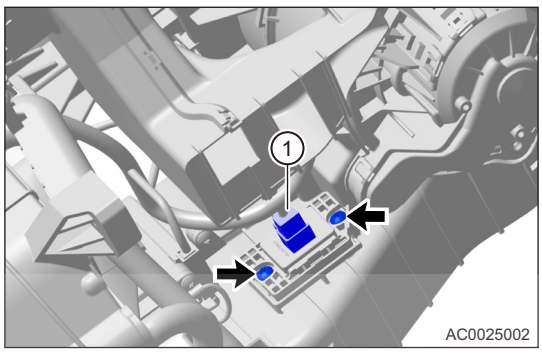
Blower Speed Regulation Module

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 the ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the blower speed regulation module.



(a) Disconnect the blower speed regulation module connector (1).
(b) Remove the fixing screws (arrow) from blower speed regulation module.

Tightening torque

1.5 ± 0.5 N·m

(c) Remove the blower speed regulation module assembly.

Installation

1. Installation is in the reverse order of removal.

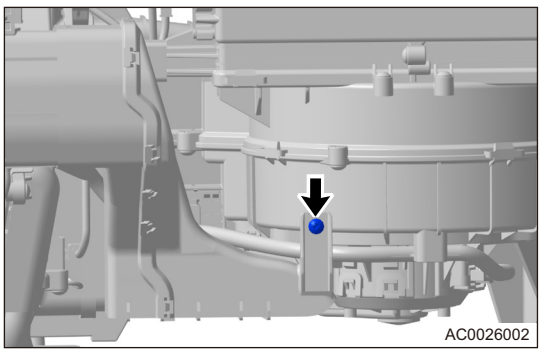
Inner/Outer Circulation Damper Motor

Removal

1. Turn off all electrical equipment and the ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the HVAC assembly (See page 31-50).
4. Remove the electric distributor housing assembly.

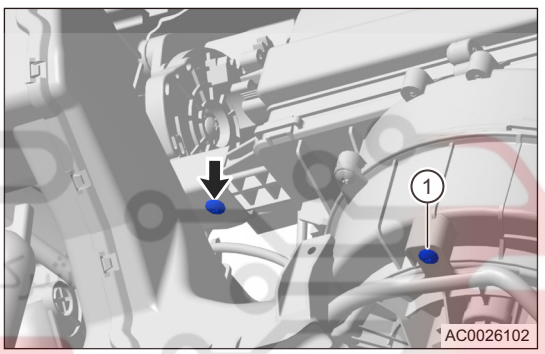
(a) Remove 1 fixing screw (arrow) from right foot air duct.

Tightening torque
1.5 ± 0.5 N·m



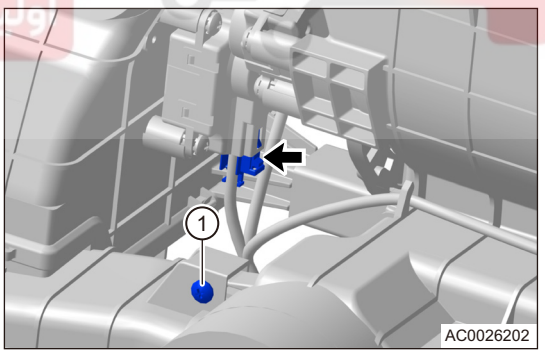
(b) Remove 1 fixing screw (arrow) between blower housing and electric distributor housing assembly and A/C wire harness fixing screw (1).

Tightening torque
1.5 ± 0.5 N·m



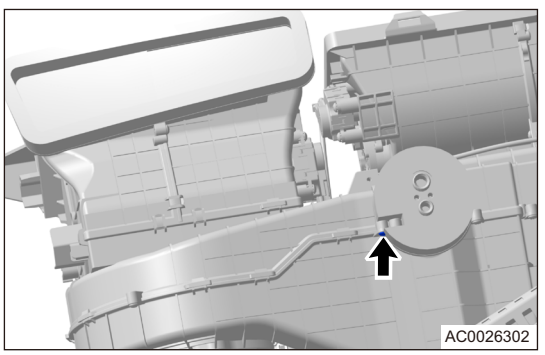
(c) Remove 1 fixing screw (arrow) between blower housing and electric distributor housing assembly and inner/outer circulation motor connector (1).

Tightening torque
1.5 ± 0.5 N·m



(d) Remove 1 fixing screw (arrow) between blower housing and electric distributor housing assembly.

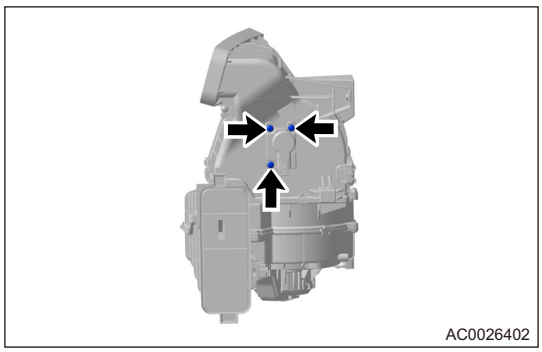
Tightening torque
1.5 ± 0.5 N·m



5. Remove the inner/outer circulation damper motor.

(a) Remove 3 fixing screws (arrow) from inner/outer circulation damper.

Tightening torque
1.5 ± 0.5 N·m



(b) Remove the inner/outer circulation damper motor.

Installation

1. Installation is in the reverse order of removal.

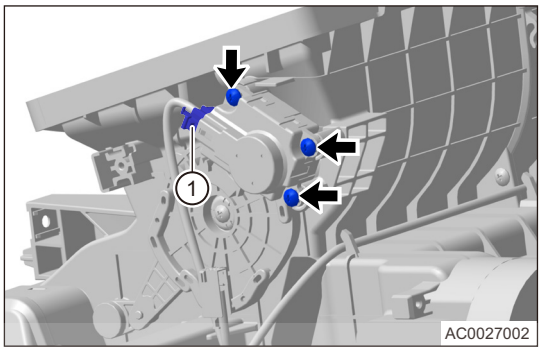
Caution:

- 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 the ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the instrument panel body assembly (See page 48-11).
4. Remove the HVAC assembly (See page 31-50).
5. Remove the electric distributor housing assembly (See page 31-51).
6. Remove the mode damper motor.



(a) Disconnect the mode damper motor connector (1).
(b) Remove 3 fixing screws (arrow) from mode damper motor.
(c) Remove the mode damper motor.

Installation

1. Installation is in the reverse order of removal.

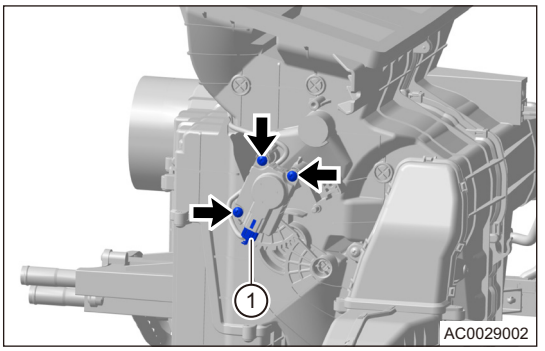
Caution:

- 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.

Mix Damper Motor

Removal

1. Turn off all electrical equipment and the ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the auxiliary fascia console front left protector (See page 48-7).
4. Remove the mix damper motor.
   (a) Disconnect the mix damper motor connector (1).
   (b) Remove 3 fixing screws (arrow) from mix damper motor.
   (c) Remove the 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 mix damper motor lever and the mix damper set to ensure the motor operates smoothly.

HVAC Assembly

Removal

WARNING

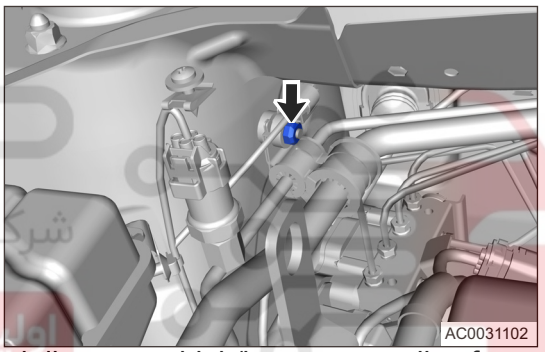
Caution:

- 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 (See page 31-39).
2. Turn off all electrical equipment and the ENGINE START STOP switch.
3. Disconnect the negative battery cable.
4. Remove the driver airbag (See page 32-64).
5. Remove the steering wheel assembly (See page 28-9).
6. Remove the auxiliary fascia console assembly (See page 48-7).
7. Remove the instrument panel assembly (See page 48-11).
8. Remove the instrument panel crossmember assembly (See page 48-20).
9. Remove the HVAC assembly.

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

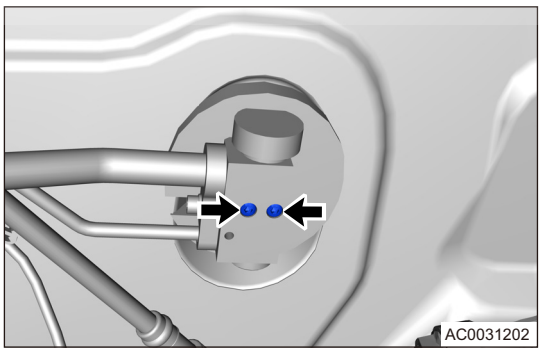
Tightening torque
7 ± 1 N·m



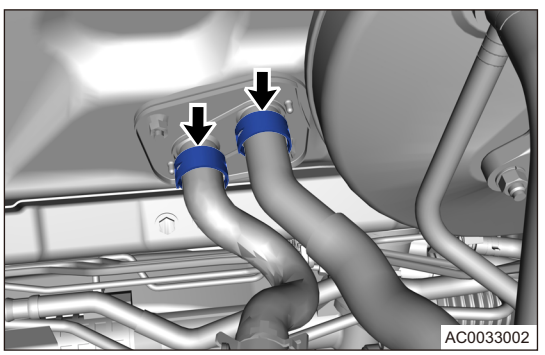
(b) Remove 1 fixing bolt (1) from high/low pressure line and disengage high/low pressure line from expansion valve.

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

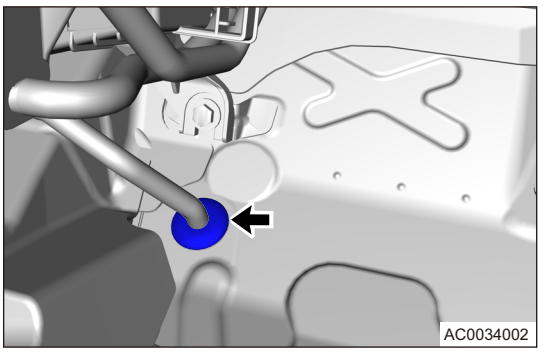
Tightening torque
5 ± 1 N·m



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

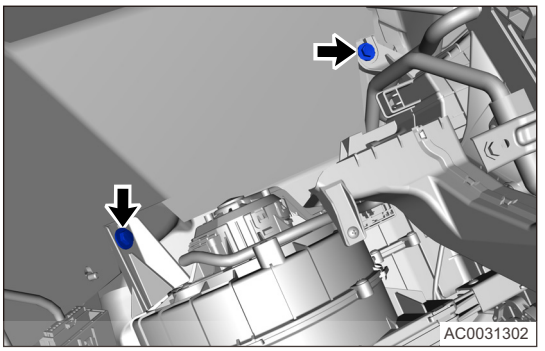


(e) Disengage the outlet hose of HVAC and fixing bush rubber (arrow) of body.



(f) Remove 2 fixing bolts (arrow) from HVAC.

Tightening torque
5 ± 1 N·m



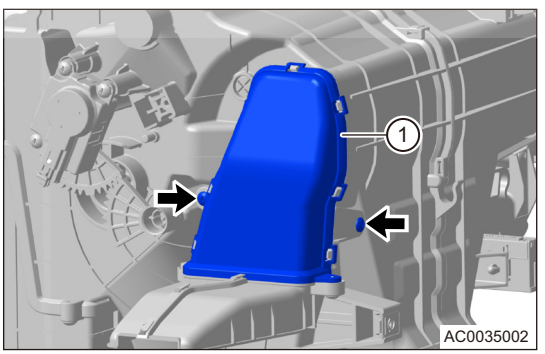
(g) Carefully take off the HVAC assembly from cabin.

Disassembly

1. Remove the blower assembly (See page 31-44).
2. Remove the blower speed regulation module (See page 31-45).
3. Remove the inner/outer circulation damper motor (See page 31-46).
4. Remove the mix damper servo motor (automatic A/C) (See page 31-49).
5. Remove the mode damper motor.
6. Remove the A/C element assembly.
7. Remove the left foot fan shield.

(a) Remove 2 fixing screws (arrow), and disengage left foot fan shield (1) from HVAC assembly.

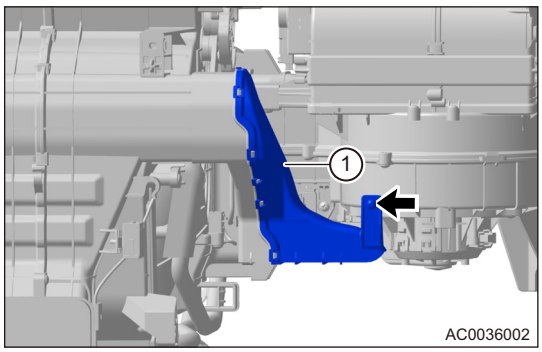
Tightening torque
1.5 ± 0.5 N·m



8. Remove the right foot fan shield.

(a) Remove 1 fixing screw (arrow), and disengage right foot fan shield (1) from HVAC assembly.

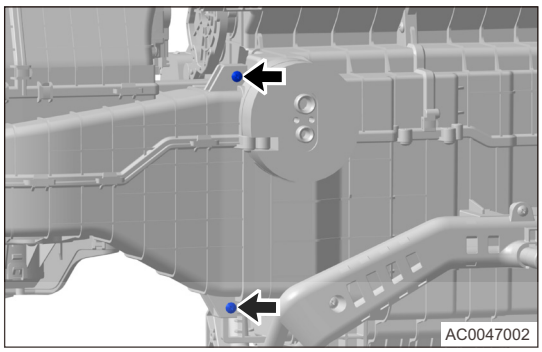
Tightening torque
1.5 ± 0.5 N·m



9. Separate electric distributor housing assembly and blower housing assembly.

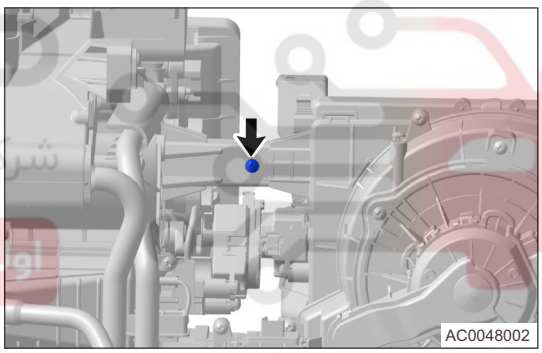
(a) Remove 2 fixing screws (arrow) between electric distributor housing assembly and blower housing assembly (rear part).

Tightening torque
1.5 ± 0.5 N·m



(b) Remove 1 fixing screw (arrow) between electric distributor housing assembly and blower housing assembly (center part).

Tightening torque
1.5 ± 0.5 N·m

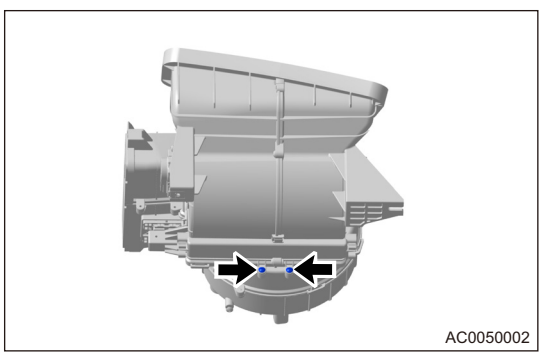


(c) Separate electric distributor housing assembly and blower housing assembly.

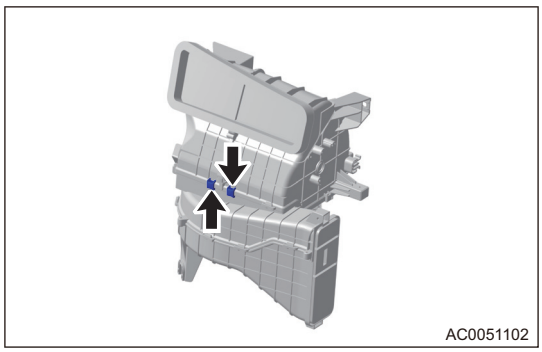
10. Separate blower housing assembly and air inlet housing assembly.

(a) Remove 2 fixing screws between blower housing assembly and air inlet housing assembly (front part).

Tightening torque
1.5 ± 0.5 N·m



(b) Remove clips between blower housing assembly and air inlet housing assembly (rear part).

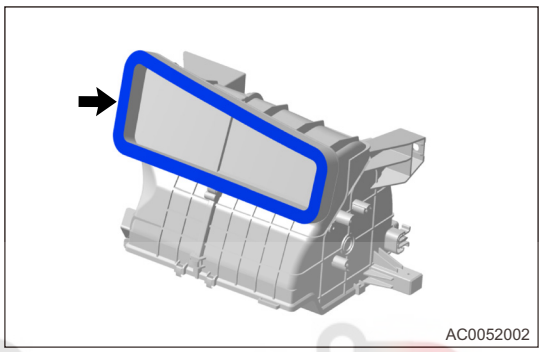

AC0051102

(c) Separate blower housing assembly and air inlet housing assembly.

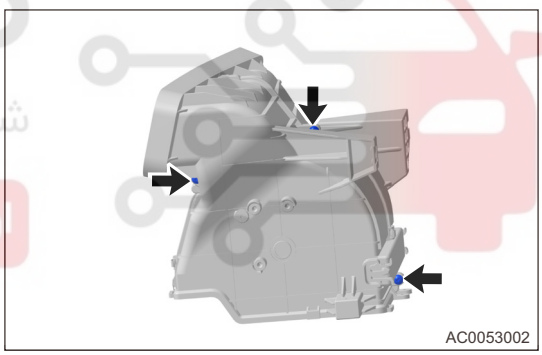
11. Remove the inner/outer circulation damper set.

(a) Remove the air inlet sealing sponge (arrow).

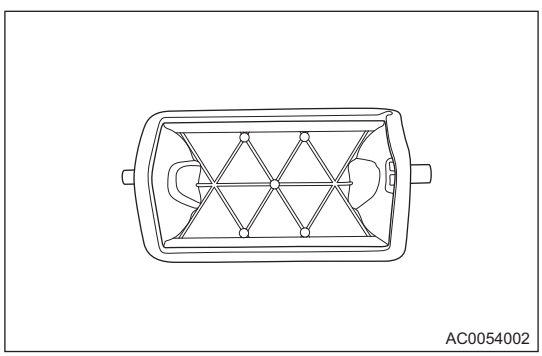
Tightening torque
1.5 ± 0.5 N·m


AC0052002

(b) Remove 3 fixing screws and 3 clips (arrow) from air inlet housing assembly.


AC0053002

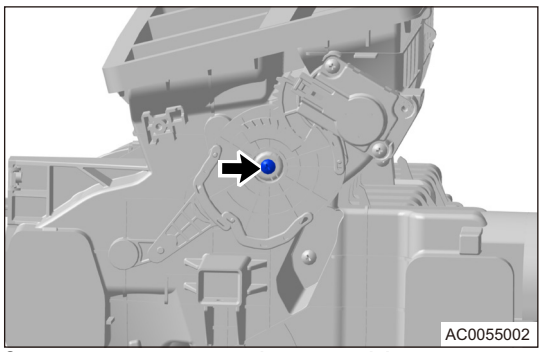
(c) Disengage fixing claw and separate air inlet housing assembly, then remove inner/outer circulation damper set.


AC0054002

12. Remove the temperature damper adjustment mechanism.

(a) Remove fixing screw (arrow) from temperature damper adjustment mechanism.

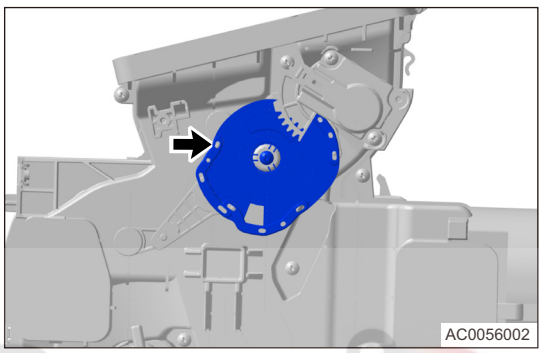
Tightening torque
1.5 ± 0.5 N·m



(b) Remove temperature damper adjustment mechanism form evaporator tank assembly.

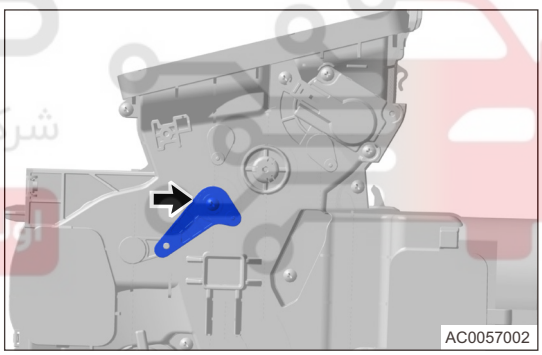
13. Remove the mode damper adjustment mechanism set.

(a) Remove 1 fixing screw (arrow) from mode damper servo motor fixing bracket.

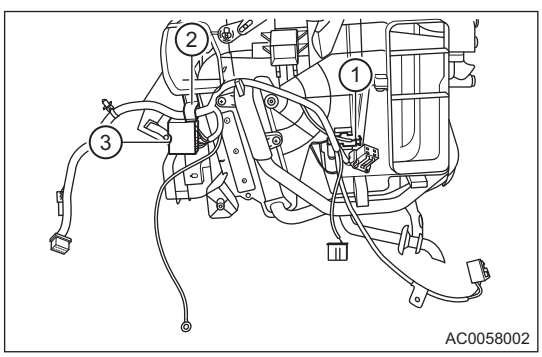


(b) Remove fixing screw (arrow) and mode damper adjustment mechanism set.

Tightening torque
1.5 ± 0.5 N·m



14. Remove the A/C wire harness assembly.

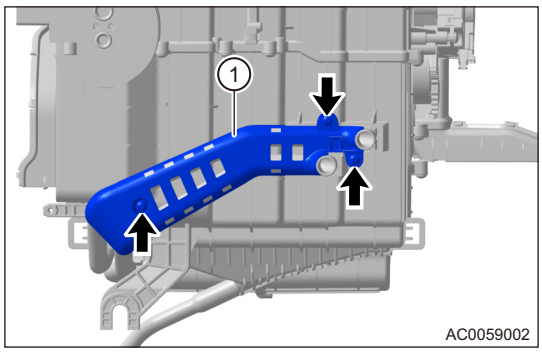


(a) Disconnect evaporator temperature sensor connector (1), and disengage A/C wire harness assembly connector (3) from distributor housing assembly.
(b) Disengage A/C wire harness assembly fixing clip (2) from distributor housing assembly.
(c) Remove the A/C wire harness assembly.

15. Remove the heater core.

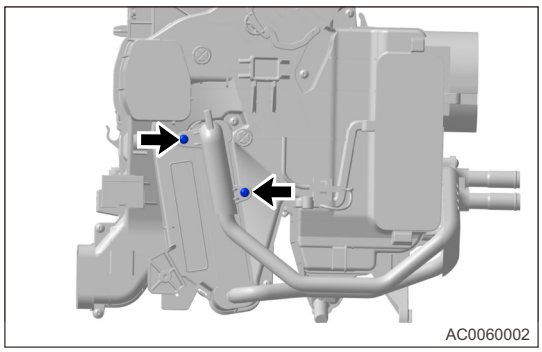
(a) Remove 3 fixing screws (arrow) from heater core line pressure plate, and remove pressure plate 1.

Tightening torque
1.5 ± 0.5 N·m



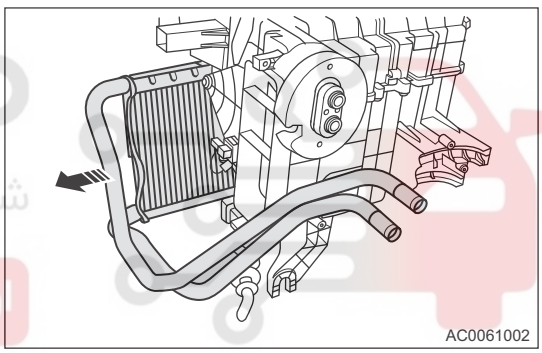
(b) Remove fixing screws (arrow) from heater core line cover plate and disengage fixing claw.

Tightening torque
1.5 ± 0.5 N·m



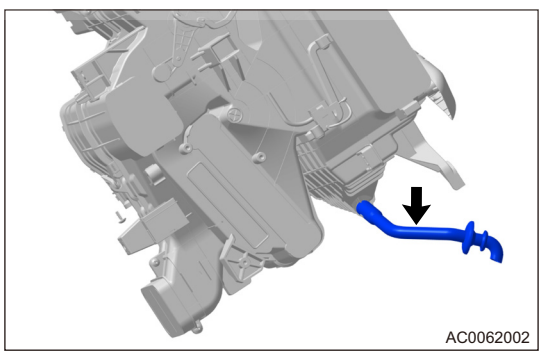
(c) Carefully remove the heater core.

Tightening torque
1.5 ± 0.5 N·m



16. Remove the A/C drain pipe.

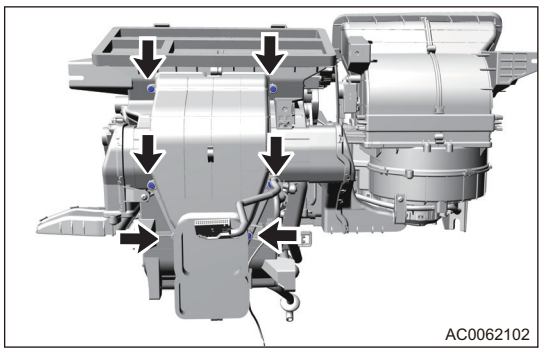
(a) Remove A/C drain pipe (arrow) from bottom of evaporator tank assembly.



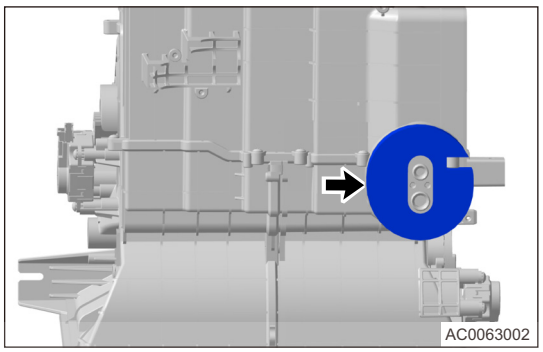
17. Remove evaporator core.

(a) Remove 6 fixing screws (arrow) from front housing of rear face air duct.

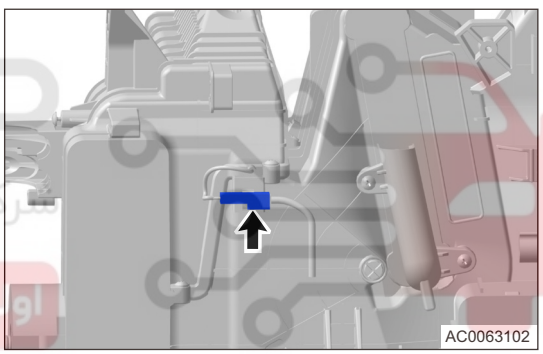
Tightening torque
1.5 ± 0.5 N·m


AC0062102

(b) Remove the evaporator core line sealing sponge (arrow).

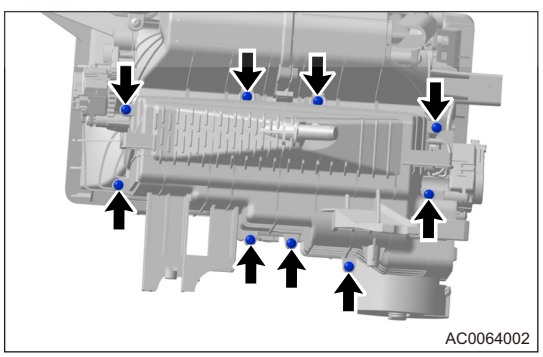

AC0063002

(c) Disconnect clip (arrow) between evaporator temperature sensor connector and evaporator tank case.

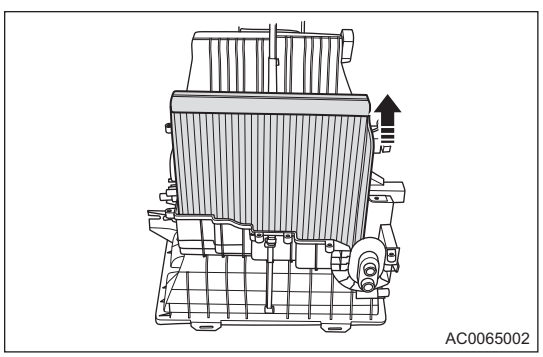

AC0063102

(d) Remove 10 fixing screws (arrow) from upper part of evaporator tank assembly.

Tightening torque
1.5 ± 0.5 N·m

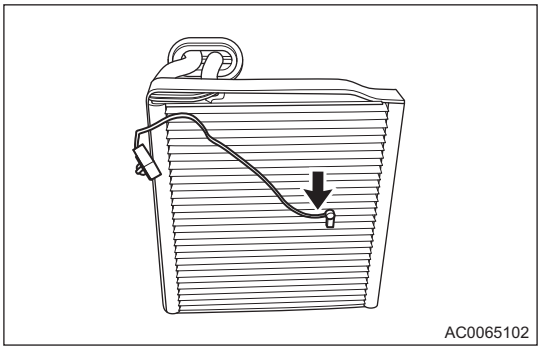

AC0064002

(e) Carefully remove evaporator core (arrow) from evaporator tank assembly.


AC0065002

18. Remove the evaporator temperature sensor.

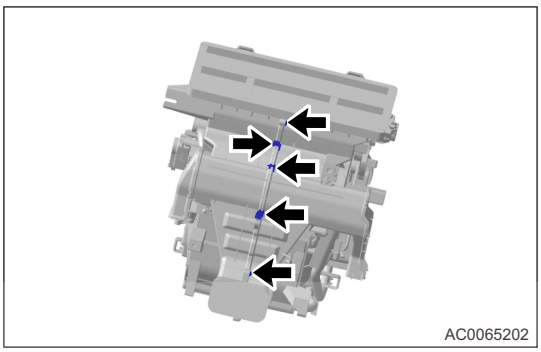
(a) Remove evaporator temperature sensor (arrow) from evaporator core.


AC0065102

19. Remove the temperature/face/defrost/foot damper set.

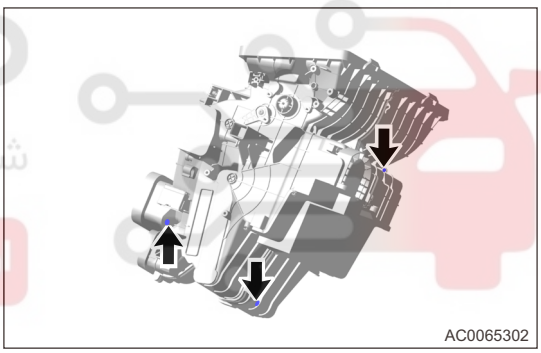
(a) Remove 2 fixing screws (arrow) and 3 fixing claws (arrow) from upper part of evaporator tank assembly.

Tightening torque
1.5 ± 0.5 N·m


AC0065202

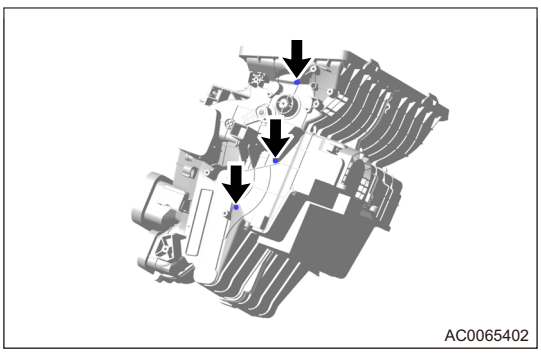
(b) Remove 3 fixing screws (arrow) from rear part of evaporator tank assembly.

Tightening torque
1.5 ± 0.5 N·m

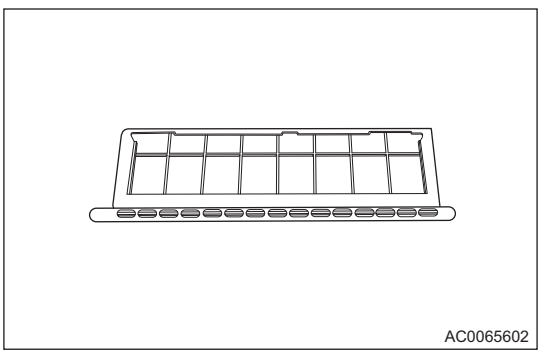

AC0065302

(c) Remove 3 fixing screws (arrow) from center part of evaporator tank assembly.

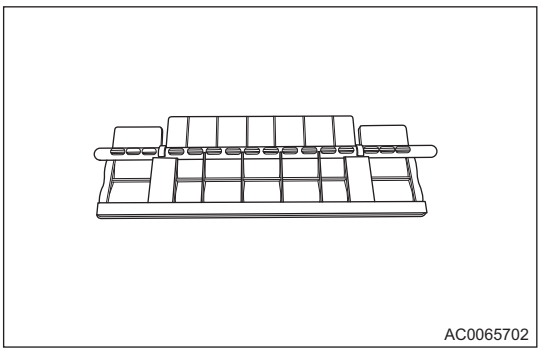
Tightening torque
1.5 ± 0.5 N·m


AC0065402

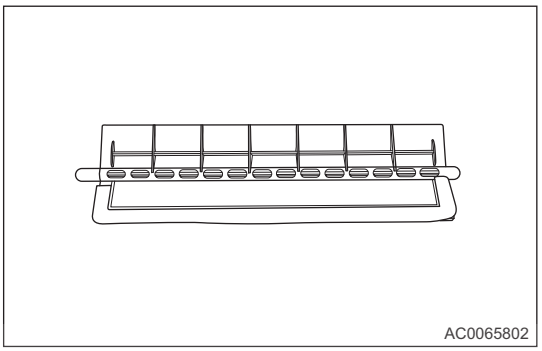
(d) Disengage fixing clip and disengage evaporator tank case, and remove temperature damper set.


AC0065602

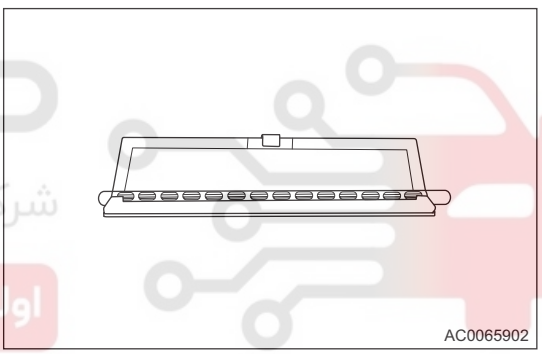
(e) Remove the face damper set.



(f) Remove the defrost damper set.



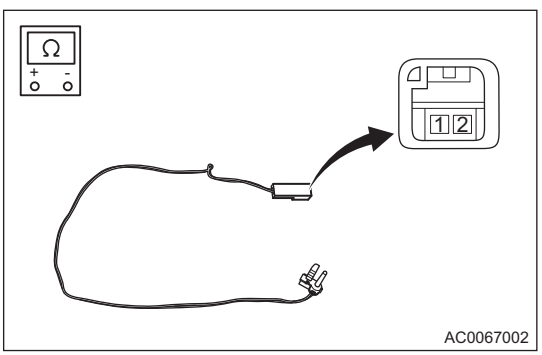
(g) Remove the foot damper set.



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.



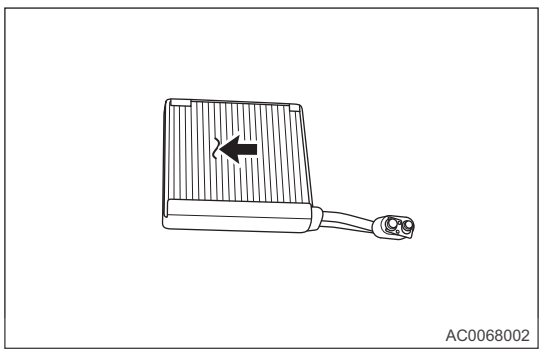
Multimeter Connection	Temperature (°C)	Standard Resistance (Ω)
Terminal 1 - Terminal 2	-5	7716
Terminal 1 - Terminal 2	0	6650
Terminal 1 - Terminal 2	5	5150
Terminal 1 - Terminal 2	10	4020
Terminal 1 - Terminal 2	15	3163
Terminal 1 - Terminal 2	20	2506

Hint:

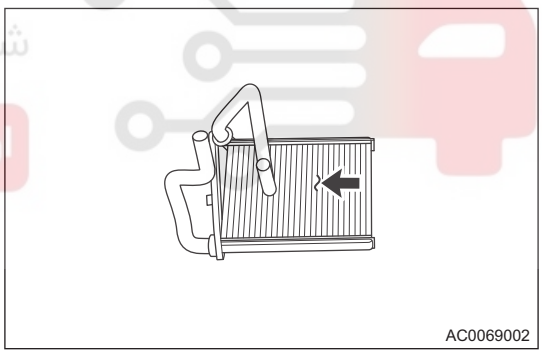
- Resistance decreases as temperature increases.
- If result is not as specified, replace the evaporator temperature sensor.

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 the evaporator core assembly.
   (b) Check the fin for bends.
      (1) If any fin is bent, carefully straighten it with a screwdriver or pliers.


AC0068002

3. Check the heater core assembly
   (a) Check if heater core assembly is cracked, damaged or leaked. Check if heater core assembly is cracked, damaged or leaked.
   (b) Check the fin for bends.
      (1) If any fin is bent, carefully straighten it with a screwdriver or pliers.


AC0069002

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 Low Pressure Line

Removal

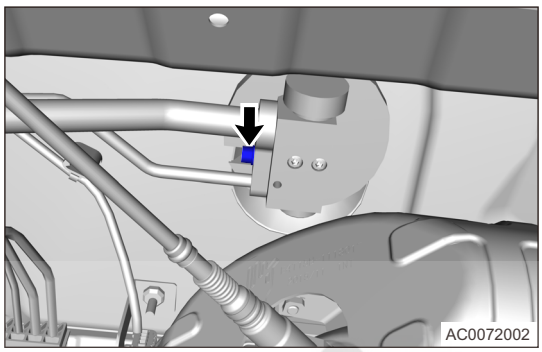
Warning / Caution / Hint:

- 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 the ENGINE START STOP switch.
3. Disconnect the negative battery cable.
4. Remove the A/C low pressure line.

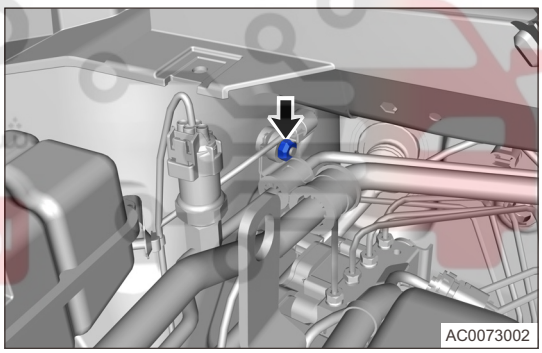
(a) Remove the fixing bolt (arrow) between A/C high/low pressure line and expansion valve, and disengage the A/C high/low pressure line.

Tightening torque
7 ± 1 N·m



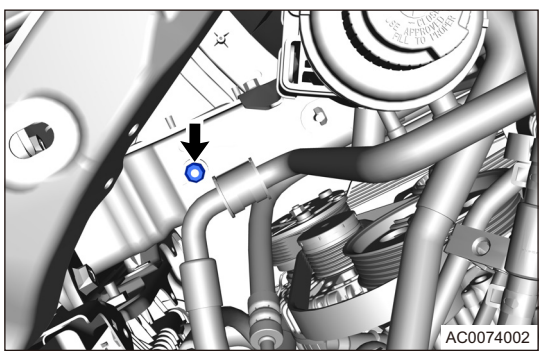
(b) Remove the coupling bolt (arrow) between A/C high/low pressure line fixing bracket and body, and disengage the A/C low pressure line.

Tightening torque
7 ± 1 N·m



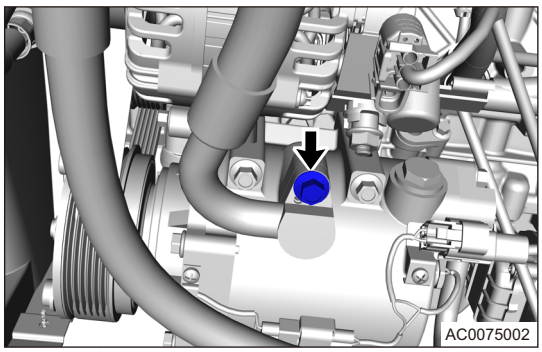
(c) Remove the coupling nut (arrow) between A/C high/low pressure line fixing bracket and body, and disengage the A/C low pressure line.

Tightening torque
7 ± 1 N·m



(d) Remove the fixing bolt (arrow) between A/C low pressure line and compressor assembly, and disengage A/C low pressure line from compressor assembly.

Tightening torque
25 ± 3 N·m



(e) Remove the A/C low pressure line (compressor to evaporator).

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.

A/C High Pressure Line

Removal

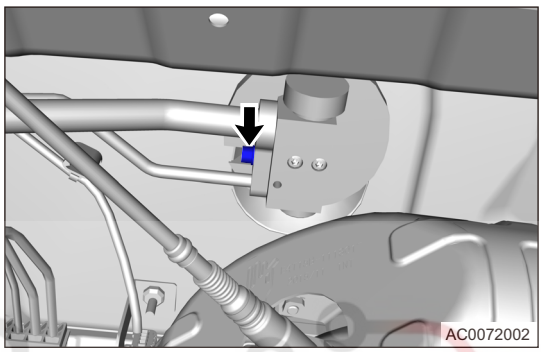
Warning / Caution / Hint:

- 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 the ENGINE START STOP switch.
3. Disconnect the negative battery cable.
4. Remove the front bumper assembly.
5. Remove the expansion valve to condenser line assembly.

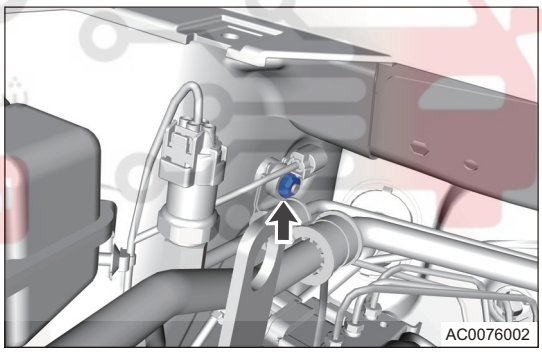
(a) Remove the fixing bolt (arrow) between A/C high/low pressure line and expansion valve, and disengage the A/C high/low pressure line.

Tightening torque
5 ± 1 N·m

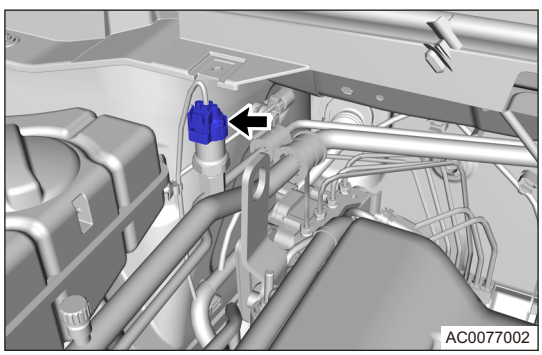


(b) Remove the coupling bolt (arrow) between expansion valve to condenser line assembly and body.

Tightening torque
7 ± 1 N·m

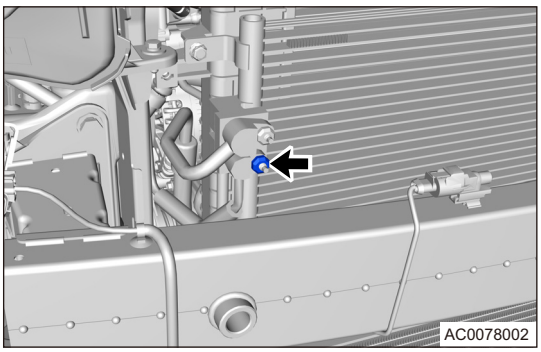


(c) Disconnect the A/C pressure sensor wire harness connector (arrow).



(d) Remove the expansion valve to condenser line assembly (arrow).

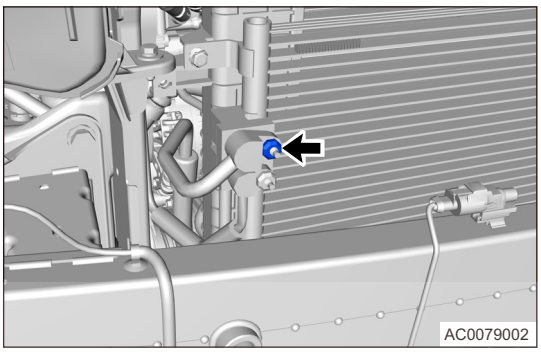
Tightening torque
7 ± 1 N·m



6. Remove the A/C high pressure line (compressor to condenser).

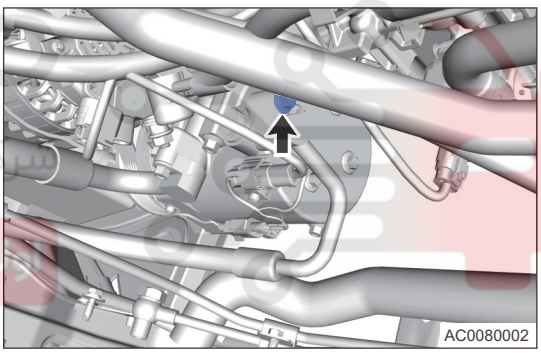
(a) Remove the fixing nut (arrow) between A/C high pressure line (compressor to condenser) and condenser.

Tightening torque
7 ± 1 N·m



(b) Remove the fixing bolt (arrow) between A/C high pressure line (compressor to condenser) and compressor.

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.
- Perform recharging for A/C system and check for refrigerant leakage.

Compressor Assembly

Removal

Warning / Caution / Hint:

Caution:

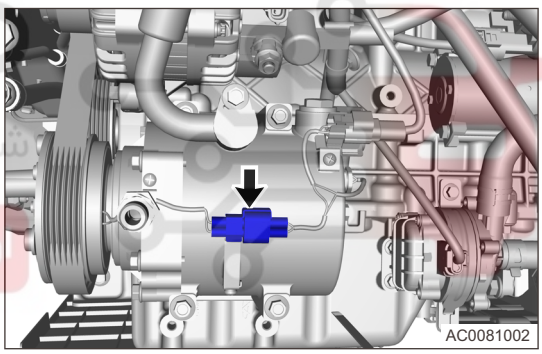
- Be sure to follow safety precautions before performing this procedure. Failure to do so may result in serious personal injury or even death.

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.

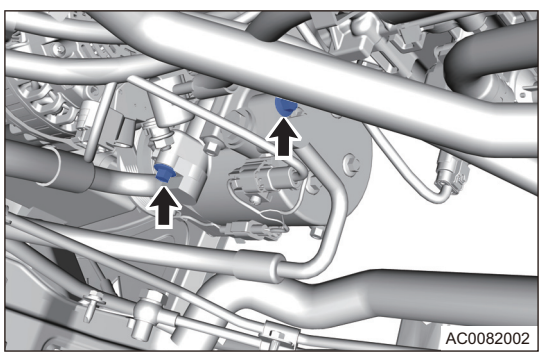
1. Recover the refrigerant from A/C system.
2. Turn off all electrical equipment and the ENGINE START STOP switch.
3. Disconnect the negative battery cable.
4. Remove the accessory drive belt.
5. Remove the engine lower protector assembly.
6. Remove the compressor assembly.

(a) Disconnect the compressor assembly wire harness connector (arrow).



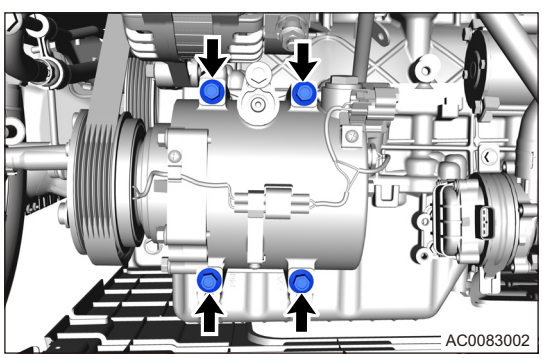
(b) Remove 2 fixing bolts (arrow) between A/C high/low pressure line and compressor assembly, and disengage A/C high/low pressure line from compressor assembly.

Tightening torque
25 ± 3 N·m



(c) Remove 4 fixing bolts (arrow) between compressor assembly and mounting bracket.

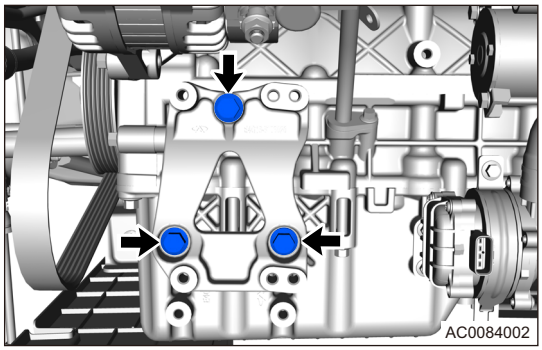
Tightening torque
25 ± 3 N·m



(d) Carefully remove compressor assembly from lower part.

7. Remove the compressor assembly mounting bracket.

(a) Remove 3 fixing bolts (arrow) between compressor mounting bracket and engine.



(b) Remove the compressor assembly mounting bracket.

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

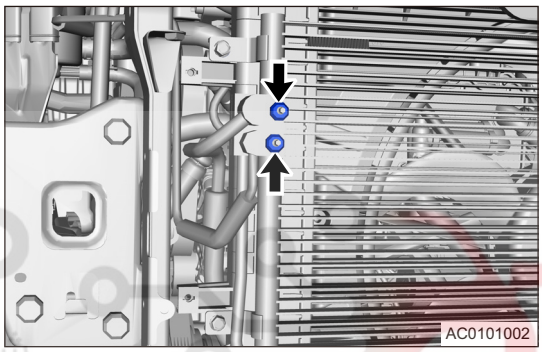
Warning / Caution / Hint:

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 the ENGINE START STOP switch.
3. Disconnect the negative battery cable.
4. Remove the front bumper assembly.
5. Remove the left/right air deflector assembly.
6. Remove the condenser assembly.

(a) Remove the fixing bolt between high/low pressure line and condenser (right), and disengage the high/low pressure line.



(1) Remove the fixing nut (arrow) between A/C high pressure line (condenser to compressor) and condenser assembly, and disengage A/C high pressure line from condenser assembly.

Tightening torque
9 ± 1.5 N·m

(2) Remove the fixing nut (arrow) between A/C high pressure line (condenser to expansion valve) and condenser assembly.

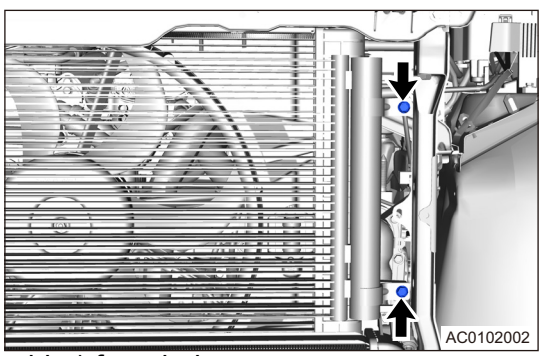
Tightening torque
9 ± 1.5 N·m

(3) Remove 2 fixing bolts (arrow) between radiator assembly and condenser assembly.

Tightening torque
5 ± 1 N·m

(b) Remove 2 fixing bolts (arrow) between radiator assembly and condenser assembly (left).

Tightening torque
5 ± 1 N·m



(c) Carefully remove the condenser assembly (w/ receiver drier) from below.

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.