

GROUP 55

HEATER, AIR CONDITIONING AND VENTILATION

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GENERAL DESCRIPTION

M1552000100351

The heater and cooling units are combined in a single unit, which, with the mode film damper and flow rate control valve in the heater unit, reduces ventilation resistance, increases fan power, and decreases noise.

ITEM	SPECIFICATION
Heater control assembly	Dial type
Compressor	10S17
Compressor Model	Swashplate type
Refrigerant and quantity (g)	R-134a (HFC-134a), 435 – 475

SAFETY PRECAUTIONS

⚠ WARNING

Wear safety goggles and gloves when servicing the refrigeration system to prevent severe damage to eyes and hands.

Because R-134a refrigerant is a hydro fluorocarbon (HFC) which contains hydrogen atoms in place of chlorine atoms, it will not cause damage to the ozone layer.

Ozone filters out harmful radiation from the sun. To assist in protecting the ozone layer, Mitsubishi Motors Corporation recommends an R-134a refrigerant recycling device.

Refrigerant R-134a is transparent and colorless in both the liquid and vapor state. Since it has a boiling point of -29.8°C (-21.64°F) at atmospheric pressure, it will be a vapor at all normal temperatures and pressures. The vapor is heavier than air, non-flammable, and non-explosive. The following precautions must be observed when handling R-134a.

⚠ WARNING

Do not heat R-134a above 40°C (104.0°F) or it may catch fire and explode.

R-134a evaporates so rapidly at normal atmospheric pressures and temperatures that it tends to freeze anything it contacts. For this reason, extreme care must be taken to prevent any liquid refrigerant from contacting the skin and especially the eyes. Always wear safety goggles when servicing the refrigeration part of the A/C system. Keep a bottle of sterile mineral oil handy when working on the refrigeration system.

1. If any liquid refrigerant gets into your eyes, use a few drops of mineral oil to wash them out. R-134a is rapidly absorbed by the oil.
2. Next, splash your eyes with plenty of cold water.
3. Call your doctor immediately even if irritation has ceased.

⚠ CAUTION

Keep R-134a containers upright when charging the system.

In most instances, moderate heat is required to bring the pressure of the refrigerant in its container above the pressure of the system when charging or adding refrigerant.

A bucket or large pan of hot water not over 40°C (104.0°F) is all the heat required for this purpose. Do not heat the refrigerant container with a blow torch or any other means that would raise temperature and pressure above this temperature. Do not weld or steam-clean on or near the system components or refrigerant lines.

⚠ WARNING

A leak detector for R-134a should be used to check for refrigerant gas leaks.

⚠ CAUTION

Do not allow liquid refrigerant to touch bright metal or it will be stained.

When metering R-134a into the refrigeration system, keep the supply tank or cans in an upright position. If the refrigerant container is on its side or upside down, liquid refrigerant will enter the system and damage the compressor.

Refrigerant will tarnish bright metal and chrome surfaces, and in combination with moisture can severely corrode all metal surfaces.

OPERATION

CONDENSER FAN AND RADIATOR FAN CONTROL

The ECU judges the required revolution speed of radiator fan motor and condenser fan motor using the input signals transmitted from A/C switch, output shaft speed sensor and engine coolant temperature sensor. The ECU activates the fan control relays to drive the radiator fan motor and condenser fan motor.

COMPRESSOR CONTROL

When operating the air conditioning switch

- The air thermo sensor, which senses the temperature of the air flowing out of the evaporator, deactivates the compressor at 3°C (37.4°F) or below.

- The dual pressure switch turns OFF when the refrigerant pressure becomes excessively high or low, thus protecting the compressor circuit (See Table below).
- When the air thermo sensor is activated, and the ignition switch, blower switch, and air conditioning switch are ON, the A/C compressor clutch relay is energized.

When operating the mode selection dial

- The air conditioning will work when the mode selection dial is set to the "Defroster" or "Defroster/foot" position, or the temperature control dial is set to the "MAX A/C" position. In other dial positions, when the air conditioning switch is turned on, the air conditioning will work.

A/C Compressor Clutch Relay ON Conditions

Ignition switch (IG2)		ON	<i>NOTE: A/C compressor clutch relay is de-energized when any one switch, sensor or control unit shown on the left turns off.</i> <i>NOTE: The components marked by * communicate with the ECU. If the air thermo sensor detects a temperature of 3°C (37.4°F), the A/C-ECU will turn off the A/C compressor clutch relay.</i>
Blower switch		ON	
Air conditioning switch, mode selection dial defroster, defroster/foot position or temperature control MAX A/C		ON	
Air thermo sensor		*	
Pressure detected by A/C pressure sensor	2940 kPa or less (If the refrigerant pressure exceeds 2940 kPa, A/C compressor clutch relay is not ON condition until the refrigerant pressure has been measured up to 2350 kPa or less.)	ON	
	190 kPa or more (If the refrigerant pressure falls short of 190 kPa, A/C compressor clutch relay is not ON condition until the refrigerant pressure has been measured up to 220 kPa or more.)		
A/C compressor clutch relay driving transistor (within ecu)		ON	

AUTO A/C DIAGNOSIS

INTRODUCTION

M1554006200062

After air is taken in through the damper, it is fed to the evaporator by the blower fan and motor and cooled. The air cooled by the air mix damper is mixed appropriately with the warmed air to achieve a comfortable temperature. If the A/C does not operate or the cooled air is not discharged, the system components or relay may be faulty.

AUTOMATIC AIR CONDITIONING TROUBLESHOOTING STRATEGY

M1554004700157

Use these steps to plan your diagnostic strategy. If you follow them carefully, you will be sure that you have exhausted most of the possible ways to find a heater, air conditioning and ventilation fault.

1. Gather information from the customer.
2. Verify that the condition described by the customer exists.
3. Find the malfunction by following the Symptom Chart.
4. Verify malfunction is eliminated.

DIAGNOSTIC FUNCTION

M1552019800046

HOW TO CONNECT THE DIAGNOSTIC TOOL (MUT-III)

Required Special Tools:

- : Diagnostic Tool (MUT-III Sub Assembly)
 - MB991824: Vehicle Communication Interface (V.C.I.)
 - MB991827: MUT-III USB Cable
 - MB991910: MUT-III Main Harness A (Vehicles with CAN communication system)

CAUTION

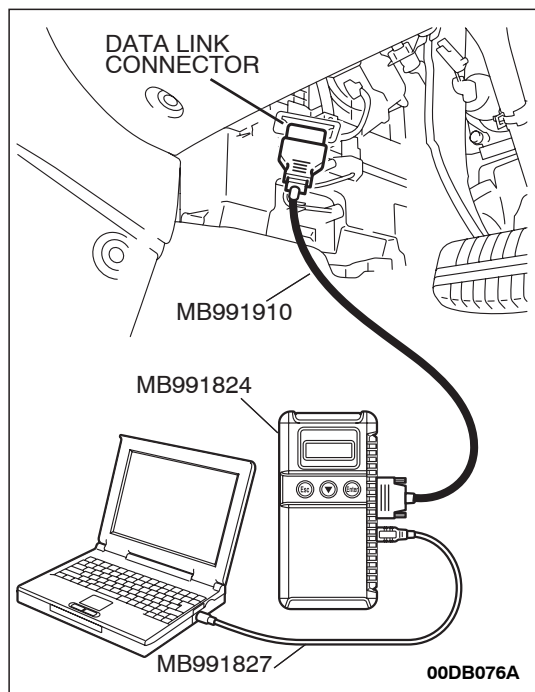
To prevent damage to diagnostic tool , always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting diagnostic tool .

1. Ensure that the ignition switch is at the "LOCK" (OFF) position.
2. Start up the personal computer.
3. Connect special tool MB991827 to special tool MB991824 and the personal computer.
4. Connect special tool MB991910 to special tool MB991824
5. Connect special tool MB991910 to the data link connector.
6. Turn the power switch of special tool MB991824 to the "ON" position.

NOTE: When the special tool MB991824 is energized, the special tool MB991824 indicator light will be illuminated in a green color.

7. Start the MUT-III system on the personal computer.

NOTE: Disconnecting the diagnostic tool special tool MB991824 is the reverse of the connecting sequence, making sure that the ignition switch is at the "LOCK" (OFF) position.



HOW TO READ AND ERASE DIAGNOSTIC TROUBLE CODES

Required Special Tools:

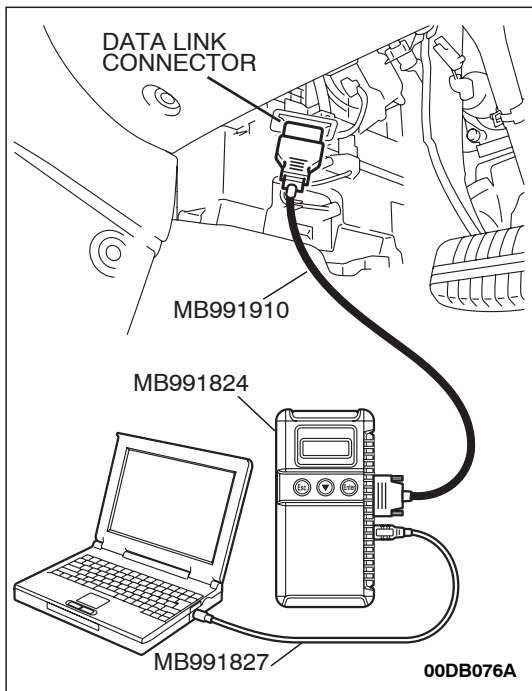
- : Diagnostic Tool (MUT-III Sub Assembly)
 - MB991824: Vehicle Communication Interface (V.C.I.)
 - MB991827: MUT-III USB Cable
 - MB991910: MUT-III Main Harness A (Vehicles with CAN communication system)

CAUTION

To prevent damage to diagnostic tool , always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting diagnostic tool .

NOTE: If the battery voltage is low, diagnostic trouble codes will not be output. Check the battery if diagnostic tool does not display.

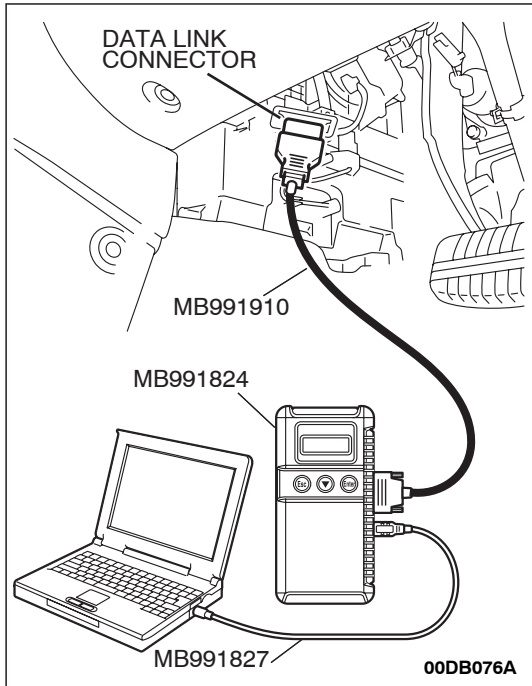
1. Connect the diagnostic tool to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select "Interactive Diagnosis" from the start-up screen.
4. Select "System Select."
5. Choose "AUTO A/C" from the "BODY" tab.
6. Select "MITSUBISHI."
7. Select "Diagnostic Trouble Code."
8. If a DTC is set, it is shown.
9. Choose "Erase DTC" to erase the DTC.



HOW TO READ DATA LIST

Required Special Tools:

- : Diagnostic Tool (MUT-III Sub Assembly)
 - MB991824: Vehicle Communication Interface (V.C.I.)
 - MB991827: MUT-III USB Cable
 - MB991910: MUT-III Main Harness A (Vehicles with CAN communication system)



CAUTION

To prevent damage to diagnostic tool , always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting diagnostic tool .

1. Connect the diagnostic tool to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select "Interactive Diagnosis" from the start-up screen.
4. Select "System Select."
5. Choose "AUTO A/C" from the "BODY" tab.
6. Select "MITSUBISHI."
7. Select "Data List."
8. Choose an appropriate item and select the "OK" button.

HOW TO PERFORM ACTUATOR TEST

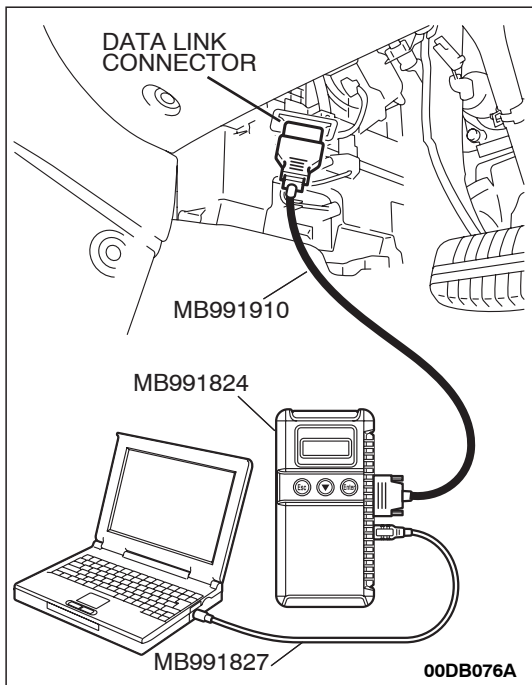
Required Special Tools:

- : Diagnostic Tool (MUT-III Sub Assembly)
 - MB991824: Vehicle Communication Interface (V.C.I.)
 - MB991827: MUT-III USB Cable
 - MB991910: MUT-III Main Harness A (Vehicles with CAN communication system)

CAUTION

To prevent damage to diagnostic tool , always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting diagnostic tool .

1. Connect the diagnostic tool to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select "Interactive Diagnosis" from the start-up screen.
4. Select "System Select."
5. Choose "AUTO A/C" from the "BODY" tab.
6. Select "MITSUBISHI."
7. Choose "Actuator Test" from "AUTO A/C" screen.
8. Choose an appropriate item and select the "OK" button.



HOW TO DIAGNOSE THE CAN BUS LINE

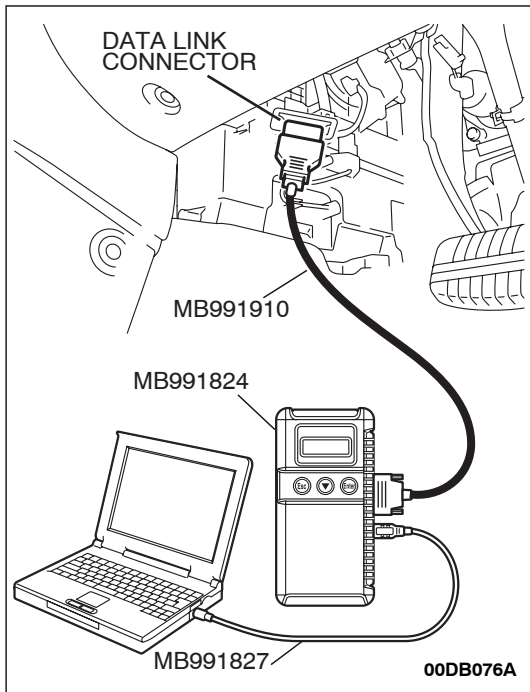
Required Special Tools:

- : Diagnostic Tool (MUT-III Sub Assembly)
 - MB991824: Vehicle Communication Interface (V.C.I.)
 - MB991827: MUT-III USB Cable
 - MB991910: MUT-III Main Harness A

⚠ CAUTION

To prevent damage to diagnostic tool , always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting diagnostic tool .

1. Connect diagnostic tool to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select "CAN bus diagnosis" from the start-up screen.
4. When the vehicle information is displayed, confirm that it matches the vehicle whose CAN bus lines will be diagnosed.
 - If they match, go to step 8.
 - If not, go to step 5.
5. Select "view vehicle information" button.
6. When the vehicle information is displayed, confirm again that it matches the vehicle which is diagnosed CAN bus line.
 - If they match, go to step 8.
 - If not, go to step 5.
7. Press the "OK" button.
8. When the options are displayed, choose the options (mark the check) and then select "OK".



DIAGNOSTIC TROUBLE CODE CHART

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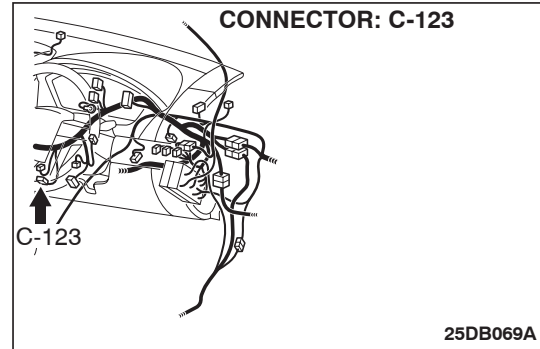
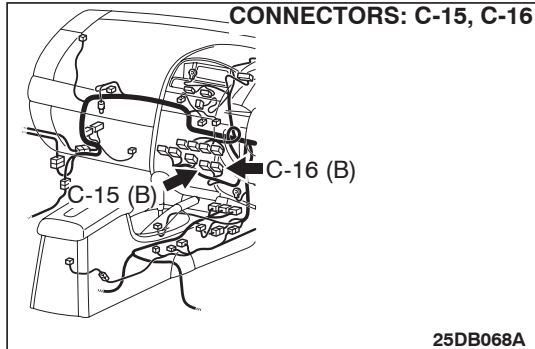
⚠ CAUTION

During diagnosis, a DTC code associated with other system may be set when the ignition switch is turned on with connector(s) disconnected. On completion of repairs, confirm all systems for DTC code(s). If DTC code(s) are set, erase them all.

DIAGNOSTIC TROUBLE CODE NO.	DIAGNOSTIC ITEM	REFERENCE PAGE
B1001	Interior temperature sensor system (short circuit)	P.55-10
B1002	Interior temperature sensor system (open circuit)	P.55-10
B1011	Ambient air temperature sensor system (short circuit)	P.55-16
B1012	Ambient air temperature sensor system (open circuit)	P.55-16
B1021	Air thermo sensor system (short circuit)	P.55-22
B1022	Air thermo sensor system (open circuit)	P.55-22
B1041	Air mixing damper control motor and potentiometer (potentiometer system shorted to its power supply)	P.55-28
B1042	Air mixing damper control motor and potentiometer (potentiometer system shorted to its ground)	P.55-28
B1045	Air mixing damper control motor and potentiometer (activating system failure)	P.55-35
B1061	Mode selection damper control motor and potentiometer (potentiometer system shorted to its power supply)	P.55-41
B1062	Mode selection damper control motor and potentiometer (potentiometer system shorted to its ground)	P.55-41
B1065	Mode selection damper control motor and potentiometer (activating system failure)	P.55-48
U1073	Bus off	P.55-54
U1100	Electronic control unit time-out (related to engine)	P.55-56
U1111	Multi-center display unit (middle grade type) time-out	P.55-60
U1120	Failure information on Electronic control unit (related to engine)	P.55-64

DIAGNOSTIC TROUBLE CODE PROCEDURES

DTC B1001, B1002: Interior Temperature Sensor System.



DTC SET CONDITION

- DTC B1001 is set if there is a short circuit in the interior temperature sensor input circuit.
- DTC B1002 is set if there is a defective connector connection, or if there is an open circuit in the harness.

TECHNICAL DESCRIPTION (COMMENT)

Current trouble

- The A/C-ECU, the interior air temperature sensor, or connector(s) or wiring between the two may be defective.

Past trouble

- If DTC B1001 or B1002 is stored as a past trouble, carry out diagnosis with particular emphasis on wiring and connector(s) between the A/C-ECU and the interior air temperature sensor. If the connectors and wiring are normal, and obviously the ECU is the cause of the trouble, replace the ECU. If in doubt, do not replace the ECU.

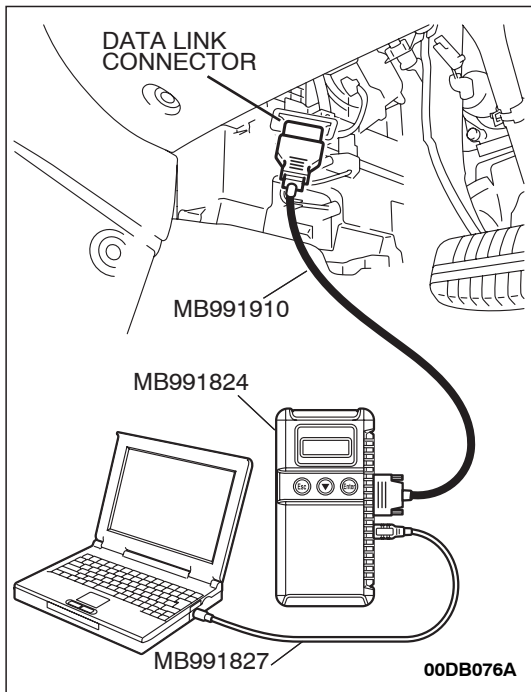
TROUBLESHOOTING HINT

- Malfunction of connector.
- Malfunction of the harness.
- Malfunction of the interior temperature sensor.
- Malfunction of the A/C-ECU.
- Refer to component locations [GROUP-70](#)
- Refer to configuration diagrams [GROUP-80](#)
- Refer to circuit diagrams [GROUP-90](#)

DIAGNOSIS

Required Special Tool:

- : Diagnostic Tool (MUT-III Sub Assembly)
 - MB991824: Vehicle Communication Interface (V.C.I.)
 - MB991827: MUT-III USB Cable
 - MB991910: MUT-III Main Harness A (Vehicles with CAN communication system)



STEP 1. Using diagnostic tool , diagnose the CAN bus line.

Use diagnostic tool to diagnose the CAN bus lines.

- (1) Connect diagnostic tool to the data link connector.
- (2) Turn the ignition switch to "ON" position.
- (3) Diagnose the CAN bus line.

Q: Is the check result satisfactory?

YES : Go to Step 2.

NO : Repair the CAN bus lines. (Refer to GROUP 54C, Diagnosis-CAN Bus Diagnostic Chart [P.54C-405](#)). Then go to Step 7.

STEP 2. Recheck for diagnostic trouble code.

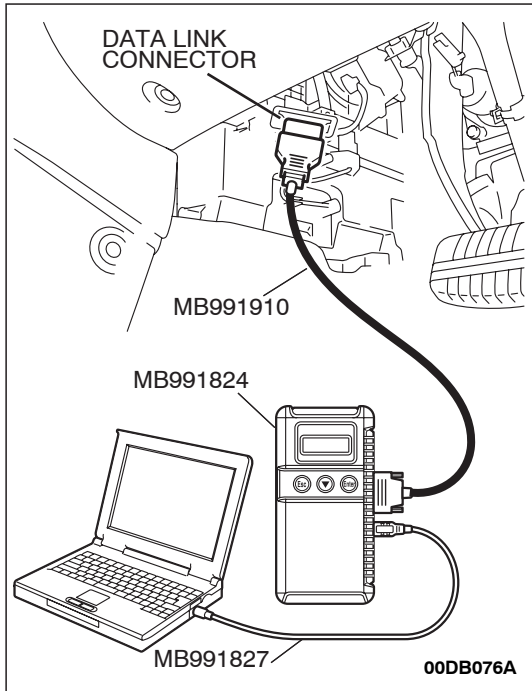
Recheck if the DTC is set.

- (1) Erase the DTC.
- (2) Turn the ignition switch to "ON" position.
- (3) Check if the DTC is set.

Q: Is the check result satisfactory?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions [P.00-14](#).

NO : Go to Step 3.



**STEP 3. Using diagnostic tool , check data list item 59:
Inside temperature sensor.**

⚠ CAUTION

To prevent damage to diagnostic tool , always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting diagnostic tool .

- (1) Connect diagnostic tool to the data link connector.
- (2) Start the engine.
- (3) Set diagnostic tool to the data reading mode for item 59:
Inside temperature sensor.
 - Check that the interior temperature matches the displayed value on the diagnostic tool.

NOTE: When this DTC is set and the system is in fail-safe status, the value of service data displays 25°C.

- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Does the interior temperature match the displayed value on the diagnostic tool?

YES : Replace the A/C-ECU. Then go to Step 7.

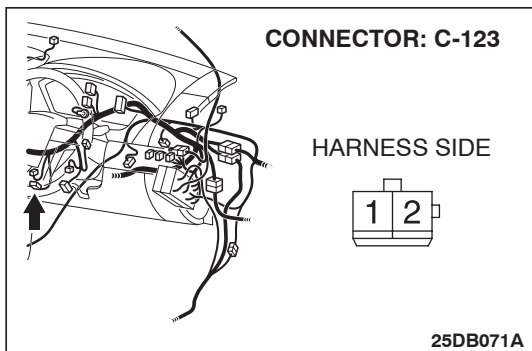
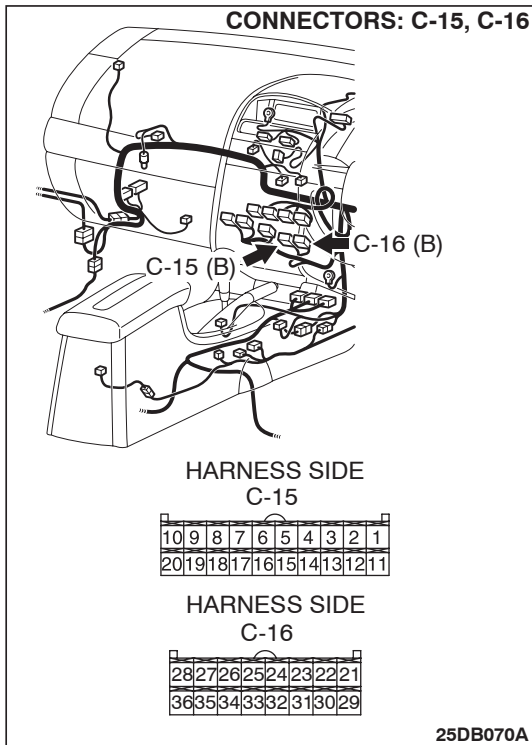
NO : Go to Step 4.

STEP 4. Check A/C-ECU connector C-15, C-16 and interior temperature sensor connector C-123 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are A/C-ECU connectors C-15, C-16 and interior temperature sensor connector C-123 in good condition?

YES : Go to Step 5.

NO : Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 7.

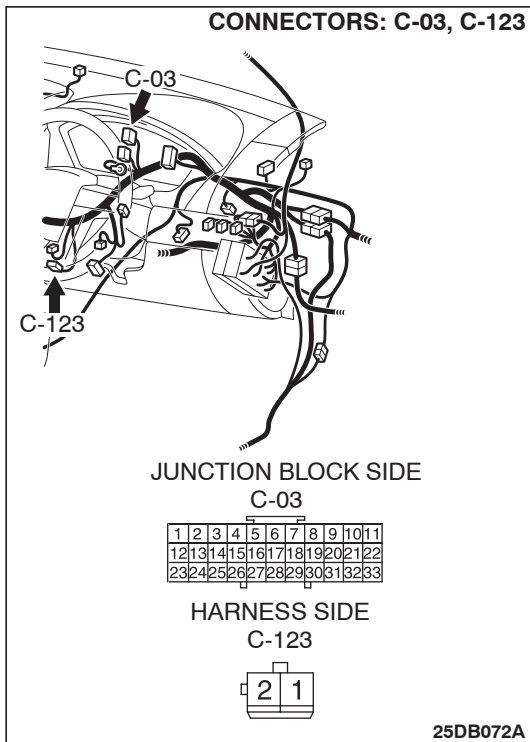
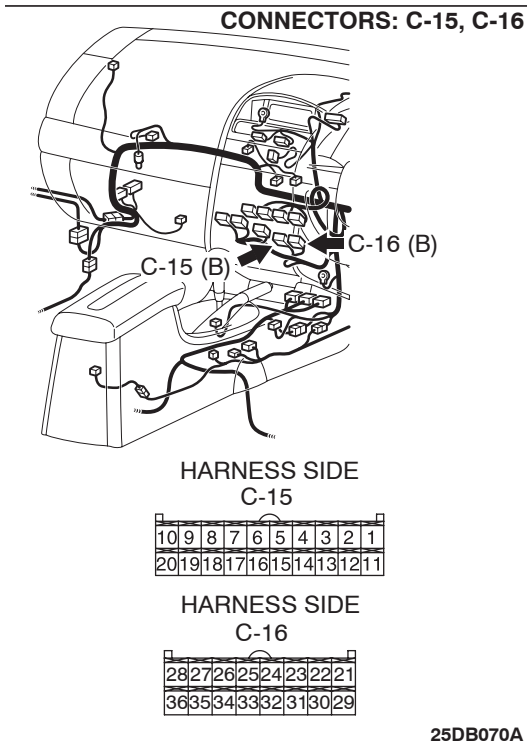


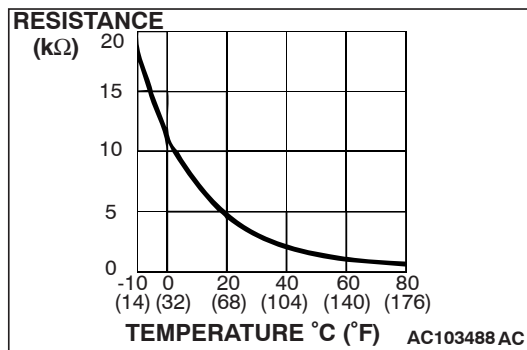
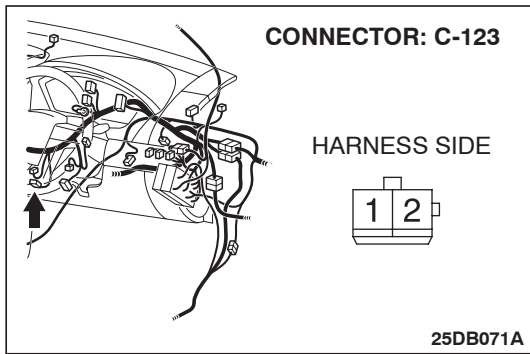
STEP 5. Check the wiring harness between A/C-ECU connector C-15 (terminals 20), C-16 (terminals 22) and interior temperature sensor connector C-123 (terminals 1 and 2).

Q: Are the wiring harnesses between A/C-ECU connector C-15 (terminals 20), C-16 (terminals 22) and interior temperature sensor connector C-123 (terminals 1 and 2) in good condition?

YES : Go to Step 6.

NO : Repair the wiring harness. Then go to Step 7.





STEP 6. Check the interior temperature sensor.

(1) Disconnect interior temperature sensor connector C-123.

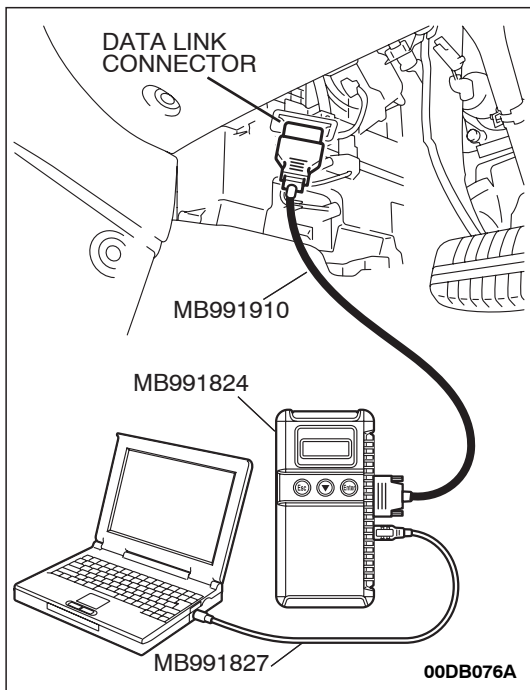
(2) When the resistance between the sensor terminals is measured under two or more temperature conditions, the resistance should approximately satisfy the illustrated values.

NOTE: The temperature conditions when checking should not exceed the range shown in the diagram.

Q: Is the interior temperature sensor in good condition?

YES : Replace the A/C-ECU. Then go to Step 7.

NO : Replace the interior temperature sensor. Then go to Step 7.



STEP 7. Recheck for diagnostic trouble code.

Check again if the DTC is set.

- (1) Connect diagnostic tool to the data link connector
- (2) Turn the ignition switch to the "ON" position.
- (3) Check if the DTC is set.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result satisfactory?

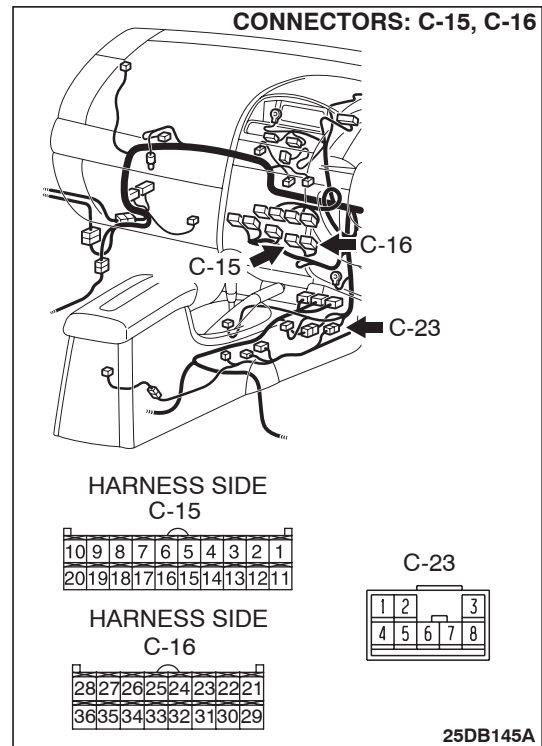
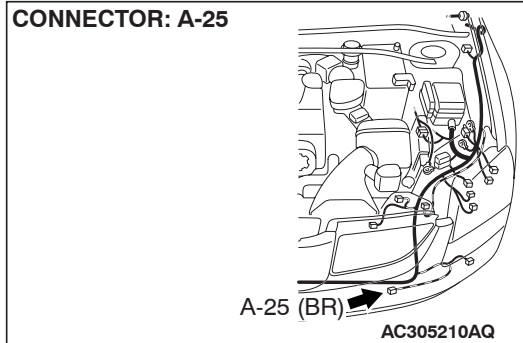
YES : The procedure is complete.

NO : Return to Step 1.

DTC B1011, B1012: Ambient Air Temperature Sensor System

CAUTION

If DTC B1011 or B1012 has been set, multi-display related DTC U1130 is also set. After B1011 or B1012 has been diagnosed, don't forget to erase DTC U1130.



DTC SET CONDITION

- DTC B1011 is set if there is a short circuit in the ambient air temperature sensor input circuit.
- DTC B1012 is set if there is a defective connector connection, or if there is an open circuit in the harness.

TECHNICAL DESCRIPTION (COMMENT)

Current trouble

- The A/C-ECU, the ambient air temperature sensor, or connector(s) or wiring between the two may be defective.

Past trouble

- If DTC B1011 or B1012 is stored as a past trouble, carry out diagnosis with particular emphasis on wiring and connector(s) between the A/C-ECU and the ambient air temperature sensor. If the connectors and wiring are normal, and obviously the ECU is the cause of the trouble, replace the ECU. If in doubt, do not replace the ECU.

TROUBLESHOOTING HINT

- Malfunction of connector.
- Malfunction of the harness.
- Malfunction of the ambient air temperature sensor.
- Malfunction of the A/C-ECU.
- Refer to component locations GROUP-70
- Refer to configuration diagrams GROUP-80
- Refer to circuit diagrams GROUP-90

DIAGNOSIS

Required Special Tool:

- : Diagnostic Tool (MUT-III Sub Assembly)
 - MB991824: Vehicle Communication Interface (V.C.I.)
 - MB991827: MUT-III USB Cable
 - MB991910: MUT-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Using diagnostic tool , diagnose the CAN bus line.

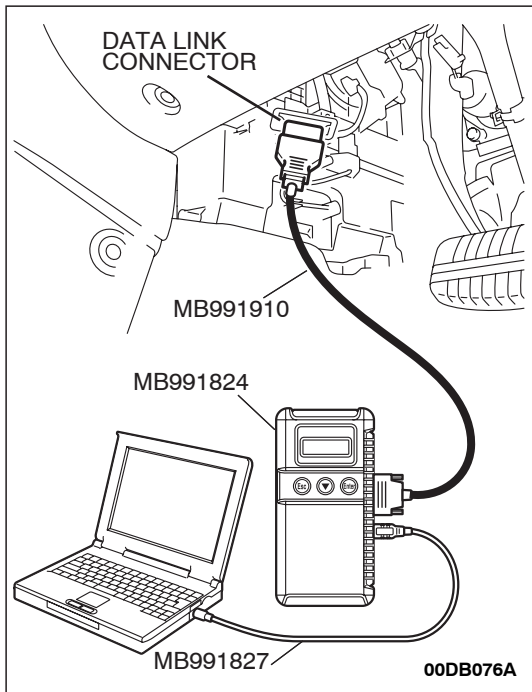
Use diagnostic tool to diagnose the CAN bus lines.

- (1) Connect diagnostic tool to the data link connector.
- (2) Turn the ignition switch to "ON" position.
- (3) Diagnose the CAN bus line.

Q: Is the check result satisfactory?

YES : Go to Step 2.

NO : Repair the CAN bus lines. Repair the CAN bus lines (Refer to GROUP 54C, Diagnosis-Can Bus Diagnostic Chart [P.54C-405](#)). Then go to Step 8.



STEP 2. Recheck for diagnostic trouble code.

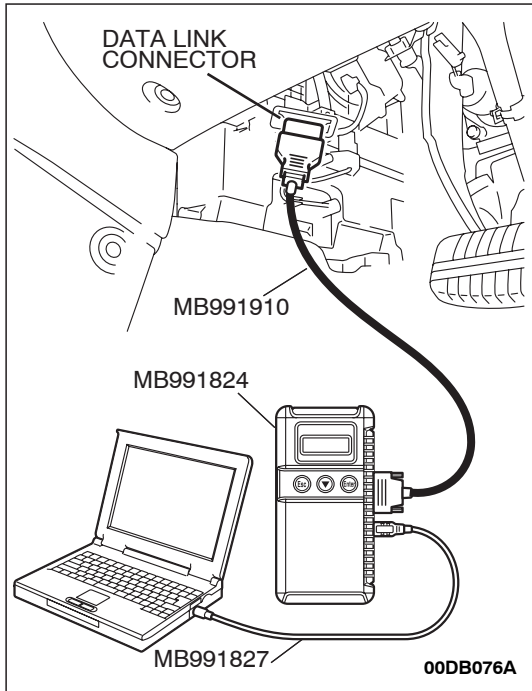
Recheck if the DTC is set.

- (1) Erase the DTC.
- (2) Turn the ignition switch to "ON" position.
- (3) Check if the DTC is set.

Q: Is the check result satisfactory?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions [P.00-14](#).

NO : Go to Step 3.



STEP 3. Using diagnostic tool , check data list item 58: Outside air temperature sensor.

⚠ CAUTION

To prevent damage to diagnostic tool , always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting diagnostic tool .

- (1) Connect diagnostic tool to the data link connector.
- (2) Start the engine.
- (3) Set diagnostic tool to the data reading mode for item 58: Outside air temperature sensor.
 - Check that the ambient temperature matches the displayed value on the diagnostic tool.

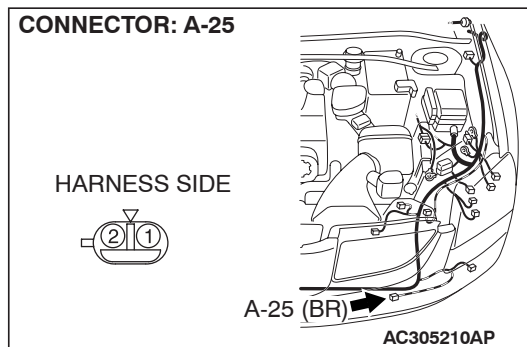
NOTE: When this DTC is set and the system is fail-safe status, the value of service data displays 20°C.

- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor within the specified range?

YES : Replace the A/C-ECU. Then go to Step 8.

NO : Go to Step 4.



STEP 4. Check ambient air temperature sensor connector A-25 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

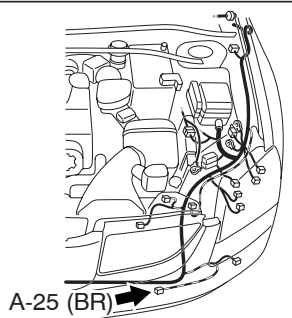
Q: Is ambient air temperature sensor connector A-25 in good condition?

YES : Go to Step 5.

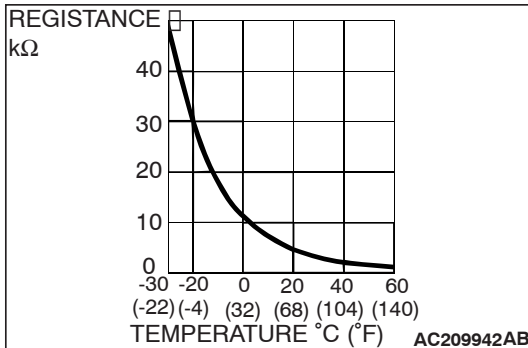
NO : Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 8.

CONNECTOR: A-25

HARNESS SIDE



AC305210AP



STEP 5. Check the ambient air temperature sensor.

(1) Disconnect ambient air temperature sensor connector A-25.

(2) Measure the resistance between the sensor terminals under at least two temperatures. The resistance values should meet the values shown.

NOTE: The temperature should be within the shown range.

Q: Is the ambient air temperature sensor in good condition?

YES : Go to Step 6.

NO : Replace the ambient air temperature sensor. Then go to Step 8.

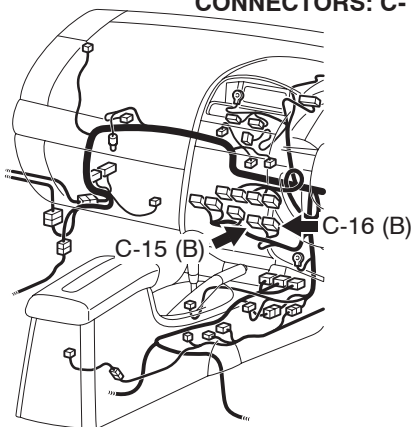
STEP 6. Check A/C-ECU connector C-15 and C-16 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are A/C-ECU connectors C-15 and C-16 in good condition?

YES : Go to Step 7.

NO : Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 8.

CONNECTORS: C-15, C-16



HARNESS SIDE
C-15

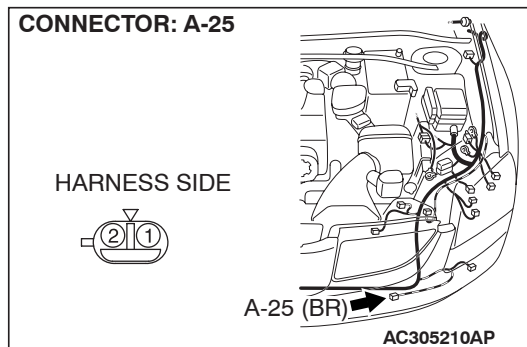
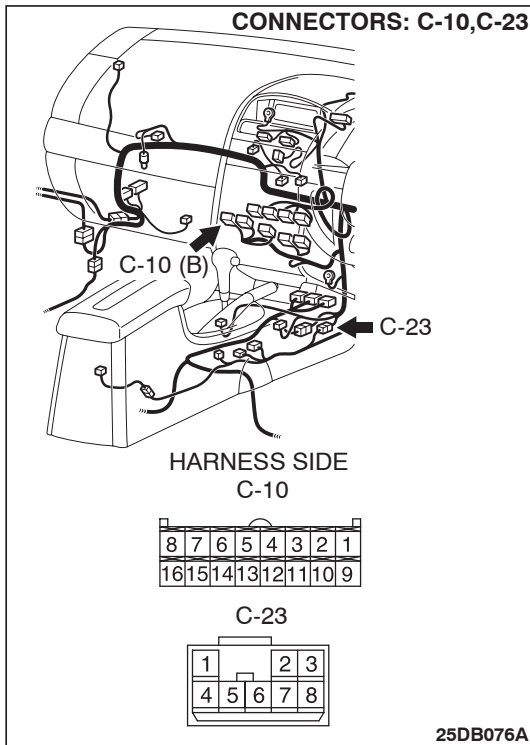
10	9	8	7	6	5	4	3	2	1
20	19	18	17	16	15	14	13	12	11

HARNESS SIDE
C-16

28	27	26	25	24	23	22	21
36	35	34	33	32	31	30	29

25DB070A

STEP 7. Check the wiring harness between A/C-ECU connector C-15 (terminals 20), C-16 (terminal 23) and ambient air temperature sensor connector A-25 (terminals 1 and 2).

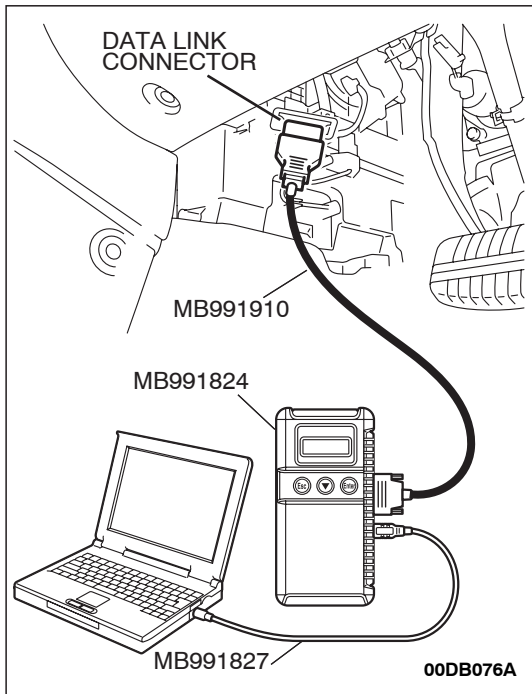


NOTE: Also check intermediate connector C-23 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-23 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection [P.00E-2](#).

Q: Is the wiring harness between A/C-ECU connector C-15 (terminals 20), C-16 (terminal 23) and ambient air temperature sensor connector A-25 (terminals 1 and 2) in good condition?

YES : Replace the A/C-ECU. Then go to Step 8.

NO : Repair the wiring harness. Then go to Step 8.



STEP 8. Recheck for diagnostic trouble code.

Check again if the DTC is set.

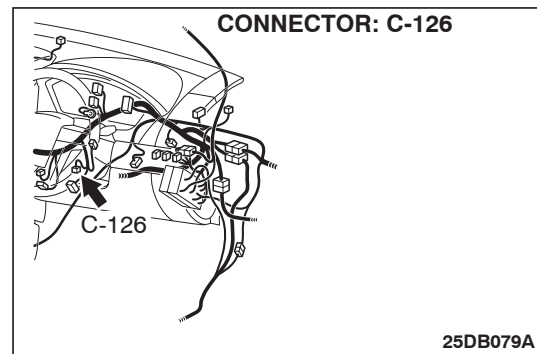
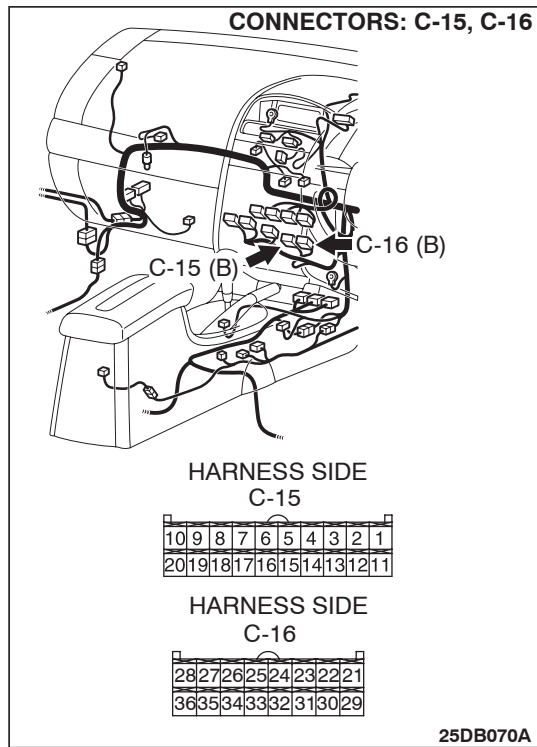
- (1) Connect diagnostic tool to the data link connector
- (2) Turn the ignition switch to the "ON" position.
- (3) Check if the DTC is set.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result satisfactory?

YES : The procedure is complete.

NO : Return to Step 1.

DTC B1021, B1022: Air Thermo Sensor System



DTC SET CONDITION

- DTC B1021 is set if there is a short circuit in the air thermo sensor input circuit.
- DTC B1022 is set if there is a defective connector connection, or if there is an open circuit in the harness.

TECHNICAL DESCRIPTION (COMMENT)

Current trouble

- The A/C-ECU, the air thermo sensor, or connector(s) or wiring between the two may be defective.

Past trouble

- If DTC B1021 or B1022 is stored as a past trouble, carry out diagnosis with particular emphasis on wiring and connector(s) between the A/C-ECU and the air thermo sensor. If the connectors and wiring are normal, and obviously the ECU is the cause of the trouble, replace the ECU. If in doubt, do not replace the ECU.

TROUBLESHOOTING HINT

- Malfunction of connector.
- Malfunction of the harness.
- Malfunction of the air thermo sensor.
- Malfunction of the A/C-ECU.
- Refer to component locations GROUP-70
- Refer to configuration diagrams GROUP-80
- Refer to circuit diagrams GROUP-90

DIAGNOSIS

Required Special Tool:

- : Diagnostic Tool (MUT-III Sub Assembly)
 - MB991824: Vehicle Communication Interface (V.C.I.)
 - MB991827: MUT-III USB Cable
 - MB991910: MUT-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Using diagnostic tool , diagnose the CAN bus line.

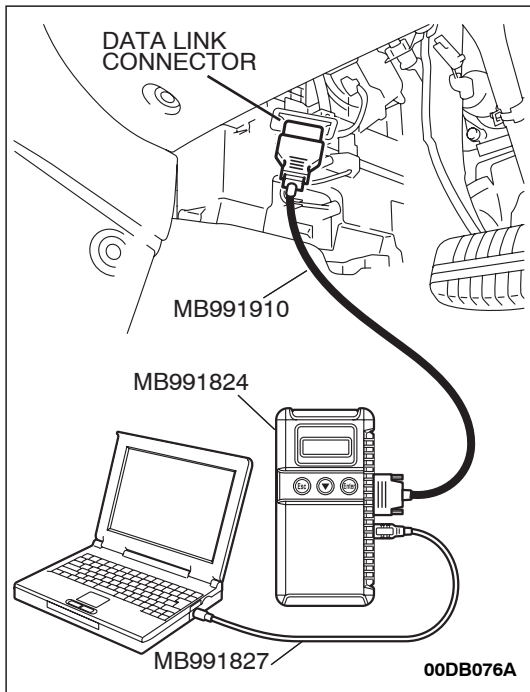
Use diagnostic tool to diagnose the CAN bus lines.

- (1) Connect diagnostic tool to the data link connector.
- (2) Turn the ignition switch to "ON" position.
- (3) Diagnose the CAN bus line.

Q: Is the check result satisfactory?

YES : Go to Step 2.

NO : Repair the CAN bus lines. Repair the CAN bus lines (Refer to GROUP 54C, Diagnosis-Can Bus Diagnostic Chart [P.54C-405](#)). Then go to Step 7.



STEP 2. Recheck for diagnostic trouble code.

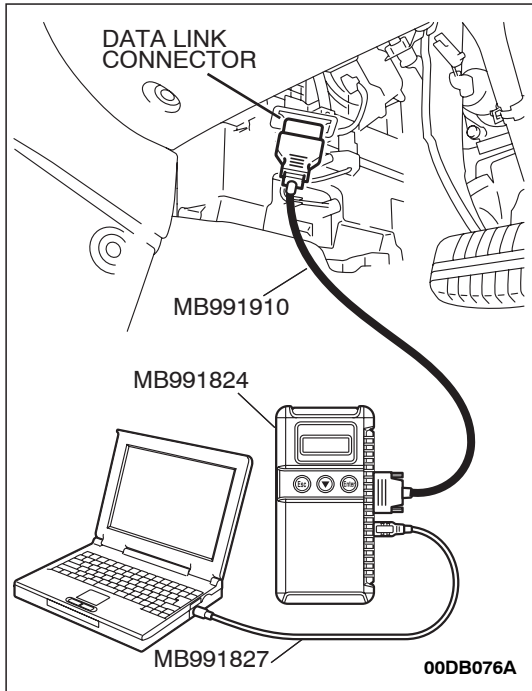
Recheck if the DTC is set.

- (1) Erase the DTC.
- (2) Turn the ignition switch to "ON" position.
- (3) Check if the DTC is set.

Q: Is the check result satisfactory?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions [P.00-14](#).

NO : Go to Step 3.



STEP 3. Using diagnostic tool , check data list item 20: Air thermo sensor.

⚠ CAUTION

To prevent damage to diagnostic tool , always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting diagnostic tool .

- (1) Connect diagnostic tool to the data link connector.
- (2) Ignition switch: ON
- (3) Set diagnostic tool to the data reading mode for item 20: Air thermo sensor.

- Check that the passenger room temperature matches the displayed value on the diagnostic tool while the engine is cold.

NOTE: When this DTC is set and the system is fail-safe status, the value of service data displays -6°C .

- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor within the specified range?

YES : Replace the A/C-ECU. Then go to Step 7.

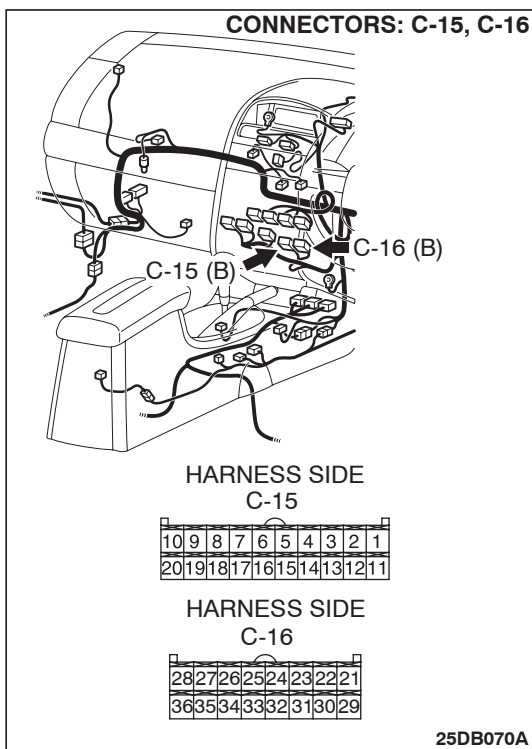
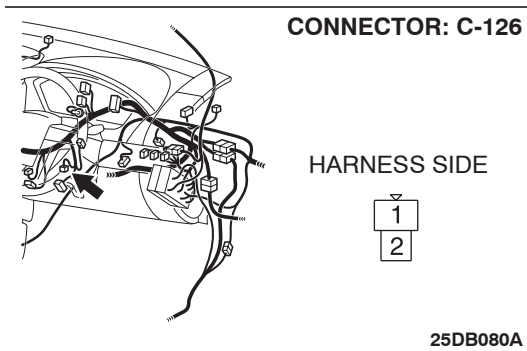
NO : Go to Step 4.

STEP 4. Check A/C-ECU connector C-15, C-16 and air thermo sensor connector C-126 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are A/C-ECU connector C-15, C-16 and air thermo sensor connector C-126 in good condition?

YES : Go to Step 5.

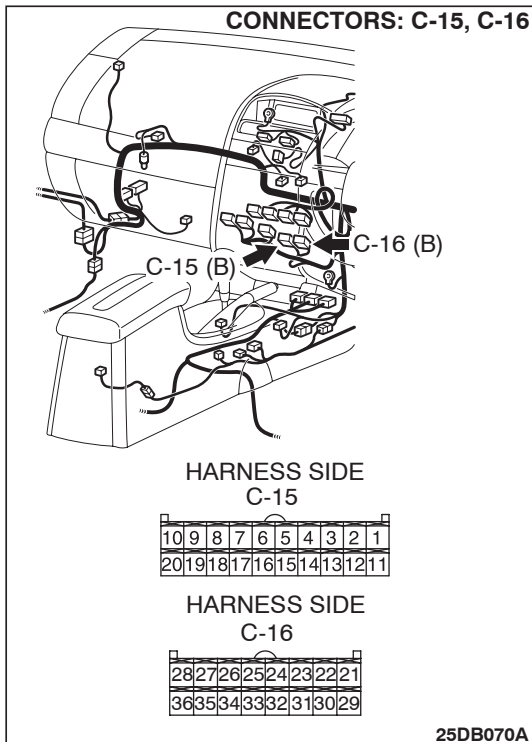
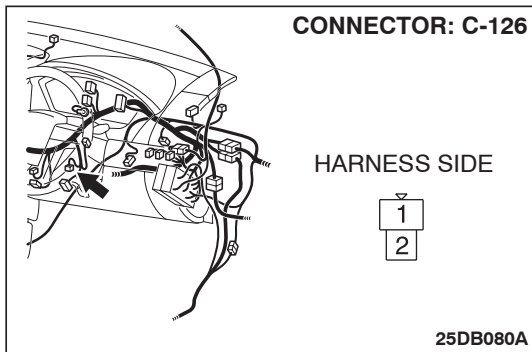
NO : Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 7.

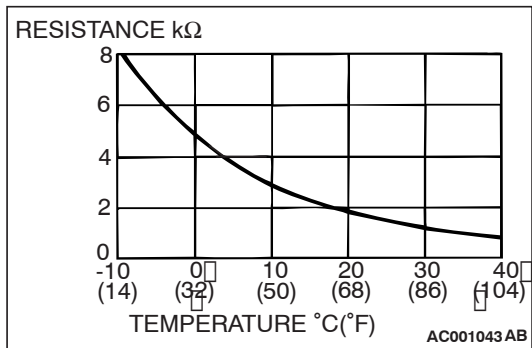
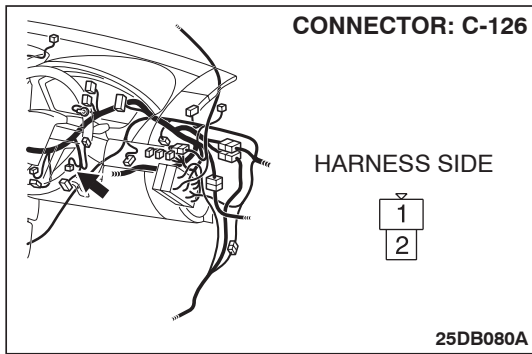


STEP 5. Check the wiring harness between A/C-ECU connector C-15 (terminal 20), C-16 (terminal 24) and air thermo sensor connector C-126 (terminals 2 and 1).
Q: Is the wiring harness between A/C-ECU connector C-10 (terminal 10 and 13) and air thermo sensor connector C-126 (terminals 2 and 1) in good condition?

YES : Go to Step 6.

NO : Repair the wiring harness. Then go to Step 7.





STEP 6. Check the air thermo sensor.

(1) Disconnect the air thermo sensor connector C-126.

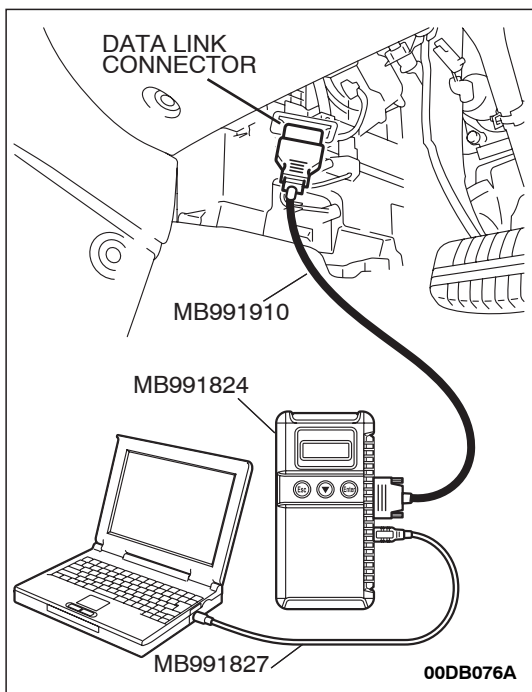
(2) Measure the resistance between connector terminals 1 and 2 under at least two different temperatures. The resistance values should generally match those in the graph.

NOTE: The temperature at the check should not exceed the range in the graph.

Q: Is the air thermo sensor in good condition?

YES : Replace the A/C-ECU. Then go to Step 7.

NO : Replace the air thermo sensor. Then go to Step 7.



STEP 7. Recheck for diagnostic trouble code.

Check again if the DTC is set.

(1) Connect diagnostic tool to the data link connector

(2) Turn the ignition switch to the "ON" position.

(3) Check if the DTC is set.

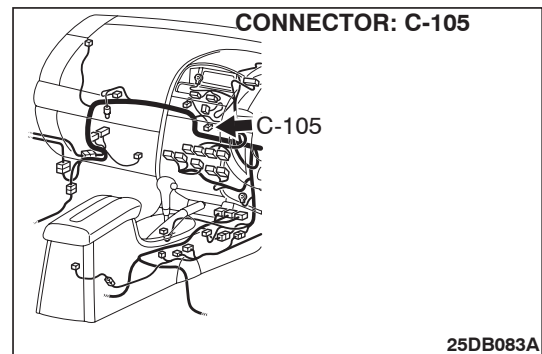
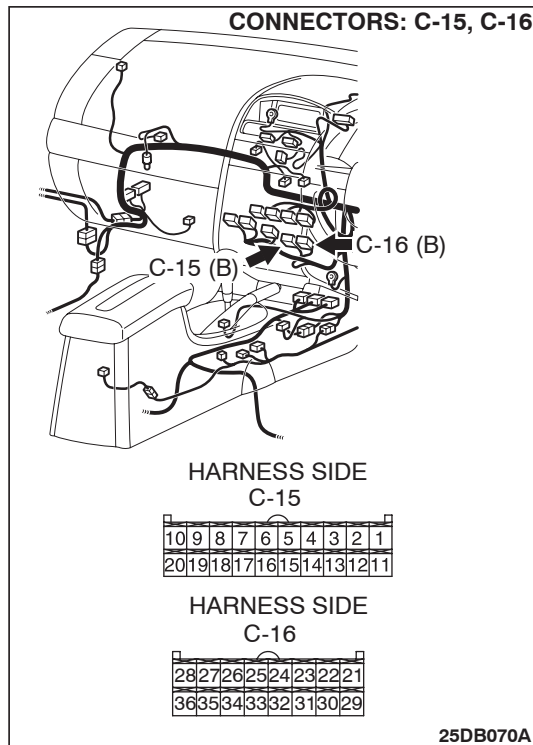
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result satisfactory?

YES : The procedure is complete.

NO : Return to Step 1.

DTC B1041, B1042: Air Mixing Damper Control Motor and Potentiometer (Potentiometer system)



DTC SET CONDITION

- DTC B1041 or B1042 is set if there is an open or short circuit in the potentiometer input circuit, or if there is an open circuit in the power circuit or earth circuit.

TECHNICAL DESCRIPTION (COMMENT)

Current trouble

- The A/C-ECU, the air mixing damper control motor and potentiometer, or connector(s) or wiring between the two may be defective.

Past trouble

- If DTC B1041 or B1042 is stored as a past trouble, carry out diagnosis with particular emphasis on wiring and connector(s) between the A/C-ECU and the air mixing damper control motor and potentiometer. If the connectors and wiring are normal, and obviously the ECU is the cause of the trouble, replace the ECU. If in doubt, do not replace the ECU.

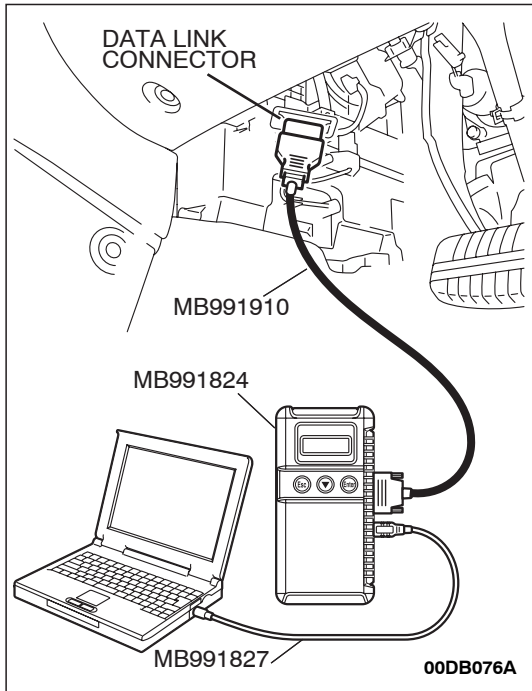
TROUBLESHOOTING HINT

- Malfunction of connector.
- Malfunction of the harness.
- Malfunction of the air mixing damper control motor and potentiometer.
- Malfunction of the A/C-ECU.
- Refer to component locations GROUP-70
- Refer to configuration diagrams GROUP-80
- Refer to circuit diagrams GROUP-90

DIAGNOSIS

Required Special Tool:

- : Diagnostic Tool (MUT-III Sub Assembly)
 - MB991824: Vehicle Communication Interface (V.C.I.)
 - MB991827: MUT-III USB Cable
 - MB991910: MUT-III Main Harness A (Vehicles with CAN communication system)



STEP 1. Using diagnostic tool , diagnose the CAN bus line.

Use diagnostic tool to diagnose the CAN bus lines.

- (1) Connect diagnostic tool to the data link connector.
- (2) Turn the ignition switch to "ON" position.
- (3) Diagnose the CAN bus line.

Q: Is the check result satisfactory?

YES : Go to Step 2.

NO : Repair the CAN bus lines. (Refer to GROUP 54C, Diagnosis-Can Bus Diagnostic Chart [P.54C-405](#)). Then go to Step 7.

STEP 2. Recheck for diagnostic trouble code.

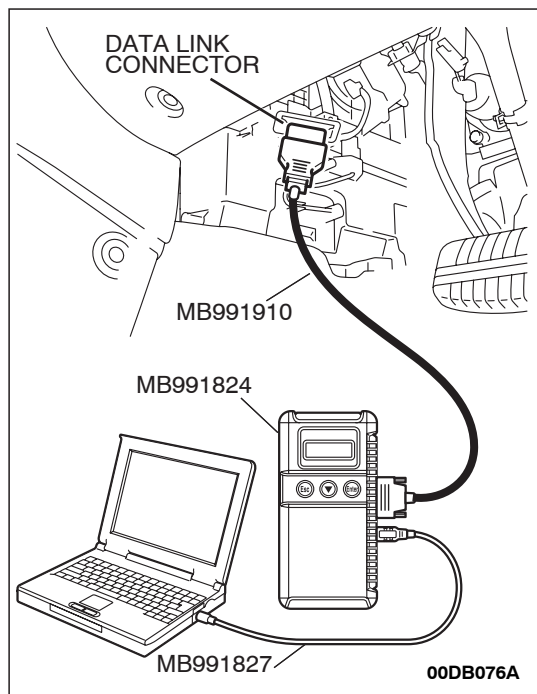
Recheck if the DTC is set.

- (1) Erase the DTC.
- (2) Turn the ignition switch to "ON" position.
- (3) Check if the DTC is set.

Q: Is the check result satisfactory?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions [P.00-14](#).

NO : Go to Step 3.



STEP 3. Using diagnostic tool , check data list item 63: Air mix potentiometer.

⚠ CAUTION

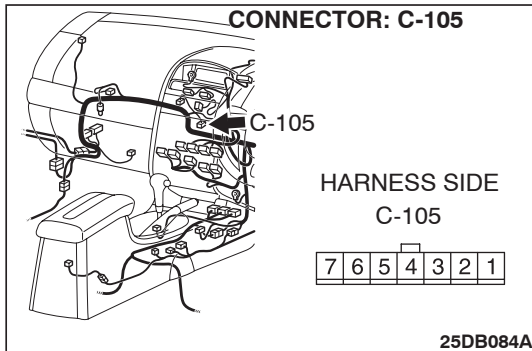
To prevent damage to diagnostic tool , always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting diagnostic tool .

- (1) Connect diagnostic tool to the data link connector.
- (2) Start the engine.
- (3) Set diagnostic tool to the data reading mode for item 63: Air mix potentiometer.
 - Check that the set position of the heater control matches the displayed position on the diagnostic tool.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor within the specified range?

YES : Replace the A/C-ECU. Then go to Step 7.

NO : Go to Step 4.

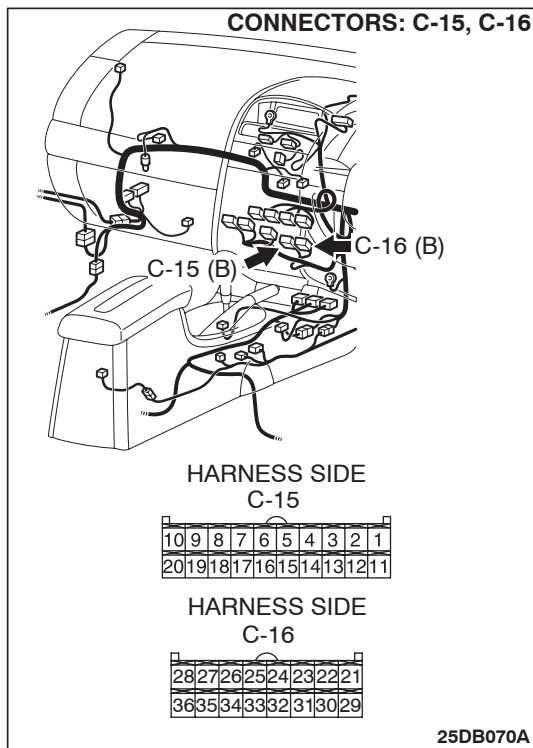


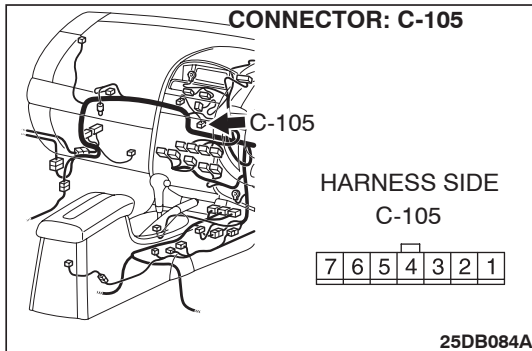
STEP 4. Check A/C-ECU connector C-15, C-16 and air mixing damper control motor and potentiometer connector C-105 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are A/C-ECU connector C-15, C-16 and air mixing damper control motor and potentiometer connector C-105 in good condition?

YES : Go to Step 5.

NO : Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 7.



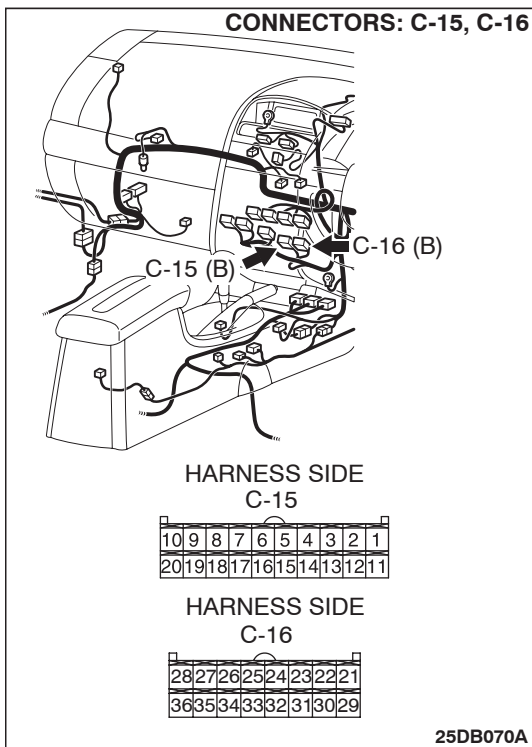


STEP 5. Check the wiring harness between A/C-ECU connectors C-15 (terminals 16 and 20), C-16 (terminal 29) and air mixing damper control motor and potentiometer connector C-105 (terminals 5, 7 and 3).

Q: Are the wiring harness between A/C-ECU connector C-15 (terminals 16 and 20), C-16 (terminal 29) and air mixing damper control motor and potentiometer connector C-105 (terminals 5, 7 and 3) in good condition?

YES : Go to Step 6.

NO : Repair the wiring harness. Then go to Step 7.

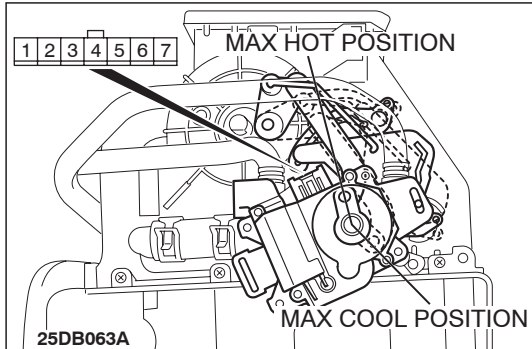


STEP 6. Check the air mixing damper control motor and potentiometer.

⚠ CAUTION

Do not apply battery voltage when the damper is in the MAX COOL or MAX HOT position.

(1) Operate the air mixing damper control motor as described in the table below.



LEVER POSITION	BATTERY CONNECTION	LEVER OPERATION
At the MAX COOL position	<ul style="list-style-type: none"> Connect terminal 2 to the positive battery terminal Connect terminal 1 to the negative battery terminal 	The lever moves from the MAX COOL position to the MAX HOT position
At the MAX HOT position	<ul style="list-style-type: none"> Connect terminal 1 to the positive battery terminal Connect terminal 2 to the negative battery terminal 	The lever moves from the MAX HOT position to the MAX COOL position

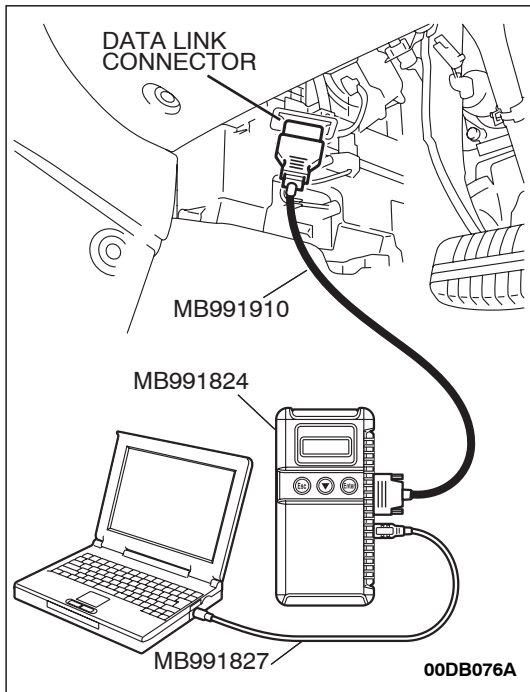
(2) Measure the resistances between connector terminals 3 and 5, and between 3 and 7, while the air mixing damper control motor is running. The resistances should change gradually within the standard value.

Standard value: 1.7 (MAX HOT) – 5.0 (MAX COOL) kΩ

Q: Are the air mixing damper control motor and potentiometer in good condition?

YES : Replace the A/C-ECU. Then go to Step 7.

NO : Replace the air mixing damper control motor and potentiometer. Then go to Step 7.



STEP 7. Recheck for diagnostic trouble code.

Check again if the DTC is set.

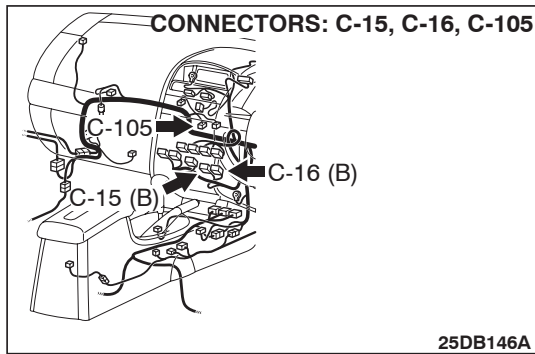
- (1) Connect diagnostic tool to the data link connector
- (2) Turn the ignition switch to the "ON" position.
- (3) Check if the DTC is set.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result satisfactory?

YES : The procedure is complete.

NO : Return to Step 1.

DTC B1045: Air mixing damper control motor and potentiometer (activating system failure)



DTC SET CONDITION

- If the air mixing damper control motor does not work normally, DTC No.B1045 will be set.

TECHNICAL DESCRIPTION (COMMENT)

Current trouble

- The A/C-ECU, the air mixing damper control motor and potentiometer, or connector(s) or wiring between the two may be defective.

Past trouble

- If DTC B1045 is stored as a past trouble, carry out diagnosis with particular emphasis on wiring and connector(s) between the A/C-ECU and the air mixing damper control motor and potentiometer. If the connectors and wiring are normal, and obviously the ECU is the cause of the trouble, replace the ECU. If in doubt, do not replace the ECU.

TROUBLESHOOTING HINT

- Malfunction of connector.
- Malfunction of the harness.
- Malfunction of the air mixing damper control motor and potentiometer.
- Malfunction of the A/C-ECU.
- Refer to component locations [GROUP-70](#)
- Refer to configuration diagrams [GROUP-80](#)
- Refer to circuit diagrams [GROUP-90](#)

DIAGNOSIS

Required Special Tool:

- : Diagnostic Tool (MUT-III Sub Assembly)
 - MB991824: Vehicle Communication Interface (V.C.I.)
 - MB991827: MUT-III USB Cable
 - MB991910: MUT-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Using diagnostic tool , diagnose the CAN bus line.

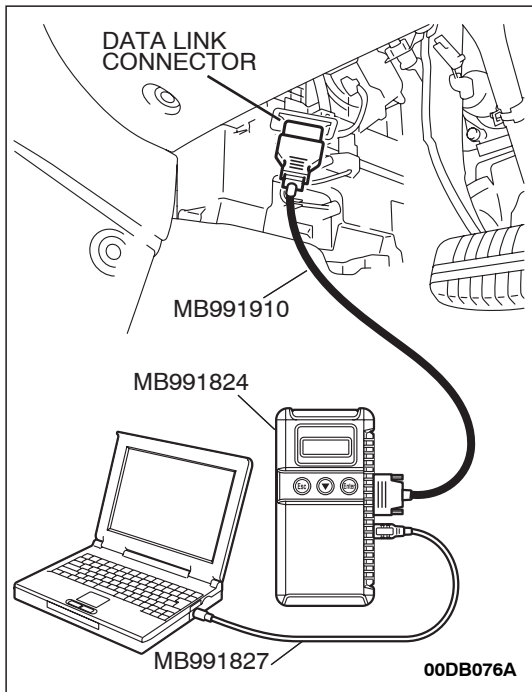
Use diagnostic tool to diagnose the CAN bus lines.

- (1) Connect diagnostic tool to the data link connector.
- (2) Turn the ignition switch to "ON" position.
- (3) Diagnose the CAN bus line.

Q: Is the check result satisfactory?

YES : Go to Step 2.

NO : Repair the CAN bus lines. (Refer to GROUP 54C, Diagnosis-Can Bus Diagnostic Chart [P.54C-405](#)).
Then go to Step 7.



STEP 2. Recheck for diagnostic trouble code.

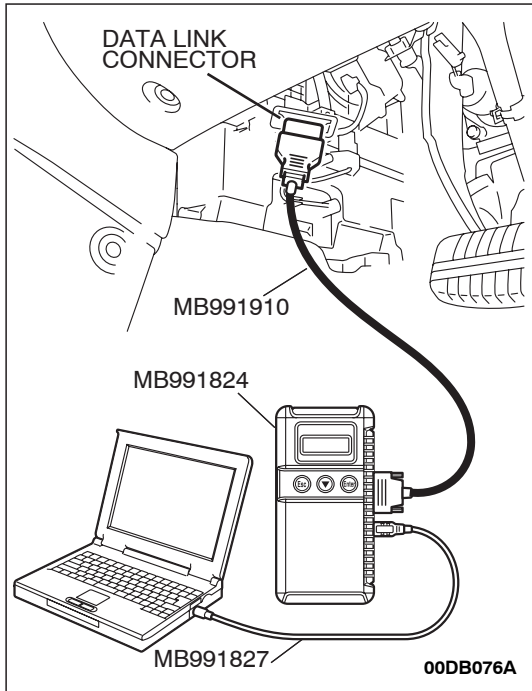
Recheck if the DTC is set.

- (1) Erase the DTC.
- (2) Turn the ignition switch to "ON" position.
- (3) Check if the DTC is set.

Q: Is the check result satisfactory?

YES : It can be assumed that this malfunction is intermittent.
Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions [P.00-14](#).

NO : Go to Step 3.



STEP 3. Using diagnostic tool , check actuator test item 42, 43: air mix damper motor.

⚠ CAUTION

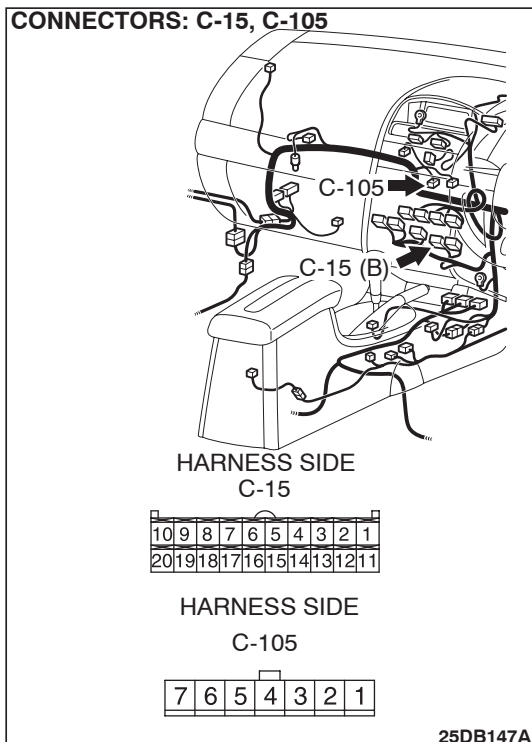
To prevent damage to diagnostic tool , always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting diagnostic tool .

- (1) Connect diagnostic tool to the data link connector.
- (2) Start the engine.
- (3) Use diagnostic tool to run the actuator test.
 - Item 42: air mix damper motor (0% MAX COOL position)
 - Item 43: air mix damper motor (100% MAX HOT position)
 - Check that the air mixing damper control motor operates.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Does the motor operate normally?

YES : Replace the A/C-ECU. Then go to Step 7.

NO : Go to Step 4.



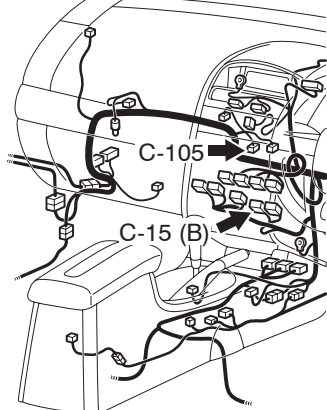
STEP 4. Check A/C-ECU connectors C-15 and air mixing damper control motor and potentiometer connector C-105 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are A/C-ECU connectors C-15 and air mixing damper control motor and potentiometer connector C-105 in good condition?

YES : Go to Step 5.

NO : Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 7.

CONNECTORS: C-15, C-105



HARNESS SIDE
 C-15

10	9	8	7	6	5	4	3	2	1
20	19	18	17	16	15	14	13	12	11

HARNESS SIDE
 C-105

7	6	5	4	3	2	1
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STEP 5. Check the wiring harness between A/C-ECU connectors C-15 (terminal 1 and 2) and air mixing damper control motor and potentiometer connector C-105 (terminals 1 and 2).

Q: Are the wiring harness between A/C-ECU connectors C-15 (terminals 1 and 2) and air mixing damper control motor and potentiometer connector C-105 (terminals 1 and 2) in good condition?

YES : Go to Step 6.

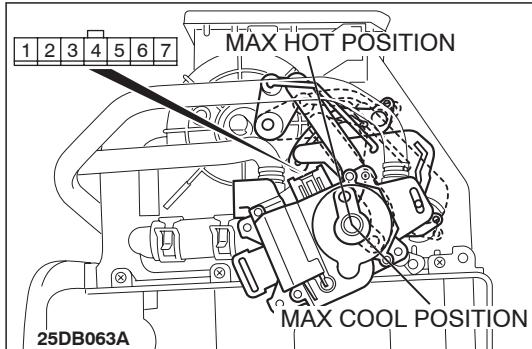
NO : Repair the wiring harness. Then go to Step 7.

STEP 6. Check the air mixing damper control motor and potentiometer.

⚠ CAUTION

Do not apply battery voltage when the damper is in the MAX COOL or MAX HOT position.

Check the air mix damper control motor by the following procedures.

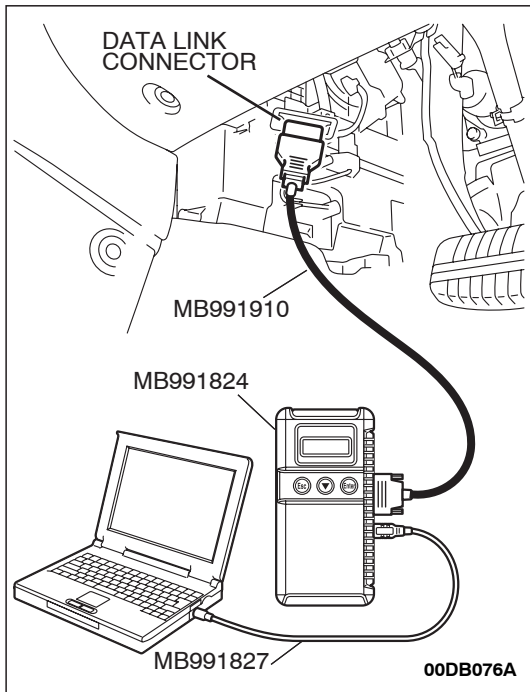


LEVER POSITION	BATTERY CONNECTION	LEVER OPERATION
At the MAX COOL position	<ul style="list-style-type: none"> Connect terminal 2 to the positive battery terminal Connect terminal 1 to the negative battery terminal 	The lever moves from the MAX COOL position to the MAX HOT position
At the MAX HOT position	<ul style="list-style-type: none"> Connect terminal 1 to the positive battery terminal Connect terminal 2 to the negative battery terminal 	The lever moves from the MAX HOT position to the MAX COOL position

Q: Are the air mixing damper control motor and potentiometer in good condition?

YES : Replace the A/C-ECU. Then go to Step 7.

NO : Replace the air mixing damper control motor and potentiometer. Then go to Step 7.



STEP 7. Recheck for diagnostic trouble code.

Check again if the DTC is set.

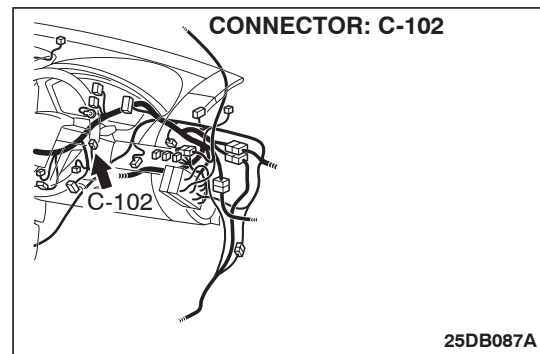
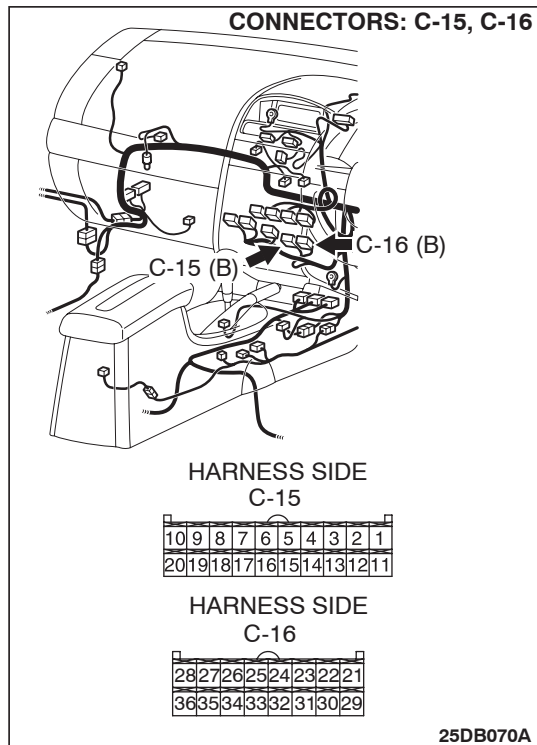
- (1) Connect diagnostic tool to the data link connector
- (2) Turn the ignition switch to the "ON" position.
- (3) Check if the DTC is set.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result satisfactory?

YES : The procedure is complete.

NO : Return to Step 1.

DTC B1061, B1062: Mode Selection Damper Control Motor and Potentiometer



DTC SET CONDITION

- DTC B1061 or B1062 is set if there is an open or short circuit in the potentiometer input circuit, or if there is an open in the power circuit or ground circuit.

TECHNICAL DESCRIPTION (COMMENT)

Current trouble

- The A/C-ECU, the mode selection damper control motor and potentiometer, or connector(s) or wiring between the two may be defective.

Past trouble

- If DTC B1061 or B1062 is stored as a past trouble, carry out diagnosis with particular emphasis on wiring and connector(s) between the A/C-ECU and the mode selection damper control motor and potentiometer. If the connectors and wiring are normal, and obviously the ECU is the cause of the trouble, replace the ECU. If in doubt, do not replace the ECU.

TROUBLESHOOTING HINT

- Malfunction of connector.
- Malfunction of the harness.
- Malfunction of the mode selection damper control motor and potentiometer.
- Malfunction of the A/C-ECU.
- Refer to component locations GROUP-70
- Refer to configuration diagrams GROUP-80
- Refer to circuit diagrams GROUP-90

DIAGNOSIS

Required Special Tool:

- : Diagnostic Tool (MUT-III Sub Assembly)
 - MB991824: Vehicle Communication Interface (V.C.I.)
 - MB991827: MUT-III USB Cable
 - MB991910: MUT-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Using diagnostic tool , diagnose the CAN bus line.

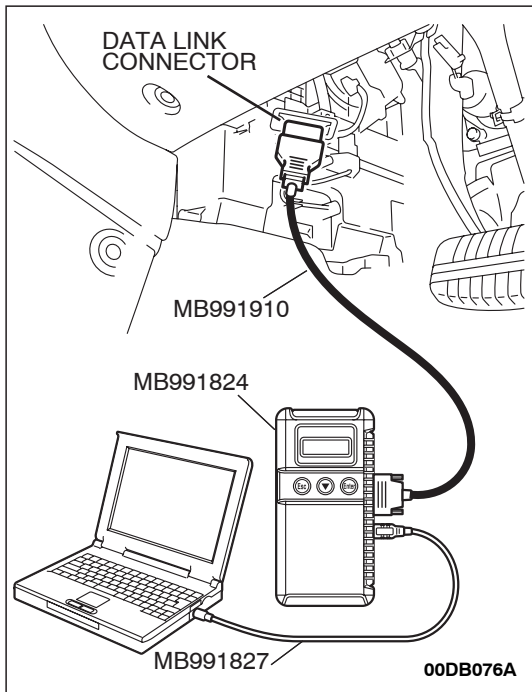
Use diagnostic tool to diagnose the CAN bus lines.

- (1) Connect diagnostic tool to the data link connector.
- (2) Turn the ignition switch to "ON" position.
- (3) Diagnose the CAN bus line.

Q: Is the check result satisfactory?

YES : Go to Step 2.

NO : Repair the CAN bus lines. (Refer to GROUP 54C, Diagnosis-Can Bus Diagnostic Chart [P.54C-405](#)). Then go to Step 7.



STEP 2. Recheck for diagnostic trouble code.

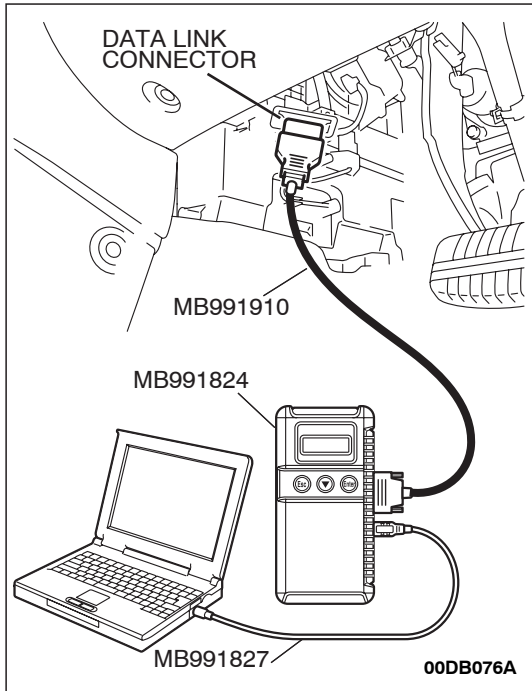
Recheck if the DTC is set.

- (1) Erase the DTC.
- (2) Turn the ignition switch to "ON" position.
- (3) Check if the DTC is set.

Q: Is the check result satisfactory?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions [P.00-14](#).

NO : Go to Step 3.



STEP 3. Using diagnostic tool , check data list item 55: Air outlet c/o potentiometer.

⚠ CAUTION

To prevent damage to diagnostic tool , always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting diagnostic tool .

- (1) Connect diagnostic tool to the data link connector.
- (2) Start the engine.
- (3) Set diagnostic tool to the data reading mode for item 55: Air outlet c/o potentiometer.
 - Check that the set position of the heater control matches the displayed position on the diagnostic tool.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor within the specified range?

YES : Replace the A/C-ECU. Then go to Step 7.

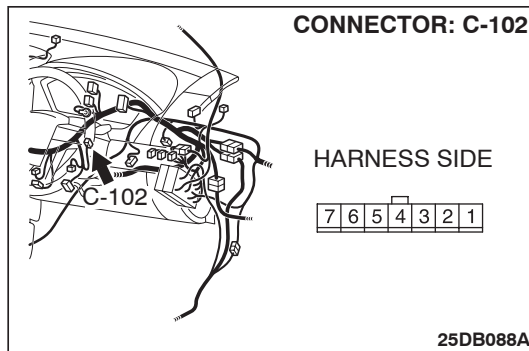
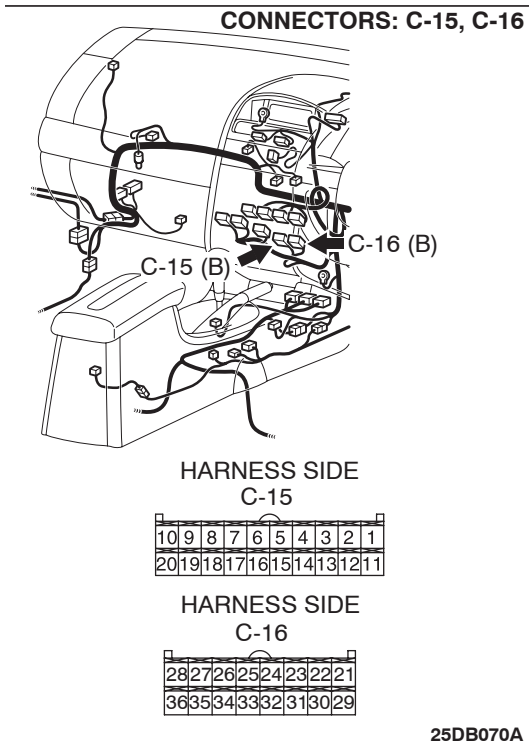
NO : Go to Step 4.

STEP 4. Check A/C-ECU connector C-15, C-16 and mode selection damper control motor and potentiometer connector C-102 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are A/C-ECU connectors C-15, C-16 and mode selection damper control motor and potentiometer connector C-102 in good condition?

YES : Go to Step 5.

NO : Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 7.

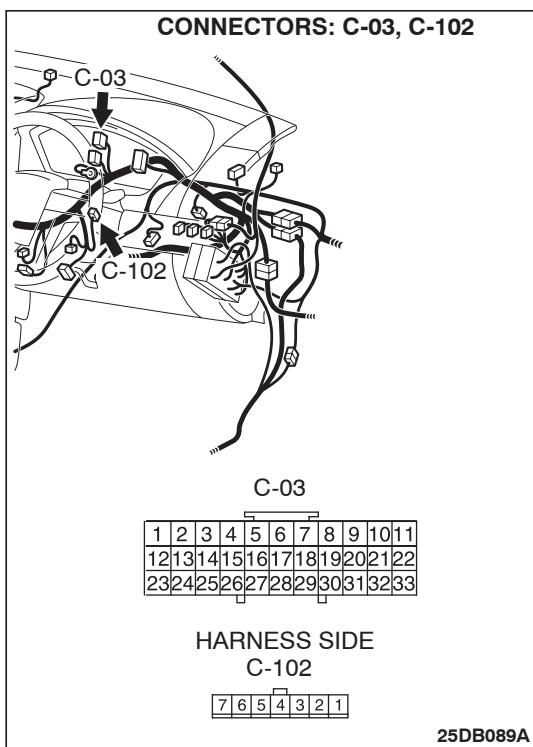
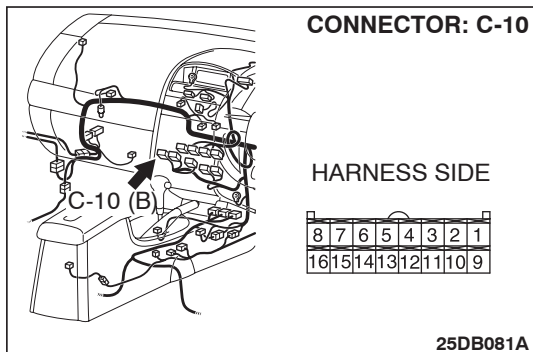


STEP 5. Check the wiring harness between A/C-ECU connectors C-15 (terminals 16 and 20), C-21 (terminal 21) and mode selection damper control motor and potentiometer connector C-102 (terminals 5, 7 and 3).

Q: Are the wiring harnesses between A/C-ECU connectors C-10 (terminals 15, 11 and 10) and mode selection damper control motor and potentiometer connector C-102 (terminals 5, 7 and 3) in good condition?

YES : Go to Step 6.

NO : Repair the wiring harness. Then go to Step 7.

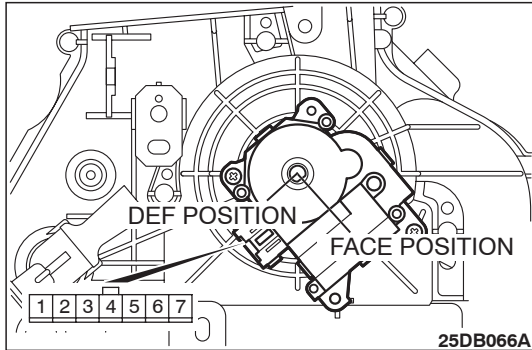


STEP 6. Check the mode selection damper control motor and potentiometer.

⚠ CAUTION

Do not apply battery voltage when the damper is in the FACE or DEF position.

(1) Operate the mode selection damper control motor as described in the table below.



LEVER POSITION	BATTERY CONNECTION	LEVER OPERATION
At the FACE position	<ul style="list-style-type: none"> Connect terminal 2 to the positive battery terminal Connect terminal 1 to the negative battery terminal 	The lever moves from the FACE position to the DEF position
At the DEF position	<ul style="list-style-type: none"> Connect terminal 1 to the positive battery terminal Connect terminal 2 to the negative battery terminal 	The lever moves from the DEF position to the FACE position

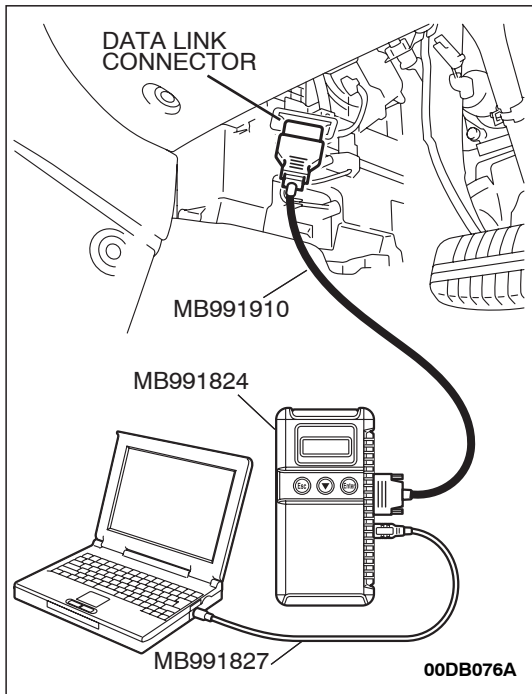
(2) Measure the resistances between connector terminals 3 and 5, and between 3 and 7, while the mode selection damper control motor is running. The resistances should change gradually within the standard value.

Standard value: 0.8 (DEF) – 4.8 (FACE) kΩ

Q: Are the mode selection damper control motor and potentiometer in good condition?

YES : Replace the A/C-ECU. Then go to Step 7.

NO : Replace the mode selection damper control motor and potentiometer. Then go to Step 7.



STEP 7. Recheck for diagnostic trouble code.

Check again if the DTC is set.

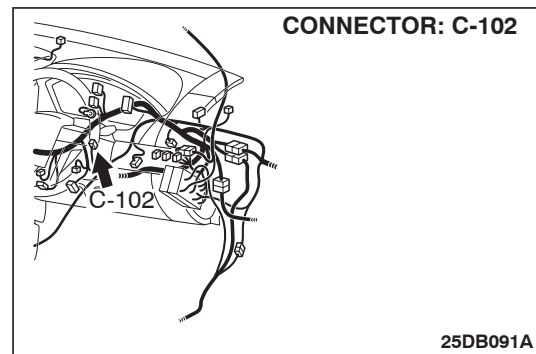
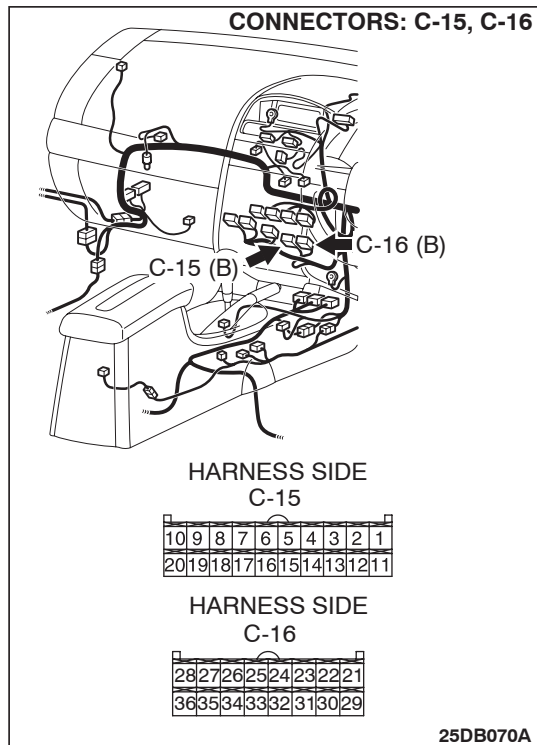
- (1) Connect diagnostic tool to the data link connector
- (2) Turn the ignition switch to the "ON" position.
- (3) Check if the DTC is set.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result satisfactory?

YES : The procedure is complete.

NO : Return to Step 1.

DTC B1065: Mode Selection Damper Control Motor and Potentiometer



DTC SET CONDITION

- If the air mixing damper control motor does not work normally, DTC B1065 will be set.

TECHNICAL DESCRIPTION (COMMENT)

Current trouble

- The A/C-ECU, the mode selection damper control motor and potentiometer, or connector(s) or wiring between them may be defective.

Past trouble

- If DTC B1065 is stored as a past trouble, carry out diagnosis with particular emphasis on wiring and connector(s) between the A/C-ECU and the mode selection damper control motor and potentiometer. If the connectors and wiring are normal, and obviously the ECU is the cause of the trouble, replace the ECU. If in doubt, do not replace the ECU.

TROUBLESHOOTING HINT

- Malfunction of connector.
- Malfunction of the harness.
- Malfunction of the mode selection damper control motor and potentiometer.
- Malfunction of the A/C-ECU.
- Refer to component locations [GROUP-70](#)
- Refer to configuration diagrams [GROUP-80](#)
- Refer to circuit diagrams [GROUP-90](#)

DIAGNOSIS

Required Special Tool:

- : Diagnostic Tool (MUT-III Sub Assembly)
 - MB991824: Vehicle Communication Interface (V.C.I.)
 - MB991827: MUT-III USB Cable
 - MB991910: MUT-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Using diagnostic tool , diagnose the CAN bus line.

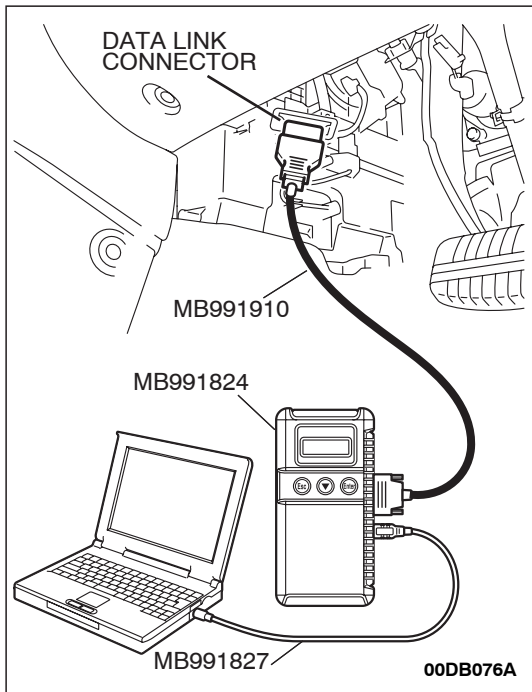
Use diagnostic tool to diagnose the CAN bus lines.

- (1) Connect diagnostic tool to the data link connector.
- (2) Turn the ignition switch to "ON" position.
- (3) Diagnose the CAN bus line.

Q: Is the check result satisfactory?

YES : Go to Step 2.

NO : Repair the CAN bus lines. (Refer to GROUP 54C, Diagnosis-Can Bus Diagnostic Chart [P.54C-405](#)).
Then go to Step 7.



STEP 2. Recheck for diagnostic trouble code.

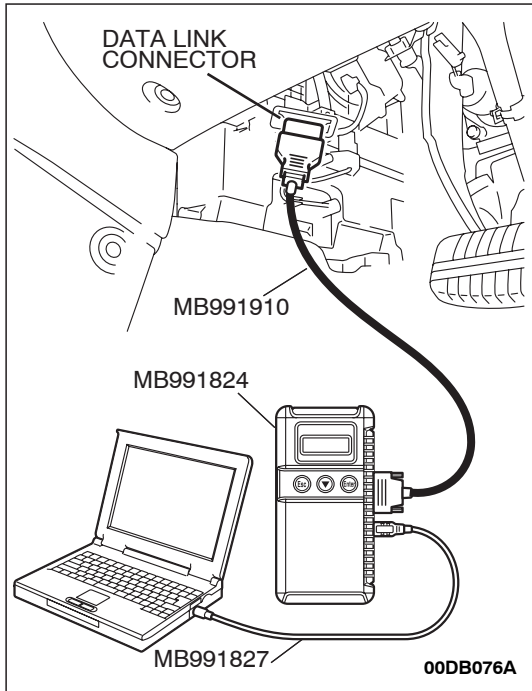
Recheck if the DTC is set.

- (1) Erase the DTC.
- (2) Turn the ignition switch to "ON" position.
- (3) Check if the DTC is set.

Q: Is the check result satisfactory?

YES : It can be assumed that this malfunction is intermittent.
Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions [P.00-14](#).

NO : Go to Step 3.



STEP 3. Using diagnostic tool , check actuator test item 67, 68, 69, 70, 71: Air outlet c/o damper.

⚠ CAUTION

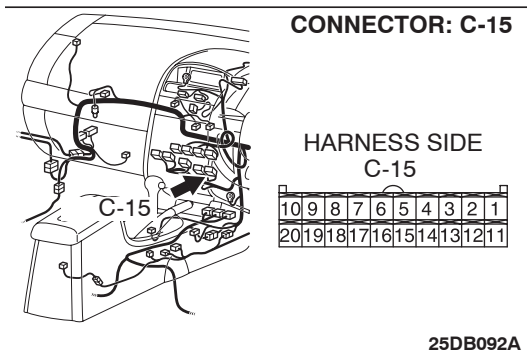
To prevent damage to diagnostic tool , always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting diagnostic tool .

- (1) Connect diagnostic tool to the data link connector.
- (2) Start the engine.
- (3) Use diagnostic tool to run the actuator test.
 - Item 67: air mix damper motor (Bi LEVEL position)
 - Item 68: air mix damper motor (DEF position)
 - Item 69: air mix damper motor (DEF/FOOT position)
 - Item 70: air mix damper motor (FACE position)
 - Item 71: air mix damper motor (FOOT position)
 - Check that the mode selection damper control motor operates.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor within the specified range?

YES : Replace the A/C-ECU. Then go to Step 7.

NO : Go to Step 4.

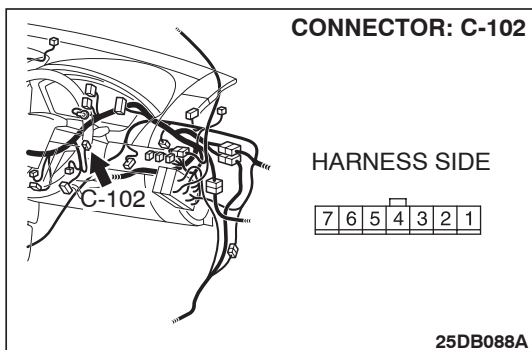


STEP 4. Check A/C-ECU connector C-15 and mode selection damper control motor and potentiometer connector C-102 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are A/C-ECU connector C-15 and mode selection damper control motor and potentiometer connector C-102 in good condition?

YES : Go to Step 5.

NO : Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 7.

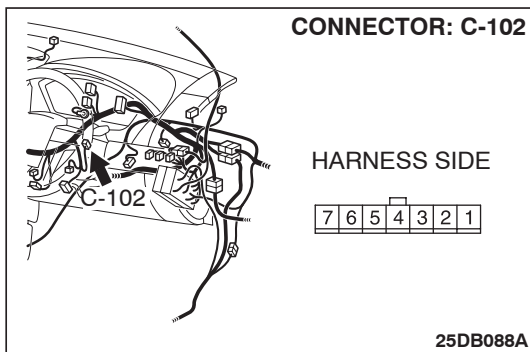
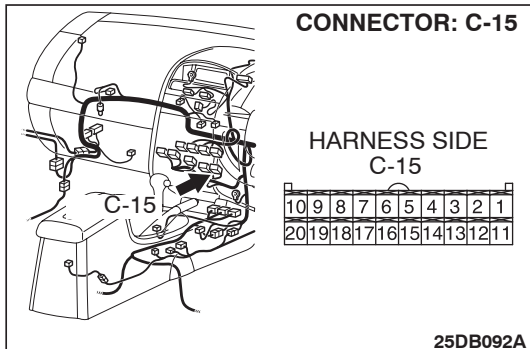


STEP 5. Check the wiring harness between A/C-ECU connector C-15 (terminals 11 and 4) and mode selection damper control motor and potentiometer connector C-102 (terminals 1 and 2).

Q: Are the wiring harnesses between A/C-ECU connector C-15 (terminals 11 and 4) and mode selection damper control motor and potentiometer connector C-102 (terminals 1 and 2) in good condition?

YES : Go to Step 6.

NO : Repair the wiring harness. Then go to Step 7.

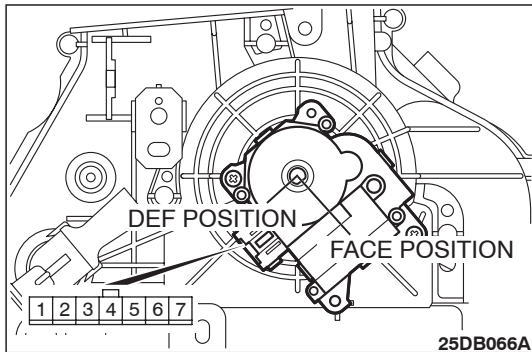


STEP 6. Check the mode selection damper control motor.

⚠ CAUTION

Do not apply battery voltage when the damper is in the FACE or DEF position.

Check the mode selection damper control motor by the following procedures.

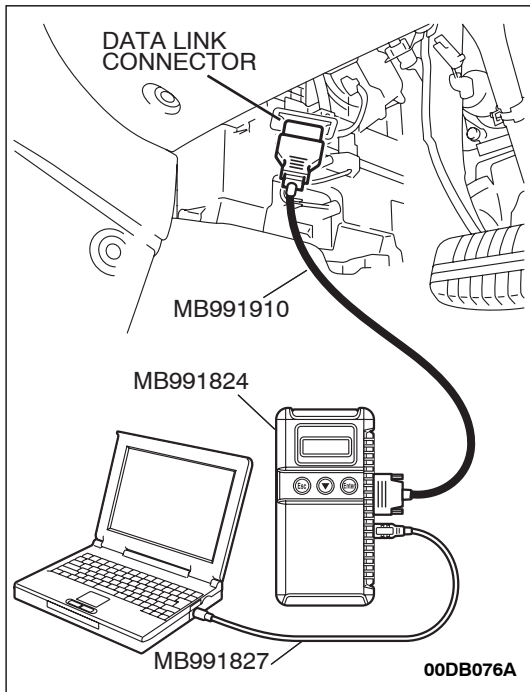


LEVER POSITION	BATTERY CONNECTION	LEVER OPERATION
At the FACE position	<ul style="list-style-type: none"> • Connect terminal 2 to the positive battery terminal • Connect terminal 1 to the negative battery terminal 	The lever moves from the FACE position to the DEF position
At the DEF position	<ul style="list-style-type: none"> • Connect terminal 1 to the positive battery terminal • Connect terminal 2 to the negative battery terminal 	The lever moves from the DEF position to the FACE position

Q: Is the mode selection damper control motor in good condition?

YES : Go to Step 7.

NO : Replace the mode selection damper control motor and potentiometer. Then go to Step 7.



STEP 7. Recheck for diagnostic trouble code.

Check again if the DTC is set.

- (1) Connect diagnostic tool to the data link connector
- (2) Turn the ignition switch to the "ON" position.
- (3) Check if the DTC is set.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result satisfactory?

YES : The procedure is complete.

NO : Return to Step 1.

DTC U1073: Bus Off

CAUTION

If DTC U1073 is set in the A/C-ECU, diagnose the CAN main bus line.

CAUTION

Whenever the ECU is replaced, ensure that the communication circuit is normal.

TROUBLE JUDGMENT

DTC U1073 will be stored when the A/C-ECU ceases CAN communication (bus off) and then resumes the communication when the ignition switch is turned to the "LOCK" (OFF) position.

TECHNICAL DESCRIPTION (COMMENT)

The wiring harness wire or connectors may have loose, corroded, or damage terminals, or terminals pushed back in the connector, or the A/C-ECU may be defective.

TROUBLESHOOTING HINTS

- Defective connector(s) or wiring harness
- Malfunction of the A/C-ECU.
- Refer to component locations GROUP-70
- Refer to configuration diagrams GROUP-80
- Refer to circuit diagrams GROUP-90

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- : Diagnostic Tool (MUT-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: USB Cable
 - MB991910: Main Harness A

STEP 1. Using diagnostic tool , diagnose the CAN bus line.

CAUTION

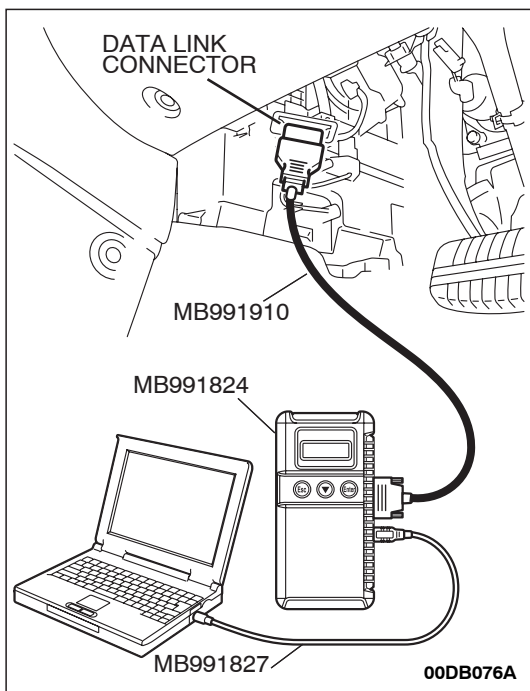
To prevent damage to diagnostic tool (MUT-III), always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting diagnostic tool (MUT-III).

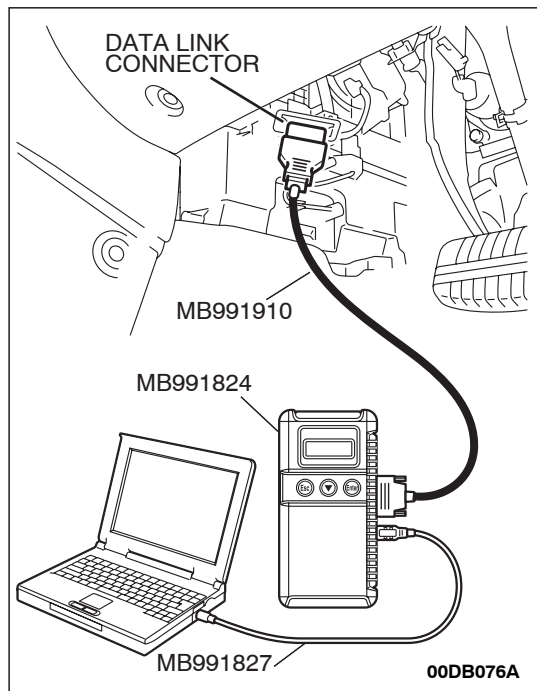
- (1) Connect diagnostic tool to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Diagnose the CAN bus line.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the CAN bus line found to be normal?

YES : Go to Step 2.

NO : Repair the CAN bus lines (Refer to GROUP 54C, precautions on how to repair the can bus lines P.54C-5).





STEP 2. Recheck for diagnostic trouble code.

Check again if the DTC is set.

- (1) Connect diagnostic tool to the data link connector
- (2) Turn the ignition switch to the "ON" position.
- (3) Check if the DTC is set.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result satisfactory?

YES : There is an intermittent malfunction such as poor engaged connector(s) or open circuit (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions [P.00-14.](#))

NO : Replace the A/C-ECU. On completion, check that the DTC is not reset.

DTC U1100: Electronic control unit Time-out (Related to Engine)

CAUTION

If DTC U1100 is set in the A/C-ECU, diagnose the CAN main bus line.

CAUTION

Whenever the ECU is replaced, ensure that the communication circuit is normal.

TROUBLE JUDGMENT

The A/C-ECU receives engine control system-related signal from the Electronic control unit. If the ECU cannot receive the signal, DTC U1100 will be set.

TECHNICAL DESCRIPTION (COMMENT)

Current trouble

- Connector(s) or wiring harness in the CAN bus lines between the Electronic control unit and the A/C-ECU, the power supply system to the Electronic control unit, the Electronic control unit itself, or the A/C-ECU may be defective.

Past trouble

- If DTC U1100 is stored as a past trouble, carry out diagnosis with particular emphasis on wiring and connector(s) in the CAN bus line between the A/C-ECU and the Electronic control unit, and the power supply system to the Electronic control unit. If the connectors and wiring are normal, and obviously the ECU is the cause of the trouble, replace the ECU. If in doubt, do not replace the ECU.

NOTE: For a past trouble, you cannot find it by the diagnostic tool CAN bus diagnostics even if there is a failure in CAN bus lines. In this case, refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-14) and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the DTC, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54C, Explanation about the scan too CAN bus diagnostics P.54C-6).

TROUBLESHOOTING HINTS

- Electronic control unit failed
- Malfunction of the A/C-ECU
- Damaged harness wires and connectors
- Refer to component locations GROUP-70
- Refer to configuration diagrams GROUP-80
- Refer to circuit diagrams GROUP-90

DIAGNOSIS

Required Special Tools:

- : Diagnostic Tool (MUT-III Sub Assembly)
 - MB991824: Vehicle Communication Interface (V.C.I.)
 - MB991827: MUT-III USB Cable
 - MB991910: MUT-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Using diagnostic tool , diagnose the CAN bus line.

⚠ CAUTION

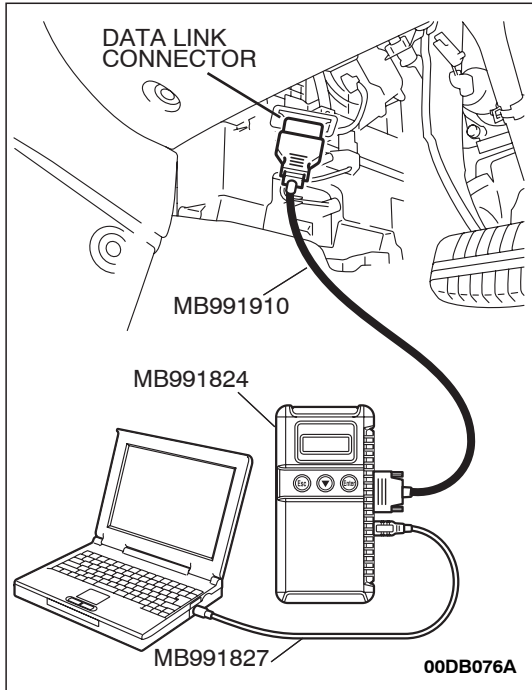
To prevent damage to diagnostic tool (MUT-III), always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting diagnostic tool (MUT-III).

- (1) Connect diagnostic tool to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Diagnose the CAN bus line.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the CAN bus line found to be normal?

YES : Go to Step 2.

NO : Repair the CAN bus lines (Refer to GROUP 54C, precautions on how to repair the can bus lines [P.54C-5](#)).



STEP 2. Using diagnostic tool read the Electronic control unit diagnostic trouble code.

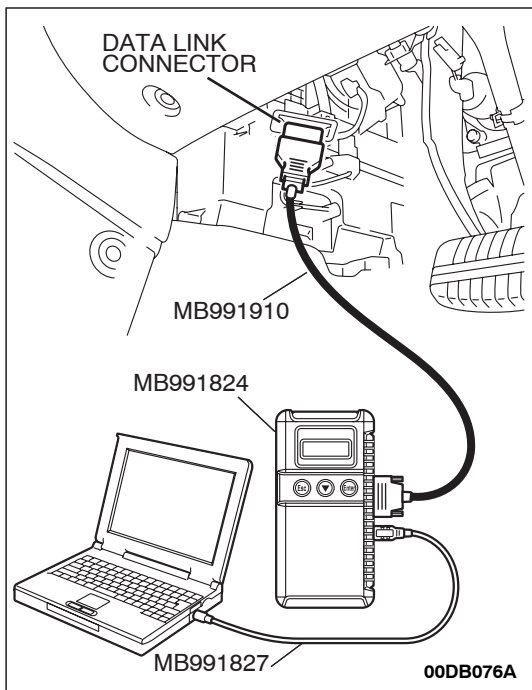
Check whether an engine and automatic transmission DTCs are set or not.

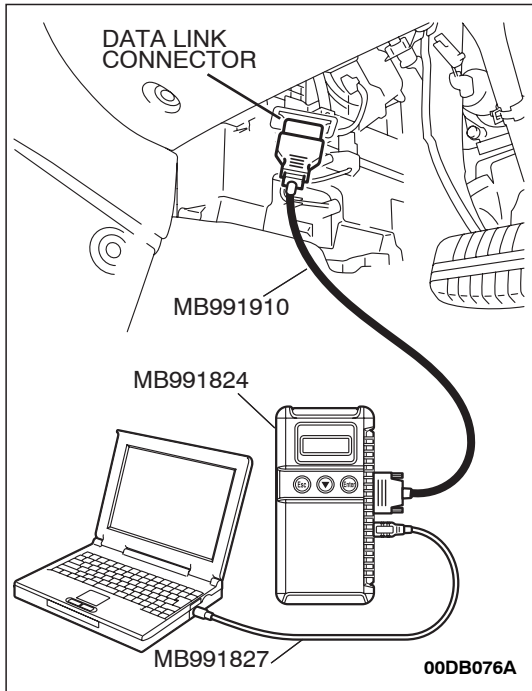
- (1) Turn the ignition switch to the "ON" position.
- (2) Check for engine and automatic transmission DTCs.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result satisfactory?

YES : Go to Step 3.

NO : Diagnose the Electronic control unit (Refer to GROUP 13A, Diagnostic Trouble Code [13A-17](#)).





STEP 3. Using diagnostic tool , check for any diagnostic trouble code.

Check if a DTC, which relates to CAN communication-linked systems below, is set.

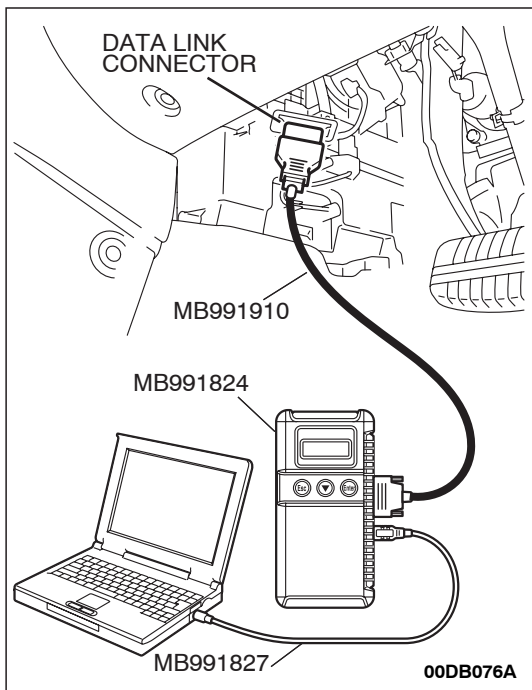
- Combination meter
DTC indicating a time-out error related to the engine or automatic transmission control system
- ETACS-ECU
DTC indicating a time-out error related to the engine or automatic transmission control system

- (1) Turn the ignition switch to the "ON" position.
- (2) Check for a DTC related to the relevant system.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result satisfactory?

YES : Go to Step 5.

NO : Go to Step 4.



STEP 4. Recheck for diagnostic trouble code.

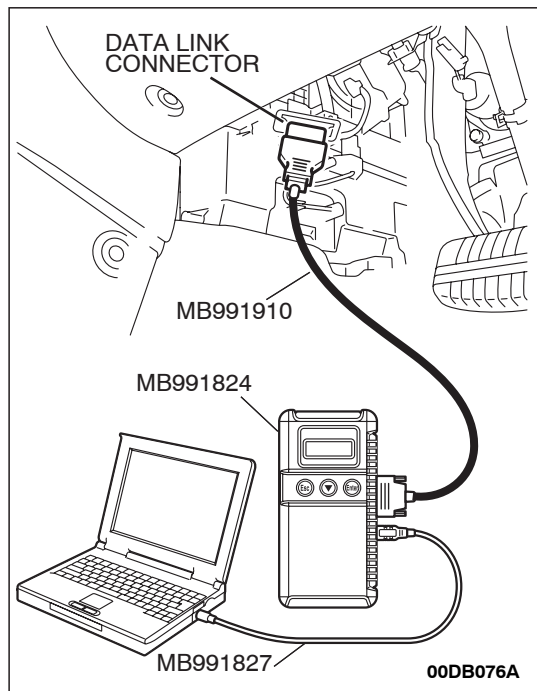
Check again if the DTC is set.

- (1) Turn the ignition switch to the "ON" position.
- (2) Check if the DTC is set.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result satisfactory?

YES : A poor connection, open circuit or other intermittent malfunction is present in the lines between the Electronic control unit and the A/C-ECU (Refer to GROUP 00E, Harness Connector Inspection [P.00E-2.](#))

NO : Replace the Electronic control unit. On completion, check that the DTC is not reset.



STEP 5. Recheck for diagnostic trouble code.

Check again if the DTC is set.

- (1) Turn the ignition switch to the "ON" position.
- (2) Check if the DTC is set.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result satisfactory?

YES : A poor connection, open circuit or other intermittent malfunction is present in the lines between the Electronic control unit and the A/C-ECU (Refer to GROUP 00E, Harness Connector Inspection [P.00E-2.](#))

NO : Replace the A/C-ECU. On completion, check that the DTC is not reset.

DTC U1111: Multi-Center Display Unit Time-out

CAUTION

If DTC U1111 is set in the A/C-ECU, diagnose the CAN main bus line.

CAUTION

Whenever the ECU is replaced, ensure that the communication circuit is normal.

TROUBLE JUDGMENT

The A/C-ECU receives signals from the multi-center display unit. If the ECU cannot receive the signal related to the multi-center display unit, DTC U1111 will be set.

TECHNICAL DESCRIPTION (COMMENT)

Current trouble

- Connector(s) or wiring harness in the CAN bus lines between the A/C-ECU and the multi-center display unit, the power supply system to the display unit, the display unit itself, or the A/C-ECU may be defective.

Past trouble

- When DTC U1111 is set as a past trouble, carry out diagnosis with particular emphasis on connector(s) or wiring harness in the CAN bus lines between the A/C-ECU and the multi-center display unit, the power supply system to the display

unit. If the connectors and wiring are normal, and obviously the ECU or the multi-center display is the cause of the trouble, replace the ECU or the multi-center display. If in doubt, do not replace the ECU or the display unit.

NOTE: For a past trouble, you cannot find it by the diagnostic tool CAN bus diagnostics even if there is a failure in the CAN bus lines. In this case, refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-14.) and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the DTC, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54C – Explanation about the diagnostic tool CAN bus diagnostics P.54C-6).

TROUBLESHOOTING HINTS

- Malfunction of multi-center display unit
- Malfunction of the A/C-ECU
- Damaged harness wires and connectors
- Refer to component locations GROUP-70
- Refer to configuration diagrams GROUP-80
- Refer to circuit diagrams GROUP-90

DIAGNOSIS

Required Special Tools:

- : Diagnostic Tool (MUT-III Sub Assembly)
 - MB991824: Vehicle Communication Interface (V.C.I.)
 - MB991827: MUT-III USB Cable
 - MB991910: MUT-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Using diagnostic tool , diagnose the CAN bus line.

⚠ CAUTION

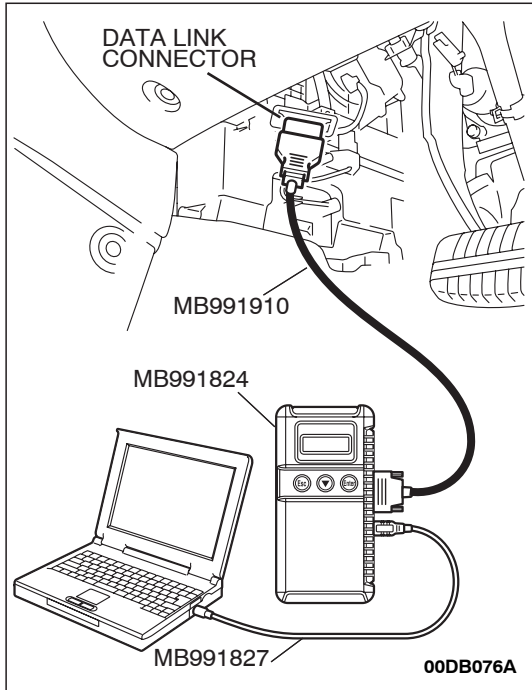
To prevent damage to diagnostic tool (MUT-III), always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting diagnostic tool (MUT-III).

- (1) Connect diagnostic tool to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Diagnose the CAN bus line.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the CAN bus line found to be normal?

YES : Go to Step 2.

NO : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis [P.54C-15](#)).



STEP 2. Using diagnostic tool , read the Electronic control unit diagnostic trouble code.

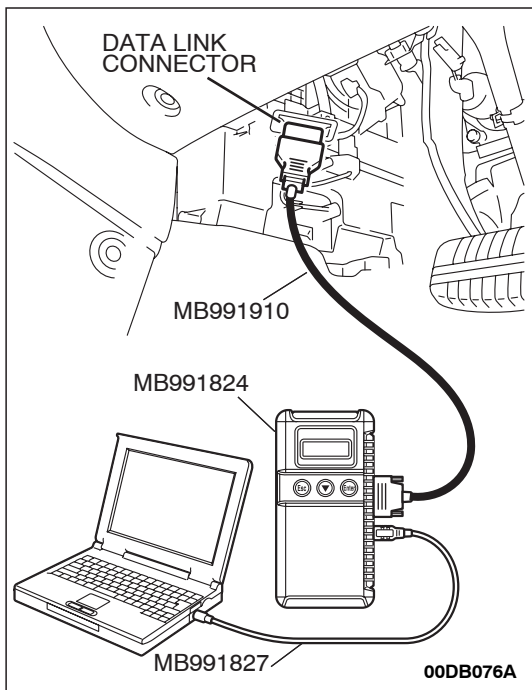
Check that the multi-center display unit sets a DTC.

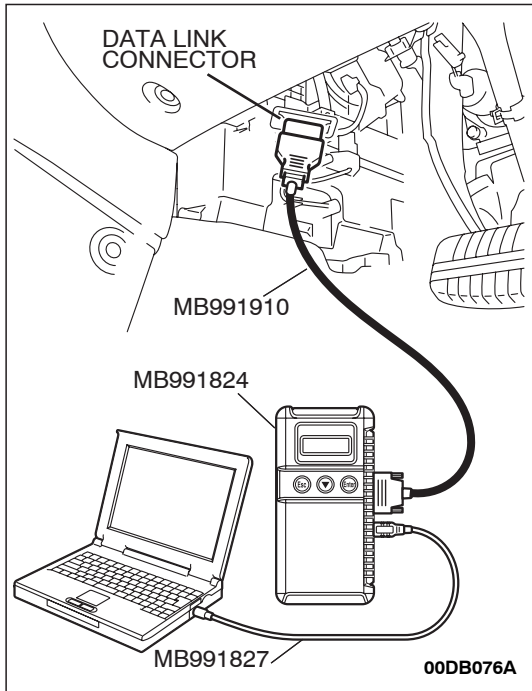
- (1) Turn the ignition switch to the "ON" position.
- (2) Check for the DTC related to the multi-center display unit.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result satisfactory?

YES : Refer to GROUP 54A, multi-center display unit – Diagnosis [P.54A-254](#).

NO : Go to Step 3.





STEP 3. Using diagnostic tool , check for any diagnostic trouble code.

Check if a DTC, which relates to CAN communication-linked systems below, is set.

- ETACS-ECU

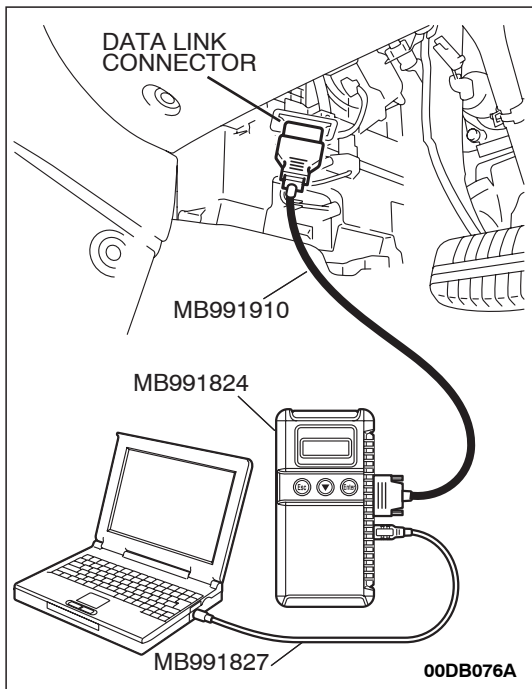
DTC indicating a time-out error of multi-center display unit

- (1) Turn the ignition switch to the "ON" position.
- (2) Check for a DTC related to the relevant system.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result satisfactory?

YES : Go to Step 4.

NO : Go to Step 5.



STEP 4. Recheck for diagnostic trouble code.

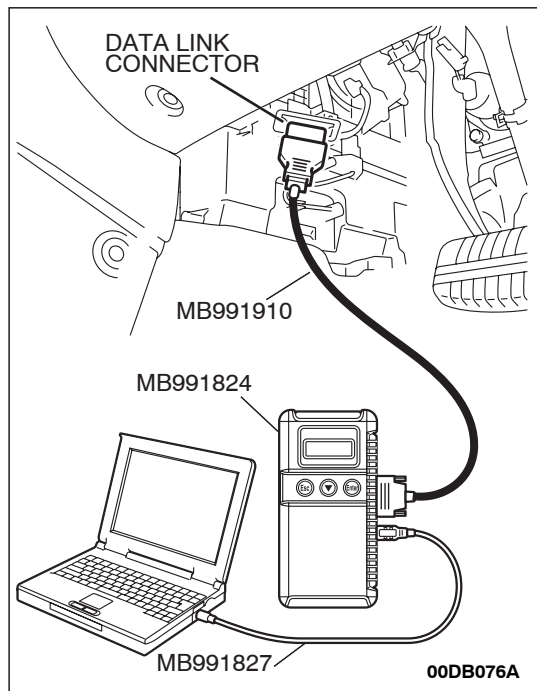
Check again if the DTC is set.

- (1) Turn the ignition switch to the "ON" position.
- (2) Check if the DTC is set.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result satisfactory?

YES : Replace the multi-center display unit. On completion, check that the DTC is not reset.

NO : A poor connection, open circuit or other intermittent malfunction is present in the CAN bus lines between the multi-center display unit and the A/C-ECU (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions [P.00-14](#)).



STEP 5. Recheck for diagnostic trouble code.

Check again if the DTC is set.

- (1) Turn the ignition switch to the "ON" position.
- (2) Check if the DTC is set.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result satisfactory?

YES : Replace the A/C-ECU. On completion, check that the DTC is not reset.

NO : A poor connection, open circuit or other intermittent malfunction is present in the CAN bus lines between the multi-center display unit and the A/C-ECU (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions [P.00-14](#)).

DTC U1120: Failure Information on Electronic control unit (Related to Engine)

CAUTION

If DTC U1120 is set in the A/C-ECU, diagnose the CAN main bus line.

CAUTION

Whenever the ECU is replaced, ensure that the communication circuit is normal.

CAUTION

The engine control system- related DTC may be set when DTC U1120 is set. (For details refer to GROUP 00, Intersystem Affiliated DTC Reference Table [P.00-17](#).) Diagnose the engine control system first when the engine control system- related DTC is set.

TROUBLE JUDGMENT

The A/C-ECU receives engine control system-related signal from the Electronic control unit by the CAN bus lines. If a fail-safe related data is contained in the signal from the Electronic control unit, DTC U1120 will be stored.

TECHNICAL DESCRIPTION (COMMENT)

Current trouble

- The wiring harness wire or connectors may have loose, corroded, or damage terminals, or terminals pushed back in the connector, the Electronic control unit, or the A/C-ECU may be defective.

Past trouble

- If DTC U1120 is stored as a past trouble, carry out diagnosis with particular emphasis on wiring and connector(s) in the CAN bus line between the A/C-ECU and the Electronic control unit, and the power supply system to the Electronic control unit. If the connectors and wiring are normal, and obviously the ECU is the cause of the trouble, replace the ECU. If in doubt, do not replace the ECU.

NOTE: For a past trouble, you cannot find it by the diagnostic tool CAN bus diagnostics even if there is a failure in CAN bus lines. In this case, refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions [P.00-14](#).) and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the DTC, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54C – Explanation about the diagnostic tool CAN bus diagnostics [P.54C-6](#)).

TROUBLESHOOTING HINTS

- Malfunction of the A/C-ECU.
- Malfunction of the Electronic control unit.
- Refer to component locations [GROUP-70](#)
- Refer to configuration diagrams [GROUP-80](#)
- Refer to circuit diagrams [GROUP-90](#)

DIAGNOSIS

Required Special Tool:

- : Diagnostic Tool (MUT-III Sub Assembly)
 - MB991824: Vehicle Communication Interface (V.C.I.)
 - MB991827: MUT-III USB Cable
 - MB991910: MUT-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Using diagnostic tool , diagnose the CAN bus line.

⚠ CAUTION

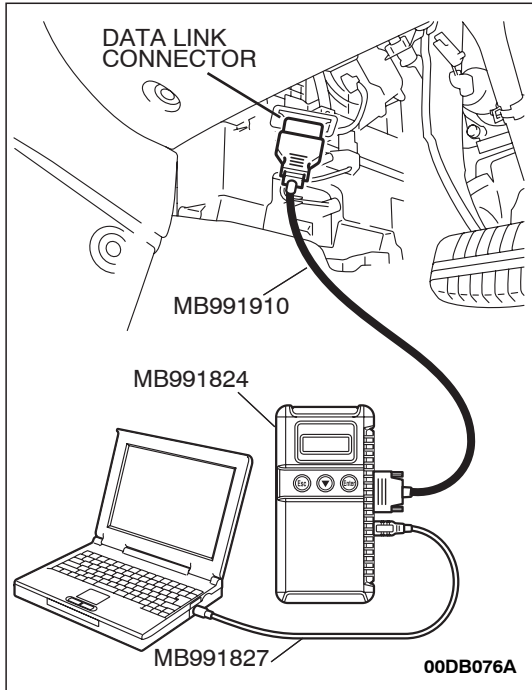
To prevent damage to diagnostic tool (MUT-III), always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting diagnostic tool (MUT-III).

- (1) Connect diagnostic tool to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Diagnose the CAN bus line.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the CAN bus line found to be normal?

YES : Go to Step 2.

NO : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis [P.54C-15](#)).



STEP 2. Using diagnostic tool , read the Electronic control unit diagnostic trouble code.

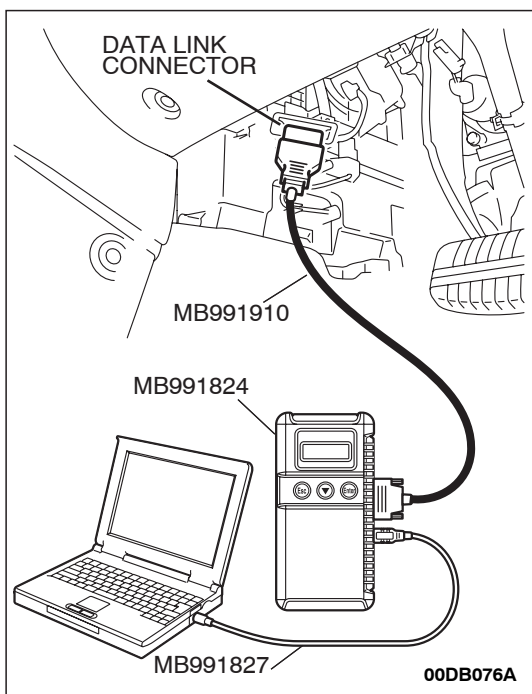
Check whether any engine or automatic transmission DTCs are set or not.

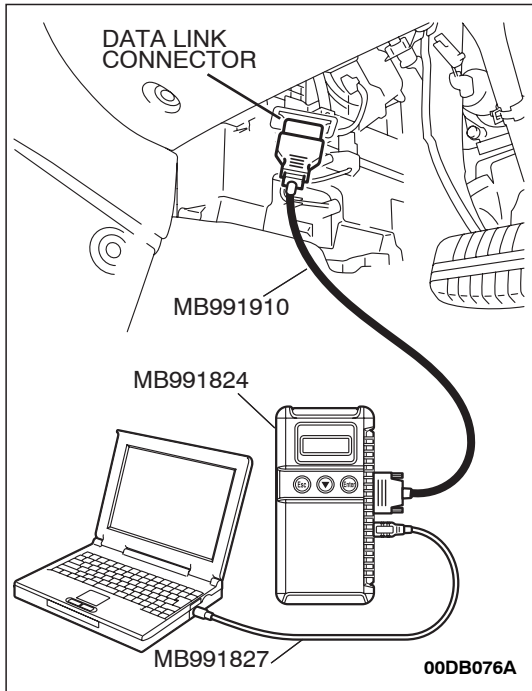
- (1) Turn the ignition switch to the "ON" position.
- (2) Check for engine and automatic transmission DTCs.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result satisfactory?

YES : Go to Step 3.

NO : Refer to GROUP 13A, Diagnostic Trouble Code [13A-17](#).





STEP 3. Using diagnostic tool , check for any diagnostic trouble code.

Check if a DTC, which relates to CAN communication-linked systems below, is set.

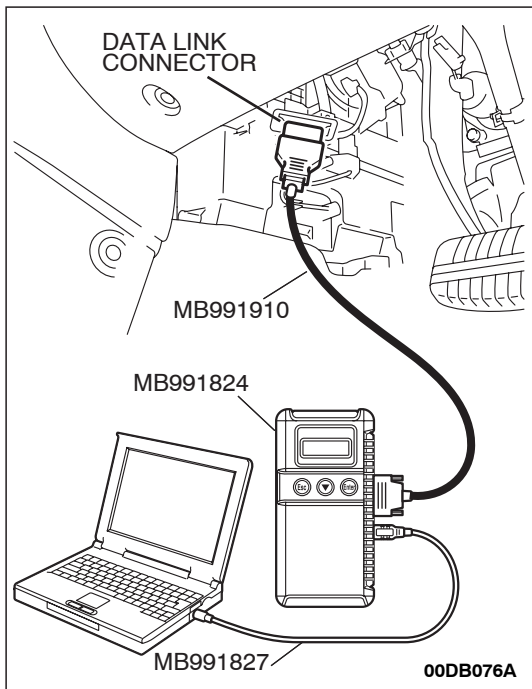
- Combination meter
DTC indicating a time-out error related to the engine or automatic transmission control system
- ETACS
DTC indicating a time-out error related to the engine or automatic transmission control system
- Multi-center display unit
DTC indicating a time-out error related to the engine or automatic transmission control system

- (1) Turn the ignition switch to the "ON" position.
- (2) Check for a DTC related to the relevant system.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result satisfactory?

YES : Go to Step 5.

NO : Go to Step 4.



STEP 4. Recheck for diagnostic trouble code.

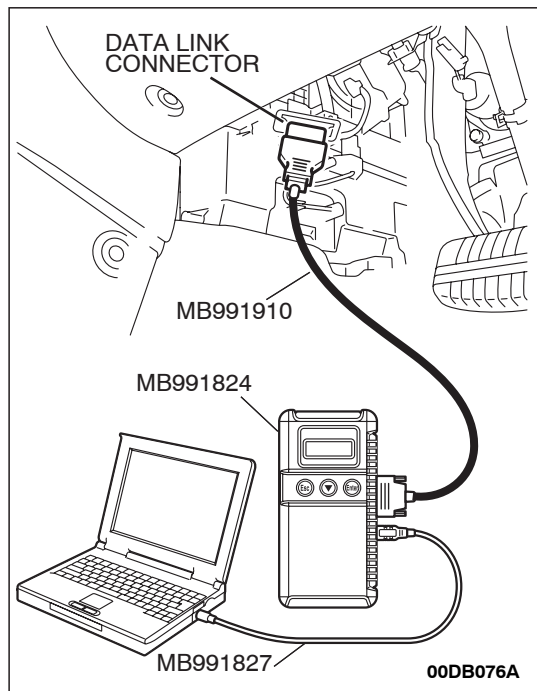
Check again if the DTC is set.

- (1) Turn the ignition switch to the "ON" position.
- (2) Check if the DTC is set.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result satisfactory?

YES : Replace the Electronic control unit. On completion, check that the DTC is not reset.

NO : There is an intermittent malfunction such as poor engaged connector(s) or open circuit (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions [P.00-14](#)).



STEP 5. Recheck for diagnostic trouble code.

Check again if the DTC is set.

- (1) Turn the ignition switch to the "ON" position.
- (2) Check if the DTC is set.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result satisfactory?

YES : A poor connection, open circuit or other intermittent malfunction is present in the lines between the Electronic control unit and the A/C-ECU (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions [P.00-14.](#))

NO : Replace the A/C-ECU. On completion, check that the DTC is not reset.

SYMP TOM CHART

M1552009900495

⚠ CAUTION

During diagnosis, a DTC code associated with other system may be set when the ignition switch is turned on with connector(s) disconnected. On completion, confirm all systems for DTC code(s). If DTC code(s) are set, erase them all.

SYMPTOM	INSPECTION PROCEDURE	REFERENCE PAGE
When the ignition switch is "ON", the A/C does not operate.	1.	P.55-69
When the air outlet changeover control knob is moved to DEFROSTER or DEFROSTER/FOOT position, the A/C or the inside/outside air changeover damper motor does not operate.	2.	P.55-69
Outside/Inside air changeover is not possible.	3.	P.55-70
When the A/C is operating, temperature inside the passenger compartment does not decrease (cool air is not emitted).	4.	P.55-75
Blower fan and motor do not turn.	5.	P.55-89
Blower air amount cannot be changed.	6.	P.55-100
The A/C indicator flashes.	7.	P.55-104
Defogger function does not operate.	8.	P.55-110
Defogger timer function does not operate.	9.	P.55-121
Malfunction of the A/C-ECU power supply system.	10.	P.55-122
Condenser fan does not operate.	11.	REFER TO GROUP 14 – SYMPTOM CHART P.14-3
When sunlight intensity changes, air outlet temperature does not change.	12	P.55-128

SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: When the Ignition Switch is "ON", the A/C does not Operate.

TECHNICAL DESCRIPTION (COMMENT)

The blower system or the compressor system may be defective if there is no cool air coming from the vents.

TROUBLESHOOTING HINTS

- Malfunction of blower motor
- Malfunction of A/C compressor
- Refer to component locations GROUP-70
- Refer to configuration diagrams GROUP-80
- Refer to circuit diagrams GROUP-90

DIAGNOSIS

Check that the blower motor operation when the blower switch is moved to the "HI" position.

- (1) Turn the ignition switch to the "ON" position.
- (2) Turn the blower speed selection dial to the blower operating position.

Q: Does the blower motor operate when the speed selection dial is turned to the blower operating position?

YES : Refer to Inspection procedure 4 "When the A/C is operating, temperature inside the passenger compartment does not decrease (cool air not emitted) [P.55-75](#)."

NO : Refer to Inspection procedure 5 "Blower fan and motor do not turn [P.55-89](#)."

INSPECTION PROCEDURE 2: When the Air Outlet Changeover Control Knob is Moved to DEFROSTER or DEFROSTER/FOOT Position, the A/C or the Inside/outside Air Changeover Damper Motor does not operate.

TECHNICAL DESCRIPTION (COMMENT)

If the outside/inside air selection damper control motor does not operate normally, the inside/outside air changeover damper motor system may be defective.

TROUBLESHOOTING HINTS

- Malfunction of the A/C-ECU
- Malfunction of the outside/inside air selection damper control motor
- Damaged harness wires or connectors
- Refer to component locations GROUP-70
- Refer to configuration diagrams GROUP-80
- Refer to circuit diagrams GROUP-90

DIAGNOSIS

Check operation of the outside/inside air selection damper control motor.

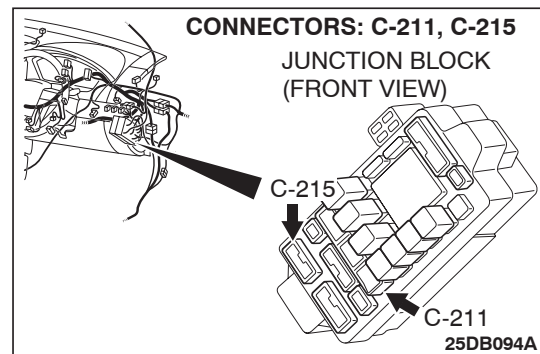
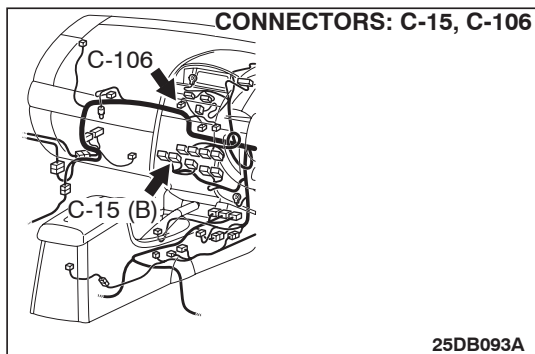
- (1) Turn the ignition switch to the "ON" position.
- (2) Outside/inside air selection damper motor switch: This is used to switch from the inside air to outside air or vice versa.
- (3) Check to see that the outside/inside air selection damper motor operates normally.

Q: Does outside/inside air selection damper control motor work normally?

YES : Replace the A/C-ECU.

NO : Refer to Inspection procedure 3, "Inside/outside air changeover is not possible [P.55-70](#)."

INSPECTION PROCEDURE 3: Outside/Inside Air Changeover is not possible.



CIRCUIT OPERATION

If the outside/inside air selection damper control motor does not operate normally, the outside/inside air selection damper control motor system may be defective.

TROUBLESHOOTING HINTS

- Malfunction of the outside/inside air selection damper control motor
- Malfunction of the A/C-ECU
- Damaged harness wires or connectors
- Refer to component locations [GROUP-70](#)
- Refer to configuration diagrams [GROUP-80](#)
- Refer to circuit diagrams [GROUP-90](#)

DIAGNOSIS

Required Special Tool:

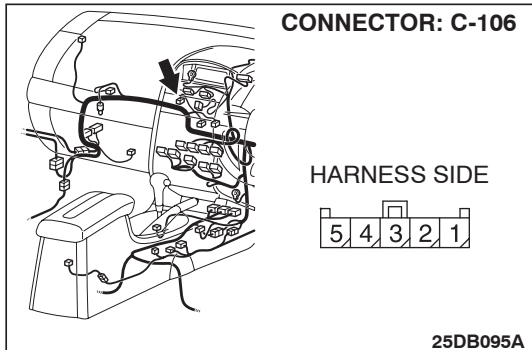
- MB991223: Test Harness Set

STEP 1. Check the defogger and A/C operations.

Q: Do the defogger and A/C work normally?

YES : Go to Step 2.

NO : Refer to Inspection procedure 10 "Malfunction of the A/C-ECU power supply system [P.55-122](#)."

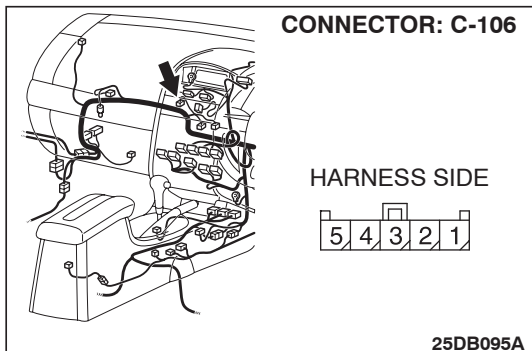


STEP 2. Check outside/inside air selection damper control motor connector C-106 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is outside/inside air selection damper control motor connector C-106 in good condition?

YES : Go to Step 3.

NO : Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that the outside/inside air selection damper control motor works normally.



STEP 3. Measure the voltage at outside/inside air selection damper control motor connector C-106.

(1) Disconnect outside/inside air selection damper control motor connector C-106, and measure the voltage at the harness side.

(2) Turn the ignition switch to the "ON" position.

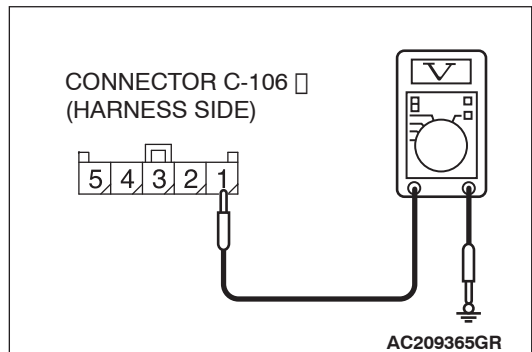
(3) Measure the voltage between terminal 1 and ground.

- The measured value should be approximately 12 volts (battery positive voltage).

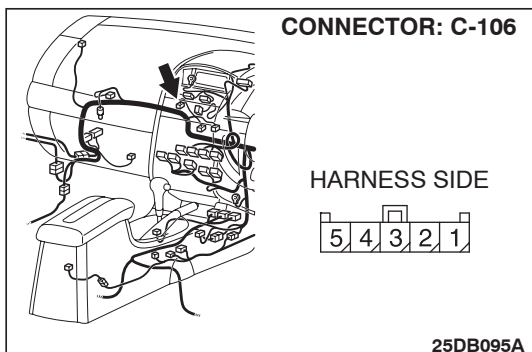
Q: Does the measured voltage correspond with this range?

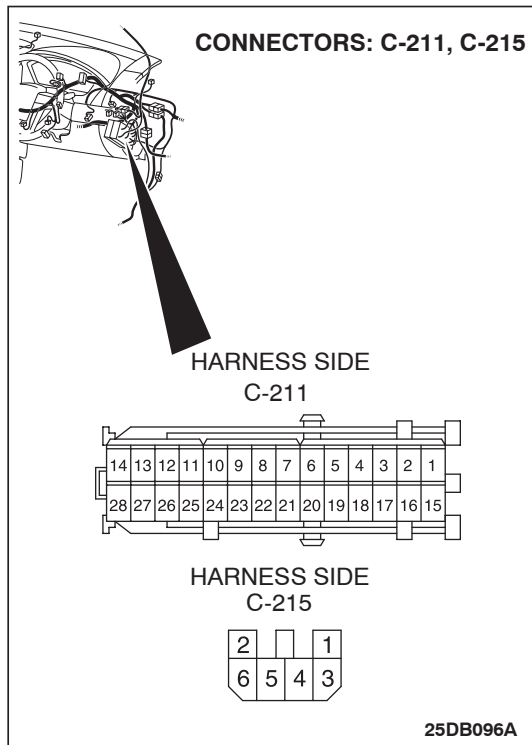
YES : Go to Step 5.

NO : Go to Step 4.



STEP 4. Check the wiring harness between outside/inside air selection damper control motor connector C-106 (terminal 1) and the ignition switch (IG2).



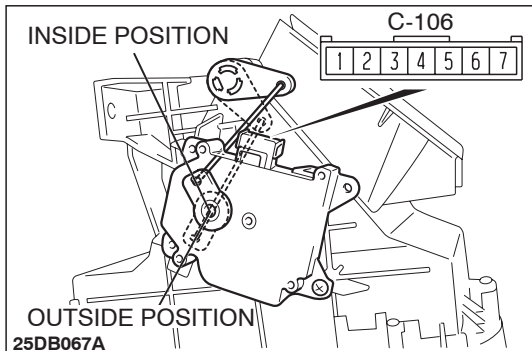


NOTE: Also check junction block connectors C-211 (terminal 16) and C-215 (terminal 2) for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If junction block connector C-211 or C-215 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection [P.00E-2](#).

Q: Is the wiring harness between outside/inside air selection damper control motor connector C-106 (terminal 1) and the ignition switch (IG2) in good condition?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions [P.00-14](#).

NO : Repair the wiring harness. Check that the outside/inside air selection damper control motor works normally.



STEP 5. Check the outside/inside air selection damper control motor.

⚠ CAUTION

Cut off the battery voltage when the damper is in the inside/outside air position.

Check the outside/inside air selection damper control motor by the following procedures.

LEVER POSITION	BATTERY CONNECTION	LEVER OPERATION
At the outside position	<ul style="list-style-type: none"> Connect terminal 1 to the positive battery terminal Connect terminal 5 to the negative battery terminal 	The lever moves from the outside position to the inside position
At the inside position	<ul style="list-style-type: none"> Connect terminal 1 to the positive battery terminal Connect terminal 4 to the negative battery terminal 	The lever moves from the inside position to the outside position

Q: Does outside/inside air selection damper control motor work normally?

YES : Go to Step 6.

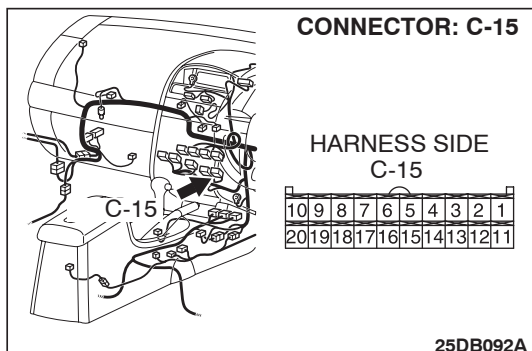
NO : Replace the outside/inside air selection damper control motor. Check that the outside/inside air selection damper control motor works normally.

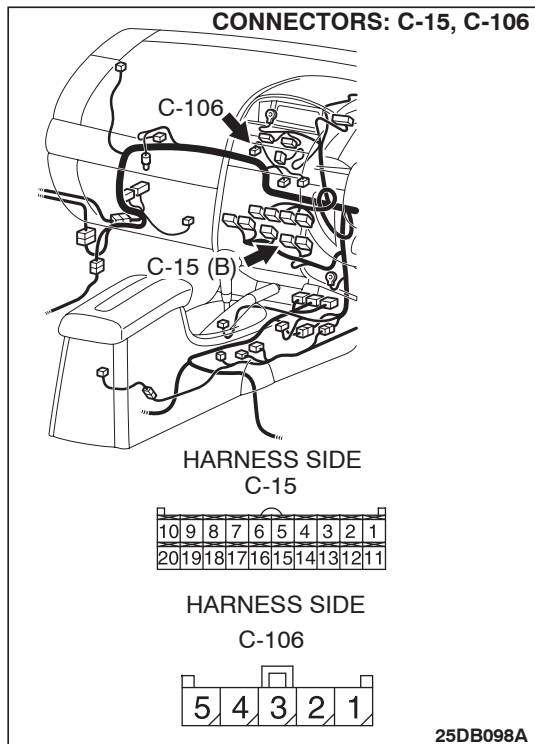
STEP 6. Check A/C-ECU connector C-15 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is A/C-ECU connector C-15 in good condition?

YES : Go to Step 7.

NO : Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that the outside/inside air selection damper control motor works normally.





STEP 7. Check the wiring harness between outside/inside air selection damper control motor connector C-106 (terminals 5 and 7) and A/C-ECU C-15 (terminals 5 and 6).

Q: Are the wiring harness between outside/inside air selection damper control motor connector C-106 (terminals 4 and 5) and A/C-ECU C-16 (terminals 5 and 6) in good condition?

YES : Go to Step 8.

NO : Repair the wiring harness. Check that the outside/inside air selection damper control motor works normally.

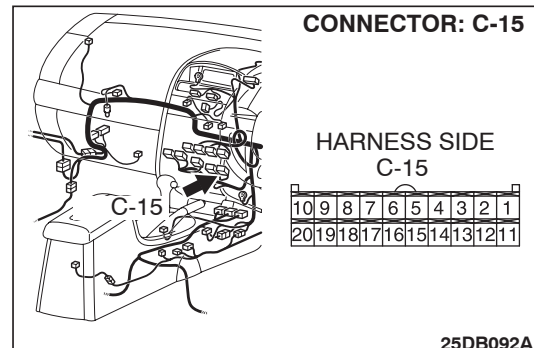
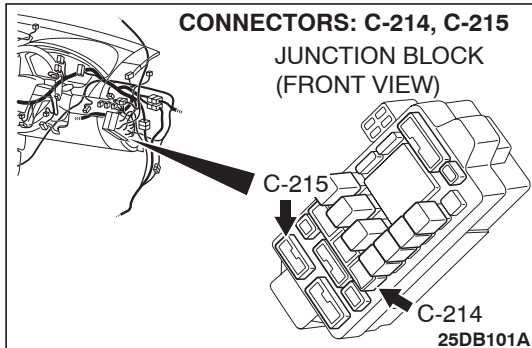
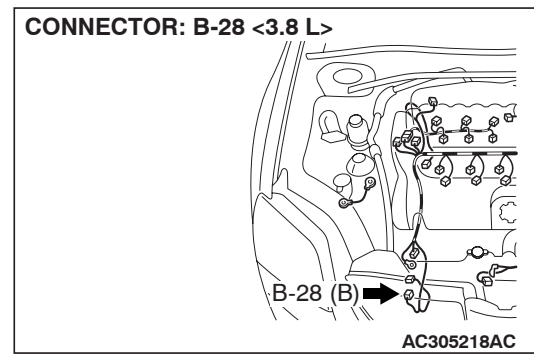
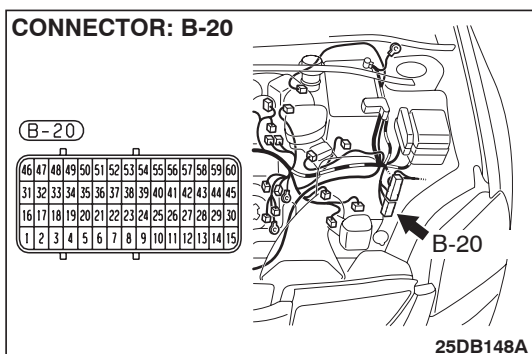
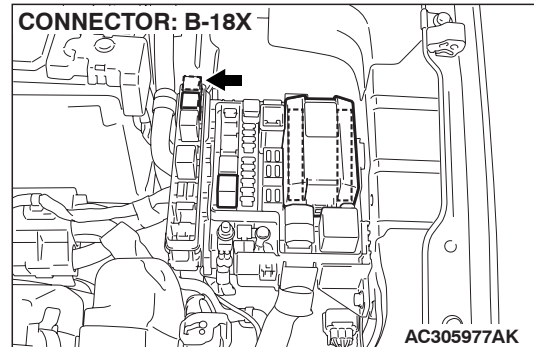
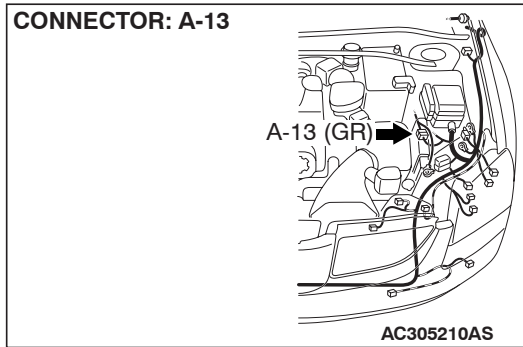
STEP 8. Retest the system.

Q: Does a malfunction take place again?

YES : Replace the A/C-ECU, and check that the outside/inside air selection damper control motor works normally.

NO : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions [P.00-14](#).

INSPECTION PROCEDURE 4: When the A/C is Operating, Temperature Inside the Passenger Compartment does not Decrease (Cool Air is not Emitted).



TECHNICAL DESCRIPTION (COMMENT)

If cool air is not distributed when the A/C switch is on, the A/C compressor relay system may be defective.

TROUBLESHOOTING HINTS

- Improper amount of refrigerant
- Malfunction of the air thermo sensor
- Malfunction of the ambient air temperature sensor
- Malfunction of the A/C pressure sensor

- Malfunction of the A/C compressor relay
- Malfunction of the A/C refrigerant temperature switch
- Malfunction of the air conditioning compressor clutch
- Malfunction of the A/C-ECU
- Malfunction of the ECU
- Damaged harness wires or connectors
- Refer to component locations [GROUP-70](#)
- Refer to configuration diagrams [GROUP-80](#)
- Refer to circuit diagrams [GROUP-90](#)

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- : Scan Tool (MUT-III Sub Assembly)

- MB991824: Vehicle Communication Interface (V.C.I.)
- MB991827: MUT-III USB Cable
- MB991910: MUT-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Check the defogger and outside/inside air selection damper control motor operation.

Q: Do the defogger and outside/inside air selection damper control motor work normally?

YES : Go to Step 2.

NO : Refer to Inspection procedure 10, "Malfunction of the A/C-ECU power supply system [P.55-122](#)."

STEP 2. Check the blower motor operation.

Q: Does the blower motor work normally?

YES : Go to Step 3.

NO : Refer to Inspection procedure 5, "Front blower fan and motor do not turn [P.55-89](#)."

STEP 3. Check the A/C compressor.

Check the A/C compressor for compressor oil leaks.

Q: Is the check result satisfactory?

YES : Go to Step 4.

NO : Replace the A/C compressor or the expansion valve.

STEP 4. Using scan tool , read the A/C diagnostic trouble code.

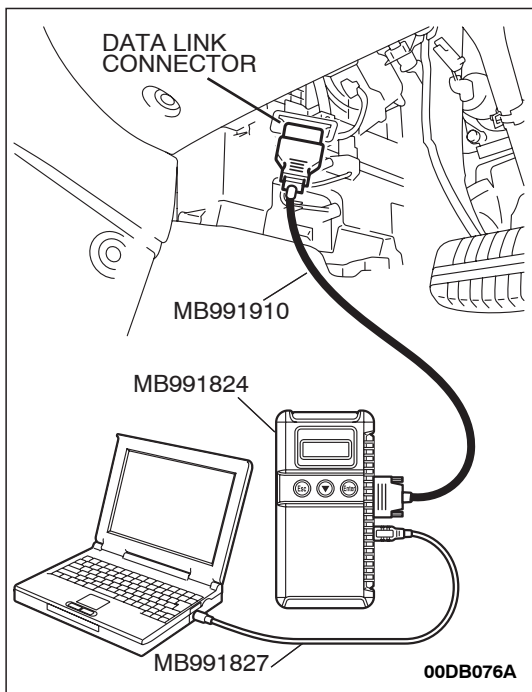
Check if an A/C-ECU DTC is set.

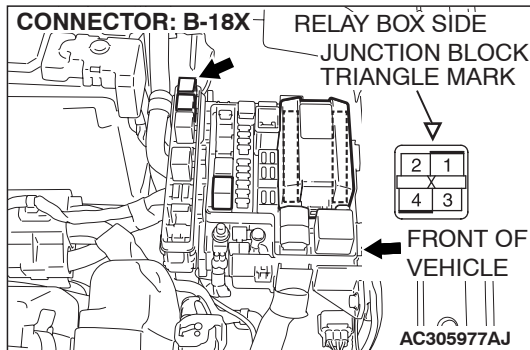
- (1) Connect scan tool to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Check if the DTC is set.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result satisfactory?

YES : Go to Step 5.

NO : Refer to DIAGNOSTIC TROUBLE CODE CHART [P.55-9](#).



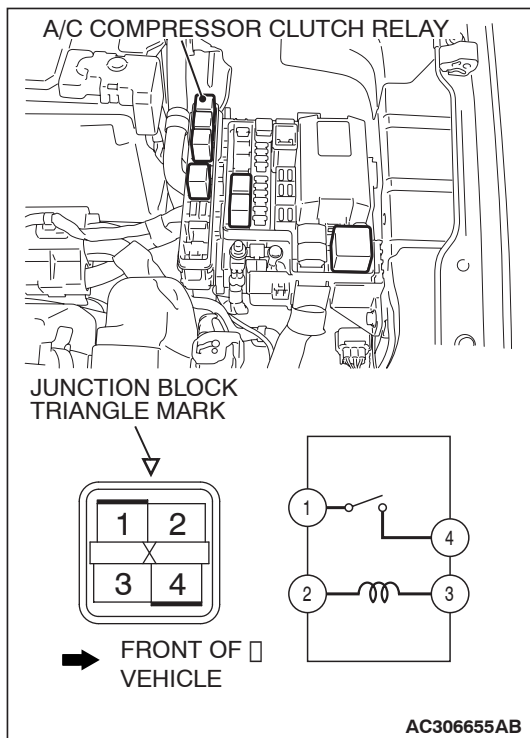


STEP 5. Check A/C compressor clutch relay connector B-18X for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is A/C compressor clutch relay connector B-18X in good condition?

YES : Go to Step 6.

NO : Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that the air conditioning works normally.



STEP 6. Check the A/C compressor clutch relay continuity.

Follow the table below to check the A/C compressor clutch relay for continuity.

BATTERY VOLTAGE	TESTER CONNECTION	SPECIFIED CONDITION
Not applied	1 – 4	Open circuit
<ul style="list-style-type: none"> Connect terminal 2 to the positive battery terminal Connect terminal 3 to the negative battery terminal 	1 – 4	Less than 2 ohms

Q: Is the A/C compressor clutch relay in good condition?

YES : Go to Step 7.

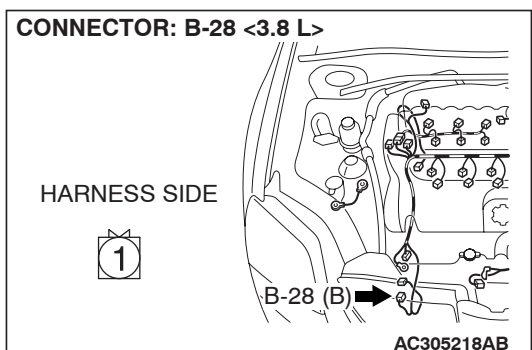
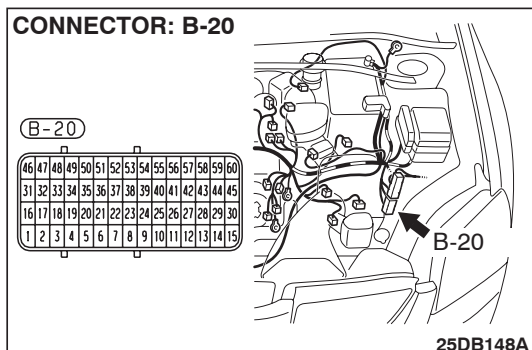
NO : Replace the A/C compressor clutch relay. Check that the air conditioning works normally.

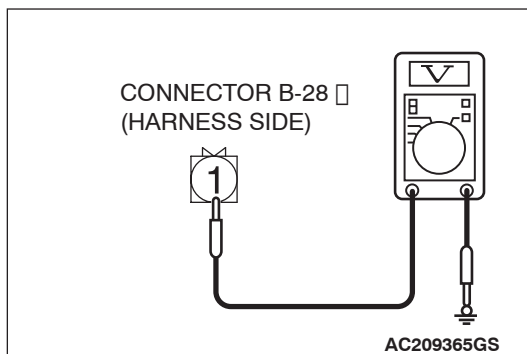
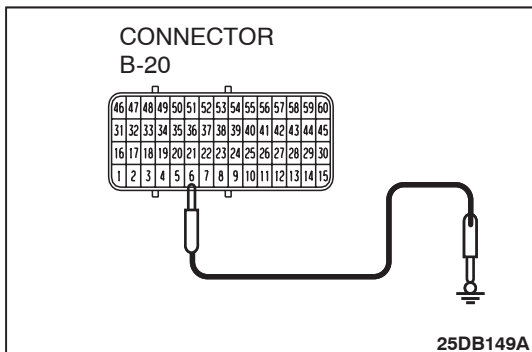
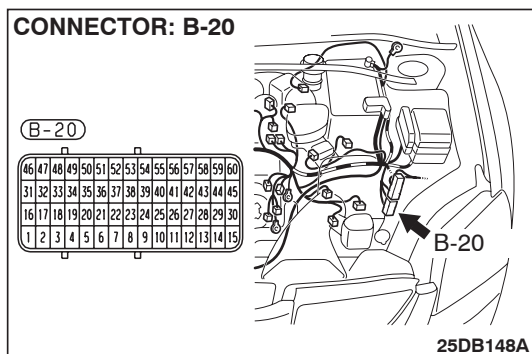
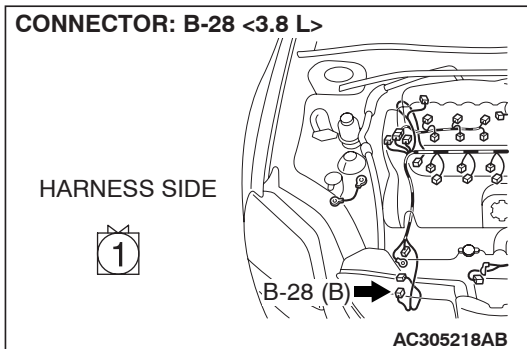
STEP 7. Check Engine ECU connector B-20 and A/C compressor assembly B-28 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are Engine ECU connector B-20 and A/C compressor assembly B-28 in good condition?

YES : Go to Step 8.

NO : Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that the air conditioning works normally.





STEP 8. Measure the voltage at A/C compressor assembly connector B-28.

(1) Disconnect A/C compressor assembly connector B-28 and measure the voltage at the relay box side.

(2) Disconnect powertrain control module connector B-20 and ground harness side terminal No.6.

(3) Turn the ignition switch to the "ON" position.

(4) A/C compressor assembly connector B-28 terminal 1 and ground.

- The measured value should be approximately 12 volts (battery positive voltage).

Q: Is the measured voltage approx. 12 volts?

YES : Go to Step 15.

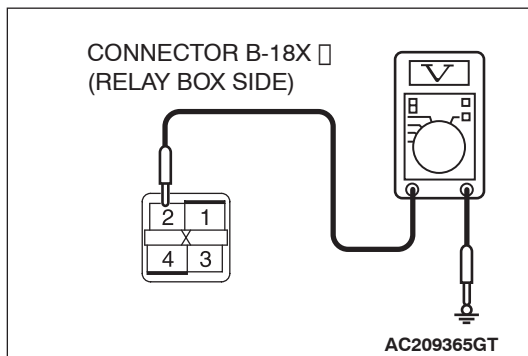
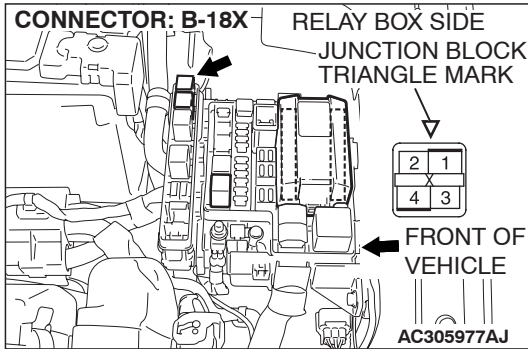
NO : Go to Step 9.

STEP 9. Measure the voltage at A/C compressor clutch relay connector B-18X.

⚠ CAUTION

The top and bottom of the A/C compressor connector are difficult to identify. Prior to inspection, confirm the triangle mark on the relay box.

- (1) Disconnect A/C compressor connector B-18X and measure the voltage at the relay box side.
- (2) Turn the ignition switch to the "ON" position.



- (3) Measure the voltage between terminal 2 and ground.

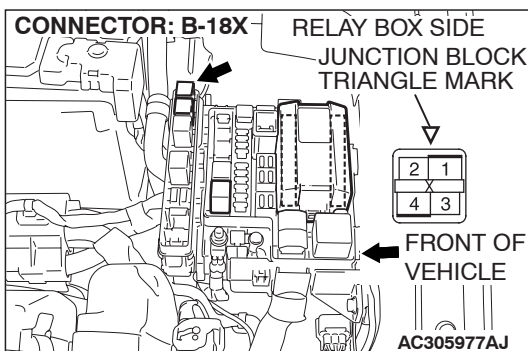
- The measured value should be approximately 12 volts (battery positive voltage).

Q: Is the measured voltage approx. 12 volts?

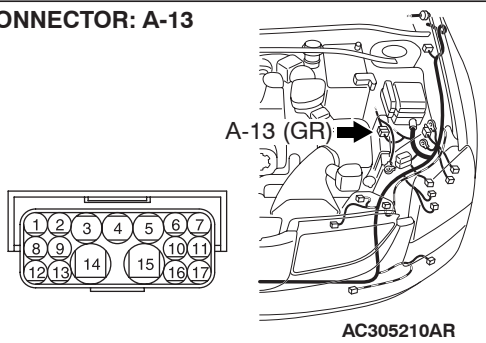
YES : Go to Step 11.

NO : Go to Step 10.

STEP 10. Check the wiring harness between A/C compressor clutch relay connector B-18X (terminal 2) and the ignition switch (IG2).



CONNECTOR: A-13



NOTE: Also check intermediate connector A-13, junction block connectors C-214 and C-215 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector A-13, junction block connector C-214 or C-215 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

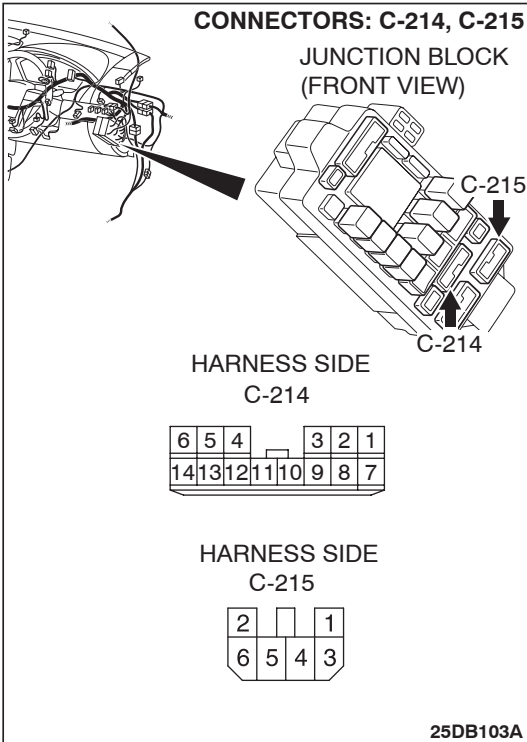
Q: Is the wiring harness between A/C compressor clutch relay connector B-18X (terminal 2) and the ignition switch (IG2) in good condition?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-14.

NO : Repair the wiring harness. Check that the air conditioning works normally.

CONNECTORS: C-214, C-215

JUNCTION BLOCK
(FRONT VIEW)

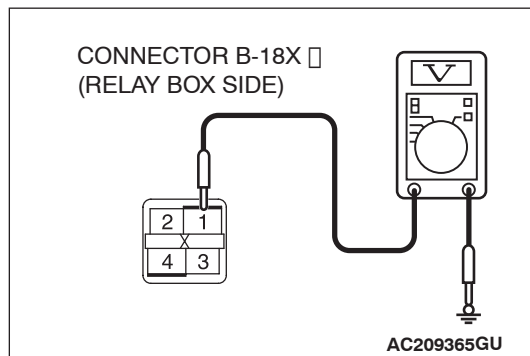
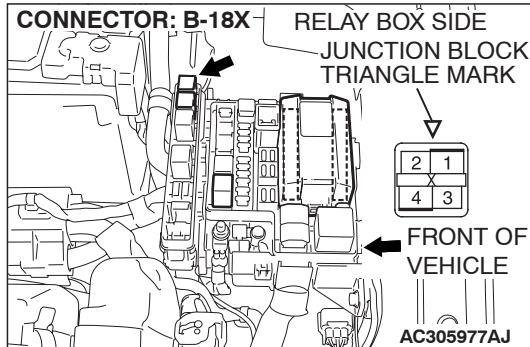


STEP 11. Measure the voltage at A/C compressor clutch relay connector B-18X.

⚠ CAUTION

The top and bottom of the A/C compressor connector are difficult to identify. Prior to inspection, confirm the triangle mark on the relay box.

(1) Disconnect A/C compressor connector B-18X and measure the voltage at the wiring harness side.



(2) Measure the voltage between terminal 1 and ground.

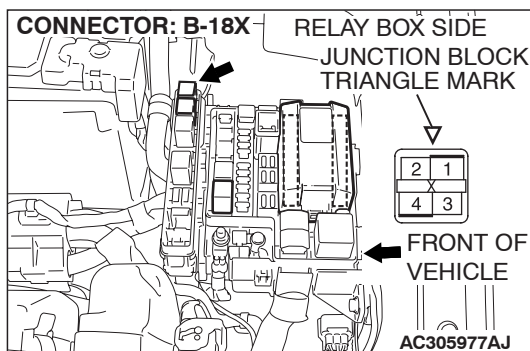
- The measured value should be approximately 12 volts (battery positive voltage).

Q: Is the measured voltage approx. 12 volts?

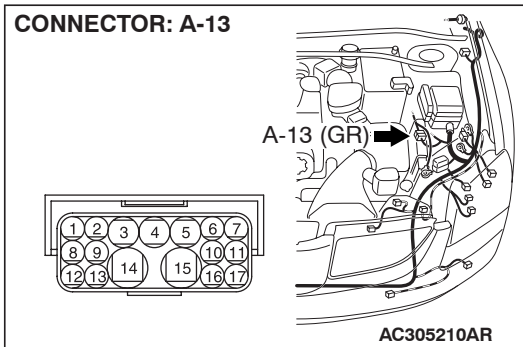
YES : Go to Step 13.

NO : Go to Step 12.

STEP 12. Check the wiring harness between A/C compressor clutch relay connector B-18X (terminal 1) and the battery.



CONNECTOR: A-13



NOTE: Also check intermediate connector A-13 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector A-13 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection [P.00E-2](#).

Q: Is the wiring harness between A/C compressor clutch relay connector B-18X (terminal 1) and the battery in good condition?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions [P.00-14](#).

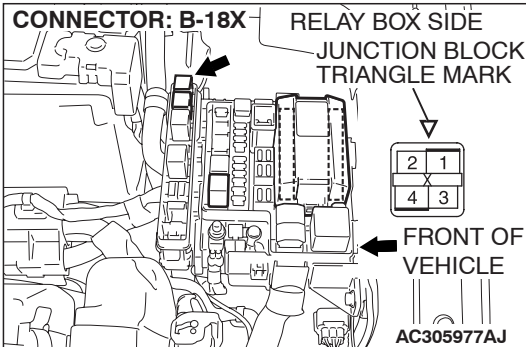
NO : Repair the wiring harness. Check that the air conditioning works normally.

STEP 13. Check the wiring harness between A/C compressor clutch relay connector B-18X (terminal 4) and A/C compressor assembly connector B-28 (terminal 1).

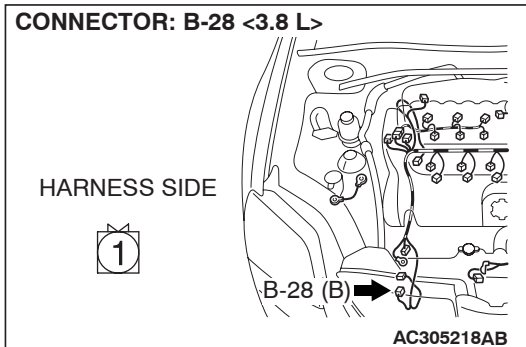
Q: Is the wiring harness between A/C compressor clutch relay connector B-18X (terminal 4) and A/C compressor connector B-28 (terminal 1) in good condition?

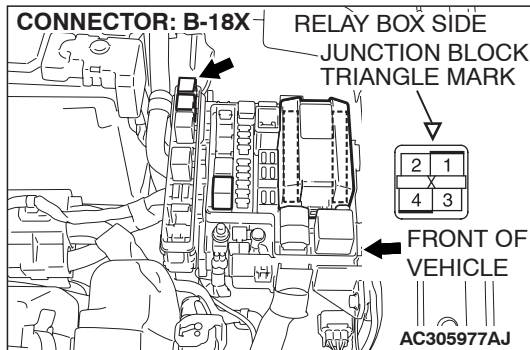
YES : Go to Step 14.

NO : Repair the wiring harness. Check that the air conditioning works normally.



CONNECTOR: B-28 <3.8 L>



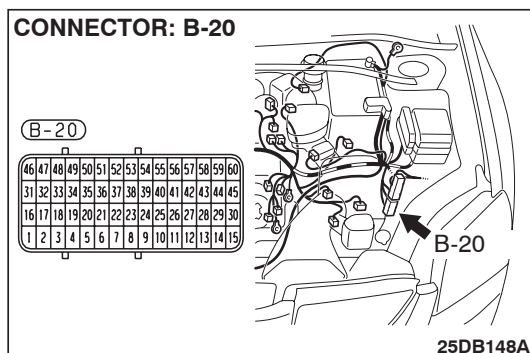


STEP 14. Check the wiring harness between powertrain control module connector B-20 (terminal 6) and A/C compressor clutch relay connector B-18X (terminal 3).

Q: Is the wiring harness between powertrain control module connector B-20 (terminal 6) and A/C compressor clutch relay connector B-18X (terminal 3) in good condition?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions [P.00-14](#).

NO : Repair the wiring harness. Check that the air conditioning works normally.

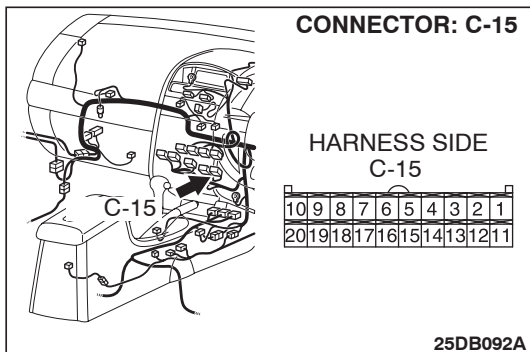


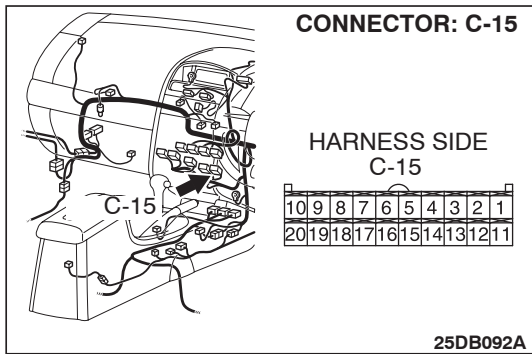
STEP 15. Check A/C-ECU connector C-15 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is A/C-ECU connector C-15 in good condition?

YES : Go to Step 16.

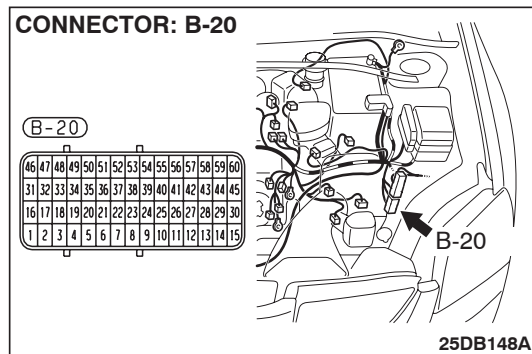
NO : Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that the air conditioning works normally.



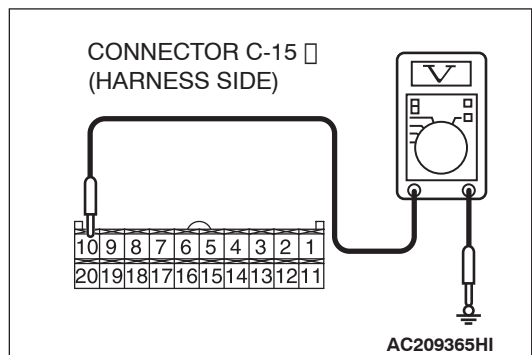
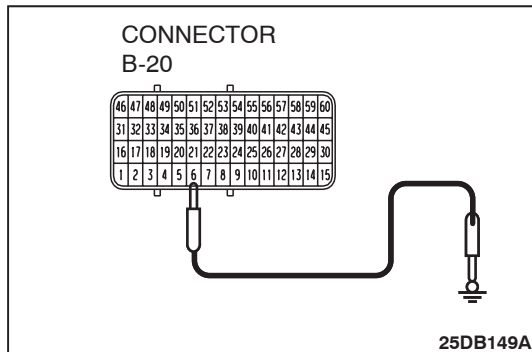


STEP 16. Measure the voltage at A/C-ECU connector C-15.

- (1) Disconnect A/C-ECU connector C-15 and measure the voltage at the relay box side.



- (2) Disconnect powertrain control module connector B-20 and ground harness side terminal No.6.
- (3) Turn the ignition switch to the "ON" position.



- (4) Measure the voltage between A/C-ECU connector C-15 terminal No.10 and ground.

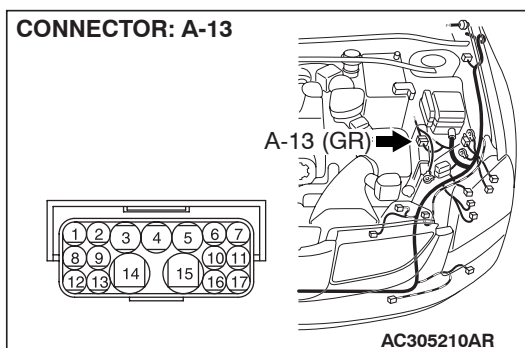
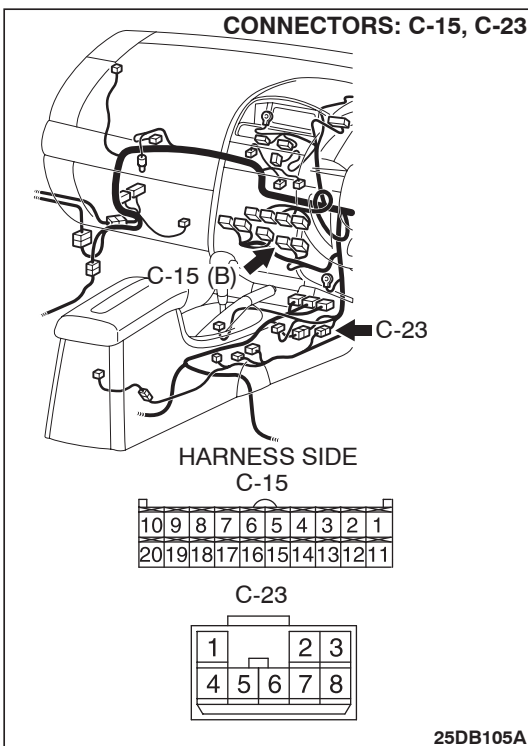
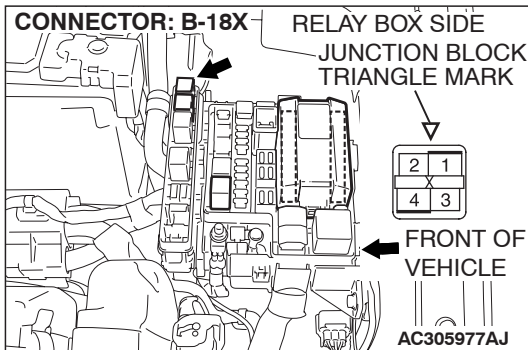
- The measured value should be approximately 12 volts (battery positive voltage).

Q: Does the measured voltage correspond with this range?

YES : Go to Step 18.

NO : Go to Step 17.

STEP 17. Check the wiring harness between A/C compressor clutch relay connector B-18X (terminal 4) and A/C-ECU connector C-15 (terminal 10).



NOTE: Also check intermediate connectors A-13 and C-23 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector A-13 or C-23 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection [P.00E-2](#).

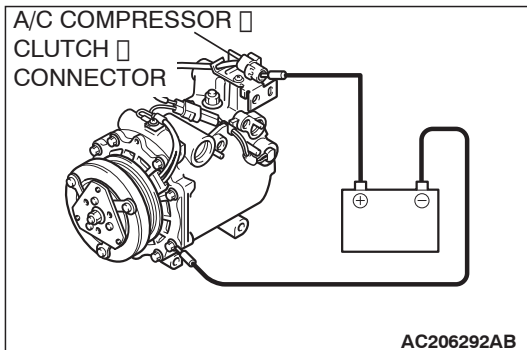
Q: Is the wiring harness between A/C compressor clutch relay connector B-18X (terminal 4) and A/C-ECU connector C-15 (terminal 10) in good condition?

YES : It can be assumed that this malfunction is intermittent.

Refer to GROUP 00, How to Use

Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions [P.00-14](#).

NO : Repair the wiring harness. Check that the air conditioning works normally.



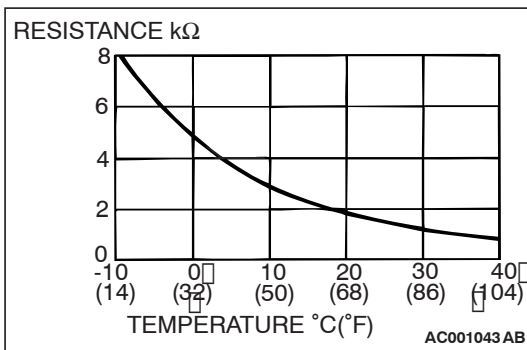
STEP 18. Check the air conditioning compressor clutch operation.

Connect the compressor connector terminal to the battery positive (+) terminal and ground the battery's negative (-) terminal to the compressor unit. At that time, the air conditioning compressor clutch should make a definite operating sound.

Q: Can the sound (click) of the air conditioning compressor clutch operation be heard?

YES : Go to Step 19.

NO : Replace the compressor magnet clutch. Check that the air conditioning works normally.



STEP 19. Check the air thermo sensor.

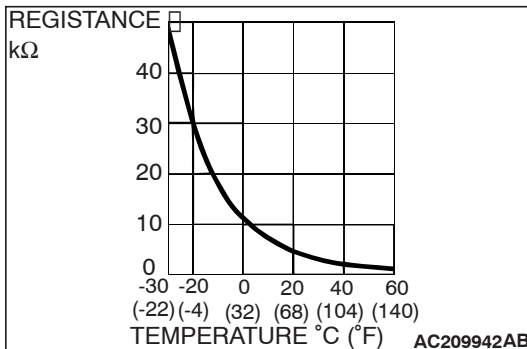
Measure the resistance between connector terminals 1 and 2 under at least two different temperatures. The resistance values should generally match those in the graph.

NOTE: The temperature at the check should not exceed the range in the graph.

Q: Is the air thermo sensor in good condition?

YES : Go to Step 20.

NO : Replace the air thermo sensor. Check that the air conditioning works normally.



STEP 20. Check the ambient air temperature sensor.

Measure the resistance between the sensor terminals under at least two temperatures. The resistance values should meet the values shown.

NOTE: The temperature should be within the shown range.

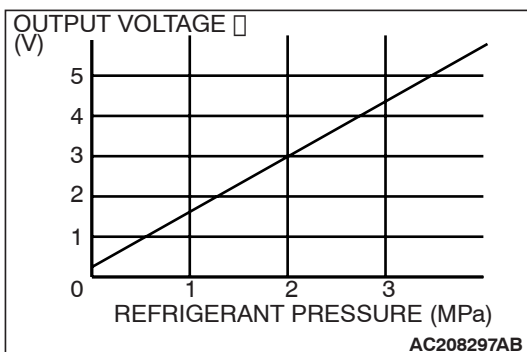
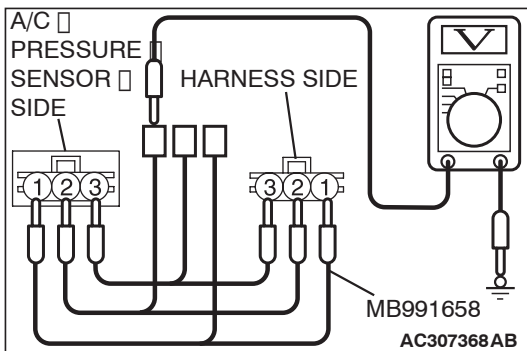
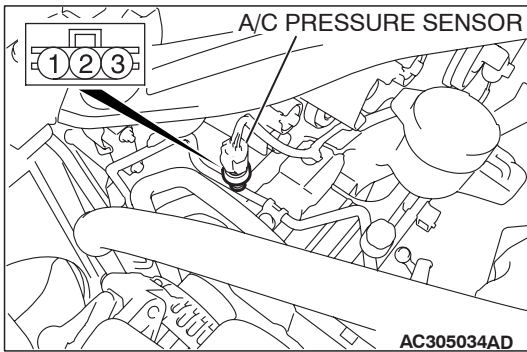
Q: Is the ambient air temperature sensor in good condition?

YES : Go to Step 22.

NO : Replace the ambient air temperature sensor. Check that the air conditioning works normally.

STEP 21. Check the A/C pressure sensor operation.

- (1) Assemble a gauge manifold on the high pressure service valve.
- (2) Disconnect the A/C pressure sensor connector and connect special tool test harness MB991658 as shown in the illustration.
- (3) Turn ON the engine and then turn ON the air conditioner switch.



- (4) At this time, check to see that the voltage of A/C pressure sensor terminal No. 2 reflects the specifications of the figure.

NOTE: The allowance shall be defined as $\pm 5\%$.

Q: Is the A/C pressure sensor operating properly?

YES : Go to Step 22.

NO : Replace the A/C pressure sensor. Check that the air conditioning works normally.

STEP 22. Check the refrigerant level.

Use the refrigerant recovery station to remove all of the refrigerant, and then calculate the amount of the refrigerant and charge it.

Q: Is the refrigerant level correct?

YES : Go to Step 23.

NO : Correct the refrigerant level (Refer to On-vehicle Service [P.55-144](#)). Check that the air conditioning works normally.

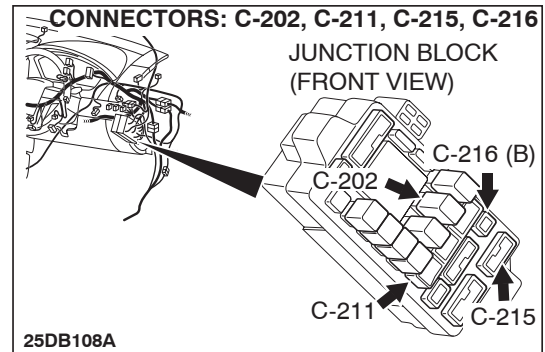
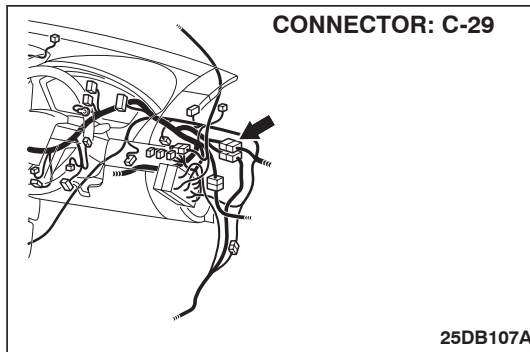
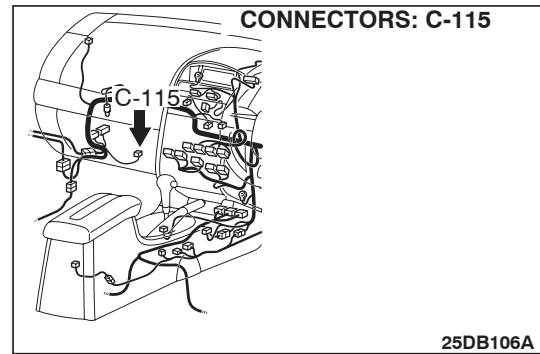
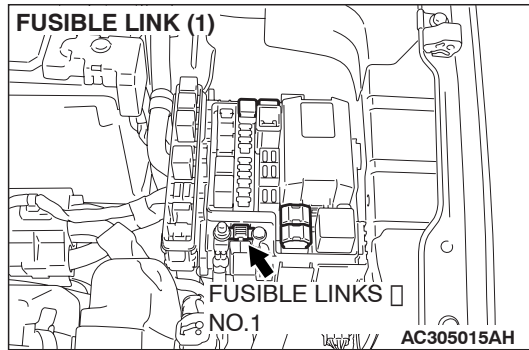
STEP 23. Replace the A/C-ECU.

Q: Does the A/C operate normally?

YES : The procedure is complete.

NO : Replace the powertrain control module. Check that the air conditioning works normally.

INSPECTION PROCEDURE 5: Front Blower Fan and Motor do not Turn.



CIRCUIT OPERATION

If the blower motor does not operate, the blower relay system is suspected.

TROUBLESHOOTING HINTS

- Malfunction of the front blower relay
- Malfunction of the power transistor
- Malfunction of the front blower motor
- Malfunction of the A/C-ECU
- Damaged harness wires or connectors
- Refer to component locations GROUP-70
- Refer to configuration diagrams GROUP-80
- Refer to circuit diagrams GROUP-90

DIAGNOSIS

Required Special Tool:

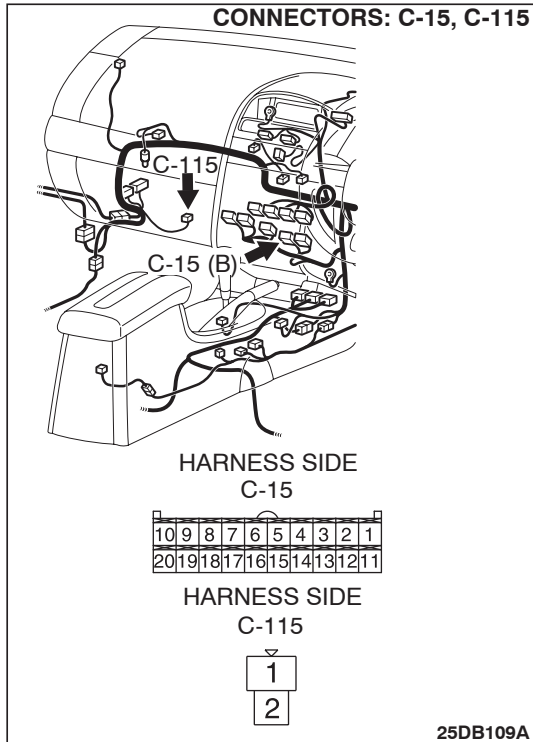
- MB991223: Test Harness Set

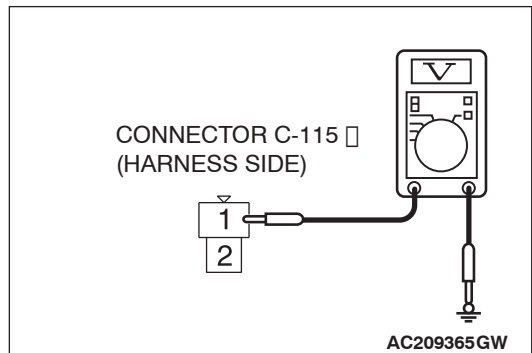
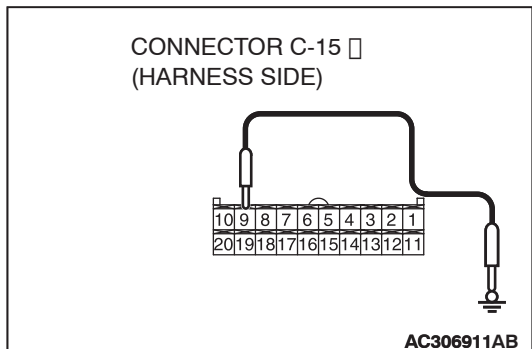
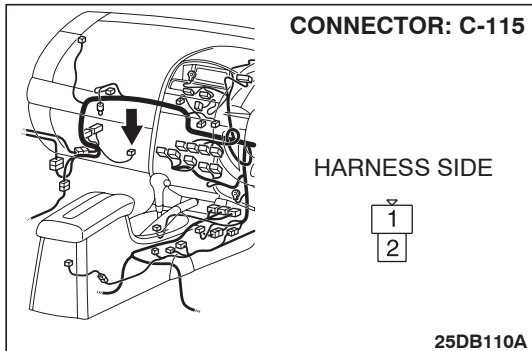
STEP 1. Check blower motor connector C-115 and A/C-ECU connector C-15 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are blower motor connector C-115 and A/C-ECU connector C-15 in good condition?

YES : Go to Step 2.

NO : Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). The blower motor should operate normally.





STEP 2. Measure the voltage at blower motor connector C-115.

(1) Disconnect blower motor connector C-115, and measure the voltage at the wiring harness side.

(2) Disconnect A/C-ECU connector C-15 and ground harness side terminal No.9.

(3) Turn the ignition switch to the "ON" position.

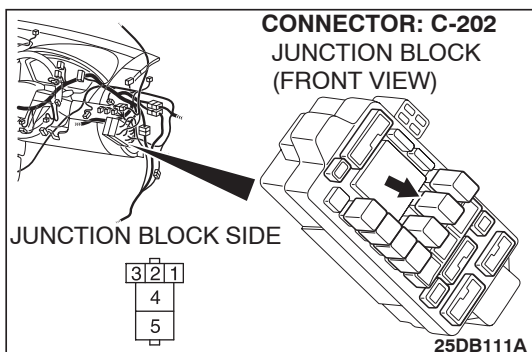
(4) Measure the voltage between C-115 (terminal 1) and ground.

- The measured value should be approx. 12 volts (battery positive voltage).

Q: Is the measured voltage approx. 12 volts?

YES : Go to Step 11.

NO : Go to Step 3.

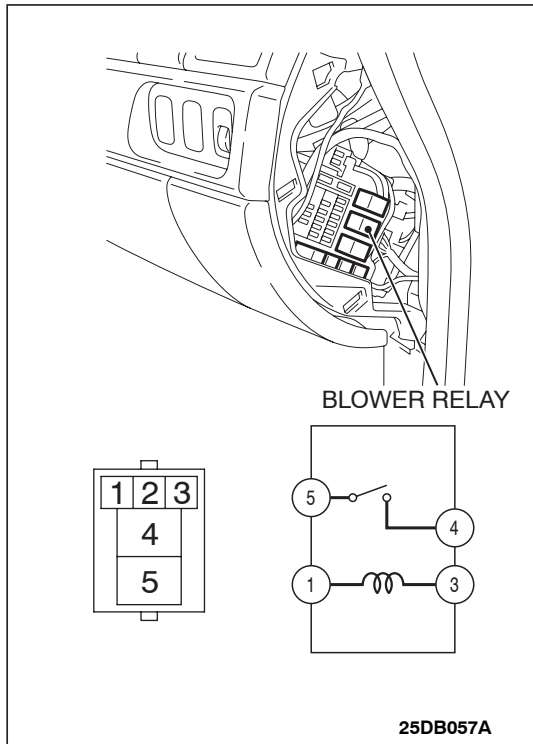


STEP 3. Check blower relay connector C-202 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is blower relay connector C-202 in good condition?

YES : Go to Step 4.

NO : Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). The blower motor should operate normally.



STEP 4. Check the blower relay continuity.

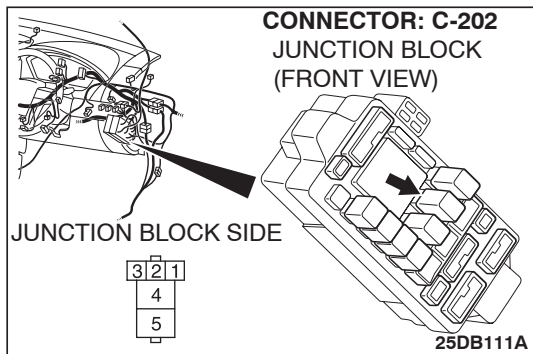
Follow the table below to check the blower relay for continuity.

BATTERY VOLTAGE	TESTER CONNECTION	SPECIFIED CONDITION
Not applied	4 – 5	Open circuit
<ul style="list-style-type: none"> Connect terminal 1 to the positive battery terminal Connect terminal 3 to the negative battery terminal 	4 – 5	Less than 2 ohms

Q: Is the blower relay continuity in good condition?

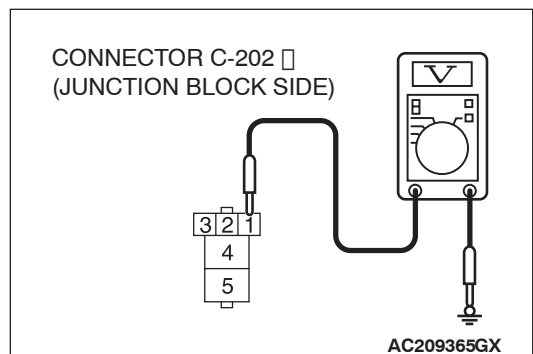
YES : Go to Step 5.

NO : Replace the blower relay. The blower motor should operate normally.



STEP 5. Measure the voltage at blower relay connector C-202.

- (1) Disconnect blower relay connector C-202, and measure the voltage at the junction block side.
- (2) Turn the ignition switch to the "ON" position.



- (3) Measure the voltage between terminal 1 and ground.

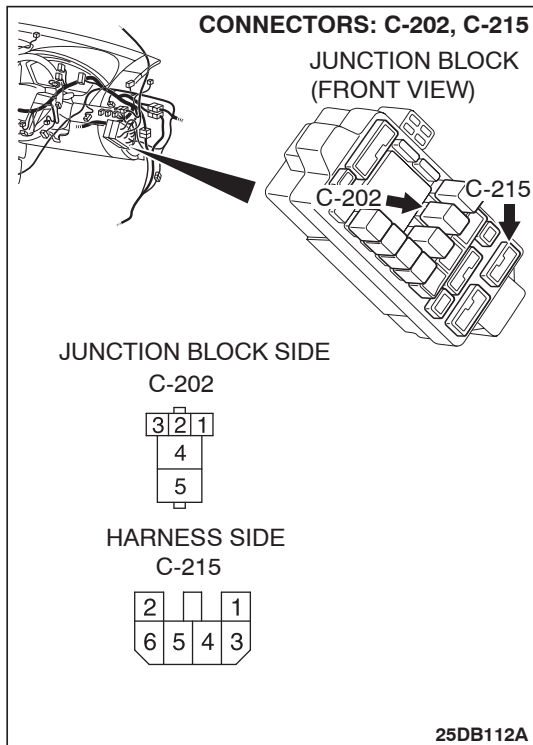
- The measured value should be approximately 12 volts (battery positive voltage).

Q: Is the measured voltage approx. 12 volts?

YES : Go to Step 7.

NO : Go to Step 6.

STEP 6. Check the wiring harness between blower relay connector C-202 (terminal 1) and the ignition switch (IG2).



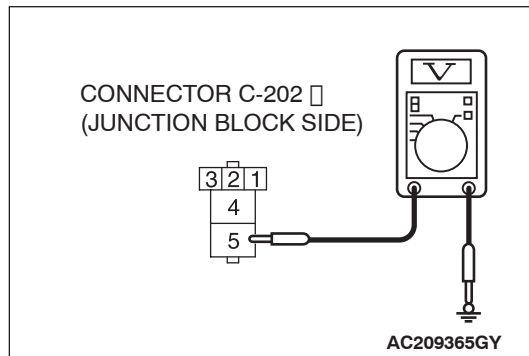
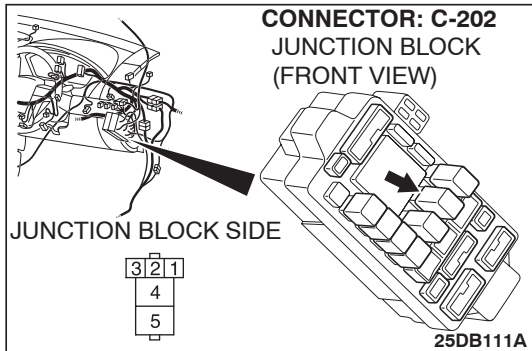
NOTE: Also check junction block connector C-215 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If junction block connector C-215 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection [P.00E-2](#).

Q: Is the wiring harness between blower relay connector C-202 (terminal 1) and the ignition switch (IG2) in good condition?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use

Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions [P.00-14](#).

NO : Repair the wiring harness. The blower motor should operate normally.



STEP 7. Measure the voltage at blower relay connector C-202.

(1) Disconnect blower relay connector C-202, and measure the voltage at the junction block side.

(2) Measure the voltage between terminal 5 and ground.

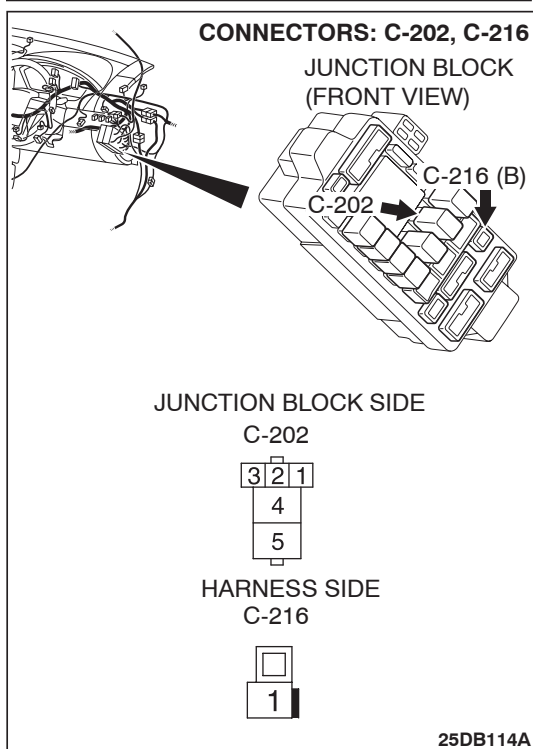
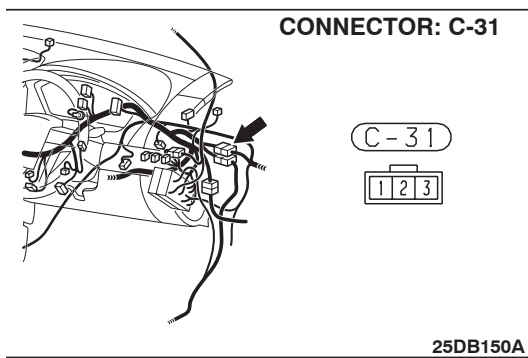
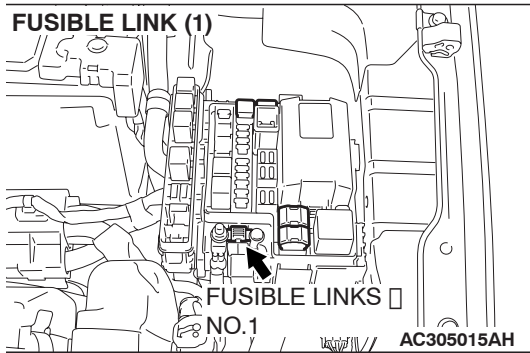
- The measured value should be approximately 12 volts (battery positive voltage).

Q: Is the measured voltage approx. 12 volts?

YES : Go to Step 9.

NO : Go to Step 8.

STEP 8. Check the wiring harness between blower relay connector C-202 (terminal 5) and fusible link (1).



NOTE: Also check intermediate connector C-31 and junction block connector C-216 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-31, junction block connector C-216 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between blower relay connector C-202 (terminal 5) and fusible link (1) in good condition?

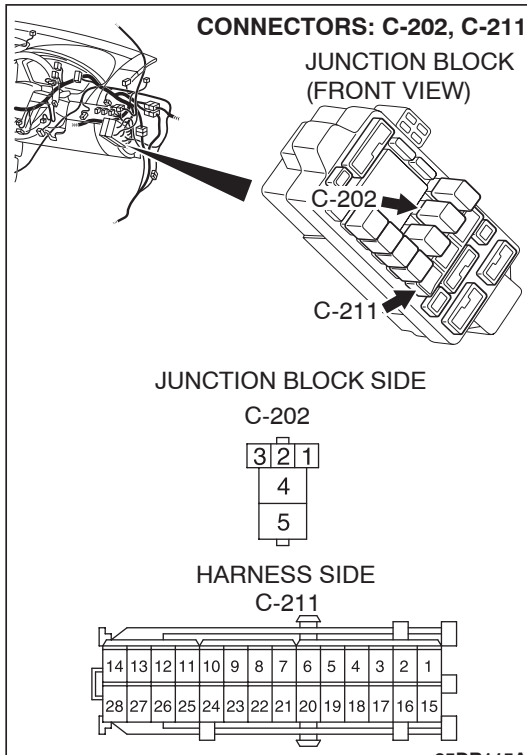
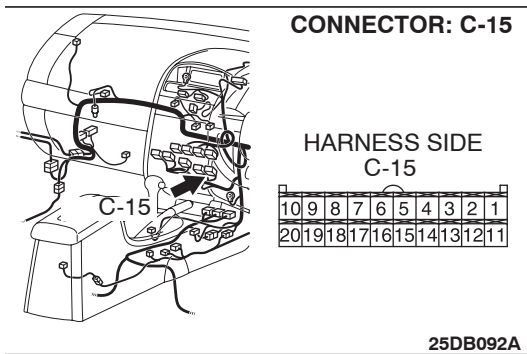
YES : It can be assumed that this malfunction is intermittent.

Refer to GROUP 00, How to Use

Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-14.

NO : Repair the wiring harness. The blower motor should operate normally.

STEP 9. Check the wiring harness between blower relay connector C-202 (terminal 3) and A/C-ECU connector C-15 (terminal 9).



NOTE: Also check junction block connector C-211 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If junction block connector C-211 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection [P.00E-2](#).

Q: Is the wiring harness between blower relay connector C-202 (terminal 3) and A/C-ECU connector C-15 (terminal 9) in good condition?

YES : Go to Step 10.

NO : Repair the wiring harness. The blower motor should operate normally.

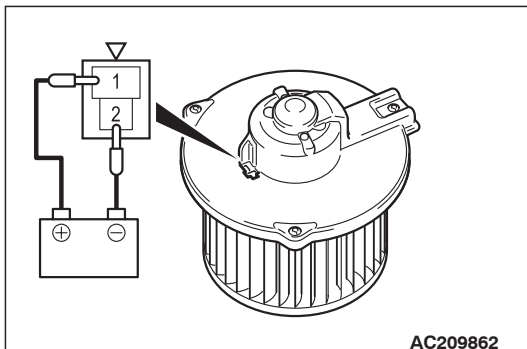
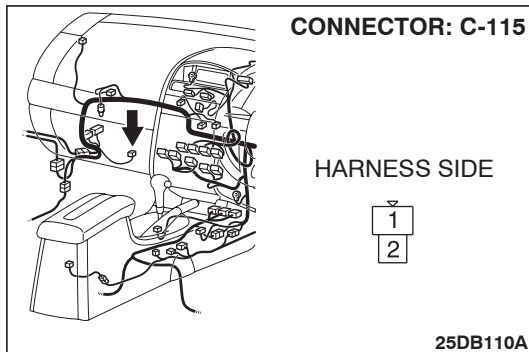
STEP 10. Check the wiring harness between blower motor connector C-115 (terminal 1) and blower relay connector C-202 (terminal 4).

Q: Is the wiring harness between blower motor connector C-115 (terminal 1) and blower relay connector C-202 (terminal 4) in good condition?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions [P.00-14](#).

NO : Repair the wiring harness. The blower motor should operate normally.

NOTE: Also check junction block connector C-215 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If junction block connector C-215 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection [P.00E-2](#).



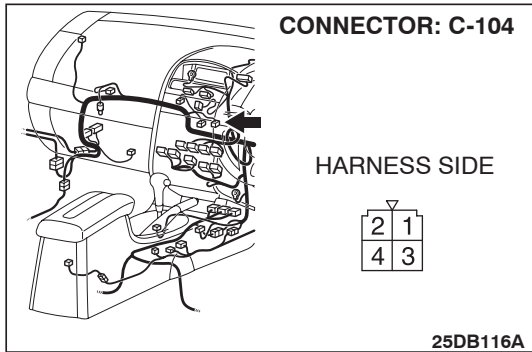
STEP 11. Check the blower fan and motor operation.

When battery voltage is applied between the terminals, check that the motor operates. Also, check that there is no abnormal noise.

Q: Is there any abnormal noise?

YES : Go to Step 12.

NO : Replace the blower relay. The blower motor should operate normally.

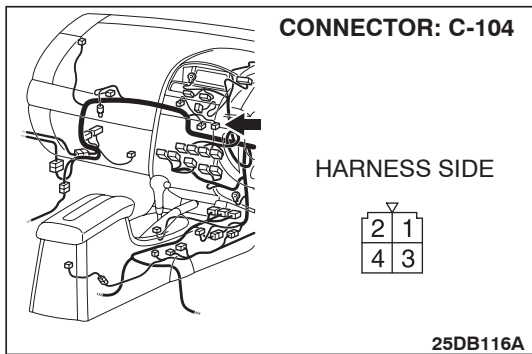


STEP 12. Check blower power transistor connector C-104 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is power transistor connector C-104 in good condition?

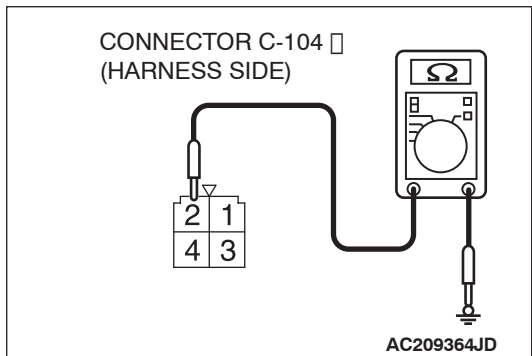
YES : Go to Step 13.

NO : Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). The blower motor should operate normally.



STEP 13. Measure the resistance at power transistor connector C-104.

(1) Disconnect power transistor connector C-104, and measure the resistance at the wiring harness side.



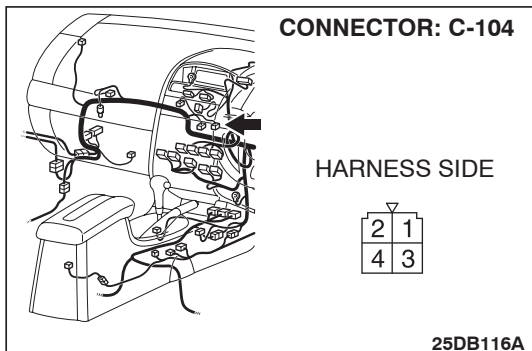
(2) Measure the resistance value between terminal 2 and ground.

- The measured value should be 2 ohms or less.

Q: Does the measured resistance value correspond with this range?

YES : Go to Step 15.

NO : Go to Step 14.

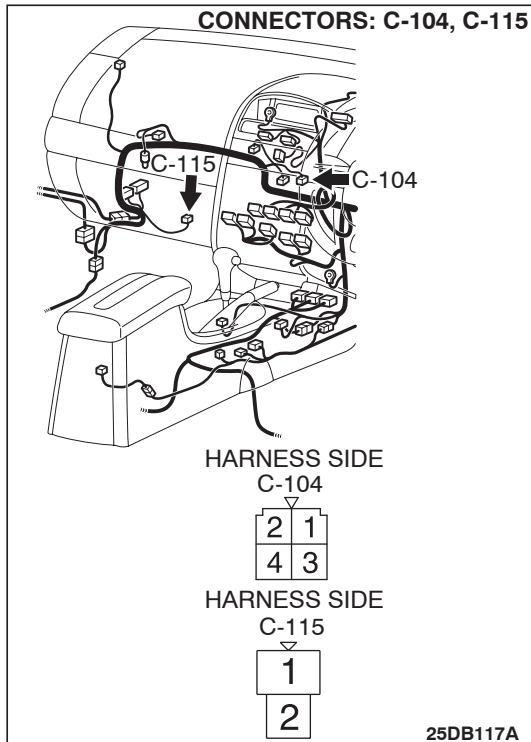


STEP 14. Check the wiring harness between power transistor connector C-104 (terminal 2) and ground.

Q: Is the wiring harness between power transistor connector C-104 (terminal 2) and ground in good condition?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions [P.00-14](#).

NO : Repair the wiring harness. The blower motor should operate normally.

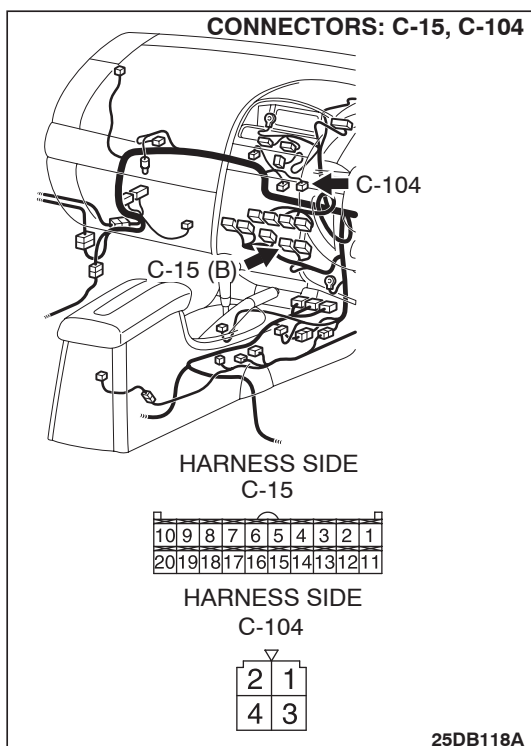


STEP 15. Check the wiring harness between power transistor connector C-104 (terminal 4) and blower motor connector C-115 (terminal 2).

Q: Is the wiring harness between power transistor connector C-104 (terminal 4) and blower motor connector C-115 (terminal 2) in good condition?

YES : Go to Step 16.

NO : Repair the wiring harness. The blower motor should operate normally.



STEP 16. Check the wiring harness between power transistor connector C-104 (terminals 1 and 3) and A/C-ECU connector C-15 (terminals 17 and 18).

Q: Are the wiring harness between power transistor connector C-104 (terminals 1 and 3) and A/C-ECU connector C-15 (terminals 17 and 18) in good condition?

YES : Go to Step 17.

NO : Repair the wiring harness. The blower motor should operate normally.

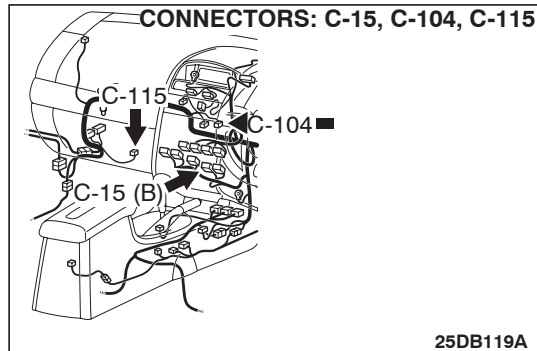
STEP 17. Replace the power transistor.

Q: Does the blower motor operate normally?

YES : No action is necessary and testing is complete.

NO : Replace the A/C-ECU. Check that the air conditioning works normally.

INSPECTION PROCEDURE 6: Front Blower Air Amount cannot be Changed.



CIRCUIT OPERATION

If the blower motor speed cannot be changed, the power transistor circuit is suspected.

TROUBLESHOOTING HINTS

- Malfunction of the power transistor

- Malfunction of the front A/C-ECU
- Damaged harness wires or connectors
- Refer to component locations GROUP-70
- Refer to configuration diagrams GROUP-80
- Refer to circuit diagrams GROUP-90

DIAGNOSIS

Required Special Tool:

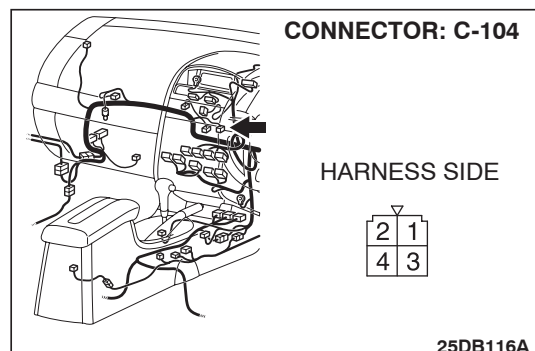
- MB991223: Test Harness Set

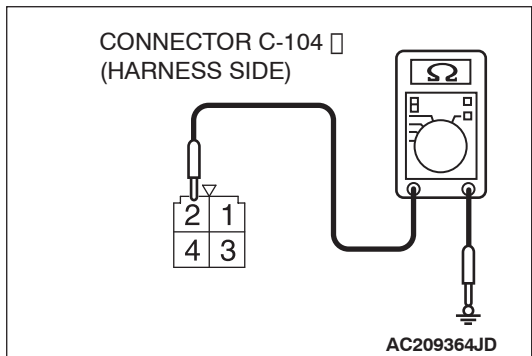
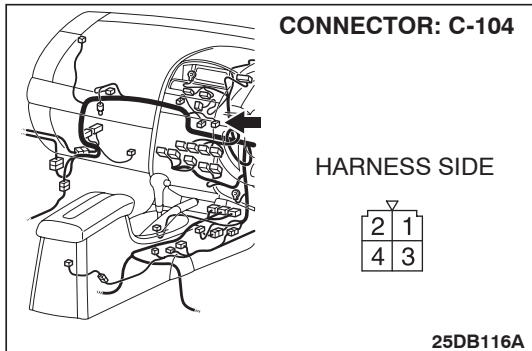
STEP 1. Check blower power transistor connector C-104 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is power transistor connector C-104 in good condition?

YES : Go to Step 2.

NO : Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The blower motor should operate normally.





STEP 2. Measure the resistance at power transistor connector C-104.

- (1) Disconnect power transistor connector C-104, and measure the resistance at the wiring harness side.

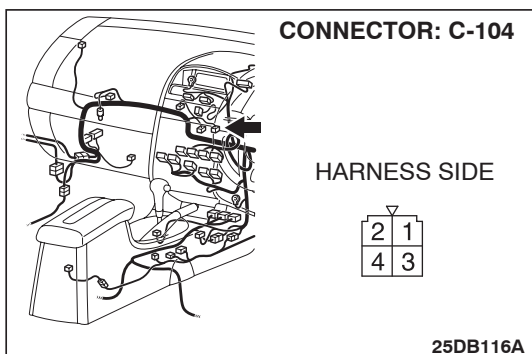
- (2) Measure the resistance value between terminal 2 and ground.

- The measured value should be 2 ohms or less.

Q: Does the measured resistance value correspond with this range?

YES : Go to Step 4.

NO : Go to Step 3.

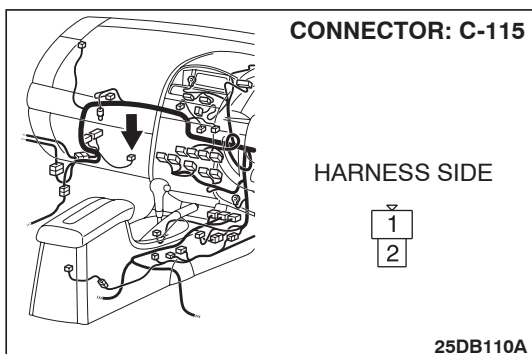


STEP 3. Check the wiring harness between power transistor connector C-104 (terminal 2) and ground.

Q: Is the wiring harness between power transistor connector C-104 (terminal 2) and ground in good condition?

YES : The blower motor should operate normally.

NO : Repair the wiring harness. The blower motor should operate normally.

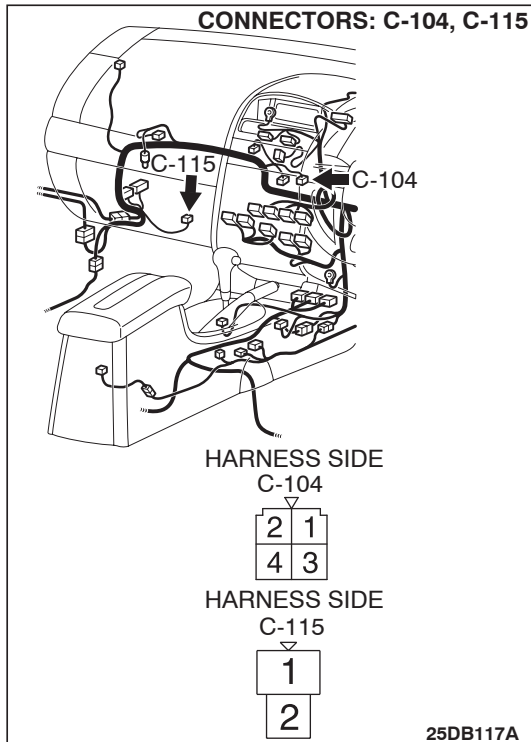


STEP 4. Check blower motor connector C-115 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is blower motor connector C-115 in good condition?

YES : Go to Step 5.

NO : Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). The blower motor should operate normally.

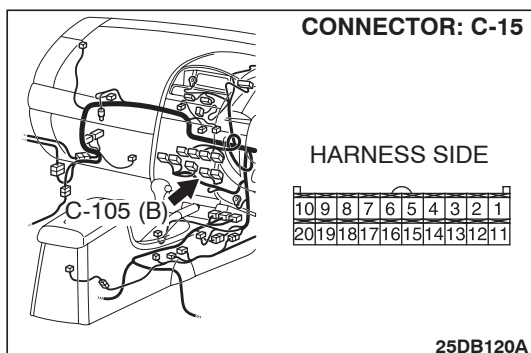


STEP 5. Check the wiring harness between power transistor connector C-104 (terminal 4) and blower motor connector C-115 (terminal 2).

Q: Is the wiring harness between power transistor connector C-104 (terminal 4) and blower motor connector C-115 (terminal 2) in good condition?

YES : Go to Step 6.

NO : Repair the wiring harness. The blower motor should operate normally.

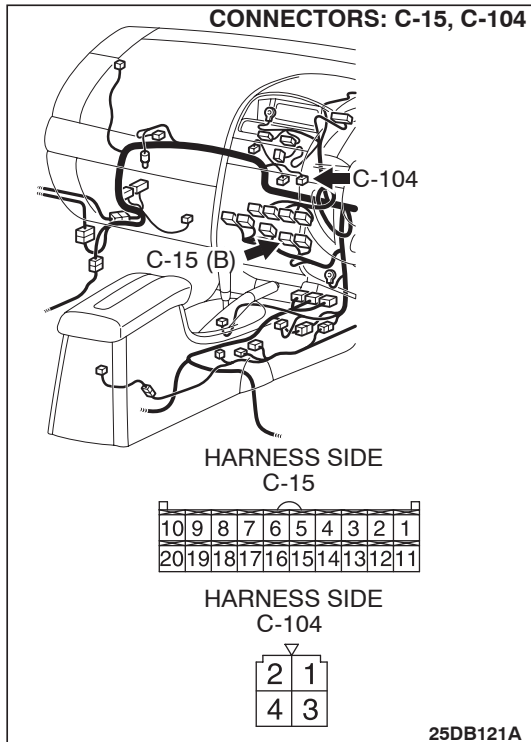


STEP 6. Check A/C-ECU connector C-15 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is A/C-ECU connector C-15 in good condition?

YES : Go to Step 7.

NO : Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). The blower motor should operate normally.



STEP 7. Check the wiring harness between power transistor connector C-104 (terminals 1 and 3) and A/C-ECU connector C-15 (terminals 17 and 18).

Q: Are the wiring harness between power transistor connector C-104 (terminals 1 and 3) and A/C-ECU connector C-15 (terminals 17 and 18) in good condition?

YES : Go to Step 8.

NO : Repair the wiring harness. The blower motor should operate normally.

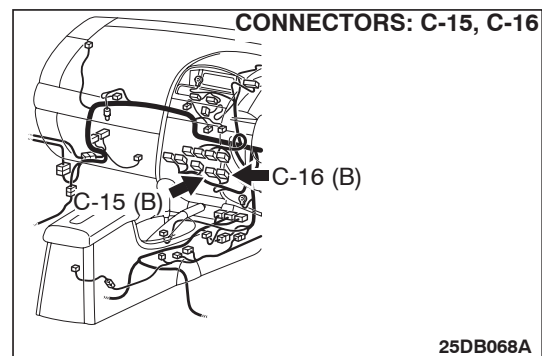
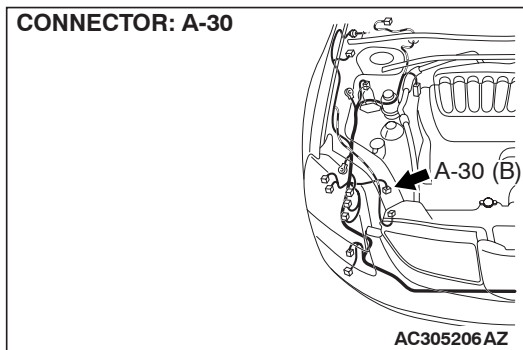
STEP 8. Replace the power transistor.

Q: Does the blower motor operate normally?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions [P.00-14](#).

NO : Replace the A/C-ECU. Check that the air conditioning works normally.

INSPECTION PROCEDURE 7: The A/C Indicator Flashes.



TECHNICAL DESCRIPTION (COMMENT)

If the A/C indicator flashes, inadequate refrigerant quantity, the ambient air temperature sensor circuit or the A/C pressure sensor circuit is suspected.

TROUBLESHOOTING HINTS

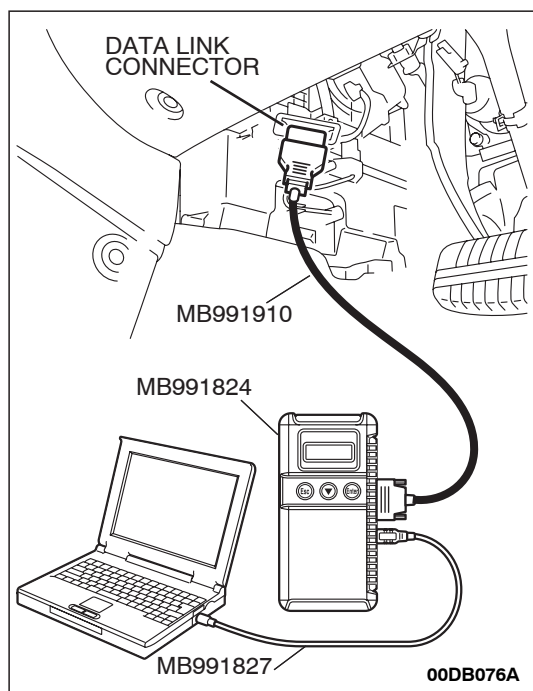
- Malfunction of the A/C pressure sensor

- Malfunction of the ambient air temperature sensor
- Malfunction of the A/C-ECU
- Refer to component locations GROUP-70
- Refer to configuration diagrams GROUP-80
- Refer to circuit diagrams GROUP-90

DIAGNOSIS

Required Special Tools:

- MB991223: Test Harness Set
- : Scan Tool (MUT-III Sub Assembly)
 - MB991824: Vehicle Communication Interface (V.C.I.)
 - MB991827: MUT-III USB Cable
 - MB991910: MUT-III Main Harness A (Vehicles with CAN communication system)



STEP 1. Using scan tool , read the diagnostic trouble code.

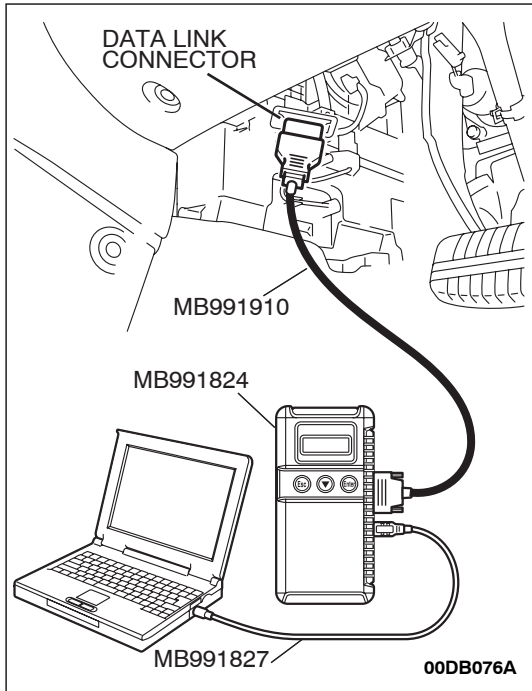
Check if an A/C-ECU DTC is set.

- (1) Connect scan tool to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Check if the DTC is set.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result satisfactory?

YES : Go to Step 2.

NO : Refer to DIAGNOSTIC TROUBLE CODE CHART
[P.55-9.](#)



STEP 2. Using scan tool , check data list item 61: A/C pressure sensor.

⚠ CAUTION

To prevent damage to scan tool , always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool .

- (1) Connect scan tool to the data link connector.
- (2) Assemble a manifold gauge onto the high pressure service valve.
- (3) Turn ON the engine and then turn ON the air conditioner switch.
- (4) Set scan tool to the data reading mode for item 61: A/C pressure sensor.
 - Check that the refrigerant pressure matches the displayed value on the scan tool.
- (5) Turn the ignition switch to the "LOCK" (OFF) position.

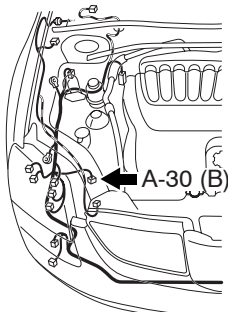
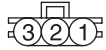
Q: Is the sensor within the specified range?

YES : Go to Step 7.

NO : Go to Step 3.

CONNECTOR: A-30

HARNESS SIDE



AC305206AY

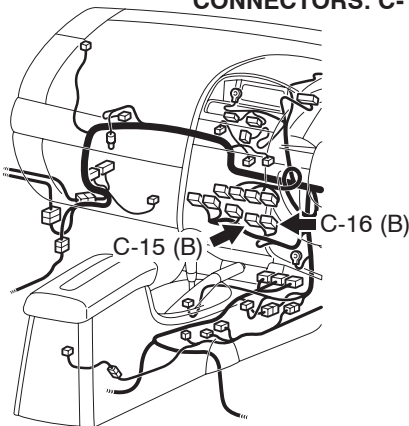
STEP 3. Check A/C pressure sensor connector A-30 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is A/C pressure sensor connector A-30 in good condition?

YES : Go to Step 4.

NO : Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that the air conditioning works normally.

CONNECTORS: C-15, C-16



HARNESS SIDE
C-15

10	9	8	7	6	5	4	3	2	1
20	19	18	17	16	15	14	13	12	11

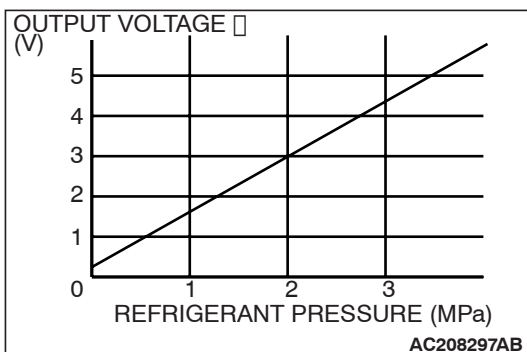
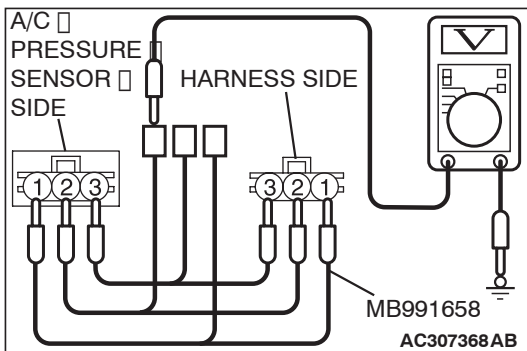
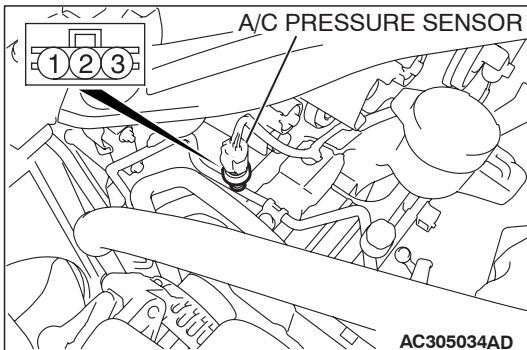
HARNESS SIDE
C-16

28	27	26	25	24	23	22	21
36	35	34	33	32	31	30	29

25DB070A

STEP 4. Check the A/C pressure sensor.

- (1) Assemble a gauge manifold on the high pressure service valve.
- (2) Disconnect the A/C pressure sensor connector and connect special tool test harness MB991658 as shown in the illustration.
- (3) Turn ON the engine and then turn ON the air conditioner switch.



- (4) At this time, check to see that the voltage of A/C pressure sensor terminal No. 2 reflects the specifications of the figure.

NOTE: The allowance shall be defined as $\pm 5\%$.

Q: Is the A/C pressure sensor in good condition?

YES : Go to Step 5.

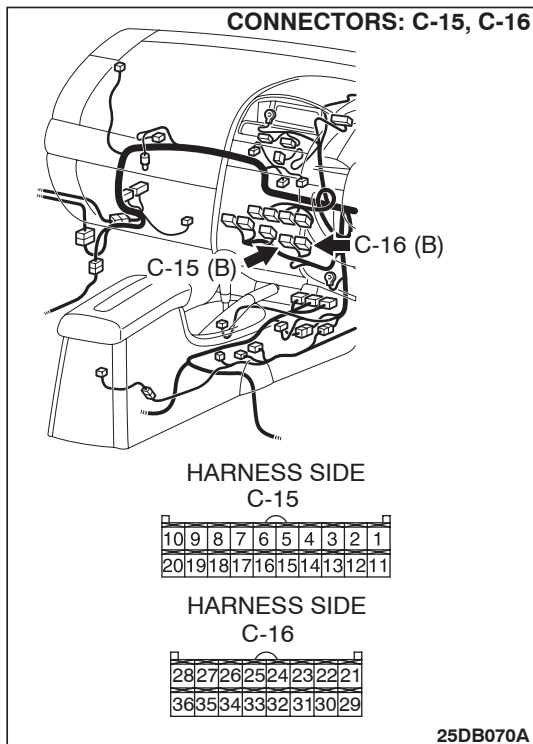
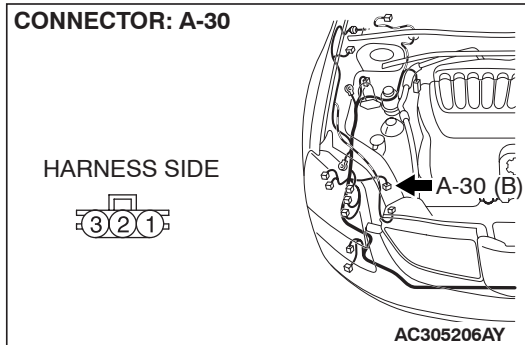
NO : Replace the A/C pressure sensor. Check that the air conditioning works normally.

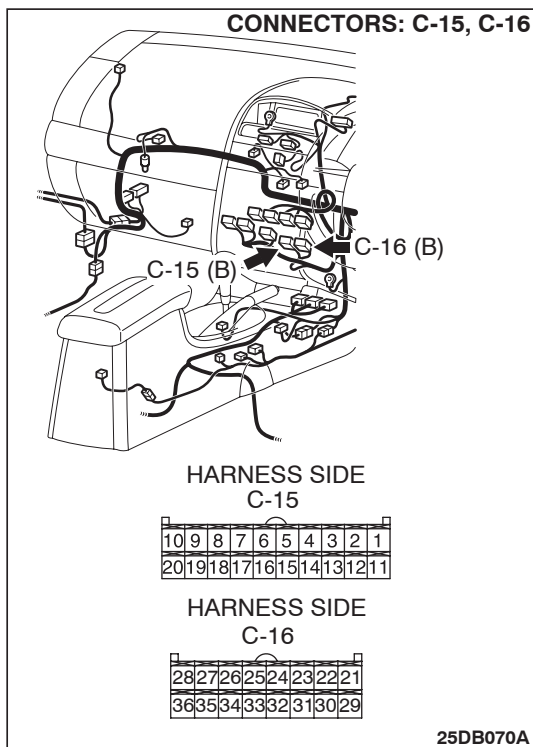
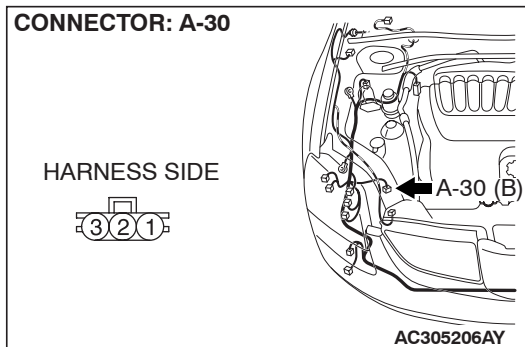
STEP 5. Check A/C-ECU C-15 and C-16 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are A/C-ECU C-15 and C-16 in good condition?

YES : Go to Step 6.

NO : Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that the air conditioning works normally.





STEP 6. Check the wiring harness between A/C-ECU connector C-15 (terminal 12), C-16 (terminals 34 and 26) and A/C pressure sensor connector A-30 (terminals 3, 1 and 2).

Q: Is the wiring harness between A/C-ECU connector C-15 (terminal 12), C-16 (terminals 34 and 26) and A/C pressure sensor connector A-30 (terminals 3, 1 and 2) in good condition?

YES : Repair the A/C-ECU. Check that the air conditioning works normally.

NO : Repair the wiring harness. Check that the air conditioning works normally.

STEP 7. Check the refrigerant level.

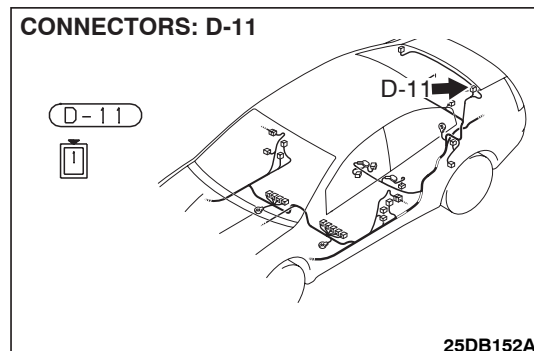
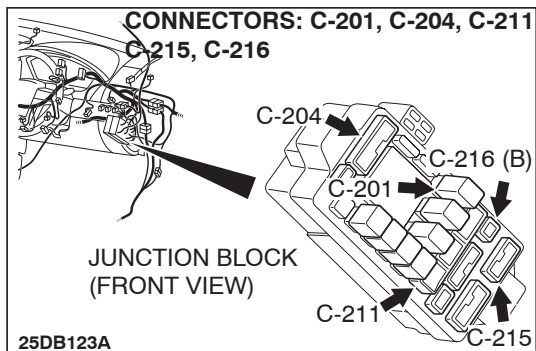
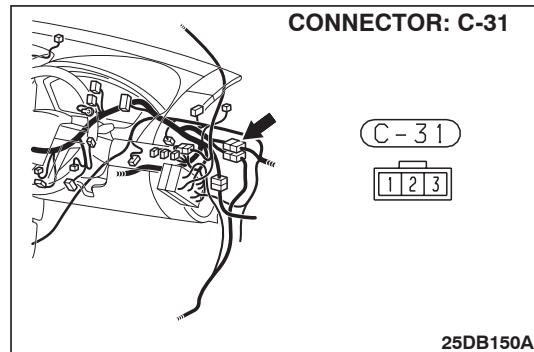
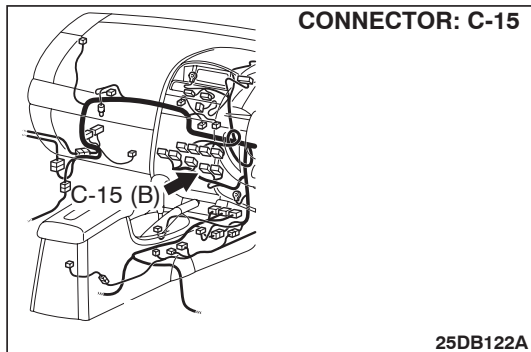
Use the refrigerant recovery station to remove all of the refrigerant, and then calculate the amount of the refrigerant and charge it.

Q: Is the refrigerant level correct?

YES : Replace the A/C-ECU. Check that the air conditioning works normally.

NO : Correct the refrigerant level (Refer to On-vehicle Service [P.55-144](#)). Check that the air conditioning works normally.

INSPECTION PROCEDURE 8: Defogger Function Does Not Operate.



TECHNICAL DESCRIPTION (COMMENT)

If the defogger does not operate when the defogger switch is turned on, the defogger relay system may be defective.

TROUBLESHOOTING HINTS

- Malfunction of the A/C-ECU
- Malfunction of the defogger relay
- Damaged harness wires or connectors
- Refer to component locations [GROUP-70](#)
- Refer to configuration diagrams [GROUP-80](#)
- Refer to circuit diagrams [GROUP-90](#)

DIAGNOSIS

Required Special Tool:

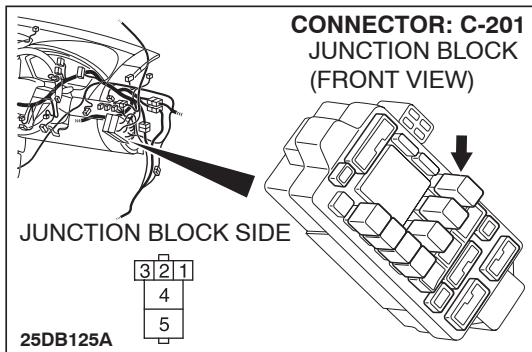
- MB991223: Test Harness Set

STEP 1. Check the A/C and outside/inside air selection damper control motor operation.

Q: Do the A/C and outside/inside air selection damper control motor work normally?

YES : Go to Step 2.

NO : Refer to Inspection procedure 10, "Malfunction of the A/C-ECU power supply system" [P.55-122.](#)

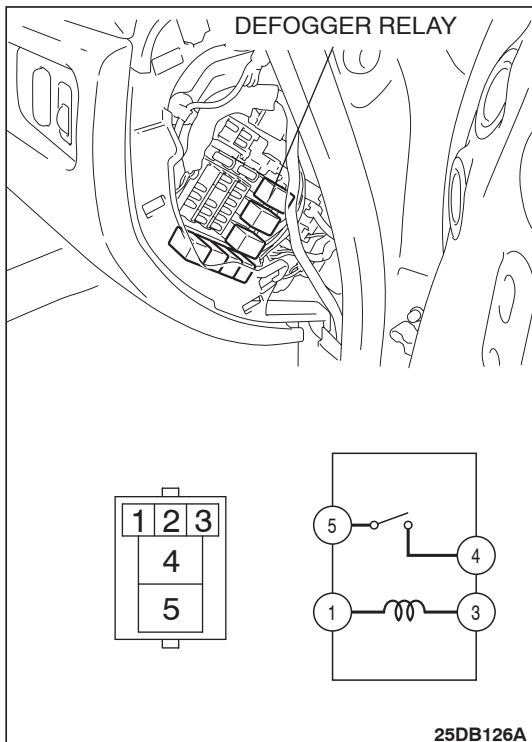


STEP 2. Check defogger relay connector C-201 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is defogger relay connector C-201 in good condition?

YES : Go to Step 3.

NO : Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). The defogger system should work normally.



STEP 3. Check the defogger relay continuity.

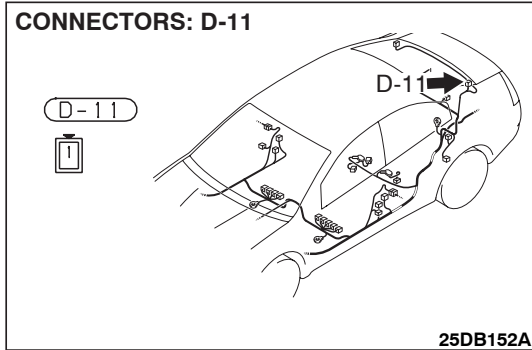
Follow the table below to check the defogger relay for continuity.

BATTERY VOLTAGE	CONNECT TESTER BETWEEN	SPECIFIED CONDITION
Not applied	4 – 5	Open Circuit
<ul style="list-style-type: none"> Connect terminal 1 to the positive battery terminal Connect terminal 3 to the negative battery terminal 	4 – 5	Less than 2 ohms

Q: Is the defogger relay in good condition?

YES : Go to Step 4.

NO : Replace the defogger relay. The defogger system should work normally.



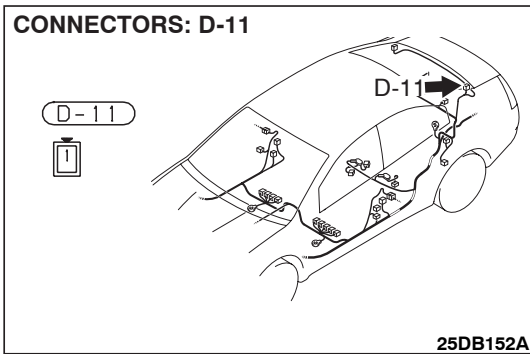
STEP 4. Check choke coil connector D-11 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is choke coil connector D-11 in good condition?

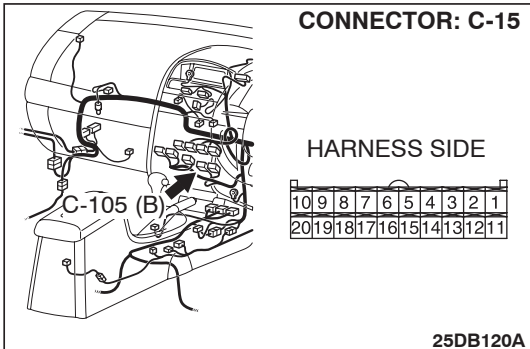
YES : Go to Step 5.

NO : Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). The defogger system should work normally.

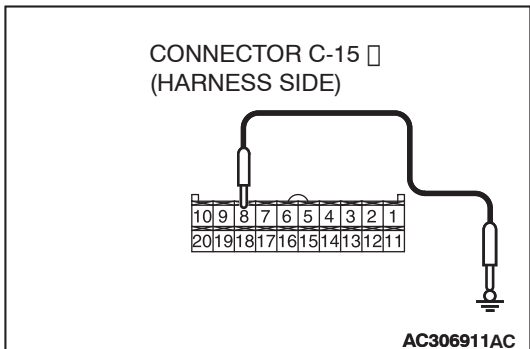
CONNECTORS: D-11



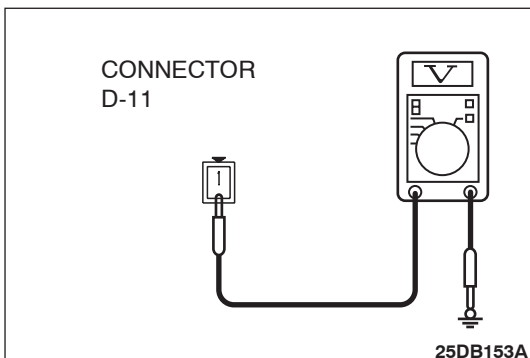
CONNECTOR: C-15



**CONNECTOR C-15 □
 (HARNESS SIDE)**



**CONNECTOR
 D-11**



STEP 5. Measure the voltage at choke coil connector D-11.

(1) Disconnect connector D-11, and measure the voltage at the harness side.

(2) Disconnect A/C-ECU connector C-15 and ground harness side terminal No.27.

(3) Turn the ignition switch to the "ON" position.

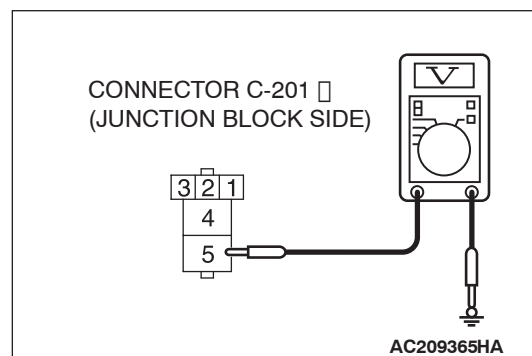
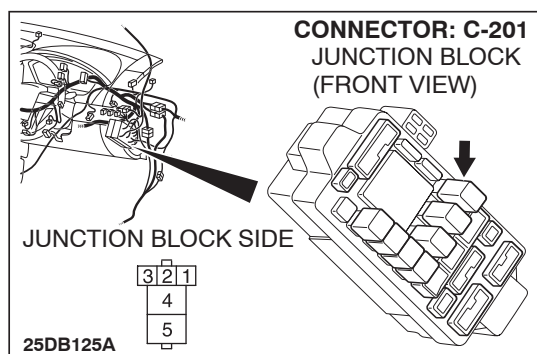
(4) Measure the voltage between choke coil connector D-11 terminal No.1 and ground.

- The measured value should be approximately 12 volts.

Q: Is the measured voltage approx. 12 volts?

YES : Go to Step 13.

NO : Go to Step 6.



STEP 6. Measure the voltage at defogger relay connector C-201.

(1) Disconnect defogger relay connector C-201, and measure the voltage at the junction block side.

(2) Measure the voltage between terminal 5 and ground.

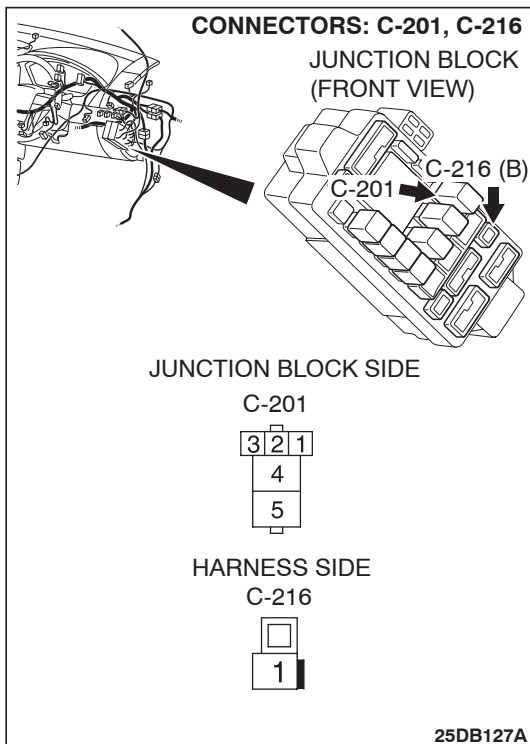
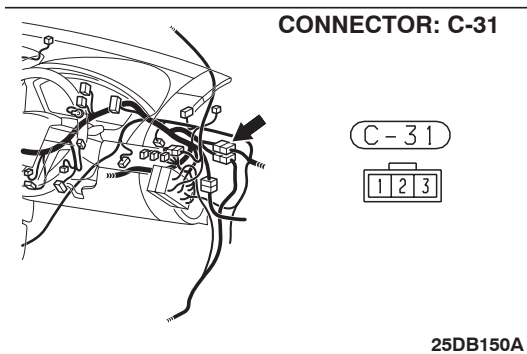
- The measured value should be approximately 12 volts (battery positive voltage).

Q: Is the measured voltage approx. 12 volts?

YES : Go to Step 8.

NO : Go to Step 7.

STEP 7. Check the wiring harness between defogger relay connector C-201 (terminal 5) and the fusible link (1).

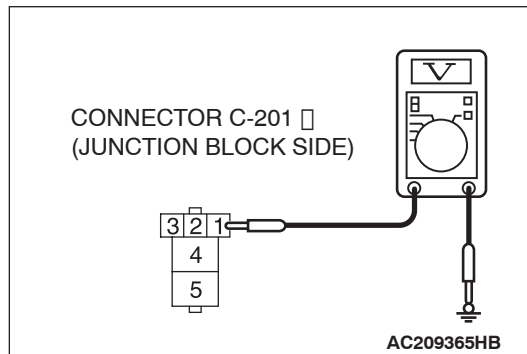
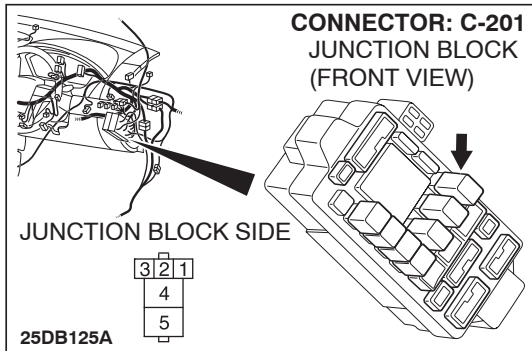


NOTE: Also check intermediate connector C-31 and junction block connector C-216 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-31 and junction block connector C-216 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection [P.00E-2](#).

Q: Is the wiring harness between defogger relay connector C-201 (terminal 5) and the fusible link (1) in good condition?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions [P.00-14](#).

NO : Repair the wiring harness. Check that the defogger system works normally.



STEP 8. Measure the voltage at defogger relay connector C-201.

- (1) Disconnect defogger relay connector C-201, and measure the voltage at the junction block side.
- (2) Turn the ignition switch to the "ON" position.

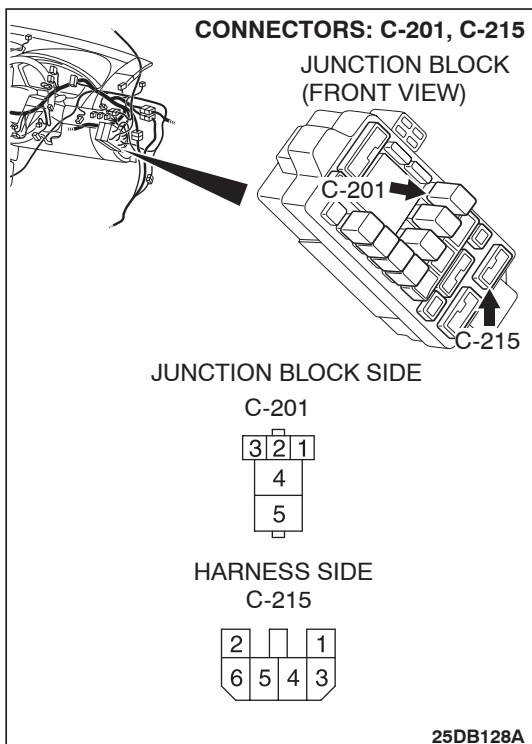
- (3) Measure the voltage between terminal 1 and ground.
 - The measured value should be approximately 12 volts (battery positive voltage).

Q: Is the measured voltage approx. 12 volts?

YES : Go to Step 10.

NO : Go to Step 9.

STEP 9. Check the wiring harness between defogger relay connector C-201 (terminal 1) and ignition switch (IG2).



NOTE: Also check junction block connector C-215 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If junction block connector C-215 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection [P.00E-2](#).

Q: Is the wiring harness between defogger relay connector C-201 (terminal 1) and ignition switch (IG2) in good condition?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions [P.00-14](#).

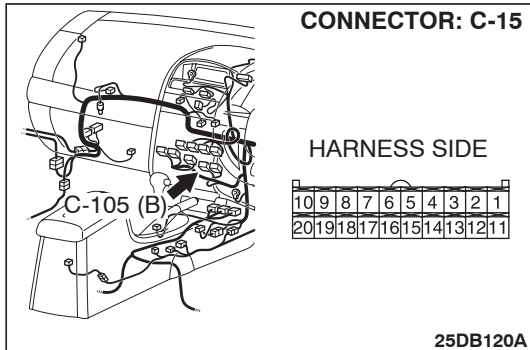
NO : Repair the wiring harness. Check that the defogger system works normally.

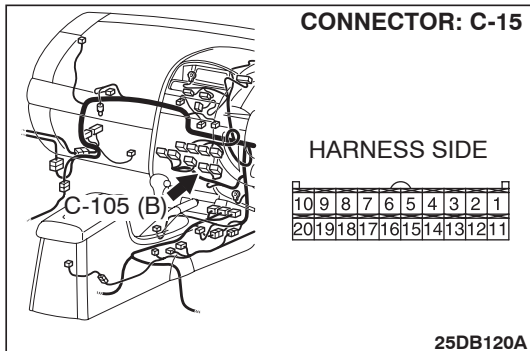
STEP 10. Check A/C-ECU connector C-15 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is A/C-ECU connector C-15 in good condition?

YES : Go to Step 11.

NO : Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that the defogger system works normally.





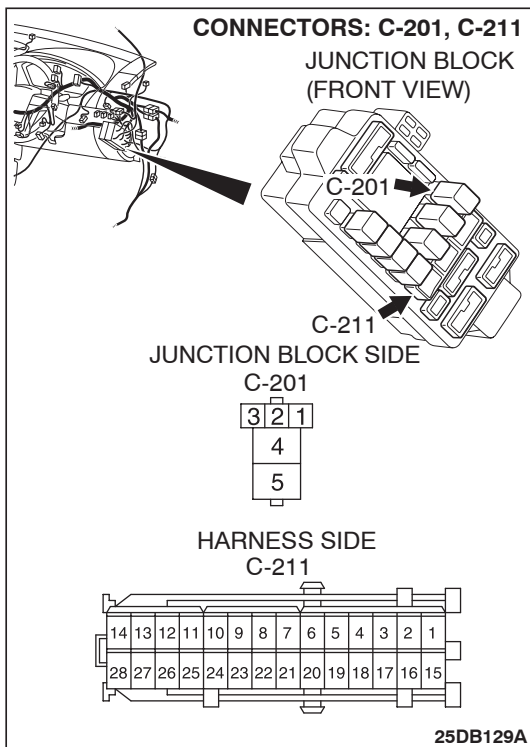
STEP 11. Check the wiring harness between defogger relay connector C-201 (terminal 3) and A/C-ECU connector C-15 (terminal 8).

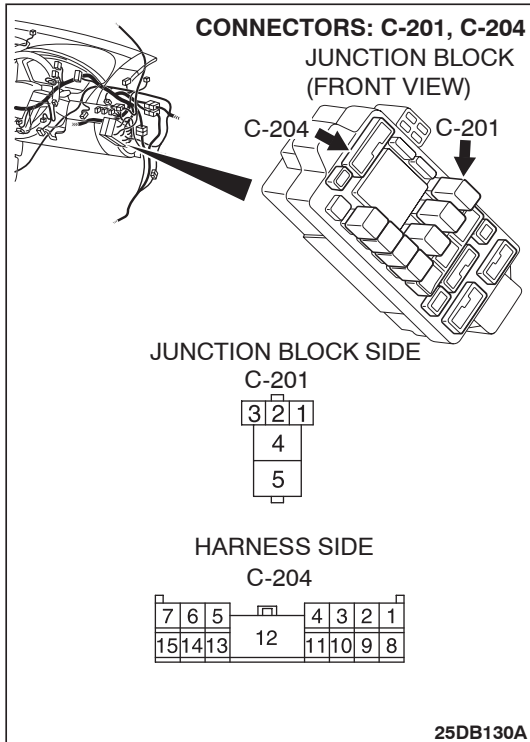
NOTE: Also check junction block connector C-211 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If junction block connector C-211 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between defogger relay connector C-201 (terminal 3) and A/C-ECU connector C-15 (terminal 8) in good condition?

YES : Go to Step 12.

NO : Repair or replace the wiring harness. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Check that the defogger system works normally.





STEP 12. Check the wiring harness between defogger relay connector C-201 (terminal 4) and choke coil connector D-11 (terminal 1).

NOTE: Also check junction block connector C-204 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If junction block connector C-204 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

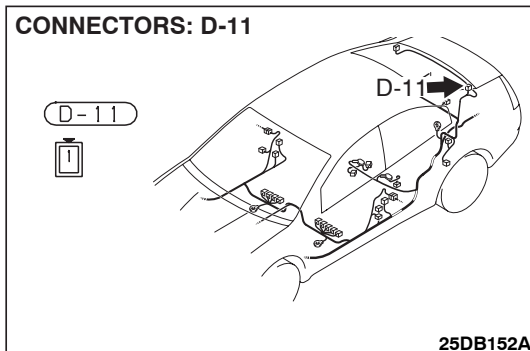
Q: Is the wiring harness between defogger relay connector C-201 (terminal 4) and choke coil connector D-11 (terminal 1) in good condition?

YES : It can be assumed that this malfunction is intermittent.

Refer to GROUP 00, How to Use

Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-14.

NO : Repair or replace the wiring harness. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Check that the defogger system works normally.

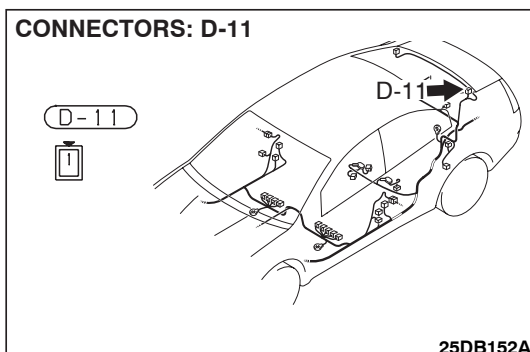


STEP 13. Check choke coil connector D-11 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

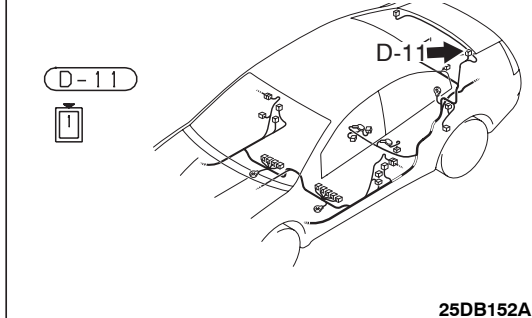
Q: Is choke coil connector D-11 in good condition?

YES : Go to Step 14.

NO : Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Check that the defogger system works normally.



CONNECTORS: D-11



STEP 14. Check the wiring harness between choke coil connector D-11 (terminal 1) and rear glass solder joint.

Q: Is the wiring harness between choke coil connector D-11 (terminal 1) and rear glass solder joint in good condition?

YES : Go to Step 15.

NO : Repair or replace the wiring harness. Refer to GROUP 00E, Harness Connector Inspection

P.00E-2. Check that the defogger system works normally.

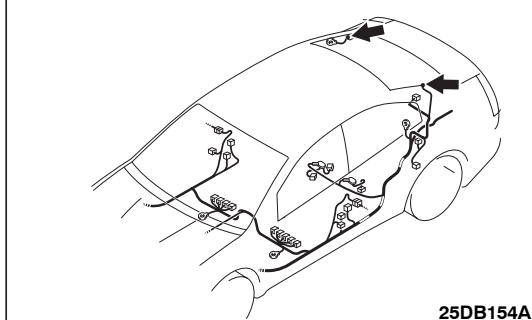
STEP 15. Check rear glass solder joints for loose, corroded or damaged joints.

Q: Are solder joints in good condition?

YES : Go to Step 16.

NO : Repair solder joint. Check that the defogger system works normally.

REAR GLASS SOLDER JOINTS:

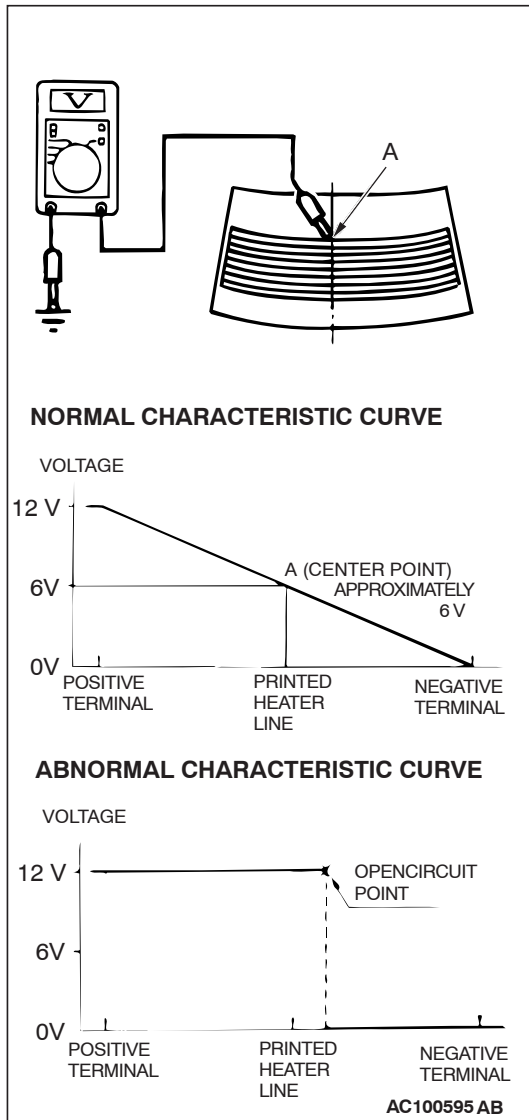


STEP 16. Check the wiring harness between RH rear glass solder joint and earth point.

Q: Is the wiring harness between RH rear glass solder joint and earth point in good condition?

YES : Go to Step 17.

NO : Repair or replace the wiring harness or repair solder joint. . Check that the defogger system works normally.



STEP 17. Check the defogger.

- (1) Let the engine run at 2,000 r/min, and check the printed heater with the battery fully charged.
- (2) Turn on the defogger switch, and use a voltmeter to measure the voltage in each printed heater at middle point A on the rear window glass.
 - The value should be approximately 6 volts.

Q: Does the defogger work normally?

YES : Replace the A/C-ECU. Check that the defogger system works normally.

NO : Repair the defogger. Or replace rear glass. Refer to GROUP 42, Rear Window Glass.[P.42-12](#)

INSPECTION PROCEDURE 9: Defogger Timer Function does not Operate.

CIRCUIT OPERATION

Turn ON the defogger switch. If the defogger does not shut off after about 16 minutes then the defogger timer is malfunctioning.

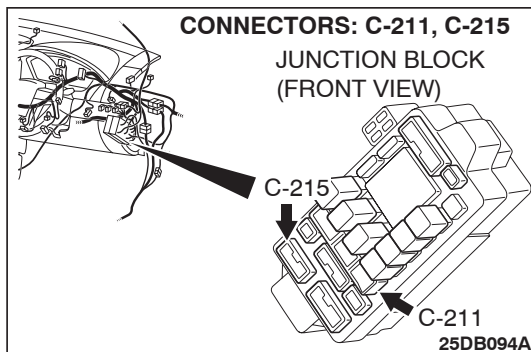
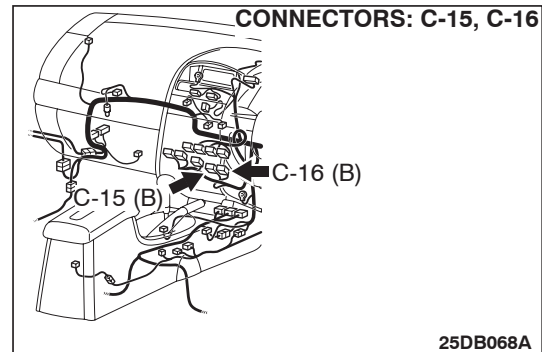
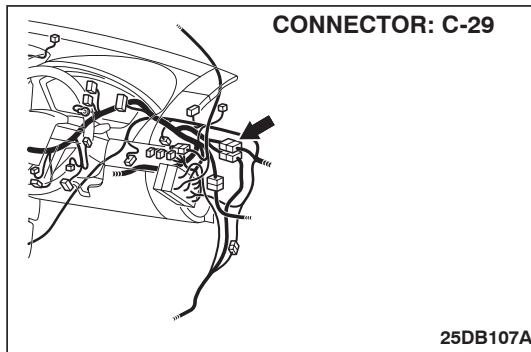
TROUBLESHOOTING HINT

- Malfunction of the A/C-ECU
- Malfunction of the defogger timer
- Refer to component locations [GROUP-70](#)
- Refer to configuration diagrams [GROUP-80](#)
- Refer to circuit diagrams [GROUP-90](#)

DIAGNOSIS

Replace the A/C-ECU.

INSPECTION PROCEDURE 10: Malfunction of the A/C-ECU Power Supply System.



TECHNICAL DESCRIPTION (COMMENT)

The A/C-ECU power system may be defective if the air conditioner, defogger, and outside/inside air selection damper motor all do not operate normally.

TROUBLESHOOTING HINTS

- Malfunction of the A/C-ECU
- Damaged harness wires or connectors
- Refer to component locations GROUP-70
- Refer to configuration diagrams GROUP-80
- Refer to circuit diagrams GROUP-90

DIAGNOSIS

Required Special Tool:

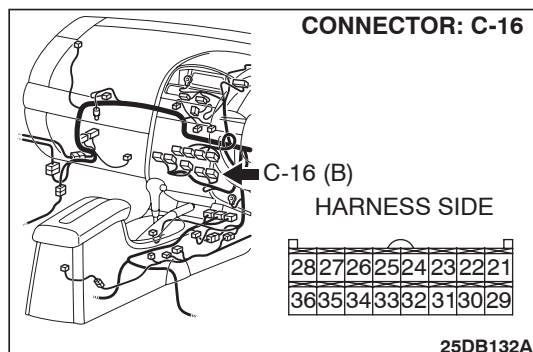
- MB991223: Test Harness Set

STEP 1. Check A/C-ECU connector C-16 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

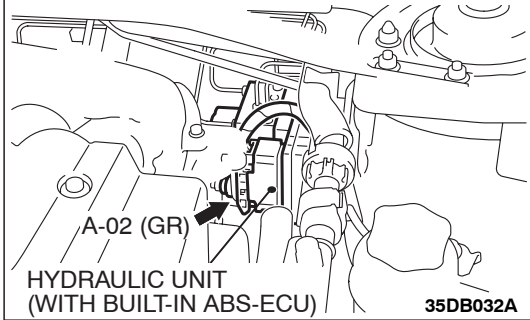
Q: Is A/C-ECU connector C-16 in good condition?

YES : Go to Step 2.

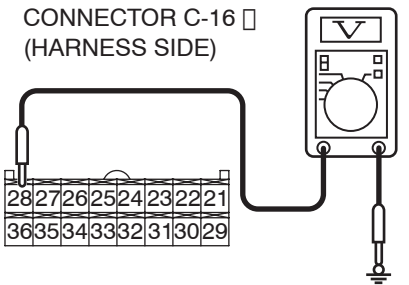
NO : Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Check that the air conditioning works normally.



CONNECTOR: A-02



**CONNECTOR C-16 □
(HARNESS SIDE)**



STEP 2. Measure the voltage at A/C-ECU connector C-16.

- (1) Disconnect A/C-ECU connector C-16 and measure the voltage at the harness side.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between terminal 28 and ground.
 - The measured value should be approximately 12 volts (battery positive voltage).

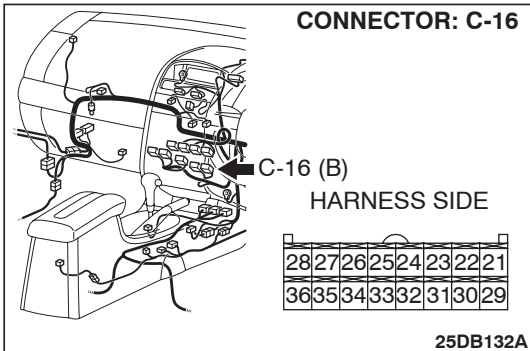
Q: Is the measured voltage approx. 12 volts?

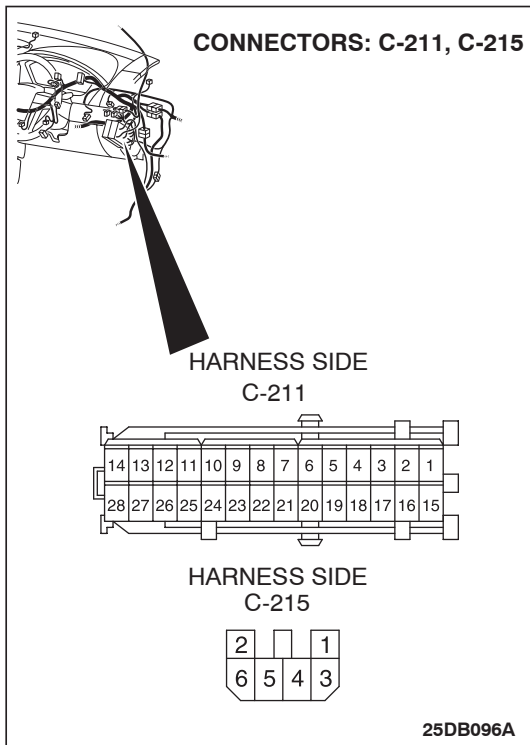
YES : Go to Step 4.

NO : Go to Step 3.

STEP 3. Check the wiring harness between A/C-ECU connector C-16 (terminal 28) and the ignition switch (IG2).

CONNECTOR: C-16



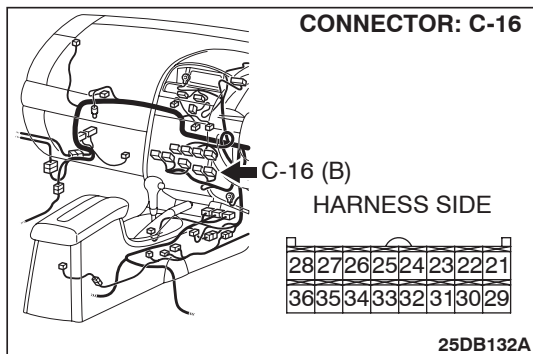


NOTE: Also check junction block connectors C-211 and C-215 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If junction block connector C-211 or C-215 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection [P.00E-2](#).

Q: Is the wiring harness between A/C-ECU connector C-16 (terminal 28) and the ignition switch (IG2) in good condition?

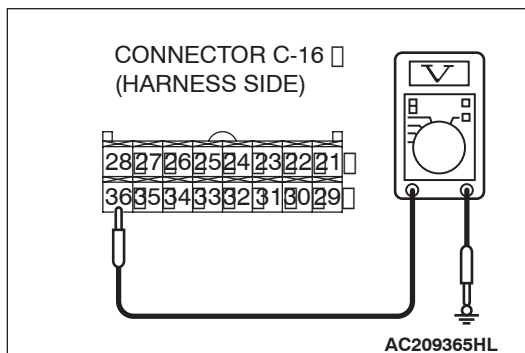
YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions [P.00-14](#).

NO : Repair the wiring harness. Check that the air conditioning works normally.



STEP 4. Measure the voltage at A/C-ECU connector C-16.

- (1) Disconnect A/C-ECU connector C-16 and measure the voltage at the harness side.
- (2) Turn the ignition switch to the "ACC" position.



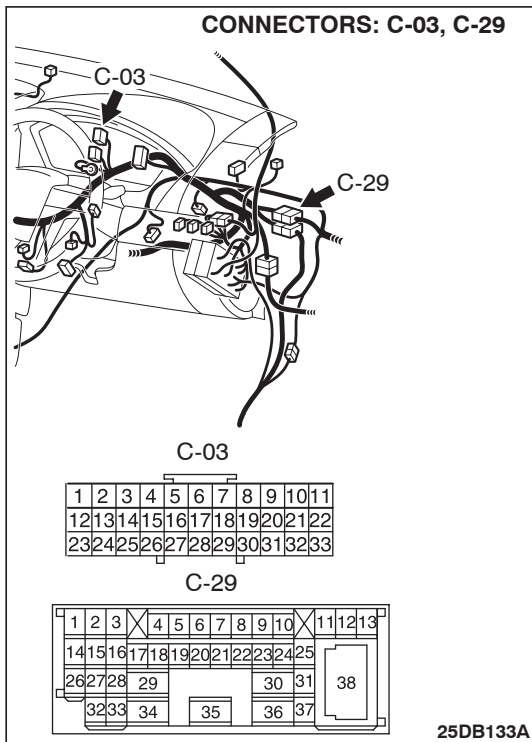
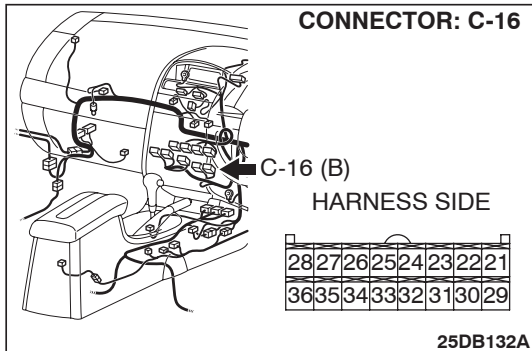
- (3) Measure the voltage between terminal 36 and ground.
 - The measured value should be approximately 12 volts (battery positive voltage).

Q: Is the measured voltage approx. 12 volts?

YES : Go to Step 6.

NO : Go to Step 5.

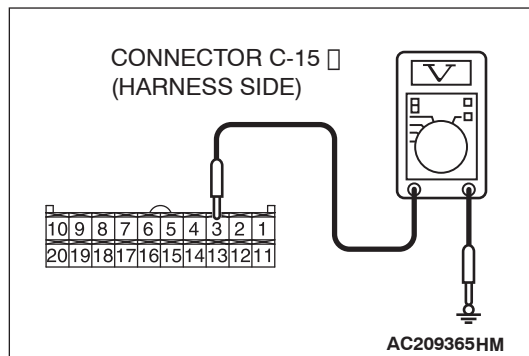
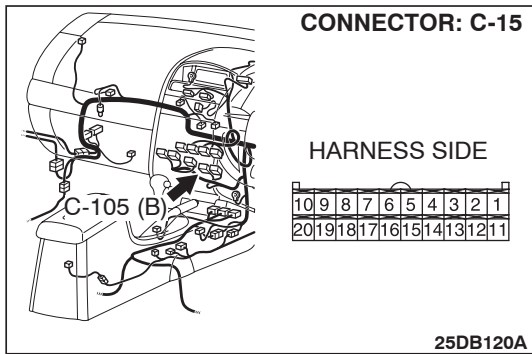
STEP 5. Check the wiring harness between A/C-ECU connector C-16 (terminal 36) and the ignition switch (ACC).



NOTE: Also check intermediate connector C-29 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-29 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection [P.00E-2](#).

Q: Is the wiring harness between A/C-ECU connector C-16 (terminal 36) and the ignition switch (ACC) in good condition?

- YES :** It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions [P.00-14](#).
- NO :** Repair the wiring harness. Check that the air conditioning works normally.



STEP 6. Measure the voltage at A/C-ECU connector C-15.

- (1) Disconnect A/C-ECU connector C-16 and measure the voltage at the harness side.

- (2) Measure the voltage between terminal 3 and ground.

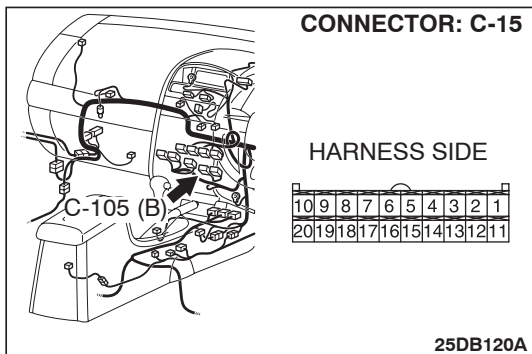
- The measured value should be approximately 12 volts (battery positive voltage).

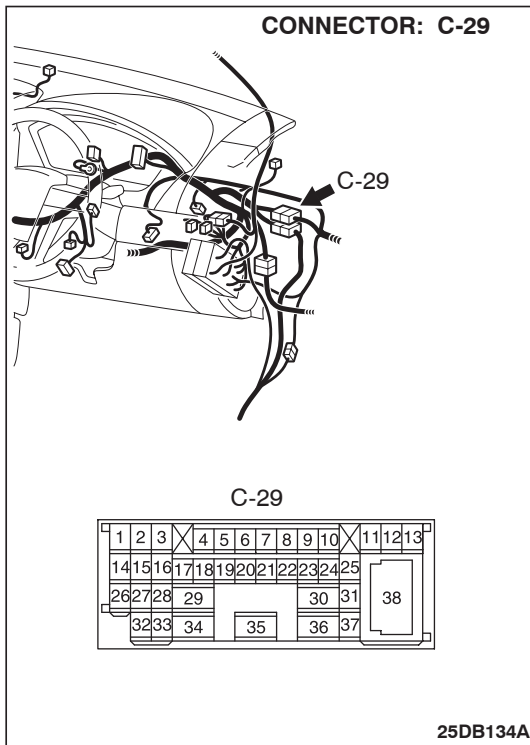
Q: Is the measured voltage approx. 12 volts?

YES : Go to Step 8.

NO : Go to Step 7.

STEP 7. Check the wiring harness between A/C-ECU connector C-15 (terminal 3) and the battery.

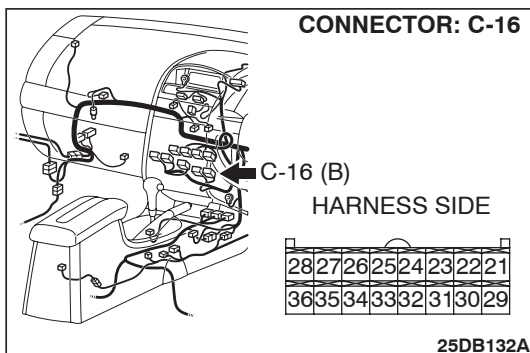




NOTE: Also check intermediate connector C-29 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-29 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection [P.00E-2](#).

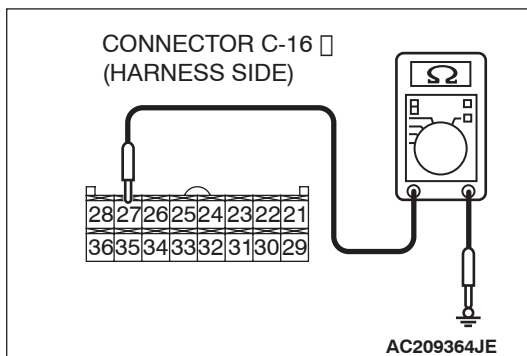
Q: Is the wiring harness between A/C-ECU connector C-16 (terminal 3) and the battery in good condition?

- YES :** It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions [P.00-14](#).
- NO :** Repair the wiring harness. Check that the air conditioning works normally.



STEP 8. Measure the resistance at A/C-ECU connector C-16.

(1) Disconnect A/C-ECU connector C-16, and measure at the wiring harness side.

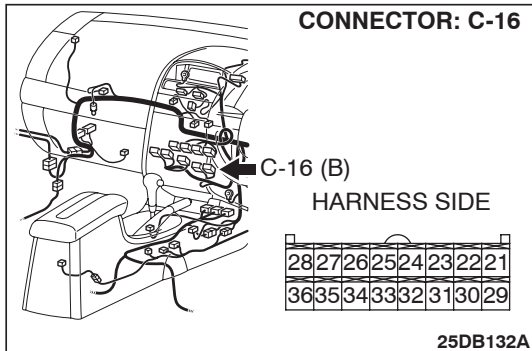


(2) Measure the resistance between terminal 27 and ground.

- The measured value should be 2 ohms or less.

Q: Does the measured resistance value correspond with this range?

- YES :** Replace the A/C-ECU, and check that the air conditioning works normally.
- NO :** Go to Step 9.



STEP 9. Check the wiring harness between A/C-ECU connector C-16 (terminal 27) and the ground.

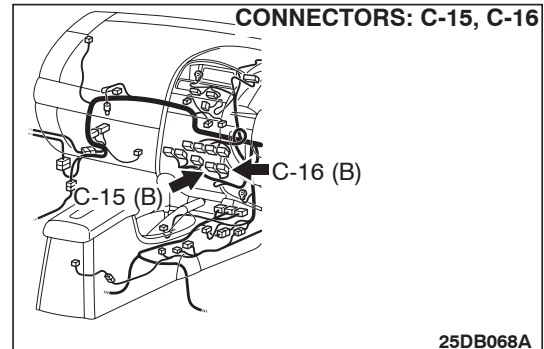
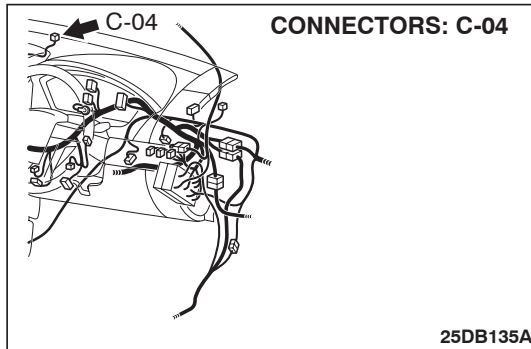
Q: Is the wiring harness between A/C-ECU connector C-16 (terminal 27) and ground in good condition?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use

Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions [P.00-14](#). check that the air conditioning works normally.

NO : Repair the wiring harness. Check that the air conditioning works normally.

INSPECTION PROCEDURE 12: When Sunlight Intensity Changes, Air Outlet Temperature Does Not Change.



CIRCUIT OPERATION

When the blower air temperature cannot be changed even if the preset temperature is changed, the sensors may be defective.

TROUBLESHOOTING HINTS

- Improper amount of refrigerant
- Malfunction of the A/C pressure sensor

- Malfunction of the photo sensor
- Malfunction of the A/C-ECU
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector.
- Refer to component locations [GROUP-70](#)
- Refer to configuration diagrams [GROUP-80](#)
- Refer to circuit diagrams [GROUP-90](#)

DIAGNOSIS

Required Special Tools:

- : Scan Tool (MUT-III Sub Assembly)
 - MB991824: Vehicle Communication Interface (V.C.I.)
 - MB991827: MUT-III USB Cable
 - MB991910: MUT-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Check the defogger and outside/inside air selection damper control motor operation.

Q: Do the defogger and outside/inside air selection damper control motor work normally?

YES : Go to Step 2.

NO : Refer to GROUP 55, AUTO A/C Diagnosis, [P.55-70](#).

STEP 2. Using scan tool , read diagnostic trouble code.

CAUTION

To prevent damage to scan tool , always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool .

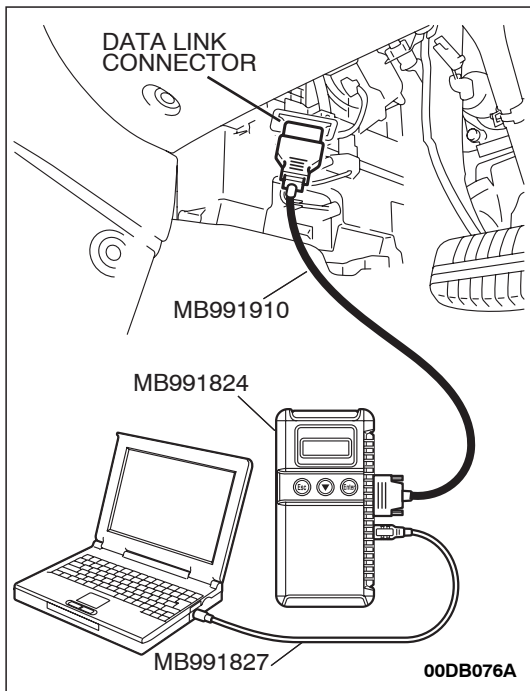
Check if an A/C-ECU DTC is set.

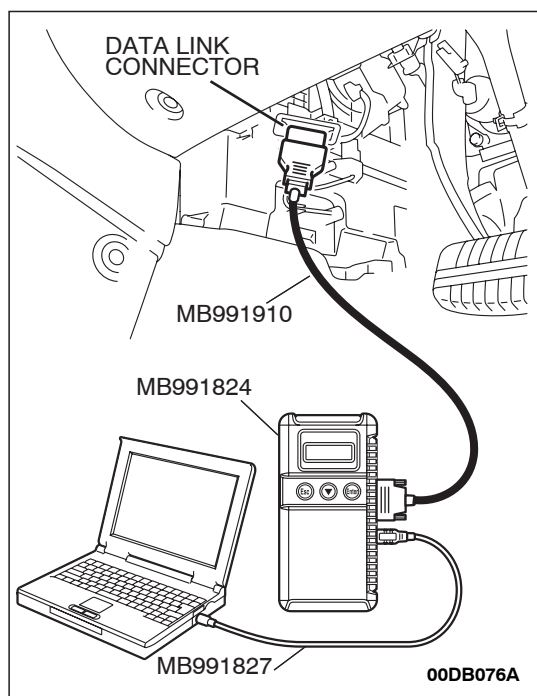
1. Connect scan tool to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Check if the DTC is set.
4. Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Refer to [P.55-9](#).

NO : Go to Step 3.





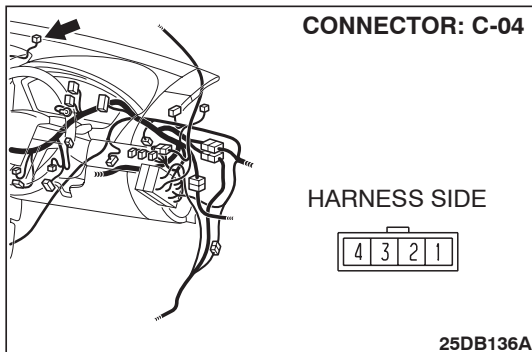
STEP 3. Using scan tool , check data list item 67: Photo sensor.

- (1) Connect scan tool to the data link connector.
- (2) Start the engine.
- (3) Set scan tool to the data reading mode for item 67: Photo sensor.
 - Check that the display on the scan tool changes when the photo sensor is covered with hands.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor within the specified range?

YES : Go to Step 7.

NO : Go to Step 4.

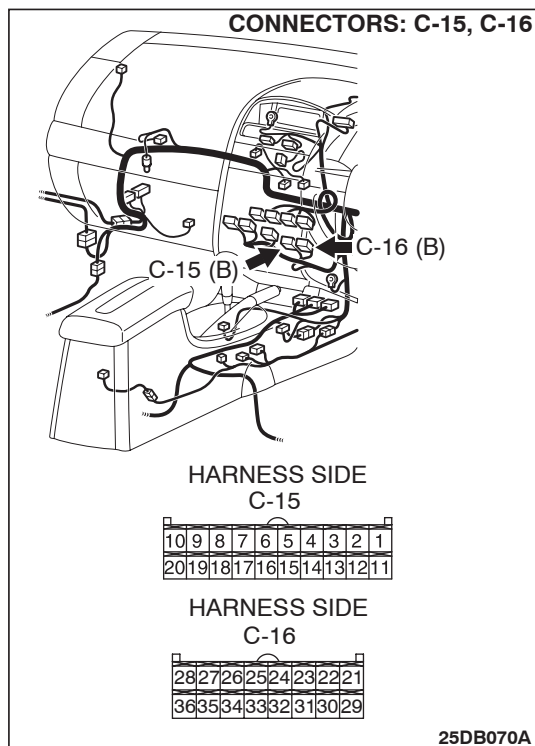


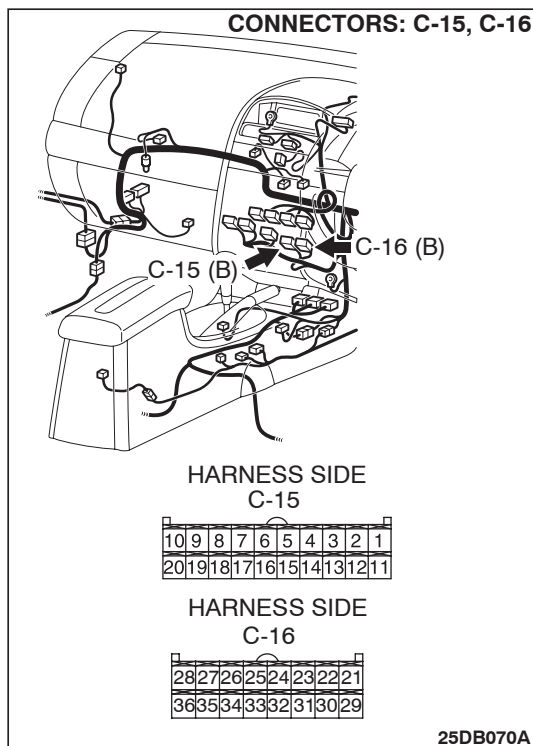
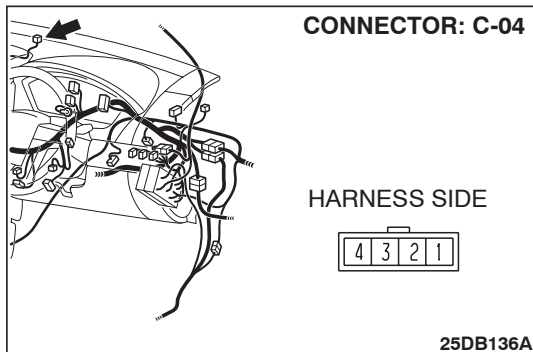
STEP 4. Check A/C-ECU connectors C-15, C-16 and photo sensor connector C-04 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are A/C-ECU connectors C-15, C-16 and photo sensor connector C-04 in good condition?

YES : Go to Step 5.

NO : Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that the air conditioning works normally.





STEP 5. Check the wiring harness between photo sensor connector C-04 (terminals 3, 4) and A/C-ECU connector C-15 (terminal 19), C-16 (terminal 25).

Q: Is the wiring harness between photo sensor connector C-04 (terminals 3, 4) and A/C-ECU connector C-15 (terminal 19), C-16 (terminal 25) in good condition?

YES : Go to Step 6.

NO : Repair the wiring harness. Check that the air conditioning works normally.

STEP 6. Replace the photo sensor.

Q: Does the A/C operate normally?

YES : No action is necessary and testing is complete.

NO : Replace the A/C-ECU. Check that the air conditioning works normally.

STEP 7. Check the refrigerant level.

Use the refrigerant recovery station to remove all of the refrigerant, and then calculate the amount of the refrigerant and charge it.

Q: Is the refrigerant level correct?

YES : Refer to GROUP 55A, Symptom Chart [P.55-68](#).

NO : Correct the refrigerant level. Check that the air conditioning works normally. (Refer to GROUP 55A On-vehicle Service [P.55-141](#)).

DATA LIST REFERENCE TABLE

M1554005100136

MUT-III DIAGNOSTIC TOOL DISPLAY	ITEM NO.	INSPECTION ITEM	INSPECTION REQUIREMENT		NORMAL VALUE
Inside temperature sensor	59	Interior temperature sensor	Ignition switch: ON		Inside air temperature and temperature displayed on the diagnostic tool are identical.
Outside temperature sensor	58	Outside temperature sensor	Ignition switch: ON		Outside air temperature and temperature displayed on the diagnostic tool are identical.
Air thermo sensor	20	Air thermo sensor	Ignition switch: ON		The temperature measured behind the evaporator matches the displayed value on the diagnostic tool while the engine is cold.
Pressure sensor	61	A/C pressure sensor	Ignition switch: ON		Measured refrigerant pressure is nearly equal to the value shown on the diagnostic tool (MPa).
Water temperature sensor	62	Engine coolant temperature sensor (Data received by CAN Communication)	Ignition switch: ON		Engine coolant temperature and temperature displayed on the diagnostic tool are identical.
Photo sensor	67	Photo sensor	Ignition switch: ON		Amount of light is proportional to voltage displayed on the diagnostic tool.
Air mix potentiometer	63	Air mixing damper control motor potentiometer	Ignition switch: ON	Damper position	Opening degree (V)
				MAX. HOT	Approx. 5
				MAX. COOL	Approx. 0
Air mix potentiometer (Target)	64	Target value for air mixing damper control motor potentiometer	Ignition switch: ON	Damper position	Opening degree (V)
				MAX. HOT	Approx. 5
				MAX. COOL	Approx. 0

MUT-III DIAGNOSTIC TOOL DISPLAY	ITEM NO.	INSPECTION ITEM	INSPECTION REQUIREMENT		NORMAL VALUE
Air outlet c/o potentiometer	55	Mode selection damper control motor potentiometer	Ignition switch: ON	Damper position	Opening degree (V)
				FACE	Approx. 5
				FOOT	Approx. 3.75
				FOOT/DEF.	Approx. 2.5
				DEF.	Approx. 1.75
Air outlet c/o potentiometer (target)	56	Target value for mode selection damper control motor potentiometer	Ignition switch: ON	Damper position	Opening degree (V)
				FACE	Approx. 5
				FOOT	Approx. 3.75
				FOOT/DEF.	Approx. 2.5
				DEF.	Approx. 1.75
In/out air changeover damper motor	65	Outside/inside air selection damper control motor	Ignition switch: ON	Damper set position	Damper position
				Fresh air position	FRESH
				Air recirculation position	RECIRC
Front blower fan	68	Blower motor	Ignition switch: ON		The actual air volume (blower motor speed) corresponds to the air volume shown on the diagnostic tool.
Front blower motor voltage	71	Blower motor	Ignition switch: ON		The air volume set by the heater control corresponds to the value shown on the diagnostic tool. (V)
Air conditioning switch state	1	Air conditioning switch	Ignition switch: ON	Air conditioning switch: ON	Diagnostic tool indication: "pressed"
				Air conditioning switch: OFF	Diagnostic tool indication: "release"
Rear defogger switch state	7	Rear window defogger switch	Ignition switch: ON	Rear window defogger switch: ON	Diagnostic tool indication: "pressed"
				Rear window defogger switch: OFF	Diagnostic tool indication: "release"
Refrigerant pressure	73	Refrigerant pressure	Ignition switch: ON		The diagnostic tool indication is normal

MUT-III DIAGNOSTIC TOOL DISPLAY	ITEM NO.	INSPECTION ITEM	INSPECTION REQUIREMENT		NORMAL VALUE
Temperature setting	23	Temperature setting actual	Ignition switch: ON		The actual setting corresponds with diagnostic tool display.
Vehicle speed	26	Actual vehicle speed	Ignition switch: ON		The vehicle speed corresponds with diagnostic tool display.
A/C compressor drive request	27	Compressor clutch	Engine: ON	Compressor: ON	Diagnostic tool indication: "ON"
				Compressor: OFF	Diagnostic tool indication: "OFF"
Illumination	15	Display lighting	Ignition switch: ON	Lights: ON	Diagnostic tool indication: "ON"
				Lights: OFF	Diagnostic tool indication: "OFF"
Engine speed	23	Actual engine speed	Engine: ON		The engine speed corresponds with diagnostic tool display.
In/out air select switch state	3	In/out air select switch	Ignition switch: ON	In/out air switch: ON	Diagnostic tool indication: "pressed"
				In/out air switch: OFF	Diagnostic tool indication: "release"
Rear defogger relay	72	Rear defogger relay	Ignition switch: ON	Rear defogger: ON	Diagnostic tool indication: "ON"
				Rear defogger: OFF	Diagnostic tool indication: "OFF"

ACTUATOR TEST REFERENCE

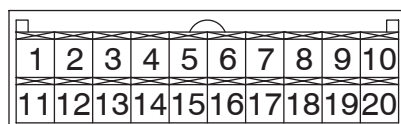
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MUT-III DIAGNOSTIC TOOL DISPLAY	ITEM NO.	INSPECTION ITEM	DRIVE CONTENT
Blower fan: OFF	83	Blower motor	OFF
Blower fan: Middle	84		Middle speed
Blower fan: High	85		High speed
Air mix damper motor: 0%	42	Air mixing damper control motor	Opening degree: approx. 0% (Max cool)
Air mix damper motor: 100%	43		Opening degree: approx. 100% (Max hot)
Air outlet c/o damper: FACE	70	Mode selection damper control motor	FACE
Air outlet c/o damper: Bi_ Level	67		FOOT/FACE
Air outlet c/o damper: FOOT	71		FOOT
Air outlet c/o damper: DEF/FOOT	69		DEF/FOOT
Air outlet c/o damper: DEF	68		DEF
Idle up request: high load	74	Idle speed	HIGH idle up
Idle up request: low load	75		LOW idle up
Idle up request: OFF	76		OFF
Rear defogger switch: OFF	40	Rear window defogger switch	Rear window defogger: OFF
Rear defogger switch: ON	41		Rear window defogger: ON
Idle up request: OFF	50	Idle up operation	Idle up: OFF
Idle up request: low load	51		Idle up: low load
Idle up request: high load	52		Idle up: high load
Condenser: 0%	77	Condenser fan	OFF
Condenser: 50%	79		Middle speed
Rheostat: 0%	80	Rheostat- Illumination control	OFF
Rheostat: 100%	81		Full duty
Rheostat: 50%	82		Half duty

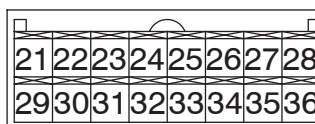
CHECK AT A/C-ECU TERMINAL

M1552010300572

C-15



C-16



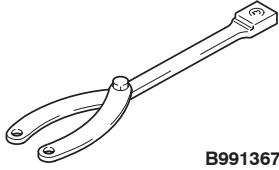
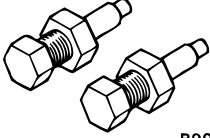
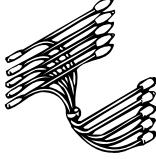
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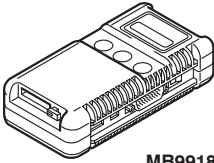
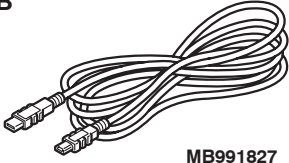
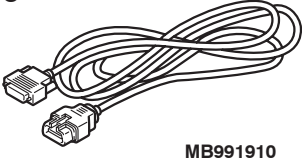
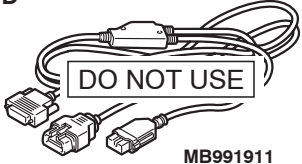
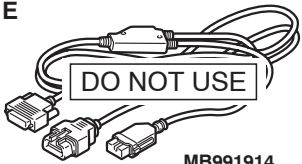
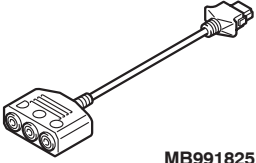
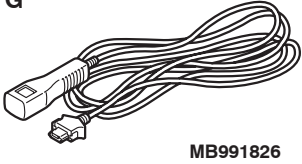
TERMINAL NO.	CHECK ITEM	CHECKING REQUIREMENTS	NORMAL CONDITION
1	Air mixing damper control motor	When the air mix damper is moved to the MAX. COOL position.	10 V
		When the air mix damper is moved to the MAX. HOT position.	0.5 V
2	Air mixing damper control motor	When the air mix damper is moved to the MAX. COOL position.	0.5 V
		When the air mix damper is moved to the MAX. HOT position.	10 V
3	Back-up power supply	Always	Battery positive voltage
4	Mode selection damper control motor (DEF)	When the damper is moved to the FACE position.	0.5 V
		When the damper is moved to the DEF position.	10 V
5	Outside/inside air selection damper control motor (outside)	When the damper is moved to the inside air recirculation position.	0.5 V
		When the damper is moved to the outside air induction position.	0 V (when the motor is stopped)
6	Outside/inside air selection damper control motor (inside)	When the damper is moved to the inside air recirculation position.	0 V (when the motor is stopped)
		When the damper is moved to the outside air induction position.	0.5 V
8	Rear defogger relay	Ignition switch: ON	Battery positive voltage
9	Front blower relay	Ignition switch: ON	Battery positive voltage
10	A/C compressor relay	A/C compressor relay: ON	Battery positive voltage
11	Mode selection damper control motor (FACE)	When the damper is moved to the FACE position.	10 V
		When the damper is moved to the DEF position.	0.5 V
12	A/C pressure sensor	Ignition switch: ON	5 V

TERMINAL NO.	CHECK ITEM	CHECKING REQUIREMENTS	NORMAL CONDITION
16	Potentiometer power supply	Ignition switch: ON	5 V
17	Power transistor (BASE)	When the blower speed selection dial shows Maximum air volume.	1 V
18	Power transistor (COLLECTOR)	When the blower speed selection dial shows Maximum air volume.	12.1 V
19	Photo sensor	Ignition switch: ON	5 V
20	Sensors and potentiometers ground	Always	0 V
21	Mode selection damper control motor potentiometer input	When the damper is moved to the FACE position.	4 V
22	Interior temperature sensor	Ignition switch: ON	5 V
23	Ambient temperature sensor input	When sensor temperature is 25°C (77°F) [4 kΩ]	1.9 V
24	Air thermo sensor input	When sensor temperature is 25°C (77°F) [1.5 kΩ]	2.2 V
25	Photo sensor ground	Ignition switch: ON	0 V
26	A/C pressure sensor	at 2.6 MPa	3.9 V
27	Ground	Always	0 V
28	Power supply to the ignition switch (IG2)	Ignition switch: ON	Battery positive voltage
29	Air mixing damper control motor potentiometer input	When the damper door is moved to the MAX. HOT position.	1.4 V
30	Illumination ground	Always	0 V
31	ILL power supply	Lighting switch: ON	Battery positive voltage
34	A/C pressure sensor ground	Always	0 V
36	Power supply to the ignition switch (ACC)	Ignition switch: ON	Battery positive voltage

SPECIAL TOOLS

M1552000600334

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
 <p>B991367</p>	MB991367 Special spanner	MB991367-01	Armature mounting nut of compressor removal and installation
 <p>B991386</p>	MB991386 Pin	MIT217213	Armature mounting nut of compressor removal and installation
 <p>MB991658</p>	MB991658 Test harness set	Tool not available	Inspection of throttle position sensor

TOOL	TOOL NUMBER AND NAME	SUPERSESSON	APPLICATION
<p>A</p>  <p>MB991824</p> <p>B</p>  <p>MB991827</p> <p>C</p>  <p>MB991910</p> <p>D</p>  <p>MB991911</p> <p>E</p>  <p>MB991914</p> <p>F</p>  <p>MB991825</p> <p>G</p>  <p>MB991826 MB991958</p>	<p>A: MB991824 B: MB991827 C: MB991910 D: MB991911 E: MB991914 F: MB991825 G: MB991826</p> <p>MUT-III Sub Assembly</p> <p>A: Vehicle communication interface (V.C.I.) B: MUT-III USB cable C: MUT-III main harness A (Vehicles with CAN communication system) D: MUT-III main harness B (Vehicles without CAN communication system) E: MUT-III main harness C (for Daimler Chrysler models only) F: MUT-III measurement adapter G: MUT-III Trigger Harness</p>	<p>MB991824-KIT</p> <p>NOTE: . G: MB991826 MUT-III Trigger Harness is not necessary when pushing V.C.I. ENTER key.</p>	<p>Checking diagnostic trouble codes</p> <p>CAUTION</p> <p>For vehicles with CAN communication, use MUT-III main harness A to send simulated vehicle speed. If you connect MUT-III main harness B instead, the CAN communication does not function correctly.</p>

ON-VEHICLE SERVICE

REFRIGERANT LEVEL TEST

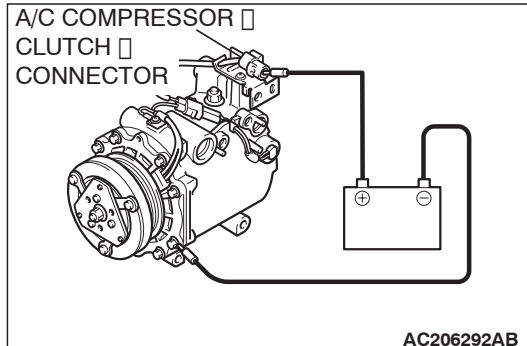
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Use the refrigerant recovery station to remove all of the refrigerant, and then calculate the amount of the refrigerant and charge it.

A/C COMPRESSOR CLUTCH TEST

M1552019900032

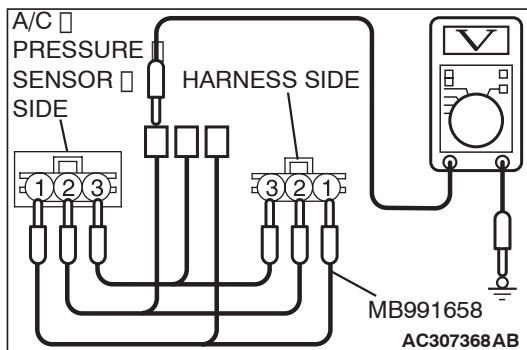
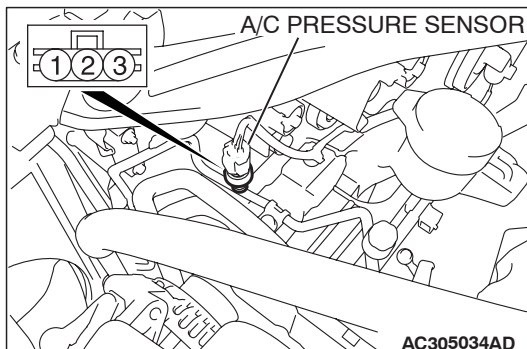
1. Disconnect the air conditioning compressor clutch connector to the air conditioning compressor clutch.
2. Connect positive battery voltage directly to the connector for the air conditioning compressor clutch.
3. If the air conditioning compressor clutch is normal, there will be a "click." If the pulley and armature do not make contact ("no click"), there is a malfunction.

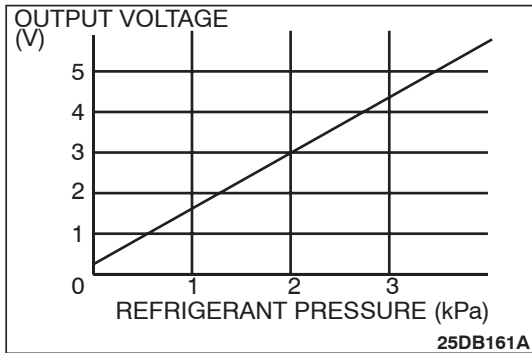


SIMPLE INSPECTION OF THE A/C PRESSURE SENSOR

M1552014700118

1. Assemble a gauge manifold on the high pressure service valve.
2. Disconnect the A/C pressure sensor connector and connect special tool test harness MB991658 as shown in the illustration.
3. Turn ON the engine and then turn ON the air conditioner switch.





4. At this time, check to see that the voltage of A/C pressure sensor terminal No. 2 reflects the specifications of the figure.

NOTE: The allowance shall be defined as $\pm 5\%$.

COMPRESSOR DRIVE BELT ADJUSTMENT

M1552001000357

Refer to GROUP 00, Maintenance Service – Drive Belts

[P.00-39.](#)

CHARGING

M1552001200403

Use the refrigerant recovery station to charge the refrigerant.

METHOD BY USING REFRIGERANT RECOVERY AND RECYCLING UNIT

Using the refrigerant recovery and recycling unit, refill the refrigerant.

NOTE: Refer to the Refrigerant Recovery and Recycling Unit's Instruction Manual for operation of the unit.

DISCHARGING SYSTEM

Use the refrigerant recovery unit to discharge refrigerant gas from the system.

NOTE: Refer to the Refrigerant Recovery and Recycling Unit's Instruction Manual for operation of the unit.

REFILLING OF OIL IN THE A/C SYSTEM

Too little oil will provide inadequate compressor lubrication and cause a compressor failure. Too much oil will increase discharge air temperature.

When a compressor is installed at the factory, it contains 140 ml of refrigerant oil. While the A/C system is in operation, the oil is carried through the entire system by the refrigerant. Some of this oil will be trapped and retained in various parts of the system.

When the following system components are changed, it is necessary to add oil to the system to replace the oil being removed with the component.

Compressor oil: ND Oil 8

Quantity:

Evaporator: 40 ml

Condenser: 40 ml

M1552001400526

PERFORMANCE TEST

The vehicles to be tested should be parked out of direct sunlight.

1. Close the high and low-pressure valve of the gauge manifold.
2. Connect the charging hose (blue) to the low-pressure valve and connect the charging hose (red) to the high-pressure valve of the gauge manifold.
3. Install the quick joint (for low-pressure) to the charging hose (blue), and connect the quick joint (for high-pressure) to the charging hose (red).

CAUTION

- To connect the quick joint, press section A firmly against the service valve until a click is heard.
- When connecting, run your hand along the hose while pressing to ensure that there are no bends in the hose.

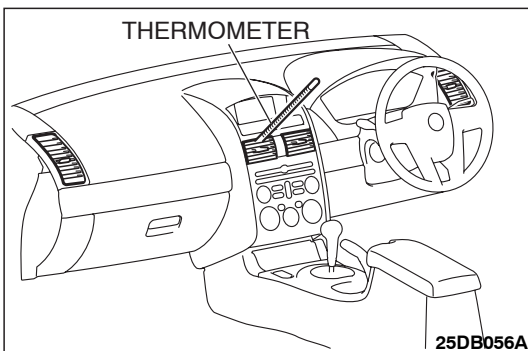
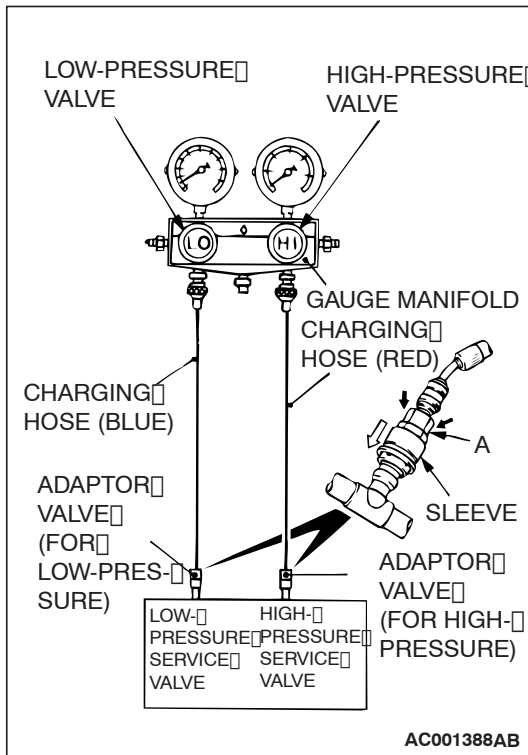
4. Connect the quick joint (for low-pressure) to the low-pressure service valve and connect the quick joint (for high-pressure) to the high-pressure service valve.

NOTE: The high-pressure service valve is on the A/C pipe and the low-pressure service valve is on the suction hose.

5. Start the engine.
6. Set the A/C controls as follows:
 - A/C switch: A/C – ON position
 - Mode selection: FACE position
 - Temperature control: MAXIMUM COOLING position
 - Air selection: RECIRCULATION position
 - Blower switch: Maximum air volume
7. Adjust engine speed to 1,500 r/min with A/C clutch engaged.
8. Engine should be warmed up with doors and windows closed.
9. Insert a thermometer in the center air outlet and operate the engine for 20 minutes.

NOTE: If the A/C clutch cycles, take the reading before the clutch disengages.

10. Note the discharge air temperature.



PERFORMANCE TEMPERATURE CHART

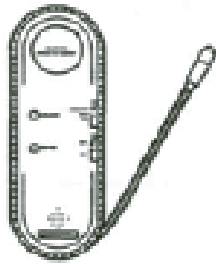
GARAGE AMBIENT AIR TEMPERATURE °C (°F)	20 (68)	25 (77)	30 (86)	35 (95)
Discharge air temperature °C (°F)	1 (34) – 6 (43)			
Compressor high pressure kPa (psi)	1275 (185) – 1863 (270)			
Compressor low pressure kPa (psi)	49 (7.1) – 294 (42.7)			

REFRIGERANT LEAK INSPECTION PROCEDURE

M1552001500299

LEAK INSPECTION

ELECTRONIC LEAK DETECTOR

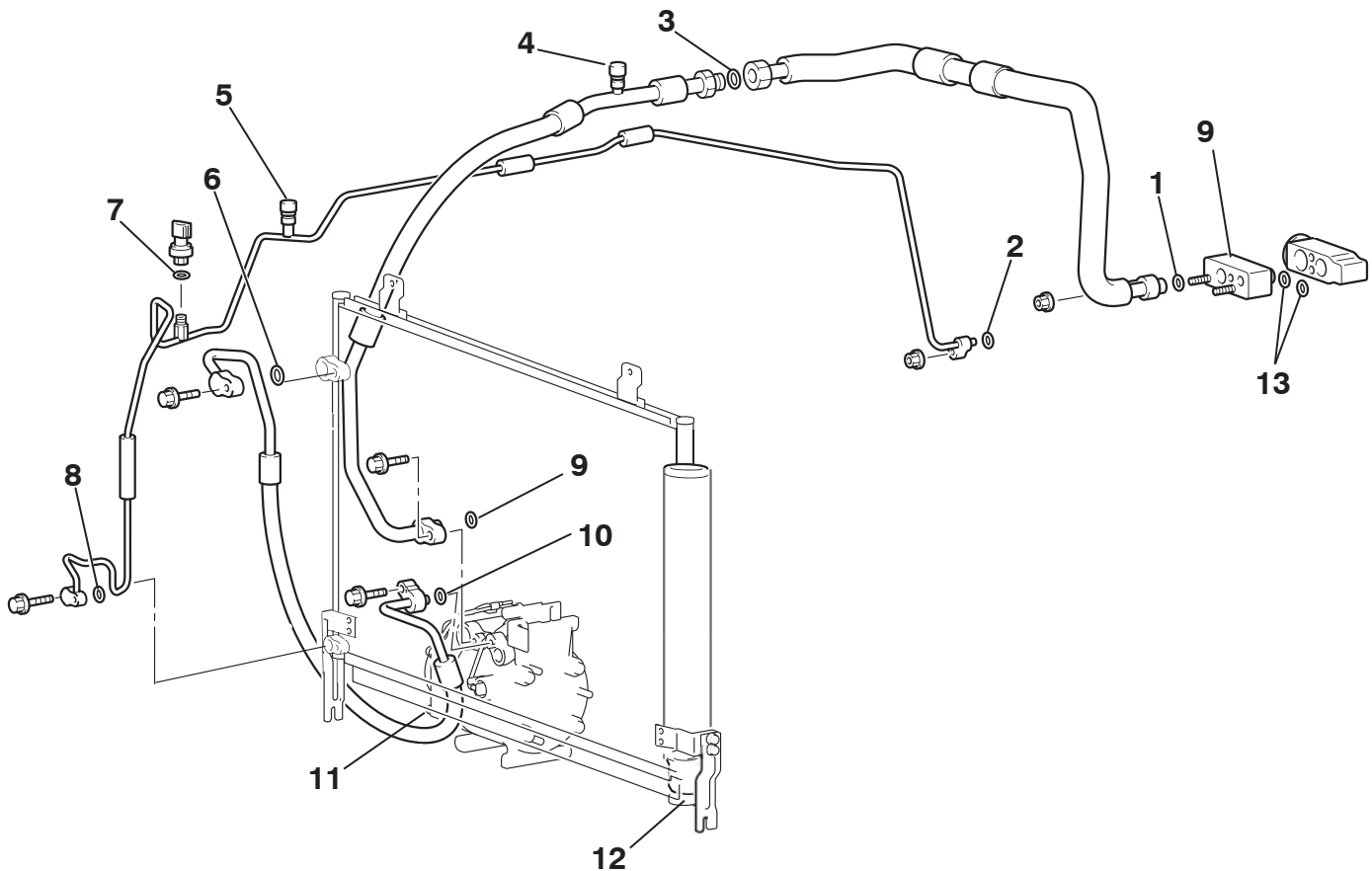


25DB164A

1. Check for leakage using Special Tool at the following locations.

CAUTION

Good ventilation is necessary during the leak inspection. If the surrounding air is contaminated with refrigerant gas, the inspection readings will not be accurate.



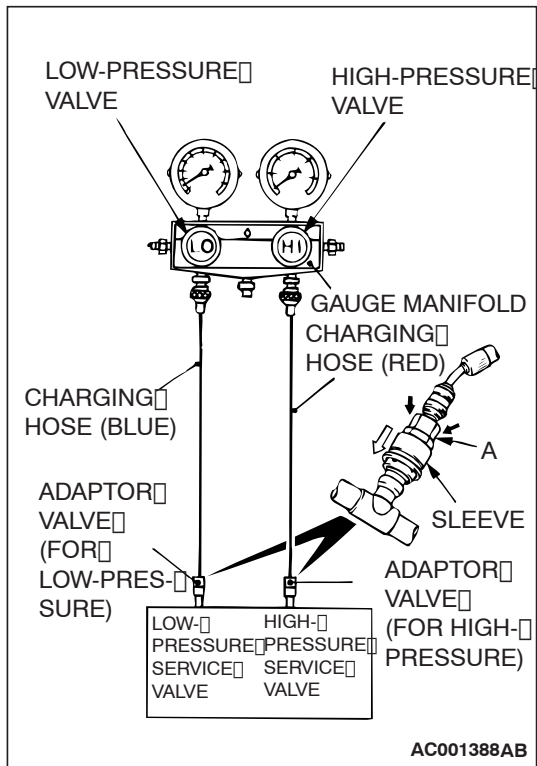
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LEAK CHECK LOCATION

1. SUCTION HOSE TO TX VALVE
2. LIQUID TUBE TO TX VALVE
3. SUCTION HOSE JOINT
4. LOW PRESSURE SERVICE VALVE
5. HIGH PRESSURE SERVICE VALVE
6. CONDENSER-DISCHARGE HOSE JOINT
7. PRESSURE SENSOR

LEAK CHECK LOCATION

8. CONDENSER-LIQUID TUBE JOINT
9. COMPRESSOR-SUCTION HOSE JOINT
10. COMPRESSOR-DISCHARGE HOSE JOINT
11. UNDER COMPRESSOR CLUTCH
12. AROUND MODULATOR CAP
13. TX VALVE TO EVAPORATOR JOINT



LOST CHARGE

If the system has lost all of its refrigerant charge due to a leak:

1. Evacuate the system. (Refer to P.55-142).
2. Charge the system with approximately 0.453 kg (1 pound) of refrigerant.
3. Check for leaks.
4. Discharge the system.
5. Repair leaks.

⚠ CAUTION

Replacement filter-dryer units must be sealed while in storage. The dryer used in these units will saturate water quickly upon exposure to the atmosphere. When installing a dryer, have all tools and supplies ready for quick assembly to avoid keeping the system open any longer than necessary.

6. Replace receiver dryer. (Refer to P.55-168).
7. Evacuate and charge system.

LOW CHARGE

If the system has not lost all of its refrigerant charge; locate and repair all leaks. If it is necessary to increase the system pressure to find the leak (because of an especially low charge) add refrigerant. If it is possible to repair the leak without discharging the refrigerant system, use the procedure for correcting low refrigerant level.

HANDLING TUBING AND FITTINGS

Kinks in the refrigerant tubing or sharp bends in the refrigerant hose lines will greatly reduce the capacity of the entire system. High pressures are produced in the system when it is operating. Extreme care must be exercised to make sure that all connections are pressure tight. Dirt and moisture can enter the system when it is opened for repair or replacement of lines or components. The following precautions must be observed. The system must be completely discharged before opening any fitting of connection in the refrigeration system. Open fittings with caution even after the system has been discharged. If any pressure is noticed as a fitting is loosened, allow trapped pressure to bleed off very slowly.

Never attempt to rebend formed lines to fit. Use the correct line for the installation you are servicing. A good rule for the flexible hose lines is keep the radius of all bends at least 10 times the diameter of the hose.

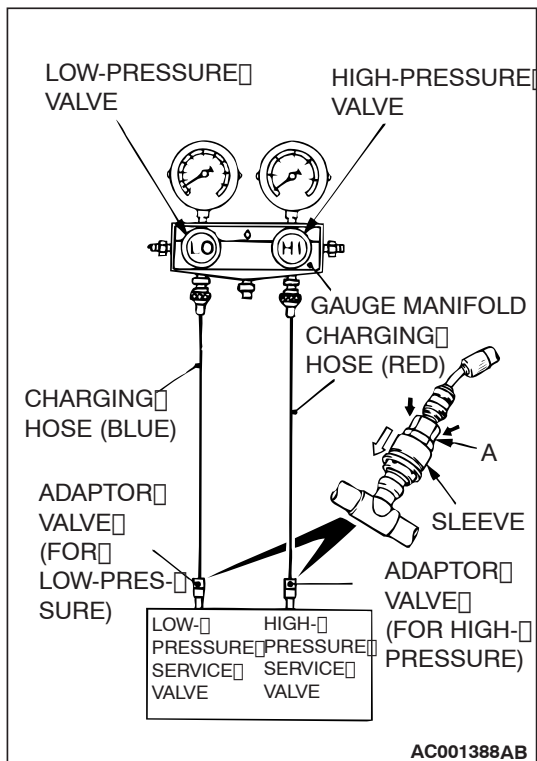
Sharper bends will reduce the flow of refrigerant. The flexible hose lines should be routed so that they are at least 80 mm (3.1 inches) from the exhaust manifold. It is good practice to inspect all flexible hose lines at least once a year to make sure they are in good condition and properly routed. On standard plumbing fittings with O-rings, these O-rings are not reusable.

AIR CONDITIONING NOISE TEST

You must first know the conditions when the noise occurs. These conditions are: weather, vehicle speed, in gear or neutral, engine temperature or any other special conditions. Noises that develop during A/C operation can often be misleading. For example: what sounds like a failed front bearing or connecting rod, may be caused by loose bolts, nuts, mounting brackets, or a loose clutch assembly. Verify accessory drive belt tension (power steering or generator). Improper accessory drive belt tension can cause a misleading noise when the compressor is engaged and little or no noise when the compressor is disengaged. Drive belts are speed-sensitive. That is, at different engine speeds, and depending upon belt tension, belts can develop unusual noises that are often mistaken for mechanical problems within the compressor. Normal air conditioning operation will generate some level of operational noise. To judge what is normal and abnormal, requires an understanding of the air conditioning system. This test is to detail the most common noise complaints and the repair methods.

VEHICLE CONDITION

1. Ensure the system is not over or under charged. (Refer to [P.55-142](#)).
2. Tighten all compressor mounting bolts, clutch mounting bolts and compressor drive belt.
3. Inspect layout of the system is correct, ie no interference between hoses and all retaining clamps are in place.



TEST PROCEDURES

1. Select a quiet area for testing.
2. Duplicate problem (customer complaint) as much as possible.
3. Judge if the noise is abnormal (ie. it is important to understand the characteristics of the vehicle and its normal state to judge what is abnormal) - Compare with similar vehicle if necessary.
4. Detail what and how noise occurs.
5. Find the noise source and verify its transmission by isolating the subject part from the vehicle.
6. Repair the problem.
7. Explain and report your findings.

DETAILS OF A/C NOISE

NOISE DESCRIPTION	WHEN IT OCCURS	SOURCE OF NOISE
Rumbling (Bearing noise)	With A/C On or Off	Magnetic clutch, idler pulley
Clang-Clack noise	When compressor is engaged	Magnetic clutch operation
Squawking (Belt sliding noise)	When compressor is engaged	V-belt
Whistling or Whooping noise	Immediately after the A/C is engaged.	Expansion valve
Hissing or swishing noise	When A/C is engaged, but decreases as flow is stable	Refrigerant flow
Rattling (Internal compressor)	When compressor is operating	Compressor internal part
Wooping (Resonant noise)	With A/C On, occurs at certain speed.	Resonance of accessories
Cooing (Discharge pulsation noise)	With A/C On or Off	Resonating noise with the vehicle body

POSSIBLE CAUSES, CHECKS AND REPAIRS

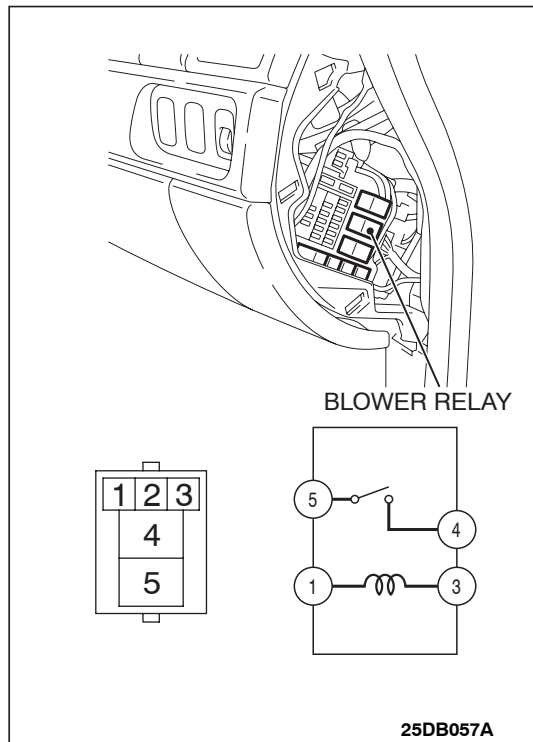
NOISE DESCRIPTION	POSSIBLE CAUSE	CHECK	REPAIR
Rumbling (Bearing noise)	Bearing damage in rotor	Manual rotation of bearing	Replace compressor
	Rotor slipping on boss	Wear on compressor boss surface	Replace compressor
	Bearing damage in pulley	Check alignment between pulleys	Replace compressor
Clang-Clack noise	Hub to stator misaligned	Wear on inner clutch face	Replace compressor
	Gap between clutch surface is too large	Check Air gap is within specification	Replace compressor
Squawking (Belt sliding noise)	Oil/water between the belt and rotor surface	Oil and water contamination	Clean
	Low belt tension	Belt tension	Reset or Replace belt and set tension to correct specification
Whistling or Whooping noise	Vibration of expansion valve	Expansion valve	Replace TX valve

NOISE DESCRIPTION	POSSIBLE CAUSE	CHECK	REPAIR
Hissing or swishing noise	Low refrigerant quantity	Refrigerant level	Check system for leaks and charge to specification
Rattling (Internal compressor)	Lack of lubricating oil. In a system with a gas leak the oil has escaped with the refrigerant	Rattling noise from internal compressor	Repalce the compressor and also fix the system leak to prevent reoccurrence
Wooing (Resonant noise)	Drive accessory (P/S pump, Alternator,etc) resonating at specific engine speed	The drive accessories for vibration	Stop vibrations of the assembly or modify transmission route to the vehicle body
Cooing (Discharge pulsation noise)	Pressure fluctuation of refrigerant discharged from compressor, which vibrates the high pressure piping	Remove the piping mounting clamps and re-check. Hold the condenser without mountings by hand and re-check	Put rubber bush between pipe clamps and the vehicle body. decrease refrigerant to minimum specified level.

POWER RELAY CHECK

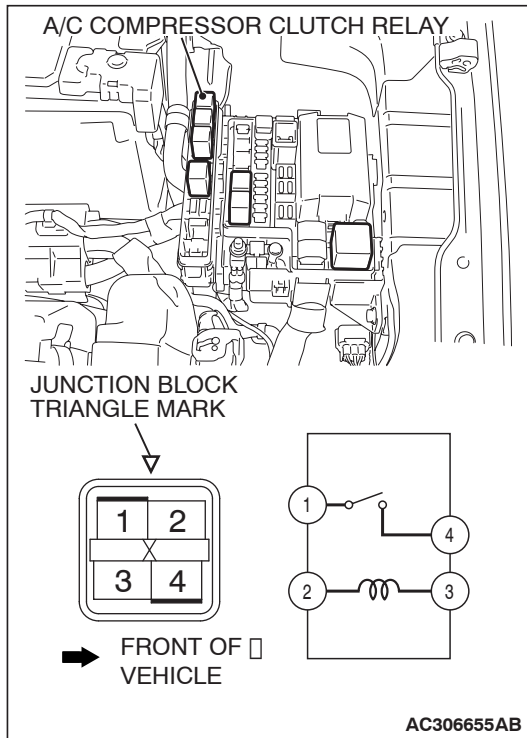
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BLOWER RELAY CONTINUITY CHECK



BATTERY VOLTAGE	TESTER CONNECTION	SPECIFIED CONDITION
Not applied	4 – 5	Open circuit
<ul style="list-style-type: none"> Connect terminal 1 to the positive battery terminal Connect terminal 3 to the negative battery terminal 	4 – 5	Less than 2 ohms

A/C COMPRESSOR CLUTCH RELAY CONTINUITY CHECK



BATTERY VOLTAGE	TESTER CONNECTION	SPECIFIED CONDITION
Not applied	1 – 4	Open circuit
<ul style="list-style-type: none"> Connect terminal 2 to the positive battery terminal Connect terminal 3 to the negative battery terminal 	1 – 4	Less than 2 ohms

IDLE-UP OPERATION CHECK

M1552001600401

Before inspection and adjustment, set vehicle in the following condition:

- Engine coolant temperature: 80 – 90 °C (176.0 – 194.0 °F)
- Lights, electric cooling fan and accessories: OFF
- Transmission: Neutral ("N" or "P" position)
- Steering wheel: Straightforward

1. Check whether or not the idle speed is the standard value.

Standard value: 680 ± 50 r/min

2. Turn on the air conditioning switch and the blower speed selection dial. Engine idling speed should be within the standard value:

Standard value: 680 ± 50 r/min

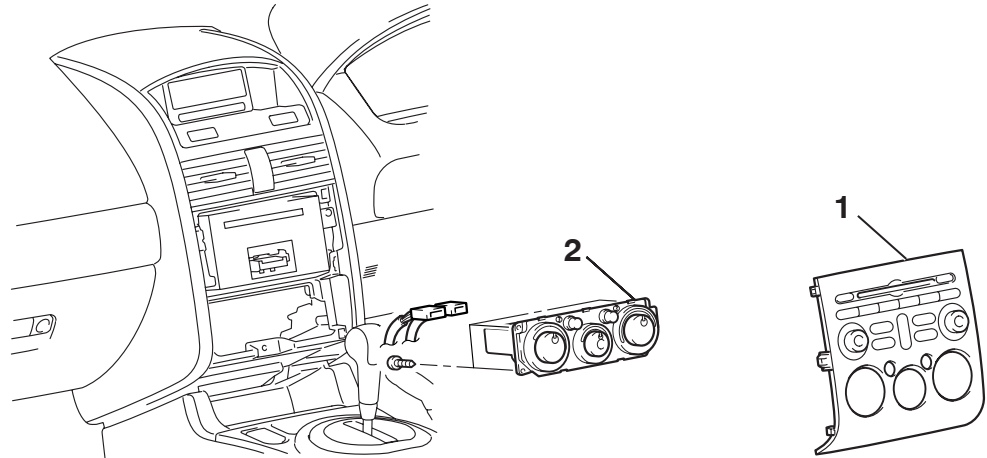
NOTE: The Electronic control unit determines whether the A/C load is low or high according to the output signal from the A/C-ECU.

NOTE: It is not necessary to make an adjustment, because the idling speed is automatically controlled by the ENGINE ECU.

HEATER CONTROL ASSEMBLY AND A/C SWITCH

REMOVAL AND INSTALLATION

M1552002400369



25DB137A

REMOVAL STEPS

1. CENTER PANEL ASSEMBLY
(REFER TO GROUP 52A,
INSTRUMENT PANEL [P.52A-4](#))
2. HEATER CONTROL (A/C-ECU)

HEATER UNIT, HEATER CORE, BLOWER ASSEMBLY AND EVAPORATOR UNIT

REMOVAL AND INSTALLATION

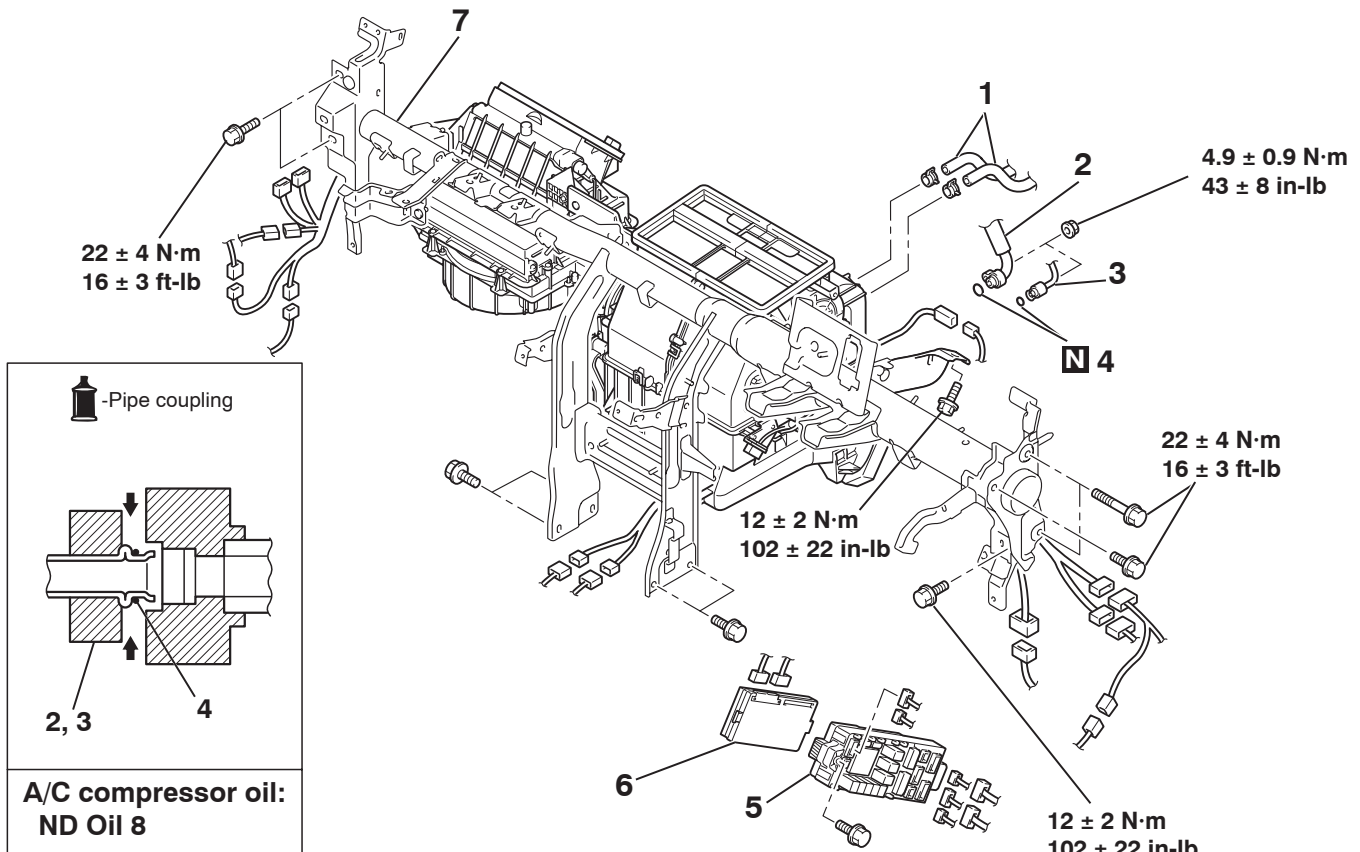
M1552021400012

⚠ WARNING

- Before removing the front seat assembly, refer to **GROUP 52B, Service Precautions P.52B-16** and **Air Bag Module and Clock Spring P.52B-237**.

Pre-removal and Post-installation Operation

- Refrigerant draining and Refilling (Refer to Charging and Discharging **P.55-142**).
- Engine coolant Draining and Refilling (Refer to GROUP 00, Engine coolant **P.00-47**).
- Instrument Panel Removal and Installation (Refer to GROUP 52A, Instrument Panel **P.52A-4**).
- Steering Column Shaft Assembly Removal and Installation (Refer to GROUP 37A, Steering Shaft **P.37-25**).
- Floor Console Removal and Installation (Refer to GROUP 52A, Floor Console **P.52A-10**).
- Front Seat Assembly Removal and Installation (Refer to GROUP 52A, Front Seat **P.52A-21**).
- ² Strut Tower Bar (Refer to GROUP 42, Removal And Installation **P.42-12**.)



25DB058A

REMOVAL STEPS

- BATTERY
 - AIR CLEANER BODY (REFER TO GROUP 15, AIR CLEANER **P.15-4**.)
1. HEATER HOSE CONNECTION
 2. SUCTION PIPE CONNECTION

<<A>>

REMOVAL STEPS (Continued)

3. LIQUID PIPE CONNECTION
4. O-RING
- REAR HEATER DUCT A AND B (REFER TO **P.55-175**.)
5. JUNCTION BLOCK

<<A>>

REMOVAL STEPS (Continued)

<>

6. ETACS-ECU
7. HEATER UNIT AND DECK
CROSSMEMBER ASSEMBLY

REMOVAL SERVICE POINTS

<<A>> SUCTION PIPE AND LIQUID PIPE DISCONNECTION

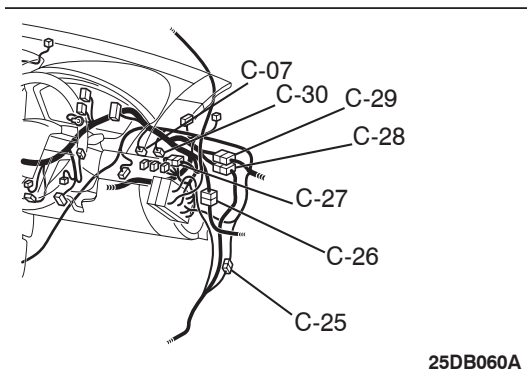
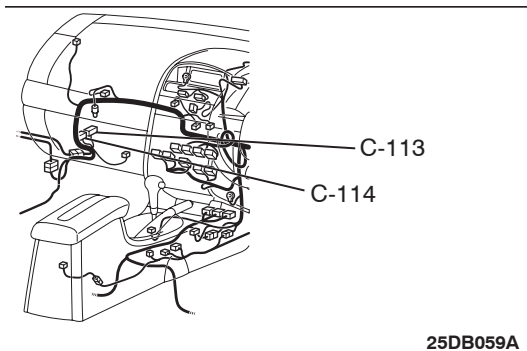
⚠ CAUTION

As the compressor oil and receiver are highly moisture absorbent, use a non-porous material to plug the hose and nipples.

To prevent the entry of dust or other foreign bodies, plug the dismantled hose and the nipples of the expansion valves.

**<> HEATER UNIT AND DECK
CROSSMEMBER ASSEMBLY REMOVAL**

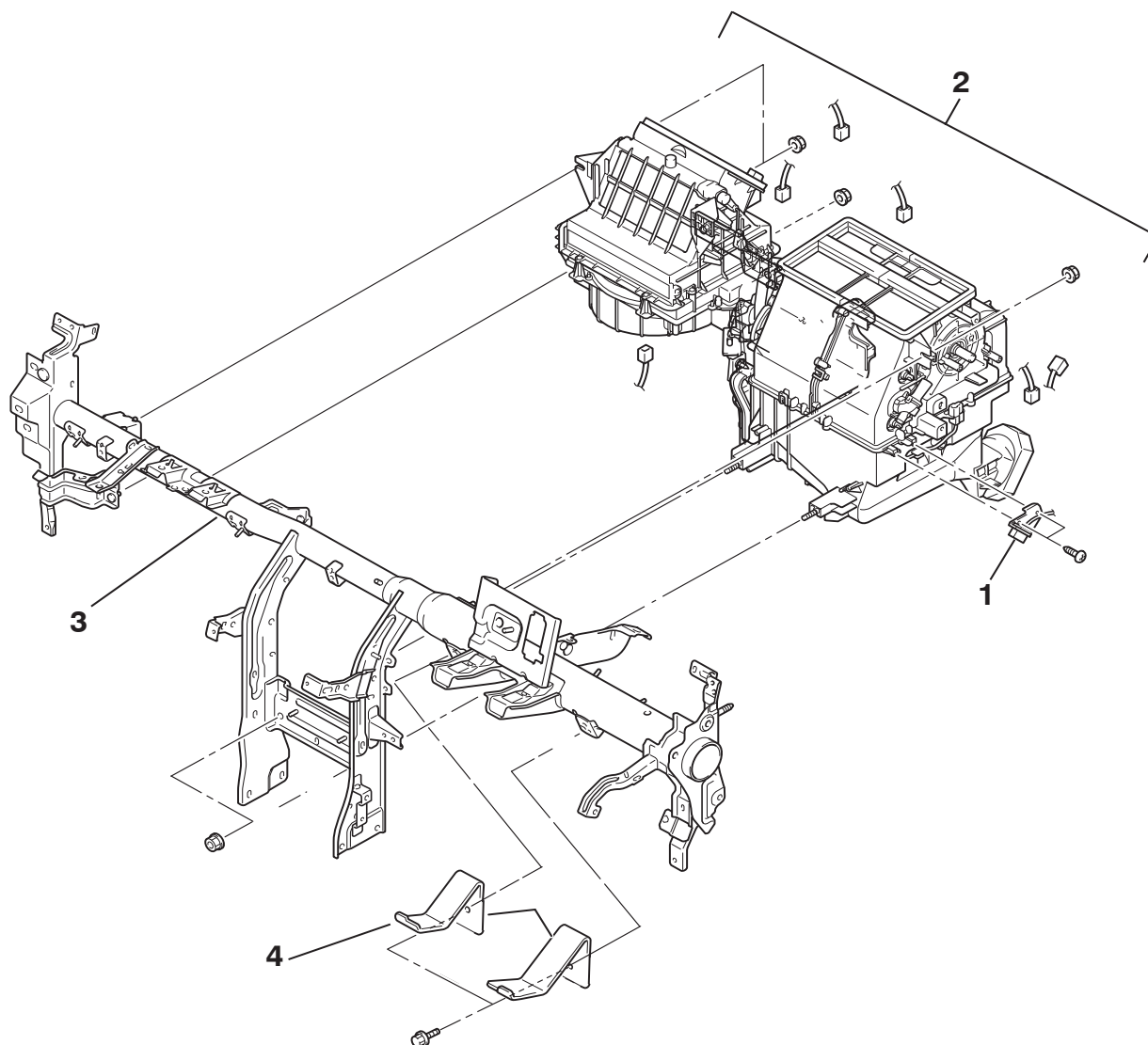
Disconnect the following connectors to gain access to the front deck crossmember.



Connector number	Connector name
C-113	AUDIO AMPLIFIER
C-114	AUDIO AMPLIFIER
C-25	FRONT WIRING HARNESS AND FLOOR WIRING HARNESS COMBINATION
C-26	INSTRUMENT PANEL WIRING HARNESS AND FRONT DOOR WIRING HARNESS (LH) COMBINATION
C-27	INSTRUMENT PANEL WIRING HARNESS AND ROOF WIRING HARNESS COMBINATION
C-28	INSTRUMENT PANEL WIRING HARNESS AND FLOOR WIRING HARNESS COMBINATION
C-29	INSTRUMENT PANEL WIRING HARNESS AND FRONT WIRING HARNESS COMBINATION
C-30	STOPLIGHT SWITCH
C-07	CLUTCH PEDAL SWITCH

REMOVAL AND INSTALLATION

M1552011600316



25DB061A

REMOVAL STEPS

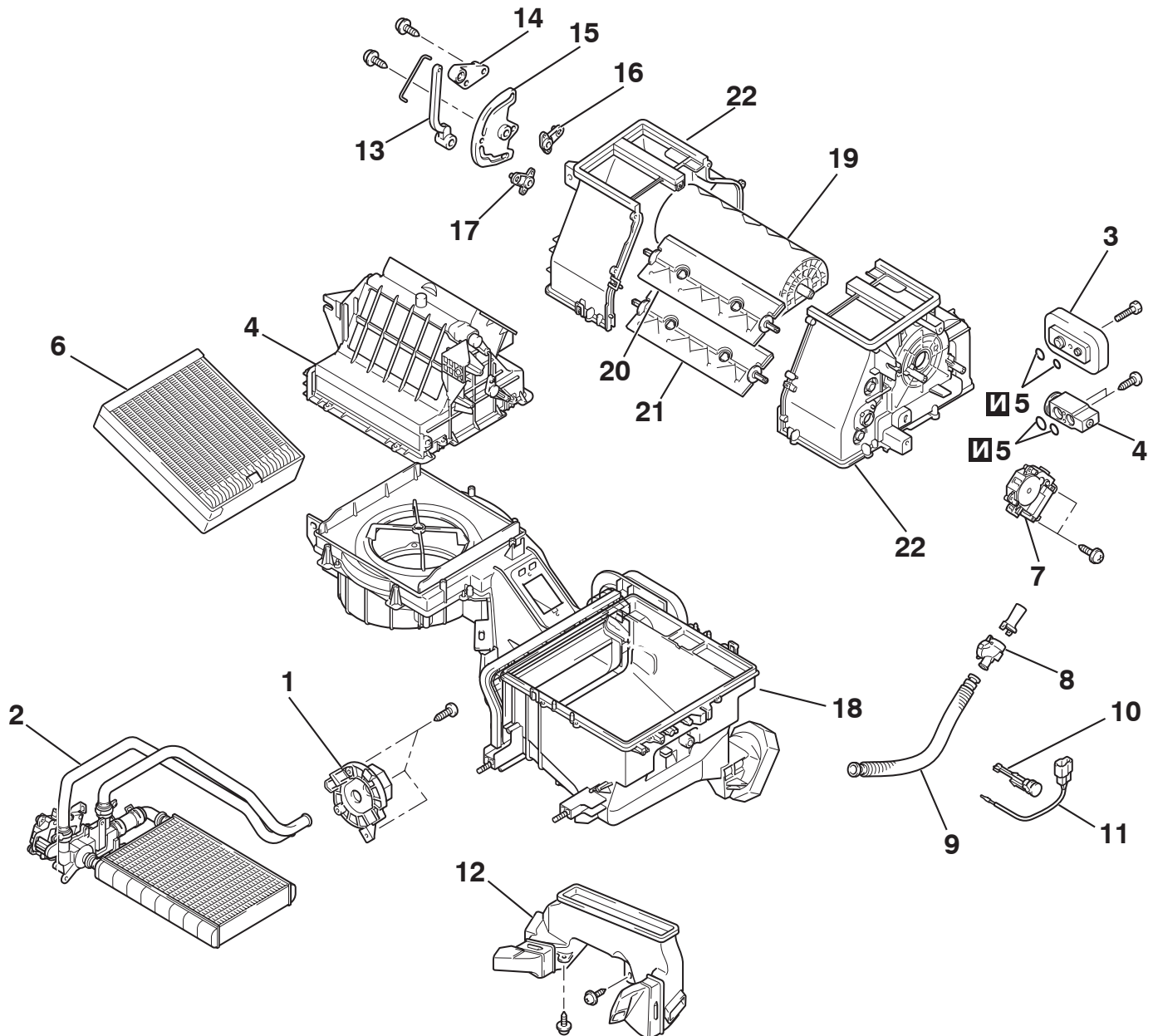
1. DATA LINK CONNECTOR BRACKET
2. HEATER UNIT AND BLOWER ASSEMBLY

REMOVAL STEPS (Continued)

3. DECK CROSSMEMBER ASSEMBLY
4. STAY

DISASSEMBLY AND ASSEMBLY

M1551005400365



25DB062A

DISASSEMBLY STEPS

1. PACKING
2. HEATER CORE ASSEMBLY
3. EXPANSION VALVE JOINT
4. EXPANSION VALVE
5. O-RING
6. EVAPORATOR
7. MODE SELECTION DAMPER
CONTROL MOTOR AND
POTENTIOMETER
8. ASPIRATOR
9. ASPIRATOR HOSE
10. AIR THERMO SENSOR CLIP

DISASSEMBLY STEPS

11. AIR THERMO SENSOR
12. FOOT DUCT
13. LEVER A
14. LEVER B
15. LEVER C
16. LEVER D
17. LEVER E
18. HEATER CASE LOWER
19. MODE SELECTION DAMPER
20. MAX A/C DAMPER
21. AIR MIXING DAMPER
22. HEATER CASE UPPER

INSPECTION

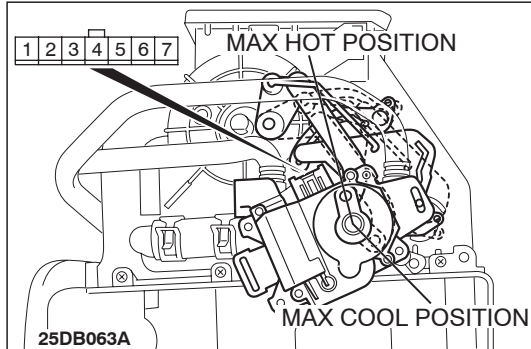
M1552014301157

AIR MIXING DAMPER CONTROL MOTOR CHECK

⚠ CAUTION

Do not apply battery voltage when the damper is in the **MAX COOL** or **MAX HOT** position.

Check the air mix damper control motor by the following procedures.



LEVER POSITION	BATTERY CONNECTION	LEVER OPERATION
At the MAX COOL position	<ul style="list-style-type: none"> Connect terminal 2 to the positive battery terminal Connect terminal 1 to the negative battery terminal 	The lever moves from the MAX COOL position to the MAX HOT position
At the MAX HOT position	<ul style="list-style-type: none"> Connect terminal 1 to the positive battery terminal Connect terminal 2 to the negative battery terminal 	The lever moves from the MAX HOT position to the MAX COOL position

POTENTIOMETER CHECK

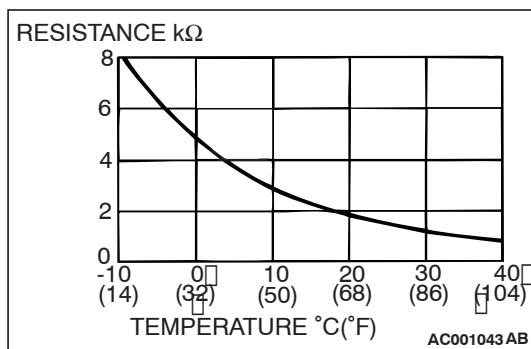
While checking the air mix damper control motor, measure the resistances between terminals numbers 3 and 5 and between numbers 3 and 7. At this time, the resistances should change gradually within the standard value.

Standard value: 1.7 (MAX HOT) – 5.0 (MAX COOL) kΩ

AIR THERMO SENSOR INSPECTION

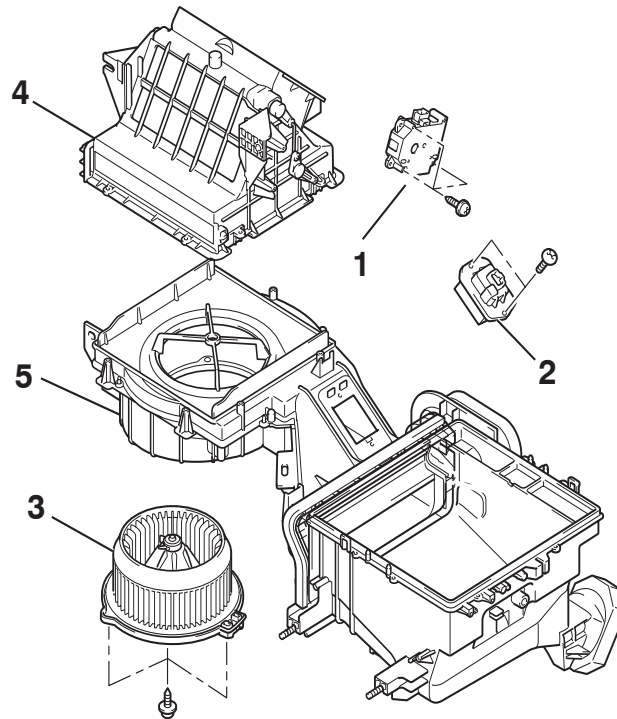
Measure the resistance between connector terminals 1 and 2 under at least two different temperatures. The resistance values should generally match those in the graph.

NOTE: The temperature at the check should not exceed the range in the graph.



BLOWER ASSEMBLY DISASSEMBLY AND ASSEMBLY

M1551005500209



25DB064A

DISASSEMBLY STEPS

1. OUTSIDE/INSIDE AIR
SELECTION DAMPER CONTROL
MOTOR
2. POWER TRANSISTOR

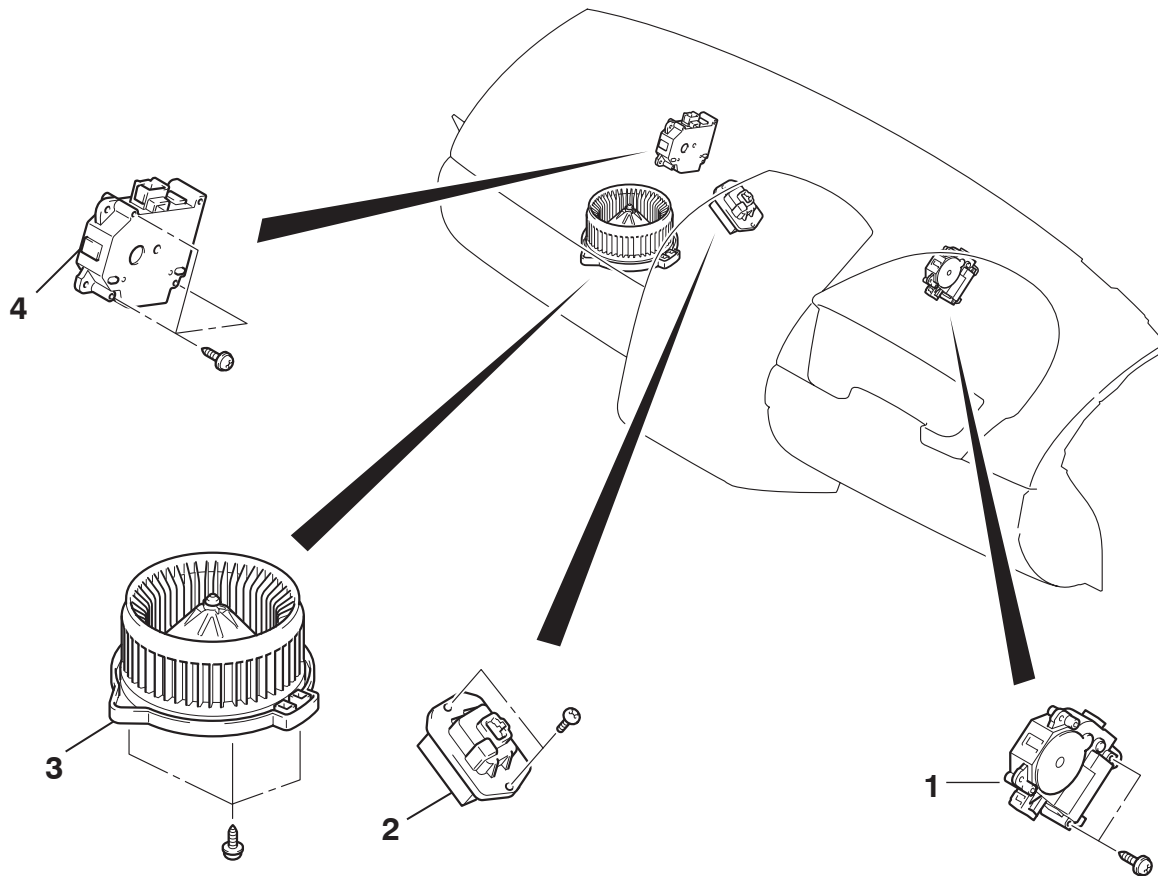
DISASSEMBLY STEPS

3. BLOWER MOTOR
4. BLOWER CASE UPPER
5. BLOWER CASE LOWER

MOTORS AND TRANSISTOR

REMOVAL AND INSTALLATION

M1551006900028



MODE SELECTION DAMPER CONTROL MOTOR REMOVAL STEP

1. MODE SELECTION DAMPER
CONTROL MOTOR
**POWER TRANSISTOR REMOVAL
STEP**
 - GLOVE BOX ASSEMBLY,
INSTRUMENT CENTER PANEL
ASSEMBLY (REFER TO GROUP
52A, INSTRUMENT PANEL
[P.52A-4](#)).
2. POWER TRANSISTOR

BLOWER MOTOR REMOVAL STEP

3. BLOWER MOTOR
**OUTSIDE/INSIDE AIR
SELECTION DAMPER MOTOR
REMOVAL STEP**
 - GLOVE BOX ASSEMBLY,
INSTRUMENT CENTER PANEL
ASSEMBLY (REFER TO GROUP
52A, INSTRUMENT PANEL
[P.52A-4](#)).
4. OUTSIDE/INSIDE AIR
SELECTION DAMPER MOTOR

INSPECTION

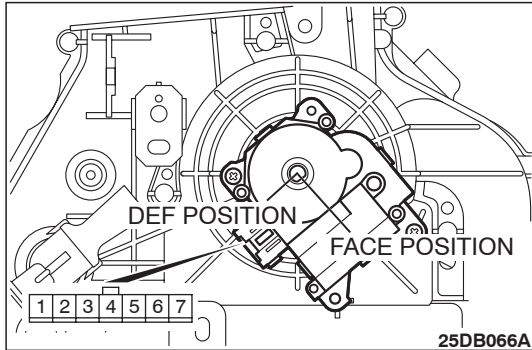
M1551006300338

MODE SELECTION DAMPER CONTROL MOTOR CHECK

⚠ CAUTION

Do not apply battery voltage when the damper is in the **FACE** or **DEF** position.

Check the mode selection damper control motor by the following procedures.



LEVER POSITION	BATTERY CONNECTION	LEVER OPERATION
At the FACE position	<ul style="list-style-type: none"> Connect terminal 2 to the positive battery terminal Connect terminal 1 to the negative battery terminal 	The lever moves from the FACE position to the DEF position
At the DEF position	<ul style="list-style-type: none"> Connect terminal 1 to the positive battery terminal Connect terminal 2 to the negative battery terminal 	The lever moves from the DEF position to the FACE position

POTENTIOMETER CHECK

While checking the mode selection damper control motor, measure the resistances between terminal numbers 3 and 5 and between terminal numbers 3 and 7. At this time, the resistances should change gradually within the standard value.

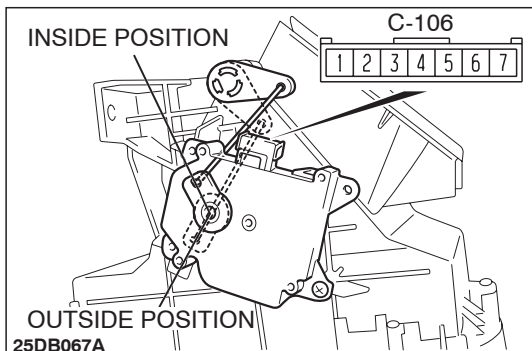
Standard value: 0.8 (DEF) – 4.8 (FACE) kΩ

OUTSIDE/INSIDE AIR SELECTION DAMPER CONTROL MOTOR CHECK

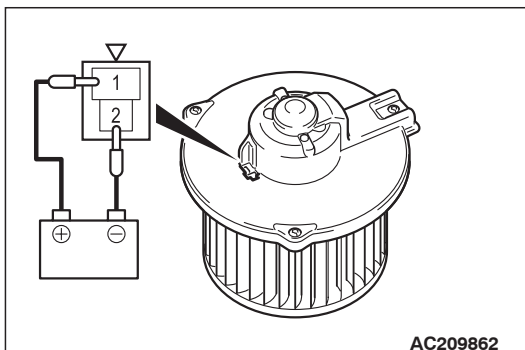
⚠ CAUTION

Cut off the battery voltage when the damper is in the **inside/outside air position**.

Check the outside/inside air selection damper control motor by the following procedures.



LEVER POSITION	BATTERY CONNECTION	LEVER OPERATION
At the inside position	<ul style="list-style-type: none"> • Connect terminal 1 to the positive battery terminal • Connect terminal 7 to the negative battery terminal 	The lever moves from the outside position to the inside position
At the outside position	<ul style="list-style-type: none"> • Connect terminal 1 to the positive battery terminal • Connect terminal 5 to the negative battery terminal 	The lever moves from the inside position to the outside position



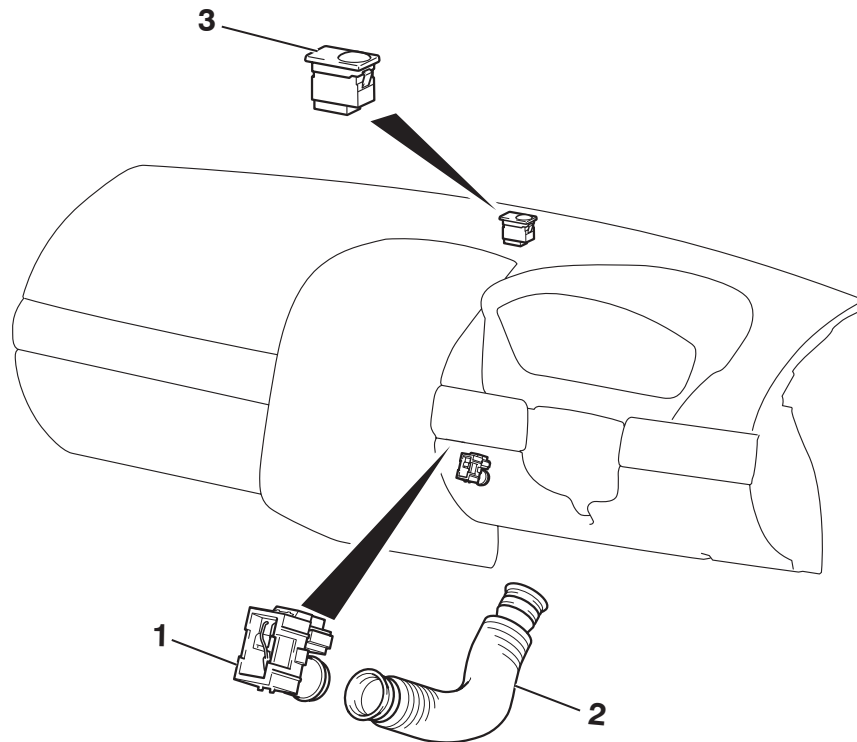
BLOWER FAN AND MOTOR CHECK

When battery voltage is applied between the terminals, check that the motor operates. Also, check that there is no abnormal noise.

SENSORS

REMOVAL AND INSTALLATION

M1554001900088



INTERIOR TEMPERATURE SENSOR REMOVAL STEPS

- LOWER PANEL (REFER TO GROUP 52A, INSTRUMENT PANEL [P.52A-4](#)).
- 1. INTERIOR TEMPERATURE SENSOR
- 2. ASPIRATOR HOSE

PHOTO SENSOR REMOVAL^{25DB138/} STEPS

3. PHOTO SENSOR

Required Special Tools:

- : Diagnostic Tool (MUT-III Sub Assembly)
 - MB991824: Vehicle Communication Interface (V.C.I.)
 - MB991827: MUT-III USB Cable
 - MB991910: MUT-III Main Harness A

INSPECTION

M1554002000130

INTERIOR TEMPERATURE SENSOR CHECK

When the resistance between the sensor terminals is measured under two or more temperature conditions, the resistance should approximately satisfy the illustrated values.

NOTE:

The temperature conditions when checking should not exceed the range shown in the diagram.

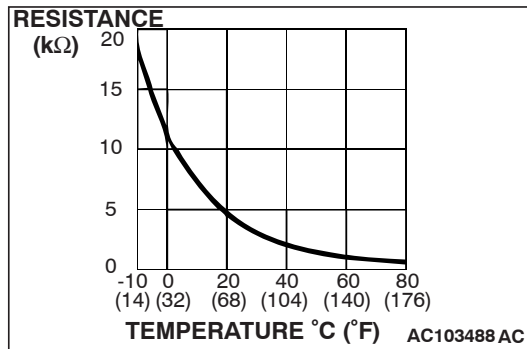
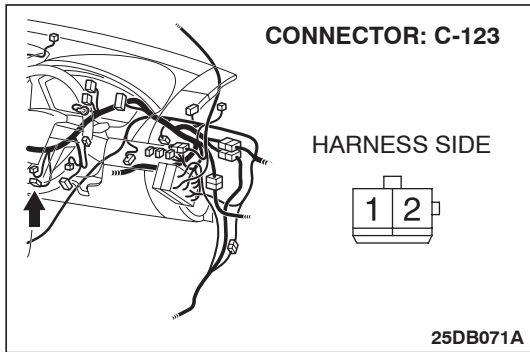


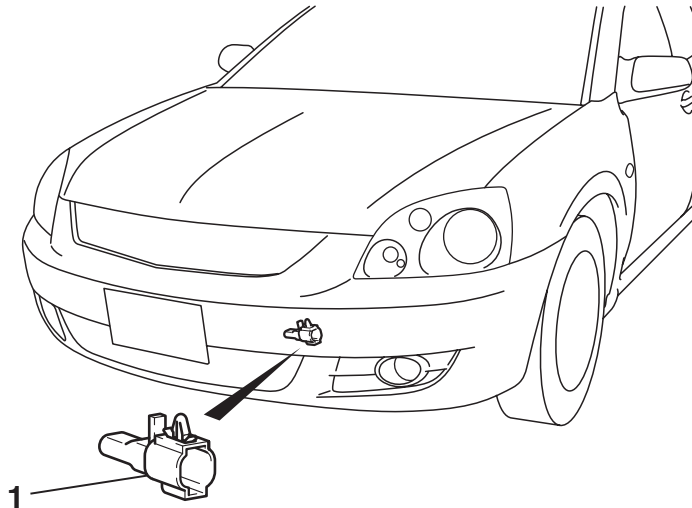
PHOTO SENSOR CHECK

1. Connect diagnostic tool , and check the data list of the photo sensor. (Refer to [P.55-133](#))
2. Check that the displayed value changes when you cover the photo sensor with your hands.

AMBIENT TEMPERATURE SENSOR

REMOVAL AND INSTALLATION

M1554003400108



25DB158A

REMOVAL STEP

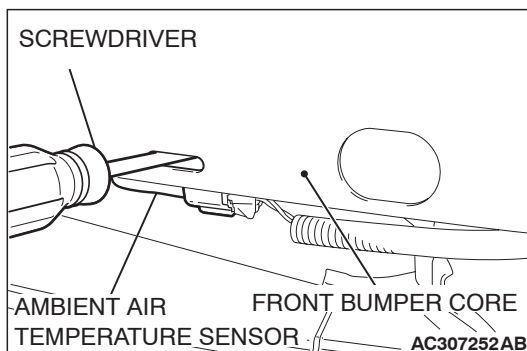
- FRONT BUMPER ASSEMBLY AND FRONT BUMPER CORE (REFER TO GROUP 51, FRONT BUMPER ASSEMBLY [P.51-2](#)).
1. AMBIENT AIR TEMPERATURE SENSOR

<<A>>

REMOVAL SERVICE POINT

<<A>> AMBIENT AIR TEMPERATURE SENSOR REMOVAL

Insert a screwdriver into the mounting hole of the front bumper core to release the clip, and remove the ambient temperature sensor.



INSPECTION

M1551006300349

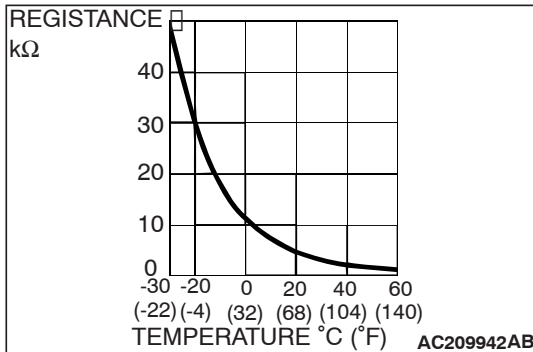
AMBIENT AIR TEMPERATURE SENSOR CHECK

CAUTION

The ambient air temperature sensor should be checked without removing it from bumper. If the sensor is removed, damage will occur to clip rendering it unserviceable.

Measure the resistance between the sensor terminals under at least two temperatures. The resistance values should meet the values shown.

NOTE: The temperature should be within the shown range.



COMPRESSOR ASSEMBLY AND DRIVE BELT

REMOVAL AND INSTALLATION

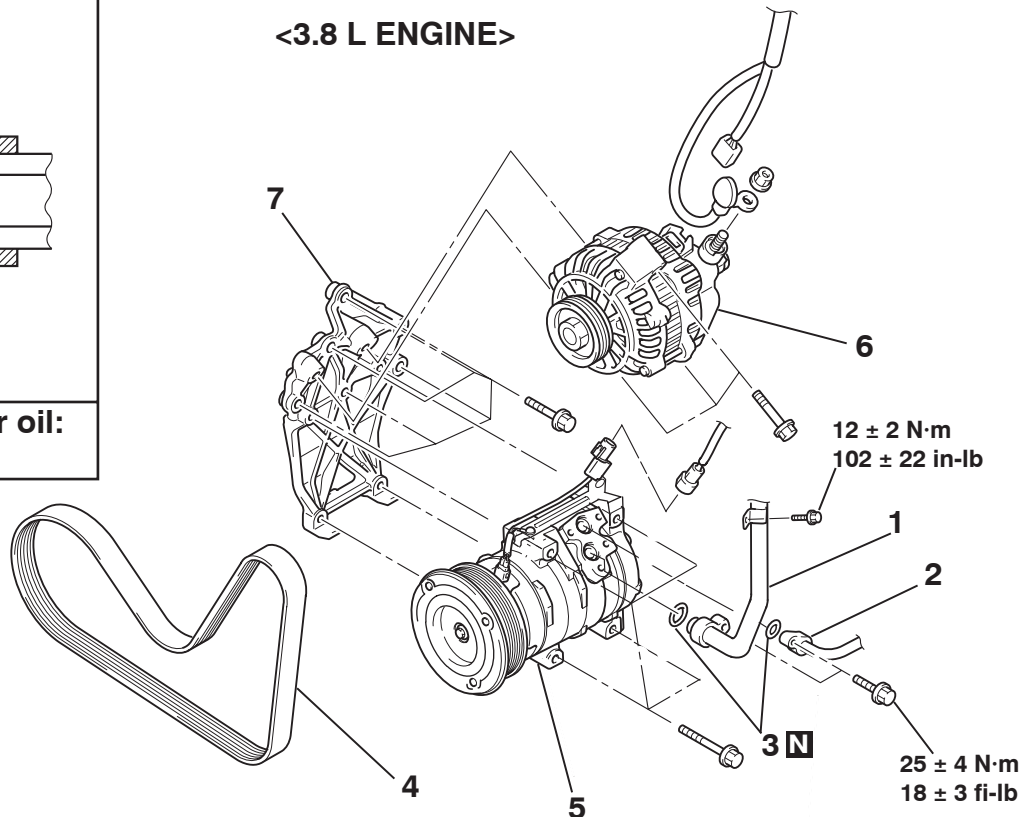
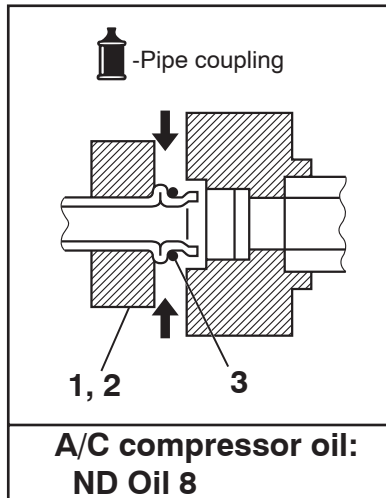
M1552004100289

Pre-removal Operation

- Refrigerant Discharging (Refer to P.55-142).
- Front Bumper Under Cover (Refer to GROUP 51, FRONT BUMPER P.51-2).
- Front Under Cover RH (Refer to GROUP 51, UNDER COVER P.51-13).

Post-installation Operation

- Drive Belt Tension Adjustment (Refer to GROUP 00, Maintenance Service – Drive Belt P.00-39).
- Refrigerant Charging (Refer to P.55-142).
- Front Bumper Under Cover (Refer to GROUP 51, FRONT BUMPER P.51-2).
- Front Under Cover RH (Refer to GROUP 51, UNDER COVER P.51-13).



25DB139A

- <<A>> >>A<<
- <<A>>
- REMOVAL STEPS**
1. FLEXIBLE SUCTION HOSE CONNECTION
 2. FLEXIBLE DISCHARGE HOSE CONNECTION
 3. O-RING

- <> >>B<<
- REMOVAL STEPS (Continued)**
4. DRIVE BELT
 5. A/C COMPRESSOR
 6. ALTERNATOR
 7. A/C COMPRESSOR BRACKET

REMOVAL SERVICE POINTS

<<A>> FLEXIBLE SUCTION HOSE AND FLEXIBLE DISCHARGE HOSE DISCONNECTION

CAUTION

As the compressor oil and receiver are highly moisture absorbent, use a non-porous material to plug the hose and nipples.

To prevent the entry of dust or other foreign bodies, plug the dismantled hoses and compressor nipples.

<> COMPRESSOR REMOVAL

Take care not to spill any compressor oil when removing the compressor.

INSTALLATION SERVICE POINT

>>A<< FLEXIBLE SUCTION HOSE CONNECTION

To prevent mis-alignment of suction hose to bracket use the following assembly procedure.

1. Insert hoseconnector into compressor and hand start bolt.
2. Assemble P-clip to hose and suction hose bracket. Tighten bolt.
3. Tighten bolt between compressor and hose connector.

>>B<< COMPRESSOR INSTALLATION

If a new compressor is installed, first adjust the amount of oil according to the procedures described below, and then install the compressor.

1. Measure the amount (X ml) of oil within the removed compressor.
2. Drain (from the new compressor) the amount of oil calculated according to the following formula, and then install the new compressor.

New compressor oil amount = 140 ml

$$140 \text{ ml} - X \text{ ml} = Y \text{ ml}$$

NOTE: Y ml indicates the amount of oil in the refrigerant line, the condenser, the evaporator, etc.

NOTE: When replacing the following parts at the same times as the compressor, subtract the rated oil amount of each part from Y ml and discharge from the new compressor.

Compressor oil: ND Oil 8

Quantity:

Evaporator: 40 ml

Condenser: 40 ml

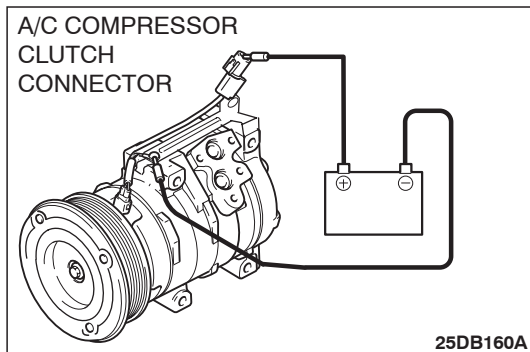
Receiver: 40 ml

INSPECTION

M1552014301083

COMPRESSOR AIR CONDITIONING COMPRESSOR CLUTCH OPERATION CHECK

Connect the compressor connector terminal to the battery positive (+) terminal and ground the battery's negative (-) terminal to the compressor unit. At that time, the air conditioning compressor clutch should make a definite operating sound.



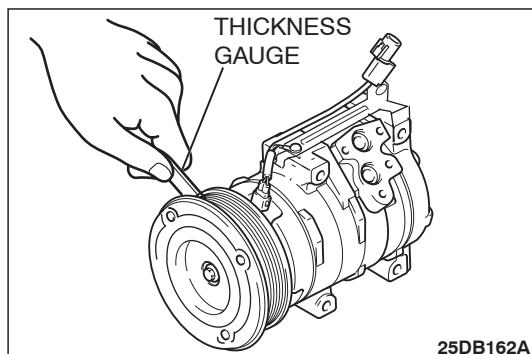
AIR GAP ADJUSTMENT

Check whether or not the air gap of the clutch is within the standard value.

Standard value:

0.35 – 0.60mm

NOTE: If there is a deviation of the air gap from the standard value, assess the operation of the clutch and replace the compressor assembly as required.



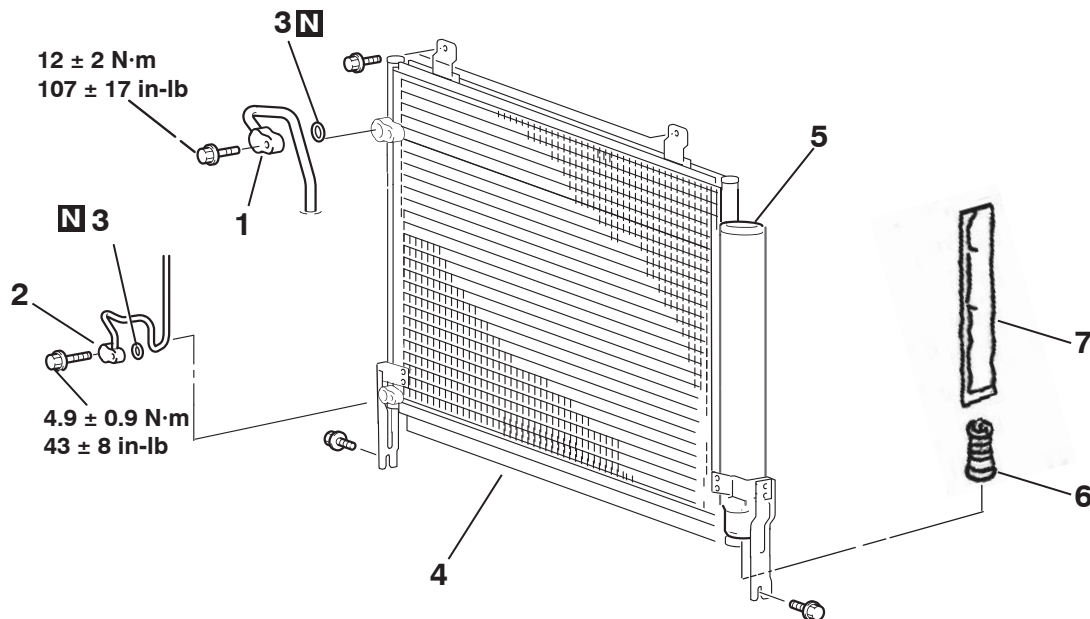
CONDENSER AND CONDENSER FAN

REMOVAL AND INSTALLATION

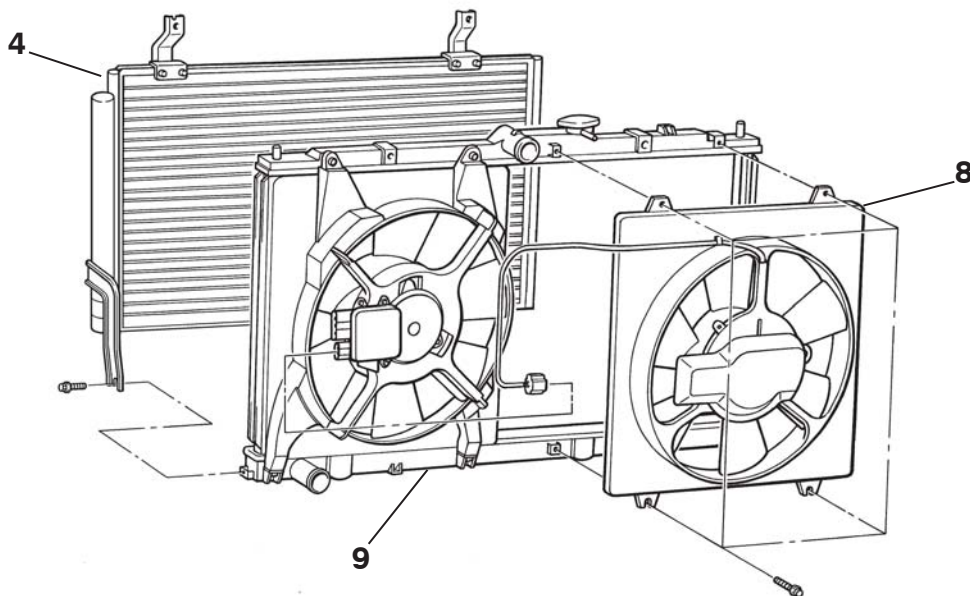
M1552006700414

Pre-removal and Post-installation Operation

- Refrigerant Draining and Refilling (Refer to P.55-142).
- Air Duct Removal and Installation (Refer to GROUP 15, Air Cleaner P.15-4).
- Radiator Grilles Removal and Installation (Refer to GROUP 51, Radiator Grilles P.51-6).
- Front End Structure Bar Removal and Installation (Refer to GROUP 14, Radiator P.14-32).
- Cooler tube removal (Refer to GROUP 37, Power steering P.37-45).



25DB156A



25DB144A

<<A>>

1. FLEXIBLE DISCHARGE HOSE CONNECTION
2. LIQUID PIPE A CONNECTION

<<A>>

>>B<<

3. O-RING
4. CONDENSER ASSEMBLY
5. RECEIVER

CONDENSER REMOVAL STEPS

CONDENSER REMOVAL STEPS

- <> >>A<< 6. CAP WITH FILTER
<> >>A<< 7. DESICCANT BAG
- FRONT UNDER COVER
 - RADIATOR GRILLES
 - FRONT END STRUCTURE BAR

CONDENSER FAN REMOVAL STEPS

8. CONDENSER FAN ASSEMBLY
9. RADIATOR AND FAN ASSEMBLY

REMOVAL SERVICE POINTS

<<A>> FLEXIBLE SUCTION HOSE AND LIQUID PIPE A DISCONNECTION

⚠ CAUTION

As the compressor oil and receiver are highly moisture absorbent, use a non-porous material to plug the hose and nipples.

To prevent the entry of dust or other foreign bodies, plug the dismantled hose and condenser assembly nipples.

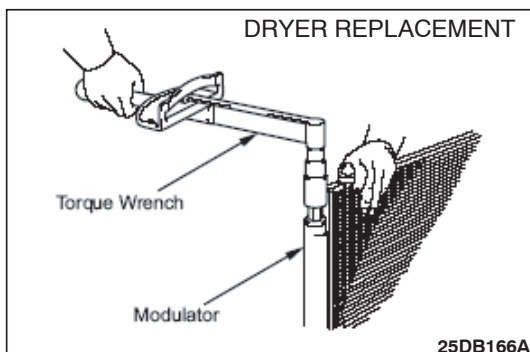
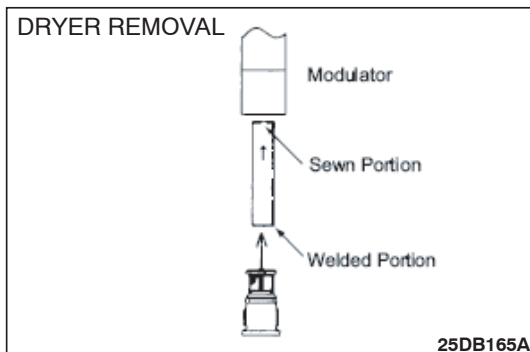
INSTALLATION SERVICE POINT

>>A<< DRYER REMOVAL PROCEDURE

1. Remove the condenser assembly from the vehicle to access the modulator.
2. Remove the modulator cap using a 14 mm hexagon wrench.
3. Remove the desiccant bag from the modulator.

⚠ CAUTION

Do not remove the desiccant bag from the plastic bag until just before inserting it into the modulator.



<> DRYER REPLACEMENT PROCEDURE

1. Fit the desiccant bag with the welded portion facing the bottom of the modulator towards the screw-thread end.
2. Add 40 ml of ND Oil 8 into system to balance the oil removed from the system.
3. Tighten the cap to the required torque.

2.9 ± 1.0 Nm

⚠ CAUTION

Because the plastic cap has a large, 14 mm hex socket, it is susceptible to generating excessive torque. Therefore, be careful not to damage the crown portion of the cap.

>>B<< CONDENSER INSTALLATION

When replacing the condenser, refill it with a specified amount of compressor oil and install it to the vehicle.

Compressor oil: ND Oil 8

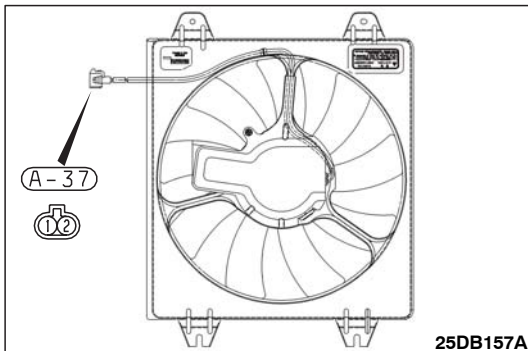
Quantity: 40 ml

INSPECTION

M1552014301102

CONDENSER FAN MOTOR CHECK

Check to be sure that the condenser fan motor operates when battery voltage is applied to terminal 2 and terminal 1 grounded.



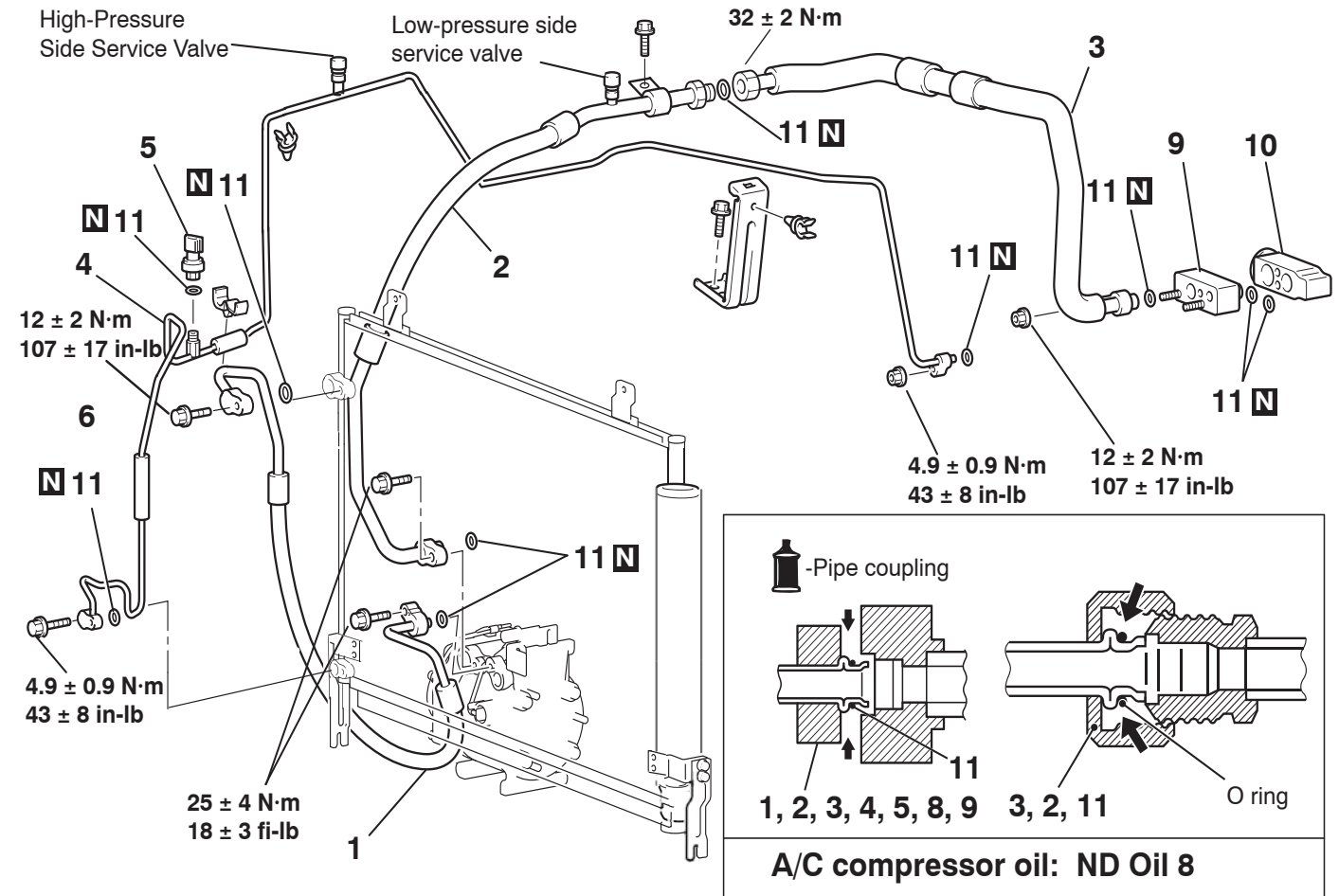
REFRIGERANT LINE

REMOVAL AND INSTALLATION

M1552006400446

Pre-removal and Post-installation Operation

- Refrigerant Draining and Refilling (Refer to Charging and Discharging P.55-142).
- Radiator Grille Removal and Installation (Refer to GROUP 51, Radiator Grilles P.51-6).



25DB140A

REMOVAL STEPS

- | | | |
|-------------|----|-------------------------|
| <<A>> | 1. | FLEXIBLE DISCHARGE HOSE |
| <<A>> >>A<< | 2. | FLEXIBLE SUCTION HOSE |
| <> >>A<< | 3. | SUCTION PIPE |
| <<A>> | 4. | LIQUID PIPE |

REMOVAL STEPS (Continued)

- | | | |
|-------|-----|-----------------------|
| <<A>> | 5. | A/C PRESSURE SENSOR |
| <<A>> | 9. | EXPANSION VALVE JOINT |
| <<A>> | 10. | EXPANSION VALVE |
| <<A>> | 11. | O-RING |

REMOVAL SERVICE POINT

<<A>> HOSE/PIPE DISCONNECTION

CAUTION

As the compressor oil and receiver are highly moisture absorbent, use a non-porous material to plug the hose and nipples.

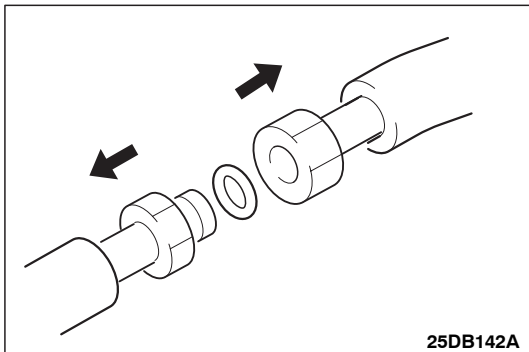
To prevent the entry of other foreign bodies, plug the condenser, compressor, and expansion valve nipples.

<> SUCTION PIPE AND SUCTION FLEXIBLE HOSE DISCONNECTION

CAUTION

As the compressor oil and receiver are highly moisture absorbent, use a non-porous material to plug the hose and nipples.

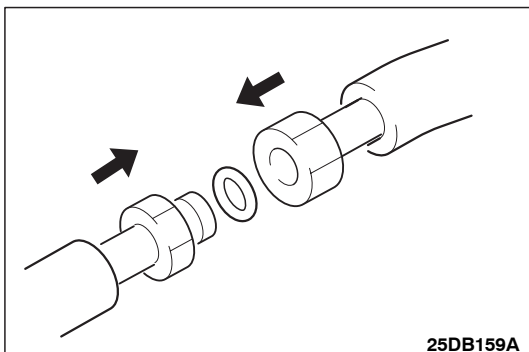
To disconnect the suction hose from the suction flexible hose, loosen the union nut on the suction pipe counterclockwise until nut is completely disengaged from suction hose thread . Plug the hose nipple to prevent entry of dust and dirt.



INSTALLATION SERVICE POINT

>>A<< SUCTION HOSE INSTALLATION

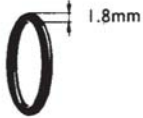
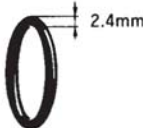
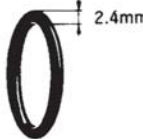
1. When replacing the suction hose, refill them with a specified amount of compressor oil, and then install them.
2. Ensure o-ring is installed correctly and lubricated then fit suction hose into suction pipe fitting. With suitable tools hold the suction hose fitting while tightening union nut to specified torque.



O-RING AND PIPE SERVICE POINT

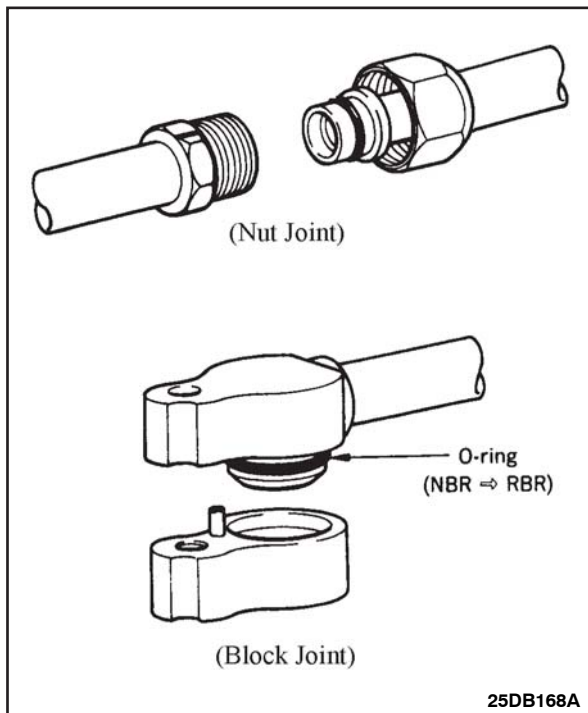
O-RING AND PIPE FITTING

1. The following o-rings and pipe fittings are used in this air conditioning system.
2. Ensure the correct size o-ring is installed as required during service of system.

Pipe size	O-ring
For $\phi 8$ piping (L) (I. D. : 6.7mm)	 1.8mm
For $\phi 1/2$ piping (D) (I. D. : 10.8mm)	 2.4mm
For $\phi 5/8$ piping (S) (I. D. : 13.4mm)	 2.4mm

25DB167A

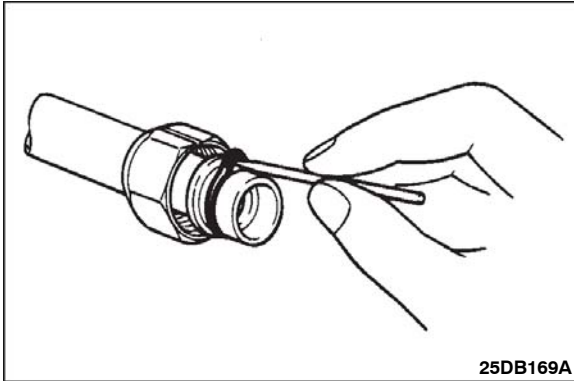
3. Two types of pipe fittings are used in this air conditioning system.



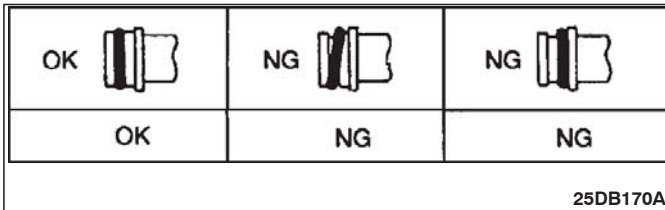
25DB168A

O-RING REPLACEMENT

1. Removal- use a wooden toothpick or plastic awl to remove o-ring without damaging the tube.



2. Installation- lubricate o-ring with ND-Oil 8, roll the new o-ring into captured position.



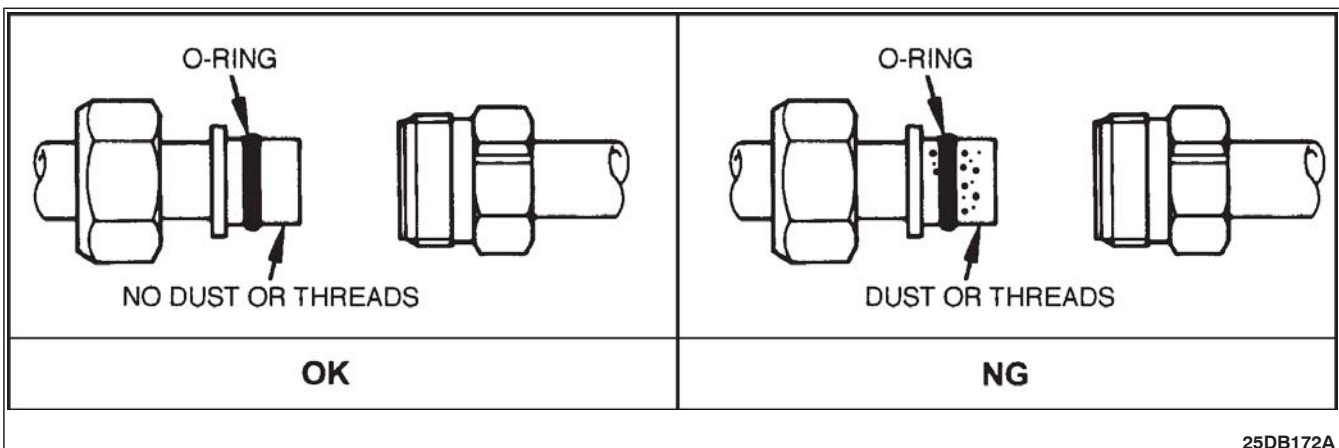
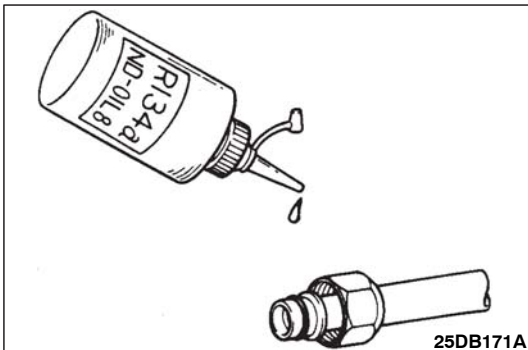
PIPE JOINT PRECAUTIONS

1. Before making any hose and tube connections, always apply ND-Oil 8 compressor oil to o-ring.

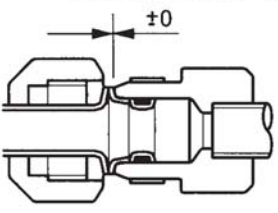
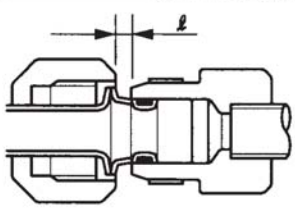
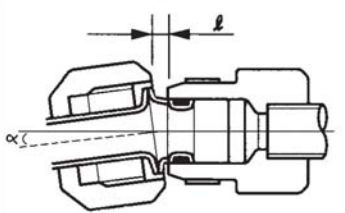
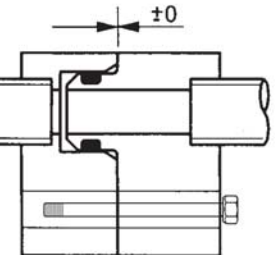
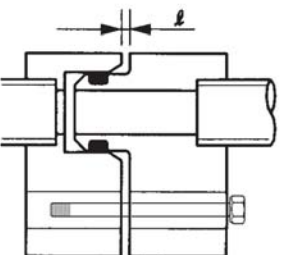
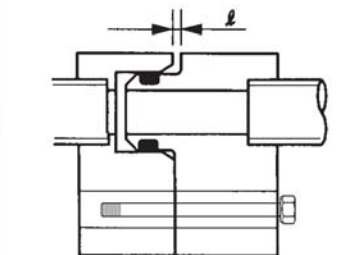
⚠ CAUTION

Avoid applying oil in areas with acrylic resin or ABS plastic as it causes enviromental stress cracking to these resins.

2. Ensure the connecting parts are free of foreign material.

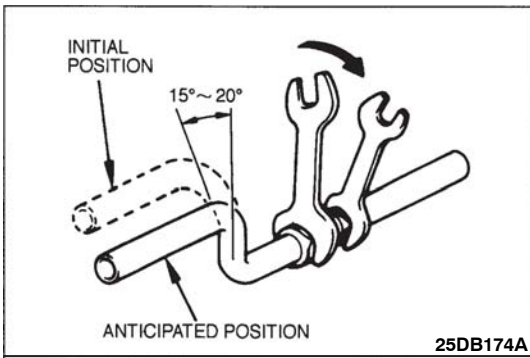


3. Ensure a complete mating of joint before tightening the bolts or nut.

	Complete Mating (Insert a male part into a female part.)	Incomplete Mating	In-align Mating
Nut union			
Determination	OK	NG	NG
Block joint			
Determination	OK	NG	NG

ℓ: Incomplete joint (an opening)
α: In-align Joint

25DB173A



4. Tighten the joint to the specific torque. For the nut joint, pay special attention to following cautions.

CAUTION

Always use two wrenches to prevent the tubes from twisting.

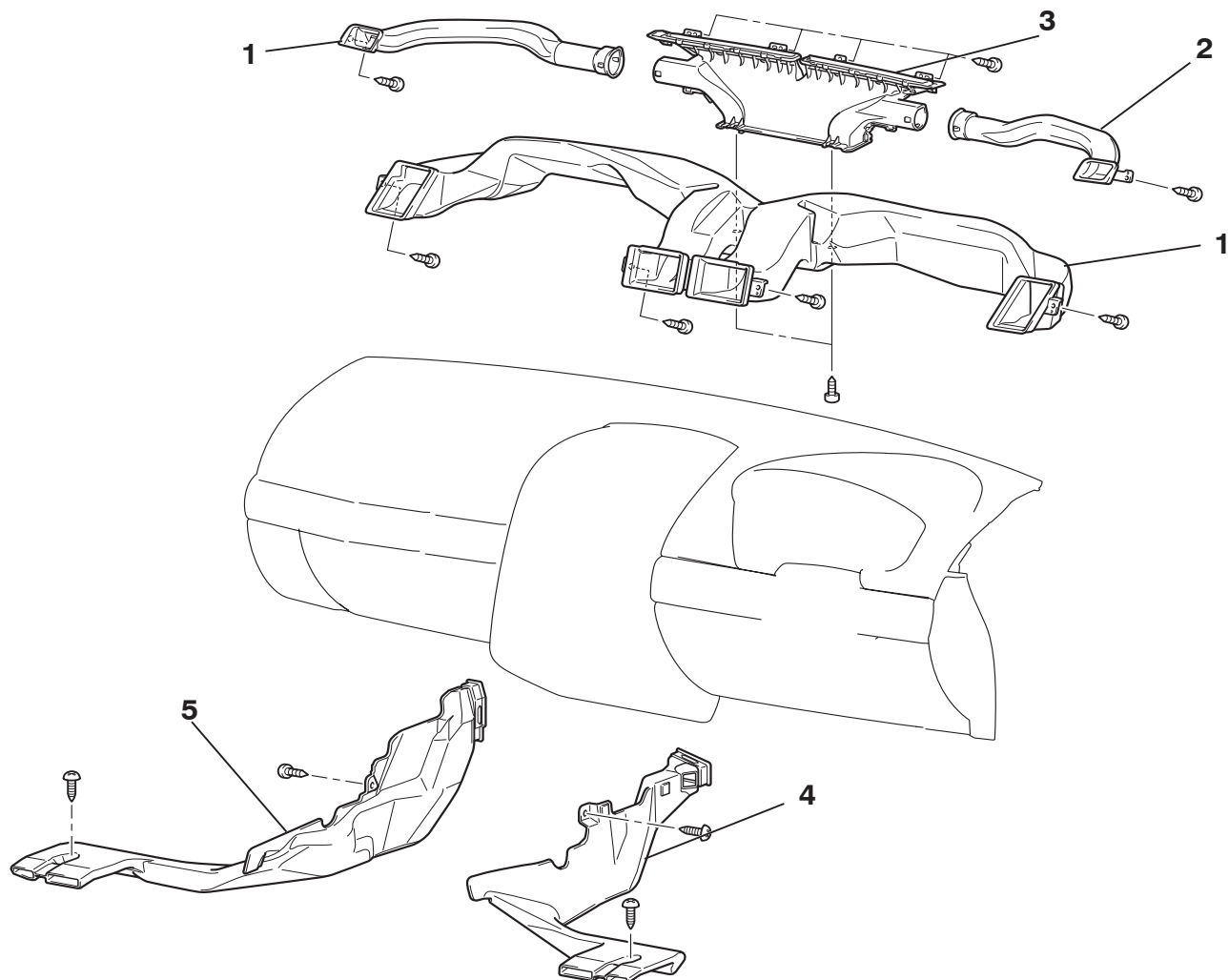
Pipes will rotate 15 - 20 clockwise during tightening, so ensure final position is the correct location.

When finally tightening the pipes, do not rotate the fixed side(female side).

DUCTS

REMOVAL AND INSTALLATION

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25DB141A

DEFROSTER NOZZLE AND DISTRIBUTION DUCT REMOVAL STEPS

- INSTRUMENT PANEL (REFER TO GROUP 52A [P.52A-4](#)).
- 1. VENTILATOR AIR DISTRIBUTION DUCT
- 2. SIDE DEFROSTER DUCT
- 3. DEFROSTER NOZZLE

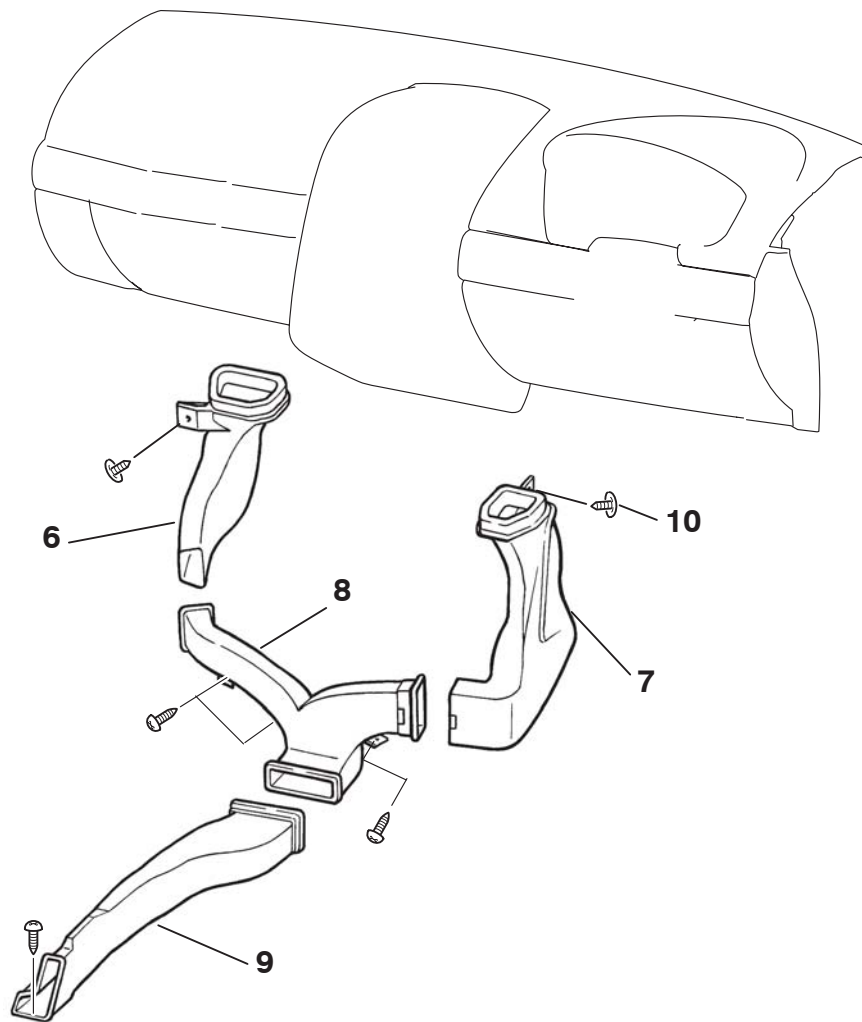
FOOT DUCT AND REAR HEATER DUCT REMOVAL STEPS

- FRONT SEAT ASSEMBLY (REFER TO GROUP 52A, FRONT SEAT ASSEMBLY [P.52A-21](#)).
- FRONT SCUFF PLATE, COWL SIDE TRIM (REFER TO GROUP 52A, TRIMS [P.52A-11](#).)

FOOT DUCT AND REAR HEATER DUCT REMOVAL STEPS

- FLOOR CARPET PEELING
- FLOOR CONSOLE ASSEMBLY (REFER TO GROUP 52A, FLOOR CONSOLE ASSEMBLY [P.52A-10](#).)
- TRUNK LID RELEASE HANDLE COVER (REFER TO GROUP 42, TRUNK LID [P.42-63](#).)
- ACCELERATOR STOPPER (REFER TO GROUP 17, ACCELERATOR CABLE AND PEDAL [P.17-9](#).)
- 4. REAR HEATER DUCT A
- 5. REAR HEATER DUCT B

DUCTS Cont.



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. **REAR CONSOLE DUCT
REMOVAL STEPS**

6. REMOVE TRIM CLIP FROM
DUCT, CONSOLE A
7. REMOVE 2 TRIM CLIPS FROM
DUCT CONSOLE C

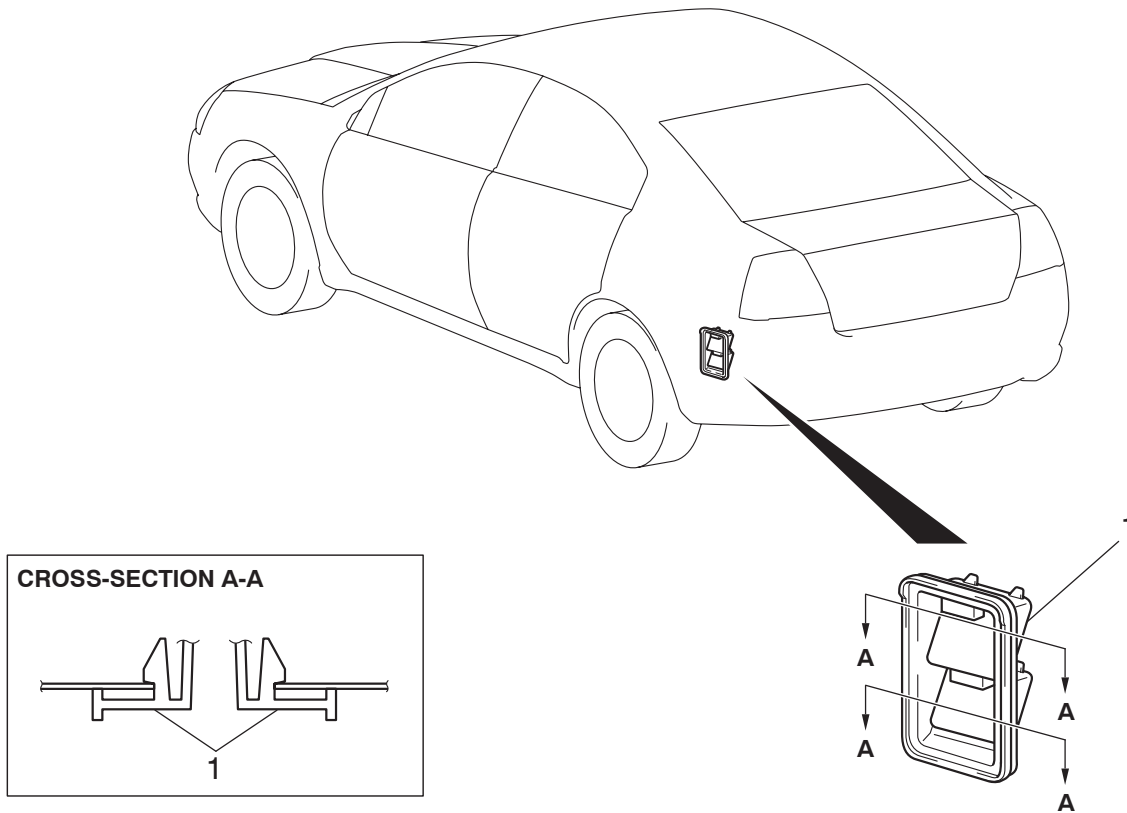
. **REAR CONSOLE DUCT
REMOVAL STEPS (Continued)**

8. REMOVE 3 SCREWS FROM
DUCT CONSOLE B
9. REMOVE 2 SCREWS FROM
DUCT CONSOLE D
10. TRIM CLIP

VENTILATORS

REMOVAL AND INSTALLATION

M1553001600352



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REAR VENTILATION DUCT REMOVAL STEPS

- REAR BUMPER ASSEMBLY
(REFER TO GROUP 51, [P.51-5](#)).
1. REAR VENTILATION DUCT

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

M1552012100273

ITEM	SPECIFICATION
Liquid pipe mounting nut (heater unit side)	$4.9 \pm 0.9 \text{ N}\cdot\text{m}$ ($43 \pm 8 \text{ in}\cdot\text{lb}$)
Liquid pipe mounting bolt (condenser side)	$4.9 \pm 0.9 \text{ N}\cdot\text{m}$ ($44 \pm 8 \text{ in}\cdot\text{lb}$)
Suction flexible hose mounting nut (compressor side)	$25 \pm 4 \text{ N}\cdot\text{m}$ ($18 \pm 3 \text{ ft}\cdot\text{lb}$)
Suction pipe mounting nut (heater unit side)	$12 \pm 2 \text{ N}\cdot\text{m}$ ($107 \pm 17 \text{ in}\cdot\text{lb}$)
Suction pipe to suction hose union nut	$32 \pm 2 \text{ N}\cdot\text{m}$
Discharge flexible hose mounting bolt (compressor side)	$25 \pm 4 \text{ N}\cdot\text{m}$ ($18 \pm 3 \text{ ft}\cdot\text{lb}$)
Discharge flexible hose mounting nut (condenser side)	$12 \pm 2 \text{ N}\cdot\text{m}$ ($107 \pm 17 \text{ in}\cdot\text{lb}$)

GENERAL SPECIFICATIONS

M1552000200262

ITEM	MANUAL AIR CONDITIONING
Heater control	Dial type
Air conditioning switch	Push-button type
Compressor	Type
	10S17 (Swashplate type)
	Displacement (cm^3)
	188
Refrigerant	Type
	R134a (HFC-134a)
	Amount (grams)
	435 – 475

SERVICE SPECIFICATIONS

M1552000300333

ITEM	STANDARD VALUE
Idle speed r/min	680 ± 50
Idle-up speed r/min	680 ± 50
Air mix damper potentiometer resistance $\text{k}\Omega$	1.7 – 5.0
Air outlet changeover damper potentiometer resistance $\text{k}\Omega$	0.8 – 4.8
Air gap (air conditioning compressor clutch) mm (in)	0.3 – 0.5 (0.012 – 0.020)

LUBRICANTS

M1552000400329

ITEM	SPECIFIED LUBRICANT	QUANTITY(ml)
Each connection of refrigerant line	ND Oil 8	As required
Compressor refrigerant unit lubricant (ml)	ND Oil 8	140