

GROUP 55B

AUTOMATIC AIR CONDITIONING

CONTENTS

GENERAL DESCRIPTION.....	55B-2	HEATER CONTROL UNIT	55B-42
		REMOVAL AND INSTALLATION	55B-42
AUTOMATIC A/C DIAGNOSIS	55B-3	DAMPER CONTROL MOTOR	
INTRODUCTION.....	55B-3	ASSEMBLY.....	55B-43
AUTOMATIC AIR CONDITIONING		DAMPER CONTROL MOTOR	
TROUBLESHOOTING STRATEGY	55B-4	ASSEMBLY REMOVAL AND	
DIAGNOSTIC FUNCTION	55B-4	INSTALLATION.....	55B-43
DIAGNOSTIC TROUBLE CODE CHART..	55B-8	DAMPER CONTROL MOTOR	
DIAGNOSTIC TROUBLE CODE		ASSEMBLY INSPECTION	55B-44
PROCEDURES.....	55B-9		
TROUBLE SYMPTOM CHART.....	55B-24	AMBIENT TEMPERATURE	
SYMPTOM PROCEDURES	55B-25	SENSOR.....	55B-46
DATA LIST REFERENCE TABLE	55B-35	REMOVAL AND INSTALLATION	55B-46
ACTUATOR TEST TABLE	55B-37	INSPECTION.....	55B-46
CHECK AT A/C-ECU TERMINALS.....	55B-38		
SPECIAL TOOLS.....	55B-39	OTHER PARTS.....	55B-47
		OTHER PARTS MAINTENANCE	
		SERVICE POINTS	55B-47

GENERAL DESCRIPTION

M1552000101321

The blower, heater, and evaporator have been integrated with the heater and A/C system to achieve greater fan power and noise reduction.

ITEM	SPECIFICATION
Heater control assembly	Push-button type
Compressor mode	VCR-08
Compressor type	Two vane type
Refrigerant and quantity g (oz)	R-134a (HFC-134a), 250 – 290 (8.8 – 10.2)

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. Should any liquid refrigerant get 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

COOLING FAN CONTROL

The ECM judges the required revolution speed of cooling fan motor using the input signals transmitted from A/C switch, secondary pulley speed sensor <CVT> or vehicle speed sensor (VSS) <M/T> and engine coolant temperature sensor.

COMPRESSOR CONTROL

When operating the A/C switch

- The air thermo sensor, which senses the temperature of the air flowing out of the evaporator, deactivates the compressor at 1°C (33.8°F) or below.
- A/C-ECU detect refrigerant pressure by A/C pressure sensor and 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 A/C switch are ON, the A/C compressor clutch relay is energized.

When operating the mode selection dial

- The A/C 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 A/C switch is turned on, the A/C 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 1 °C (33.8 °F), the A/C-ECU will turn off the A/C compressor clutch relay.</i>
Blower switch		ON	
A/C 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	2.94 MPa (427psi) or less [If the refrigerant pressure exceeds 2.94 MPa (427psi), A/C compressor clutch relay is not ON condition until the refrigerant pressure has been measured up to 2.35 MPa (341psi) a or less.]	ON	
	0.19 MPa (27psi) or more [If the refrigerant pressure falls short of 0.19 MPa (27psi), A/C compressor clutch relay is not ON condition until the refrigerant pressure has been measured up to 0.22 MPa (32psi) or more.]		
A/C compressor clutch relay driving transistor (within powertrain control module)		ON	

AUTOMATIC A/C DIAGNOSIS

INTRODUCTION

After air is taken in through the air selection damper, it is fed to the evaporator by the blower fan and motor and cooled. The air cooled by the evaporator is mixed appropriately with the warmed air which pass through the heater core 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.

M1554006200125

AUTOMATIC AIR CONDITIONING TROUBLESHOOTING STRATEGY

M1554004701161

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

M1552019800455

HOW TO CONNECT THE SCAN TOOL (M.U.T.-III)

Required Special Tools:

- MB992744: Vehicle communication interface-Line (V.C.I.-Line)
- MB992745: V.C.I.-Line main harness A (for vehicle with CAN communication)
- MB992747: V.C.I.-Line USB cable short
- MB992748: V.C.I.-Line USB cable long
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
 - MB991824: Vehicle Communication Interface (V.C.I.)
 - MB991827: M.U.T.-III USB Cable
 - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

1. Ensure that the ignition switch is at the "LOCK" (OFF) position.
2. Start up the personal computer.
3. Connect special tool MB992747/MB992748 or MB991827 to special tool MB992744 or MB991824 and the personal computer.
4. Connect special tool MB992745 or MB991910 to special tool MB992744 or MB991824
5. Connect special tool MB992745 or MB991910 to the data link connector.

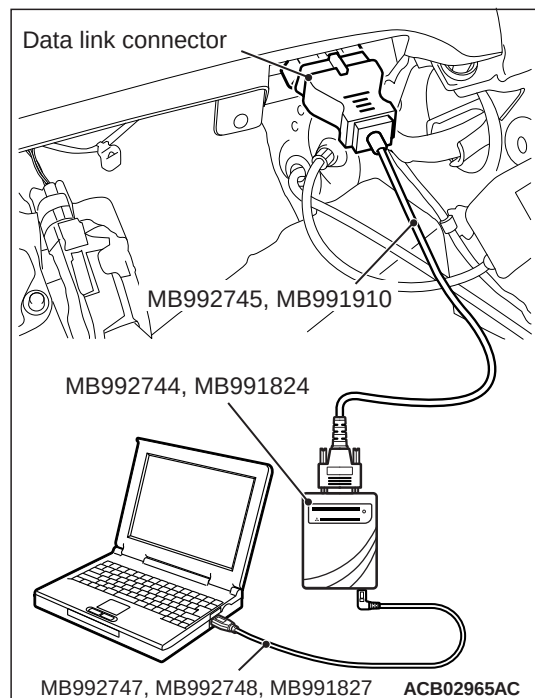
NOTE: When the special tool MB992744 or MB991824 is connected to the data link connector, the special tool MB992744 or MB991824 indicator light will be illuminated in a green color.

6. Turn the power switch of special tool MB992744 or MB991824 to the "ON" position.

NOTE: When the special tool MB992744 or MB991824 is energized, the special tool MB992744 or MB991824 indicator light will be illuminated in a green color.

7. Start the M.U.T.-III system on the personal computer.

NOTE: Disconnecting the scan tool special tool MB992744 or 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:

- MB992744: Vehicle communication interface-Line (V.C.I.-Line)
- MB992745: V.C.I.-Line main harness A (for vehicle with CAN communication)
- MB992747: V.C.I.-Line USB cable short
- MB992748: V.C.I.-Line USB cable long
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
 - MB991824: Vehicle Communication Interface (V.C.I.)
 - MB991827: M.U.T.-III USB Cable
 - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

CAUTION

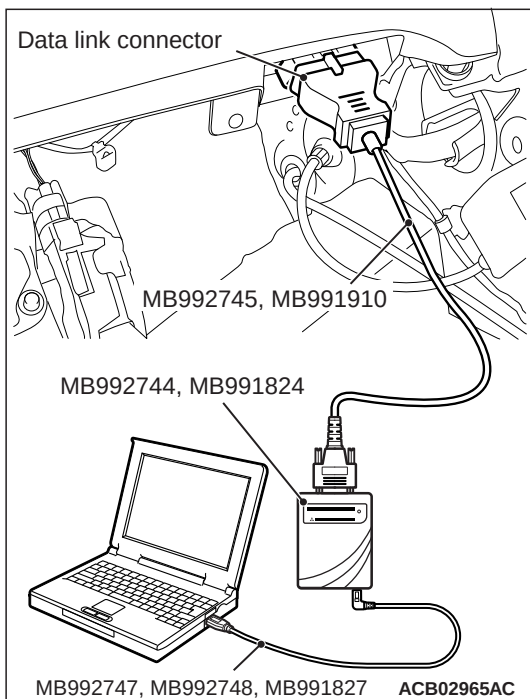
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

NOTE: If the battery voltage is low, diagnostic trouble codes will not be output. Check the battery if scan tool MB991958 does not display.

1. Connect the scan tool MB991958 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select "System select" from the start-up screen.
4. Select "From 2014 MY" of "Model Year." When the "Vehicle Information" is displayed, check the contents.
5. Select "AUTO A/C" from "System List," and press the "OK" button.

NOTE: When the "Loading Option Setup" list is displayed, check the applicable item.

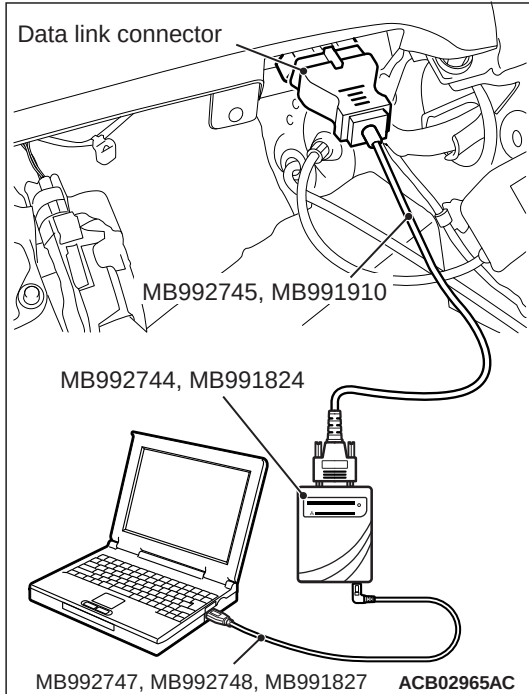
6. Select "Diagnostic Trouble Code" to read the DTC.
7. If a DTC is set, it is shown.
8. Choose "Erase DTCs" to erase the DTC.



HOW TO READ DATA LIST

Required Special Tools:

- MB992744: Vehicle communication interface-Line (V.C.I.-Line)
- MB992745: V.C.I.-Line main harness A (for vehicle with CAN communication)
- MB992747: V.C.I.-Line USB cable short
- MB992748: V.C.I.-Line USB cable long
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
 - MB991824: Vehicle Communication Interface (V.C.I.)
 - MB991827: M.U.T.-III USB Cable
 - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

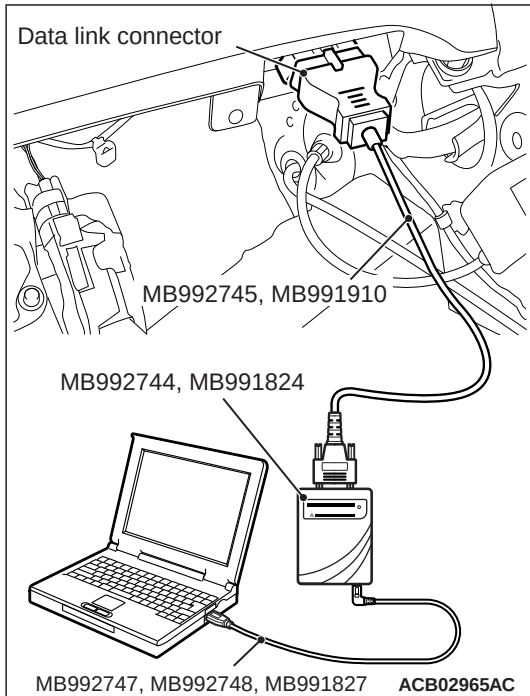
**⚠ CAUTION**

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

1. Connect the scan tool MB991958 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."
Select "AUTO A/C" from "System List," and press the "OK" button.
5. Select "Data List."
6. Choose an appropriate item and select the "OK" button.

HOW TO PERFORM ACTUATOR TEST**Required Special Tools:**

- MB992744: Vehicle communication interface-Line (V.C.I.-Line)
- MB992745: V.C.I.-Line main harness A (for vehicle with CAN communication)
- MB992747: V.C.I.-Line USB cable short
- MB992748: V.C.I.-Line USB cable long
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
 - MB991824: Vehicle Communication Interface (V.C.I.)
 - MB991827: M.U.T.-III USB Cable
 - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)



⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

1. Connect the scan tool MB991958 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select "System Select."
4. Select "AUTO A/C" from "System List," and press the "OK" button.
5. Choose "Actuator Test" from "AUTO A/C" screen.
6. Choose an appropriate item and select the "OK" button.

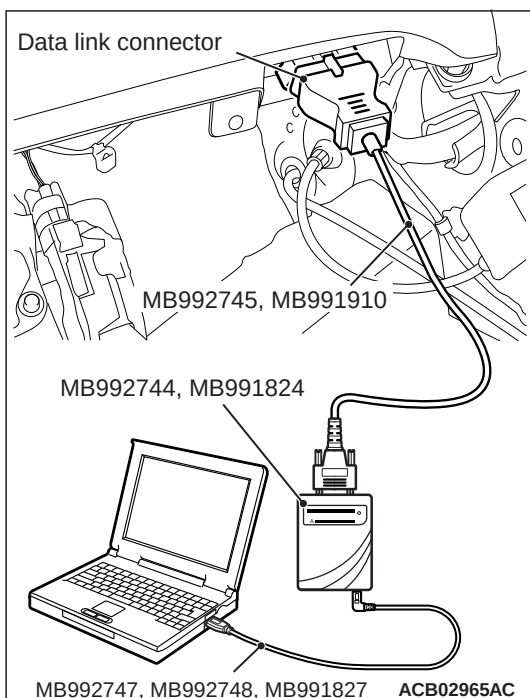
HOW TO DIAGNOSE THE CAN BUS LINE

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
 - MB991824: Vehicle Communication Interface (V.C.I.)
 - MB991827: M.U.T.-III USB Cable
 - MB991910: M.U.T.-III Main Harness A

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.



1. Connect scan tool MB991958 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".

CHECK OF FREEZE FRAME DATA

The freeze frame data can be checked by using the scan tool (GROUP 00, How to Cope with Intermittent Malfunction [P.00-13](#)).

When detecting fault and storing the DTC, the ECU connected to CAN bus line obtains the data before the determination of the DTC and the data when the DTC is determined, and then stores the ECU status of that time. By analyzing the data from scan tool, the troubleshooting can be performed more efficiently. The displayed items are as shown in the table below.

Display item list

Item No.	Item name	Data item	Unit
01	Odometer	Total driving distance after the diagnostic trouble code is generated	mile*
02	Ignition cycle	Number of times the ignition switch is turned "ON" or "LOCK" (OFF) after the past failure transition	Number of counts is displayed.
04	Accumulative time	Cumulative time for current malfunction of diagnostic trouble code	min

NOTE:

- *: If a failure occurs to both the ABS-ECU and ETACS-ECU, 0000 km or FFFF mile is displayed to the scan tool MB991958.

DIAGNOSTIC TROUBLE CODE CHART

M1554004902908

<A/C-ECU>

Code No.	Diagnostic item	Reference page	Service data display contents when diagnostic trouble code is set
B1001	Inside temperature sensor low	P.55B-9	25°C
B1002	Inside temperature sensor high		
B1041	A/M damper potentiometer high	P.55B-9	-
B1042	A/M damper potentiometer low		
B1045	Air mix damper motor	P.55B-10	—
B1061	Air outlet damper potentio. high.	P.55B-10	-
B1062	Air outlet damper potentio. low.		
B1065	Air outlet changeover DMPR.motor	P.55B-12	—
B1083	EEPROM error	P.55B-14	—
U1000	OSS/F.A.S.T._OSS CAN timeout	P.55B-14	—
U1100	Engine CAN timeout	P.55B-16	—
U1108	Meter CAN timeout/Not equipped	P.55B-19	—
U1109	ETACS CAN timeout/Not equipped	P.55B-21	—
U1190	No receive fault detect signal	P.55B-24	—
U1195	Coding not completed	P.55B-24	—

<Engine control module>

For details, refer to GROUP 13A, Diagnostic Trouble Code Inspection Procedure.

NOTE: Diagnostic trouble codes regarding the A/C pressure sensor and the fin thermo sensor will be set in the engine control module.

Code No.	Diagnosis item	Reference page
P0532	A/C pressure sensor circuit low	(Refer to GROUP 13A – P.13A-361)
P0533	A/C pressure sensor circuit high	(Refer to GROUP 13A – P.13A-365)
P0537	A/C EVAP. TEMP. SNSR. circuit low <Automatic A/C>	(Refer to GROUP 13A – P.13A-367)
P0538	A/C EVAP. TEMP. SNSR. circuit high <Automatic A/C>	(Refer to GROUP 13A – P.13A-369)

DIAGNOSTIC TROUBLE CODE PROCEDURES

Code No.B1001: Inside temperature sensor low

Code No.B1002: Inside temperature sensor high

DIAGNOSTIC TROUBLE CODE SET CONDITION

This code is stored when the interior temperature sensor circuit is open (Code No.B1002) or is short (Code No.B1001).

POSSIBLE CAUSES

- Malfunction of the auto A/C controller assembly (A/C-ECU).

Code No.B1041: A/M damper potentiometer high

Code No.B1042: A/M damper potentiometer low

DIAGNOSTIC TROUBLE CODE SET CONDITION

This code is stored when the air mixing damper control motor potentiometer does not send any signal to the A/C-ECU due to short or open circuit.

POSSIBLE CAUSES

- Malfunction of the air mixing damper control motor and potentiometer
- Damaged the wiring harness or connectors
- Malfunction of the auto A/C controller assembly (A/C-ECU)

DIAGNOSIS

STEP 1. Using scan tool MB991958, check data list.

Check that the following service data display contents are normal. (Refer to [P.55B-35](#)).

Item No.63: Air mix potentiometer

Q: Is the check result normal?

YES : Go to Step 3.

NO : Go to Step 2.

STEP 2. Check open and short circuit in SENB, A/MP and SENG line between air mixing damper control motor and potentiometer connector (potentiometer side) and auto A/C controller assembly (A/C-ECU) connector.

Q: Is the check result normal?

YES : Go to Step 4.

NO : Repair the connector(s) or wiring harness.

STEP 3. Check the air mixing damper control motor and potentiometer.

Refer to [P.55B-44](#).

Q: Is the check result normal?

YES : Go to Step 4.

NO : Replace the air mixing damper control motor and potentiometer.

STEP 4. Check whether the diagnostic trouble code is stored again.

Q: Is the diagnostic trouble code stored?

YES : Replace the auto A/C controller assembly (A/C-ECU).

NO : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction [P.00-13](#)).

Code No.B1045: Air mix damper motor

DIAGNOSTIC TROUBLE CODE SET CONDITION

This code is stored when the air mixing damper control motor cannot be rotated to the preset opening angle.

POSSIBLE CAUSES

- Malfunction of the air mixing damper control motor and potentiometer.
- Malfunction of the auto A/C controller assembly (A/C-ECU).
- Damaged the wiring harness or connectors

DIAGNOSIS

STEP 1. Using scan tool MB991958, check actuator test of A/C controller assembly (A/C-ECU) check.

Check that the following actuator test can be executed normally.

Item No.6: Air mix damper motor

Q: Is the check result normal?

YES : Go to Step 4.

NO : Go to Step 2.

STEP 2. Check open and short circuit in COOL and HOT line between air mixing damper control motor and potentiometer connector (damper control motor side) and auto A/C controller assembly (A/C-ECU) connector.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the connector(s) or wiring harness.

STEP 3. Check the air mixing damper control motor and potentiometer.

Refer to [P.55B-44](#).

Q: Is the check result normal?

YES : Go to Step 4.

NO : Replace the air mixing damper control motor and potentiometer.

STEP 4. Check whether the diagnostic trouble code is stored again.

Recheck if the diagnostic trouble code is stored.

Q: Is the diagnostic trouble code stored?

YES : Replace the auto A/C controller assembly (A/C-ECU).

NO : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction [P.00-13](#)).

Code No.B1061: Air outlet damper potentio.high

Code No.B1062: Air outlet damper potentio.low

DIAGNOSTIC TROUBLE CODE SET CONDITION

This code is stored when the mode selection damper control motor potentiometer does not send any signal to the A/C-ECU due to short or open circuit.

POSSIBLE CAUSES

- Malfunction of the mode selection damper control motor and potentiometer
- Damaged the wiring harness or connectors
- Malfunction of the auto A/C controller assembly (A/C-ECU).

DIAGNOSIS

STEP 1. Using scan tool MB991958, check data list.

Check that the following service data display contents are normal.

Item No.55: Air outlet c/o potentiometer

Item No.56: Air outlet c/o potentio.(Target)

Q: Is the check result normal?

YES : Go to Step 3.

NO : Go to Step 2.

STEP 2. Check open and short circuit in SENB, MODP and SENG line between mode selection damper control motor and potentiometer connector (potentiometer side) and auto A/C controller assembly (A/C-ECU) connector.

Q: Is the check result normal?

YES : Go to Step 4.

NO : Repair the connector(s) or wiring harness.

STEP 3. Check the mode selection damper control motor and potentiometer.

Refer to [P.55B-44](#).

Q: Is the check result normal?

YES : Go to Step 4.

NO : Replace the mode selection damper control motor and potentiometer.

STEP 4. Check whether the diagnostic trouble code is stored again.

Q: Is the diagnostic trouble code stored?

YES : Replace the auto A/C controller assembly (A/C-ECU).

NO : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction [P.00-13](#)).

Code No.B1065: Air outlet changeover DMPR.motor

DIAGNOSTIC TROUBLE CODE SET CONDITION

This code is stored when the mode selection damper control motor cannot be rotated to the preset opening angle.

POSSIBLE CAUSES

- Malfunction of the mode selection damper control motor and potentiometer.
- Malfunction of the auto A/C controller assembly (A/C-ECU).
- Damaged the wiring harness or connectors

DIAGNOSIS

STEP 1. Using scan tool MB991958, check actuator test of A/C controller assembly (A/C-ECU) check.

Check that the following actuator test can be executed normally.

Item No.8: Air outlet c/o damper

Q: Is the check result normal?

YES : Go to Step 4.

NO : Go to Step 2.

STEP 2. Check open and short circuit in DEF and FACE line between mode selection damper control motor and potentiometer connector (mode selection damper control motor side) and auto A/C controller assembly (A/C-ECU) connector

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the connector(s) or wiring harness.

STEP 3. Check the mode selection damper control motor and potentiometer.

Refer to [P.55B-44](#).

Q: Is the check result normal?

YES : Go to Step 4.

NO : Replace the mode selection damper control motor and potentiometer.

STEP 4. Check whether the diagnostic trouble code is stored again.

Recheck if the diagnostic trouble code is stored.

Q: Is the diagnostic trouble code stored?

YES : Replace the auto A/C controller assembly (A/C-ECU).

NO : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction [P.00-13](#)).

Code No. B1083 EEPROM error

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

This code is stored when EEPROM writing error occurs 3 times consecutively.

PROBABLE CAUSES

- Malfunction of the auto A/C controller assembly (A/C-ECU).

Code No. U1000: OSS/F.A.S.T._OSS CAN timeout

⚠ CAUTION

If diagnostic trouble code No.U1000 is set in the auto A/C controller assembly (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 auto A/C controller assembly (A/C-ECU) receives air conditioning control-related signals from the KOS&OSS-ECU via the CAN bus lines. If the ECU cannot receive any of the air conditioning control-related signals from the KOS&OSS-ECU, diagnostic trouble code U1000 will be set.

COMMENTS ON TROUBLE SYMPTOM**Current trouble**

- Connector(s) or wiring harness in the CAN bus lines between the KOS&OSS-ECU and the auto A/C controller assembly (A/C-ECU), the power supply system to the OSS, the KOS&OSS-ECU itself, or the auto A/C controller assembly (A/C-ECU) may be faulty.

Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness in the CAN bus lines between the auto A/C controller assembly (A/C-ECU) and the KOS&OSS-ECU, and the power supply system to the OSS. For diagnosis procedures, refer to "How to treat past trouble" (Refer to GROUP 00 – How to Treat Past Trouble [P.00-14](#)).

NOTE: For a past trouble, you can not find it by the scan tool MB991958 CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00, How to Cope with Intermittent Malfunction [P.00-13](#) and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the diagnostic trouble code, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54C – CAN Bus Line Diagnostic Flow [P.54C-7](#)).

⚠ CAUTION

If the ignition switch is turned to the "ON" position without starting the engine, diagnostic trouble code U1000 (past trouble) may be set in the auto A/C controller assembly (A/C-ECU) after three minutes.

PROBABLE CAUSES

- Damaged wiring harness or connectors
- Malfunction of the KOS&OSS-ECU
- Malfunction of the auto A/C controller assembly (A/C-ECU)

DIAGNOSIS

STEP 1. Using SCAN tool MB991958, diagnose the CAN bus lines.

Use the scan tool MB991958 to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the CAN bus lines (Refer to GROUP 54C Troubleshooting [P.54C-12](#)). On completion, go to Step 6.

STEP 2. Check whether the DTC is set.

Check whether the KOS&OSS-ECU-related diagnostic trouble code is set.

Q: Is the diagnostic trouble code set?

YES : Diagnose the KOS&OSS-ECU. (Refer to GROUP 42B Troubleshooting [P.42B-13](#)).

NO : Go to Step 3.

STEP 3. Check whether the DTC is set again.

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

- ETACS-ECU
U0100: OSS/F.A.S.T._OSS CAN timeout

Q: Is the diagnostic trouble code set?

YES : Go to Step 4.

NO : Go to Step 5.

STEP 4. Check whether the diagnostic trouble code is set again.

Recheck if the diagnostic trouble code is set.

- (1) Erase the diagnostic trouble code.
- (2) Ignition switch: "LOCK" (OFF) to "ON"
- (3) Check if the diagnostic trouble code is set.

Q: Is the diagnostic trouble code set?

YES : Replace the KOS&OSS-ECU, and then go to Step 6.

NO : A poor connection, open circuit or other intermittent malfunction in the CAN bus line between the OSS and auto A/C controller assembly (A/C-ECU) (Refer to GROUP 00 – How to Cope with Intermittent Malfunction [P.00-13](#)).

STEP 5. Check whether the diagnostic trouble code is set again.

Recheck if the diagnostic trouble code is set.

- (1) Erase the diagnostic trouble code.
- (2) Ignition switch: "LOCK" (OFF) to "ON"
- (3) Check if the diagnostic trouble code is set.

Q: Is the diagnostic trouble code set?

YES : Replace the auto A/C controller assembly (A/C-ECU), and then go to Step 6.

NO : A poor connection, open circuit or other intermittent malfunction in the CAN bus line between the OSS and the auto A/C controller assembly (A/C-ECU) (Refer to GROUP 00 – How to Cope with Intermittent Malfunction [P.00-13](#)).

STEP 6. Check whether the diagnostic trouble code is set again.

Recheck if the diagnostic trouble code is set.

- (1) Erase the diagnostic trouble code.
- (2) Ignition switch: "LOCK" (OFF) to "ON"
- (3) Check if the diagnostic trouble code is set.

Q: Is the diagnostic trouble code set?

YES : Return to Step 1.

NO : The procedure is complete.

Code No.U1100 Engine CAN timeout

** CAUTION**

If diagnostic trouble code No.U1100 is set in the auto A/C controller assembly (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 air conditioning control-related signals from the engine control module via the CAN bus lines. If the ECU cannot receive any of the air conditioning control-related signals from the engine control module, diagnostic trouble code U1100 will be set.

COMMENTS ON TROUBLE SYMPTOM**Current trouble**

- Connector(s) or wiring harness in the CAN bus lines between the engine control module and the auto A/C controller assembly (A/C-ECU), the power supply system to the engine control module, the engine control module itself, or the auto A/C controller assembly (A/C-ECU) may be faulty.

Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness in the CAN bus lines between the auto A/C controller assembly (A/C-ECU) and the engine control module, and the power supply system to the engine control module. For diagnosis procedures, refer to "How to treat past trouble" (Refer to GROUP 00 – How to Treat Past Trouble [P.00-14](#)).

NOTE: For a past trouble, you can not find it by the scan tool MB991958 CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00, How to Cope with Intermittent Malfunction [P.00-13](#) and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the diagnostic trouble code, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54C – CAN Bus Line Diagnostic Flow [P.54C-7](#)).

CAUTION

If the ignition switch is turned to the "ON" position without starting the engine, diagnostic trouble code U1100 (past trouble) may be set in the auto A/C controller assembly (A/C-ECU) after three minutes.

PROBABLE CAUSES

- Damaged wiring harness or connectors
- Malfunction of the engine control module
- Malfunction of the auto A/C controller assembly (A/C-ECU)

DIAGNOSIS

STEP 1. Using SCAN tool MB991958, diagnose the CAN bus lines.

Use the scan tool MB991958 to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the CAN bus lines (Refer to GROUP 54C Troubleshooting [P.54C-12](#)). On completion, go to Step 6.

STEP 2. Check whether the DTC is set.

Check whether the engine control module-related diagnostic trouble code is set.

Q: Is the diagnostic trouble code set?

YES : Diagnose the engine control module (Refer to GROUP 13A Troubleshooting [P.13A-47](#)).

NO : Go to Step 3.

STEP 3. Check whether the DTC is set again.

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

- ETACS-ECU
U1100: Engine CAN timeout

Q: Is the diagnostic trouble code set?

YES : Go to Step 4.

NO : Go to Step 5.

STEP 4. Check whether the diagnostic trouble code is set again.

Recheck if the diagnostic trouble code is set.

- (1) Erase the diagnostic trouble code.
- (2) Ignition switch: "LOCK" (OFF) to "ON"
- (3) Check if the diagnostic trouble code is set.

Q: Is the diagnostic trouble code set?

YES : Replace the engine control module, and then go to Step 6.

NO : A poor connection, open circuit or other intermittent malfunction in the CAN bus line between the engine control module and auto A/C controller assembly (A/C-ECU) (Refer to GROUP 00 – How to Cope with Intermittent Malfunction [P.00-13](#)).

STEP 5. Check whether the diagnostic trouble code is set again.

Recheck if the diagnostic trouble code is set.

- (1) Erase the diagnostic trouble code.
- (2) Ignition switch: "LOCK" (OFF) to "ON"
- (3) Check if the diagnostic trouble code is set.

Q: Is the diagnostic trouble code set?

YES : Replace the auto A/C controller assembly (A/C-ECU) and then go to Step 6.

NO : A poor connection, open circuit or other intermittent malfunction in the CAN bus line between the engine control module and the auto A/C controller assembly (A/C-ECU) (Refer to GROUP 00 – How to Cope with Intermittent Malfunction [P.00-13](#)).

STEP 6. Check whether the diagnostic trouble code is set again.

Recheck if the diagnostic trouble code is set.

- (1) Erase the diagnostic trouble code.
- (2) Ignition switch: "LOCK" (OFF) to "ON"
- (3) Check if the diagnostic trouble code is set.

Q: Is the diagnostic trouble code set?

YES : Return to Step 1.

NO : The procedure is complete.

Code No.U1108 Meter CAN timeout/Not equipped

 CAUTION

If diagnostic trouble code No.U1108 is set in the auto A/C controller assembly (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 auto A/C controller assembly (A/C-ECU) receives air conditioning control-related signals from the combination meter via the CAN bus lines. If the ECU cannot receive any of the air conditioning control-related signals from the combination meter, diagnostic trouble code U1100 will be set.

COMMENTS ON TROUBLE SYMPTOM

Current trouble

- Connector(s) or wiring harness in the CAN bus lines between the combination meter and the auto A/C controller assembly (A/C-ECU), the power supply system to the combination meter, the combination meter itself, or the auto A/C controller assembly (A/C-ECU) may be faulty.

Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness in the CAN bus lines between the auto A/C controller assembly (A/C-ECU) and the combination meter, and the power supply system to the combination meter. For diagnosis procedures, refer to "How to treat past trouble" (Refer to GROUP 00 – How to Treat Past Trouble [P.00-14](#)).

NOTE: For a past trouble, you can not find it by the scan tool MB991958 CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00, How to Cope with Intermittent Malfunction [P.00-13](#) and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the diagnostic trouble code, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54C – CAN Bus Line Diagnostic Flow [P.54C-7](#)).

 CAUTION

If the ignition switch is turned to the "ON" position without starting the engine, diagnostic trouble code U1108 (past trouble) may be set in the A/C-ECU after three minutes.

PROBABLE CAUSES

- Damaged wiring harness or connectors
- Malfunction of the combination meter
- Malfunction of the auto A/C controller assembly (A/C-ECU)

DIAGNOSIS

STEP 1. Using scan tool MB991958, diagnose the CAN bus lines.

Use the scan tool MB991958 to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the CAN bus lines (Refer to GROUP 54C Troubleshooting [P.54C-12](#)). On completion, go to Step 6.

STEP 2. Check whether the DTC is set.

Check whether the combination meter-related diagnostic trouble code is set.

Q: Is the diagnostic trouble code set?

YES : Diagnose the combination meter (Refer to GROUP 54A Troubleshooting [P.54A-18](#)).

NO : Go to Step 3.

STEP 3. Check whether the DTC is set again.

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

- ETACS-ECU
U1108: Meter CAN timeout/Not equipped

Q: Is the diagnostic trouble code set?

YES : Go to Step 4.

NO : Go to Step 5.

STEP 4. Check whether the diagnostic trouble code is set again.

Recheck if the diagnostic trouble code is set.

- (1) Erase the diagnostic trouble code.
- (2) Ignition switch: "LOCK" (OFF) to "ON"
- (3) Check if the diagnostic trouble code is set.

Q: Is the diagnostic trouble code set?

YES : Replace the auto A/C controller assembly (A/C-ECU), and then go to Step 6.

NO : A poor connection, open circuit or other intermittent malfunction in the CAN bus line between the combination meter and auto A/C controller assembly (A/C-ECU) (Refer to GROUP 00 – How to Cope with Intermittent Malfunction [P.00-13](#)).

STEP 5. Check whether the diagnostic trouble code is set again.

Recheck if the diagnostic trouble code is set.

- (1) Erase the diagnostic trouble code.
- (2) Ignition switch: "LOCK" (OFF) to "ON"
- (3) Check if the diagnostic trouble code is set.

Q: Is the diagnostic trouble code set?

YES : Replace the meter and auto A/C controller assembly (A/C-ECU), and then go to Step 6.

NO : A poor connection, open circuit or other intermittent malfunction in the CAN bus line between the combination meter and the meter and A/C-ECU (Refer to GROUP 00 – How to Cope with Intermittent Malfunction [P.00-13](#)).

STEP 6. Check whether the diagnostic trouble code is set again.

Recheck if the diagnostic trouble code is set.

- (1) Erase the diagnostic trouble code.
- (2) Ignition switch: "LOCK" (OFF) to "ON"
- (3) Check if the diagnostic trouble code is set.

Q: Is the diagnostic trouble code set?

YES : Return to Step 1.

NO : The procedure is complete.

Code No. U1109: ETACS-ECU CAN time-out/Not equipped

 CAUTION

If diagnostic trouble code No.U1109 is set in the auto A/C controller assembly (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 auto A/C controller assembly (A/C-ECU) receives air conditioning operation-related signal from the ETACS-ECU via the CAN bus lines. If the auto A/C controller assembly (A/C-ECU) cannot receive the air conditioning operation-related signal at all on the ETACS-ECU, diagnostic trouble code No.U1109 will be set.

COMMENTS ON TROUBLE SYMPTOM**Current trouble**

- Connector(s) or wiring harness in the CAN bus lines between the ETACS-ECU and the auto A/C controller assembly (A/C-ECU), the power supply system to the ETACS-ECU, the ETACS-ECU itself, or the auto A/C controller assembly (A/C-ECU) may be faulty.

Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness in the CAN bus lines between the ETACS-ECU and the auto A/C controller assembly (A/C-ECU), and the power supply system to the ETACS-ECU. For diagnosis procedures, refer to "How to treat past trouble" (Refer to GROUP 00 – How to Treat Past Trouble [P.00-14](#)).

NOTE: For a past trouble, you can not find it by the scan tool MB991958 CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00, How to Cope with Intermittent Malfunction [P.00-13](#) and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the diagnostic trouble code, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54C – CAN Bus Line Diagnostic Flow [P.54C-7](#)).

** CAUTION**

If the ignition switch is turned "ON" without starting the engine and then three minutes pass, the A/C-ECU may store U1109 as past trouble.

PROBABLE CAUSES

- Damaged wiring harness or connectors
- Malfunction of the ETACS-ECU
- Malfunction of the auto A/C controller assembly (A/C-ECU)

DIAGNOSIS

STEP 1. Using SCAN tool MB991958, diagnose the CAN bus lines.

Use the scan tool MB991958 to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the CAN bus lines (Refer to GROUP 54C, Troubleshooting [P.54C-12](#)). On completion, go to Step 6.

STEP 2. Check whether the DTC is set.

Check whether the ETACS-related diagnostic trouble code is set.

Q: Is the diagnostic trouble code set?

YES : Diagnose the ETACS-ECU (Refer to GROUP 54A, Troubleshooting [P.54A-218](#)).

NO : Go to Step 3.

STEP 3. Check whether the DTC is set again.

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

- ETACS-ECU
U1109: ETACS CAN timeout/Not equipped

Q: Is the diagnostic trouble code set?

YES : Go to Step 4.

NO : Go to Step 5.

STEP 4. Check whether the diagnostic trouble code is set again.

Recheck if the diagnostic trouble code is set.

- (1) Erase the diagnostic trouble code.
- (2) Ignition switch: "LOCK" (OFF) to "ON"
- (3) Check if the diagnostic trouble code is set.

Q: Is the diagnostic trouble code set?

YES : Replace the ETACS-ECU, and then go to Step 6.

NO : A poor connection, open circuit or other intermittent malfunction in the CAN bus line between the ETACS-ECU and the auto A/C controller assembly (A/C-ECU) (Refer to GROUP 00 – How to Cope with Intermittent Malfunction [P.00-13](#)).

STEP 5. Check whether the diagnostic trouble code is set again.

Recheck if the diagnostic trouble code is set.

- (1) Erase the diagnostic trouble code.
- (2) Ignition switch: "LOCK" (OFF) to "ON"
- (3) Check if the diagnostic trouble code is set.

Q: Is the diagnostic trouble code set?

YES : Replace the auto A/C controller assembly (A/C-ECU), and then go to Step 6.

NO : A poor connection, open circuit or other intermittent malfunction in the CAN bus line between the ETACS-ECU and the auto A/C controller assembly (A/C-ECU) (Refer to GROUP 00 – How to Cope with Intermittent Malfunction [P.00-13](#)).

STEP 6. Check whether the diagnostic trouble code is set again.

Recheck if the diagnostic trouble code is set.

- (1) Erase the diagnostic trouble code.
- (2) Ignition switch: "LOCK" (OFF) to "ON"
- (3) Check if the diagnostic trouble code is set.

Q: Is the diagnostic trouble code set?

YES : Return to Step 1.

NO : The procedure is complete.

Code No.U1190 No receive fault detect signal**TROUBLE JUDGMENT**

ETACS-ECU sends the diagnostic trouble code (U code) detection permission or prohibition signal to each ECU connected to the CAN bus line. If the A/C-ECU cannot receive the diagnostic trouble code (U code) detection permission or prohibition signal for 5 seconds after turning the electric motor switch to ON position, diagnostic trouble code U1190 will be stored.

PROBABLE CAUSES

- Malfunction of the ETACS-ECU
- Malfunction of CAN bus line

Code No.U1195 Coding not completed**⚠ CAUTION**

- If diagnostic trouble code No. U1195 is stored, diagnose the CAN bus lines.
- When replacing the ECU, always check that the communication circuit is normal.

DIAGNOSTIC FUNCTION

If the vehicle information data is not registered to the ETACS-ECU, the auto A/C controller assembly (A/C-ECU) stores diagnostic trouble code No. U1195.

PROBABLE CAUSES

- Malfunction of CAN bus line
- Malfunction of combination meter
- Malfunction of the ETACS-ECU

TROUBLE SYMPTOM CHART

M1554005002663

Trouble symptom	Inspection procedure No.	Reference page
Communication with the scan tool MB991958 is not possible	1	P.55B-25
Cool air does not come	2	P.55B-25
The blower does not work	3	P.55B-26
The blower air volume cannot be changed	4	P.55B-28
The inside/outside air changeover is impossible	5	P.55B-30
A/C pressure sensor system	6	P.55B-31
The A/C compressor does not work	7	P.55B-32

Trouble symptom	Inspection procedure No.	Reference page
A/C-ECU power supply system	8	P.55B-34

SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: Communication with the scan tool MB991958 is not possible.

COMMENTS ON TROUBLE SYMPTOM

If communication with all other systems is not possible, there is a high possibility that there is a malfunction of the diagnosis line. If only the A/C system can not communicate with the scan tool MB991958, the auto A/C controller assembly (A/C-ECU) may be defective.

PROBABLE CAUSE

Malfunction of the auto A/C controller assembly (A/C-ECU)

INSPECTION PROCEDURE 2: Cool air does not come

CIRCUIT OPERATION

If the blower air temperature can not be cool when turning A/C switch ON and lowering the preset temperature, inadequate refrigerant quantity, sensors, harness or connectors may be suspected.

PROBABLE CAUSE

Damaged wiring harness or connectors

DIAGNOSIS

STEP 1. Check the blower operation

Check that air blows through the air outlets.

- (1) Turn the ignition switch to the "ON" position.
- (2) Blower knob: Other than "OFF"
- (3) Check that the air comes out of the blower.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Refer to Inspection Procedure 3 "The blower does not work [P.55B-26](#)".

STEP 2. Check the A/C compressor operation

Check that the compressor operates under the following conditions.

- Engine operation
- Air conditioning switch: "ON"
- Blower knob: Maximum air volume
- Temperature control dial: "MAX COOL"

NOTE: The compressor does not work when the blower intake temperature is 0 °C or less.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Refer to INSPECTION PROCEDURE 6: "The A/C compressor does not work [P.55B-32](#)".

STEP 3. Using scan tool MB991958, diagnose the CAN bus lines.

Use the scan tool MB991958 to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 4.

NO : Repair the CAN bus lines (Refer to GROUP 54C – Troubleshooting [P.54C-12](#)).

STEP 4. Using scan tool MB991958, DTC check.

Check that the diagnostic trouble code related to the air conditioning is not set.

Q: Is the diagnostic trouble code set?

YES : Carry out the diagnostic trouble code procedures.
Refer to [P.55B-8](#).

NO : Go to Step 5.

STEP 5. Check the refrigerant level.

Refer to [P.55A-17](#).

Q: Is the check result normal?

YES : Intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction [P.00-13](#)).

NO : Correct the refrigerant amount.

INSPECTION PROCEDURE 3: The blower does not work

COMMENTS ON TROUBLE SYMPTOM

If the blower motor does not operate, the blower motor circuit system may be defective.

PROBABLE CAUSES

- Malfunction of the blower motor
- Malfunction of the power transistor
- Malfunction of the auto A/C controller assembly (A/C-ECU).
- Damaged wiring harness or connectors

DIAGNOSIS

STEP 1. Using scan tool MB991958, diagnose the CAN bus lines.

Use the scan tool MB991958 to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the CAN bus lines (Refer to GROUP 54C – Troubleshooting [P.54C-12](#)).

STEP 2. Using scan tool MB991958, DTC check.

Check that the diagnostic trouble code related to the air conditioning is not set.

Q: Is the diagnostic trouble code set?

YES : Carry out the diagnostic trouble code procedures.
Refer to [P.55B-8](#).

NO : Go to Step 3.

STEP 3. Check the blower relay.

Refer to [P.55A-21](#).

Q: Is the blower relay in good condition?

YES : Go to Step 4.

NO : Replace the blower relay.

STEP 4. Check open circuit in blower relay line between IG2 relay, fusible link (2), and blower relay and body ground.

NOTE: Before the wiring harness check, check the junction block connector.

Q: Is the check result normal?

YES : Go to Step 5.

NO : Repair the connector(s) or wiring harness.

STEP 5. Check the blower motor.

Refer to [P.55B-46](#).

Q: Is the check result normal?

YES : Go to Step 6.

NO : Replace the blower motor.

STEP 6. Voltage measurement at blower motor connector.

(1) Disconnect the connector, and measure at the wiring harness side.

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

(3) Voltage between terminal 1 and body ground.

OK: System voltage

Q: Is the check result normal?

YES : Go to Step 7.

NO : Replace the blower motor.

STEP 7. Check open circuit in blower motor line between blower relay, blower motor and power transistor.

Q: Is the check result normal?

YES : Go to Step 8.

NO : Repair the connector(s) or wiring harness.

STEP 8. Resistance measurement at the power transistor connector.

(1) Disconnect the connector, and measure at the wiring harness side.

(2) Continuity between terminal 2 and body ground.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?

YES : Go to Step 9.

NO : Repair the wiring harness wires between power transistor connector terminal and body ground.

STEP 9. Check open circuit in RVM, BASE and E line between power transistor, body ground and auto A/C controller assembly (A/C-ECU).

Q: Is the check result normal?

YES : Go to Step 10.

NO : Repair the connector(s) or wiring harness.

STEP 10. Check the data list below on the scan tool MB991958.

All the following items in the data list should be normal.

Item No.68: Front blower fan

Item No.69: Front blower fan (Target)

Q: Is the check result normal?

YES : Go to Step 11.

NO : Replace the auto A/C controller assembly (A/C-ECU).

STEP 11. Replace the power transistor and recheck the trouble symptom

Check that the blower motor operates normally.

Q: Is the check result normal?

YES : This diagnosis is complete.

NO : Replace the auto A/C controller assembly (A/C-ECU).

INSPECTION PROCEDURE 4: The blower air volume cannot be changed

COMMENTS ON TROUBLE SYMPTOM

If air volume cannot be adjusted by using the blower control, the A/C control panel, the auto A/C controller assembly (A/C-ECU) or the power transistor may be faulty.

PROBABLE CAUSES

- Malfunction of the A/C control panel
- Malfunction of the power transistor
- Damaged wiring harness or connectors
- Malfunction of the auto A/C controller assembly (A/C-ECU)

DIAGNOSIS

STEP 1. Using SCAN tool MB991958, diagnose the CAN bus lines.

Use the scan tool MB991958 to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the CAN bus lines (Refer to GROUP 54C, Troubleshooting [P.54C-12](#)).

STEP 2. Using scan tool MB991958, DTC check.

Check that the diagnostic trouble code related to the air conditioning is not set.

Q: Is the diagnostic trouble code set?

YES : Carry out the diagnostic trouble code procedures.
Refer to [P.55B-8](#).

NO : Go to Step 3.

STEP 3. Resistance measurement at the power transistor connector.

- (1) Disconnect the connector, and measure at the wiring harness side.
- (2) Continuity between terminal 2 and body ground.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?

YES : Go to Step 4.

NO : Repair the wiring harness wires between power transistor connector terminal No. 1 and body ground.

STEP 4. Check open circuit in RVM, BASE and E line between power transistor, body ground and auto A/C controller assembly (A/C-ECU)

Q: Is the check result normal?

YES : Go to Step 5.

NO : Repair the connector(s) or wiring harness.

STEP 5. Check the data list below on the scan tool MB991958.

All the following items in the data list should be normal.

Item No.68: Front blower fan

Q: Is the check result normal?

YES : Go to Step 6.

NO : Replace the auto A/C controller assembly (A/C-ECU).

STEP 6. Replace the power transistor and check the trouble symptom

Check that the blower motor operates normally.

Q: Does the blower motor work normally?

YES : This diagnosis is complete.

NO : Replace the auto A/C controller assembly (A/C-ECU).

INSPECTION PROCEDURE 5: The Inside/Outside Air Changeover is impossible.

COMMENTS ON TROUBLE SYMPTOM

If the air recirculation cannot be changed by using the inside air/outside air changeover switch, the inside air/outside air changeover motor system may be faulty.

PROBABLE CAUSES

- Malfunction of the outside/inside air selection damper control motor
- Damaged wiring harness or connectors
- Malfunction of the auto A/C controller assembly (A/C-ECU).

DIAGNOSIS

STEP 1. Using scan tool MB991958, DTC check.

Check that the diagnostic trouble code related to the air conditioning is not set.

Q: Is the diagnostic trouble code set?

YES : Carry out the diagnostic trouble code procedures.
Refer to [P.55B-8](#).

NO : Go to Step 2.

STEP 2. Using scan tool MB991958, check actuator test of A/C controller assembly (A/C-ECU) check.

Carry out the actuator test (Refer to [P.55B-37](#)).

Item No.5: In/out selection damper/

Q: Does the blower motor work normally?

YES : This diagnosis is complete.

NO : Go to Step 3.

STEP 3. Check open and short circuit in FRE and REC line between IG2 relay, outside/inside air selection damper control motor and auto A/C controller assembly (A/C-ECU).

NOTE: Before the wiring harness check, check the junction block connector.

Q: Is the check result normal?

YES : Go to Step 4.

NO : Repair the connector(s) or wiring harness.

STEP 4. Check the data list below on the scan tool MB991958.

All the following items in the data list should be normal.

Item No.45: In/out select damper poten (target)

Item No.46: In/out select damper potentiometer

Q: Is the check result normal?

YES : Go to Step 5.

NO : Replace the auto A/C controller assembly (A/C-ECU).

STEP 5. Replace the air outside/inside air circulation switching damper motor, and then recheck the trouble symptom.

Check to see that the outside air/inside air circulation switching damper motor operates normally.

Q: Is the check result normal?

YES : This diagnosis is complete.

NO : Replace the auto A/C controller assembly (A/C-ECU)

INSPECTION PROCEDURE 6: A/C pressure sensor system

COMMENTS ON TROUBLE SYMPTOM

If the A/C pressure sensor system is defective, the wiring harness between the A/C pressure sensor and the engine control module is suspected.

PROBABLE CAUSES

- Malfunction of the A/C pressure sensor
- Malfunction of the engine control module.
- Damaged wiring harness or connectors

DIAGNOSIS

STEP 1. Inspection of the A/C pressure sensor

Refer to [P.55A-17](#).

Q: Is the A/C pressure sensor normal?

YES : Go to Step 2.

NO : Replace the A/C pressure sensor.

STEP 2. Check open circuit in AC/P, BVSE&ACPE and BVS5 & ACP5 line between A/C pressure sensor connector and engine control module connector.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the connector(s) or wiring harness.

STEP 3. Check the data list below on the scan tool MB991958.

All the following items in the data list should be normal.

Item No.61: Pressure sensor**Q: Is the check result normal?**

YES : Go to Step 4.

NO : Replace the engine control module.

STEP 4. Retest the system.**Q: Is the check result normal?**

YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction [P.00-13](#)).

NO : Replace the engine control module.

INSPECTION PROCEDURE 7: The A/C compressor does not work

COMMENTS ON TROUBLE SYMPTOM

When the A/C compressor does not work, the A/C compressor circuit system may be defective.

PROBABLE CAUSES

- Malfunction of the A/C compressor
- Malfunction of the A/C compressor relay
- Damaged harness wires or connectors
- Malfunction of the engine control module

DIAGNOSIS

STEP 1. Using scan tool MB991958, diagnose the CAN bus lines.

Use the scan tool MB991958 to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the CAN bus lines (Refer to GROUP 54C – Troubleshooting [P.54C-12](#)).

STEP 2. Using scan tool MB991958, DTC check.

Check whether the A/C sets a diagnostic trouble code or not.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Refer to diagnostic trouble code chart [P.55B-8](#).

STEP 3. Voltage measurement at A/C compressor assembly connector.

- (1) Disconnect the connector, and measure at the wiring harness side.
- (2) Turn the ignition switch to the "ON" position.
- (3) Disconnect engine control module connector and ground terminal.
- (4) Voltage between A/C compressor terminal 1 and body ground.

OK: System voltage

Q: Is the check result normal?

YES : Go to Step 4.

NO : Go to Step 7.

STEP 4. Check the A/C compressor.

Refer to [P.55A-46](#).

Q: Is the check result normal?

YES : Go to Step 5.

NO : Replace the A/C compressor.

STEP 5. Check the refrigerant level.

Refer to [P.55A-17](#).

Q: Is the refrigerant level correct?

YES : Go to Step 6.

NO : Correct the refrigerant level (Refer to On-vehicle Service [P.55A-17](#)).

STEP 6. Replace the engine control module, and then recheck the trouble symptom

Check that the compressor works normally.

Q: Is the check result normal?

YES : This diagnosis is complete.

NO : Replace the engine control module.

STEP 7. Check the A/C compressor relay

Refer to [P.55A-21](#).

Q: Is the check result normal?

YES : Go to Step 8.

NO : Replace the A/C compressor relay.

STEP 8. Voltage measurement at A/C compressor relay connector.

- (1) Remove the relay, and measure at the relay block side.
- (2) Voltage between terminal 1, 4 and body ground.

OK: System voltage

Q: Is the check result normal?

YES : Go to Step 10.

NO : Go to Step 9.

STEP 9. Check open circuit in A/C compressor relay line between fusible link (6) and A/C compressor relay.

NOTE: Before the wiring harness check, check the junction block connector.

Q: Is the check result normal?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction [P.00-13](#)).

NO : Repair the wiring harness.

STEP 10. Check open circuit in A/C compressor and clutch assembly line between A/C compressor relay and A/C compressor and clutch.

Q: Is the check result normal?

YES : Go to Step 11.

NO : Repair the wiring harness.

STEP 11. Check open circuit in engine control module (AC/R) line between IG2 relay, A/C compressor relay and engine control module

NOTE: Before the wiring harness check, check the junction block connector and joint connector.

Q: Is the check result normal?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction [P.00-13](#)).

NO : Repair the wiring harness.

INSPECTION PROCEDURE 8: A/C-ECU power supply system

COMMENTS ON TROUBLE SYMPTOM

If the auto A/C controller assembly (A/C-ECU) is not energized, the power supply or ground system to the ECU may be defective.

PROBABLE CAUSES

- Malfunction of the A/C-ECU.
- Damaged wiring harness or connectors

DIAGNOSIS

STEP 1. Check whether the DTC is set.

Check that the ETACS-ECU has not set a diagnostic trouble code.

Q: Is the diagnostic trouble code set?

YES : Carry out the diagnostic trouble code procedures (Refer to GROUP 54A, ETACS-ECU [P.54A-218](#)).

NO : Go to Step 2.

STEP 2. Measure the voltage at the auto A/C controller assembly (A/C-ECU) connector.

- (1) Disconnect the connector, and measure at the wiring harness side.
- (2) Voltage between terminal No. 20 and body ground.

OK: System voltage

Q: Is the check result normal?

YES : Go to Step 3.

NO : Go to Step 4.

STEP 3. Check open circuit in IG2 line between IG (2) relay and A/C controller assembly (A/C-ECU) connector.

NOTE: Before the wiring harness check, check the junction block connector.

Q: Is the check result normal?

YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction [P.00-13](#)).

NO : Repair the connector(s) or wiring harness.

STEP 4. Measure the resistance at the auto A/C controller assembly (A/C-ECU) connector.

- (1) Disconnect the connector, and measure at the wiring harness side.
- (2) Resistance between terminal No. 19 and body ground.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?

YES : Replace the auto A/C controller assembly (A/C-ECU).

NO : Go to Step 5.

STEP 5. Check open circuit in E line between auto A/C controller assembly (A/C-ECU) connector and body ground.

Q: Is the check result normal?

YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction [P.00-13](#)).

NO : Repair the wiring harness.

DATA LIST REFERENCE TABLE

M1554005101496

Item No.	Check item	Inspection status	The display contents under normal condition
15	Illumination	Headlights: "ON" (LCD dims)	ON
		Headlights: "OFF" (LCD illuminates at a high intensity)	OFF
17	Engine speed	–	Displays correct engine speed.

Item No.	Check item	Inspection status	The display contents under normal condition
19	Ambient temperature sensor	—	Ambient temperature is the same as scan tool MB991958 displayed temperature
20	Air thermo sensor	—	Evaporator outlet temperature is the same as scan tool MB991958 displayed temperature.
21	Interior temperature sensor	—	Interior temperature is the same as scan tool MB991958 displayed temperature
23	Temperature setting		Displays air conditioning set temperature.
24	ECT sensor	—	Engine coolant temperature is the same as scan tool MB991958 displayed temperature.
26	Vehicle speed	—	Displays vehicle speed.
27	A/C Compressor drive request	Compressor "ON"	ON
		Compressor "OFF"	OFF
28	Air conditioning switch	Air conditioning switch "ON"	ON
		Air conditioning switch "OFF"	OFF
30	PTC heater drive request	PTC heater "ON"	ON
		PTC heater "OFF"	OFF
34	Idle up request	—	Displays idle-up request signal.
45	In/out select damp poten (target)	—	Displays outside/inside air selection damper target position.
46	In/out select damp potentiometer	—	Displays outside/inside air selection damper position.
55	Air outlet c/o potentiometer	—	Displays air outlet changeover damper position.
56	Air outlet c/o potentio. (Target)	—	Displays air outlet changeover damper target position.
60	Rear defogger switch	Rear window defogger switch "ON"	ON
		Rear window defogger switch "OFF"	OFF
61	Pressure sensor	—	Displays refrigerant pressure.
63	Air mix potentiometer	—	Displays the air mix damper position.

Item No.	Check item	Inspection status	The display contents under normal condition
68	Front blower fan	–	Displays blower motor condition.
69	Front blower fan (Target)	–	Displays blower motor target value.
72	Rear defogger relay	Rear window defogger relay: ON	ON
		Rear window defogger relay: OFF	OFF
91	A/C compressor drive flag	A/C compressor drive: ON	ON
		A/C compressor drive: OFF	OFF
92	Wiper operation flag	Wiper operation: "ON"	ON
		Wiper operation: "OFF"	OFF
93	Ignition position information	Ignition switch: "ON"	ON
		Ignition switch: "OFF"	OFF
94	Auto switch	AUTO switch on the A/C control panel: "ON"	ON
		AUTO switch on the A/C control panel: "OFF"	OFF
97	Air conditioning output	Air conditioning output: "ON"	ON
		Air conditioning output: "OFF"	OFF

NOTE: *: Other items than listed above are also displayed. However, ignore them.

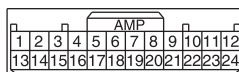
ACTUATOR TEST TABLE

M1554005201341

Item No.	Check item	Driven content
1	A/C compressor drive	A/C compressor drive selection (OFF/ON)
2	Idle up request	Idle up request signal
5	In/out select damper	The moving position of outside/inside air selection damper motor
6	Air mix damper motor	The moving position of air mix damper motor
7	Front blower fan	The amount of blower motor rotation
8	Air outlet c/o dumper	Air outlet changeover damper motor moving position
9	Air conditioning output	Air conditioning output selection (OFF/ON)
10	Max cool request	Max cool switch selection (OFF/ON)
13	PTC heater drive request	PTC heater switch selection (OFF/ON)
14	LCD/indicator	LCD or indicator illuminate selection (OFF/ON)
15	LCD backlight	LCD backlight illuminate selection (OFF/ON)
16	Switch illumination	Switch illumination illuminate selection (OFF/ON)
17	Defogger indicator	Defogger indicator illuminate selection (OFF/ON)
18	Rear defogger indicator	Rear defogger indicator illuminate selection (OFF/ON)

CHECK AT A/C-ECU TERMINALS

M1552010303225



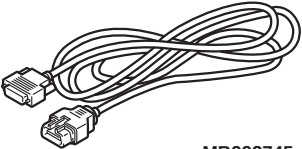
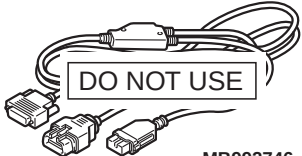
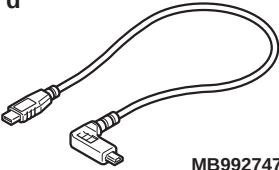
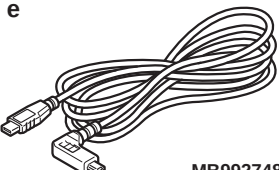
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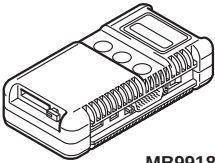
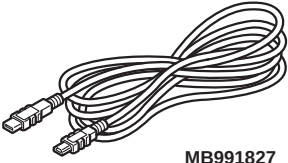
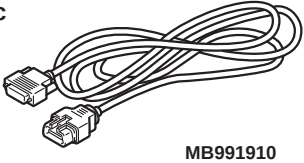
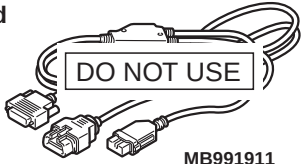
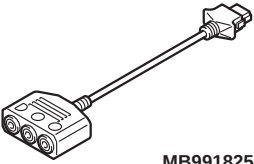
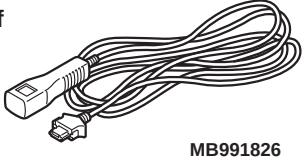
Terminal No.	Terminal code	Check item	Check condition	Normal condition
1	HOT	Air mix damper motor (HOT)	When shifting to COOL	1 V or less
			When shifting to HOT	Battery voltage
2	FRE	Motor for air outside/inside air circulation switching damper motor	When moving to the inside air recirculation position	1 V or less
			When moving to the outside air position	
3	REC		When moving to the inside air recirculation position	Battery voltage
			When moving to the outside air position	
4	RLY	Rear window defogger relay	Refer to GROUP 54A – Rear Window Defogger P.54A-271 .	Refer to GROUP 54A – Rear Window Defogger P.54A-271 .
5	ILL-	Illumination	Lighting switch: "ON"	0 V
6	ILL+			Battery voltage
7	SENG	Mode selection potentiometer and air mixing potentiometer (input)	Mode selection damper motor	0 V
			Air mix damper motor	0 V
8	A/MP	Air mixing potentiometer	"MAX COOL"	1.15 V
9	MODP	Mode selection potentiometer	"FACE"	4 V
10	–	–	–	–
11	CANL	Output to the engine control module		
12	CANH			
13	COOL	Air mix damper motor (COOL)	When shifting to COOL	Battery voltage
			When shifting to HOT	1 V or less
14	FACE	Mode selection damper control motor (FACE)	When moving toward FACE position	Battery voltage
			When moving toward DEF position	1 V or less
15	DEF	Mode selection damper control motor (DEF)	When moving toward FACE position	Battery voltage
			When moving toward DEF position	
16	IND	Rear window defogger	–	–
17	RVM	Power transistor	Air volume adjustment dial: Max.	Battery voltage
18	BASE			0 to 2 V

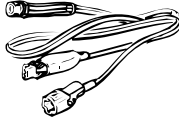
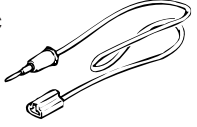
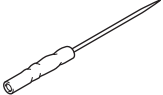
Terminal No.	Terminal code	Check item	Check condition	Normal condition
19	E	Earth	Always	0 V
20	IG2	IG (2) power supply	Ignition switch: "ON"	Battery voltage
21	B/UP	Back-up power supply	Always	
22	SENB	Sensor power supply	Ignition switch: "ON"	5 V
23 - 24	—	—	—	—

SPECIAL TOOLS

M1551000601367

Tool	Tool number and name	Supersession	Application
a  MB992744 b  MB992745 c  MB992746 d  MB992747 e  MB992748 ACB05421AB	a. MB992744 b. MB992745 c. MB992746 d. MB992747 e. MB992748 a. Vehicle communication interface-Lite (V.C.I.-Lite) b. V.C.I.-Lite main harness A (for vehicles with CAN communication) c. V.C.I.-Lite main harness B (for vehicles without CAN communication) d. V.C.I.-Lite USB cable short e. V.C.I.-Lite USB cable long	—	DTC, service data and actuator test check.

Tool	Tool number and name	Supersession	Application
a  MB991824 b  MB991827 c  MB991910 d  MB991911 e  MB991825 f  MB991826 MB991955	MB991958 a. MB991824 b. MB991827 c. MB991910 d. MB991911 e. MB991825 f. MB991826 M.U.T.-III sub-assembly a. Vehicle Communication Interface (V. C. I). b. USB cable c. M.U.T.-III main harness A (applicable to vehicles with CAN communication) d. M.U.T.-III main harness B (applicable to vehicles without CAN communication) e. Measurement adapter f. Trigger harness	MB991824-KIT <i>NOTE: G: MB991826 M.U.T.-III Trigger Harness is not necessary when pushing V.C.I. ENTER key.</i>	⚠ CAUTION For vehicles with CAN communication, use M.U.T.-III main harness A to send simulated vehicle speed. If you connect M.U.T.-III main harness B instead, the CAN communication does not function correctly. Check the A/C (The M.U.T.-III diagnostic trouble codes display, service data display and actuator test)

Tool	Tool number and name	Supersession	Application
a  b  c  d  DO NOT USE MB991223	MB991223 a. MB991219 b. MB991220 c. MB991221 d. MB991222 Harness set a. Test harness b. LED harness c. LED harness adapter d. Probe	General service tool (jumper wires)	Making voltage and resistance measurements during troubleshooting a. Connect pin contact pressure inspection b. Power circuit inspection c. Power circuit inspection d. Commercial tester connection
 MB992006	MB992006 Extra fine probe	General service tool	Continuity check and voltage measurement at harness wire or connector

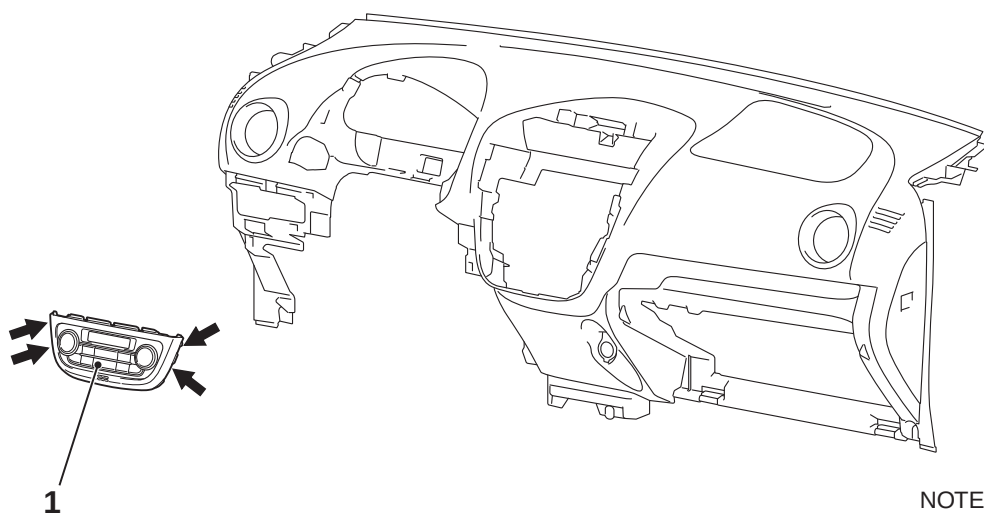
HEATER CONTROL UNIT

REMOVAL AND INSTALLATION

M1554014701010

Pre-removal and Post-installation Operation

- Removal and Installation of Instrument center panel (Refer to GROUP 52A, Instrument Center Panel).
- Removal and Installation of Radio and CD player bracket (Refer to GROUP 54A, Radio and CD Player).



NOTE:

← : Clip positions

ACC02859AB

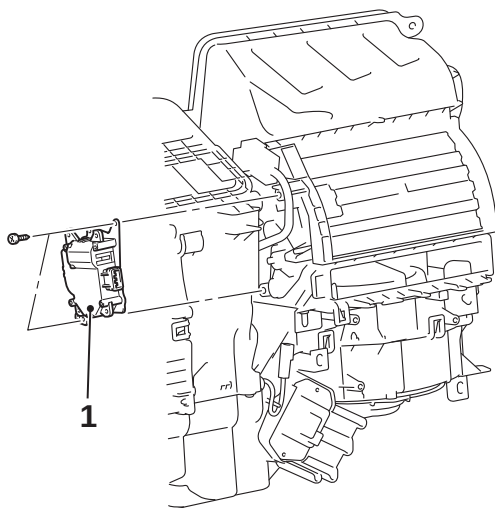
Removal steps

1. Auto A/C controller assembly

DAMPER CONTROL MOTOR ASSEMBLY

DAMPER CONTROL MOTOR ASSEMBLY REMOVAL AND INSTALLATION

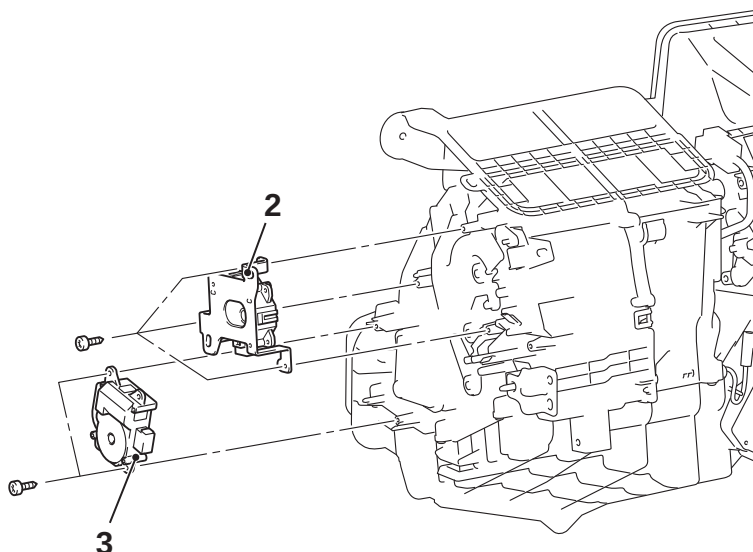
M1554001600076



ACC02781AB

Outside/inside air selection damper control motor and potentiometer removal step

- Passenger's (front) air bag module (Refer to GROUP 52B, Passenger's (front) Air Bag Module)
1. Outside/Inside air selection damper control motor and potentiometer



ACC02783AB

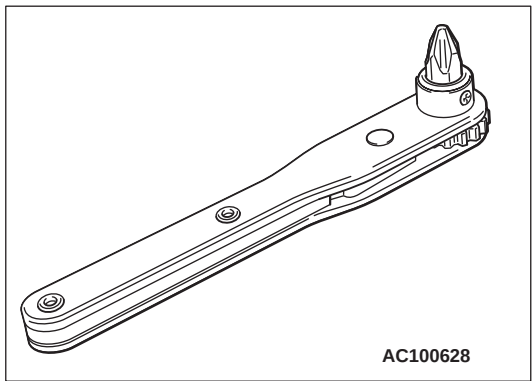
- Mode selection damper control motor and potentiometer removal step

- Instrument panel lower cover (Refer to GROUP 52A, Instrument panel lower cover P.52A-6)
 - Mode selection damper control motor and potentiometer
- <<A>>
- Air mixing damper control motor and potentiometer removal step

- Air mixing damper control motor and potentiometer

REMOVAL SERVICE POINT

<<A>> AIR MIXING DAMPER CONTROL MOTOR AND POTENTIOMETER REMOVAL



NOTE: A commercial plate type ratchet screwdriver is recommended.

DAMPER CONTROL MOTOR ASSEMBLY INSPECTION

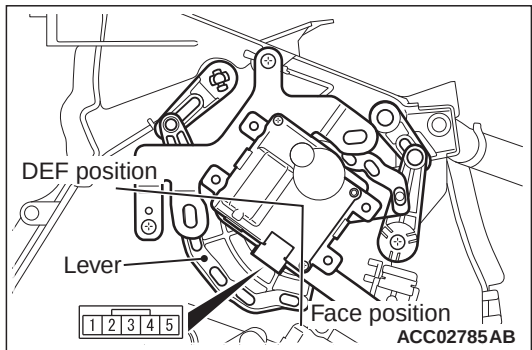
M1554001700095

CHECK THE MODE SELECTION DAMPER CONTROL MOTOR AND POTENTIOMETER

⚠ CAUTION

Stop energizing when the lever is set to the operation stopping position.

MOTOR CHECK



Battery connection (+) terminal	Battery connection (-) terminal	Lever operation
1	2	Rotate to the FACE side
2	1	Rotate to the DEF side

Potentiometer check

When the resistance value between connector terminals 3 and 4 is measured while checking the motor, check that the resistance value changes gradually within the standard value.

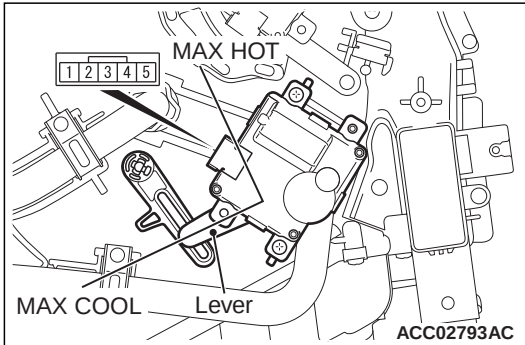
Standard value: 1.2 (FACE) – 4.80 (DEF) kΩ

CHECK THE AIR MIXING DAMPER CONTROL MOTOR AND POTENTIOMETER

⚠ CAUTION

Stop energizing when the lever is set to the operation stopping position.

MOTOR CHECK



Battery connection (+) terminal	Battery connection (-) terminal	Lever operation
2	1	Rotate to the COOL side.
1	2	Rotate to the HOT side.

Potentiometer check

When the resistance value between connector terminals 3 and 4 is measured while checking the motor, check that the resistance value changes gradually within the standard value.

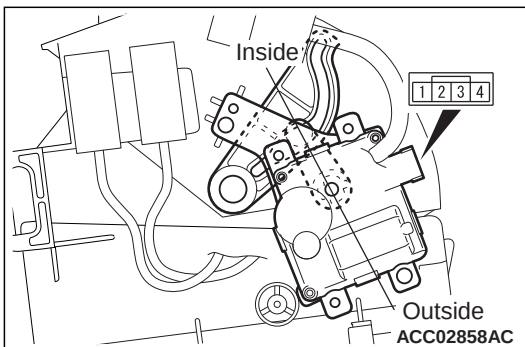
Standard value: 1.38 (MAX HOT) – 4.98 (MAX COOL) kΩ

CHECK THE OUTSIDE/INSIDE AIR SELECTION DAMPER CONTROL MOTOR

⚠ CAUTION

Stop energizing when the lever is set to the operation stopping position.

MOTOR CHECK



Battery connection (+) terminal	Battery connection (-) terminal	Lever operation
1	3	Rotate to the inside.
1	4	Rotate to the outside.

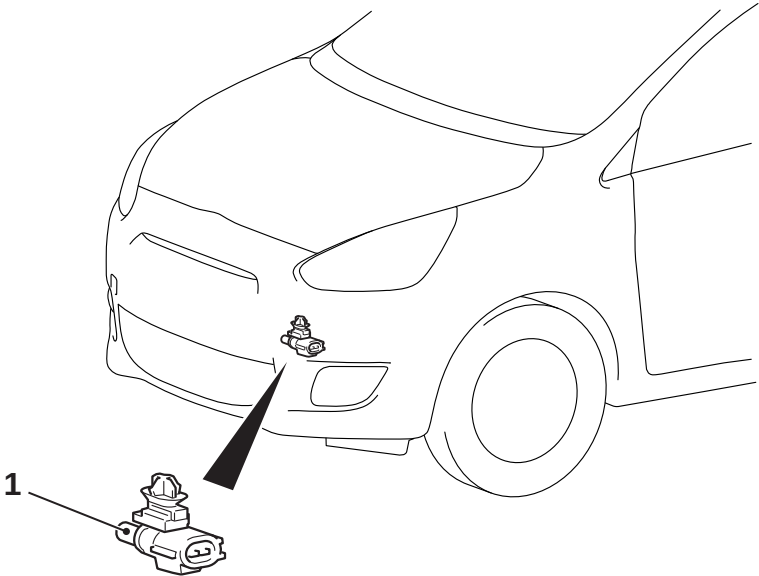
AMBIENT TEMPERATURE SENSOR

REMOVAL AND INSTALLATION

M1554003400926

Pre-removal and Post-installation Operation

- Front bumper assembly Removal and Installation (Refer to GROUP 51, Front bumper assembly [P.51-3](#)).



ACB03226AB

**Ambient temperature sensor
removal**

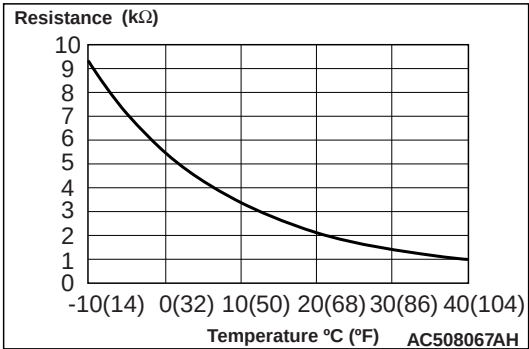
1. Ambient temperature sensor

INSPECTION

M1552014305320

AMBIENT TEMPERATURE SENSOR CHECK

Check to see that the resistance shown in the graph is almost satisfied when measuring the resistance between the terminals under two or more different temperature conditions.



OTHER PARTS

OTHER PARTS MAINTENANCE SERVICE POINTS

M1554004000987

The following maintenance service points are the same as for the manual A/C.

Item		Reference page
On-vehicle service	Refrigerant level check, draining and charging	P.55A-17
	Simple inspection of the a/c pressure sensor	P.55A-17
	Compressor drive belt adjustment	P.55A-18
	Performance test	P.55A-19
	Power relay continuity check	P.55A-21
	Idle-up operation check	P.55A-23
	Replace the air refresher	P.55A-27

Item	Reference page
Heater unit and blower assembly	P.55A-35
Heater hose	P.55A-40
Blower assembly and resistor ^{*1}	P.55A-42
Compressor assembly	P.55A-44
Condenser	P.55A-48
Refrigerant line	P.55A-49
Ducts	P.55A-51
Rear ventilation duct	P.55A-53

NOTE: ^{*1}: The resistor can be removed and installed in the same procedure as for the power transistor.

NOTES