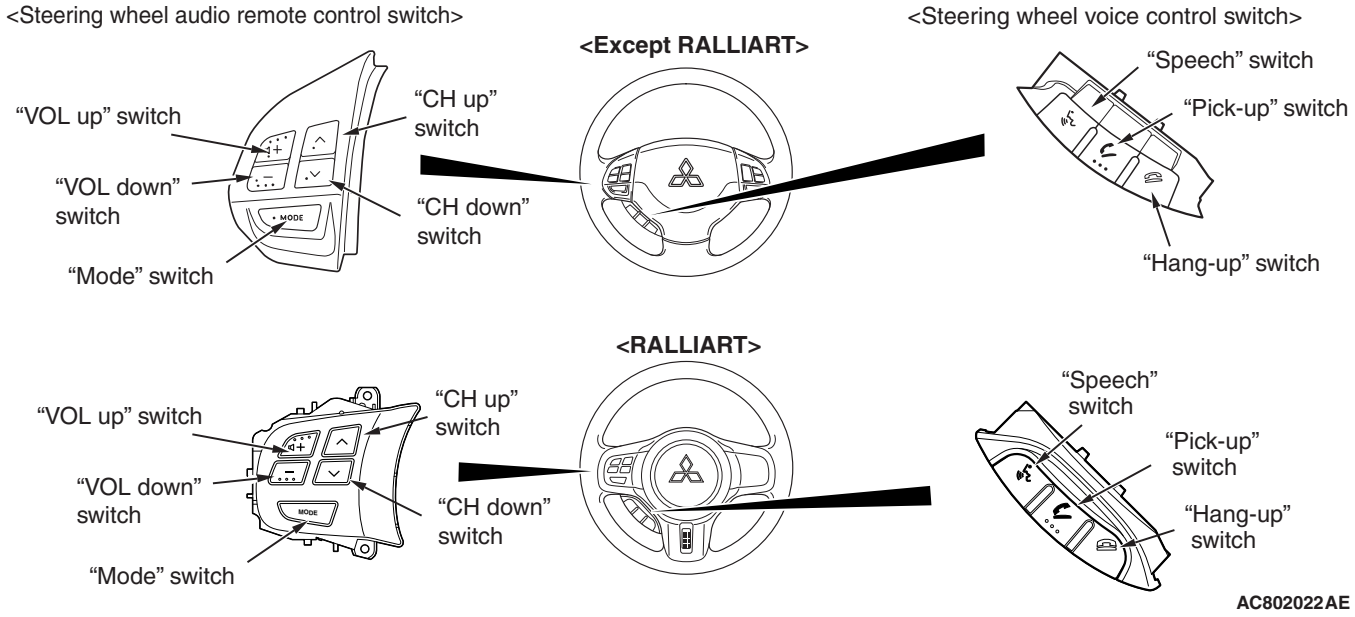
STEERING WHEEL AUDIO REMOTE CONTROL SWITCH

GENERAL INFORMATION

M1544000100903

On the spoke of steering wheel, the steering wheel audio remote control switch and steering wheel voice control switch have been installed.



STEERING WHEEL AUDIO REMOTE CONTROL SWITCH

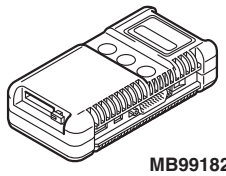
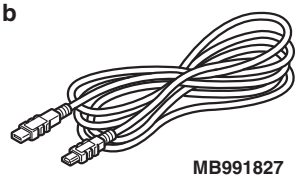
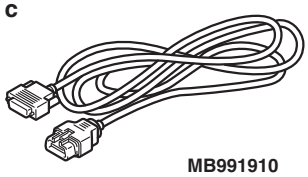
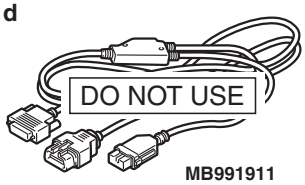
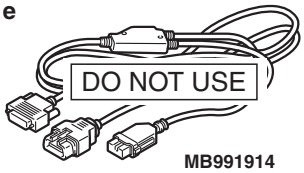
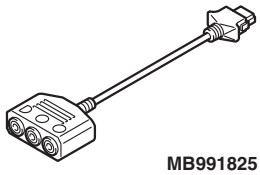
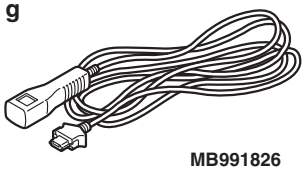
Using the steering wheel audio remote control switch, the volume adjustment of the radio and CD player and the multivision display, mode changeover, CD track up/down, and others can be performed.

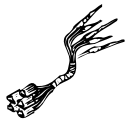
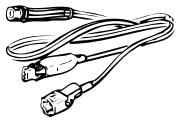
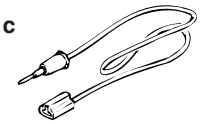
STEERING WHEEL VOICE CONTROL SWITCH <VEHICLE WITH HANDS FREE MODULE>

Using the steering wheel voice control switch, hands free cellular phone system.

SPECIAL TOOLS

M1544000600599

Tool	Tool number and name	Supersession	Application
a  MB991824 b  MB991827 c  MB991910 d  MB991911 e  MB991914 f  MB991825 g  MB991826 MB991958	MB991958 a. MB991824 b. MB991827 c. MB991910 d. MB991911 e. MB991914 f. MB991825 g. MB991826 M.U.T.-III sub assembly a. Vehicle communication interface (V.C.I.) b. M.U.T.-III USB cable c. M.U.T.-III main harness A (Vehicles with CAN communication system) d. M.U.T.-III main harness B (Vehicles without CAN communication system) e. M.U.T.-III main harness C (for Chrysler models only) f. M.U.T.-III measurement adapter g. M.U.T.-III trigger harness	MB991824-KIT *NOTE: G: MB991826 M.U.T.-III Trigger Harness is not necessary when pushing V.C.I. ENTER key.*	**⚠ CAUTION** **M.U.T.-III main harness A (MB991910) should be used. M.U.T.-III main harness B and C should not be used for this vehicle.** CAN bus diagnostics or service data check.

Tool	Tool number and name	Supersession	Application
a  b  c  d MB991223	MB991223 a. MB991219 b. MB991220 c. MB991221 d. MB991222 Harness set a. Test harness b. LED harness c. LED harness adaptor d. Probe	General service tools	Continuity check and voltage measurement at harness wire or connector for loose, corroded or damaged terminals, or terminals pushed back in the connector. a. Connector pin contact pressure inspection b. Power circuit inspection c. Power circuit inspection d. Commercial tester connection

DIAGNOSIS

STANDARD FLOW OF DIAGNOSTIC TROUBLESHOOTING

M1544004800584

Refer to GROUP 00, Troubleshooting contents P.00-7.

TROUBLE SYMPTOM CHART

M1544004900826

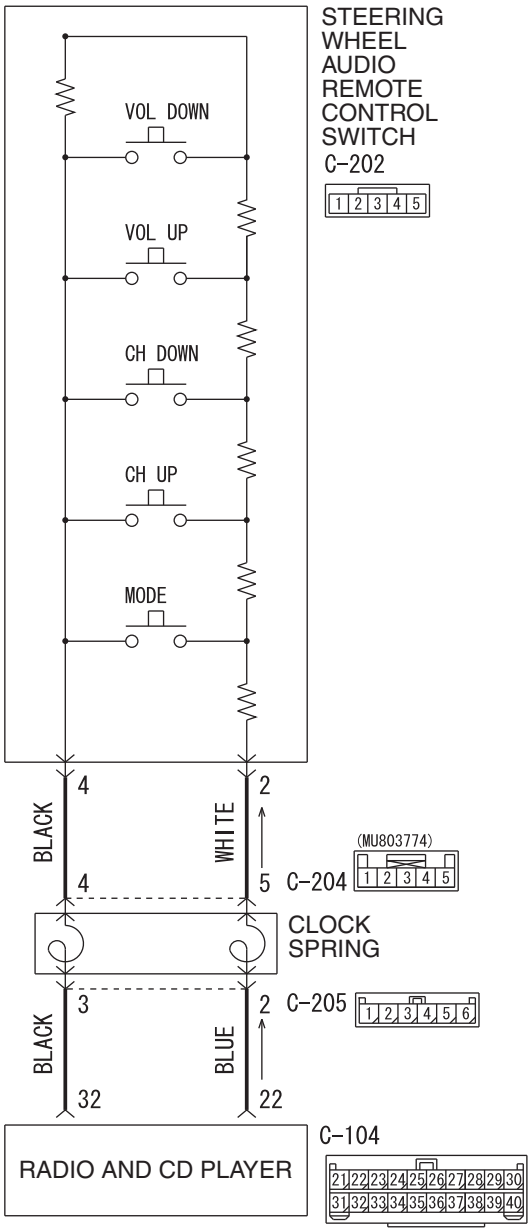
Inspection Procedure No.	Trouble symptom		Reference page
1	Steering wheel audio remote control switch does not function	<vehicles without MMCS>	P.54A-542
2		<vehicles with MMCS>	P.54A-547
3	Steering wheel audio remote control switch illumination does not come on.		P.54A-551

SYMPTOM PROCEDURES

Inspection Procedure 1: Steering Wheel Audio Remote Control Switch does not Function. <Vehicles without MMCS>

⚠ CAUTION
Before replacing the radio and CD player, ensure that the power supply circuit, the ground circuit and the communication circuit are normal.

Steering Audio Switch Circuit



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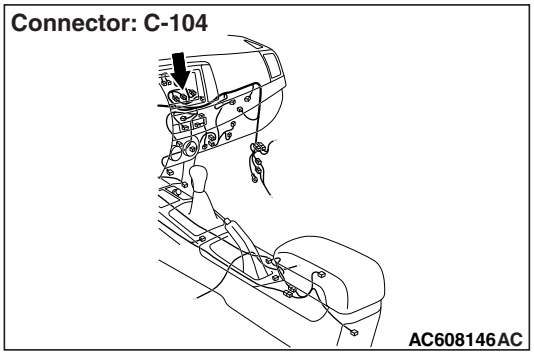
TSB Revision

Connector: C-104



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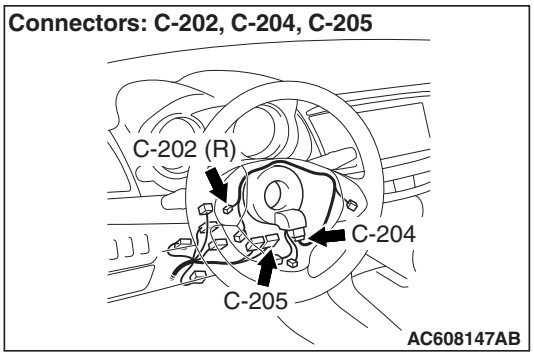
Connectors: C-202, C-204, C-205



AC608147AB

TECHNICAL DESCRIPTION (COMMENT)

The power supply circuit to the steering remote control switch, the steering remote control switch, the radio and CD player, or the clock spring may be defective.

TROUBLESHOOTING HINTS

- Malfunction of steering remote control switch
- Malfunctions of radio and CD player
- Malfunction of the clock spring
- Damaged harness wires and connectors

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- 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

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

Check whether the service data below are normal. (Refor to P.54A-427.)

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

(2) Operate each switch of the steering remote control. Check whether the normal conditions listed below are displayed.

Item No.	Item name	Normal condition
Item 1	RADIO remoto SW (SEEK-)	ON
Item 2	RADIO remoto SW (SEEK+)	ON
Item 3	RADIO remoto SW (MODE)	ON
Item 4	RADIO remoto SW (VOL-)	ON
Item 5	RADIO remoto SW (VOL+)	ON

OK: Normal condition is displayed.

Q: Is the check result normal?

YES : Replace the radio and CD player.

NO : Go to Step 2.

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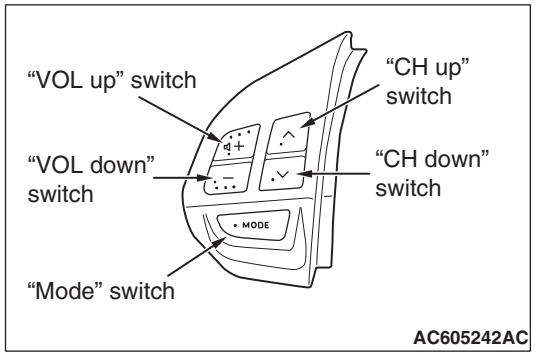
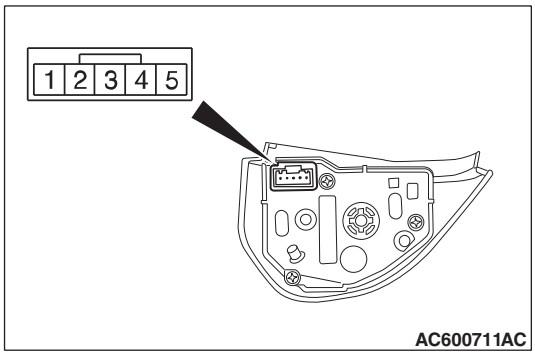




STEP 2. Check the remote controlled radio switch.

Remove the remote controlled radio switch. Then check continuity between the switch terminals.

Switch Position	Tester Connection	Measurement Value
No push	2 – 4	Approximately 71 kΩ
Mode		Approximately 270 Ω
CH up		Approximately 740 Ω
CH down		Approximately 1.3 kΩ
VOL up		Approximately 2.1 kΩ
VOL down		Approximately 3.1 kΩ

Q: Is the remote controlled radio switch in good condition?

YES : Go to Step 3.

NO : Replace the remote controlled radio switch.

STEP 3. Check clock spring connector C-204 and C-205 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are clock spring connector C-204 and C-205 in good condition?

YES : Go to Step 4.

NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The steering remote control switch should work normally.

STEP 4. Check the clock spring.

Check whether the clock spring is in good condition (Refer to GROUP 52B, Driver's Air Bag Module and Clock Spring P.52B-425 <Except RALLIART>or P.52B-433 <RALLIART>).

Q: Is the check result normal?

YES : Go to Step 5.

NO : Replace the clock spring.

STEP 5. Check radio and CD player connector C-104 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is radio and CD player connector C-104 in good condition?

YES : Go to Step 6.

NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The steering remote control switch should work normally.

STEP 6. Check the wiring harness between radio and CD player connector C-104 (terminal 22, 32) and clock spring connector C-205 (terminal 2, 3).

- Check the communication lines for open and short circuit.

Q: Is the wiring harness between radio and CD player connector C-104 (terminal 22, 32) and clock spring connector C-205 (terminal 2, 3) in good condition?

YES : Go to Step 7.

NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.

STEP 7. Check steering remote control switch connector C-202 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is steering remote control switch connector C-202 in good condition?

YES : Go to Step 8.

NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The steering remote control switch should work normally.

STEP 8. Check the wiring harness between steering remote control switch connector C-202 (terminal 2, 4) and clock spring connector C-204 (terminal 5, 4).

- Check the communication lines for open and short circuit.

Q: Is the wiring harness between steering remote control switch connector C-202 (terminal 2, 4) and clock spring connector C-204 (terminal 5, 4) in good condition?

YES : Go to Step 9.

NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.

STEP 9. Retest the system

Check whether you can operate the radio and CD player by using the steering remote control.

Q: Is the check result normal?

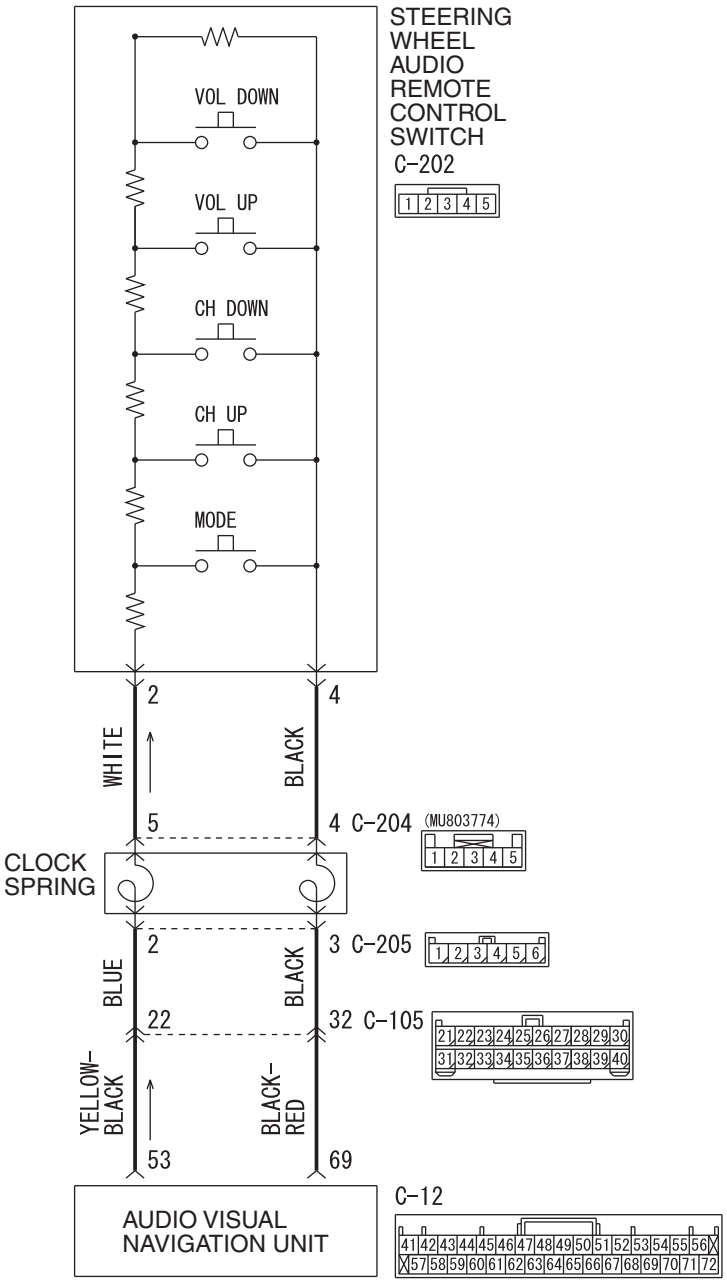
YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to use Troubleshooting/inspection Service Points, How to Cope with Intermittent Malfunction P.00-14).

NO : Replace the radio and CD player.

Inspection Procedure 2: Steering Wheel Audio Remote Control Switch does not Function. <Vehicles with MMCS>

⚠ CAUTION
Before replacing the audio visual navigation unit, ensure that the power supply circuit, the ground circuit and the communication circuit are normal.

Steering Audio Switch Circuit



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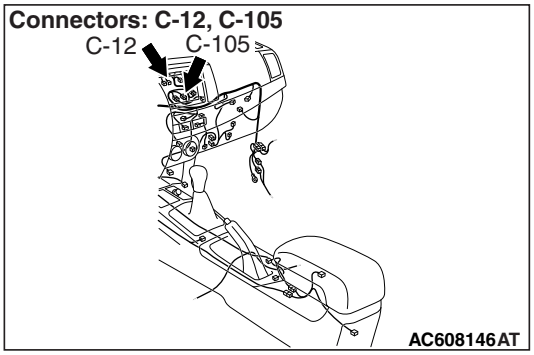
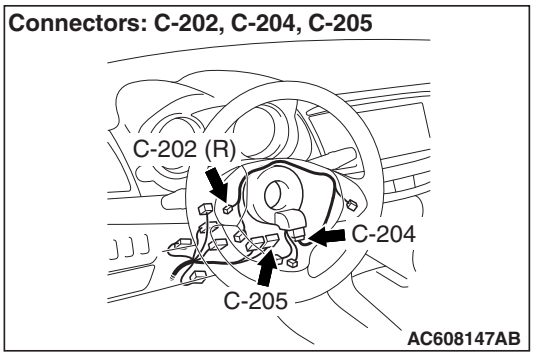
TSB Revision





TECHNICAL DESCRIPTION (COMMENT)

The power supply circuit to the steering remote control switch, the steering remote control switch, the audio visual navigation unit, or the clock spring may be defective.

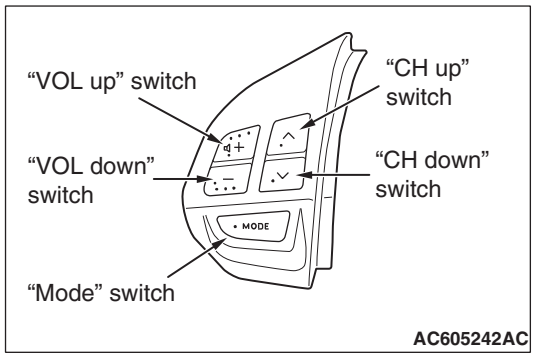
TROUBLESHOOTING HINTS

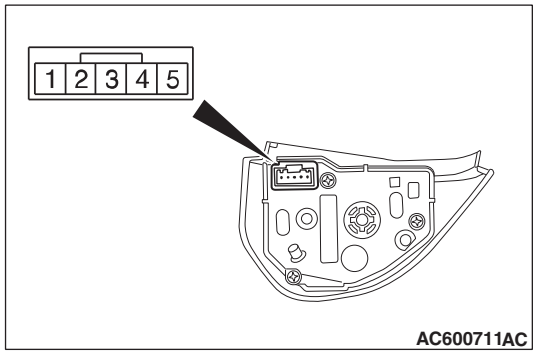
- Malfunction of steering remote control switch
- Malfunctions of audio visual navigation unit
- Malfunction of the clock spring
- Damaged harness wires and connectors

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra Fine Probe





STEP 1. Check the remote controlled radio switch.

Remove the remote controlled radio switch. Then check continuity between the switch terminals.

Switch Position	Tester Connection	Measurement Value
No push	2 – 4	Approximately 71 kΩ
Mode		Approximately 270 Ω
CH up		Approximately 740 Ω
CH down		Approximately 1.3 kΩ
VOL up		Approximately 2.1 kΩ
VOL down		Approximately 3.1 kΩ

Q: Is the remote controlled radio switch in good condition?

YES : Go to Step 2.

NO : Replace the remote controlled radio switch.

TSB Revision

STEP 2. Check clock spring connector C-204 and C-205 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are clock spring connector C-204 and C-205 in good condition?

YES : Go to Step 3.

NO : Repair or replace the damaged component (Refer to GROUP 00E, Harness Connector Inspection P.00E-2). The steering remote control switch should work normally.

STEP 3. Check the clock spring.

Check whether the clock spring is in good condition (Refer to GROUP 52B - Driver's Air Bag Module and Clock Spring P.52B-425 <Except RALLIART>or P.52B-433 <RALLIART>).

Q: Is the check result normal?

YES : Go to Step 4.

NO : Replace the clock spring.

STEP 4. Check audio visual navigation unit connector C-12 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is audio visual navigation unit connector C-12 in good condition?

YES : Go to Step 5.

NO : Repair or replace the damaged component (Refer to GROUP 00E, Harness Connector Inspection P.00E-2). The steering remote control switch should work normally.

STEP 5. Check the wiring harness between audio visual navigation unit connector C-12 (terminal 53, 69) and clock spring connector C-205 (terminal 2, 3).

- Check the communication lines for open and short circuit.

NOTE: Also check intermediate connector C-105 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-105 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between audio visual navigation unit connector C-12 (terminal 53, 69) and clock spring connector C-205 (terminal 2, 3) in good condition?

YES : Go to Step 6.

NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.

STEP 6. Check steering remote control switch connector C-202 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is steering remote control switch connector C-202 in good condition?

YES : Go to Step 7.

NO : Repair or replace the damaged component (Refer to GROUP 00E, Harness Connector Inspection P.00E-2). The steering remote control switch should work normally.

STEP 7. Check the wiring harness between steering remote control switch connector C-202 (terminal 2, 4) and clock spring connector C-204 (terminal 5, 4).

- Check the communication lines for open and short circuit.

Q: Is the wiring harness between steering remote control switch connector C-202 (terminal 2, 4) and clock spring connector C-204 (terminal 5, 4) in good condition?

YES : Go to Step 8.

NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.

STEP 8. Retest the system

Check whether you can operate the audio visual navigation unit by using the steering remote control.

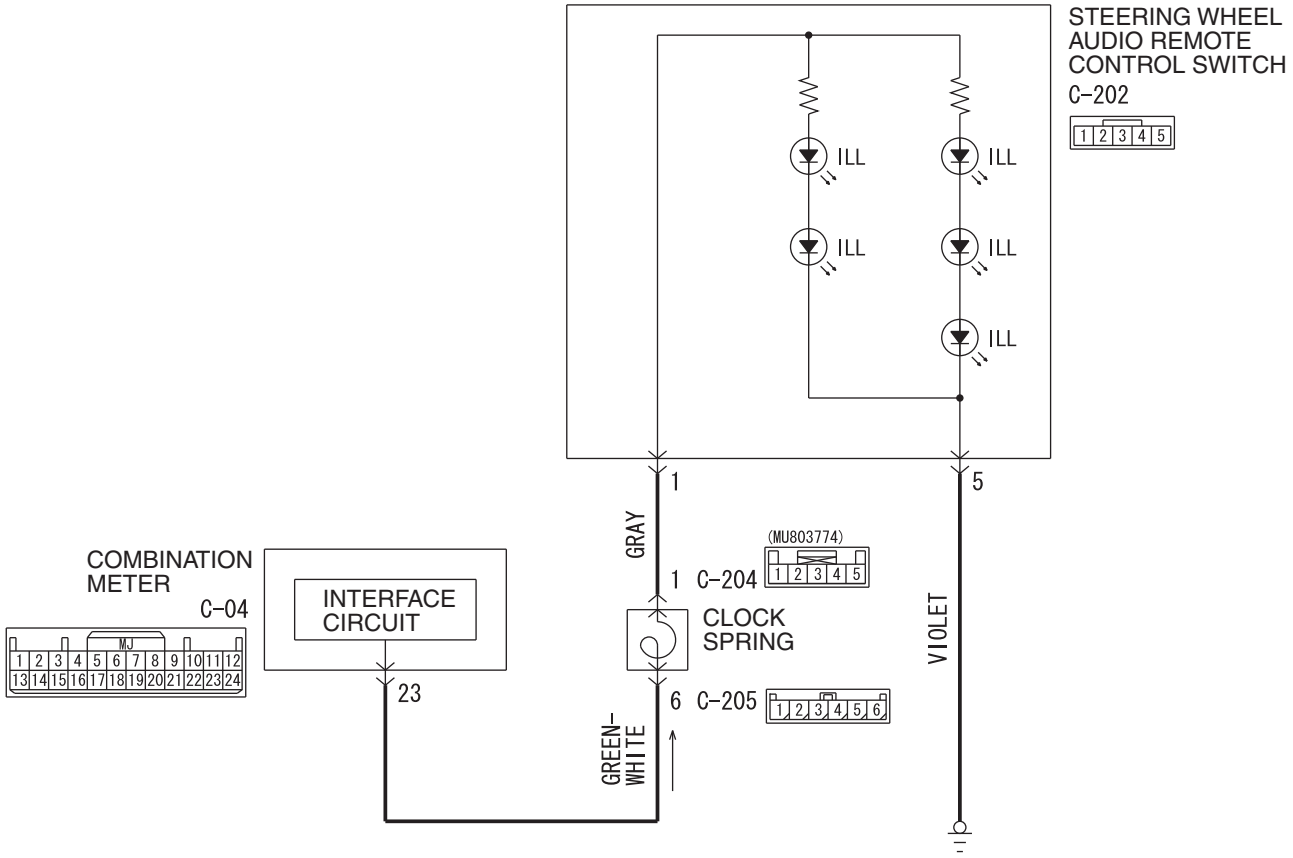
Q: Is the check result normal?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to use Troubleshooting/inspection Service Points, How to Cope with Intermittent Malfunction P.00-14).

NO : Replace the audio visual navigation unit.

Inspection Procedure 3: Steering wheel audio remote control switch illumination does not come on.

Steering Wheel Audio Remote Control Switch Illumination Circuit



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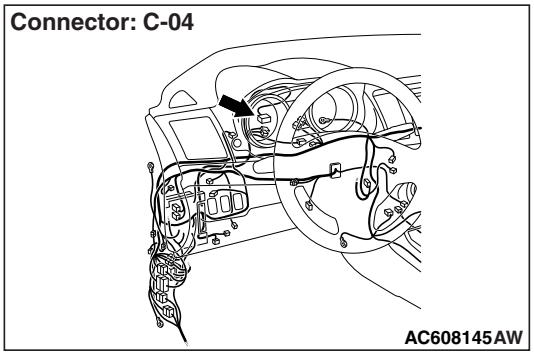
Connector: C-04



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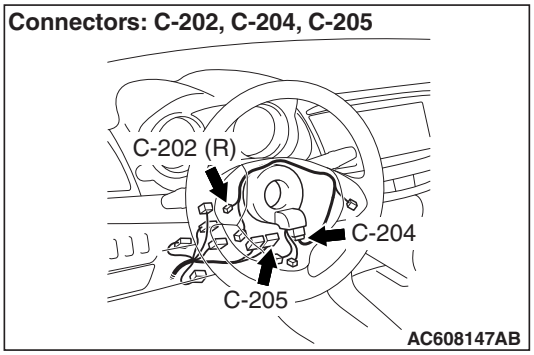
Connectors: C-202, C-204, C-205



AC608147AB

TECHNICAL DESCRIPTION (COMMENT)

The power supply circuit to the steering remote control switch, the steering remote control switch, the combination meter, or the clock spring may be defective.

TROUBLESHOOTING HINTS

- Malfunction of steering remote control switch
- Malfunctions of combination meter
- Malfunction of the clock spring
- Damaged harness wires and connectors

TSB Revision

DIAGNOSIS

Required Special Tools:
- MB991223: Harness Set
- MB992006: Extra Fine Probe

STEP 1. Check the combination meter.
Check whether the combination meter works normally.

Q: Does the combination meter operate normally?

YES : Go to Step 2.
NO : Diagnose the combination meter (Refer to P.54A-33).

STEP 2. Check steering wheel audio remote control switch connector C-202 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is steering wheel audio remote control switch connector C-202 in good condition?

YES : Go to Step 3.
NO : Repair or replace the damaged component (Refer to GROUP 00E, Harness Connector Inspection P.00E-2). The steering remote control switch should work normally.

STEP 3. Check the wiring harness between steering wheel audio remote control switch connector C-202 (terminal 5) and ground.
- Check the ground wire for open circuit.

Q: Is the wiring harness between steering wheel audio remote control switch connector C-202 (terminal 5) and ground in good condition?

YES : Go to Step 4.
NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.

STEP 4. Check clock spring connectors C-204 and C-205 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are clock spring connectors C-204 and C-205 in good condition?

YES : Go to Step 5.
NO : Repair or replace the damaged component (Refer to GROUP 00E, Harness Connector Inspection P.00E-2). The steering remote control switch should work normally.

STEP 5. Check the clock spring.
Check whether the clock spring is in good condition (Refer to GROUP 52B - Driver's Air Bag Module and Clock Spring P.52B-425 <Except RALLIART>or P.52B-433 <RALLIART>).

Q: Is the check result normal?

YES : Go to Step 6.
NO : Replace the clock spring.

STEP 6. Check the wiring harness between steering wheel audio remote control switch connector C-202 (terminal 1) and clock spring connector C-204 (terminal 1).

- Check the power supply line for open circuit and short circuit.

Q: Is the wiring harness between steering wheel audio remote control switch connector C-202 (terminal 1) and clock spring connector C-204 (terminal 1) in good condition?

YES : Go to Step 7.
NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.

STEP 7. Check combination meter connector C-04 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is combination meter connector C-04 in good condition?

YES : Go to Step 8.
NO : Repair or replace the damaged component (Refer to GROUP 00E, Harness Connector Inspection P.00E-2). The steering remote control switch should work normally.

STEP 8. Check the wiring harness between combination meter connector C-04 (terminal 23) and clock spring connector C-205 (terminal 6).

- Check the power supply line for open circuit and short circuit.

Q: Is the wiring harness between combination meter connector C-04 (terminal 23) and clock spring connector C-205 (terminal 6) in good condition?

YES : Go to Step 9.
NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.

STEP 9. Retest the system

Check whether the illumination of the steering wheel audio remote control switch comes on normally.

Q: Doe the illumination of the steering wheel audio remote control switch comes on normally?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to use Troubleshooting/inspection Service Points, How to Cope with Intermittent Malfunction P.00-14).

NO : Replace the steering wheel audio remote control switch.

SERVICE DATA

M1544014100111

Refer to Radio and CD player P.54A-427.

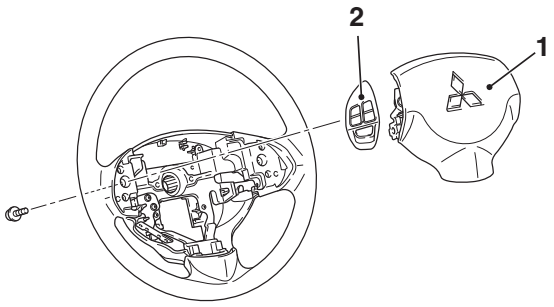
REMOVAL AND INSTALLATION

M1544015600142

⚠ WARNING

- ***Before removing the air bag module, refer to GROUP 52B, Service Precautions (P.52B-25) and Driver's Air Bag Module and Clock Spring (P.52B-419 <Except RALLIART> or P.52B-427 <RALLIART>).***
- ***When removing and installing the steering wheel, do not let it bump against the air bag module.***

<Except RALLIART>

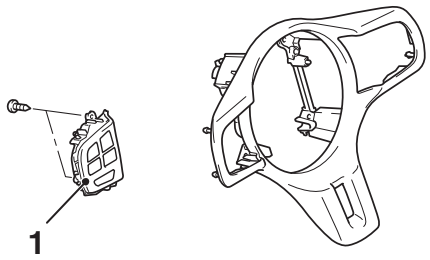


AC605239AC

Removal Steps

1. Air bag module (Refer to GROUP 52B - Driver's Air Bag Module P.52B-419 <RALLIART> or P.52B-427 <Except RALLIART>).
2. Steering wheel audio remote control switch

<RALLIART>



AC709217AC

Removal Steps

- Garnish (Refer to GROUP37 – Steering wheel P.37-32.)

1. Steering wheel audio remote control switch

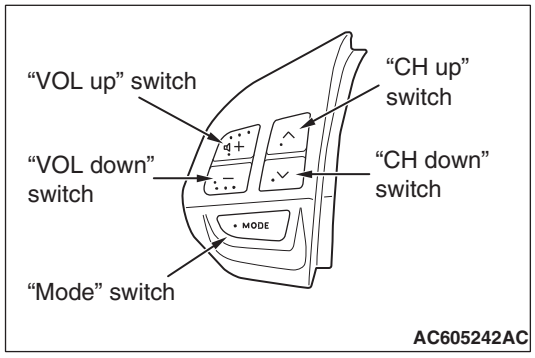
STEERING WHEEL AUDIO REMOTE CONTROL SWITCH INSPECTION

M1544015700343

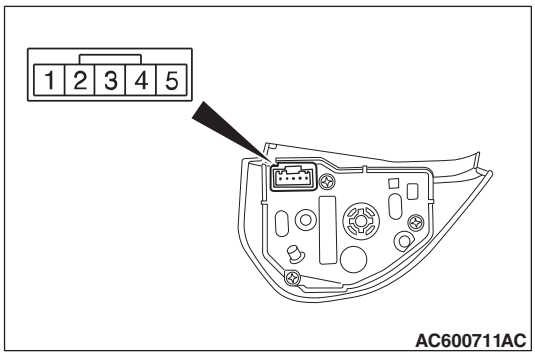
<EXCEPT RALLIART>

STEERING WHEEL AUDIO REMOTE CONTROL SWITCH CHECK

Use an ohmmeter to measure the resistance value between the terminal.



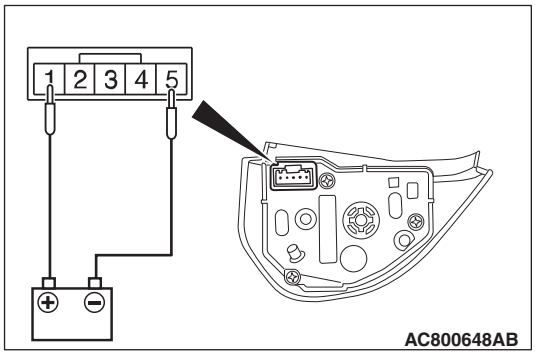
AC605242AC



AC600711AC

Switch Position	Tester Connection	Measurement Value
No push	2 – 3	Approximately 3.1 kΩ
	2 – 4	Approximately 71 kΩ
"Mode" switch		Approximately 270 Ω
"CH up" switch		Approximately 740 Ω
"CH down" switch		Approximately 1.3 kΩ
"VOL up" switch		Approximately 2.1 kΩ
"VOL down" switch		Approximately 3.1 kΩ

TSB Revision



ILLUMINATION CHECK

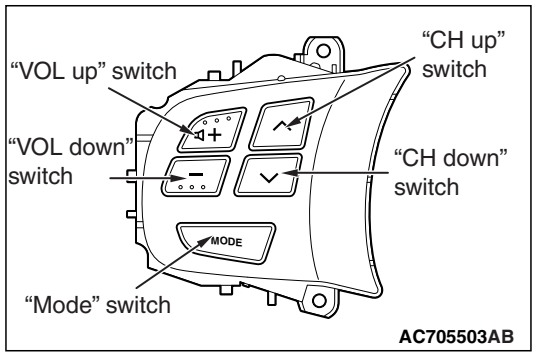
Apply the battery voltage of steering wheel audio remote control switch connector terminal No. 1 and 5, and check if the steering wheel audio remote control switch illuminates.

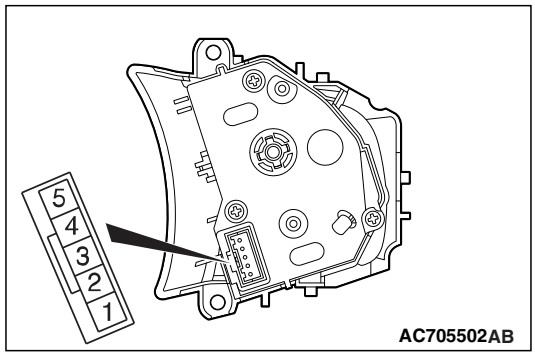
NOTE: Make sure that the polarity is correct.

<RALLIART>

STEERING WHEEL AUDIO REMOTE CONTROL SWITCH CHECK

Use an ohmmeter to measure the resistance value between the terminal.





Switch Position	Tester Connection	Measurement Value
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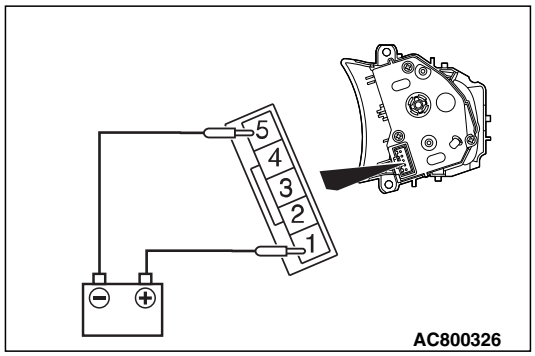
"CH down" switch		Approximately 1.3 kΩ
"VOL up" switch		Approximately 2.1 kΩ
"VOL down" switch		Approximately 3.1 kΩ

ILLUMINATION CHECK



Apply the battery voltage of steering wheel audio remote control switch connector terminal No. 1 and 5, and check if the steering wheel audio remote control switch illuminates.

NOTE: Make sure that the polarity is correct.

HANDS FREE CELLULAR PHONE SYSTEM

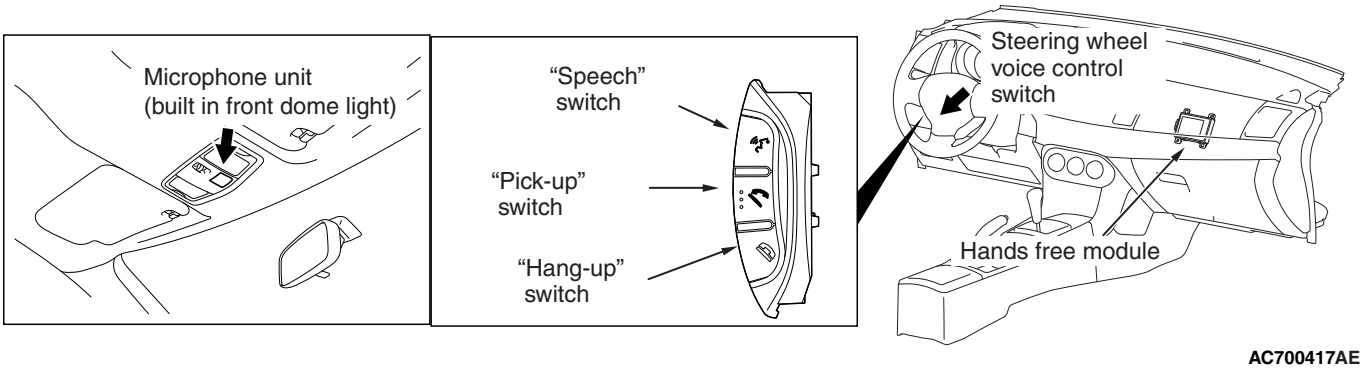
GENERAL INFORMATION

M1544401200127

With the hands free cellular phone system by registering a cellular phone for Bluetooth®* with voice recognition to the hands free module, the telephone function becomes available without operating the cellular phone directly. The hands free cellular phone system can be used without connecting the cellular phone to the vehicle via wiring cable.

*NOTE: *: Bluetooth® is the short-distance digital wireless communication technology using 2.45 GHz frequency band. The communication effective area is within 10 m, and the feature is that the communication can be achieved even when an obstacle is present between the communicating devices.*

Construction diagram



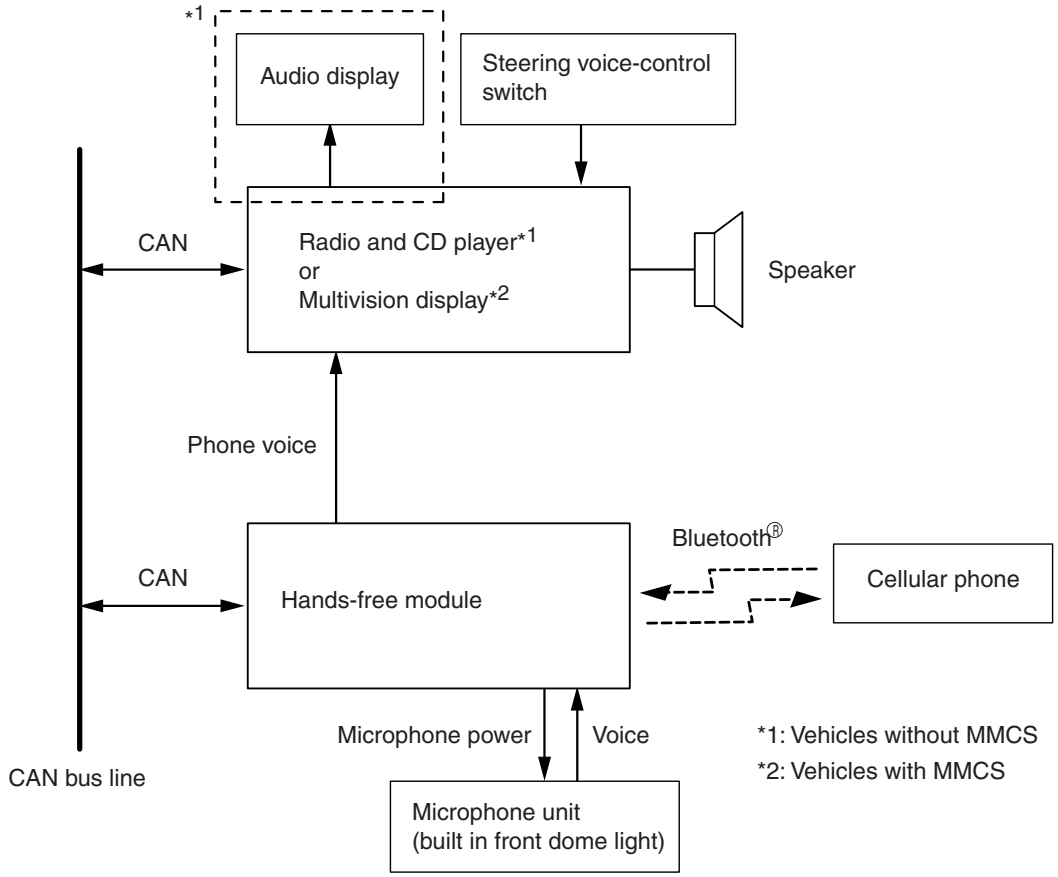
AC700417AE

When the registered cellular phone is inside the vehicle, the hands free cellular phone system operates as follows.

NOTE: The owner's manual contains details on pairing a cellular phone with the Bluetooth system, speaker enrollment, and other functions.

- When the cellular phone receives a call, the occupant can start conversation by pressing "Pick-up" in the steering wheel voice control switch on the steering wheel. When the conversation ends, the occupant can finish the call by pressing "Hang-up" in the steering voice-control switches.
- To make a call, press "Speech" in the steering wheel voice control switch on the steering wheel, call up the registered receiver's information in the voice input mode, press "Pick-up". Then, the transmission starts to call the receiver. Also, when the conversation ends, the occupant can finish the call by pressing "Hang-up" in the steering wheel voice control switch.
- The communication directly via a cellular phone can be switched to the communication via a hands free module. Also, the communication via a hands free module can be switched to the communication directly via a cellular phone.
- The voice input mode corresponds to the following languages: English, American Spanish, Canadian French.
- The voice of occupant is picked up by the microphone unit incorporated in the front dome light, and then transmitted to the cellular phone via hands free module. Also, the receiver's voice is transmitted from the cellular phone to radio and CD player <vehicles without MMCS> or Multivision display <vehicles with MMCS> via hands free module, and then output from the vehicle-mounted speaker.
- Using the steering wheel audio remote control switch, the volume can be adjusted.
- The reception state of the cellular phone is indicated on the display section of radio and CD player <vehicles without MMCS> or Multivision display <vehicles with MMCS>.

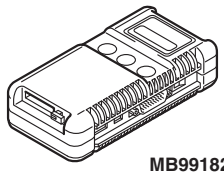
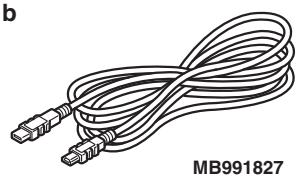
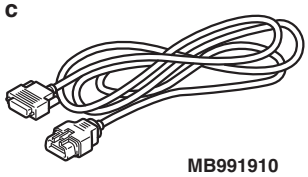
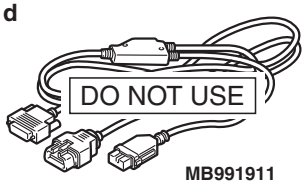
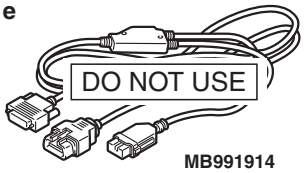
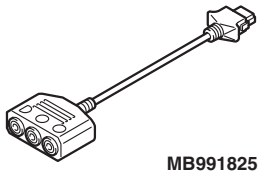
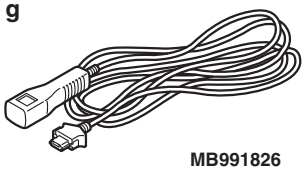
System block diagram

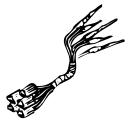
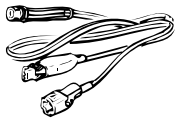
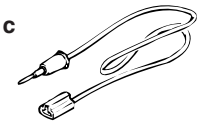
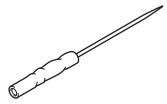


AC613221AX

SPECIAL TOOLS

M1544403500094

Tool	Tool number and name	Supersession	Application
a  MB991824 b  MB991827 c  MB991910 d  MB991911 e  MB991914 f  MB991825 g  MB991826 MB991958	MB991958 a. MB991824 b. MB991827 c. MB991910 d. MB991911 e. MB991914 f. MB991825 g. MB991826 M.U.T.-III sub-assembly a. Vehicle communication interface (V.C.I.) b. M.U.T.-III USB cable c. M.U.T.-III main harness A (Vehicles with CAN communication system) d. M.U.T.-III main harness B (Vehicles without CAN communication system) e. M.U.T.-III main harness C (for Chrysler models only) f. M.U.T.-III measurement adapter g. M.U.T.-III trigger harness	MB991824-KIT *NOTE: G: MB991826 M.U.T.-III Trigger Harness is not necessary when pushing V.C.I. ENTER key.*	**⚠ CAUTION** **M.U.T.-III main harness A (MB991910) should be used. M.U.T.-III main harness B and C should not be used for this vehicle.** CAN bus diagnostics or data list check.

Tool	Tool number and name	Supersession	Application
a  b  c  d MB991223	MB991223 a. MB991219 b. MB991220 c. MB991221 d. MB991222 Harness set a. Check harness b. LED harness c. LED harness adapter d. Probe	General service tool (jumper)	Continuity check and voltage measurement at harness wire or connector a. For checking connector pin contact pressure b. For checking power supply circuit c. For checking power supply circuit d. For connecting a locally sourced tester
 MB992006	MB992006 Extra fine probe	–	Continuity check and voltage measurement at harness wire or connector

DIAGNOSIS

STANDARD FLOW OF DIAGNOSTIC TROUBLESHOOTING

M1540203800011

Refer to GROUP 00 – Contents of troubleshooting P.00-7.

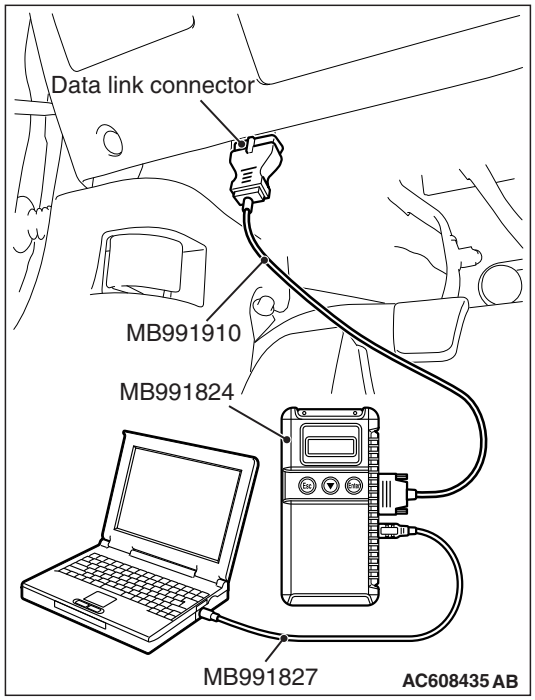
DIAGNOSIS FUNCTION

M1544403100159

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

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles 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 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 special tool MB991824 is energized, special tool MB991824 indicator light will be illuminated in a green color.
7. Start the M.U.T.-III system on the personal computer.

NOTE: Disconnecting scan tool MB991958 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:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles 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)

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

1. Connect 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 2006 MY" of "Model Year." When the "Vehicle Information" is displayed, check the contents.
5. Select "Meter" 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 DIAGNOSE THE CAN BUS LINES

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles 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)

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 being diagnosed.
   - If they match, go to Step 8.
   - If not, go to Step 5.
5. Select the "view vehicle information" button.
6. Enter the vehicle information and select the "OK" button.
7. When the vehicle information is displayed, confirm again that it matches the vehicle being diagnosed.
   - If they match, go to Step 8.
   - If not, go to Step 5.
8. Select the "OK" button.
9. When the optional equipment screen is displayed, choose the one which the vehicle is fitted with, and then select the "OK" button.

CHECK OF FREEZE FRAME DATA

The freeze frame data can be checked by using scan tool MB991958.

When detecting fault and storing the diagnostic trouble code, the ECU connected to CAN bus line obtains the data before the determination of the diagnostic trouble code and the data when the diagnostic trouble code is determined, and then stores the ECU status of that time. By analyzing each data from scan tool MB991958, the troubleshooting can be performed more efficiently. The displayed items are as the table below.

Display item list

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

DIAGNOSIS CODE CHART

M1544403200178

⚠ CAUTION

On troubleshooting, if the ignition switch is turned ON while disconnecting connector(s), diagnosis code(s) associated with other system may be set. On completion, confirm all systems for diagnosis code(s). If diagnosis code(s) are set, erase them all.

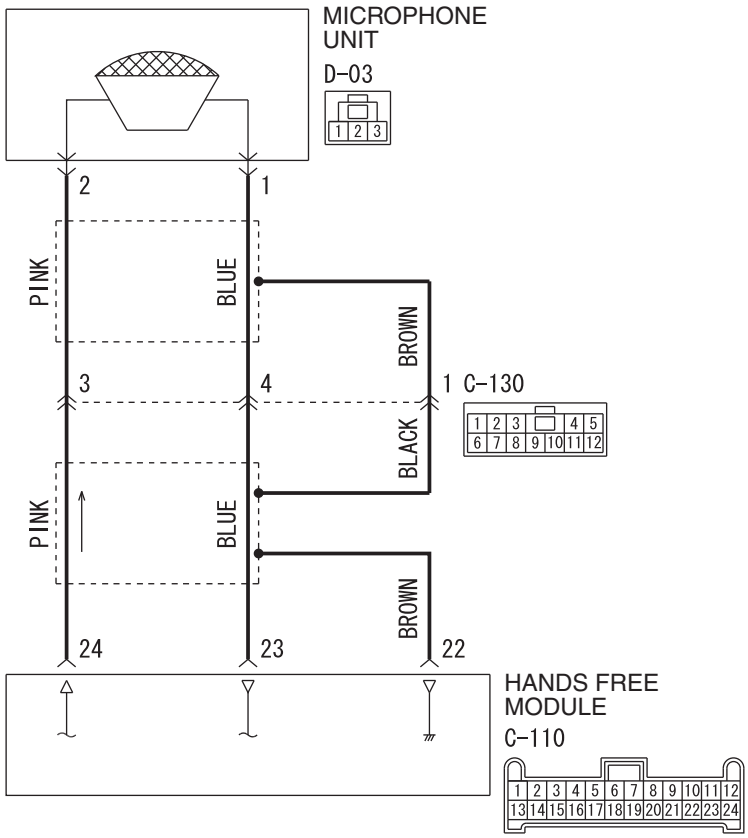
DTC No.	Description	Reference page
B2468	Microphone input short to BATT	P.54A-564
B2470	Microphone input short to earth	
B2471	On hook button stuck	P.54A-567
B2472	Off hook button stuck	
B2473	VR button stuck	
B2475	VIN not programmed	P.54A-573
U0019	Bus off (CAN-B)	P.54A-575
U0141	ETACS CAN timeout	P.54A-577
U0151	SRS-ABG CAN timeout	P.54A-579
U0154	OCM (occupant classification-ECU) CAN timeout	P.54A-581
U0155	Meter CAN timeout	P.54A-583
U0164	A/C CAN timeout	P.54A-585
U0168	WCM CAN timeout	P.54A-587
U0184	AUDIO CAN timeout	P.54A-589
U0195	Satellite radio CAN timeout	P.54A-591
U0245	AND [Audio visual Navigation (HDD) unit] CAN timeout	P.54A-592

DIAGNOSTIC TROUBLE CODE PROCEDURES

DTC B2468: Microphone input short to BATT
DTC B2470: Microphone input short to ground

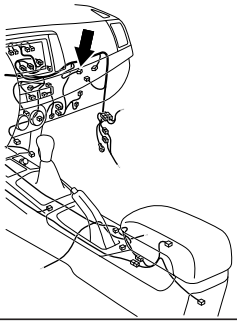
⚠ CAUTION
Before replacing the module, ensure that the communication circuit is normal.

Hands Free Cellular Phone System Circuit



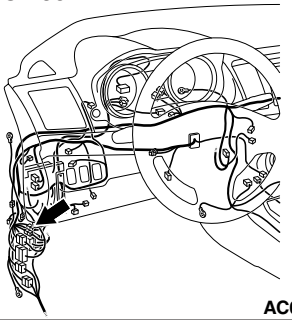
W9H54M049A

Connector: C-110



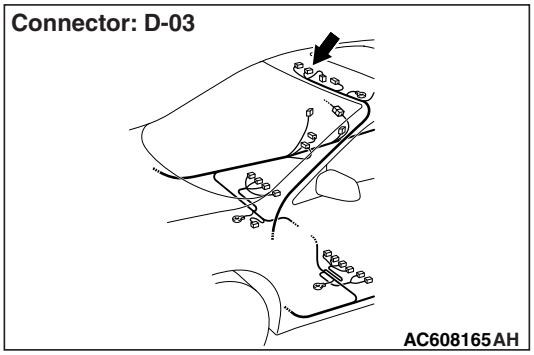
AC608146CH

Connector: C-130



AC608145AX

TSB Revision



JUDGMENT CRITERIA

When the hands free module judges that the connection with microphone unit is abnormal for 5 seconds or more, it stores diagnostic trouble code B2468 or B2470.

PROBABLE CAUSES

- The hands free module may be defective.
- The microphone unit may be defective.
- Damaged harness wires and connectors

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles 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)

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

Use scan tool MB991958 to diagnose the CAN bus lines.

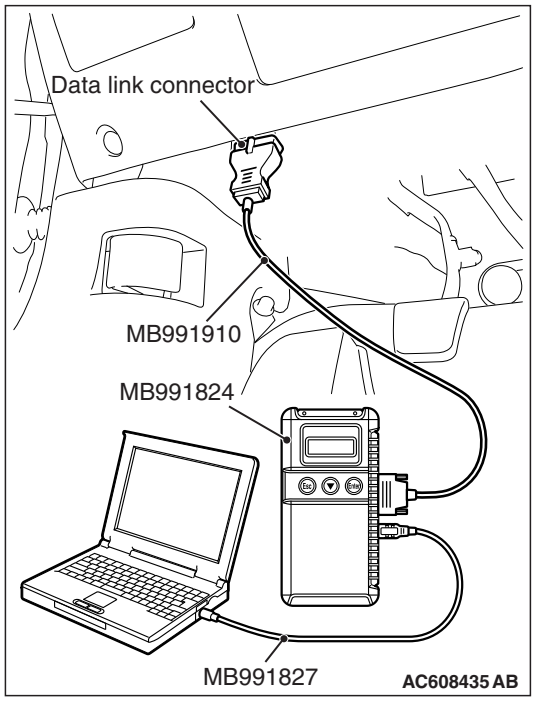
⚠ CAUTION

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. Refer to "How to connect the Scan Tool (M.U.T.-III) P.54A-560."
(2) Turn the ignition switch to "ON" position.
(3) Diagnose the CAN bus line.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis P.54C-17).



STEP 2. Check microphone unit connector D-03 and hands free module connector C-110 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are microphone unit connector D-03 and hands free module connector C-110 in good condition?

YES : Go to Step 3.
NO : Repair the defective connector.

STEP 3. Check the wiring harness between microphone unit connector D-03 (terminal 1, 2) and hands free module connector C-110 (terminal 23, 24).

- Check the communication lines for open circuit and short circuit.

NOTE: Also check intermediate connector C-133 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-133 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between microphone unit connector D-03 (terminal 1, 2) and hands free module connector C-110 (terminal 23, 24) in good condition?

YES : Go to Step 4.
NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.

STEP 4. Recheck for diagnostic trouble code.

Check again if the DTC is set to the hands free module.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is set.

Q: Is the DTC set?

YES : Go to Step 5.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to use Troubleshooting/inspection Service Points, How to Cope with Intermittent Malfunction P.00-14).

STEP 5. Temporarily replace the microphone unit, and check whether the diagnostic trouble code.

(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC.

Q: Is the DTC set?

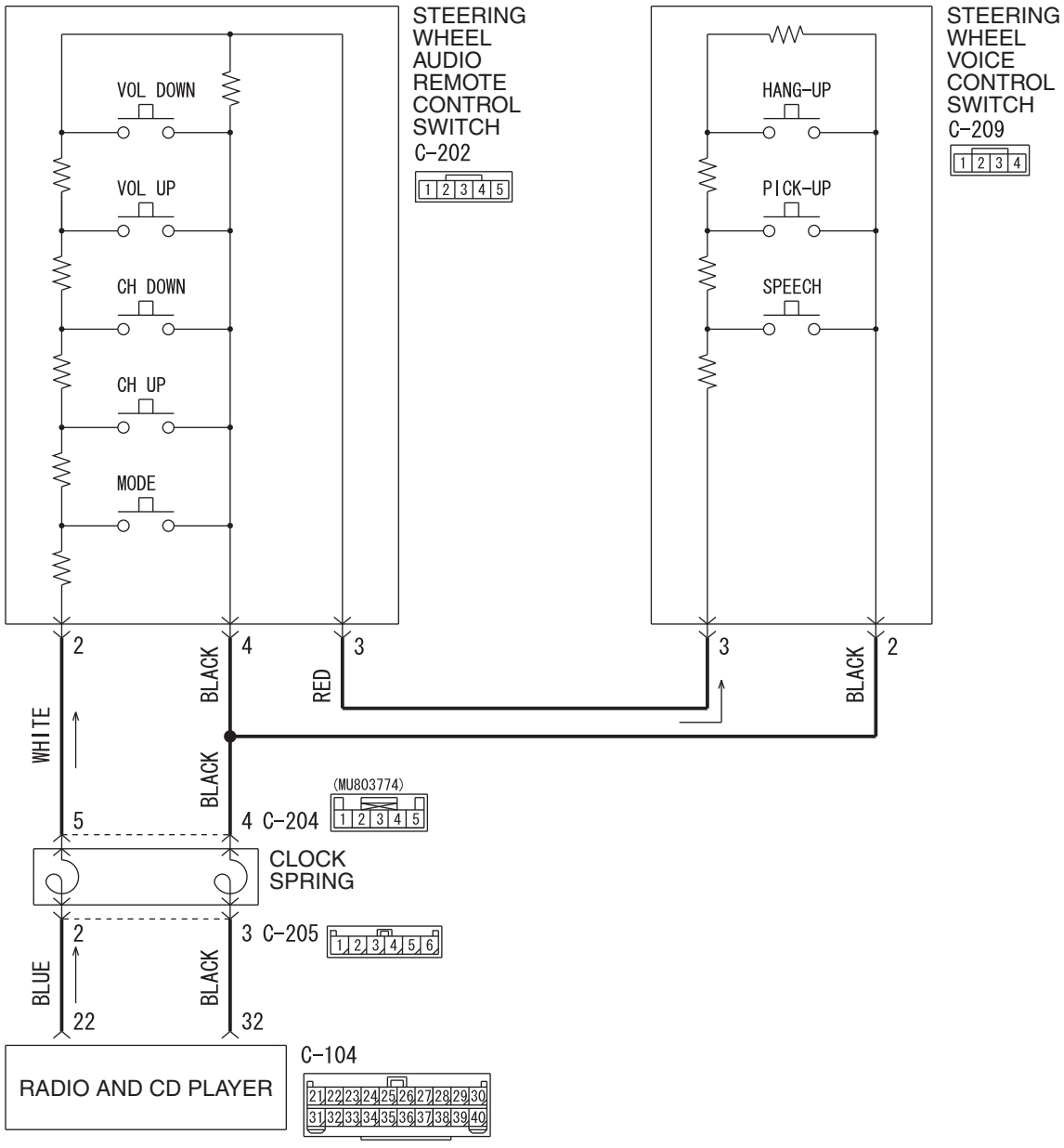
YES : Replace the hands free module.
NO : Replace the microphone unit.

TSB Revision

DTC B2471: On hook button stuck
DTC B2472: Off hook button stuck
DTC B2473: VR button stuck

⚠ CAUTION
Before replacing the module, ensure that the communication circuit is normal.

Steering Wheel Voice Controln Switch Circuit <Vehicles without MMCS>



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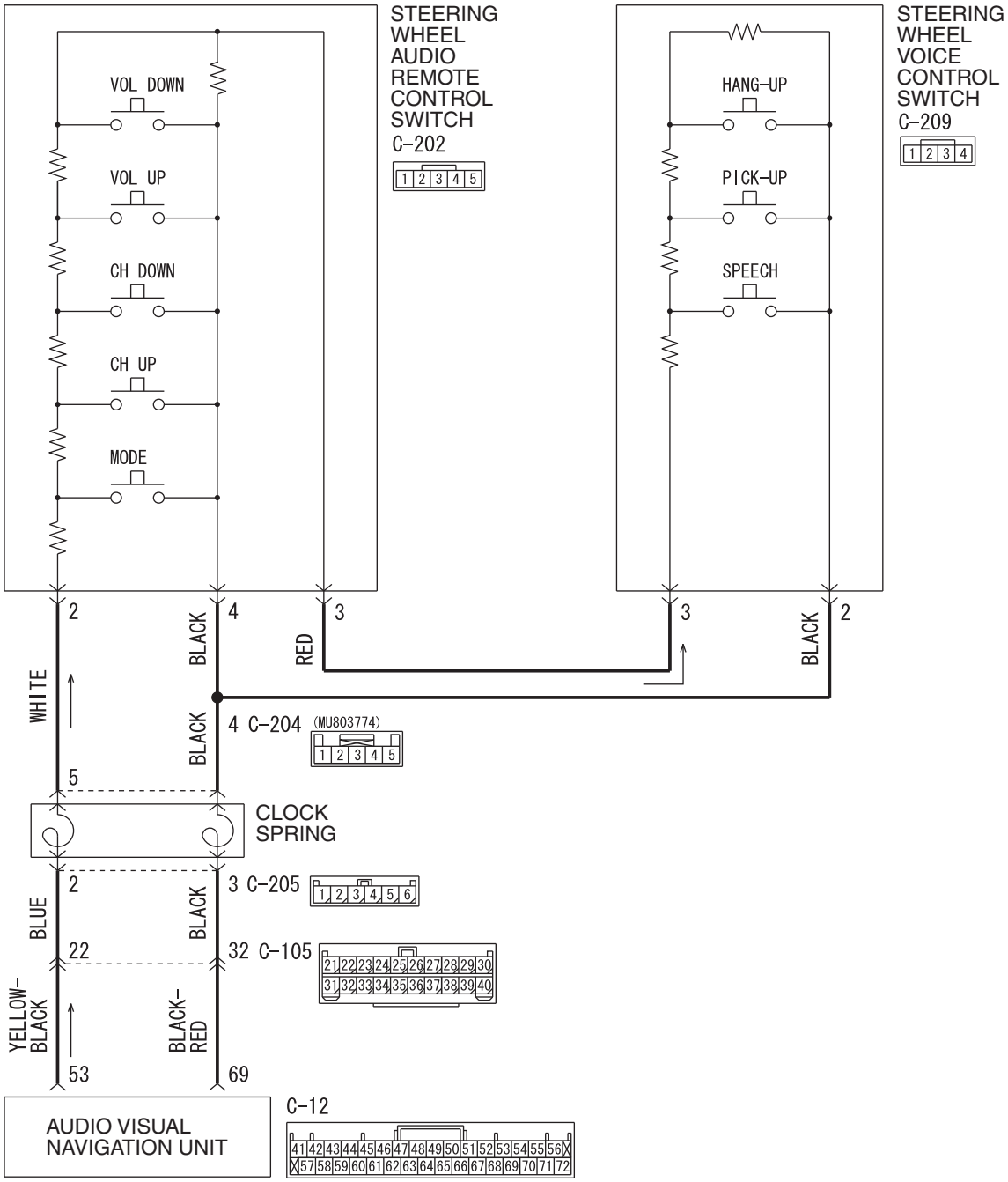
TSB Revision

Steering Wheel Voice Controln Switch Circuit <Vehicles with MMCS>



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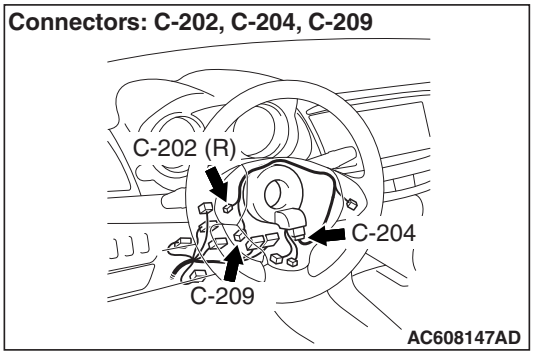


PROBABLE CAUSES

- Damaged harness wires and connectors
- The hands free module may be defective.
- The microphone unit may be defective.
- The CAN bus line may be defective.
- The steering wheel voice control switch may be defective.
- The the radio and CD player <vehicles without MMCS> or audio visual navigation unit <vehicles with MMCS> may be defective.

JUDGMENT CRITERIA

When the hands free module receives any switch signal from the speech switch, pick-up switch, hang-up switch of steering wheel voice control switch for approximately 1 or 2 minutes continuously, it stores diagnostic trouble code B2471 (hang-up switch), B2472 (pick-up switch) or B2473 (speech switch) for each switch.

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles 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)

STEP 1. Check the radio and CD player <vehicles without MMCS> or audio visual navigation unit <vehicles with MMCS>.

Check that the radio and CD player <vehicles without MMCS> or audio visual navigation unit <vehicles with MMCS> works normally.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Diagnose the radio and CD player <vehicles without MMCS> or audio visual navigation unit <vehicles with MMCS> (Refer to radio and CD player – Diagnosis P.54A-377 <vehicles without MMCS> or MMCS – Diagnosis P.54A-478 <vehicles with MMCS>).

STEP 2. Check the steering wheel audio remote control switch.

Check that the radio and CD player <vehicles without MMCS> or audio visual navigation unit <vehicles with MMCS> can be operated normally using the steering wheel audio remote control switch.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Diagnose the steering wheel audio remote control switch (Refer to P.54A-542 <vehicles without MMCS> or P.54A-547 <vehicles with MMCS>).

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

Use scan tool MB991958 to diagnose the CAN bus lines.

⚠ CAUTION

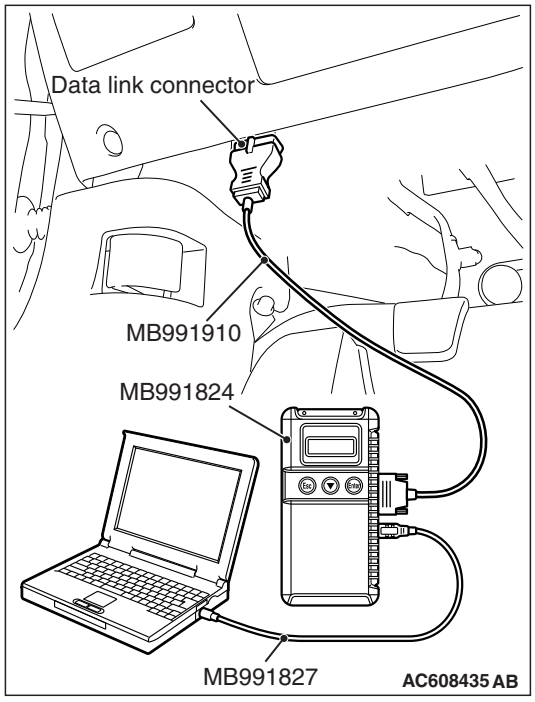
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958. Refer to "How to connect the Scan Tool (M.U.T.-III) P.54A-560."
(2) Turn the ignition switch to "ON" position.
(3) Diagnose the CAN bus line.

Q: Is the check result normal?

YES : Go to Step 4.

NO : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis P.54C-17).



STEP 4. Using scan tool MB991958 read the radio and CD player <vehicles without MMCS> or CAN box unit <vehicles with MMCS> diagnostic trouble code.

Check the diagnostic trouble code is set to the radio and CD player <vehicles without MMCS> or CAN box unit <vehicles with MMCS>.

Check whether a radio and CD player <vehicles without MMCS> or CAN box unit <vehicles with MMCS> DTCs are set or not.

(1) Turn the ignition switch to the "ON" position.
(2) Check for combination meter DTCs.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Diagnose the radio and CD player <vehicles without MMCS> or audio visual navigation unit <vehicles with MMCS> (Refer to radio and CD player – Diagnosis P.54A-347 <vehicles without MMCS> or MMCS – Diagnosis P.54A-452 <vehicles with MMCS>).

NO : Go to Step 5.

STEP 5. Check the steering wheel voice control switch.

Refer to P.54A-625.

Q: Is the check result normal?

YES : Go to Step 6.

NO : Replace the steering wheel voice control switch.

STEP 6. Check the steering wheel audio remote control switch.

Refer to P.54A-555.

Q: Is the check result normal?

YES : Go to Step 7.

NO : Replace the steering wheel audio remote control switch.

STEP 7. Check steering wheel audio remote control switch connector C-202 and steering wheel voice control switch connector C-209 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are wheel audio remote control switch connector C-202 and steering wheel voice control switch connector C-209 in good condition?

YES : Go to Step 8.

NO : Repair the defective connector.

STEP 8. Check the wiring harness between steering wheel voice control switch connector C-209 (terminal 3) and steering wheel audio remote control switch connector C-202 (terminal 3).

- Check the communication line for open circuit and short circuit.

Q: Is the wiring harness between steering wheel voice control switch connector C-209 (terminal 3) and steering wheel audio remote control switch connector C-202 (terminal 3) in good condition?

YES : Go to Step 9.

NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.

STEP 9. Check the wiring harness between steering wheel voice control switch connector C-209 (terminal 2) and clock spring connector C-204 (terminal 4).

- Check the communication line for open circuit and short circuit.

Q: Is the wiring harness between steering wheel voice control switch connector C-209 (terminal 2) and clock spring connector C-204 (terminal 4) in good condition?

YES : Go to Step 10.

NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.

STEP 10. Recheck for diagnostic trouble code.

Check again if the DTC is set to the hands free module.

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

Q: Is the DTC set?

YES : Go to Step 11.

NO : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to use Troubleshooting/inspection Service Points, How to Cope with Intermittent Malfunction P.00-14).

STEP 11. Temporarily replace the hands free module, and check whether the diagnostic trouble code is reset.
Check again if the DTC is set to the hands free module.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is set.

Q: Is the DTC set?

YES : Replace the radio and CD player <vehicles without MMCS> or audio visual navigation unit <vehicles with MMCS>.
NO : Replace the hands free module.

DTC B2475: VIN not programmed

⚠ CAUTION
- **If the diagnostic trouble code B2475 is set, be sure to diagnose the CAN bus line.**
- **When replacing the module, always check that the communication circuit is normal.**

TROUBLE JUDGMENT

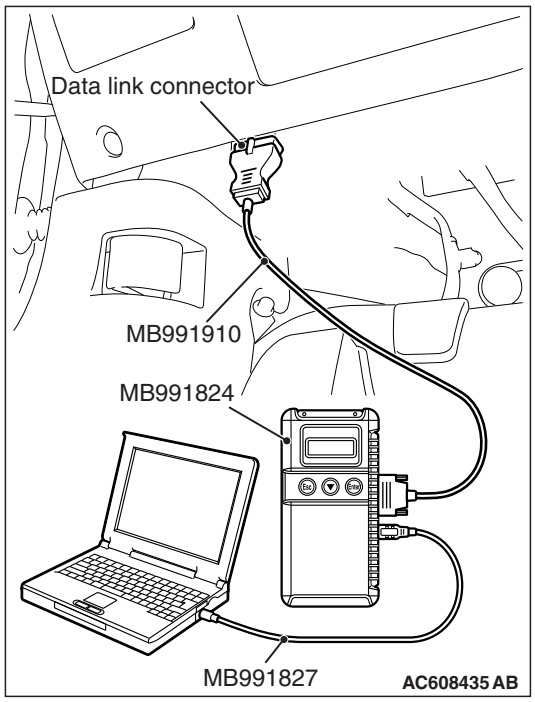
With the ignition switch at the "ON" position, if the VIN is not written to the hands free module, diagnostic trouble code B2475 is stored.

TROUBLESHOOTING HINTS

- The CAN bus line may be defective
- The hands free module may be defective
- The ECM may be defective

DIAGNOSIS

Required Special Tools:
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles 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)



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

⚠ 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. Refer to "How to connect the Scan Tool (M.U.T.-III) P.54A-560."
(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-17).

STEP 2. Using scan tool MB991958, read the ETACS-ECU diagnostic trouble code.

Check if the diagnostic trouble code relating to the coding error is set to the ETACS-ECU.

Q: Is the DTC set?

YES : Troubleshoot the ETACS-ECU (Refer to P.54A-678), and then go to Step 3.
NO : Go to Step 3.

STEP 3. Recheck for diagnostic trouble code.

Check again if the DTC is set to the hands free module.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the hands free module.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to use Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunction P.00-14).

DTC U0019: Bus off (CAN-B)

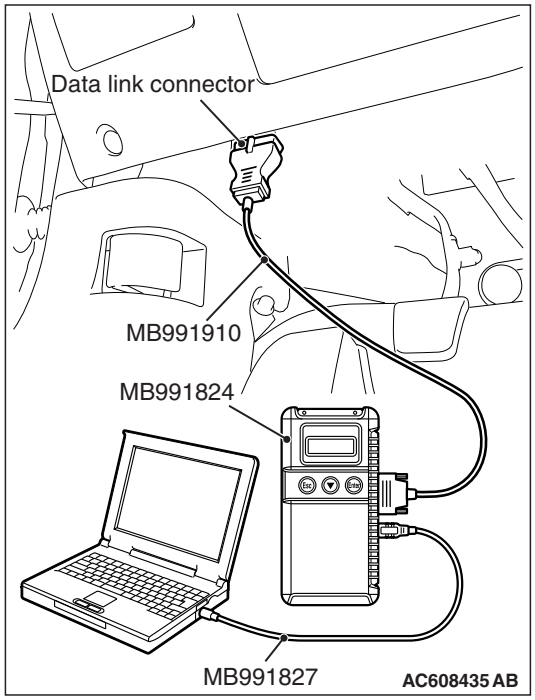
⚠ CAUTION
- **If DTC U0019 is set, be sure to diagnose the CAN bus line.**
- **When replacing the module, always check that the communication circuit is normal.**

TROUBLE JUDGMENT
When the hands free module is returned from the bus off state, or when the bus error is indicated to the hands free module state, the DTC U0019 (CAN-B) is set.

COMMENTS ON TROUBLE SYMPTOM
The hands free module, power supply for the hands free module, earth circuit, or CAN bus line may have a problem.

PROBABLE CAUSES
- The hands free module may be defective.
- The CAN bus line may be defective.

DIAGNOSIS
Required Special Tools:
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles 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)



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

Use scan tool MB991958 to diagnose the CAN bus lines.

⚠ 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. Refer to "How to connect the Scan Tool (M.U.T.-III) P.54A-560."
(2) Turn the ignition switch to "ON" position.
(3) Diagnose the CAN bus line.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus line. (Refer to GROUP 54C, Diagnosis P.54C-17.) On completion, go to Step 2.

STEP 2. Check whether the scan tool MB991958 can communicate with the hands free module.

Q: Is the check result normal?

YES : Erase the diagnosis code. The procedure is complete.
NO : Check the power supply circuit of the hands free module, and repair if necessary.

DTC U0141: ETACS CAN timeout

⚠ CAUTION
- **If the DTC U0141 is set, be sure to diagnose the CAN bus line.**
- **When replacing the module, always check that the communication circuit is normal.**

TECHNICAL DESCRIPTION (COMMENT)

If the signal from ETACS-ECU cannot be received, the hands free module sets the diagnostic trouble code No. U0141.

TROUBLESHOOTING HINTS

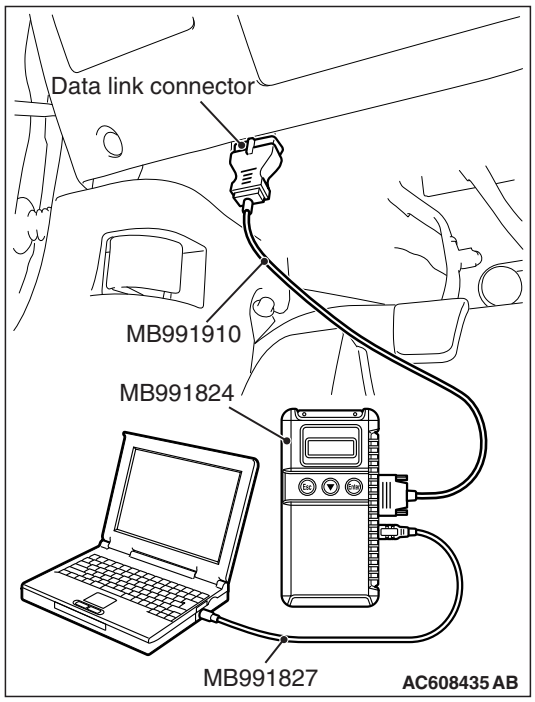
- The CAN bus line may be defective
- The hands free module may be defective
- The ETACS-ECU may be defective

DIAGNOSIS

Required Special Tools:
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles 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)

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

⚠ 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. Refer to "How to connect the Scan Tool (M.U.T.-III) P.54A-560."
(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-17).

STEP 2. Using scan tool MB991958, read the ETACS-ECU diagnostic trouble code.

Check again if the DTC is set to the ETACS-ECU.

Q: Is the DTC set?

YES : Diagnose the ETACS-ECU (Refer to P.54A-678).
NO : Go to Step 3.

TSB Revision

STEP 3. Using scan tool MB991958, read the combination meter diagnostic trouble code.
Check if DTC U0141 is set to the combination meter.

Q: Is the DTC set?

YES : Go to Step 4.
NO : Go to Step 5.

STEP 4. Recheck for diagnostic trouble code.
Check again if the DTC is set to the hands free module.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the ETACS-ECU.
NO : The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the ETACS-ECU and the hands free module (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

STEP 5. Recheck for diagnostic trouble code.
Check again if the DTC is set to the hands free module.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the hands free module.
NO : The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the ETACS-ECU and the hands free module (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

DTC U0151: SRS-ECU CAN timeout

⚠ CAUTION
- **If DTC U0151 is set, be sure to diagnose the CAN bus line.**
- **When replacing the ECU, always check that the communication circuit is normal.**

TECHNICAL DESCRIPTION (COMMENT)

If the signal from SRS-ECU cannot be received, the hands free module sets the DTC U0151.

TROUBLESHOOTING HINTS

- The CAN bus line may be defective
- The hands free module may be defective
- The SRS-ECU may be defective

DIAGNOSIS

Required Special Tools:
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles 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)

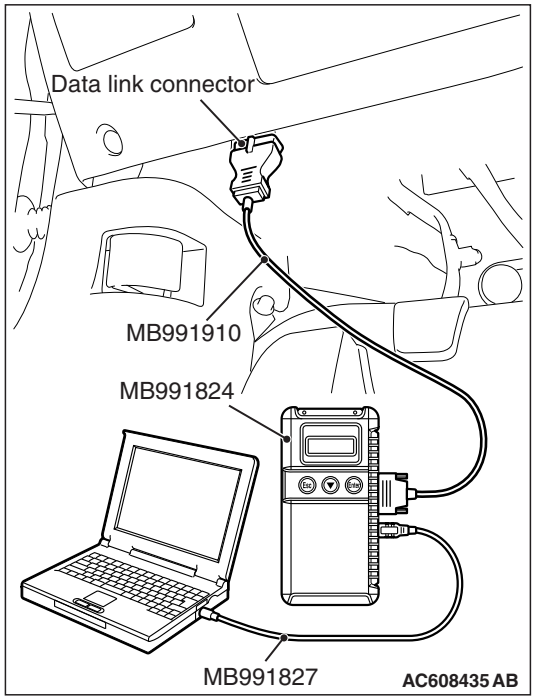
STEP 1. Using scan tool MB991958, diagnose the CAN bus line

⚠ 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. Refer to "How to connect the Scan Tool (M.U.T.-III) P.54A-560."
(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-17).



STEP 2. Using scan tool MB991958, read the SRS-ECU diagnostic trouble code

Check again if the DTC is set to the SRS-ECU.

Q: Is the DTC set?

YES : Troubleshoot the SRS (Refer to GROUP 52B, Troubleshooting P.52B-32).
NO : Go to Step 3.

TSB Revision

STEP 3. Using scan tool MB991958, read the combination meter diagnostic trouble code.
Check if the DTC U0151 is set to the combination meter.

Q: Is the DTC set?

YES : Go to Step 4.
NO : Go to Step 5.

STEP 4. Recheck for diagnostic trouble code.
Check again if the DTC is set to the hands free module.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the SRS-ECU.
NO : The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the SRS-ECU and the hands free module (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

STEP 5. Recheck for diagnostic trouble code.
Check again if the DTC is set to the hands free module.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the hands free module.
NO : The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the SRS-ECU and the hands free module (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

DTC U0154: OCM (occupant classification-ECU) CAN timeout

⚠ CAUTION
If DTC U0154 is set, be sure to diagnose the CAN bus line.

⚠ CAUTION
When replacing the module, always check that the communication circuit is normal.

DIAGNOSTIC FUNCTION

When the signals from occupant classification-ECU cannot be received, the hands free module sets DTC U0154.

TROUBLESHOOTING HINTS

- The CAN bus line may be defective.
- The hands free module may be defective.
- The occupant classification-ECU may be defective.

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles 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)

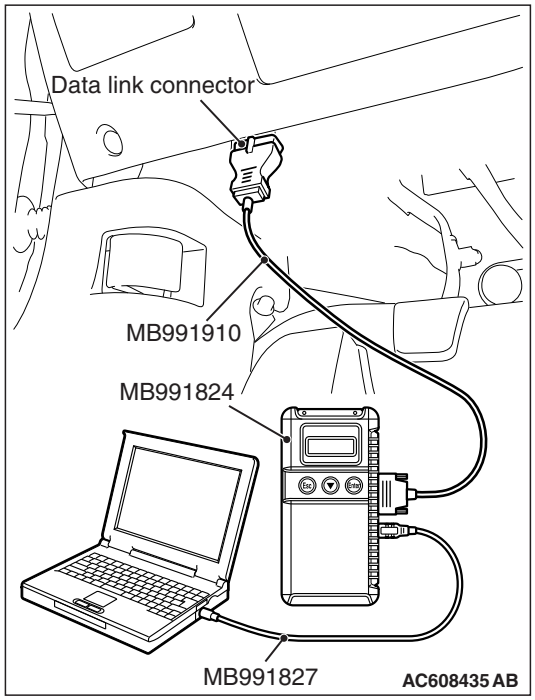
STEP 1. Using scan tool MB991958, diagnose the CAN bus line.

⚠ 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. Refer to "How to connect the Scan Tool (M.U.T.-III) P.54A-560."
(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-17).



STEP 2. Using scan tool MB991958, read the occupant classification-ECU diagnostic trouble code.
Check if DTC is set to the occupant classification-ECU.

Q: Is the DTC set?

YES : Troubleshoot the SRS (Refer to GROUP 52B, Diagnosis P.52B-319).
NO : Go to Step 3.

STEP 3. Using scan tool MB991958, read the A/C-ECU diagnostic trouble code.
Check if the DTC U0154 is set to the A/C-ECU.

Q: Is the DTC set?

YES : Go to Step 4.
NO : Go to Step 5.

STEP 4. Recheck for diagnostic trouble code.
Check again if the DTC is set to the hands free module.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the occupant classification-ECU.
NO : The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the occupant classification-ECU and the hands free module (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

STEP 5. Recheck for diagnostic trouble code.
Check again if the DTC is set to the hands free module.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the hands free module.
NO : The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the occupant classification-ECU and the hands free module (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

DTC U0155: Meter CAN timeout

⚠ CAUTION
If DTC U0155 is set in the hands free module, diagnose the CAN main bus line.

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

DIAGNOSTIC FUNCTION

If the signal from combination meter cannot be received, the hands free module sets the DTC U0155.

TROUBLESHOOTING HINTS

- The CAN bus line may be defective.
- The hands free module may be defective.
- The combination meter may be defective.

DIAGNOSIS

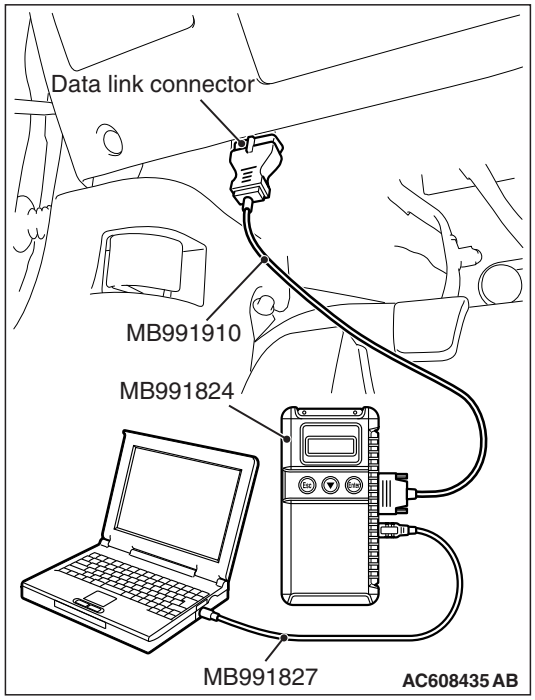
Required Special Tools:

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

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

⚠ 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. Refer to "How to connect the Scan Tool (M.U.T.-III) P.54A-560."
(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-17).

STEP 2. Using scan tool MB991958 read the combination meter diagnostic trouble code.

Check whether a combination meter DTCs are set or not.

Q: Is the DTC set?

YES : Diagnose the combination meter (Refer to combination meter, Diagnosis P.54A-33).
NO : Go to Step 3.

TSB Revision

STEP 3. Using scan tool MB991958, read the A/C-ECU diagnostic trouble code.

Check if the DTC U0155 is set to the A/C-ECU.

Q: Is the DTC set?

YES : Go to Step 4.
NO : Go to Step 5.

STEP 4. Recheck for diagnostic trouble code.

Check again if the DTC is set to the hands free module.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the combination meter.
NO : The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the combination meter and the hands free module (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

STEP 5. Recheck for diagnostic trouble code.

Check again if the DTC is set to the hands free module.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the hands free module.
NO : The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the combination meter and the hands free module (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

DTC U0164: A/C CAN timeout

⚠ CAUTION
- **If DTC U0164 is set, be sure to diagnose the CAN bus line.**
- **When replacing the module, always check that the communication circuit is normal.**

TECHNICAL DESCRIPTION (COMMENT)

If the signal from A/C-ECU cannot be received, the hands free module sets the DTC U0164.

TROUBLESHOOTING HINTS

- The CAN bus line may be defective.
- The A/C-ECU may be defective.
- The hands free module may be defective.

DIAGNOSIS

Required Special Tools:
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles 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)

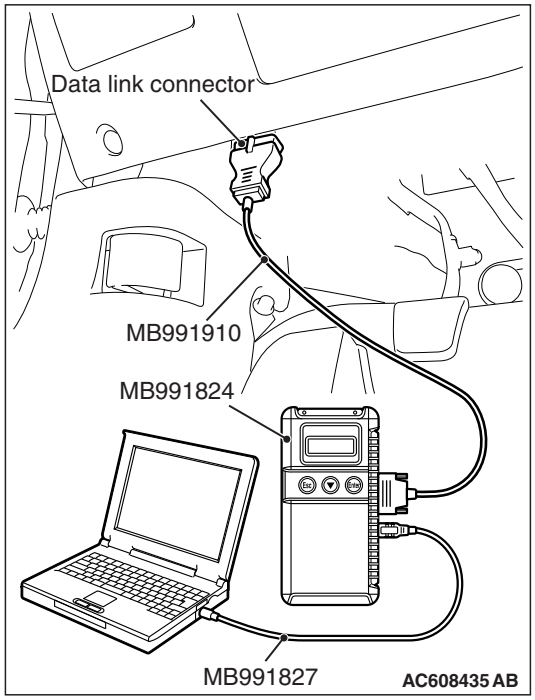
STEP 1. Using scan tool MB991958, diagnose the CAN bus line.

⚠ 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. Refer to "How to connect the Scan Tool (M.U.T.-III) P.54A-560."
(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-17).



STEP 2. Using scan tool MB991958, read the A/C-ECU diagnostic trouble code.
Check if DTC is set to the A/C-ECU.

Q: Is the DTC set?

YES : Troubleshoot the A/C/Heater control unit (Refer to GROUP 55A, Manual A/C Diagnosis P.55A-9 or GROUP 55B, Auto A/C Diagnosis P.55B-8).
NO : Go to Step 3.

STEP 3. Using scan tool MB991958, read the ETACS diagnostic trouble code.
Check if the DTC U0164 is set to the ETACS-ECU.

Q: Is the DTC set?

YES : Go to Step 4.
NO : Go to Step 5.

STEP 4. Recheck for diagnostic trouble code.
Check again if the DTC is set to the hands free module.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the A/C-ECU.
NO : The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the A/C-ECU and the hands free module (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

STEP 5. Recheck for diagnostic trouble code.
Check again if the DTC is set to the hands free module.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the hands free module.
NO : The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the A/C-ECU and the hands free module (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

DTC U0168: WCM/KOS CAN timeout

⚠ CAUTION
- **If DTC U0168 is set, be sure to diagnose the CAN bus line.**
- **When replacing the ECU, always check that the communication circuit is normal.**

TECHNICAL DESCRIPTION (COMMENT)

If the signal from KOS-ECU <vehicles with KOS> or WCM <vehicles with WCM> cannot be received, the hands free module sets DTC U0168.

TROUBLESHOOTING HINTS

- The CAN bus line may be defective.
- The KOS-ECU may be defective. <vehicles with KOS>
- The WCM may be defective. <vehicles with WCM>
- The hands free module may be defective.

DIAGNOSIS

Required Special Tools:
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles 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)

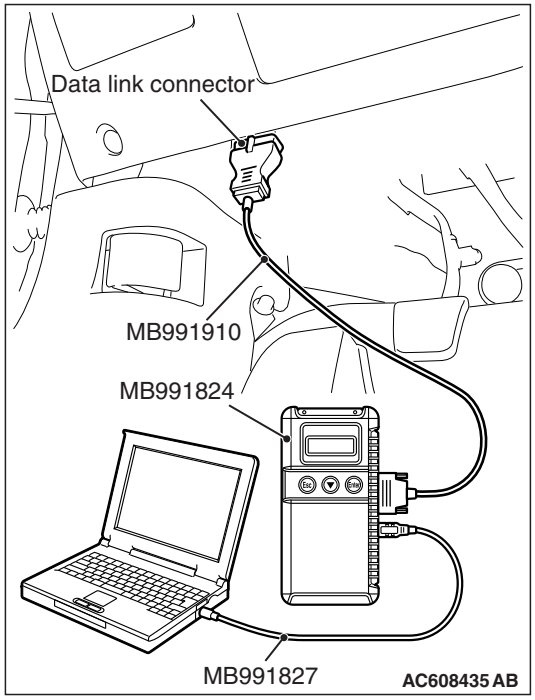
STEP 1. Using scan tool MB991958, diagnose the CAN bus line.

⚠ 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. Refer to "How to connect the Scan Tool (M.U.T.-III) P.54A-560."
(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-17).



STEP 2. Using scan tool MB991958, read the KOS-ECU <vehicles with KOS> or WCM <vehicles with WCM> diagnostic trouble code.

Check again if the DTC is set to the KOS-ECU <vehicles with KOS> or WCM <vehicles with WCM>.

Q: Is the DTC set?

YES : Troubleshoot the KOS or WCM (Refer to GROUP 42B, Diagnosis P.42B-28 <KOS> or GROUP 42C, Diagnosis P.42C-17 <WCM>).

NO : Go to Step 3.

STEP 3. Using scan tool MB991958, read the diagnostic trouble code.

Check if the DTC U0168 is set to the ETACS-ECU.

Q: Is the DTC set?

YES : Go to Step 4.

NO : Go to Step 5.

STEP 4. Recheck for diagnostic trouble code.

Check again if the DTC is set to the hands free module.

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

Q: Is the DTC set?

YES : Replace the WCM or KOS-ECU.

NO : The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the WCM or KOS-ECU and the hands free module (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

STEP 5. Recheck for diagnostic trouble code.

Check again if the DTC is set to the hands free module.

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

Q: Is the DTC set?

YES : Replace the hands free module.

NO : The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the WCM or KOS-ECU and the hands free module (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

DTC No.U0184 AUDIO CAN timeout

⚠ CAUTION

- **If DTC U0184 is set, be sure to diagnose the CAN bus line.**
- **When replacing the module, always check that the communication circuit is normal.**

TECHNICAL DESCRIPTION (COMMENT)

If the signal from the radio and CD player cannot be received, the hands free module sets the diagnostic trouble code No. U0184.

TROUBLESHOOTING HINTS

- The radio and CD player may be defective.
- The hands free module may be defective.
- The CAN bus may be defective.

DIAGNOSIS

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 (Vehicles with CAN communication system)

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

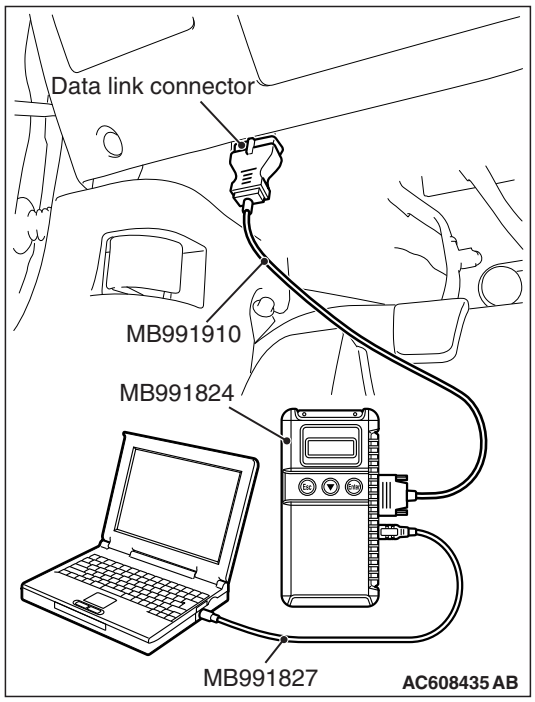
⚠ CAUTION

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. Refer to "How to connect the Scan Tool (M.U.T.-III) P.54A-560."
(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-17).



STEP 2. Using scan tool MB991958, read the radio and CD player or CD changer diagnostic trouble code.
Check if DTC is set to the radio and CD player.

Q: Is the DTC set?

YES : Troubleshoot the radio and CD player (Refer to P.54A-347).
NO : Go to Step 3.

STEP 3. Using scan tool MB991958, read the ETACS diagnostic trouble code.
Check if the DTC U0184 is set to the ETACS-ECU.

Q: Is the DTC set?

YES : Go to Step 4.
NO : Go to Step 5.

STEP 4. Recheck for diagnostic trouble code.
Check again if the DTC is set to the hands free module.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the radio and CD player.
NO : The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the radio and CD player and the hands free module (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

STEP 5. Recheck for diagnostic trouble code.
Check again if the DTC is set to the hands free module.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the hands free module.
NO : The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the radio and CD player and the hands free module (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

DTC U0195: Satellite radio CAN timeout

⚠ CAUTION
- **If DTC U0195 is set, be sure to diagnose the CAN bus line.**
- **When replacing the ECU, always check that the communication circuit is normal.**

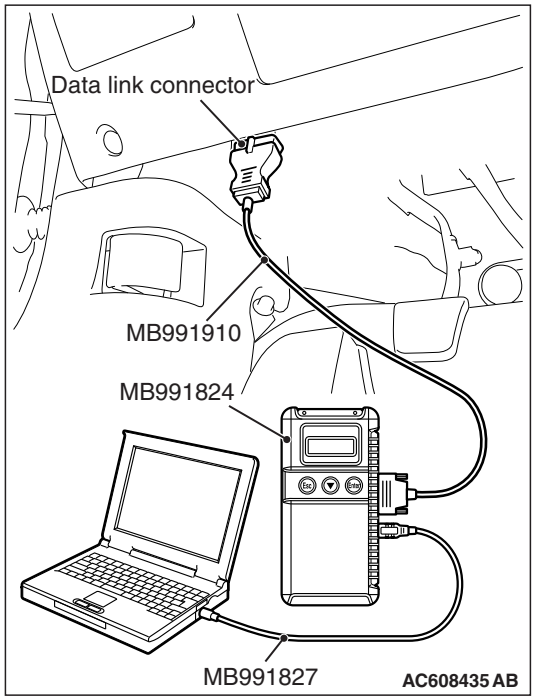
DIAGNOSTIC FUNCTION
When the signals from satellite radio tuner cannot be received, the hands free module sets DTC U0195.

TROUBLESHOOTING HINTS
- The CAN bus line may be defective.
- The hands free module may be defective.
- The satellite radio tuner may be defective.

DIAGNOSIS
Required Special Tools:
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

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

⚠ 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. Refer to "How to connect the Scan Tool (M.U.T.-III) P.54A-560."
(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-17).

STEP 2. Using scan tool MB991958 read the satellite radio tuner diagnostic trouble code.
Check whether a satellite radio tuner DTCs are set or not.

Q: Is the DTC set?

YES : Diagnose the satellite radio tuner.
NO : Go to Step 3.

STEP 3. Recheck for diagnostic trouble code.

Check again if the DTC is set to the hands free module.

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

Q: Is the DTC set?

YES : Replace the hands free module.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to use Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunction P.00-14).

DTC U0245 AND [Audio visual Navigation (HDD) unit] CAN timeout

⚠ CAUTION

- **If DTC U0245 is set, be sure to diagnose the CAN bus line.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DIAGNOSTIC FUNCTION

When the signals from CAN box unit (audio visual navigation unit) cannot be received, the hands free module sets the diagnostic trouble code No. U0245.

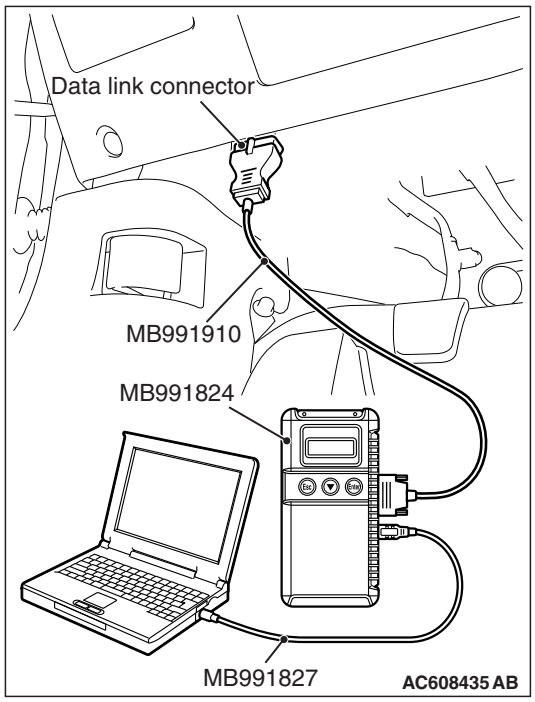
TROUBLESHOOTING HINTS

- The CAN bus line may be defective.
- The hands free module may be defective.
- The CAN box unit may be defective.

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles 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)



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

⚠ 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. Refer to "How to connect the Scan Tool (M.U.T.-III) P.54A-560."
(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-17).

STEP 2. Using scan tool MB991958, read the CAN box unit diagnostic trouble code

Check the DTC is set to the CAN box unit.

Q: Is the DTC set?

YES : Troubleshoot the CAN box unit (Refer to MMCS – Diagnostic Trouble Code Chart P.54A-452).
NO : Go to Step 3.

STEP 3. Using scan tool MB991958, read the ETACS diagnostic trouble code.

Check if the DTC U0245 is set to the ETACS-ECU.

Q: Is the DTC set?

YES : Go to Step 4.
NO : Go to Step 5.

STEP 4. Recheck for diagnostic trouble code.

Check again if the DTC is set to the hands free module.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the CAN box unit (multivision display).
NO : The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the CAN box unit (multivision display) and the hands free module (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

STEP 5. Recheck for diagnostic trouble code.

Check again if the DTC is set to the hands free module.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the hands free module.
NO : The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the CAN box unit (multivision display) and the hands free module (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

TROUBLE SYMPTOM CHART

M1546001800815

Inspection Procedure No.	Trouble symptom	Reference page
1	Hands free cellular phone system does not work normally.	P.54A-595
2	During the conversation with the hands free cellular phone system, the speaker's voice cannot be heard by the other party.	P.54A-603
3	During the conversation with the hands free cellular phone system, the voice of other party cannot be heard.	P.54A-606
4	Even when the steering wheel voice control switch is operated, the conversation is not possible.	P.54A-607
5	The cellular phone is not recognized or the connection cannot be established.	P.54A-612
6	Steering wheel voice control switch illumination does not come on.	P.54A-614
7	Check the hands free module power supply circuit.	P.54A-617

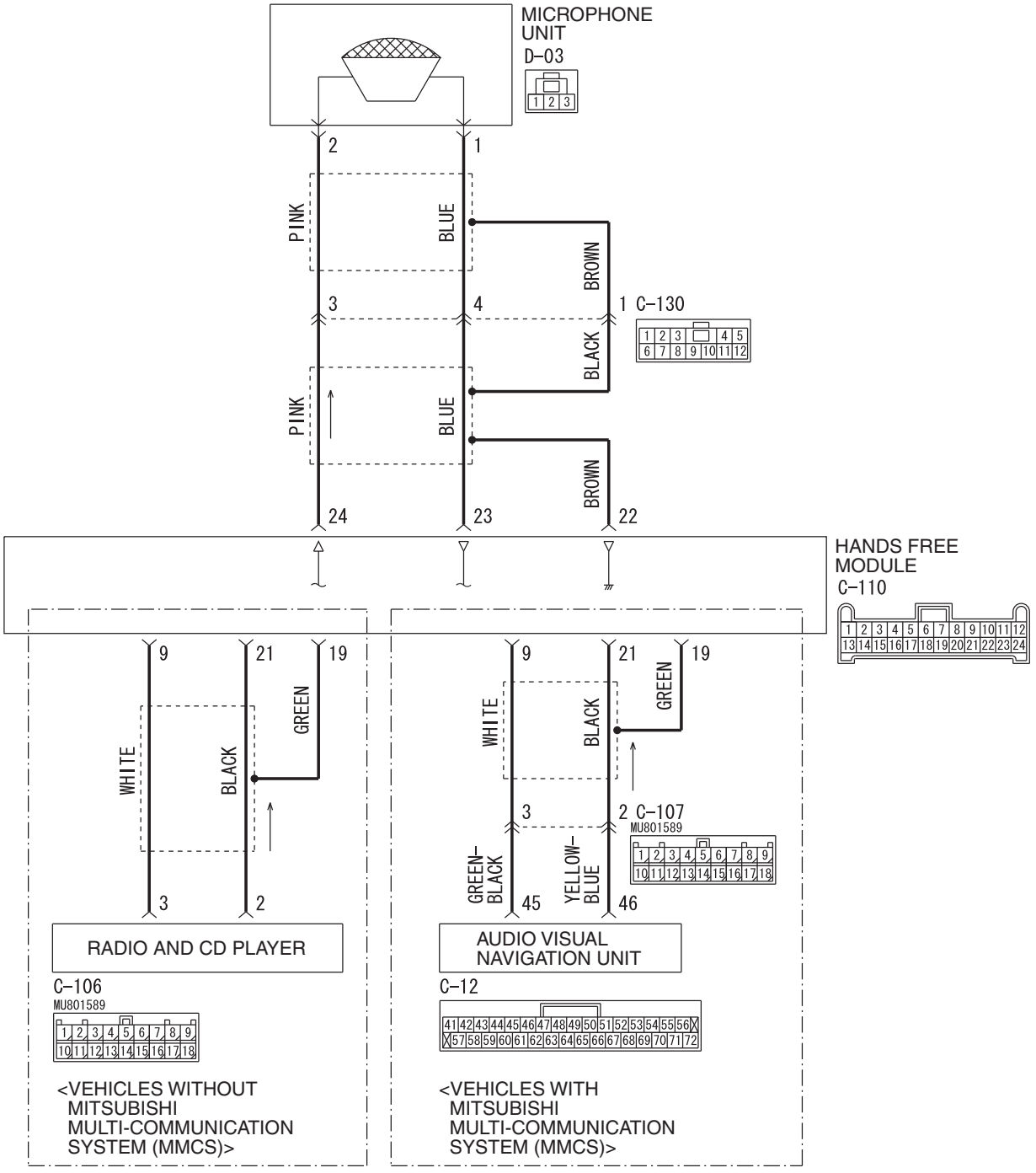
TSB Revision

SYMPTOM PROCEDURES

Inspection Procedure 1: Hands free cellular phone system does not work normally.

⚠ CAUTION
Before replacing the module, ensure that the power supply circuit, the ground circuit and the communication circuit are normal.

Hands Free Cellular Phone System Circuit



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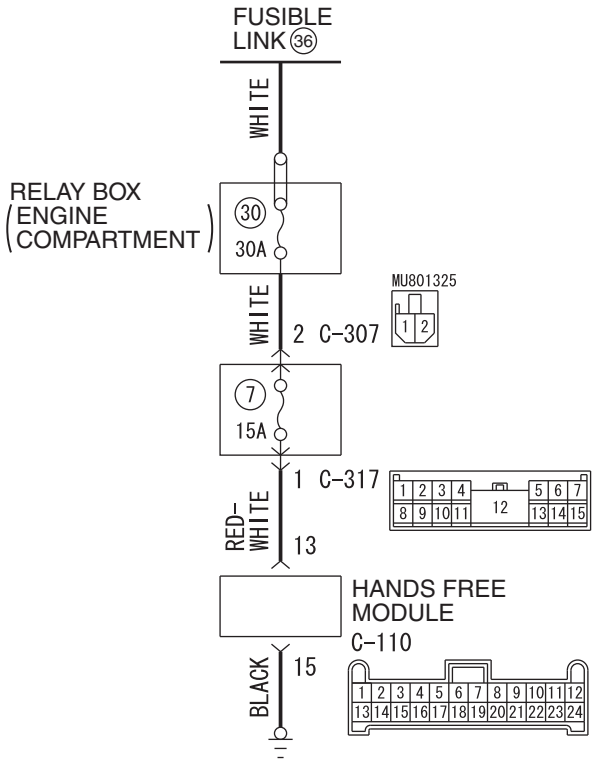
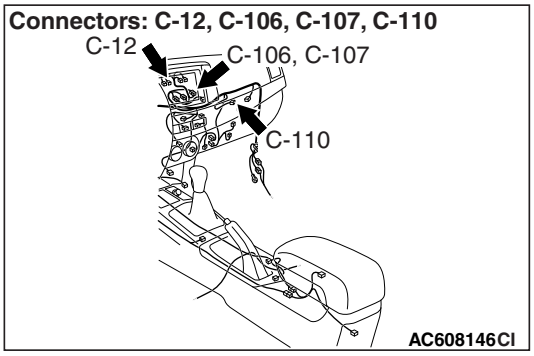
Hands Free Module Power Supply Circuit



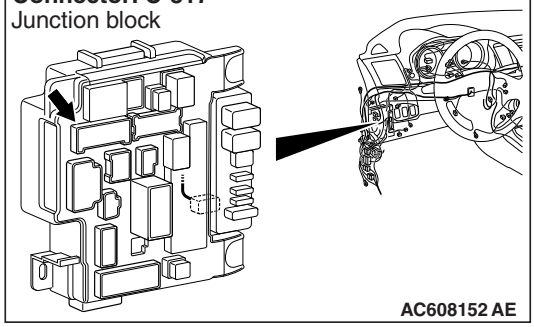
W8G54M020A

Connectors: C-12, C-106, C-107, C-110



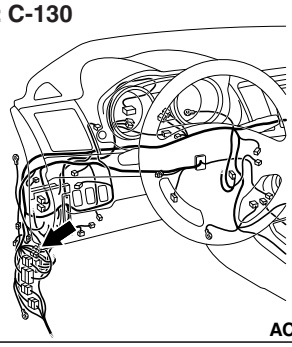
AC608146CI

Connector: C-317
Junction block



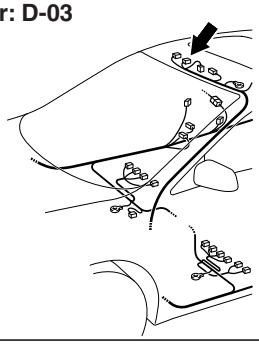
AC608152AE

Connector: C-130



AC608145AX

Connector: D-03



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TSB Revision

FUNCTION

During the conversation with the hands free cellular phone system, the signal of speaker's voice is transmitted from the microphone unit to the hands free module. Then the signal is transmitted from the hands free module to the cellular phone. The voice of other party is transmitted from the cellular phone to the hands-free module. Then, the voice is transmitted from the hands free module to the radio and CD player <vehicles without MMCS> or audio visual navigation unit <vehicles with MMCS>, and output from the speaker.

TROUBLE JUDGMENT CONDITIONS

If the hands free cellular phone system cannot be used normally, the hands free module, microphone unit, steering wheel voice control switch, or radio and CD player <vehicles without MMCS> or audio visual navigation unit <vehicles with MMCS> may be defective.

TROUBLESHOOTING HINTS

- Malfunction of the hands free module
- Malfunction of the microphone unit
- Malfunction of the steering wheel voice control switch
- Malfunction of the radio and CD player <vehicles without MMCS> or audio visual navigation unit <vehicles with MMCS>
- Damaged harness wires and connectors

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles 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)

STEP 1. Check the cellular phone.

Check that the cellular phone can be used normally as a unit.

Q: Is it possible to use the cellular phone normally?

YES : Go to Step 2.

NO : Repair or replace the cellular phone.

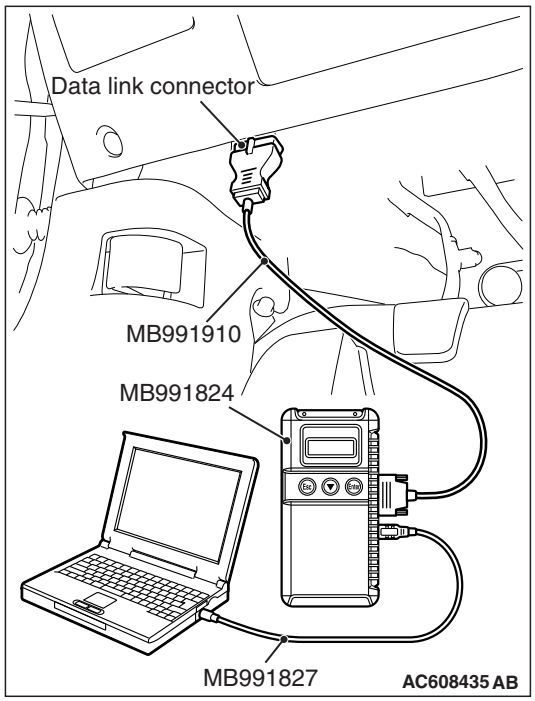
STEP 2. Temporarily replace the cellular phone, and check the trouble symptom.

Temporarily register a separate Bluetooth supported cellular phone, and check that the hands free cellular phone system operates normally.

Q: Is the normal conversation possible with the hands-free system?

YES : Ask the customer to have the cellular phone repaired or replaced. Then, delete the temporarily registered cellular phone. Once the customer prepares the normally working cellular phone, register the cellular phone to the hands free module. (Refer to P.54A-620.)

NO : Go to Step 3.



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

⚠ 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. Refer to "How to connect the Scan Tool (M.U.T.-III) P.54A-560."
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line.
(4) Turn the ignition switch to "LOCK" (OFF) position.

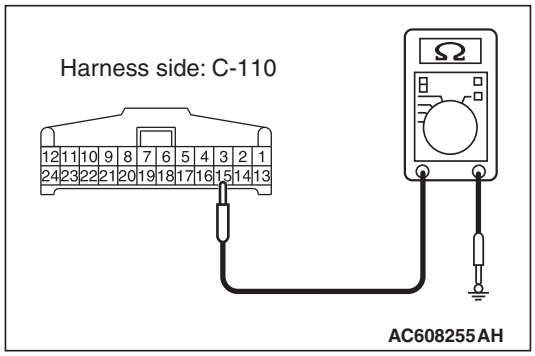
Q: Is the CAN bus line found to be normal?

YES : Go to Step 4.
NO : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis P.54C-17).

STEP 4. Check hands-free module connector C-110 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are hands free module connector C-110 in good condition?

YES : Go to Step 5.
NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 5. Check the ground circuit to the hands free module. Measure the resistance at hands free module connector C-110.

(1) Disconnect hands free module connector C-110, and measure at the wiring harness side.
(2) Measure resistance between terminal 15 and ground.

OK: The resistance should be 2 ohm or less.

Q: Is the measured resistance 2 ohms or less?

YES : Go to Step 7.
NO : Go to Step 6.

STEP 6. Check the wiring harness between hands-free module connector C-110 (terminal 15) and ground.

- Check the ground wire for open circuit.

Q: Is the wiring harness between hands-free module connector C-110 (terminal 15) and ground in good condition?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to use Troubleshooting/inspection Service Points, How to Cope with Intermittent Malfunction P.00-14).
NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.

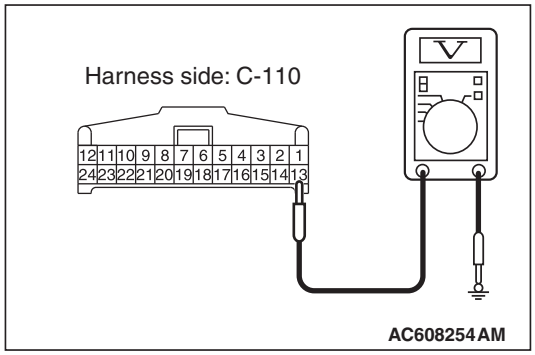
STEP 7. Check the power supply circuit to the hands-free module. Measure the voltage at hands free module connector C-110.

(1) Disconnect hands free module connector C-110, and measure the voltage available at the hands-free module side of the connector.
(2) Measure the voltage between terminal 13 and ground.

OK: The voltage should measure approximately 12 volts (battery positive voltage).

Q: Is the measured voltage approximately 12 volts (battery positive voltage)?

YES : Go to Step 9.
NO : Go to Step 8.



STEP 8. Check the wiring harness between hands-free module connector C-110 (terminal 13) and ETACS-ECU connector C-317 (terminal 1).

- Check the power supply line for open circuit and short circuit.

Q: Is the wiring harness between hands-free module connector C-110 (terminal 13) and ETACS-ECU connector C-317 (terminal 1) in good condition?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to use Troubleshooting/inspection Service Points, How to Cope with Intermittent Malfunction P.00-14).

NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.

STEP 9. Check microphone unit connector D-03 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is microphone unit connector D-03 in good condition?

YES : Go to Step 10.

NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

STEP 10. Check the wiring harness between hands free module connector C-110 and microphone unit connector D-03.

- Check the communication lines for open circuit and short circuit.

(1) Disconnect hands-free module connector C-110 and microphone unit connector D-03, and check the wiring harness.

NOTE: Also check intermediate connector C-130 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-130 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

(2) Check the wiring harness between hands free module connector C-110 (terminal 23) and microphone unit connector D-03 (terminal 1)

(3) Check the wiring harness between hands-free module connector C-110 (terminal 24) and microphone unit connector D-03 (terminal 2)

Q: Is the wiring harness between hands free module connector C-110 and microphone unit connector D-03 in good condition?

YES : Go to Step 11.

NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.

STEP 11. Check radio and CD player connector C-106 <vehicles without MMCS> or audio visual navigation unit connector C-12 <vehicles with MMCS> for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is radio and CD player C-106 <vehicles without MMCS> or audio visual navigation unit connector C-12 <vehicles with MMCS> in good condition?

YES : Go to Step 12.

NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

STEP 12. Check the wiring harness between hands free module connector C-110 and radio and CD player connector C-106 <vehicles without MMCS> or audio visual navigation unit connector C-12 <vehicles with MMCS>.

- Check the communication lines for open circuit and short circuit.

(1) Disconnect hands-free module connector C-110 and radio and CD player C-106 <vehicles without MMCS> or audio visual navigation unit connector C-12 <vehicles with MMCS>, and check the wiring harness.

NOTE: Also check intermediate connector C-107 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-107 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2. <vehicles with MMCS>

(2) Check the wiring harness between hands free module connector C-110 (terminal 9) and radio and CD player or CD changer connector C-106 (terminal 3) <vehicles without MMCS>

(3) Check the wiring harness between hands free module connector C-110 (terminal 21) and radio and CD player or CD changer connector C-106 (terminal 2) <vehicles without MMCS>

(4) Check the wiring harness between hands free module connector C-110 (terminal 9) and audio visual navigation unit connector C-12 (terminal 45) <vehicles with MMCS>

(5) Check the wiring harness between hands free module connector C-110 (terminal 21) and audio visual navigation unit connector C-12 (terminal 46) <vehicles with MMCS>

Q: Is the wiring harness between hands free module connector C-110 and radio and CD player connector C-106 <vehicles without MMCS> or audio visual navigation unit connector C-12 <vehicles with MMCS> in good condition?

YES : Go to Step 13.
NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.

STEP 13. Temporarily replace the microphone unit, and check the trouble symptom.

Check that the normal conversation is possible with the hands free cellular phone system.

Q: Is the normal conversation possible with the hands free cellular phone system?

YES : Replace the microphone unit.
NO : Go to Step 14.

STEP 14. Temporarily replace the hands free module, and check the trouble symptom.

Check that the normal conversation is possible with the hands free cellular phone system.

Q: Is the normal conversation possible with the hands free cellular phone system?

YES : Replace the hands free module.

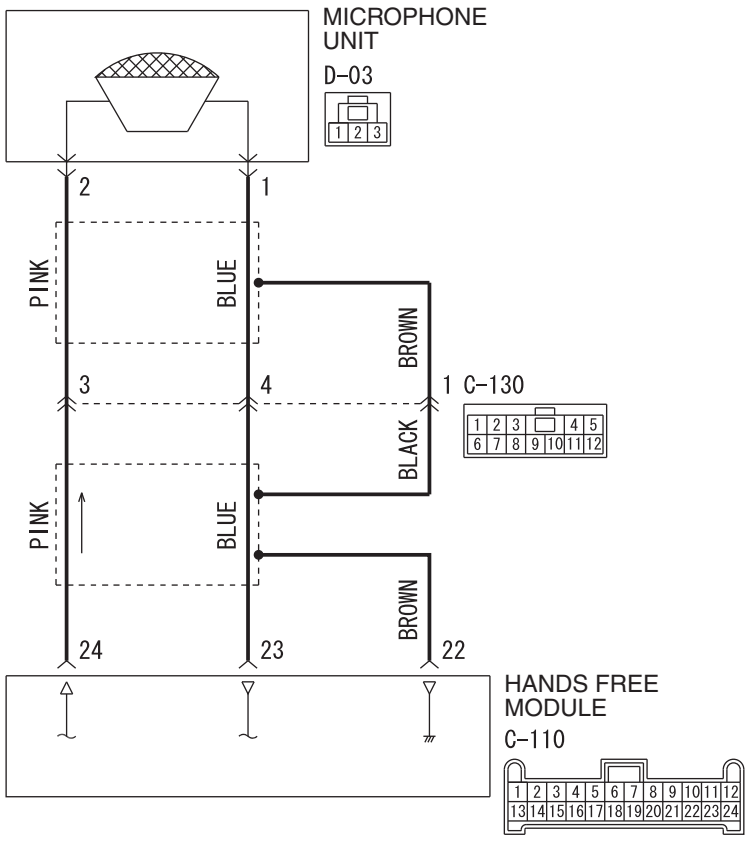
NO : Replace the radio and CD player <vehicles without MMCS> or audio visual navigation unit <vehicles with MMCS>.

Inspection Procedure 2: During the conversation with the hands free cellular phone system, the speaker's voice cannot be heard by the other party.

⚠ CAUTION

Before replacing the module, ensure that the communication circuit is normal.

Hands Free Cellular Phone System Circuit



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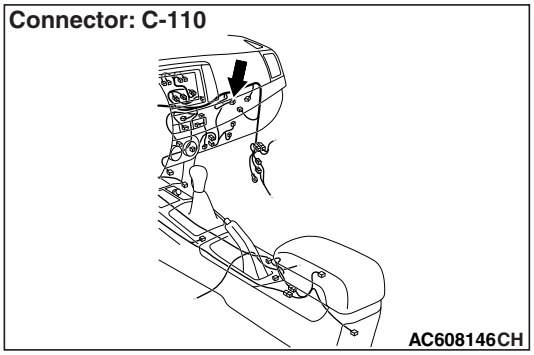
Connector: C-110



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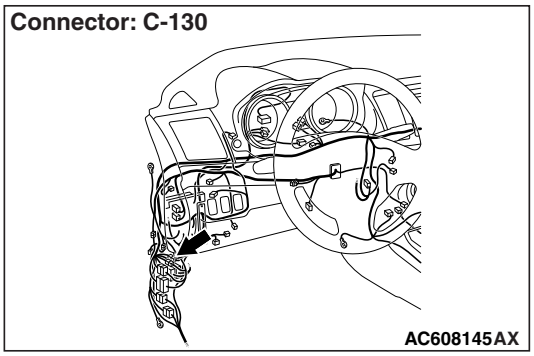
Connector: C-130



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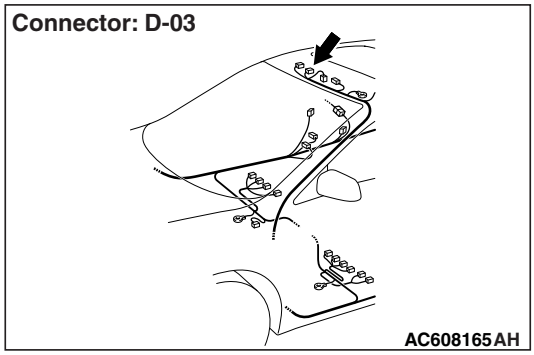
Connector: D-03



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FUNCTION

During the conversation with the hands free cellular phone system, the signal of speaker's voice is transmitted from the microphone unit to the hands free module. Then the signal is transmitted from the hands free module to the cellular phone.

TROUBLE JUDGMENT CONDITIONS

During the conversation with the hands free cellular phone system, if the speaker's voice cannot be heard by the other party, the hands free module or microphone unit may be defective.

TROUBLESHOOTING HINTS

- Malfunction of the hands free module
- Malfunction of the microphone unit
- Damaged harness wires and connectors

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra Fine Probe

STEP 1. Check the cellular phone.

Check that the cellular phone can be used normally as a unit.

Q: Is it possible to use the cellular phone normally?

YES : Go to Step 2.

NO : Repair or replace the cellular phone.

STEP 2. Check hands-free module connector C-110 and microphone unit connector D-03 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are hands-free module connector C-110 and microphone unit connector D-03 in good condition?

YES : Go to Step 3.

NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

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STEP 3. Check the wiring harness between hands free module connector C-110 and microphone unit connector D-03.

(1) Disconnect hands-free module connector C-110 and microphone unit connector D-03, and check the wiring harness.
- Check the communication lines for open circuit and short circuit.

NOTE: Also check intermediate connector C-130 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-130 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

(2) Check the wiring harness between hands free module connector C-110 (terminal 23) and microphone unit connector D-03 (terminal 1)

(3) Check the wiring harness between hands free module connector C-110 (terminal 24) and microphone unit connector D-03 (terminal 2)

Q: Is the wiring harness between hands free module connector C-110 and microphone unit connector D-03 in good condition?

YES : Go to Step 4.

NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.

STEP 4. Temporarily replace the microphone unit, and check the trouble symptom.

Check that the normal conversation is possible with the hands-free system.

Q: Is the normal conversation possible with the hands free system?

YES : Replace the microphone unit.

NO : Replace the hands free module.

Inspection Procedure 3: During the conversation with the hands free cellular phone system, the voice of other party cannot be heard.

FUNCTION

During the conversation with the hands free cellular phone system, the voice signal of other party is transmitted from the cellular phone to the hands free module. Then, the signal is transmitted from the hands free module to the radio and CD player <vehicles without MMCS> or audio visual navigation unit <vehicles with MMCS>, and then output from the speaker.

TROUBLE JUDGMENT CONDITIONS

During the conversation with the hands free cellular phone system, if the voice of other party cannot be heard, the hands free module, or the radio and CD player <vehicles without MMCS> or audio visual navigation unit <vehicles with MMCS> may be defective.

TROUBLESHOOTING HINTS

- Malfunction of the hands free module
- Malfunction of the radio and CD player <vehicles without MMCS> or audio visual navigation unit <vehicles with MMCS>

DIAGNOSIS

STEP 1. Check the cellular phone.

Check that the cellular phone can be used normally as a unit.

Q: Is it possible to use the cellular phone normally?

YES : Go to Step 2.
NO : Repair or replace the cellular phone.

STEP 2. Check the radio and CD player <vehicles without MMCS> or audio visual navigation unit <vehicles with MMCS>.

Check that the sound of radio and CD player <vehicles without MMCS> or audio visual navigation unit <vehicles with MMCS> is output normally from the speaker.

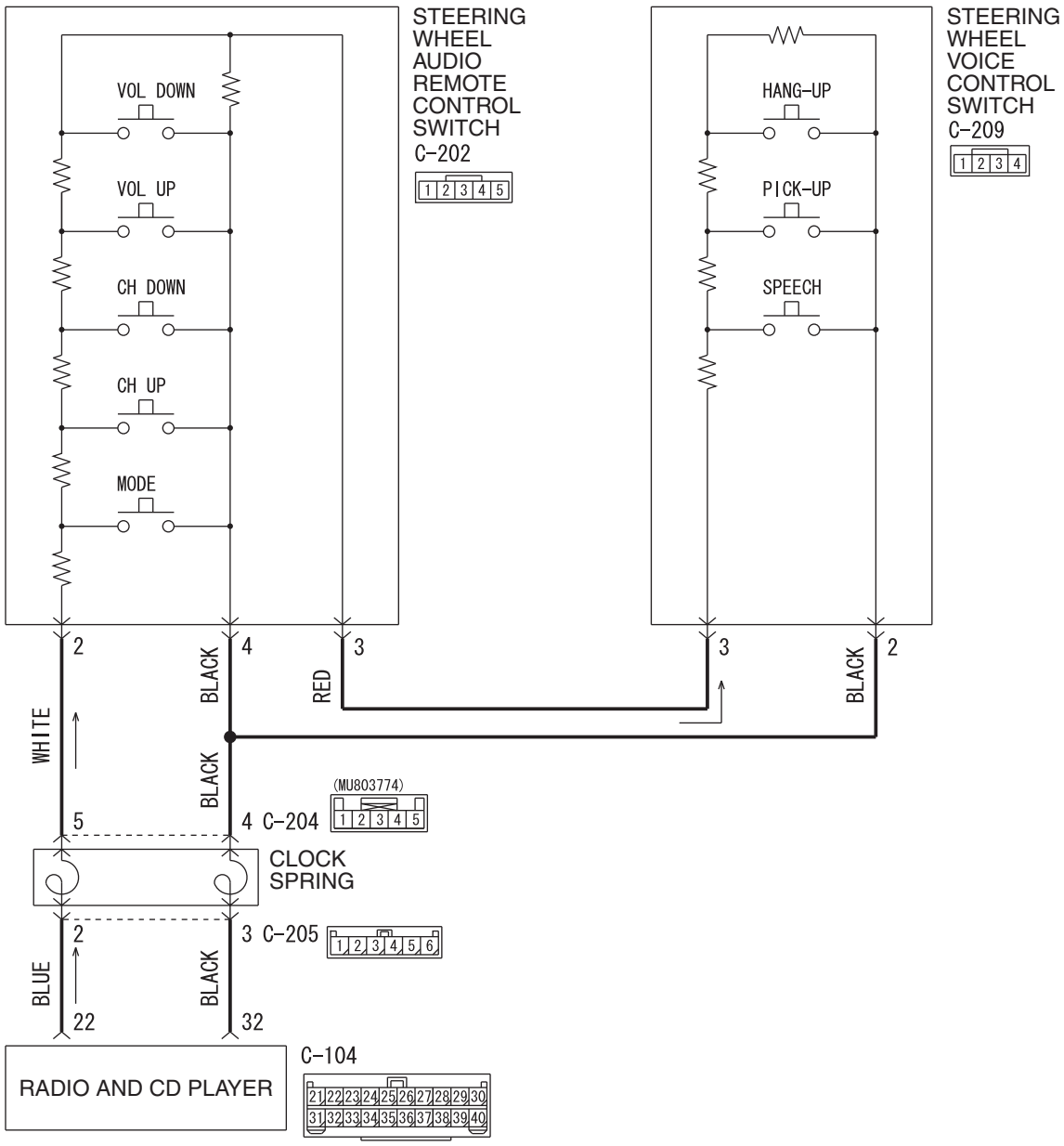
Q: Is the sound of radio and CD player <vehicles without MMCS> or audio visual navigation unit <vehicles with MMCS> output normally from the speaker?

YES : Replace the hands free module.
NO : Diagnose the radio and CD player <vehicles without MMCS> or audio visual navigation unit <vehicles with MMCS> (Refer to P.54A-541 <vehicles without MMCS> or P.54A-541 <vehicles with MMCS>).

Inspection Procedure 4: Even when the steering wheel voice control switch is operated, the conversation is not possible.

⚠ CAUTION
Before replacing the ECU, ensure that the power supply circuit, the ground circuit and the communication circuit are normal.

Steering Wheel Voice ControlIn Switch Circuit <Vehicles without MMCS>



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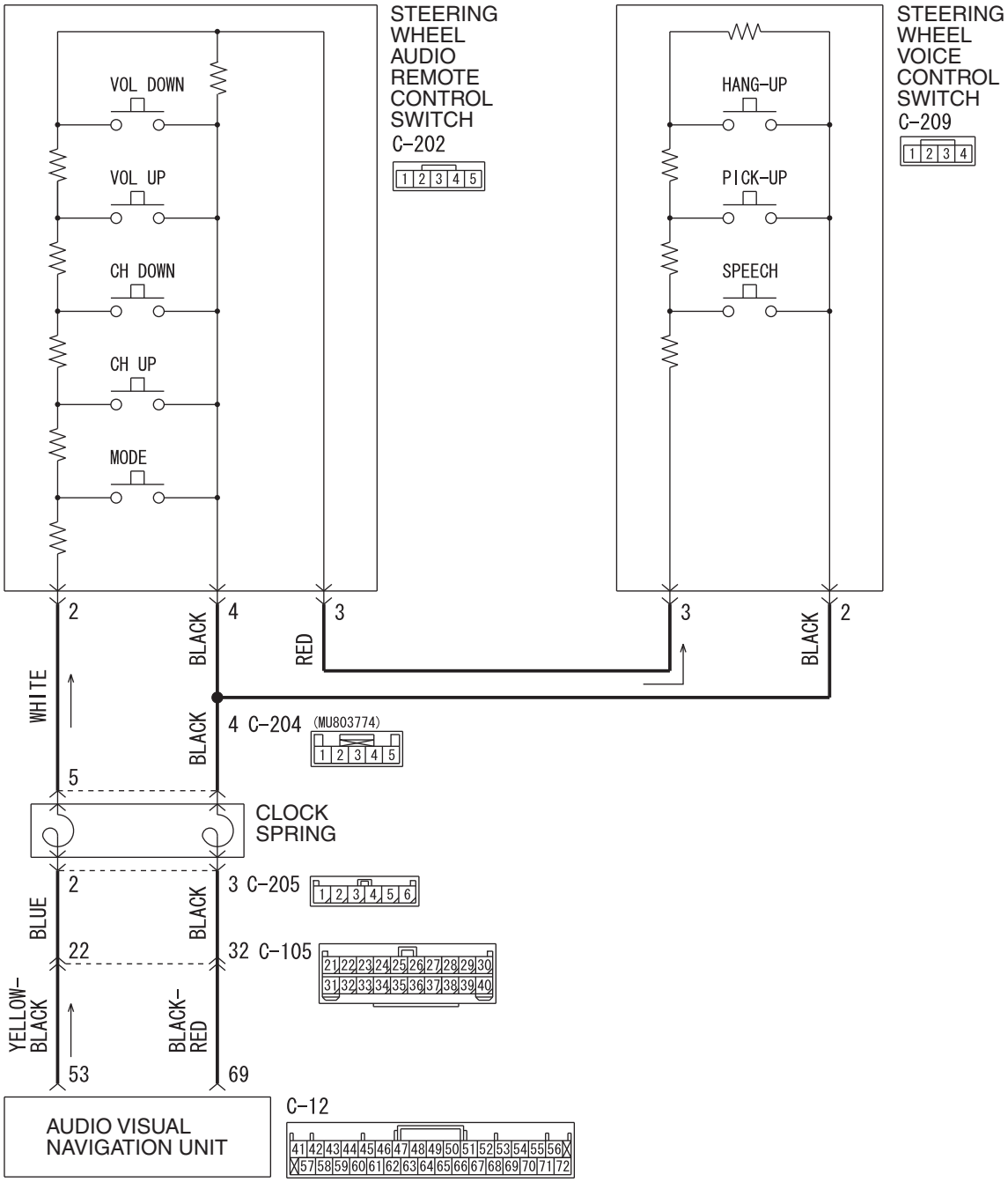
Steering Wheel Voice Controln Switch Circuit <Vehicles with MMCS>



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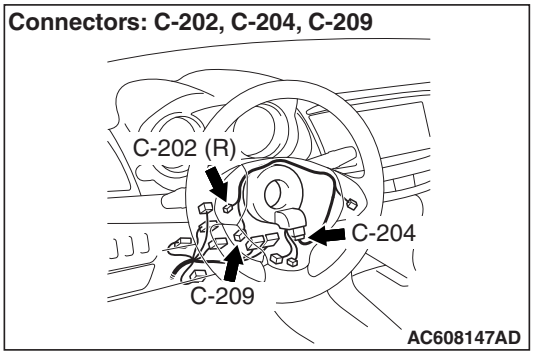


FUNCTION

When the steering wheel voice control switch is operated, the switch signal is transmitted to the radio and CD player <vehicles without MMCS> or audio visual navigation unit <vehicles with MMCS>. Then, via the CAN communication, the signal is transmitted from the radio and CD player <vehicles without MMCS> or audio visual navigation unit <vehicles with MMCS> to the hands free module.

TROUBLE JUDGMENT CONDITIONS

If the conversation is not possible even when the steering wheel voice control switch is operated, the steering wheel voice control switch or radio and CD player <vehicles without MMCS> or the audio visual navigation unit <vehicles with MMCS> may be defective.

TROUBLESHOOTING HINTS

- Malfunction of the steering wheel voice control switch
- Malfunction of the hands free module
- Malfunction of the radio and CD player <vehicles without MMCS> or audio visual navigation unit <vehicles with MMCS>
- Damaged harness wires and connectors

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra Fine Probe

STEP 1. Check the steering wheel audio remote control switch.

Check that the radio and CD player <vehicles without MMCS> or audio visual navigation unit <vehicles with MMCS> can be operated normally using the steering wheel audio remote control switch.

Q: Is it possible to normally operate the radio and CD player <vehicles without MMCS> or audio visual navigation unit <vehicles with MMCS> using the steering wheel audio remote control switch?

YES : Go to Step 2.

NO : Diagnose the steering wheel audio remote control switch (Refer to P.54A-541 <vehicles without MMCS> or P.54A-541 <vehicles with MMCS>.)

STEP 2. Using scan tool MB991958, diagnose the CAN bus line.

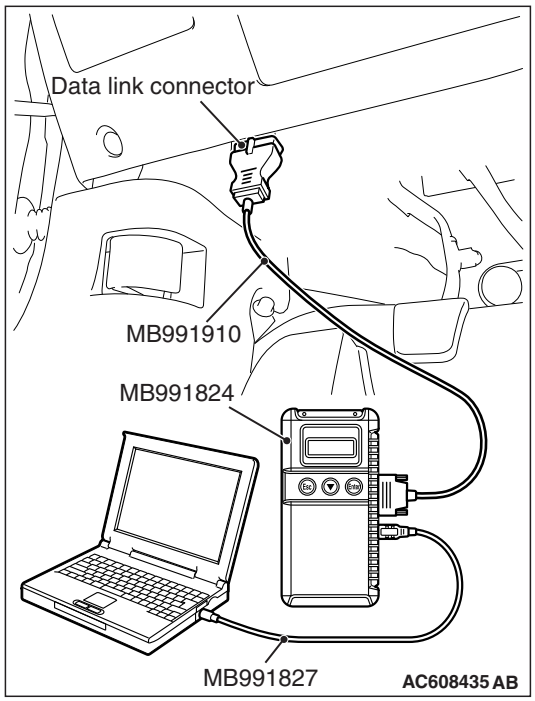
⚠ CAUTION

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) Diagnose the CAN bus line.
(4) Turn the ignition switch to "LOCK" (OFF) position.

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

YES : Go to Step 3.
NO : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis P.54C-17).



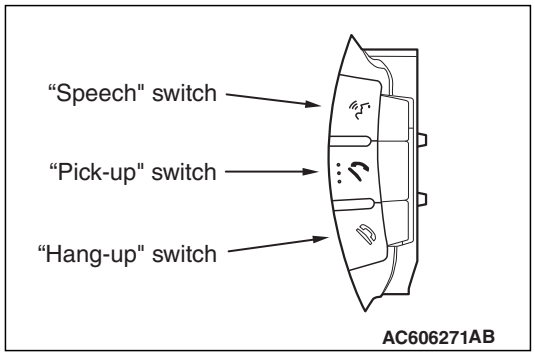
STEP 3. Check the steering wheel voice-control switch.

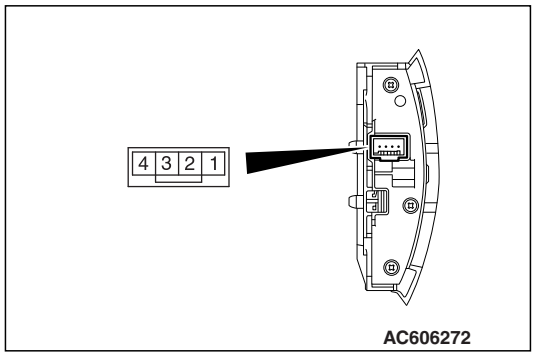
Remove the steering wheel voice control switch. Then check continuity between the switch terminals.

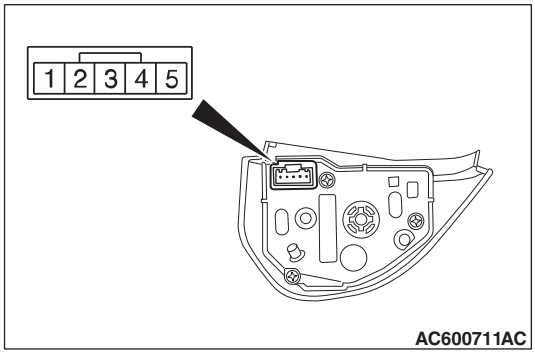
Switch Position	Tester Connection	Measurement Value
No push	2 – 3	Approximately 74 kΩ
"Speech" switch		Approximately 1.5 kΩ
"Pick-up" switch		Approximately 3.3 kΩ
"Hang-up" switch		Approximately 5.0 kΩ

Q: Is the steering wheel voice control switch in good condition?

YES : Go to Step 4.
NO : Replace the steering wheel voice control switch.







STEP 4. Check the steering wheel audio remote control switch.

Remove the steering wheel audio remote control switch. Then check continuity between the switch terminals.

Switch Position	Tester Connection	Measurement Value
No push	2 – 3	Approximately 3.1 kΩ

Q: Is the steering wheel audio remote control switch in good condition?

YES : Go to Step 5.

NO : Replace the steering wheel audio remote control switch.

STEP 5. Check steering wheel voice control switch connector C-209 and steering wheel audio remote control switch connector C-202 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are steering wheel voice control switch connector C-209 and steering wheel audio remote control switch connector C-202 in good condition?

YES : Go to Step 6.

NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The steering remote control switch should work normally.

STEP 6. Check the wiring harness between steering wheel voice-control switch connector C-209 (terminal 3) and steering wheel audio remote control switch connector C-202 (terminal 3).

- Check the communication line for open circuit and short circuit.

Q: Is the wiring harness between steering wheel voice-control switch connector C-209 (terminal 3) and steering wheel audio remote control switch connector C-202 (terminal 3) in good condition?

YES : Go to Step 7.

NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.

STEP 7. Check the wiring harness between steering wheel voice-control switch connector C-209 (terminal 2) and clock spring connector C-204 (terminal 4).

- Check the communication line for open circuit and short circuit.

Q: Is the wiring harness between steering wheel voice-control switch connector C-209 (terminal 2) and clock spring connector C-204 (terminal 4) in good condition?

YES : Go to Step 8.
NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.

STEP 8. Retest the system

Check that the hands free cellular phone system works normally when the steering wheel voice control switch is operated.

Q: Check that the hands free cellular phone system works normally when the steering wheel voice control switch is operated.

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to use Troubleshooting/inspection Service Points, How to Cope with Intermittent Malfunction P.00-14).
NO : Replace the radio and CD player <vehicles without MMCS> or audio visual navigation unit <vehicles with MMCS>.

Inspection Procedure 5: The cellular phone is not recognized or the connection cannot be established.

FUNCTION

With the hands free cellular phone system, the cellular phone and hands free module communicate with each other by using Bluetooth®.

TROUBLE JUDGMENT CONDITIONS

When the cellular phone cannot be recognized or the communication cannot be established, the cellular phone or hands free module may be defective.

TROUBLESHOOTING HINTS

- Malfunction of the cellular phone
- Malfunction of the hands free module

DIAGNOSIS

STEP 1. Check the cellular phone.

Check that the cellular phone can be used normally as a unit.

Q: Is it possible to use the cellular phone normally?

YES : Go to Step 2.
NO : Repair or replace the cellular phone.

STEP 2. Check the position of cellular phone.
Check that the function becomes normal when the cellular phone is moved closer to the hands free module.

Q: Does the function become normal when the cellular phone is moved closer to the hands-free module?
YES : No action is necessary and testing is complete.
NO : Go to Step 3.

STEP 3. Check the registration method of cellular phone.
By referring to the operation manuals, check that the cellular phone was registered to the hands-free module by following the normal procedure.

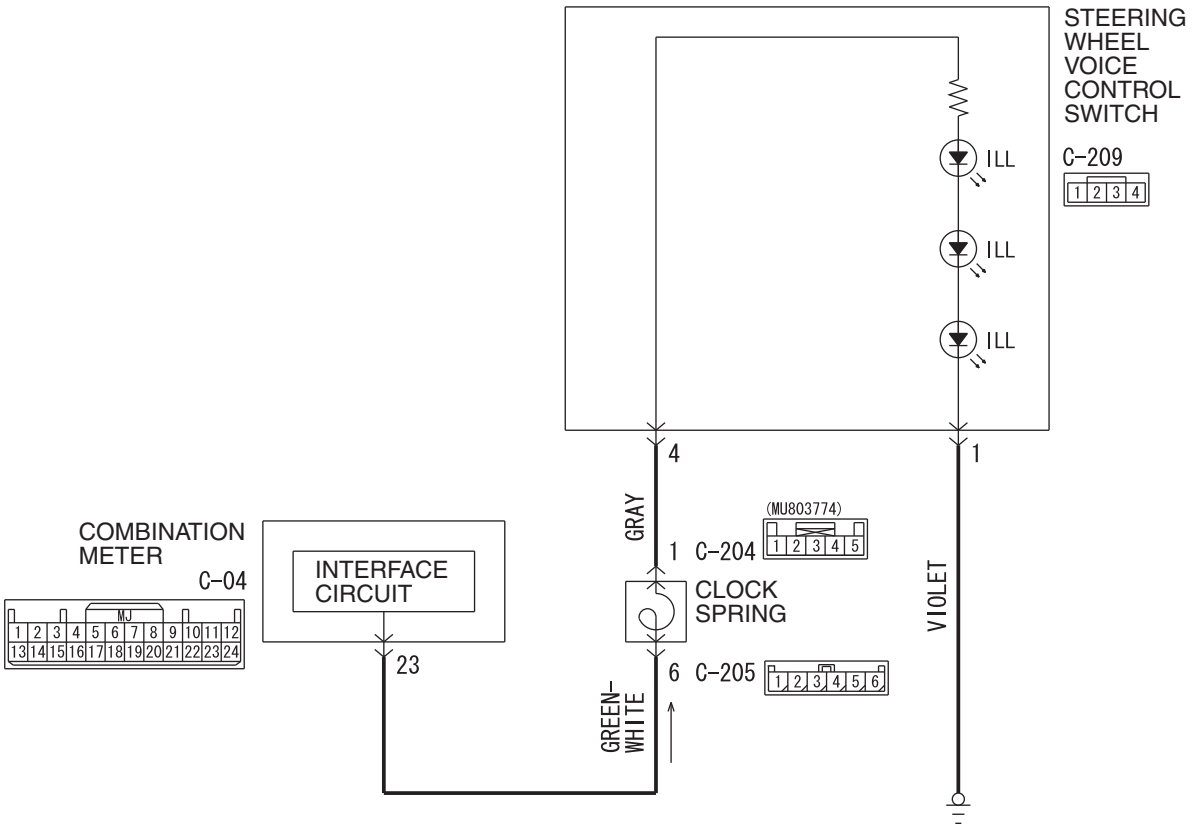
Q: Was the cellular phone registered by following the normal procedure?
YES : Check the trouble symptom, and finish when it is normal. When the abnormality is present, go to Step 4.
NO : Register a cellular phone according to a regular procedure.

STEP 4. Temporarily replace the cellular phone, and check the trouble symptom.
Temporarily register a separate Bluetooth® supported cellular phone, and check that the hands free cellular phone system operates normally.

Q: Is the normal conversation possible with the hands-free system?
YES : Ask the customer to have the cellular phone repaired or replaced. Then, delete the temporarily registered cellular phone. Once the customer prepares the normally working cellular phone, register the cellular phone to the hands free module.
NO : Replace the hands free module.

Inspection Procedure 6: Steering wheel voice control switch illumination does not come on.

Steering Wheel Voice Control Switch Illumination Circuit



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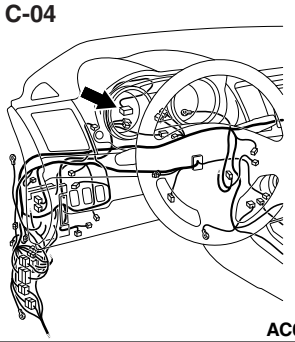
Connector: C-04



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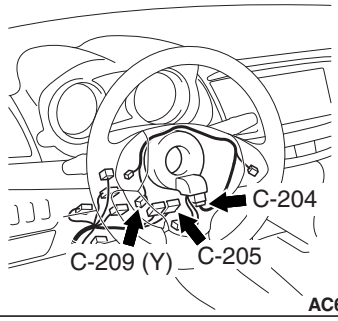
Connectors: C-204, C-205, C-209



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TECHNICAL DESCRIPTION (COMMENT)

The power supply circuit to the steering wheel voice control switch, the steering wheel voice control switch, the combination meter, or the clock spring may be defective.

TROUBLESHOOTING HINTS

- Malfunction of steering wheel voice control switch
- Malfunctions of combination meter
- Malfunction of the clock spring
- Damaged harness wires and connectors

TSB Revision

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- 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

STEP 1. Check the combination meter.

Check whether the combination meter works normally.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Diagnose the combination meter (Refer to P.54A-33).

STEP 2. Check steering wheel voice-control switch connector C-209 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is steering wheel voice control switch connector C-209 in good condition?

YES : Go to Step 3.

NO : Repair or replace the damaged component (Refer to GROUP 00E, Harness Connector Inspection P.00E-2). The steering remote control switch should work normally.

STEP 3. Check the wiring harness between steering wheel voice-control switch connector C-209 (terminal 1) and the ground.

- Check the ground wire for open circuit.

Q: Is the wiring harness between steering wheel voice-control switch connector C-209 (terminal 1) and the ground in good condition?

YES : Go to Step 4.

NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.

STEP 4. Check clock spring connectors C-204 and C-205 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are clock spring connectors C-204 and C-205 in good condition?

YES : Go to Step 5.

NO : Repair or replace the damaged component (Refer to GROUP 00E, Harness Connector Inspection P.00E-2). The steering remote control switch should work normally.

STEP 5. Check the clock spring.
Check whether the clock spring is in good condition (Refer to GROUP 52B – Driver's air bag module and clock spring P.52B-425 <except RALLIART> or P.52B-433 <RALLIART>).

Q: Is the check result normal?
YES : Go to Step 6.
NO : Replace the clock spring.

STEP 6. Check the wiring harness between steering wheel voice-control switch connector C-209 (terminal 4) and clock spring connector C-204 (terminal 1).
- Check the power supply line open circuit and short circuit.

Q: Is the wiring harness between steering wheel voice control switch connector C-209 (terminal 4) and clock spring connector C-204 (terminal 1) in good condition?
YES : Go to Step 7.
NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.

STEP 7. Check combination meter connector C-04 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is combination meter connector C-04 in good condition?
YES : Go to Step 8.
NO : Repair or replace the damaged component (Refer to GROUP 00E, Harness Connector Inspection P.00E-2). The steering remote control switch should work normally.

STEP 8. Check the wiring harness between combination meter connector C-04 (terminal 23) and clock spring connector C-205 (terminal 6).
- Check the power supply line open circuit and short circuit.

Q: Is the wiring harness between combination meter connector C-04 (terminal 23) and clock spring connector C-205 (terminal 6) in good condition?
YES : Go to Step 9.
NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.

STEP 9. Retest the system

Check whether the illumination of the steering remote control switch comes on normally.

Q: Doe the illumination of the steering remote control switch comes on normally?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to use Troubleshooting/inspection Service Points, How to Cope with Intermittent Malfunction P.00-14).

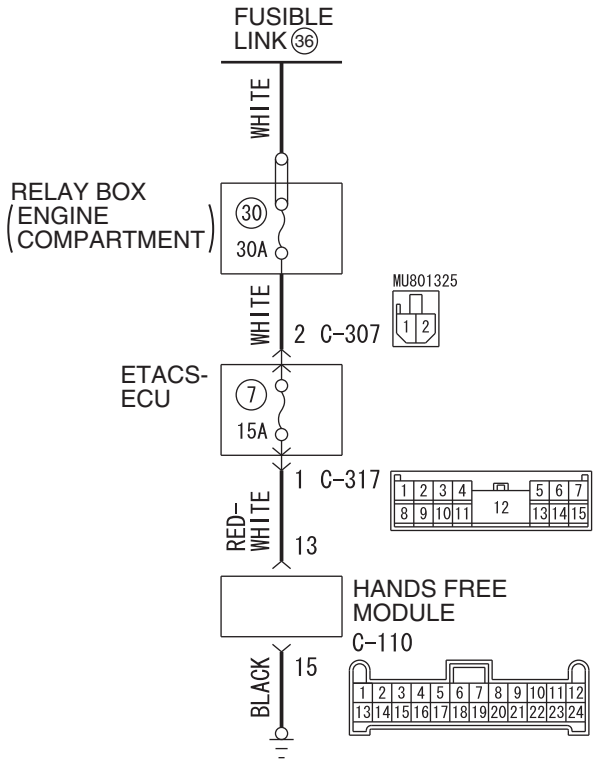
NO : Replace the steering wheel voice control switch.

Inspection Procedure 7: Check the hands free module power supply circuit.

⚠ CAUTION

Before replacing the module, ensure that the power supply circuit, the ground circuit and the communication circuit are normal.

Hands Free Module Power Supply Circuit



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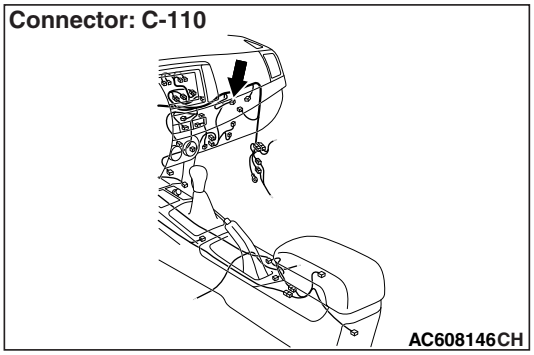
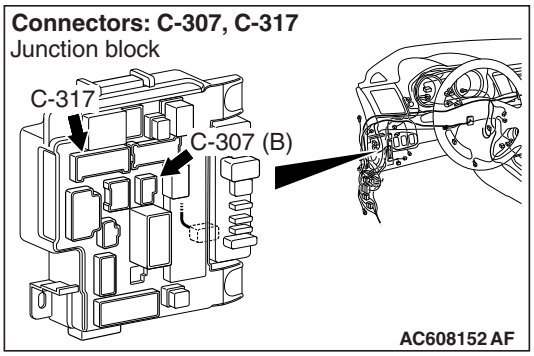




CIRCUIT OPERATION

The power supply to the hands free module is provided by the fusible link (36).

TECHNICAL DESCRIPTION (COMMENT)

If the hands free cellular phone system don't work, power supply and ground system to the hands free module, or the hands-free module itself may be defective.

TROUBLESHOOTING HINTS

- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The hands-free module may be defective

DIAGNOSIS

Required Special Tools:

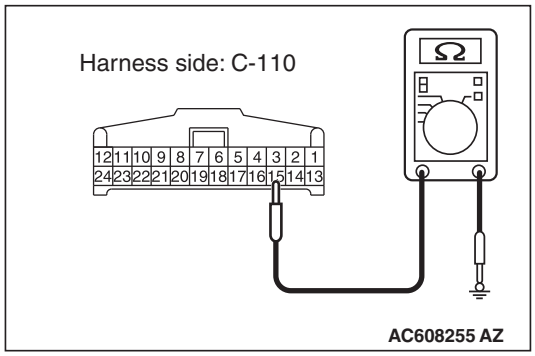
- MB991223: Harness Set
- MB992006: Extra Fine Probe

STEP 1. Check hands free module connector C-110 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is hands-free module connector C-110 in good condition?

YES : Go to Step 2.

NO : Repair or replace the damaged component (Refer to GROUP 00E, Harness Connector Inspection P.00E-2).



STEP 2. Check the ground circuit to the hands-free module. Measure the resistance at hands free module connector C-110.

(1) Disconnect hands free module connector C-110, and measure at the wiring harness side.
(2) Measure the resistance value between terminal 15 and ground.

OK: The resistance should be 2 ohms or less.

Q: Is the measured resistance 2 ohms or less?

YES : Go to Step 4.
NO : Go to Step 3.

STEP 3. Check the wiring harness between hands-free module connector C-110 (terminal 15) and ground.

- Check the ground wire for open circuit.

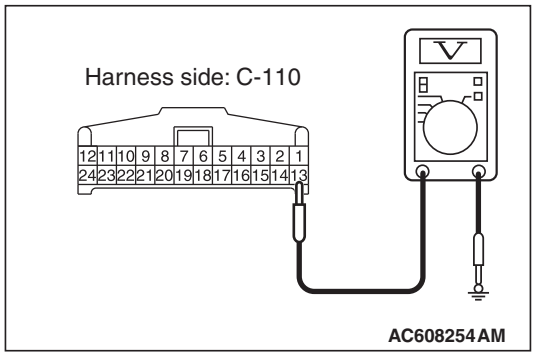
Q: Is the wiring harness between hands free module connector C-110 (terminal 15) and ground in good condition?

YES : Replace the hands free module. The system should communicate with the hands free module normally.
NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.

STEP 4. Check the power supply circuit to the hands-free module. Measure the voltage at hands-free module connector C-110.

(1) Disconnect hands free module connector C-110, and measure the voltage available at the hands-free module side of the connector.
(2) Measure the voltage between terminal 13 and ground.

OK: The voltage should measure approximately 12 volts (battery positive voltage).



Q: Is the measured voltage approximately 12 volts (battery positive voltage)?

YES : Replace the hands free module. The system should communicate with the hands-free module normally.
NO : Go to Step 5.

STEP 5. Check the wiring harness between hands-free module connector C-110 (terminal 13) and fusible link (36).

- Check the power supply line for open circuit and short circuit.

NOTE: Also check ETACS-ECU connectors C-307 and C-317 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If ETACS-ECU connector C-307 or C-317 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between hands-free module connector C-110 (terminal 13) and fusible link (36) in good condition?

YES : Replace the hands-free module. The system should communicate with the hands-free module normally.

NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.

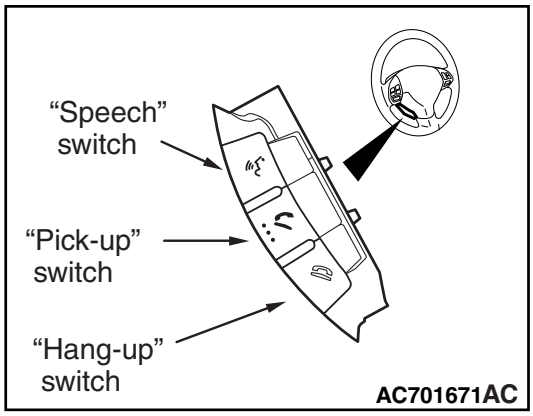
ON-VEHICLE SERVICE

PAIRING A CELLULAR PHONE OR DELETING A PHONE

M1544403700162

NOTE:

- *Several Bluetooth® cellular phones may not be compatible with the hands free-ECU*
- *A maximum of seven Bluetooth® cellular phones can be registered.*
- *The hands free cellular phone system can not be used when a battery of Bluetooth® cellular phone was exhausted.*



PAIRING A CELLULAR PHONE

1. Shift the selector lever to "P" (parking) position <CVT> or shift lever "N" (neutral) position <M/T, TC-SST> and pull the parking brake lever.
2. Turn the ignition switch to "ACC" or "ON" position.
3. Press the "Speech" switch.
4. Say "Setup."
5. Say "Pairing options."
6. The voice guide will say "Do you want to Pair a phone, delete a phone or list paired phones?"
7. Say “Pair a phone.”
8. The voice guide will say "Please say a 4-digit pin number."
9. Say a 4 digit number. The 4 digit number will be registered as a pin number for the phone.
   - When the confirmation function is on, the system will confirm whether the number said is acceptable. Answer "Yes" to go Step 10. Say "No" to return to pin number selection.

   NOTE:
   - *The pin number entered here is only used for the Bluetooth® connection certification. It is any 4-digit number the user would like to select.*

- *Remember the pin number as it needs to be keyed into the phone later in the pairing process.*
- *Depending on the selected Bluetooth® connection settings, entry of the paring code may be required each time the Bluetooth® cellular phone attempts to connect to the hands free cellular phone system.Refer to your cellular phone owner's manual for connection defaults and settings.*

10. The voice guide will say “Start pairing procedure on phone. See phone’s manual for instructions.” Refer to the owner’s manual for your cellular phone and enter into the phone the pin number that was registered in Step 9.
11. When the hands free cellular phone system finds a Bluetooth® cellular phone, the voice guide will say "Please say the name of the phone after the beep."
12. After you hear the beep, name the phone by saying a name of your preference.

    NOTE:
    - *When the hands free cellular phone system cannot recognize the Bluetooth® cellular phone, the pairing process will end and the system will beep and then return to normal status.*
    - *Try the pairing process again after reconfirming whether or not the Hands free cellular phone system supports your Bluetooth® compatible cellular phone.*
13. The voice guide will say "Assign a priority level between 1 and 7. 1 is the highest priority."
14. Say a number between 1 and 7 to set a priority level for the cellular phone.
    - If you selected a priority level that has already been set for a different phone, the hands free cellular phone system will ask you whether you wish to overwrite that priority level. To overwrite the priority level, answer "Yes." Answer "No" to return to the priority level selection in Step 13.
15. After the voice guide says "<phone tag> set to priority <priority>," the hands free cellular phone system will start the pairing process. Wait a moment for the pairing process to complete.
    - When the confirmation function is "ON", the hands free cellular phone system will confirm the assigned phone name and priority again. Answer "Yes" to go to next step, or answer "No" to return to the priority level selection in Step 13.
16. When the pairing process is completed, the voice guide will say "Pairing Complete." The hands free cellular phone system will then beep and the voice recognition mode will be deactivated.

DELETING A PHONE

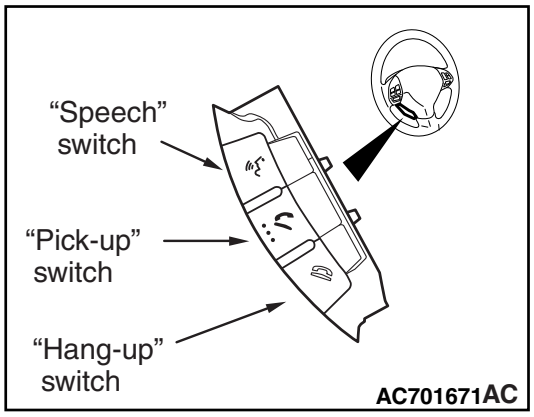
1. Turn the ignition switch to "ACC" or "ON" position.
2. Press the "Speech" switch.
3. Say “Setup.”

4. Say “Pairing options”
5. The voice guide will say “Do you want to Pair a phone, delete a phone or list paired phones?”
6. Say “Delete a phone.”
7. After the voice guide says "Please say," it will read out each priority number and phone name pair in order, starting with the phone that has the highest priority level (from 1 to 7). After it completes reading all pairs, the voice guide will say "or all."
8. Say the priority number of the phone that you want to delete from the hands free cellular phone system. If you want to delete all paired phones from the hands free cellular phone system, say "All."
9. For confirmation purposes, the voice guide will say "Removing <phone tag> (all) is this correct?" Answer "Yes" to delete the phone(s). If you answer "No," the voice guide will ask "Which phone please?" Say again the priority number of the phone that you want to delete from the hands free cellular phone system.
10. When the phone deletion process is completed, the voice guide will say "Deleted." The hands free cellular phone system will then beep and the voice recognition mode will be deactivated.
    - If the phone deletion process fails for some reason, the voice guide will say "Delete failed." The hands free cellular phone system will then beep and the voice recognition mode will be deactivated. Start over again from Step 1.

ERASE THE PASSCODE

M1544403800170

The 4-digit passcode set by security function can be erased by operating the hang-up switch.



1. Turn the ignition switch to the "ON" or "ACC" position, and check if the radio and CD player or the audio visual navigation unit is activated.
2. Check that the hands free cellular phone system is not in voice recognition mode.
3. Press and hold the hang-up switch for approximately 2 seconds (1.5 seconds or more).
4. Within approximately 10 seconds after performing step 3, press and hold the hang-up switch for approximately 2 seconds (1.5 seconds or more) twice again.

NOTE: Even if the passcode is erased, guidance such as voice guide is not provided.

5. After the operation, check if the lock with the passcode is unlocked. If the lock is not unlocked, repeat from step 2.

SERVICE DATA

M1544401300061

Item No.	Scan tool display	Check condition	Normal condition
1	VR switch	When the "Speech" switch is pushed	ON
2	On hook switch	When the "Hang-up" switch is pushed	ON
3	Off hook switch	When the "Pick-up" switch is pushed	ON

TSB Revision

ACTUATOR TEST TABLE

M1544404000014

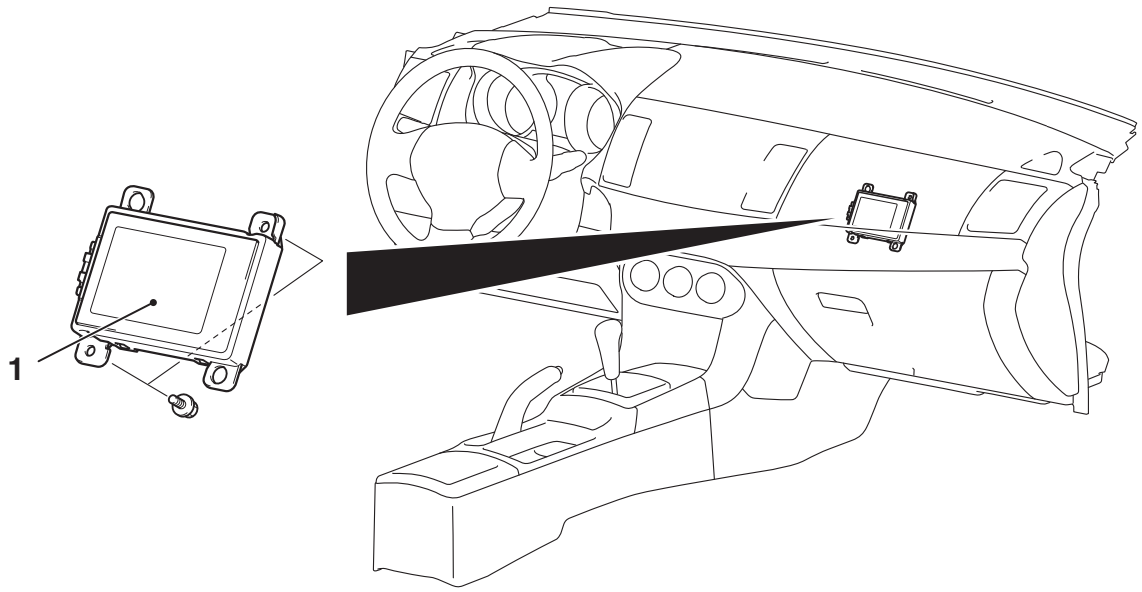
The following actuators can be forcibly operated using scan tool.

Item No.	Item name	Test item	Driven component
1	VR switch	"Speech" switch short press	Perform the operation when the "Speech" switch is pressed shortly. (Start the voice recognition mode)
2	On hook switch	"Hang-up" switch short press	Perform the operation when the "Hang-up" switch is pressed shortly. (Hangs up the phone while the call is in progress)
3	Off hook switch	"Pick-up" switch short press	Perform the operation when the "Pick-up" switch is pressed shortly. (Take incoming calls)

REMOVAL AND INSTALLATION

M1544401000220

HANDS FREE MODULE



AC608894AB

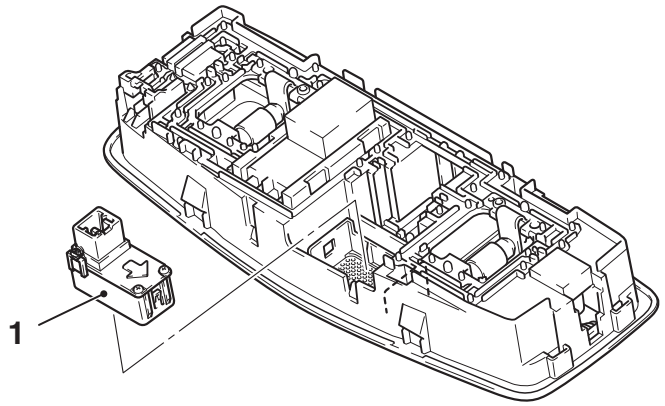
Removal Steps

- Grove box cover (Refer to GROUP 52A – Grove box Assembly P.52A-6).

1. Hands free module

TSB Revision

MICROPHONE UNIT



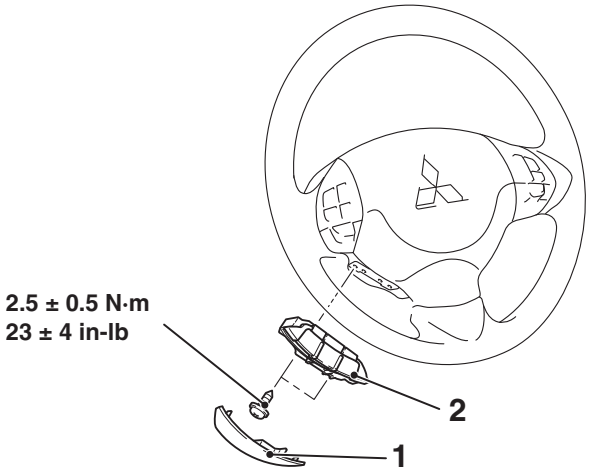
AC606269AB

Removal Steps

- Front dome light assembly (Refer to GROUP 52A – Headlining P.52A-18).

1. Microphone unit

STEERING WHEEL VOICE CONTROL SWITCH <EXCEPT RALLIART>

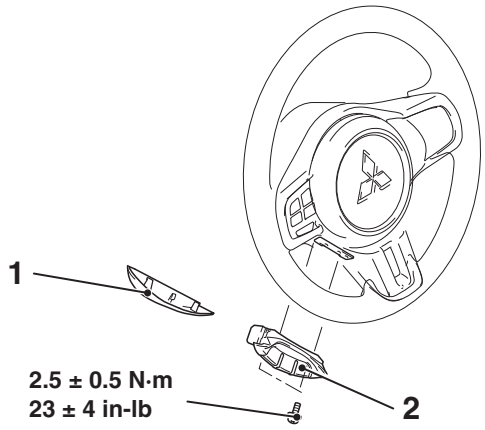


AC609419AD

Removal Steps

1. Steering wheel voice control cover
2. Steering wheel voice control switch

STEERING WHEEL VOICE CONTROL SWITCH <RALLIART>



AC709152AB

Removal Steps

1. Steering wheel voice control cover
2. Steering wheel voice control switch

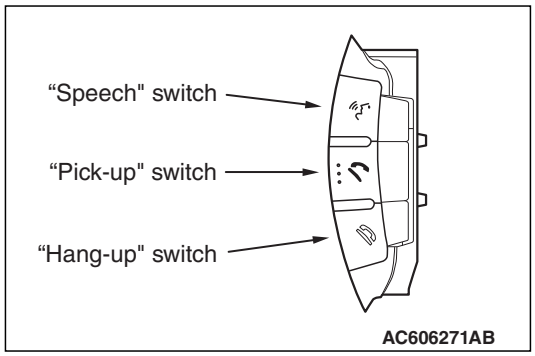
STEERING WHEEL VOICE CONTROL SWITCH CONTINUITY CHECK

M1544401100324

<EXCEPT RALLIART>

STEERING WHEEL VOICE CONTROL SWITCH CHECK

Use an ohmmeter to measure the resistance value between the terminal.



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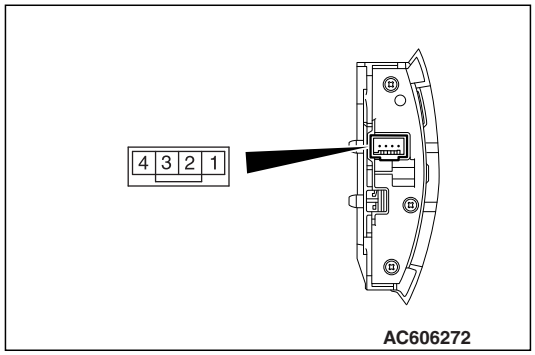
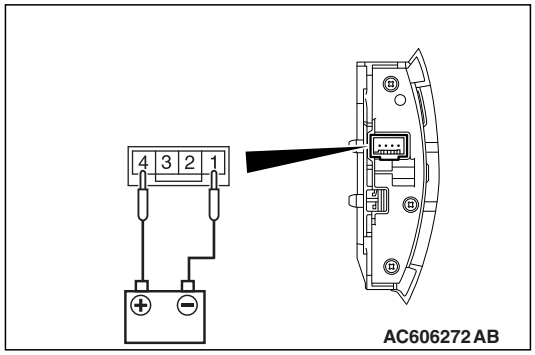


AC606272

Switch position	Tester connection	Measurement value
No push	2 – 3	Approximately 74 kΩ
"Speech" switch		Approximately 1.5 kΩ
"Pick-up" switch		Approximately 3.3 kΩ
"Hang-up" switch		Approximately 6.0 kΩ



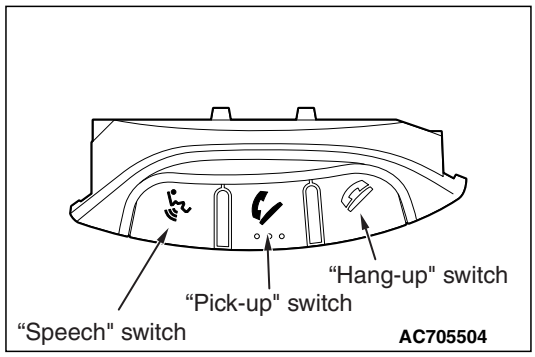
ILLUMINATION CHECK

Apply the battery voltage of steering wheel voice control switch connector terminal No. 4 and 1, and check if the steering wheel audio remote control switch illuminates.

NOTE: Make sure that the polarity is correct.

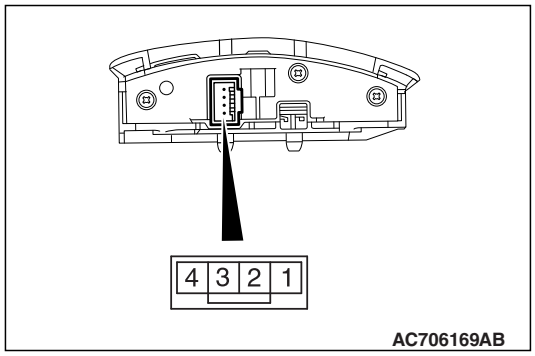
<RALLIART>

STEERING WHEEL VOICE CONTROL SWITCH CHECK

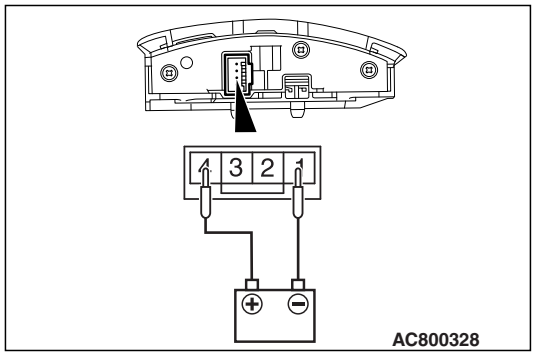


Use an ohmmeter to measure the resistance value between the terminal.

Switch position	Tester connection	Measurement value
No push	2 – 3	Approximately 74 kΩ
"Speech" switch		Approximately 1.5 kΩ
"Pick-up" switch		Approximately 3.3 kΩ
"Hang-up" switch		Approximately 6.0 kΩ



ILLUMINATION CHECK



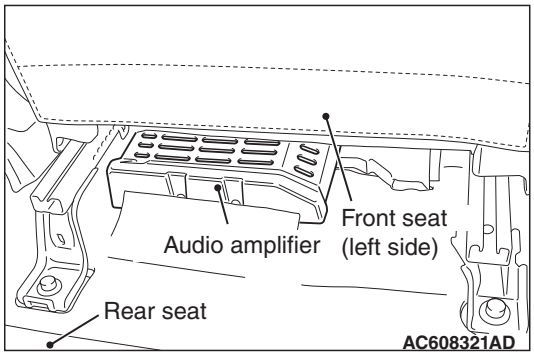
Apply the battery voltage of steering wheel voice control switch connector terminal No. 4 and 1, and check if the steering wheel voice control switch illuminates.

NOTE: Make sure that the polarity is correct.

AMPLIFIER

GENERAL INFORMATION

M1544000100862



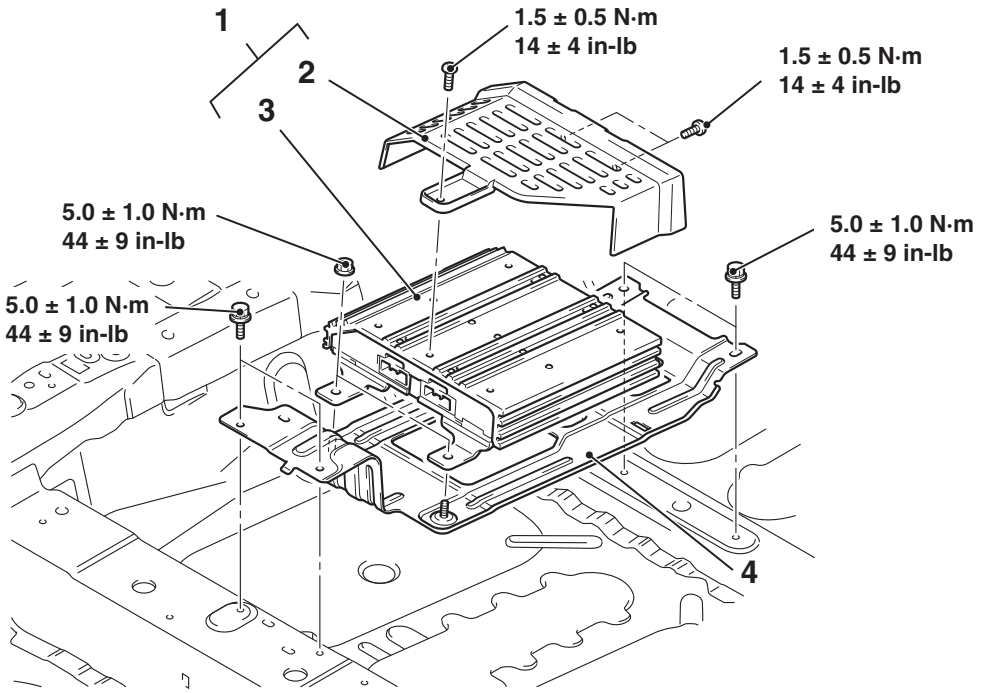
The 8-ch high-power audio amplifier with integrated digital signal processor (total maximum output of 710 W) equipped with the front seat (left side) has been combined with the 9-speaker 7-position system, adopting the Rockford Fosgate ® premium sound system. The audio amplifier offers the clear treble without distortion.

REMOVAL AND INSTALLATION

M1544004100626

⚠ CAUTION

To remove the front seat assembly of vehicle with side air bag, refer to GROUP 52B – Service Precautions P.52B-25 and Air Bag Module(S) And Clock Spring P.52B-419 <Except RALLIART> or P.52B-427 <RALLIART>.



Removal Steps

- Front (driver's) seat assembly (Refer to GROUP 52A – Front Seat Assembly P.52A-21).

1. Audio amplifier assembly <<A>>

Removal Steps (Continued)

2. Audio amplifier cover
3. Audio amplifier
4. Audio amplifier box bracket

TSB Revision

REMOVAL SERVICE POINT

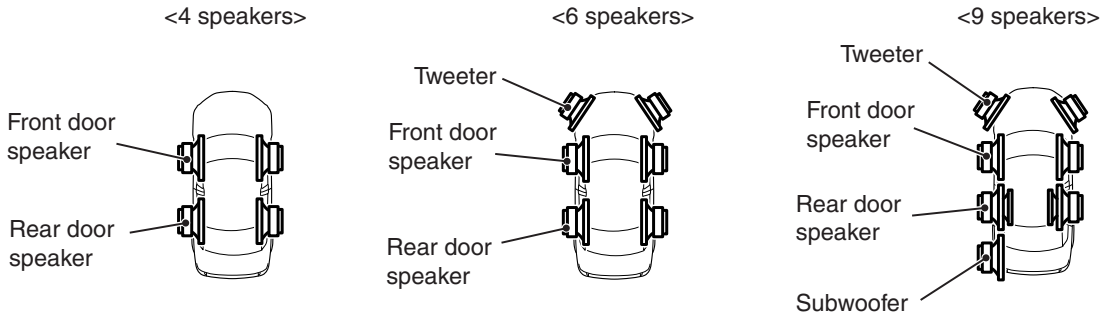
<<A>> REMOVAL OF AUDIO AMPLIFIER BOX BRACKET

Turn up and remove the carpet.

SPEAKER

GENERAL INFORMATION

M1544101000092

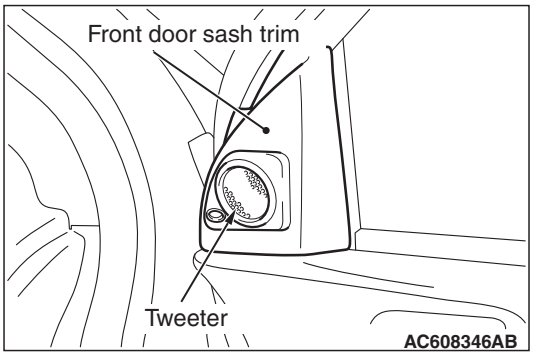


AC608693AB

The following three types of speakers are available.

- 4 speakers (Front door: 16 cm, rear door: 16 cm)
- 6 speakers (tweeter: 3.5 cm, front door: 16 cm, rear door: 16 cm)
- 9 speakers (tweeter: 3.5 cm, front door: 16 cm, rear door: 2-way coaxial 16 cm, subwoofer: 25 cm) <Rockford Fosgate® premium sound system>

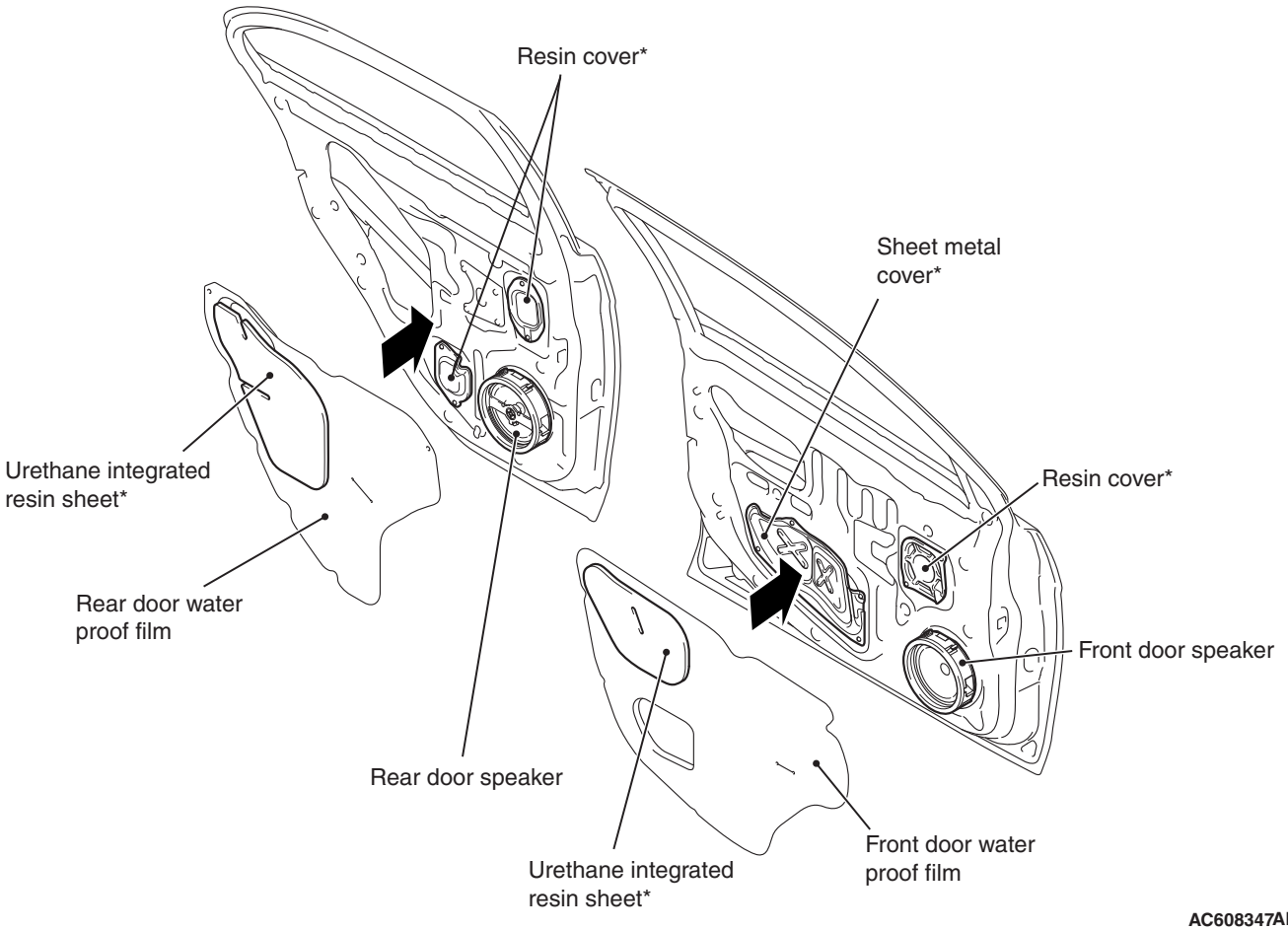
TWEETER



AC608346AB

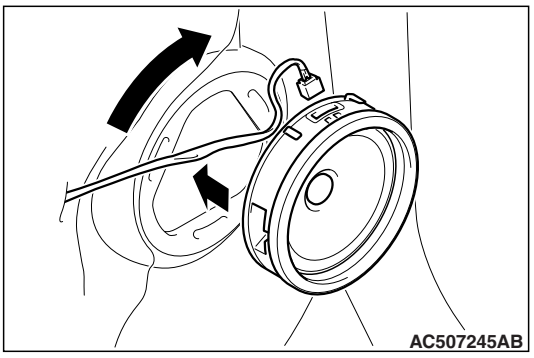
For the front sash trim, two types of tweeters, the balanced dome tweeter <Vehicles with 6 speakers> and soft dome tweeter <Vehicles with 9 speakers (Rockford Fosgate ® premium sound system)>, have been established. The soft dome tweeter can play clearer treble with less distortion compared to the balanced dome tweeter. For better treble, two types of front sash garnish, resin type <Vehicles with 6 speakers> and punching metal type <Rockford Fosgate ® premium sound system>, has been established. With the punching metal type, the metal has been adopted for the punching part to enlarge the punching opening, enabling the playback of cleaner treble.

DOOR SPEAKER



NOTE: The parts with "" are installed exclusively to the vehicles with Rockford Fosgate® premium sound system.*

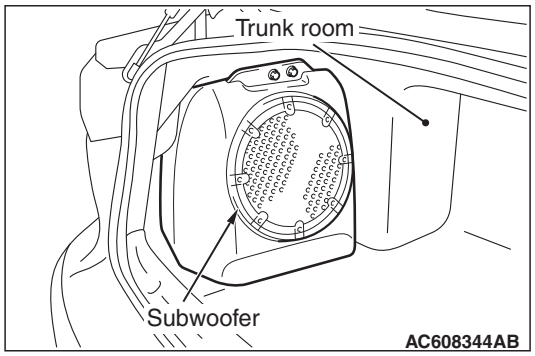
For the front door speaker, two types of speakers, 16 cm paper cone speaker <vehicles with 4 speakers, 6 speakers> and PP (polypropylene) cone speaker <Rockford Fosgate® premium sound system>, are available. For the rear door speaker, two types of speakers, 16 cm paper cone speaker <Vehicles with 4 speakers, 6 speakers> and PP (polypropylene) cone 2-way coaxial speaker <Vehicles with 9 speakers (Rockford Fosgate® premium sound system)>, are available. Compared to the paper cone speakers, the PP (polypropylene) cone speakers can playback crisper bass. The door opening of the vehicles with 9 speaker (Rockford Fosgate® premium sound system) is blocked by using the sheet metal cover and the urethane integrated resin sheet (resin cover and water proof film) to make the door into a speaker box, thus improving the sound quality. As an advantage of the sheet metal cover, the rigidity of the areas around the speaker has been increased, and the higher sound pressure, suppression of high harmonic, and suppression of dumping are achieved to improve sound quality.



The one-touch installable speaker (with 3 tabs, fixed by rotating) has been adopted to improve serviceability.

TSB Revision

SUBWOOFER <VEHICLES WITH ROCKFORD FOSGATE® PREMIUM SOUND SYSTEM>



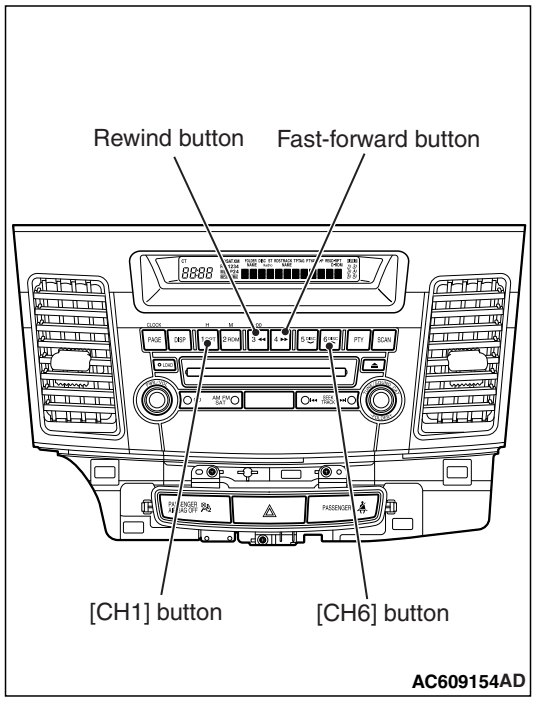
The 25 cm dual voice coil subwoofer has been installed to the trunk room, enabling the playback of dynamic deep bass.

ON-VEHICLE SERVICE

SPEAKER TEST <VEHICLES WITH RADIO AND CD PLAYER>

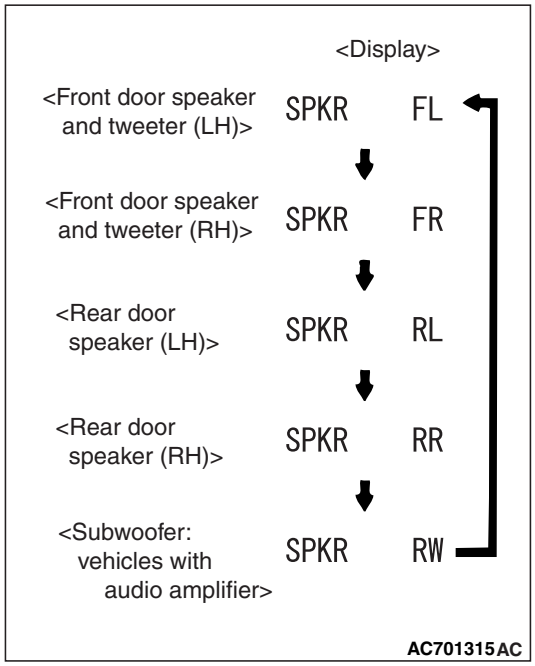
M1544100500425

SPEAKER CONNECTION CHECK MODE



Enter the speaker connection check mode according to the following steps:

1. Turn the Ignition switch to the "ACC" or "ON" position and switch off the radio and CD player.
2. Press the following buttons in that order within sixty seconds from step (1).
   (1) [CH1] button
   (2) Rewind button
   (3) Fast-forward button
   (4) [CH6] button



3. Check that the speaker, which is displayed on the center panel display, sounds (If the [CH6] button is pressed, the speaker will be changed).

NOTE: The display of "FL", "FR", "RL", "RR","RW"blinks.

4. If a button other than the [CH6] button is pressed, or the ignition switch is turned to "LOCK" (OFF) position, you will exit from the speaker connection check mode.

BUZZ NOISE CHECK MODE

Inserting a CD during the speaker connection check mode shifts the mode to the buzz noise check mode, and the buzz noise sound of each speaker can be checked.
As with the speaker connection check mode, press the [CH6] button to switch the output speaker of the buzz noise check sound.
Check that the buzz noise sound is output from the output speaker of buzz noise check sound.

NOTE: "SPKR" is displayed as "BUZZ" during buzz noise check mode.

SPEAKER TEST <VEHICLES WITH MMCS>

M1544100500328

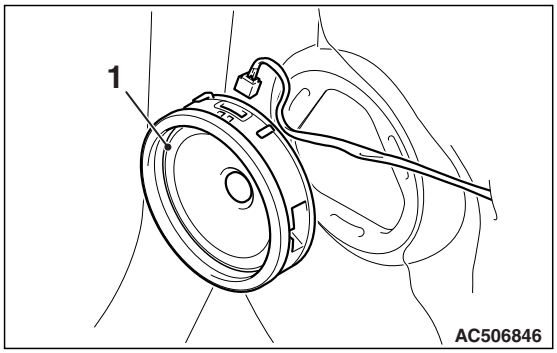
Refor to P.54A-437

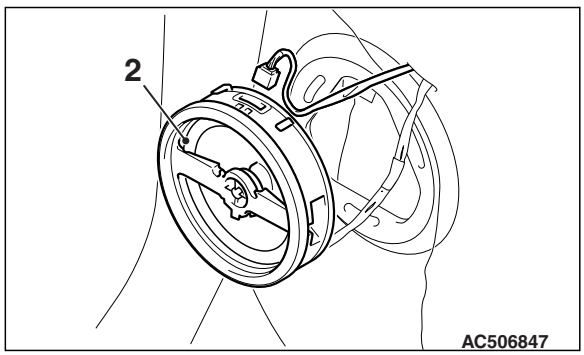
REMOVAL AND INSTALLATION

M1544100300119

DOOR SPEAKER

Pre-removal Operation
Learning of the power window fully closed position (Refer to GROUP 42A – Door, On-vehicle service P.42A-122).





AC507216AB

TSB Revision

Front Door Speaker Removal Steps

- Front door trim (Refer to GROUP 52A – Door Trim P.52A-16).

<<A>> 1. Front door speaker

Rear Door Speaker Removal Steps

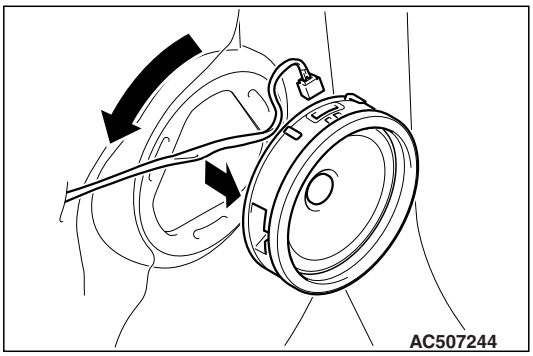
- Rear door trim (Refer to GROUP 52A – Door Trim P.52A-16).

<<A>> 2. Rear door speaker

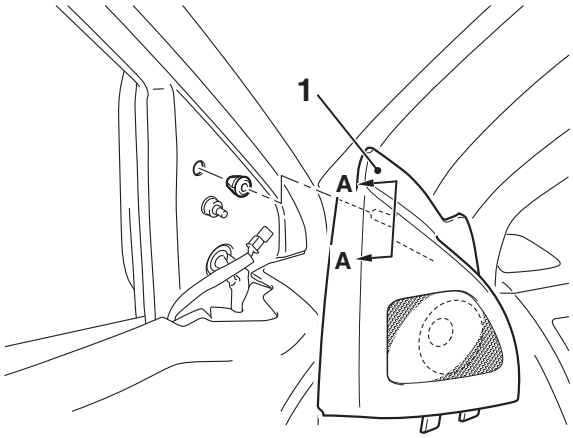
REMOVAL SERVICE POINT

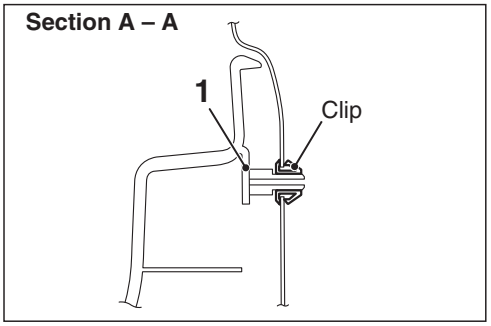
<<A>> REMOVAL OF FRONT DOOR SPEAKER/REAR DOOR SPEAKER

Disconnect the connector, and remove by twisting as shown in the figure.

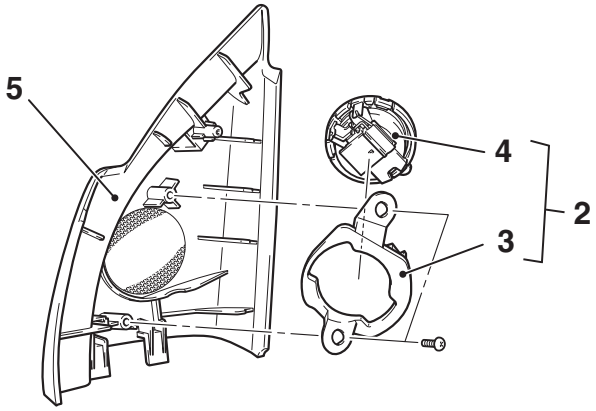


TWEETER





AC608780AB

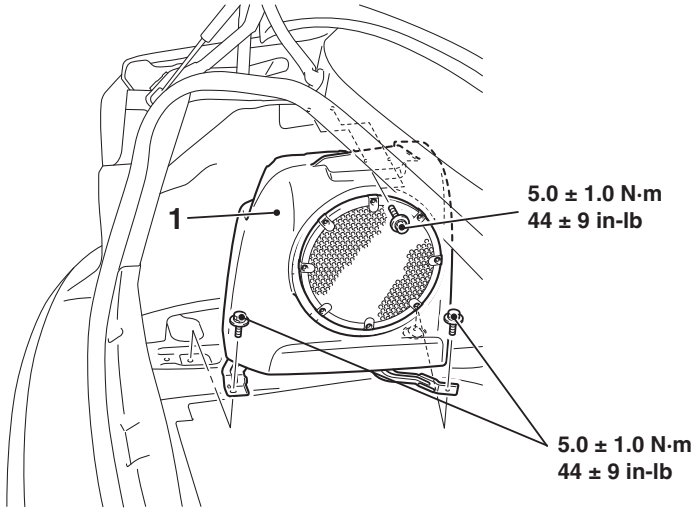


AC608782AB

Removal Steps
1. Front door sash trim assembly
2. Tweeter bracket and Tweeter
3. Tweeter bracket

Removal Steps (Continued)
4. Tweeter
5. Front door sash trim

SUBWOOFER



AC608803AB

Removal Step
1. Rear speaker box assembly

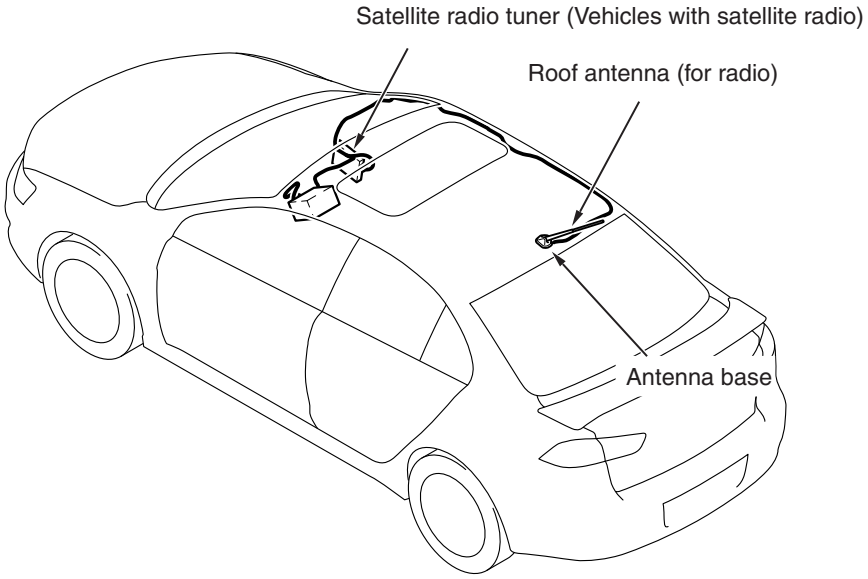
ANTENNA

GENERAL INFORMATION

M1544200500013

The roof antenna has been adopted for the radio. The antenna base incorporates the radio amplifier. When the satellite radio tuner is installed, the antenna base that also corresponds to the satellite radio is installed.

CONSTRUCTION DIAGRAM

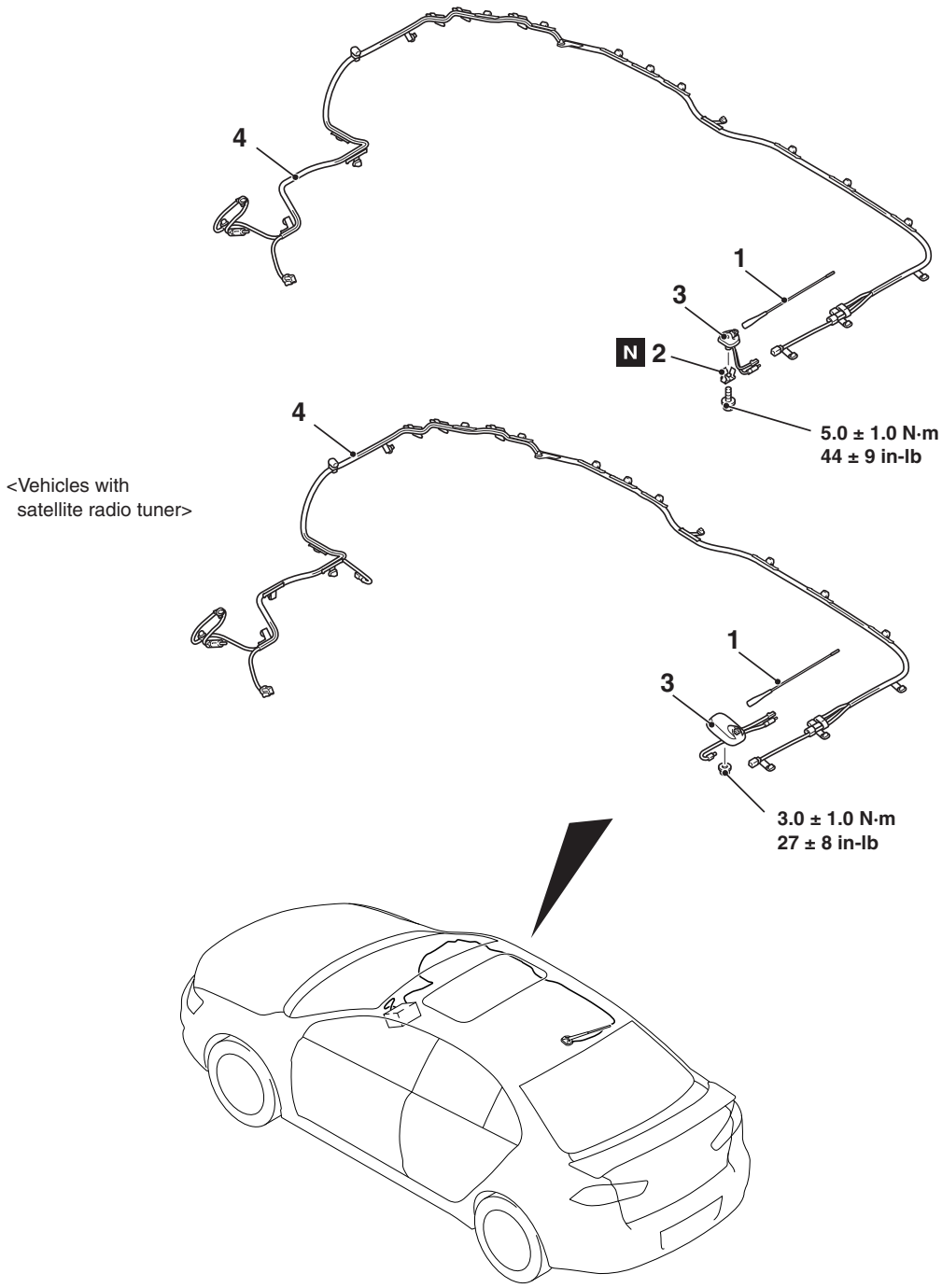


AC608360AB

TSB Revision

REMOVAL AND INSTALLATION

M1544200200551



AC710537AB

Removal Steps

1. Antenna rod
   - Headlining (Refer to GROUP 52A – Headlining P.52A-18).
2. Antenna base (antenna spring) <Vehicles without satellite radio tuner>
3. Antenna base
   - Radio and CD player (Refer to P.54A-428). <Vehicles with radio and CD player>

<<A>>

Removal Steps (Continued)

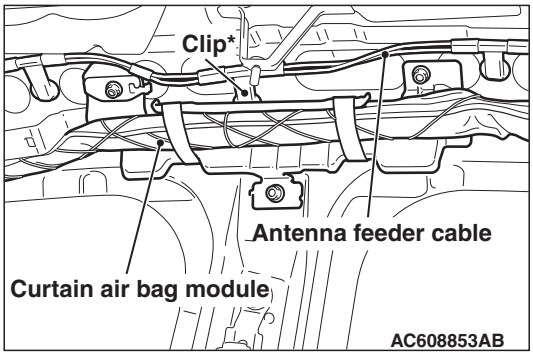
- Multivision display assembly (Refer to P.54A-428). <Vehicles with MMCS>
- Grove box cover (Refer to GROUP 52A – Grove box P.52A-6).
- Rear side roof energy absorption box (RH) <Vehicle with sunroof>(Refer to GROUP 52A – Headlining P.52A-18).

4. Antenna feeder

TSB Revision

REMOVAL SERVICE POINT

<<A>> REMOVAL OF ANTENNA FEEDER



Remove a part of the curtain airbag module, and remove the clip* of antenna feeder. <Vehicles with sun roof>

SATELLITE RADIO TUNER

GENERAL INFORMATION

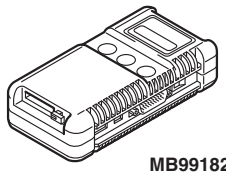
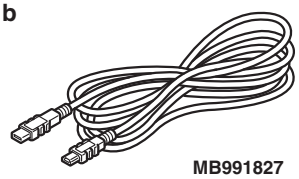
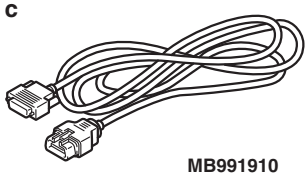
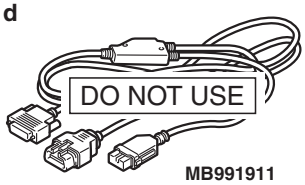
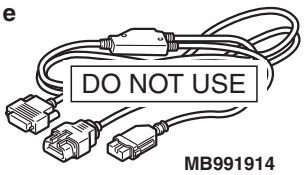
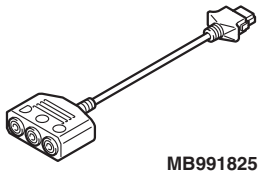
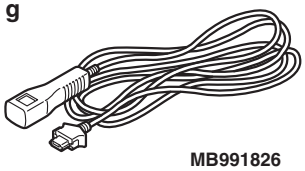
M1544000100527

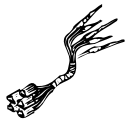
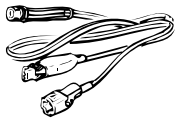
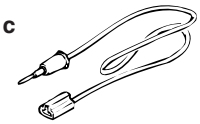
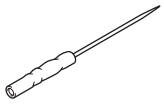
SATELLITE RADIO

- The satellite radio is a broadcast technology that offers a clear digital sound directly by using satellites.
- The registered service provider is SIRIUS™ satellite radio.
- This service offers listeners more than 100 programs such as news, sports, music, and entertainment.

SPECIAL TOOLS

M1544000600629

Tool	Tool number and name	Supersession	Application
a  MB991824 b  MB991827 c  MB991910 d  MB991911 e  MB991914 f  MB991825 g  MB991826 MB991958	MB991958 a. MB991824 b. MB991827 c. MB991910 d. MB991911 e. MB991914 f. MB991825 g. MB991826 M.U.T.-III sub-assembly a. Vehicle communication interface (V.C.I.) b. M.U.T.-III USB cable c. M.U.T.-III main harness A (Vehicles with CAN communication system) d. M.U.T.-III main harness B (Vehicles without CAN communication system) e. M.U.T.-III main harness C (for Daimler Chrysler models only) f. M.U.T.-III measurement adapter g. M.U.T.-III trigger harness	MB991824-KIT *NOTE: G: MB991826 M.U.T.-III Trigger Harness is not necessary when pushing V.C.I. ENTER key.*	**⚠ CAUTION** **M.U.T.-III main harness A (MB991910) should be used. M.U.T.-III main harness B and C should not be used for this vehicle.** CAN bus diagnostics or data list check.

Tool	Tool number and name	Supersession	Application
a  b  c  d MB991223	MB991223 a. MB991219 b. MB991220 c. MB991221 d. MB991222 Harness set a. Check harness b. LED harness c. LED harness adapter d. Probe	General service tool (jumper)	Continuity check and voltage measurement at harness wire or connector a. For checking connector pin contact pressure b. For checking power supply circuit c. For checking power supply circuit d. For connecting a locally sourced tester
 MB992006	MB992006 Extra fine probe	–	Continuity check and voltage measurement at harness wire or connector

DIAGNOSIS

INTRODUCTION TO SATELLITE RADIO DIAGNOSIS

M1544004700361

ERROR CODE (SIRIUS SATELLITE RADIO)

The display displays the error codes if an abnormality related to the satellite radio is detected. (Refer to P.54A-343.)

STANDARD FLOW OF DIAGNOSTIC TROUBLESHOOTING

M1544016500018

Refer to GROUP 00, Troubleshooting contents P.00-7.

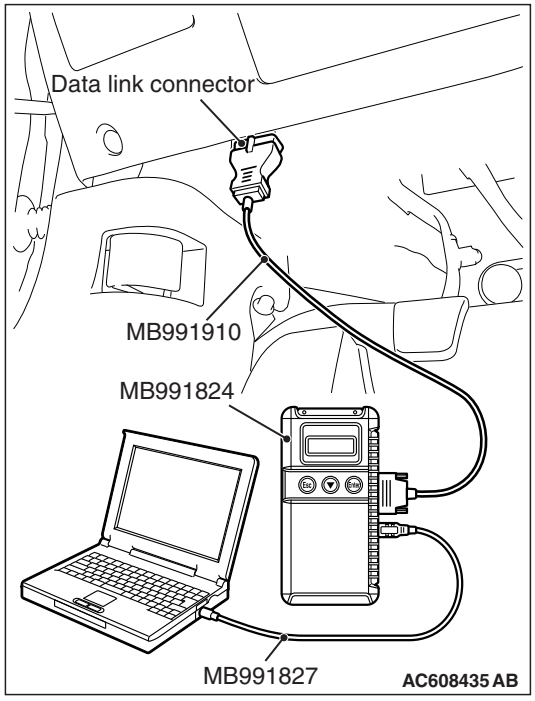
DIAGNOSIS FUNCTION

M1544013200405

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

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles 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 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 special tool MB991824 is energized, special tool MB991824 indicator light will be illuminated in a green color.
7. Start the M.U.T.-III system on the personal computer.

NOTE: Disconnecting scan tool MB991958 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:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles 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)

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

1. Connect 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 2006 MY" of "Model Year." When the "Vehicle Information" is displayed, check the contents.
5. Select "Meter" 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 DIAGNOSE THE CAN BUS LINES

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles 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)

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 being diagnosed.
   - If they match, go to step 8.
   - If not, go to step 5.
5. Select the "view vehicle information" button.
6. Enter the vehicle information and select the "OK" button.
7. When the vehicle information is displayed, confirm again that it matches the vehicle being diagnosed.
   - If they match, go to step 8.
   - If not, go to step 5.
8. Select the "OK" button.
9. When the optional equipment screen is displayed, choose the one which the vehicle is fitted with, and then select the "OK" button.

CHECK OF FREEZE FRAME DATA

The freeze frame data can be checked by using M.U.T.-III.

When detecting fault and storing the diagnostic trouble code, the ECU connected to CAN bus line obtains the data before the determination of the diagnostic trouble code and the data when the diagnostic trouble code is determined, and then stores the ECU status of that time. By analyzing each data from M.U.T.-III, the troubleshooting can be performed more efficiently. The displayed items are as the table below.

Display item list

Item No.	Item name	Content	Unit
1	Odometer	Total driving distance after the diagnostic trouble code is generated	mile
2	Ignition cycle	Number of times the ignition switch is turned "ON" or "LOCK (OFF)" after the past failure transition	Number of counts is displayed.
4	Accumulated minute	Cumulative time for current malfunction of diagnostic trouble code	min

DIAGNOSTIC TROUBLE CODE CHART

M1544012900359

DTC No.	Trouble content	Reference page
B2222	Radio receiver Internal fail	P.54A-640
U0019	Bus off (CAN-B)	P.54A-642
U0141	ETACS CAN timeout	P.54A-644
U0151	SRS-ABG CAN timeout	P.54A-646
U0154	OCM (occupant classification-ECU) CAN timeout	P.54A-648
U0155	Meter CAN timeout	P.54A-650
U0164	A/C CAN timeout	P.54A-652
U0168	WCM CAN timeout	P.54A-654
U0184	Audio CAN timeout	P.54A-656
U0197	Hands free module CAN timeout	P.54A-659

DIAGNOSTIC TROUBLE CODE PROCEDURES

DTC B2222: Radio receiver internal fail

⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

⚠ CAUTION

Before replacing the satellite radio tuner, be sure to check that the power supply circuit, ground circuit, and communication circuit are normal.

TROUBLE JUDGMENT

When the ignition switch is ON and the system voltage is from 10 V to 16 V (data from ETACS-ECU), if the satellite radio tuner receives abnormal status by signal conditioning 10 times consecutively, DTC B2222 is stored.

TSB Revision

COMMENTS ON TROUBLE SYMPTOM

The satellite radio tuner or CAN bus line may have a problem.

PROBABLE CAUSES

- Malfunctions of satellite radio tuner
- Malfunction of CAN bus line wiring harness and connector

DIAGNOSIS

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

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

Use scan tool MB991958 to diagnose the CAN bus lines.

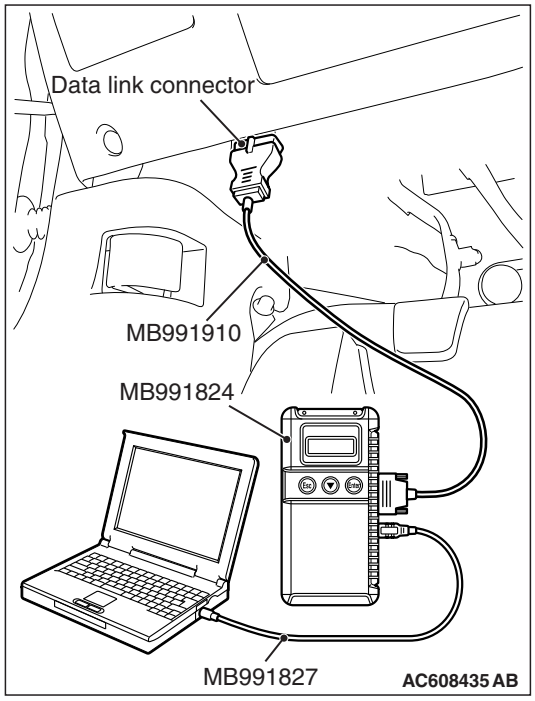
⚠ CAUTION

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 "ON" position.
(3) Diagnose the CAN bus line.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus line. (Refer to GROUP 54C, Diagnosis P.54C-17.) On completion, go to Step 2.



STEP 2. Recheck for diagnostic trouble code.
Check again if the DTC is set to the satellite radio tuner.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if the DTC is set.

Q: Is the DTC set?

YES : Replace the satellite radio tuner.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to use Troubleshooting/inspection Service Points, How to Cope with Intermittent Malfunction P.00-14).

DTC U0019: Bus off (CAN-B)

⚠ CAUTION
If DTC U0019 is set, be sure to diagnose the CAN bus line.

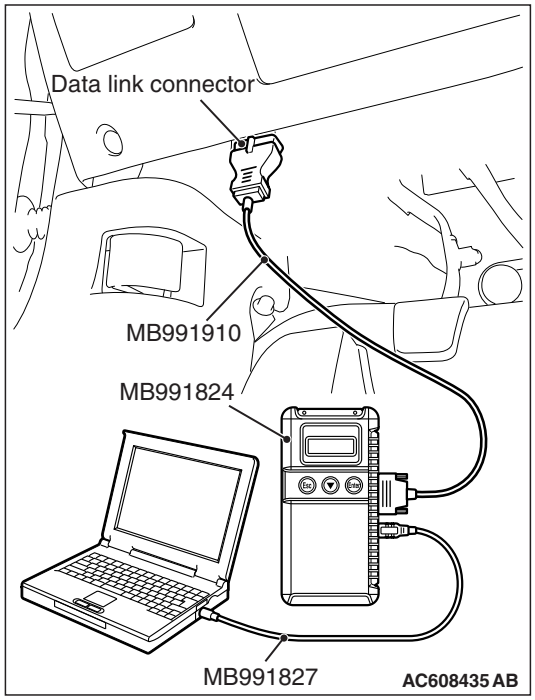
⚠ CAUTION
When replacing the ECU, always check that the communication circuit is normal.

DIAGNOSTIC FUNCTION
If the CAN-B circuit malfunction occurs, the satellite radio tuner sets DTC U0019.

JUDGMENT CRITERIA
With the ignition switch at the ON position and the system voltage at 10 – 16 volts (data from ETACS-ECU), if the satellite radio tuner becomes unable to transmit data normally due to the CAN-B bus circuit malfunction, the satellite radio tuner determines that a problem has occurred.

TROUBLESHOOTING HINTS
The satellite radio tuner, power supply for the satellite radio tuner, earth circuit, or CAN bus line may have a problem.

DIAGNOSIS
Required Special Tools:
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles 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)



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

Use scan tool MB991958 to diagnose the CAN bus lines.

⚠ 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. Refer to "How to connect the Scan Tool (M.U.T.-III) P.54A-638."
(2) Turn the ignition switch to "ON" position.
(3) Diagnose the CAN bus line.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus line. (Refer to GROUP 54C, Diagnosis P.54C-17.) On completion, go to Step 2.

STEP 2. Check whether the scan tool MB991958 can communicate with the satellite radio tuner.

Q: Is the check result normal?

YES : Erase the diagnosis code. The procedure is complete.
NO : Check the power supply circuit of the satellite radio tuner, and repair if necessary.

DTC U0141: ETACS CAN timeout

⚠ CAUTION
If DTC U0141 is set, be sure to diagnose the CAN bus line.

⚠ CAUTION
When replacing the ECU, always check that the communication circuit is normal.

DIAGNOSTIC FUNCTION

If the signal from ETACS-ECU cannot be received, the satellite radio tuner sets the DTC U0141.

JUDGMENT CRITERIA

With the ignition switch in the ON position, system voltage between 10 – 16 volts (data from ETACS-ECU), power supply fuse(IOD fuse) is OK, or odometer value is 80.5 km (50 miles) or more, and the communication with ETACS-ECU cannot be established for 2,500 ms or more, the satellite radio tuner determines that a problem has occurred.

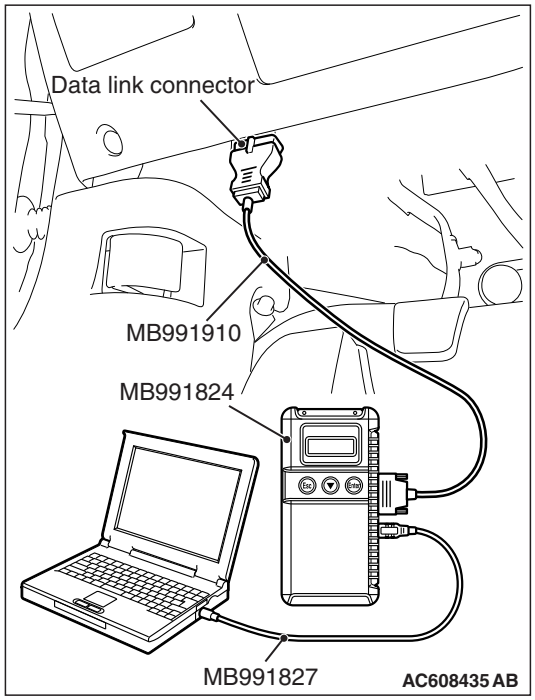
TROUBLESHOOTING HINTS

- The CAN bus line may be defective
- The satellite radio tuner may be defective
- The ETACS-ECU may be defective

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles 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)



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

⚠ 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. Refer to "How to connect the Scan Tool (M.U.T.-III) P.54A-638."
(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-17).

STEP 2. Using scan tool MB991958, read the ETACS-ECU diagnostic trouble code.
Check again if the DTC is set to the ETACS-ECU.

Q: Is the DTC set?

YES : Diagnose the ETACS-ECU (Refer to P.54A-678).
NO : Go to Step 3.

STEP 3. Using scan tool MB991958, read the combination meter diagnostic trouble code.
Check if DTC U0141 is set to the combination meter.

Q: Is the DTC set?

YES : Go to Step 4.
NO : Go to Step 5.

STEP 4. Recheck for diagnostic trouble code.
Check again if the DTC is set to the satellite radio tuner.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the ETACS-ECU.
NO : The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the ETACS-ECU and the satellite radio tuner (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

STEP 5. Recheck for diagnostic trouble code.
Check again if the DTC is set to the satellite radio tuner.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the satellite radio tuner.
NO : The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the ETACS-ECU and the satellite radio tuner (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

DTC U0151: SRS-ECU CAN timeout

⚠ CAUTION

- **If DTC U0151 is set, be sure to diagnose the CAN bus line.**
- **When replacing the satellite radio tuner, always check that the communication circuit is normal.**

DIAGNOSTIC FUNCTION

If the signal from SRS-ECU cannot be received, the satellite radio tuner sets DTC U0151.

JUDGMENT CRITERIA

With the ignition switch in the ON position, system voltage between 10–16 volts (data from ETACS-ECU), power supply fuse (IOD fuse) is OK, or odometer value is 80.5 km (50 miles) or more, and the communication with SRS-ECU cannot be established for 2,500 ms or more, the satellite radio tuner determines that a problem has occurred.

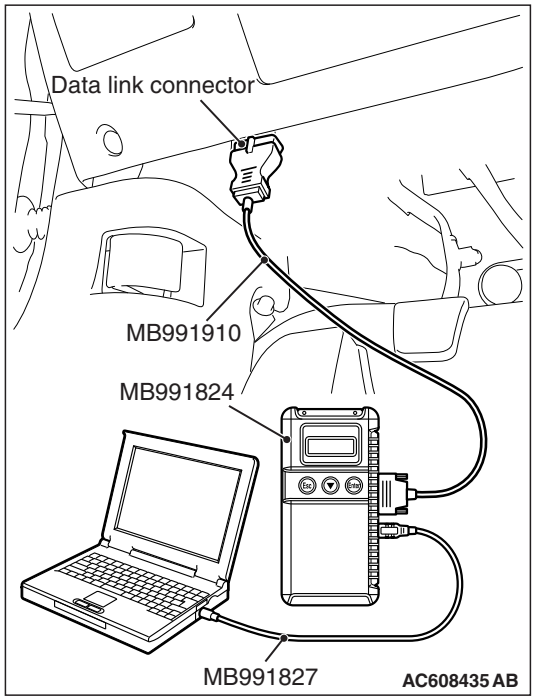
TROUBLESHOOTING HINTS

- The CAN bus line may be defective
- The satellite radio tuner may be defective
- The SRS-ECU may be defective

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles 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)



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

⚠ 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. Refer to "How to connect the Scan Tool (M.U.T.-III) P.54A-638."
(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-17).

STEP 2. Using scan tool MB991958, read the SRS-ECU diagnostic trouble code

Check again if the DTC is set to the SRS-ECU.

Q: Is the DTC set?

YES : Troubleshoot the SRS (Refer to GROUP 52B, Troubleshooting P.52B-32).

NO : Go to Step 3.

STEP 3. Using scan tool MB991958, read the A/C-ECU diagnostic trouble code.

Check if the DTC U0151 is set to the A/C-ECU.

Q: Is the DTC set?

YES : Go to Step 4.

NO : Go to Step 5.

STEP 4. Recheck for diagnostic trouble code.

Check again if the DTC is set to the satellite radio tuner.

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

Q: Is the DTC set?

YES : Replace the SRS-ECU.

NO : The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the SRS-ECU and the satellite radio tuner (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

STEP 5. Recheck for diagnostic trouble code.

Check again if the DTC is set to the satellite radio tuner.

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

Q: Is the DTC set?

YES : Replace the satellite radio tuner.

NO : The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the SRS-ECU and the satellite radio tuner (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

DTC U0154: OCM (occupant classification-ECU) CAN timeout

⚠ CAUTION
If DTC U0154 is set, be sure to diagnose the CAN bus line.

⚠ CAUTION
When replacing the ECU, always check that the communication circuit is normal.

DIAGNOSTIC FUNCTION
When the signals from occupant classification-ECU cannot be received, the satellite radio tuner sets DTC U0154.

JUDGMENT CRITERIA
With the ignition switch in the ON position, system voltage between 10 – 16 volts (data from ETACS-ECU), power supply fuse (IOD fuse) is OK, or odometer value is 80.5 km (50 miles) or more, and the communications with occupant classification-ECU cannot be established for 2,500 ms or more, the satellite radio tuner determines that a problem has occurred.

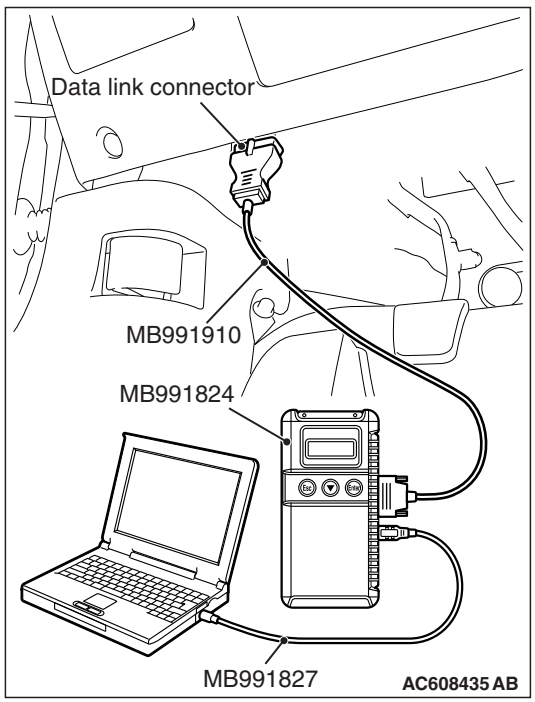
TROUBLESHOOTING HINTS
- The CAN bus line may be defective.
- The satellite radio tuner may be defective.
- The occupant classification-ECU may be defective.

DIAGNOSIS
Required Special Tools:
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles 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)

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

⚠ 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. Refer to "How to connect the Scan Tool (M.U.T.-III) P.54A-638."
(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-17).



STEP 2. Using scan tool MB991958, read the occupant classification-ECU diagnostic trouble code.
Check if DTC is set to the occupant classification-ECU.

Q: Is the DTC set?

YES : Troubleshoot the SRS (Refer to GROUP 52B, Diagnosis P.52B-319).
NO : Go to Step 3.

STEP 3. Using scan tool MB991958, read the A/C-ECU diagnostic trouble code.
Check if the DTC U0154 is set to the A/C-ECU.

Q: Is the DTC set?

YES : Go to Step 4.
NO : Go to Step 5.

STEP 4. Recheck for diagnostic trouble code.
Check again if the DTC is set to the satellite radio tuner.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the occupant classification-ECU.
NO : The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the occupant classification-ECU and the satellite radio tuner (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

STEP 5. Recheck for diagnostic trouble code.
Check again if the DTC is set to the satellite radio tuner.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the satellite radio tuner.
NO : The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the occupant classification-ECU and the satellite radio tuner (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

DTC U0155: Meter CAN timeout

⚠ CAUTION
If DTC U0155 is set in the satellite radio tuner, diagnose the CAN main bus line.

⚠ CAUTION
Whenever the satellite radio tuner is replaced, ensure that the communication circuit is normal.

DIAGNOSTIC FUNCTION
When the signals from combination meter cannot be received, the satellite radio tuner sets DTC U0155.

JUDGMENT CRITERIA
With the ignition switch in the ON position, system voltage between 10 – 16 volts (data from ETACS-ECU), power supply fuse (IOD fuse) is OK, or odometer value is 80.5 km (50 miles) or more, and the communications with combination meter cannot be established for 2,500 ms or more, the satellite radio tuner determines that a problem has occurred.

TROUBLESHOOTING HINTS
- The CAN bus line may be defective.
- The satellite radio tuner may be defective.
- The combination meter may be defective.

DIAGNOSIS
Required Special Tools:
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

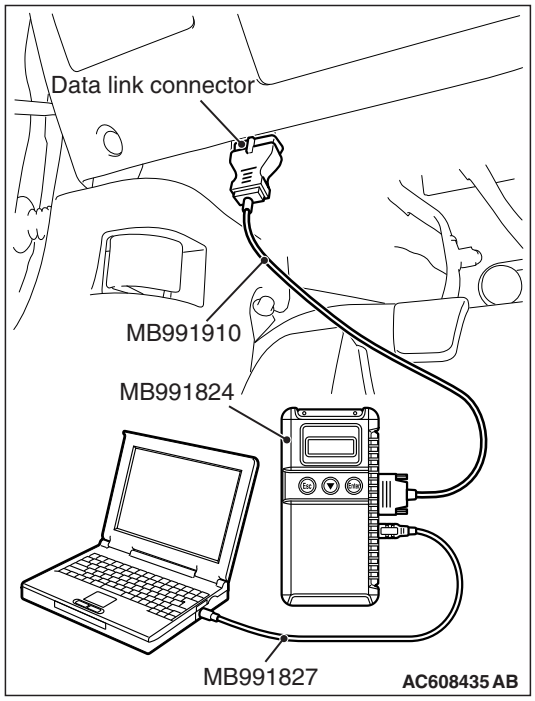
STEP 1. Using scan tool MB991958, diagnose the CAN bus line

⚠ 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. Refer to "How to connect the Scan Tool (M.U.T.-III) P.54A-638."
(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-17).



STEP 2. Using scan tool MB991958 read the combination meter diagnostic trouble code.

Check whether a combination meter DTCs are set or not.

(1) Turn the ignition switch to the "ON" position.
(2) Check for combination meter 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 combination meter (Refer to combination meter, Diagnosis P.54A-33).

STEP 3. Using scan tool MB991958, read the A/C-ECU diagnostic trouble code.

Check if the DTC U0155 is set to the A/C-ECU.

Q: Is the DTC set?

YES : Go to Step 4.
NO : Go to Step 5.

STEP 4. Recheck for diagnostic trouble code.

Check again if the DTC is set to the satellite radio tuner.

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

Q: Is the DTC set?

YES : Replace the combination meter.
NO : The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the combination meter and the satellite radio tuner (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

STEP 5. Recheck for diagnostic trouble code.

Check again if the DTC is set to the satellite radio tuner.

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

Q: Is the DTC set?

YES : Replace the satellite radio tuner.
NO : The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the combination meter and the satellite radio tuner (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

DTC U0164: A/C CAN timeout

⚠ CAUTION

- **If DTC U0164 is set, be sure to diagnose the CAN bus line.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DIAGNOSTIC FUNCTION

If the signal from A/C-ECU cannot be received, the satellite radio tuner sets DTC U0164.

JUDGMENT CRITERIA

With the ignition switch in the ON position, system voltage between 10–16 volts (data from ETACS-ECU), power supply fuse (IOD fuse) is OK, or odometer value is 80.5 km (50 miles) or more, and the communication with A/C-ECU cannot be established for 2,500 ms or more, the satellite radio tuner determines that a problem has occurred.

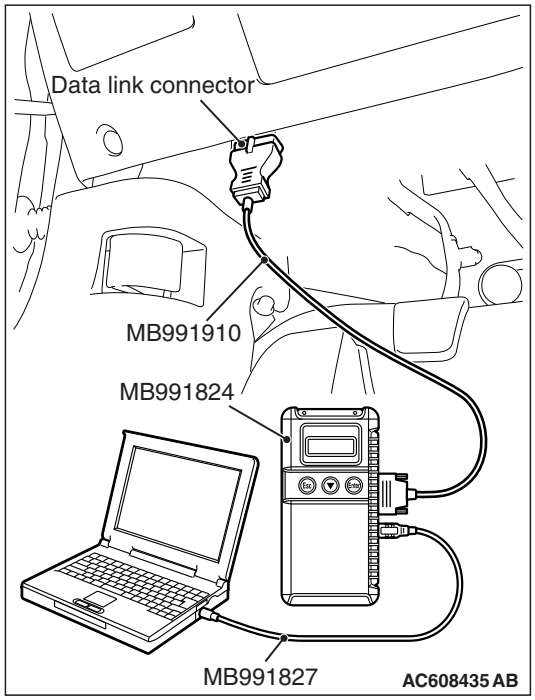
TROUBLESHOOTING HINTS

- The CAN bus line may be defective.
- The A/C-ECU may be defective.
- The satellite radio tuner may be defective.

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles 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)



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

⚠ 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. Refer to "How to connect the Scan Tool (M.U.T.-III) P.54A-638."
(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-17).

STEP 2. Using scan tool MB991958, read the A/C-ECU diagnostic trouble code.
Check if DTC is set to the A/C-ECU.

Q: Is the DTC set?

YES : Troubleshoot the A/C/Heater control unit (Refer to GROUP 55A, Manual A/C Diagnosis P.55A-9 or GROUP 55B, Auto A/C Diagnosis P.55B-8).
NO : Go to Step 3.

STEP 3. Using scan tool MB991958, read the ETACS diagnostic trouble code.
Check if the DTC U0164 is set to the ETACS-ECU.

Q: Is the DTC set?

YES : Go to Step 4.
NO : Go to Step 5.

STEP 4. Recheck for diagnostic trouble code.
Check again if the DTC is set to the satellite radio tuner.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the A/C-ECU.
NO : The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the A/C-ECU and the satellite radio tuner (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

STEP 5. Recheck for diagnostic trouble code.
Check again if the DTC is set to the satellite radio tuner.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the satellite radio tuner.
NO : The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the A/C-ECU and the satellite radio tuner (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

DTC U0168: WCM/KOS CAN timeout

⚠ CAUTION

- **If DTC U0168 is set, be sure to diagnose the CAN bus line.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DIAGNOSTIC FUNCTION

If the signal from KOS-ECU <vehicles with KOS> or WCM <vehicles with WCM> cannot be received, the satellite radio tuner sets DTC U0168.

JUDGMENT CRITERIA

With the ignition switch in the ON position, system voltage between 10 – 16 V (data from ETACS-ECU), power supply fuse (IOD fuse) is OK, or odometer value is 80.5 km (50 miles) or more, and the communication with KOS-ECU <vehicles with KOS> or WCM <vehicles with WCM> cannot be established for 2,500 ms or more, the satellite radio tuner determines that a problem has occurred.

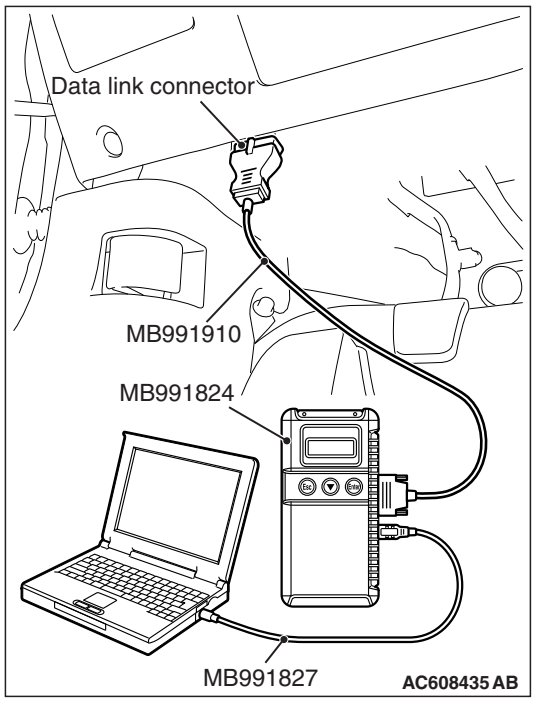
TROUBLESHOOTING HINTS

- Malfunction of CAN bus line may be defective.
- Malfunction of the KOS-ECU may be defective. <vehicles with KOS>
- Malfunction of the WCM may be defective. <vehicles with WCM>
- Malfunction of satellite radio tuner may be defective.

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles 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)



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

⚠ 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. Refer to "How to connect the Scan Tool (M.U.T.-III) P.54A-638."
(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-17).

STEP 2. Using scan tool MB991958, read the KOS-ECU <vehicles with KOS> or WCM <vehicles with WCM> diagnostic trouble code.

Check again if the DTC is set to the KOS-ECU <vehicles with KOS> or WCM <vehicles with WCM>.

Q: Is the DTC set?

YES : Troubleshoot the KOS or WCM (Refer to GROUP 42B, Diagnosis P.42B-28 <KOS> or GROUP 42C, Diagnosis P.42C-17 <WCM>).
NO : Go to Step 3.

STEP 3. Using scan tool MB991958, read the diagnostic trouble code.

Check if the DTC U0168 is set to the ETACS-ECU.

Q: Is the DTC set?

YES : Go to Step 4.
NO : Go to Step 5.

STEP 4. Recheck for diagnostic trouble code.

Check again if the DTC is set to the satellite radio tuner.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the WCM or KOS-ECU.
NO : The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the WCM or KOS-ECU and the satellite radio tuner (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

STEP 5. Recheck for diagnostic trouble code.

Check again if the DTC is set to the satellite radio tuner.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the satellite radio tuner.
NO : The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the WCM or KOS-ECU and the satellite radio tuner (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

DTC U0184: Audio CAN timeout

⚠ CAUTION
- **If DTC U0184 is set to the satellite radio tuner, always diagnose the CAN bus line.**
- **Before replacing the satellite radio tuner, ensure that the communication circuit is normal.**

TROUBLE JUDGMENT

If the signal from radio and CD player cannot be received, the satellite radio tuner sets DTC U0184.

JUDGMENT CRITERIA

After the following statuses continue to be true for 5 seconds, if the communication with the radio and CD player cannot be established for 0.6 second or more, the satellite radio tuner determines that a problem has occurred.

- No abnormality is present to the network.
- Ignition switch is in the ON position.
- No abnormality is present to the power supply fuse (IOD fuse), or the odometer value is at 80.5 km (50.0 miles) or more.
- ETACS-ECU system voltage is at 10–16 volts.

TROUBLESHOOTING HINTS

- The radio and CD changer may be defective.
- The satellite radio tuner may be defective.
- The CAN bus may be defective.

DIAGNOSIS

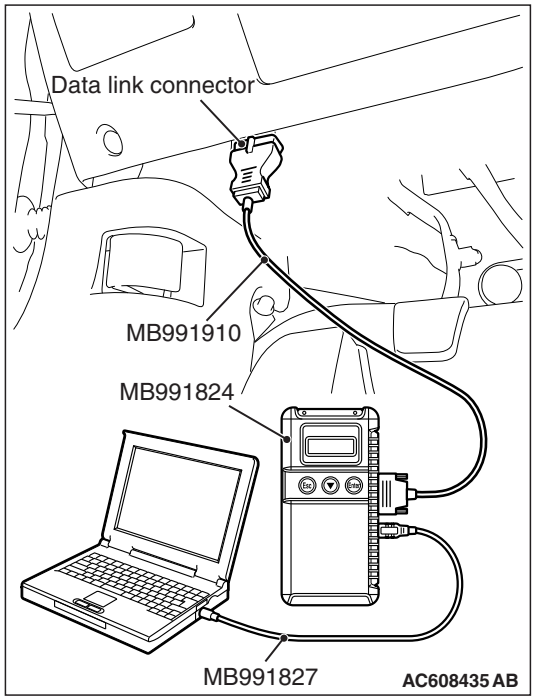
Required Special Tools:

- 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 (Vehicles with CAN communication system)

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

⚠ 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. Refer to "How to connect the Scan Tool (M.U.T.-III) P.54A-638."
(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-17).

STEP 2. Using scan tool MB991958, read the radio and CD player diagnostic trouble code.

Check if DTC is set to the radio and CD player.

Q: Is the DTC set?

YES : Troubleshoot the radio and CD player (Refer to P.54A-640).
NO : Go to Step 3.

STEP 3. Using scan tool MB991958, read the ETACS diagnostic trouble code.

Check if the DTC U0184 is set to the ETACS-ECU.

Q: Is the DTC set?

YES : Go to Step 4.
NO : Go to Step 5.

TSB Revision

STEP 4. Recheck for diagnostic trouble code.

Check again if the DTC is set to the satellite radio tuner.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the radio and CD player.
NO : The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the radio and CD player and the satellite radio tuner (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

STEP 5. Recheck for diagnostic trouble code.

Check again if the DTC is set to the satellite radio tuner.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the satellite radio tuner.
NO : The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the radio and CD player and the satellite radio tuner (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

DTC U0197: Hands free module CAN timeout

⚠ CAUTION

- **If DTC U0197 is set, be sure to diagnose the CAN bus line.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DIAGNOSTIC FUNCTION

When the signals from hands free module cannot be received, the satellite radio tuner sets DTC U0197.

JUDGMENT CRITERIA

With the ignition switch in the ON position, system voltage between 10 – 16 volts (data from ETACS-ECU), power supply fuse(IOD fuse) is OK, or odometer value is 80.5 km (50 miles) or more, and the communications with hands free module cannot be established for 2,500 ms or more, the satellite radio tuner determines that a problem has occurred.

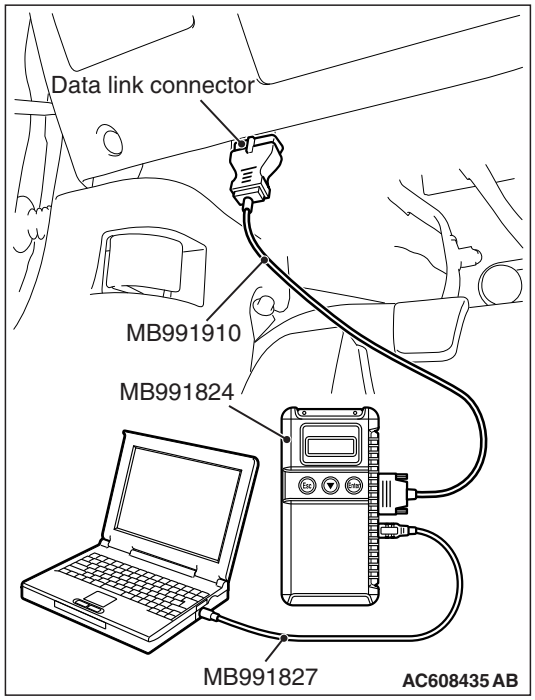
TROUBLESHOOTING HINTS

- The CAN bus line may be defective.
- The satellite radio tuner may be defective.
- The hands free module may be defective.

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles 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)



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

⚠ 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. Refer to "How to connect the Scan Tool (M.U.T.-III) P.54A-638."
(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-17).

STEP 2. Using scan tool MB991958, read the hands free module diagnostic trouble code.
Check again if the DTC is set to the hands free module.

Q: Is the DTC set?

YES : Troubleshoot the hands free cellular phone system. (Refer to P.54A-563.)
NO : Go to Step 3.

STEP 3. Using scan tool MB991958, read the ETACS-ECU diagnostic trouble code.
Check if the DTC U0197 is set to the ETACS-ECU.

Q: Is the DTC set?

YES : Go to Step 4.
NO : Go to Step 5.

STEP 4. Recheck for diagnostic trouble code.
Check again if the DTC is set to the satellite radio tuner.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the hands free module.
NO : The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the hands free module and the satellite radio tuner (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

STEP 5. Recheck for diagnostic trouble code.
Check again if the DTC is set to the satellite radio tuner.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the DTC set?

YES : Replace the satellite radio tuner.
NO : The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the hands free module and the satellite radio tuner (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-14).

TROUBLE SYMPTOM CHART

M1544016400055

Inspection Procedure No.	Trouble symptom	Reference page
1	A satellite radio cannot be received.	P.54A-661
2	Check the satellite radio tuner power supply circuit.	P.54A-665
3	The error code "ANTENNA ERROR" is displayed on the display.	P.54A-669

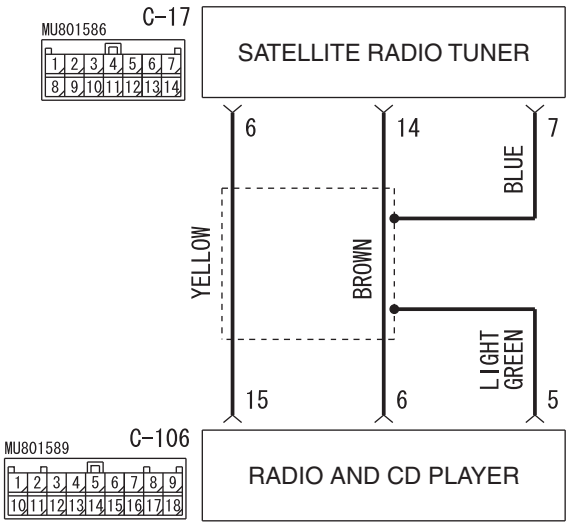
SYMPTOM PROCEDURES

Inspection Procedure 1: A satellite radio cannot be received.

⚠ CAUTION

Before replacing the satellite radio tuner, antenna feeder cable, radio and CD player <vehicles with radio and CD player> or audio visual navigation unit <vehicles with MMCS>, ensure that the power supply circuit, the ground circuit and the communication circuit are normal.

Satellite Radio Tuner Communication Circuit <Vehicles with Radio and CD Player>



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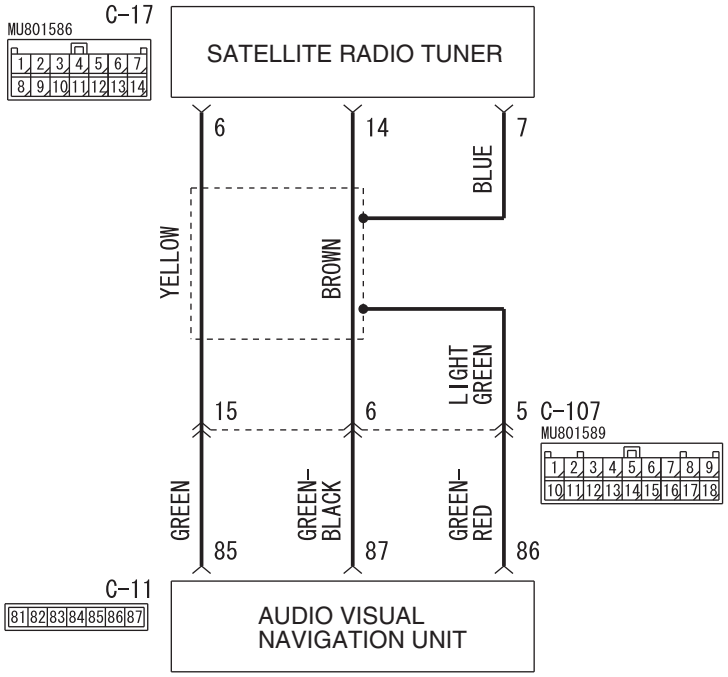
Satellite Radio Tuner Communication Circuit <Vehicles with MMCS>



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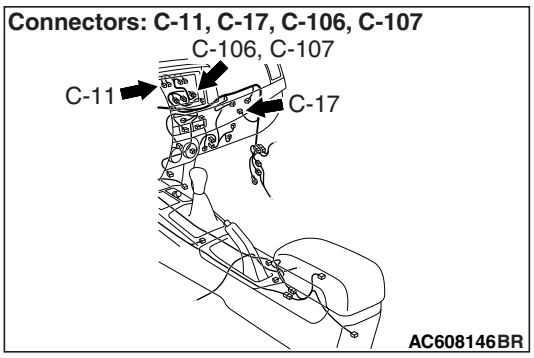

COMMENTS ON TROUBLE SYMPTOM

There may be a failure in the wiring harness from the satellite radio tuner to the radio and CD player <vehicles with radio and CD player> or audio visual navigation unit <vehicles with MMCS>, its respective connector(s), the satellite radio tuner, the CD player <vehicles with radio and CD player> or the audio visual navigation unit <vehicles with MMCS>.

PROBABLE CAUSES

- Malfunctions of satellite radio tuner
- Malfunctions of radio and CD player <vehicles with radio and CD player> or audio visual navigation unit <vehicles with MMCS>
- Damaged harness wires and connectors

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- 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

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STEP 1. Check whether AM or FM broadcast frequency is received.

Check whether AM or FM broadcast frequency is received.

Q: Is AM or FM broadcast frequency received?

YES : Go to Step 2.

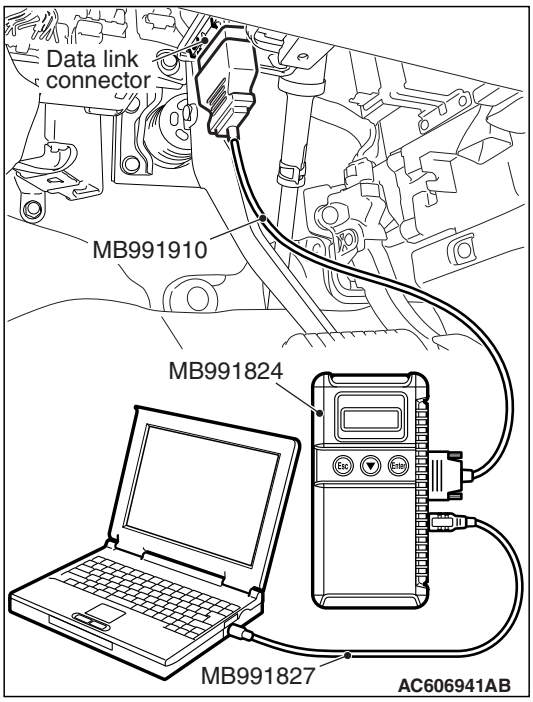
NO : Diagnose the radio and CD player <vehicles with radio and CD player> or the audio visual navigation unit <vehicles with MMCS> (Refer to P.54A-377 <vehicles with radio and CD player> or P.54A-478 <vehicles with MMCS>).

STEP 2. Using scan tool MB991958, diagnose the CAN bus line.

⚠ 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) 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 <vehicles with radio and CD player> : Go to Step 3.

YES <vehicles with MMCS> : Go to Step 6.

NO <vehicles with radio and CD player or MMCS> : Repair the CAN bus line. (Refer to GROUP 54C, Diagnosis P.54C-17).

STEP 3. Check satellite radio tuner connector C-17 and radio and CD player connector C-106 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is satellite radio tuner connector C-17 or radio and CD player connector C-106 in good condition?

YES : Go to Step 4.

NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

STEP 4. Check the wiring harness between satellite radio tuner connector C-17 (terminal 6, 14) and radio and CD player connector C-106 (terminal 15, 6).

- Check the communication lines for open circuit and short circuit.

Q: Is the wiring harness between satellite radio tuner connector C-17 (terminal 6, 14) and radio and CD player connector C-106 (terminal 15, 6) in good condition?

YES : Go to Step 5.
NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.

STEP 5. Substitute a known good radio and CD player, and check the trouble symptom.

Check whether satellite radio broadcast can be received.

Q: Can a satellite radio be received?

YES : Replace the radio and CD player.
NO : Replace the satellite radio tuner.

STEP 6. Check satellite radio tuner connector C-17 and audio visual navigation unit connector C-11 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is satellite radio tuner connector C-17 or audio visual navigation unit connector C-11 in good condition?

YES : Go to Step 7.
NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

STEP 7. Check the wiring harness between satellite radio tuner connector C-17 (terminal 6, 14) and audio visual navigation unit connector C-11 (terminal 85, 87).

- Check the communication lines for open circuit and short circuit.

NOTE: Also check intermediate connector C-107 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-107 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between satellite radio tuner connector C-17 (terminal 6, 14) and audio visual navigation unit connector C-11 (terminal 85, 87) in good condition?

YES : Go to Step 8.
NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.

STEP 8. Substitute a known good audio visual navigation unit, and check the trouble symptom.
Check whether satellite radio broadcast can be received.

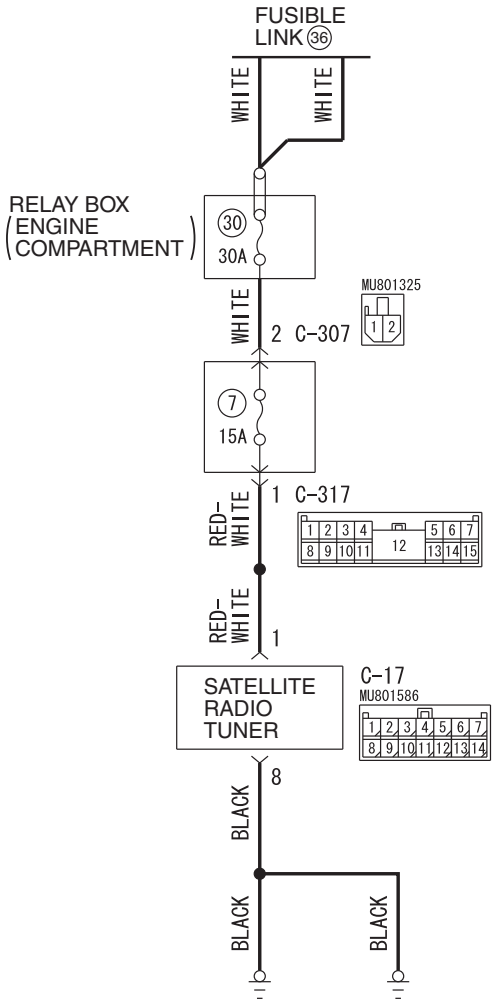
Q: Can a satellite radio be received?

YES : Replace the audio visual navigation unit.
NO : Replace the satellite radio tuner.

Inspection Procedure 2: Check the satellite radio tuner power supply circuit.

⚠ CAUTION
Before replacing the satellite radio tuner, antenna feeder cable, radio and CD player <vehicles with radio and CD player> or audio visual navigation unit <vehicles with MMCS>, ensure that the power supply circuit, the ground circuit and the communication circuit are normal.

Satellite Radio Tuner Power Supply Circuit



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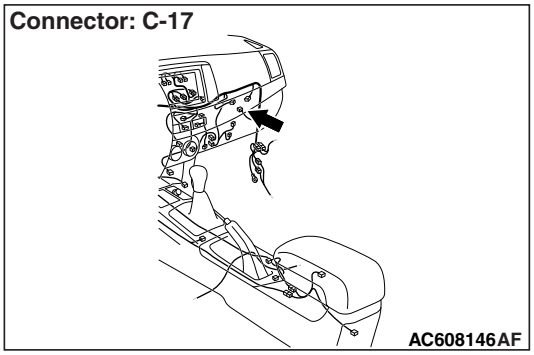
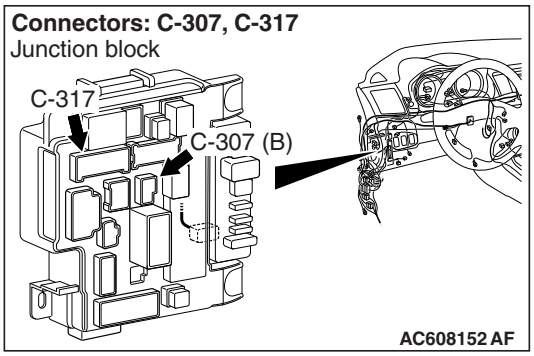




TECHNICAL DESCRIPTION (COMMENT)

If the satellite radio tuner functions do not work at all, the satellite radio tuner power supply system, ground system, or satellite radio tuner may have a problem.

TROUBLESHOOTING HINTS

- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The satellite radio tuner may be defective

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra Fine Probe

STEP 1. Check satellite radio tuner connectors C-17 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

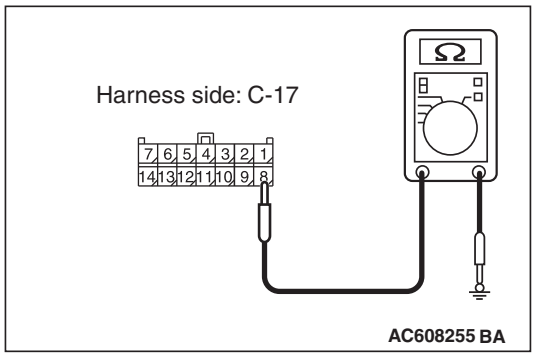
Q: Is satellite radio tuner connectors C-17 in good condition?

YES : Go to Step 2.

NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

STEP 2. Check the ground circuit to the satellite radio tuner. Measure the resistance at satellite radio tuner connectors C-17.

(1) Disconnect satellite radio tuner connector C-17 and measure the resistance available at the wiring harness side of the connector.
(2) Measure the resistance value between satellite radio tuner connector C-17 terminal 8 and ground.
- The resistance should be 2 ohms or less.



Q: Is the measured resistance 2 ohms or less?

YES : Go to Step 4.
NO : Go to Step 3.

STEP 3. Check the wiring harness between satellite radio tuner connector C-17 (terminal 8) and ground.

- Check the ground wire for open circuit.

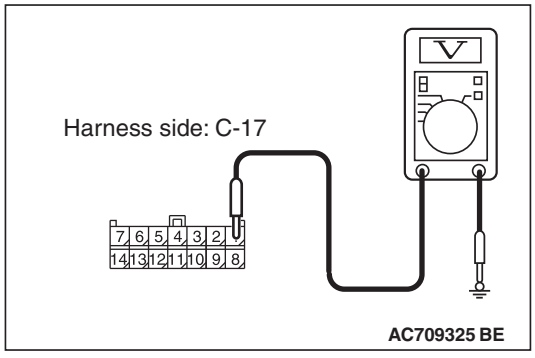
Q: Is the wiring harness between satellite radio tuner connector C-17 (terminal 8) and ground in good condition?

YES : No action is necessary and testing is complete.
NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.

STEP 4. Check the power supply circuit to the satellite radio tuner. Measure the voltage at satellite radio tuner connector C-17.

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

OK: Battery positive voltage



Q: Is the measured voltage battery positive voltage?

YES : Go to Step 6.
NO : Go to Step 5.

STEP 5. Check the wiring harness between satellite radio tuner connector C-17 (terminal 1) and fusible link (36).

- Check the power supply line for open circuit and short circuit.

NOTE: Also check ETACS-ECU connectors C-307 and C-317 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If ETACS-ECU connector C-307 or C-317 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between satellite radio tuner connector C-17 (terminal 1) and fusible link (36) in good condition?

YES : No action is necessary and testing is complete.

NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. The system should communicate with the satellite radio tuner normally.

STEP 6. Retest the system

Check if the satellite radio tuner works normally.

Q: Is the check result normal?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to use Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunction P.00-14).

NO : Replace the satellite radio tuner.

Inspection Procedure 3: The error code "ANTENNA ERROR" is displayed on the display.

⚠ CAUTION
Before replacing the satellite radio tuner, antenna feeder cable, radio and CD player <vehicles with radio and CD player> or audio visual navigation unit <vehicles with MMCS>, ensure that the power supply circuit, the ground circuit and the communication circuit are normal.

TECHNICAL DESCRIPTION (COMMENT)

When there is a failure in the antenna base, antenna rod, or there is an open circuit or improper connection in the antenna feeder, and the satellite radio tuner cannot receive normal voltage value or current value, the error code "ANTENNA ERROR" is displayed on the display.

TROUBLESHOOTING HINTS

- Malfunction of the antenna rod.
- Malfunction of the antenna base.
- Malfunction of the antenna feeder cable.
- Malfunction of the satellite radio tuner.

DIAGNOSIS

STEP 1. Check if the antenna base or antenna rod are damaged.

Q: Are the antenna base or antenna rod damaged?
YES : Replace the antenna base or antenna rod.
NO : Go to Step 2.

STEP 2. Check the connection between the antenna base and the antenna feeder.

Q: Is the connection between the antenna base and the antenna feeder normal?
YES : Go to Step 3.
NO : Repair the connection.

STEP 3. Check if the antenna feeder is damaged.

Q: Is the antenna feeder damaged or bent?
YES : Repair or replace the antenna feeder.
NO : Go to Step 4.

STEP 4. Check the connection between the antenna feeder cable and the satellite radio tuner.

Q: Is the connection between the antenna feeder and the satellite radio tuner normal?
YES : Go to Step 5.
NO : Repair the connection.

STEP 5. Temporarily replace the antenna base, and check if "ANTENNA ERROR" is displayed on the display.

Q: Is "ANTENNA ERROR" displayed on the display?
YES : Replace the satellite radio tuner.
NO : Replace the antenna base.

ON-VEHICLE SERVICE

HOW TO READ SIRIUS ID

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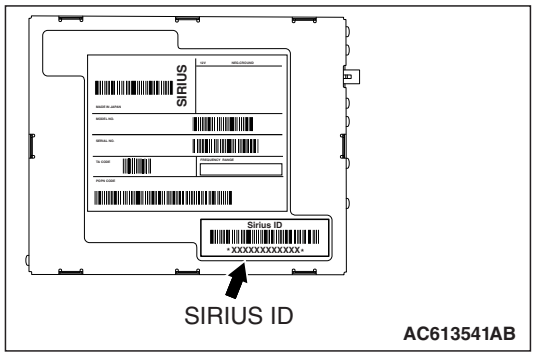
READ THE SIRIUS ID DIRECTLY FROM THE SATELLITE RADIO TUNER.

When the SIRIUS ID (12 digits) cannot be displayed by operating the multivision display, or radio and CD player, it can be read directly by the satellite radio tuner.

1. Remove the satellite radio tuner. Refer to P.54A-670.
2. Read the SIRIUS ID (12 digits) from the satellite radio tuner.



REMOVAL AND INSTALLATION

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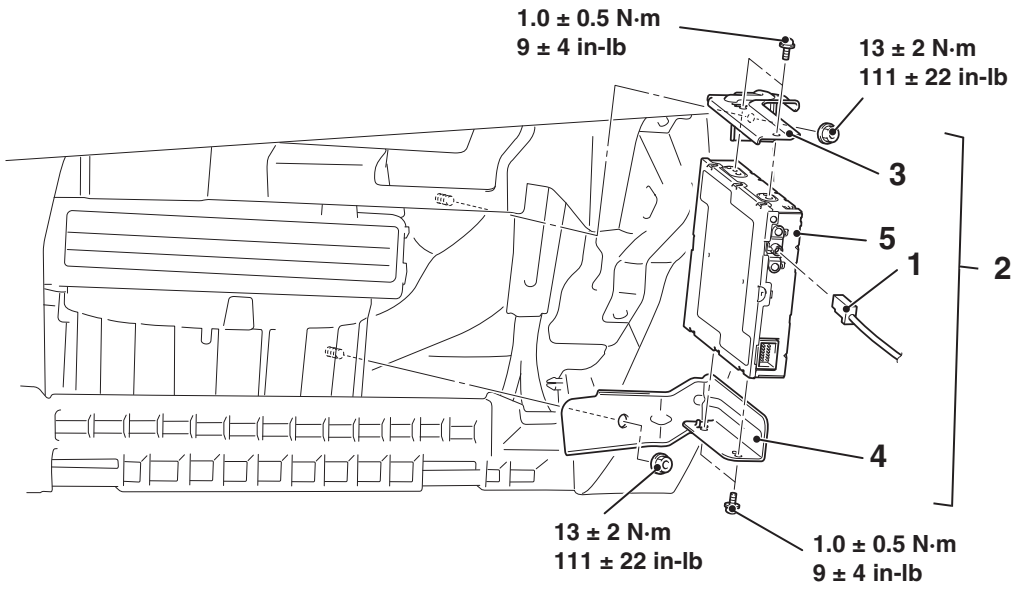

Removal Steps

- Bottom cover (passenger side) (Refer to GROUP 52A – Grove box P.52A-6).
- Grove box (Refer to GROUP 52A – Grove box P.52A-6).

Removal Steps (Continued)

1. Satellite radio tuner connector
2. Satellite radio tuner assembly
3. Satellite radio tuner bracket (upper)
4. Satellite radio tuner bracket (lower)
5. Satellite radio tuner

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