GROUP 54A

CHASSIS ELECTRICAL

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⚠ WARNING
Battery posts, terminals and related accessories contain lead and lead compounds. WASH HANDS AFTER HANDLING.

WARNINGS REGARDING SERVICING OF SUPPLEMENTAL RESTRAINT SYSTEM (SRS) EQUIPPED VEHICLES

⚠ WARNING

- ***Improper service or maintenance of any component of the SRS, or any SRS-related component, can lead to personal injury or death to service personnel (from inadvertent firing of the air bag) or to the driver and passenger (from rendering the SRS inoperative).***
- ***Service or maintenance of any SRS component or SRS-related component must be performed only at an authorized MITSUBISHI dealer.***
- ***MITSUBISHI dealer personnel must thoroughly review this manual, and especially its GROUP 52B - Supplemental Restraint System (SRS) before beginning any service or maintenance of any component of the SRS or any SRS-related component.***

NOTE
The SRS includes the following components: SRS air bag control unit, SRS warning light, front impact sensors, air bag module, clock spring, and interconnecting wiring. Other SRS-related components (that may have to be removed/installed in connection with SRS service or maintenance) are indicated in the table of contents by an asterisk (*).

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BATTERY

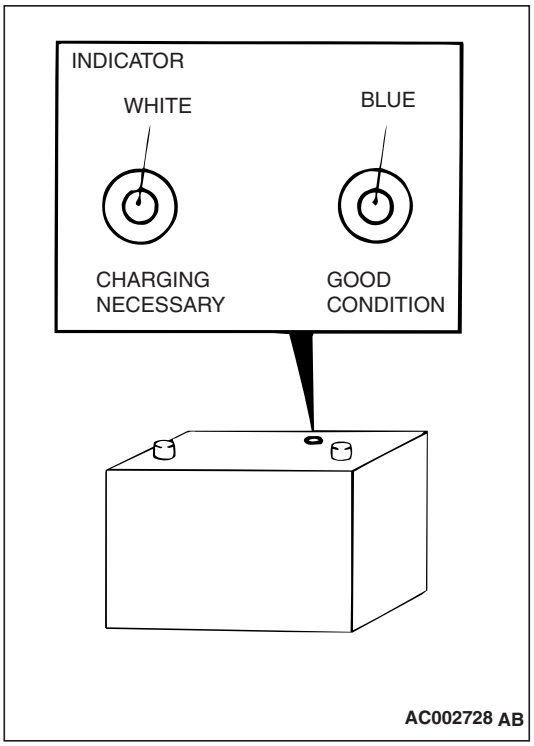
ON-VEHICLE SERVICE

BATTERY CHECK

M1541001000342

⚠ ***WARNING***

Battery posts, terminals and related accessories contain lead and lead compounds. WASH HANDS AFTER HANDLING.



BATTERY VISUAL INSPECTION (1)

The battery contains a visual test indicator which gives a blue signal when an adequate charge level exists, and a white signal when charging is required.

BATTERY VISUAL INSPECTION (2)

Make sure the ignition switch is in "LOCK" (OFF) position and all battery fed accessories are OFF.

1. Disconnect the negative cable from battery before disconnecting the positive cable.

⚠ ***WARNING***

Care should be taken in the event battery case is cracked or leaking to protect hands from the electrolyte. A suitable pair of rubber gloves (not the household type) should be worn when removing battery by hand.

2. Remove the battery from the vehicle.
3. Inspect the battery carrier for damage caused by loss of acid from battery. If acid damage is present, it is necessary to clean area with a solution of clean warm water and baking soda. Scrub area with a stiff bristle brush. Wipe clean with a cloth moistened with ammonia or baking soda in water.
4. Clean the battery, especially the top, with the same solutions as described in step 3.
5. Inspect the battery case and cover for cracks. If cracks are present, battery must be replaced.
6. Clean the battery post with a suitable battery post cleaning tool.
7. Clean the inside surfaces of the terminal clamps with a suitable battery terminal cleaning tool. Replace damaged or frayed cables and broken terminal clamps.
8. Install the battery in the vehicle.
9. Connect the positive and negative cables to the battery in the order of mention.
10. Tighten the clamp nut securely.

BATTERY CHARGING

M1541001100394

⚠ ***WARNING***

When batteries are being charged, an explosive gas forms beneath the cover of each cell. Do not smoke near batteries on charge or which have recently been charged. Do not break live circuits at the terminals of the batteries on charge. A spark will occur where the live circuit is broken. Keep all open flames away from the battery.

Battery electrolyte temperature may temporarily be allowed to rise to 55 °C (131 °F). Increase of electrolyte temperature above 55 °C (131 °F) is harmful to the battery, causing deformation of battery cell, decrease in life of battery, etc.

CHARGE RATE

If the test indicator is white, the battery should be charged as outlined below. When the dot appears or when maximum charge shown below is reached, charging should be stopped.

Charge Rate Chart

BATTERY	**75D23L**
Slow charging	5 amps 11 hours
	10 amps 6 hours
Fast charging	20 amps 3 hours
	30 amps 2 hours

BATTERY TEST

M1541001200625

BATTERY TESTING PROCEDURE

STEP 1. Check the battery cables.
(1) Remove the negative cable, then the positive cable.
(2) Check for dirty or corroded connections.

Q: Are the battery cables dirty or have corroded connections?
YES : Clean the battery cables. Then go to Step 2.
NO : Go to Step 2.

STEP 2. Check the battery posts.
Check for loose battery post.

Q: Are the battery posts loose?
Yes : Replace the battery. Then go to Step 4.
NO : Go to Step 3.

STEP 3. Check the battery case and cover.
(1) Remove the hold-downs and shields.
(2) Check for broken/cracked case or cover.

Q: Is the battery case or cover faulty?
YES : Replace the battery. Then go to Step 4.
NO : Go to Step 4.

STEP 4. Check the open circuit voltage.
(1) Turn headlights on for 15 seconds.
(2) Turn headlights off for two minutes to allow battery positive voltage to stabilize.
(3) Disconnect the battery cables.
(4) Read open circuit voltage.

Q: Is open circuit voltage 12.4 volts or more?
YES : Charge the battery at 5 amps for 15 hours. Then re-test.
NO : Go to Step 5.

STEP 5. Check the load test.
(1) Connect a load tester to the battery.
(2) Load the battery at the recommended discharge rate (See LOAD TEST RATE CHART) for 15 seconds.
(3) Read voltage after 15 seconds, then remove load.
(4) Compare the measured value with the minimum voltage. (See LOAD TEST CHART.)

Q: Is the voltage higher than minimum voltage?
YES : The battery is normal.
NO : Replace the battery. Then go to Step 4.

LOAD TEST CHART (PENDING)

TEMPERATURE °C (°F)	21 (70) AND ABOVE	16 (60)	10 (50)	4 (40)	– 1 (30)	– 7 (20)	– 12 (10)	– 18 (0)
Minimum voltage	9.6	9.5	9.4	9.3	9.1	8.9	8.7	8.5

LOAD TEST RATE CHART

Load test	260 amps
Cranking ratio (– 18° C, 0° F)	520 amps
Reserve capacity	118 minutes
Application	75D23L

IGNITION SWITCH

GENERAL DESCRIPTION

M1543000100546

IGNITION KEY REMINDER TONE ALARM

The ignition key reminder tone alarm will sound under the following condition, and warn the driver to remove the ignition key.

- The driver's door is opened when the ignition switch is at "LOCK" (OFF) or "ACC" position without removing the ignition key.

However, the light reminder tone alarm will take precedence over this function.

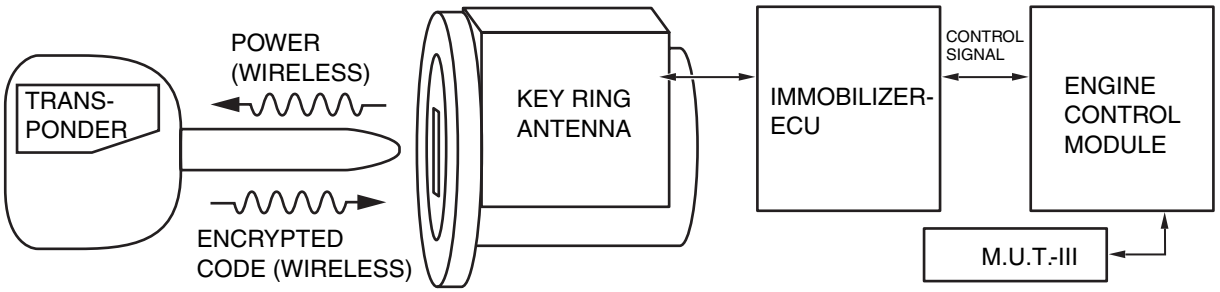
IMMOBILIZER SYSTEM

The immobilizer system consists of the ignition key, the key ring antenna, the immobilizer-ECU, and the engine control module (ECM). The ignition key has a built-in transponder. Only the registered ignition key permits the engine to start, therefore, the engine can never be started by means of a forged key or by connecting the ignition wiring directly. The system is significantly safe and reliable against theft. In addition, the driver has only to turn the ignition switch to the "ON" position to activate the immobilizer system. If the requirements for starting the engine are not satisfied, the engine will be immobilized. If a registered ignition key is lost, all your ignition keys need to be registered again using scan tool MB991958 (M.U.T.-III Sub Assembly) to ensure security (Refer to P.54A-38). An additional ignition key can be registered as follows (only if two registered ignition keys are available):

- Using scan tool MB991958 (M.U.T.-III Sub Assembly) (Refer to P.54A-38).
- By operating two ignition keys that have been already registered (Refer to P.54A-38).

OPERATION

1. After the ignition is switched on, the engine control module sends a control signal and transponder read command signal to the immobilizer-ECU.
2. When the immobilizer-ECU receives the control signal from the engine control module through the key ring antenna, the immobilizer-ECU supplies a current and sends random number data to the transponder in the ignition key.
3. The transponder uses the random number data to derive an ID code, which is sent to the immobilizer-ECU through the key ring antenna.
4. The immobilizer-ECU compares the ID code that was sent with pre-registered ID codes, and if it matches, a control signal approving ignition is sent to the engine control module. If the ID code does not match (in the case of counterfeit ignition keys, for example), the immobilizer-ECU sends a control signal denying ignition to the engine control module, preventing the engine from starting.



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CAUTION WHEN REPLACING IMMOBILIZER SYSTEM RELATED PARTS

To replace immobilizer system related parts, refer to the table below. When the ignition key is re-registered with scan tool MB991958, the originally registered ignition key registration information will be lost.

ITEMS	PCM	IMMOBILIZER-ECU	IGNITION KEY
When replacing PCM	-	Replacement not required	Replacement not required. All ignition keys re-registration are required.
When rewriting PCM*	-	Replacement not required	Replacement not required. Re-registration not required.
When replacing immobilizer-ECU	Replacement not required	-	Replacement not required. Re-registration are required.
When adding ignition keys newly (if no registered ignition keys are lost)	Replacement not required	Replacement not required	Register only additional ignition keys to be registered.
When adding ignition key newly (if a registered ignition key is lost)	Replacement not required	Replacement not required	Register ignition key to be added and re-register all other ignition keys.
When ignition key is lost	Replacement not required	Replacement not required	Re-register all other ignition keys except the lost one.

*NOTE: *: When the PCM other than immobilizer system is rewritten, it is not necessary to register the ignition key again.*

IGNITION KEY REMINDER TORN ALARM

M1543000700872

The Ignition key reminder tone alarms is controlled by the Simplified Wiring System (SWS). For troubleshooting, refer to GROUP 54B, SWS Diagnosis P.54B-23.

IMMOBILIZER SYSTEM DIAGNOSIS

INTRODUCTION TO IMMOBILIZER SYSTEM DIAGNOSIS

M1543009901207

⚠ CAUTION

The encrypted code should always be re-registered when replacing the immobilizer-ECU.The immobilizer system consists of the ignition key, the key ring antenna, the immobilizer-ECU, and the engine control module. If the engine cannot be started by using a registered ignition key, one of these components may be defective. If the immobilizer system has immobilized the engine, MFI system DTC P0513 will be output. In this case, observe the immobilizer system troubleshooting.

IMMOBILIZER SYSTEM DIAGNOSTIC TROUBLESHOOTING STRATEGY

M1543006900863

Use the following steps to plan your diagnostic strategy.

1. Gather information about the problem from the customer.
2. Verify that the condition as described by the customer exists.
3. Check the vehicle for any immobilizer system DTCs.
4. If you cannot verify the condition and there are no immobilizer system DTCs, the malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/inspection Service Points –How to Cope with Intermittent Malfunctions P.00-13.
5. If you can verify the condition but there are no immobilizer system DTCs, or the system cannot communicate with scan tool MB991958, refer to Symptom Chart and find the fault P.54A-17.
6. If there is an immobilizer system DTC, record the DTC, then erase it from the memory using scan tool MB991958.
7. Recreate the immobilizer system DTC set conditions to see if the same immobilizer system DTC will resets.
   (1) If the same immobilize system DTC resets, perform the appropriate diagnostic procedure. Refer to Diagnostic Trouble Code Chart P.54A-11.
   (2) If the same immobilizer system DTC does not reset, the malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/ inspection Service Points –How to Cope with Intermittent Malfunctions P.00-13.

DIAGNOSIS FUNCTION

M1543007000562

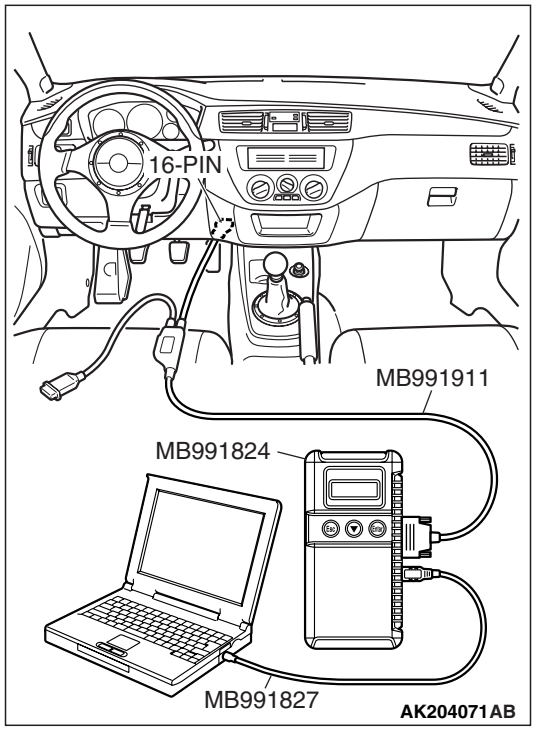
HOW TO CONNECT THE SCAN TOOL

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
  - MB991911: M.U.T.-III Main Harness B

⚠ 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 MB991911 to special tool MB991824.
5. Connect special tool MB991911 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 CODE

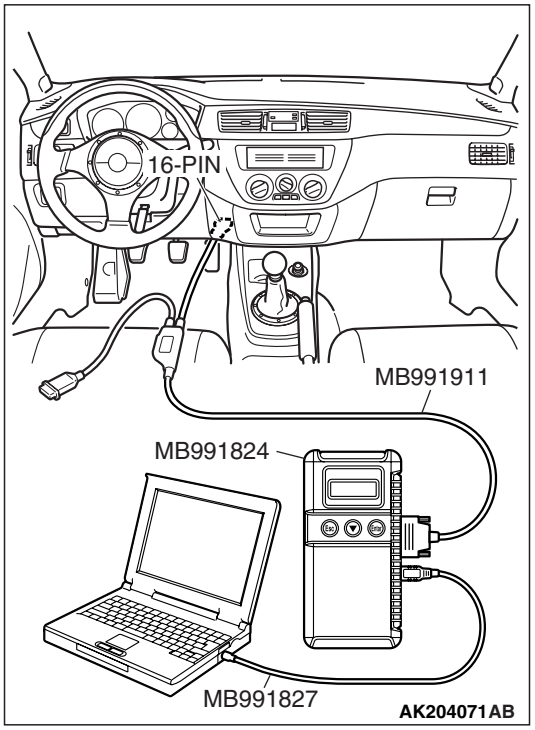
Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991911: M.U.T.-III Main Harness B

⚠ CAUTION

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

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

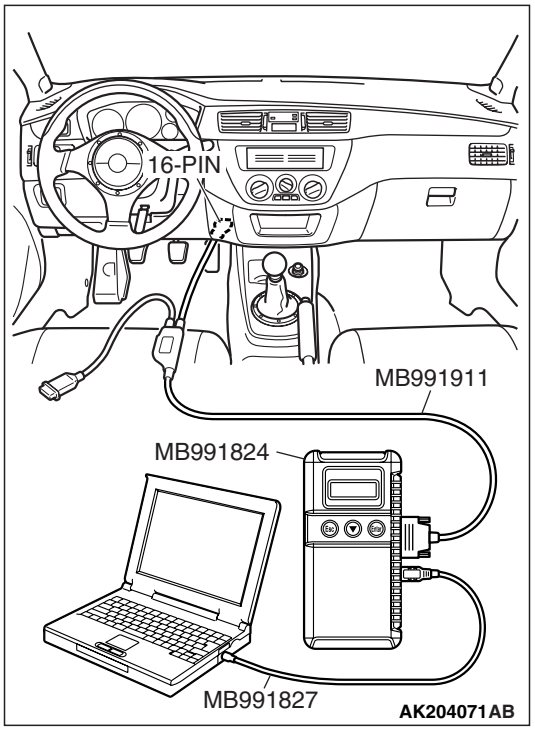


1. Connect scan tool MB991958 to the data link connector.
2. Turn the ignition switch to "ON" position.
3. Select "Interactive Diagnosis" from the start-up screen.
4. Select "System select."
5. Choose "IMMOBILIZER" from the "POWER TRAIN" tab.
6. Select "MITSUBISHI" .
7. Select "Diagnostic Trouble Code."
8. If a DTC is set, it is shown.
9. Choose "Erase DTCs" to erase the DTC.

HOW TO READ DATA LIST

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
  - MB991911: M.U.T.-III Main Harness B



⚠ 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. Select "Interactive Diagnosis" from the start-up screen.
4. Select "System select."
5. Choose "IMMOBILIZER" from the "POWER TRAIN" tab.
6. Select "MITSUBISHI" .
7. Select "Data List."
8. Choose an appropriate item and select the "OK" button

   NOTE: refer to "Transponder Lock Check" P.54A-44.

DIAGNOSTIC TROUBLE CODE CHART

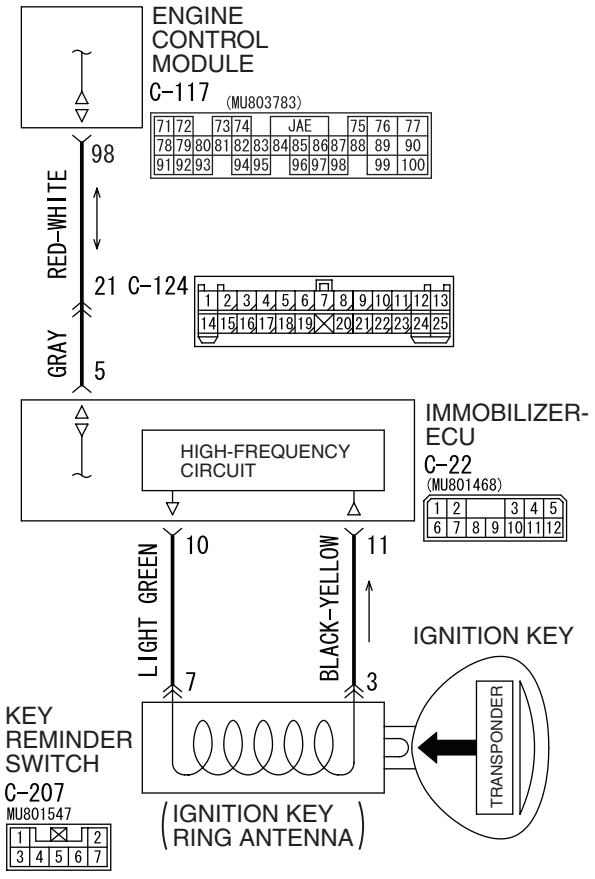
M1543007100536

Use the following chart to develop proper diagnostic strategy.

DIAGNOSTIC TROUBLE CODE NO.	DESCRIPTION	REFERENCE PAGE
11	Transponder communication system or radio interference of encrypted code	P.54A-11.
12	Encrypted codes are not the same or are not registered	P.54A-17.

DIAGNOSTIC TROUBLE CODE PROCEDURES

DTC 11: Transponder Communication System or Radio Interference of Encrypted Code



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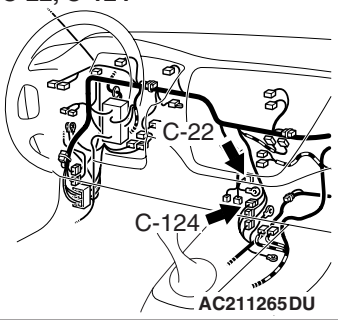
TSB Revision

CONNECTORS: C-22, C-124



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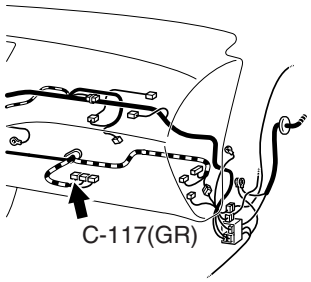
CONNECTOR : C-117



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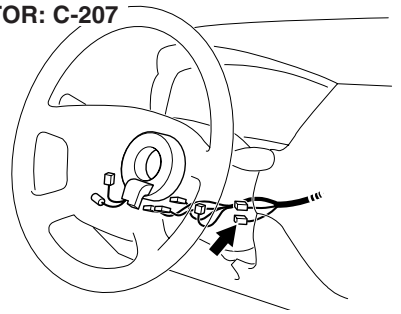
CONNECTOR: C-207



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CIRCUIT OPERATION

The ignition key is powered by the ignition key ring antenna. The ignition key then sends an encrypted code. The ignition key ring antenna receives the encrypted code, and determines if the ignition key is registered.

DTC SET CONDITION

- DTC 11 may be output if other ignition keys are in the vicinity of the vehicle as it is being started.
- The transponder's encrypted code is not sent to the immobilizer-ECU immediately after the ignition switch is turned to "ON" position.

NOTE: DTC 11 is always output together with MFI system DTC P0513.

TROUBLESHOOTING HINTS

- Radio interference of the encrypted code
- Malfunction of the transponder
- Malfunction of the immobilizer-ECU.
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the 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
  - MB991911: M.U.T.-III Main Harness B

STEP 1. Check for presence of other key near the key in the ignition.

Q: Is there any other key near the key in the ignition?

YES : Move the other key well away from key being used. Retest the system.

NO : Go to Step 2.

TSB Revision

STEP 2. Check that the engine start using the spare ignition key which encrypted code has been registered.

Q: Does the engine start using the spare ignition key for which the encrypted code has been registered?

YES : replace the ignition key that does not work. Then register the password (secret code) and encrypted code P.54A-38. Retest the system.

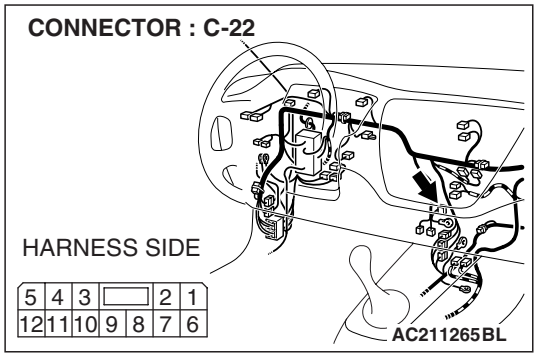
NO : Go to Step 3.

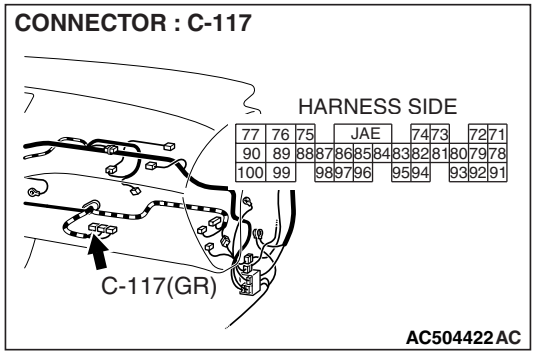
STEP 3. Check immobilizer-ECU connector C-22, key reminder switch connector C-207 and ECM connector C-117 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

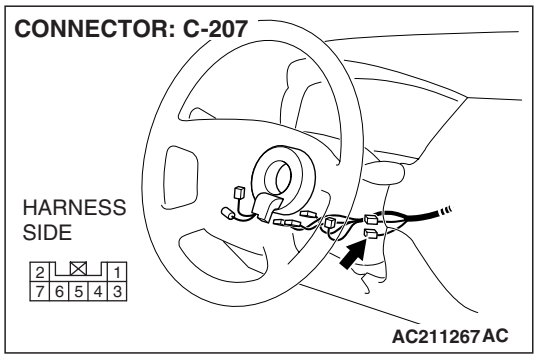
Q: Are immobilizer-ECU connector C-22, key reminder switch connector C-207 and ECM connector C-117 in good condition?

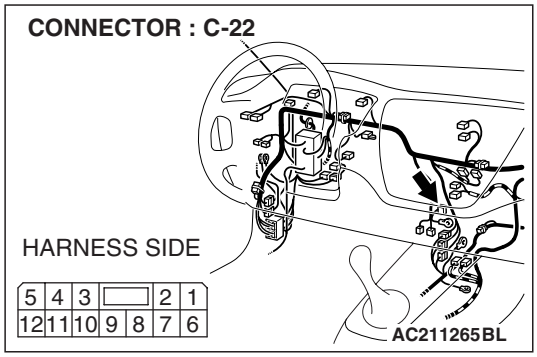
YES : Go to Step 4.

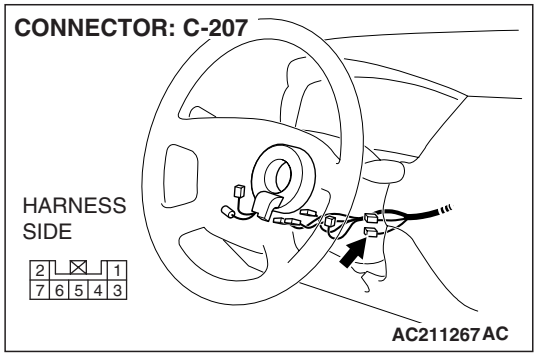
NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Confirm that scan tool MB991958 communicates normally.











STEP 4. Check the harness wires between immobilizer-ECU connector C-22 (terminals 10 and 11) and key reminder switch connector C-207 (terminals 7 and 3).

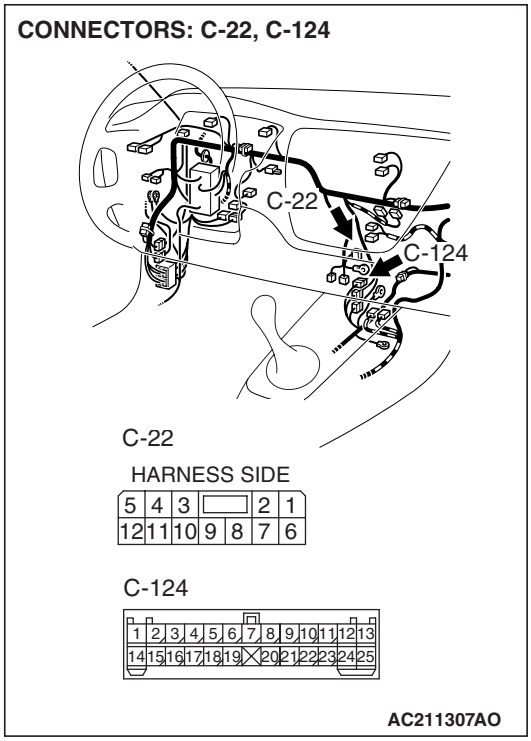
Q: Are the harness wires between immobilizer-ECU connector C-22 (terminals 10 and 11) and key reminder switch connector C-207 (terminals 7 and 3) in good condition?

YES : Go to Step 5.

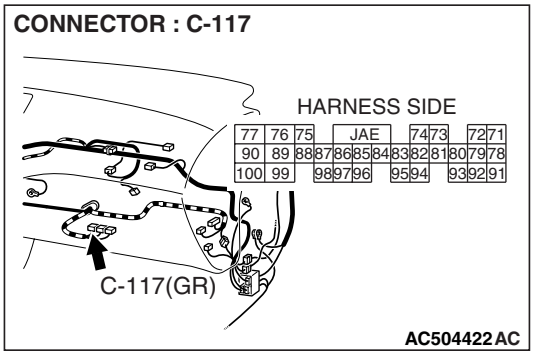
NO : Replace damaged component(s). Confirm that scan tool MB991958 communicates normally.

STEP 5. Check the harness wires between immobilizer-ECU connector C-22 (terminal 5) and ECM connector C-117 (terminal 98).

CONNECTORS: C-22, C-124



CONNECTOR : C-117



NOTE: Also check intermediate connector C-124 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-124 is damaged, Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wires between immobilizer-ECU connector C-22 (terminal 5) and ECM connector C-117 (terminal 98) in good condition?

YES : Go to Step 6.

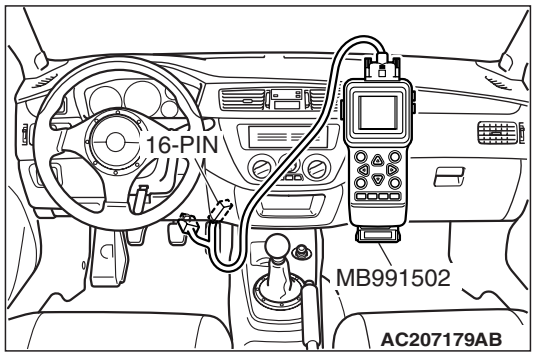
NO : Replace damaged component(s). Confirm that scan tool MB991958 communicates normally.

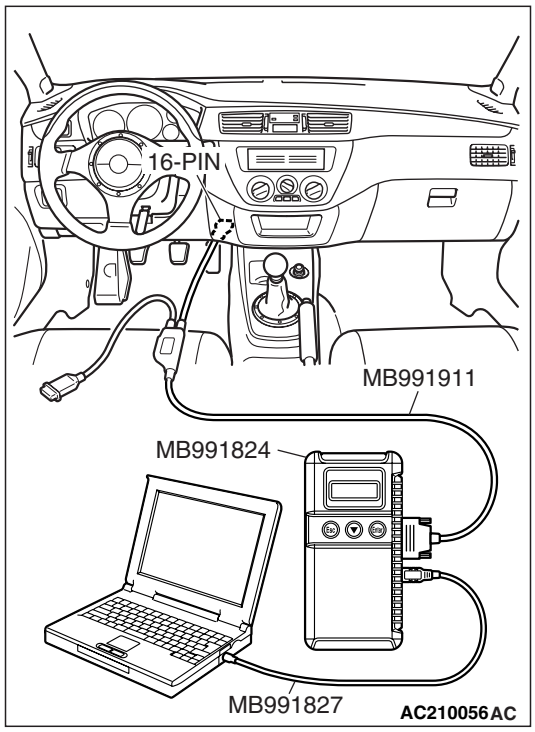
STEP 6. Using scan tool MB991958, read the diagnostic trouble code.

⚠ 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) Use scan tool MB991958 to check immobilizer system diagnostic trouble codes.
(4) Turn the ignition switch to "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.





Q: Which DTC is output, DTC 11 or 12?

DTC12 is output : Refer to DTC 12 P.54A-17.
DTC11 is output : Go to Step 7.

STEP 7. Replace the key ring antenna.

Replace the key ring antenna.

Q: Has the immobilizer system set the DTC?

YES : Replace the immobilizer-ECU. Then register the password (secret code) and encrypted code P.54A-38. Retest the system.
NO : There is no action to be taken.

DTC12: Encrypted Codes are Not the Same or are Not Registered.

DTC SET CONDITION

The encrypted code sent by the transponder is not the same encrypted code which is registered in the immobilizer-ECU.

NOTE: DTC 12 is always output together with MFI system DTC P0513.

TROUBLESHOOTING HINTS

- The encrypted code in the ignition key has not been properly registered
- Malfunction of immobilizer-ECU.

DIAGNOSIS

Was the encrypted code registered?

YES : Replace the immobilizer-ECU. and then re-register the encrypted code (Refer to P.54A-38).

NO : Register the encrypted code (Refer to P.54A-38).

SYMPTOM CHART

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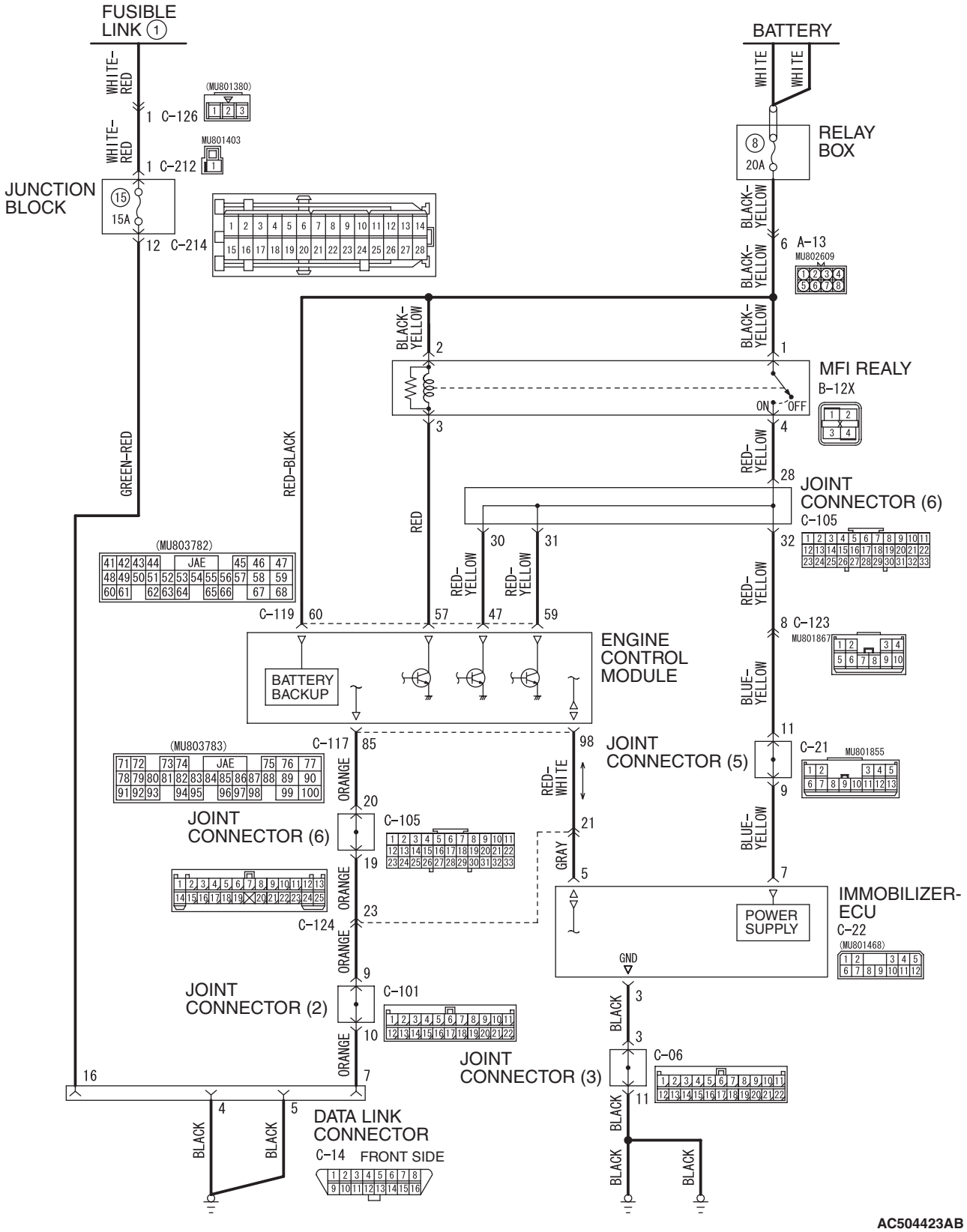
SYMPTOM	INSPECTION PROCEDURE NO.	REFERENCE PAGE
Communication with scan tool MB991958 is impossible	1	P.54A-18
The ignition key cannot be registered	2	P.54A-26
Engine cranks but does not start	3	P.54A-27
The immobilizer indicator light does not illuminate.	4	P.54A-29

SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: Communication with Scan Tool MB991958 is Impossible.



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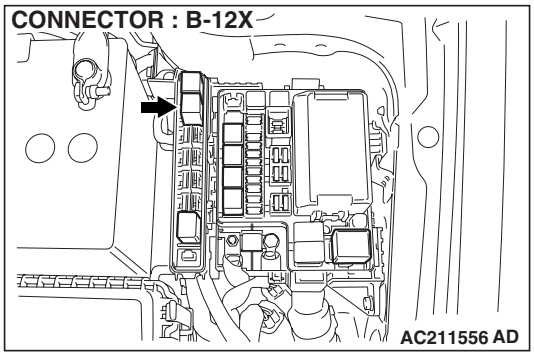
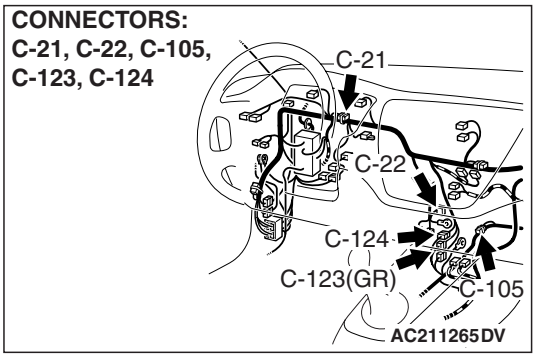
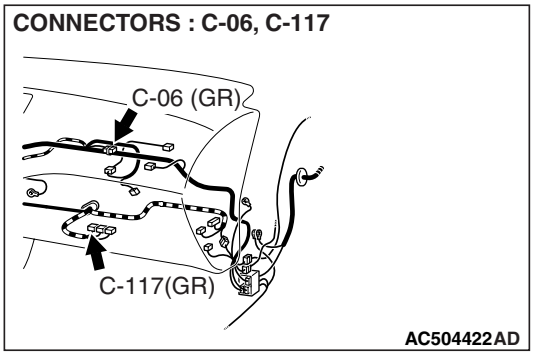






CIRCUIT OPERATION

The Immobilizer-ECU is energized by the MFI relay when the ignition switch is turned "ON". The ECM transmits a signal from scan tool MB991958 to the immobilizer-ECU as it is. In the same way, a signal from the immobilizer-ECU is also transmitted to scan tool MB991958 as it is.

TECHNICAL DESCRIPTION (COMMENT)

- This malfunction may be caused by a defective immobilizer-ECU, ECM, or a defect in the communication line between the immobilizer-ECU and ECM. If this malfunction appears when the MFI system and scan tool MB991958 can communicate each other, MFI system DTC P0513 will reset.
- If the MFI system is normal, the MFI relay can be determined as normal. In addition, if the MFI system and scan tool MB991958 can communicate each other, the circuits between the data link connector and the ECM can determined as normal.

  NOTE: If this malfunction appears, MFI system DTC P0513 will be output.

TROUBLESHOOTING HINTS

- Malfunction of the immobilizer-ECU
- Malfunction of the ECM
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the 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
  - MB991911: M.U.T.-III Main Harness B

STEP 1. Using scan tool MB991958, read the MFI system diagnostic trouble code.

⚠ CAUTION

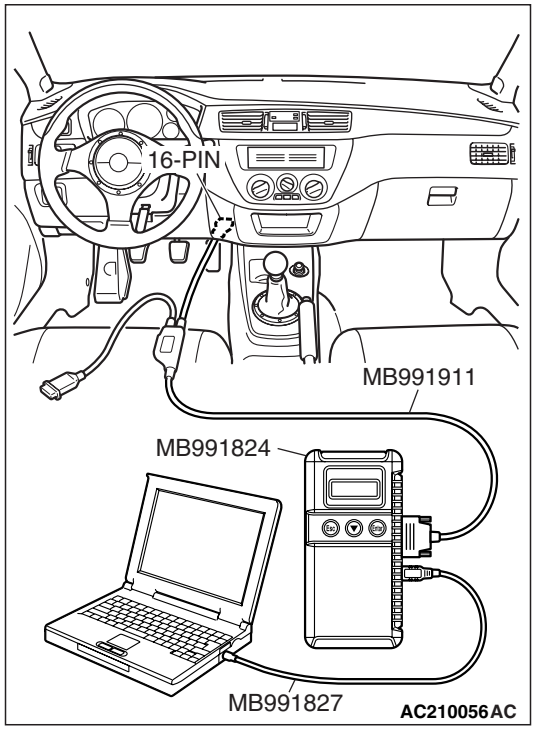
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502 or MB991958.

Use scan tool MB991958 to confirm the MFI system DTC.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch "ON" position.
(3) Read the MFI system diagnosis code.

Q: Can scan tool MB991958 communicate with the MFI system? Is an MFI system DTC other than P0513 output?

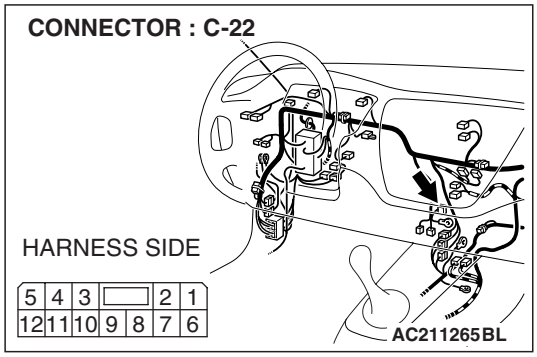
YES : Go to Step 2.
NO : Refer to GROUP 13A, MFI Diagnosis P.13A-605.



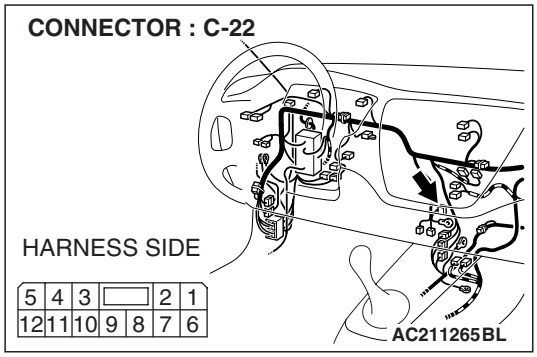
STEP 2. Check immobilizer-ECU connector C-22 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is immobilizer-ECU connector C-22 in good condition?

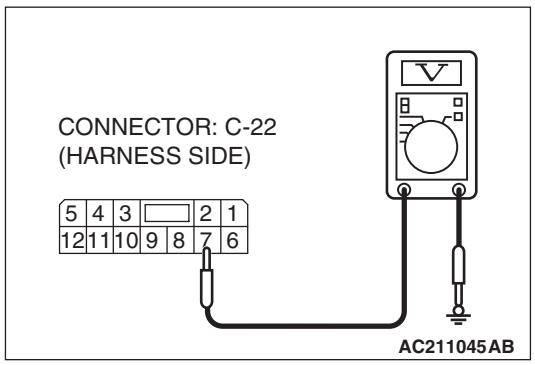
YES : Go to Step 3.
NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Confirm that scan tool MB991958 communicates normally.



STEP 3. Check the battery power supply (MFI relay) circuit to the immobilizer-ECU. Measure the voltage at immobilizer-ECU connector C-22.



(1) Disconnect immobilizer-ECU connector C-22 and measure the voltage available at the wiring harness side of the connector.
(2) Turn the ignition switch to the "ON" position.

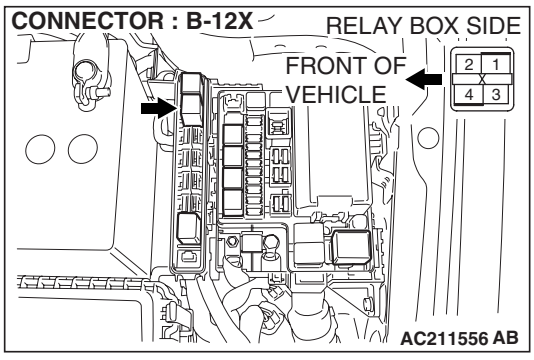


(3) Measure the voltage between terminal 7 and ground.

Q: Is battery voltage (approximately 12 volts) present?

YES : Go to Step 6.
NO : Go to Step 4.

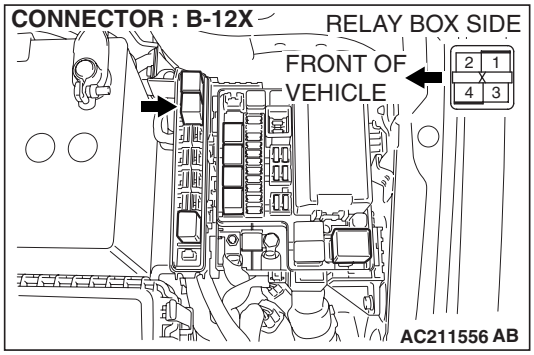
STEP 4. Check MFI relay connector B-12X for loose, corroded or damaged terminals, or terminals pushed back in the connector.

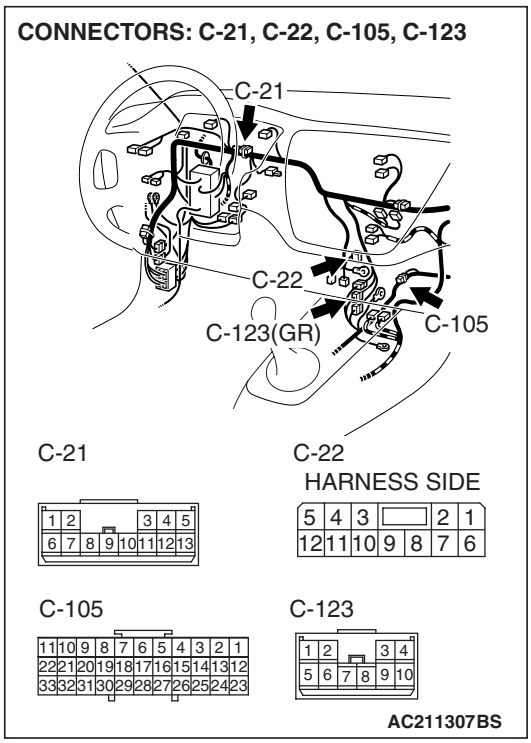


Q: Is MFI relay connector B-12X in good condition?

YES : Go to Step 5.
NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Confirm that scan tool MB991958 communicates normally.

STEP 5. Check the harness wires between immobilizer-ECU connector C-22 (terminal 7) and MFI relay connector B-12X (terminal 4).





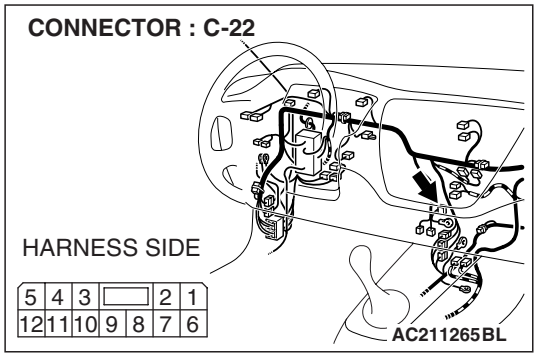
NOTE: Also check intermediate connector C-123, joint connector C-21 and C-105 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-123, joint connector C-21 or C-105 is damaged, Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wires between immobilizer-ECU connector C-22 (terminal 7) and MFI relay connector B-12X (terminal 4) in good condition?

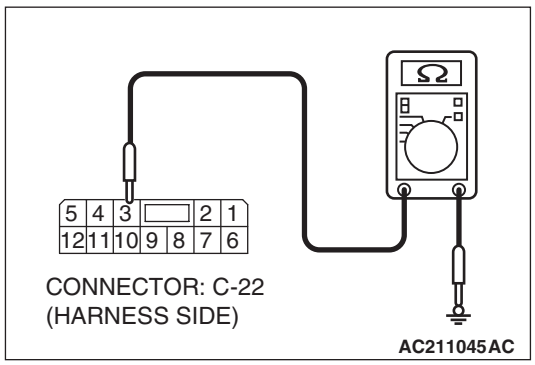
YES : There is no action to be taken.

NO : Replace damaged component(s). Confirm that scan tool MB991958 communicates normally.

STEP 6. Check the ground circuit to the immobilizer-ECU. Measure the resistance at immobilizer-ECU connector C-22.



(1) Disconnect immobilizer-ECU connector C-22 and measure the resistance available at the wiring harness side of the connector.

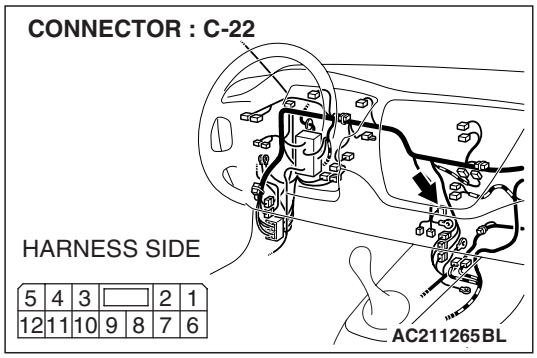


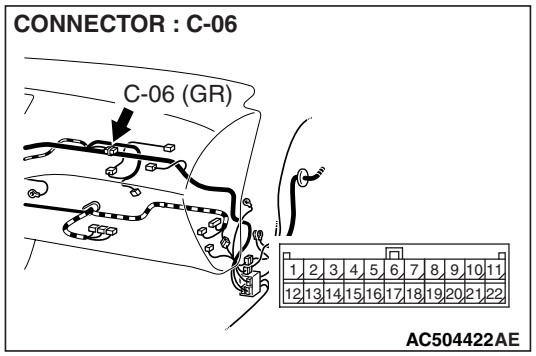
(2) Measure the resistance between terminal 3 and ground.

Q: Is the resistance less than 2 ohms?

YES : Go to Step 8.
NO : Go to Step 7.

STEP 7. Check the harness wire between immobilizer-ECU connector C-22 (terminal 3) and ground.





NOTE: Also check joint connector C-06 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If joint connector C-06 is damaged, Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the harness wire between immobilizer-ECU connector C-22 (terminal 3) and ground in good condition?

YES : There is no action to be taken.
NO : Repair or replace the damaged component(s). Confirm that scan tool MB991958 communicates normally.

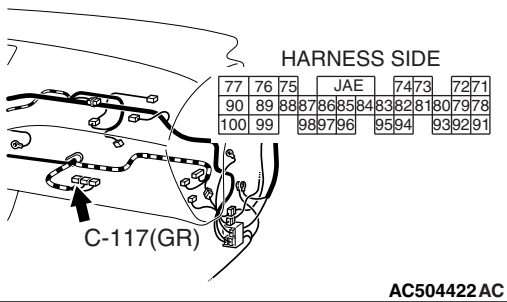
STEP 8. Check ECM connector C-117 for loose, corroded or damaged terminals, or terminal pushed back in the connector.

Q: Is ECM connector C-117 in good condition?

YES : Go to Step 9.

NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Confirm that scan tool MB991958 communicates normally.

CONNECTOR : C-117



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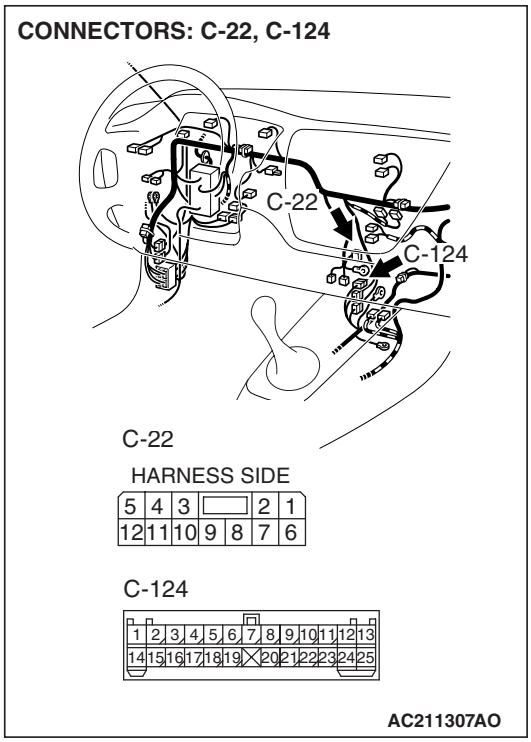
STEP 9. Check the harness wires between immobilizer-ECU connector C-22 (terminal 5) and ECM connector C-117 (terminal 98).

CONNECTORS: C-22, C-124



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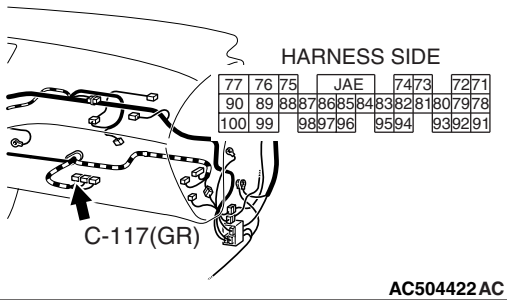
CONNECTOR : C-117



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NOTE: Also check intermediate connector C-124 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-124 is damaged, Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wires between immobilizer-ECU connector C-22 (terminal 5) and ECM connector C-117 (terminal 98) in good condition?

YES : Go to Step 10.

NO : Repair or replace the damaged component(s). Confirm that scan tool MB991958 communicates normally.

STEP 10. Replace the immobilizer-ECU or ECM.

Replace the immobilizer-ECU or ECM.

Q: Did the communication with the scan tool become possible after replacing the immobilizer-ECU or the engine control module?

YES : Register the password (secret code) and encrypted code P.54A-38. Confirm that scan tool MB991958 communicates normally

NO : Go to Step 11.

STEP 11. Recheck for malfunction.

Q: Is a malfunction eliminated?

YES : The procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-13).

NO : Replace the immobilizer-ECU or ECM.

INSPECTION PROCEDURE 2: The Ignition Key cannot be Registered.

TECHNICAL DESCRIPTION (COMMENT)
The ignition key transponder or the immobilizer-ECU is suspected to be defective.

TROUBLESHOOTING HINTS
- Malfunction of the ignition key
- Malfunction of immobilizer-ECU

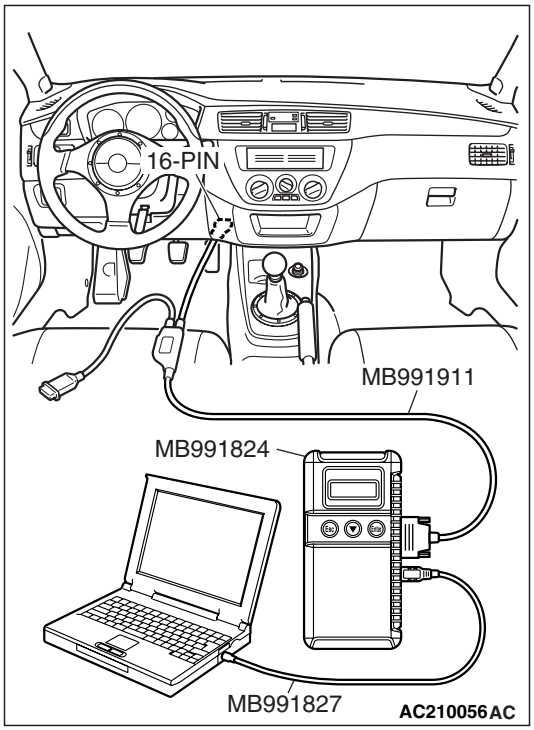
DIAGNOSIS

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
  - MB991911: M.U.T.-III Main Harness B

STEP 1. Using scan tool MB991958, read the diagnostic trouble code.

⚠ 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.

Use scan tool MB991958 to check if DTC 11 is set.
(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch "ON" position.
(3) Read the immobilizer system diagnosis code.



Q: Does DTC11 reset?

YES : Refer to P.54A-11.

NO : Replace the ignition key that cannot be registered. Then re-register the encrypted code (Refer to P.54A-38). Verify that the ignition key can be registered, then Go to Step 2.

STEP 2. Retest the system.

Q: Does registered ignition key function properly?

YES : The procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-13).

NO : Replace the immobilizer-ECU.

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INSPECTION PROCEDURE 3: Engine Cranks but does not Start.

TECHNICAL DESCRIPTION
If the engine cranks, but does not start, an MFI system problem may exist in addition to a malfunctioning immobilizer system. The engine will not start if the ignition key has not been properly registered.

TROUBLESHOOTING HINTS
- Malfunction of MFI system
- Malfunction of immobilizer-ECU

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
  - MB991911: M.U.T.-III Main Harness B

STEP 1. Check the battery voltage.
Measure the battery voltage during cranking.

Q: Is the voltage 8 volts or more?

YES : Go to Step 2.
NO : Check the condition of the battery. Refer to P.54A-4.

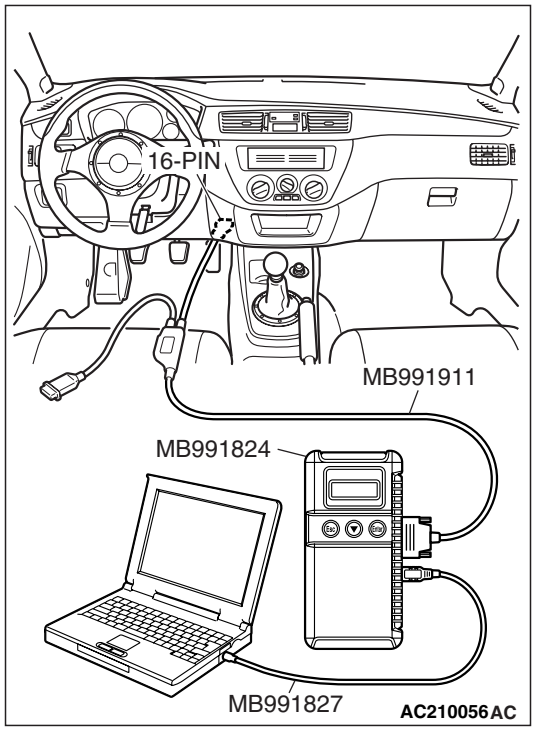
STEP 2. Using scan tool MB991958, read the MFI system diagnostic trouble code.

⚠ 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 "ON" position.
(3) Read the diagnosis code.

Q: Have any DTCs set?

Yes : Go to Step 3.
No : Go to Step 5.



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

Q: Have any immobilizer system DTCs set?

YES : Refer to P.54A-11.
NO : Go to Step 4.

STEP 4. Check for MFI system DTCs.

Q: Have any MFI system DTCs set?

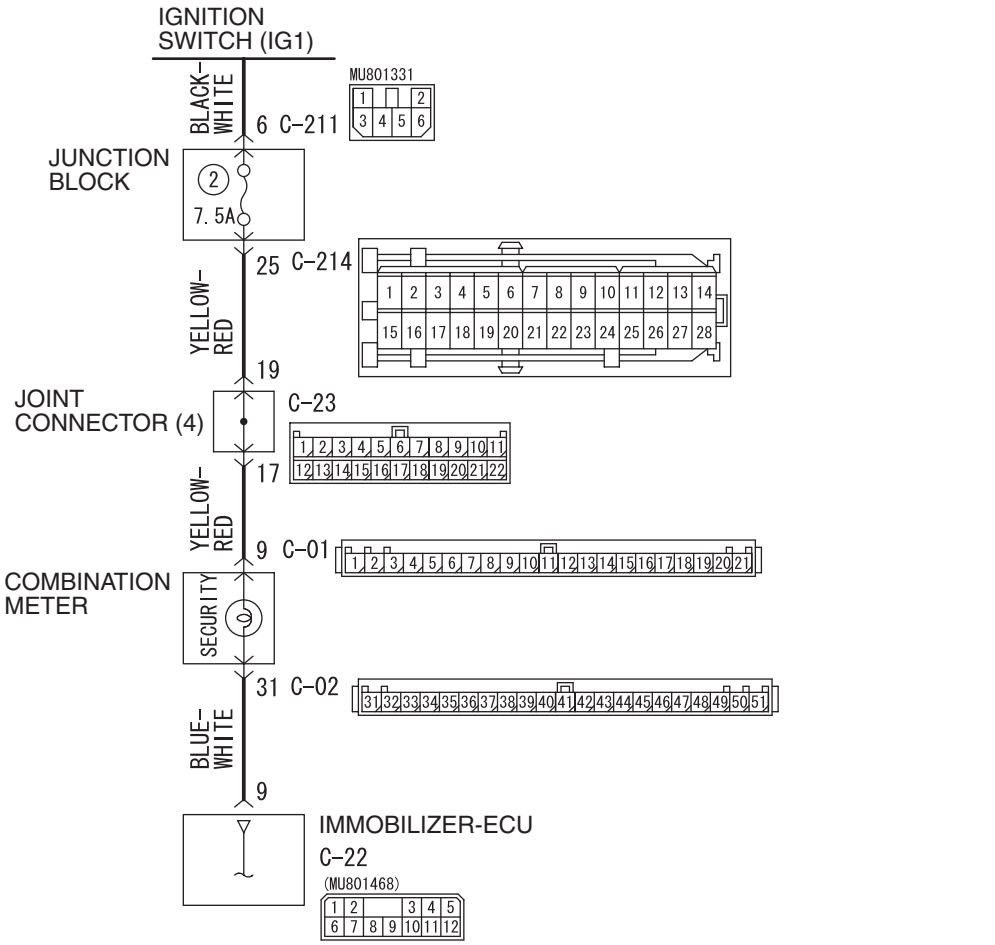
YES : Refer to GROUP 13A, Diagnosis P.13A-41.
NO : Go to Step 5.

STEP 5. Attempt to start the engine.

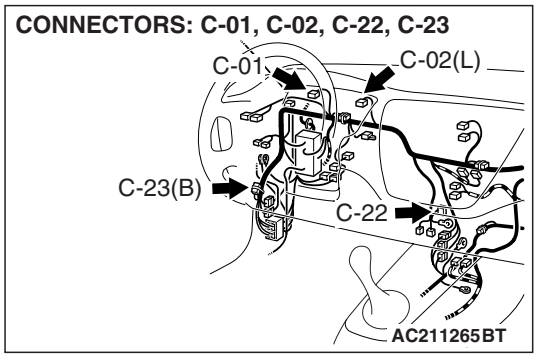
Q: Does the engine start?

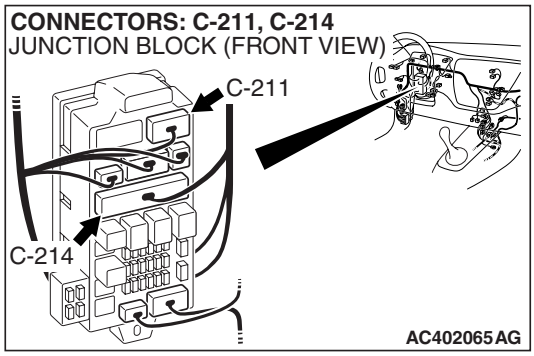
YES : The procedure is complete (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-13).
NO : Refer to GROUP 13A, Diagnosis –Symptom Chart P.13A-44. If the malfunction is not resolved, replace the immobilizer-ECU. Then register the password (secret code) and encrypted code (Refer to P.54A-38). The engine should now start.

INSPECTION PROCEDURE 4: The Immobilizer Indicator Light does not Illuminate.



TSB Revision





CIRCUIT OPERATION

If the requirements for starting the engine are not satisfied, the immobilizer-ECU flashes the immobilizer indicator for 30 seconds.

TECHNICAL DESCRIPTION (COMMENT)

The immobilizer indicator light or a malfunction of the combination meter or immobilizer-ECU.

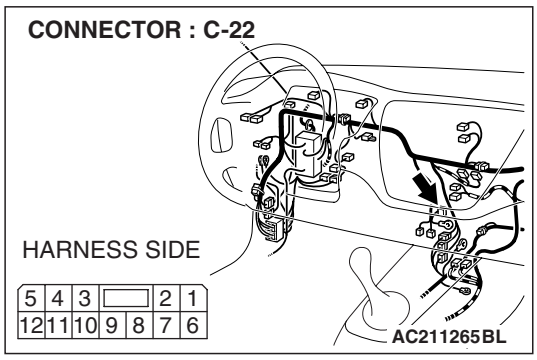
TROUBLESHOOTING HINTS

- Malfunction of combination meter
- Malfunction of immobilizer-ECU
- Damaged harness wires or connectors

DIAGNOSIS

Required Special Tools:

- MB991223: Harness

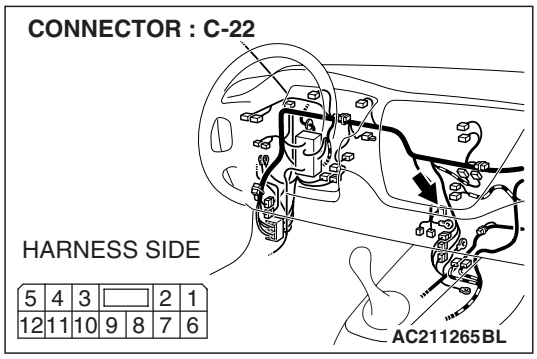


STEP 1. Check immobilizer-ECU connector C-22 for loose, corroded or damaged terminals, or terminals pushed back in the connector

Q: Is immobilizer-ECU connector C-22 in good condition?

YES : Go to Step 2.

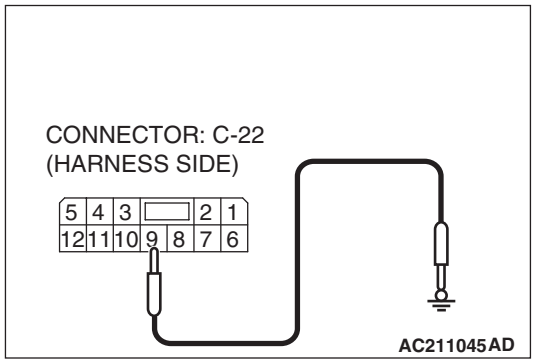
NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Confirm that scan tool MB991958 communicates normally.



STEP 2. Check at immobilizer-ECU connector C-22 in order to check the immobilizer indicator light circuit.

(1) Disconnect immobilizer-ECU C-22, and measure at the wiring harness side.

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



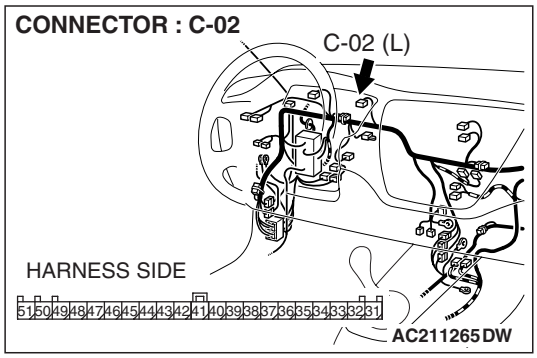
(3) Connect terminal 9 to the ground.

Q: Does only the immobilizer indicator light illuminate? (other indicator lights are in good condition)

YES : Replace the immobilizer-ECU. Then register the password (secret code) and encrypted code (Refer to P.54A-38).

NO : Go to Step 3.

STEP 3. Check combination meter connector C-02 for loose, corroded or damaged terminals, or terminals pushed back in the connector.



Q: Is combination meter connector C-02 in good condition?

YES : Go to Step 4.

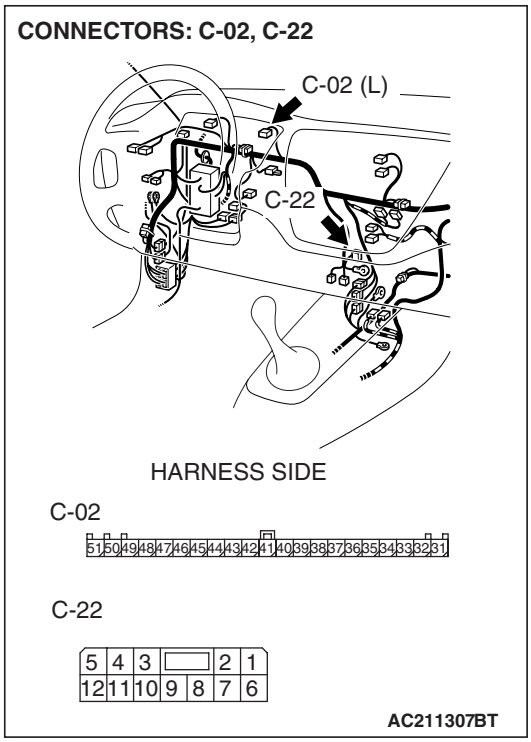
NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Confirm that scan tool MB991958 communicates normally.

STEP 4. Check the wiring harness between combination meter connector C-02 (terminal 31) and immobilizer-ECU connector C-22 (terminal 9).

Q: Is the wiring harness between combination meter connector C-02 (terminal 31) and immobilizer-ECU connector C-22 (terminal 9) in good condition?

YES : Go to Step 5.

NO : Repair the wiring harness. Check to see that all meters operate.

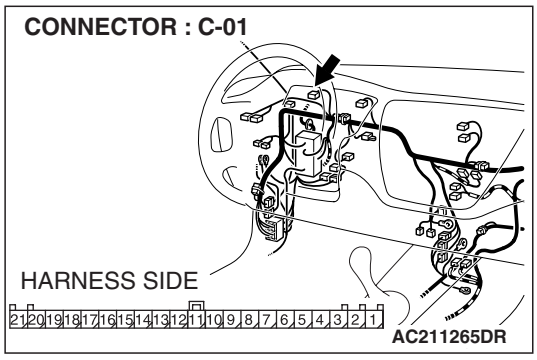


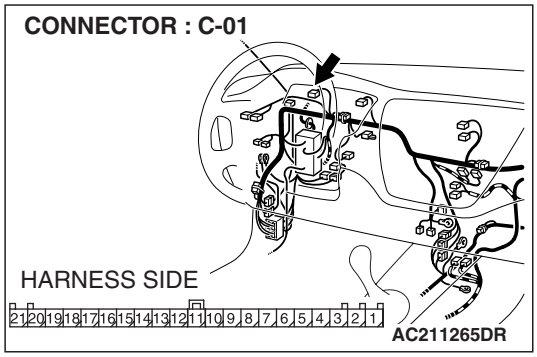
STEP 5. Check combination meter connector C-01 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is combination meter connector C-01 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. Confirm that scan tool MB991958 communicates normally.

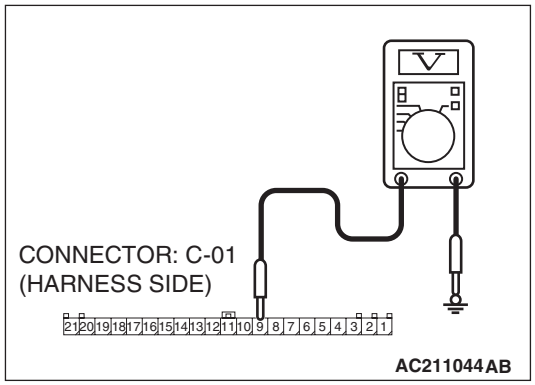




STEP 6. Check the ignition switch (IG1) circuit to the combination meter. Measure the voltage at combination meter connector C-01.

(1) Disconnect combination meter connector C-01 and measure the voltage available at the wiring harness side of the connector.

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



(3) Measure the voltage between terminal 9 and ground.

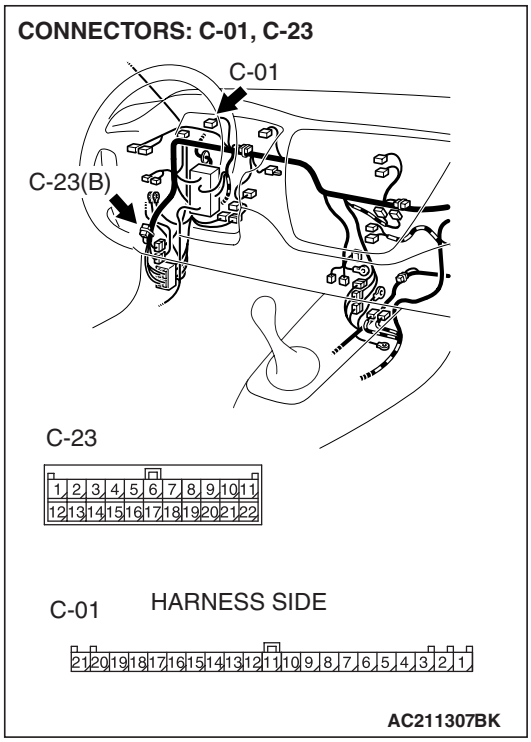
- The measured value should be approximately 12 volts (battery positive voltage).

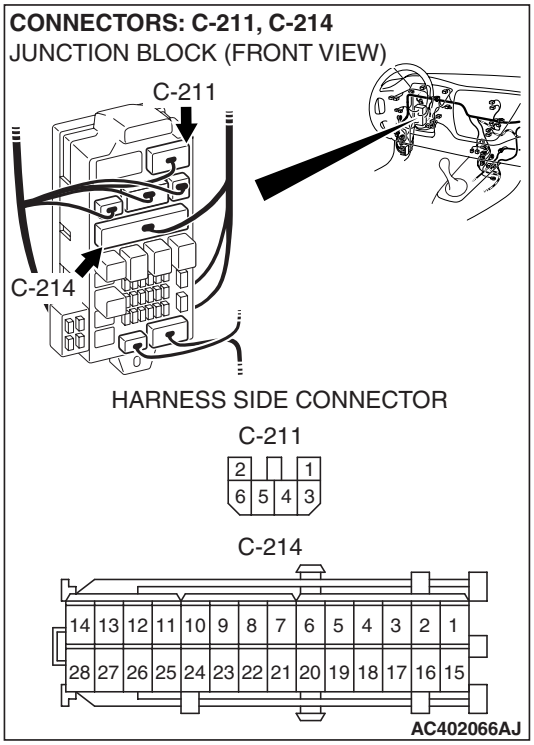
Q: Is battery voltage (approximately 12 volts) present?

YES : Go to Step 8.

NO : Go to Step 7.

STEP 7. Check the wiring harness between combination meter connector C-01 (terminal 9) and the ignition switch (IG1).





NOTE: Also check junction block connector C-211 and C-214 and joint connector C-23 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If junction block connector C-211 or C-214 or joint connector C-23 is damaged, Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between combination meter connector C-01 (terminal 9) and the ignition switch (IG1) in good condition?

YES : Go to Step 8.

NO : Repair the wiring harness. Check to see that all meters operate.

STEP 8. Retest the system.

Q: Is the malfunction eliminated?

YES : The procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Point P.00-13).

NO : Go to Step 1.

DATA LIST REFERENCE TABLE

M1543007300273

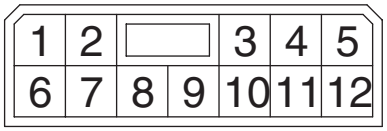
M.U.T.-III SCAN TOOL DISPLAY	ITEM NO.	INSPECTION ITEM	INSPECTION REQUIREMENT	NORMAL CONDITION
REGD.KEY	01	Key has been registered	-	Number of registered ignition keys
TP LOCK CHECK	02	Determining whether the ignition key can be registered or not	UNLOCK	Can be overwritten (Correct)
			LOCK	Can not be overwritten (Incorrect)

CHECK AT IMMOBILIZER-ECU

M1543007600412

TERMINAL VOLTAGE CHECK

C-22

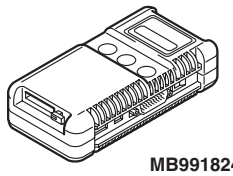
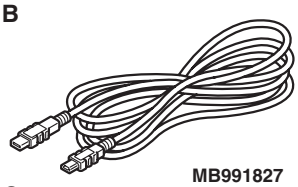
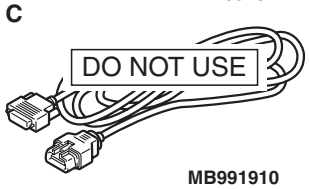
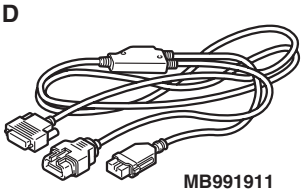
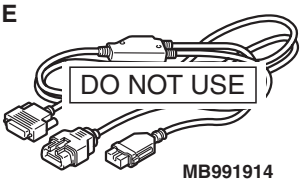
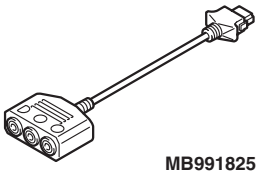
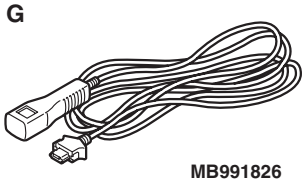
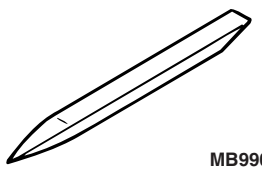


AC211809AB

TERMINAL NO.	SIGNAL	CHECKING REQUIREMENT	TERMINAL VOLTAGE
1	Stoplight switch	ON (When brake pedal is depressed)	Battery positive voltage
		OFF (When brake pedal is not depressed)	0 V
3	Immobilizer-ECU ground	Always	0 V
5	Powertrain control module	–	–
7	Immobilizer-ECU power supply	Ignition switch: "LOCK" (OFF)	0 V
		Ignition switch: "ON"	Battery positive voltage
9	Immobilizer indicator light	When immobilizer indicator light is illuminated	Approximately 5 volts
		When immobilizer indicator light is not illuminated	0 V
10	Ignition key ring antenna	–	–
11	Ignition key ring antenna	–	–

SPECIAL TOOLS

M1543000601986

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.*	• Reading diagnostic trouble code • Estimated vehicle speed sent **⚠ CAUTION** **M.U.T.-III main harness B (MB991911) should be used. M.U.T.-III main harness A and C should not be used for this vehicle.**
 MB990784	MB990784 Ornament remover	General service tool	Removal of trim, etc.

ON-VEHICLE SERVICE

HOW TO REGISTER ENCRYPTED CODE

M1543008100700

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
  - MB991911: M.U.T.-III Main Harness B

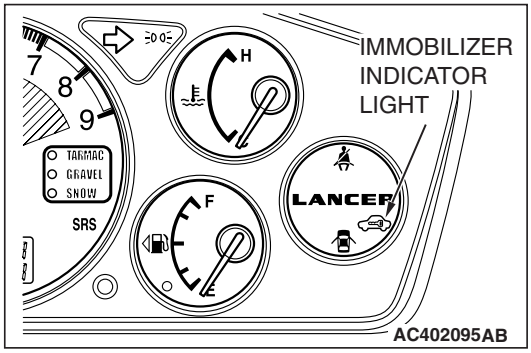
⚠ CAUTION

Because registering the encrypted codes is done after all previously-registered codes have been erased, you should keep all of the ignition keys that have already been registered accessible.

If the ignition key, Immobilizer-ECU, ECM is replaced or an ignition key is added, encrypted codes of all the ignition keys must be registered. (A maximum of eight different ignition key can be registered). Moreover, when the immobilizer-ECU has been replaced, you will need to use scan tool MB991958 to register the immobilizer-ECU and input the vehicle secret code and to register the password (secret code) into the immobilizer-ECU.

If an attempt is made to start the engine with an unregistered ignition key, cranking occurs, but fuel supply is cut off to disable the engine. In approx. 10 seconds, the immobilizer indicator will blink for approx. 30 seconds.

NOTE: ECM has an encrypted code for immobilizer-ECU, and the encrypted code is registered in the immobilizer-ECU and ignition key.



POINTS TO NOTE DURING OPERATION

If none of the functions can be used, check the diagnostic trouble codes, and after carrying out any necessary repairs, repeat the operation.

If an incorrect password is input five times in a row, the immobilizer-ECU judges that an unauthorized operation is being attempted. Start-prevention mode will be set, and engine operation will stop and all special functions will be disabled. If the ignition switch is turned to "ON" position and left in that position for approximately 20 minutes, "Unauthorized operation, start-prevention mode" will be cancelled.

KEY ID REGISTRATION

All ignition keys can be registered with scan tool MB991958. Additional ignition keys can be registered with or without scan tool MB991958.

REGISTRATION WITH THE SCAN TOOL MB991958

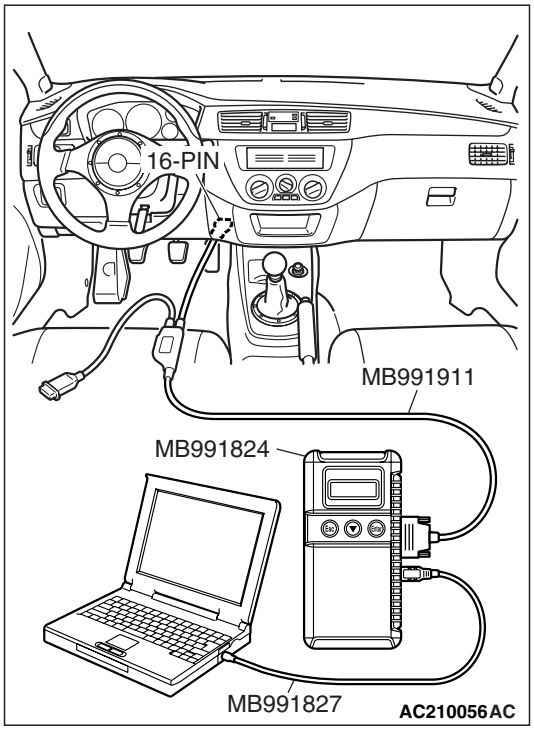
⚠ CAUTION

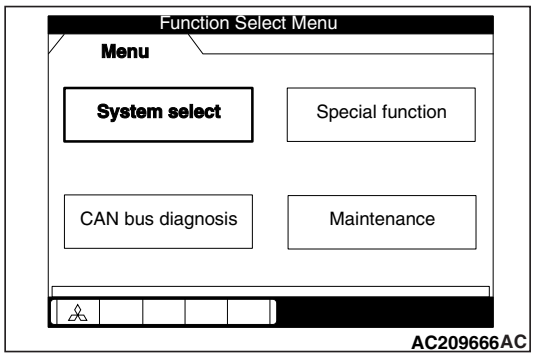
To prevent damage to scan tool MB991958, always turn the ignition switch to "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

NOTE:

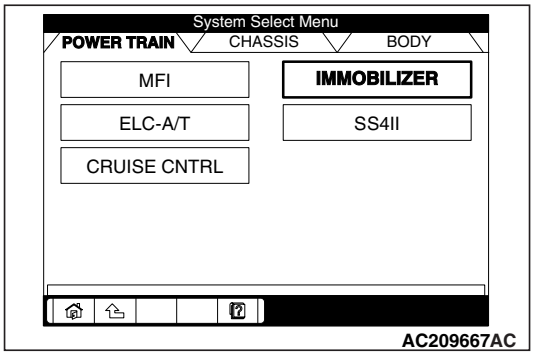
- *Before registration, check that no DTC code is set. If a DTC code is set, resolve the problem beforehand.*
- *Using the key ID register function will cause all key IDs that have been previously registered in the immobilizer-ECU to be erased. All keys need to be registered. Those which have been registered before should be on hand before using this function.*
- *If registering more than one key, do not disconnect scan tool MB991958 halfway through the registration process.*
- *After registering key IDs, check that the engine can be started using all of the keys that have been registered. If the engine will not start, refer to Immobilizer System Diagnosis P.54A-8.*

1. Connect the scan tool MB991958 to the data link connector.
2. Turn the ignition switch to "ON" position.
3. Select "Interactive Diagnosis" from the start-up screen.

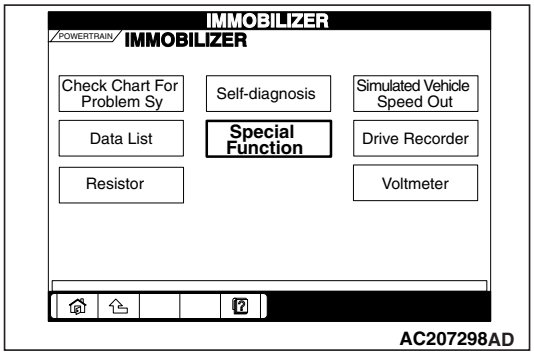




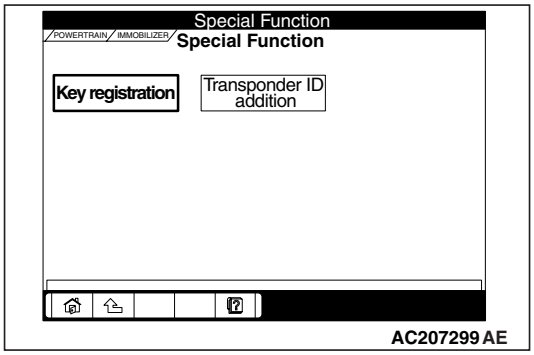
4. Select "System select."



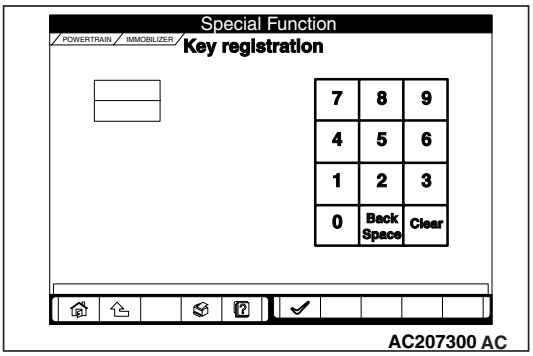
5. Choose "IMMOBILIZER" from the "POWER TRAIN" tab.



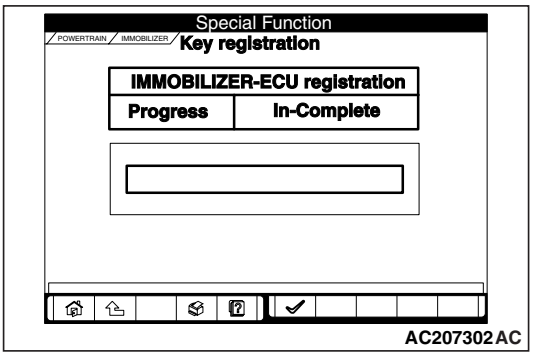
6. Choose "Special Function" from "IMMOBILIZER" screen.



7. Choose "Key registration" from "Special Function" screen.



8. Input the password, and then click the check mark icon.



9. If the key ID was registered successfully, "Progress" indication will turn active (gray). Then the registration process completes. If the key ID failed to be registered, "In-Complete" indication will turn active (gray).
10. The number of keys currently registered will be displayed. To register an additional key, replace the ignition key with the next key to be registered within five seconds. Key ID registration screen will be displayed, then register another key.

    NOTE: A maximum of eight keys can be registered.

11. This completes the registration operation. Turn the ignition switch "LOCK" (OFF) and leave it off for approximately ten seconds.
12. Check that the engine can be started with each of the registered ignition keys.
13. Check that the immobilizer system DTC and MFI system DTC did not set.
14. If not DTC is shown, terminate the M.U.T.-III.
15. Turn the ignition switch to "LOCK" (OFF) position.
16. Disconnect scan tool MB991958.

REGISTRATION OF ADDITIONAL KEYS WITH THE SCAN TOOL MB991958

Additional key(s) can be registered with the scan tool while keeping all existing key data.

⚠ CAUTION

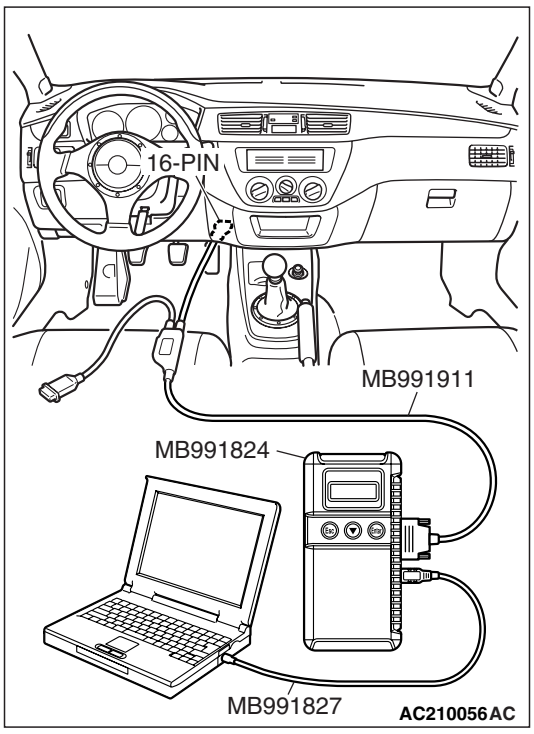
To prevent damage to scan tool MB991958, always turn the ignition switch to "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

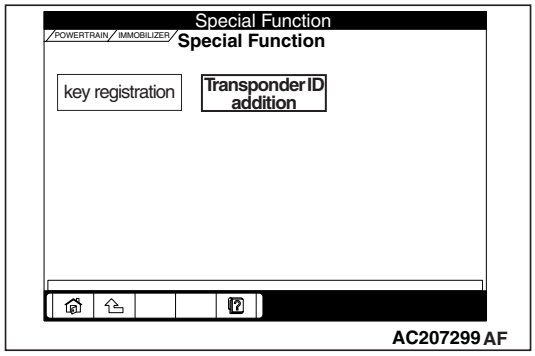
NOTE: To register additional keys with the scan tool, two registered keys must be available.

1. Connect scan tool MB991958 to the 16-pin data link connector.
2. Turn the ignition switch to "ON" position.

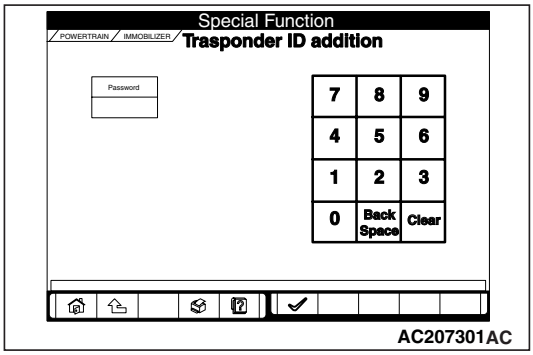
NOTE: Before registration, check that no DTC code is set. If a DTC code is set, resolve the problem beforehand.

3. Carry out steps 3 to 6 of the sub-section "Registration with scan tool."

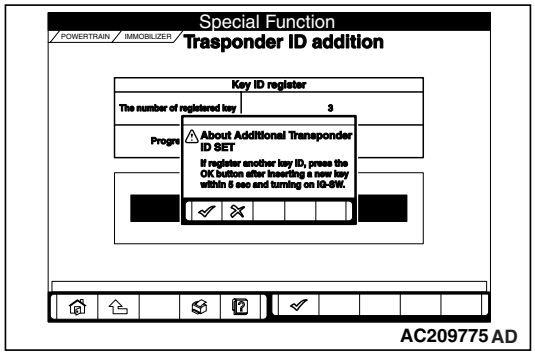




4. Choose "Transponder ID addition" from "Special Function" screen.



5. Input the password on the "Transponder ID addition" screen, and then click the check mark icon.



6. If an additional registration is made successfully, the screen will ask if another key is registered or not. If the third ignition key is registered, remove the key, which has been registered. Then insert the third key within five seconds, and then turn it to the ON position.
7. Register the additional ignition key according to step 6 above. The number of the registered ignition keys are shown on "The number of registered key" screen.

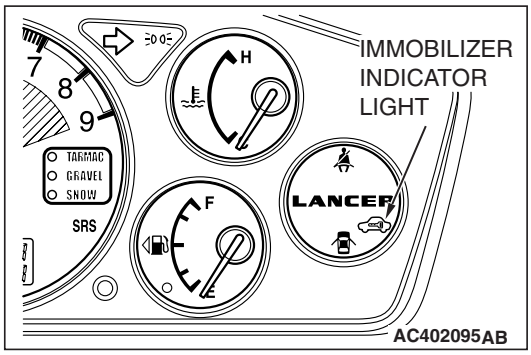
   NOTE: A maximum of eight keys can be registered.
8. This completes the registration operation. Turn the ignition switch "LOCK" (OFF) and leave it off for approximately ten seconds.
9. Check that the engine can be started with each of the registered ignition keys.
10. Check that the immobilizer system DTC and MFI system DTC did not set.
11. If not DTC is shown, terminate the M.U.T.-III.
12. Turn the ignition switch to "LOCK" (OFF) position.
13. Disconnect scan tool MB991958.

REGISTRATION OF ADDITIONAL KEY(S) WITHOUT USING THE SCAN TOOL

If the scan tool is not available, new key(s) can be registered by using two keys which have been registered to the vehicle (A maximum of eight keys can be registered to one vehicle). Follow the procedure below to register new key(s) to the vehicle.

NOTE: The registered key is the key that allows you to start the engine.

1. Turn "ON" the ignition switch by using the first registered key (key A), and wait for five seconds.
2. Remove the first registered key (key A).
3. Insert the second registered ignition key (key B), and turn it to the ON position.
4. After approximately 10 seconds the immobilizer indicator light should flash, and then additional registration mode is entered.
5. Check the immobilizer indicator light flashes, and then remove the second registered key (key B).
6. Insert the third ignition key, and turn it to the ON position.
7. The immobilizer-ECU identifies the new key to accept or reject it, and operates the immobilizer indicator (See the table below).



The new key is:	Registration is:	Immobilizer indicator:	
		Operation	Timing
Not registered yet	Accepted	Illuminates for three seconds	In approximately three seconds after the ignition key(s) have been registered
Already registered	Rejected	Illuminates for three seconds	In approximately three seconds after the ECU judges that the keys have been registered
Read error	Rejected	Extinguished	After the ECU detects a read error

8. If more new ignition keys are to be registered, repeat steps 1 to 7 above.

A maximum of eight ignition keys can be registered to one vehicle (If you attempt to register the ninth key, the immobilizer-ECU rejects the key). If any of the following conditions are satisfied, the additional key registration mode will terminate:

- The ignition switch has been on for more than 30 seconds.
- After the ignition key has been turned to the "LOCK" (OFF), the engine control relay is turned off.
- The scan tool has started communicating with vehicle systems.

9. After the registration mode has terminated, the additionally registered key(s) should allow you to start the engine.

TRANSPONDER LOCK CHECK

M1543024100250

Required Special Tools:

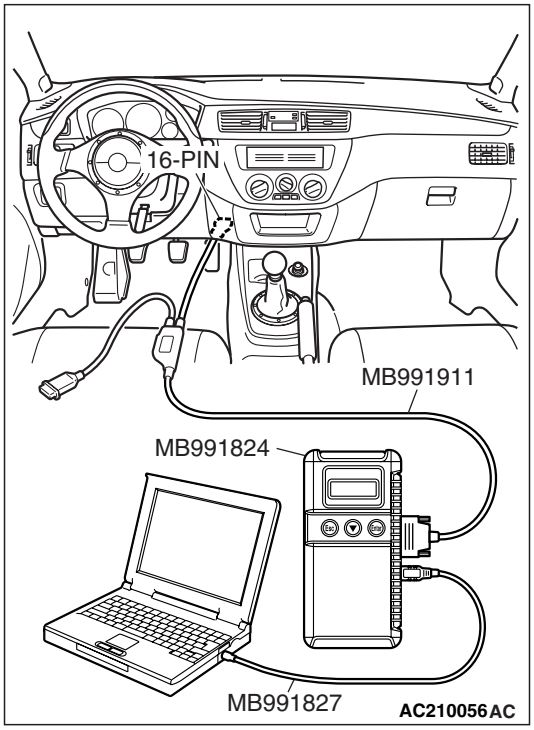
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991911: M.U.T.-III Main Harness B

⚠ CAUTION

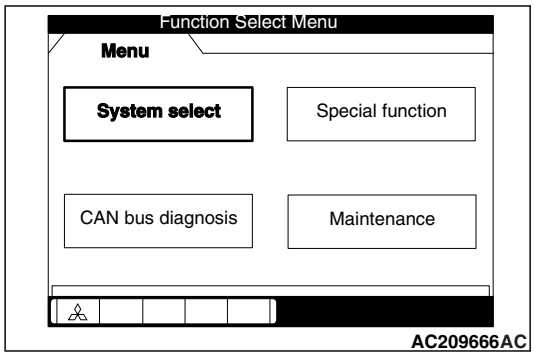
To prevent damage to scan tool MB991958, always turn the ignition switch to "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

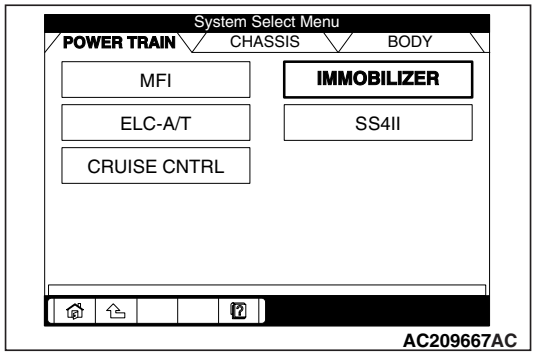
Follow the procedure below to judge if the ignition key can be overwritten (i.e. the ignition key is correct) or not.

1. Connect the scan tool MB991958 to the data link connector.
2. Insert the key to be checked and turn the ignition switch to "ON" position.
3. Select "Interactive Diagnosis" from the start-up screen.

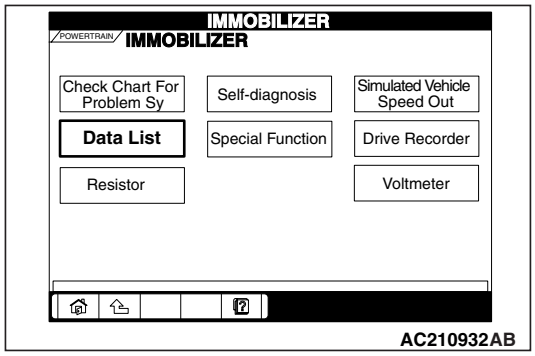


4. Select "System select."

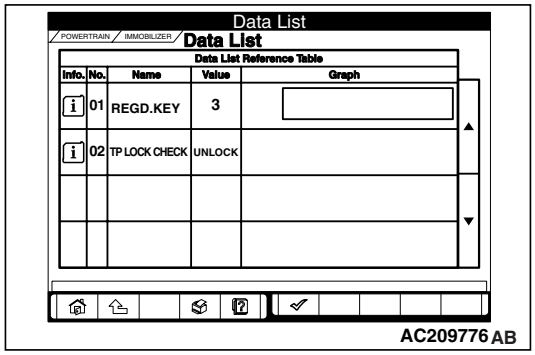




5. Choose "IMMOBILIZER" from the "POWER TRAIN" tab.



6. Select "Data List."



7. The multi-center display shows whether the ignition key, which has been inserted in the switch, can be rewritten and how many ignition keys have ever been registered. Repeat this check for an other keys to be registered.

TP LOCK CHECK	IGNITION KEY:	JUDGMENT OF IGNITION KEY
UNLOCK	Can be overwritten	Correct
LOCK	Can not be overwritten	Incorrect

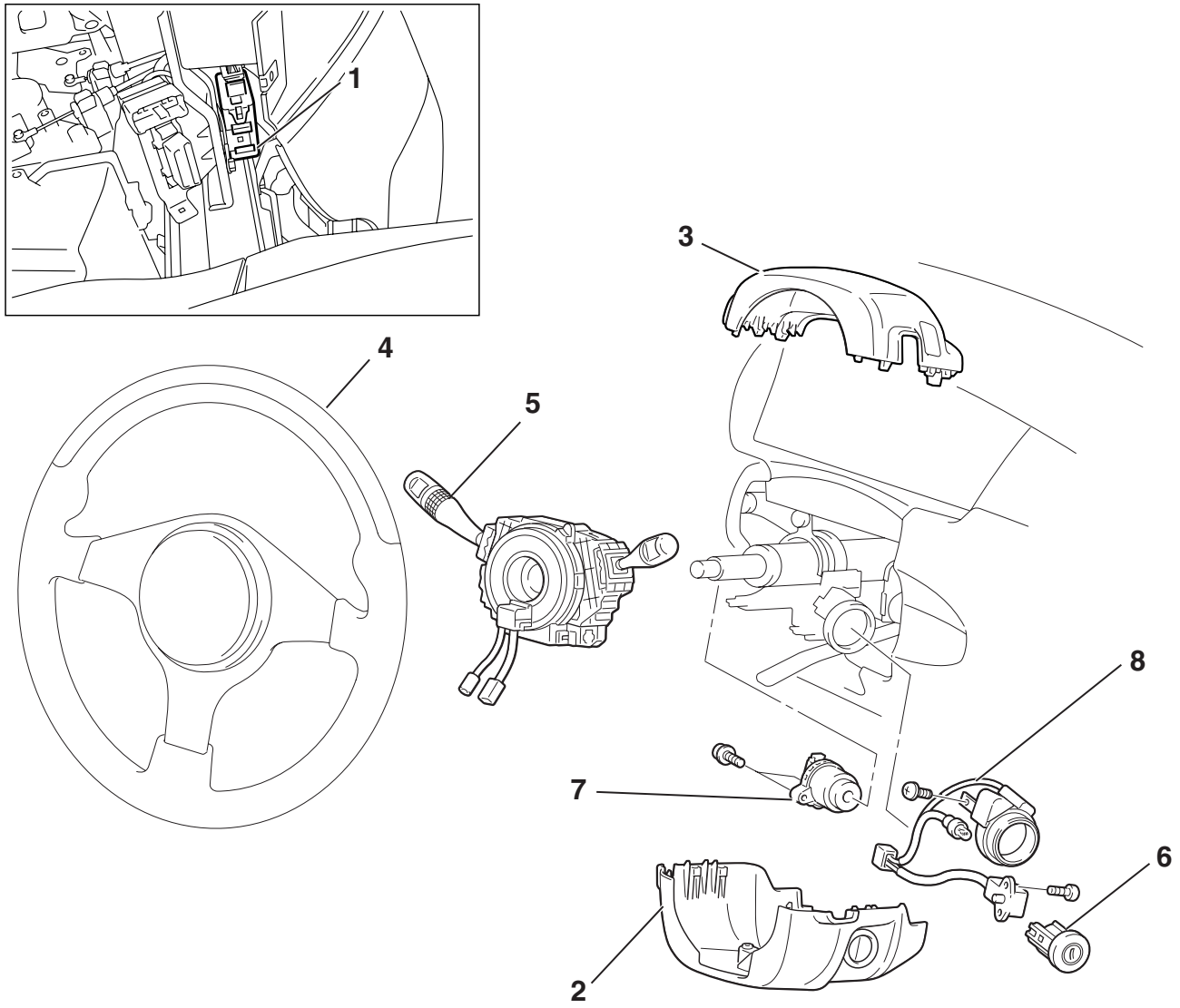
IGNITION SWITCH

REMOVAL AND INSTALLATION

M1543002101103

⚠ ***WARNING***

- ***Before removing the steering wheel - driver's air bag module assembly, refer to GROUP 52B, Service Precautions (P.52B-16) and Air Bag Module and Clock Spring (P.52B-168).***
- ***When removing and installing the steering wheel, do not let it bump against the air bag module.***



AC211041 AC

IMMOBILIZER-ECU REMOVAL STEPS

- UNDER COVER (REFER TO GROUP 52A, INSTRUMENT PANEL P.52A-3.)

1. IMMOBILIZER-ECU

IGNITION SWITCH REMOVAL STEPS

2. LOWER COLUMN COVER (REFER TO GROUP 52A, INSTRUMENT PANEL P.52A-3.)
3. UPPER COLUMN COVER (REFER TO GROUP 52A, INSTRUMENT PANEL P.52A-3.)
4. STEERING WHEEL (REFER TO GROUP 37, STEERING WHEEL P.37-24.)

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IGNITION SWITCH REMOVAL STEPS (Continued)

5. CLOCK SPRING AND COLUMN SWITCH ASSEMBLY (REFER TO GROUP 52B, AIR BAG MODULE AND CLOCK SPRING P.52B-168).

<<A>> 6. STEERING LOCK CYLINDER
7. IGNITION SWITCH
8. KEY REMINDER SWITCH

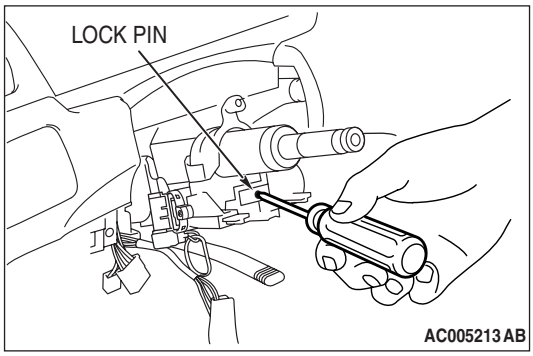
Required Special Tool:

- MB990784: Ornament remover

REMOVAL SERVICE POINT

<<A>> STEERING LOCK CYLINDER REMOVAL

1. Insert the key into steering lock cylinder to turn the ignition key to the "ACC" position.
2. Insert the locking pin with a small cross-tipped screwdriver, etc., and remove the steering lock cylinder.

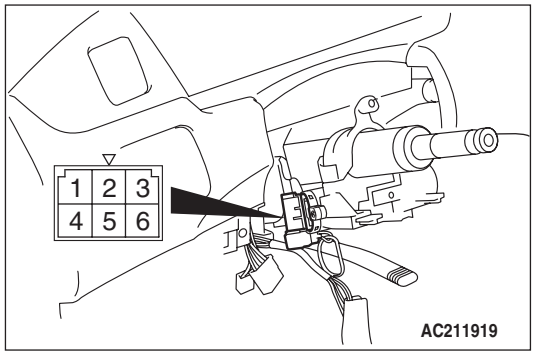


INSPECTION

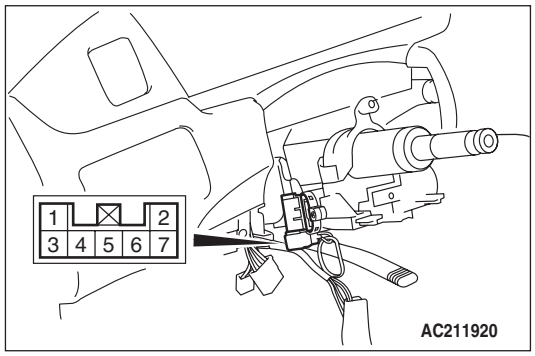
M1543019501965

IGNITION SWITCH CONTINUITY CHECK

Disconnect ignition switch connector C-87 without removing the ignition switch and steering lock cylinder. Then check the continuity.



SWITCH POSITION	TESTER CONNECTION	SPECIFIED CONNECTION
"LOCK" (OFF)	1 – 2, 1 – 4, 1 – 5, 1 – 6	Open circuit
"ACC"	1 – 6	Less than 2 ohms
"ON"	1 – 2, 1 – 4, 1 – 6	Less than 2 ohms
"START"	1 – 2, 1 – 5	Less than 2 ohms



KEY REMINDER SWITCH AND IGNITION KEY RING ANTENNA CONTINUITY CHECK

1. Ignition key reminder switch continuity check.
   Disconnect key reminder switch connector C-88 without removing the ignition switch and steering lock cylinder. Then check the continuity.

STATUS OF IGNITION KEY	TESTER CONNECTION	SPECIFIED CONNECTION
Removed	4 – 6	Less than 2 ohms
Inserted	4 – 6	Open circuit

2. Ignition key ring antenna check.
   Check for continuity between terminal 3 and terminal 7.
   Standard value: Less than 2 ohms

COMBINATION METER ASSEMBLY AND VEHICLE SPEED SENSOR

EQUIPMENT DIAGNOSIS

INTRODUCTION TO COMBINATION METER DIAGNOSIS

M1543009901081

All vehicles are equipped with an electrical speedometer and tachometer. If the speedometer or tachometer does not function, there may be trouble in the electrical system.

TROUBLESHOOTING STRATEGY

M1543006900562

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

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

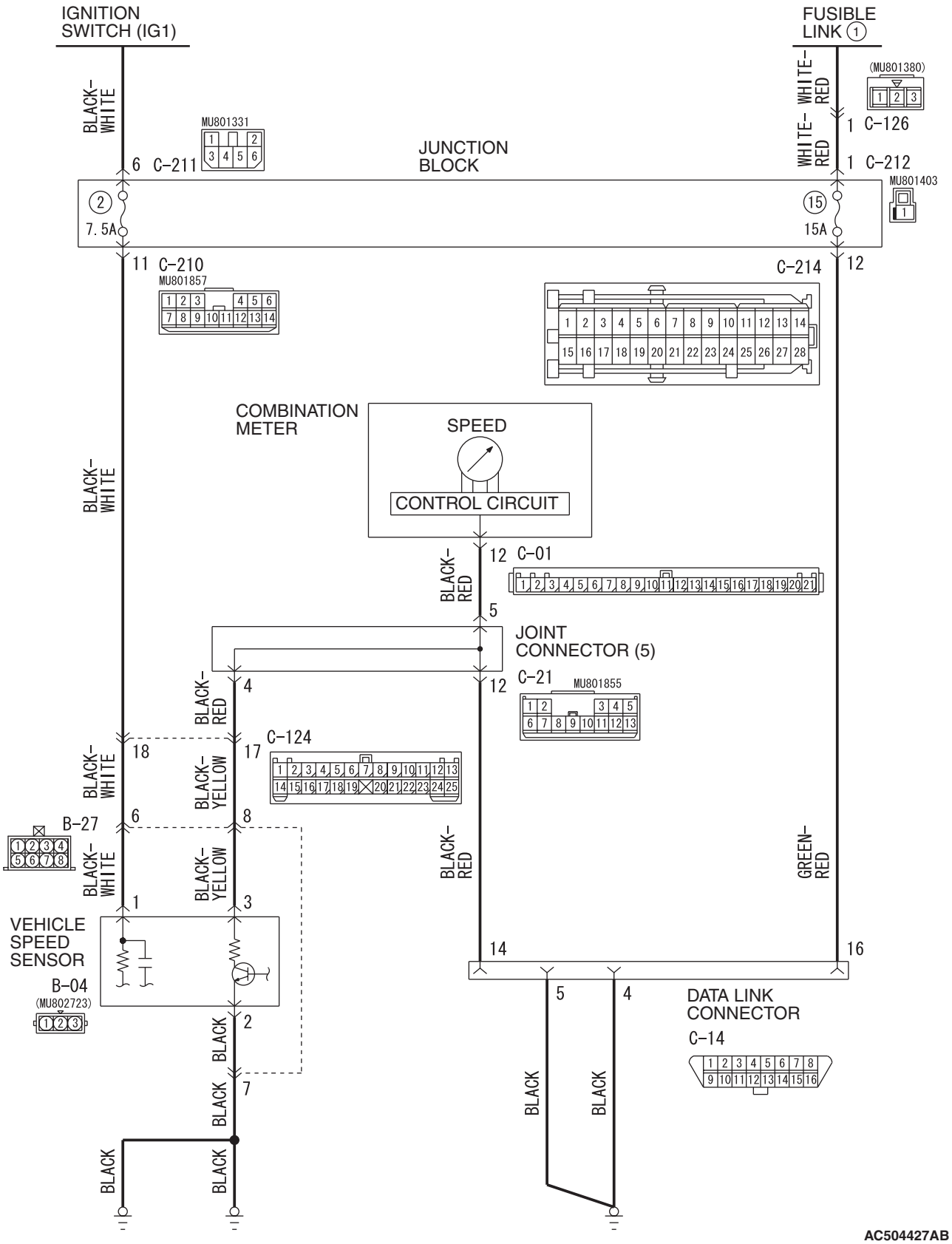
SYMPTOM CHART

M1543007201309

SYMPTOM	INSPECTION PROCEDURE	REFERENCE PAGE
Speedometer does not work.	1	P.54A-49
Tachometer does not work.	2	P.54A-53
Fuel gauge does not work.	3	P.54A-57
Engine coolant temperature gauge does not work.	4	P.54A-62
Combination meters do not work.	5	P.54A-65

SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: Speedometer does not Work.



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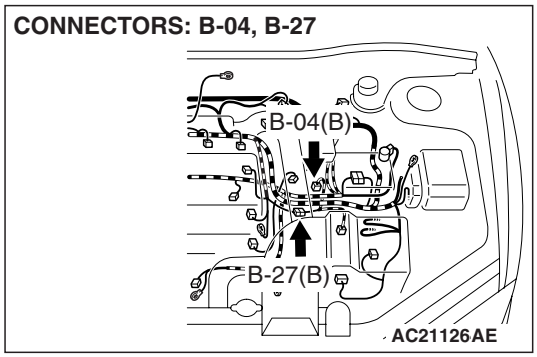
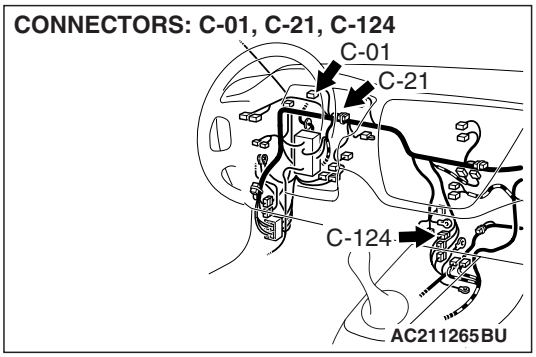




CIRCUIT OPERATION

- The ignition switch (IG1) circuit is the power source for the speedometer and vehicle speed sensor.
- The vehicle speed sensor is installed on the transaxle. Four pulses are generated with one turn of the vehicle speed sensor shaft. These pulse signals are sent into the speedometer. The speedometer calculates the pulse signals, and operates the indicator. At the same time, the travel distance is calculated.

TECHNICAL DESCRIPTION (COMMENT)

The cause may be a faulty vehicle speed sensor circuit system or a faulty speedometer. Vehicle speed sensor is also used by the engine control module (ECM).

TROUBLESHOOTING HINTS

- Malfunction of the vehicle speed sensor
- Malfunction of the combination meter (printed-circuit board or speedometer and tachometer)
- Damaged harness wires or connectors

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
  - MB991911: M.U.T.-III Main Harness B

STEP 1. Check with other meter.

Check to see that the tachometer, fuel gauge and water thermometer are operating normally.

Q: Do all other meters operate?

YES <other meters all operate.> : Go to Step 2.

NO <one or more of the other meters does not operate.> : Refer to INSPECTION PROCEDURE 5 P.54A-65.

STEP 2. Using scan tool MB991958, read the MFI system diagnostic trouble code.

⚠ CAUTION

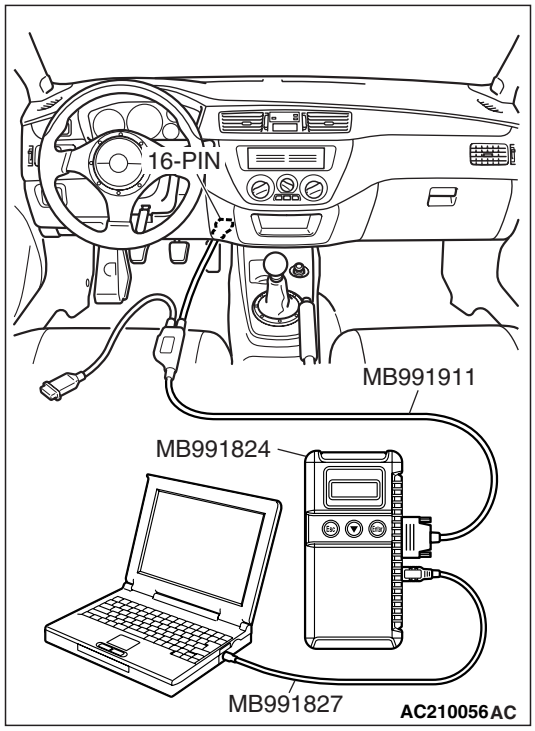
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Read the MFI system diagnostic trouble code.

Q: Is DTC P0500 output?

YES : Refer to GROUP 13A, Multiport Fuel Injection (MFI) Diagnosis. P.13A-41

NO : Go to Step 3.

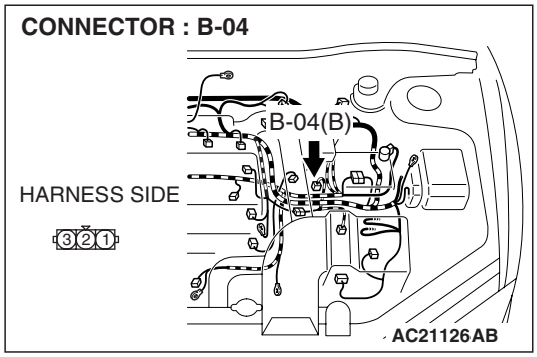


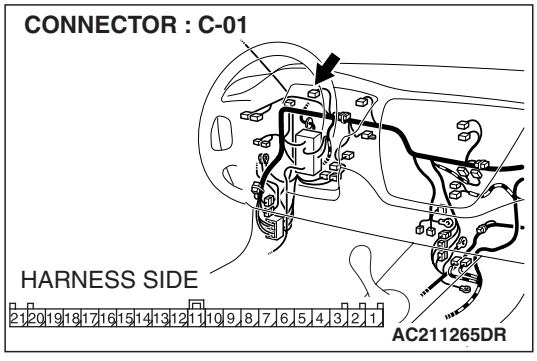
STEP 3. Check combination meter connector C-01 and vehicle speed sensor connector B-04 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are combination meter connector C-01 and vehicle speed sensor connector B-04 in good condition?

YES : Go to Step 4.

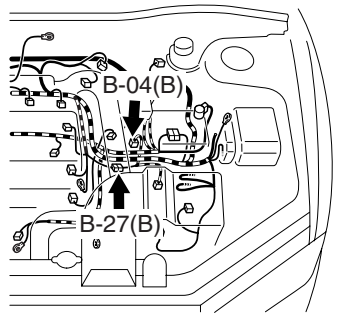
NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The speedometer should work normally.

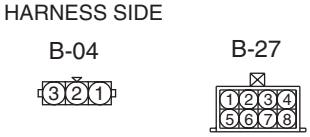




STEP 4. Check the wiring harness between combination meter connector C-01 (terminal 12) and vehicle speed sensor connector B-04 (terminal 3).

CONNECTORS: B-04, B-27





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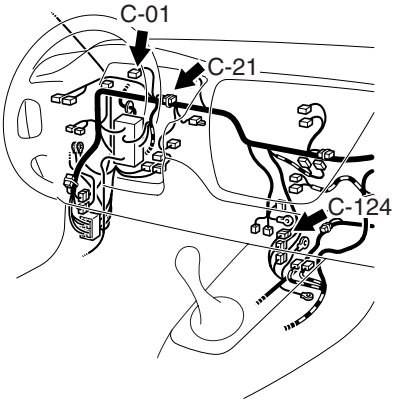
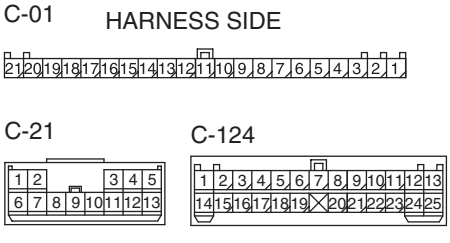
CONNECTORS: C-01, C-21, C-124





AC211307BM

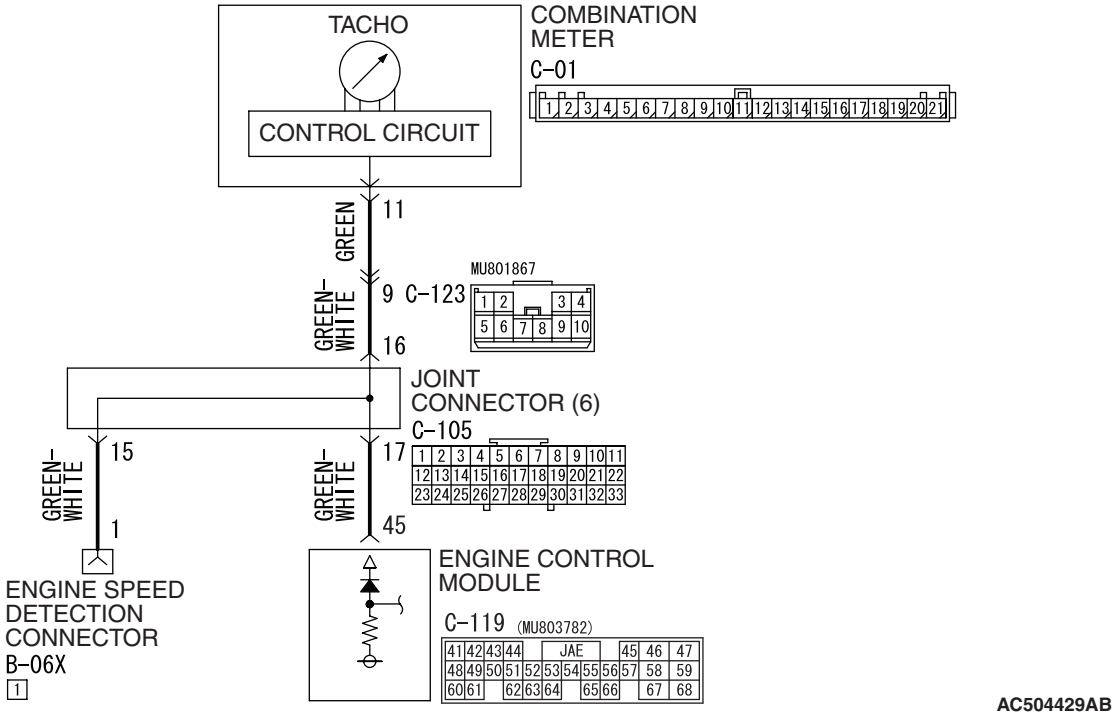
NOTE: Also check joint connector C-21, intermediate connector B-27 and C-124 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If joint connector C-21, intermediate connector B-27 or C-124 are damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between combination meter connector C-01 (terminal 12) and vehicle speed sensor connector B-04 (terminal 3) in good condition?

YES : Replace the combination meter. The speedometer should work normally.

NO : Repair the wiring harness. The speedometer should work normally.

INSPECTION PROCEDURE 2: Tachometer does not Work.



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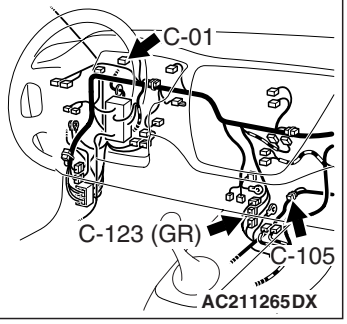
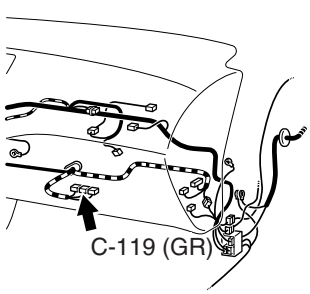
CONNECTORS: C-01, C-105, C-123



AC211265DX

CONNECTOR : C-119



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CIRCUIT OPERATION

- The tachometer power is supplied from the ignition switch (IG) circuit.
- The tachometer calculates the engine revolution (r/min) according to the ECM signals to operate the needle.

TECHNICAL DESCRIPTION (COMMENT)

The cause may be ECM signals are not transmitted, or combination meter error.

TROUBLESHOOTING HINTS

- Malfunction of the combination meter (printed circuit board or speedometer and tachometer)
- Malfunction of the ECM
- Damaged wiring harness or connectors

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
  - MB991911: M.U.T.-III Main Harness B

STEP 1. Check the other meters.

Check to see that the speedometer, fuel gauge and water thermometer operate normally.

Q: Do all other meters operate?

YES <other meters all operate.> : Go to Step 2.

NO <one of the meters do not operate.> : Refer to INSPECTION PROCEDURE 5 P.54A-65.

STEP 2. Using scan tool MB991958, read the MFI system diagnostic trouble code.

⚠ CAUTION

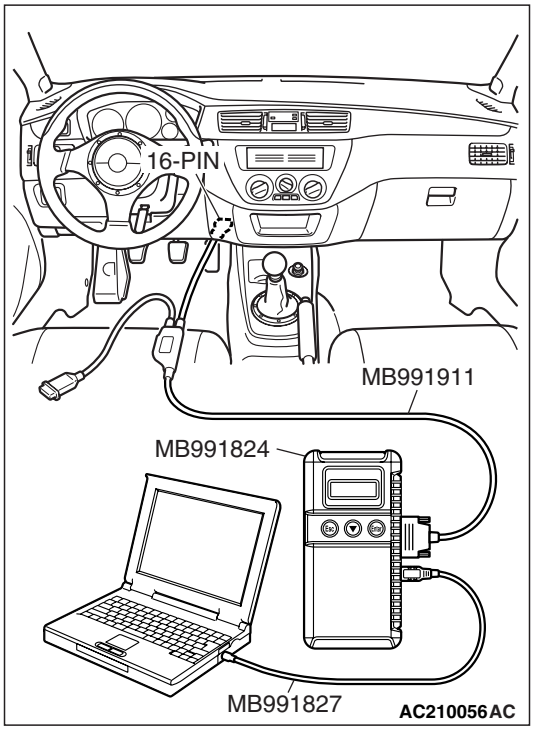
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

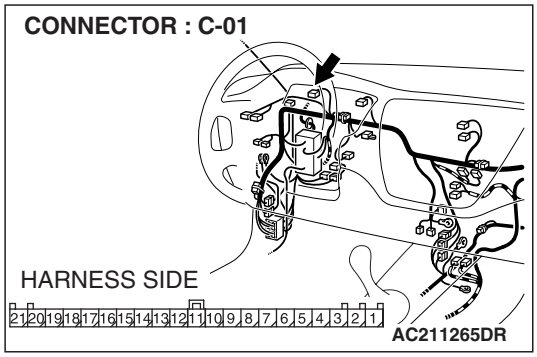
(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to "ON" position.
(3) Read the MFI system diagnostic trouble code.

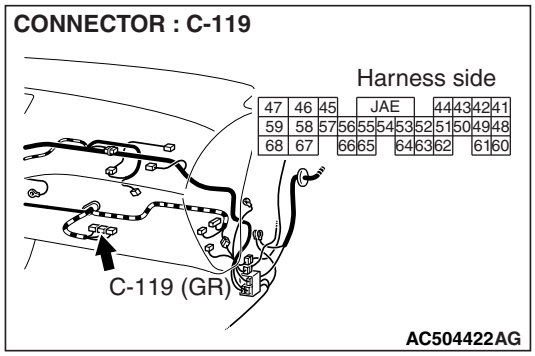
Q: Is DTC output to the MFI system?

YES : Refer to Group 13, Multiport Fuel Injection (MFI) Diagnosis. P.13A-41

NO : Go to Step 3.







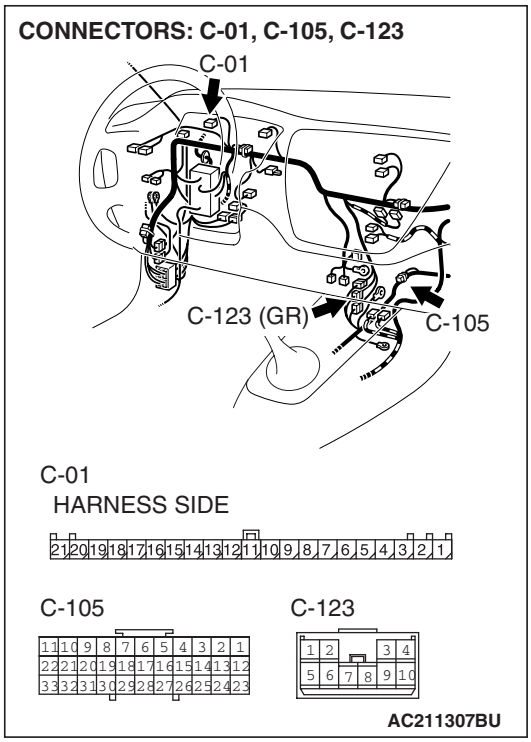
STEP 3. Check combination meter connector C-01 and ECM connector C-119 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

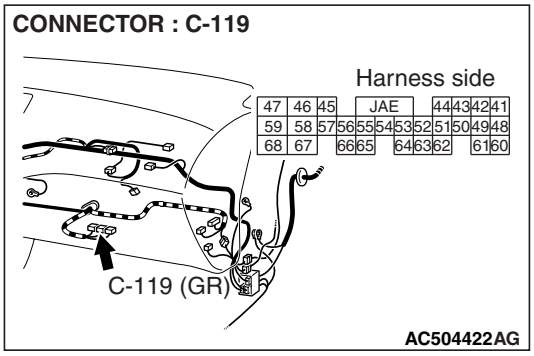
Q: Are combination meter connector C-01 and ECM connector C-119 in good condition?

YES : Go to Step 4.

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

STEP 4. Check the wiring harness between combination meter connector C-01 (terminal 11) and ECM connector C-119 (terminal 45).





NOTE: Also check joint connector C-105 and intermediate connector C-123 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If joint connector C-105 or intermediate connector C-123 are damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the wiring harness between combination meter connector C-01 (terminal 11) and ECM connector C-119 (terminal 45) in good condition?

YES : Go to Step 5.

NO : Repair the wiring harness. The speedometer should work normally.

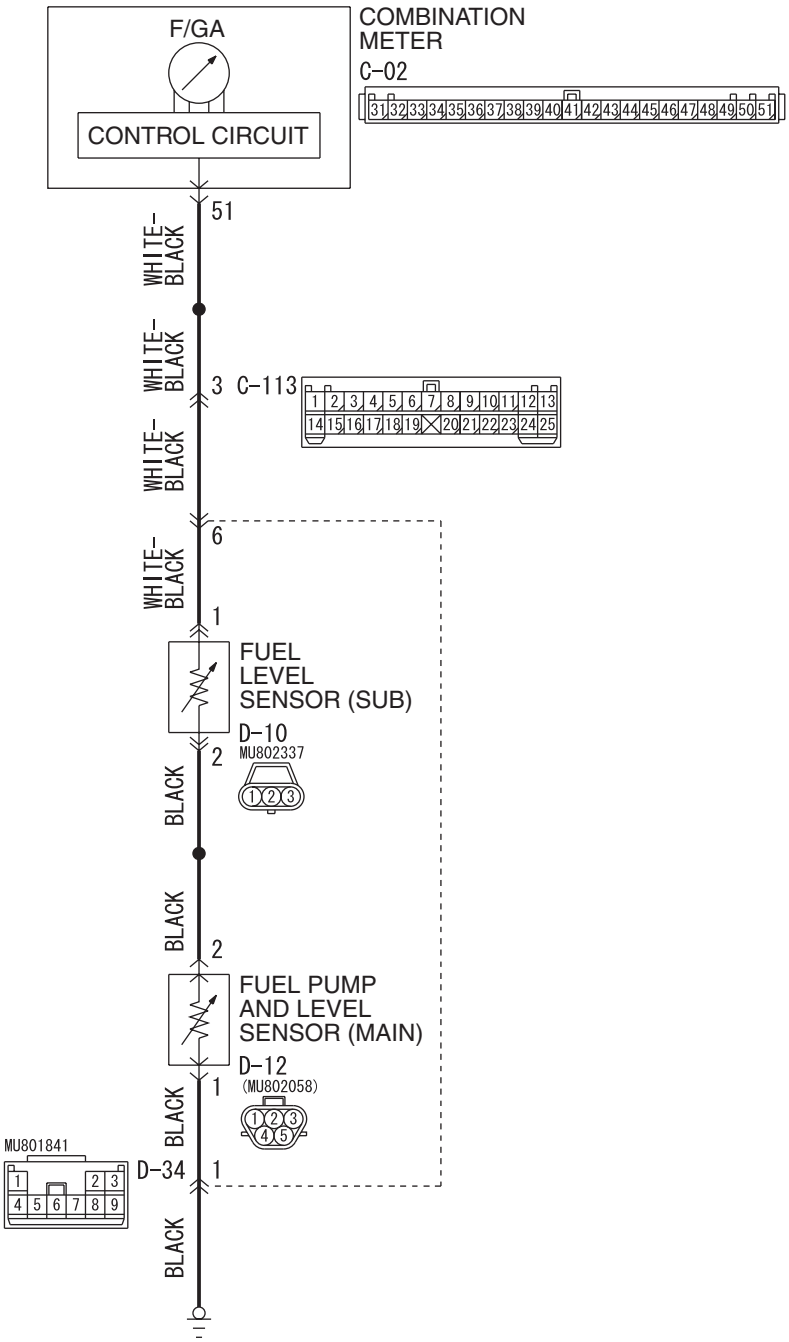
STEP 5. Replace the combination meter and check operation.

Q: Does the tachometer operate?

YES : There is no action to be taken.

NO : Replace the ECM. The tachometer should work normally.

INSPECTION PROCEDURE 3: Fuel Gauge does not Work.



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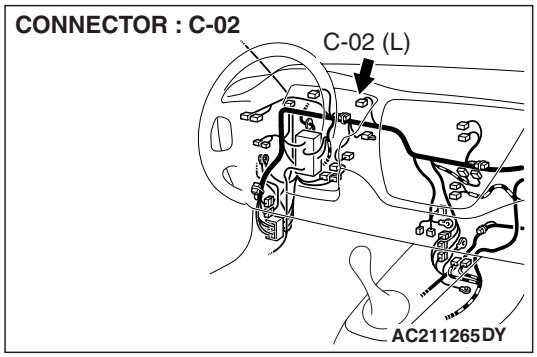
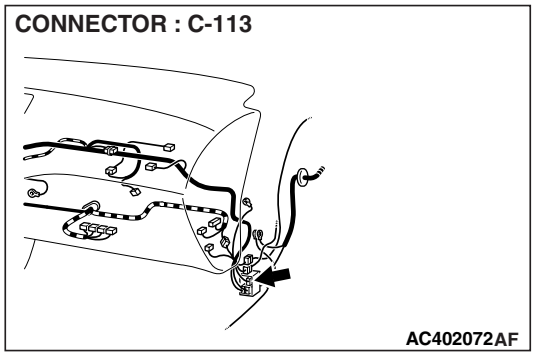
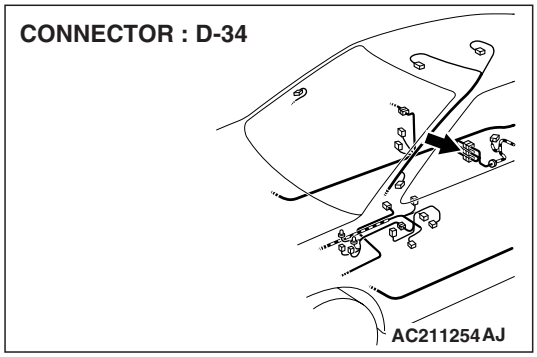
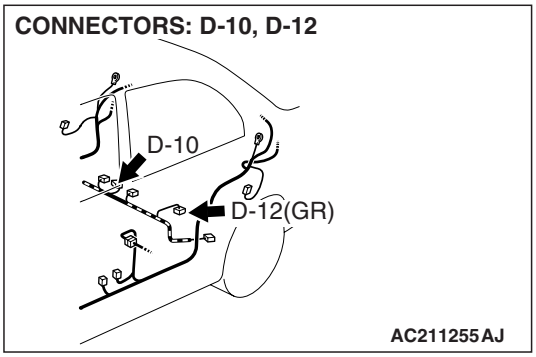








CIRCUIT OPERATION

- The ignition switch (IG1) circuit is the power source for the fuel gauge.
- The resistance value fluctuates causing the circuit current to fluctuate when the fuel level sensor the float moves up and down.
- The fuel gauge moves the needle by the circuit current.

TECHNICAL DESCRIPTION (COMMENT)

If the ignition switch (IG1) circuit is open, the gauge needle will not move at all. If the ground circuit is open, the gauge needle will move up to its extreme position.

TROUBLESHOOTING HINTS

- Malfunction of the fuel level sensor (fuel gauge unit)
- Malfunction of the combination meter (printed-circuit board or fuel gauge assembly)

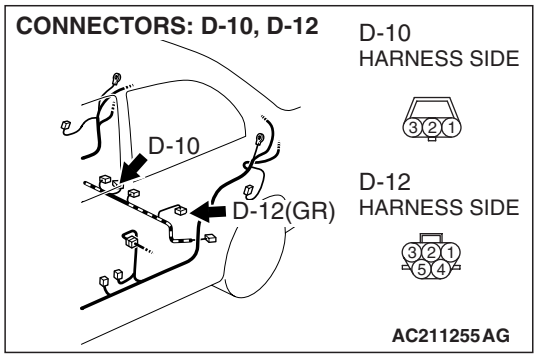
DIAGNOSIS

Required Special Tool:
MB991223: Harness Set

STEP 1. Check with other meter.
Check to see that the speedometer, fuel gauge and water thermometer operate normally.

Q: Do all other meters operate?

YES <other meters all operate.> : Go to Step 2.
NO <one or more of the other meters does not operate.> : Refer to INSPECTION PROCEDURE 5 P.54A-65.



STEP 2. Check fuel level sensor (sub) connector D-10 and fuel level sensor (main) connector D-12 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are fuel level sensor (sub) connector D-10 and fuel level sensor (main) connector D-12 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. The fuel gauge should work normally.

STEP 3. Check the fuel level sensor (sub) and fuel level sensor (main).

Check to see that the fuel level sensor (sub) and fuel level sensor (main) are normal. Refer to P.54A-73.

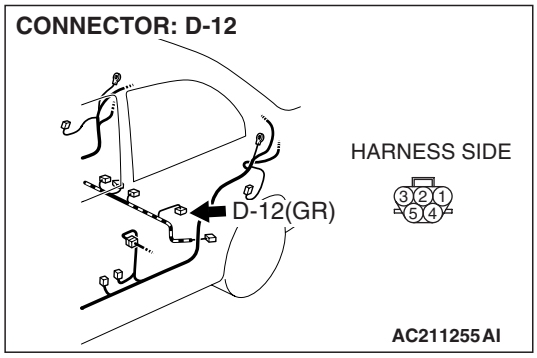
Q: Are fuel level sensor (sub) and fuel level sensor (main) normal?

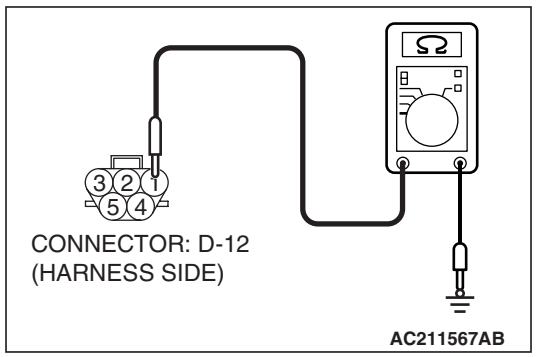
YES : Go to Step 4.

NO : Replace fuel level sensor (sub) and fuel level sensor (main). The fuel gauge should work normally.

STEP 4. Check the ground circuit to the fuel level sensor (main). Measure the resistance at fuel level sensor (main) connector D-12.

(1) Disconnect fuel level sensor (main) connector D-12 and measure the resistance available at the wiring harness side of the connector.





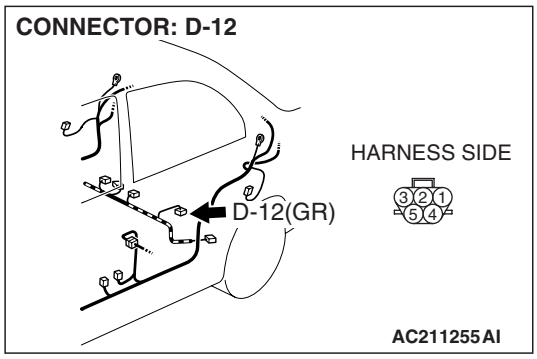
(2) Measure the resistance value between terminal 1 and ground.
- The resistance should equal 2 ohms or less.

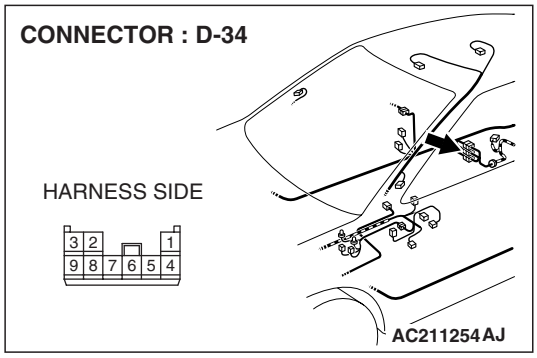
Q: Is the measured resistance 2 ohms or less?

YES : Go to Step 6.

NO : Go to Step 5.

STEP 5. Check the wiring harness between fuel level sensor (main) connector D-12 (terminal 1) and ground.





NOTE: Also check intermediate connector D-34 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector D-34 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between fuel level sensor (main) connector D-12 (terminal 1) and ground in good condition?

YES : There is no action to be taken.

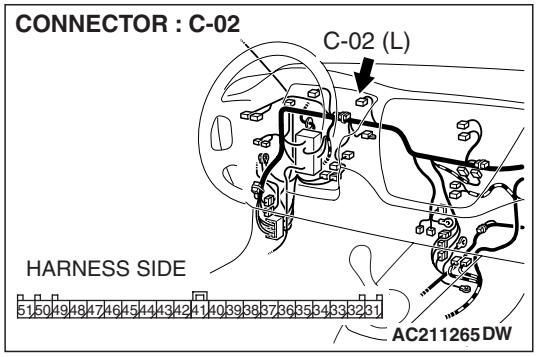
NO : Repair the wiring harness. The fuel gauge should work normally.

STEP 6. Check combination meter connector C-02 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

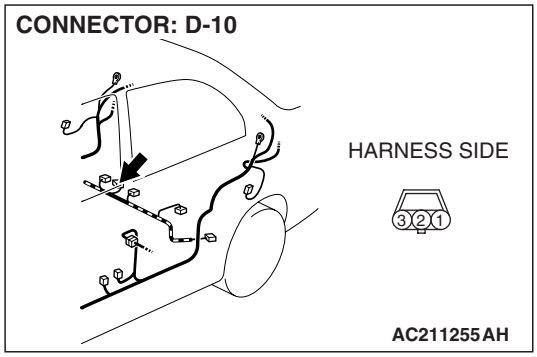
Q: Is combination meter connector C-02 in good condition?

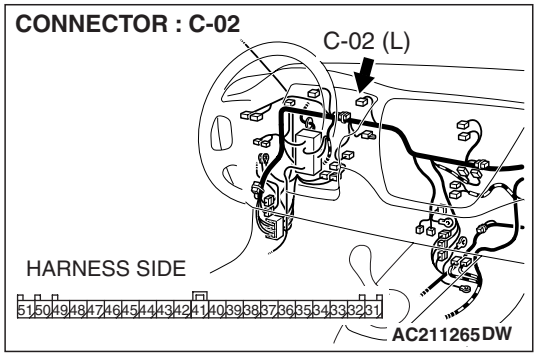
YES : Go to Step 7.

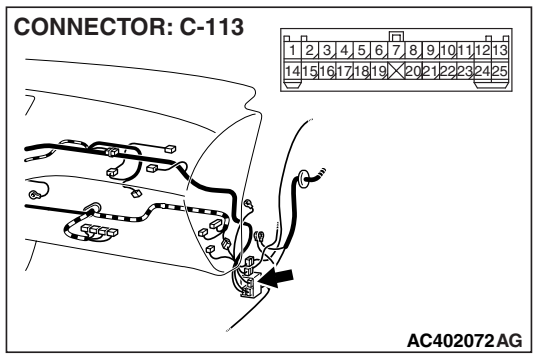
NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The fuel gauge should work normally.

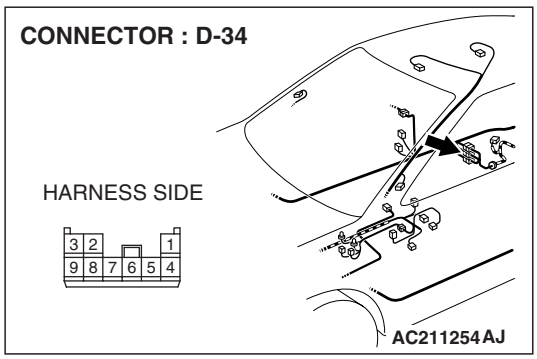


STEP 7. Check the wiring harness between fuel level sensor (sub) connector D-10 (terminal 1) and combination meter connector C-02 (terminal 51).







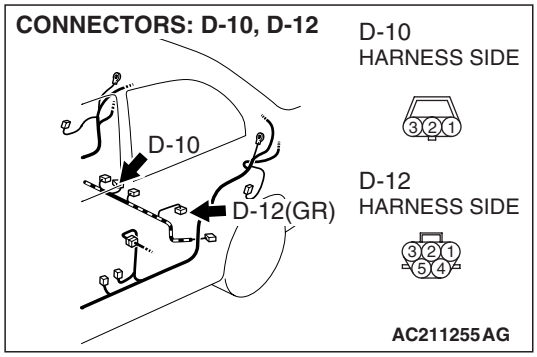


NOTE: Also check intermediate connectors C-113 and D-34 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-113 or D-34 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between fuel level sensor (sub) connector D-10 (terminal 1) and combination meter connector C-02 (terminal 51) in good condition?

YES : Go to Step 8.

NO : Repair the wiring harness. The fuel gauge should work normally.



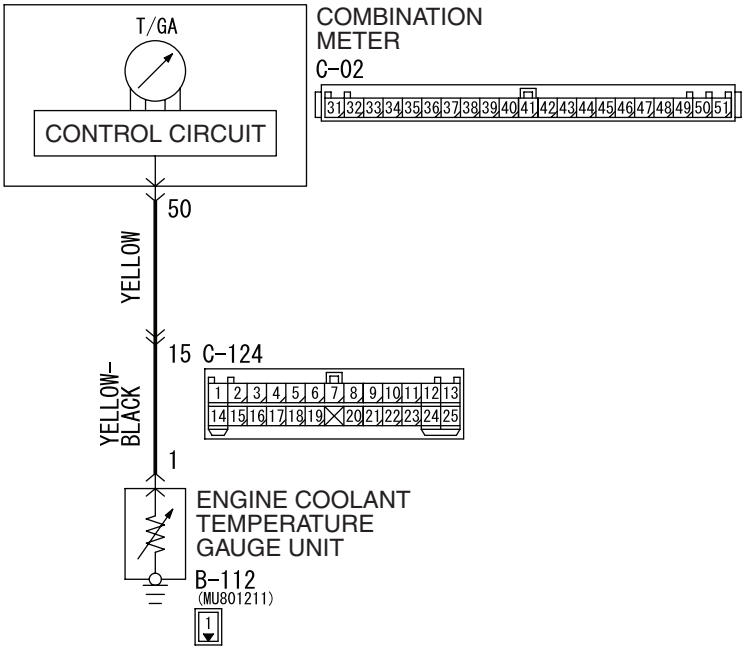
STEP 8. Check the wiring harness between fuel level sensor (sub) connector D-10 (terminal 2) and fuel level sensor (main) connector D-12 (terminal 2).

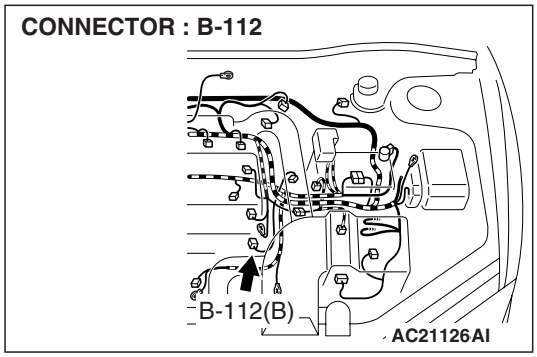
Q: Is the wiring harness between fuel level sensor (sub) connector D-10 (terminal 2) and fuel level sensor (main) connector D-12 (terminal 2) in good condition?

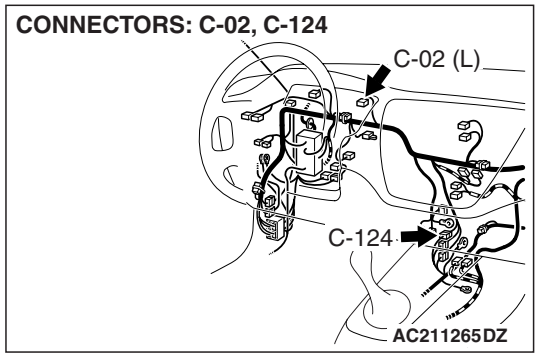
YES : Repair or replace the combination meter. The fuel gauge should work normally.

NO : Repair the wiring harness. The fuel gauge should work normally.

INSPECTION PROCEDURE 4: Engine Coolant Temperature Gauge does not Work.







TSB Revision

CIRCUIT OPERATION

- The ignition switch (IG1) circuit is the power source for the engine coolant temperature gauge.
- Resistance value, which the engine coolant temperature gauge unit sends to the combination meter, is dependent on temperature of the engine coolant. This causes circuit current to fluctuate.
- The engine coolant temperature gauge moves the needle according to the circuit current.

TECHNICAL DESCRIPTION (COMMENT)

If the ignition switch (IG1) circuit is open, the gauge needle will not move at all. If the ground circuit is open, the gauge needle will move up to its extreme position.

TROUBLESHOOTING HINTS

- Malfunction of the engine coolant temperature gauge unit
- Malfunction of the combination meter (printed-circuit board or engine coolant temperature gauge assembly)
- Damaged harness wires or connectors

DIAGNOSIS

Required Special Tool:
MB991223: Harness Set

STEP 1. Check with other meter.
Check to see that the speedometer, tachometer and engine coolant temperature gauge unit operate normally.

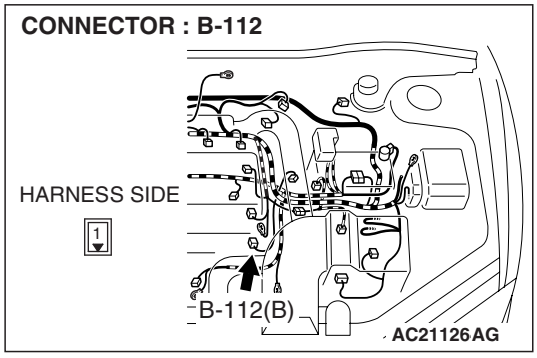
Q: Do all other meters operate?

YES <other meters all operate.> : Go to Step 2.
NO <one of the meters do not operate.> : Refer to INSPECTION PROCEDURE 5 P.54A-65.

STEP 2. Check engine coolant temperature gauge unit connector B-112 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is engine coolant temperature gauge unit connector B-112 in good condition?

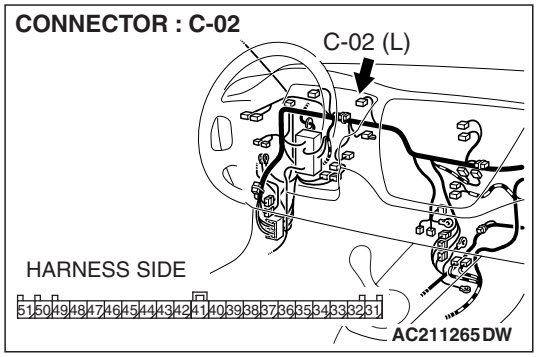
YES : Go to Step 3.
NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The engine coolant temperature gauge unit should work normally.



STEP 3. Check the engine coolant temperature gauge unit.
Check to see that the engine coolant temperature gauge unit operate normally. Refer to P.54A-75.

Q: Is the engine coolant temperature gauge unit normal?

YES : Go to Step 4.
NO : Replace the engine coolant temperature gauge unit. The engine coolant temperature gauge unit should work normally.

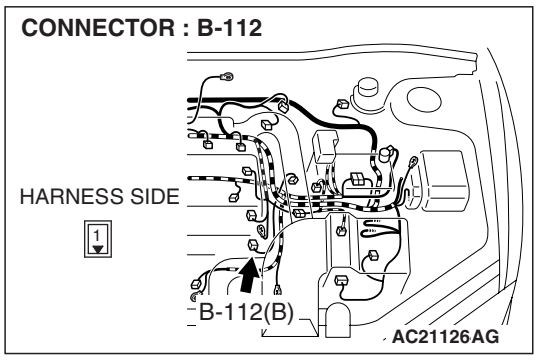


STEP 4. Check combination meter connector C-02 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

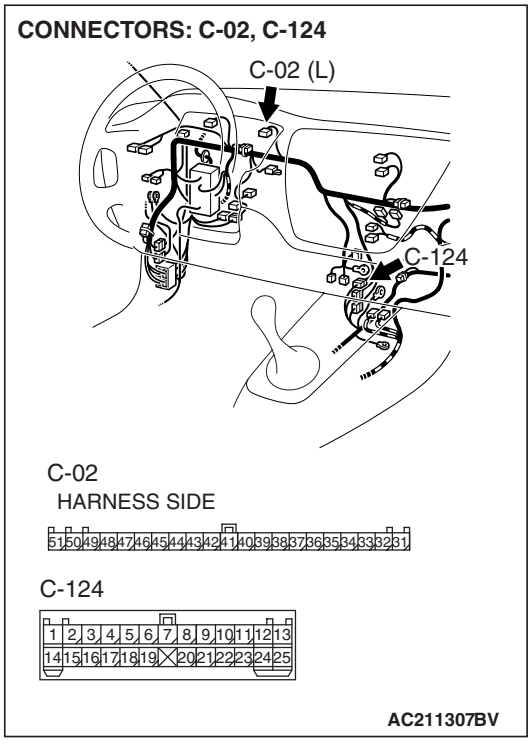
Q: Is combination meter connector C-02 in good condition?

YES : Go to Step 5.

NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The engine coolant temperature gauge unit should work normally.



STEP 5. Check the wiring harness between engine coolant temperature gauge unit connector B-112 (terminal 1) and combination meter connector C-02 (terminal 50).



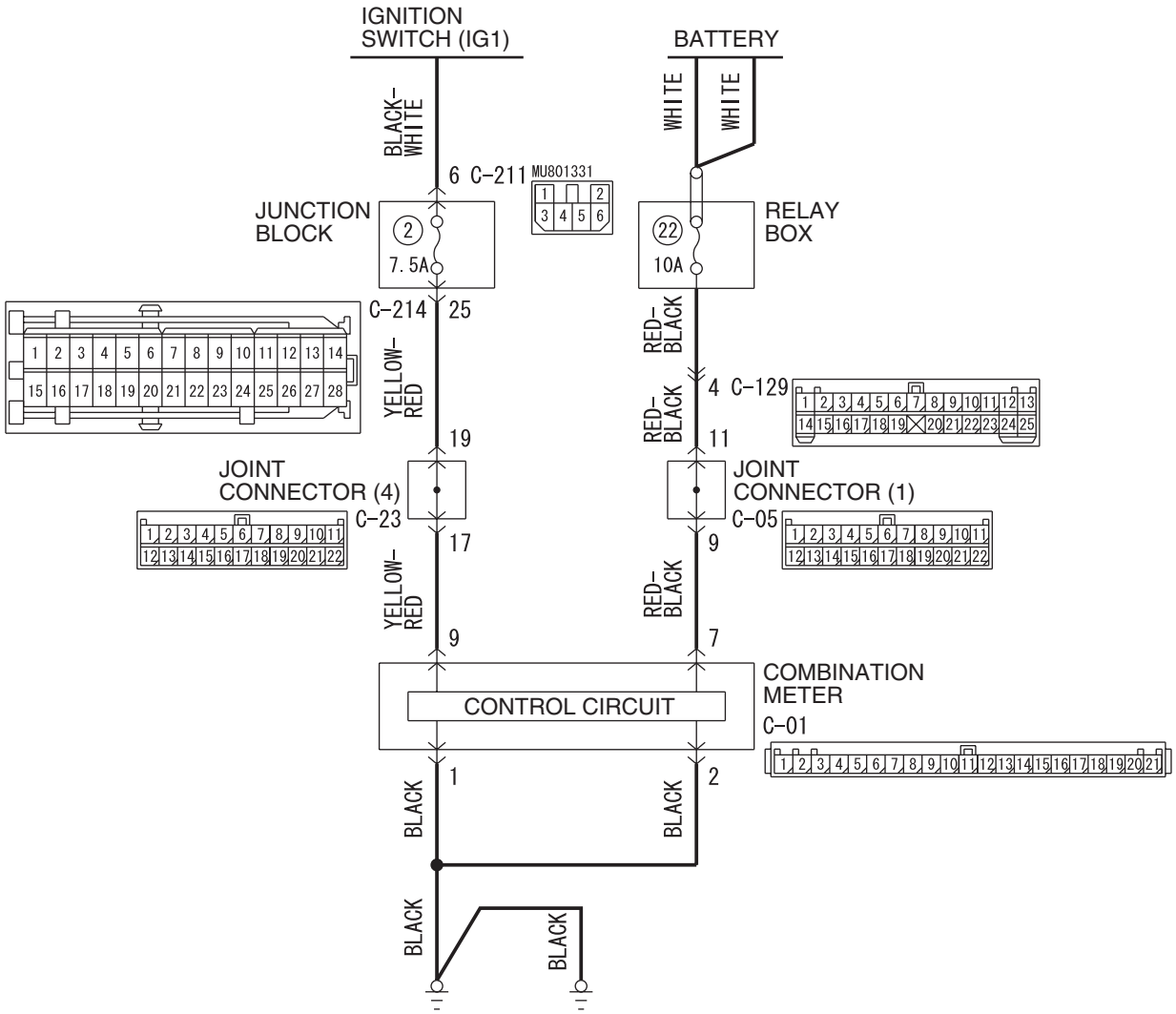
NOTE: Also check intermediate connector C-124 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-124 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the wiring harness between engine coolant temperature gauge unit connector B-112 (terminal 1) and combination meter connector C-02 (terminal 50) in good condition?

YES : Repair or replace the combination meter. The engine coolant temperature gauge unit should work normally.

NO : Repair the wiring harness. The engine coolant temperature gauge unit should work normally.

INSPECTION PROCEDURE 5: Combination meter does not work.



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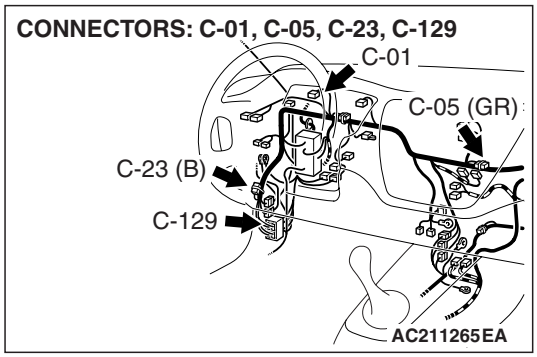
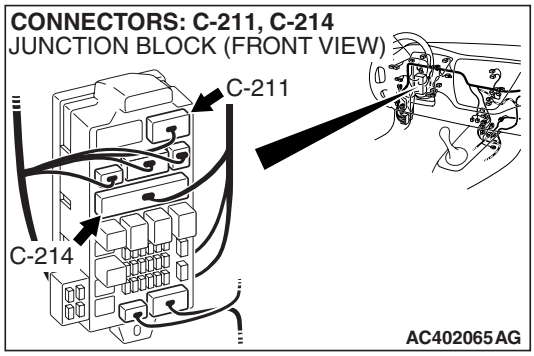
TSB Revision





CIRCUIT OPERATION

The combination meter is powered by the ignition switch (IG1) and battery.

TECHNICAL DESCRIPTION (COMMENT)

The cause may be malfunction of the power and/or ground circuitry or combination meter.

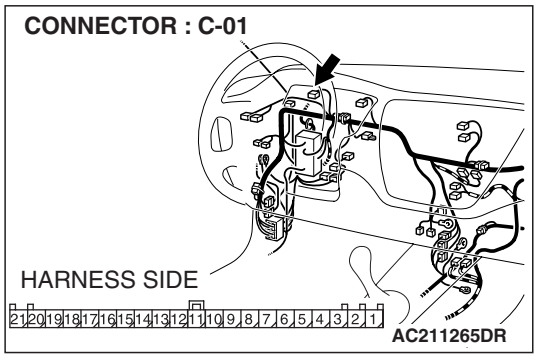
TROUBLESHOOTING HINTS

- Malfunction of the combination meter (printed-circuit board or speedometer and tachometer)
- Damaged wiring harness or connectors

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set



STEP 1. Check combination meter connector C-01 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

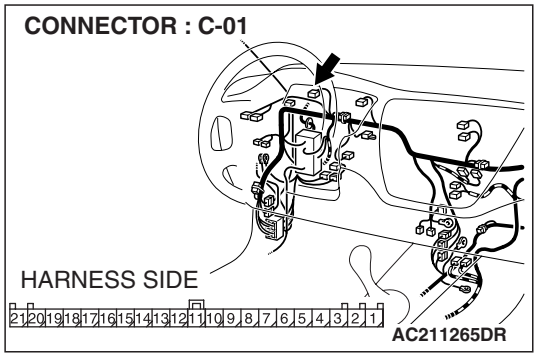
Q: Is combination meter connector C-01 in good condition?

YES : Go to Step 2.

NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. If the functions, which are described in "CIRCUIT OPERATION", work normally, the input signal from the ignition switch (IG1) should be normal.

STEP 2. Check the battery power supply circuit to the combination meter. Measure the voltage at combination meter connector C-01.

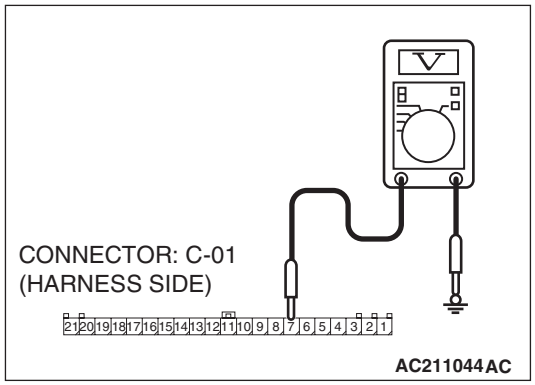
(1) Disconnect combination meter connector C-01 and measure the voltage available at the wiring harness side of the connector.



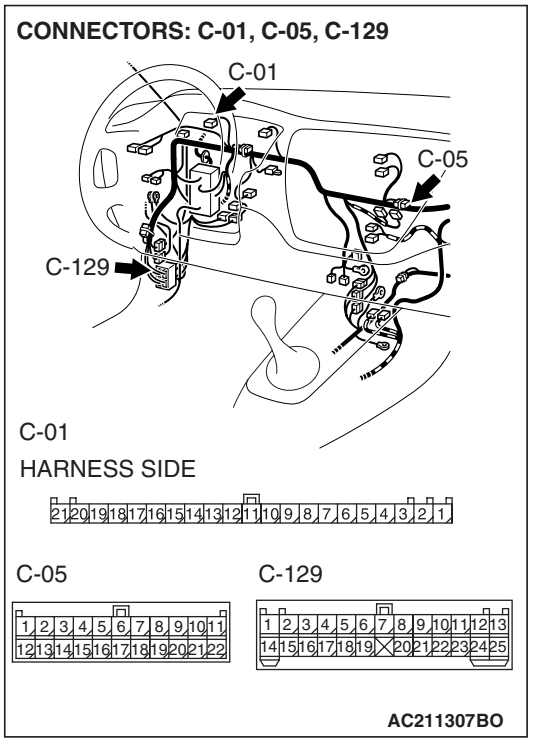
(2) Measure the voltage between terminal 7 and ground.
- The voltage should equal approximately 12 volts (battery positive voltage).

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

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



STEP 3. Check the wiring harness between combination meter connector C-01 (terminal 7) and battery.

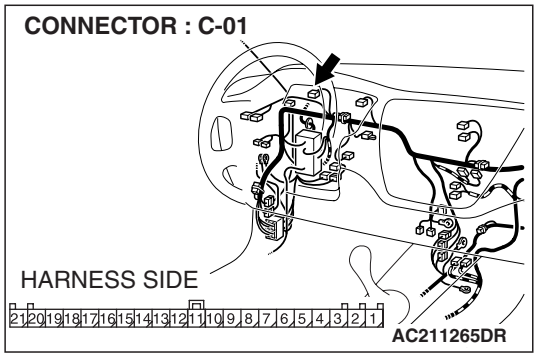


NOTE: Also check intermediate connector C-129 and joint connector C-05 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-129 or joint connector C-05 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

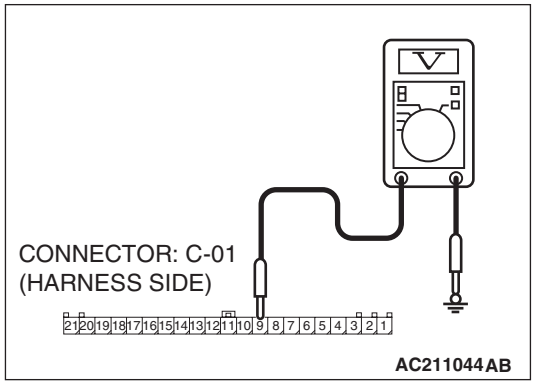
Q: Is the wiring harness between combination meter connector C-01 (terminal 7) and battery in good condition?

YES : There is no action to be taken.
NO : Repair the wiring harness. Check to see that all meters operate.

STEP 4. Check the ignition switch (IG1) circuit to the combination meter. Measure the voltage at combination meter connector C-01.



(1) Disconnect combination meter connector C-01 and measure the voltage available at the wiring harness side of the connector.
(2) Turn the ignition switch to the "ON" position.

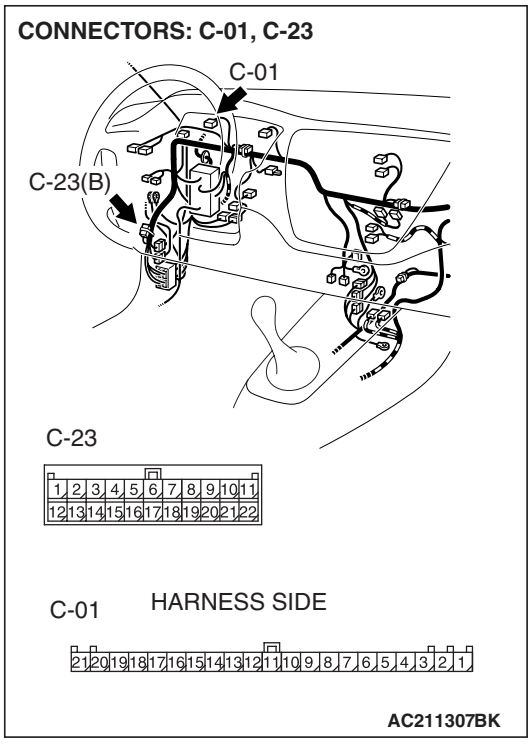


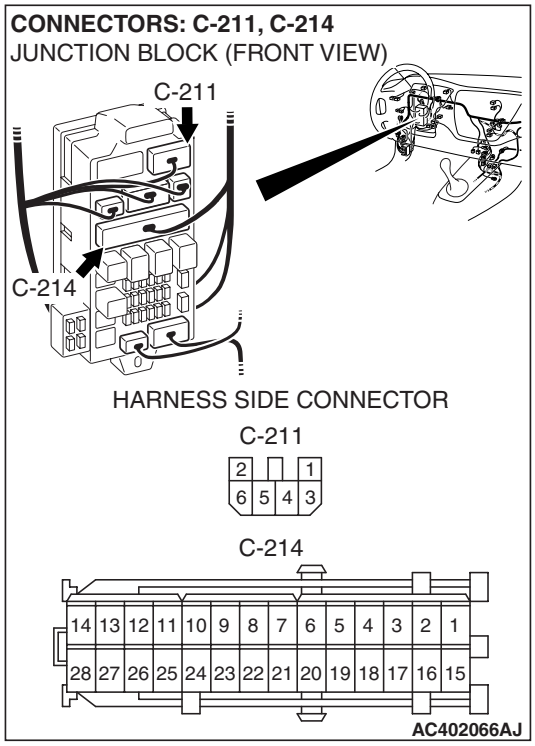
(3) Measure the voltage between terminal 9 and ground.
- The voltage should equal approximately 12 volts (battery positive voltage).

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

YES : Go to Step 6.
NO : Go to Step 5.

STEP 5. Check the wiring harness between combination meter connector C-01 (terminal 9) and ignition switch (IG1).



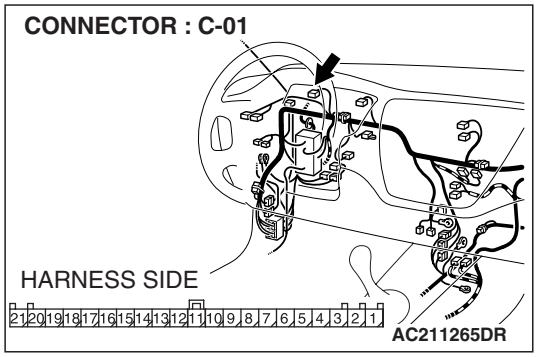


NOTE: Also check junction block connector C-211 and C-214 and joint connector C-23 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If junction block connector C-211 or C-214 or joint connector C-23 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between combination meter connector C-01 (terminal 9) and ignition switch (IG1) in good condition?

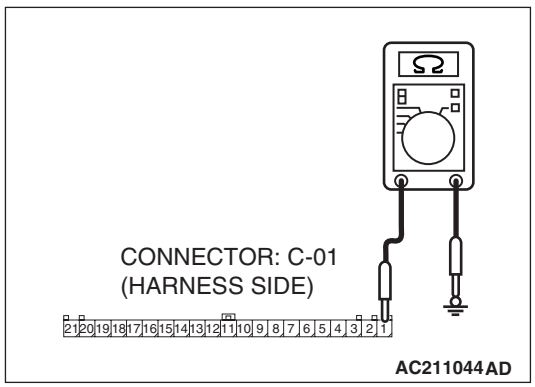
YES : There is no action to be taken.

NO : Repair the wiring harness. Check to see that all meters operate.



STEP 6. Check the ground circuit to the combination meter. Measure the resistance at combination meter connector C-01.

(1) Disconnect combination meter connector C-01 and measure the resistance available at the wiring harness side of the connector.



(2) Measure the resistance value between terminal 1 and ground.
- The resistance should equal 2 ohms or less.

Q: Is the measured resistance 2 ohms or less?

YES : Repair or replace the combination meter. Check to see that all meters operate.

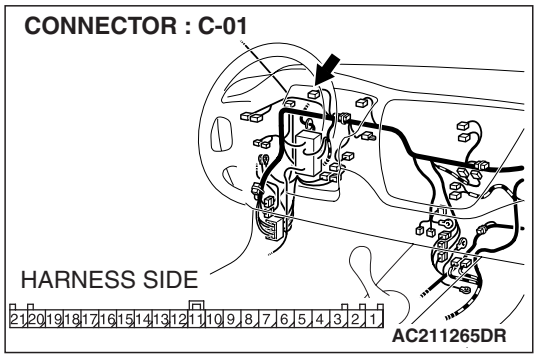
NO : Go to Step 7.

STEP 7. Check the wiring harness between combination meter connector C-01 (terminals 1 and 2) and ground.

Q: Are the wiring harness between combination meter connector C-01 (terminals 1 and 2) and ground in good condition?

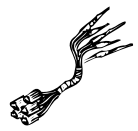
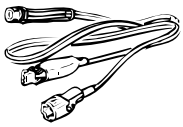
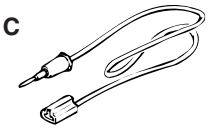
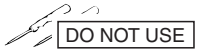
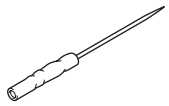
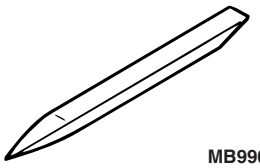
YES : There is no action to be taken.

NO : Repair the wiring harness. Check to see that all meters operate.



SPECIAL TOOLS

M1543000603078

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
A  B  C  D  MB991223AZ	MB991223 Harness set A: MB991219 Test harness B: MB991220 LED harness C: MB991221 LED harness adapter D: MB991222 Probe	MB991223	Making voltage and resistance measurements during troubleshooting A: Connect pin contact pressure inspection B: Power circuit inspection C: Power circuit inspection D: Commercial tester connection
 MB992006	MB992006 Extra fine probe	General service tool	Making voltage and resistance measurement during troubleshooting
 MB990784	MB990784 Ornament remover	General service tool	Removal of meter bezel

ON-VEHICLE SERVICE

SPEEDOMETER CHECK

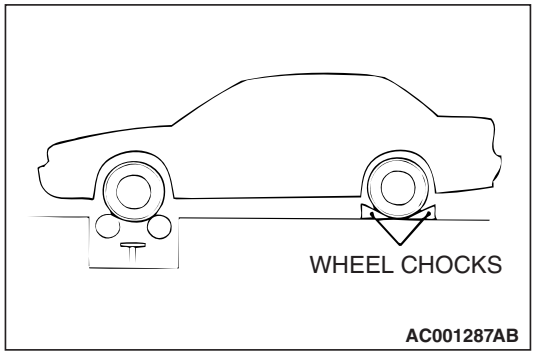
M1543000900337

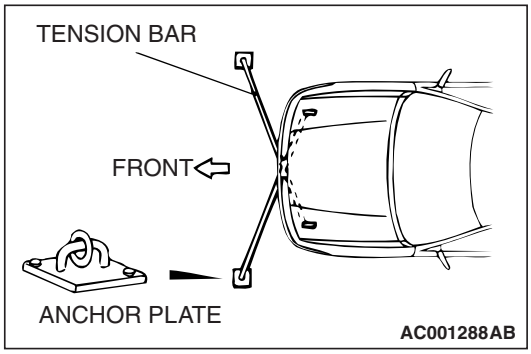
Adjust the pressure of tires to the specified level. (Refer to GROUP 31, On-vehicle Service P.31-6.)

⚠ CAUTION

Do not operate the clutch suddenly. Do not increase/decrease speed rapidly while testing.

1. Set the vehicle onto a speedometer tester and use wheel chocks to hold the front wheels.
2. Set the vehicle onto a speedometer tester and use wheel chocks to hold the rear wheels.





3. To prevent the front wheels from moving from side to side, attach tension bars to the tie-down hook, and secure both ends to anchor plates.
4. To prevent the vehicle from moving, attach a chain or wire to the rear retraction hook, and make sure the end of the chain or wire is secured.
5. Check if the speedometer indicator range is within the standard values.

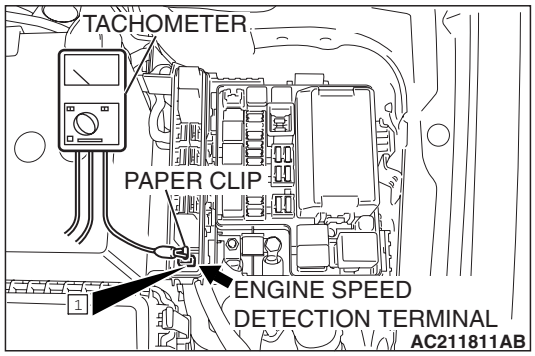
   Standard value:

STANDARD INDICATION mph (km/h)	ALLOWANCE RANGE mph (km/h)
10 (16)	8.5 –11.5 (13.6 –18.4)
25 (40)	23.5 –26.5 (37.7 –42.6)
50 (80)	48.5 –51.5 (78.0 –82.8)
75 (120)	73.5 –76.5 (118.2 –123.0)
100 (161)	98.5 –102.5 (158.4 –164.8)
125 (201)	123.5 –127.5 (198.6 – 205.0)
150 (241)	148.5 –157.5 (238.8 – 253.3)

6. If not within the standard value, inspect for proper tire size. If not correct, replace the tires with original size tires and retest. If correct, replace the speedometer. If still not to standard value, replace the vehicle speed sensor.

TACHOMETER CHECK

M1543001000348



1. Attach an external high quality tachometer to the engine speed detection connector on the harness side (such as with a paper clip).

   NOTE: For tachometer check, use an external high quality inductive tachometer.

2. Compare the readings of the vehicle tachometer and the external tachometer at every engine speed, and check if the variations are within the standard values.

   Standard values:

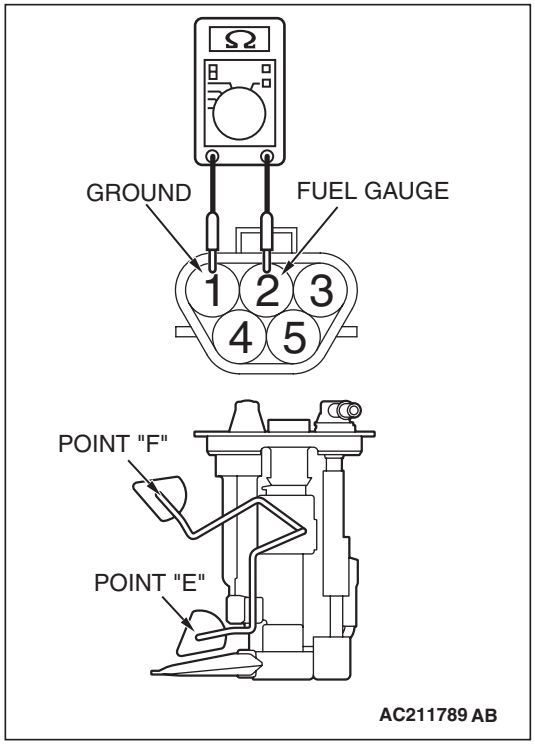
Engine speed (r/min)	Indication allowance of tachometer r/min
700	±120
3,000	–100 + 225
5,000	–125 + 325
6,000	–125 + 375

FUEL LEVEL SENSOR CHECK

M1543001200795

Remove the fuel pump module and the remove the fuel level sensor. (Refer to GROUP 13B, Fuel Tank P.13B-13.)

FUEL LEVEL SENSOR RESISTANCE

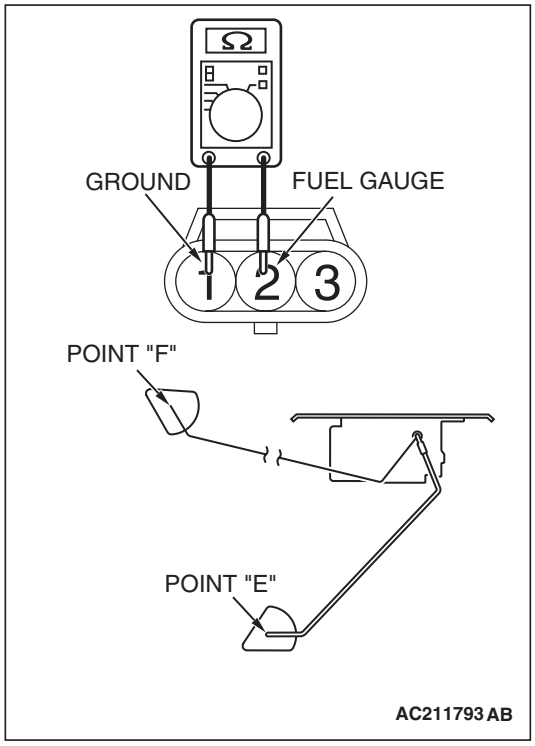


FUEL LEVEL SENSOR (MAIN)

1. Check that resistance value between terminals 2 and 1 is at the standard value when the fuel level sensor float is between point "F" (highest) and point "E" (lowest).

   Standard value:
   - **Point "F": 6.5 ±1 ohm**
   - **Point "E": 41.2 ±1 ohm**

2. Check that resistance value changes smoothly when the float moves slowly between point "F" (highest) and point "E" (lowest).
3. If all checks are correct, go to fuel level sensor float height check. If any check is not correct, replace the fuel level sensor.



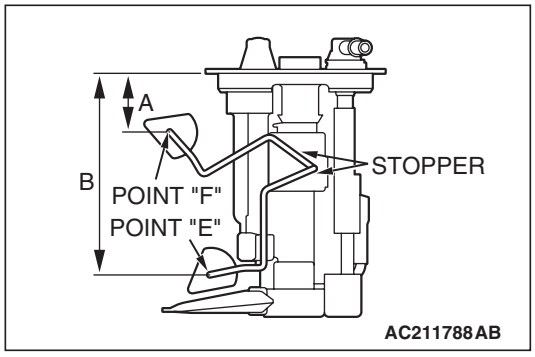
FUEL LEVEL SENSOR (SUB)

1. Check that resistance value between terminals 2 and 1 is at the standard value when the fuel level sensor float is between point "F" (highest) and point "E" (lowest).

   Standard value:
   - **Point "F": 6.5 ±1 ohm**
   - **Point "E": 78.8 ±1 ohm**

2. Check that resistance value changes smoothly when the float moves slowly between point "F" (highest) and point "E" (lowest).
3. If all checks are correct, go to fuel level sensor float height check. If any check is not correct, replace the fuel level sensor.

FUEL LEVEL SENSOR FLOAT HEIGHT

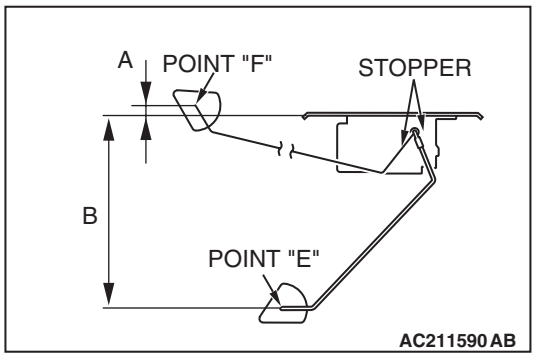


FUEL LEVEL SENSOR (MAIN)

1. Move the float and measure height A at point "F" (highest) and B at point "E" (lowest) with the float arm touching stopper.

   Standard value:
   - **A: 33.3 ±2 mm (1.31 ±0.08 inches)**
   - **B: 121.9 ±2 mm (4.8 ±0.08 inches)**

2. Adjust the float arm to the standard value, then go to the thermistor check.



FUEL LEVEL SENSOR (SUB)

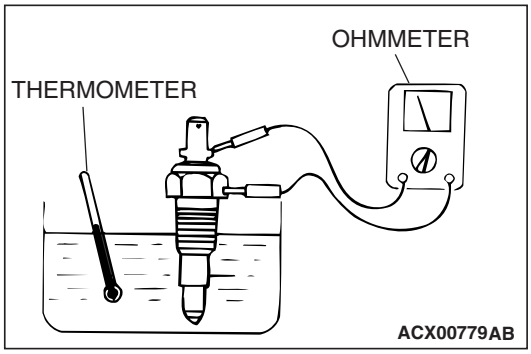
1. Move the float and measure height A at point "F" (highest) and B at point "E" (lowest) with the float arm touching stopper.

   Standard value:
   - **A: 5.7 ±2 mm (0.224 ±0.08 inch)**
   - **B: 141 ±2 mm (5.5 ±0.08 inches)**

2. Adjust the float arm to the standard value, then go to the thermistor check.

ENGINE COOLANT TEMPERATURE GAUGE UNIT CHECK

M1543001500321

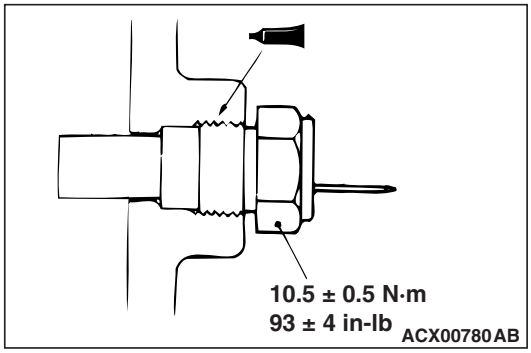


1. Drain the engine coolant. (Refer to GROUP 00, Maintenance Service –Engine Coolant P.00-48.)
2. Remove the engine coolant temperature gauge unit.
3. Put the water temperature gauge unit into the hot water in specified temperature, and ensure the resistance is within standard value.

   Standard value: 70 °C (150 °F) 104 ±13.5 ohm

   Reference value:

Temperature	Resistance Ω
50° C (122° F)	230 ±23
60° C (140° F)	155 ±15.5
80° C (176° F)	73 ±7.3



4. After inspection, apply specified sealant at threads of water temperature gauge unit, and tighten to the specified torque.

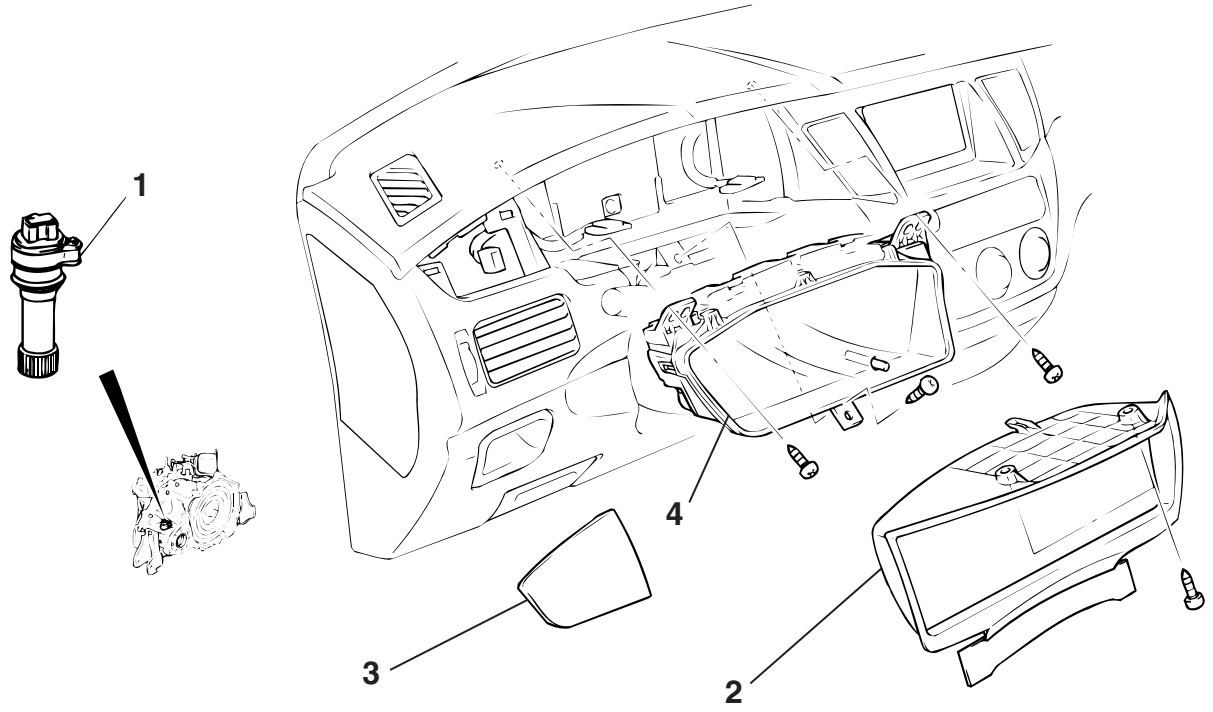
   Semi-drying sealant: 3M™ AAD part No.2310 or equivalent

5. Refill coolant. (Refer to GROUP 00, Maintenance Service – Engine Coolant P.00-48.)

COMBINATION METER ASSEMBLY AND VEHICLE SPEED SENSOR

REMOVAL AND INSTALLATION

M1543002900344



AC005195AB

1. VEHICLE SPEED SENSOR

COMBINATION METER REMOVAL STEPS

2. METER BEZEL
3. INSTRUMENT PANEL ORNAMENT
4. COMBINATION METER

Required Special Tool:

- MB990784: Ornament remover

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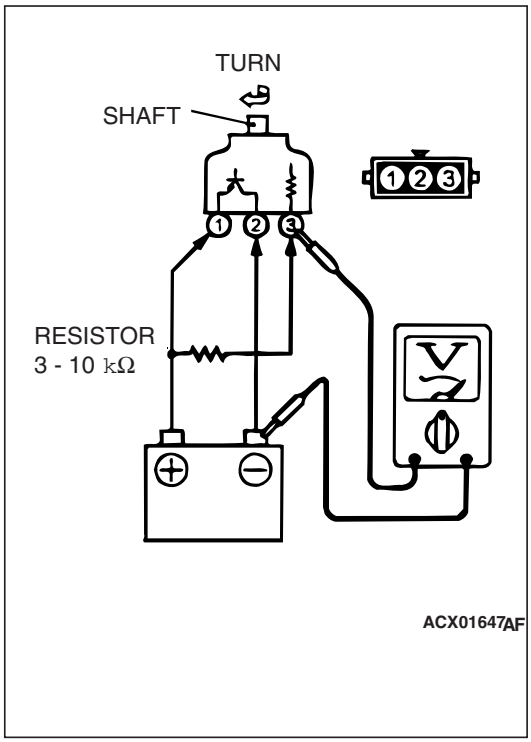
INSPECTION

M1543019501976

VEHICLE SPEED SENSOR CHECK

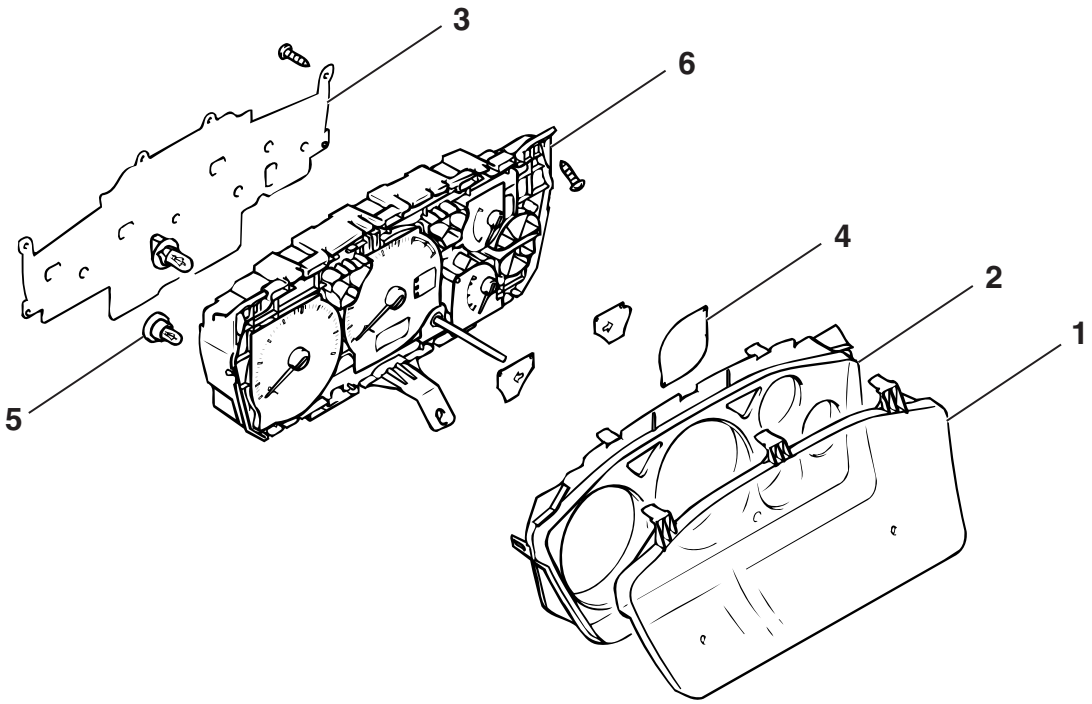


1. Remove the vehicle speed sensor and connect a 3 – 10 kΩ resistor as shown in the illustration.
2. Turn the shaft of the vehicle speed sensor and check that there is voltage between terminals 2 – 3. (1 turn = 4 pulses)

   Standard value: 0 or Battery Voltage (1 turn = 4pulses)
3. If within the standard value, the vehicle speed sensor is OK. If not within the standard value, replace the vehicle speed sensor.

DISASSEMBLY AND ASSEMBLY

M1543003100266



DISASSEMBLY STEPS

1. GLASS
2. WINDOW PLATE
3. CIRCUIT BOARD COVER

DISASSEMBLY STEPS (Continued)

4. INDICATOR PLATE
5. BULB
6. METER ASSEMBLY

TSB Revision

HEADLIGHT, FRONT SIDE MARKER LIGHT AND POSITION LIGHT ASSEMBLY

LIGHTING SYSTEM DIAGNOSIS

HEADLIGHT DIAGNOSIS

M1542010500605

INTRODUCTION

The headlights are controlled by the Simplified Wiring System (SWS). For troubleshooting, refer to GROUP 54B, SWS Diagnosis P.54B-23.

TROUBLESHOOTING STRATEGY

M1542010600152

⚠ ***WARNING***
Do not touch the socket and the connector while the headlights are on. High voltage current is flowing in the socket and the connector while the headlights are on. If you fail to handle them correctly, serious injury or damage may be caused.

⚠ ***WARNING***
Do not attempt to use a tester to check them. If a tester is used, serious injury or damage may be caused by high-voltage current.

⚠ ***WARNING***
Do not turn on the headlights while the controller or the bulb is removed. If the headlights are turned on while the controller or the bulb is removed, serious injury or damage may be caused.

⚠ ***WARNING***
Before service work, ensure that the battery terminal and the controller connector is disconnected. Do not touch the components with wet hands. If you work on the components with wet hands or in wet conditions, serious injury may be caused.

⚠ **CAUTION**
Do not illuminate the bare headlight bulb. If the headlight bulb illuminates without fitting it in the headlight unit, it may burst due to rise in its internal pressure.

⚠ **CAUTION**
If the discharge headlight is damaged, strictly observe "How to check discharge headlight components." If you fail to observe "How to check discharge headlight components," the vehicle may be damaged.

HOW TO CHECK DISCHARGE HEADLIGHT COMPONENTS.

VISUAL CHECK OF THE CONTROLLER (CASE)

If any of the defects below are found, replace the controller.

Items to be checked	Why the controller should be replaced
Obvious deformation (warping, twisting, dents, nicks, cracks, chipped edges) of the controller case	Because the printed circuit board or the element(s) may be cracked
Damaged connector (chipped or cracked plastics, or deformed terminal)	Because the damaged part(s) may cause poor connection

CHECK THE WIRING HARNESS BETWEEN THE CONTROLLER AND THE BULB.

If any of the defects below are found, replace the wiring harness between the controller and the bulb.

⚠ CAUTION

If the wiring harness between the controller and the bulb is defective, always replace it. Attempting to repair the wiring harness may cause a melted harness wire.

Items to be checked	Why the controller should be replaced
Wiring harness shield damaged (breakage)	Causing abnormal noise
Damaged connector (chipped or cracked plastics, or deformed terminal)	Because the damaged part(s) may cause poor connection

CHECKING WHILE THE HEADLIGHTS ARE ON

If any of the defects below are found, replace the controller.

⚠ WARNING

While the headlights are on, do not touch the headlight bulbs. There is a high risk of scalding, as the headlight bulb will become extremely hot.

NOTE: Ensure that the headlight control system and its circuit (power supply control at engine start and during steady illumination, high-voltage generating circuit, etc.) are working normally. Then check whether internal breakage has occurred in the controller. However, some internal breakage may not be able to be found.

Check how the lights illuminate.
Turn on and off the headlights several times when they are cold and warm. Observe how the headlights illuminate.
Observe the headlights until they illuminate steadily (approximately five minutes after switching on them). Check that the headlights do not flash or flicker.
Turn on the headlights for thirty minutes. Check that the brightness is the same between right and left lights. Also check that the headlights do not flash or flicker.

HOW TO DIAGNOSE THE DISCHARGE HEADLIGHTS

1. Check that the connectors are connected securely and the fuse has not been blown.
2. Before starting the diagnosis, read through the "Symptom chart" to understand what and how you should do. Follow all the procedures carefully.
3. The components should be checked with their connectors disconnected.

SYMPTOM CHART

Item to be checked	Symptom		
	The headlights do not illuminate.	**The headlights flicker.**	**The headlights are dim.**
Fuse	1	–	–
Wiring harness and connector	2	1	–
Column switch	3	–	–
Bulb	4	2	1
Controller	5	3	2

NOTE:

1. *The numbers indicate the sequence in which the component is checked.*
2. *Refer to GROUP 54B for the troubleshooting other than above. (Refer to GROUP 54B, Troubleshooting, symptom chart P.54B-23.)*
3. *If the ETACS-ECU failed, only the low-beam headlights will illuminate as a fail-safe measure.*

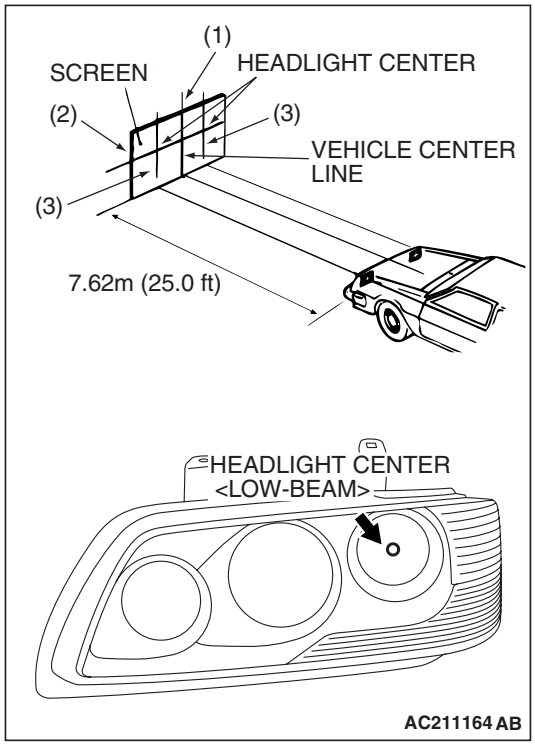
ON-VEHICLE SERVICE

HEADLIGHT AIMING

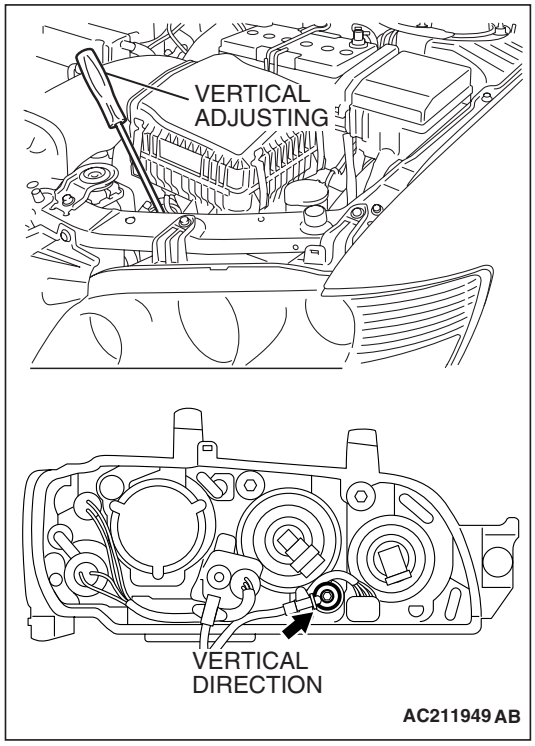
M1542000900419

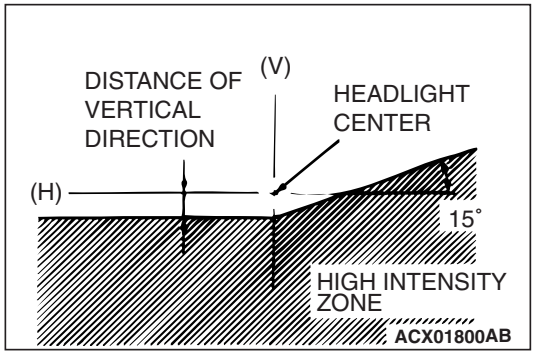
PRE-AIMING INSTRUCTIONS

1. Inspect for badly rusted or faulty headlight assemblies.
2. These conditions must be corrected before a satisfactory adjustment can be made.
3. Inspect tire inflation, and adjust if necessary.
4. If the fuel tank is not full, place a weight in luggage room of vehicle to simulate weight of a full tank [3 kg (6.5 pounds) per gallon.]
5. There should be no other load in the vehicle other than driver or substituted weight of approximately 70 kg (150 pounds) placed in driver's position.
6. Thoroughly clean the headlight lenses.
7. Set the headlight leveling switch to zero position.
8. Place the vehicle on a level floor, perpendicular to a flat screen 7.62m (25.0 feet) away from the bulb center-marks on the headlight lens.
9. Rock vehicle sideways to allow vehicle to assume its normal position.
10. Bounce the front suspension through three oscillations by applying the body weight to hood or bumper.
11. Four lines of adhesive tape (or equivalent markings) are required on screen or wall:
    (1) Position a vertical tape or mark so that it is aligned with the vehicle center line.
    (2) Measure the distance from the center-marks on the headlight lens to the floor. Transfer the measurement to the screen. Horizontal tape or mark on the screen is for reference of vertical adjustment.
    (3) Measure the distance from the center line of the vehicle to the center of each headlight. Transfer the measurement to the screen. Vertical tape or mark on the screen with reference to the center line of each headlight bulb.



HEADLIGHT ADJUSTMENT





1. The low beam headlight should project on the screen upper edge of the beam (cut-off).
2. If not the case, turn the adjusting screws to achieve the specified low-beam cut-off location on the aiming screen.

   Standard value: (Vertical direction) Range of headlight center line 53 ±50 mm (2.09 ±1.97 inches)

   NOTE: There is no horizontal aim adjustment. Horizontal aim is preset and does not require adjustment.
3. When adjusting one headlight, disconnect the other headlight harness.

⚠ CAUTION

Do not cover a headlight for more than three minutes, or the plastic headlight lens will become deformed.

4. High-beam pattern should be correct when the low-beams are adjusted properly.

FOG LIGHT AIMING

M1542001100405

PRE-AIMING INSTRUCTIONS

1. Inspect for badly rusted or faulty fog light assemblies.
2. These conditions must be corrected before a satisfactory adjustment can be made.
3. Inspect tire inflation, and adjust if necessary.
4. If fuel tank is not full, place a weight in the trunk of the vehicle to simulate weight of a full tank [3 kilograms (6.5 pounds) per gallon.]
5. There should be no other load in the vehicle other than driver or substituted weight of approximately 70 kilograms (150 pounds) placed in driver's position.
6. Thoroughly clean the fog light lenses.

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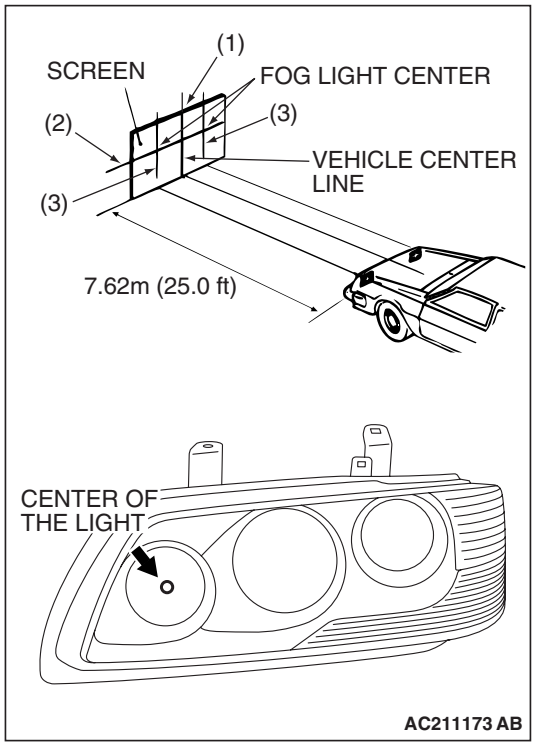
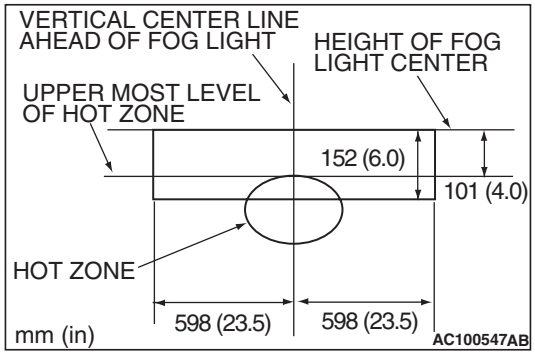
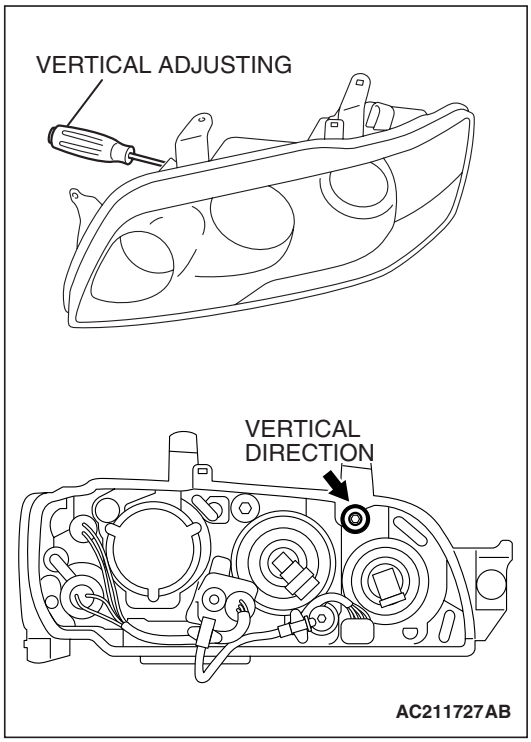
7. Place the vehicle on a level floor, perpendicular to a flat screen 7.62 meters (25.0 feet) away from the bulb center-marks on the headlight lens.
8. Rock the vehicle sideways to allow the vehicle to assume its normal position.
9. Bounce the front suspension through three oscillations by applying the body weight to the hood or bumper.
10. Measure the center of the fog lights as shown in the illustration.
11. Four lines of adhesive tape (or equivalent markings) are required on screen or wall:
    (1) Position a vertical tape or mark so that it is aligned with the vehicle center line.
    (2) Measure the distance from the center of the fog light lens to the floor. Transfer the measurement to the screen. Horizontal tape or mark on the screen is for reference of vertical adjustment.
    (3) Measure the distance from the center line of the vehicle to the center of each fog light. Transfer the measurement to the screen. Vertical tape or mark on the screen is for reference to the center line of each fog light.



FOG LIGHT ADJUSTMENT

1. Check if the beam shining onto the screen is at the standard value.





2. If it is not within the standard value range, adjust by turning the adjusting screw.

   Standard value:
   (Vertical direction): Top of the hot zone should be 101 mm (4.0 inches) (0.76°) downward from the height of the fog light center.

   Limit:
   (Vertical direction): Top of the hot zone should be 152mm (6.0 inches) (1.14°) in maximum downward from the height of the fog light center.

   NOTE: The horizontal direction is non-adjustable. If deviation of the light beam axis exceeds the standard value, check that the mounting location or some other points are not faulty.

INTENSITY MEASUREMENT

M1542001000334

1. Set the headlights to high-beam
2. Using a photometer, and following its manufacturer's instruction manual, measure the headlight center intensity and check to be sure that the limit value is satisfied.

   Limit: 40,000 cd or more {When a screen is set 18.3m (60.0 feet) ahead of the vehicle}

NOTE: When measuring the intensity, maintain an engine speed of 2,000 r/min, with the battery fully charged.
There may be special local regulations pertaining to headlight intensity. Be sure to make any adjustments necessary to satisfy such regulations.
If an illuminometer is used to make the measurements, convert its values to photometer values by using the following formula.

I =Er2 Where:
- I = intensity (cd)
- E = illumination (lux)
- r = distance (m) from headlights to illuminometer

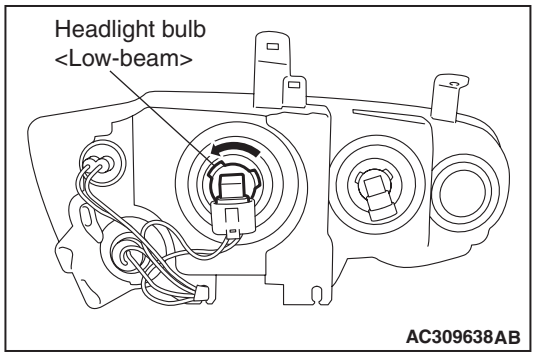
⚠ CAUTION

1. **On the headlight not yet adjusted, perform aiming with connector removed and the lights switched off, if applicable. in addition, care should be taken to prevent a change of optical axis when connector is reconnected.**
2. **Plastic outer lens are equipped with headlights. If the lens surface is covered, headlight operation time should be within 3 minutes. In addition, do not mask the headlight with tape, etc.**

BULB REPLACEMENT

M1542001300766

HEADLIGHT BULB <LOW-BEAM, VEHICLES WITHOUT DISCHARGE HEADLIGHT>



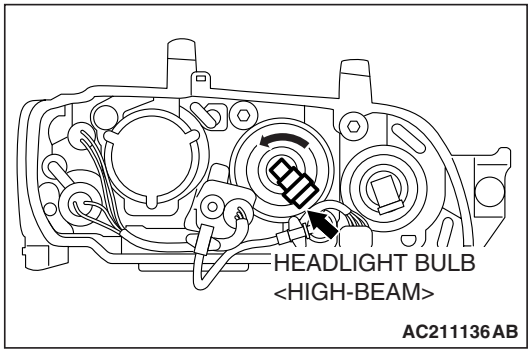
1. Disconnect the battery.
2. Disconnect the connector.

⚠ CAUTION

Do not touch the surface of the bulb with hands or dirty gloves, as the bulb may pop after a short time. If the surface does become dirty, clean it with alcohol or thinner, and let it dry thoroughly before installing.

3. Screw out the head light bulb.
4. Replace the valve, and connect securely the connector.

HEADLIGHT BULB <HIGH-BEAM>



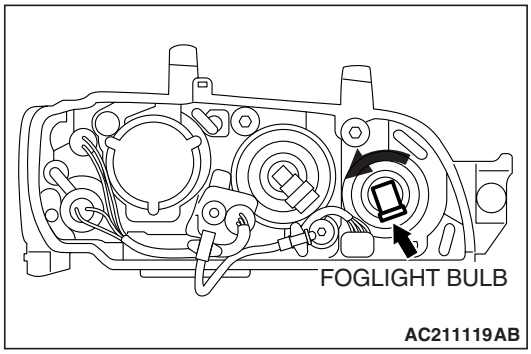
1. Disconnect the battery.
2. Disconnect the connector.

⚠ CAUTION

Do not touch the surface of the bulb with hands or dirty gloves, as the bulb may pop after a short time. If the surface does become dirty, clean it with alcohol or thinner, and let it dry thoroughly before installing.

3. Screw out the head light bulb.
4. Replace the valve, and connect securely the connector.

FOGLIGHT BULB <VEHICLES WITH DISCHARGE HEADLIGHT>



1. Disconnect the battery.
2. Disconnect the connector.

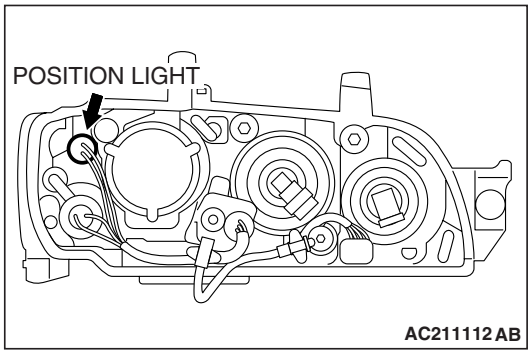
⚠ CAUTION

Do not touch the surface of the bulb with hands or dirty gloves as the bulb may pop after a short time. If the surface does become dirty, clean it with alcohol or thinner, and let it dry thoroughly before installing.

3. Screw out the fog light bulb.
4. Replace the valve, and securely connect the connector.

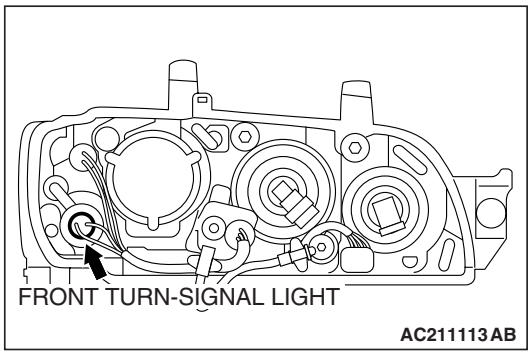
POSITION LIGHT BULB

1. Remove the splash shield.
2. Screw out the position light socket.



FRONT TURN SIGNAL LIGHT BULB

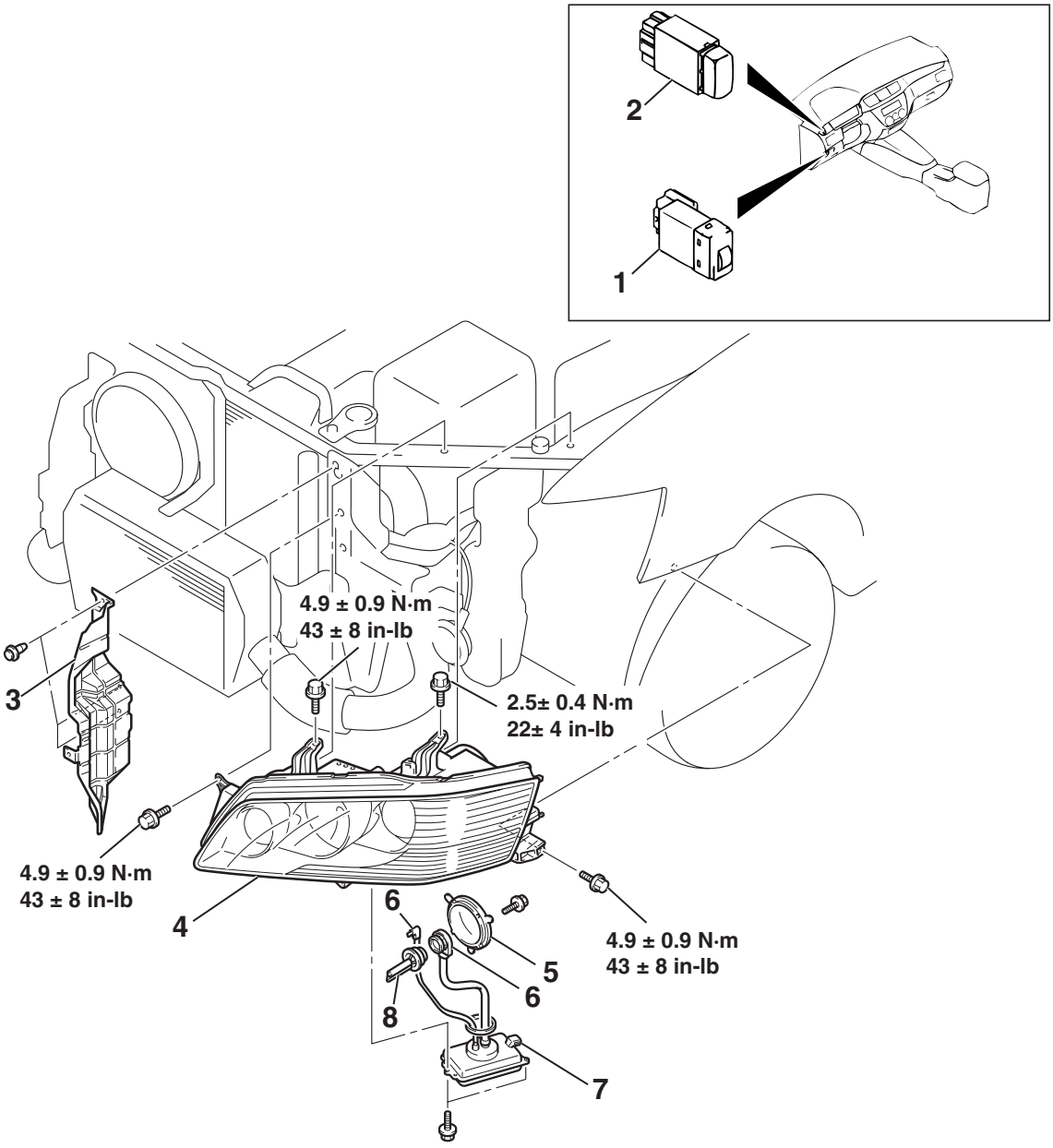
1. Remove the splash shield.
2. Screw out the front turn signal socket.



HEADLIGHT

REMOVAL AND INSTALLATION

M1542002700392



AC211140AB

HEADLIGHT LEVELING SWITCH REMOVAL STEPS

- SWITCH PANEL (REFER TO GROUP 52A, INSTRUMENT PANEL P.52A-3.)

1. HEADLIGHT LEVELING SWITCH

FOG LIGHT SWITCH REMOVAL STEPS

- INSTRUMENT PANEL ORNAMENT (REFER TO GROUP 52A, INSTRUMENT PANEL P.52A-3.)

2. FOG LIGHT SWITCH

HEADLIGHT ASSEMBLY REMOVAL STEPS

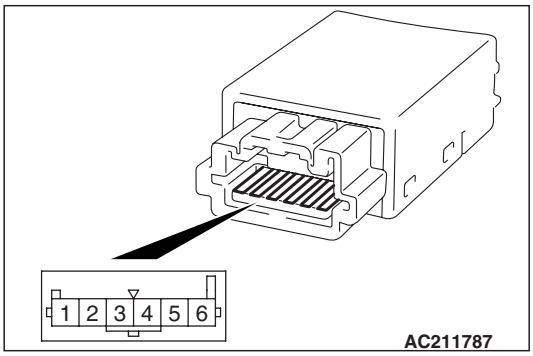
3. AIR GUIDE PANEL
4. HEADLIGHT ASSEMBLY
5. SOCKET COVER <VEHICLES WITH DISCHARGE HEADLIGHT>
6. CONNECTOR <VEHICLES WITH DISCHARGE HEADLIGHT>
7. DISCHARGE-CONTROLLER <VEHICLES WITH DISCHARGE HEADLIGHT>
8. BULB <VEHICLES WITH DISCHARGE HEADLIGHT>

TSB Revision

INSPECTION

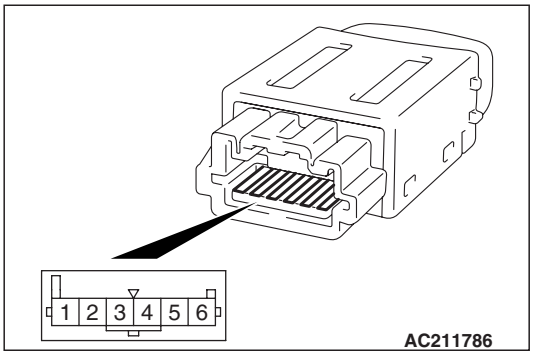
M1542011200748

HEADLIGHT LEVELING SWITCH CONTINUITY CHECK



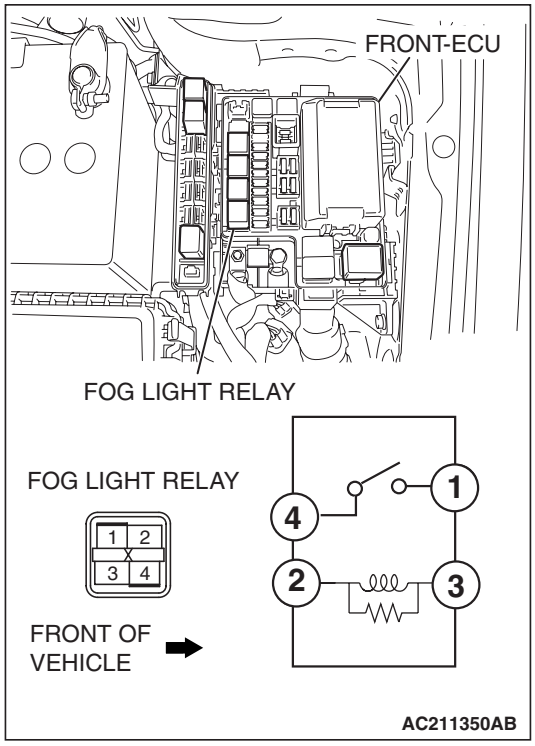
SWITCH POSITION	TESTER CONNECTION	SPECIFIED CONDITION
0	4 – 5	120 ohms
1	4 – 5	300 ohms
2	4 – 5	620 ohms
3	4 – 5	1.1 kΩ
4	4 – 5	2 kΩ

FOG LIGHT SWITCH CONTINUITY CHECK



SWITCH POSITION	TESTER CONNECTION	SPECIFIED CONDITION
ON	1 – 2	Less than 2 ohms
OFF	1 – 2	Open circuit

FOG LIGHT RELAY CHECK



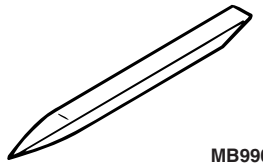
BATTERY VOLTAGE	TESTER CONNECTION	SPECIFIED CONDITION
Not applied	1 – 4	Open circuit
• Connect terminal 2 to the positive battery terminal • Connect terminal 3 to the negative battery terminal	1 – 4	Less than 2 ohms

TSB Revision

TURN-SIGNAL LIGHT

SPECIAL TOOL

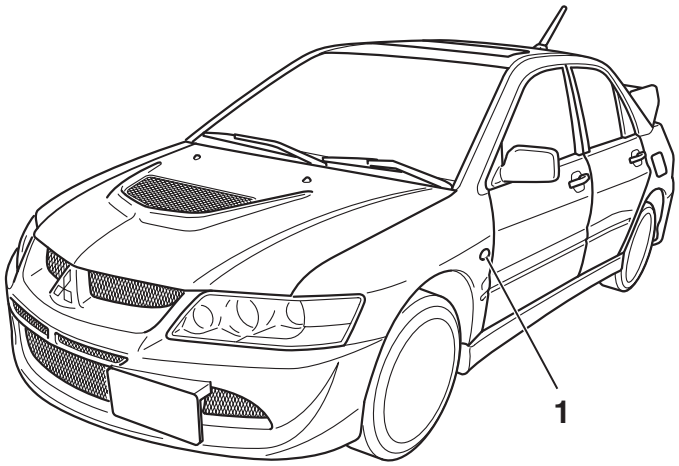
M1542000600485

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
 MB990784	MB990784 Ornament remover	General service tool	Side turn-signal light removal

TURN-SIGNAL LIGHT

REMOVAL AND INSTALLATION

M1542003300212



AC205386AB

REMOVAL STEP

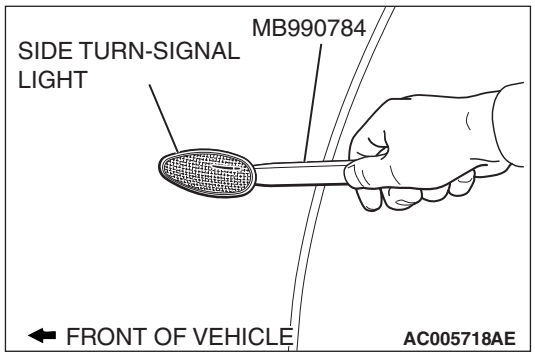
<<A>> >>A<< 1. SIDE TURN-SIGNAL LIGHT

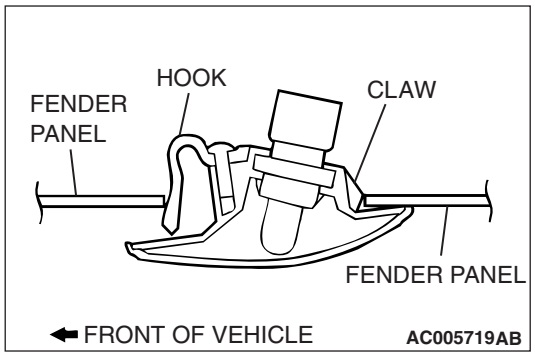
Required Special Tool:

- MB990784: Ornament Remover

REMOVAL SERVICE POINT

<<A>> SIDE TURN-SIGNAL LIGHT REMOVAL
Use special tool MB990784, etc. to press and deflect the hook to vehicle front from fender, and unhook the pawls to remove the side turn-signal light.





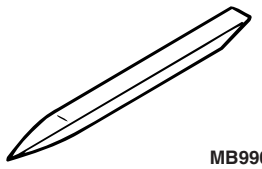
INSTALLATION SERVICE POINT

>>A<< SIDE TURN-SIGNAL LIGHT INSTALLATION
Insert the pawls into the fender panel and install the side turn-signal light.

REAR COMBINATION LIGHT

SPECIAL TOOL

M1542000600496

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
 MB990784	MB990784 Ornament remover	General service tool	Rear combination light removal

LIGHTING SYSTEM DIAGNOSIS

DIAGNOSIS

M1542010500843

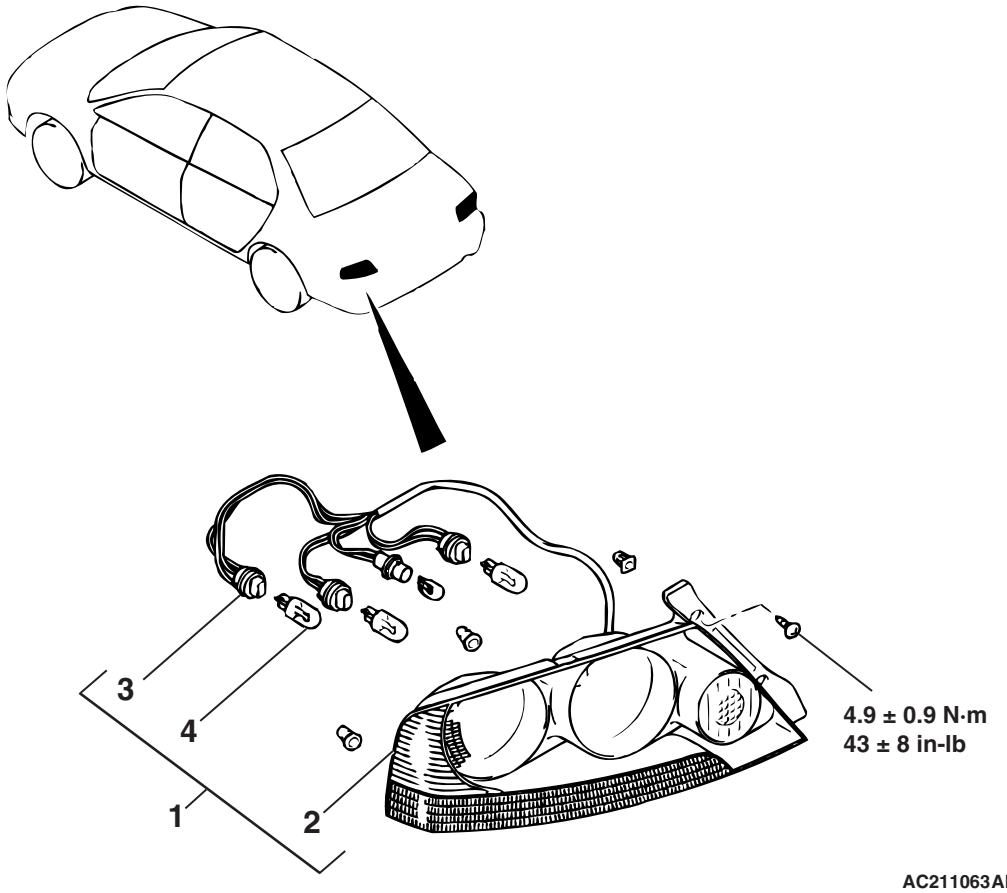
The taillights and turn-signal lights are controlled by the Simplified Wiring System (SWS). For trouble-shooting, refer to GROUP 54B, SWS Diagnosis P.54B-9.

TSB Revision

REAR COMBINATION LIGHT

REMOVAL AND INSTALLATION

M1542003900548



REMOVAL STEPS
1. REAR COMBINATION LIGHT ASSEMBLY
2. REAR COMBINATION LIGHT BODY

REMOVAL STEPS (Continued)
3. SOCKET ASSEMBLY
4. BULB

Required Special Tool:
- MB990784: Ornament remover

DOME LIGHT

LIGHTING SYSTEM DIAGNOSIS

DIAGNOSIS

M1542010500616

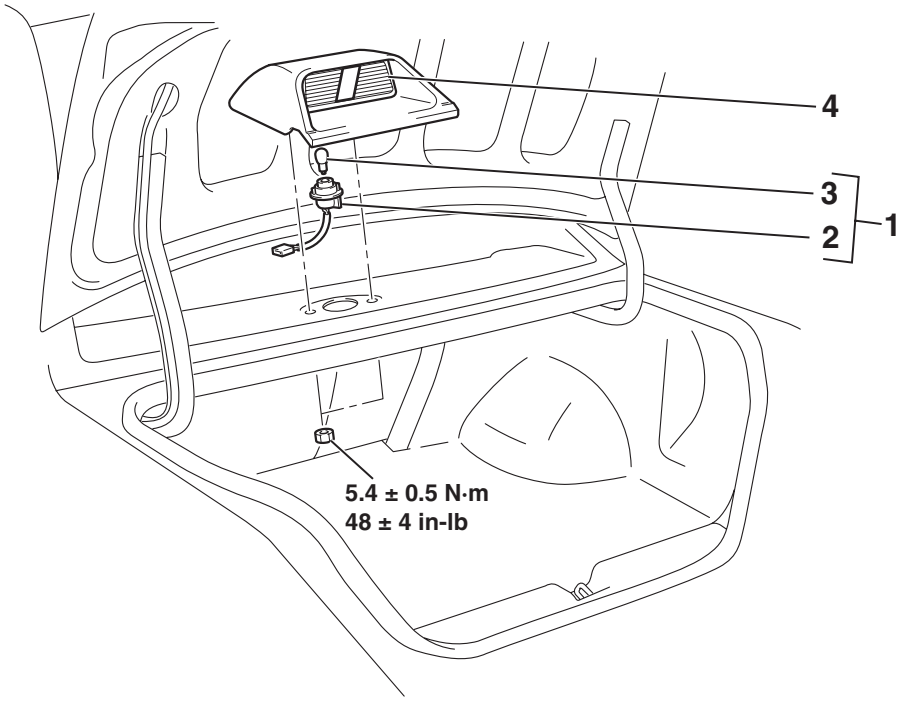
The dome light is controlled by the Simplified Wiring System (SWS). For troubleshooting, refer to GROUP 54B, SWS Diagnosis P.54B-23.

TSB Revision

HIGH-MOUNTED STOPLIGHT

REMOVAL AND INSTALLATION

M1542005100344



AC210133AB

REMOVAL STEPS

1. SOCKET ASSEMBLY
2. SOCKET

REMOVAL STEPS (Continued)

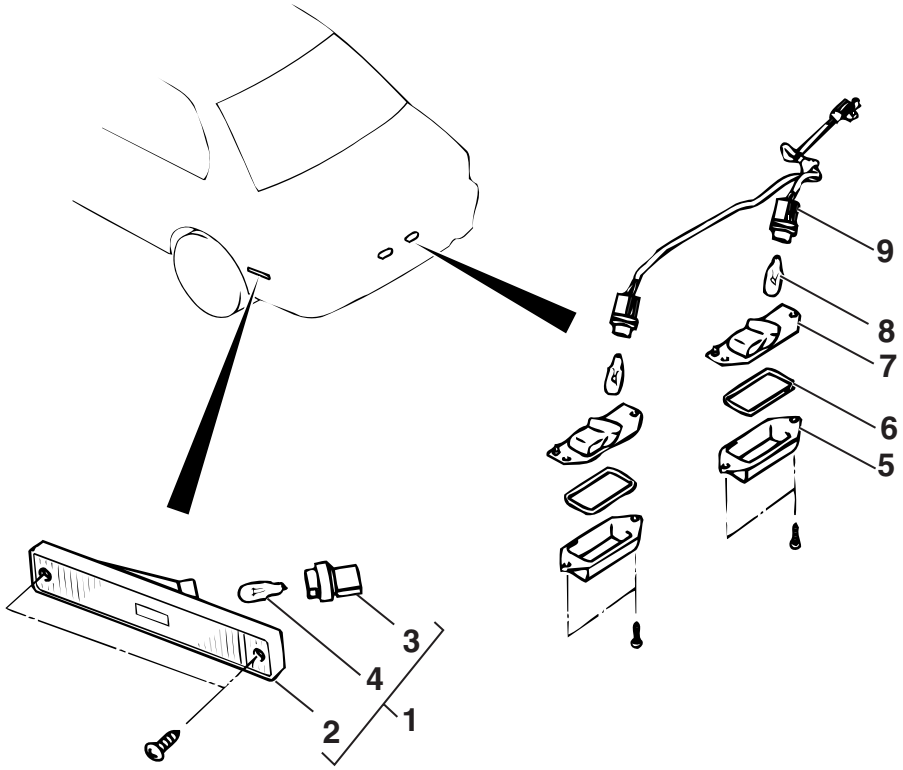
3. BULB
4. HIGH-MOUNTED STOPLIGHT

TSB Revision

LICENSE PLATE LIGHT

REMOVAL AND INSTALLATION

M1542004200111



AC211620 AB

REAR SIDE MARKER LIGHT REMOVAL STEPS

1. REAR SIDE MARKER LIGHT ASSEMBLY
2. REAR SIDE MARKER LIGHT LENS
3. SOCKET
4. BULB

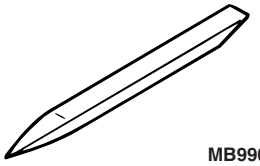
LICENSE PLATE LIGHT REMOVAL STEPS

5. LICENSE PLATE LIGHT LENS
6. PACKING
7. LICENSE PLATE LIGHT BODY
8. BULB
- REAR BUMPER (REFER TO GROUP 51, REAR BUMPER ASSEMBLY P.51-5.)
9. SOCKET ASSEMBLY

HAZARD WARNING LIGHT SWITCH

SPECIAL TOOL

M1542000600504

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
 MB990784	MB990784 Ornament remover	General service tool	Center panel assembly removal

TSB Revision

LIGHTING SYSTEM DIAGNOSIS

DIAGNOSIS

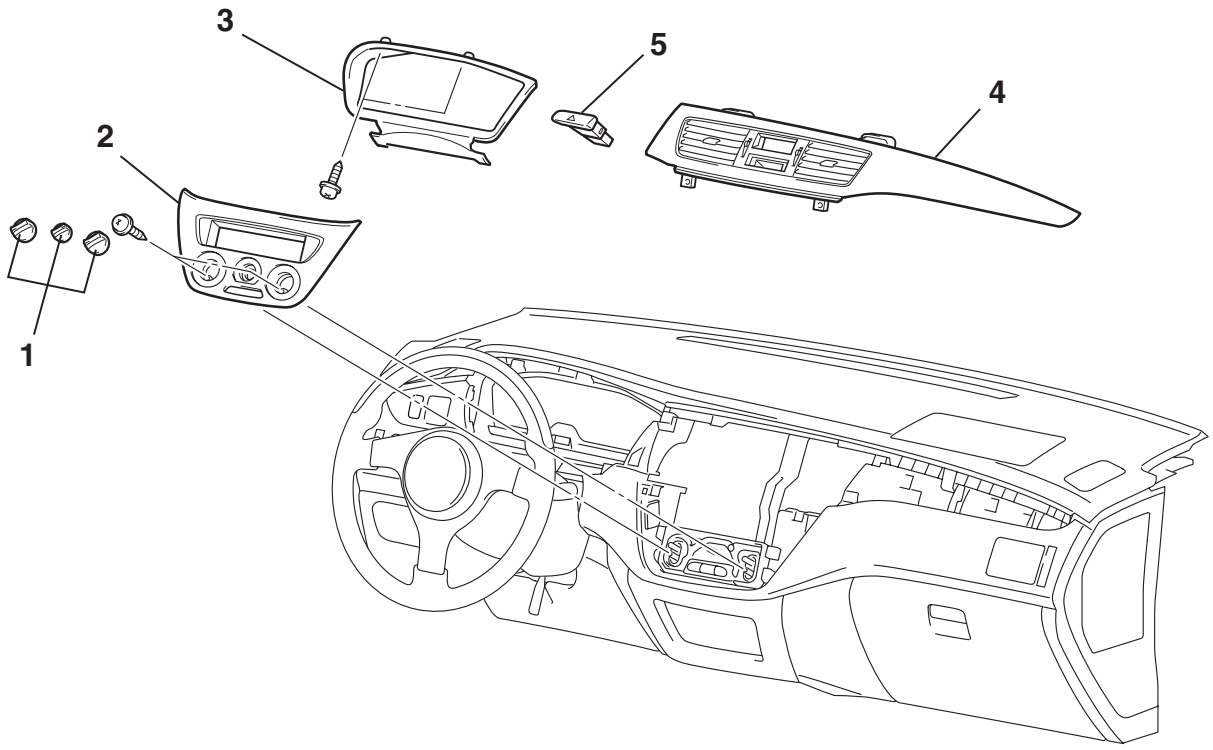
M1542010500854

The hazard warning lights are controlled by the Simplified Wiring System (SWS). For troubleshooting, refer to GROUP 54B, SWS Diagnosis P.54B-9.

HAZARD WARNING LIGHT SWITCH

REMOVAL AND INSTALLATION

M1542006600557



AC211605AB

HAZARD WARNING LIGHT SWITCH REMOVAL STEPS

1. KNOB ASSEMBLY (REFER TO GROUP 55, HEATER CONTROL ASSEMBLY, A/C SWITCH P.55-99.)
2. CENTER PANEL ASSEMBLY (REFER TO GROUP 52A, INSTRUMENT PANEL P.52A-3.)

HAZARD WARNING LIGHT SWITCH REMOVAL STEPS (Continued)

3. METER BEZEL (REFER TO P.54A-76.)
4. CENTER AIR OUTLET PANEL (REFER TO GROUP 52A, INSTRUMENT PANEL P.52A-3.)
5. HAZARD WARNING LIGHT SWITCH

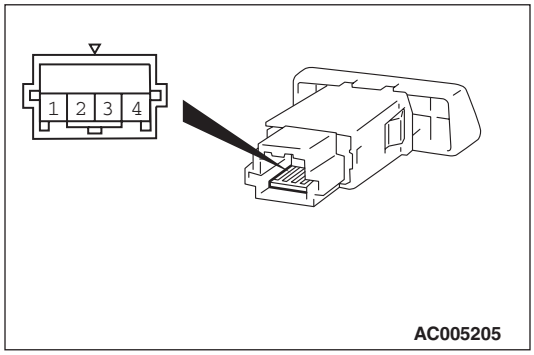
Required Special Tool:

- MB990784: Ornament remover

INSPECTION

M1542011200566

HAZARD WARNING LIGHT SWITCH CONTINUITY CHECK

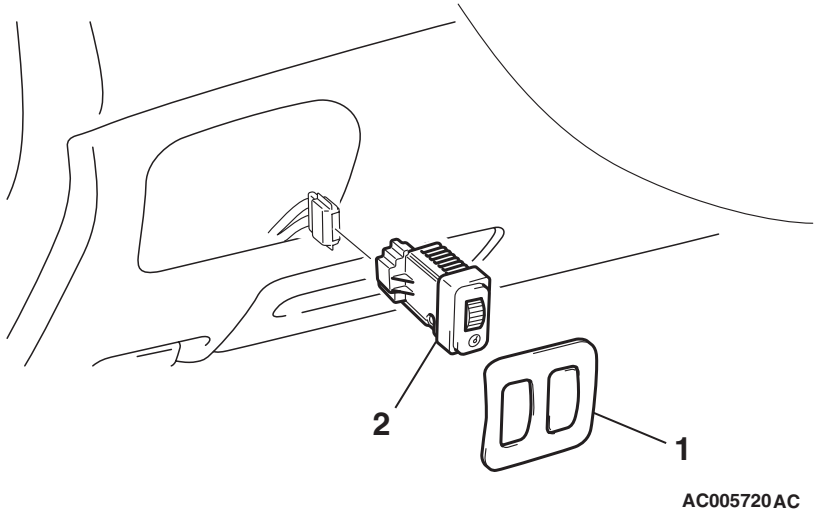


SWITCH POSITION	TESTER CONNECTION	SPECIFIED CONDITION
OFF	1 – 2	Open Circuit
ON	1 – 2	Less than 2 ohms

RHEOSTAT

REMOVAL AND INSTALLATION

M1542006000232



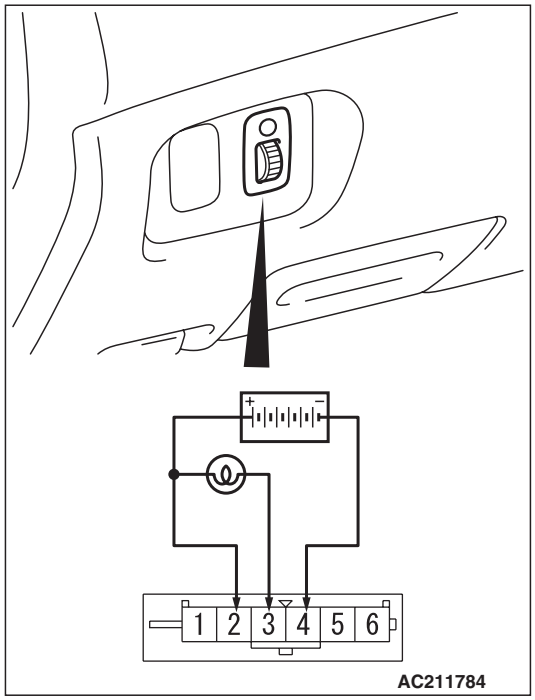
RHEOSTAT REMOVAL STEPS

1. SWITCH PANEL
2. RHEOSTAT

INSPECTION

M1543019501987

RHEOSTAT CHECK

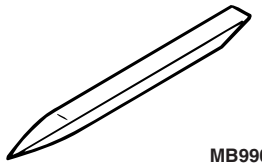


1. Connect a test light (40 W) as shown in the illumination.
2. Operate the rheostat, If the luminance of the lamp changes steadily with no flashing, the rheostat is functioning normally.

COLUMN SWITCH

SPECIAL TOOL

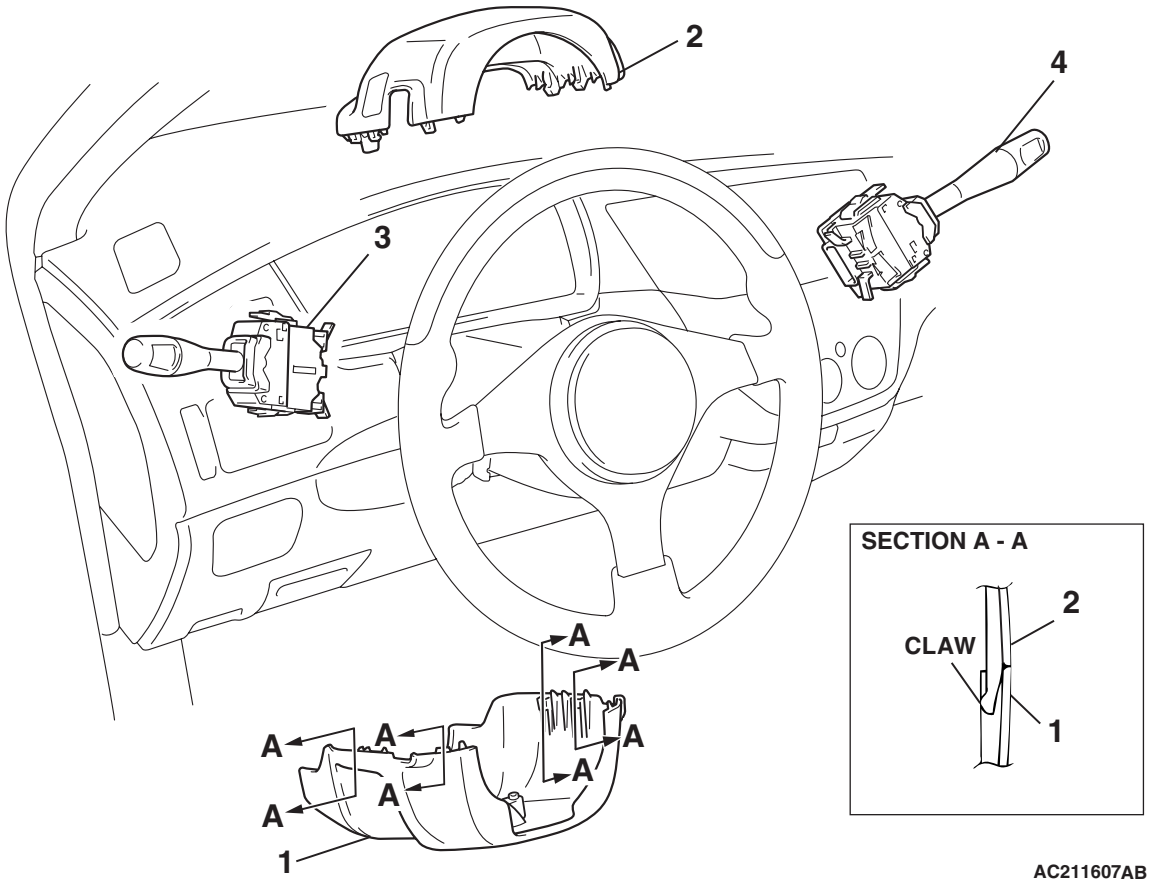
M1542000600515

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
 MB990784	MB990784 Ornament remover	General service tool	Column cover removal

COLUMN SWITCH

REMOVAL AND INSTALLATION

M1543009100521



REMOVAL STEPS

1. COLUMN COVER LOWER
2. COLUMN COVER UPPER

REMOVAL STEPS (Continued)

3. TURN-SIGNAL AND LIGHTING SWITCH
4. WINDSHIELD WIPER AND WINDSHIELD WASHER SWITCH

Required Special Tool:

- MB990784: Ornament remover

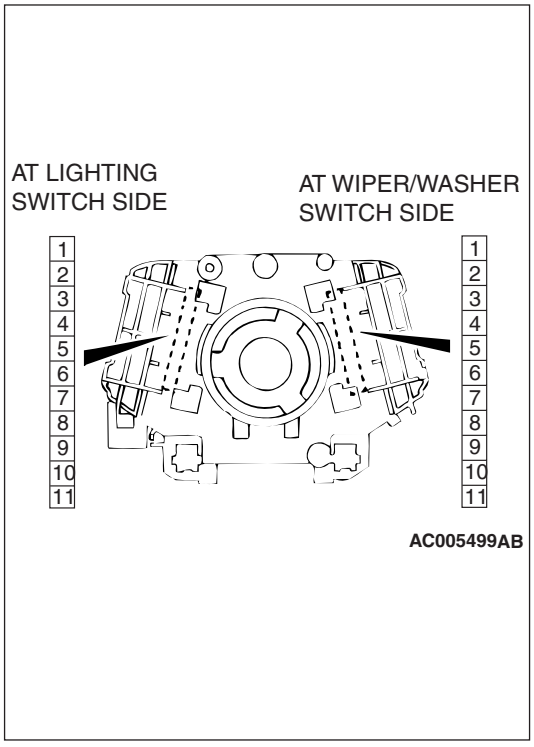
INSPECTION

M1543019501998

Integrated column-ECU does not allow lighting switch continuity test. For inspection, troubleshooting in GROUP 54B should be performed. See P.54B-23.

COLUMN SWITCH CONTINUITY CHECK (AT SWITCH BODY)

1. Remove the lighting switch and the wiper/washer switch.
2. Among individual connectors of the column switch body remaining in the steering column, check for continuity between same number terminals (No. 3-11).



COLUMN SWITCH BODY	TERMINAL NO.	SPECIFIED CONDITION
Connector at the lighting switch side Connector at the wiper/washer switch side	3 – 3 4 – 4 5 – 5 6 – 6 7 – 7 8 – 8 9 – 9 10 – 10 11 – 11	Less than 2 ohms

HORN

DIAGNOSIS <VEHICLE WITH KEYLESS ENTRY SYSTEM>

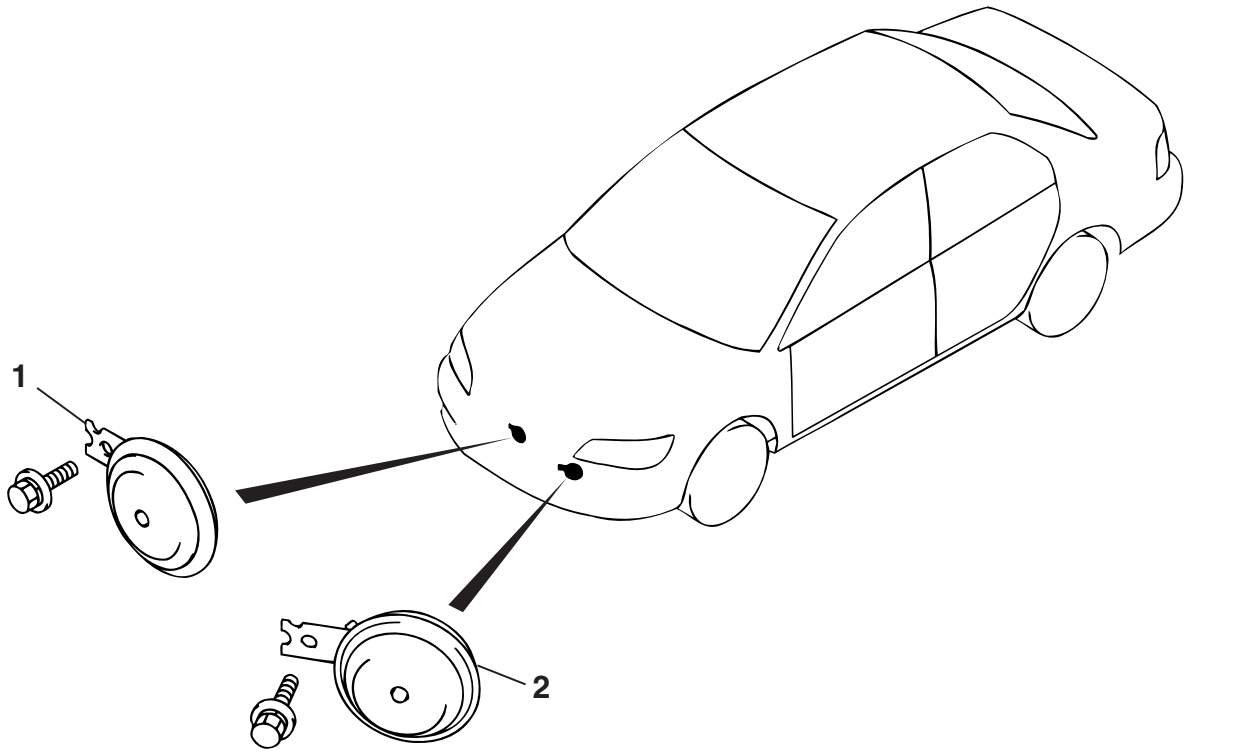
M1543000700764

The keyless entry system horn answerback is controlled by the Simplified Wiring System (SWS). For troubleshooting, refer to GROUP 54B, SWS Diagnosis P.54B-23.

HORN

REMOVAL AND INSTALLATION

M1543007900338



AC211783AB

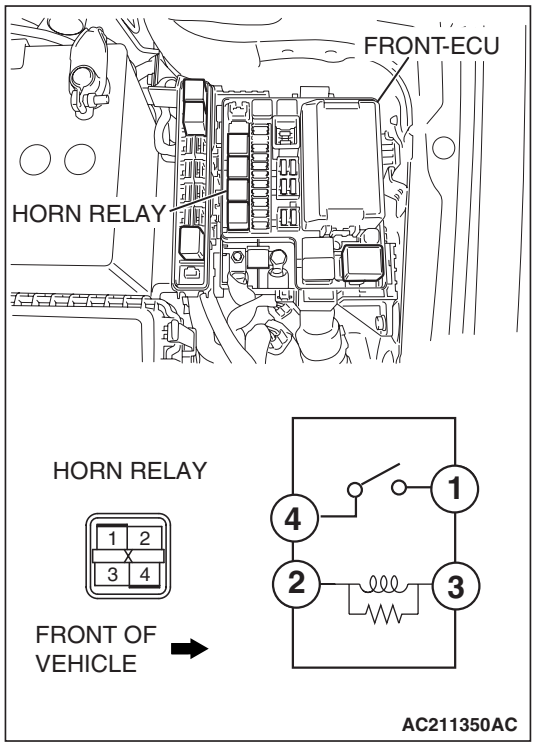
REMOVAL STEPS

1. HORN (LOW)
2. HORN (HI)

INSPECTION

M1543019502009

HORN RELAY CONTINUITY CHECK

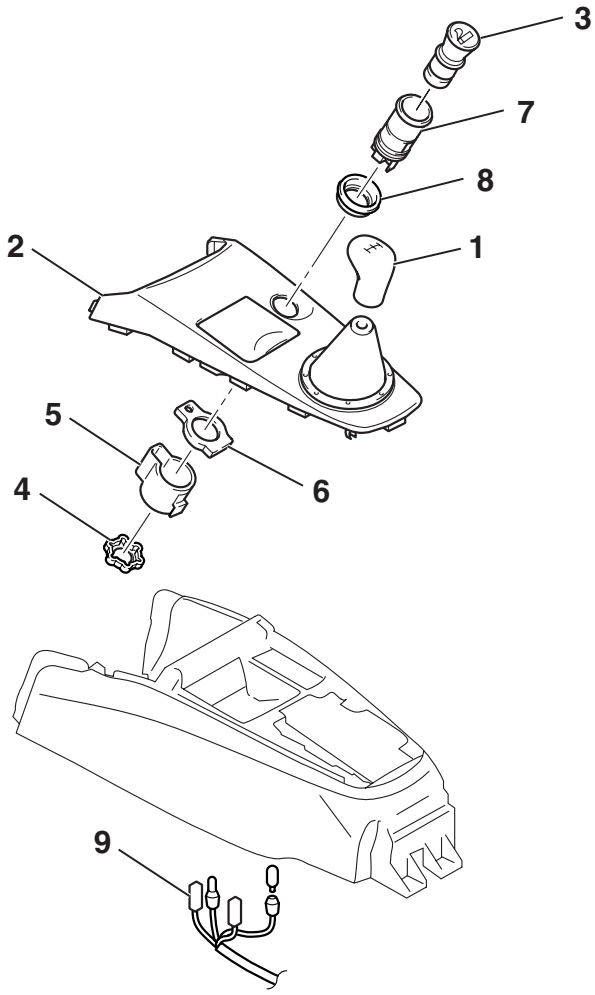


BATTERY VOLTAGE	TESTER CONNECTION	SPECIFIED CONDITION
Not applied	1 – 4	Open circuit
• Connect terminal 2 to the positive battery terminal • Connect terminal 3 to the negative battery terminal	1 – 4	Less than 2 ohms

CIGARETTE LIGHTER AND ACCESSORY SOCKET

REMOVAL AND INSTALLATION

M1543013500210



AC211042 AB

CIGARETTE LIGHTER REMOVAL STEPS

1. GEARSHIFT LEVER KNOB
2. FRONT FLOOR CONSOLE (REFER TO GROUP52A, FRONT FLOOR CONSOLE P.52A-7.)
3. PLUG

CIGARETTE LIGHTER REMOVAL STEPS (Continued)

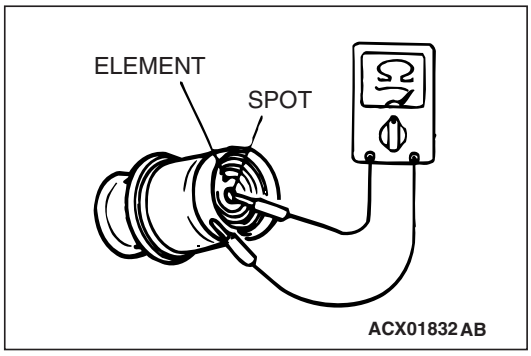
4. FIXING RING
5. SOCKET CASE
6. SOCKET WASHER
7. SOCKET
8. PROTECTOR
9. HARNESS

TSB Revision

INSPECTION

M1543019502010

CIGARETTE LIGHTER CHECK

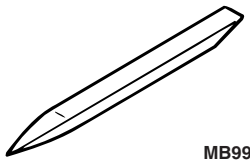


- Take out the plug, and check for a worn edge on the element spot connection, and for shreds of tobacco or other material on the element.
- Using an ohmmeter, check that the element resistance value is 1.7 ohms.

CLOCK

SPECIAL TOOL

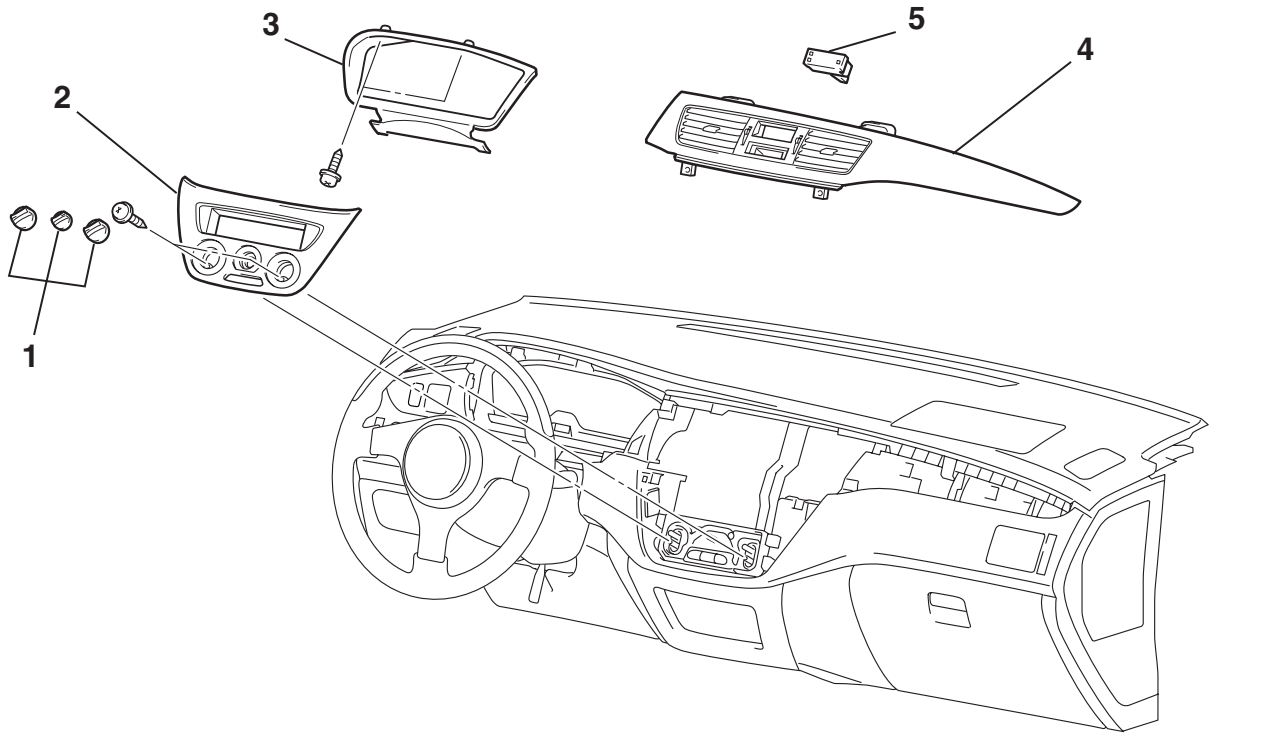
M1542000600526

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
 MB990784	MB990784 Ornament remover	General service tool	Center panel assembly, meter bezel, center air outlet panel removal

CLOCK

REMOVAL AND INSTALLATION

M1543005900116



AC211606AB

CLOCK SWITCH REMOVAL STEPS

1. KNOB ASSEMBLY (REFER TO GROUP 55, HEATER CONTROL ASSEMBLY, A/C SWITCH P.55-99.)
2. CENTER PANEL ASSEMBLY (REFER TO GROUP 52A, INSTRUMENT PANEL P.52A-3.)

CLOCK SWITCH REMOVAL STEPS

3. METER BEZEL (REFER TO P.54A-76.)
4. CENTER AIR OUTLET PANEL (REFER TO GROUP 52A, INSTRUMENT PANEL P.52A-3.)
5. CLOCK

Required Special Tool:

- MB990784: Ornament remover

RADIO AND TAPE PLAYER

RADIO WITH TAPE PLAYER AND CD PLAYER, SPEAKER AND ANTENNA DIAGNOSIS

INTRODUCTION TO AUDIO SYSTEM DIAGNOSIS

M1543009901467

Diagnosis is provided for symptoms such as noise, no sound being played, or sound coming only out of one side while listening to the audio system.

TROUBLESHOOTING STRATEGY

M1544004800324

Use these steps to plan your diagnostic strategy. If you follow them carefully, you will be sure that you have exhausted most of the possible ways to find audio system fault.

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

SYMPTOM CHART

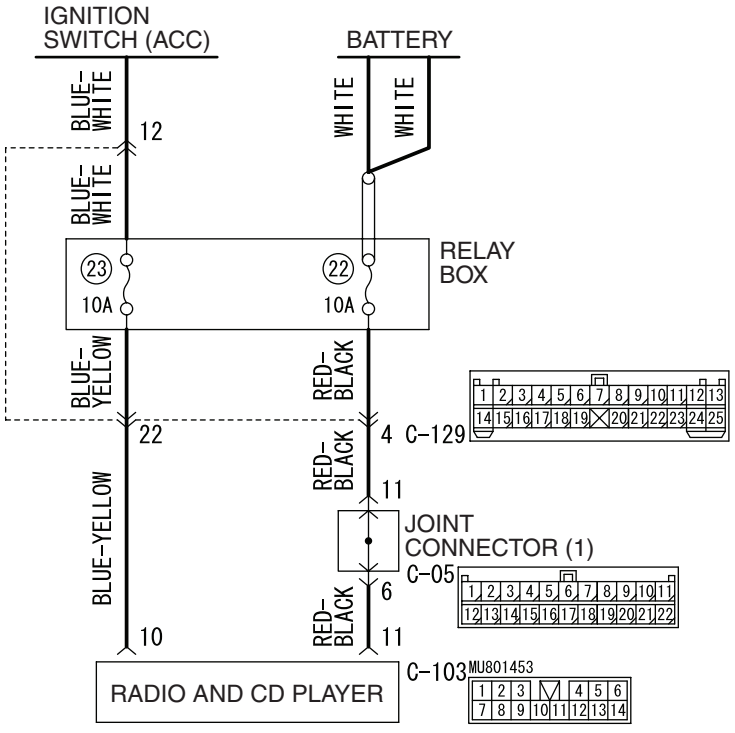
M1544004900484

SYMPTOM		INSPECTION PROCEDURE	REFERENCE PAGE
When power switch is turned "ON," no power is available.		1	P.54A-105
No sound. <vehicles with audio amplifier>		2	P.54A-109
No sound from one speaker.		3	P.54A-114
No sound from one speaker. <vehicles with audio amplifier>		4	P.54A-130
CD auto changer does not operate.		5	P.54A-143
Noise	Noise appears at certain places when traveling (AM).	6	P.54A-143
	Noise appears at certain places when traveling (FM).	7	P.54A-144
	Mixed with noise, only at night (AM).	8	P.54A-145
	Broadcasts can be heard but both AM and FM have a lot of noise.	9	P.54A-146
	There is more noise on either AM or FM.	10	P.54A-147
	There is noise when starting the engine.	11	P.54A-148
	Some noise appears when there is vibration or shocks during traveling.	12	P.54A-150
	Noise sometimes appears on FM during traveling.	13	P.54A-151
	Ever-present noise.	14	P.54A-152

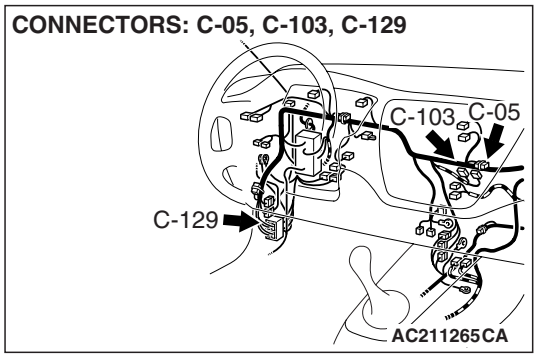
SYMPTOM		INSPECTION PROCEDURE	REFERENCE PAGE
Radio	There is noise but no reception for both AM and FM or no sound from AM, or no sound from FM.	15	P.54A-152
	Poor reception.	16	P.54A-153
	Distortion on AM or on both AM and FM.	17	P.54A-155
	Distortion on FM only.	18	P.54A-155
	Using the auto select function, too few automatic stations are selected.	19	P.54A-156
	Preset stations are erased.	20	P.54A-157
CD player	CD can not be inserted.	21	P.54A-160
	No sound (CD only).	22	P.54A-161
	CD sound skips.	23	P.54A-161
	Sound quality is poor.	24	P.54A-162
	CD cannot be ejected.	25	P.54A-162

SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: When Power Switch is Turned "ON," No Power is Available.



TSB Revision



CIRCUIT OPERATION

Power is supplied to the radio and CD player when the ignition switch is in the "ACC" position or "ON" position. When the ignition is switched on, the radio and CD player will return to the previous state when the ignition was switch off at the last time.

TECHNICAL DESCRIPTION (COMMENT)

The cause is probably a faulty radio and CD player power supply circuit system circuit.

TROUBLESHOOTING HINTS

- Damaged wiring harness or connector.
- Malfunction of the radio and CD player.

DIAGNOSIS

Required Special Tool:

- MB991223: Harness set

STEP 1. Check to see that the radio and CD player are energized when the power switch is turned ON.

(1) Turn the ignition switch to "ACC" position.
(2) Turn ON the radio and CD player power switch.

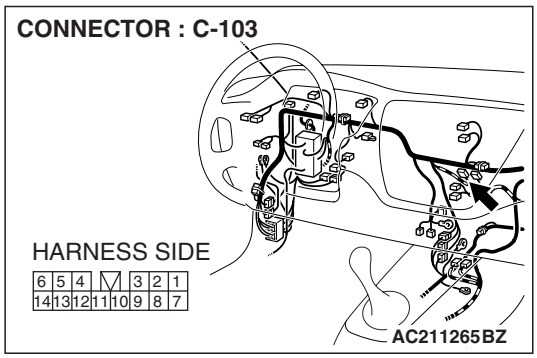
Q: Are the radio and CD player energized when the power switch is turned ON?

YES : Go to Step 2.
NO : Go to Step 5.

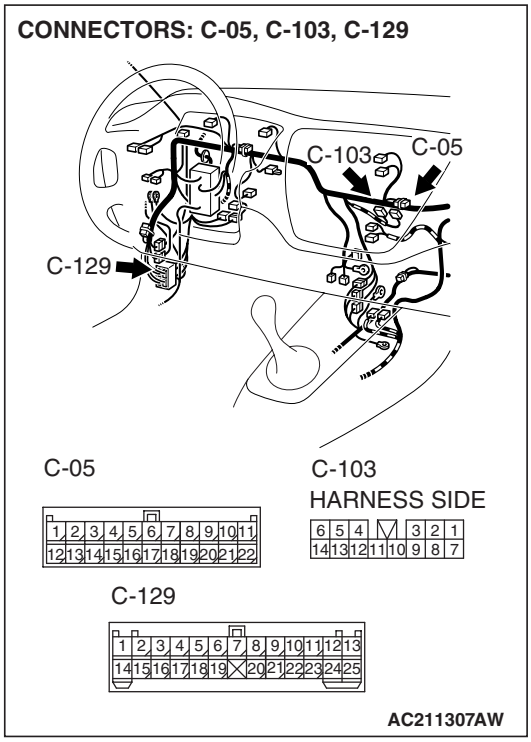
STEP 2. Check radio and CD player connector C-103 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is radio and CD player connector C-103 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. If the power switch is turned on, the radio and CD player should operate normally.



STEP 3. Check the wiring harness between radio and CD player connector C-103 (terminal 11) and the battery.



NOTE: Also check intermediate connector C-129 and joint connector C-05 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-129 or joint connector C-05 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between radio and CD player connector C-103 (terminal 11) and battery in good condition?

YES : Go to Step 4.

NO : Repair the wiring harness. If the power switch is turned on, the radio and CD player should operate normally.

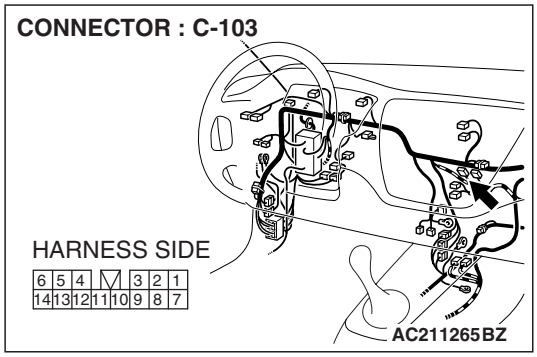
STEP 4. Check the installation condition of the radio and CD player.

NOTE: The radio and CD player are grounded to the instrument panel center reinforcement directly.

Q: Are the radio and CD player installed correctly?

YES : Repair or replace the radio and CD player. If the power switch is turned on, the radio and CD player should operate normally.

NO : Install the radio and CD player properly. If the power switch is turned on, the radio and CD player should operate normally.



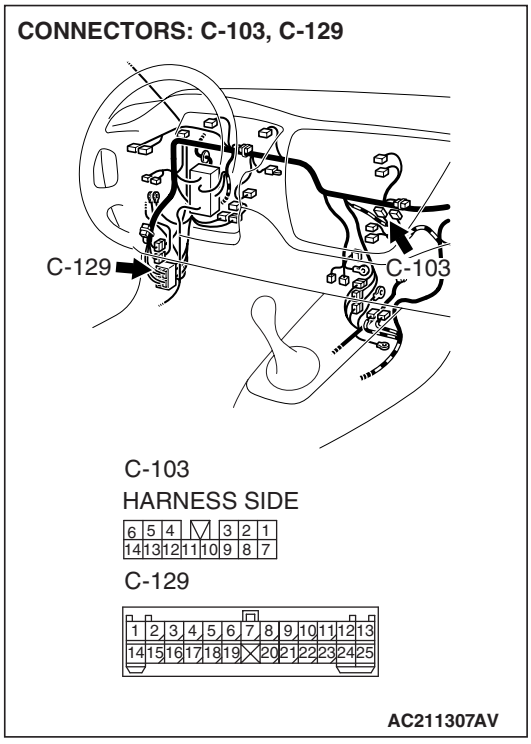
STEP 5. Check radio and CD player connector C-103 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is radio and CD player connector C-103 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. If the power switch is turned on, the radio and CD player should operate normally.

STEP 6. Check the wiring harness between radio and CD player connector C-103 (terminal 10) and ignition switch (ACC).



NOTE: Also check intermediate connector C-129 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-129 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between radio and CD player connector C-103 (terminal 10) and ignition switch (ACC) in good condition?

YES : Go to Step 7.

NO : Repair the wiring harness. If the power switch is turned on, the radio and CD player should operate normally.

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STEP 7. Check the installation condition of the radio and CD player.

NOTE: The radio and CD player are grounded to the instrument panel center reinforcement directly.

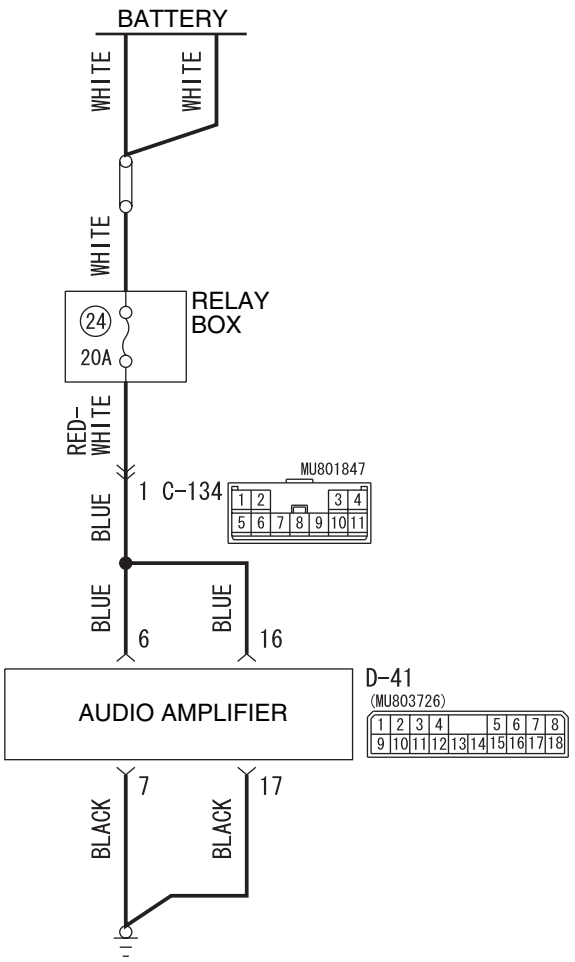
Q: Are the radio and CD player installed correctly?

YES : Repair or replace the radio and CD player. If the power switch is turned on, the radio and CD player should operate normally.

NO : Install the radio and CD player properly. If the power switch is turned on, the radio and CD player should operate normally.

INSPECTION PROCEDURE 2: No Sound <Vehicles with Audio Amplifier>

Audio Amplifier Power Supply Circuit



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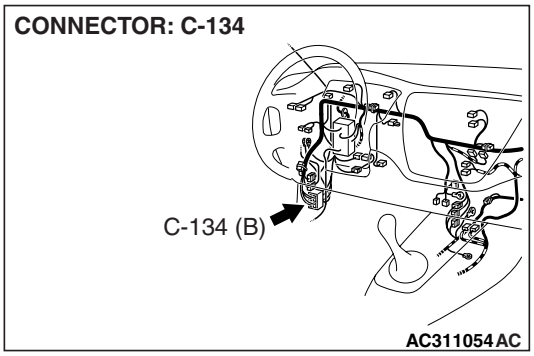
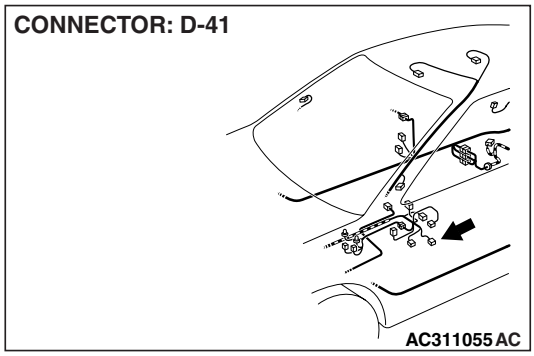




CIRCUIT OPERATION
Power is supplied from the battery directly to the audio amplifier.

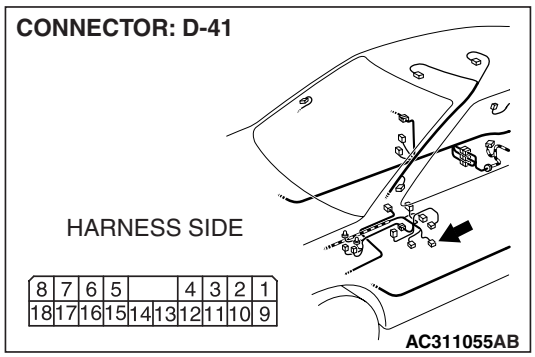
TECHNICAL DESCRIPTION (COMMENT)
The cause is probably a faulty audio amplifier power supply circuit system.

TROUBLESHOOTING HINTS
- Damaged wiring harness or connector
- Malfunction of the audio amplifier

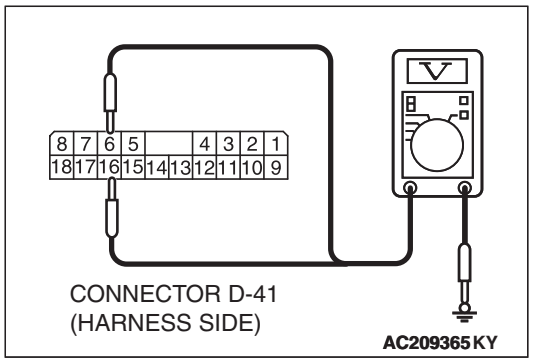
DIAGNOSIS

Required Special Tool:
- MB991223: Harness set

STEP 1. Measure the voltage at audio amplifier connector D-41 in order to check the battery circuit of power supply system to the audio amplifier.



(1) Disconnect audio amplifier connector D-41, and measure at the wiring harness side.



(2) Measure the voltage between terminal 6 and ground.
- The voltage should measure approximately 12 volts (battery positive voltage).

(3) Measure the voltage between terminal 16 and ground.
- The voltage should measure approximately 12 volts (battery positive voltage).

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

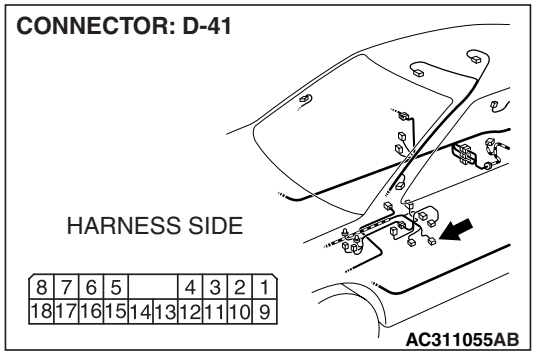
YES : Go to Step 4.
NO : Go to Step 2.

STEP 2. Check audio amplifier connector D-41 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

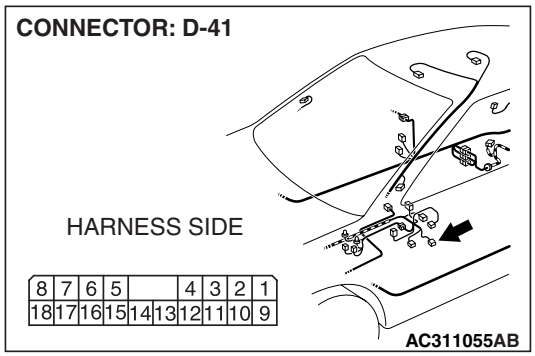
Q: Is audio amplifier connector D-41 in good condition?

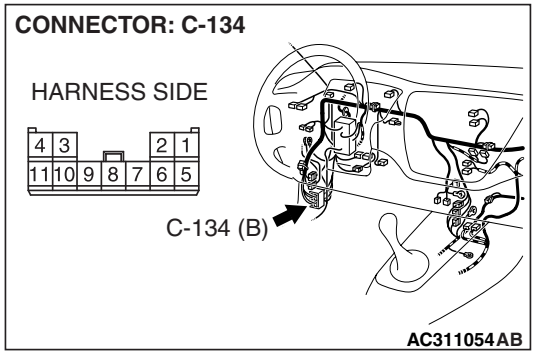
YES : Go to Step 3.

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



STEP 3. Check the wiring harness between audio amplifier connector D-41 (terminal 6 and 16) and the battery.





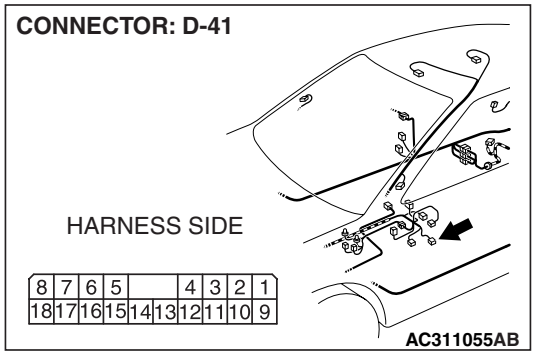
NOTE: Also check intermediate connector C-134 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connectors C-134 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between audio amplifier connector D-41 (terminal 6 and 16) and the battery in good condition?

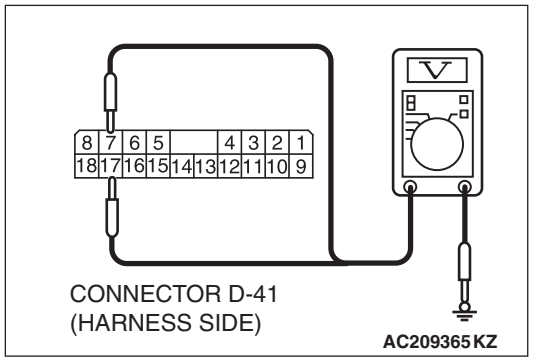
YES : There is no action to be taken.

NO : Repair the wiring harness. The speakers should sound.

STEP 4. Measure the resistance at audio amplifier connector D-41 in order to check the ground circuit to the audio amplifier.



(1) Disconnect audio amplifier connector D-41, and measure at the wiring harness side.



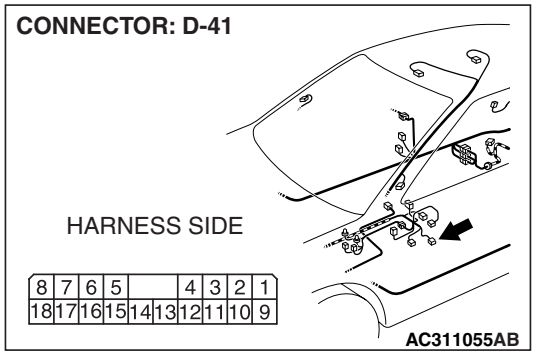
(2) Measure the resistance between terminal 7 and ground.
- The resistance should be 2 ohms or less.

(3) Measure the resistance between terminal 17 and ground.
- The resistance should be 2 ohms or less.

Q: Is the measured resistance 2 ohms or less?

YES : Go to Step 7.
NO : Go to Step 5.

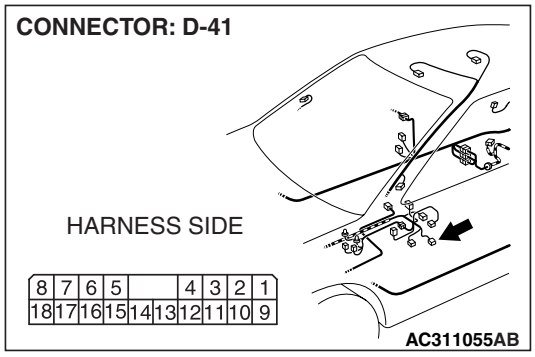
STEP 5. Check audio amplifier connector D-41 for loose, corroded or damaged terminals, or terminals pushed back in the connector.



Q: Is audio amplifier connector D-41 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 speakers should sound.

STEP 6. Check the wiring harness between audio amplifier connector D-41 (terminal 7 and 17) and ground.



Q: Is the wiring harness between audio amplifier connector D-41 (terminal 7 and 17) and ground in good condition?

YES : There is no action to be taken.
NO : Repair the wiring harness. The speakers should sound.

TSB Revision

STEP 7. Check the DIN cable between audio amplifier and radio and CD player is connected correctly.

Q: Do the speakers sound normally?

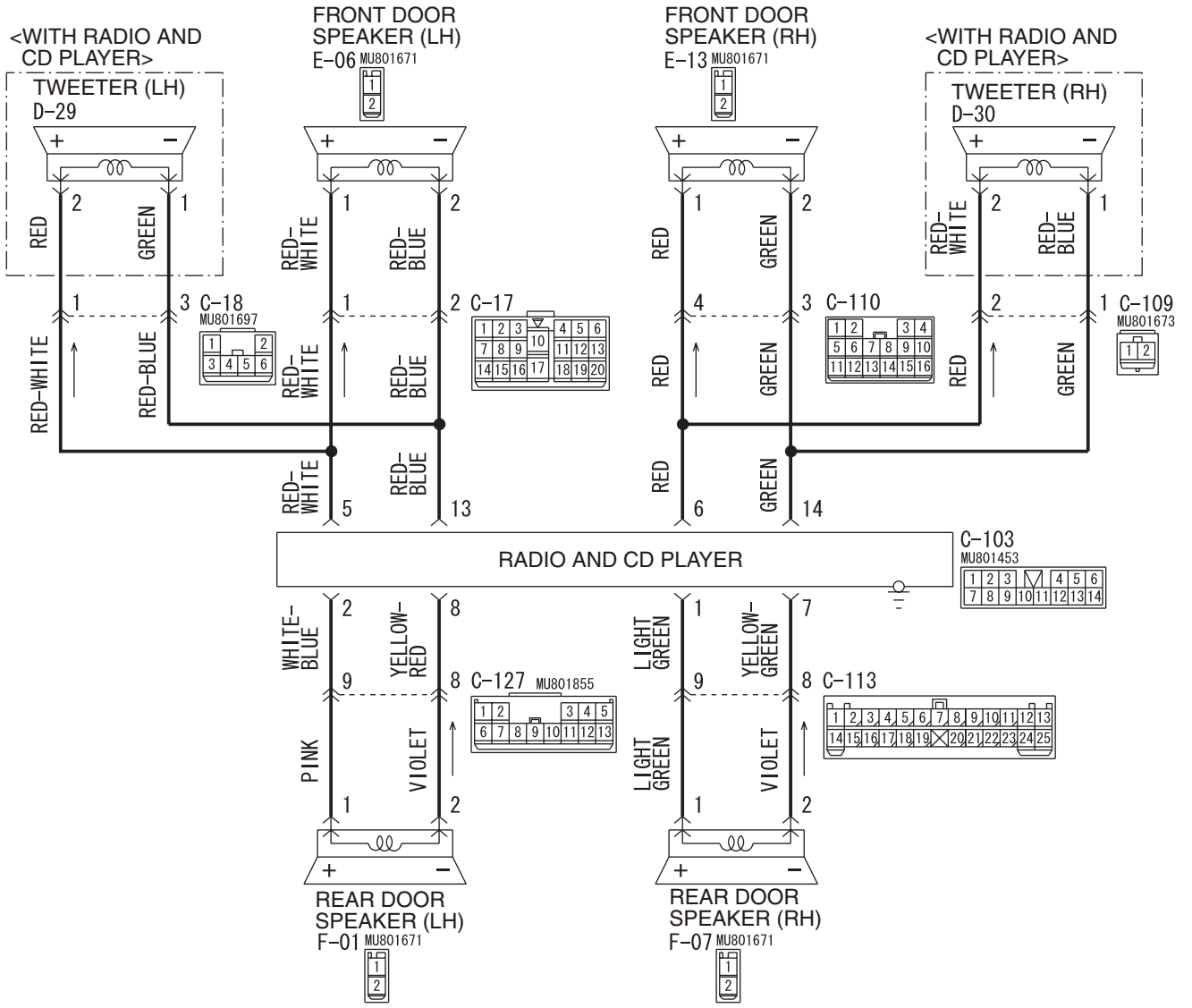
YES : Go to Step 8.
NO : Repair or replace the DIN cable. The door speaker (LH) should sound.

STEP 8. Check the DIN cable between radio and CD player and CD auto changer is connected correctly.

Q: Do the speakers sound normally?

YES : The procedure is complete.
NO : Repair or replace the DIN cable. The door speaker (LH) should sound.

INSPECTION PROCEDURE 3: No sound From One Speaker



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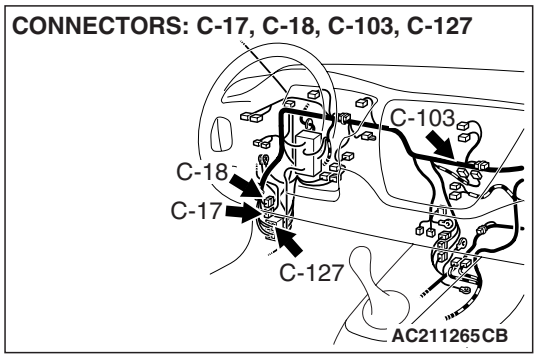

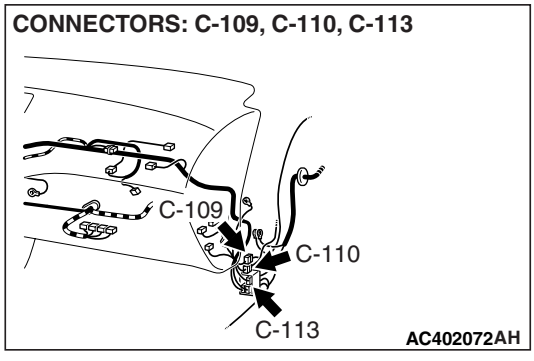

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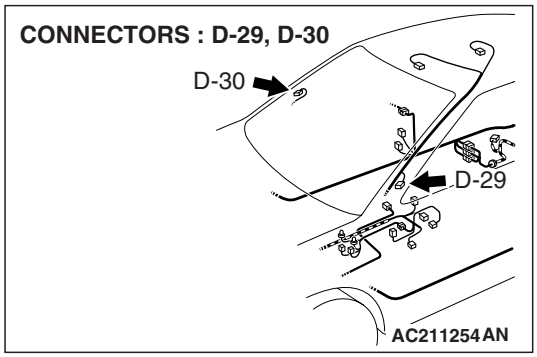
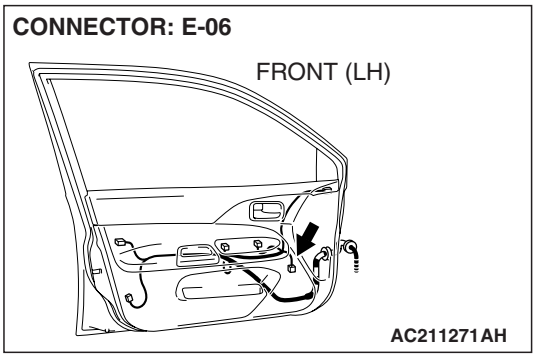
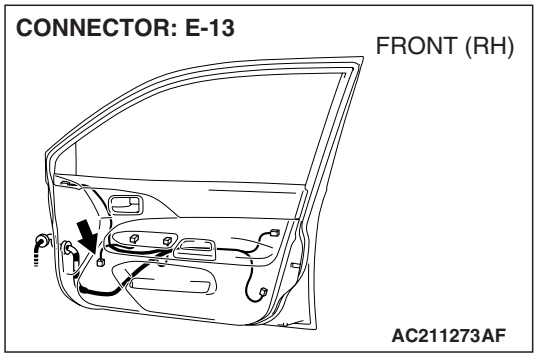
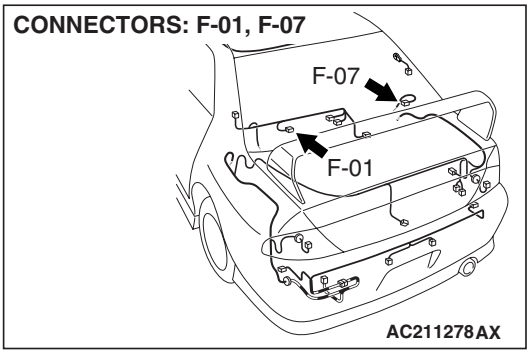








CIRCUIT OPERATION
The sound is heard from the speaker according to audio signal output from the radio and CD player.

TROUBLESHOOTING HINTS
- Malfunction of the speaker.

TECHNICAL DESCRIPTION (COMMENT)
The cause is probably a faulty speaker circuit system.
- Damaged harness wire or connector.
- Malfunction of the radio and CD player.

DIAGNOSIS

STEP 1. Check which speaker has no sound.
(1) Use the speaker test to determine which speaker does not sound.

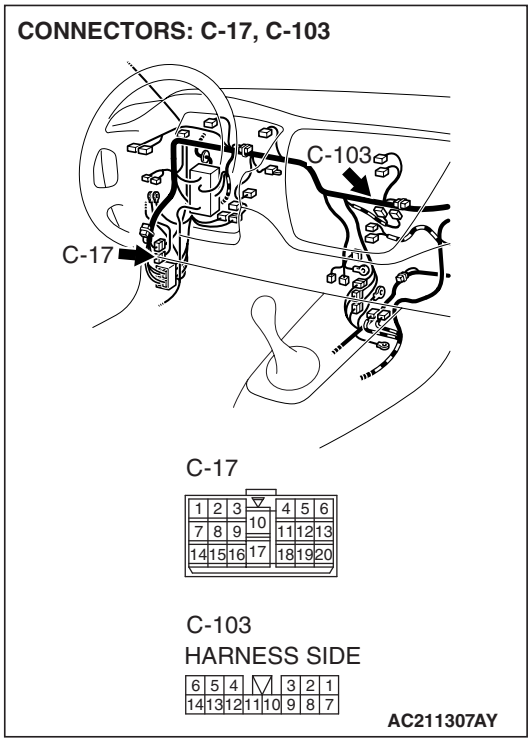
Q: Which speaker has no sound?
The front door speaker (LH) and the tweeter (LH) do not sound. : Go to Step 2.
The front door speaker (RH) and the tweeter (RH) do not sound. : Go to Step 4.
Only the front door speaker (LH) does not sound. : Go to Step 6.
Only the front door speaker (RH) does not sound. : Go to Step 10.
Only the rear door speaker (LH) does not sound. : Go to Step 14.
Only the rear door speaker (RH) does not sound. : Go to Step 18.
The tweeter (LH) does not sound. : Go to Step 22.
The tweeter (RH) does not sound. : Go to Step 26.

STEP 2. Check radio and CD player connector C-103 and intermediate connector C-17 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are radio and CD player connector C-103 and intermediate connector C-17 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. The door speaker (LH) should sound.

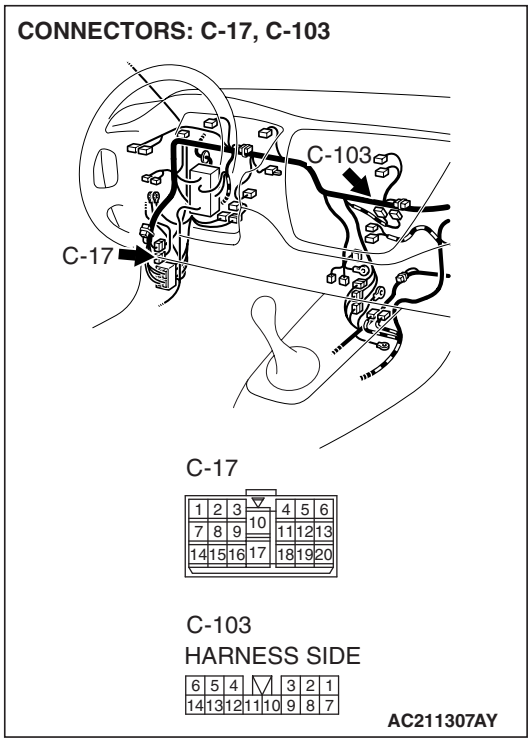


STEP 3. Check the wiring harness between intermediate connector C-17 (terminals 1 and 2) and radio and CD player connector C-103 (terminals 5 and 13).

Q: Is the wiring harness between intermediate connector C-17 (terminals 1 and 2) and radio and CD player connector C-103 (terminals 5 and 13) in good condition?

YES : Repair or replace the radio and CD player. The front door speaker (LH) and tweeter (LH) should sound.

NO : Repair the wiring harness. The front door speaker (LH) and tweeter (LH) should sound.

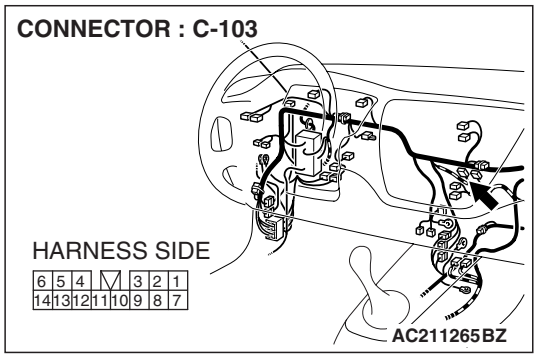


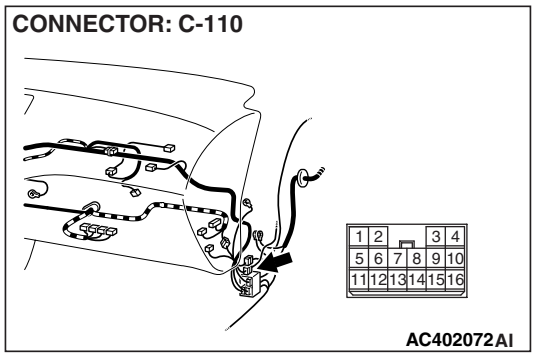
STEP 4. Check radio and CD player connector C-103 and intermediate connector C-110 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are radio and CD player connector C-103 and intermediate 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. The front door speaker (RH) and tweeter (RH) should sound.



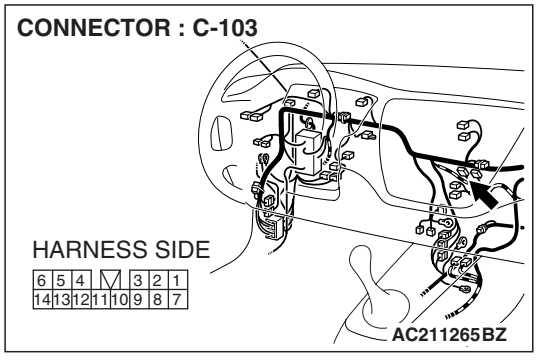


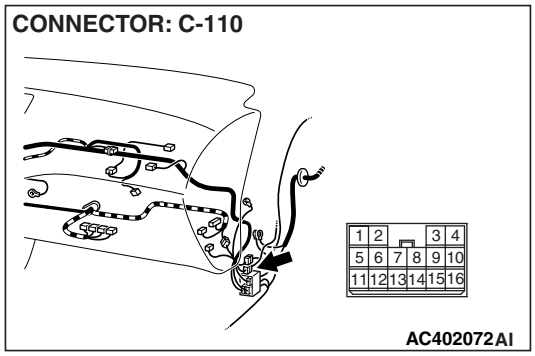
STEP 5. Check the wiring harness between intermediate connector C-110 (terminals 3 and 4) and radio and CD player connector C-103 (terminals 14 and 6).

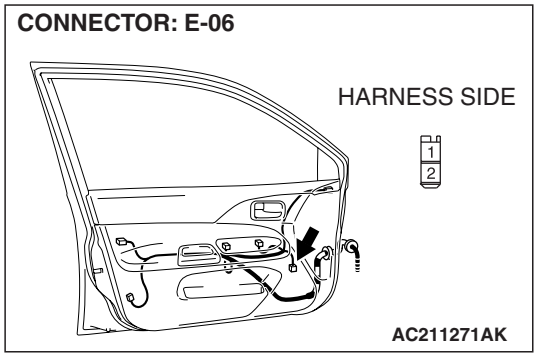
Q: Is the wiring harness between and intermediate connector C-110 (terminals 3 and 4) and radio and CD player connector C-103 (terminals 14 and 6) in good condition?

YES : Repair or replace the radio and CD player. The front door speaker (RH) and tweeter (RH) should sound.

NO : Repair the wiring harness. The front door speaker (RH) and tweeter (RH) should sound.





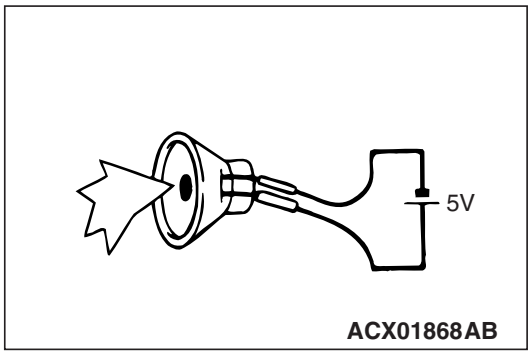


STEP 6. Check front door speaker (LH) connector E-06 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is front door speaker (LH) connector E-06 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. The door speaker (LH) should sound.



STEP 7. Check the front door speaker (LH).

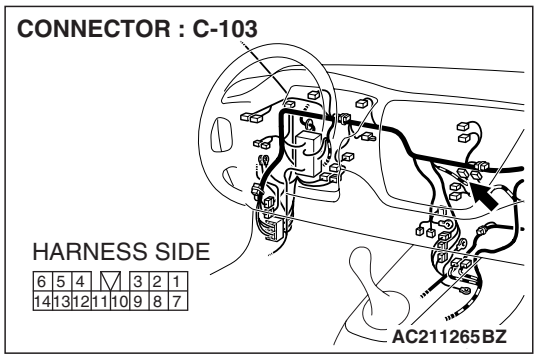
(1) Remove the front door speaker (LH). Refer to P.54A-168.

(2) Check that the front door speaker (LH) generates noise when a five-volt voltage is applied on the front door speaker (LH) terminal.

Q: Is the front door speaker (LH) generating noise?

YES : Go to Step 8.

NO : Replace the front door speaker (LH). The front door speaker (LH) should sound.



STEP 8. Check radio and CD player connector C-103 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

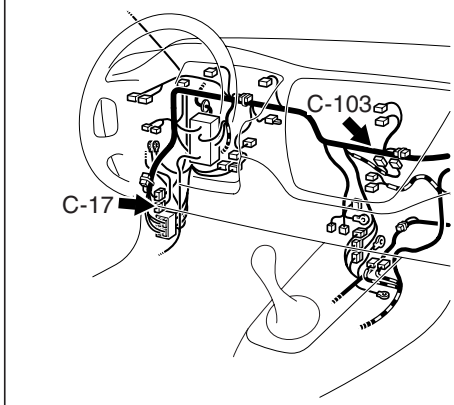
Q: Is radio and CD player connector C-103 in good condition?

YES : Go to Step 9.

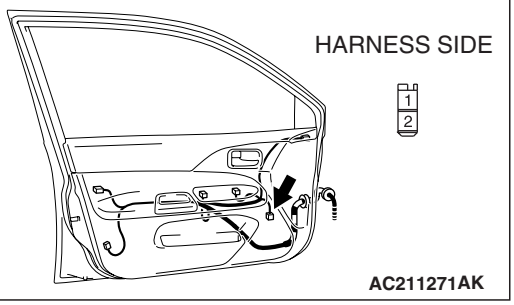
NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The door speaker (LH) should sound.

STEP 9. Check the wiring harness between front door speaker (LH) connector E-06 (terminals 1 and 2) and radio and CD player connector C-103 (terminals 5 and 13).

CONNECTORS: C-17, C-103



CONNECTOR: E-06

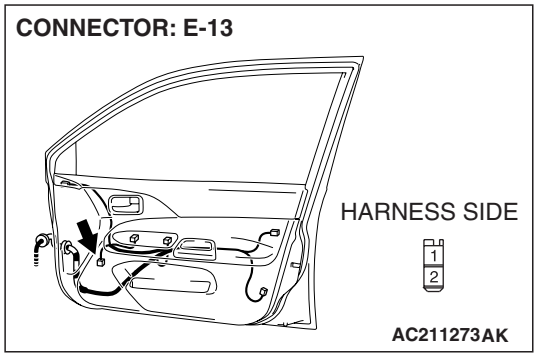


NOTE: Also check intermediate connector C-17 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-17 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between front door speaker (LH) connector E-06 (terminals 1 and 2) and radio and CD player connector C-103 (terminals 5 and 13) in good condition?

YES : Repair or replace the radio and CD player. The front door speaker (LH) should sound.

NO : Repair the wiring harness. The front door speaker (LH) should sound.

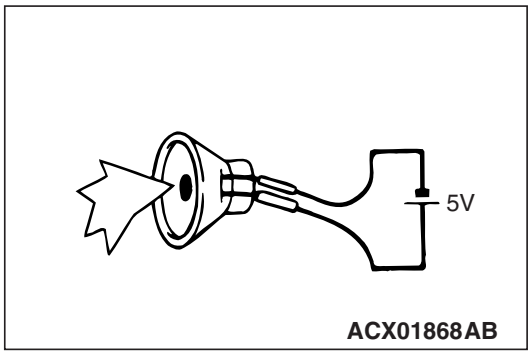


STEP 10. Check front door speaker (RH) connector E-13 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is front door speaker (RH) connector E-13 in good condition?

YES : Go to Step 11.

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



STEP 11. Check the front door speaker (RH).

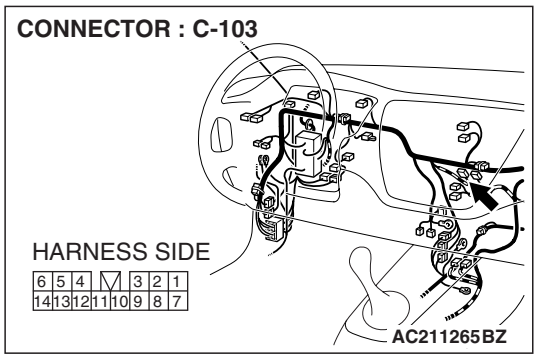
(1) Remove the front door speaker (RH). Refer to P.54A-168.

(2) Check that the front door speaker (RH) generates noise when a five-volt voltage is applied on the front door speaker (RH) terminal.

Q: Is the front door speaker (RH) generating noise?

YES : Go to Step 12.

NO : Replace the front door speaker (RH). The front door speaker (RH) should sound.



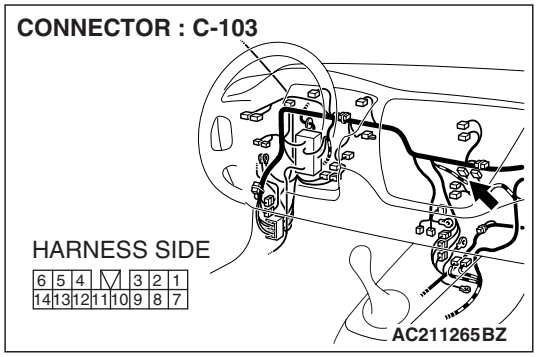
STEP 12. Check radio and CD player connector C-103 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

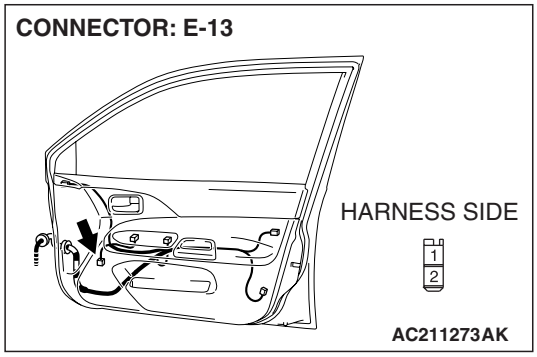
Q: Is radio and CD player connector C-103 in good condition?

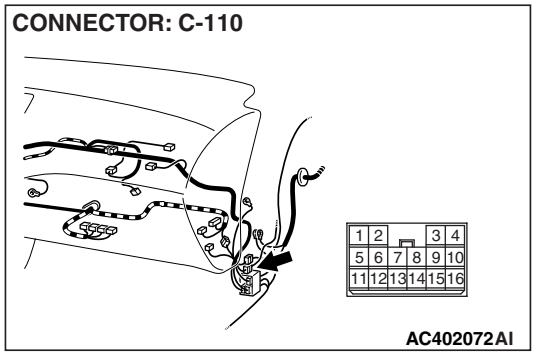
YES : Go to Step 13.

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

STEP 13. Check the wiring harness between front door speaker (RH) connector E-13 (terminals 1 and 2) and radio and CD player connector C-103 (terminals 6 and 14).





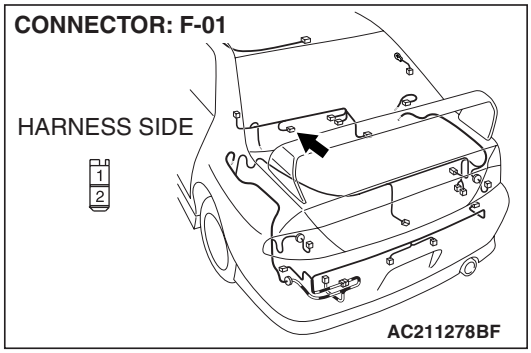


NOTE: Also check intermediate connector C-110 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-110 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between front door speaker (RH) connector E-13 (terminals 1 and 2) and radio and CD player connector C-103 (terminals 6 and 14) in good condition?

YES : Repair or replace the radio and CD player. The front door speaker (RH) should sound.

NO : Repair the wiring harness. The front door speaker (RH) should sound.

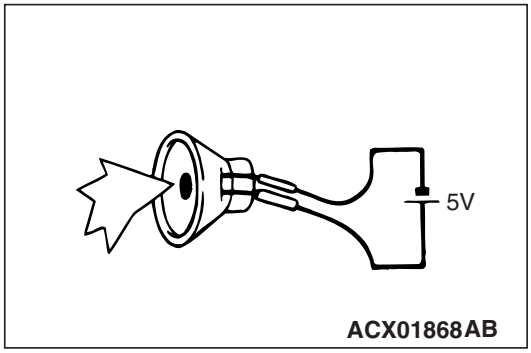


STEP 14. Check rear door speaker (LH) connector F-01 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is rear door speaker (LH) connector F-01 in good condition?

YES : Go to Step 15.

NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The rear door speaker (LH) should sound.



STEP 15. Check the rear door speaker (LH).

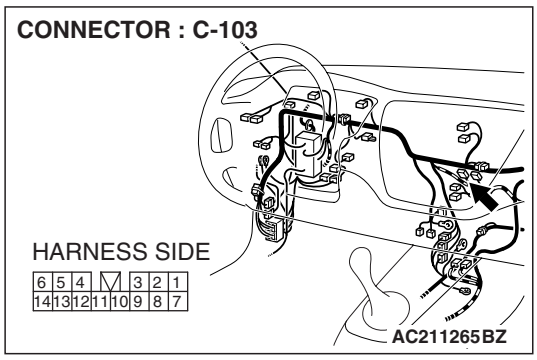
(1) Remove the rear door speaker (LH). Refer to P.54A-168.

(2) Check that the rear door speaker (LH) generates noise when a five-volt voltage is applied on the rear door speaker (LH) terminal.

Q: Is the rear door speaker (LH) generating noise?

YES : Go to Step 16.

NO : Replace the rear door speaker (LH). The rear door speaker (LH) should sound.



STEP 16. Check radio and CD player connector C-103 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

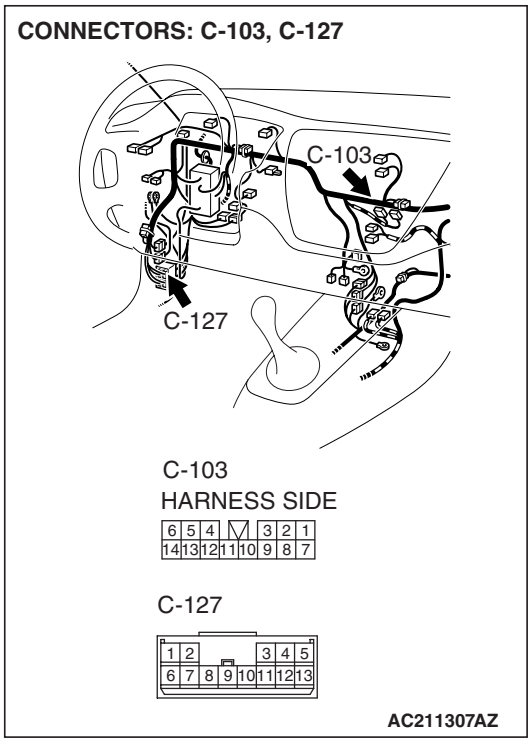
Q: Is radio and CD player connector C-103 in good condition?

YES : Go to Step 17.

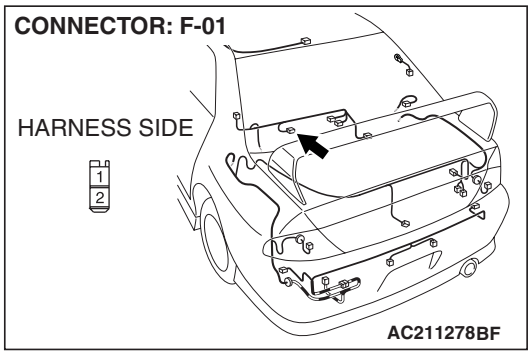
NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The rear door speaker (LH) should sound.

STEP 17. Check the wiring harness between rear door speaker (LH) connector F-01 (terminals 1 and 2) and radio and CD player connector C-103 (terminals 2 and 8).

CONNECTORS: C-103, C-127



CONNECTOR: F-01

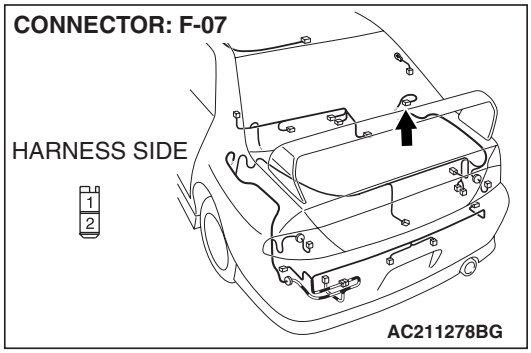


NOTE: Also check intermediate connector C-127 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-127 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between the rear door speaker (LH) connector F-01 (terminals 1 and 2) and radio and CD player connector C-103 (terminals 2 and 8) in good condition?

YES : Repair or replace the radio and CD player. The rear door speaker (LH) should sound.

NO : Repair the wiring harness. The rear door speaker (LH) should sound.

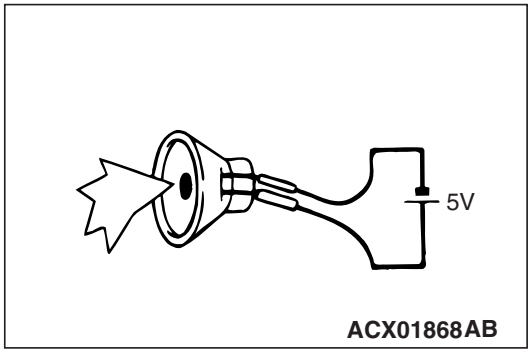


STEP 18. Check rear door speaker (RH) connector F-07 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is rear door speaker (RH) connector F-07 in good condition?

YES : Go to Step 19.

NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The rear door speaker (LH) should sound.



STEP 19. Check the rear door speaker (RH).

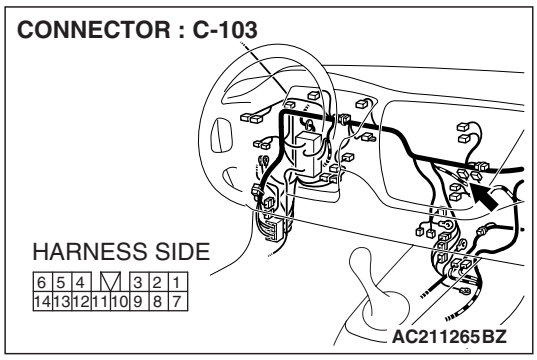
(1) Remove the rear door speaker (RH). Refer to P.54A-168.

(2) Check that the rear door speaker (RH) generates noise when a five-volt voltage is applied on the rear door speaker (RH) terminal.

Q: Is the rear door speaker (RH) generating noise?

YES : Go to Step 20.

NO : Replace the rear door speaker (RH). The rear door speaker (RH) should sound.



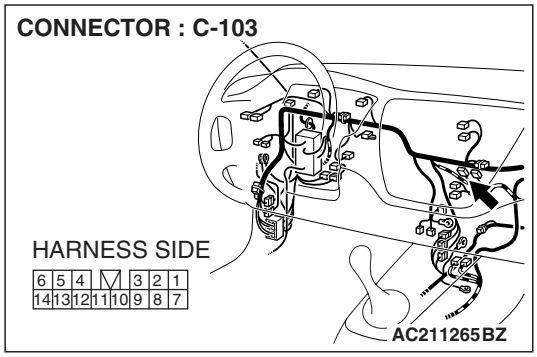
STEP 20. Check radio and CD player connector C-103 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

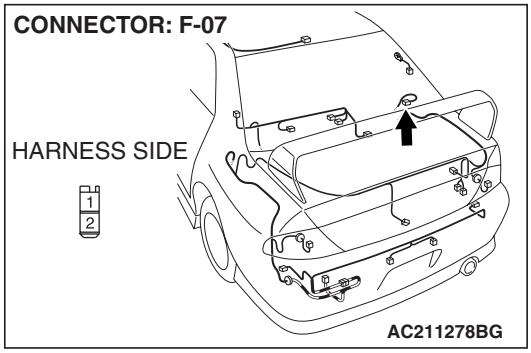
Q: Is radio and CD player connector C-103 in good condition?

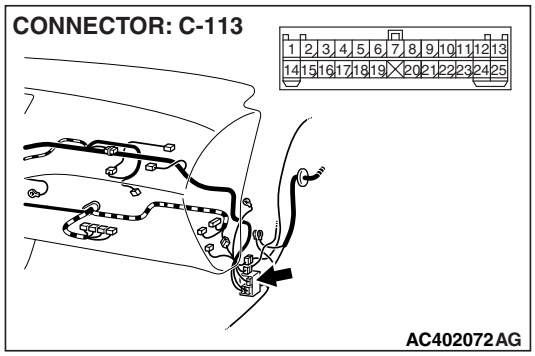
YES : Go to Step 21.

NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The rear door speaker (LH) should sound.

STEP 21. Check the wiring harness between rear door speaker (RH) connector F-07 (terminals 1 and 2) and radio and CD player connector C-103 (terminals 1 and 7).





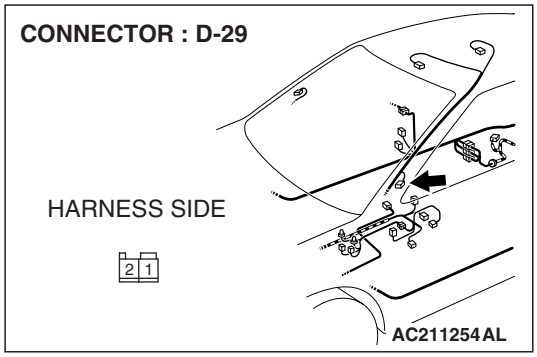


NOTE: Also check intermediate connector C-113 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-113 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between rear door speaker (RH) connector F-07 (terminals 1 and 2) and radio and CD player connector C-103 (terminals 1 and 7) in good condition?

YES : Repair or replace the radio and CD player. The rear door speaker (RH) should sound.

NO : Repair the wiring harness. The rear door speaker (RH) should sound.

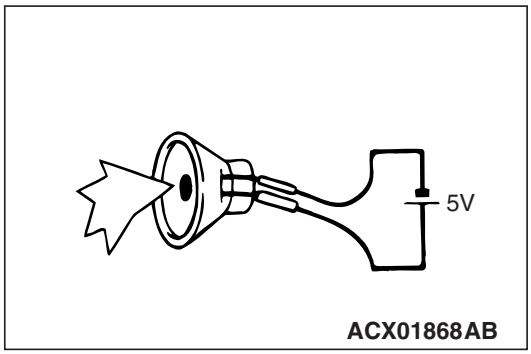


STEP 22. Check tweeter (LH) connector D-29 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is tweeter (LH) connector D-29 in good condition?

YES : Go to Step 23.

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



STEP 23. Check the tweeter (LH).

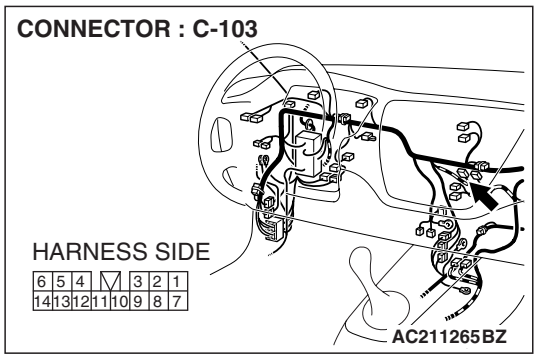
(1) Remove the tweeter (LH). Refer to P.54A-168.

(2) Check that the tweeter (LH) generates noise when a five-volt voltage is applied on the tweeter (LH) terminal.

Q: Is the tweeter (LH) generating noise?

YES : Go to Step 24.

NO : Replace the tweeter (LH). The tweeter (LH) should sound.



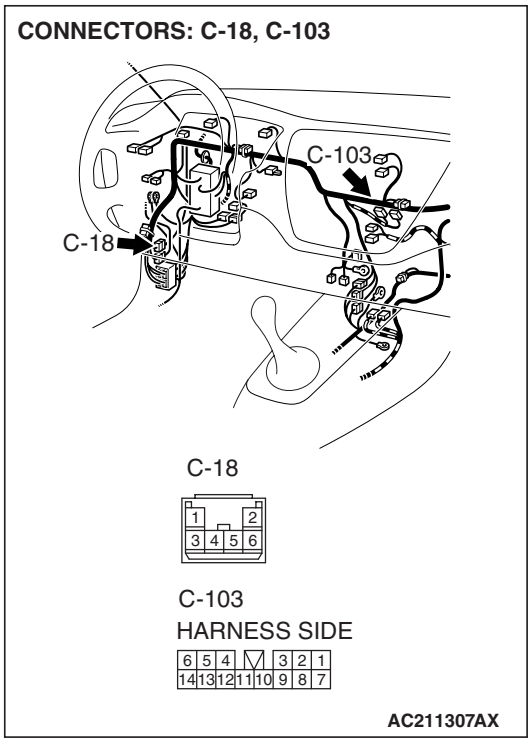
STEP 24. Check radio and CD player connector C-103 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

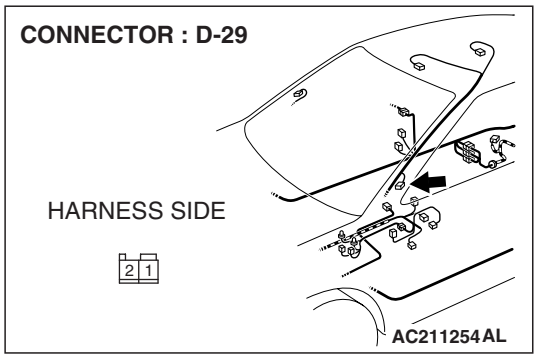
Q: Is radio and CD player connector C-103 in good condition?

YES : Go to Step 25

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

STEP 25. Check the wiring harness between tweeter (LH) connector D-29 (terminals 1 and 2) and radio and CD player connector C-103 (terminals 13 and 5).



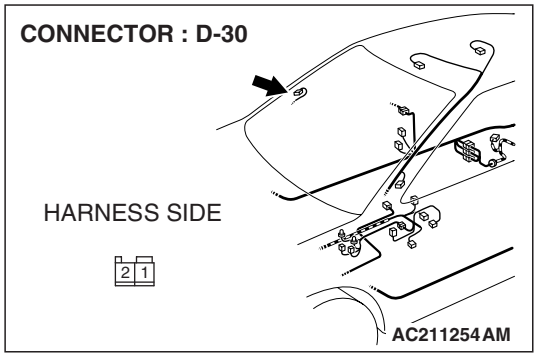


NOTE: Also check intermediate connector C-18 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-18 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between the tweeter (LH) connector D-29 (terminals 1 and 2) and radio and CD player connector C-103 (terminals 13 and 5) in good condition?

YES : Repair or replace the radio and CD player. The tweeter (LH) should sound.

NO : Repair the wiring harness. The tweeter (LH) should sound.

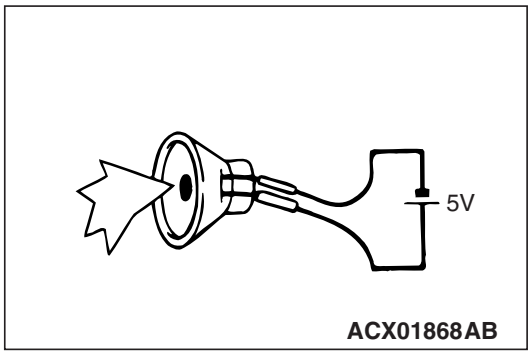


STEP 26. Check tweeter (RH) connector D-30 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is tweeter (RH) connector D-30 in good condition?

YES : Go to Step 27.

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



STEP 27. Check the tweeter (RH).

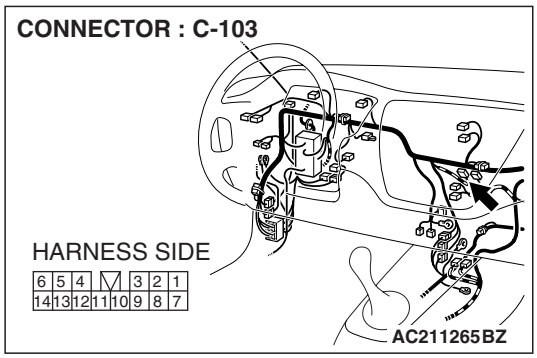
(1) Remove the tweeter (RH). Refer to P.54A-168.

(2) Check that the tweeter (RH) generates noise when a five-volt voltage is applied on the tweeter (RH) terminal.

Q: Is the tweeter (RH) generating noise?

YES : Go to Step 28.

NO : Replace the tweeter (RH). The tweeter (RH) should sound.



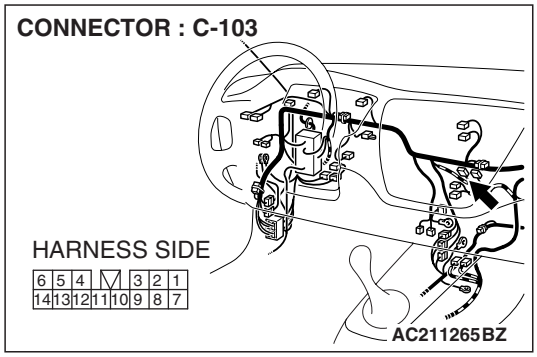
STEP 28. Check radio and CD player connector C-103 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

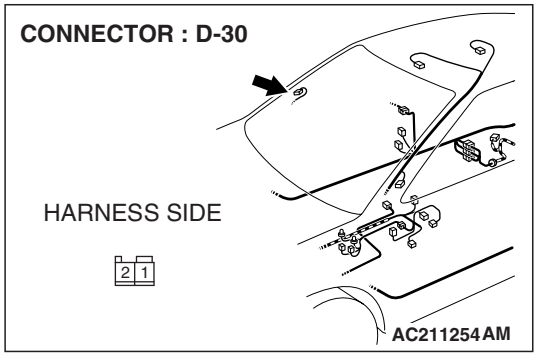
Q: Is radio and CD player connector C-103 in good condition?

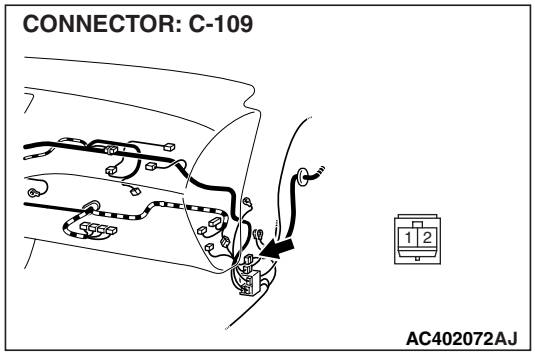
YES : Go to Step 29.

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

STEP 29. Check the wiring harness between tweeter (RH) connector D-30 (terminals 1 and 2) and radio and CD player connector C-103 (terminals 14 and 6).







NOTE: Also check intermediate connector C-109 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-109 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

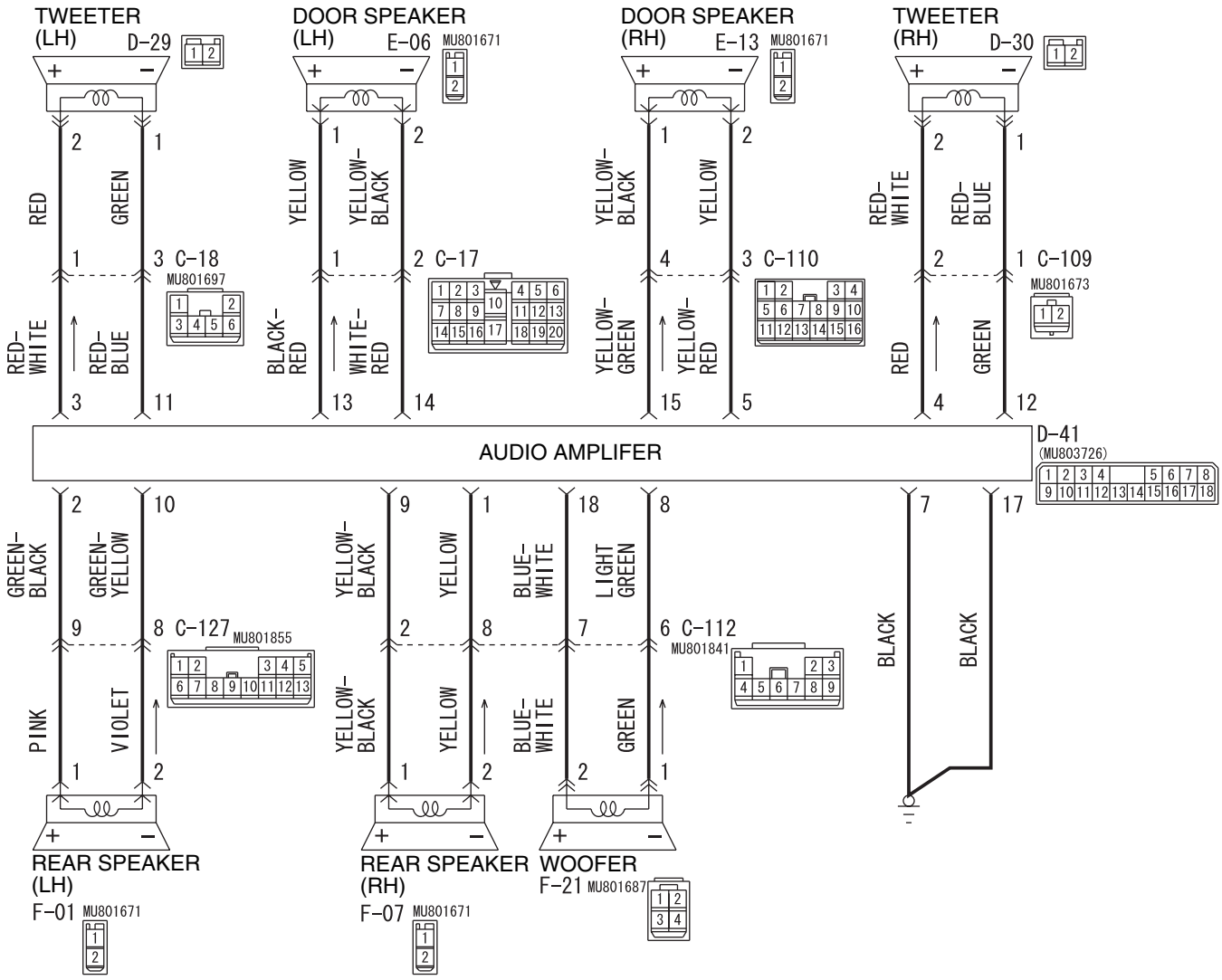
Q: Is the wiring harness between tweeter (RH) connector D-30 (terminals 1 and 2) and radio and CD player connector C-103 (terminals 14 and 6) in good condition?

YES : Repair or replace the radio and CD player. The tweeter (RH) should sound.

NO : Repair the wiring harness. The tweeter (RH) should sound.

INSPECTION PROCEDURE 4: No Sound from One Speaker <Vehicles with Audio Amplifier>

Speaker System Circuit <Vehicles with Audio Amplifier>



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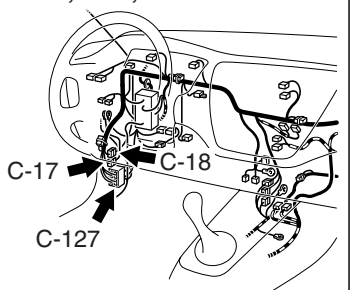
CONNECTORS: C-17, C-18, C-127



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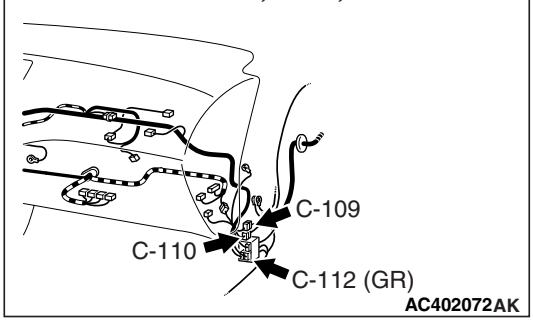
CONNECTORS: C-109, C-110, C-112



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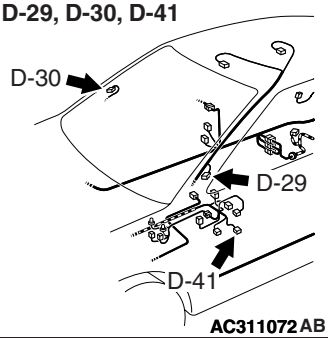
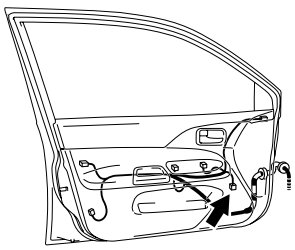
TSB Revision

CONNECTORS: D-29, D-30, D-41



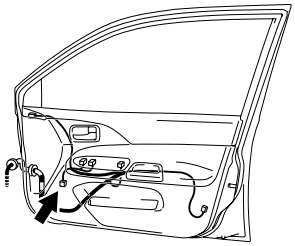
AC311072AB

CONNECTOR: E-06



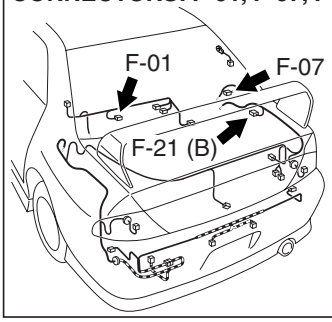
AC311075AB

CONNECTOR: E-13



AC311077AB

CONNECTORS: F-01, F-07, F-21



AC311071AB

CIRCUIT OPERATION

The sound signals are sent from the audio amplifier. After the signals are amplified and filtered, the sound signals are sent to the speaker.

TECHNICAL DESCRIPTION (COMMENT)

The cause is probably a faulty speaker circuit system.

TROUBLESHOOTING HINTS

- Malfunction of the speaker
- Damaged wiring harness or connector
- Malfunction of the audio amplifier

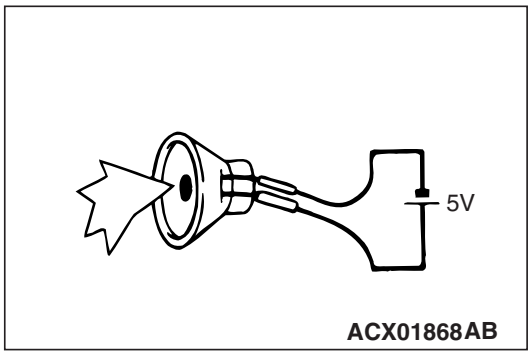
DIAGNOSIS

STEP 1. Check which speaker has no sound on the vehicles with seven speakers.

Determine which speaker does not sound.

Q: Which speaker does not sound?

Tweeter (LH) : Go to Step 2.
Tweeter (RH) : Go to Step 5.
Front door speaker (LH) : Go to Step 8.
Front door speaker (RH) : Go to Step 11.
Rear door speaker (LH) : Go to Step 14.
Rear door speaker (RH) : Go to Step 17.
Woofer : Go to Step 20.



STEP 2. Check the tweeter (LH).

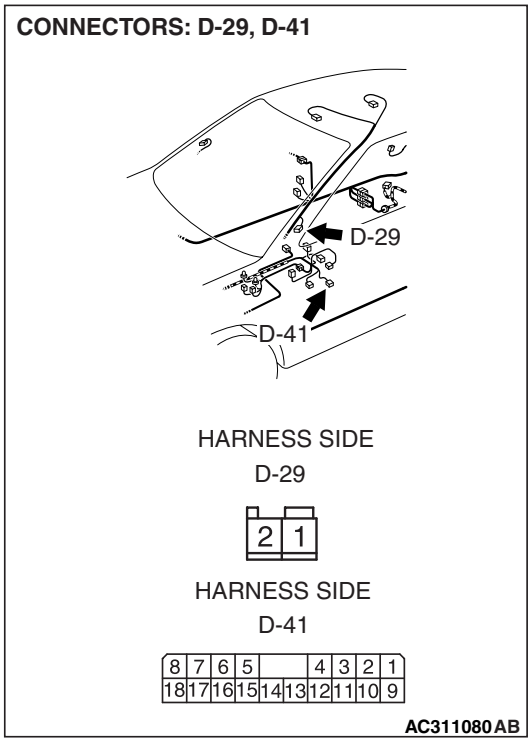
(1) Remove the tweeter (LH). Refer to P.54A-168.

(2) Check that the tweeter (LH) generates noise when a five-volt voltage is applied on the tweeter (LH) terminal.

Q: Is the tweeter (LH) generating noise?

YES : Go to Step 3.

NO : Replace the tweeter (LH). The tweeter (LH) should sound.



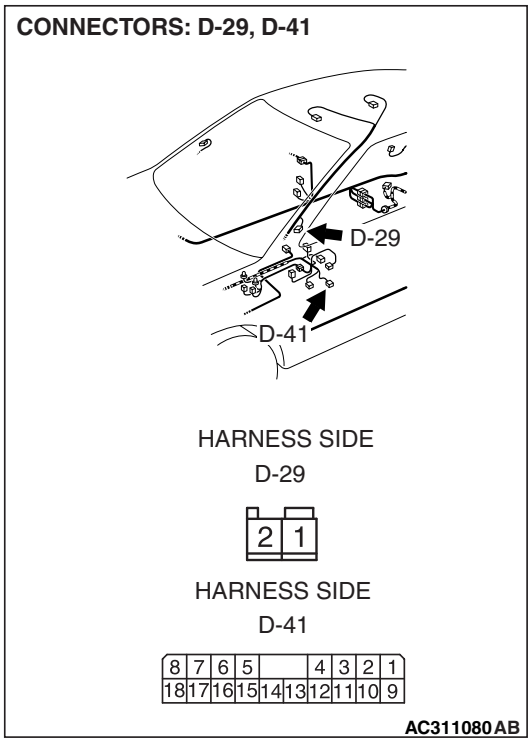
STEP 3. Check tweeter (LH) connector D-29 and audio amplifier connector D-41 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

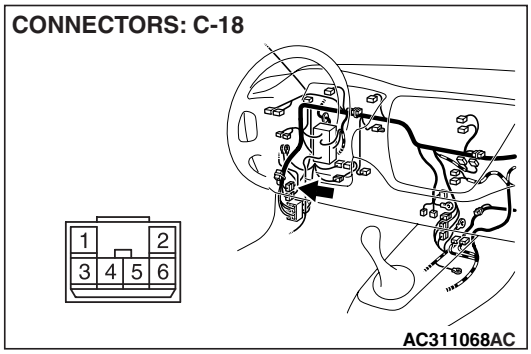
Q: Are harness connectors D-29 and D-41 in good condition?

YES : Go to Step 4.

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

STEP 4. Check the wiring harness between tweeter (LH) connector D-29 (terminals 1 and 2) and audio amplifier connector D-41 (terminals 3 and 11).





NOTE: Also check intermediate connector C-18 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-18 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between tweeter (LH) connector D-29 (terminals 1 and 2) and audio amplifier connector D-41 (terminals 3 and 11) in good condition?

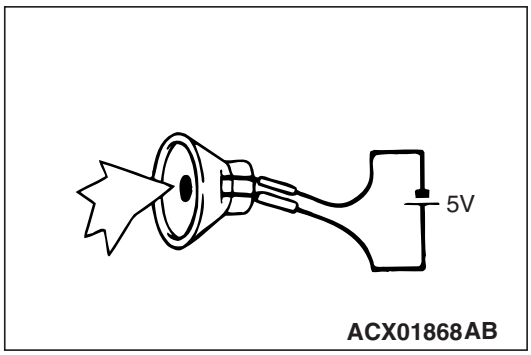
YES : Replace the audio amplifier. The tweeter (LH) should sound.

NO : Repair the wiring harness. The tweeter (LH) should sound.

STEP 5. Check the tweeter (RH).

(1) Remove the tweeter (RH). Refer to P.54A-168.

(2) Check that the tweeter (RH) generates noise when a five-volt voltage is applied on the tweeter (RH) terminal.



Q: Is the tweeter (RH) generating noise?

YES : Go to Step 6.

NO : Replace the tweeter (RH). The tweeter (RH) should sound.

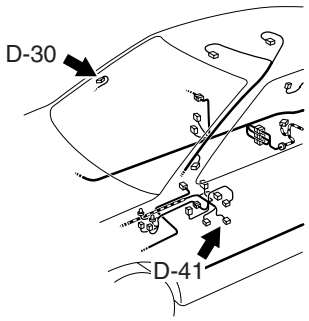
STEP 6. Check tweeter (RH) connector D-30 and audio amplifier connector D-41 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are harness connectors D-30 and D-41 in good condition?

YES : Go to Step 7.

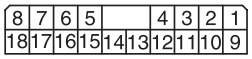
NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The tweeter (RH) should sound.

CONNECTORS: D-30, D-41



HARNESS SIDE
D-30

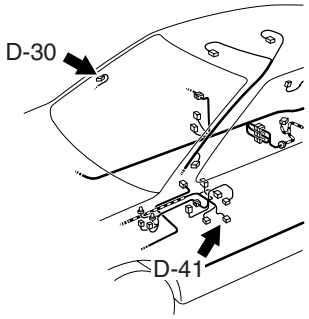
HARNESS SIDE
D-41



AC311080AC

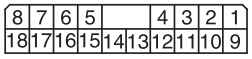
STEP 7. Check the wiring harness between tweeter (RH) connector D-30 (terminals 1 and 2) and audio amplifier connector D-41 (terminals 4 and 12).

CONNECTORS: D-30, D-41

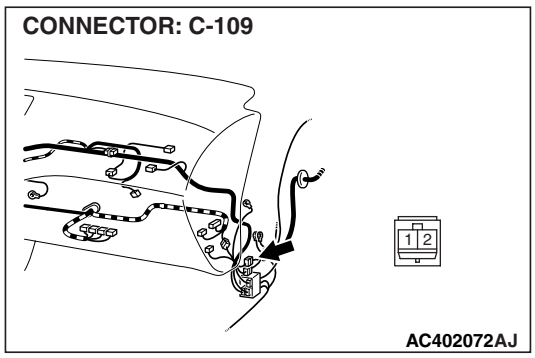


HARNESS SIDE
D-30

HARNESS SIDE
D-41



AC311080AC

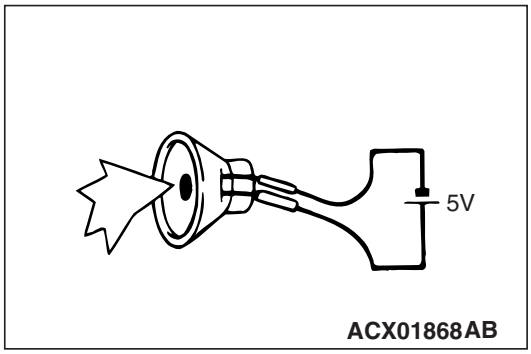


NOTE: Also check intermediate connector C-109 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-109 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between tweeter (RH) connector D-30 (terminals 1 and 2) and audio amplifier connector D-41 (terminals 4 and 12) in good condition?

YES : Replace the audio amplifier. The tweeter (RH) should sound.

NO : Repair the wiring harness. The tweeter (RH) should sound.



STEP 8. Check the front door speaker (LH).

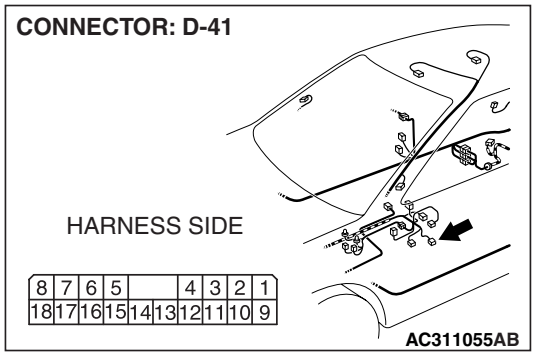
(1) Remove the front door speaker (LH). Refer to P.54A-168.

(2) Check that the front door speaker (LH) generates noise when a five-volt voltage is applied on the front door speaker (LH) terminal.

Q: Is the front door speaker (LH) generating noise?

YES : Go to Step 9.

NO : Replace the front door speaker (LH). The front door speaker (LH) should sound.

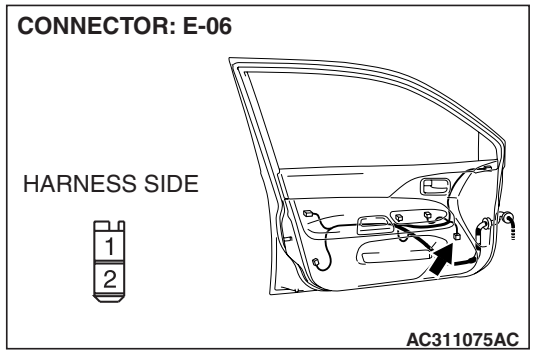


STEP 9. Check front door speaker (LH) connector E-06 and audio amplifier connector D-41 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

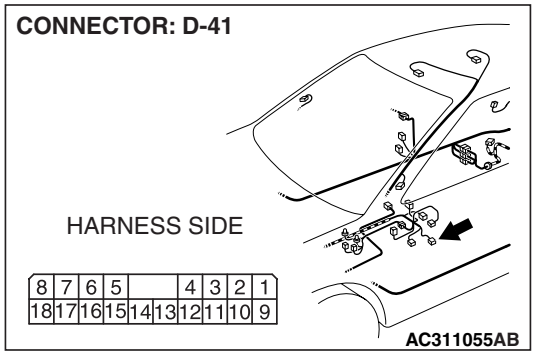
Q: Are harness connectors E-06 and D-41 in good condition?

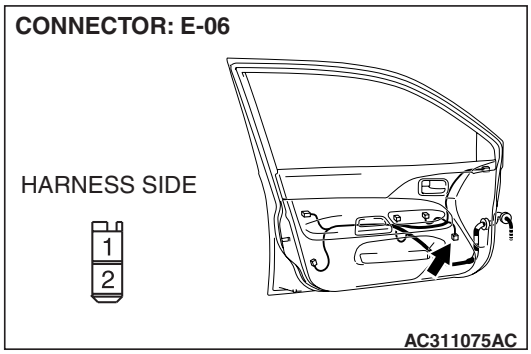
YES : Go to Step 10.

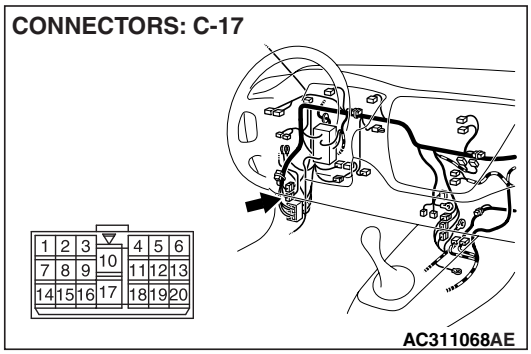
NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The front door speaker (LH) should sound.



STEP 10. Check the wiring harness between front door speaker (LH) connector E-06 (terminals 1 and 2) and audio amplifier connector D-41 (terminals 13 and 14).







NOTE: Also check intermediate connector C-17 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-17 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between front door speaker (LH) connector E-06 (terminals 1 and 2) and audio amplifier connector D-41 (terminals 13 and 14) in good condition?

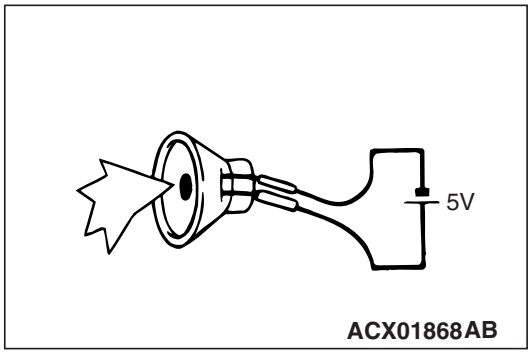
YES : Replace the audio amplifier. The front door speaker (LH) should sound.

NO : Repair the wiring harness. The front door speaker (LH) should sound.

STEP 11. Check the front door speaker (RH).

(1) Remove the front door speaker (RH). Refer to P.54A-168.

(2) Check that the front door speaker (RH) generates noise when a five-volt voltage is applied on the front door speaker (RH) terminal.



Q: Is the front door speaker (RH) generating noise?

YES : Go to Step 12.

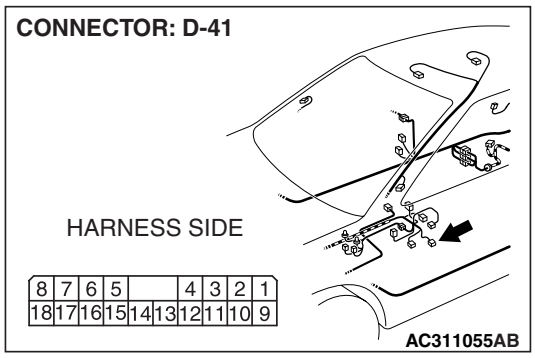
NO : Replace the front door speaker (RH). The front door speaker (RH) should sound.

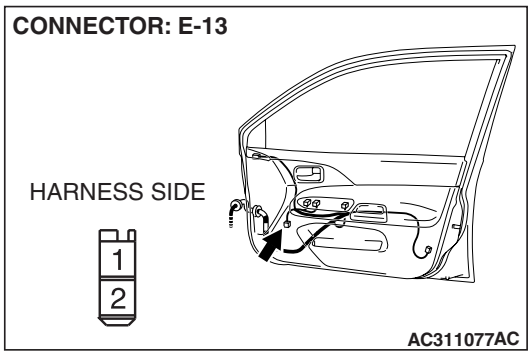
STEP 12. Check front door speaker (RH) connector E-13 and audio amplifier connector D-41 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are harness connectors E-13 and D-41 in good condition?

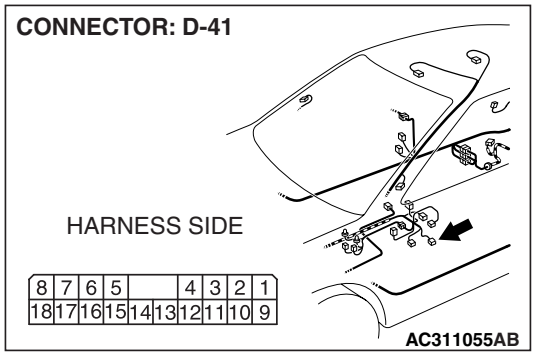
YES : Go to Step 13.

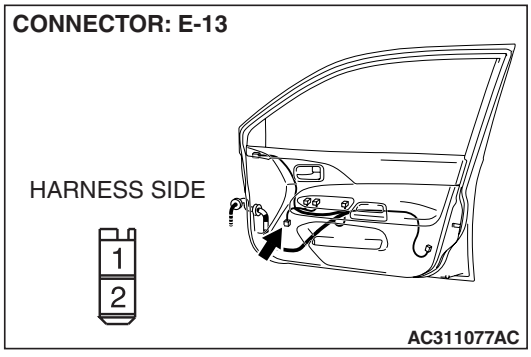
NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The front door speaker (RH) should sound.

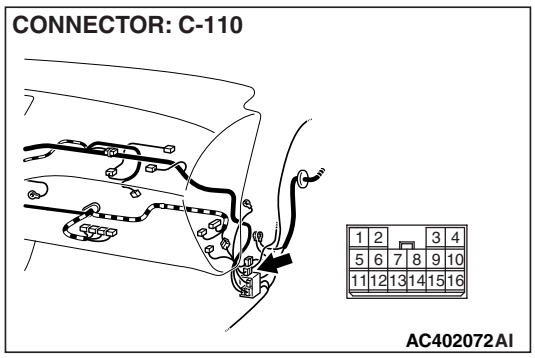




STEP 13. Check the wiring harness between front door speaker (RH) connector E-13 (terminals 1 and 2) and audio amplifier connector D-41 (terminals 5 and 15).





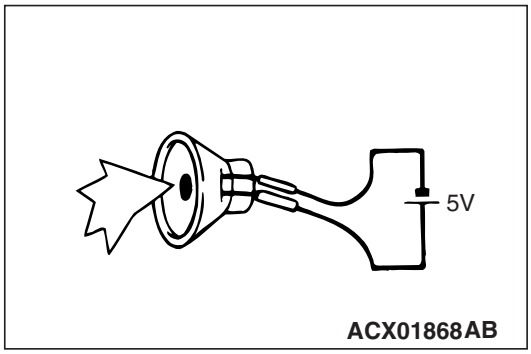


NOTE: Also check intermediate connector C-110 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-110 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between front door speaker (RH) connector E-13 (terminals 1 and 2) and audio amplifier connector D-41 (terminals 5 and 15) in good condition?

YES : Replace the audio amplifier. The front door speaker (RH) should sound.

NO : Repair the wiring harness. The front door speaker (RH) should sound.



STEP 14. Check the rear door speaker (LH).

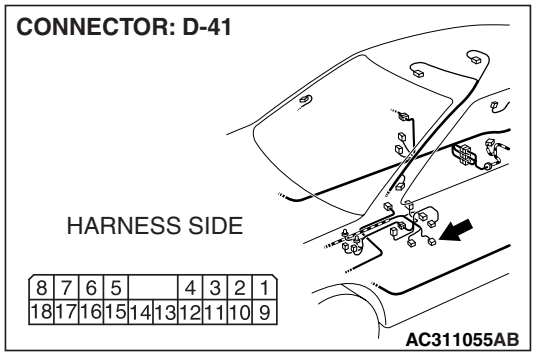
(1) Remove the rear door speaker (LH). Refer to P.54A-168.

(2) Check that the rear door speaker (LH) generates noise when a five-volt voltage is applied on the rear door speaker (LH) terminal.

Q: Is the rear door speaker (LH) generating noise?

YES : Go to Step 15.

NO : Replace the rear door speaker (LH). The rear door speaker (LH) should sound.

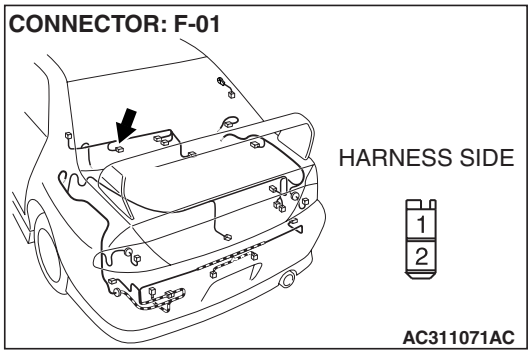


STEP 15. Check rear door speaker (LH) connector F-01 and audio amplifier connector D-41 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

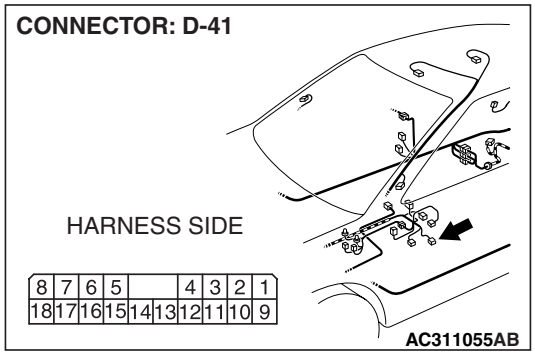
Q: Are harness connectors F-01 and D-41 in good condition?

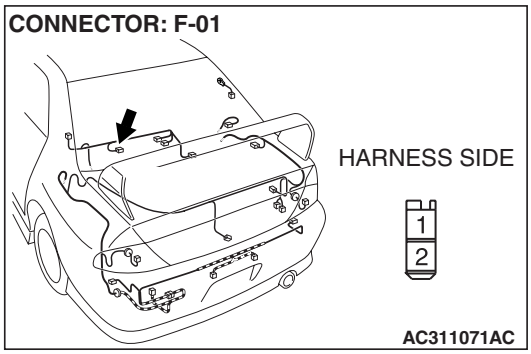
YES : Go to Step 16.

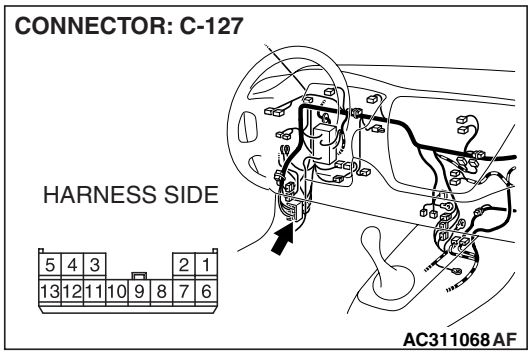
NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The rear door speaker (LH) should sound.



STEP 16. Check the wiring harness between rear door speaker (LH) connector F-01 (terminals 1 and 2) and audio amplifier connector D-41 (terminals 2 and 10).







NOTE: Also check intermediate connector C-127 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-127 is damaged, repair or replace the connectors as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between the rear door speaker (LH) connector F-01 (terminals 1 and 2) and audio amplifier connector D-41 (terminals 2 and 10) in good condition?

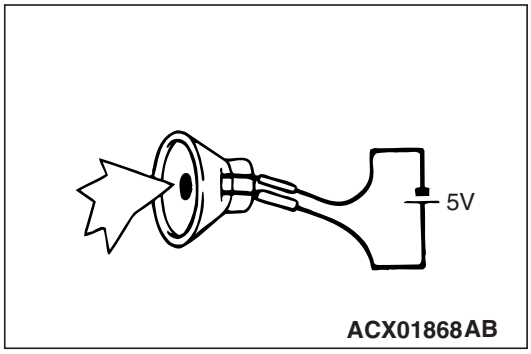
YES : Replace the audio amplifier. The rear door speaker (LH) should sound.

NO : Repair the wiring harness. The rear door speaker (LH) should sound.

STEP 17. Check the rear door speaker (RH).

(1) Remove the rear door speaker (RH). Refer to P.54A-168.

(2) Check that the rear door speaker (RH) generates noise when a five-volt voltage is applied on the rear door speaker (RH) terminal.



Q: Is the rear door speaker (RH) generating noise?

YES : Go to Step 18.

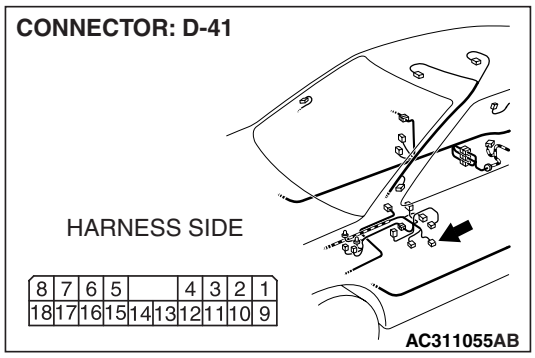
NO : Replace the rear door speaker (RH). The rear door speaker (RH) should sound.

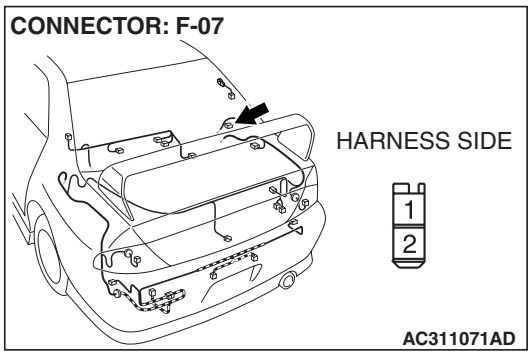
STEP 18. Check rear door speaker (RH) connector F-07 and audio amplifier connector D-41 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are harness connectors F-07 and D-41 in good condition?

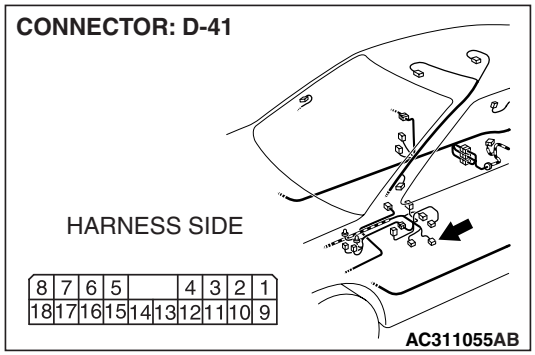
YES : Go to Step 19.

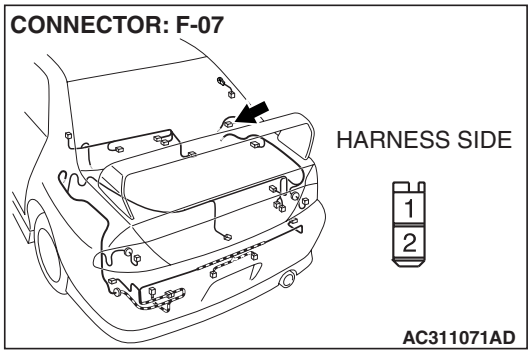
NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The rear door speaker (RH) should sound.

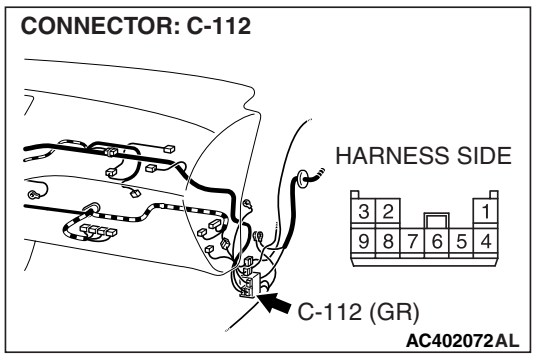




STEP 19. Check the wiring harness between rear door speaker (RH) connector F-07 (terminals 1 and 2) and audio amplifier connector D-41 (terminals 1 and 9).







NOTE: Also check intermediate connector C-112 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-112 is damaged, repair or replace the connectors as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between rear door speaker (RH) connector F-07 (terminals 1 and 2) and audio amplifier connector D-41 (terminals 1 and 9) in good condition?

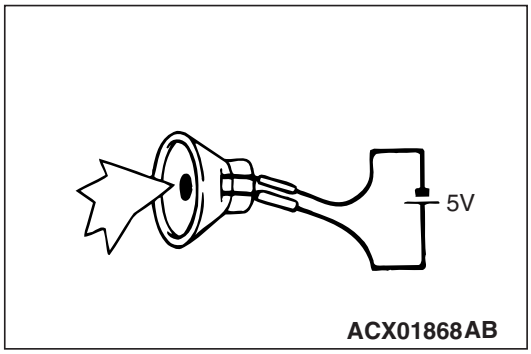
YES : Replace the audio amplifier. The rear door speaker (RH) should sound.

NO : Repair the wiring harness. The rear door speaker (RH) should sound.

STEP 20. Check the woofer.

(1) Remove the woofer. Refer to P.54A-168.

(2) Check that the woofer generates noise when a five-volt voltage is applied on the woofer terminal.

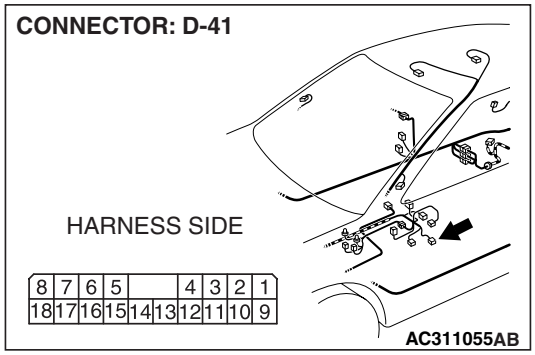


Q: Is the woofer generating noise?

YES : Go to Step 21.

NO : Replace the woofer. The woofer should sound.

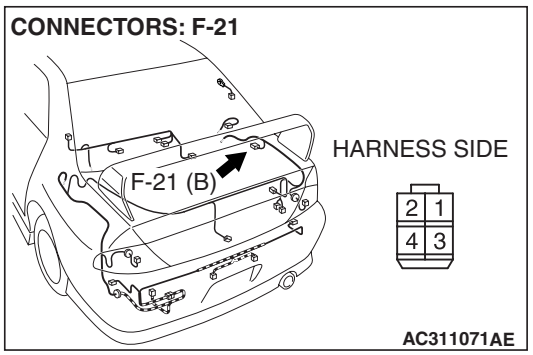
STEP 21. Check woofer connector F-21 and audio amplifier connector D-41 for loose, corroded or damaged terminals, or terminals pushed back in the connector.



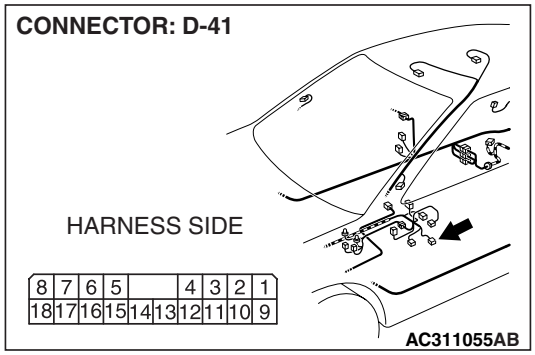
Q: Are harness connectors F-21 and D-41 in good condition?

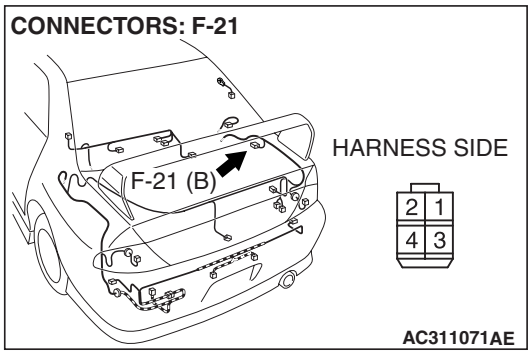
YES : Go to Step 22.

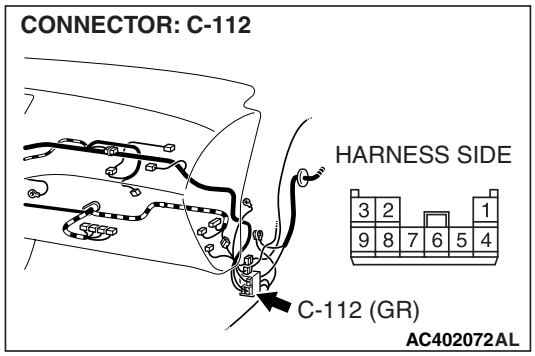
NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The woofer should sound.



STEP 22. Check the wiring harness between woofer connector F-21 (terminals 1 and 2) and audio amplifier connector D-41 (terminals 8 and 18).







NOTE: Also check intermediate connector C-112 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-112 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between woofer connector F-21 (terminals 1 and 2) and audio amplifier connector D-41 (terminals 8 and 18) in good condition?

YES : Replace the audio amplifier. The woofer should sound.

NO : Repair the wiring harness. The woofer should sound.

INSPECTION PROCEURE 5: CD Auto Changer does Not Operate.

TECHNICAL DESCRIPTION (COMMENT)
The CD auto changer is connected via only the DIN cable to the radio and CD player. Therefore, if the DIN cable is defective, the audio system does not operate normally.

TROUBLESHOOTING HINTS
- Damaged DIN cable.
- Malfunction of the CD auto changer.
- Malfunction of the radio and CD player.

DIAGNOSIS

If the DIN cable between CD auto changer and radio and CD player is damaged, repair or replace it. The CD auto changer should operate normally.
If the DIN cable is in good condition, repair or replace the CD auto changer or radio and CD player. The CD auto changer should operate normally.

INSPECTION PROCEDURE 6: Noise Appears at Certain Places When Traveling (AM).

DIAGNOSIS

STEP 1. Check whether the noise occurs when entering or near a particular structure (building, tunnel, mountain, etc.)

Q: Dose the noise occur when entering or near a particular structure (building, tunnel, mountain, etc.)?

YES : Go to Step 3.
NO : Go to Step 2.

STEP 2. After taking the following measures to prevent the noise, check that no noise appears.
(1) Change to a different station with a stronger signal.
(2) Suppress high tones to reduce noise.
(3) Extend antenna completely.

Q: Do the above measures eliminate the noise?

YES : The above causes should be considered.
NO : Go to Step 4.

STEP 3. Ask the owner about the state of the noise.
(1) Find out the following information from the owner.
(2) Place where the noise occurs.
(3) Locality conditions (valley, mountain, etc.)
(4) Name and frequency of stations affected by noise

Q: Is the noise a vehicle noise or an external noise?

Vehicle noise : It may not be possible to prevent noise if the signal is weak.
External noise : In almost all cases, prevention on the receiver side is impossible. Weak signals especially are susceptible to interference. Go to Step 4.

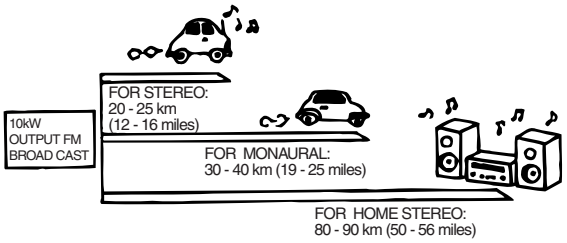
STEP 4. Check that there is no noise.

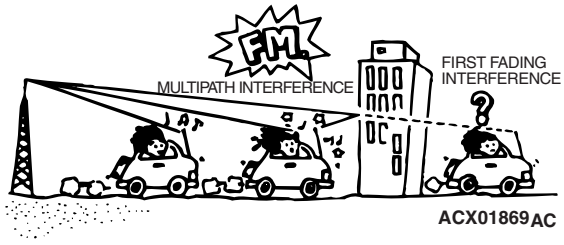
Q: Does noise still exist?

YES : If there is more noise than on radios in other vehicles, find out the noise condition and the name and frequency of the receiving stations from the owner, and consult with the radio manufacturer's service center.

NO : Normal.

INSPECTION PROCEDURE 7: Noise Appears at Certain Places When Traveling (FM).





DIAGNOSIS

NOTE: About FM waves: FM waves have the same properties as light, and can be deflected and blocked. Wave reception is not possible in the shadow of obstructions such as buildings or mountains.

1. The signal becomes weak as the distance from the station's transmission antenna increases. This may depend on the signal strength of the transmitting station and intervening geographical formation of buildings. Generally speaking, the area of good reception is approximately 20 - 25 km (12 –16 miles) for stereo reception, and 30 – 40 km (19 –25 miles) for monaural reception.
2. The signal becomes weak when an area of shadow from the transmitting antenna (places where there are obstructions such as mountains or buildings between the station transmitter and the vehicle), and noise will appear. <This is called first fading, and gives a steady buzzing noise.>
3. If a direct signal hits the antenna at the same time as a signal reflected by obstructions such as mountains or buildings, interference of the two signals will generate noise. During traveling, noise will appear each time the vehicle's antenna passes through this kind of obstructed area. The strength and interval of the noise varies according to the signal strength and the conditions of deflection. <This is called multipath noise, and is a repetitive buzzing.>
4. Since FM stereo transmission and reception has a weaker field than monaural, it is often accompanied by a hissing noise.

After taking measures to prevent the noise, check that no noise occurs.

5. Change to a different station with a stronger wave to boost resistance to interference.
6. Suppress high tones to reduce noise.
7. Extend antenna completely.

If there is noise, the following causes can be considered.

8. If due to vehicle noise: It may not be possible to prevent noise if the signal is weak.
9. If due to external noise: In almost all cases, prevention on the receiver side is impossible. Weak signals especially are susceptible to interference.

If there is more noise than on radios in other vehicles, find out the noise condition and the name and frequency of the receiving stations from the owner, and consult with the radio manufacturer's service center.

INSPECTION PROCEDURE 8: Mixed With Noise, Only at Night (AM).

The following factors can be considered as possible causes of noise occurring at night.

1. Factors due to signal conditions: Due to the fact that long-distance signals are more easily received at night, even stations that are received without problem during the day may experience interference in a general worsening of reception conditions. The weaker a station is, the more susceptible it is to interference, and a change to different station or the appearance of a beating sound* may occur.

   NOTE: Beat sound: Two signals close in frequency interfere with each other, creating a repetitious high-pitched sound. This sound is generated not only by sound signals but electrical waves as well.*
2. Factors due to vehicle noise: Generator noise may be a cause.

DIAGNOSIS

STEP 1. Check that the noise is still obvious even when the lights are off.

Q: Is the noise still obvious even when the lights are off?

YES : Go to Step 2.
NO : Go to Step 3.

STEP 2. Check with the following actions.

(1) Tune to a station with a stronger signal.
(2) Tune to a station with a stronger signal without completely extending the antenna (Whip antenna).

Q: Is there more noise than on the radio in other vehicles?

YES : Consult the radio manufacturer's service center.
NO : Check that there is no noise.

STEP 3. Check that the noise fades away when the vehicle harness is moved away from the radio (if the harness is not in the proper position).

Q: Does the noise fade away when the vehicle harness is moved any from the radio (if the harness is not in the proper position)?

YES : Consult the radio manufacturer's service center.
NO : If there is more noise than other radios, consult the radio manufacturer's service center.

INSPECTION PROCEDURE 9: Broadcasts can be Heard but Both AM and FM have a Lot of Noise.

DIAGNOSIS

STEP 1. Check the state of the antenna.

Q: Is the roof antenna pole assembled?

YES : Go to Step 2.
NO : Assemble the roof antenna pole. Check to see that the noise is gone.

STEP 2. Check that the noise occurs when the engine is stopped or the engine is running.

Q: Does noise occur when the engine is stopped or the engine is running?

When the engine is stopped : Go to Step 3.
When the engine is running : Check the vehicle's noise suppressor. (Refer to Inspection Procedure 11 P.54A-148.)

STEP 3. Check that the following actions eliminate the noise.

(1) Tune to a station with a stronger signal.
(2) Extend the antenna completely (roof antenna pole).
(3) Adjust the sound quality to suppress high tones.

Q: Is the noise eliminated?

YES : Consult the radio manufacturer's service center.
NO : Go to Step 4.

STEP 4. Check that the radio is correctly grounded

The radio is connected to the ground with an assembling screw.

Q: Is the radio correctly grounded?

YES : Go to Step 5.
NO : Consult the radio manufacturer's service center.

STEP 5. Check the connection of the antenna plug and radio and CD player.

Q: Is the antenna plug thoroughly connected to the radio and CD player?

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

STEP 6. Check that the noise is eliminated when the antenna plug is properly attached.

Q: Is the noise eliminated?

YES : Consult the radio manufacturer's service center.
NO : Go to Step 7.

STEP 7. Check that the antenna is in good condition and is it properly mounted.

Q: Is the antenna in good condition and is it properly mounted?

YES : Consult the radio manufacturer's service center.
NO : Either repair or replace the antenna assembly. Check to see that the noise is gone.

INSPECTION PROCEDURE 10: There is More Noise on Either AM or FM.

DIAGNOSIS

There is much noise only on AM. Due to differences in AM and FM systems, AM is more susceptible to noise interference.

STEP 1. Check that there is noise under the following state(s).

- A motorcycle was passing.
- Lighting was flashing.
- A vehicle passed close by, but it appeared to be a vehicle generating a particularly large amount of noise radiation.
- Passed beneath a power line.
- Passed beneath a telephone line.
- Passed close by a signal generator.
- Passed close by some other sources of electrical noise.
- Passed under a bridge.

Q: Is there noise in the above states?

YES : Go to Step 3.
NO : Go to Step 2.

STEP 2. Continue to check for static; when static is detected, check for the conditions listed above.

Q: Is there noise in the state described in Step 1?

YES : Noise prevention on the radio side is difficult. If the problem is particularly worse than other radios, consult a service center.
NO : Go to Step 3.

STEP 3. Noise prevention on the radio side is difficult.

Q: Is the noise level worse than other radios?

YES : Consult a service center. Noise encountered during FM reception only. Due to differences in FM and AM systems, FM is not as susceptible as AM to interference from engines, power lines, lighting, etc. On the other hand, due to the characteristics of FM waves, there are sometimes cases of noise or distortion which are generated by typical noise interference (first fading and multipath). (Refer to Inspection Procedure 6 P.54A-145.) <Noise (hissing) occurs in weak signal areas such as mountainous regions, but this is not due to Furthermore, the amount of interference will be comparatively less for vehicles equipped with a diversity antenna system*. If there is an equivalent amount of distortion in vehicles or radios of the same type, then differences will be because of differences in antenna systems, and this should be explained to the user. a problem with the radio.> Furthermore, the amount of interference will be comparatively less for vehicles equipped with a diversity antenna system*. If there is an equivalent amount of distortion in vehicles or radios of the same type, then differences will be because of differences in antenna systems, and this should be explained to the user.

NO : If the noise level is roughly the same as other radios, there is no action to be taken.

INSPECTION PROCEDURE 11: There is Noise When Starting the Engine.

DIAGNOSIS

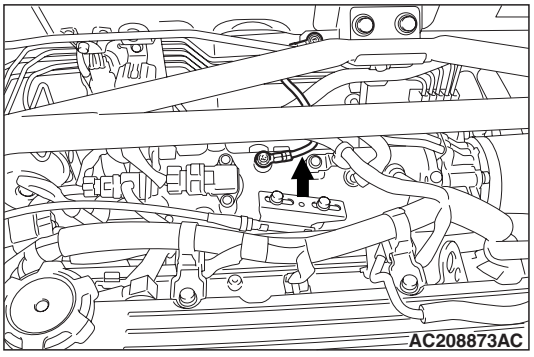
⚠ CAUTION

- **Connecting a high tension cable to the noise filter may destroy the noise filter and should never be done.**
- **Check that there is no external noise. Since failure to do this may result in an incorrect diagnosis due to the inability to identify the noise source, this operation must be performed.**
- **Noise prevention should be performed by suppressing strong sources of noise step by step.**

NOTE: Capacitor: The capacitor does not pass DC current, but as the number of waves increases when it passes AC current, impedance (resistance against AC) decreases, and current flow is facilitated. A noise suppressing capacitor which take advantage of this property is inserted between the power line for the noise source and the ground. This suppresses noise by grounding the noise component (AC or pulse signal) to the body of the vehicle.

NOTE: Coil: The coil passes DC current, but impedance rises as the number of waves increases relative to the AC current. A noise suppressing coil which takes advantage of this property is inserted into the power line for the noise source, and works by preventing the noise component from flowing or radiating out of the line.

NOISE TYPE SOUNDS ARE IN PARENTHESES	CONDITIONS	CAUSE	REMEDY
AM or FM: ignition noise (popping, snapping, cracking, buzzing)	• Increasing the engine speed causes the generator whine sound to speed up and the volume to decrease • Disappears when the ignition switch turned to "ACC."	• Mainly due to the spark plugs • Due to engine noise	• Check or replace the ground cable. • Check or replace the noise capacitor.
Other electrical components	–	Noise may occur as the electrical components become older.	Repair or replace the electrical components.
Static electricity (cracking, crinkling)	• Disappears when the vehicle is completely stopped. • Severe when the clutch is engaged	Occurs when parts or wiring move for some reason and contact metal parts of the body.	Return parts or wiring to their proper position.
Static electricity (cracking, crinkling)	• Various noise are produced depending on the body part of the vehicle.	Due to removal of the front hood, bumpers, exhaust pipe and muffler, suspension, etc.	Ground parts by bonding. Cases where the problem is not eliminated by a signal response to one area are common, due to several body parts being imperfectly grounded.



INSPECTION PROCEDURE 12: Some Noise Appears When There is Vibration or Shocks During Traveling.

DIAGNOSIS

STEP 1. Check radio and CD player connector C-102 and amplifier connector D-27 <with amplifier> for damage.

Q: Are radio and CD player connector C-102 and amplifier connector D-27 <with amplifier> in good condition?

YES : Go to Step 2.
NO : Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Check that there is no noise.

STEP 2. Check that noise appear when the radio switch is turned on while the vehicle is stopped and the radio is tapped while tuned away from a station.

NOTE: Static electricity noise: Body static electric from the shock absorber rubber bushings used to prevent vibration, tires, etc. occurs because of separation from the ground, causing a buzzing noise. Since no measures can be taken to discharge the static electricity of the vehicle body. Check that there is no noise.

Q: Does noise appear when the radio switch is turned on while the vehicle is stopped and the radio is tapped while tuned away from a station?

YES : Go to Step 3.
NO : It may be static electricity noise.

STEP 3. Check that the radio is correctly grounded.

The radio is connected to the ground with an assembling screw.

Q: Is the radio correctly grounded?

YES : Go to Step 4.
NO : Tighten the screw securely. Check that there is no noise.

STEP 4. Check by replacing radio and CD player.

Q: Are operations normal when using another radio and CD player?

YES : Replace the radio and CD player. Check that there is no noise.
NO : Either repair or replace the antenna assembly. Check that there is no noise.

INSPECTION PROCEDURE 13: Noise Sometimes Appears on FM During Traveling.

DIAGNOSIS

STEP 1. Check the state of the antenna.

Q: Is the roof antenna pole assembled?

YES : Go to Step 2.

NO : Assemble the roof antenna pole. Check that there is no noise.

STEP 2. Check after adjusting the radio.

Q: Readjust the radio. Is the noise eliminated?

YES : Check that there is no noise.

NO : Go to Step 3.

STEP 3. Check with several broadcasting stations.

NOTE: Multipath noise and fading noise: Because the frequency of FM waves is extremely high, it is highly susceptible to effects from geological formations and buildings. These effects disrupt the broadcast signal and obstruct reception in several ways.

- *Multipath noise*
  This describes the echo that occurs when the broadcast signal is reflected by a large obstruction and enters the receiver with a slight time delay relative to the direct signal (repetitious buzzing).
- *Fading noise*
  This is a buzzing noise that occurs when the broadcast signal is disrupted by obstructing objects and the signal strength fluctuates intricately within a narrow range.

Q: Is the abnormality in reception generated only within a certain range?

YES : The effect of an electrical field condition (multipath noise, fading noise) could be the cause. Check that there is not noise.

NO : Go to Step 4.

STEP 4. Check that noise appears when the radio switch is turned on while the vehicle is stopped.

NOTE: Static electricity noise: Body static electric from the shock absorber rubber bushings used to prevent vibration, tires, etc. occurs because of separation from the ground, causing a buzzing noise. There are no measures to discharge the static electricity of the vehicle body. Check that there is no noise.

Q: Does noise appear when the radio switch is turned on while the vehicle is stopped and the radio is tapped while tuned away from a station?

YES : Go to Step 5.

NO : It may be static electricity noise.

STEP 5. Check that the radio is correctly grounded.
The radio is connected to the ground with an assembling screw.

Q: Is the radio correctly grounded?

YES : Go to Step 6.
NO : Tighten the screw securely. Check that there is no noise.

STEP 6. Check by replacing radio and CD player.

Q: Are operations normal when using another radio and CD player?

YES : Replace the radio and CD player. Check that there is no noise.
NO : Either repair or replace the antenna assembly. Check that there is no noise.

INSPECTION PROCEDURE 14: Ever-Present Noise

DIAGNOSIS

Noise is often created by the following factors, and often the radio is OK when it is checked individually.

- Traveling conditions of the vehicle
- Terrain of area traveled through
- Surrounding buildings
- Signal conditions
- Time period

For this reason, if there are still problems with noise even after the measures described in inspection procedure 7 to 14 have been taken, get information on the factors listed above as well as determining whether the problem occurs with AM or FM, the station names, frequencies, etc. and contact the radio manufacturer's service center.

INSPECTION PROCEDURE 15: There is Noise but No Reception for Both AM and FM or No Sound from AM, or No Sound from FM.

DIAGNOSIS

STEP 1. Check the state of the antenna.

Q: Is the roof antenna pole assembled?

YES : Go to Step 2.
NO : Assemble the roof antenna pole. The radio should sound normally.

STEP 2. Check to see if inspections are taking place is an area exposed to special electric fields.

Q: Are inspections taking place under special electric field conditions? (underground garage, inside a building, etc.)?

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

STEP 3. Relocate and check.
Move the vehicle to a good reception area that is not exposed to special electric fields.

Q: Is reception of the strongest radio frequency possible within the area?
YES : There is no action to be taken.
NO : Go to Step 4.

STEP 4. Tune then check.

Q: Did the sensitivity improve after tuning?
YES : There is no action to be taken.
NO : Go to Step 5.

STEP 5. Check the connection of the antenna plug and radio and CD player.

Q: Is the antenna plug thoroughly connected to the radio and CD player?
YES : Go to Step 6.
NO : Thoroughly connect the antenna plug and the radio and CD player. The radio should sound normally.

STEP 6. Check by replacing radio and CD player.

Q: Are operations normal when using another radio and CD player?
YES : Replace the radio and CD player. The radio should sound normally.
NO : Either repair or replace the antenna assembly. The radio should sound normally.

INSPECTION PROCEDURE 16: Poor Reception

DIAGNOSIS

STEP 1. Check the state of the antenna.

Q: Is the roof antenna pole assembled?
YES : Go to Step 2.
NO : Assemble the roof antenna pole. Check that a poor reception is resolved.

STEP 2. Check to see if inspections are taking place is an area exposed to special electric fields.

Q: Are inspections taking place under special electric field conditions? (underground garage, inside a building, etc.)?
YES : Go to Step 3.
NO : Go to Step 4.

STEP 3. Relocate and check.

Move the vehicle to a good reception area that is not exposed to special electric fields.

Q: Is reception of the strongest radio frequency possible within the area?

YES : Check that a poor reception is resolved.
NO : Go to Step 4.

STEP 4. Tune then check.

Q: Did the sensitivity improve after tuning?

YES : Check that a poor reception is resolved.
NO : Go to Step 5.

STEP 5. Check with several broadcasting stations.

NOTE: Multipath noise and fading noise: Because the frequency of FM waves is extremely high, it is highly susceptible to effects from geological formations and buildings. These effects disrupt the broadcast signal and obstruct reception in several ways.

- *Multipath noise*
  This describes the echo that occurs when the broadcast signal is reflected by a large obstruction and enters the receiver with a slight time delay relative to the direct signal (repetitious buzzing).
- *Fading noise*
  This is a buzzing noise that occurs when the broadcast beam is disrupted by obstructing objects and the signal strength fluctuates intricately within a narrow range.

Q: Is the abnormality in reception generated only within a certain range?

YES : Check that a poor reception is resolved.
NO : Go to Step 6.

STEP 6. Check the connection of the antenna plug and radio and CD player.

Q: Is the antenna plug thoroughly connected to the radio and CD player?

YES : Go to Step 7.
NO : Thoroughly connect the antenna plug and the radio and CD player. Check that a poor reception is resolved.

STEP 7. Check by replacing the radio and CD player.

Q: Are operations normal when using another radio and CD player?

YES : Replace the radio and CD player. Check that a poor reception is resolved.
NO : Either repair or replace the antenna assembly. Check that a poor reception is resolved.

INSPECTION PROCEDURE 17: Distortion on AM or on Both AM and FM

DIAGNOSIS

STEP 1. Check the degree to which distortion is generated.

Q: How much distortion is generated?
Occasional distortion : Go to Step 2.
Constant distortion : Go to Step 3.

STEP 2. Check the transmission antenna.

Q: Is there distortion by the transmission antenna?
YES : The input from the antenna is too big.
NO : Go to Step 3.

STEP 3. Check how the speakers are set up.

Q: Are any cords coming in contact with the paper cones of the speakers?
YES : Move the cords so that they do not come in contact with the paper cones of the speaker. Check that distortion is resolved.
NO : Go to Step 4.

STEP 4. Check the speakers.
(1) Remove the speakers.
(2) Check to see if there is any ripping of the paper cones or any foreign obstacles in the paper cone.

Q: Are the speakers normal?
YES : Go to Step 5.
NO : Repair or replace the speakers. Check that distortion is resolved.

STEP 5. Check the installation condition of the speakers.

Q: Are the speakers installed correctly?
YES : Replace the radio and CD player. Check that distortion is solved.
NO : Reinstall the speaker(s) correctly. Check that distortion is solved.

INSPECTION PROCEDURE 18: Distortion on FM Only

DIAGNOSIS

STEP 1. Check with another broadcasting station.

Q: Is there distortion when tuning to another broadcasting station?
YES : Go to Step 2.
NO : The signal from that station is too weak.

STEP 2. Move the vehicle to another area and re-check.

Q: Does the distortion increase or decrease?
YES : The cause may be multipath noise.
NO : Replace the radio and CD player. Check that distortion is resolved.

INSPECTION PROCEDURE 19: Using the Auto Select Function, Too Few Automatic Stations are Selected.

DIAGNOSIS

STEP 1. Check the state of the antenna.

Q: Is the roof antenna pole assembled?

YES : Go to Step 2.
NO : Assemble the roof antenna pole. The auto-select function should operate normally.

STEP 2. Check the number of radio stations.

Q: Are there sufficient numbers of radio stations within the area?

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

STEP 3. Check the distance from the transmission antenna.

Q: Is there a transmission antenna within miles?

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

STEP 4. Check if there are not that many radio stations and when there is no transmission antenna in the vicinity.
Execute automatic selection and check to see that the strongest radio frequency is receivable within the area.

Q: Is reception of the strongest radio frequency possible within the area?

YES : There is no action to be taken.
NO : Go to Step 5.

STEP 5. Check to see if the inspection are taking place is an area exposed to special electric fields.

Q: Is inspection taking place under special electric field conditions? (underground garage, inside a building, etc.)?

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

STEP 6. Move the vehicle and recheck.
Move the vehicle to in a good reception area that is not exposed to special electric fields.

Q: Is reception of the strongest radio frequency possible within the area?

YES : There is no action to be taken.
NO : Go to Step 7.

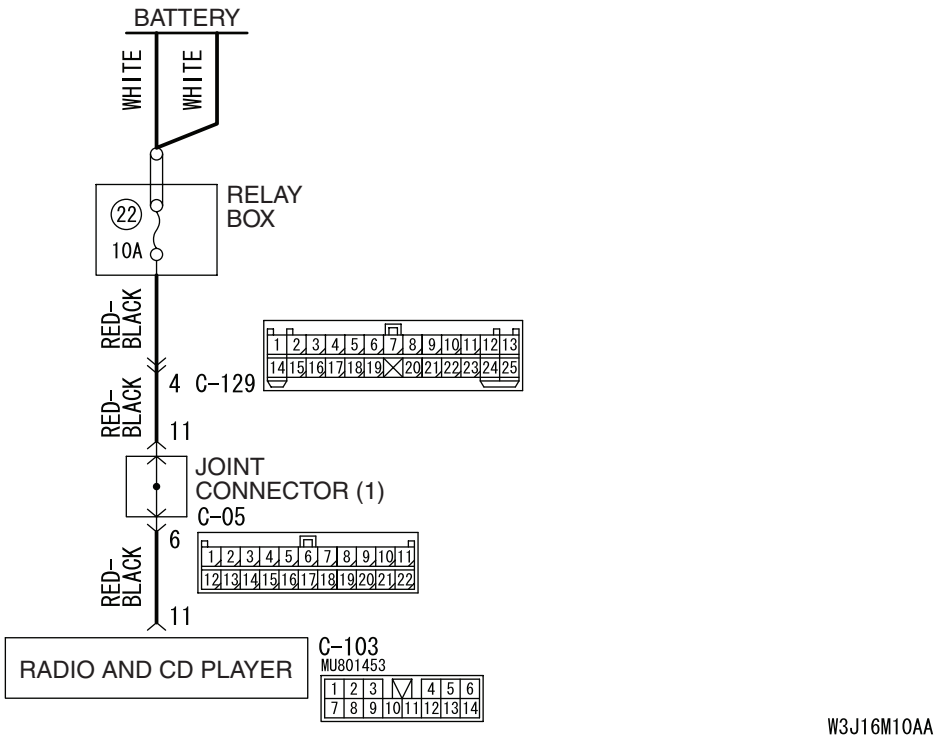
STEP 7. Check the connection of the antenna plug and radio and CD player.

Q: Is the antenna plug properly connected to the radio and CD player?

YES : Replace the radio and CD player. The auto-select function should operate normally.

NO : Securely connect the antenna plug and the radio and CD player. The auto-select function should operate normally.

INSPECTION PROCEDURE 20: Preset Stations are Erased.



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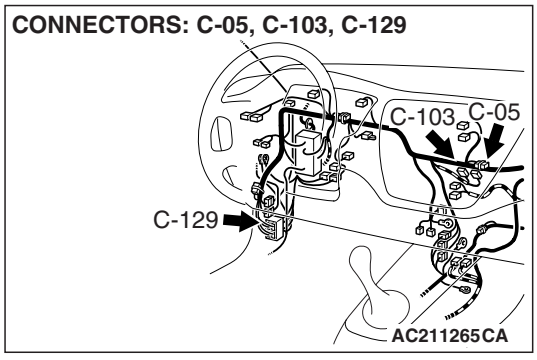


CIRCUIT OPERATION

Power is constantly supplied to the radio and CD player.

TECHNICAL DESCRIPTION (COMMENT)

The cause is probably a faulty radio and CD player memory backup power supply circuit system.

TSB Revision

TROUBLESHOOTING HINTS

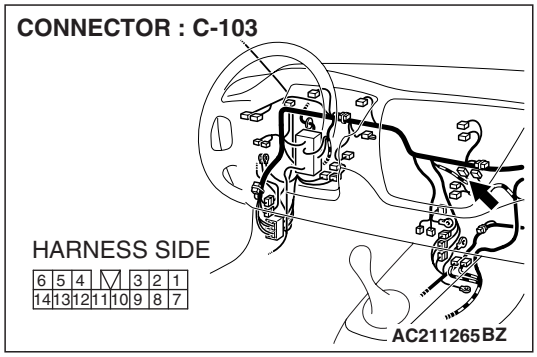
- Damaged harness wire or connector.
- Malfunction of the radio and CD player.

DIAGNOSIS

Required Special Tool:

- MB991223: Harness set

STEP 1. Check radio and CD player connector C-103 for loose, corroded or damaged terminals, or terminals pushed back in the connector.



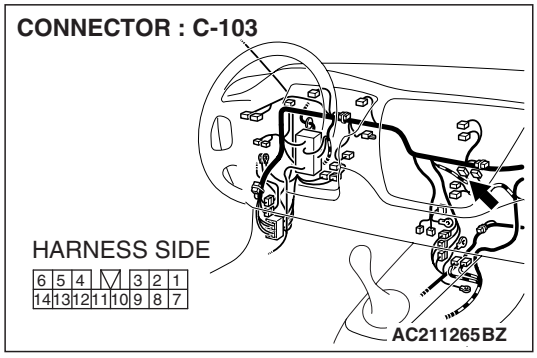
Q: Is radio and CD player connector C-103 in good condition?

YES : Go to Step 2.

NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Check that a radio station is retained in memory.

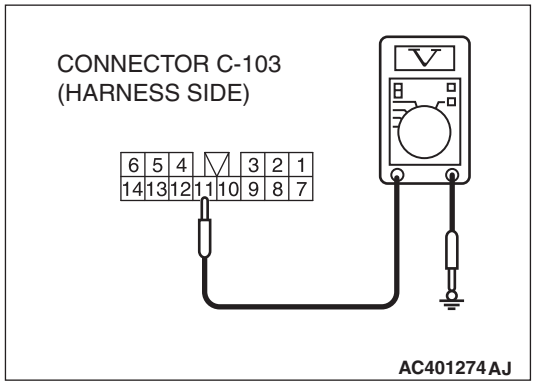
STEP 2. Check at radio and CD player connector C-103 by backprobing in order to check the power supply circuit to the radio and CD player (through the battery).

(1) Do not disconnect radio and CD player connector C-103.



(2) Measure the voltage between terminal number 11 and ground by backprobing.

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

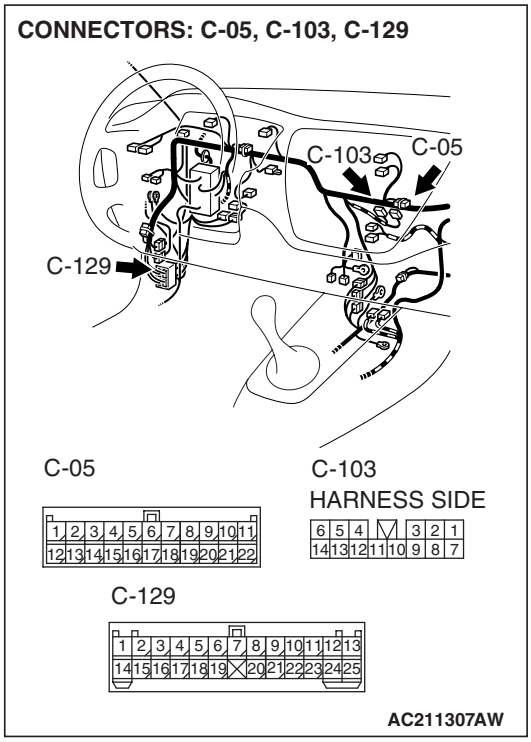


Q: Is the measured voltage approx. 12V?

When YES <radio and CD player still does not retain station in memory.> : Replace the radio and CD player. Check that memory is retained.

NO : Go to Step 3.

STEP 3. Check the wiring harness between radio and CD player connector C-103 (terminal 11) and battery.



NOTE: Also check intermediate connector C-129 and joint connector C-05 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-129 or joint connector C-05 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between radio and CD player connector C-103 (terminal 11) and battery in good condition?

YES : Replace the radio and CD player. Check that memory is retained.

NO : Repair the wiring harness. Check that memory is retained.

INSPECTION PROCEDURE 21: CD Cannot be Inserted.

DIAGNOSIS

STEP1. Check that a CD has been already loaded.

Q: Has a CD been already loaded?

NO : Go to Step 2.

YES : Take out the CD (If the CD cannot be ejected, refer to INSPECTION PROCEDURE 25 P.54A-162.) Check that a CD can be inserted.

STEP 2. Check how a CD is inserted.

- Ensure that the ignition switch is at "ACC" or "ON".

NOTE: If you try to load a CD when the ignition switch is at positions other than "ACC" or "ON", the CD will not be inserted completely. It will be rejected.

Q: If you try to load the CD, does the CD stops halfway and then rejected?

YES : Refer to INSPECTION PROCEDURE 25 P.54A-162.

NO : Go to Step 3.

STEP3. Check after the CD is loaded.

NOTE: Even though the CD is loaded, "E" (error) is sometimes displayed with the CD rejected because of vibration/shock or dew on the CD face or optical lens.

Q: Though the CD is inserted completely, is "E" (error) displayed and the CD ejected?

YES : Go to Step 4.

NO : There is no action to be taken.

STEP 4. Check the CD.

Check the CD for the conditions below:

- Is the CD loaded with its label facing down?
- Is the recorded face dirty or scratched?
- Is there dew on the recorded face?

Q: Is the CD in good condition?

YES : Go to Step 5.

NO : The original CD is defective. Check that another CD can be inserted.

STEP 5. Check again using a normal CD, which is not dirty or scratched.

- Load another normal CD.
- Check that the CD player recognizes and plays the CD.

Q: When you substitute another normal CD, is the CD loaded correctly?

YES : The original CD is defective. Check that another CD can be inserted.

NO : Replace the CD player. Check that a CD can be inserted.

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INSPECTION PROCEDURE 22: No sound. (CD only)

DIAGNOSIS

STEP 1. Check again using a normal CD, which is not dirty or scratched.

Q: When you substitute another normal CD, is the CD played normally?

YES : The original CD is defective. The CD player should sound normally.

NO : Go to Step 2.

STEP 2. Check power supply to the CD player when the ignition switch is at "ACC" or "ACC".

Q: Is the radio and CD player energized when the ignition switch is turned to the "ACC" or "ON position?

YES : Replace the CD player. The CD player should sound normally.

NO : Check the memory backup power supply circuit. Refer to Inspection Procedure 1 P.54A-105.

INSPECTION PROCEDURE 23: CD Sound Skips.

DIAGNOSIS

STEP 1. Check the state in which the sound on the CD jumps.

Q: Does the sound jump when the car is parked?

YES : Go to Step 2.

NO : Go to Step 4.

STEP 2. Check the surface of the CD.

Q: Are there any scratches or dirt on the CD?

YES : The CD is defective if there are any scratches. Clean the CD surface if it is dirty. Check that CD sound skip is resolved.

NO : Go to Step 3.

STEP 3. Check when replacing with a clean, undamaged CD that can be played normally.

Q: Does the CD play normally when replaced with a CD that is not scratched or dirty?

YES : Defective CD used. Check that CD sound skip is resolved.

NO : Go to Step 4.

STEP 4. Check by tapping the radio and CD player.

NOTE: Check by using a proper CD which is free from scratches, dirt or any other abnormality.

Q: Does the sound jump when tapping the radio and CD player?

YES : Securely mount the radio and CD player. Check that a CD sound skip is resolved.

NO : Replace the radio and CD player.
Check that CD sound skip is resolved.

INSPECTION PROCEDURE 24: Sound Quality is Poor.

DIAGNOSIS

Check to see that the CD can be played normally and that it is free of any scratches or dirt.

Replace with better quality CD.

Q: Is the sound quality better replacing the CD with a clean CD without any scratches that can be played?

YES : The CD is defective. The sound quality should return to normal.

NO : Replace the CD player. The sound quality should return to normal.

INSPECTION PROCEDURE 25: CD Cannot be Ejected.

DIAGNOSIS

Check the power of ignition switch "ACC".

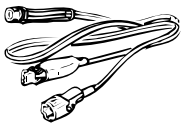
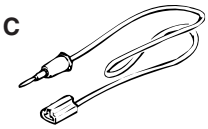
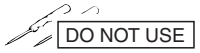
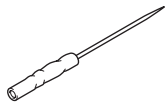
Q: Does the radio and CD player power turn ON when the ignition switch is in the "ACC" or "ON" position?

YES : Replace the radio and CD player. Check that a CD can be ejected normally.

NO : Check the memory backup power supply circuit.
Refer to Inspection Procedure 1 P.54A-105.

SPECIAL TOOLS

M1544000600306

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
A B  C  D  MB991223AZ	MB991223 A: MB991219 B: MB991220 C: MB991221 D: MB991222 Harness set A: Test harness B: LED harness C: LED harness adapter D: Probe	MB991223	Making voltage and resistance measurements during troubleshooting A: Connect pin contact pressure inspection B: Power circuit inspection C: Power circuit inspection D: Commercial tester connection
 MB992006	MB992006 Extra fine probe	General service tool	Making voltage and resistance measurement during troubleshooting

ON-VEHICLE SERVICE

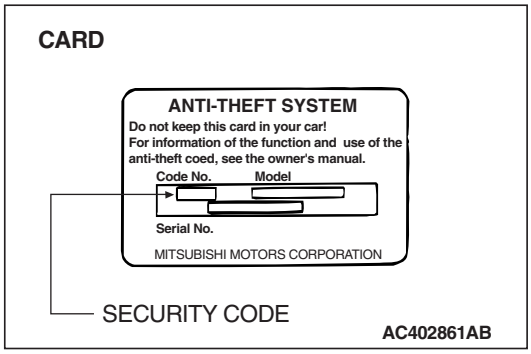
PROCEDURE FOR INPUT OF ANTI-THEFT CODE FOR ANTI-THEFT SYSTEM

M1544004400229

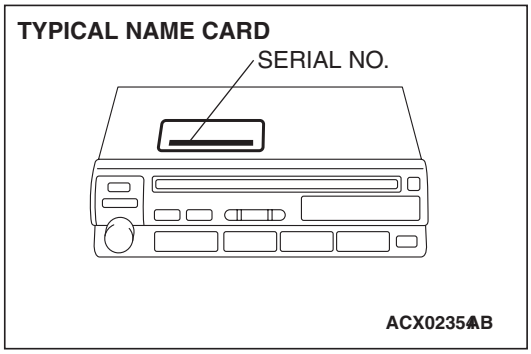
The radio and CD player do not work under the following conditions:

- Power supply to the radio and CD player has been suspended for more than an hour continuously by removing the cable from the battery terminal or disconnecting the harness connectors.
- The power supply to the radio and CD player has been suspended for more than an hour due to a blown fuse or discharged battery.
- The radio and CD player has been replaced.

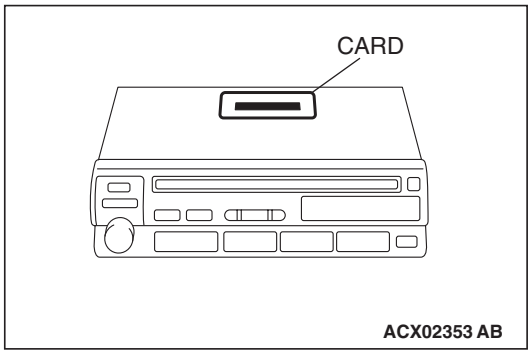
If the radio and CD player does not work for these conditions, enter the security code as follows:



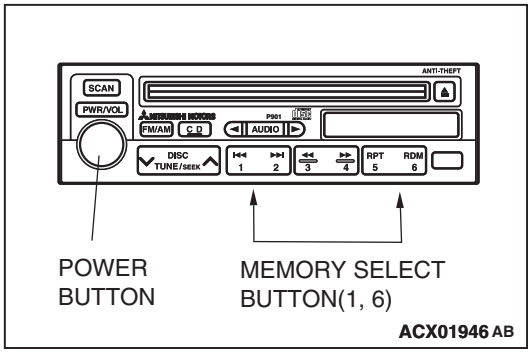
1. Confirm the security code using any of the following methods.
   (1) Use the security code indicated on the cards retained in the vehicle.



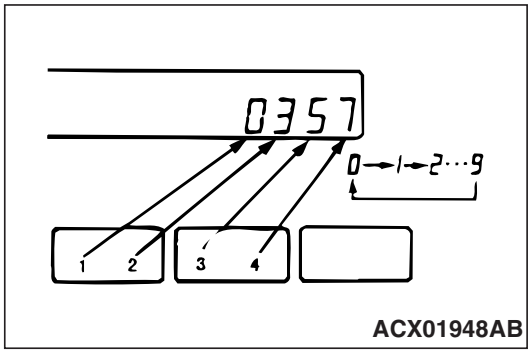
   (2) If the security code is unknown because the card is lost:
      a. Remove the radio and CD player, referring to P.54A-167.
      b. Read the serial number stamped on the radio and CD player.
      c. Look up the security code (anti-theft code table) corresponding to the serial number.



   (3) When the radio and CD player is replaced: Use the security code on the cards attached to the upper surface of the replacement radio and CD player.
   NOTE: Deliver the two cards to the owner.
2. Connect the radio to the vehicle harness.
3. Turn the ignition key to the "ACC" or "ON" position.



4. Press the "PWR" button, and "codE" will be displayed.



5. Press number 1 through number 4 memory select button to set the four-digit security code shown on the card. Every time each digit key is pressed, the figure changes as follows: 0 to 1 to 2 to 3 to 4 to 5 to 6 to 7 to 8 to 9 to 0
6. Press the "CD" button, and a beep will be heard. If entered correctly, the radio and will work.

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7. If the security code is not accepted, "Err" is displayed. In a few seconds, it will change to "code." Then repeat steps 5 and 6.

   NOTE: NOTE: The anti-theft system will allow three attempts maximum to input the correct code.

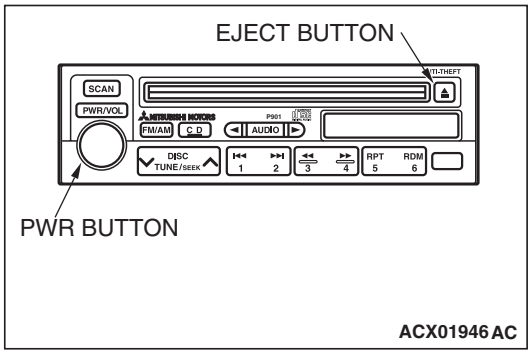
   NOTE: NOTE: The second error is displayed as "2 Err." When the third error is made, "3 Err" is displayed and then the display changes to "oFF." If this should occur, the unit will not work any more.

   NOTE: NOTE: To input the security code again, turn the ignition switch to the "ACC" or "ON" position and wait for one hour when "oFF" is displayed. After "oFF" disappears on the display, press the "PWR" button and "codE" will be displayed. The security code can be input again.

THREE-MINUTE OPERATION MODE

To facilitate replacement or check, the radio and CD player can be operated for three minutes without inputting the security code.

1. Press the "PWR" button and "EJECT" button together to operate the radio and CD player.
2. In three minutes the unit will not be able to work. Then the radio and CD player will be switched off.

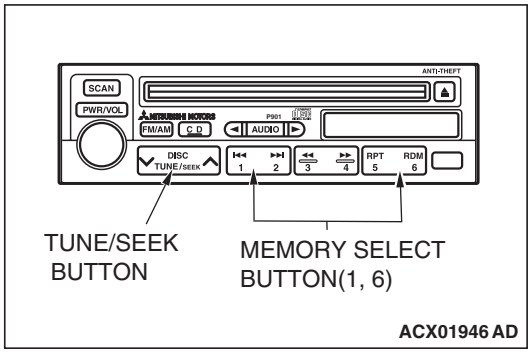


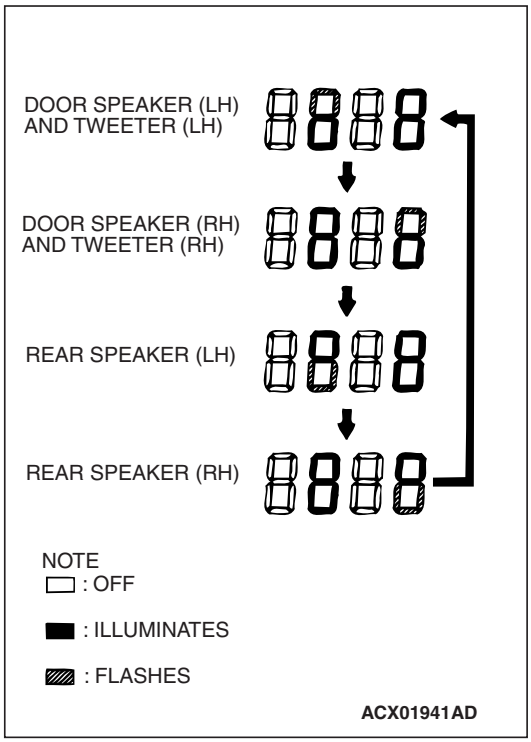
SPEAKER TEST

M1544005400426

Enter the speaker test 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) Memory select "1" button
   (2) "TUNE/SEEK (DOWN)" button
   (3) "TUNE/SEEK (UP)" button
   (4) Memory select "6" button



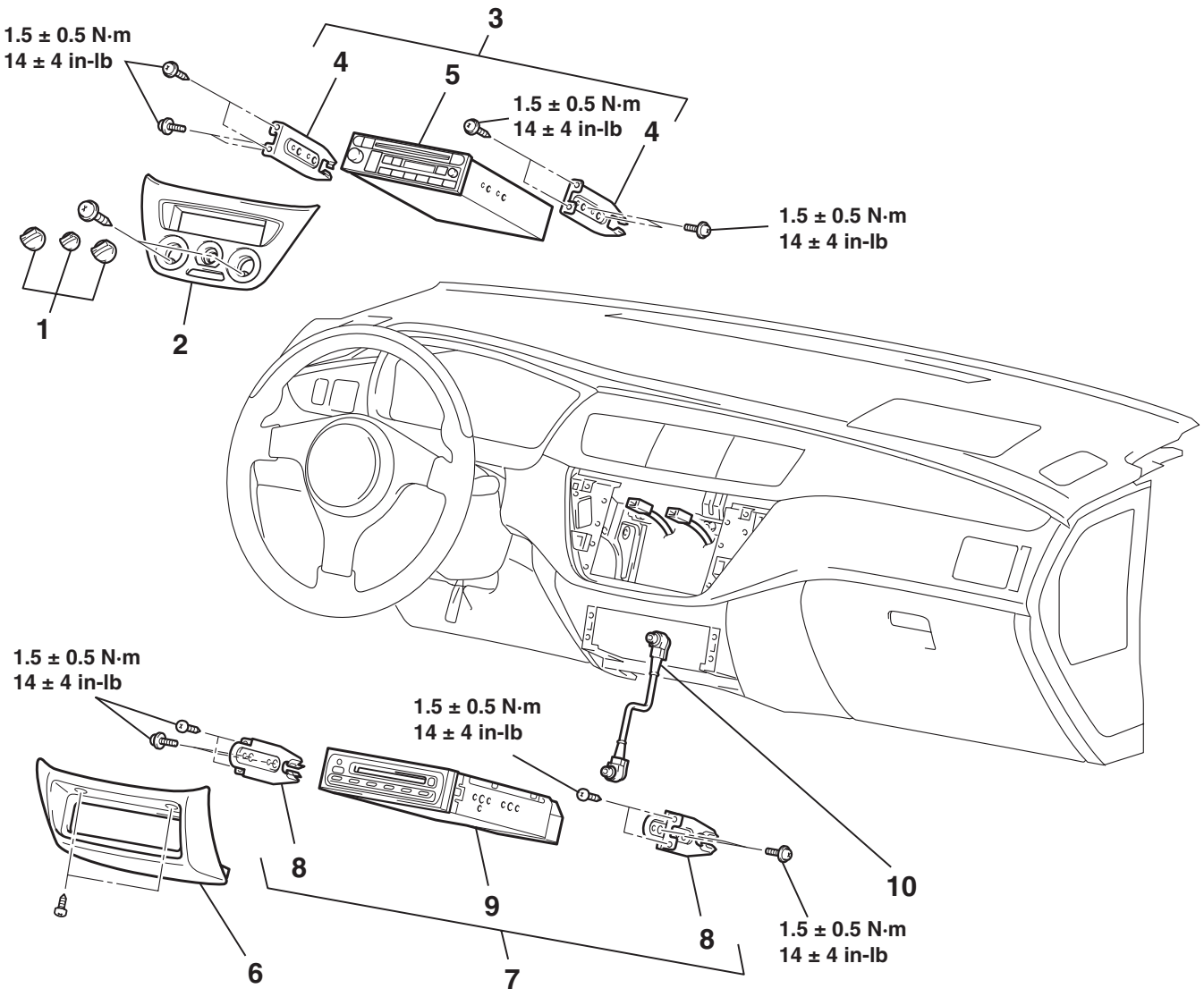


3. Check that the speaker, which is displayed on the multi-center display, sounds (If the memory select "6" button is pressed, the speaker will be changed).
4. If a button other than the memory select "6" button and "EJECT" button is pressed, or the ignition switch is turned to "LOCK" (OFF) position, you will exit from the speaker test mode.

RADIO AND TAPE PLAYER

REMOVAL AND INSTALLATION

M1544001400361



AC211626AB

RADIO REMOVAL STEPS

1. KNOB ASSEMBLY (REFER TO GROUP 55, HEATER CONTROL ASSEMBLY, A/C SWITCH P.55-99.)
2. CENTER PANEL ASSEMBLY (REFER TO GROUP 52A, INSTRUMENT PANEL P.52A-3.)
3. RADIO AND CD PLAYER ASSEMBLY
4. RADIO BRACKET
5. RADIO AND CD PLAYER

CD AUTO CHANGER REMOVAL STEPS

6. CENTER LOWER CASE (REFER TO GROUP 52A, INSTRUMENT PANEL P.52A-3.)
7. CD AUTO CHANGER ASSEMBLY
8. CD AUTO CHANGER BRACKET
9. CD AUTO CHANGER
10. DIN CABLE

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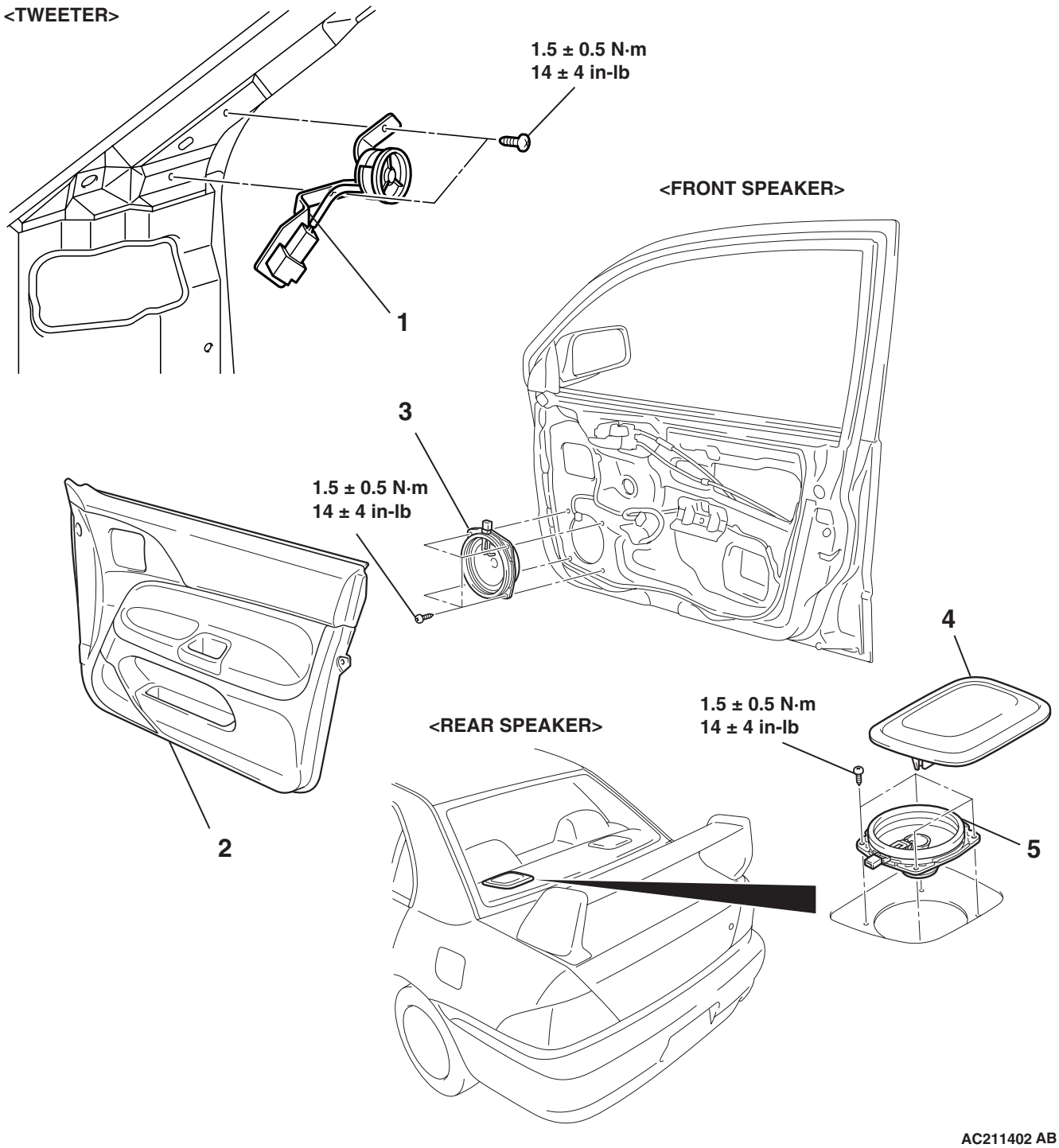
SPEAKER

REMOVAL AND INSTALLATION

M1544002600584



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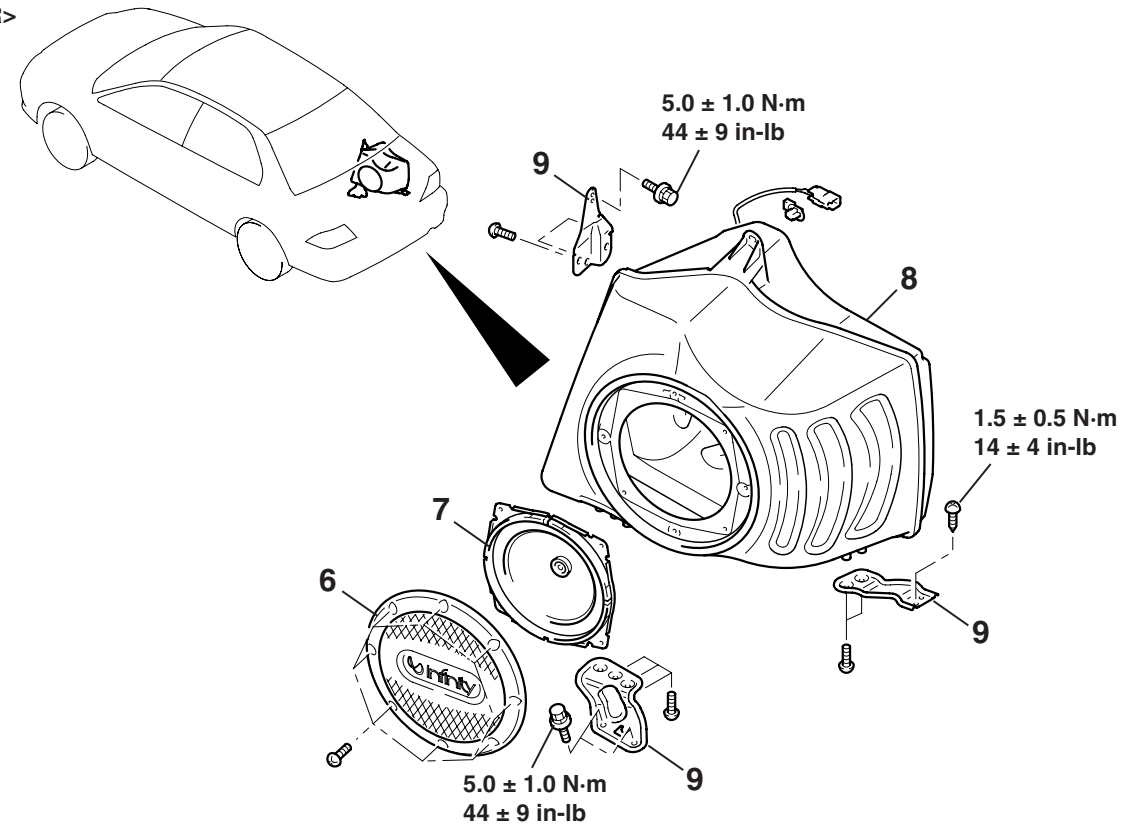
<BOX WOOFER>



AC308414 AC

TWEETER REMOVAL STEPS

- FRONT PILLAR TRIM (REFER TO GROUP 52A, TRIMS P.52A-11.)

1. TWEETER

FRONT SPEAKER REMOVAL STEPS

2. DOOR TRIM (REFER TO GROUP 52A, DOOR TRIM AND WATERPROOF FILM P.52A-13.)
3. FRONT DOOR SPEAKER

REAR SPEAKER REMOVAL STEPS

4. REAR SPEAKER GARNISH
5. REAR SPEAKER

REAR SPEAKER (WOOFER) REMOVAL STEPS

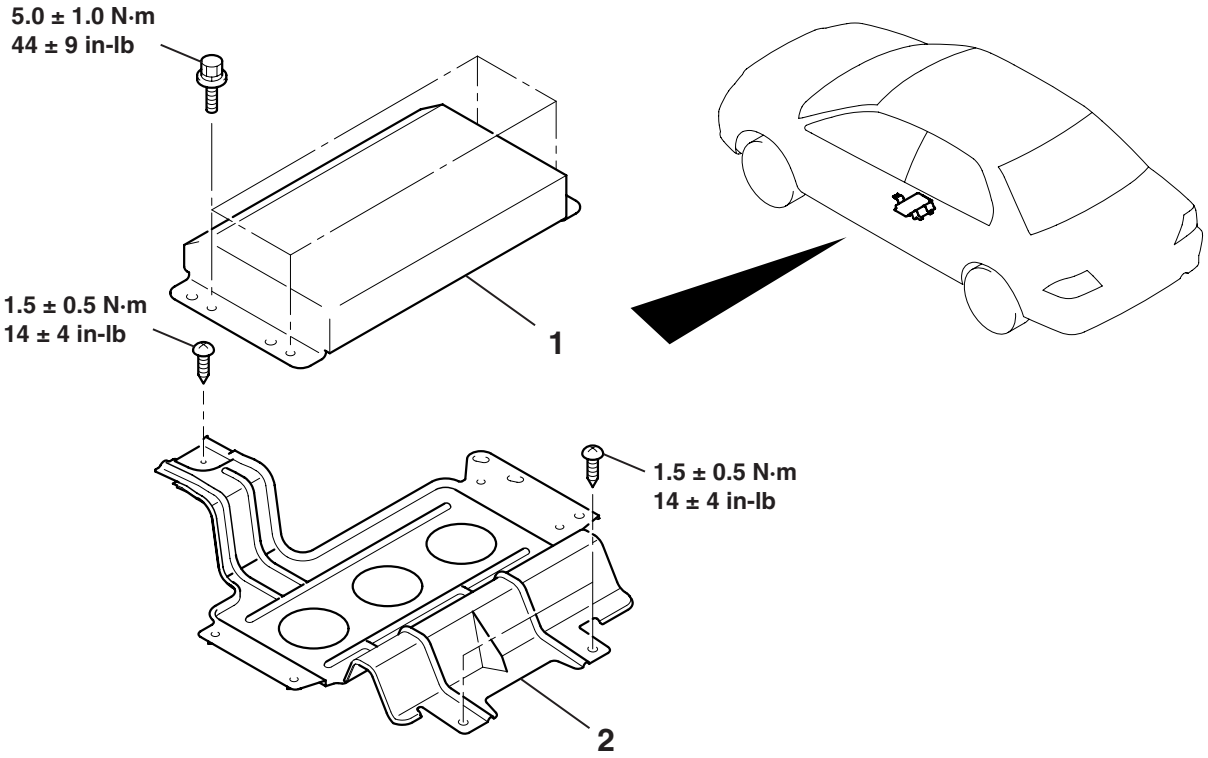
- TRUNK FLOOR BOARD

6. REAR SPEAKER (WOOFER) GARNISH
7. REAR SPEAKER (WOOFER)
8. ENCLOSURE
9. BRACKET

AMPLIFIER <VEHICLES WITH AMPLIFIER>

REMOVAL AND INSTALLATION

M1544004100325



AC308395AC

REMOVAL STEPS

- FRONT SEAT ASSEMBLY (RH) (REFER TO GROUP 52A, FRONT SEAT P.52A-20.)

REMOVAL STEPS (Continued)

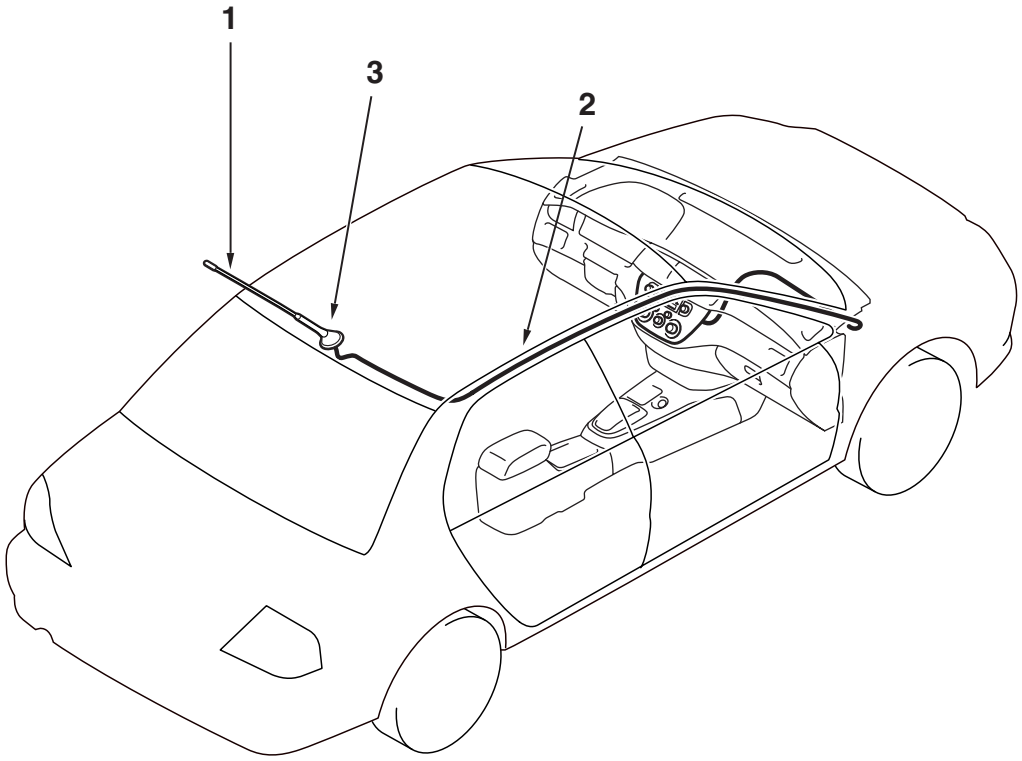
1. AUDIO AMPLIFIER
2. AMPLIFIER BOX BRACKET

ANTENNA

REMOVAL AND INSTALLATION

M1544002900488

Pre-removal and Post-installation Operation
- Front Pillar Trim, Rear Trim and Lower/Upper Center Pillar Trim Removal and Installation (Refer to GROUP 52A - Trim P.52A-11.)
- Assist Strap Removal and Installation (Refer to GROUP 52A - Headlining P.52A-18.)
- Front Dome Light and Rear Dome Light Removal and Installation
- Headlining Removal and Installation (Refer to GROUP 52A - Headlining P.52A-18.)



AC005156AB

1. ROOF ANTENNA POLE

ANTENNA FEEDER CABLE REMOVAL STEPS

2. ROOF ANTENNA BASE
- INSTRUMENT PANEL (REFER TO GROUP 52A, INSTRUMENT PANEL P.52A-3.)

3. ANTENNA FEEDER CABLE

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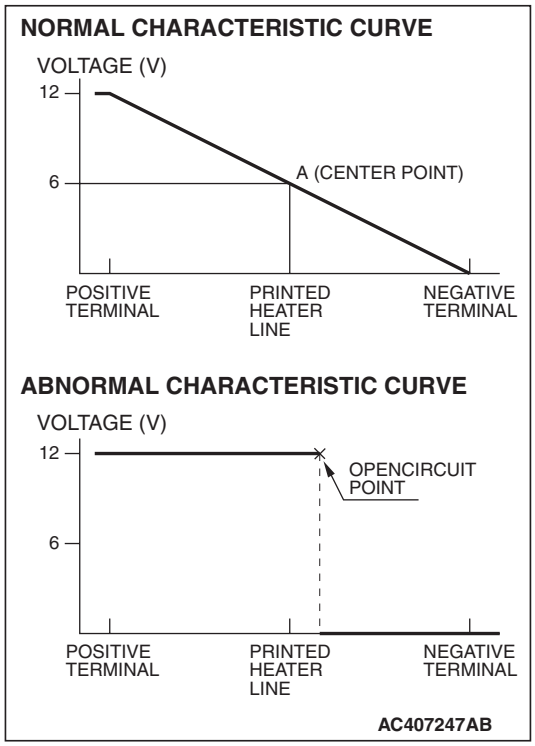
REAR WINDOW DEFOGGER

ON-VEHICLE SERVICE

PRINTED-HEATER LINES CHECK

M1543001800225



1. Run engine at 2,000 r/min. Check heater element with battery at full.
2. Turn "ON" rear window defogger switch. Measure heater element voltage with circuit tester at rear window glass center A. Condition is good if it indicates about 6 V.
3. If 12 V is indicated at A, there is a break in the negative terminals from A. Move test bar slowly to negative terminal to detect where voltage changes suddenly (0V).
4. If 0 V is indicated at A, there is a break in the positive terminals from A. Defect where the voltage changes suddenly (12 V) in the same method described above.

REAR WINDOW DEFOGGER

REAR WINDOE DEFOGGER SWITCH REMOVAL AND INSTALLATION

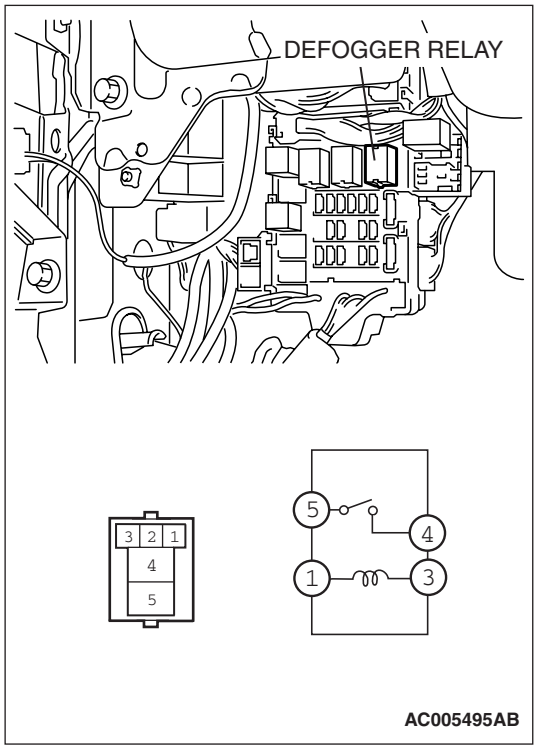
M1543006200369

Refer to GROUP 55, Heater Control Assembly and Blower Switch Assembly P.55-99.

INSPECTION

M1543019502021

DEFOGGER RELAY CHECK



BATTERY VOLTAGE	TESTER CONNECTION	SPECIFIED CONDITION
Not applied	5 –4	Open circuit
• Connect terminal 1 to the positive battery terminal • Connect terminal 3 to the negative battery terminal	5 –4	Less than 2 ohms

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

M1544004600353

ITEM	SPECIFICATIONS
Amplifier mounting bolt	5.0 ±1.0 N· m (44 ±9 in-lb)
Amplifier mounting screw	1.5 ±0.5 N· m (14 ±4 in-lb)
Door speaker mounting screw	1.5 ±0.5 N· m (14 ±4 in-lb)
Engine coolant temperature gauge unit	10.5 ±0.5 N· m (93 ±4 in-lb)
Headlight mounting bolt	2.5 ±0.4 N· m (22 ±4 in-lb)
	4.9 ±0.9 N· m (43 ±8 in-lb)
High-mounted stop light mounting nut	5.4 ±0.5 N· m (48 ±4 in-lb)
Radio, tape player, CD player and CD auto changer mounting screw	1.5 ±0.5 N· m (14 ±4 in-lb)
Radio bracket mounting screw	1.5 ±0.5 N· m (14 ±4 in-lb)
Rear combination light mounting screw	4.9 ±0.9 N· m (43 ±8 in-lb)
Rear speaker mounting screw	1.5 ±0.5 N· m (14 ±4 in-lb)
Rear speaker (woofer) bracket mounting bolt	5.0 ±1.0 N· m (44 ±9 in-lb)
Rear speaker (woofer) bracket mounting screw	1.5 ±0.5 N· m (14 ±4 in-lb)
Tweeter mounting screw	1.5 ±0.5 N· m (14 ±4 in-lb)

SERVICE SPECIFICATIONS

M1543000300595

<IMMOBILIZER SYSTEM>

ITEM	STANDARD VALUE
Ignition key ring antenna resistance Ω	Less than 2

<COMBINATION METER>

ITEM		STANDARD VALUE
Speedometer indication allowance range mph (km/h)	10 (16)	8.5 –11.5 (13.6 –18.4)
	25 (40)	23.5 – 26.5 (37.7 – 42.6)
	50 (80)	48.5 – 51.5 (78.0 – 82.8)
	75 (120)	73.5 – 76.5 (118.2 – 123.0)
	100 (161)	98.5 –102.5 (158.4 – 164.8)
	125 (201)	123.5 –127.5 (198.6 – 205.0)
	150 (241)	148.5 –157.5 (238.8 – 253.3)
Tachometer indication allowance range r/min	700	±120
	3,000	–100 + 225
	5,000	–125 + 325
	6,000	–125 + 375
Fuel level sensor resistance Ω (main fuel level sensor)	Float point "F"	6.5 ±1
	Float point "E"	41.2 ±1
Fuel level sensor resistance Ω (sub fuel level sensor)	Float point "F"	6.5 ±1
	Float point "E"	78.8 ±1
Fuel level sensor float height mm (in) (main fuel level sensor)	A (Float point "F")	33.3 ±2 (1.31 ±0.08)
	B (Float point "E")	121.9 ±2 (4.8 ±0.08)
Fuel level sensor float height mm (in) (sub fuel level sensor)	A (Float point "F")	5.7 ±2 (0.224 ±0.08)
	B (Float point "E")	141 ±2 (5.5 ±0.08)
Engine coolant temperature gauge unit resistance Ω 70° C (150° F		104 ±13.5
Vehicle speed sensor voltage		0 or battery voltage (1 turn = 4 pulses)

<HEADLIGHT>

ITEM		STANDARD VALUE	LIMIT
Headlight aiming	Vertical direction	Headlight center line53 ± 50 mm (2.09 ± 1.97 in)	–
Headlight intensity cd (at high-beam)		–	40,000 or more {when a screen is set 18.3m (60 feet) ahead of the vehicles}

<FOG LIGHT>

ITEM		STANDARD VALUE	LIMIT
Fog light aiming	Vertical direction	Top of the hot zone should be 101 mm (4.0 in) (0.76°) downward from the height of the fog light center	Top of the hot zone should be 152 mm (6.0 inches) (1.14°) in maximum downward from the height of the fog light center

SEALANTS AND ADHESIVE

M1543000500254

<COMBINATION METER>

ITEM	SPECIFIED SEALANT	REMARK
Engine coolant temperature gauge unit threaded portion	3M™AAD part No. 2310 or equivalent	Semi-drying sealant