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, side-airbag module, curtain air bag module, side impact sensors, seat belt pre-tensioners, 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

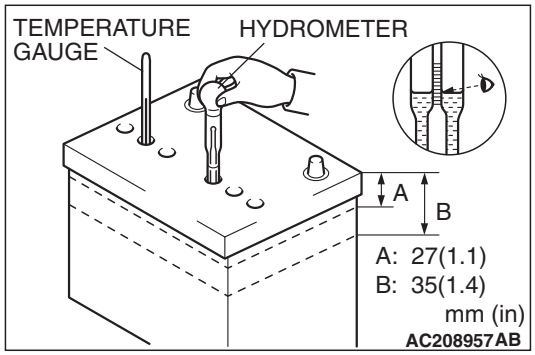
BATTERY CHECK

M1541001000580

⚠ ***WARNING***

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

BATTERY VISUAL INSPECTION (1)



1. Ensure that the battery electrolyte level is between A and B shown in the figure. Add if the level is lower than the specified range.
2. Use a hydrometer and temperature gauge to check the specific gravity of the electrolyte.

   Standard value:
   1.220 −1.290 [at 20° C (68° F)]

The specific gravity of electrolyte depends on its temperature. Use the formula below to determine the proper value.

Conversion on centigrade
D_{20}=(t −20) x 0.0007 + Dt

Conversion on Fahrenheit
D_{20}=(t −68) x 0.0007 + Dt

D_{20} : Specific gravity as if electrolyte temperature is 20° C (68° F)

D_t : Measured specific gravity

t : Measured temperature

BATTERY VISUAL INSPECTION (2)

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

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

⚠ ***WARNING***

Care should be taken in the event the 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 battery carrier for damage caused by loss of acid from the 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 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

M1541001101030

⚠ ***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

Recommended rate and time for fully discharged condition (flat discharged) is shown below. When the specific gravity of electrolyte keeps 1.22 to 1.29 for more than one hour, charging should be stopped.

Charge Rate Chart

BATTERY	BCI Group size 86	BCI Group size 24
Slow charging	4 amps 21 hours	4 amps 21 hours

BATTERY TEST

M1541001201598

BATTERY TESTING PROCEDURE

STEP 1. Check the battery cables.

Remove the negative cable, then the positive cable. 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 post.

Check for loose battery post.

Q: Are the battery posts faulty?
YES : Replace the battery.
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.
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 : Go to Step 6.
NO : Go to Step 5.

STEP 5. Battery charging

Charge the battery. (See CHARGE RATE CHART P.54A-6)

Q: Is open circuit voltage 12.4 volts or more?

YES : Go to Step 6.

NO : Replace the battery.

STEP 6. 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.

LOAD TEST RATE CHART

Load test	Cranking ratio [-18°C (0°F)]	Reserve capacity	Application
260 AMPS	525 amps	90 minutes	BCI Group size 86
270 AMPS	550 amps	115 minutes	BCI Group size 24

LOAD TEST CHART

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

IGNITION SWITCH

GENERAL DESCRIPTION

M1543000100814

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.

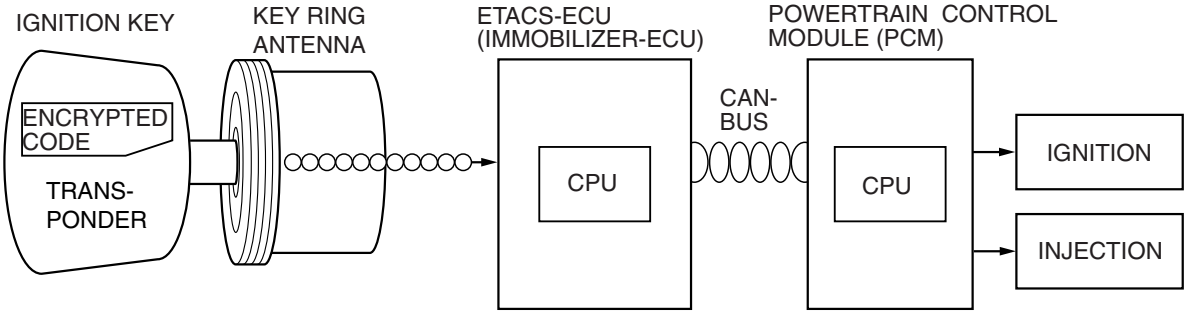
DOOR LOCK PREVENTION FUNCTION

If the key is left in the ignition switch while the driver's door opened or the assistant door opened, all door are automatically unlock to prevent locking the ignition key in the vehicle after door is locked.

IMMOBILIZER SYSTEM

The engine immobilizer system prevents the engine from starting and immobilizes the vehicle if a key other than the key registered for that vehicle is used in an attempt to start the engine after forced entry.
The engine immobilizer system consists of the ignition key, the key ring antenna, the ETACS-ECU (immobilizer-ECU), and the powertrain control module (PCM). It has these functions:
The system is designed to be maintenance-free because the power source for the transponder is supplied by the ETACS-ECU (immobilizer-ECU) via the key ring antenna. Two ignition keys are provided, and up to eight keys can be registered to one vehicle (one receiver) as needed. There are 4 billion combinations for the encrypted code. In addition, one part of the code is changed each time the key is switched on, which improves security by preventing theft using a copied encrypted code.

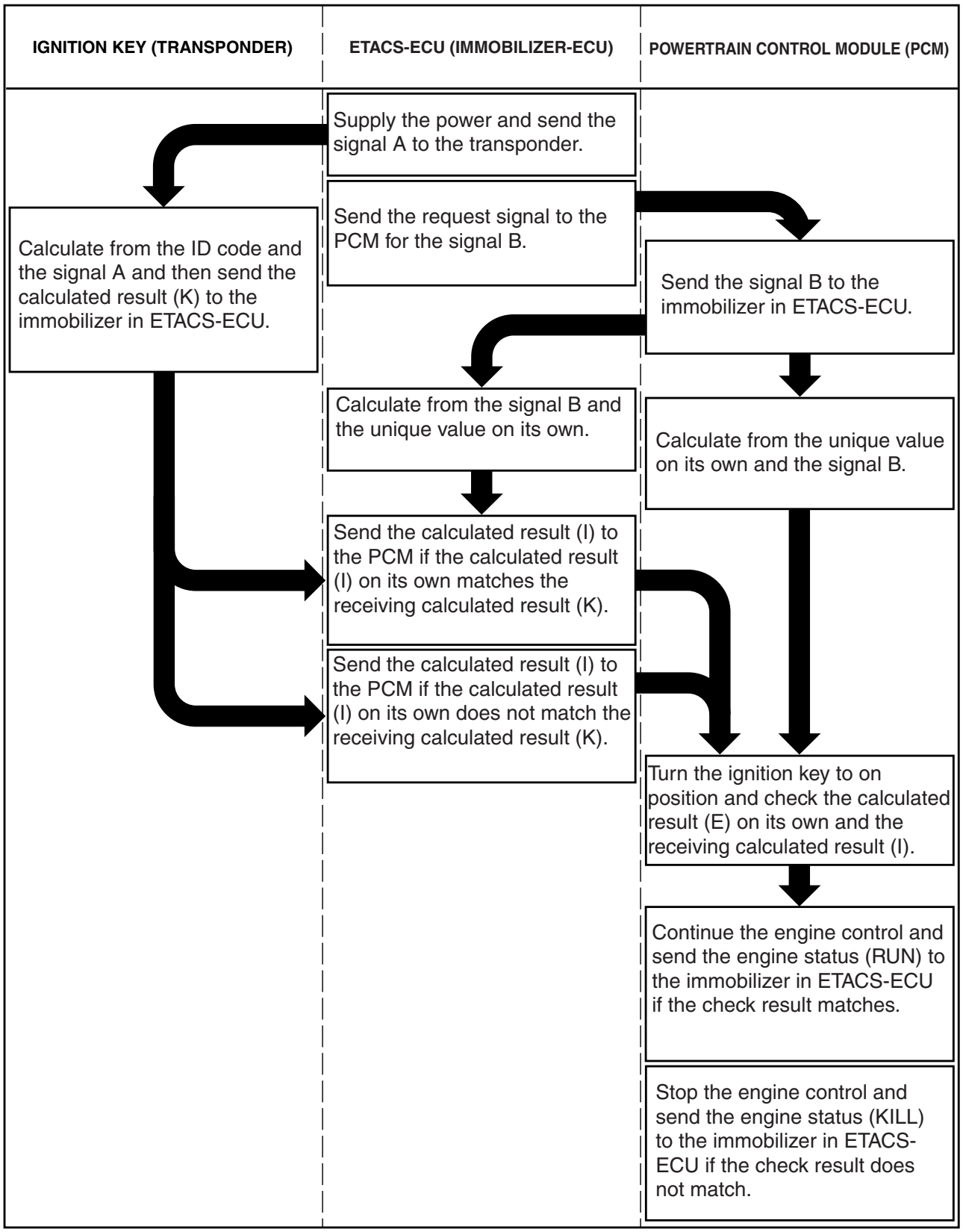
CONSTRUCTION DIAGRAM



AC406526AF

OPERATION

With the ignition switch "ON" position, the immobilizer system operates as follows.



AC406584AD

TSB Revision

IGNITION KEY REMINDER TONE ALARM AND DOOR LOCK PREVENTION FUNCTION DIAGNOSIS

M1543000701626

The Ignition key reminder tone alarms and door lock prevention function are controlled by the Simplified Wiring System (SWS). For troubleshooting, refer to GROUP 54B, SWS Diagnosis P.54B-57.

ENCRYPTED CODE REGISTRATION CRITERIA TABLE

M1543026000259

⚠ CAUTION

Do not replace the powertrain control module and the ETACS-ECU simultaneously. Always replace either one of the ECUs first, and register the encrypted code. Then, replace the other ECU.

The ignition key contains a transponder (small transmitter), which retains an unique encrypted code. When replacing the parts of the immobilizer system, always register the encrypted code or VIN, or both of them according to the list below. The ETACS-ECU can retain a maximum of eight different encrypted codes. This means that a maximum of eight ignition keys can be registered.

ITEM	OPERATION	REFERENCE PAGE
When the powertrain control module is replaced	Record the VIN.	Refer to GROUP 00, Precautions Before Service P.00-21.
When the ETACS-ECU is replaced	1. Record the VIN. 2. Register all the ignition keys again. 3. Register the transmitter for all the ignition keys again.	1. Recording of the VIN: Refer to GROUP 00, Precautions Before Service P.00-21. 2. Reregistration of the ignition key: Refer to encrypted code registration using ignition key P.54A-40. 3. Reregistration of the transmitter: Refer to GROUP 42, How to Register Secret Code P.42-75.
When the ignition key ring antenna is replaced	Registration not needed	–
When the ignition key is added as a single unit	1. Register all the ignition keys again. 2. Register the transmitter for all the ignition keys again.	1. Reregistration of the ignition key: Refer to encrypted code registration using ignition key P.54A-40. 2. Reregistration of the transmitter: Refer to GROUP 42, How to Register Secret Code P.42-75.

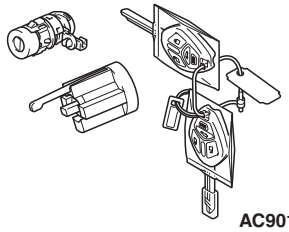
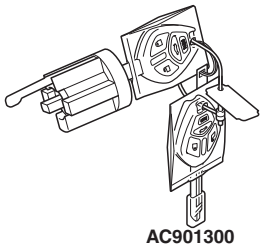
ITEM	OPERATION	REFERENCE PAGE
When the ignition key is lost as a single unit	1. Register all the ignition keys except the lost ignition key again. 2. Register all the transmitter except the lost ignition key again.	1. Reregistration of the ignition key: Refer to encrypted code registration using ignition key P.54A-40. 2. Reregistration of the transmitter: Refer to GROUP 42, How to Register Secret Code P.42-75.
When the ignition key is replaced by the full service key set or the handle lock service key set is replaced by the piece.	1. Register all the ignition keys according to the barcode tag on the key set. 2. Register the transmitter for all the ignition keys again.	1. Reregistration of the ignition key: Refer to encrypted code registration using bercode No. P.54A-40. 2. Reregistration of the transmitter: Refer to GROUP 42, How to Register Secret Code P.42-75.
When the ignition key is replaced by the door service key set is replaced by the piece.	Register the transmitter for all the ignition keys again.	Reregistration of the transmitter: Refer to GROUP 42, How to Register Secret Code P.42-75.

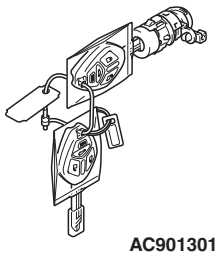
NOTE: The engine does not start until the matching has been completed.

SUPPLY UNIT LIST FOR INDIVIDUAL KEY

Ignition key (with transmitter)
AC901298

KEY SUPPLY UNIT LIST FOR OTHER THAN INDIVIDUAL KEY

Full service key set	Handle lock service key set
 AC901299	 AC901300

Door service key set ***NOTE: It can only be used for locking and unlocking, and it cannot start the engine.***
 AC901301

IMMOBILIZER SYSTEM DIAGNOSIS

INTRODUCTION TO IMMOBILIZER SYSTEM DIAGNOSIS

M1543009901746

⚠ CAUTION

The encrypted code should always be re-registered when replacing the ETACS-ECU (immobilizer-ECU).

The immobilizer system consists of the ETACS-ECU (immobilizer-ECU), powertrain control module, ignition key and ignition key ring antenna. 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 set. In this case, follow the immobilizer system troubleshooting.

IMMOBILIZER SYSTEM DIAGNOSTIC TROUBLESHOOTING STRATEGY

M1543006900915

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.00-14.
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-23.
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 immobilizer system DTC resets, perform the appropriate diagnostic procedure. Refer to Diagnostic Trouble Code Chart P.54A-15.
   (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.00-14.

DIAGNOSIS FUNCTION

M1543007001015

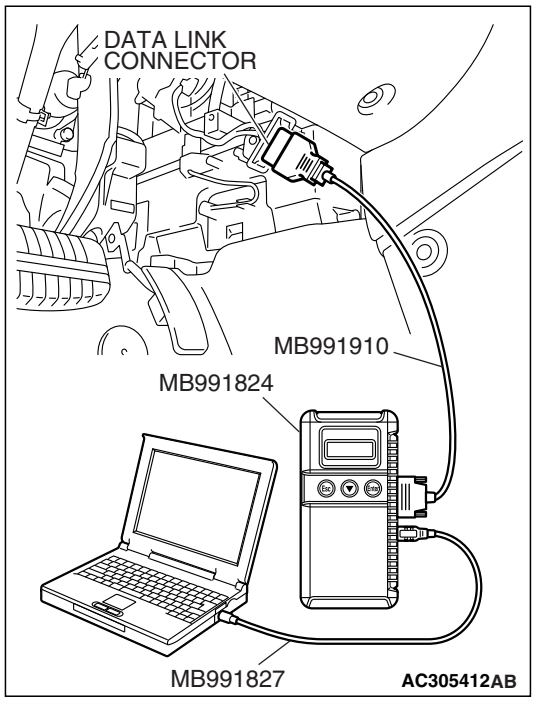
HOW TO CONNECT SCAN TOOL (M.U.T.-III)

Required Special Tools:

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

⚠ CAUTION

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



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

   NOTE: When special tool MB991824 is energized, special tool MB991824 indicator light will be illuminated in a green color.
7. Start the M.U.T.-III system on the personal computer.

   NOTE: Disconnecting the scan tool MB991958 is the reverse of the connecting sequence, making sure that the ignition switch is at the "LOCK" (OFF) position.

HOW TO READ AND ERASE DIAGNOSTIC TROUBLE CODES

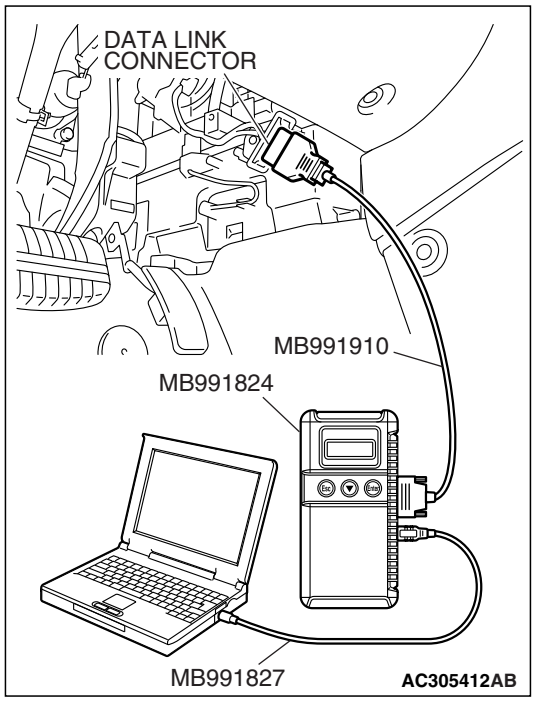
Required Special Tools:

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

⚠ CAUTION

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

NOTE: If the battery voltage is low, diagnostic trouble codes will not be 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 "Self-diagnosis."
7. If a DTC is set, it is shown.
8. Choose "Erase DTCs" to erase the DTC.

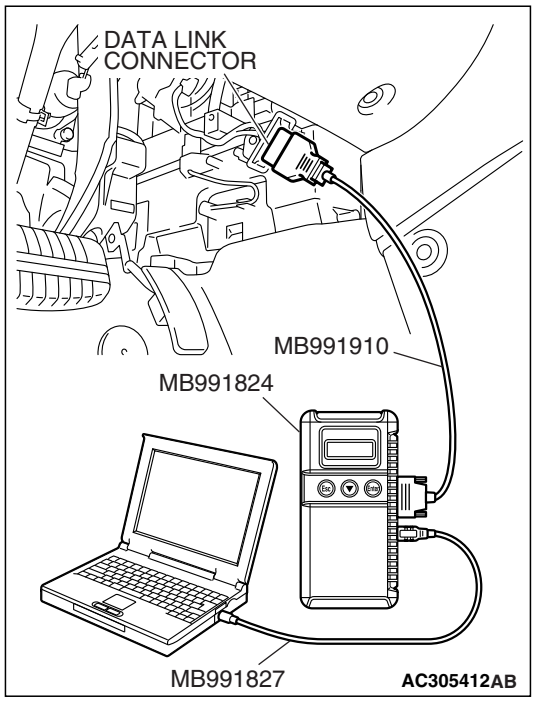
HOW TO READ DATA LIST

Required Special Tools:

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

⚠ CAUTION

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



1. Connect 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 "Data List."
7. Choose an appropriate item and select the "OK" button.

DIAGNOSTIC TROUBLE CODE CHART

M1543007101216

⚠ CAUTION

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

Use the following chart to develop proper diagnostic strategy.

DTC NO.	DESCRIPTION	REFERENCE PAGE
B1702*1	Reception error of encrypted code	P.54A-16
B1703*1	Encrypted code inconsistent	P.54A-20
B1731	Communication error with the powertrain control module	P.54A-21
B1761	VIN not recorded	P.54A-23
U1073	Bus off	Refer to GROUP 54B – Diagnostic trouble code chart P.54B-26.
U1100*2	Powertrain control module time-out (related to engine)	
U1101*2	Powertrain control module time-out (related to transaxle)	

NOTE:

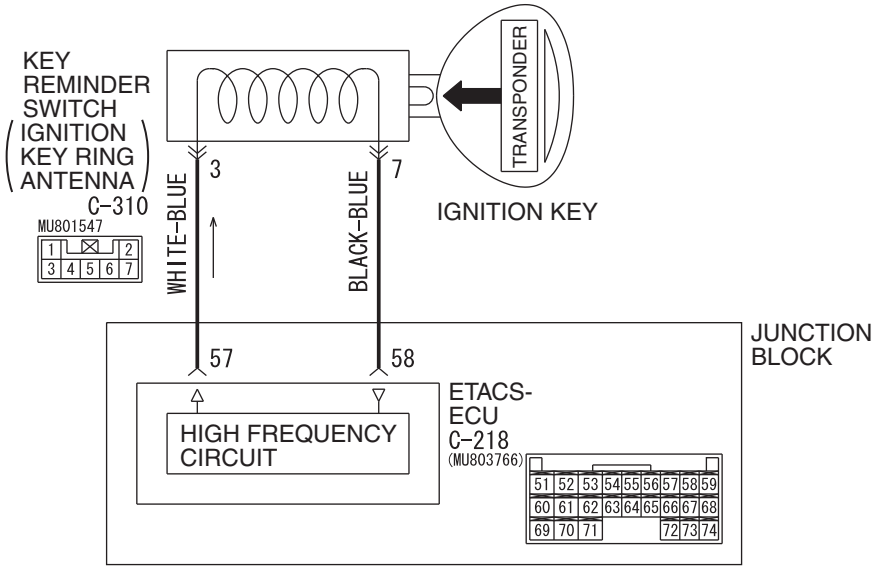
- **1: The DTC for a past problem is not sent*
- **2: When the DTC relating to the CAN communication error are output, make sure of the vehicle equipment. When the vehicle is not equipped with the system the ETACS-ECU communicates to, the DTC is always output. This is not abnormal.*

DIAGNOSTIC TROUBLE CODE PROCEDURES

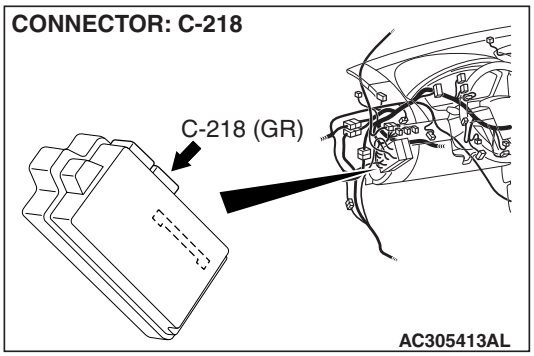
DTC B1702: Reception error of encrypted code

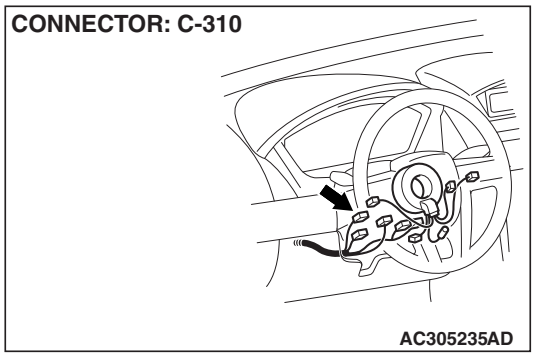
⚠ CAUTION
Whenever the ECU is replaced, ensure that the input and output signal circuits are normal.

Ignition Key Ring Antenna and Immobilizer-ECU Circuit



W6P54M105A





CIRCUIT OPERATION

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

DTC SET CONDITION

- DTC B1702 may be set if other ignition keys or things that interferes communication (such as magnets and equipment that generates radio waves) are in the vicinity of the ignition switch as it is being started.
- The transponder encrypted code is not sent to the ETACS-ECU immediately after the ignition switch is turned to "ON" position.

NOTE: DTC B1702 is always output together with MFI system DTC P0513.

TSB Revision

TROUBLESHOOTING HINTS

- Radio interference of the encrypted code
- Malfunction of the transponder
- Malfunction of the ETACS-ECU

DIAGNOSIS

Required Special Tools:

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

STEP 1. Check for presence of other key or things that interferes communication (such as magnets and equipment that generates radio waves) near the key in the ignition.

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

YES : Move the other key or things that interferes communication (such as magnets and equipment that generates radio waves) well away from key being used. Retest the system.

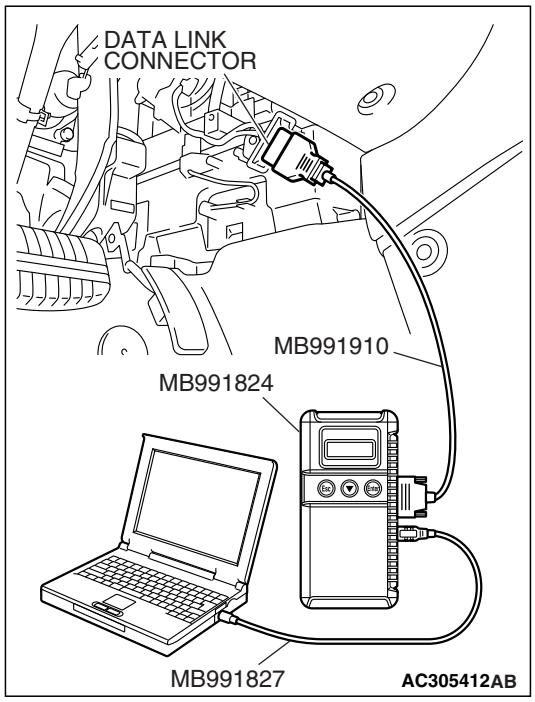
NO : Go to Step 2.

STEP 2. Check that the engine starts 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 and then register the ID codes again (Refer to P.54A-10.). Retest the system.

NO : Go to Step 3.



STEP 3. Recheck for diagnostic trouble code.

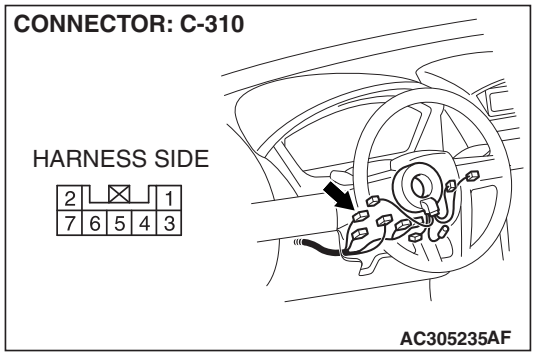
⚠ CAUTION

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.

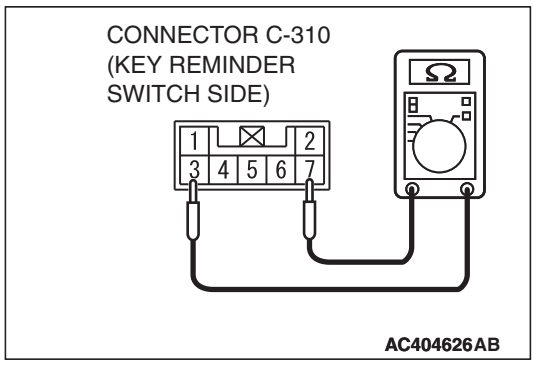
Q: Which DTC is set, DTC B1702 or B1703?

DTC B1703 is set : Refer to DTC B1703 P.54A-20.
DTC B1702 is set : Go to Step 4.



STEP 4. Check the key reminder switch (ignition key ring antenna).

(1) Disconnect the key reminder switch (ignition key ring antenna) connector C-310.



(2) Measure the resistance value between terminal number 3 and terminal number 7.
- The measured value should be 7.65 –9.35 ohm.

Q: Is the check result normal?

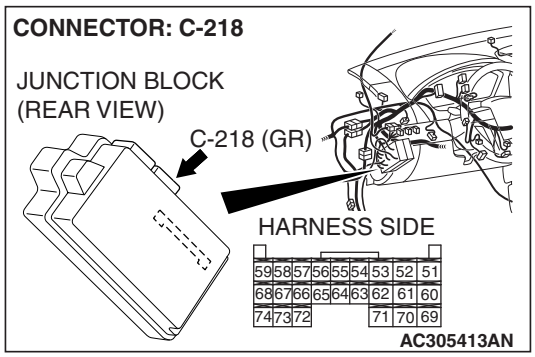
YES : Go to Step 5.
NO : Replace the key reminder switch (ignition key ring antenna). Retest the system.

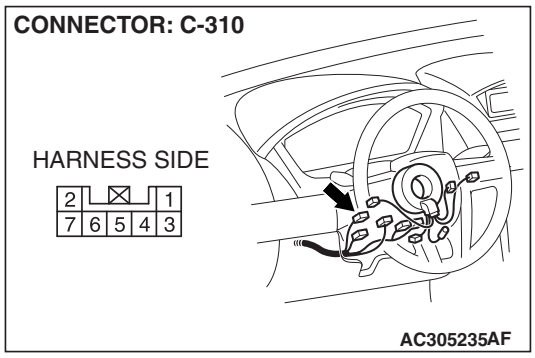
STEP 5. Check ETACS-ECU connector C-218 and key reminder switch (ignition key ring antenna) connector C-310 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are ETACS-ECU connector C-218 and key reminder switch (ignition key ring antenna) connector C-310 in good condition?

YES : Go to Step 6.

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



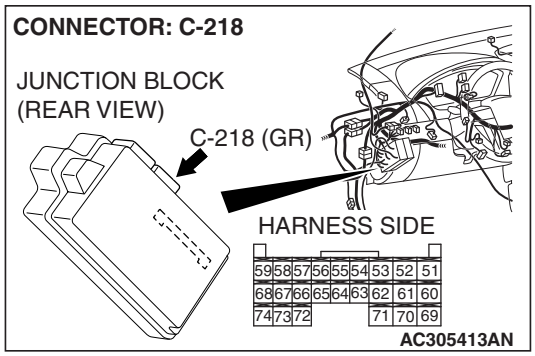


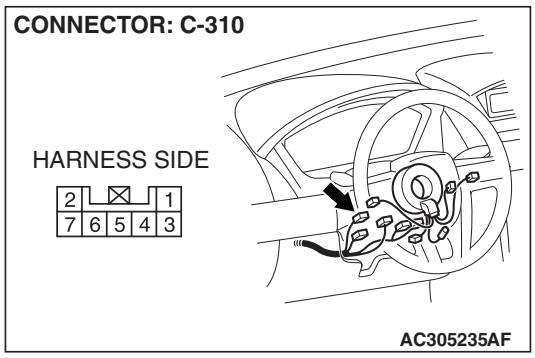
STEP 6. Check the wiring harness between ETACS-ECU connector C-218 (terminal 57 and 58) and key reminder switch (ignition key ring antenna) connector C-310 (terminal 3 and 7).

Q: Are the wiring harness between ETACS-ECU connector C-218 (terminal 57 and 58) and key reminder switch (ignition key ring antenna) connector C-310 (terminal 3 and 7) in good condition?

YES : Replace the ETACS-ECU and register the ID codes again (Refer to P.54A-10.). Retest the system.

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





TSB Revision

DTC B1703: Encrypted code inconsistent

⚠ CAUTION
Whenever the ECU is replaced, ensure that the input and output signal circuits are normal.

DTC SET CONDITION

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

NOTE: DTC B1703 is always set together with MFI system DTC P0513.

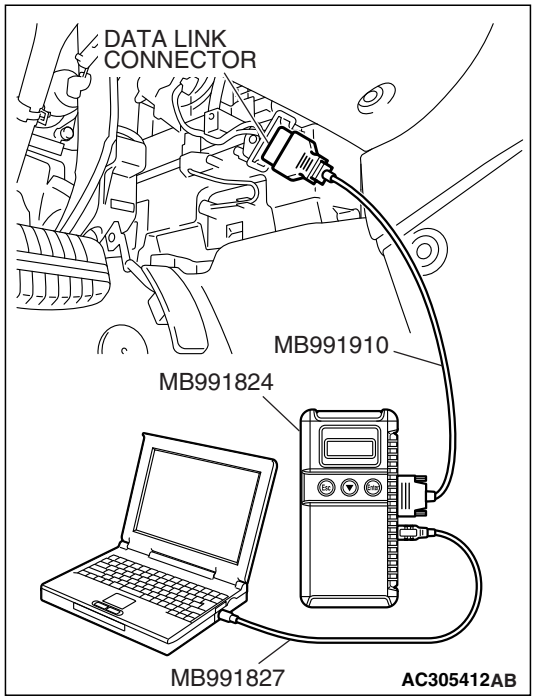
TROUBLESHOOTING HINTS

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

DIAGNOSIS

Required Special Tools:

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



Register all the ignition key encrypted codes again, and recheck the diagnostic code.

(1) Register all the ignition keys again. (Refer to P.54A-10.)
(2) Connect scan tool MB991958 to the data link connector.
(3) Turn the ignition switch to the "ON" position.
(4) Use scan tool MB991958 to check ETACS system diagnostic trouble codes.
(5) Turn the ignition switch to "LOCK"(OFF) position.
(6) Disconnect scan tool MB991958.

Q: Is DTC B1703 set?

YES : Replace the ETACS-ECU and register the ID codes. (Refer to P.54A-10.) After registering the ID codes, check if the diagnostic code is set.
NO : The procedure is complete.

DTC B1731: Communication error with the powertrain control module

⚠ CAUTION
If DTC B1731 is set in the ETACS-ECU, diagnose the CAN bus lines.

⚠ CAUTION
Whenever the ECU is replaced, ensure that the input and output signal circuits are normal.

DTC SET CONDITION

If the ETACS-ECU cannot receive the signal from the powertrain control module, DTC B1731 will be set.

TECHNICAL DESCRIPTION (COMMENT)

If a data error is detected in the powertrain control module, DTC B1731 will be set.

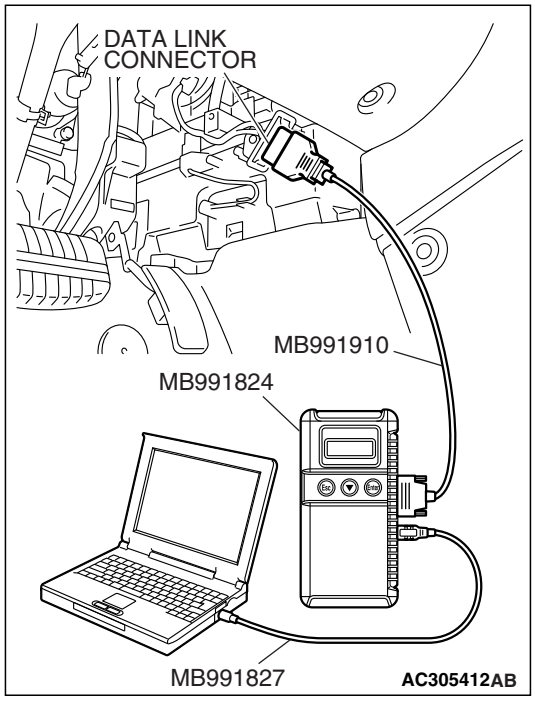
TROUBLESHOOTING HINTS

- Damaged wiring harness or connector
- Malfunction of powertrain control module
- Malfunction of the ETACS-ECU

DIAGNOSIS

Required Special Tools:

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



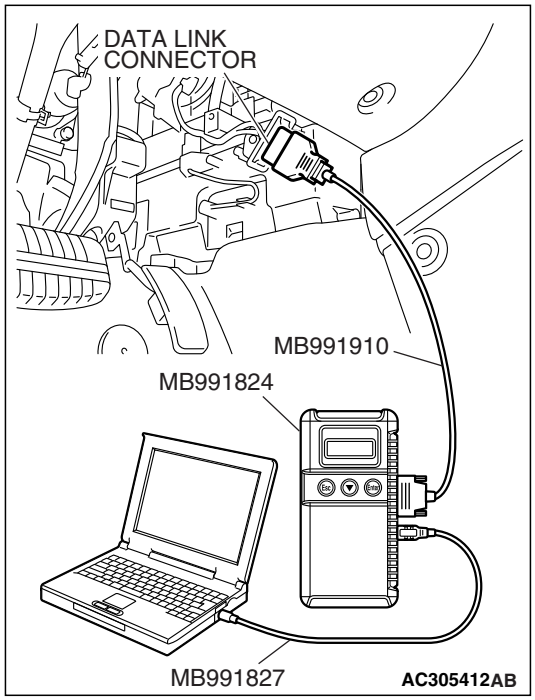
STEP 1. Using scan tool MB991958, diagnose the CAN bus line.

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

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

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

YES : Go to Step 2.
NO : Repair the CAN bus lines (Refer to GROUP 54C, precautions on how to repair the can bus lines P.54C-5).

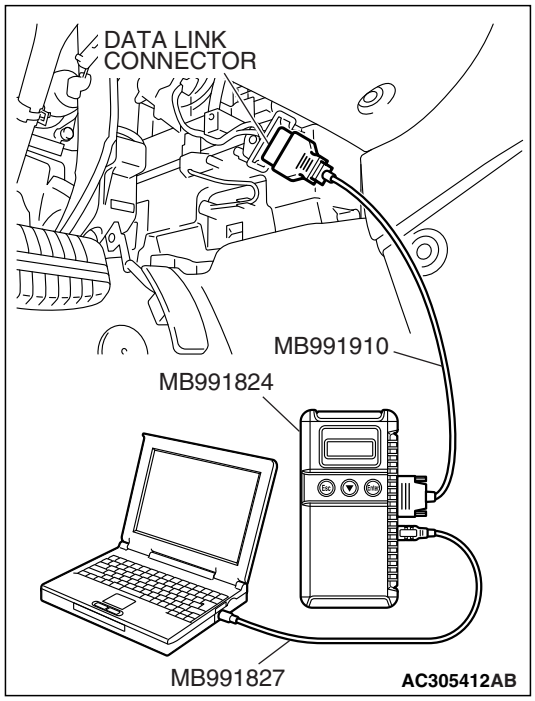


STEP 2. Recheck for diagnostic trouble code.

Recheck if the diagnostic trouble code is set.
(1) Turn the ignition switch to "ON" position.
(2) Erase the diagnostic trouble code.
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to "ON" position.
(5) Check if the diagnostic trouble code is set.
(6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC B1731 set?

YES : Replace the ETACS-ECU and register the ID codes. (Refer to P.54A-10.) After registering the ID codes, go to Step 3.
NO : The procedure is complete.



STEP 3. Recheck for diagnostic trouble code.

Recheck if the diagnostic trouble code is set.
(1) Turn the ignition switch to "ON" position.
(2) Erase the diagnostic trouble code.
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to "ON" position.
(5) Check if the diagnostic trouble code is set.
(6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC B1731 set?

YES : Replace the powertrain control module and resister the ID code. (Refer to P.54A-10.) Retest the system.
NO : The procedure is complete.

DTC B1761: VIN Not Recorded

⚠ CAUTION
Whenever the ECU is replaced, ensure that the input and output signal circuits are normal.

TECHNICAL DESCRIPTION (COMMENT)

If the VIN data are not written when the ETACS-ECU is replaced, the ETACS-ECU sets diagnosis code No.B1761.

TROUBLESHOOTING HINTS

- VIN not written
- Damaged harness wires and connectors
- Malfunction of the ETACS-ECU

DIAGNOSIS

Required Special Tools:

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

Write the VIN.
Write the VIN data to the ETACS-ECU. [Refer to GROUP 00 – How to perform vehicle identification number (VIN) writing P.00-21.]

Q: Is DTC B1761 set?

YES : Replace the ETACS-ECU and register the ID codes. (Refer to P.54A-10.)
NO : The procedure is complete.

SYMPTOM CHART

M1543007202669

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

SYMPTOM	INSPECTION PROCEDURE NO.	REFERENCE PAGE
Communication with scan tool MB991958 is impossible.	–	Refer to GROUP 54B, Symptom procedures P.54B-87.
The ignition key cannot be registered.	1	P.54A-24
Engine cranks, but does not start.	2	P.54A-25
The immobilizer indicator light does not illuminate.	3	P.54A-30
Defective power supply system of the ignition switch	4	P.54A-35

SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: The Ignition Key cannot be Registered.

TECHNICAL DESCRIPTION (COMMENT)

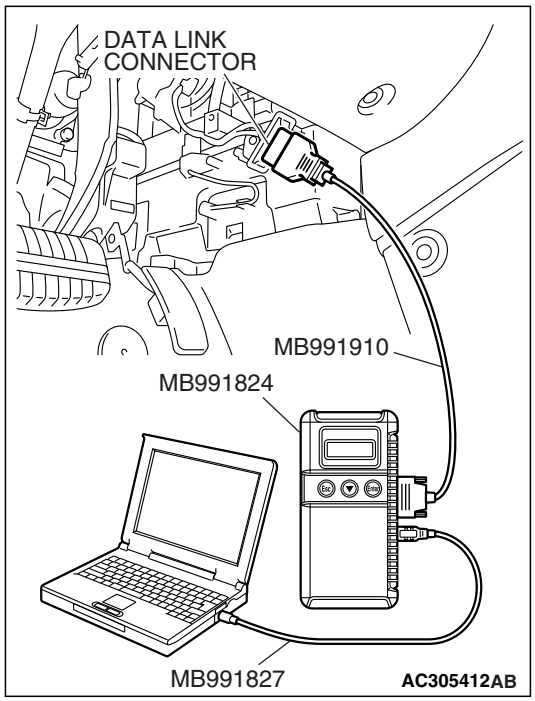
The ignition key transponder or the ETACS-ECU is suspected to be defective.

TROUBLESHOOTING HINTS

- Malfunction of the ignition key
- Malfunction of ETACS-ECU

Required Special Tools:

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



STEP 1. Check the diagnostic trouble code.

Use scan tool MB991958 to check if DTC B1702 or B1703 is set.

⚠ CAUTION

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

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

Q: Is DTC B1702 or B1703 reset?

DTC B1702 is set. : Refer to DTC B1702 P.54A-16.
DTC B1703 is set. : Refer to DTC B1703 P.54A-20.
No DTC is set. : Replace the ignition key and then register the ID codes again (Refer to P.54A-10.). Then go to Step 2.

STEP 2. Retest the system.

Q: Does registered ignition key function properly?

YES : The procedure is complete.
NO : Replace the ETACS-ECU and register the ID codes again (Refer to P.54A-10.). Retest the system.

INSPECTION PROCEDURE 2: 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.

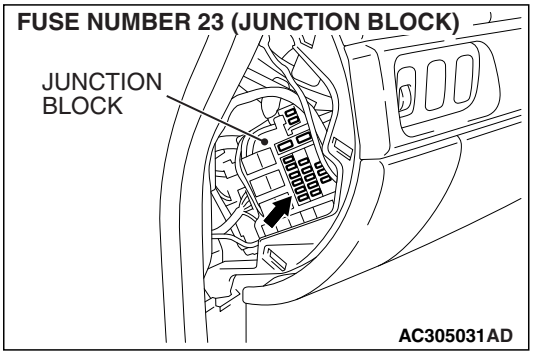
TROUBLESHOOTING HINTS

- Malfunction of MFI system
- Malfunction of ETACS-ECU
- Malfunction of fuse number 23 (junction block)
- VIN is not recorded
- Encrypted code is not registered

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A



STEP 1. Check the fuse number 23 (juncton block).

Check that fuse number 23 (junction block) is in good condition.

Q: Is fuse number 23 (junction block) in good condition?

YES : Go to Step 2.
NO : Repair the fuse number 23 (junction block).

STEP 2. Check the powertrain control module.

Check the replacing the powertrain control module.

Q: Was the powertrain control module replaced?

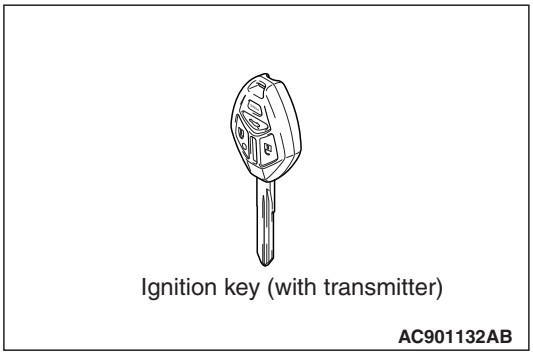
YES : Go to Step 5.
NO : Go to Step 3.

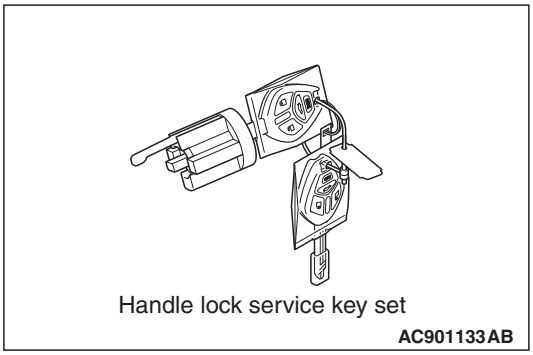
STEP 3. Check the ETACS-ECU.

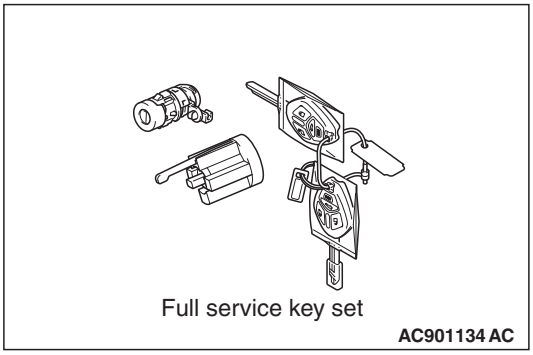
Check the replacing the ETACS-ECU.

Q: Was the ETACS-ECU replaced?

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


Ignition key (with transmitter)
AC901132AB


Handle lock service key set
AC901133AB


Full service key set
AC901134AC

STEP 4. Check the ignition key.

Check if the ignition key was replaced.

NOTE: When adding the ignition key separately, or replacing the handle lock service key set or full service key set as shown, replace the ignition key for starting engine to register the encrypted code.

Q: Was the ignition key replaced?

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

STEP 5. Check the VIN.

Q: Is the VIN recorded?

YES : Go to Step 8.
NO : Record the VIN (Refer to P.54A-10).

STEP 6. Check the VIN.

Q: Is the VIN recorded?

YES : Go to Step 7.
NO : Record the VIN (Refer to P.54A-10). Then go to Step 7 .

STEP 7. Check the encrypted code.

Q: Is the encrypted code reregistered?

YES : Go to Step 8.
NO : Register the encrypted code again (Refer to P.54A-10).

STEP 8. Check the battery voltage.

Measure the battery voltage during cranking.

Q: Is the voltage 8 volts or more?

YES : Go to Step 9.
NO : Check the condition of the battery. Refer to P.54A-5.

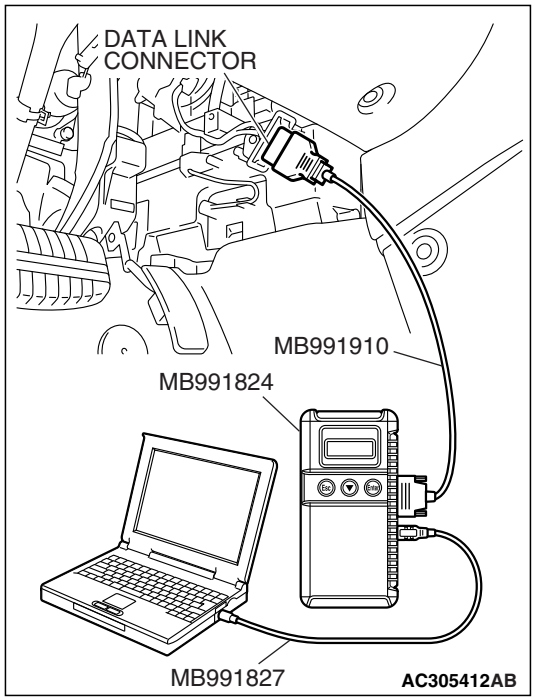
STEP 9. Using scan tool MB991958, read the diagnostic trouble code.

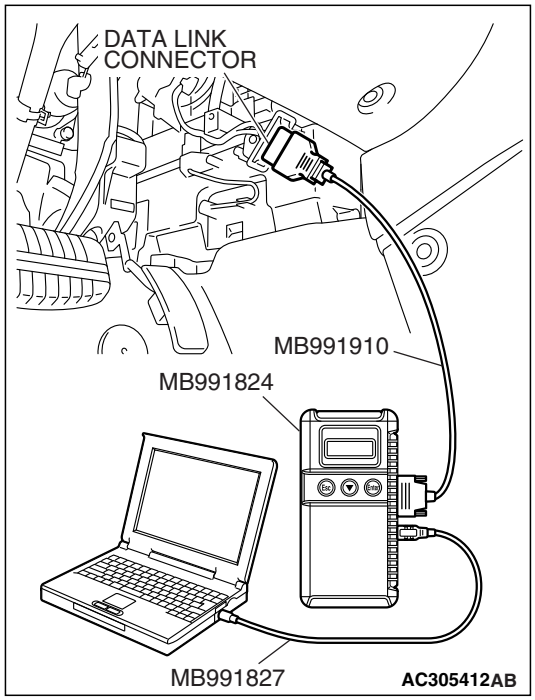
⚠ CAUTION
To prevent damage to scan tool MB991958, always turn the ignition switch to "LOCK" (OFF) position before connecting or disconnecting scan tool.

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

Q: Have any DTCs set?

Yes : Refer to Diagnostic trouble code chart P.54A-15.
No : Go to Step 10.





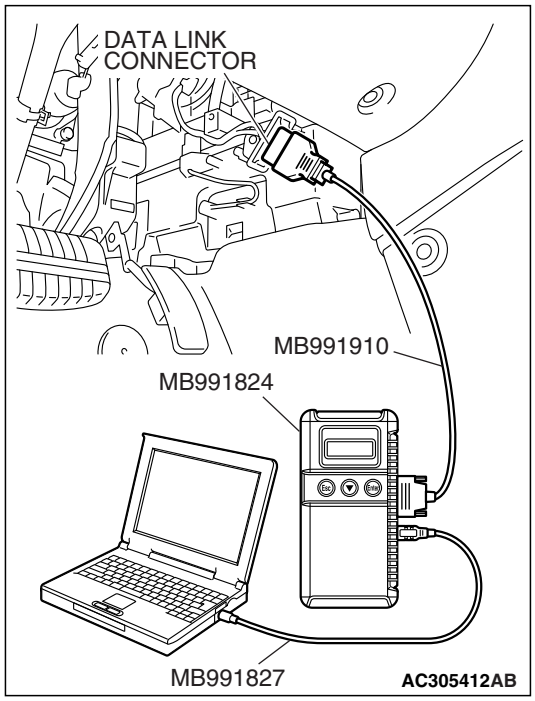
STEP 10. Using scan tool MB991958, read the MFI system diagnostic trouble code.

(1) Turn the ignition switch "ON" position.
(2) Read the diagnostic trouble code.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Have any MFI system DTCs set?

Yes : Refer to GROUP 13A, MFI Diagnosis –Diagnostic Trouble Code Chart P.13A-800 <2.4L ENGINE> or GROUP 13B, MFI Diagnosis –Diagnostic Trouble Code Chart P.13B-846 <3.8L ENGINE>.

No : Go to Step 11.



STEP 11. Using scan tool MB991958, other system check data list.

(1) Turn the ignition switch to the "ON" position.
(2) Check the following items in the data list. Refer to GROUP 13A, Data List Reference Table P.13A-1169 <2.4L ENGINE> or GROUP 13B, Data List Reference Table P.13B-1199 <3.8L ENGINE>.
- Item 18: Cranking signal (ignition switch-ST).

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

Q: Is the cranking signal (ignition switch-ST) "ON" position?

YES : Go to Step 12.

NO : Refer to GROUP 13A, MFI Diagnosis –Symptom Chart P.13A-51 <2.4L ENGINE> or GROUP 13B, MFI Diagnosis –Symptom Chart P.13B-51 <3.8L ENGINE>.

STEP 12. Reregistration of the ignition key.
Register the encrypted code again (Refer to P.54A-10).

Q: Does the engine start?

YES : The procedure is complete.
NO : Go to Step 13.

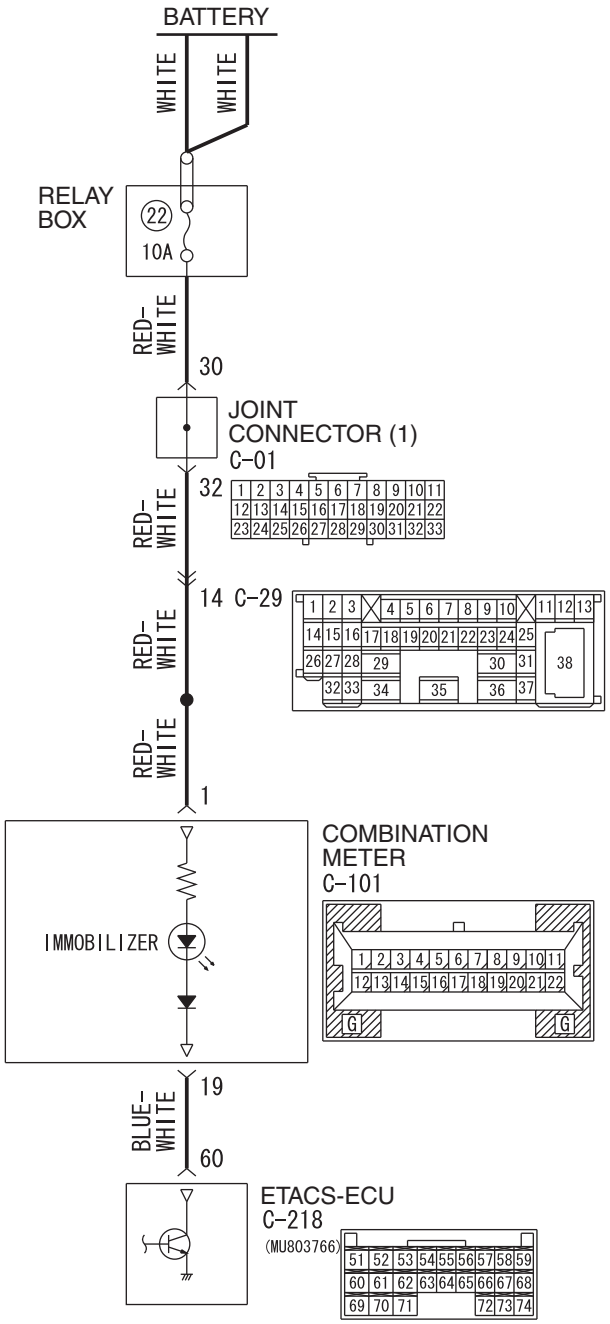
STEP 13. Replace the powertrain control module.
Replace the powertrain control module, and then record the VIN (Refer to P.54A-10).

Q: Does the engine start?

YES : The procedure is complete.
NO : Replace the ETACS-ECU and register the ID codes again (Refer to P.54A-10.).

INSPECTION PROCEDURE 3: The Immobilizer Indicator Light does not Illuminate.

Immobilizer Indicator Light Circuit



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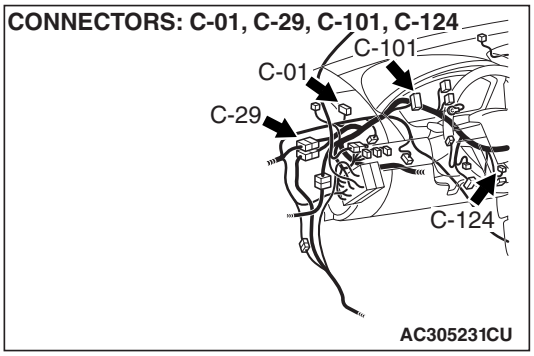
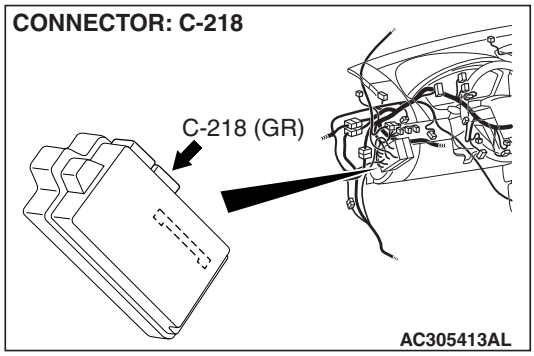




CIRCUIT OPERATION

The immobilizer indicator starts flashing in approximately 10 seconds after the additional key registration mode is entered. It illuminates for 3 seconds after the additional key registration of the unregistered key is completed or after the registration completion judgment of the registered key. In addition, when a read error is detected, the immobilizer indicator stops flashing after read error judgment.

TECHNICAL DESCRIPTION (COMMENT)

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

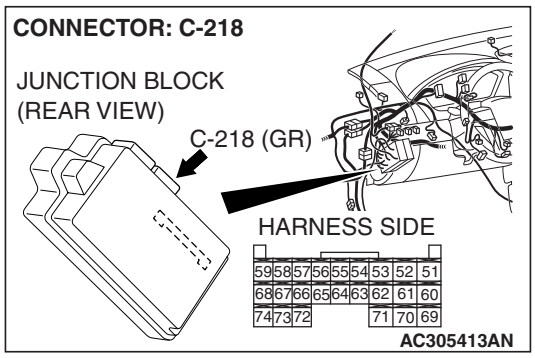
TROUBLESHOOTING HINTS

- Malfunction of combination meter
- Malfunction of ETACS-ECU
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector

DIAGNOSIS

Required Special Tool:

- MB991223: Harness Set



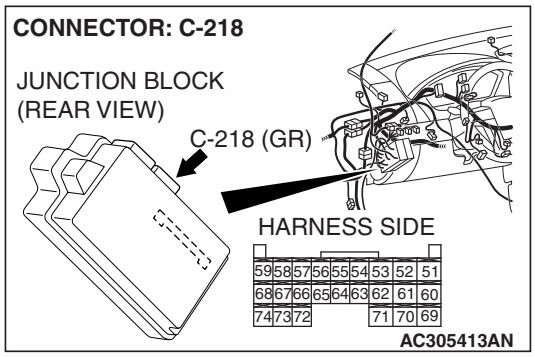
STEP 1. Check ETACS-ECU connector C-218 for loose, corroded or damaged terminals, or terminals pushed back in the connector

Q: Is ETACS-ECU connector C-218 in good condition?

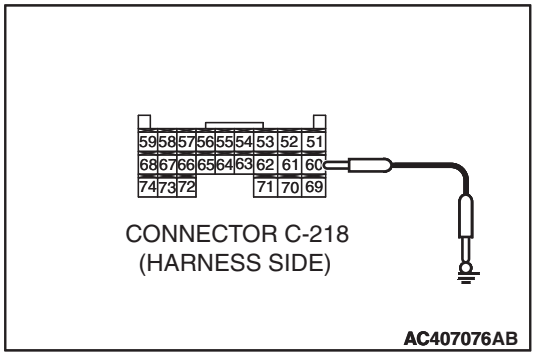
YES : Go to Step 2.

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

STEP 2. Check the immobilizer indicator light circuit of ETACS-ECU connector C-218.



(1) Disconnect the ETACS-ECU connector C-218 and measure at the harness side.
(2) Turn the ignition switch to the "ON" position.



(3) Connect terminal 60 to the ground.

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

YES : Replace the ETACS-ECU and register the ID codes again (Refer to P.54A-10.). Retest the system.

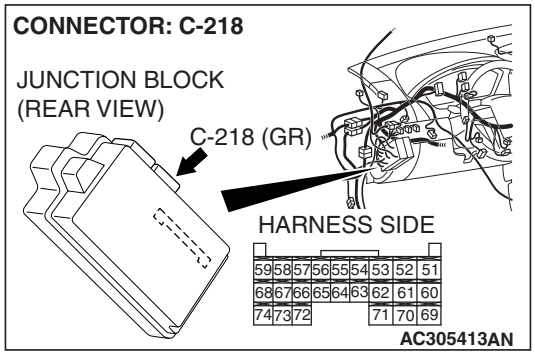
NO : Go to Step 3.

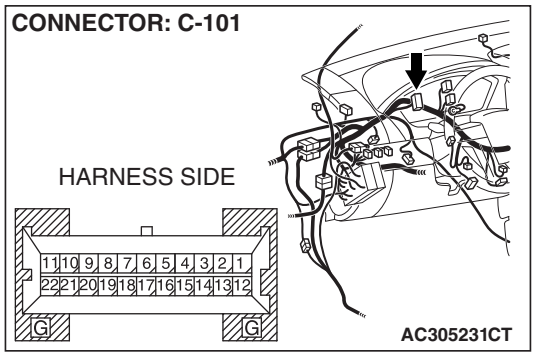
STEP 3. Check ETACS-ECU connector C-218 and combination meter connector C-101 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are ETACS-ECU connector C-218 and combination meter connector C-101 in good condition?

YES : Go to Step 4.

NO : Repair or replace the component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Confirm that the immobilizer indicator light illuminates normally.



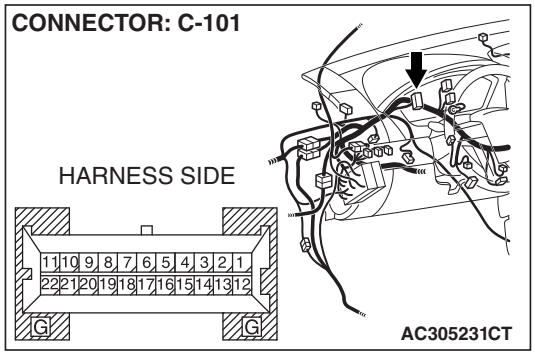


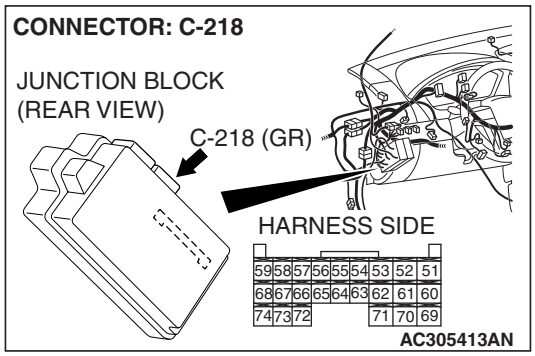
STEP 4. Check the wiring harness between combination meter connector C-101 (terminal 19) and ETACS-ECU connector C-218 (terminal 60).

Q: Is the wiring harness between combination meter connector C-101 (terminal 19) and ETACS-ECU connector C-218 (terminal 60) in good condition?

YES : Go to Step 5.

NO : Repair the wiring harness. Confirm the immobilizer indicator light illuminates normally.

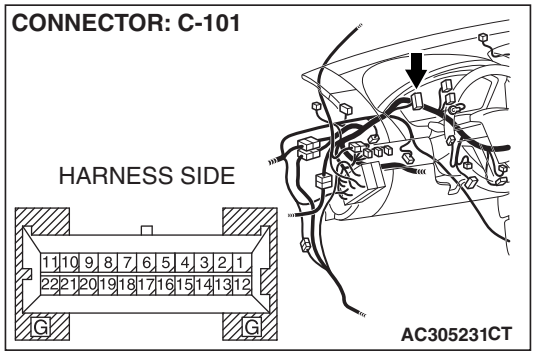


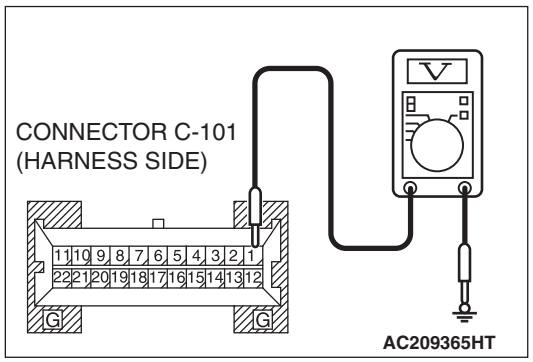


STEP 5. Measure the voltage at combination meter connector C-101 in order to check the battery circuit of power supply system to the combination meter.

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

(2) Disconnect combination meter connector C-101, and measure at the wiring harness side.





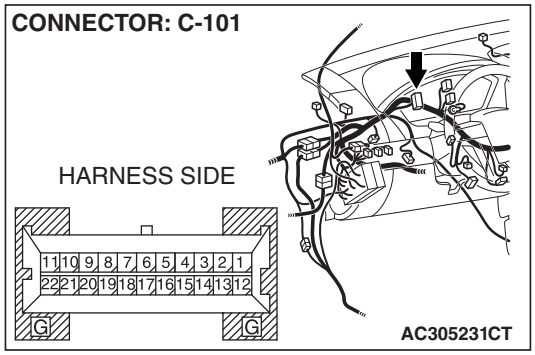
(3) Measure the voltage between terminal 1 and ground.

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

Q: Is measured voltage approximately 12 volts?

YES : Go to Step 8.

NO : Go to Step 6.

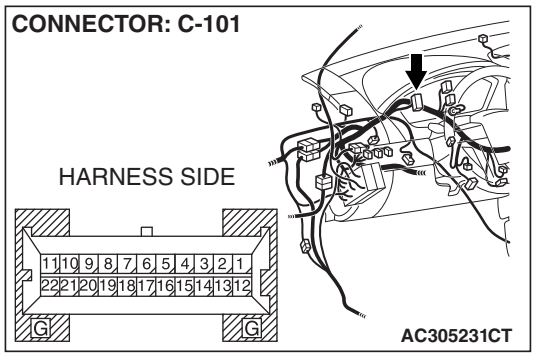


STEP 6. Check combination meter connector C-101 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

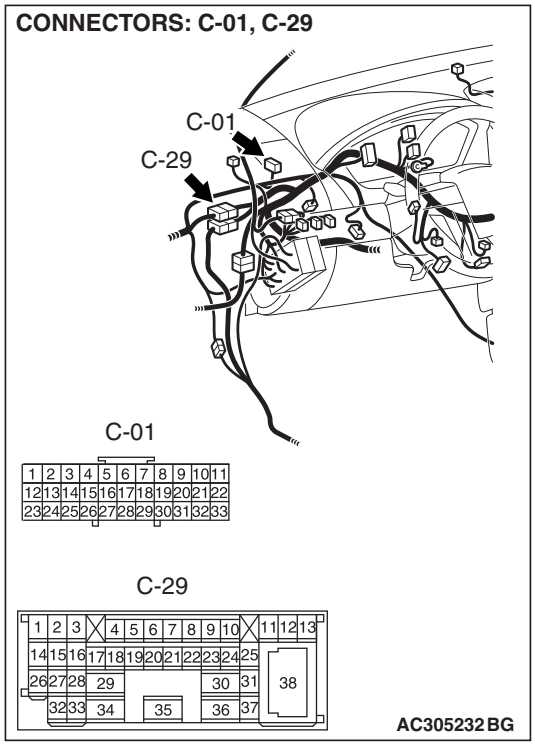
Q: Is combination meter connector C-101 in good condition?

YES : Go to Step 7.

NO : Repair or replace the component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Confirm the immobilizer indicator light illuminates normally.



STEP 7. Check the wiring harness between combination meter connector C-101 (terminal 1) and the battery.



NOTE: Also check joint connector C-01 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-29 is damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between combination meter connector C-101 (terminal 1) and the battery 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.

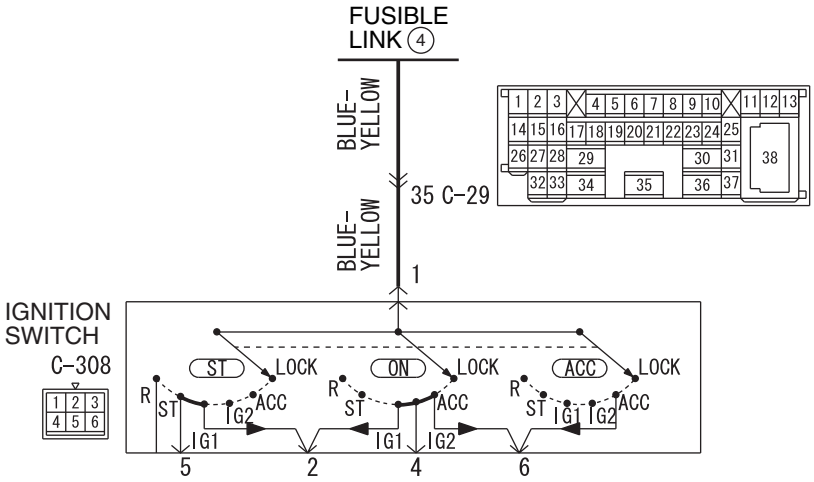
Q: Is the malfunction eliminated?

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 Points-How to Cope with Intermittent Malfunction P.00-14).

NO : Replace the combination meter.

Inspection Procedure 4: Defective power supply system of the ignition switch

Ignition Switch Power Supply Circuit



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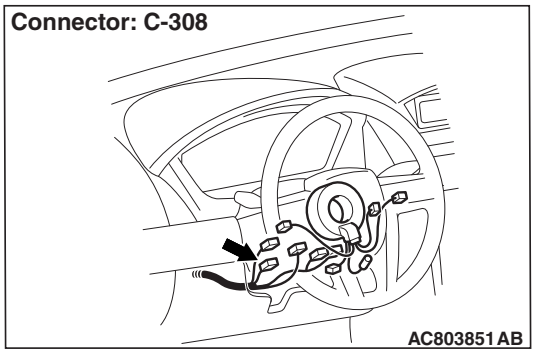


TECHNICAL DESCRIPTION (COMMENT)

When the power supply system of ignition switch has a problem, none of the equipment and system connected to the ignition switch works even if the ignition switch is operated.

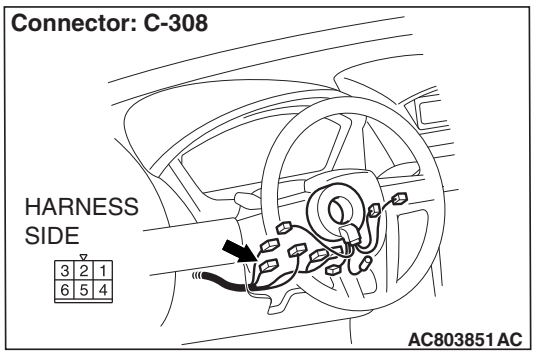
TROUBLESHOOTING HINTS

- Malfunction of the ignition switch
- Damaged harness wires and connectors

DIAGNOSIS

Required Special Tools:
- MB992006: Extra fine probe
- MB991223: Harness set

STEP 1. Check ignition switch connector C-308 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

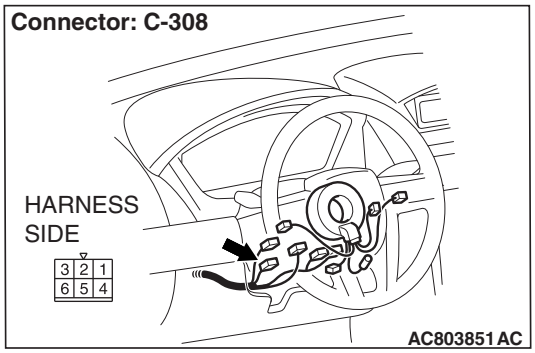


Q: Is ignition switch connector C-308 in good condition?

YES : Go to Step 2.
NO : Repair the defective connector.

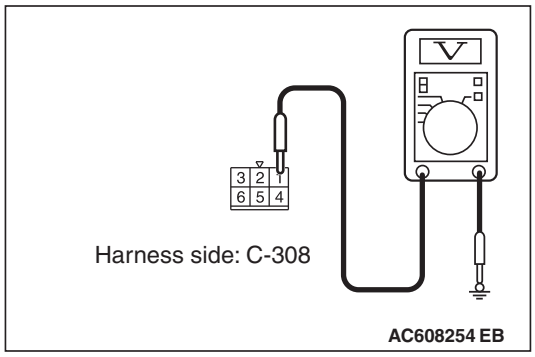
STEP 2. Check the battery power supply circuit to the ignition switch. Measure the voltage at ignition switch connector C-308.

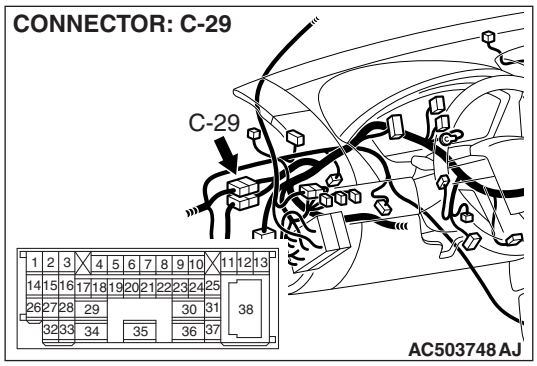
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the voltage between terminal 1 and ground.
- The voltage should measure approximately 12 volts (battery positive voltage).



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

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





STEP 3. Check the Wiring harness between ignition switch connector C-308 (terminal No.1) and fusible link (4).

NOTE: Prior to the wiring harness inspection, check intermediate connector C-29, and repair if necessary.

- Check the battery power supply line for open circuit.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Repair the wiring harness.

STEP 4. Check the ignition switch.

Remove the ignition switch. Then check continuity between the switch terminal.

Ignition key position	Terminal number	Normal condition
LOCK	1 –2, 1 –4, 1 –5, 1 –6	No continuity
ACC	1–4 –6	Continuity exists (2 ohms or less)
ON	1 –2 –4–5 –6	Continuity exists (2 ohms or less)
START	1 –2 –5	Continuity exists (2 ohms or less)

Q: Is the ignition switch in good condition?

YES : Go to Step 5.
NO : Replace the ignition switch.

STEP 5. Retest the system.

Q: When the ignition switch is operated, do the equipment and system work normally?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to use Troubleshooting/inspection Service Points –How to Cope with Intermittent Malfunction P.00-14).
NO : Return to Step 1.

DATA LIST REFERENCE TABLE

M1543007300875

ITEM NO.	INSPECTION ITEM	INSPECTION REQUIREMENT	NORMAL CONDITION
1	Memorized transponder keys	–	Number of memorized transponder keys

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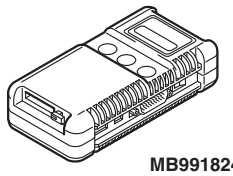
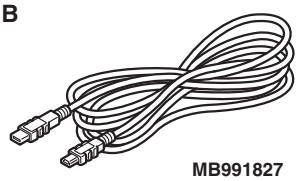
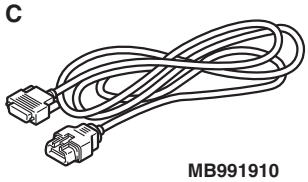
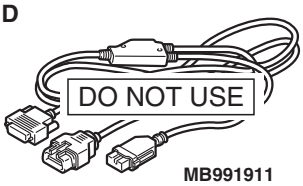
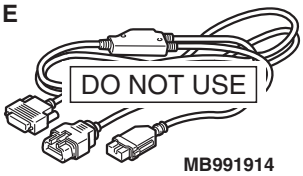
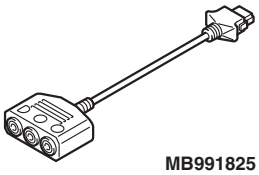
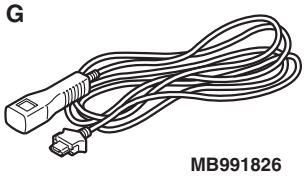
SPECIAL TOOLS

M1543000603335

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
A  MB991824 B  MB991827 C  MB991910 D  MB991911 E  MB991914 F  MB991825 G  MB991826 MB991958	MB991958 A: MB991824 B: MB991827 C: MB991910 D: MB991911 E: MB991914 F: MB991825 G: MB991826 M.U.T.-III sub assembly A: Vehicle communication interface (V.C.I.) B: M.U.T.-III USB cable C: M.U.T.-III main harness A (Vehicles with CAN communication system) D: M.U.T.-III main harness B (Vehicles without CAN communication system) E: M.U.T.-III main harness C (for Chrysler models only) F: M.U.T.-III measurement adapter G: M.U.T.-III trigger harness	MB991824-KIT *NOTE: G: MB991826 M.U.T.-III Trigger Harness is not necessary when pushing V.C.I. ENTER key.*	**⚠ CAUTION** **For vehicles with CAN communication, use M.U.T.-III main harness A to send simulated vehicle speed. If you connect M.U.T.-III main harness B instead, the CAN communication does not function correctly.** Reading diagnostic trouble code

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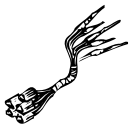
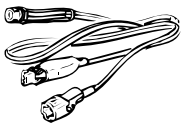
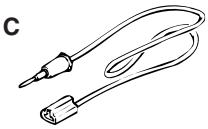
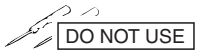
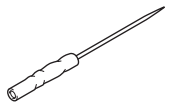
TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
A  B  C  D  MB991223AZ	MB991223 A: MB991219 B: MB991220 C: MB991221 D: MB991222 Harness set A: Test harness B: LED harness C: LED harness adapter D: Probe	General service tool (jumper)	Making voltage and resistance measurements during troubleshooting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

ON-VEHICLE SERVICE

ENCRYPTED CODE REGISTRATION PROCEDURE

M1543008100915

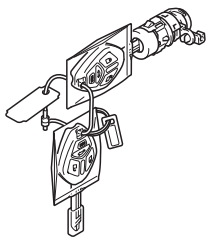
⚠ CAUTION

- **When registering encrypted codes again, keep all the ignition keys that are already registered. If the encrypted codes are registered again, all the encrypted codes that were registered before will be erased. For this reason, keep all the ignition keys that are already registered.**
- **Do not register the ignition keys other than the ignition key that starts the engine. (When replacing by the door service key set of illustration <A> , the engine cannot start if the encrypted code is registered with the bar-code on the ignition key supplied simultaneously. If the ignition key using for each lock cylinder and starting engine is used as a common ignition key, replace by the full service key set of illustration <B>.)**
- **When the transmitter is replaced, the transmitter must be registered after registering the encrypted code. For the registration of the transmitter, refer to GROUP 42, How to Register Secret Code P.42-75.**

If the ignition key is replaced or additional keys are requested, the encrypted codes of all ignition keys must be registered. (A maximum of eight ignition keys can be registered.)

NOTE: The encrypted codes can be registered using the ignition key and barcode No.

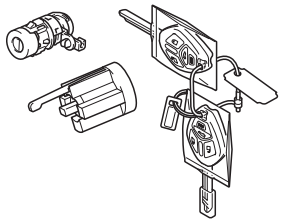
<A>



Door service key set

AC901135AB

<B>



Full service key set

AC901134 AB

PRECAUTIONS DURING SERVICE

If all functions do not work, check the diagnostic trouble code, and repair the system. Then, repeat the operation.
If a wrong password is entered consecutively five times by scan tool (M.U.T.-III sub assembly), the immobilizer-ECU judges that the system is operated incorrectly. Then, the engine immobilization mode is set, and the ECU stops the engine and all special functions is stopped. In addition, when the ignition switch is held at the ON position for approximately 20 minutes with engine immobilization mode, "incorrect operation, engine immobilization mode" is cancelled.

ENCRYPTED CODE REGISTRATION USING IGNITION KEY <REGISTRATION USING SCAN TOOL MB991958 (M.U.T.-III SUB ASSEMBLY)>

When the powertrain control module or the ETACS-ECU is replaced, or the ignition key is lost or additional keys are requested, the ignition key must be used to register encrypted codes.

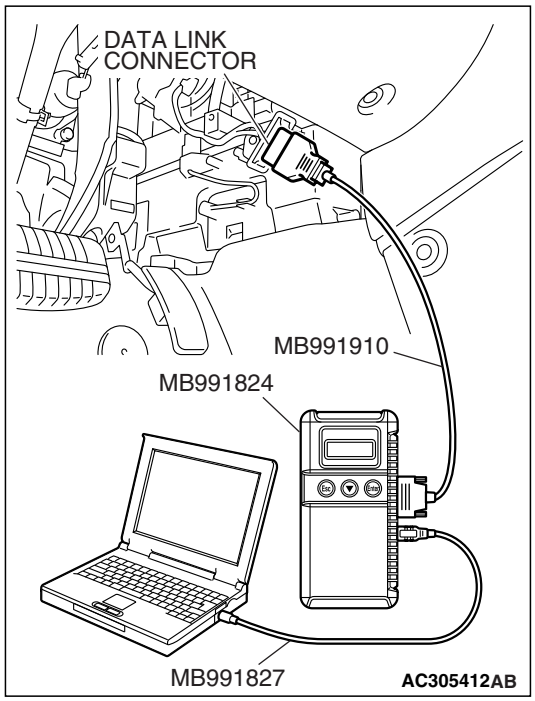
Required Special Tools:

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

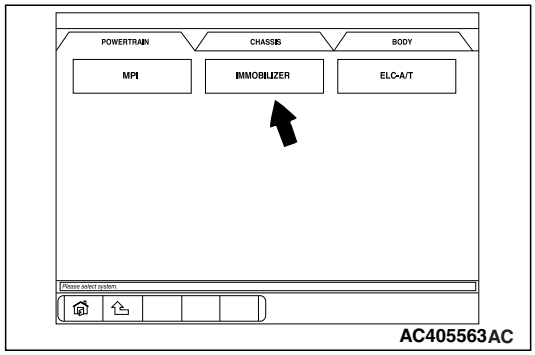
⚠ CAUTION

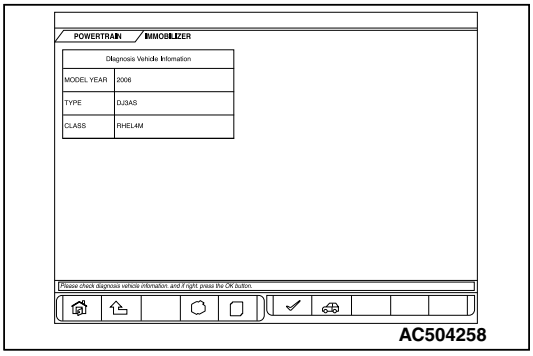
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

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



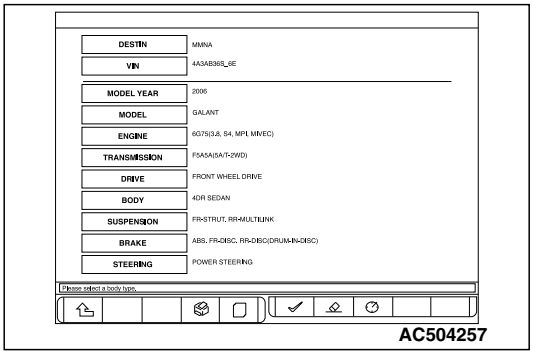
3. Choose "IMMOBILIZER" from the "POWER TRAIN" tab.



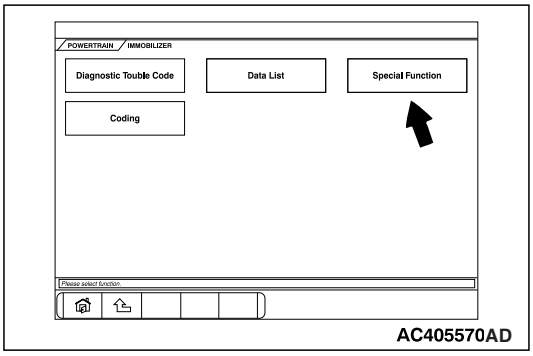


AC504258

4. Enter the VIN code of the vehicle that is registered. Then, press "OK" button.

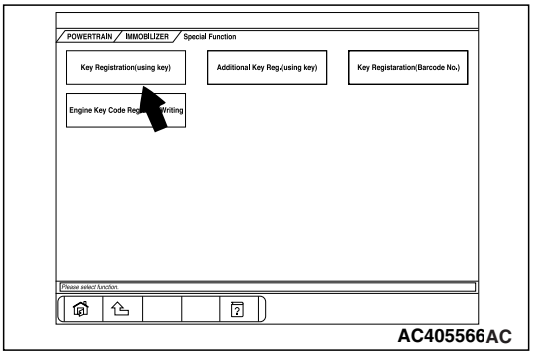


AC504257



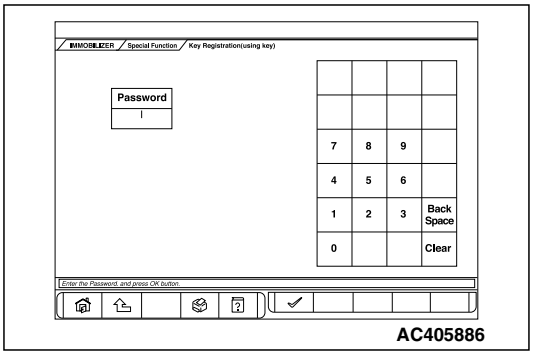
AC405570AD

5. Select "Special Function."



AC405566AC

6. Select "Key Registration (using key)."



AC405886

7. Enter the password of the vehicle, and press the OK button.

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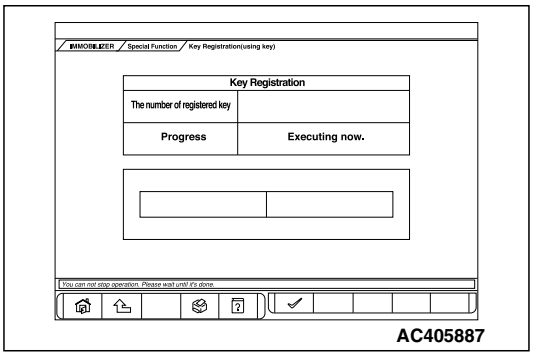
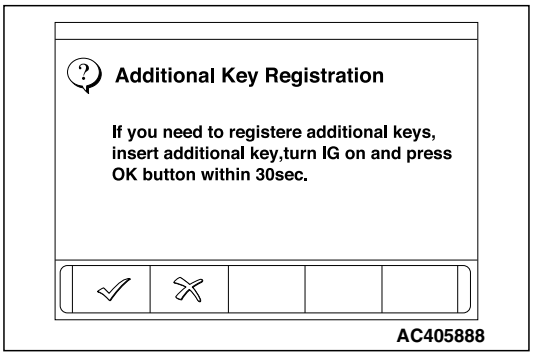


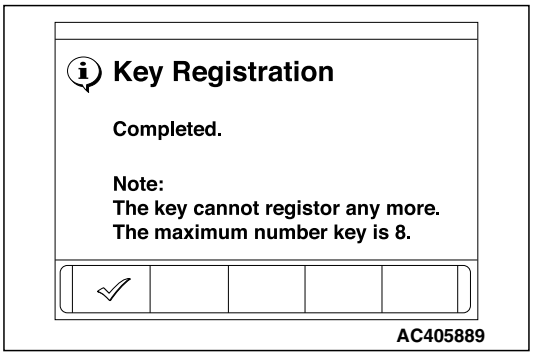
AC405887

8. Registration of the ignition key will be started.



AC405888

9. When the ignition key registration is finished, the additional key registration menu is displayed. To register the additional key, insert the key and turn the ignition switch to the "ON" position. Then, press the OK button. Press the CANCEL button to terminate the ignition key registration.



AC405889

10. A maximum of eight ignition keys can be registered. When the registration of the eighth ignition key is finished, key registration completion menu is displayed. Press the OK button and finish the ignition key registration.

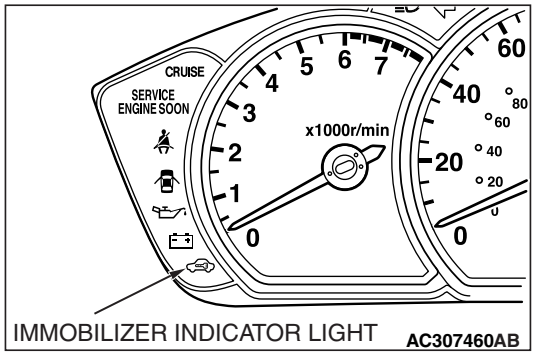
ENCRYPTED CODE REGISTRATION USING IGNITION KEY <REGISTRATION USING IGNITION KEY ONLY>

When the ignition key is lost or additional keys are requested, the ignition key must be used to register encrypted codes.

⚠ CAUTION

Two ignition keys that have been registered are needed.

1. Turn the ignition switch to the "ON" position using the registered ignition key and keep it there for 5 seconds.
2. Turn the ignition switch to the "LOCK" (OFF) position, and remove the registered ignition key.
3. Within 30 seconds after the ignition key is removed, insert the other registered ignition key that has already been registered and turn the ignition switch to the "ON" position.



4. The immobilizer indicator light starts flashing in approximately 10 seconds after the ignition switch is turned to the "ON" position.
5. When the immobilizer indicator light starts flashing, turn the ignition switch to the "LOCK" (OFF) position and remove the ignition key.

   NOTE: When an error occurs while the immobilizer indicator light is flashing, the immobilizer indicator light extinguishes.
6. Within 30 seconds after the immobilizer indicator light flashes in Step 5, insert the ignition key to be added and turn the ignition switch to the "ON" position.
7. When registering another ignition key, repeat the procedure from the beginning.

NOTE:

<When the additional ignition key cannot be registered>

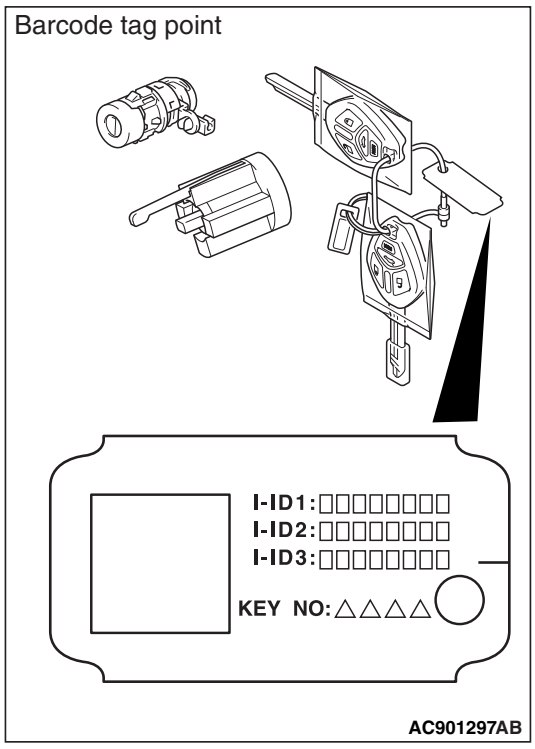
- *When the immobilizer indicator is not illuminated during registration*
- *When the immobilizer indicator light does not change in 3 seconds after carrying out step 6*

<When the additional registeration of the ignition key terminates automatically>

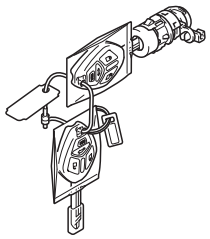
- *When 30 seconds have passed before inserting the ignition key in Step 3 after the ignition key is removed in Step 2.*
- *When 30 seconds have passed after the immobilizer indicator light flashed*

ENCRYPTED CODE REGISTRATION USING BARCODE NO.

When the ignition key that starts the engine is replaced due to the replacement of the ignition key set, the ignition key cylinder, etc., the barcode No. must be used to register encrypted codes.



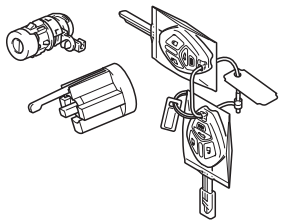
<A>



Door service key set

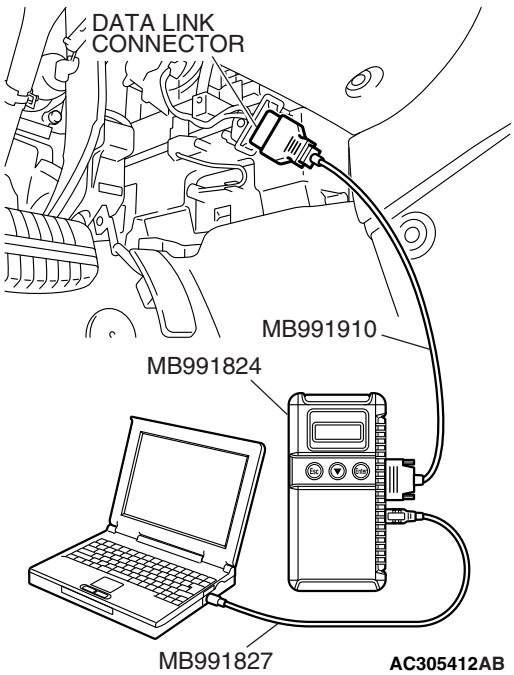
AC901135AB

<B>



Full service key set

AC901134 AB



AC305412AB

⚠ CAUTION

- **Do not register the ignition keys other than the ignition key that starts the engine. (When replacing by the door service key set of illustration <A>, the engine cannot start if the encrypted code is registered with the bar-code on the ignition key supplied simultaneously. If the ignition key using for each lock cylinder and starting engine is used as a common ignition key, replace by the full service key set of illustration <B>.)**
- **After the ignition key registration is finished, discard the barcode plate correctly at Mitsubishi dealer. The barcode plate has important information of the immobilizer system. Therefore, improper disposal of the bar-code plate may decrease the security level.**
- **When the transmitter is replaced, the transmitter must be registered after registering the encrypted code. For the registration of the transmitter, refer to GROUP 42, How to Register Secret Code P.42-75.**

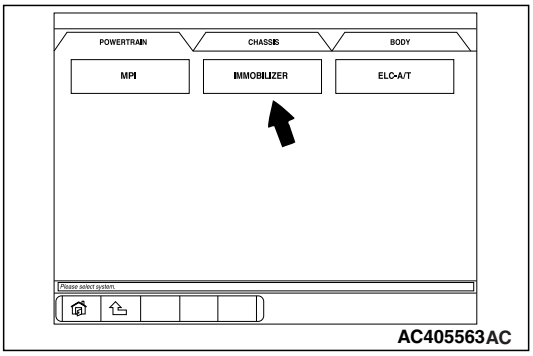
Required Special Tools:

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

⚠ CAUTION

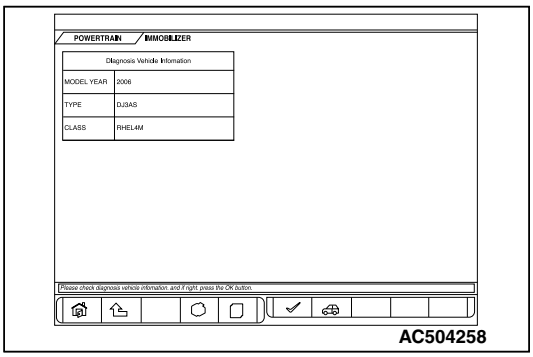
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

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



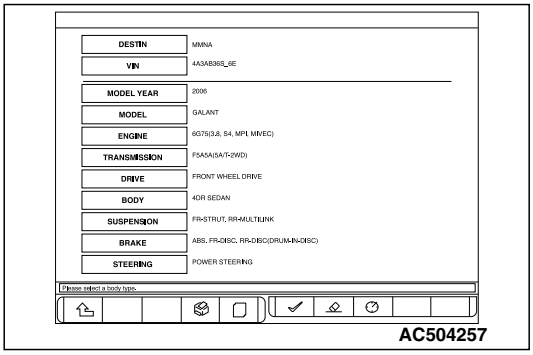
AC405563AC

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



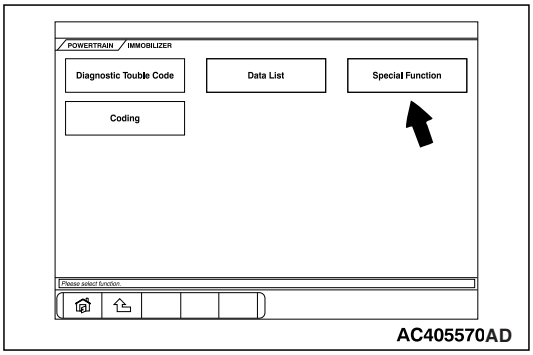
AC504258

4. Enter the VIN code of the vehicle that is registered. Then, press "OK" button.



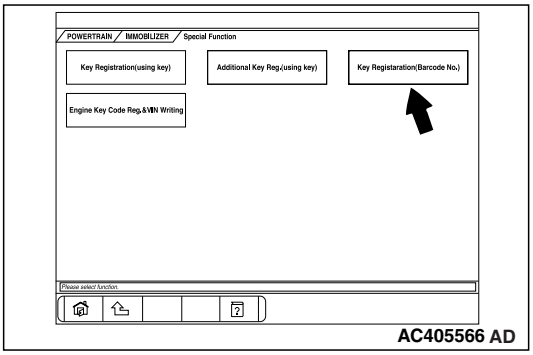
AC504257

5. Select "Special Function."

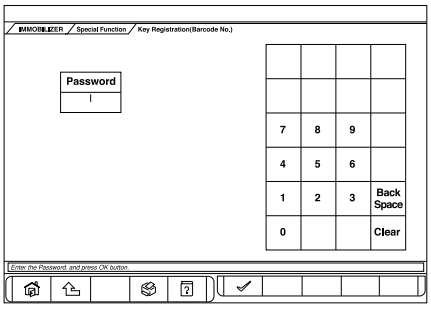


AC405570AD

6. Select "Key Registration (Barcode No.)."

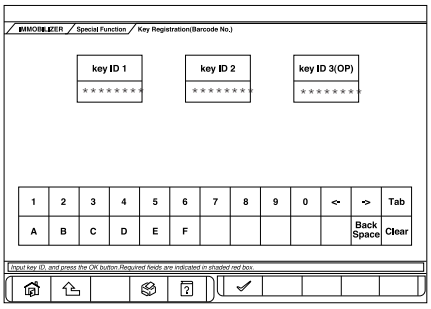


AC405566 AD



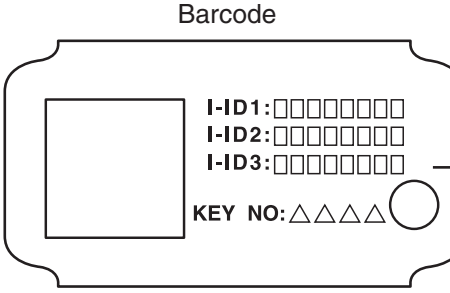
AC405890

7. Enter the password of the vehicle, and press the OK button.



AC405891AB

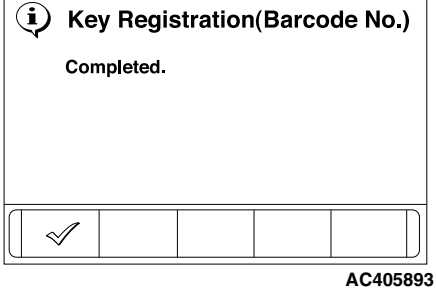
8. Enter the ID on the bar code plate which is attached to the ignition key, and press the OK button.



AC807910 AC

AC405892

9. When the execution confirmation menu of the key registration (Barcode No.) is displayed, press the OK button.



AC405893

10. When the key registration completion menu is displayed, press the OK button.

TSB Revision

IGNITION SWITCH

REMOVAL AND INSTALLATION

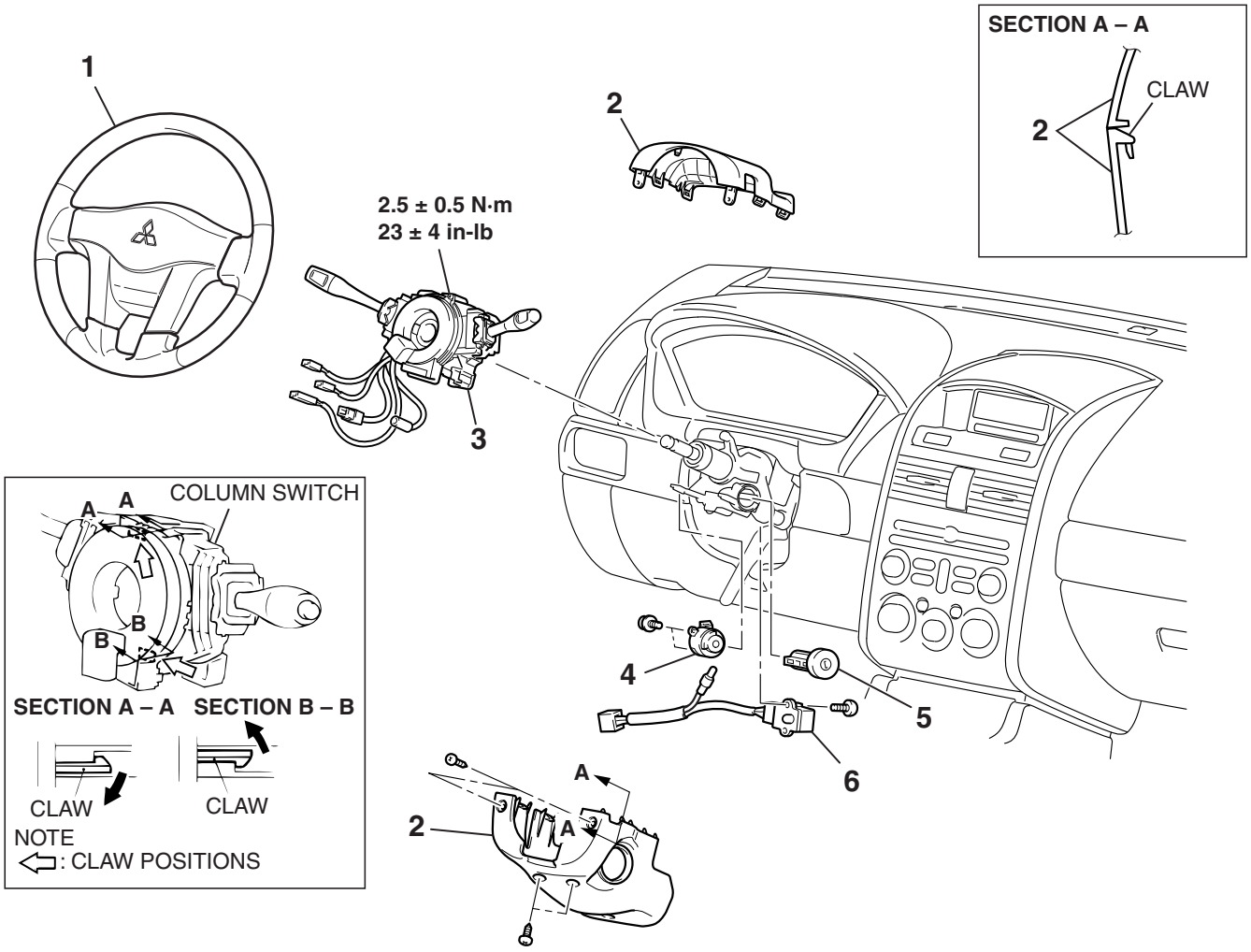
M1543002101170

⚠ WARNING

- ***Before removing the steering wheel, air bag module assembly and clock spring refer to GROUP 52B, Service Precautions (P.52B-26) and Air Bag Module and Clock Spring (P.52B-435).***
- ***When removing and installing the steering wheel, do not let it bump against the air bag module.***

⚠ CAUTION

When the steering lock cylinder is replaced, register the encrypted code. Refer to P.54A-10.



AC803875AB

REMOVAL STEPS

1. STEERING WHEEL ASSEMBLY (REFER TO GROUP 37, STEERING WHEEL P.37-28.)

<<A>>

2. STEERING COLUMN COVER (REFER TO GROUP 52A, INSTRUMENT PANEL ASSEMBLY P.52A-15.)

REMOVAL STEPS (Continued)

3. CLOCK SPRING AND COLUMN SWITCH ASSEMBLY (REFER TO GROUP 52B, AIR BAG MODULE(S) AND CLOCK SPRING P.52B-435.)

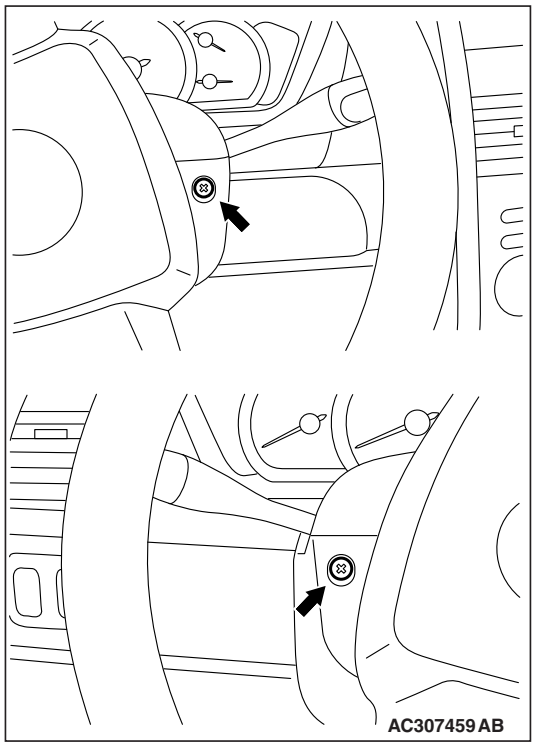
<<B>>

4. IGNITION SWITCH
5. STEERING LOCK CYLINDER
6. KEY REMINDER SWITCH

TSB Revision

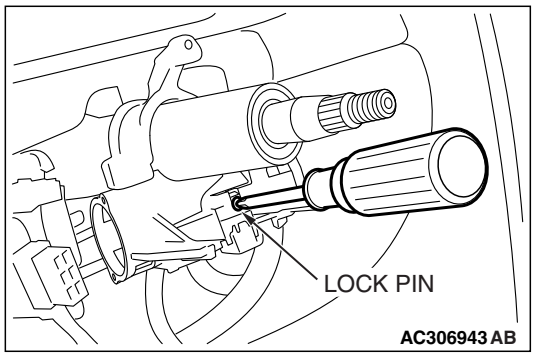
REMOVAL SERVICE POINTS

<<A>> STEERING COLUMN COVER REMOVAL



Rotate the steering wheel with a slightly from side-to-side to access and remove the mounting screws.

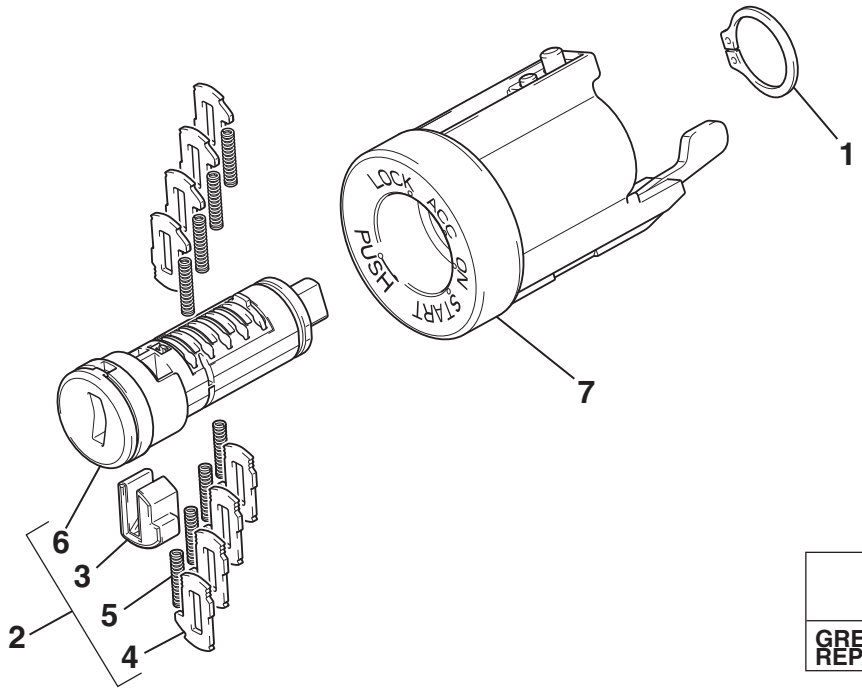
<<B>> STEERING LOCK CYLINDER REMOVAL



1. Insert the key in the steering lock cylinder and turn it to the "ACC" position.
2. Using a small Phillips head screwdriver, pull the steering lock cylinder toward you.

HANDLE LOCK CYLINDER DISASSEMBLY AND ASSEMBLY

M1541200800026



GREASE:
REPAIR KIT GREASE

AC602566AB

DISASSEMBLE STEPS

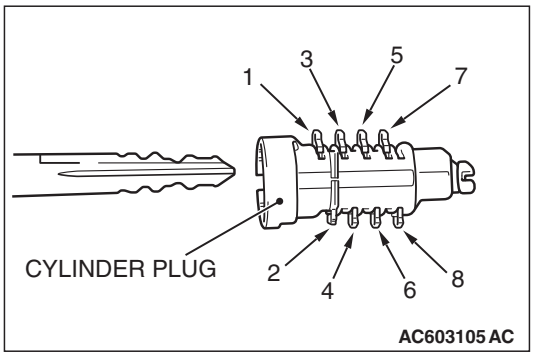
1. RETAINER
>>**B**<< 2. CYLINDER SUB-ASSEMBLY
3. ACTUATOR
>>**A**<< 4. TUMBLER
5. TUMBLER SPRING
6. CYLINDER PLUG
7. CASE SUB-ASSEMBLY

ASSEMBLY SERVICE POINT

>>A<< TUMBLER ASSEMBLY

<How to select the tumbler when the tumbler layout information can be obtained by the key code>

1. From the key code select the proper tumbler combinations required to make afunctional lock, reference key biting and tumbler placement chart (refer to table 1).
2. Tumblers load from both sides of the cylinder.
3. Locate the tumbler chamber that is closest to the head of the cylinder plug. That is tumbler ward number of the key code. Tumbler ward number 3, 5 and 7 are also located on that side of the cylinder plug (odd on one side even on other).
4. Place one tumbler spring in each of the four spring pockets.



AC603105 AC

TSB Revision

5. Using the appropriate tumbler number (tumbler number is stamped on tumbler and matches cut depth) place a tumbler in each chamber and depress tumbler tilting slightly towards the spring. The tumbler should drop freely in place and be retained. After all tumblers are inserted into the cylinder plug insert the key to make sure the tumblers drop flush with the cylinder plug body. If one does not remove and replace with thew correct tumbler that matches the cut of the key.
6. Turn the cylinder plug over and repeat the same process for chambers 2, 4, 6, and 8. Insert the key and make sure all the tumblers drop flush with the diameter of the cylinder.

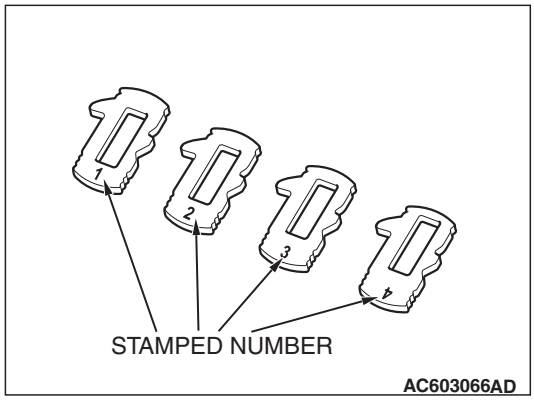
Table 1: Key code to tumbler placement

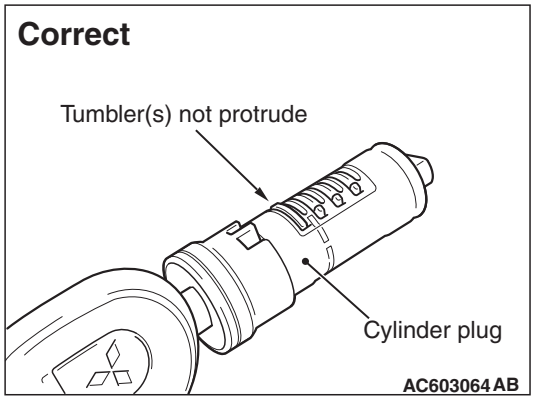
	HEAD OF KEY/CYLINDER							TIP OF KEY	
Notch location	1	2	3	4	5	6	7	8	
All Ignitions	X	X	X	X	X	X	X	X	All spaces
Door	X	X	X	X	X	X	X	X	All spaces
Deck	X	X	X	X	X	X	X	X	All spaces
Trunk Release				X	X	X	X	X	5 spaces
I/P					X	X	X	X	Last 4 spaces

NOTE: The mark X in the table indicates the stamped number (from 1 to 4) on the tumbler.

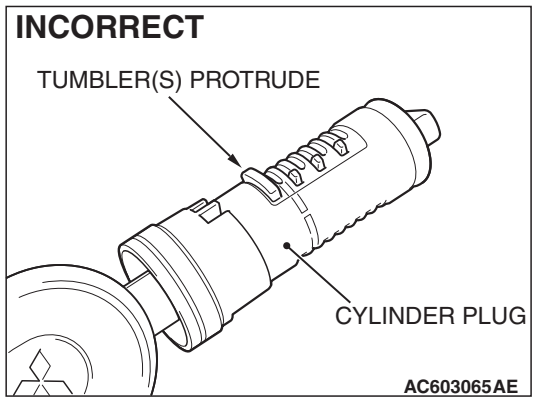
<How to select the tumbler when the tumbler layout information cannot be obtained by the key code>

1. The repair kit contains 20 tumblers (five tumblers for each No. 1 to 4.)
2. Insert the tumbler spring into the cylinder plug spring pocket.
3. Set the tumbler No. 1 onto the cylinder plug tumbler chamber, and insert the key. Then, check that the tumbler is not protruding from the cylinder plug.

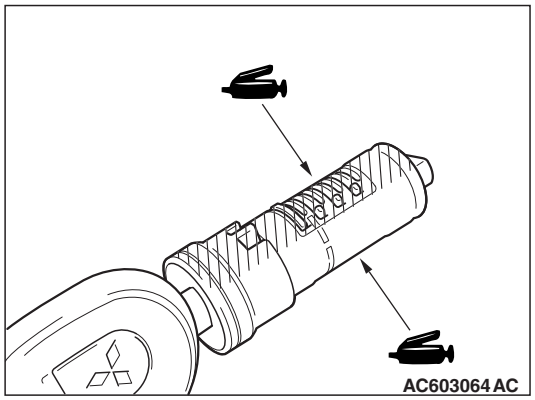




4. When the tumbler is not protruding, the correct tumbler is selected. Otherwise, the wrong tumbler is selected.If the wrong tumbler has been selected, remove the tumbler No. 1, and set the tumbler in the order from No. 2 to 4. Then, check the key insertion state and select the tumbler which does not protrude from the cylinder plug.
5. Repeat the steps previously mentioned, and set the correct tumbler into all tumbler chambers. Insert the key at last, and check that all the tumblers are clearly arranged, not protruding from the cylinder plug.



>>B<< CYLINDER SUB-ASSEMBLY ASSEMBLY

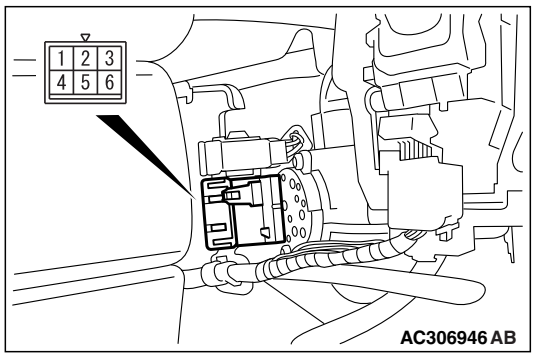


Apply the supplied grease to body surfaces of the cylinder opposite of the tumblers, in the keyway of the cylinder plug head and actuator pocket, and the inside diameter of the case.

INSPECTION

M1543019504425

IGNITION SWITCH CONTINUITY CHECK

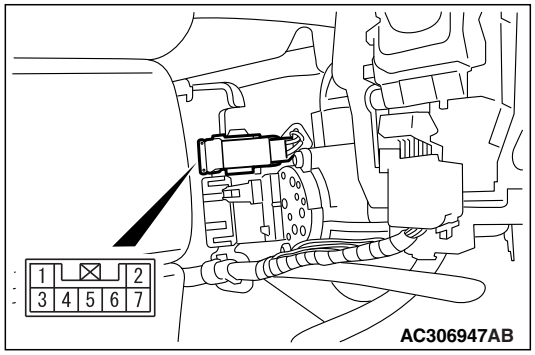


Disconnect ignition switch connector C-308 without removing the ignition switch and steering lock cylinder. Then check the continuity.

SWITCH POSITION	CONNECT TESTER BETWEEN:	SPECIFIED CONDITION
"LOCK" (OFF)	1-2, 1-4, 1-5, 1-6	Open circuit

SWITCH POSITION	CONNECT TESTER BETWEEN:	SPECIFIED CONDITION
"ACC"	1-4, 1-6	Less than 2 ohms
"ON"	1-2, 1-4, 1-5, 1-6	Less than 2 ohms
"START"	1-2, 1-5	Less than 2 ohms

KEY REMINDER SWITCH CHECK



1. Disconnect key reminder switch connector C-310 without removing the key reminder switch and steering lock cylinder.
2. Check for continuity between terminal 4 and terminal 6.

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

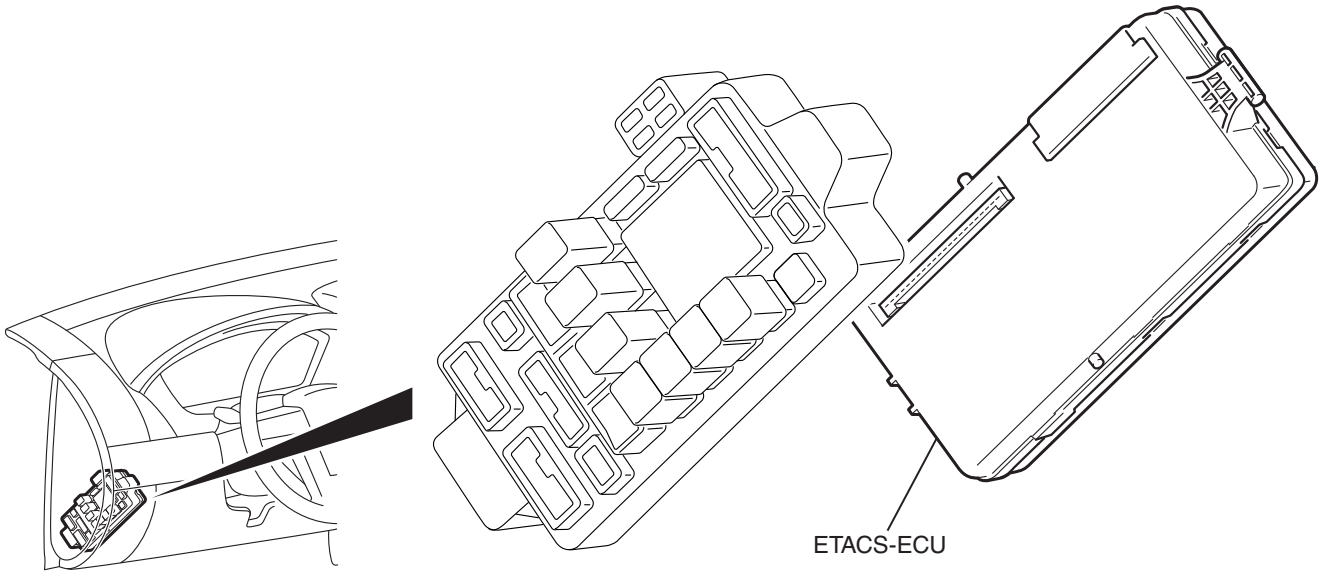
ETACS-ECU

REMOVAL AND INSTALLATION

M1543031800035

⚠ CAUTION

When the ETACS-ECU is replaced, register the encrypted code. Refer to P.54A-10.



REMOVAL STEPS

- HOOD LOCK RELEASE HANDLE (REFER TO GROUP 42, HOOD P.42-8.)

REMOVAL STEPS (Continued)

- INSTRUMEN LOWER PANEL (REFER TO GROUP 52A, INSTRUMENT PANEL ASSEMBLY P.52A-15.)

1. ETACS-ECU

TSB Revision

COMBINATION METER ASSEMBLY

GENERAL DESCRIPTION

M1543000101033

Some of the combination meter indications are based on information from ECUs via CAN bus communication. If there is any failure in the meters connected via the CAN bus communication, diagnose the CAN bus communication system. The following instruments, indicator lights and warning lights in the combination meter are controlled by ECUs via CAN bus communication.

ITEM	INSTRUMENTS, INDICATOR LIGHTS, AND WARNING LIGHTS	ECU SENDING DATA VIA CAN COMMUNICATION
Meter	Tachometer	Powertrain control module
	Speedometer	
	Engine coolant temperature gauge	
	Odometer	
Indicator lamp	High-beam	ETACS-ECU
	Turn-signal	
	Front fog	
	Door ajar	
	A/T shift position	Powertrain control module
	Auto cruise	
	ASC OFF	TCL/ASC-ECU
Warning lamp	Service engine soon	Powertrain control module
	ABS	TCL/ASC-ECU
	ASC/TCL	
	SRS	SRS-ECU

COMBINATION METERS DIAGNOSIS

TROUBLESHOOTING STRATEGY

M1543006900926

Use these steps to plan your diagnostic strategy. Follow through with each step to ensure that you have exhausted all possible methods of finding a combination meter fault.

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

DIAGNOSIS FUNCTION

M1543007001026

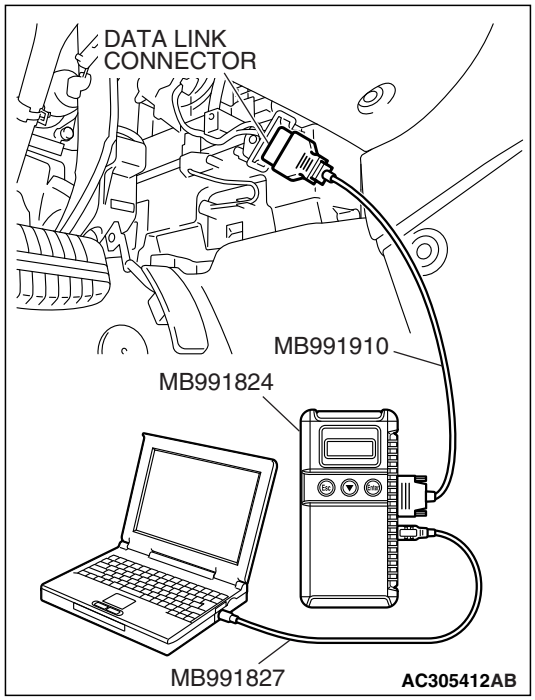
HOW TO CONNECT SCAN TOOL (M.U.T.-III)

Required Special Tools:

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

⚠ CAUTION

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



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

   NOTE: When special tool MB991824 is energized, special tool MB991824 indicator light will be illuminated in a green color.
7. Start the M.U.T.-III system on the personal computer.

   NOTE: Disconnecting the scan tool MB991958 is the reverse of the connecting sequence, making sure that the ignition switch is at the "LOCK" (OFF) position.

HOW TO READ AND ERASE DIAGNOSTIC TROUBLE CODES

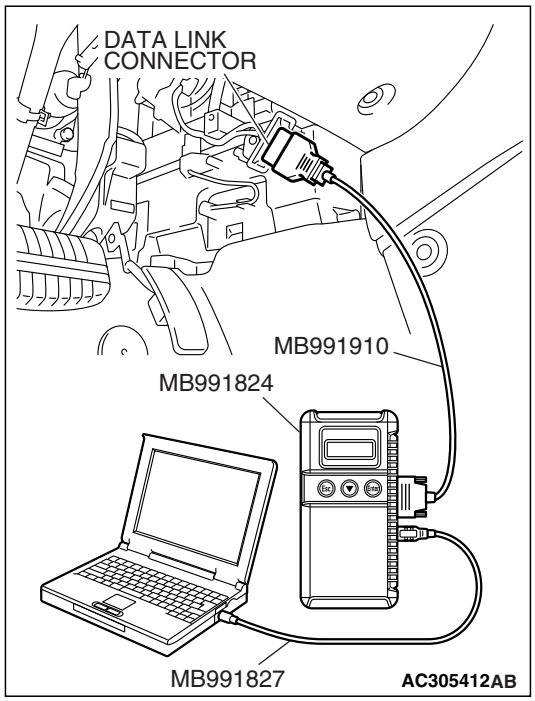
Required Special Tools:

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

⚠ CAUTION

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

NOTE: If the battery voltage is low, diagnostic trouble codes will not be 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 "Meter" from the "BODY" tab.
6. Select "Diagnostic Trouble Code."
7. If a DTC is set, it is shown.
8. Choose "Erase DTCs" to erase the DTC.

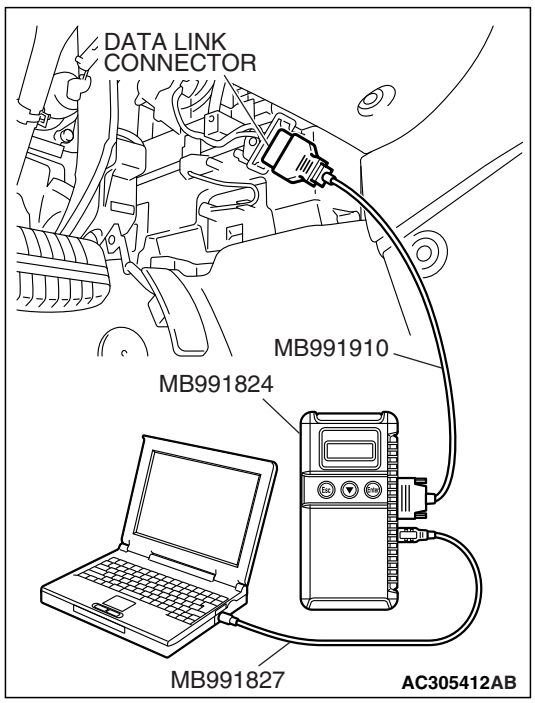
HOW TO DIAGNOSE THE CAN BUS LINES

Required Special Tools:

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

⚠ CAUTION

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



1. Connect scan tool MB991958 to the data link connector.
2. Turn the ignition switch to "ON" position.
3. Select "CAN bus diagnosis" from the start-up screen.
4. When the vehicle information is displayed, confirm that it matches the vehicle whose CAN bus lines will be diagnosed.
   - If they matches, go to step 8.
   - If not, go to step 5.
5. Select "view vehicle information" button.
6. Enter the vehicle information and select the "OK" button.
7. When the vehicle information is displayed, confirm again that it matches the vehicle whose CAN bus lines will be diagnosed.
   - If they matches, go to step 8.
   - If not, go to step 5.
8. Select the "OK" button.
9. When the optional equipment is displayed, choose the one which the vehicle is fitted with, and then select the "OK" button.

DIAGNOSTIC TROUBLE CODE CHART

M1543007101443

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

DTC NO.	DIAGNOSTIC ITEM	REFERENCE PAGE
B1200	Defective odometer	P.54A-57
B1201	Defective fuel gauge	P.54A-59
U1073	Bus off	P.54A-73
U1100*	Powertrain control module time-out (related to engine)	P.54A-75
U1101*	Powertrain control module time-out (related to A/T)	
U1102*	TCL/ASC-ECU time-out	P.54A-78
U1109*	ETACS-ECU time-out	P.54A-81
U1112*	SRS-ECU time-out	P.54A-84
U1120	Failure information on powertrain control module (related to engine)	P.54A-86
U1206	Flag invalid	P.54A-89

*NOTE: *: When the DTC relating to the CAN communication error are output, make sure of the vehicle equipment. When the vehicle is not equipped with the system the combination meter communicates to, the DTC is always output. This is not abnormal.*

DIAGNOSTIC TROUBLE CODE PROCEDURES

DTC B1200: Defective odometer

⚠ CAUTION
- **If DTC B1200 is set in the combination meter, always diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the communication circuit is normal.**

CIRCUIT OPERATION
The combination meter receives a signal from the PCM and displays the driven distance.

DTC SET CONDITION
If an abnormal value is sent from the odometer, the combination meter sets DTC B1200.

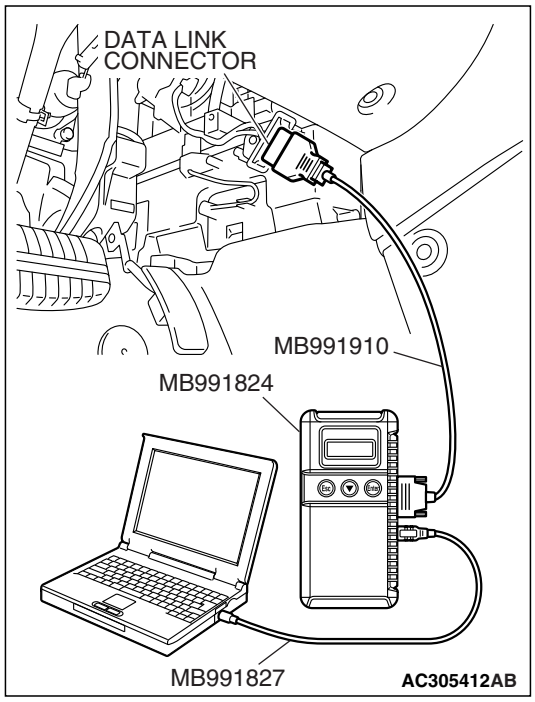
TECHNICAL DESCRIPTION (COMMENT)
The wiring harness or connectors may have loose, corroded, or damage terminals, or terminals pushed back in the connector, or the combination meter may be defective.

TROUBLESHOOTING HINTS
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- Malfunction of combination meter

DIAGNOSIS

Required Special Tools:

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



STEP 1. Recheck for diagnostic trouble code.

Recheck if the DTC is set.

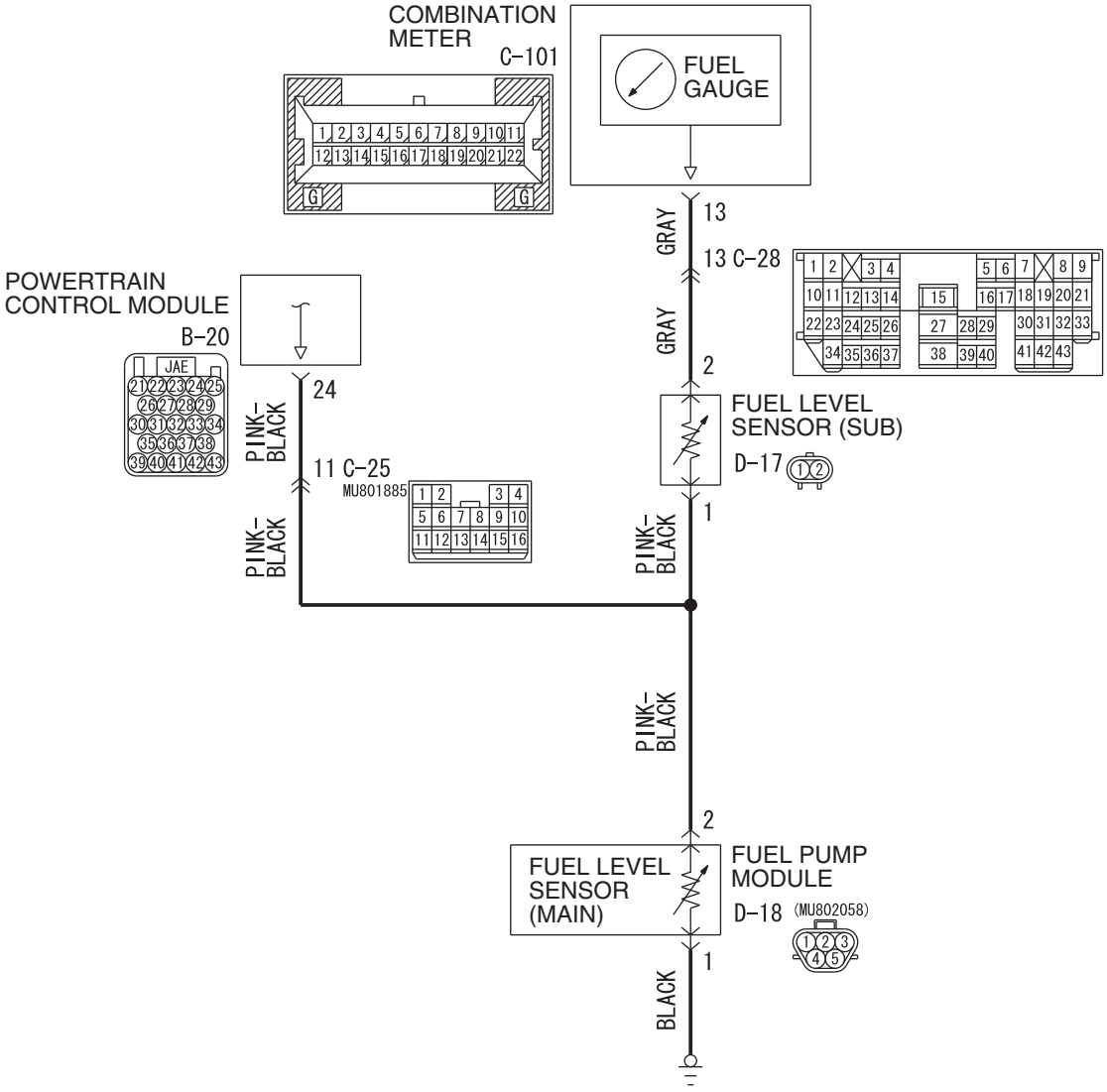
(1) Erase the DTC.
(2) Turn the ignition switch to "OFF" position.
(3) Turn the ignition switch to "ON" position.
(4) Drive the vehicle and check that the diagnostic trouble code is not set.

Q: Is the DTC set?

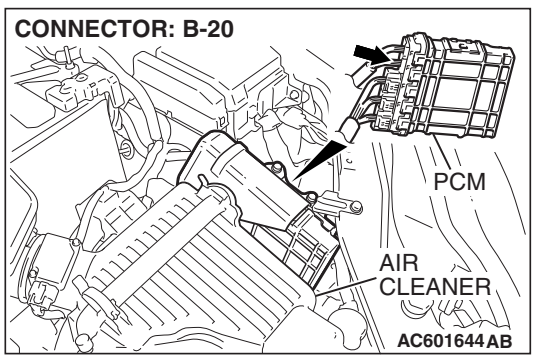
YES : Replace combination meter.
NO : An intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting / Inspection Service Points - How to Cope with Intermittent Malfunction P.00-14.

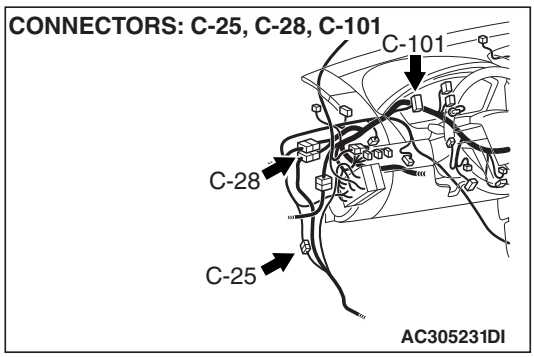
DTC B1201: Defective fuel gauge

Fuel Gauge Circuit



WAP54M033A





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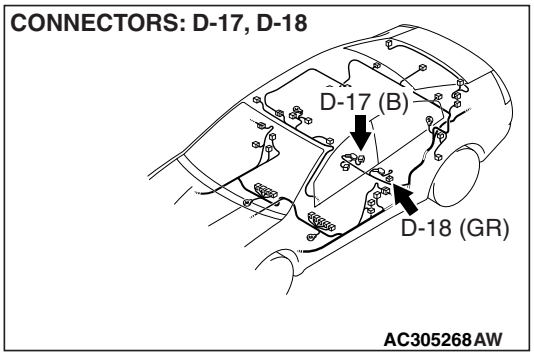


⚠ CAUTION
- **If DTC B1201 is set in the combination meter, always diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the communication circuit is normal.**

CIRCUIT OPERATION
The fuel gauge displays the amount of the remaining fuel on the combination meter.

DTC SET CONDITION
DTC B1201 is set if an open circuit and short to ground in the fuel sender circuit are detected for 64 seconds or more when the ignition switch is ON.

TECHNICAL DESCRIPTION (COMMENT)
The wiring harness or connectors may have loose, corroded, or damage terminals, or terminals pushed back in the connector, or the combination meter may be defective.

TROUBLESHOOTING HINTS
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- Malfunction of powertrain control module
- Malfunction of fuel level sensor (sub)
- Malfunction of fuel pump module
- Malfunction of combination meter

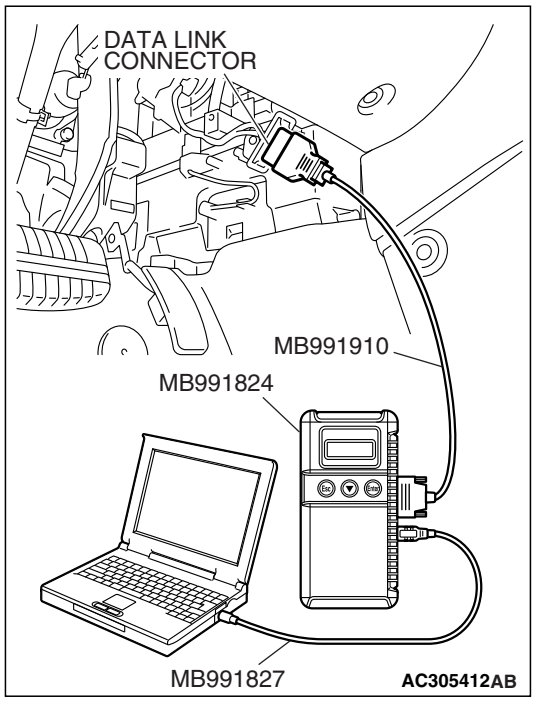
DIAGNOSIS
Required Special Tools:
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)
- MB991223: Harness Set
- MB992006: Extra Fine Probe

STEP 1. Using scan tool MB991958, read the MFI system diagnostic trouble code.
Check if an MFI system DTC is set.

Q: Is the DTC set?

YES : Diagnose the MFI system by referring to GROUP 13A, MFI Diagnosis –Diagnostic Trouble Code Chart P.13A-46 <2.4L ENGINE> or GROUP 13B, MFI Diagnosis –Diagnostic Trouble Code Chart P.13B-46 <3.8L ENGINE>.

NO : Go to Step 2.



STEP 2. Using scan tool MB991958, check data list.

⚠ CAUTION

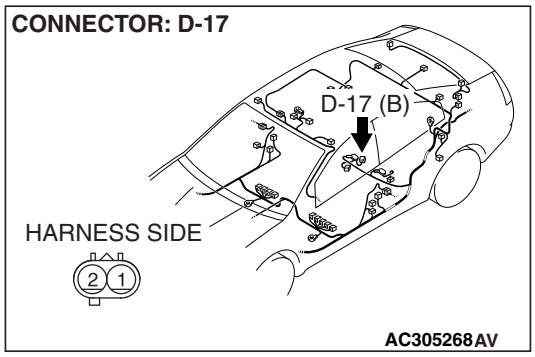
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to the actuator test mode.
- Item 89: Fuel gauge.
  - Fuel gauge unit resistance value and scan tool displayed value agree with each other.
- Item 8A: Fuel gauge (Target).
  - Fuel gauge and scan tool displayed values agree with each other.

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

Q: Is the solenoid valve operating properly?

YES : Go to Step 18.
NO : Go to Step 3.



STEP 3. Check fuel level sensor (sub) connector D-17 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is fuel level sensor (sub) connector D-17 in good condition?

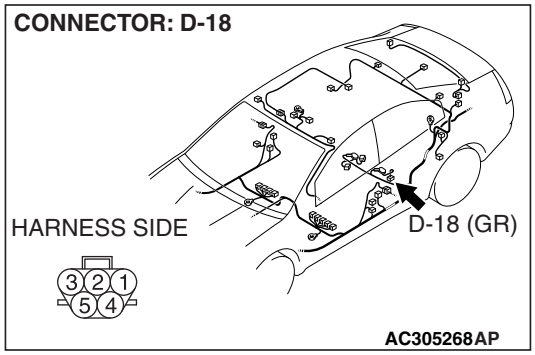
YES : Go to Step 4.
NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The combination meter work normally.

STEP 4. Check the fuel level sensor (sub).

Check to see if the fuel level sensor (sub) is normal. Refer to P.54A-124.

Q: Is the fuel level sensor (sub) normal?

YES : Go to Step 5.
NO : Replace the fuel level sensor (Refer to GROUP 13C, Fuel Tank P.13C-12).



STEP 5. Check fuel pump module connector D-18 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is fuel pump module connector D-18 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. Verify that the combination meter work normally.

STEP 6. Check the fuel pump module.

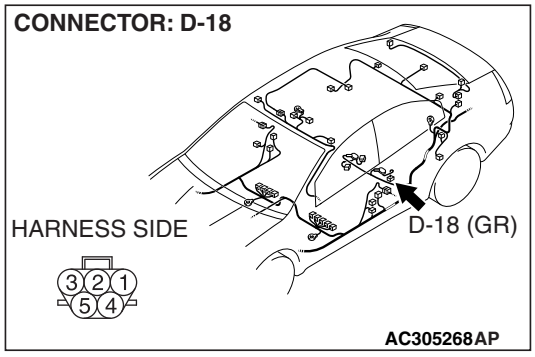
Check to see if the fuel pump module is normal. Refer to P.54A-124.

Q: Is the fuel pump module normal?

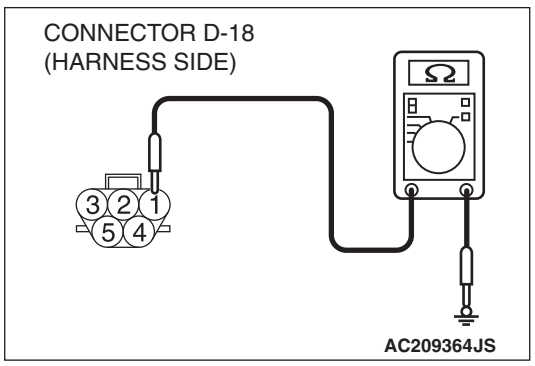
YES : Go to Step 7.

NO : Replace the fuel pump module (Refer to GROUP 13C, Fuel Tank P.13C-12). The fuel gauge should now operate normally.

STEP 7. Check the ground circuit to the fuel pump module. Measure the resistance at fuel pump module connector D-18.



(1) Disconnect fuel pump module connector D-18 and measure the resistance available at the harness side of the connector.

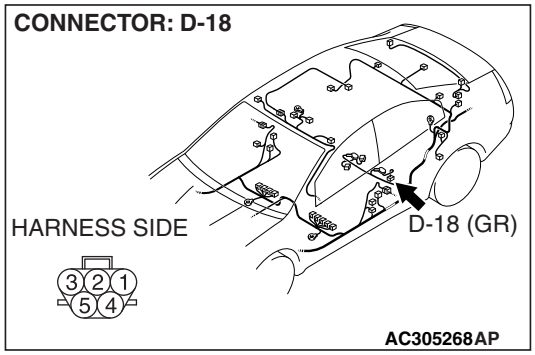


(2) Measure the resistance value between terminal 1 and ground.
- The resistance should be 2 ohms or less.

Q: Is the measured resistance 2 ohms or less?

YES : Go to Step 8.

NO : Go to Step 9.



STEP 8. Check the wiring harness between fuel pump module connector D-18 (terminal 1) and ground.

- Check the ground wire for open circuit.

Q: Is the wiring harness between fuel pump module connector D-18 (terminal 1) and ground in good condition?

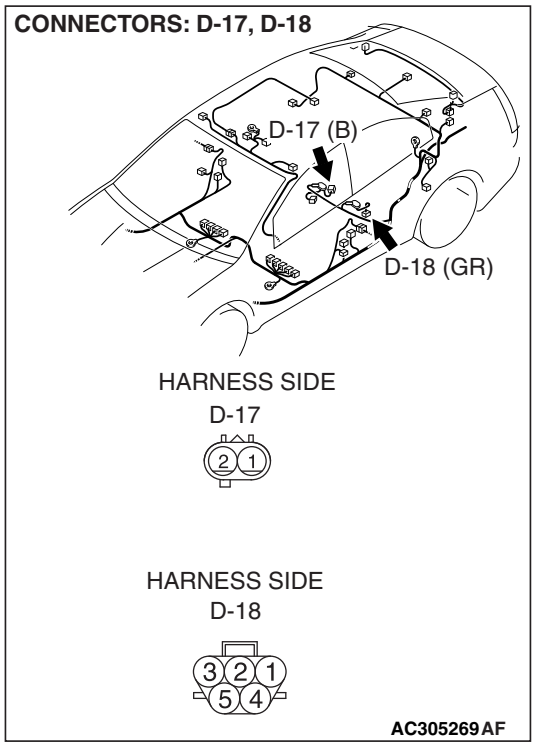
YES : An intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction P.00-14.

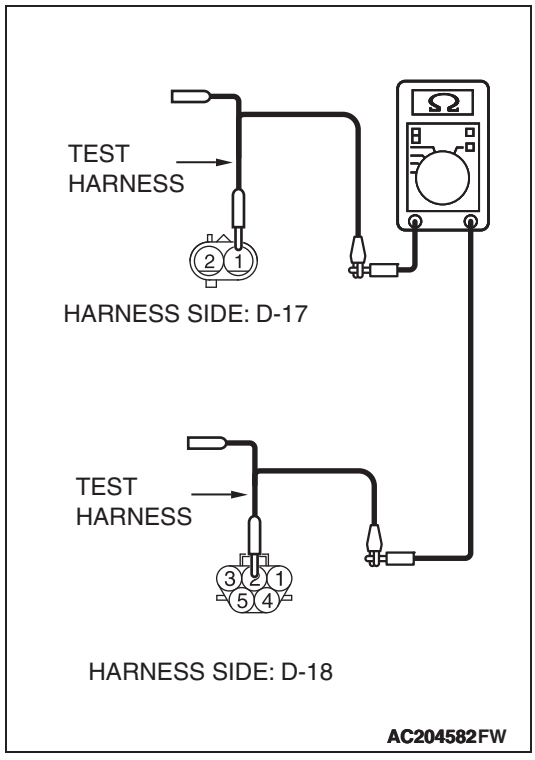
NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Verify that the combination meter work normally.

STEP 9. Check the wiring harness between fuel level sensor (sub) connector D-17 (terminal 1) and fuel pump module connector D-18 (terminal 2)

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

(1) Disconnect fuel level sensor (sub) connector D-17 and fuel pump module connector D-18, and measure the resistance at the wiring harness side.



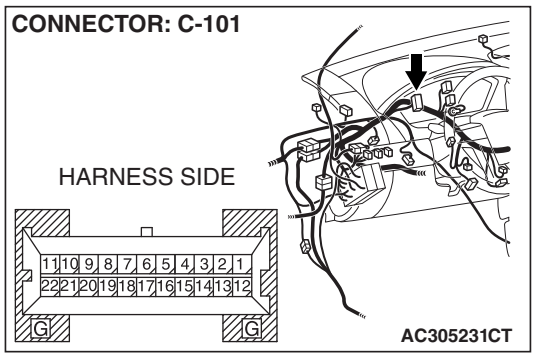


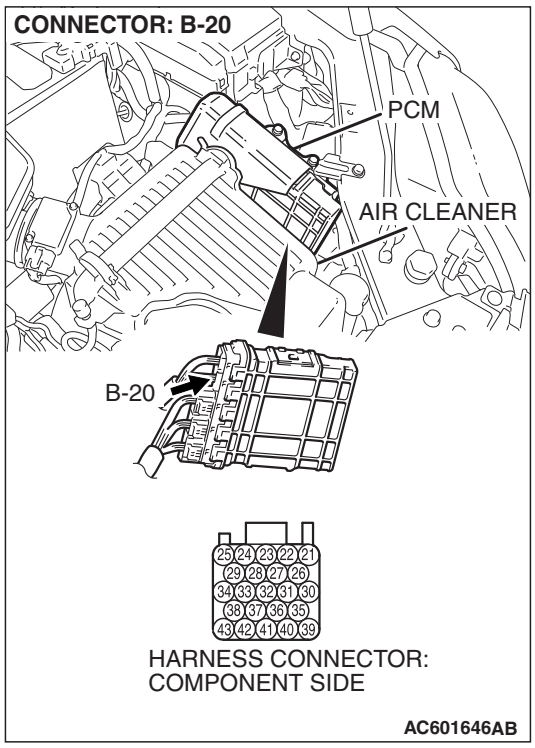
(2) Measure the resistance between fuel level sensor (sub) connector D-17 terminal 1 and fuel pump module connector D-18 terminal 2.

- The resistance should be 2 ohms or less.

Q: Is the measured resistance 2 ohms or less?

YES : Go to Step 10.
NO : Repair the wiring harness.



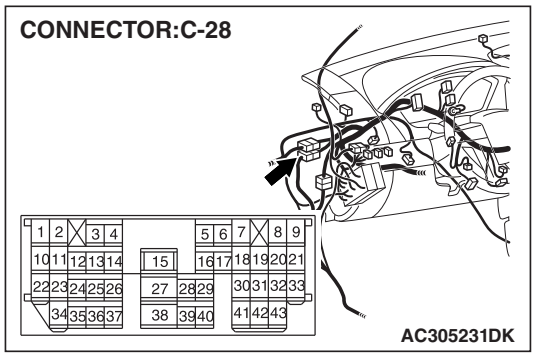


STEP 10. Check combination meter connector C-101 and powertrain control module connector B-20 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are combination meter connector C-101 and powertrain control module connector B-20 in good condition?

YES : Go to Step 11.

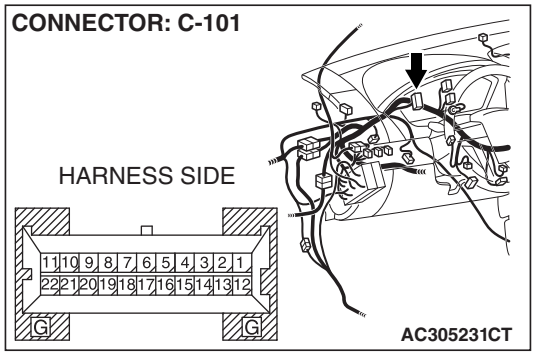
NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Verify that the combination meter work normally.



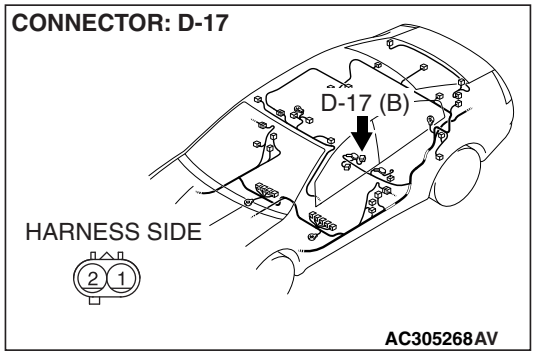
STEP 11. Check the wiring harness between combination meter connector C-101 (terminal 13) and fuel level sensor (sub) connector D-17 (terminal 2).

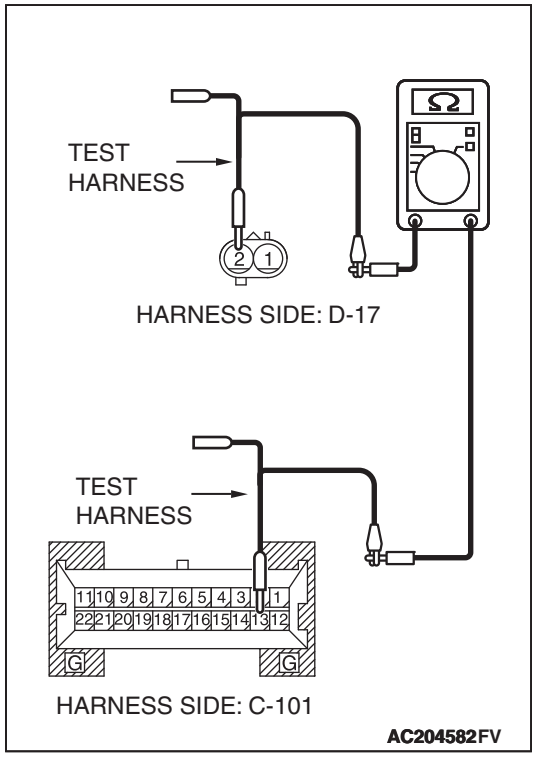
- Check the communication lines for open circuit and short circuit.

  NOTE: Also check intermediate connector C-28 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-28 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P.00E-2.



(1) Disconnect combination meter connector C-101 and fuel level sensor (sub) connector D-17, and measure the resistance at the wiring harness side.





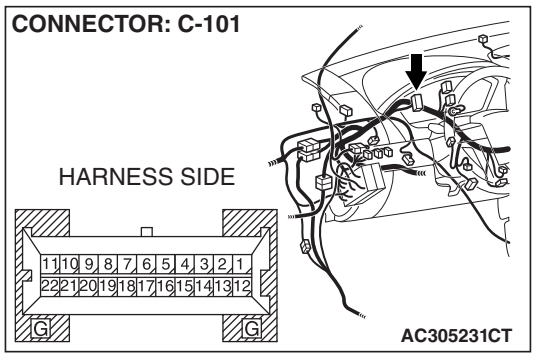
(2) Measure the resistance between combination meter connector C-101 terminal 13 and fuel level sensor (sub) connector D-17 terminal 2.
- The resistance should be 2 ohms or less.

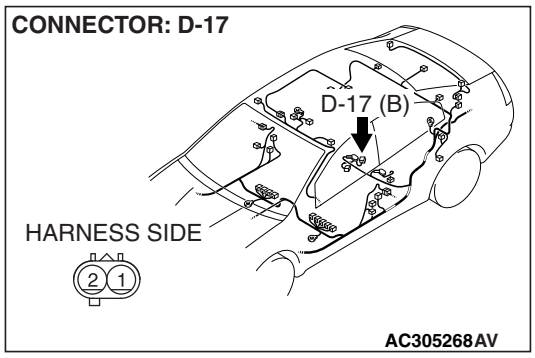
Q: Is the measured resistance 2 ohms or less?

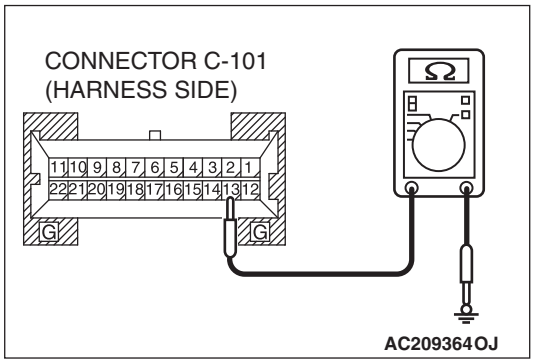
YES : Go to Step 12.
NO : Repair the wiring harness.

STEP 12. Check the wiring harness between combination meter and the fuel level sensor (sub) for short to ground. Measure the resistance at combination meter connector C-101.

(1) Disconnect combination meter connector C-101 and fuel level sensor (sub) connector D-17, and measure the resistance available at the harness side of the combination meter connector C-101.







(2) Measure the resistance value between terminal 13 and ground.
- The resistance should be 1 kΩ or more.

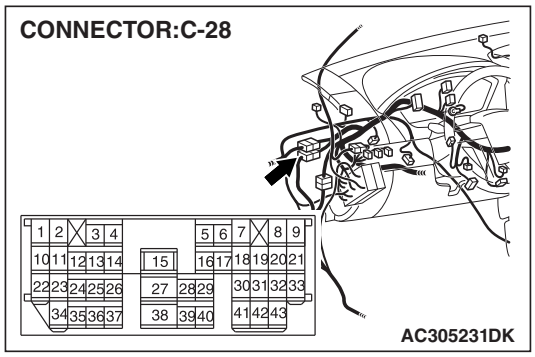
Q: Is the measured resistance 1 kΩ or more?

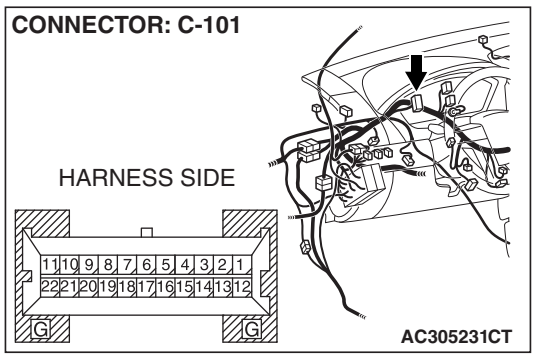
YES : Go to Step 14.
NO : Go to Step 13.

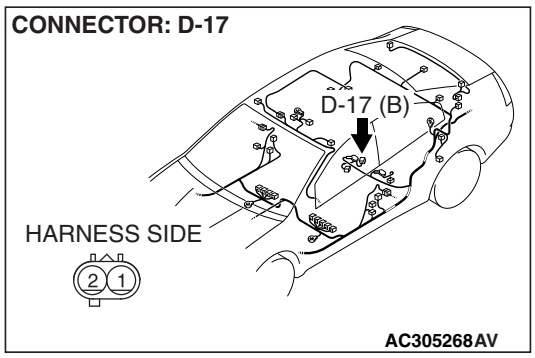
STEP 13. Check the wiring harness between combination meter connector C-101 (terminal 13) and fuel level sensor (sub) connector D-17 (terminal 2).

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

NOTE: Also check intermediate connector C-28 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-28 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P.00E-2.







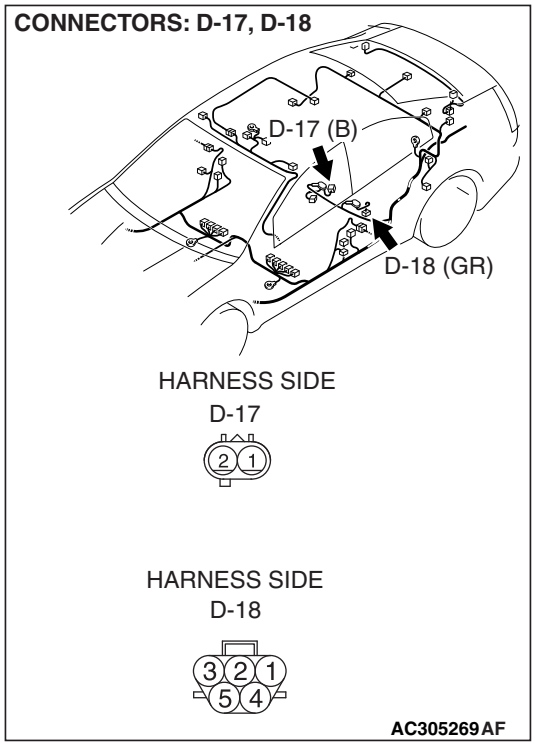
Q: Is the wiring harness between combination meter connector C-101 (terminal 13) and fuel level sensor (sub) connector D-17 (terminal 2) in good condition?

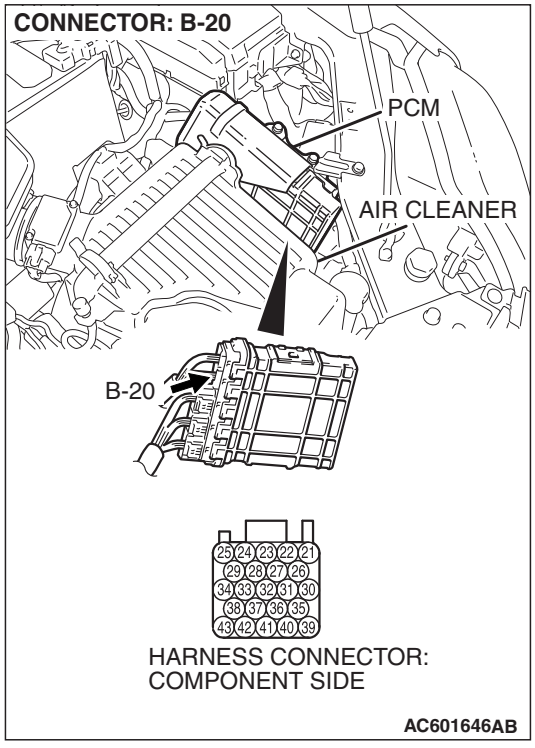
YES : An intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction P.00-14.

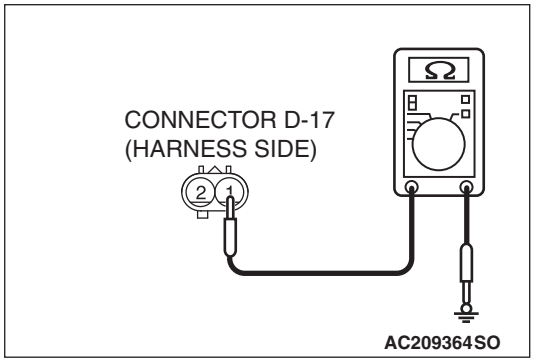
NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Verify that the combination meter work normally.

STEP 14. Check the wiring harness between fuel level sensor (sub), the fuel pump module and the powertrain control module for short to ground. Measure the resistance at fuel level sensor (sub) connector D-17.

(1) Disconnect fuel level sensor (sub) connector D-17, fuel pump module connector D-18 and powertrain control module connector B-20, and measure the resistance available at the harness side of the fuel level sensor (sub) connector D-17.





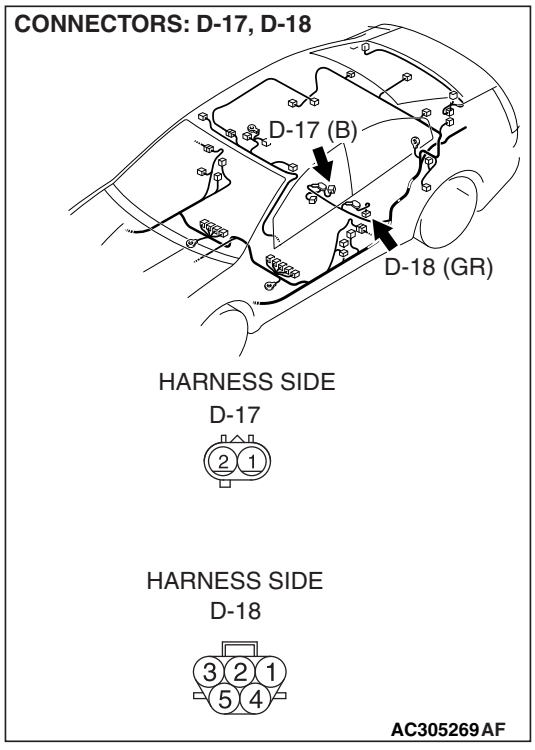


(2) Measure the resistance value between terminal 1 and ground.
- The resistance should be 1 kΩ or more.

Q: Is the measured resistance 1 kΩ or more?

YES : Go to Step 17.
NO : Go to Step 15.

STEP 15. Check the wiring harness between fuel level sensor (sub) connector D-17 (terminal 1) and fuel pump module connector D-18 (terminal 2).
- Check the communication lines for open circuit and short circuit.



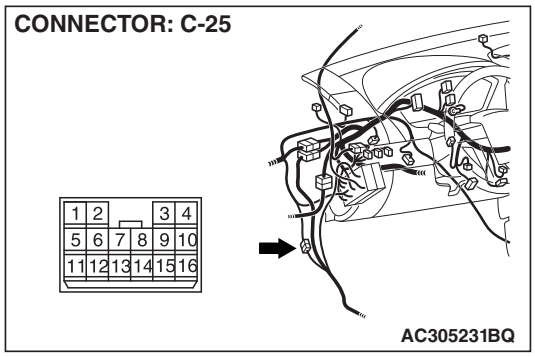
Q: Is the wiring harness between fuel level sensor connector D-17 (terminal 1) and fuel pump module connector D-18 (terminal 2) in good condition?

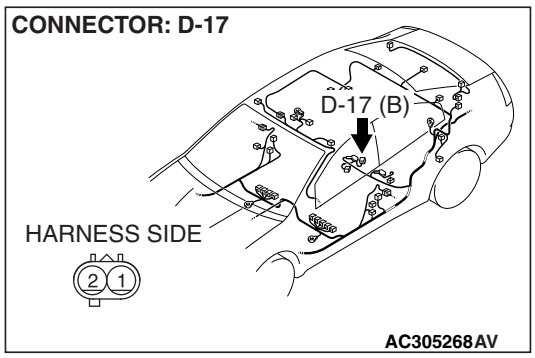
YES : Go to Step 16.
NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Verify that the combination meter work normally.

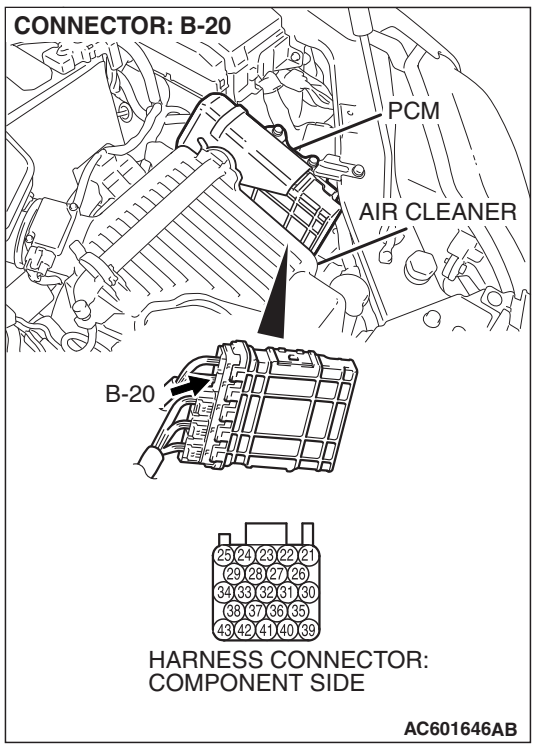
STEP 16. Check the wiring harness between fuel level sensor (sub) connector D-17 (terminal 1) and powertrain control module connector B-20 (terminal 24).

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

NOTE: Also check intermediate connector C-25 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-25 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P.00E-2.







Q: Is the wiring harness between fuel level sensor connector D-17 (terminal 1) and powertrain control module connector B-20 (terminal 24) in good condition?

YES : Go to Step 17.

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

STEP 17. Replace the combination meter, and then recheck the DTC.

Replace the combination meter, and then check that the DTC is not reset.

Q: Is the check result normally?

YES : The procedure is complete.

NO : Replace powertrain control module. When the powertrain control module is replaced, register the encrypted code. Refer to P.54A-40.

STEP 18. Recheck for diagnostic trouble code.

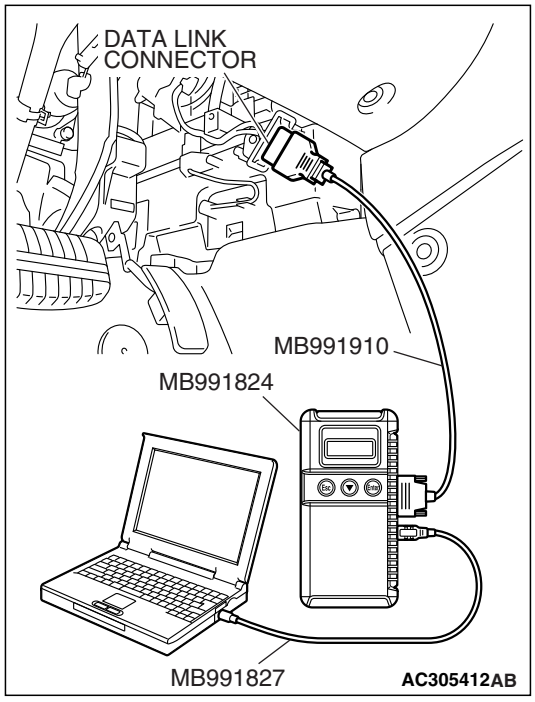
Recheck if the DTC is set.

(1) Erase the DTC.
(2) Turn the ignition switch to "OFF" position.
(3) Turn the ignition switch to "ON" position.
(4) Drive the vehicle and check that the diagnostic trouble code is not set.

Q: Is the check result satisfactory?

YES : The procedure is complete.

NO : Replace combination meter.



DTC U1073: Bus Off

⚠ CAUTION

If DTC U1073 is set in the combination meter, always diagnose the CAN bus lines.

⚠ CAUTION

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

CIRCUIT OPERATION

Some instruments of the combination meter are linked to the CAN bus line. Both the combination meter and the powertrain control module have a terminator resistor.

DTC SET CONDITION

If the combination meter ceases communicating once (i.e. bus off) and then returns to it, the combination meter will not communicate for five minutes immediately after that point. This five minute period is called "Penalty mode." Immediately after the combination meter returns to communication, the DTC is set.

TECHNICAL DESCRIPTION (COMMENT)

The wiring harness or connectors may have loose, corroded, or damage terminals, or terminals pushed back in the connector, or the combination meter may be defective.

TSB Revision

TROUBLESHOOTING HINTS

- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- Malfunction of combination meter

DIAGNOSIS

Required Special Tools:

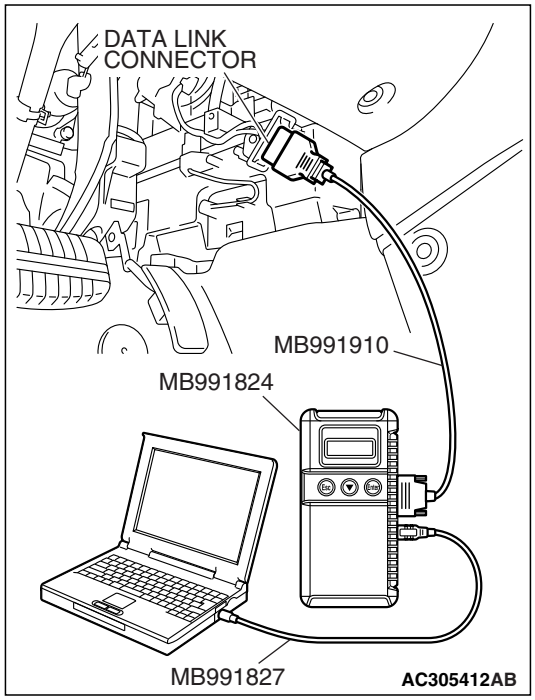
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

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

Use scan tool MB991958 to diagnose the CAN bus lines.
(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to "ON" position.
(3) Diagnose the CAN bus line.

Q: Is the check result satisfactory?

YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C, Diagnosis - Can Bus Diagnostic Chart P.54C-13).



STEP 2. Recheck for diagnostic trouble code.

Recheck if the DTC is set.

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

Q: Is the DTC set?

YES : Replace combination meter.
NO : An intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction P.00-14.

TSB Revision

DTC U1100: Powertrain Control Module Time-out (Related to Engine)
DTC U1101: Powertrain Control Module Time-out (Related to A/T)

⚠ CAUTION
If DTC U1100 or U1101 is set in the combination meter, always diagnose the CAN bus lines.

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

NOTE: When the DTC relating to the CAN communication error are set, make sure of the vehicle equipment. When the vehicle is not equipped with the system the combination meter communicates to, the DTC is always set. This is not abnormal.

DTC SET CONDITION

U1100

- The combination meter receives engine control system-related signals from the powertrain control module via CAN bus lines. If the display unit can not receives the necessary signals, DTC U1100 will be set.

U1101

- The combination meter receives A/T control system-related signal from the powertrain control module via CAN bus lines. If the display unit can not receive the necessary signals, DTC U1101 will be set.

TECHNICAL DESCRIPTION (COMMENT)

⚠ CAUTION
If the ignition switch is turned to the ON position without starting the engine, DTC (past trouble) 017 and 018 may be set on the combination meter (incorporating meter-ECU) after three minutes.

Current trouble

- Connector(s) or wiring harness in the CAN bus lines between the powertrain control module and the combination meter, the power supply system to the powertrain control module, the powertrain control module itself, or the combination meter may be defective.

Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness in the CAN bus lines between the powertrain control module and the combination meter, and the power supply system to the powertrain control module. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-14).

  NOTE: For a past trouble, you may not find it by the M.U.T.-III CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-14.) and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the DTC, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54C, CAN bus line Diagnostics Flow P.54C-6).

TROUBLESHOOTING HINTS

- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- Malfunction of powertrain control module
- Malfunction of combination meter

DIAGNOSIS

Required Special Tools:

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

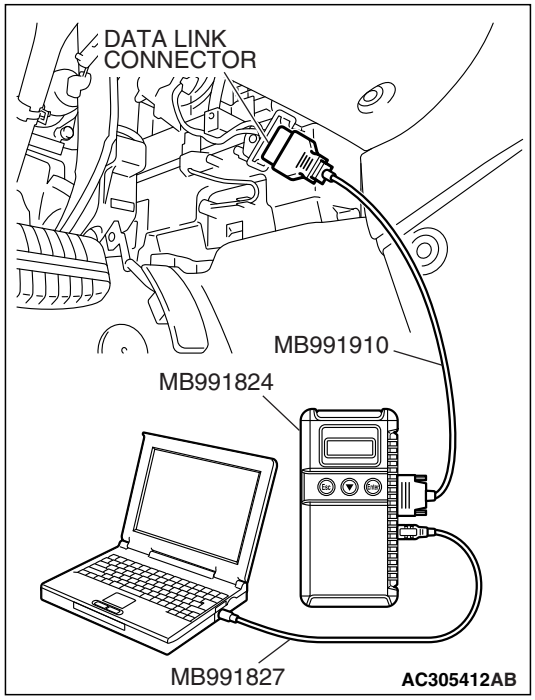
STEP 1. Using scan tool MB991958, diagnose the CAN bus line.

Use scan tool MB991958 to diagnose the CAN bus lines.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to "ON" position.
(3) Diagnose the CAN bus line.

Q: Is the check result satisfactory?

YES : Go to Step 2.
NO : Repair the CAN bus lines (Refer to GROUP 54C, Diagnosis-Can Bus Diagnostic Chart P.54C-13). On completion, go to Step 6.



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

Check if an MFI system DTC is set.

Q: Is the DTC set?

YES : Diagnose the MFI system by referring to GROUP 13A, MFI Diagnosis –Diagnostic Trouble Code Chart P.13A-46 <2.4L ENGINE> or GROUP 13B, MFI Diagnosis –Diagnostic Trouble Code Chart P.13B-46 <3.8L ENGINE>.
NO : Go to Step 3.

STEP 3. Using scan tool MB991958, read the diagnostic trouble code related to the other system.

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

TCL/ASC-ECU
- DTC U1100: Powertrain control module time-out (related to Engine)
- DTC U1101: Powertrain control module time-out (related to automatic transaxle)

Multi-center display
- DTC U1100: Powertrain control module time-out (related to Engine)
- DTC U1101: Powertrain control module time-out (related to A/T)

ETACS-ECU
- DTC U1100: Powertrain control module time-out (related to Engine)
- DTC U1101: Powertrain control module time-out (related to A/T)

A/C-ECU
- DTC U1100: Powertrain control module time-out (related to Engine)

Q: Is the DTC set?

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

STEP 4. Recheck for diagnostic trouble code.

Recheck if the DTC is set.

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

Q: Is the DTC set?

YES : Replace powertrain control module and then go to Step 6.
NO : A poor connection, open circuit or other intermittent malfunction is present in the CAN bus lines between the powertrain control module and the combination meter (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-14).

STEP 5. Recheck for diagnostic trouble code.
Recheck if the DTC is set.
1. Erase the DTC.
2. Turn the ignition switch to "ON" position.
3. Check if the DTC is set.

Q: Is the DTC set?
YES : Replace combination meter and then go to Step 6.
NO : A poor connection, open circuit or other intermittent malfunction is present in the CAN bus lines between the powertrain control module and the combination meter (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-14).

STEP 6. Recheck for diagnostic trouble code.
Recheck if the DTC is set.
1. Erase the DTC.
2. Turn the ignition switch to "ON" position.
3. Check if the DTC is set.

Q: Is the DTC set?
YES : Go to Step 1.
NO : The procedure is complete.

DTC U1102: TCL/ASC-ECU Time-out

⚠ CAUTION
If DTC U1102 is set in the combination meter, always diagnose the CAN bus lines.

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

NOTE: When the DTC relating to the CAN communication error are set, make sure of the vehicle equipment. When the vehicle is not equipped with the system the combination meter communicates to, the DTC is always set. This is not abnormal.

DTC SET CONDITION

The combination meter communicates with the TCL/ASC-ECU through CAN bus lines. If it can not receive all the necessary signals from the TCL/ASC-ECU, DTC U1102 is set.

TECHNICAL DESCRIPTION (COMMENT)

⚠ CAUTION
If the ignition switch is turned to the ON position without starting the engine, DTC (past trouble) U1100, U1101 and U1102 may be set on the combination meter after one minutes.

Current trouble
- Connector(s) or wiring harness in the CAN bus lines between the TCL/ASC-ECU and the combination meter, the power supply system to the TCL/ASC-ECU, the TCL/ASC-ECU itself, or the combination meter may be defective.

Past trouble
- Carry out diagnosis with particular emphasis on connector(s) or wiring harness in the CAN bus lines between the TCL/ASC-ECU and the combination meter, and the power supply system to the TCL/ASC-ECU. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-14).

NOTE: For a past trouble, you may not find it by the M.U.T.-III CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-14.) and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the DTC, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54C, CAN bus line Diagnostics Flow P.54C-6).

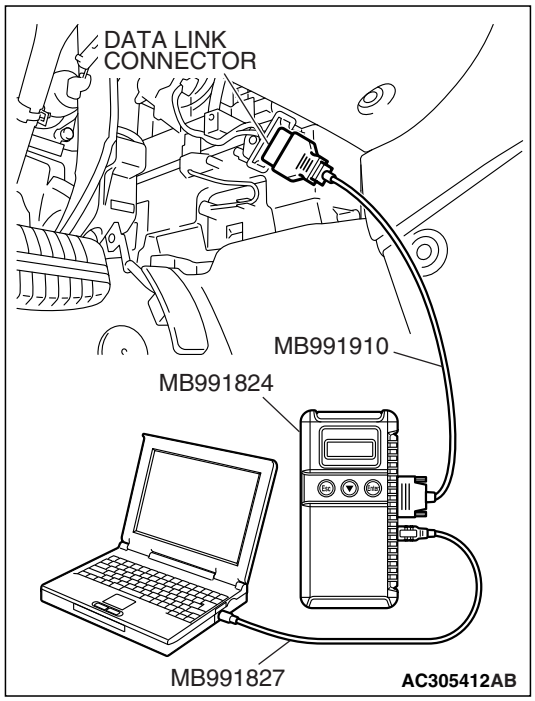
TROUBLESHOOTING HINTS

- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- Malfunction of TCL/ASC-ECU
- Malfunction of combination meter

DIAGNOSIS

Required Special Tools:

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



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

Use scan tool MB991958 to diagnose the CAN bus lines.
(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to "ON" position.
(3) Diagnose the CAN bus line.

Q: Is the check result satisfactory?

YES : Go to Step 2.
NO : Repair the CAN bus lines (Refer to GROUP 54C, Diagnosis –Can Bus Diagnostic Chart P.54C-13). On completion, go to Step 6.

STEP 2. Using scan tool MB991958, read TCL/ASC diagnostic trouble code.

Check that the TCL/ASC-ECU sets a DTC.

Q: Is the DTC set?

YES : Refer to GROUP 35C, Diagnosis –Diagnostic Trouble Code Chart P.35C-15.
NO : Go to Step 3.

TSB Revision

STEP 3. Using scan tool MB991958, read the MFI diagnostic trouble code.
Check if the powertrain control module has set DTC U1102 (TCL/ASC-ECU time-out).

Q: Is the DTC set?

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

STEP 4. Recheck for diagnostic trouble code.
Recheck if the DTC is set.

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

Q: Is the DTC set?

YES : Replace TCL/ASC-ECU and then go to step 6.
NO : A poor connection, open circuit or other intermittent malfunction is present in the lines between the TCL/ASC-ECU and the combination meter (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-14).

STEP 5. Recheck for diagnostic trouble code.
Recheck if the DTC is set.

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

Q: Is the DTC set?

YES : Replace combination meter and go to Step 6.
NO : A poor connection, open circuit or other intermittent malfunction is present in the lines between the TCL/ASC-ECU and the combination meter (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-14).

STEP 6. Recheck for diagnostic trouble code.
Recheck if the DTC is set.

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

Q: Is the DTC set?

YES : Go to Step 1.
NO : The procedure is complete.

DTC U1109: ETACS-ECU Time-out

⚠ CAUTION
If DTC U1109 is set in the combination meter, diagnose the CAN main bus line.

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

NOTE: When the DTC relating to the CAN communication error are set, make sure of the vehicle equipment. When the vehicle is not equipped with the system the combination meter communicates to, the DTC is always set. This is not abnormal.

CIRCUIT OPERATION

The ETACS-ECU communicates with the combination meter and the powertrain control module via CAN bus line to obtain necessary information. Both the combination meter and the powertrain control module have terminator resistors.

DTC SET CONDITION

The combination meter receives signal from the ETACS-ECU via CAN bus lines. If it can not receive all the necessary signals from the ETACS-ECU, DTC U1109 is set.

TECHNICAL DESCRIPTION (COMMENT)

Current trouble

- Connector(s) or wiring harness in the CAN bus lines between the ETACS-ECU and the combination meter, the power supply system to the ETACS-ECU, the ETACS-ECU itself, or the combination meter may be defective.

Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness in the CAN bus lines between the ETACS-ECU and the combination meter, and the power supply system to the ETACS-ECU. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-14).

  NOTE: For a past trouble, you may not find it by the M.U.T.-III CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-14.) and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the DTC, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54C, CAN bus line Diagnostics Flow P.54C-6).

TROUBLESHOOTING HINTS

- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- Malfunction of ETACS-ECU
- Malfunction of combination meter (incorporating ECU)

DIAGNOSIS

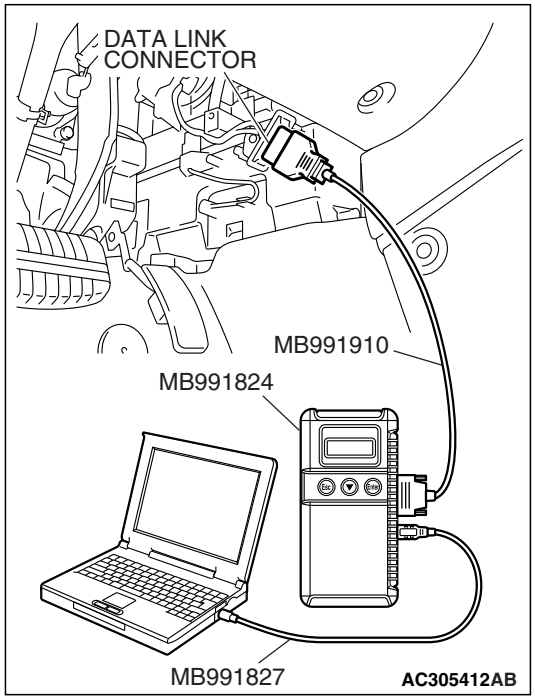
Required Special Tools:

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

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

Use scan tool MB991958 to diagnose the CAN bus lines.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to "ON" position.
(3) Diagnose the CAN bus line.



Q: Is the check result satisfactory?

YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C, Diagnosis –Can Bus Diagnostic Chart P.54C-13). On completion, go to Step 4.

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

Check that the ETACS-ECU sets a DTC.

Q: Is the DTC set?

YES : Diagnose the SWS system by referring to P.54B-26.
NO : Go to Step 3.

STEP 3. Using scan tool MB991958, read the multi-center display diagnostic trouble code.

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

- Multi-center display
  DTC 019: ETACS-ECU time-out

Q: Is the DTC set?

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

STEP 4. Recheck for diagnostic trouble code.

Recheck if the DTC is set.

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

Q: Is the DTC set?

YES : Replace ETACS-ECU and then go to step 6.

NO : A poor connection, open circuit or other intermittent malfunction is present in the lines between the ETACS-ECU and the combination meter (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-14).

STEP 5. Recheck for diagnostic trouble code.

Recheck if the DTC is set.

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

Q: Is the DTC set?

YES : Replace combination meter and then go to step 6.

NO : A poor connection, open circuit or other intermittent malfunction is present in the lines between the ETACS-ECU and the combination meter (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-14).

STEP 6. Recheck for diagnostic trouble code.

Recheck if the DTC is set.

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

Q: Is the DTC set?

YES : Go to Step 1.

NO : The procedure is complete.

DTC U1112: SRS-ECU Time-out

⚠ CAUTION
If DTC U1112 is set in the combination meter, always diagnose the CAN bus lines.

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

NOTE: When the DTC relating to the CAN communication error are set, make sure of the vehicle equipment. When the vehicle is not equipped with the system the combination meter communicates to, the DTC is always set. This is not abnormal.

DTC SET CONDITION

The combination meter communicates with the SRS-ECU through CAN bus lines. If it can not receive all the necessary signals from the SRS-ECU, DTC U1112 is set.

TECHNICAL DESCRIPTION (COMMENT)

Current trouble

- Connector(s) or wiring harness in the CAN bus lines between the SRS-ECU and the combination meter, the power supply system to the SRS-ECU, the SRS-ECU itself, or the combination meter may be defective.

Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness in the CAN bus lines between the SRS-ECU and the combination meter, and the power supply system to the SRS-ECU. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-14).

  NOTE: For a past trouble, you may not find it by the M.U.T.-III CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction P.00-14.) and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the DTC, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54C, CAN bus line Diagnostics Flow P.54C-6).

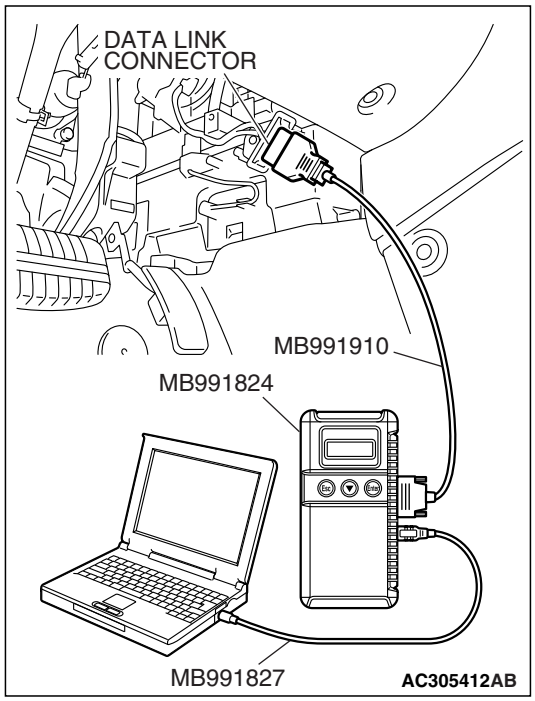
TROUBLESHOOTING HINTS

- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector.
- Malfunction of SRS-ECU
- Malfunction of combination meter

DIAGNOSIS

Required Special Tools:

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



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

Use scan tool MB991958 to diagnose the CAN bus lines.
(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to "ON" position.
(3) Diagnose the CAN bus line.

Q: Is the check result satisfactory?

YES : Go to Step 2.
NO : Repair the CAN bus lines (Refer to GROUP 54C, Diagnosis –Can Bus Diagnostic Chart P.54C-13). On completion, go to Step 4.

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

Check that the SRS-ECU sets a DTC.

Q: Is the DTC set?

YES : Refer to GROUP 52B, Diagnosis –Diagnostic Trouble Code Chart P.52B-33.
NO : Go to Step 3.

STEP 3. Recheck for diagnostic trouble code.

Recheck if the DTC is set.

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

Q: Is the DTC set?

YES : Replace SRS-ECU and then go to step 4.
NO : A poor connection, open circuit or other intermittent malfunction is present in the lines between the SRS-ECU and the combination meter (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-14).

STEP 4. Recheck for diagnostic trouble code.
Recheck if the DTC is set.
1. Erase the DTC.
2. Turn the ignition switch to "ON" position.
3. Check if the DTC is set.

Q: Is the DTC set?

YES : Replace combination meter and then go to step 5.
NO : A poor connection, open circuit or other intermittent malfunction is present in the lines between the ETACS-ECU and the combination meter (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-14).

STEP 5. Recheck for diagnostic trouble code.
Recheck if the DTC is set.
1. Erase the DTC.
2. Turn the ignition switch to "ON" position.
3. Check if the DTC is set.

Q: Is the DTC set?

YES : Go to Step 1.
NO : The procedure is complete.

DTC U1120: Failure Information on Powertrain Control Module (Related to Engine)

⚠ CAUTION
If DTC U1120 is set in the combination meter, diagnose the CAN main bus line.

⚠ CAUTION
If DTC U1120 has been set, SWS related DTC 021 is also set. After SWS has been diagnosed, don't forget to erase DTC 021.

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

DTC SET CONDITION

The combination meter communicates with the powertrain control module via CAN bus line. If failure information is sent to the powertrain control module, DTC U1120 will be set.

TECHNICAL DESCRIPTION (COMMENT)

Current trouble
- The powertrain control module or the combination meter may be defective.

Past trouble
- Carry out diagnosis with particular emphasis on connector(s) or wiring harness between the powertrain control module and the combination meter. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-14).

TROUBLESHOOTING HINTS

- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- Malfunction of powertrain control module
- Malfunction of combination meter

DIAGNOSIS

Required Special Tools:

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

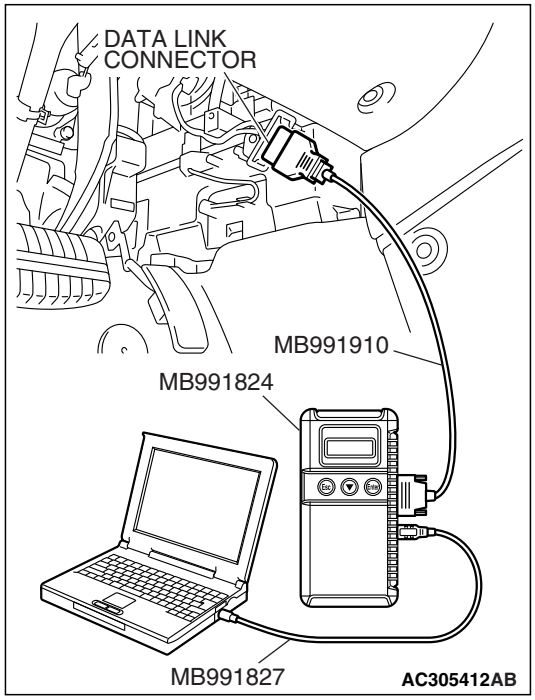
STEP 1. Using scan tool MB991958, diagnose the CAN bus line.

Use scan tool MB991958 to diagnose the CAN bus lines.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to "ON" position.
(3) Diagnose the CAN bus line.

Q: Is the check result satisfactory?

YES : Go to Step 2.
NO : Repair the CAN bus lines (Refer to GROUP 54C, Diagnosis –Can Bus Diagnostic Chart P.54C-13). On completion, go to Step 6.



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

Check if an MFI system DTC is set.

Q: Is the DTC set?

YES : Diagnose the MFI system by referring to GROUP 13A, MFI Diagnosis –Diagnostic Trouble Code Chart P.13A-46 or GROUP 13B, MFI Diagnosis –Diagnostic Trouble Code Chart P.13B-46.
NO : Go to Step 3.

STEP 3. Using scan tool MB991958, read the diagnostic trouble code related to the other system.

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

- TCL/ASC-ECU
  DTC U1120: Failure information on powertrain control module (related to engine)
- Multi-center display
  DTC 020: Failure information on powertrain control module (related to engine)
- A/C-ECU
  DTC U1120: Failure information on powertrain control module (related to engine)

Q: Is the DTC set?

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

STEP 4. Recheck for diagnostic trouble code.

Recheck if the DTC is set.

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

Q: Is the DTC set?

YES : Replace powertrain control module and then go to step 6.
NO : A poor connection, open circuit or other intermittent malfunction is present in the lines between the powertrain control module and the combination meter (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-14).

STEP 5. Recheck for diagnostic trouble code.

Recheck if the DTC is set.

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

Q: Is the DTC set?

YES : Replace combination meter and then go to step 6.
NO : A poor connection, open circuit or other intermittent malfunction is present in the lines between the powertrain control module and the combination meter (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-14).

STEP 6. Recheck for diagnostic trouble code.
Recheck if the DTC is set.
1. Erase the DTC.
2. Turn the ignition switch to "ON" position.
3. Check if the DTC is set.

Q: Is the DTC set?
YES : Go to Step 1.
NO : The procedure is complete.

DTC U1206: Flag invalid

⚠ CAUTION
If DTC U1206 is set in the combination meter, diagnose the CAN main bus line.

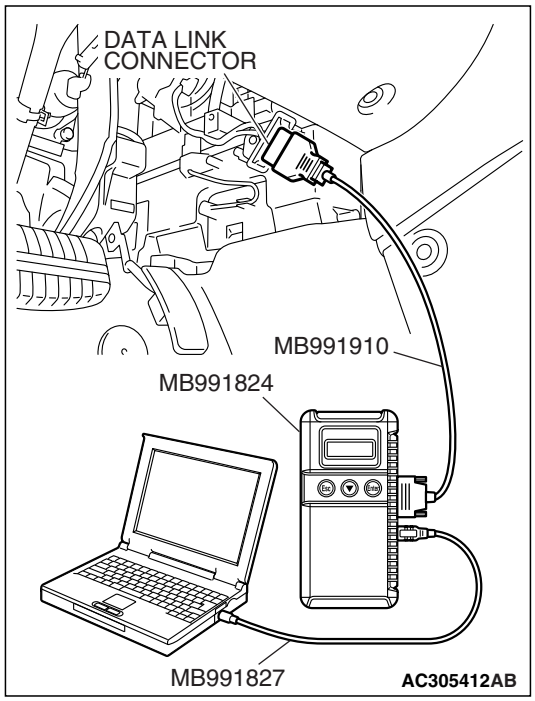
TROUBLE JUDGMENT
When the ignition switch is in the LOCK (OFF) position, the combination meter receives door-open signal or communication standby instruction from the ETACS-ECU and keeps CAN communication. If there is a contradiction between these two signals, DTC U1206 will be set.

COMMENTS ON TROUBLE SYMPTOM
Current trouble
- The door switch system of the ETACS-ECU, the ETACS-ECU, or the combination meter may be defective.

Past trouble
- Carry out diagnosis with particular emphasis on connector(s) or wiring harness between the ETACS-ECU and the door switch, and the power supply system to the ETACS-ECU. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-14).

POSSIBLE CAUSES
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- Malfunction of ETACS-ECU
- Malfunction of combination meter

DIAGNOSIS
Required Special Tools:
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)



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

Use scan tool MB991958 to diagnose the CAN bus lines.
(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to "ON" position.
(3) Diagnose the CAN bus line.

Q: Is the check result satisfactory?

YES : Go to Step 2.
NO : Repair the CAN bus lines (Refer to GROUP 54C, Diagnosis-Can Bus Diagnostic Chart P.54C-13). On completion, go to Step 4.

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

Check that the ETACS-ECU sets a DTC.

Q: Is the DTC set?

YES : Diagnose the SWS system by referring to P.54B-26.
NO : Go to Step 3.

STEP 3. Replace the ETACS-ECU and then recheck the DTC.

Replace the ETACS-ECU, and then check that the DTC is not reset.

Q: Is the DTC set?

YES : Replace combination meter and then go to step 4.
NO : Go to Step 4.

STEP 4. Recheck for diagnostic trouble code.

Recheck if the DTC is set.

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

Q: Is the DTC set?

YES : Go to Step 1.
NO : The procedure is complete.

TSB Revision

SYMPTOM CHART

M1543007202647

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

SYMPTOM	INSPECTION PROCEDURE	REFERENCE PAGE
Communication with scan tool is not possible.	1	P.54A-91
Power supply circuit.	2	P.54A-93
Odometer and trip meter are not displayed.	3	
No needle meters work.	4	
When the ignition switch is turned to the ON position, the indicator and warning lights do not illuminate.	5	
Speedometer does not work.	6	P.54A-99
The fuel gauge needle moves excessively.	7	
Tachometer does not work.	8	P.54A-101
Fuel Gauge does not work (other meters work).	9	P.54A-104
Engine coolant temperature gauge does not work (other meters work).	10	P.54A-112

SYMPTOM PROCEDURES

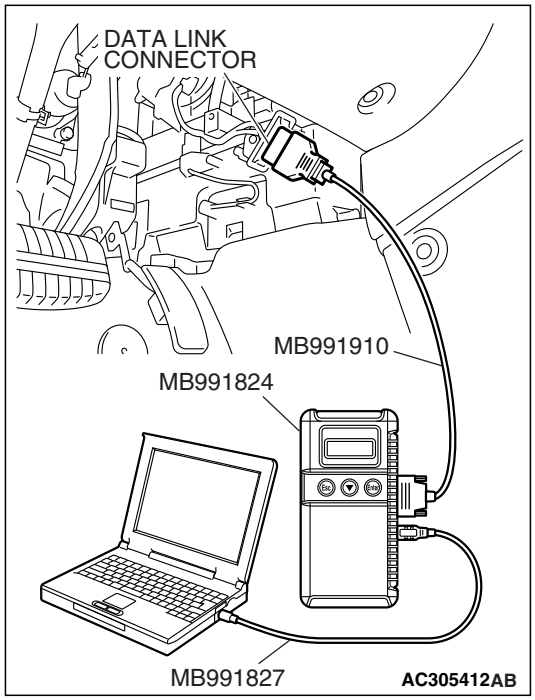
INSPECTION PROCEDURE 1: Communication with Scan Tool is Not Possible.

CIRCUIT OPERATION
The combination meter is linked to the data link connector via CAN bus line to communicate with the scan tool.

TECHNICAL DESCRIPTION (COMMENT)
If the system does not communicate with scan tool, power supply to data link connector or CAN bus lines may be defective.

TROUBLESHOOTING HINTS
- 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
  - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)



STEP 1. Check that the powertrain control module communicates with the scan tool.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to "ON" position.
(3) Check if scan tool MB991958 can communicate with the powertrain control module.

Q: Is the check result satisfactory?

YES : Go to Step 2.
NO : Refer to GROUP 13A, MFI Diagnosis –Diagnostic Trouble Code Chart P.13A-46 or GROUP 13B, MFI Diagnosis –Diagnostic Trouble Code Chart P.13B-46.

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

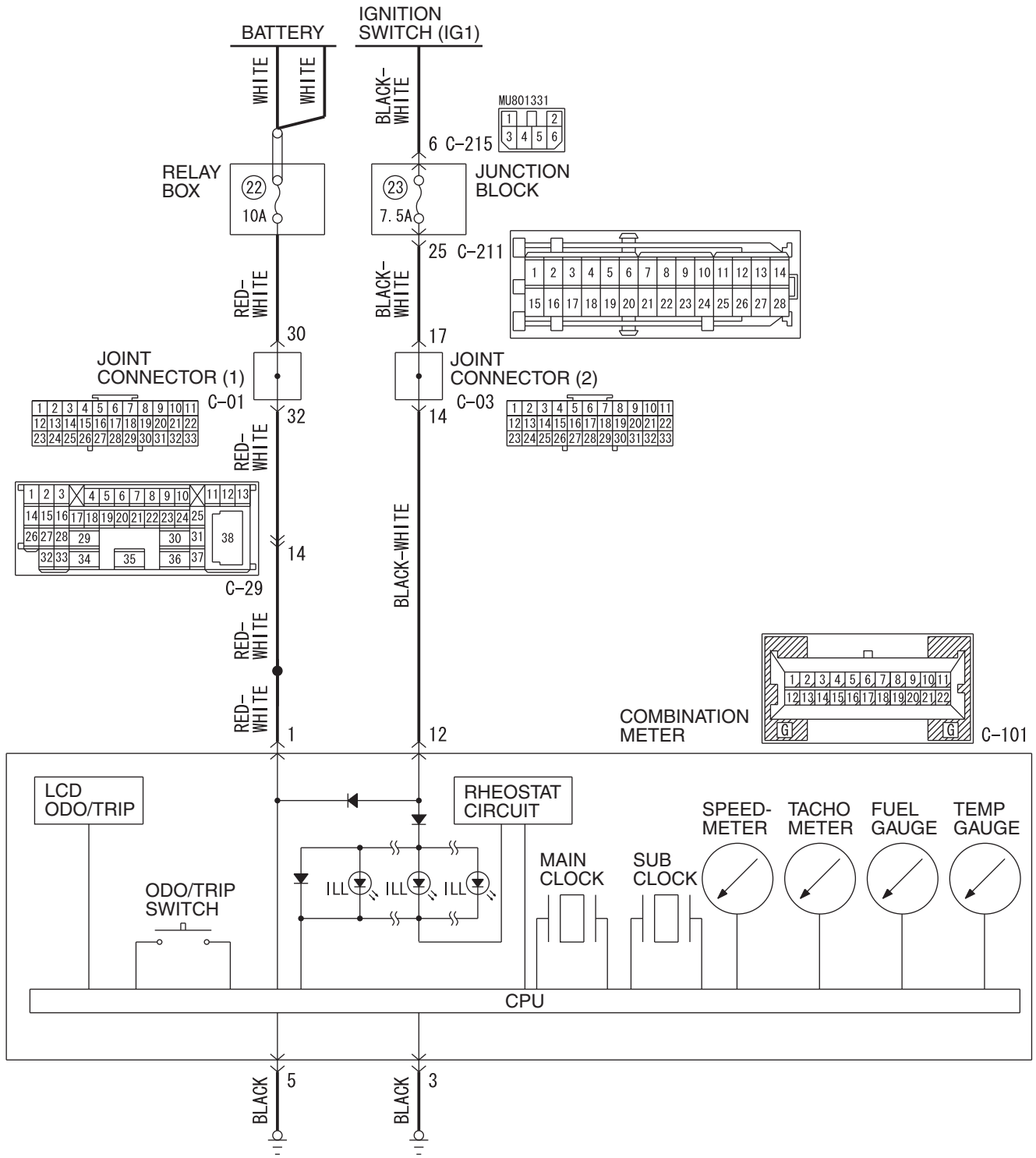
Use scan tool MB991958 to diagnose the CAN bus lines.

Q: Is the check result satisfactory?

YES : Diagnose the power supply circuit. Refer to P.54A-93.
NO : Repair the CAN bus lines (Refer to GROUP 54C, Diagnosis –Can Bus Diagnostic Chart P.54C-13).

INSPECTION PROCEDURE 2: Power Supply Circuit.
INSPECTION PROCEDURE 3: Odometer and Trip Meter are not Displayed.
INSPECTION PROCEDURE 4: No needle meters work.
INSPECTION PROCEDURE 5: When the Ignition Switch is Turned to the ON Position, the Indicator and Warning Lights do not Illuminate.

Combination Meter Power Supply Circuit



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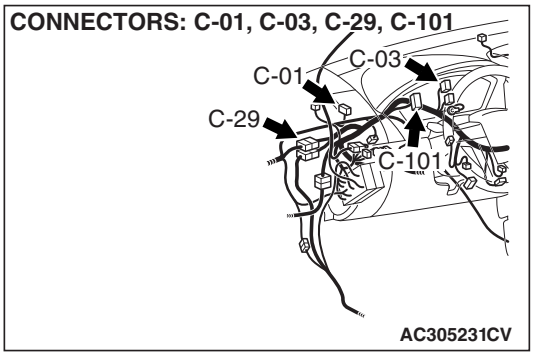
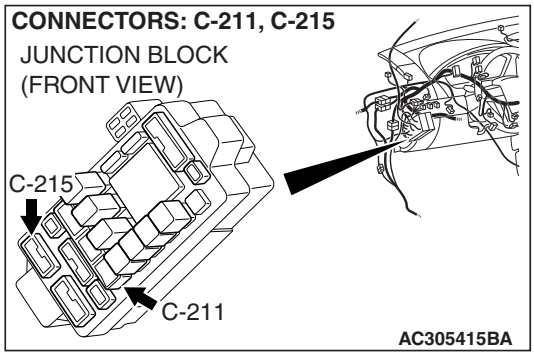




CIRCUIT OPERATION

The combination meter is energized by the battery through ignition switch (IG1).

TECHNICAL DESCRIPTION (COMMENT)

If the odometer and trip meter are not displayed or no needle meters work, power supply and ground system to the combination meter, or the combination meter itself may be defective.

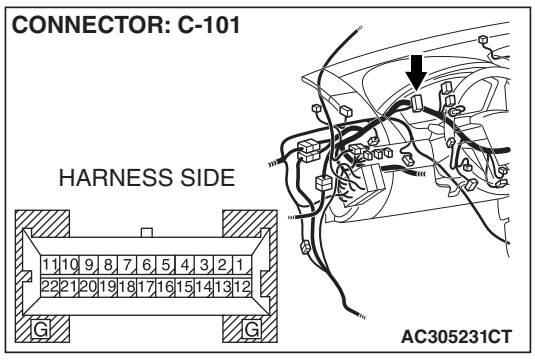
POSSIBLE CAUSES

- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- Malfunction of the combination meter

DIAGNOSIS

Required Special Tool:

- MB991223: Harness set



STEP 1. Check combination meter connector C-101 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

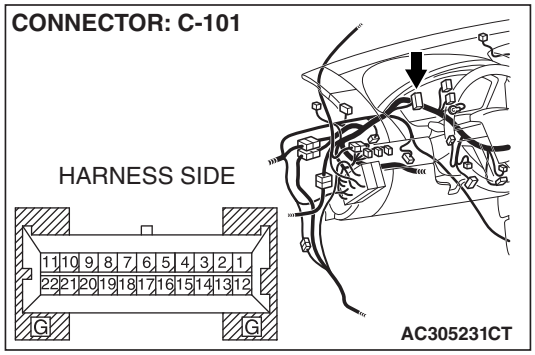
Q: Is combination meter connector C-101 in good condition?

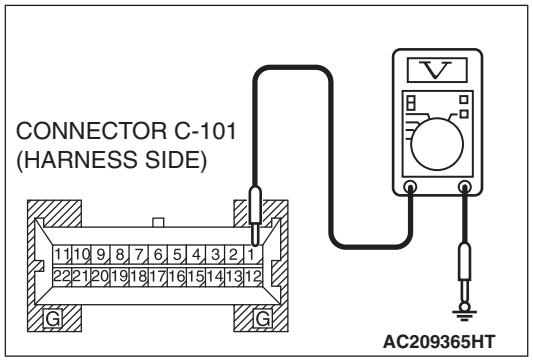
YES : Go to Step 2.

NO : Repair or replace the component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The combination meter works normally.

STEP 2. Measure at combination meter connector C-101 in order to power supply circuit to combination meter (battery power supply).

(1) Disconnect combination meter connector C-101, and measure at the wiring harness side.
(2) Turn the ignition switch to "LOCK" (OFF) position.





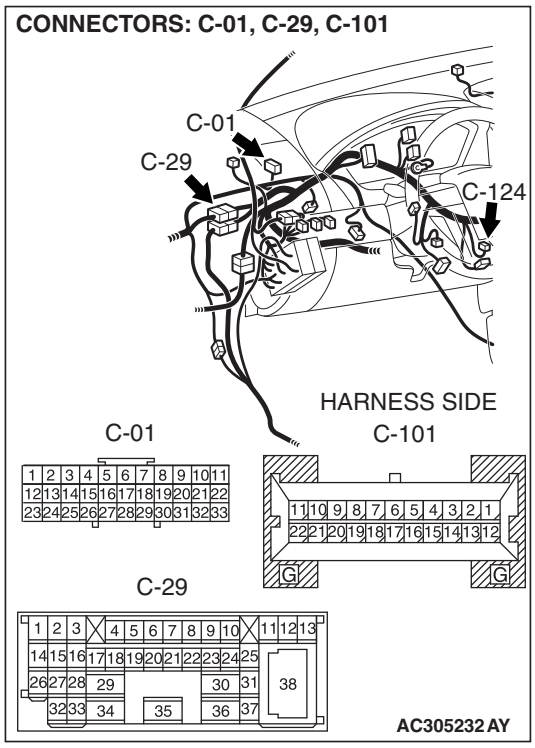
(3) Measure the voltage between terminal 1 and ground.
- The voltage should measure approximately 12 volts (battery positive voltage).

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

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

STEP 3. Check the wiring harness between combination meter connector C-101 (terminal 1) and the fuse No.22.

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



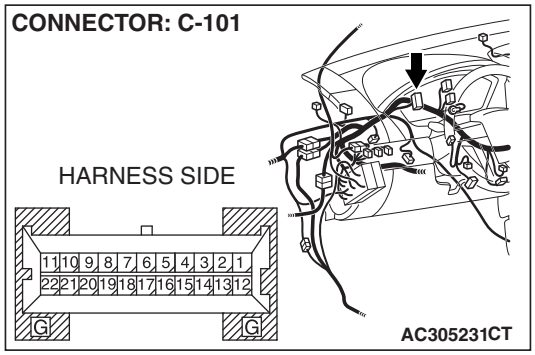
NOTE: Also check intermediate connector C-29 and joint connector (1) C-01 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-29 or joint connector (1) C-01 is damaged, repair or replace. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between combination meter connector C-101 (terminal 1) and the fuse No.22 in good condition?

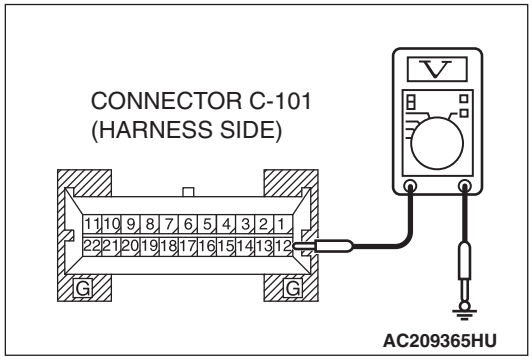
YES : Retest the system.
NO : Repair the wiring harness. Check that the combination meter is normally.

STEP 4. Measure the voltage at combination meter connector C-101 in order to power supply circuit to combination meter (IG1 power supply).

(1) Disconnect combination meter connector C-101, and measure at the wiring harness side.
(2) Turn the ignition switch to "ON" position.



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

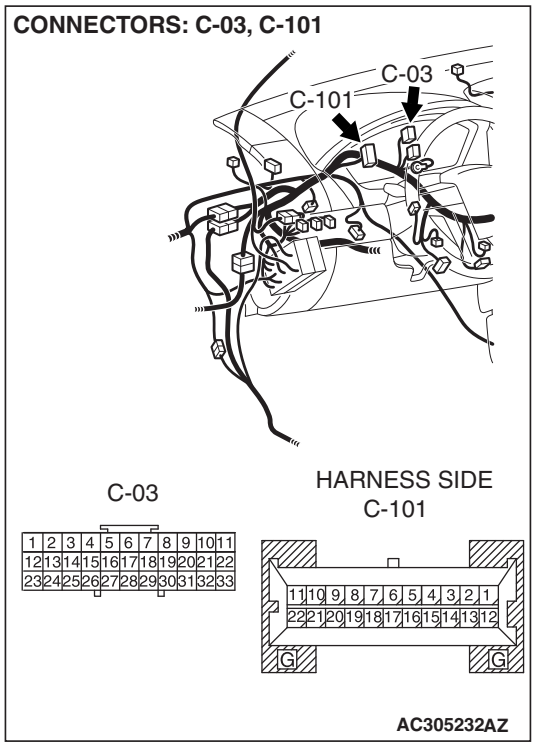


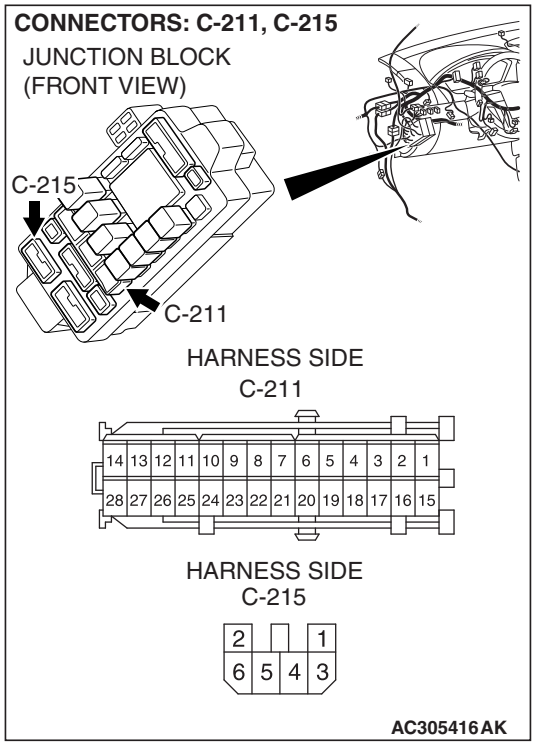
Q: Is the measured voltage approximately 12 volts (battery positive voltage)?

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

STEP 5. Check the wiring harness between combination meter connector C-101 (terminal 12) and the ignition switch (IG1)

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





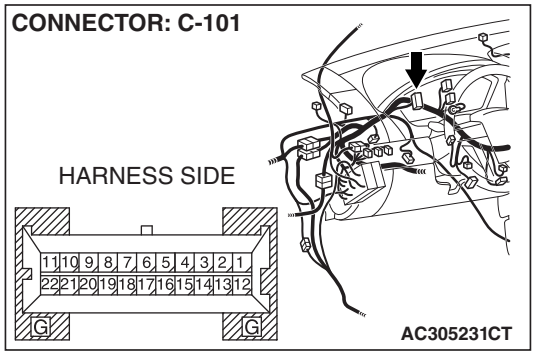
NOTE: Also check joint connector (2) C-03, junction block connector C-211 and C-215 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If inspecting joint connector (2) C-03 or junction block connector C-211 or C-215 is damaged, repair or replace. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between combination meter connector C-101 (terminal 12) and the ignition switch (IG1) in good condition?

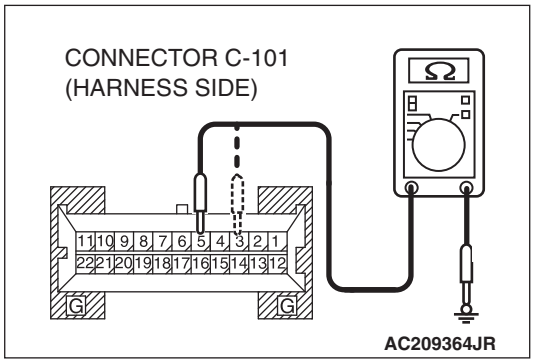
YES : Retest the system.

NO : Repair the wiring harness. Check that the combination meter is normally.

STEP 6. Measure the resistance at combination meter connector C-101 in order to the ground circuit to the combination meter.



(1) Disconnect combination meter connector C-101, and measure at the wiring harness side.



(2) Measure the resistance value between terminal 3, 5 and ground.
- The resistance should be 2 ohms or less.

Q: Is the measured resistance 2 ohms or less?

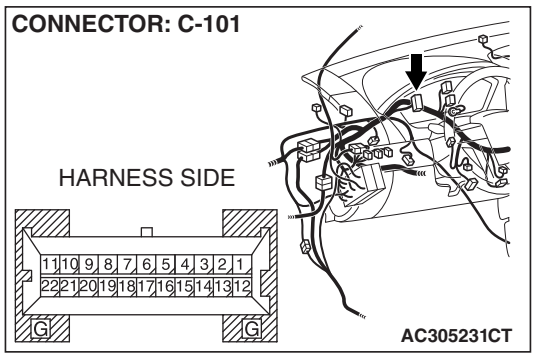
YES : Go to Step 8.
NO : Go to Step 7.

STEP 7. Check the wiring harness between combination meter connector C-101 (terminal 3 and 5) and ground.

- Check the ground wire for open circuit.

Q: Is the wiring harness between combination meter connector C-101 (terminal 3 and 5) and ground in good condition?

YES : Retest the system.
NO : Repair the wiring harness. Check that the combination meter is normally.



STEP 8. Retest the system.

Q: Is the check result satisfactory?

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.00-14).
NO : Replace the combination meter.

INSPECTION PROCEDURE 6: Speedometer does not Work.
INSPECTION PROCEDURE 7: The Fuel Gauge Needle Moves Excessively.

⚠ CAUTION
When the battery cable is disconnected or the combination meter is removed, the fuel gauge learned value will be erased. To let the display unit re-learn it, enter the vehicle speed (by driving the vehicle or entering simulated vehicle speed) and then stop the vehicle.

CIRCUIT OPERATION

The output shaft speed sensor sends vehicle signal to the combination meter via the powertrain control module and the CAN bus line.

TECHNICAL DESCRIPTION (COMMENT)

If only the speedometer does not operate, the powertrain control module system, the combination meter, the wiring harness or its connector may be defective. Furthermore, incorrect level of fuel is shown on the gauge, because the display unit can not learn the fuel gauge.

TROUBLESHOOTING HINTS

- Malfunction of the combination meter
- Malfunction of the powertrain control module
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector.

DIAGNOSIS

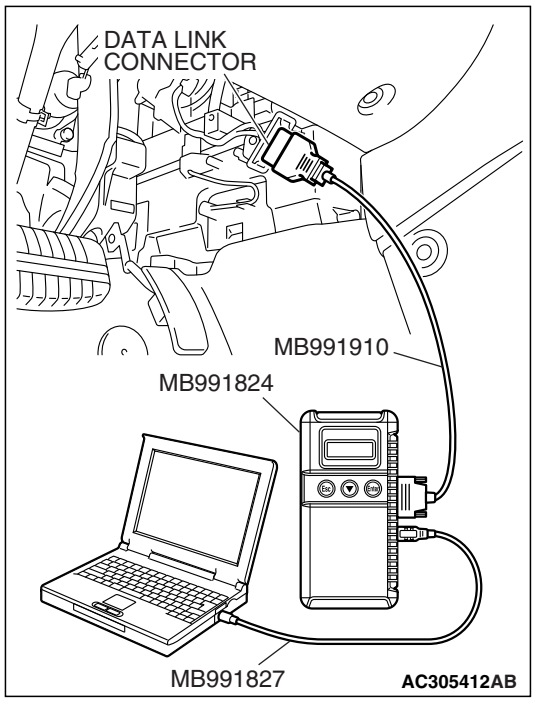
Required Special Tools:
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

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

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to "ON" position.
(3) Diagnose the CAN bus line.

Q: Is the check result satisfactory?

YES : Go to Step 2.
NO : Repair the CAN bus lines (Refer to GROUP 54C, Diagnosis-Can Bus Diagnostic Chart P.54C-13). On completion, go to Step 5.



STEP 2. Using scan tool MB991958, read A/T diagnostic trouble code.

Check if an A/T system DTC is set.

Q: Is the DTC set?

YES : Refer to GROUP 23A, Automatic Transaxle Diagnosis –Diagnostic Trouble Code Chart P.23A-65. On completion, go to Step 5.

NO : Go to Step 3.

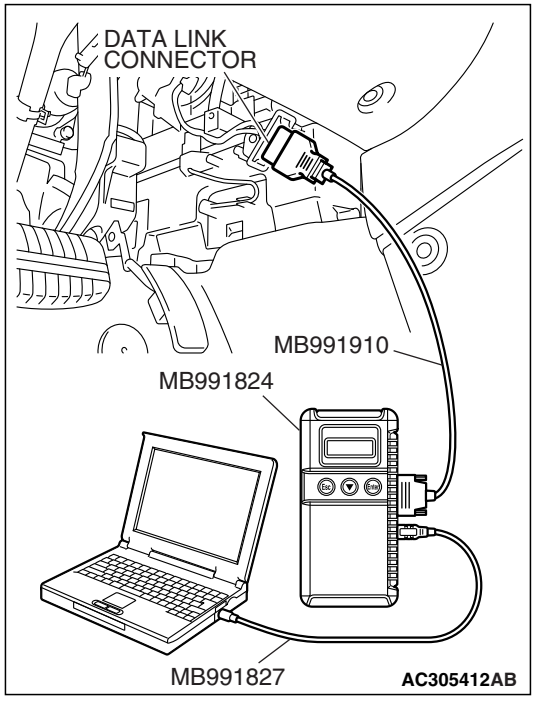
STEP 3. Using scan tool MB991958, check data list.

⚠ 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) Set scan tool MB991958 to the data reading mode.
- Item 80: Speedometer
  - Vehicle speeds displayed on the speedometer and scan tool MB991958 are identical.
- Item 81: Speedometer (Target)
  - Speed meter and scan tool MB991958 displayed values agree with each othervoltage.

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



Q: Is the check result satisfactory?

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

NO : Go to Step 4.

STEP 4. Check the speedometer

Use scan tool MB991958 to enter simulated vehicle speed.
(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 "Meter" from the "BODY" tab.
(6) Select "Simulated vehicle Speed Output."

OK: The speedometer shows that simulated vehicle speed.

Q: Is the check result satisfactory?

YES : Go to Step 5.

NO : Replace the combination meter, then go to Step 5.

STEP 5. Retest the system.
Check that the speedometer works normally.

Q: Is the check result satisfactory?

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.00-14).

NO : Replace the combination meter.

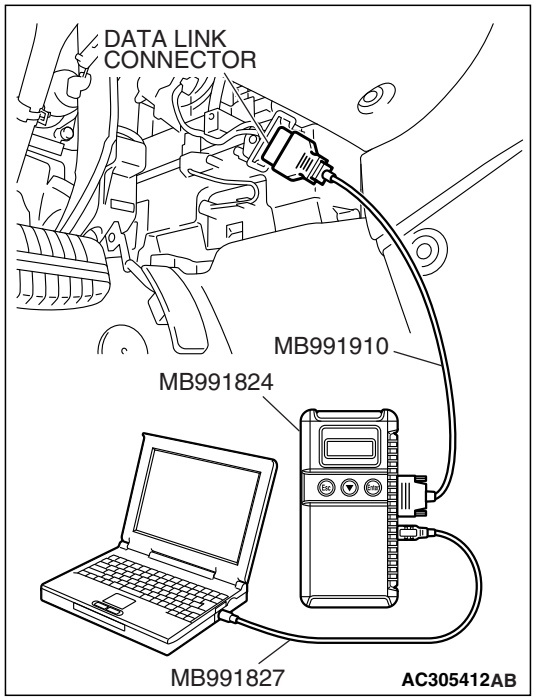
INSPECTION PROCEDURE 8: Tachometer does not Work.

CIRCUIT OPERATION
The powertrain control module sends ignition signal to the combination meter via CAN bus line.

TECHNICAL DESCRIPTION (COMMENT)
If only the tachometer does not operate, the powertrain control module system may not be sending ignition signal, or the combination meter, the wiring harness or its connector may be defective.

TROUBLESHOOTING HINTS
- Malfunction of the combination meter
- 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
  - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)



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

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to "ON" position.
(3) Diagnose the CAN bus line.

Q: Is the check result satisfactory?

YES : Go to Step 2.
NO : Repair the CAN bus lines (Refer to GROUP 54C, Diagnosis, Can Bus Diagnostic Chart P.54C-13). On completion, go to Step 3.

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

Check if the MFI system DTC is set.

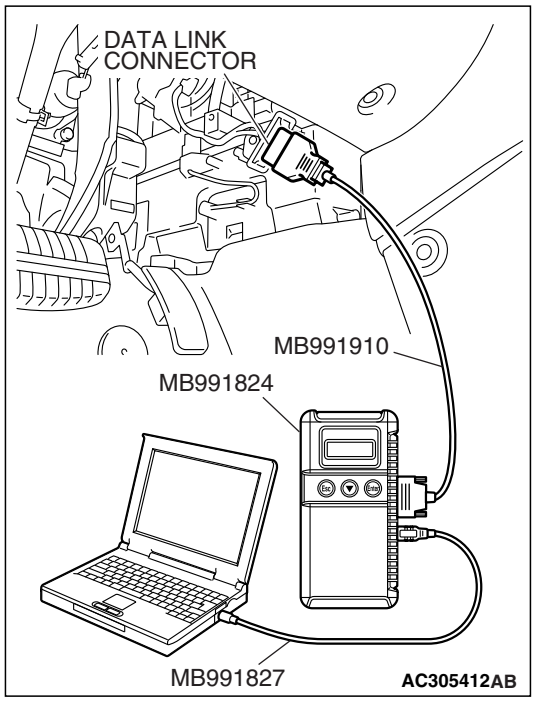
Q: Is the DTC set?

YES : Diagnose the MFI system (Refer to GROUP 13A, MFI Diagnosis –Diagnostic Trouble Code Chart P.13A-46 <2.4L ENGINE> or GROUP 13B, MFI Diagnosis – Diagnostic Trouble Code Chart P.13B-46 <3.8L ENGINE>). On completion, go to Step 5.
NO : Go to Step 3.

STEP 3. Using scan tool MB991958, check data list.

⚠ 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) Set scan tool MB991958 to the data reading mode.
- Item 87: Tachometer
  - Tachometer displayed value and scan tool MB991958 displayed value agree with each other.

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

Q: Is the check result normally?

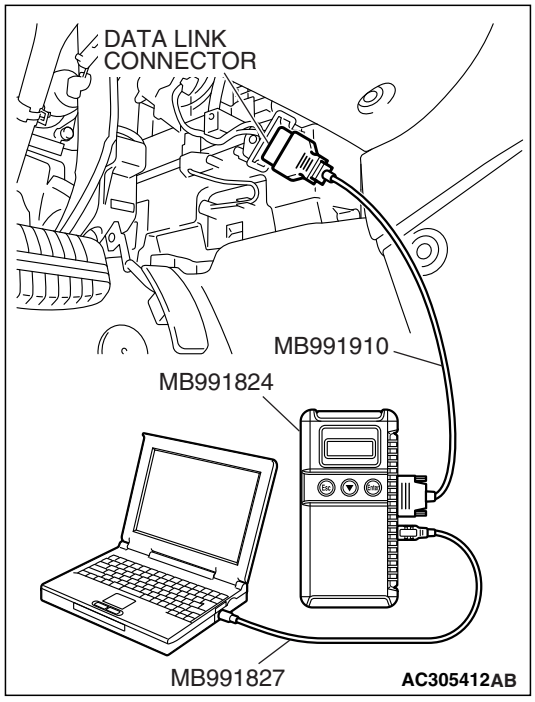
YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-14.

NO : Go to Step 4.

STEP 4. Using scan tool MB991958, check actuator test.

⚠ 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) Set scan tool MB991958 to the actuator test mode.
- Item 84: Tachometer: 0 r/min
  - The tachometer displays 0 r/min.
- Item 85: Tachometer: 2000 r/min
  - The tachometer displays 2,000 r/min.
- Item 86: Tachometer: 5000 r/min
  - The tachometer displays 5,000 r/min.

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

Q: Is the check result normally?

YES : Go to Step 5.

NO : Replace the combination meter.

STEP 5. Retest the system.
Check that the tachometer works normally.

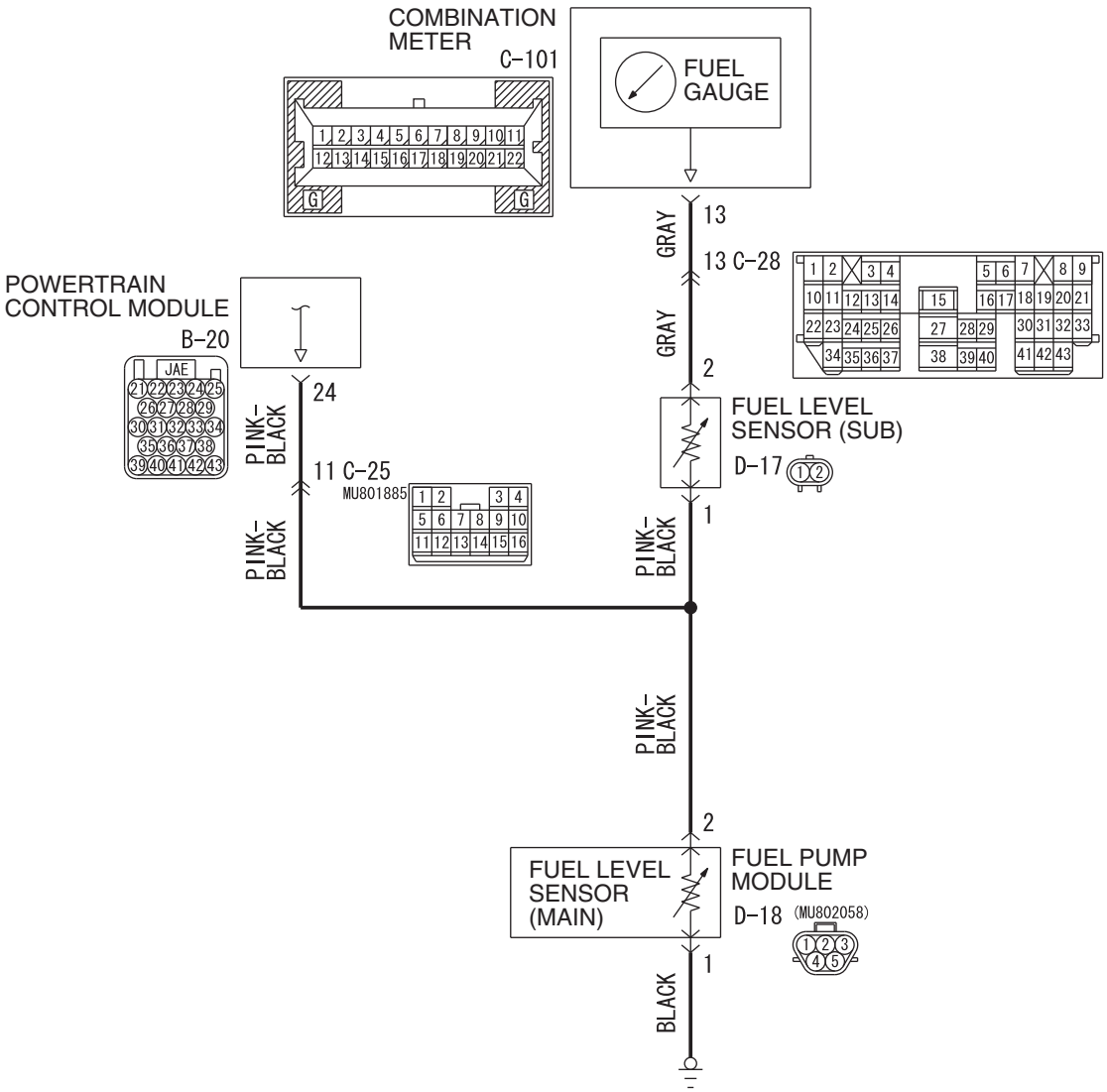
Q: Is the check result satisfactory?

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.00-14).

NO : Replace the combination meter.

INSPECTION PROCEDURE 9: Fuel Gauge does not work (other meters work).

Fuel Gauge Circuit



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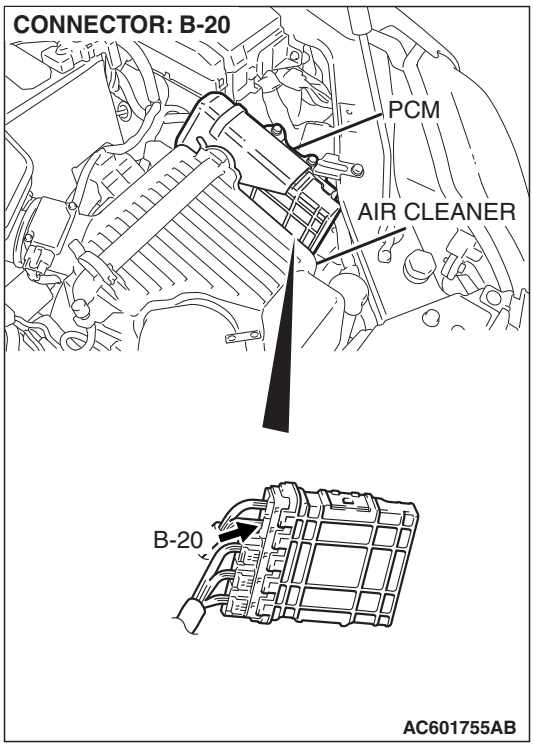
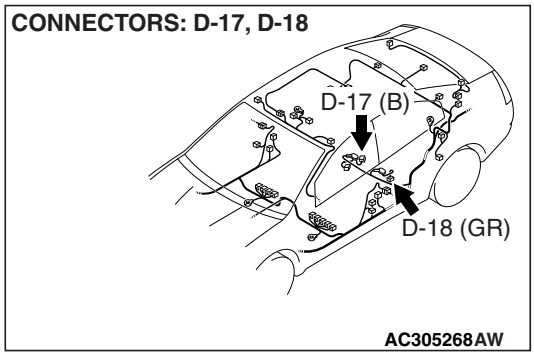
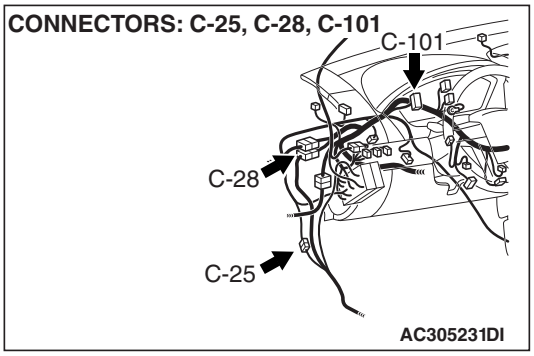






CIRCUIT OPERATION

- The ignition switch (IG1) circuit is the power supply for the fuel gauge.
- When the float in the fuel level sensor moves, the circuit resistance will change.
- The fuel gauge needle is moved by a change in the circuit current.

TECHNICAL DESCRIPTION (COMMENT)

If only the fuel gauge does not operate, the fuel pump module, the fuel level sensor (sub), the combination meter, wiring harness or connector(s) may be defective.

TROUBLESHOOTING HINTS

- Malfunction of the powertrain control module
- Malfunction of the fuel level sensor (sub)
- Malfunction of the fuel pump module
- Malfunction of the combination meter
- 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
  - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)
- MB991223: Harness Set
- MB992006: Extra Fine Probe

STEP 1. Using scan tool MB991958, check actuator test.

⚠ CAUTION

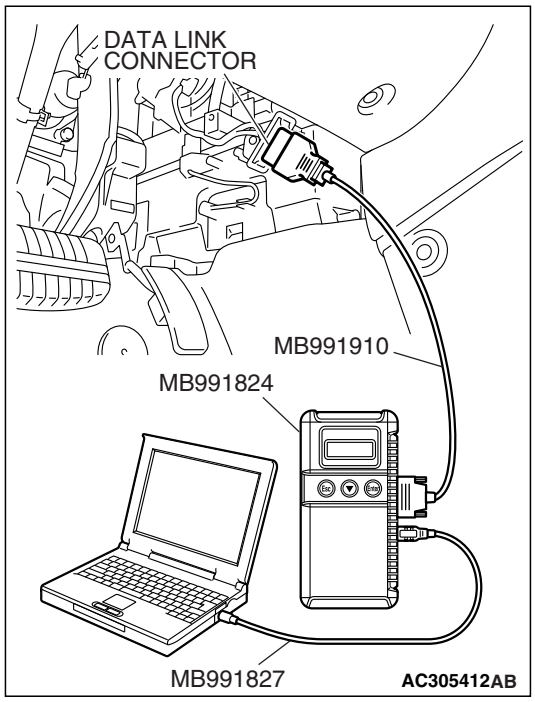
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

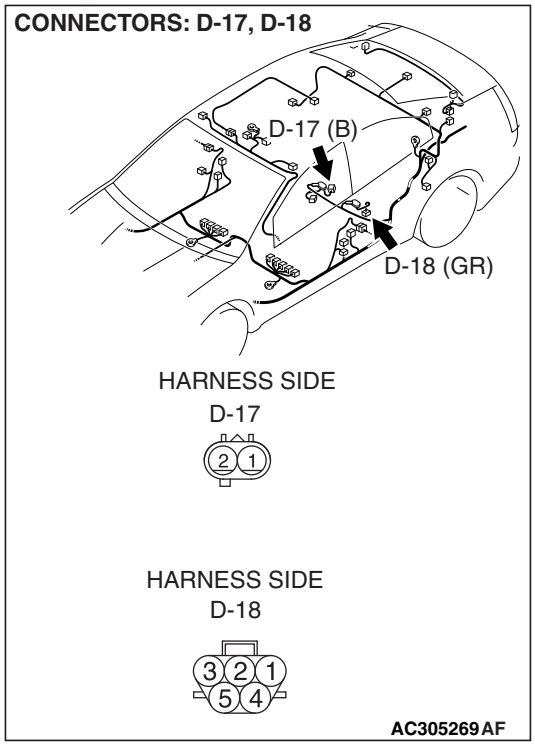
(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to the actuator test mode.
  - Item 8C: Fuel Gauge: 0%
    - Fuel gauge shows 0 %
  - Item 8D: Fuel Gauge: 50%
    - Fuel gauge shows 50 %
  - Item 8E: Fuel Gauge: 100%
    - Fuel gauge shows 100 %

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

Q: Is the check result normal?

YES : Go to Step 2.
NO : Replace the combination meter.





STEP 2. Check fuel level sensor (sub) connector D-17 and fuel pump module connector D-18 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is fuel level sensor (sub) connector D-17 and fuel pump module connector D-18 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 combination meter work normally.

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

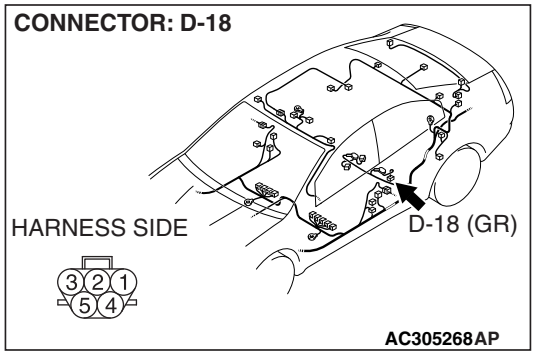
Check to see if the fuel level sensor (sub) and fuel pump module is normal. Refer to P.54A-124.

Q: Is the fuel level sensor (sub) and fuel pump module normal?

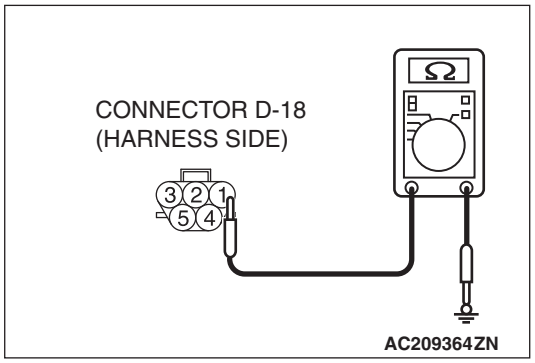
YES : Go to Step 4.

NO : Replace the fuel level sensor or fuel pump module (Refer to GROUP 13C, Fuel Tank P.13C-12). Verify that the combination meter work normally.

STEP 4. Check the ground circuit to the fuel pump module. Measure the resistance at fuel pump module connector D-18.



(1) Disconnect fuel pump module connector D-18 and measure the resistance available at the harness side of the connector.



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

Q: Is the measured resistance 2 ohms or less?

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

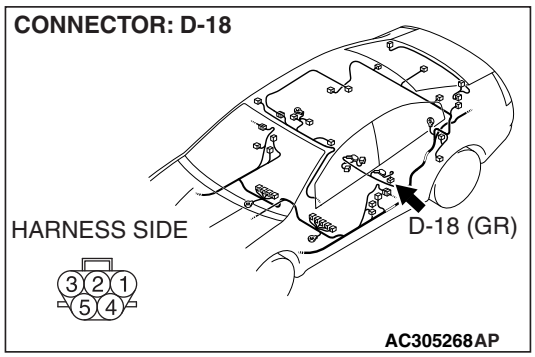
STEP 5. Check the wiring harness between fuel pump module connector D-18 (terminal 1) and ground.

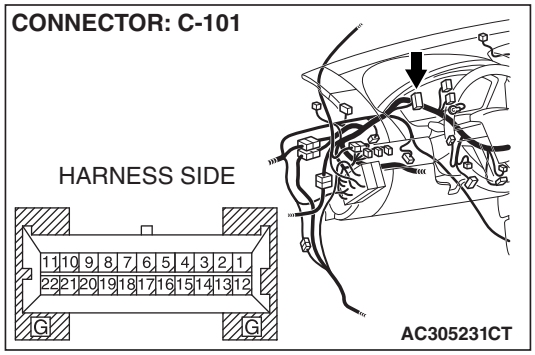
- Check the ground wire for open circuit.

Q: Is the wiring harness between fuel pump module connector D-18 (terminal 1) and ground in good condition?

YES : An intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-14.

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



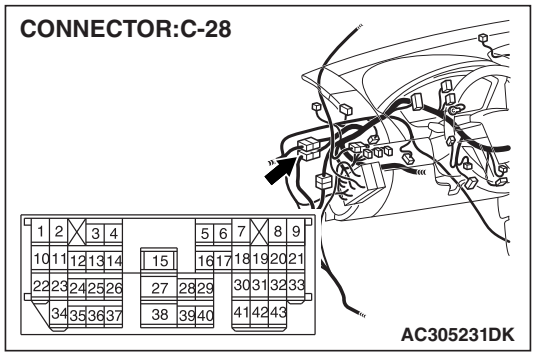


STEP 6. Check combination meter connector C-101 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is combination meter connector C-101 in good condition?

YES : Go to Step 7.

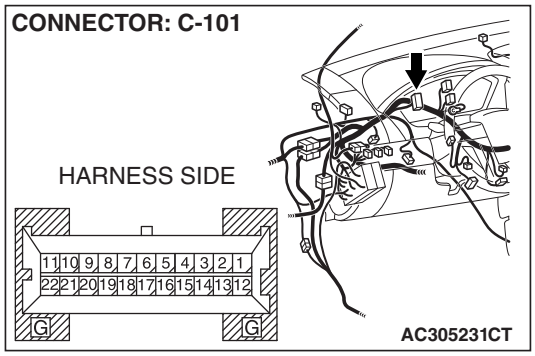
NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Verify that the combination meter work normally.



STEP 7. Check the wiring harness between combination meter connector C-101 (terminal 13) and fuel level sensor (sub) connector D-17 (terminal 2).

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

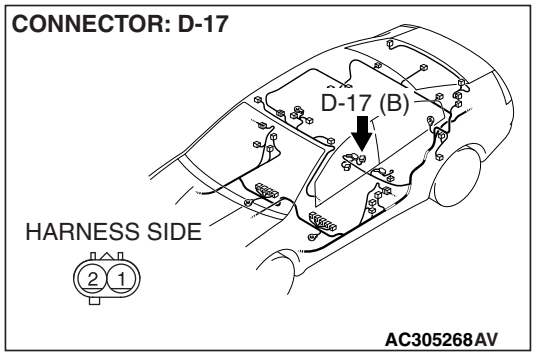
NOTE: Also check intermediate connector C-28 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-28 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P.00E-2.

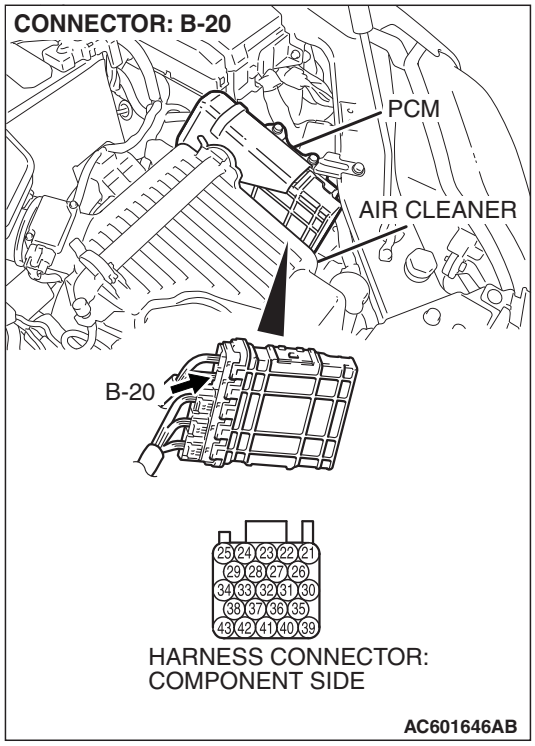


Q: Is the wiring harness between combination meter connector C-101 (terminal 13) and fuel level sensor connector D-17 (terminal 2) in good condition?

YES : Go to Step 8.

NO : The wiring harness may be damaged or the connector may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Verify that combination meter work normally.



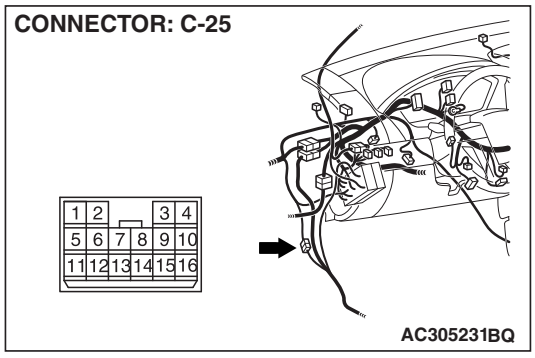


STEP 8. Check powertrain control module connector B-20 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is powertrain control module connector B-20 in good condition?

YES : Go to Step 9.

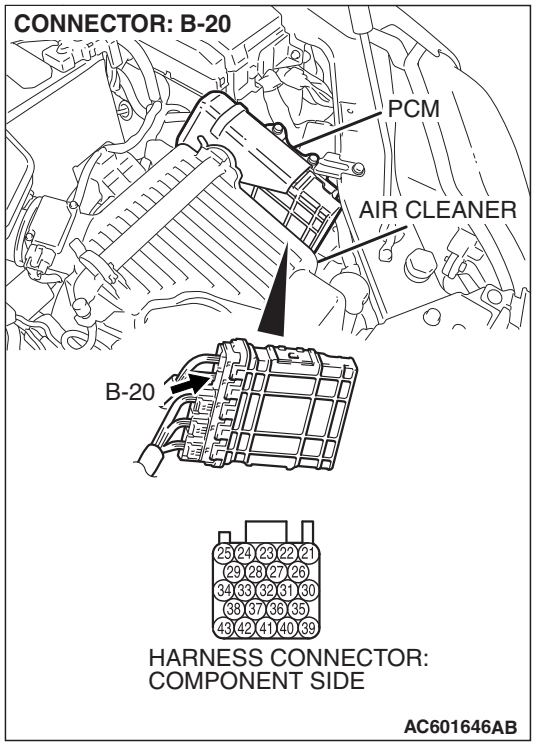
NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Verify that the combination meter work normally.

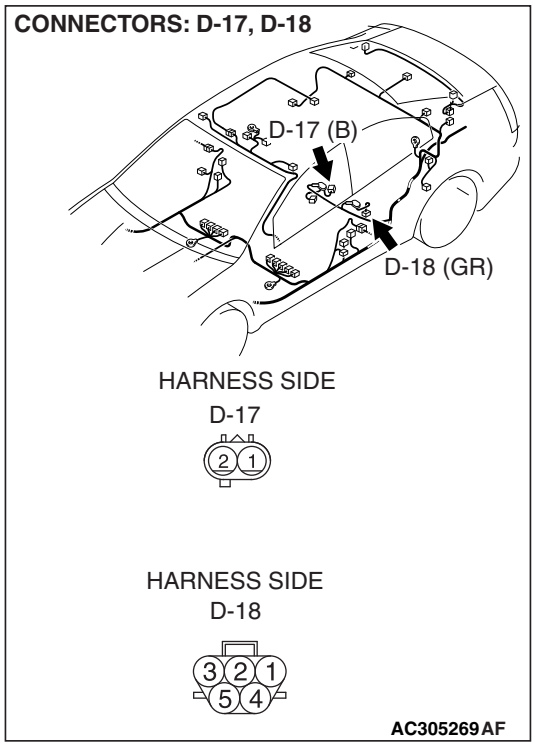


STEP 9. Check the wiring harness between fuel level sensor (sub) connector D-17 (terminal 1) and fuel pump module connector D-18 (terminal 2), and between fuel level sensor (sub) connector D-17 (terminal 1) and powertrain control module connector B-20 (terminal 24).

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

NOTE: Also check intermediate connector C-25 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-25 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P.00E-2.





Q: Is the wiring harness between fuel level sensor (sub) connector D-17 (terminal 1) and fuel pump module connector D-18 (terminal 2), and between fuel level sensor (sub) connector D-17 (terminal 1) and powertrain control module connector B-20 (terminal 24) in good condition?

YES : Go to Step 10.

NO : The wiring harness may be damaged or the connector may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Verify that combination meter work normally.

STEP 10. Retest the system.

Check to see that the fuel gauge operates normally.

Q: Is the check result satisfactory?

YES : An intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-14.

NO : Replace the combination meter.

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INSPECTION PROCEDURE 10: Engine Coolant Temperature Gauge does not Work (other meters work).

CIRCUIT OPERATION

The engine coolant temperature sensor sends signal to the combination meter via the powertrain control module and the CAN bus line.

TECHNICAL DESCRIPTION (COMMENT)

If only the engine coolant temperature gauge does not operate, the powertrain control module system, the combination meter, the wiring harness or its connector may be defective.

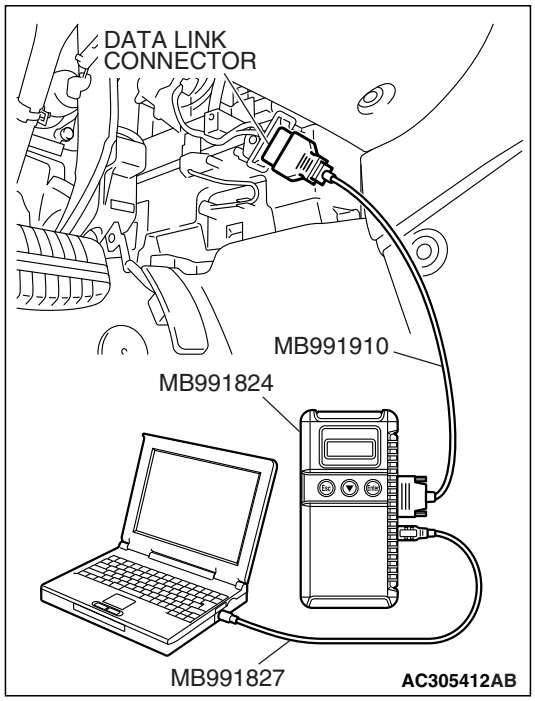
TROUBLESHOOTING HINTS

- Malfunction of the powertrain control module
- Malfunction of the combination meter
- 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
  - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)



STEP 1. Using scan tool MB991824, diagnose the CAN bus line.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to "ON" position.
(3) Diagnose the CAN bus line.

Q: Is the check result satisfactory?

YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C, Diagnosis –Can Bus Diagnostic Chart P.54C-13). On completion, go to Step 5.

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

Check if an MFI system DTC is set.

Q: Is the DTC set?

YES : Diagnose the MFI system by referring to GROUP 13A, MFI Diagnosis –Diagnostic Trouble Code Chart P.13A-46 <2.4L ENGINE> or GROUP 13B, MFI Diagnosis –Diagnostic Trouble Code Chart P.13B-46 <3.8L ENGINE>. On completion, go to Step 5.

NO : Go to Step 3.

STEP 3. Using scan tool MB991958, check data list.

⚠ 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.

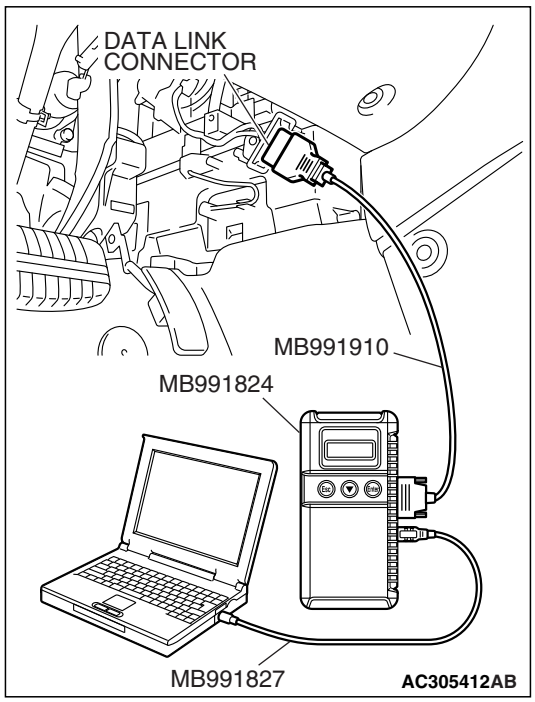
(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to the data reading mode.
- Item 8C: Engine coolant temperature gauge
  - Engine coolant temperature and M.U.T.-III displayed values agree with each other.
- Item 8E: Coolant Temp. confirmation flag
  - Normal condition: ON

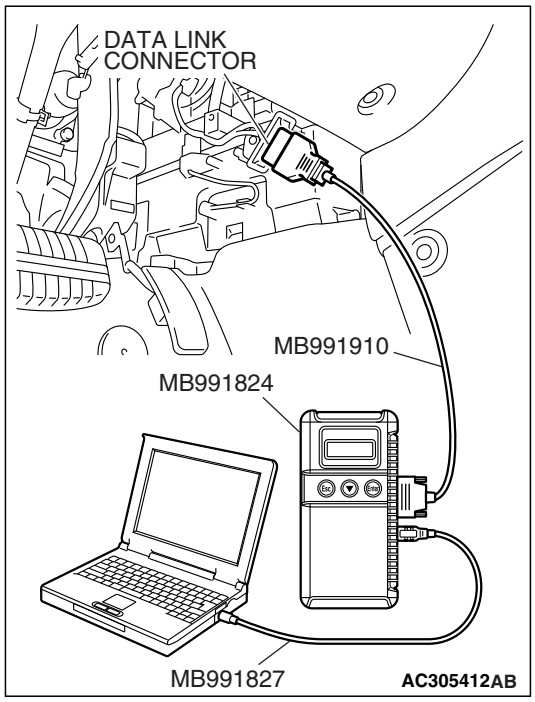
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result normally?

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

NO : Go to Step 4.





STEP 4. Using scan tool MB991958, check actuator test.

⚠ 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) Set scan tool MB991958 to the actuator test mode.
- Item 88: Engine coolant Temp. gauge: 0 °C (32° F)
  - Engine coolant temperature gauge shows 0° C (32° F)
- Item 89: Engine coolant Temp. gauge: 85 °C (185° F)
  - Engine coolant temperature gauge shows 85° C (185° F)
- Item 8A: Engine coolant Temp. gauge: 126 °C (259° F)
  - Engine coolant temperature gauge shows 126° C (259° F)

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

Q: Is the check result normally?

YES : Go to Step 5.
NO : Replace the combination meter.

STEP 5. Retest the system.

Check to see that the engine coolant temperature gauge operates normally.

Q: Is the check result satisfactory?

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.00-14).
NO : Replace combination meter and then go to step 1.

DATA LIST REFERENCE TABLE

M1543007300886

The following items of the ECU input data can be read using scan tool MB991958.

No.	DATA LIST ITEM	CHECK CONDITIONS	NORMAL CONDITIONS
80	Speedometer	Perform a test run of the vehicle.	Vehicle speeds displayed on the speedometer and scan tool MB991958 are identical.
81	Speedometer(Target)	Ignition switch: ON	Speed meter and scan tool MB991958 displayed values agree with each other.
82	Speed sensor failure flag	Ignition switch: ON	OFF
83	Speed sensor confirmation flag	Ignition switch: ON	ON
84	Vehicle stop flag	Ignition switch: ON	ON
87	Tachometer	Start the engine.	Tachometer displayed value and scan tool MB991958 displayed value agree with each other.
89	Fuel gauge	Ignition switch: ON	Fuel gauge unit resistance value and scan tool MB991958 displayed value agree with each other.
8A	Fuel gauge(Target)	Ignition switch: ON	Fuel gauge and scan tool MB991958 displayed values agree with each other.
8C	Engine coolant temperature gauge	Ignition switch: ON	Engine coolant temperature and scan tool MB991958 displayed values agree with each other.
8E	Coolant Temp. confirmation flag	Ignition switch: ON	ON
90	Odometer	Ignition switch: ON	Odometer displayed value and scan tool MB991958 displayed value agree with each other.
91	Rheostat	Ignition switch: ON	The brightness of the combination meter illumination changes.
A0	Door-ajar warning light	All doors are closed	OFF
		Any door is open	ON
A1	SRS warning light	• Ignition switch: ON • After warning lamp pre-check	OFF
A2	ABS warning light	• Ignition switch: ON • After warning lamp pre-check	OFF
A4	Charge indicator	• Ignition switch: ON • After warning lamp pre-check	OFF
A5	Engine malfunction indicator	• Ignition switch: ON • After warning lamp pre-check	OFF
A6	Low-fuel warning lamp	–	OFF

No.	DATA LIST ITEM	CHECK CONDITIONS	NORMAL CONDITIONS
A7	Brake warning light	• Ignition switch: ON • Parking brake: At release	OFF
		• Ignition switch: ON • Parking brake: OPERATION	ON
A8	Seat belt indicator	• Ignition switch: ON • Driver's seatbelt: fastened	OFF
		• Ignition switch: ON • Driver's seatbelt: Not fastened	ON
A9	Cruise control indicator	–	OFF
AA	ASC/TCL Operation indicator	• Ignition switch: ON • After warning lamp pre-check	OFF
AB	ASC/TCL OFF indicator	–	OFF
B1	Turn signal indicator(Right)	Turn signal lamp: OFF or only left side lamp illuminates	OFF
		Turn signal lamp: Right side lamp illuminates	ON
B2	Turn signal indicator(Left)	Turn-signal lamp: OFF or only right side lamp illuminates	OFF
		Turn-signal lamp: Left side lamp illuminates	ON
B3	Front fog light indicator	Front fog lamp: OFF	OFF
		Front fog lamp: ON	ON
B4	High beam indicator	Headlamps: OFF or low-beam illuminates	OFF
		Headlamps: High-beam illuminates	ON
C1	Shift indicator:P	Allshift position: Other than P position	OFF
		Allshift position: P position	ON
C2	Shift indicator:R	Allshift position: Other than R position	OFF
		Allshift position: R position	ON
C3	Shift indicator:N	Allshift position: Other than N position	OFF
		Allshift position: N position	ON

No.	DATA LIST ITEM	CHECK CONDITIONS	NORMAL CONDITIONS
C4	Shift indicator:D	Allshift position: Other than D position	OFF
		Allshift position: D position	ON
C8	Shift indicator:4	Perform a test run of the vehicle. (Auto mode)	OFF
		Perform a test run of the vehicle. (Manual mode)	ON
C9	Shift indicator:3	Perform a test run of the vehicle. (Auto mode)	OFF
		Perform a test run of the vehicle. (Manual mode)	ON
CA	Shift indicator:2	Perform a test run of the vehicle. (Auto mode)	OFF
		Perform a test run of the vehicle. (Manual mode)	ON

ACTUATOR TEST REFERENCE TABLE

M1543007400355

ITEM No.	CHECK ITEM	TEST CONTENT	CHECK CONDITION	NORMAL CONDITION
80	Speedometer	Set the speedometer to 0 km/h	Turn the ignition switch to the "ON" position.	Speedometer shows 0 km/h
81		Set the speedometer to 40 km/h		Speedometer shows 40 km/h
82		Set the speedometer to 100 km/h		Speedometer shows 100 km/h
84	Tachometer	Set the tachometer to 0 r/min	Turn the ignition switch to the "ON" position.	Tachometer shows 0 r/min
85		Set the tachometer to 2,000 r/min		Tachometer shows 2,000 r/min
86		Set the tachometer to 5,000 r/min		Tachometer shows 5,000 r/min
88	Engine coolant temperature gauge	Set the water temperature gauge to 0° C (32° F)	Turn the ignition switch to the "ON" position.	Water temperature gauge shows 0° C (32° F)
89		Set the water temperature gauge to 85° C (185° F)		Water temperature gauge shows 85° C (185° F)
8A		Set the water temperature gauge to 126° C (259° F)		Water temperature gauge shows 126° C (259° F)
8C	Fuel gauge	Set the fuel gauge to 0 %	Turn the ignition switch to the "ON" position.	Fuel gauge shows 0 %
8D		Set the fuel gauge to 50 %		Fuel gauge shows 50 %
8E		Set the fuel gauge to 100 %		Fuel gauge shows 100 %
90	Fuel gauge(Target)	Set the fuel gauge to 0 %	Turn the ignition switch to the "ON" position.	Fuel gauge shows 0 %
91		Set the fuel gauge to 50 %		Fuel gauge shows 50 %
92		Set the fuel gauge to 100 %		Fuel gauge shows 100 %

ITEM No.	CHECK ITEM	TEST CONTENT	CHECK CONDITION	NORMAL CONDITION
A0	Rheostat	Set the rheostat to 0 %	Turn the ignition switch to the "ON" position.	Rheostat is 0 %
A1		Set the rheostat to 50 %		Rheostat is 50 %
A2		Set the rheostat to 100 %		Rheostat is 100 %
A3	Indicator light1	Illuminate the indicator lights and the warning lights.	Turn the ignition switch to the "ON" position.	The turn-signal lights, the door indicator lights, the front fog lights, the high-beam indicator lights, the brake warning light, the high coolant temperature warning light, the active stability control indicator light, the CHECK ENGINE warning light, the charge warning light, the oil pressure indicator light, the SRS, the ABS, the seat belt and the fuel warning light illuminate.
A4		Extinguish the indicator lights and the warning lights.		The turn-signal lights, the door indicator lights, the front fog lights, the high-beam indicator lights, the brake warning light, the high coolant temperature warning light, the active stability control indicator light, the CHECK ENGINE warning light, the charge warning light, the oil pressure indicator light, the SRS, the ABS, the seat belt and the fuel warning light do not illuminate.
A9	A/T position indicator	Illuminate the A/T position indicator.	Turn the ignition switch to the "ON" position.	The A/T position indicator and the driving program display code (upper or lower arrow) illuminate.
AA		Extinguish the A/T position indicator.		The A/T position indicator and the driving program display code (upper or lower arrow) do not illuminate.

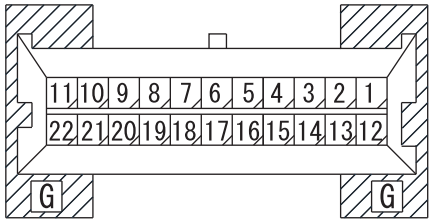
COMBINATION METER TERMINAL CHECK

M1543026700054

Measure the voltage between terminals using a voltmeter.

COMBINATION METER CONNECTOR
COMPONENT SIDE

C-101



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NOTE: The combination meter connector is fixed on the instrument panel directly, so you can not take measurement by backprobing.

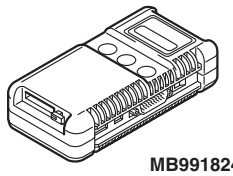
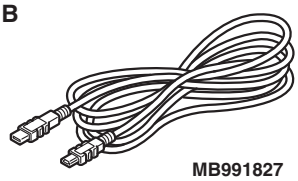
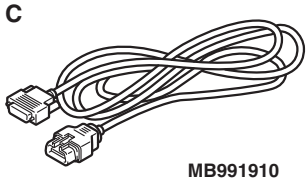
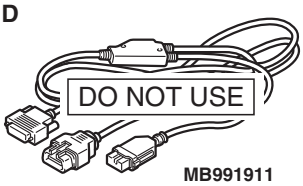
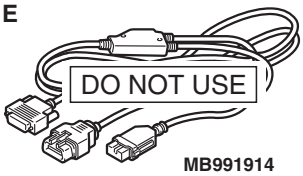
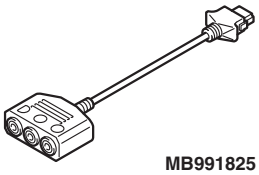
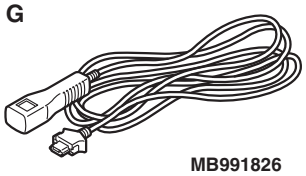
TERMINAL NO.	CHECK ITEM	CHECK CONDITION	NORMAL CONDITION
1	Battery power supply	Always	Battery positive voltage
3	Gauge ground	Always	1 V or less
5	Ground	Always	1 V or less
7	Parking brake switch and brake fluid level switch	-	-
8	Seat belt switch	-	-
9	Engine oil pressure switch	-	-
11	GENERATOR	-	-
12	Ignition switch (IG1) power supply	Ignition switch: ON	Battery positive voltage
13	Fuel gauge	-	-
19	Immobilizer	-	-
21	Illumination (power supply)	Always	Battery positive voltage
22	Illumination (ground)	With nighttime lighting control	In accordance with the rheostat switch operation, a pulse is generated.

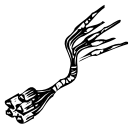
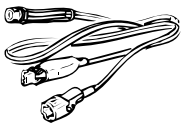
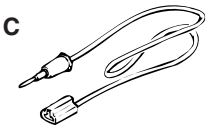
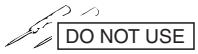
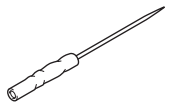
⚠ CAUTION

Never take a measurement at terminals 14 and 15. If you do this, the CAN bus lines will be impaired.

SPECIAL TOOLS

M1543000603562

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
A  MB991824 B  MB991827 C  MB991910 D  MB991911 E  MB991914 F  MB991825 G  MB991826 MB991958	MB991958 A: MB991824 B: MB991827 C: MB991910 D: MB991911 E: MB991914 F: MB991825 G: MB991826 M.U.T.-III Sub Assembly A: Vehicle communication interface (V.C.I.) B: M.U.T.-III USB cable C: M.U.T.-III main harness A (Vehicles with CAN communication system) D: M.U.T.-III main harness B (Vehicles without CAN communication system) E: M.U.T.-III main harness C (for Chrysler models only) F: M.U.T.-III measurement adapter G: M.U.T.-III trigger harness	MB991824-KIT *NOTE: G: MB991826 M.U.T.-III Trigger Harness is not necessary when pushing V.C.I. ENTER key.*	**⚠ CAUTION** **For vehicles with CAN communication, use M.U.T.-III main harness A to send simulated vehicle speed. If you connect M.U.T.-III main harness B instead, the CAN communication does not function correctly.** • Reading diagnostic trouble code • Estimated vehicle speed sent

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	General service tool (jumper)	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	–	Making voltage and resistance measurement during troubleshooting

ON-VEHICLE SERVICE

SPEEDOMETER CHECK

M1543000901222

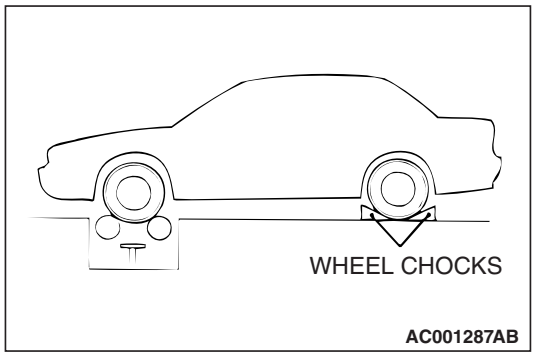
⚠ CAUTION

Since the diagnostic trouble code may be stored in the TCL/ASC-ECU when checking the speedometer with speedometer tester, erase the diagnostic trouble code.

⚠ CAUTION

Do not accelerate or decelerate suddenly during servicing work.

1. Adjust the pressure of tires to the specified level (Refer to GROUP 31, On-vehicle Service P.31-55).
2. <Vehicles with TCL/ASC> Press the ASC OFF switch to stop the TCL/ASC operation.
3. Set the vehicle onto a speedometer tester and use wheel chocks to hold the rear wheels.



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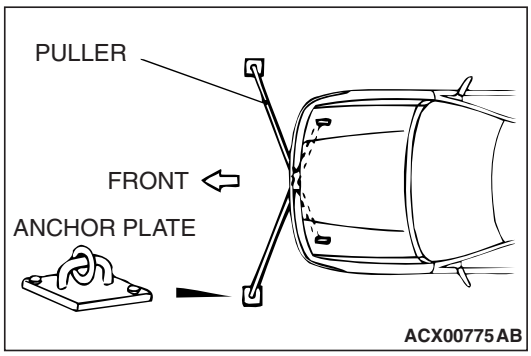
TSB Revision



4. To prevent the front wheel from moving from side to side, attach tension bars to the tie-down hook, and secure both ends to anchor plates.
5. 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.
6. Check if the speedometer indicator range is within the standard values.

Standard value <Except vehicles for CANADA>:

STANDARD INDICATION mph (km/h)	INDICATING TOLERANCE mph (km/h)
10 (16)	8.5 –11.5 (13.6 –18.4)
25 (40)	23.5 –25.5 (37.6 –42.4)
50 (80)	48.5 –51.5 (77.6 –82.4)
75 (120)	73.5 –76.5 (117.6 –122.4)
100 (161)	98.5 –102.5 (158.5 –165.0)

Standard value <Vehicles for CANADA>:

STANDARD INDICATION km/h (mph)	INDICATING TOLERANCE km/h (mph)
20 (12.4)	19 –24 (11.8 –14.9)
40 (24.8)	40 –44 (24.8 –27.3)
80 (49.7)	80 –85 (49.7 –52.8)
120 (74.6)	120.5 –125.5 (74.9 –78.0)
160 (99.4)	160.5 –165.5 (99.7 –102.8)

7. If not within the standard value, check the tire size. If an incorrect size of tire is used, replace it and check again. If the tire size is correct, a defect may be present in components and circuit between the output shaft speed sensor and the combination meter. Check the following items.
   - Output shaft speed sensor (refer to GROUP 23A, Automatic Transaxle Diagnosis P.23A-368).
   - Combination meter (refer to P.54A-99.)

TACHOMETER CHECK

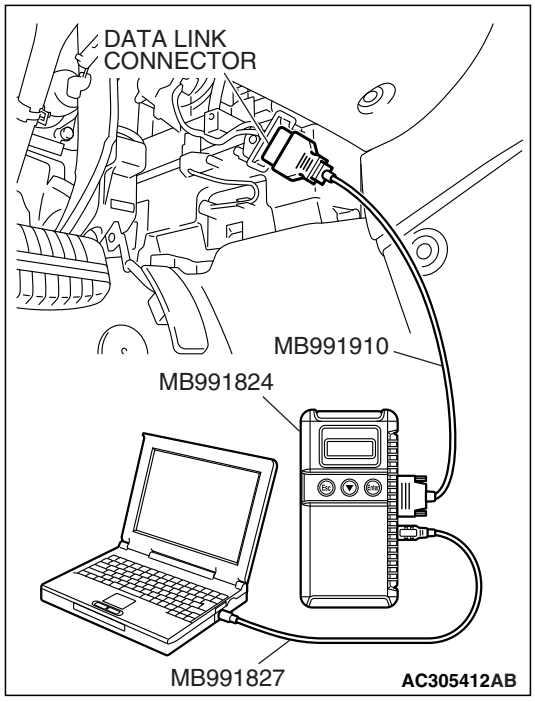
M1543001000810

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 A (Vehicles with CAN communication system)

⚠ CAUTION

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



1. Connect scan tool MB991958 to the data link connector.
2. A/T select lever: "P" position.
3. Turn the ignition switch to "ON" position.
4. Start the engine.
5. Run the engine.
6. Select MFI system data list and take a reading of the engine speed.
   Item 22: CKP SENSOR
7. Compare the engine speed shown in the scan tool with that shown on the tachometer. The engine speeds shown on the tachometer should correspond to the table below.

   NOTE: The following standard value assumes that battery voltage is 13.5 volts.

   Standard value :

ENGINE SPEED r/min	TACHOMETER INDICATING TOLERANCE r/min
600	500 –700
(2,000)	(1,900 –2,100)
3,000	2,850 –3,150
(4,000)	(3,850 –4,150)
5,000	4,850 –5,150
6,000	5,850 –6,150

NOTE: The value in parentheses is a reference value.

FUEL LEVEL SENSOR CHECK

M1543001300156

FUEL LEVEL SENSOR RESISTANCE

1. Remove the fuel pump module and fuel level sensor (sub) (Refer to GROUP 13C –Fuel tank P.13C-12.).
2. Check the resistances between fuel level sensor main terminals 1 and 2 as well as sub terminals 1 and 2 of the fuel pump module, respectively.

Standard value:

ITEM		FUEL LEVEL SENSOR (main)	FUEL LEVEL SENSOR (sub)
Resistance Ω	Point "F" (highest)	6.5	6.5 ± 1.0
	Point "E" (lowest)	45.1	74.9 ± 1.0

3. Check that resistance value changes smoothly when the float moves slowly between points.
4. If all checks are correct, go to fuel unit height check. If any check is not correct, replace the fuel pump module or fuel level sensor (sub).

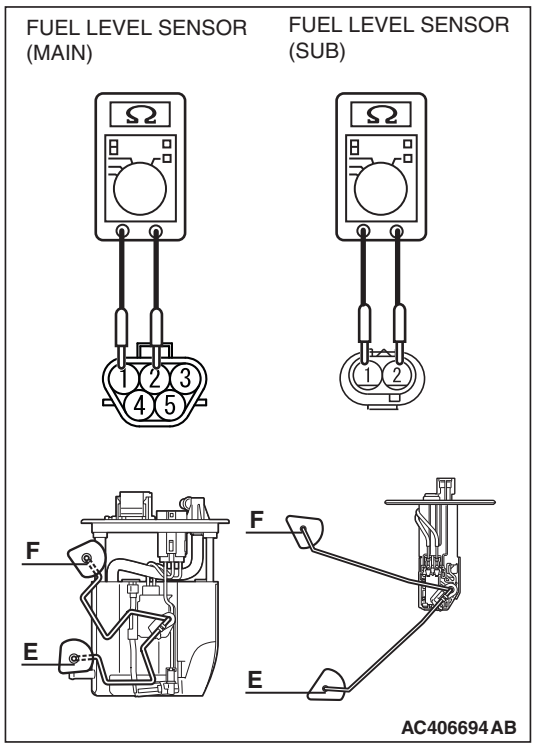
FUEL LEVEL SENSOR FLOAT HEIGHT

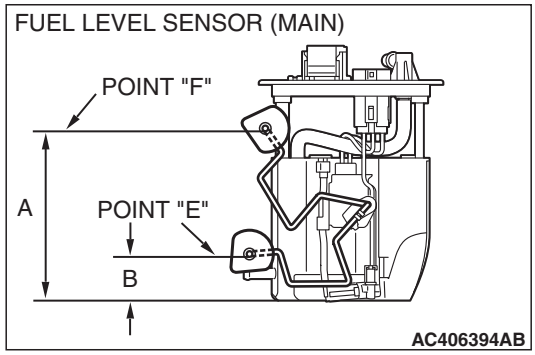
1. Remove the fuel pump module and fuel level sensor (sub) (Refer to GROUP 13C –Fuel tank P.13C-12.).
2. Move the float and measure height A at point "F" (highest) and B at point "E" (lowest).

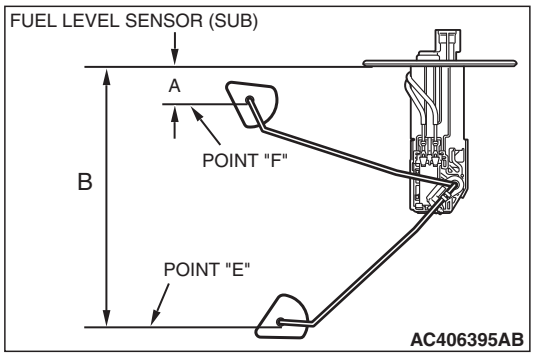
Standard value:

ITEM		FUEL LEVEL SENSOR (main)	FUEL LEVEL SENSOR (sub)
Height mm (in)	A at point "F"	131.5 (5.1)	24.9 ± 3.0 (0.9 ± 0.1)
	B at point "E"	34.5 (1.3)	172.7 ± 3.0 (6.7 ± 0.1)

3. If any check is not correct, replace the fuel pump module or fuel level sensor (sub).



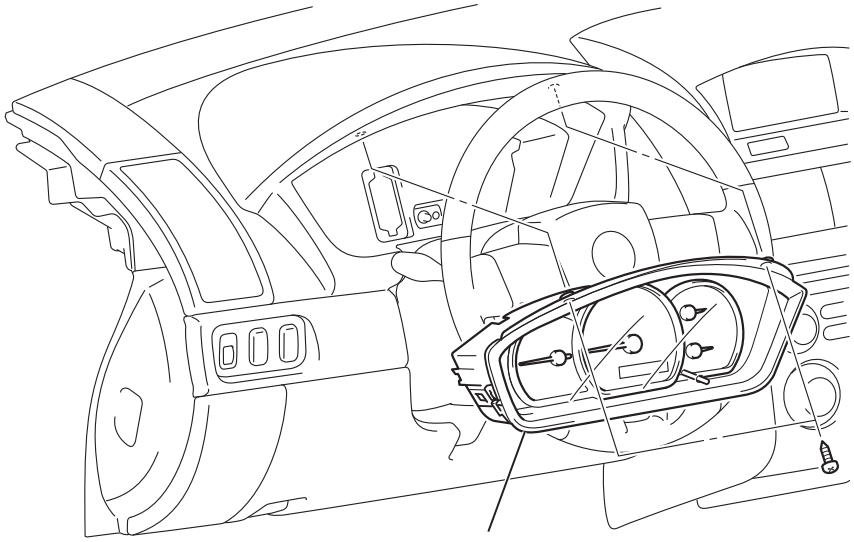




COMBINATION METER ASSEMBLY

REMOVAL AND INSTALLATION

M1543021300136



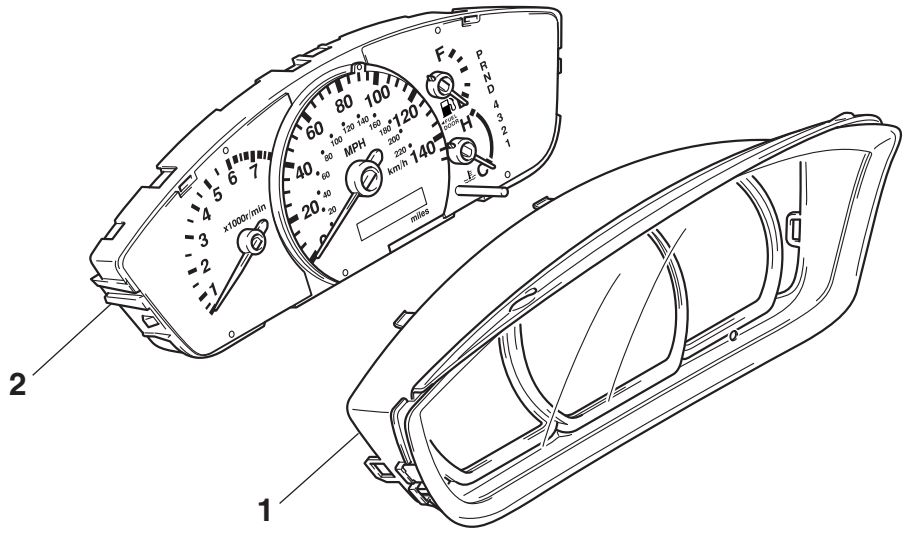
COMBINATION METER

NOTE:
THE COMBINATION METER CONNECTOR IS FIXED IN THE INSTRUMENT PANEL.

AC306952AB

DISASSEMBLY AND ASSEMBLY

M1543003100471



AC205381AC

DISASSEMBLY STEPS

1. WINDOW PLATE
2. METER ASSEMBLY

HEADLIGHT, FRONT SIDE MARKER LIGHT AND POSITION LIGHT ASSEMBLY

HEADLIGHT DIAGNOSIS

M1542010501017

The headlights are controlled by the Simplified Wiring System (SWS). For troubleshooting, refer to GROUP 54B, SWS Diagnosis –Symptom Chart P.54B-57.

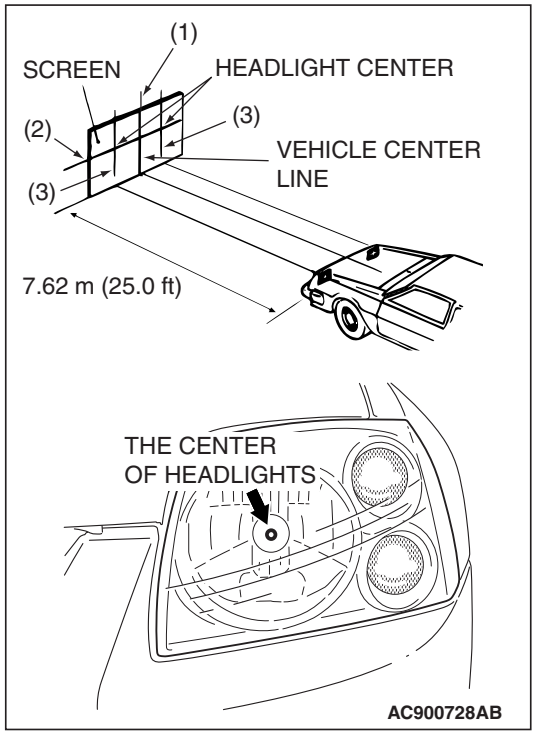
ON-VEHICLE SERVICE

HEADLIGHT AIMING

M1542000901285

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 it is necessary.
4. If the fuel tank is not full, place a weight in the trunk of the 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 68 kg (150 pounds) placed in driver's position.
6. Thoroughly clean headlight lenses.
7. Place the vehicle on a level floor, perpendicular to a flat screen 7.62 m (25.0 feet) away from the bulb center-marks on the headlight lens.
8. Rock vehicle sideways to allow vehicle to assume its normal position.
9. Bounce the front suspension through three oscillations by applying the body weight to hood or bumper.

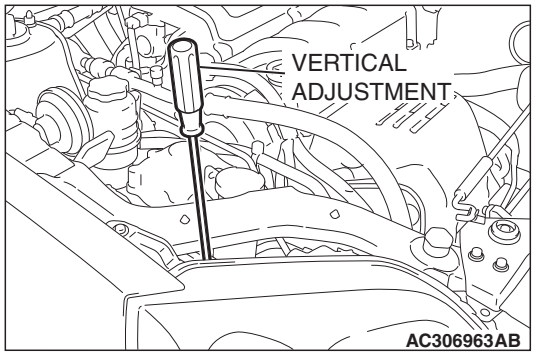


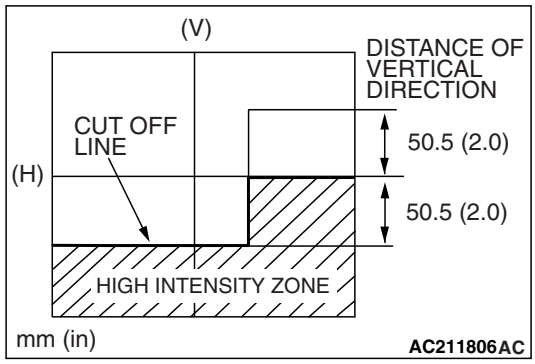
10. Set the distance between the screen and the bulb center marks of the headlight as shown in the illustration.
11. Four lines of adhesive tape (or equivalent markings) are required on screen or wall:
    (1) Position a vertical tape or mark so that it is aligned with the vehicle center line.
    (2) Measure the distance from the center-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

NOTE: When adjusting headlight, disconnect the other headlight harness.

1. The low beam headlight will project on the screen upper edge of the beam (cut-off).
2. Turn the adjusting screws to achieve the specified low-beam cut-off location on the aiming screen.





Standard value:
(Vertical direction) Horizontal center line ±50.5 mm (± 2.0 inches) (0.38 degrees angle)

⚠ CAUTION

Do not cover a headlight for more than three minutes to prevent the plastic headlight lens deformation.

NOTE: There is no horizontal aim adjustment. Horizontal aim is preset and does not require adjustment. High-beam pattern should be correct when the low-beams are adjusted properly.

LUMINOUS INTENSITY MEASUREMENT

M1542001000806

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 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.

$I = E \times r^2$:

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

BULB REPLACEMENT

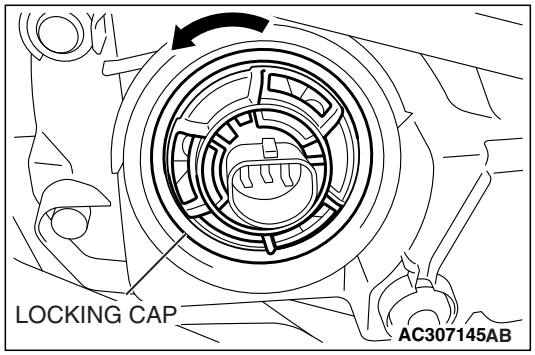
M1542001301781

HEADLIGHT BULB

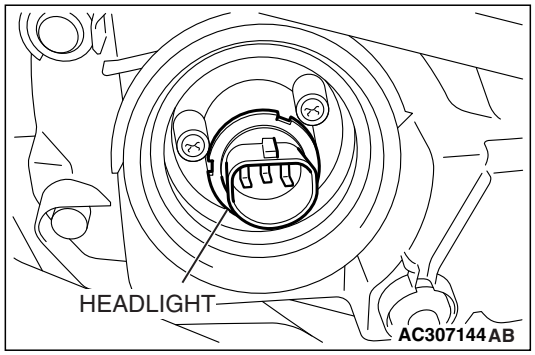
⚠ CAUTION

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

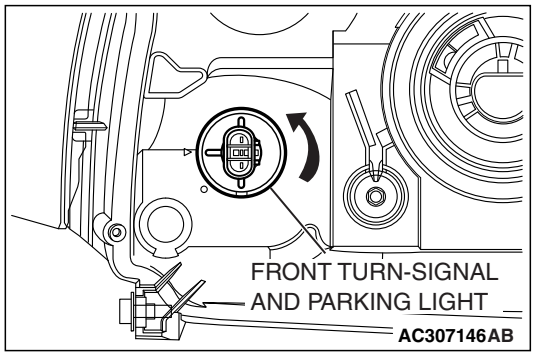
1. When replacing the headlight bulb on the left side, remove the relay box.
2. Disconnect the headlight connector.
3. Remove the locking cap by twisting it counterclockwise as shown.



4. Remove the headlight bulb with holder.
5. Install a new locking cap with bulb to the headlight by twisting it clockwise.

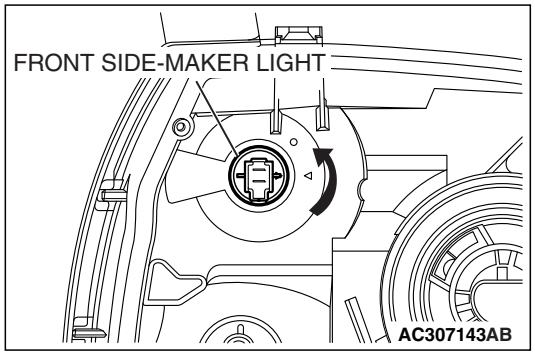


FRONT TURN-SIGNAL AND PARKING LIGHT BULB



1. Disconnect the front turn-signal light and parking light connector.
2. Remove the socket with the bulb by turning it counterclockwise as shown.
3. Twist bulb counterclockwise and pull out the bulb from the socket, and then replace the bulb.
4. Install the socket to the headlight by push and twisting it clockwise.

FRONT SIDE-MARKER LIGHT BULB



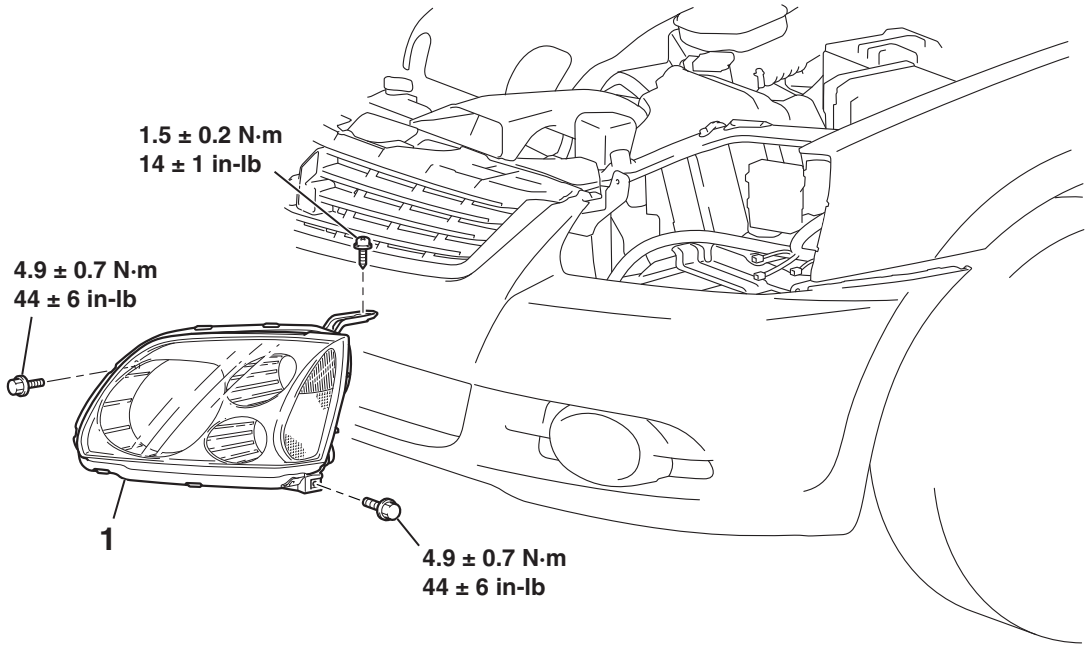
1. Disconnect the front side-marker light connector.
2. Remove the socket with the bulb by turning it counterclockwise as shown.
3. Pull out the bulb from the socket, and then replace the bulb.
4. Install the socket to the headlight by push and twisting it clockwise.

HEADLIGHT AND FRONT COMBINATION LIGHT

REMOVAL AND INSTALLATION

M1542002700615

Post-installation operation
- Headlight aiming adjustment (Refer to P.54A-126).



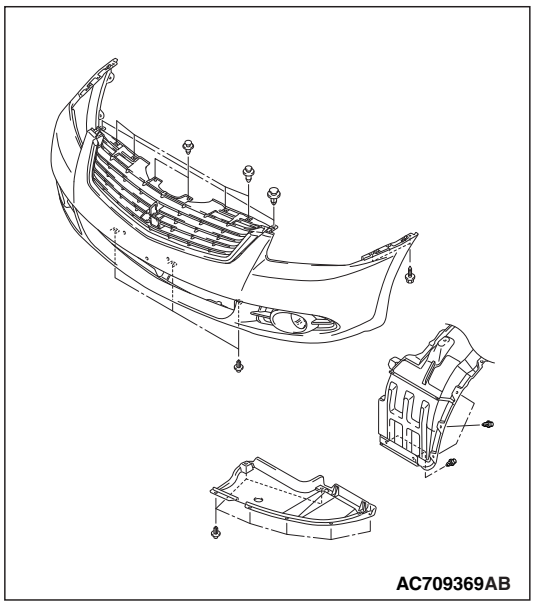
AC900726AB

REMOVAL

<<A>> 1. HEADLIGHT ASSEMBLY

REMOVAL SERVICE POINT

<<A>> HEADLAIGHT ASSEMBLY REMOVAL



AC709369AB

1. Remove the mounting bolts and clips of the splash shield, front bumper under cover and front bumper shown in the figure.
2. Disconnect the fog light connector.
3. Slide the front bumper assembly, and remove the headlight assembly.

TSB Revision

FOG LIGHT

FOG LIGHT DIAGNOSIS

M1542000702251

The fog lights are controlled by the Simplified Wiring System (SWS). For troubleshooting, refer to GROUP 54B, SWS Diagnosis P.54B-57.

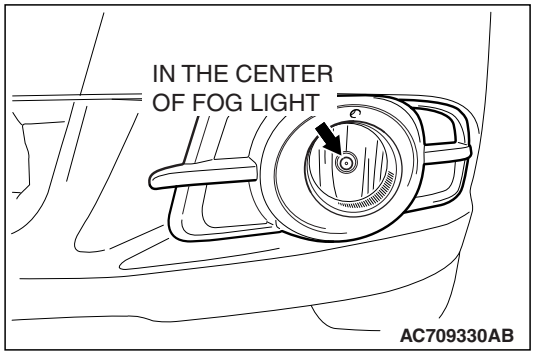
ON-VEHICLE SERVICE

FOG LIGHT AIMING

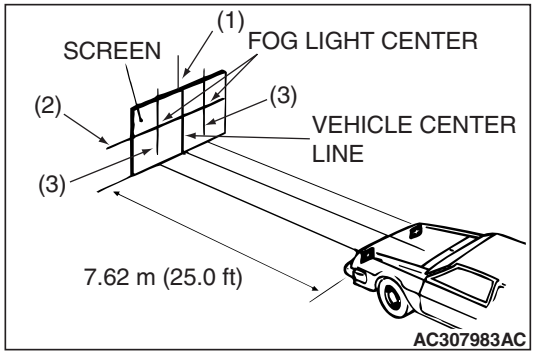
M1542001100955

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 the fuel tank is not full, place a weight in the trunk of the 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 68 kg (150 pounds) placed in driver's position.
6. Thoroughly clean the fog light lenses.
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 fog light 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.

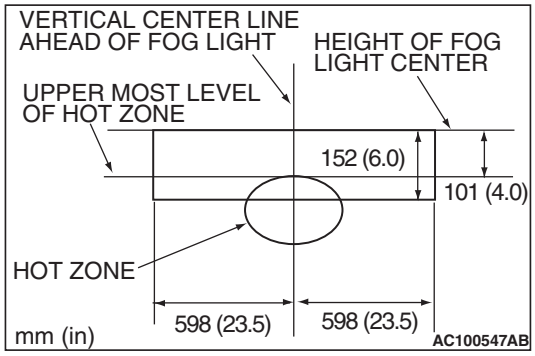


11. Four lines of adhesive tape (or equivalent markings) are required on screen or wall:
    (1) Position a vertical tape or mark so that it is aligned with the vehicle center line.
    (2) Measure the distance from the center of the fog light lens to the floor. Transfer the measurement to the screen. Horizontal tape or mark on the screen is for reference of vertical adjustment.

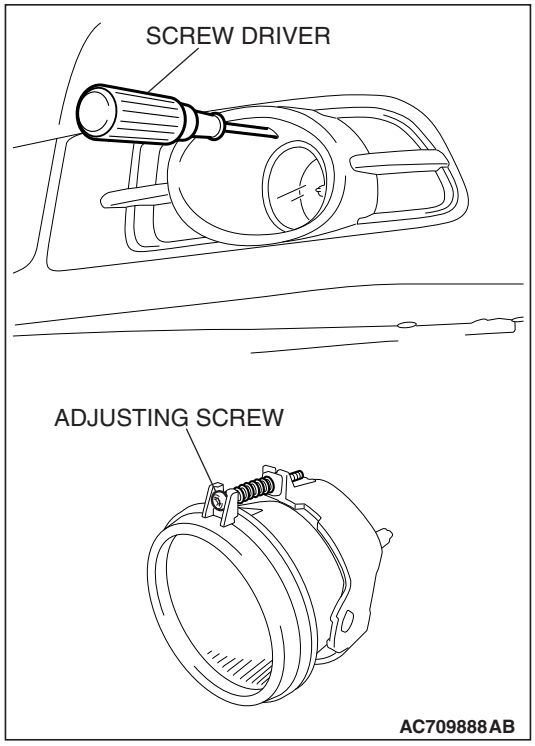


(3) Measure the distance from the center line of the vehicle to the center of each fog light. Transfer the measurement to the screen. Vertical tape or mark on the screen is for reference to the center line of each fog light.

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.

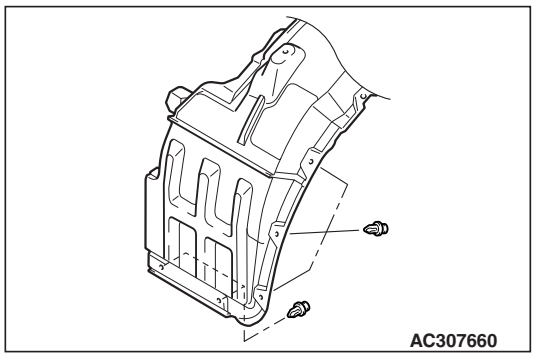
Standard value:
(Vertical direction): Top of the hot zone should be 101 mm (4.0 inches) (0.76 degrees angle) downward from the height of the fog light center.

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

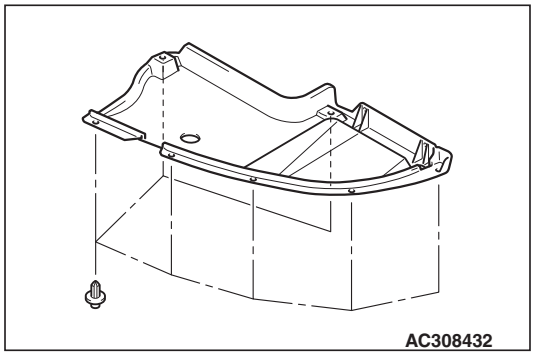
NOTE: The horizontal direction is non-adjustable. If deviation of the light beam axis exceeds the standard value, check that the mounting location or some other points are not faulty.

BULB REPLACEMENT

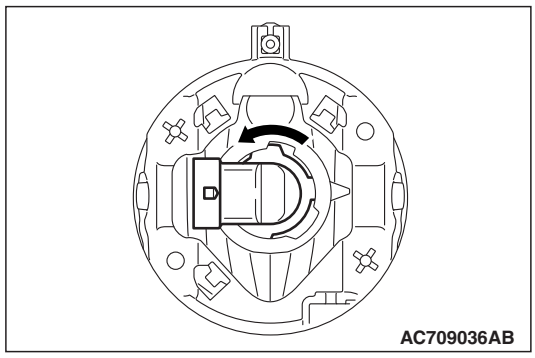
M1542001301695


AC307660

1. Remove the splash shield mounting clips, then remove the splash shield.


AC308432

2. Remove the front bumper under cover mounting clips, then remove the front bumper under cover.


AC709036AB

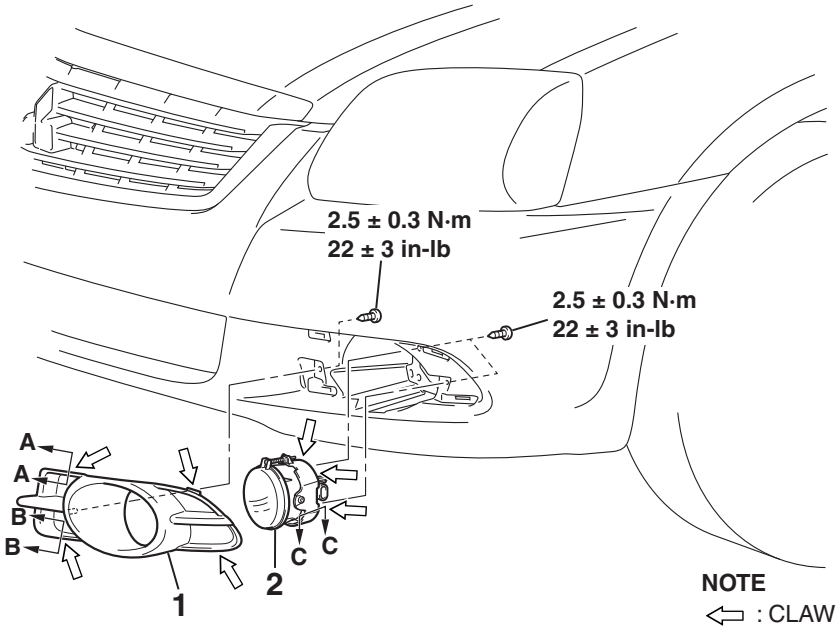
3. Remove the socket and bulb assembly by twisting it counterclockwise.
4. Remove the fog light bulb from the connector.
5. Replace the bulb, and then install the socket and bulb assembly by twisting it clockwise.

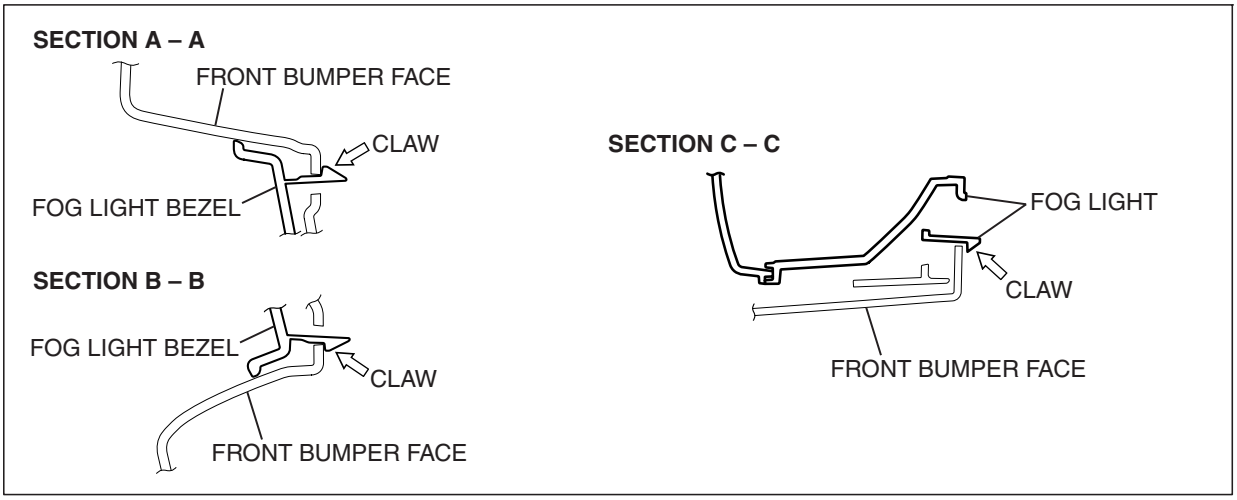
FOG LIGHT

FOG LIGHT REMOVAL AND INSTALLATION

M1542001501008

Post-installation operation
Fog light aiming (Refer to P.54A-131).





AC709378AB

FOG LIGHT REMOVAL STEPS

- FRONT BUMPER UNDER COVER (REFER TO GROUP 51, FRONT BUMPER ASSEMBLY P.51-2.)

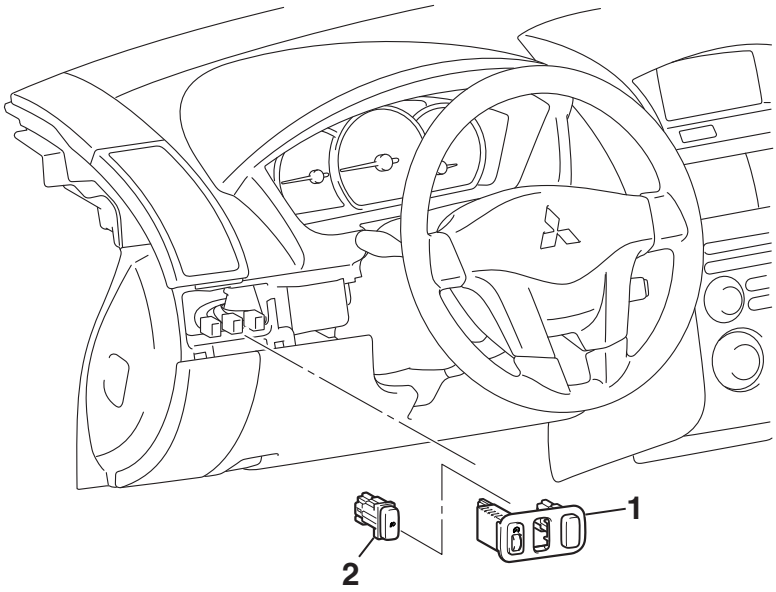
FOG LIGHT REMOVAL STEPS

1. FOG LIGHT BEZEL
2. FOG LIGHT

TSB Revision

FOG LIGHT SWITCH REMOVAL AND INSTALLATION

M1542013900141



AC709374AD

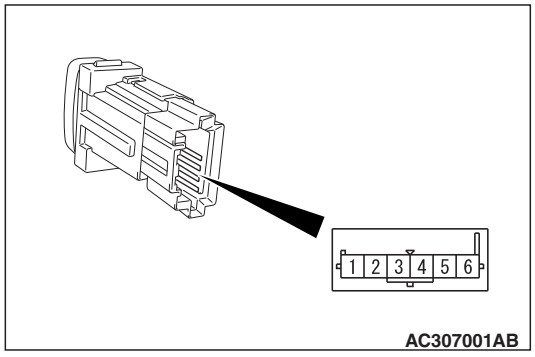
FOG LIGHT SWITCH REMOVAL STEPS

1. SWITCH PANEL ASSEMBLY
2. FOG LIGHT SWITCH

INSPECTION

M1543019504436

FOG LIGHT SWITCH CONTINUITY CHECK

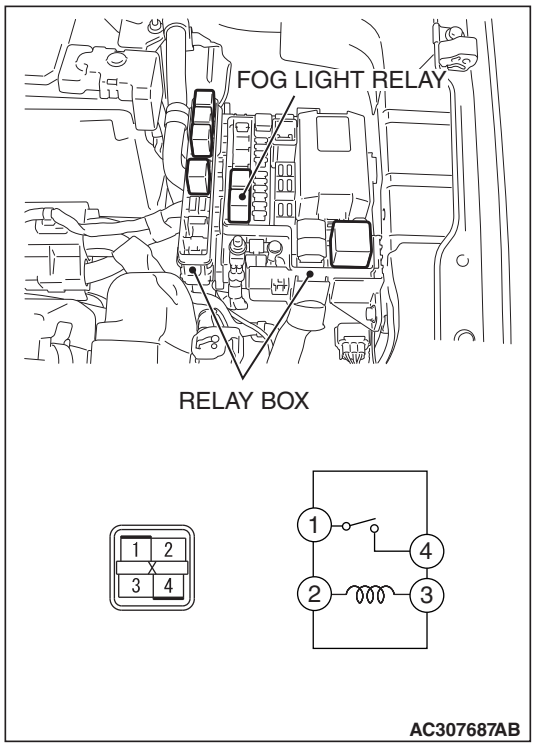


AC307001AB

SWITCH POSITION	TESTER CONNECTION	SPECIFIED CONDITION
Pressed	1-2	Less than 2 ohms
Released	1-2	Open circuit

TSB Revision

FOG LIGHT RELAY CHECK



BATTERY VOLTAGE	TESTER CONNECTION	SPECIFIED CONDITION
Not supplied	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

REAR COMBINATION LIGHT

DIAGNOSIS

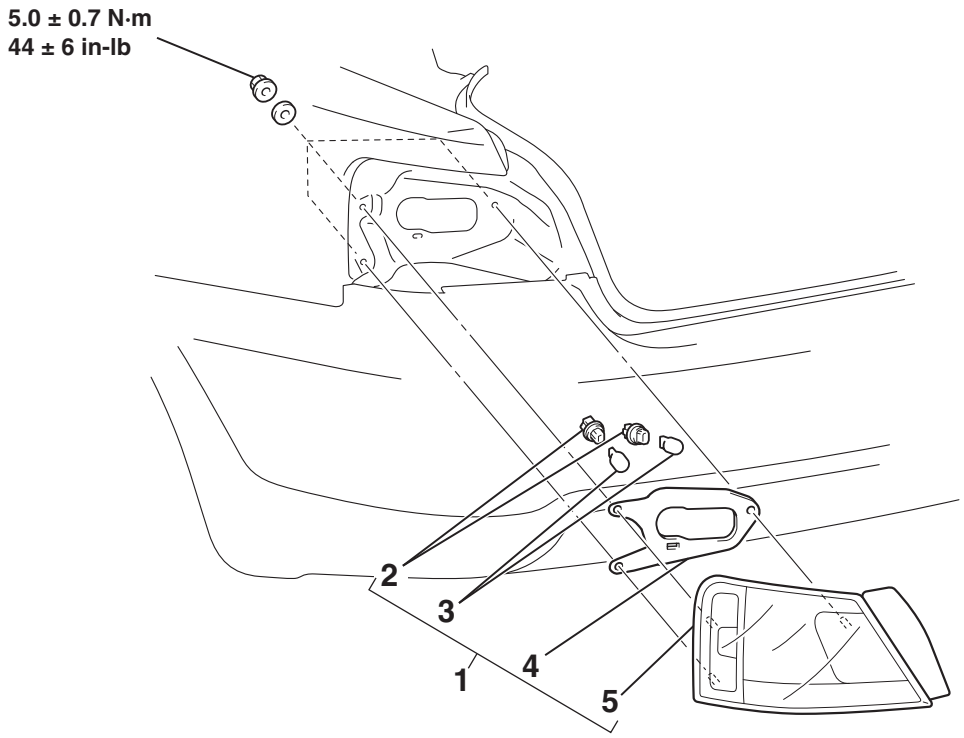
M1542000702262

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-57.

REAR COMBINATION LIGHT

REAR COMBINATION LIGHT REMOVAL AND INSTALLATION

M1542003901057



AC901538AB

REMOVAL STEPS

- TRUNK ROOM FLOOR BOARD, REAR END TRIMS (REFER TO GROUP 52A, TRIM P.52A-22.)

1. REAR COMBINATION LIGHT ASSEMBLY

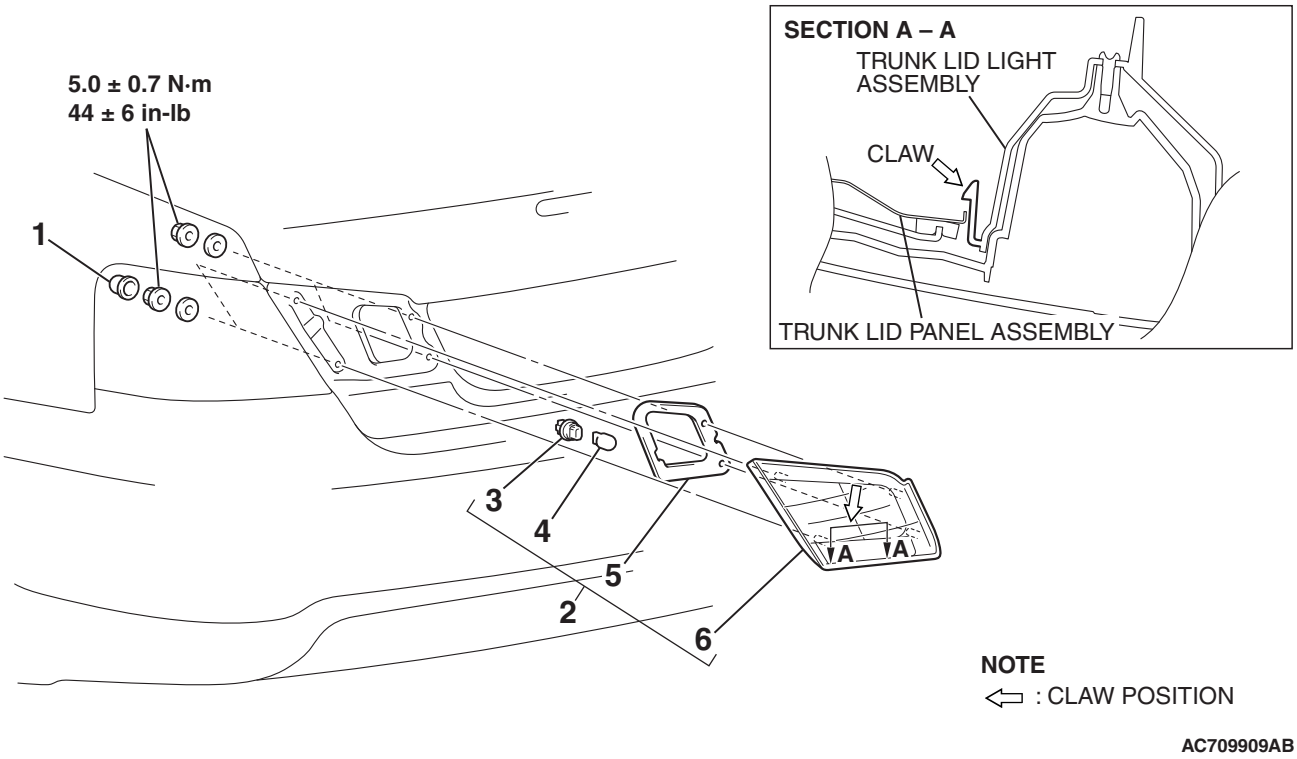
REMOVAL STEPS (Continued)

2. SOCKET
3. BULB
4. GASKET
5. REAR COMBINATION LIGHT UNIT

TSB Revision

TRUNK LID LIGHT REMOVAL AND INSTALLATION

M1542018700012



REMOVAL STEPS
1. BOLT CAP
2. TRUNK LID LIGHT ASSEMBLY
3. SOCKET

REMOVAL STEPS (Continued)
4. BULB
5. GASKET
6. TRUNK LID LIGHT UNIT

DOME LIGHT

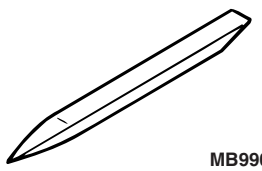
DIAGNOSIS

M1542000702273

The dome light is controlled by the Simplified Wiring System (SWS). For troubleshooting, refer to GROUP 54B, SWS Diagnosis P.54B-57.

SPECIAL TOOL

M1542000602447

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
 MB990784	MB990784 Ornament remover	General service tool	Removal of map light, cover etc.

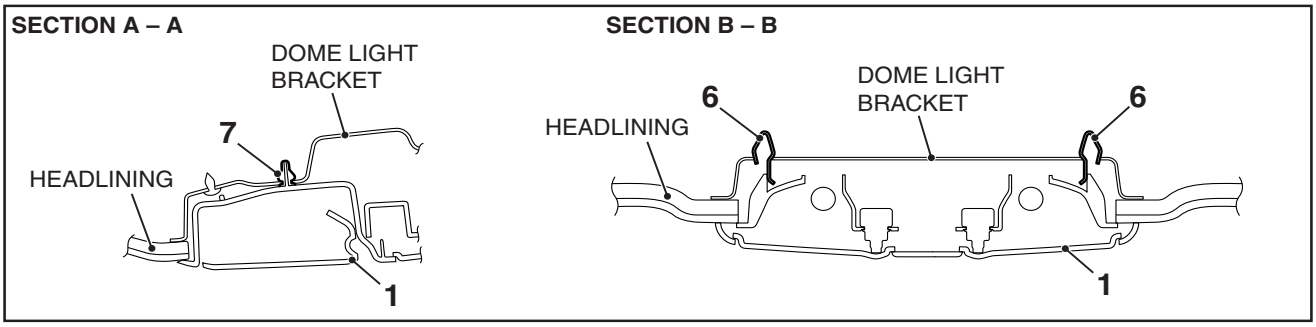
TSB Revision

DOME LIGHT

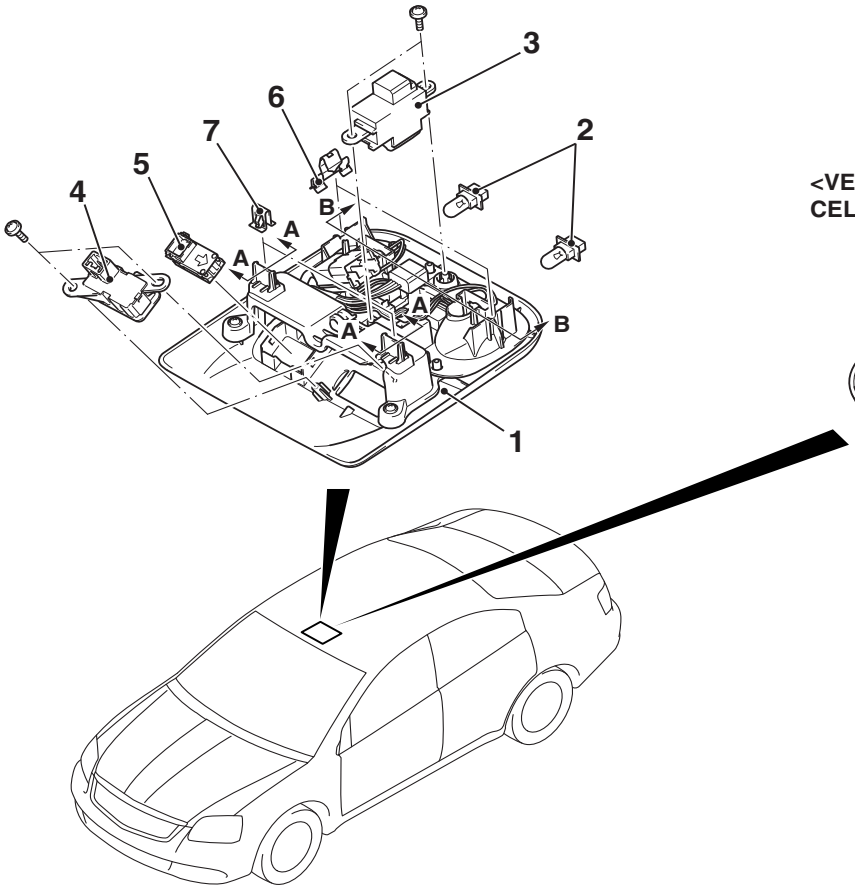
REMOVAL AND INSTALLATION

M1542006300192

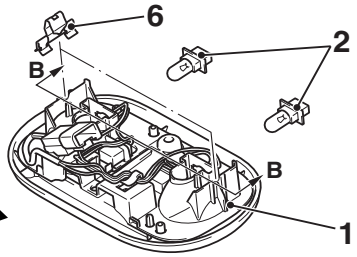
<FRONT DOME LIGHT>



<VEHICLES WITH HANDS-FREE CELLULAR PHONE SYSTEM>



<VEHICLES WITHOUT HANDS-FREE CELLULAR PHONE SYSTEM>



AC900743AB

FRONT DOME LIGHT REMOVAL STEPS

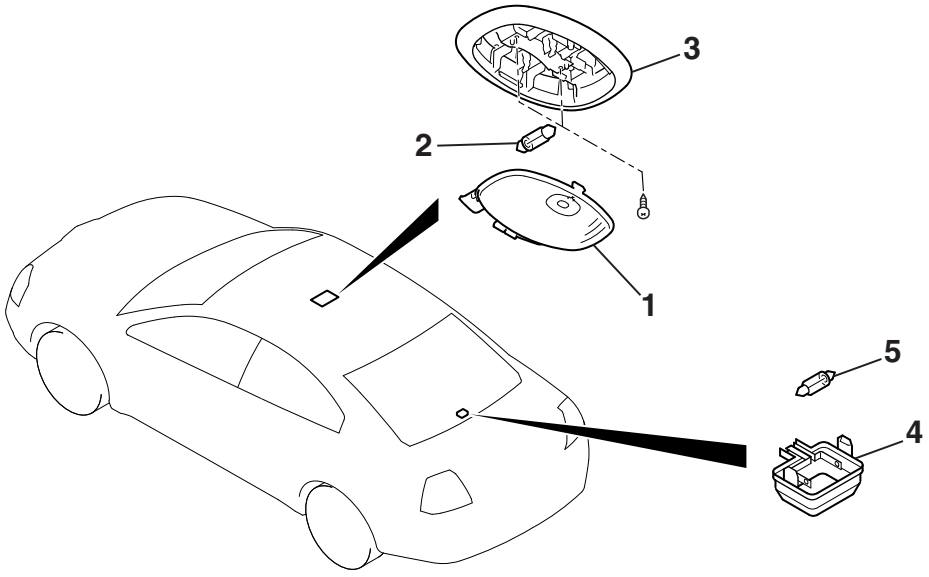
1. FRONT DOME LIGHT ASSEMBLY
2. BULB
3. SUNROOF SWITCH <VEHICLES WITH SUNROOF>
4. MICROPHONE SWITCH <VEHICLES WITH HANDS-FREE CELLULAR PHONE SYSTEM>

FRONT DOME LIGHT REMOVAL STEPS (Continued)

5. INTERPHONE MICROPHONE <VEHICLES WITH HANDS-FREE CELLULAR PHONE SYSTEM>
6. CLIP
7. CLIP

TSB Revision

<REAR DOME LIGHT AND TRUNK LIGHT>



AC900757AB

REAR DOME LIGHT REMOVAL STEPS

<<**A**>> 1. COVER
2. BULB
3. REAR DOME LIGHT

TRUNK LIGHT REMOVAL STEPS

4. TRUNK LIGHT
5. BULB

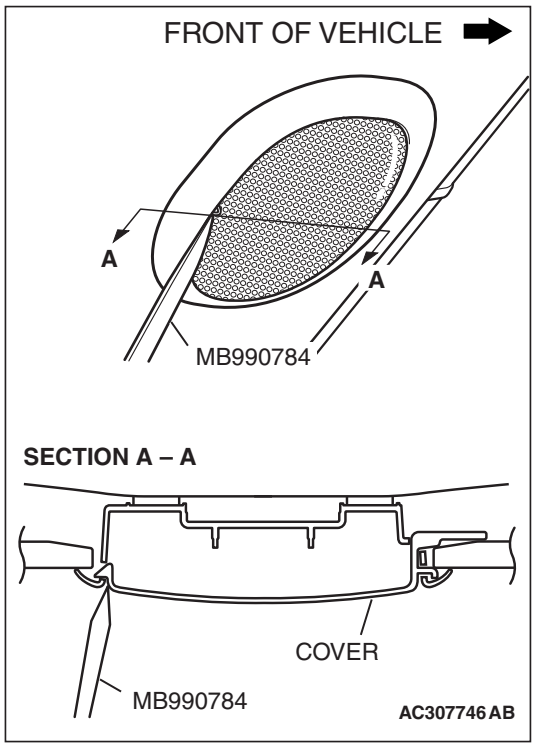
Required Special Tool:

- MB990784: Ornament Remover

REMOVAL SERVICE POINT

<<A>> COVER REMOVAL

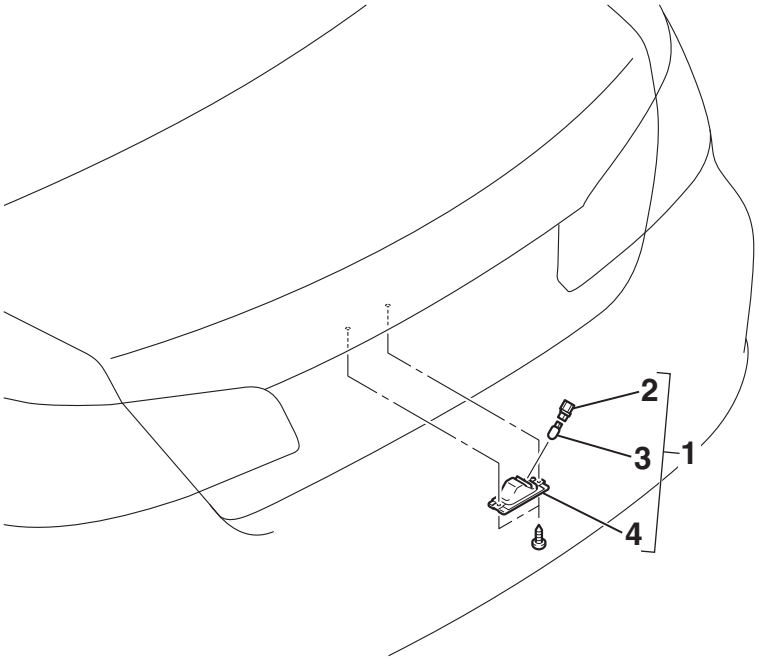
Use special tool MB990784 to remove the cover as shown in the illustration.



LICENSE PLATE LIGHT

REMOVAL AND INSTALLATION

M1542004200531



AC709938AB

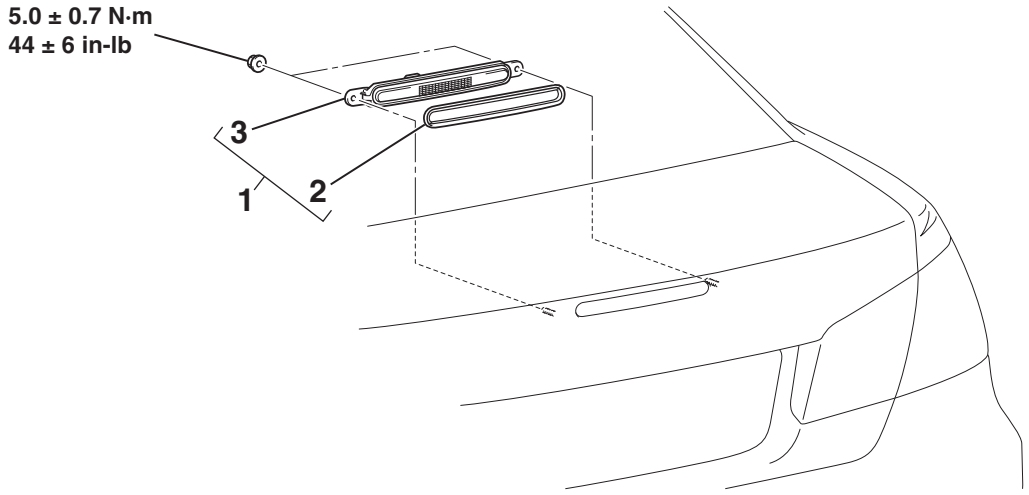
REMOVAL STEPS

1. LICENSE PLATE LIGHT ASSEMBLY
2. SOCKET
3. BULB
4. LICENSE PLATE LIGHT UNIT

HIGH-MOUNTED STOPLIGHT

REMOVAL AND INSTALLATION

M1542005100861



AC709941AB

REMOVAL STEPS

1. HIGH-MOUNTED STOPLIGHT ASSEMBLY

REMOVAL STEPS (Continued)

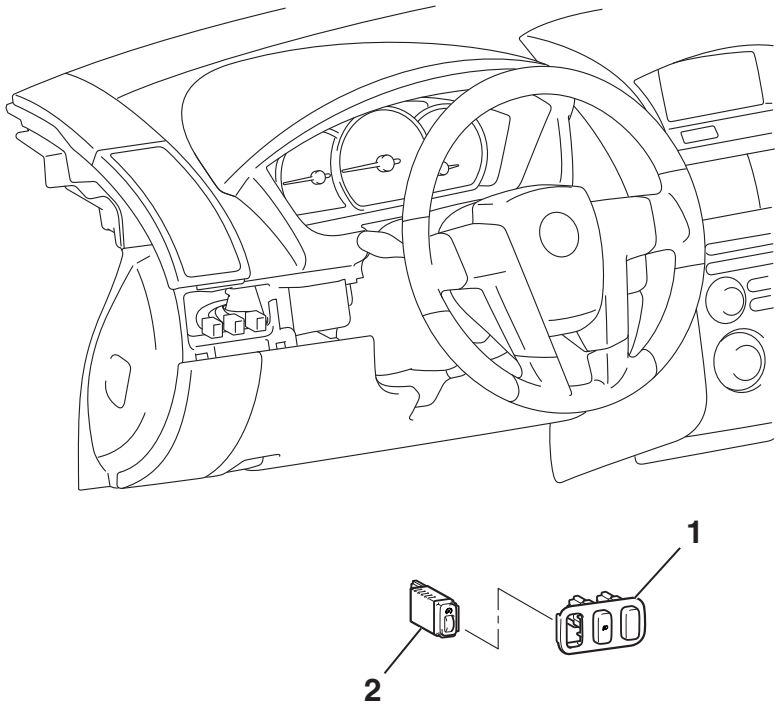
2. GASKET
3. HIGH-MOUNTED STOPLIGHT UNIT

TSB Revision

RHEOSTAT

REMOVAL AND INSTALLATION

M1542006000414



AC306975AB

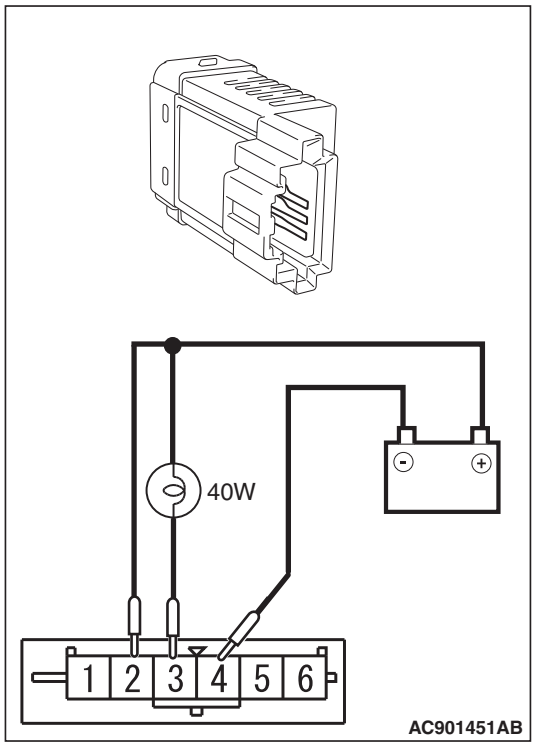
REMOVAL STEPS

1. SWITCH PANEL ASSEMBLY
2. RHEOSTAT SWITCH

INSPECTION

M1543019504447

RHEOSTAT SWITCH CHECK



1. Connect the battery and the test bulb (40W) as shown in the illustration.
2. Operate the rheostat, and if brightness changes smoothly without switching off, rheostat function is normal.

HAZARD WARNING LIGHT SWITCH

HAZARD WARNING LIGHT DIAGNOSIS

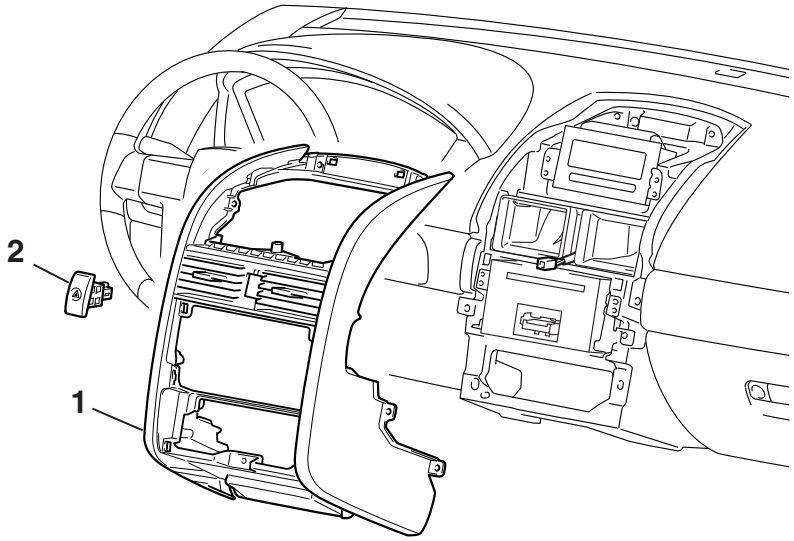
M1542000702284

The hazard warning lights are controlled by the Simplified Wiring System (SWS). For troubleshooting, refer to GROUP 54B, SWS Diagnosis P.54B-57.

HAZARD WARNING LIGHT SWITCH

REMOVAL AND INSTALLATION

M1542006600858



AC306994 AB

HAZARD WARNING LIGHT SWITCH REMOVAL STEPS

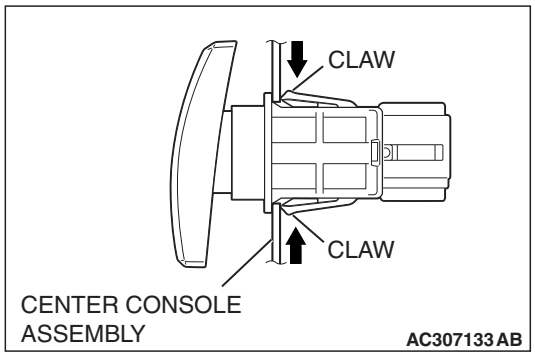
- GLOVEBOX ASSEMBLY, INSTRUMENT PANEL PARCEL BOX (REFER TO GROUP 52A, INSTRUMENT PANEL ASSEMBLY P.52A-15.)
- HOOD LOCK RELEASE HANDLE (REFER TO GROUP 42, HOOD P.42-8.)
- INSTRUMEN LOWER PANEL, INSTURMENT CENTER PANEL ASSEMBLY, CONSOLE METER HOOD (REFER TO GROUP 52A, INSTRUMENT PANEL ASSEMBLY P.52A-15.)

1. CENTER CONSOLE ASSEMBLY (REFER TO GROUP 52A, INSTRUMENT PANEL ASSEMBLY P.52A-15.)

<<A>> 2. HAZARD WARNING LIGHT SWITCH

REMOVAL SERVICE POINT

<<A>> HAZARD WARNING LIGHT SWITCH REMOVAL

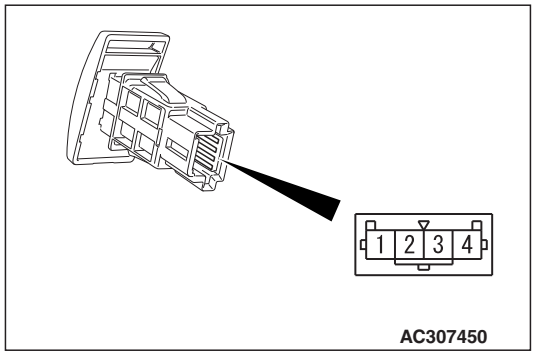


Remove the hazard warning light by pushing the claw toward the arrow in the illustration.

INSPECTION

M1543019504458

HAZARD WARNING LIGHT SWITCH CONTINUITY CHECK



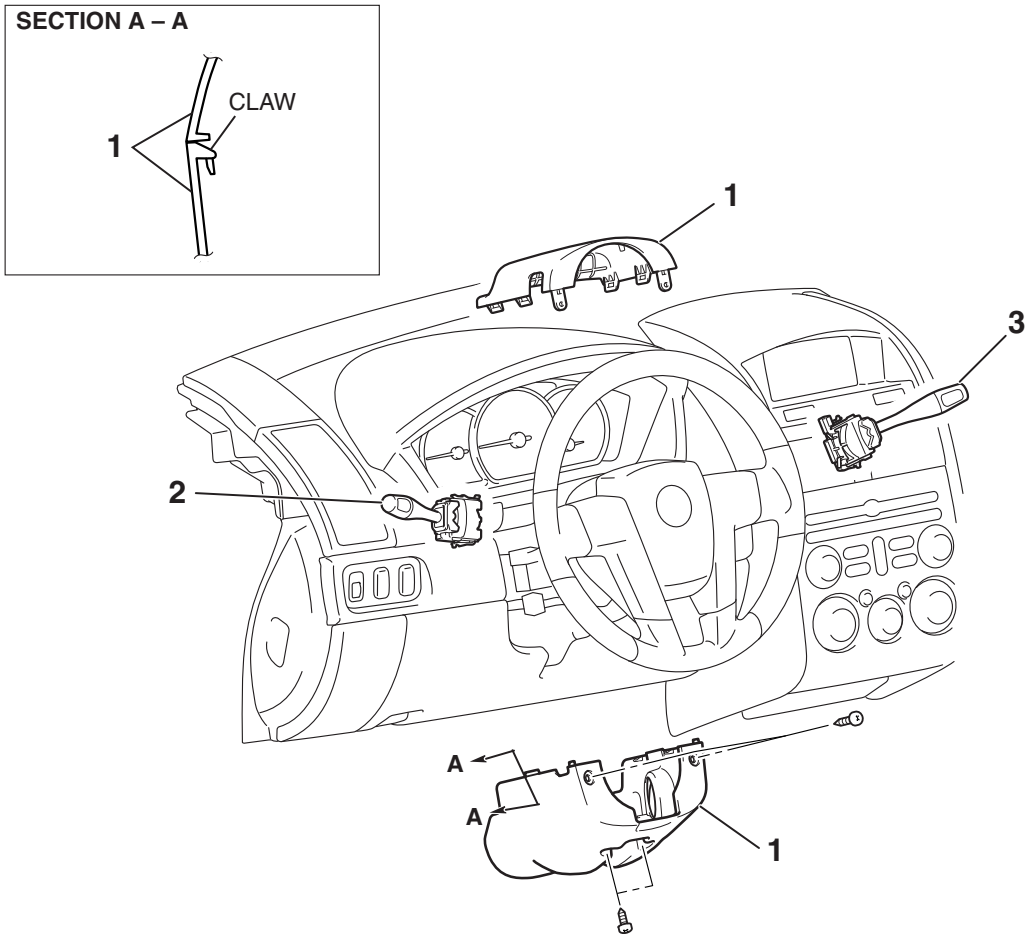
SWITCH POSITION	TESTER CONNECTION	SPECIFIED CONDITION
Pressed	1 –2	Less than 2 ohms
Released	1 –2	Open circuit

COLUMN SWITCH

REMOVAL AND INSTALLATION

M1543009100855

TURN-SIGNAL LIGHT/LIGHTING SWITCH AND WINDSHIELD WIPER/WINDSHIELD WASHER SWITCH



AC308092AB

REMOVAL STEPS

<<**A**>> 1. STEERING COLUMN COVER (REFER TO GROUP 52A, INSTRUMENT PANEL ASSEMBLY P.52A-15.)

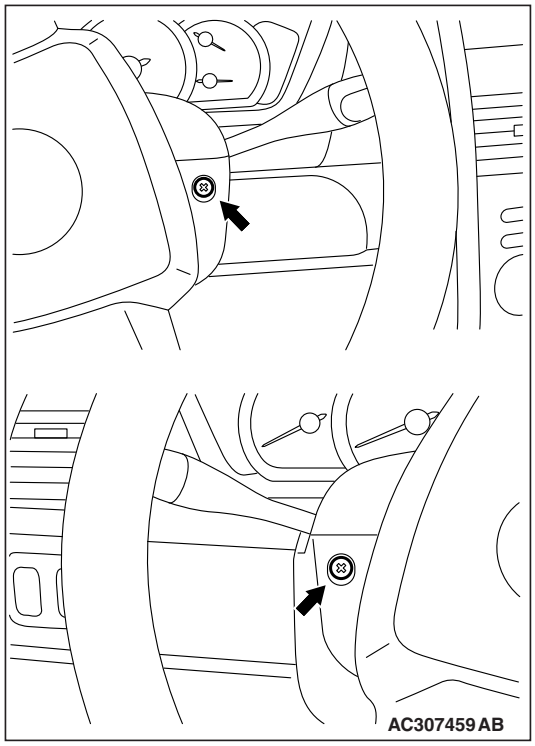
REMOVAL STEPS (Continued)

2. TURN-SIGNAL LIGHT AND LIGHTING SWITCH
3. WINDSHIELD WIPER AND WINDSHIELD WASHER SWITCH

REMOVAL SERVICE POINTS

<<A>> STEERING COLUMN UPPER COVER/STEERING COLUMN LOWER COVER REMOVAL

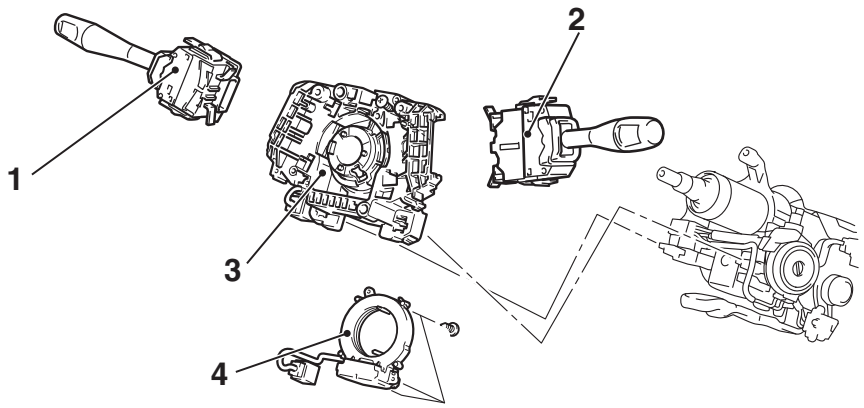
Rotate the steering wheel with a slightly side-to-side to access and remove the mounting screws.



COLUMN SWITCH BODY

⚠ CAUTION

- **To remove the driver airbag module, refer to GROUP 52B –Service Precautions P.52B-26 and Air Bag Module and Clock Spring P.52B-435.**
- **When the steering wheel sensor is replaced, always carry out calibration to make ASC-ECU learn the neutral point. (Refer to GROUP 35C –On-vehicle Service-Steering Wheel Sensor Calibration P.35C-213.)**



AC808363AB

REMOVAL STEPS

- STEERING COLUMN LOWER COVER AND STEERING COLUMN UPPER COVER (REFER TO GROUP 37 STEERING COLUMN SHAFT ASSEMBLY P.37-30).

1. TURN-SIGNAL LIGHT AND LIGHTING SWITCH
2. WINDSHIELD WIPER AND WINDSHIELD WASHER SWITCH

REMOVAL STEPS (Continued)

- CLOCK SPRING (REFER TO GROUP 52B - AIR BAG MODULE AND CLOCK SPRING P.52B-435).

3. COLUMN SWITCH BODY
4. STEERING WHEEL SENSOR (REFER TO GROUP 35C – STEERING WHEEL SENSOR P.35C-222.)

HORN

DIAGNOSIS <VEHICLE WITH KEYLESS ENTRY SYSTEM>

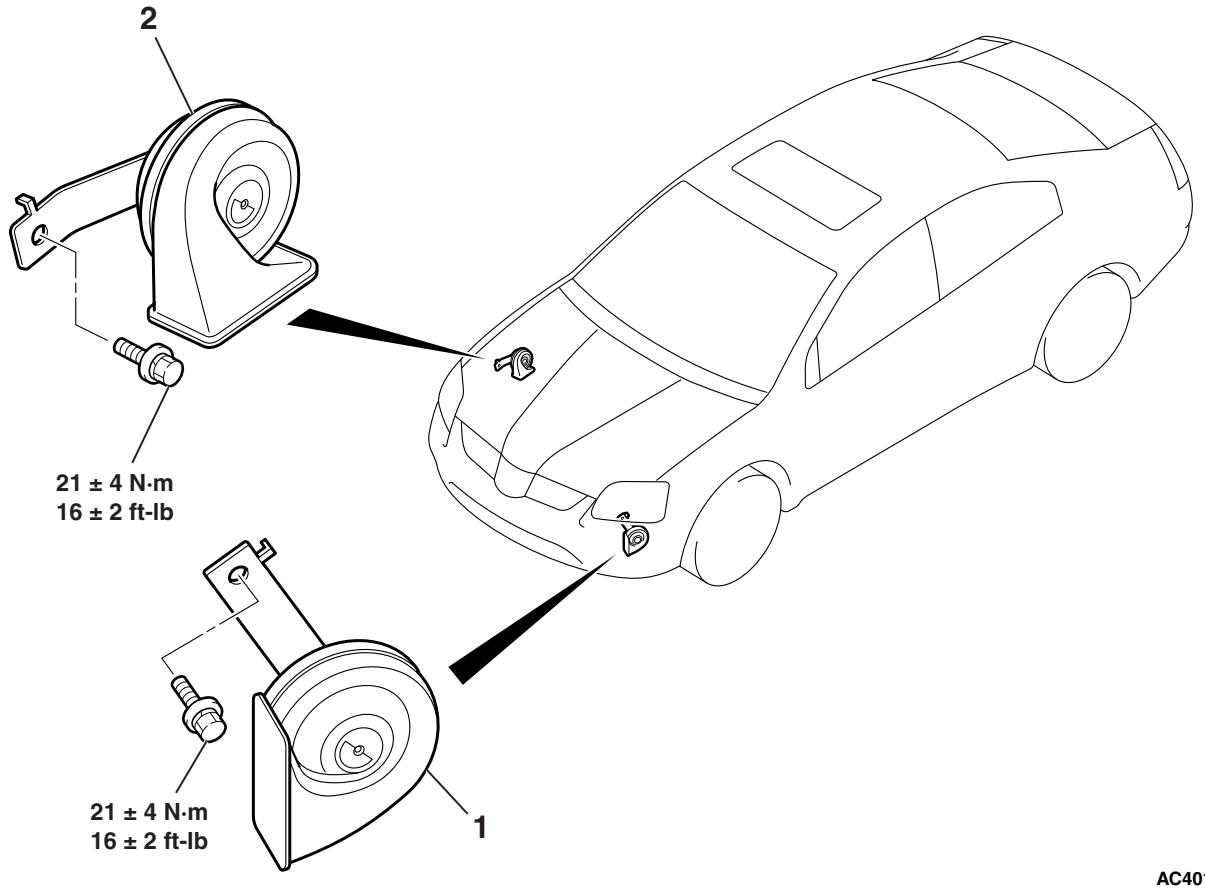
M1543000701637

The keyless entry system horn answerback are controlled by the Simplified Wiring System (SWS). For troubleshooting, refer to GROUP 54B, SWS Diagnosis P.54B-57.

HORN

REMOVAL AND INSTALLATION

M1543007900684



AC401796 AB

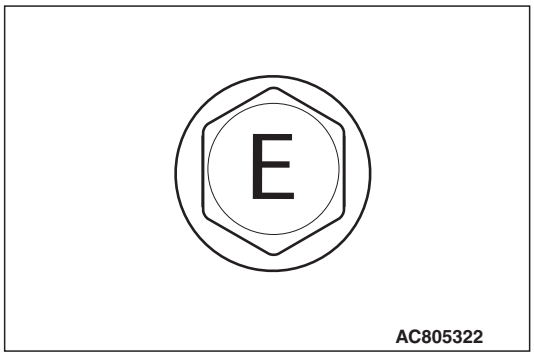
REMOVAL STEPS

>>**A**<< 1. HORN (LO)
>>**A**<< 2. HORN (HI)

INSTALLATION SERVICE POINT

>>A<< HORN (HI)/HORN (LO) INSTALLATION

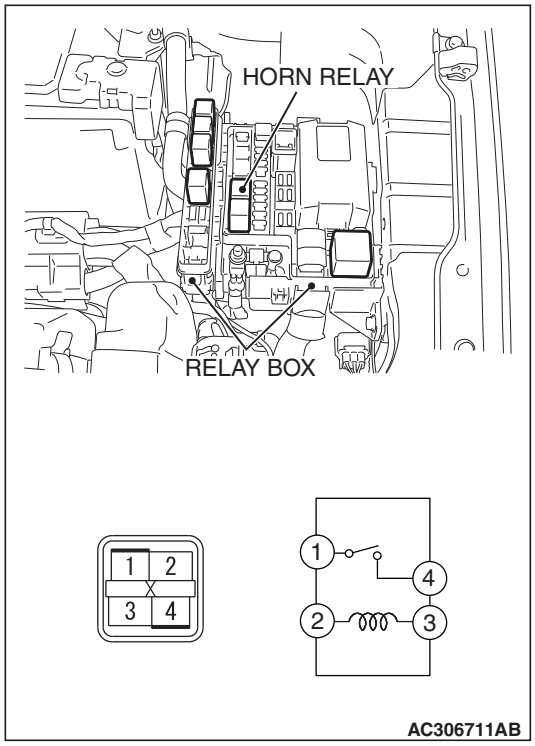
Use the ground bolts as the mounting bolts for horn (HI) and horn (LO). The ground bolts have "E" mark on the bolt heads.



INSPECTION

M1543019504469

HORN RELAY CONTINUITY CHECK

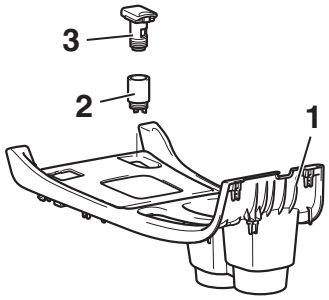


BATTERY VOLTAGE	TESTER CONNECTION	SPECIFIED CONDITION
Not applied	1-4	Open circuit
• Connect terminal 2 to the positive battery terminal • Connect terminal 3 to the negative battery terminal	1-4	Less than 2 ohms

ACCESSORY SOCKET

REMOVAL AND INSTALLATION

M1543008900513



AC709939AB

REMOVAL STEPS

1. GEARSHIFT LEVER PANEL (REFER TO GROUP 52A, FLOOR CONSOLE ASSEMBLY P.52A-21.)

REMOVAL STEPS (Continued)

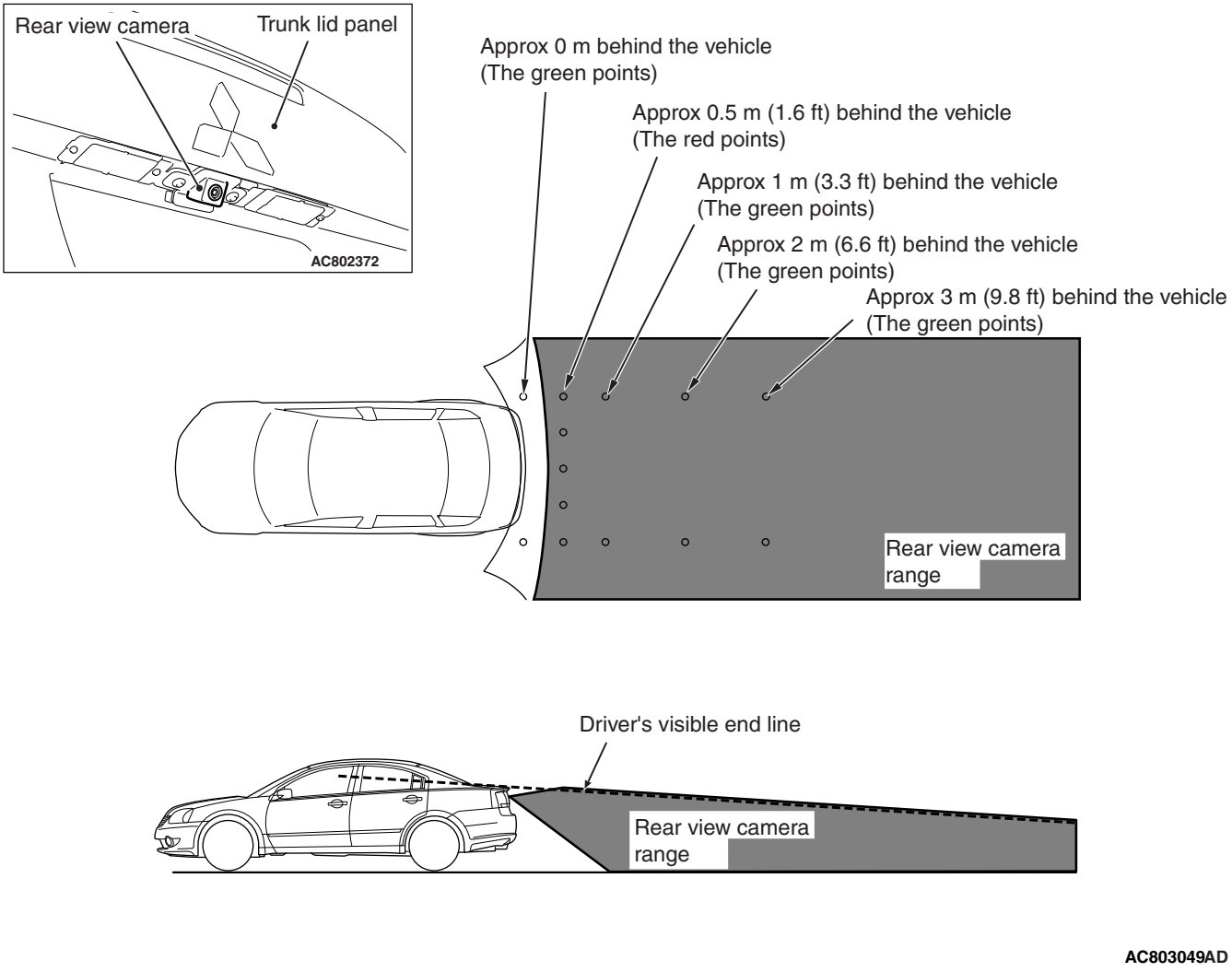
2. ACCESSORY SOCKET (ACC)
3. ACCESSORY SOCKET COVER

REAR VIEW CAMERA

GENERAL DESCRIPTION

M1540905600108

A rear view camera has been established to the trunk lid panel. The rear view camera displays the rear view image of the vehicle on the multi-center display for easy confirmation of safety when driving backward. <vehicle with MMCS>

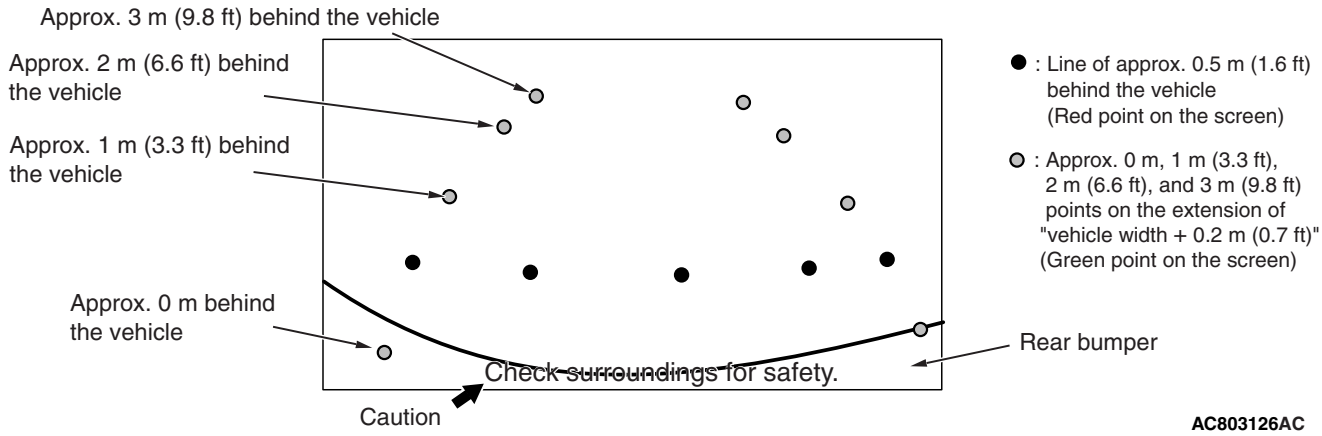


OPERATION

When the selector lever is moved to the R (reverse) position with the ignition switch "ACC" or "ON" position, the image of the rear view camera is displayed on the multi-center display screen.

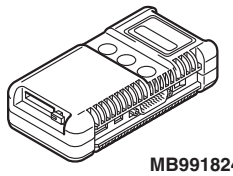
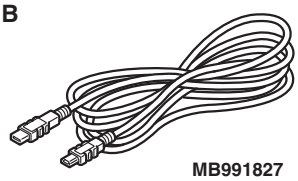
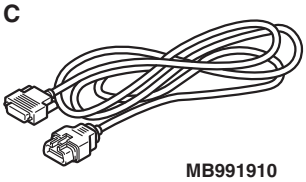
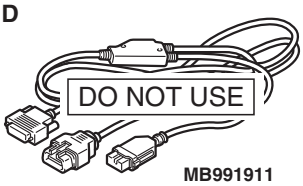
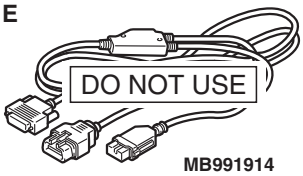
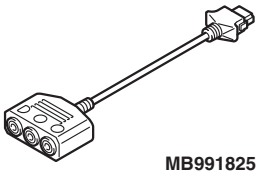
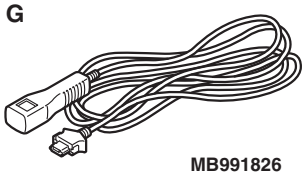
Screen display

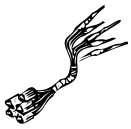
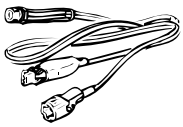
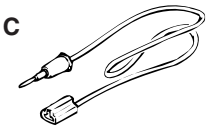
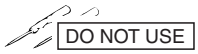
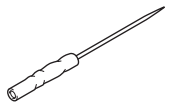
Displays rear view camera.



SPECIAL TOOLS

M1540902100096

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
A  MB991824 B  MB991827 C  MB991910 D  MB991911 E  MB991914 F  MB991825 G  MB991826 MB991958	MB991958 A: MB991824 B: MB991827 C: MB991910 D: MB991911 E: MB991914 F: MB991825 G: MB991826 M.U.T.-III sub assembly A: Vehicle communication interface (V.C.I.) B: M.U.T.-III USB cable C: M.U.T.-III main harness A (Vehicles with CAN communication system) D: M.U.T.-III main harness B (Vehicles without CAN communication system) E: M.U.T.-III main harness C (for Chrysler models only) F: M.U.T.-III measurement adapter G: M.U.T.-III trigger harness	MB991824-KIT *NOTE: G: MB991826 M.U.T.-III Trigger Harness is not necessary when pushing V.C.I. ENTER key.*	**⚠ CAUTION** **For vehicles with CAN communication, use M.U.T.-III main harness A to send simulated vehicle speed. If you connect M.U.T.-III main harness B instead, the CAN communication does not function correctly.** Reading diagnostic trouble code

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	General service tool (jumper)	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	–	Making voltage and resistance measurement during troubleshooting

TROUBLE SYMPTOM CHART

M1540900300061

Trouble symptom	Reference page
Rear view camera image is not correctly displayed	P.54A-156

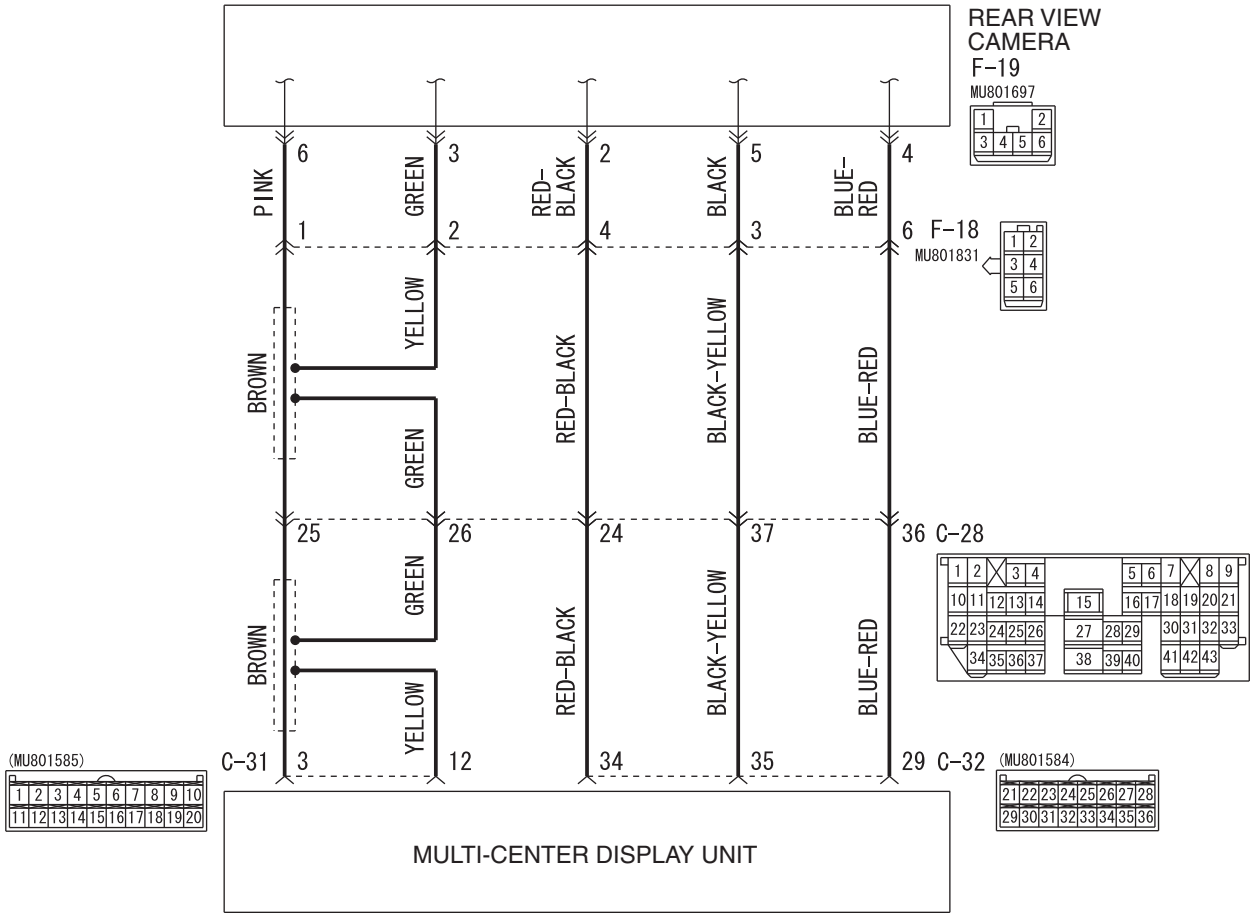
SYMPTOM PROCEDURES

Rear View Camera Image Is not Correctly Displayed.

⚠ CAUTION

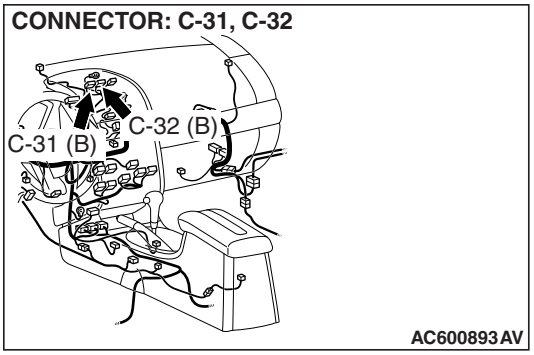
Before replacing the rear view camera or multi-center display, ensure that the power supply circuit and the ground circuit are normal. (Check that the voltage is 10 V or more.)

Rear View Camera Circuit

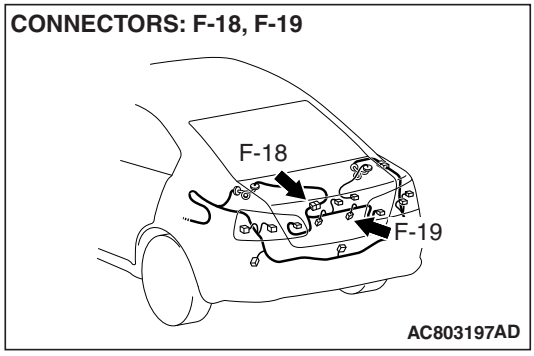


W9P54M054A

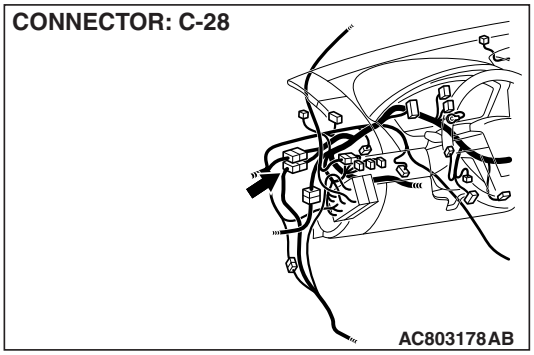
CONNECTOR: C-31, C-32



CONNECTORS: F-18, F-19



TSB Revision



COMMENTS ON TROUBLE SYMPTOM

When the screen of rear view camera is not shown even if the selector lever is "R" (Reverse) position, the rear view camera, the wiring harness, connectors, CAN bus line, power control module or multi-center display may be defective.

PROBABLE CAUSES

- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector.
- Malfunction of the power control module
- Malfunction of the CAN bus line
- Malfunction of the rear view camera
- Malfunction of the multi-center display

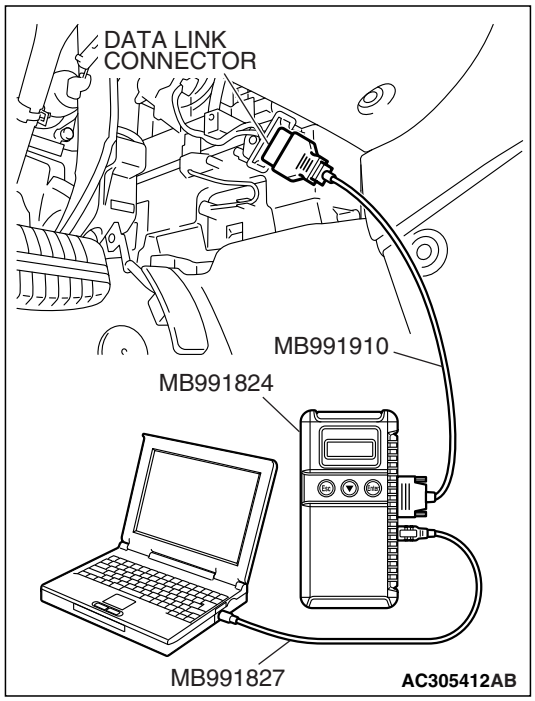
DIAGNOSTIC PROCEDURE

STEP 1. Confirmation in service mode.

(1) Display the SIGNAL CHECK MODEscreen. (Refer to P.54A-316.)
(2) Move the selector lever to the R position.
(3) Check if "R" is shown in the field of Shift position.

Q: Is the check result normal?

YES : Go to Step 6.
NO : Go to Step 2.



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

Use scan tool MB991958 to diagnose the CAN bus lines.
(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to "ON" position.
(3) Diagnose the CAN bus line.

Q: Is the check result satisfactory?

YES : Go to Step 3.
NO : Repair the CAN bus lines (Refer to GROUP 54C, Diagnosis-Can Bus Diagnostic Chart P.54C-13).

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

Check if DTC P0705 is set to the powertrain control module.

Q: Is the DTC set?

YES : Diagnose the MFI system by referring to GROUP 13A, MFI Diagnosis –Diagnostic Trouble Code Chart P.13A-46 <2.4L ENGINE> or GROUP 13B, MFI Diagnosis –Diagnostic Trouble Code Chart P.13B-46 <3.8L ENGINE>.
NO : Go to Step 4.

STEP 4. Using scan tool MB991958, read multi-center display diagnostic trouble code

Check if DTCs 11, 12, and 20 are set to the multi-center display.

Q: Is the DTC set?

YES : Diagnose the MMCS by referring to GROUP 54A – MMCS, Diagnosis Diagnostic Trouble Code Chart P.54A-328.
NO : Go to Step 5.

STEP 5. Confirmation in service mode.

(1) Display the SIGNAL CHECK MODEscreen. (Refer to P.54A-316.)
(2) Move the selector lever to the R position.
(3) Check if "R" is shown in the field of Shift position.

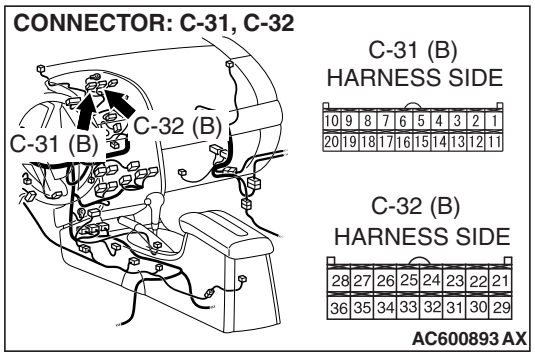
Q: Is the check result normal?

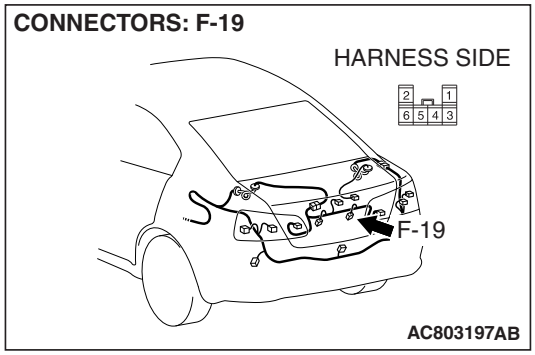
YES : Go to Step 6.
NO : Replace the multi-center display.

STEP 6. Check multi-center display connector C-31, C-32 and rear view camera connector F-19 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is multi-center display connector C-31,C-32 and rear view camera connector F-19 in good condition?

YES : Go to Step 7.
NO : Repair the damaged parts.



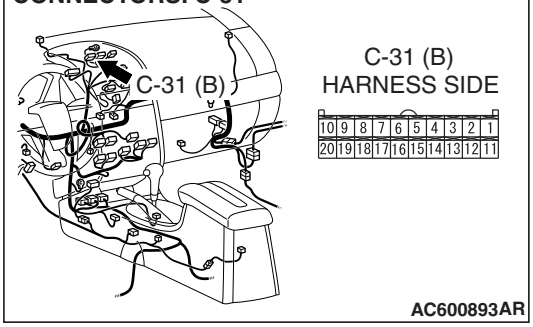


STEP 7. Check the wiring harness between multi-center display connector C-31 (terminal 3) and rear view camera connector F-19 (terminal 6).

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

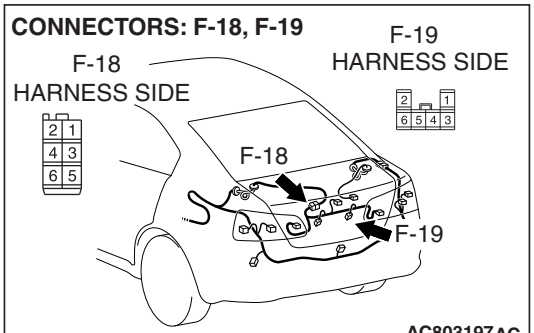
NOTE:

CONNECTORS: C-31



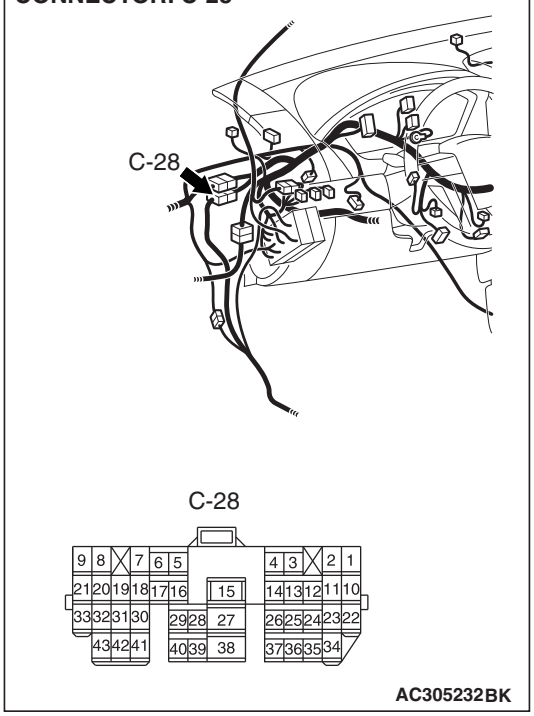
AC600893AR

CONNECTORS: F-18, F-19



AC803197AC

CONNECTOR: C-28



AC305232BK

Also check intermediate connectors C-28, F-18 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connectors C-28, F-18 are damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection .

Q: Are the wiring harness between multi-center display connector C-31 (terminal 3) and rear view camera connector F-19 (terminal 6) in good condition?

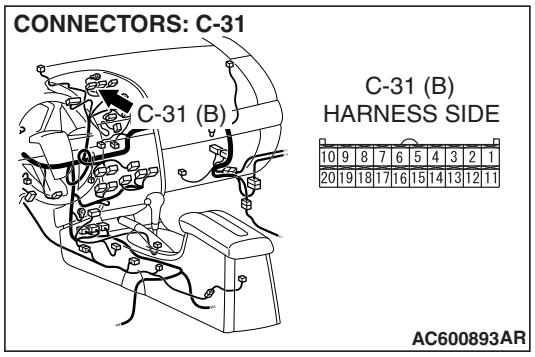
YES : Go to Step 8.

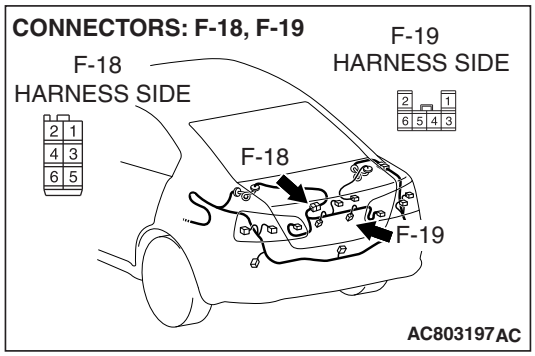
NO : The wiring harness may be damaged or the connector(s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector.

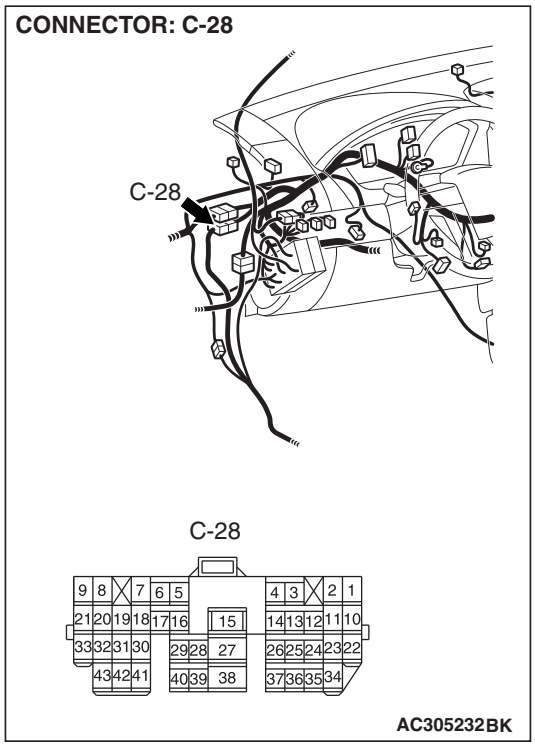
STEP 8. Check the wiring harness between multi-center display connector C-32 (terminal 34, 35, 29) and rear view camera connector F-19 (terminal 2, 5, 4).

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

NOTE:







Also check intermediate connectors C-28, F-18 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connectors C-28, F-18 are damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection .

Q: Are the wiring harness between multi-center display connector C-32 (terminal 34, 35, 29) and rear view camera connector F-19 (terminal 2, 5, 4) in good condition?

YES : Go to Step 9.

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

STEP 9. Perform "DISPLAY CHECK" in the service mode.
(1) Display the DISPLAY CHECK screen. (Refer to P.54A-316.)
(2) Check if the rear view marker screen is displayed.

Q: Is the check result normal?

YES : Go to Step 11.
NO : Replace the rear view camera temporarily, and then go to Step 10.

STEP 10. Trouble symptom recheck
Check that the display of rear view camera is shown normally.

Q: Is the check result normal?

YES : Replace the rear view camera.
NO : Replace the multi-center display.

STEP 11. Trouble symptom recheck
Check that the display of rear view camera is shown normally.

Q: Is the check result normal?

YES : Intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction P.00-14.
NO : Replace the multi-center display.

ON-VEHICLE SERVICE

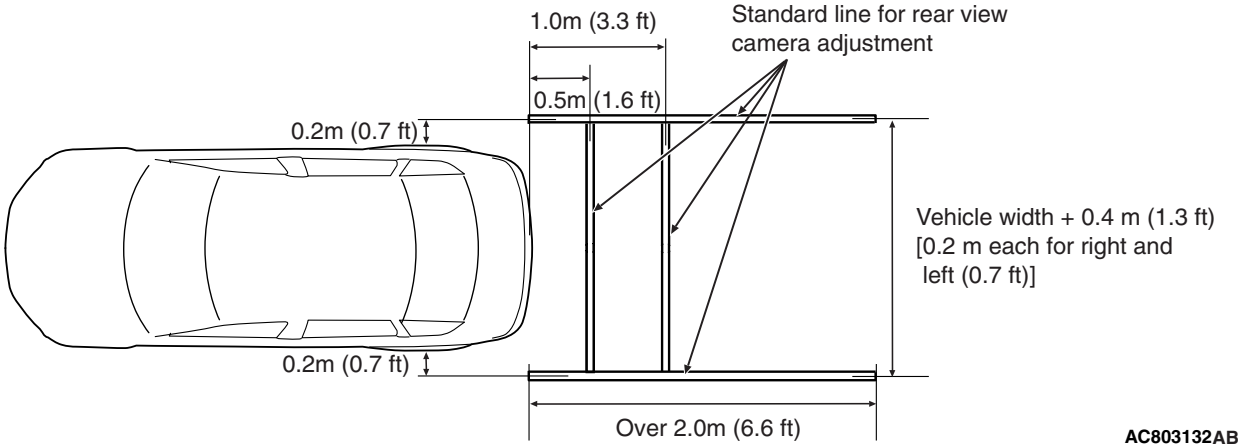
CAMERA SETTING

M1540905700064

With the service mode on the multi-center display, the guide markers can be adjusted.

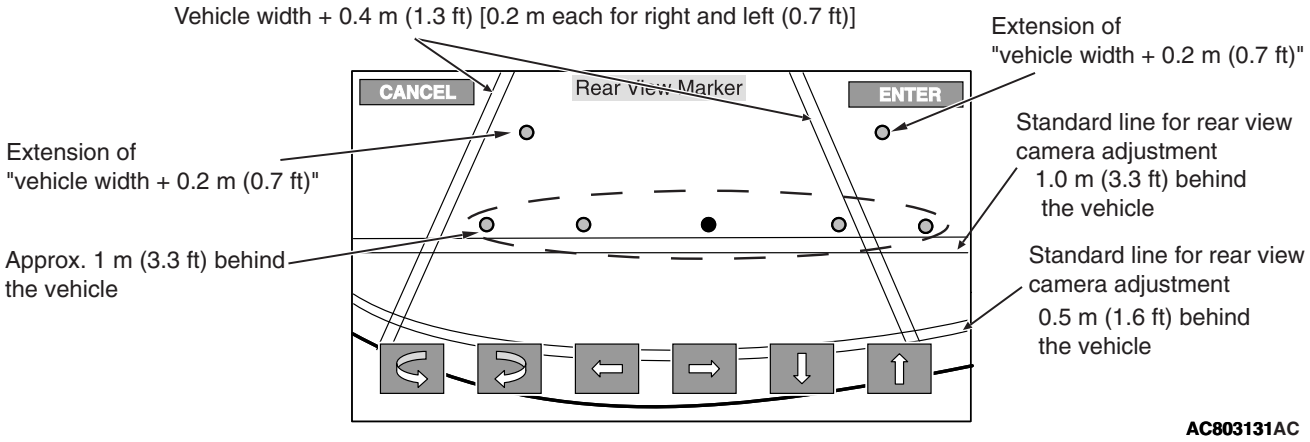
Guide marker display position adjustment

1. Set the standard lines for the rear view camera adjustment on the ground.



AC803132AB

2. Start the service mode on the multi-center display. (Refer to P.54A-316.)
3. Select "Camera" on the DISPLAY CHECK screen to display the rear view marker screen.

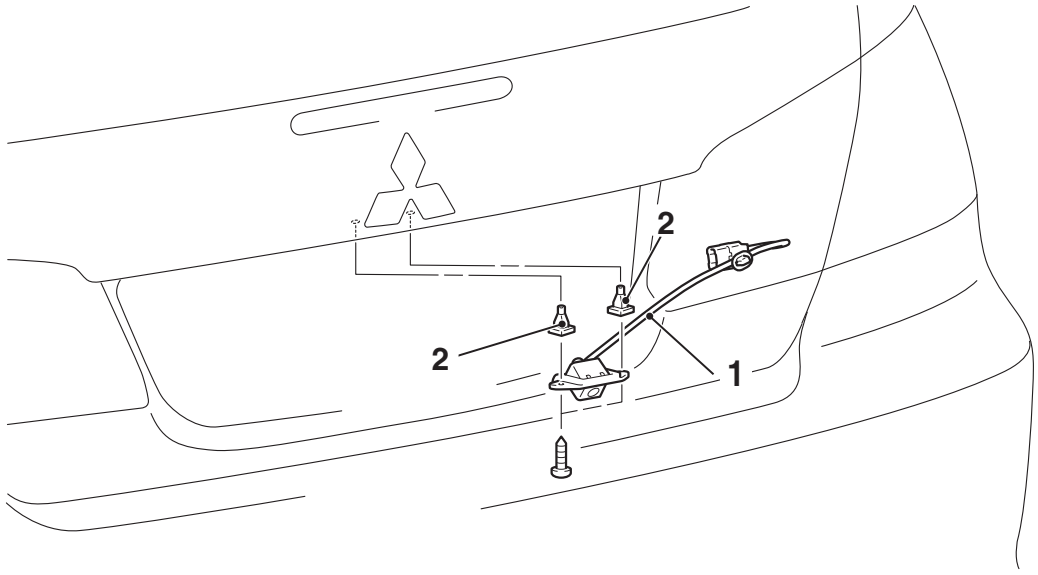


AC803131AC

4. Select and adjust the arrows* (touch panel) on the screen to set the rear view markers on the standard lines for rear view camera adjustment.
   *NOTE: *: Five adjustment levels are provided for each arrow.*
5. After adjustment, select [ENTER] to save the setting.

REMOVAL AND INSTALLATION

M1540905500112



AC802398AB

Removal Steps
1. REAR VIEW CAMERA
2. SCREW GROMMET

RADIO AND CD PLAYER

GENERAL DESCRIPTION

M1544000100776

<Vehicles without audio amplifier>
- Radio and CD player
- Shows textual information regarding audio system operation.

<Vehicles with audio amplifier>
- Radio, CD player and CD changer
- Audio amplifier is fitted.
- Shows textual information regarding audio system operation.

RADIO WITH CD PLAYER, SPEAKER AND ANTENNA DIAGNOSIS

INTRODUCTION TO AUDIO SYSTEM DIAGNOSIS

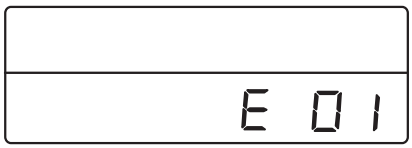
M1544004700598

The diagnosis for symptoms such as noise being emitted, no sound being played, or sound coming only out of one speaker (or set of speakers) is provided.

AUDIO ERROR CODES

If the radio and CD player or radio, CD player and CD changer detects any malfunction in itself or the inserted CD, the error codes below will be shown on the multi-center display.

ERROR SCREEN SAMPLE
<MULTI-CENTER DISPLAY>



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ERROR CODES	CAUSE	CAUSE OF TROUBLE AND ITS SOLUTION
E Com	Connection error	This error code will be shown if the radio and CD player or radio, CD player and CD changer are not connected to their related components correctly. Check the connectors and wiring harness for open or short circuit.
E01	Focus error	If there is any problem on the CD, this error code will be shown. If no error message appears when another disc is inserted, the disc is defective. Check the items below, and take a necessary action. • Contamination, scratch, or deformation • Formation of moisture or grease Insert the disc again, and check that no error appear.
E02	Abnormal disc	
E03	Mechanical error	This error codes will be shown if there is any internal mechanical or electrical problem in the radio and CD player or radio, CD player and CD changer. Replace the radio and CD player or radio, CD player and CD changer, and check that no error codes are shown.
E HOT	Protection against high temperature	If the internal temperature is extremely high, this error code will be shown. Turn off the radio and CD player or radio, or CD player and CD changer and wait until they cool down. Wait for a while, and then turn on the unit again. Check that the same error does not appear.

ERROR CODES	CAUSE	CAUSE OF TROUBLE AND ITS SOLUTION
E DC	Detection abnormal output to the speaker	When the foreign material such as a coin and drink goes into the unit and DC offset is occurred in the signal input part of the power IC, this error code will be shown. When a liquid goes inside of the unit, turn off the radio and leave for a while and make it dry. Then turn on the radio and check the same error code does not appear. When a solid goes inside, replace the unit (head unit or amplifier).

ERROR CODE (SIRIUS satellite radio) <VEHICLES WITH MULIT-CENTER DISPLAY>

The multi-center display displays the error codes below if an abnormality related to the satellite radio is detected.

ERROR CODES	CAUSE	CAUSE OF TROUBLE AND ITS SOLUTION
ANT	Antenna error	This code is displayed when there is a failure, improper connection, or open circuit in the satellite antenna base and the satellite radio tuner cannot receive normal voltage value or current value. Check the satellite radio tuner, the satellite antenna base and the antenna feeder cable, and replace if necessary.
LINKING	Cannot pick up signal	This code is displayed when the signal is too weak and it cannot be received. Move to a place where the signal can be received easily, or check if there is foreign material that interferes with signal reception on the satellite antenna base, and remove if necessary.
CALL 888-539-SIRIUS	Unauthorized channel	This code is displayed when the channel to be received is not included in the contract with SIRIUS™ satellite radio. Contact SIRIUS™ satellite radio and make a contract for the channel.
----- (HYphen)	There is no selectable channel	There is no channel that can be selected. Cancel the SKIP settings so that the channels can be selected.
_ _ _ _ _ (Underscore)	Channel is invalid	No program is broadcast on this channel now, or this channel cannot be received. Ask SIRIUS™ satellite radio.
SAT E	Mechanical fault or bad connection	This code is displayed when the satellite radio tuner has a mechanical problem or when an error occurs in the communication with radio and CD player or radio, CD player and CD changer. Check the radio and CD player or the radio, CD player and CD changer, the satellite radio tuner, and each harness and connector, and replace if necessary.
OFFAIR	OFF AIR	This code is displayed when this channel is not broadcast at this moment, or broadcast of the satellite radio is interrupted. Check the airtime and the broadcast conditions of SIRIUS™ satellite radio.
NOT ACT	ID not registered	This code is displayed when the SIRIUS ID is not written to the satellite radio tuner. Replace the satellite radio tuner.

ERROR CODES	CAUSE	CAUSE OF TROUBLE AND ITS SOLUTION
READ	Data reading in progress	This code is displayed when the data received is being read. Wait until reading of the data received is completed.
UPDT	Channel data updating in progress	This code is displayed when SIRIUS™ satellite radio is updating the channel data. Wait until update is completed.
SUB UPDT	Contract status updating complete	This code is displayed when the contract status is updated. This code disappears when any of the audio switch is pressed.

AUDIO SYSTEM DIAGNOSTIC TROUBLESHOOTING STRATEGY

M1544004800421

Use these steps to plan your diagnostic strategy. Follow through with each step to ensure that you have exhausted all possible methods of finding an 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 that the malfunction is eliminated.

SYMPTOM CHART

M1544004902071

SYMPTOM		INSPECTION PROCEDURE	REFERENCE PAGE
When power switch is turned "ON," no power is available.		1	P.54A-168
Remote controlled radio switch	When remote controlled radio power switch is turned "ON," no power is available. But radio, CD player and CD changer power switch is available. <Vehicles with audio amplifier>	2	P.54A-174
	The system does not recognize the remote controlled radio switch (RH) only. <Vehicles with audio amplifier>	3	P.54A-182
	The system does not recognize the remote controlled radio switch (LH) only. <Vehicles with audio amplifier>	4	P.54A-184
No sound. <Vehicles with audio amplifier>		5	P.54A-187
No sound from one speaker. <Vehicles without audio amplifier>		6	P.54A-192
No sound from one speaker. <Vehicles with audio amplifier>		7	P.54A-205
The sound of external input is not played.		8	P.54A-223
Noise	Noise is present while moving (AM).	9	P.54A-226
	Noise is present while moving (FM).	10	P.54A-226
	Sound mixed with noise, only at night (AM).	11	P.54A-227
	Noise is overpowering both AM and FM.	12	P.54A-228
	Excessive noise on AM and FM.	13	P.54A-229
	Noise is detected with engine running.	14	P.54A-230
	Noise appears during vibration or shocks.	15	P.54A-232
	Noise is present while moving (FM).	16	P.54A-233
	Constant noise.	17	P.54A-234
Radio	No reception (AM).	18	P.54A-235
	Poor reception.	19	P.54A-236
	Distortion on AM and/or FM.	20	P.54A-237
	Distortion on FM only.	21	P.54A-238
	Auto select function inoperative, too few automatic stations are selected.	22	P.54A-238
	Preset stations are erased.	23	P.54A-240
	Only the satellite radio cannot be heard normally.	24	P.54A-240

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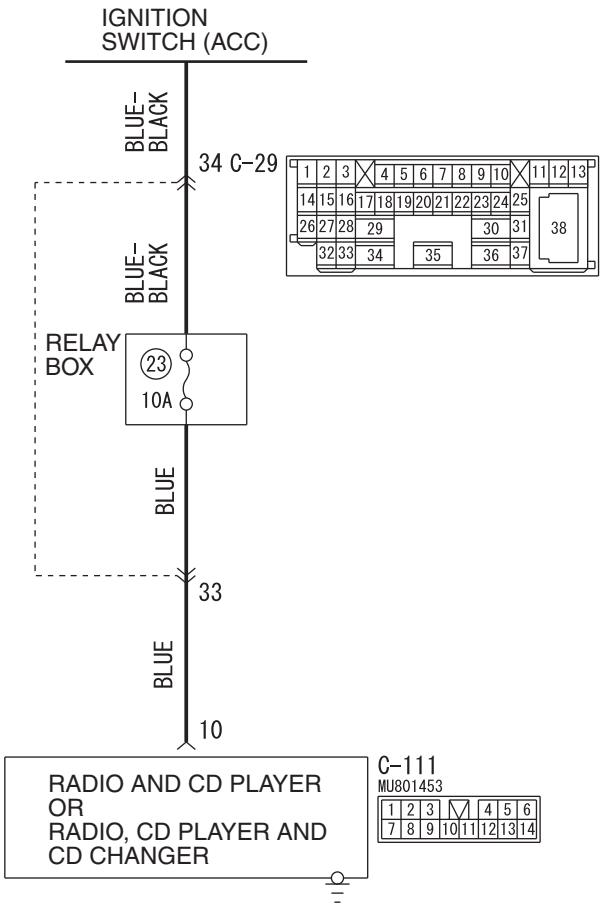
SYMPTOM		INSPECTION PROCEDURE	REFERENCE PAGE
CD player, CD auto changer	CD can not be inserted.	25	P.54A-247
	No sound (CD only).	26	P.54A-248
	CD sound skips.	27	P.54A-249
	Sound quality is poor.	28	P.54A-250
	CD cannot be ejected.	29	P.54A-250

SYMPTOM PROCEDURES

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

Radio and CD Player or Radio, CD Player and CD Changer Power Supply Circuit



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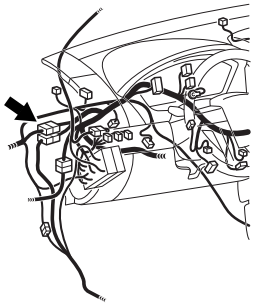
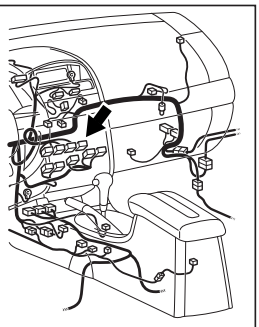
TSB Revision

CONNECTOR: C-29



AC305231CH

CONNECTOR: C-111



AC305233BZ

CIRCUIT OPERATION

Power is supplied to the radio and CD player or radio, CD player and CD changer when the ignition switch is in the "ACC" position or "ON" position. When the ignition is switched on, the radio and CD player or radio, CD player and CD changer or radio, CD player and CD changer 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 or radio, CD player and CD changer power supply circuit.

TROUBLESHOOTING HINTS

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

DIAGNOSIS

Required Special Tool:

- MB991223: Harness set

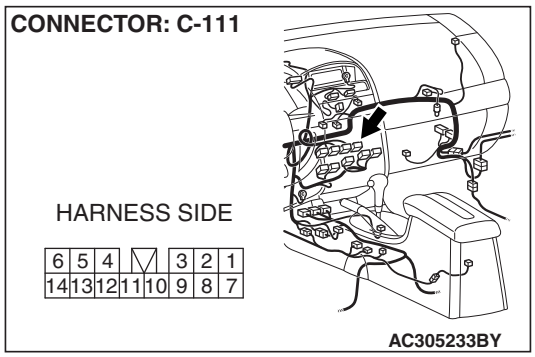
STEP 1. Check to see that the radio and CD player or radio, CD player and CD changer is energized when the power switch is turned ON.

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

Q: Is the radio and CD player or radio, CD player and CD changer 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 or radio, CD player and CD changer connector C-111 for loose, corroded or damaged terminals, or terminals pushed back in the connector.



Q: Are radio and CD player or radio, CD player and CD changer connector C-111 in good condition?

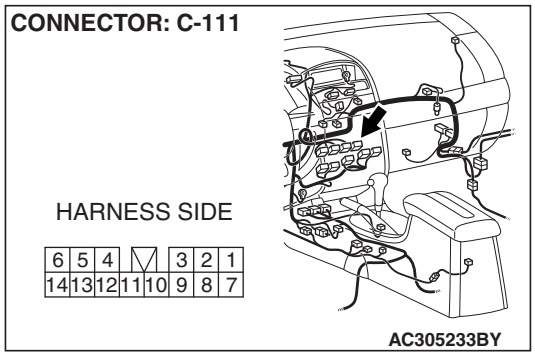
YES : Go to Step 3.

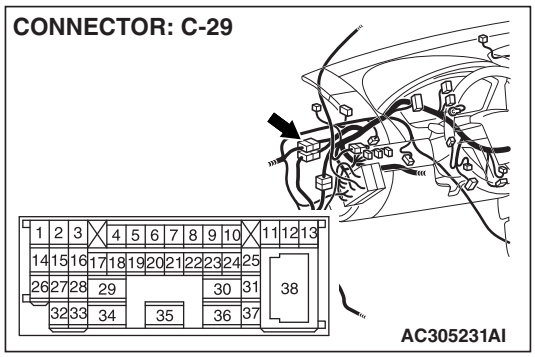
NO : Repair or replace the component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. If the power switch is turned on, the radio and CD player or radio, CD player and CD changer should operate normally.

STEP 3. Check the wiring harness between radio and CD player or radio, CD player and CD changer connector C-111 (terminal 10) and the ignition switch (ACC).

- Check the wiring harness for open circuit and short circuit.

NOTE:





Also check intermediate connector C-29 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-29 is damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between radio and CD player or radio, CD player and CD changer connector C-111 (terminal 10) and ignition switch (ACC) 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 or radio, CD player and CD changer should operate normally.

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

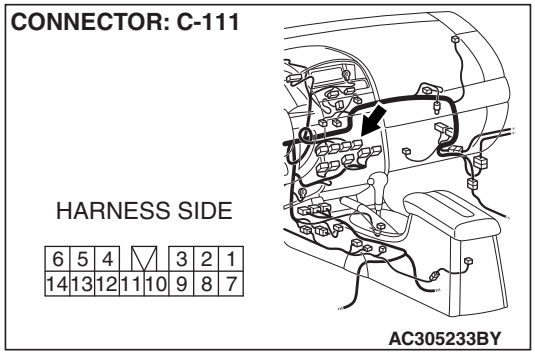
NOTE: The radio and CD player or radio, CD player and CD changer are grounded to the deck crossmember directly.

Q: Are the radio and CD player or radio, CD player and CD changer installed correctly?

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

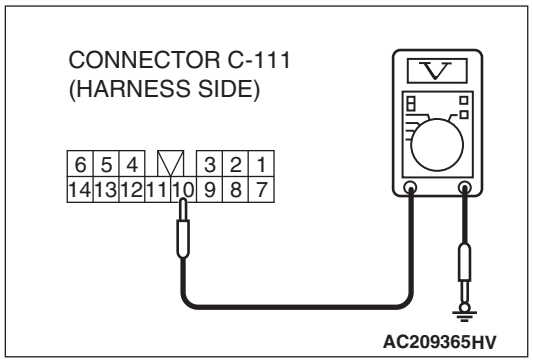
NO : Install the radio and CD player or radio, CD player and CD changer properly. If the power switch is turned on, the radio and CD player or radio, CD player and CD changer should operate normally.

STEP 5. Measure at radio and CD player or radio, CD player and CD changer connector C-111 in order to check the battery circuit of power supply system to the radio and CD player or radio, CD player and CD changer (ignition switch ACC).



(1) Disconnect radio and CD player or radio, CD player and CD changer connector C-111, and measure at the wiring harness side.

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



(3) Measure the voltage between terminal 10 and ground.

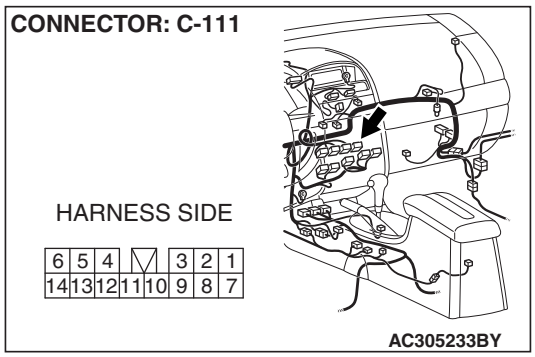
- The voltage should measure approximately 12 volts (battery positive voltage).

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

YES : Go to Step 8.

NO : Go to Step 6.

STEP 6. Check radio and CD player or radio, CD player and CD changer connector C-111 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

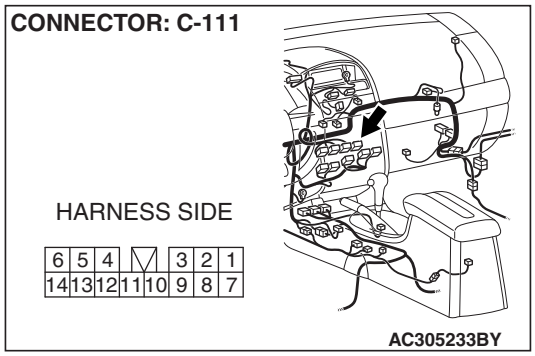


Q: Are radio and CD player or radio, CD player and CD changer connector C-111 in good condition?

YES : Go to Step 7.

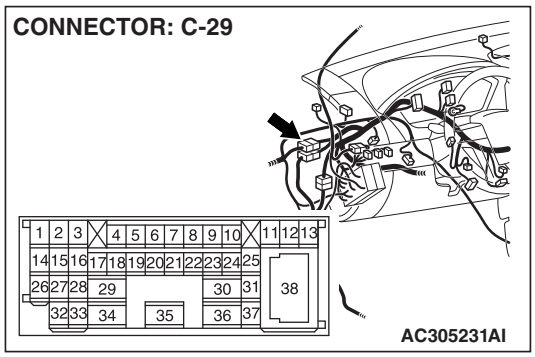
NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. If the power switch is turned on, the radio and CD player or radio, CD player and CD changer should operate normally.

STEP 7. Check the wiring harness between radio and CD player or radio, CD player and CD changer connector C-111 (terminal 10) and ignition switch (ACC).



- Check the wiring harness for open circuit and short circuit.

NOTE:



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

Q: Is the wiring harness between radio and CD player or radio, CD player and CD changer connector C-111 (terminal 10) and ignition switch (ACC) in good condition?

YES : There is no action to be taken.

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

STEP 8. Check the installation condition of the radio and CD player or radio, CD player and CD changer.

NOTE: The radio and CD player or radio, CD player and CD changer are grounded to the deck crossmember directly.

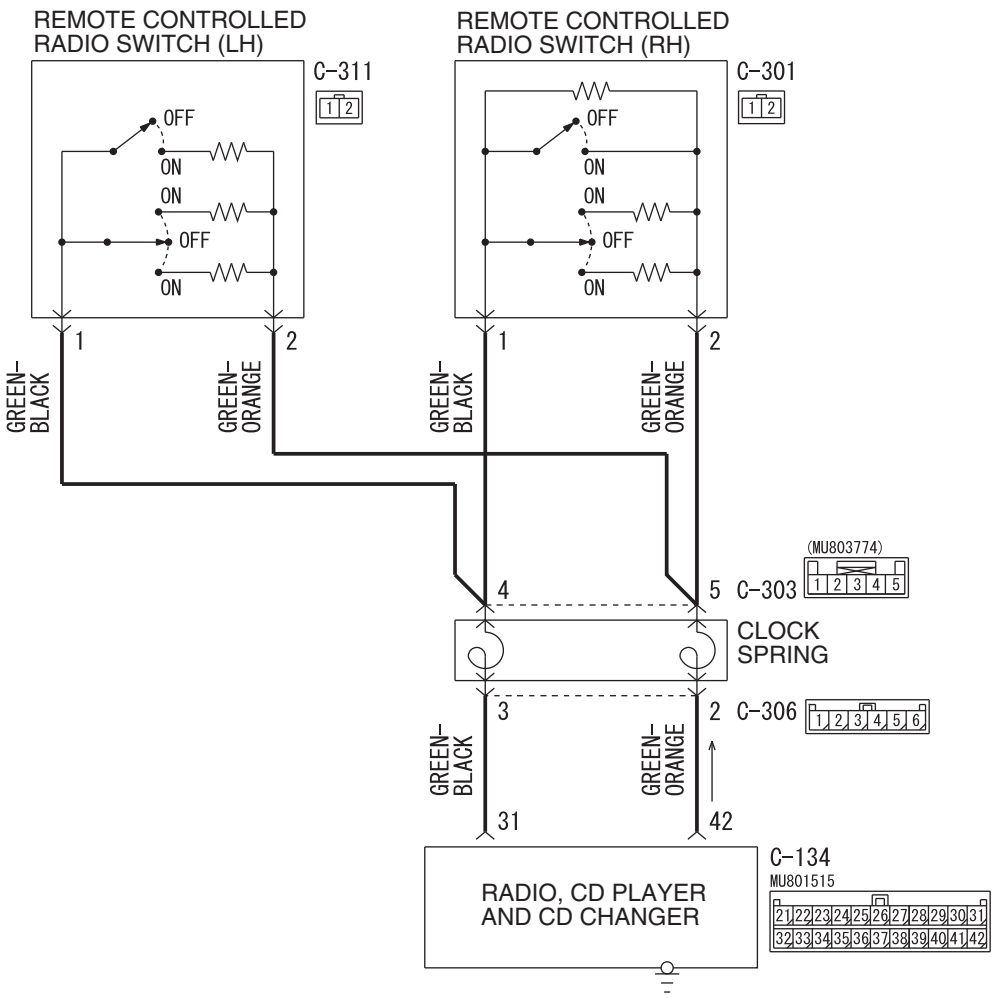
Q: Are the radio and CD player or radio, CD player and CD changer installed correctly?

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

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

INSPECTION PROCEDURE 2: When Remote Controlled Radio Power Switch is Turned "ON", no Power is Available. But Radio, CD Player and CD Changer Power Switch is Available. <Vehicles with Audio Amplifier>

Remote Controlled Radio Switch Power Supply Circuit



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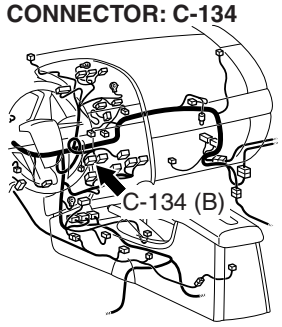
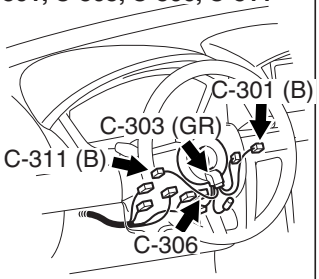
CONNECTOR: C-134



AC600893AO

CONNECTORS: C-301, C-303, C-306, C-311



AC305235AQ

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CIRCUIT OPERATION

- If the remote controlled radio switch is operated, the output voltage will change. The radio, CD player and CD changer operates according to the change on the voltage. You can switch on/off the audio unit, control the mode and volume by the remote controlled radio switch (RH). You can select a CD track and pre-set radio station, and tune it by the remote controlled radio switch (LH).

  NOTE: You can switch on the audio unit by the remote controlled switch, but can not switch it off.

TECHNICAL DESCRIPTION (COMMENT)

If the system does not recognize the remote controlled radio switches (RH), the clock spring or the radio, CD player and CD changer may be defective.

TROUBLESHOOTING HINTS

- Malfunction of the remote controlled radio switch (RH)
- Malfunction of the radio, CD player and CD changer
- Malfunction of the clock spring
- Damaged wiring harness or connectors

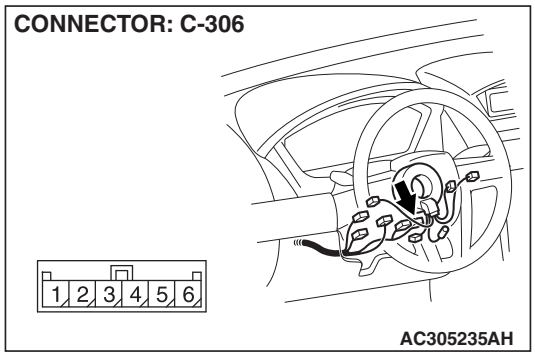
DIAGNOSIS

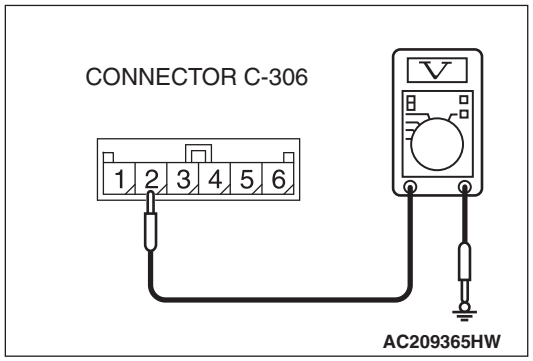
Required Special Tool:

- MB991223: Harness set

STEP 1. Measure the voltage at remote controlled radio switch power supply circuit at the clock spring connector C-306.

(1) Disconnect the clock spring connector C-306.
(2) Turn the ignition switch to "ON" position.





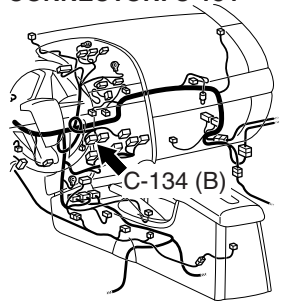
(3) Measure the voltage between clock spring connector C-306 (radio, CD player and CD changer side) terminal 2 and ground.
  - The measured value should be approximately 5 volts.

Q: Is the measured voltage approximately 5 volts?

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

STEP 2. Check radio, CD player and CD changer connector C-134 and clock spring connector C-306 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

CONNECTOR: C-134



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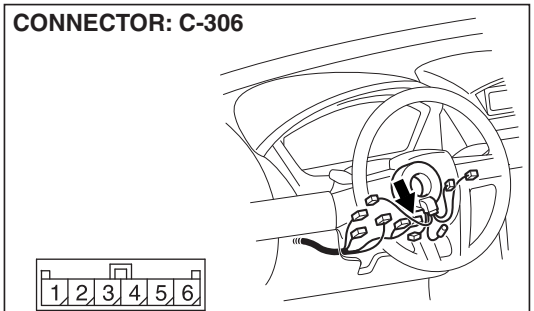
CONNECTOR: C-306



AC305235AH

Q: Are radio, CD player and CD changer connector C-134 and clock spring connector C-306 in good condition?

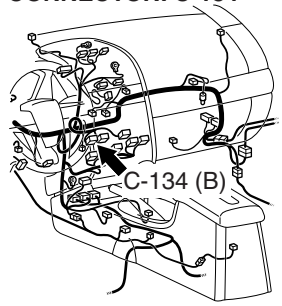
YES : Go to Step 3.

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

STEP 3. Check the wiring harness between radio, CD player and CD changer connector C-134 (terminal 42) and clock spring connector C-306 (terminal 2).

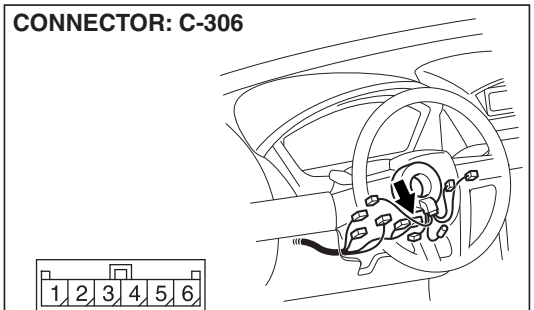
- Check the wiring harness for open circuit and short circuit.

CONNECTOR: C-134



AC600893AO

CONNECTOR: C-306



AC305235AH

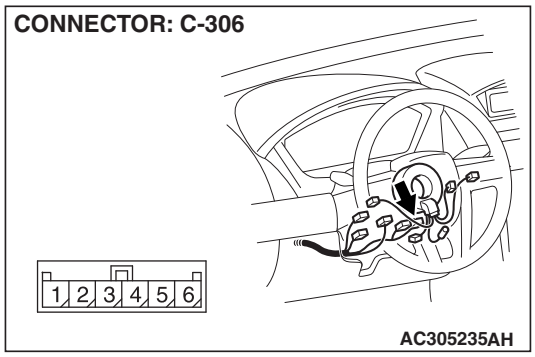
Q: Is the wiring harness between radio, CD player and CD changer connector C-134 (terminal 42) and clock spring connector C-306 (terminal 2) in good condition?

YES : Go to Step 4.

NO : Repair the wiring harness. The remote controlled radio switch should work normally.

STEP 4. Measure the resistance at remote controlled radio switch ground circuit to the clock spring connector C-306.

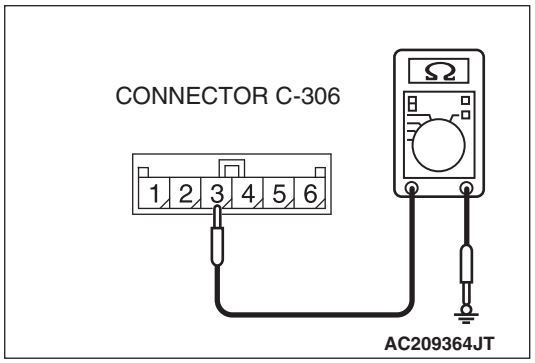
(1) Disconnect the clock spring connector C-306.



(2) Measure resistance between terminal 3 and ground.
- The measured value should be 2 ohm or less.

Q: Is the measured resistance 2 ohms or less?

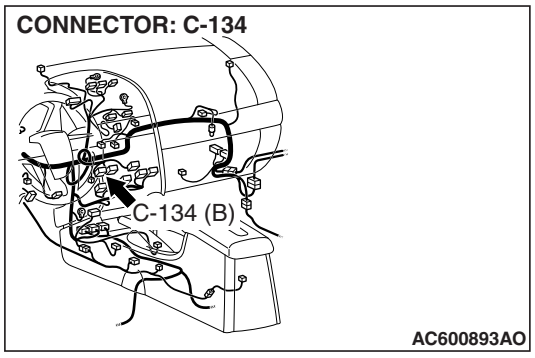
YES : Go to Step 7.
NO : Go to Step 5.

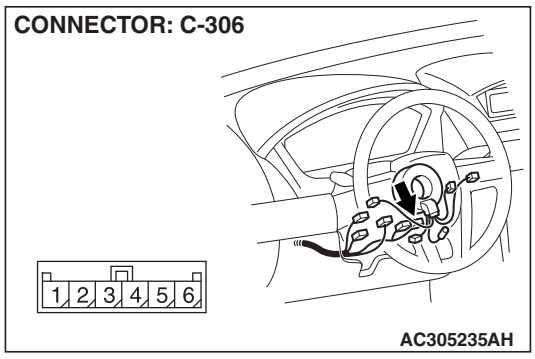


STEP 5. Check radio, CD player and CD changer connector C-134 and clock spring connector C-306 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

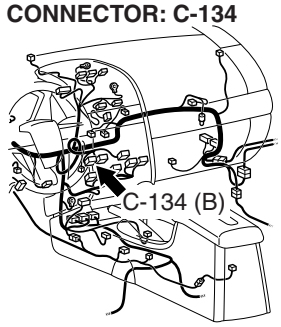
Q: Are radio, CD player and CD changer connector C-134 and clock spring connector C-306 in good condition?

YES : Go to Step 6.
NO : Repair or replace the component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The remote controlled radio switch should work normally.



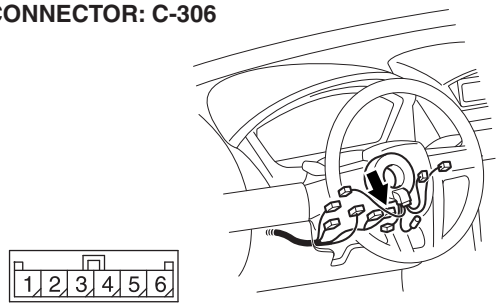


CONNECTOR: C-134



AC600893AO

CONNECTOR: C-306



AC305235AH

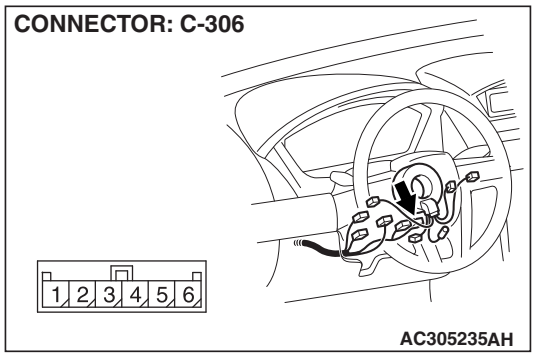
STEP 6. Check the wiring harness between radio, CD player and CD changer connector C-134 (terminal 31) and clock spring connector C-306 (terminal 3).

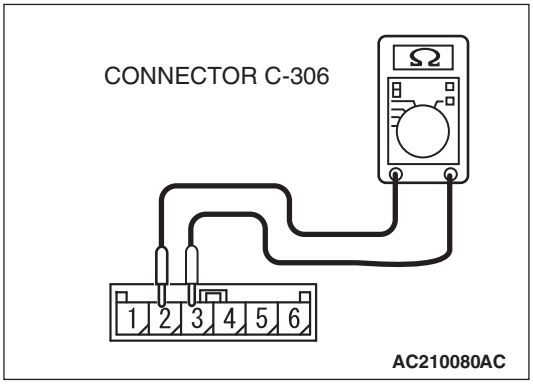
- Check the wiring harness for open circuit and short circuit.

Q: Is the wiring harness between radio, CD player and CD changer connector C-134 (terminal 31) and clock spring connector C-306 (terminal 3) in good condition?

YES : Go to Step 7.

NO : Repair the wiring harness. The remote controlled radio switch should work normally.





STEP 7. Measure the resistance between the clock spring connector C-306 terminals.

(1) Disconnect the clock spring connector C-306.

(2) Measure the resistance between clock spring connector C-306 (clock spring side) terminals 2 and 3. Operate the right remote controlled radio switches, and check that the table below is satisfied.

SWITCH POSITION	MEASUREMENT VALUE (RH SIDE SWITCH)
No push	Approximately 24.0 kΩ
Upper	Approximately 6.8 kΩ
Center	Less than 2 ohms
Lower	Approximately 15.0 kΩ

NOTE: When checking the right remote controlled radio switch, do not operate the left remote controlled radio switch.

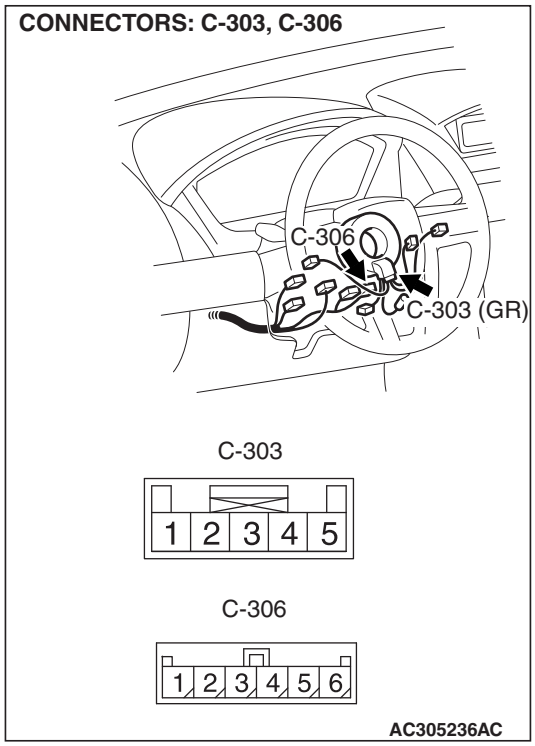
Q: Is the resistance between terminals 2 and 3 normal?

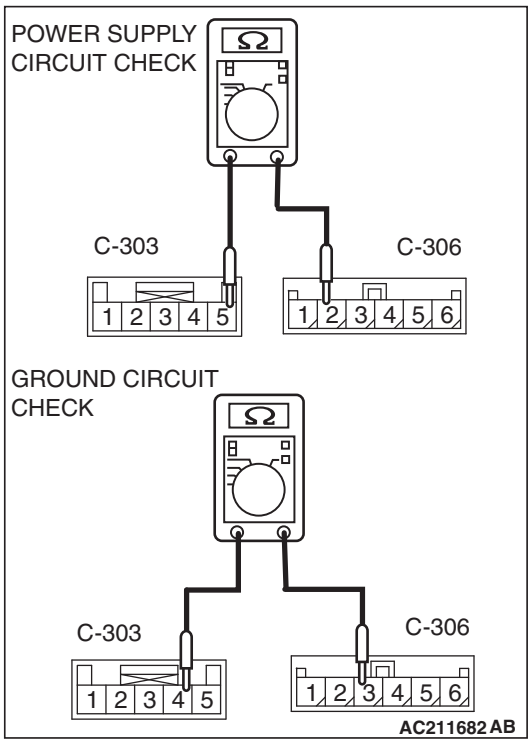
YES : This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points-How to Cope with Intermittent Malfunction P.00-14.

NO : Go to Step 8.

STEP 8. Measure the resistance at clock spring terminal.

(1) Remove the clock spring (Refer to GROUP 52B, Air Bag Module(s) and Clock Spring P.52B-435).





(2) Measure the resistance at clock spring connectors C-303 and C-306.

CIRCUIT TO BE MEASURED	CONNECTOR (TERMINAL) TO BE CHECKED	SPECIFIED CONDITION
Power supply circuit	C-303 (terminal 5) –C-306 (terminal 2)	Less than 2 ohms
Ground circuit	C-303 (terminal 4) –C-306 (terminal 3)	less than 2 ohms

Q: Is the measured resistance 2 ohms or less?

YES : Go to Step 9.

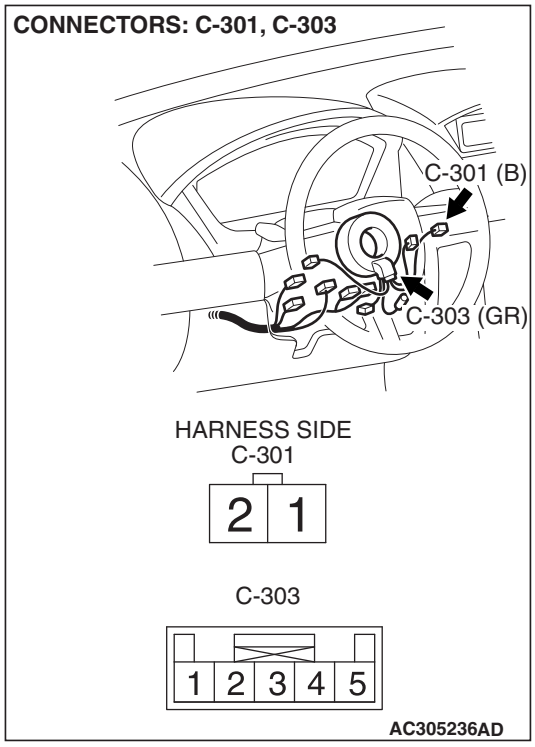
NO : Replace the clock spring.

STEP 9. Check the clock spring connector C-303 and remote controlled radio switch (RH) connector C-301 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are clock spring connector C-303 and remote controlled radio switch (RH) connector C-301 in good condition?

YES : Go to step 10.

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



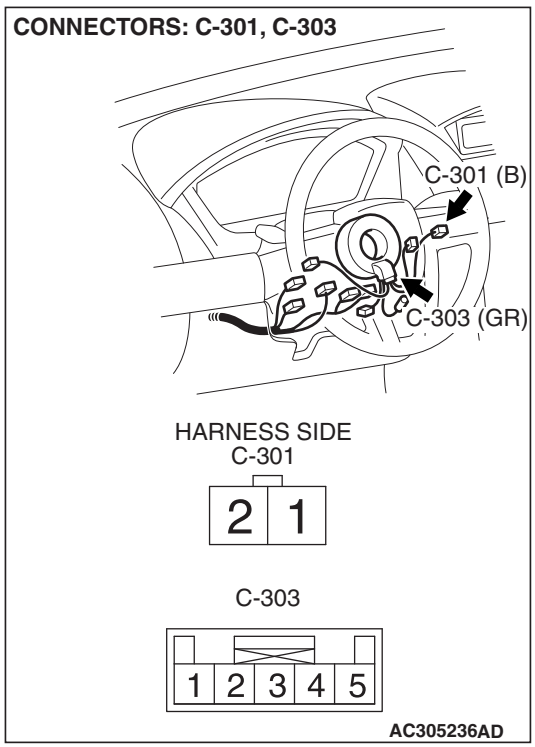
STEP 10. Check the wiring harness between clock spring connector C-303 (terminals 4 and 5) and remote controlled radio switch (RH) connector C-301 (terminals 1 and 2).

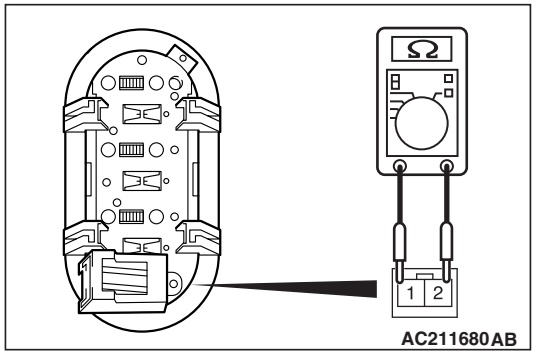
- Check the wiring harness for open circuit and short circuit.

Q: Is the wiring harness between clock spring connector C-303 (terminals 4 and 5) and remote controlled radio switch (RH) connector C-301 (terminals 1 and 2) in good condition?

YES : Go to Step 11.

NO : Repair the wiring harness. The remote controlled radio switch should work normally.





STEP 11. Measure the resistance at remote controlled radio switch (RH).

(1) Remove the airbag module assembly (Refer to GROUP 52B, Air Bag Module(s) and Clock Spring P.52B-435).
(2) Disconnect remote controlled radio switch (RH) connector C-301, and measure at the remote controlled radio switch (RH) connector side.
(3) Measure the resistance by operating the remote controlled radio switch (RH) in each position.

SWITCH POSITION	MEASUREMENT VALUE
No push	Approximately 24.0 kΩ
Upper	Approximately 6.8 kΩ
Center	Less than 2 ohms
Lower	Approximately 15.0 kΩ

Q: Are the resistance at the right remote controlled radio switch normal?

YES : Replace the radio, CD player and CD changer.
NO : Replace the remote controlled radio switch (RH).

INSPECTION PROCEDURE 3: The System does not Recognize the Remote Controlled Radio Switch (RH) Only. <Vehicles with Audio Amplifier>

CIRCUIT OPERATION

Refer to Inspection Procedure 2 P.54A-174.

TECHNICAL DESCRIPTION (COMMENT)

Refer to Inspection Procedure 2 P.54A-174.

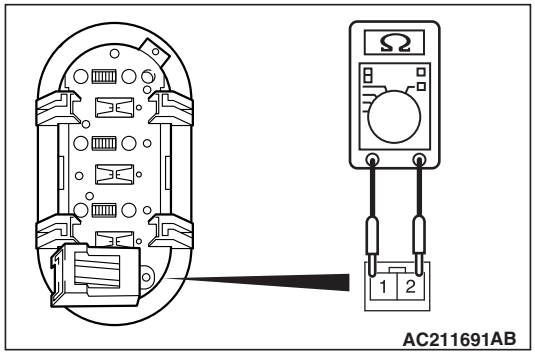
TROUBLESHOOTING HINTS

Refer to Inspection Procedure 2 P.54A-174.

DIAGNOSIS

Required Special Tool:

- MB991223: Harness set



STEP 1. Measure the resistance at remote controlled radio switch (RH).

(1) Remove the airbag module assembly (Refer to GROUP 52B, Air Bag Module(s) and Clock Spring P.52B-435).
(2) Disconnect remote controlled radio switch (RH) connector C-301, and measure at the remote controlled radio switch (RH) connector side.
(3) Measure the resistance by operating the remote controlled radio switch (RH) in each position.

SWITCH POSITION	MEASUREMENT VALUE
No push	Approximately 24.0 kΩ
Upper	Approximately 6.8 kΩ
Center	Less than 2 ohms
Lower	Approximately 15.0 kΩ

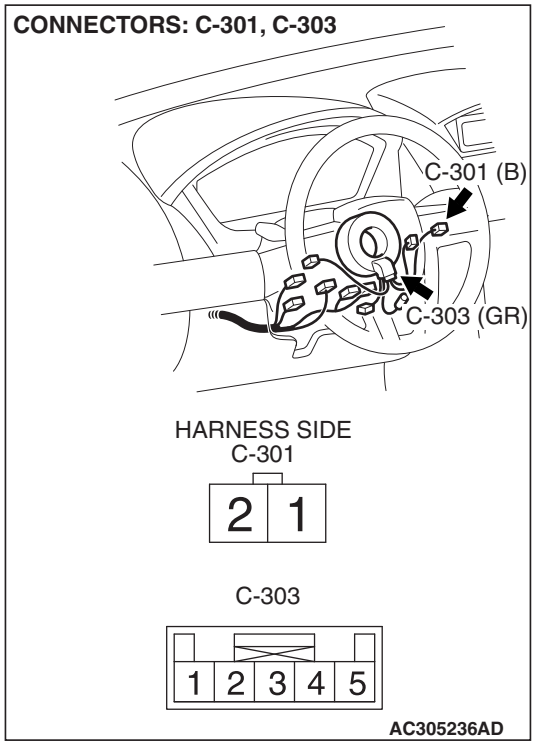
Q: Are the resistance at the right remote controlled radio switch normal?

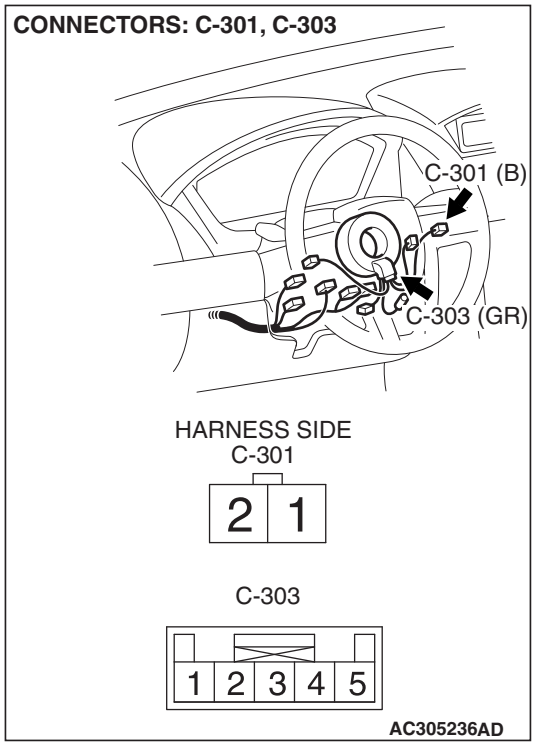
YES : Go to Step 2.
NO : Replace the remote controlled radio switch (RH).

STEP 2. Check the remote controlled radio switch (RH) connector C-301 and clock spring connector C-303 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is remote controlled radio switch (RH) connector C-301 and clock spring connector C-303 in good condition?

YES : Go to Step 3.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The remote controlled radio switch (RH) should work normally.





STEP 3. Check the wiring harness between remote controlled radio switch (RH) connector C-301 (terminals1 and 2) and clock spring connector C-303 (terminals 4 and 5).

- Check the wiring harness for open circuit and short circuit.

Q: Are the wiring harness between remote controlled radio switch (RH) connector C-301 (terminals 1 and 2) and clock spring connector C-303 (terminals 4 and 5) in good condition?

YES : The procedure is complete.

NO : Repair the wiring harness. The remote controlled radio switch (RH) should work normally.

INSPECTION PROCEDURE 4: The System does not Recognize the Remote Controlled Radio Switch (LH) Only.<Vehicles with Audio Amplifier>

CIRCUIT OPERATION

Refer to Inspection Procedure 2 P.54A-174.

TECHNICAL DESCRIPTION (COMMENT)

Refer to Inspection Procedure 2 P.54A-174.

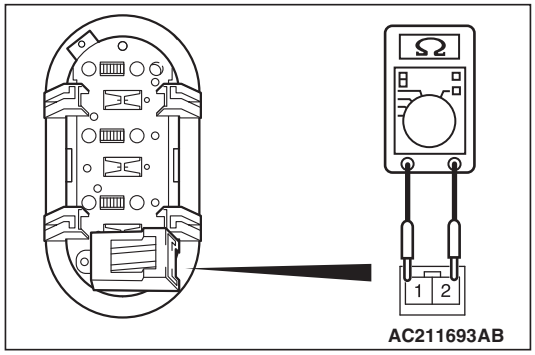
TROUBLESHOOTING HINTS

Refer to Inspection Procedure 2 P.54A-174.

DIAGNOSIS

Required Special Tool:

- MB991223: Harness set



STEP 1. Measure the resistance at remote controlled radio switch (LH).

(1) Remove the airbag module assembly (Refer to GROUP 52B, Air Bag Module(s) and Clock Spring P.52B-435).
(2) Disconnect remote controlled radio switch (RH) connector C-311, and measure at the remote controlled radio switch (LH) connector side.
(3) Measure the resistance by operating the remote controlled radio switch (LH) in each position.

SWITCH POSITION	MEASUREMENT VALUE
No push	Open circuit
Upper	Approximately 1.2 kΩ
Center	Approximately 470 Ω
Lower	Approximately 3.3 kΩ

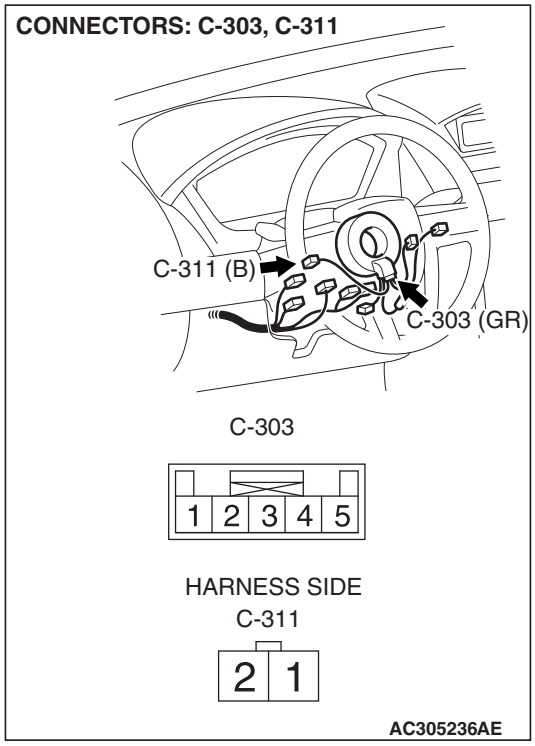
Q: Is the resistance at the left remote controlled radio switch normal?

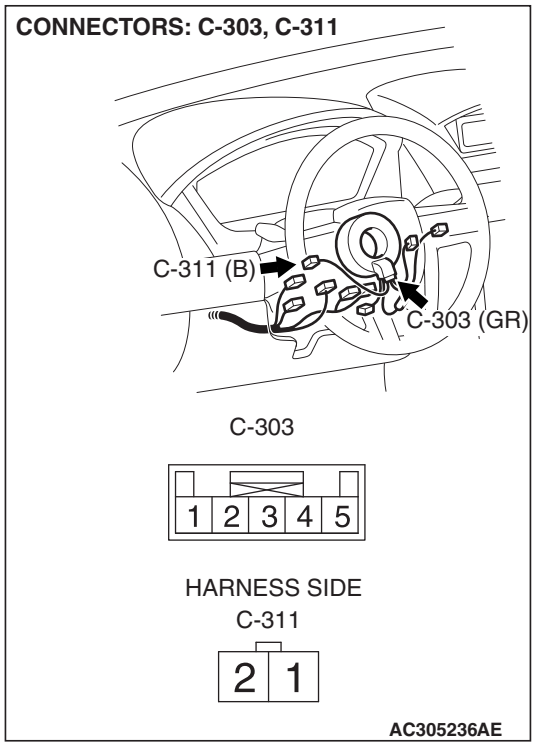
YES : Go to Step 2.
NO : Replace the remote controlled radio switch (LH).

STEP 2. Check the radio switch (LH) connector C-311 and clock spring connector C-303 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is remote controlled radio switch (LH) connector C-311 and clock spring connector C-303 in good condition?

YES : Go to Step 3.
NO : Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The remote controlled radio switch (LH) should work normally.





STEP 3. Check the wiring harness between remote controlled radio switch connector C-311 (terminals1 and 2) and clock spring connector C-303 (terminals 4 and 5).

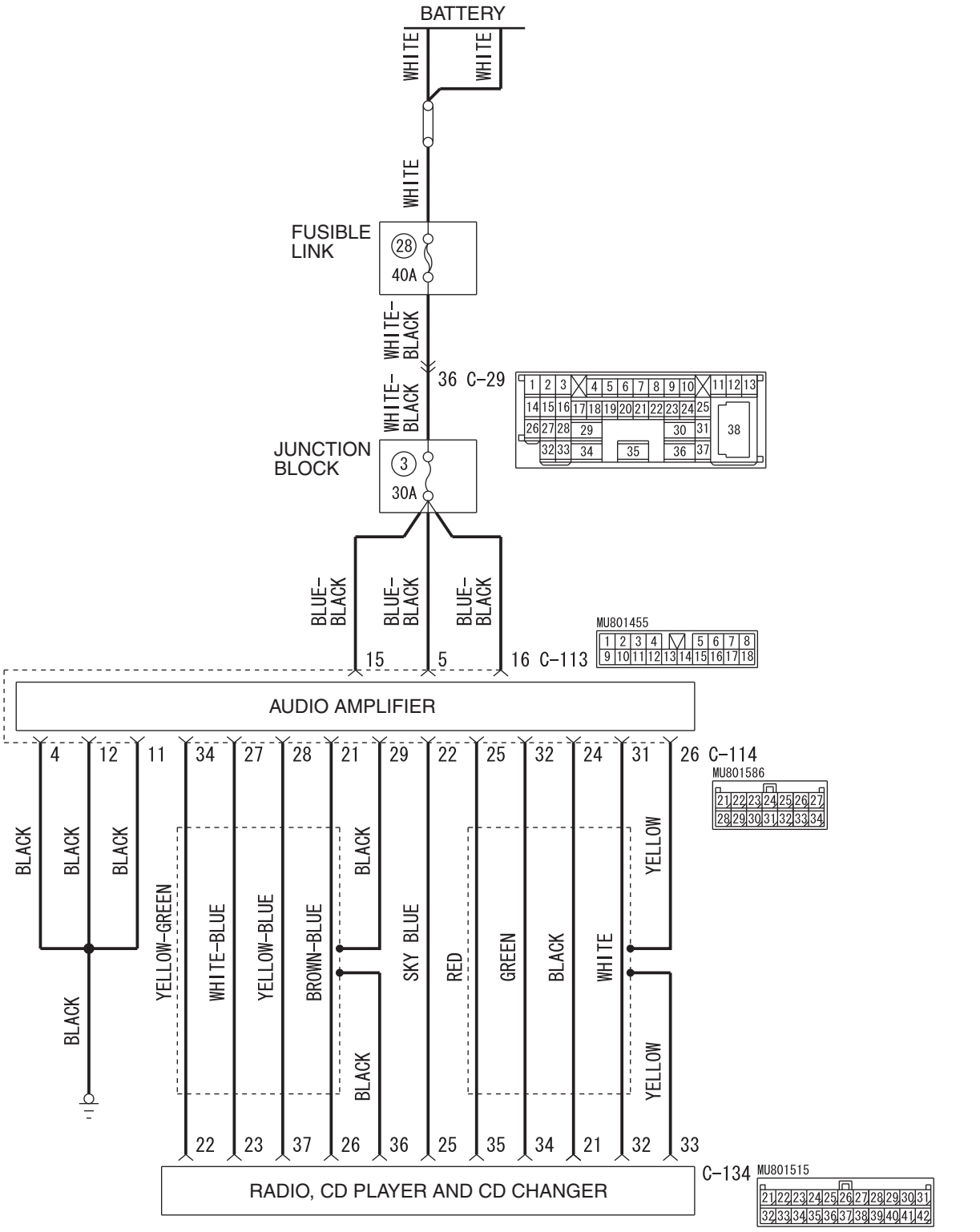
- Check the wiring harness for open circuit and short circuit.

Q: Are the wiring harness between remote controlled radio switch connector C-311 (terminals 1 and 2) and clock spring connector C-303 (terminals 4 and 5) in good condition?

YES : No action to be taken.

NO : Repair the wiring harness. The remote controlled radio switch (LH) should work normally.

INSPECTION PROCEDURE 5: No Sound. <Vehicles with Audio Amplifier>



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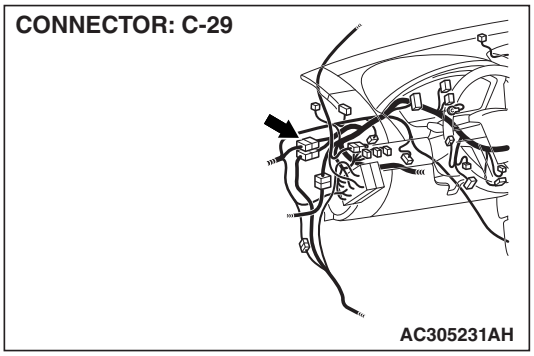
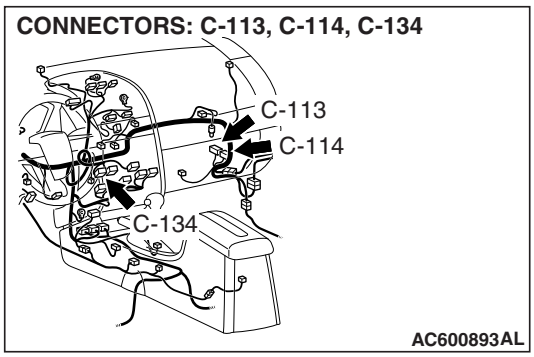




CIRCUIT OPERATION

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.

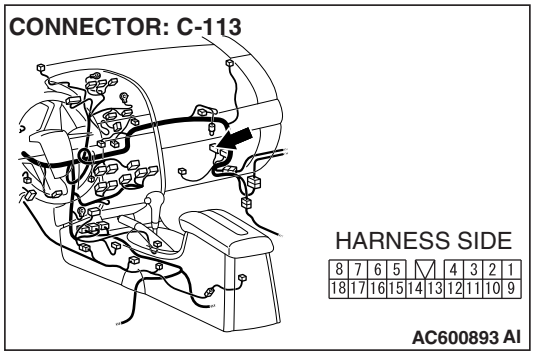
DIAGNOSIS

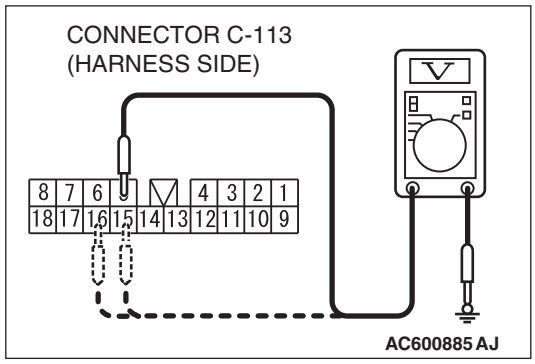
Required Special Tool:

- MB991223: Harness set

STEP 1. Measure the voltage at audio amplifier connector C-113 in order to check the battery circuit of power supply system to the audio amplifier.

(1) Disconnect audio amplifier connector C-113, and measure at the wiring harness side.





(2) Measure the voltage between terminal 5 and ground.
- The voltage should measure approximately 12 volts (battery positive voltage).

(3) Measure the voltage between terminal 15 and ground.
- The voltage should measure approximately 12 volts (battery positive voltage).

(4) 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)?

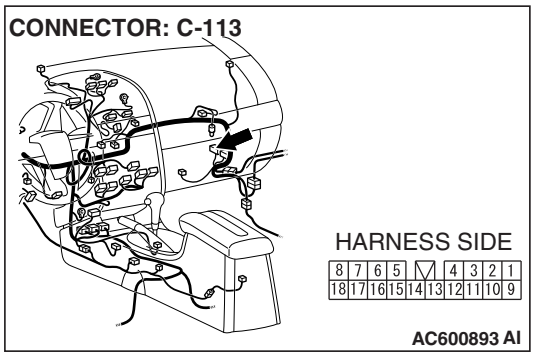
YES : Go to Step 4.
NO : Go to Step 2.

STEP 2. Check audio amplifier connector C-113 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is audio amplifier connector C-113 in good condition?

YES : Go to Step 3.

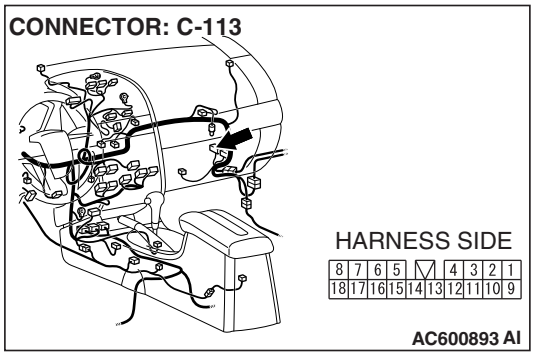
NO : Repair or replace the component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The speakers should sound.

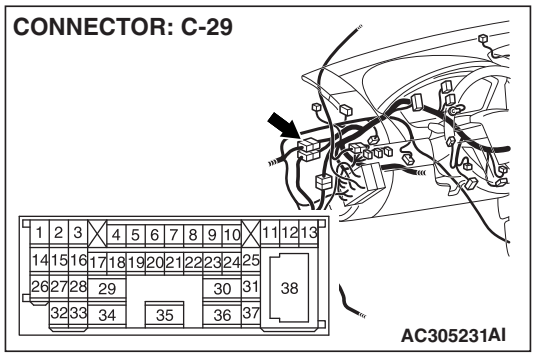


STEP 3. Check the wiring harness between audio amplifier connector C-113 (terminal 5, 15 and 16) and the battery.

- Check the wiring harness for open circuit and short circuit.

NOTE:





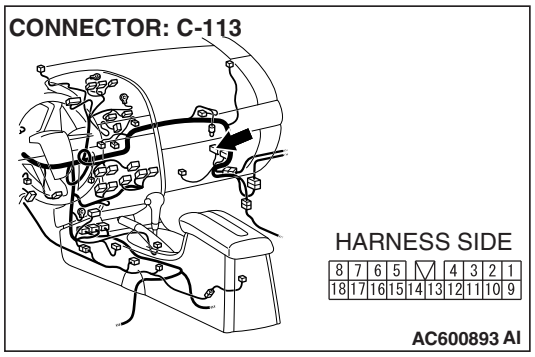
Also check intermediate connector C-29 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connectors C-29 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between audio amplifier connector C-113 (terminal 5, 15 and 16) and the battery in good condition?

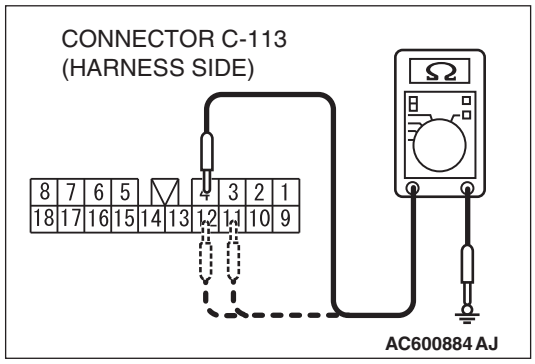
YES : There is no action to be taken.

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

STEP 4. Measure the resistance at audio amplifier connector C-113 in order to check the ground circuit to the audio amplifier.



(1) Disconnect audio amplifier connector C-113, and measure at the wiring harness side.



(2) Measure the resistance between terminal 4 and ground.
- The resistance should be 2 ohms or less.

(3) Measure the resistance between terminal 11 and ground.
- The resistance should be 2 ohms or less.

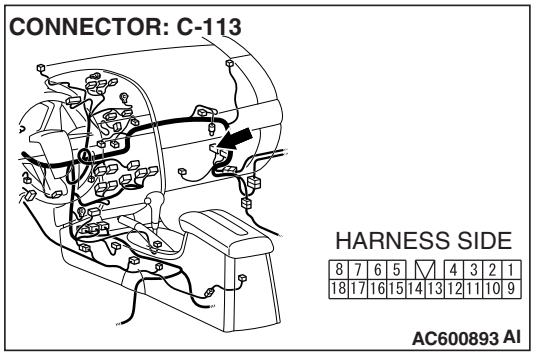
(4) Measure the resistance between terminal 12 and ground.
- The resistance should be 2 ohms or less.

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 C-113 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is audio amplifier connector C-113 in good condition?

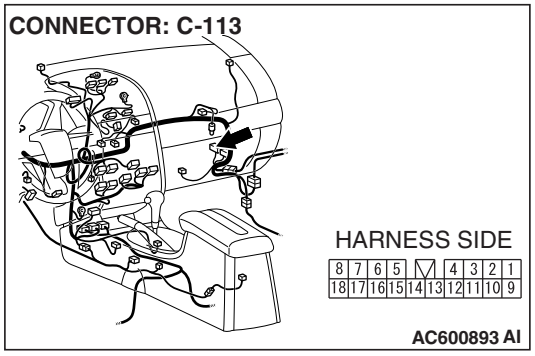


YES : Go to Step 6.
NO : Repair or replace the component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The speakers should sound.

STEP 6. Check the wiring harness between audio amplifier connector C-113 (terminal 4, 11 and 12) and ground.

- Check the ground wire for open circuit.

Q: Is the wiring harness between audio amplifier connector C-113 (terminal 4, 11 and 12) and ground in good condition?



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

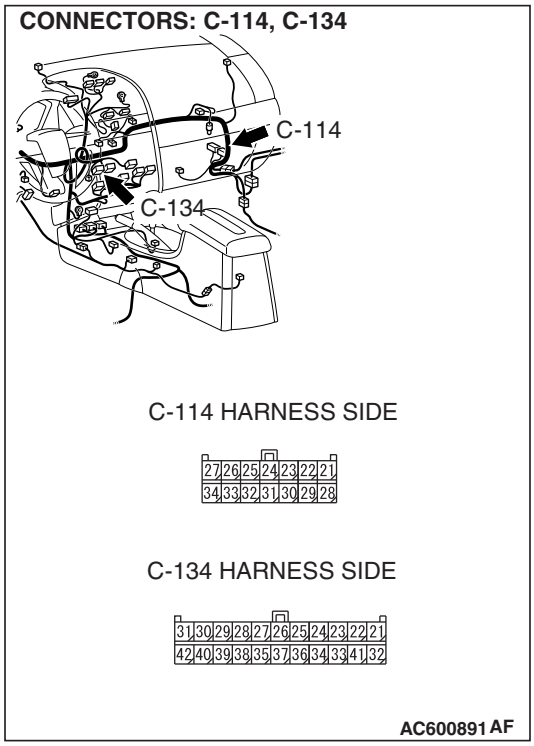
TSB Revision

STEP 7. Check radio, CD player and CD changer connector C-134 and audio amplifier connector C-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are radio, CD player and CD changer connector C-134 and audio amplifier connector C-114 in good condition?

YES : Go to Step 8.

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



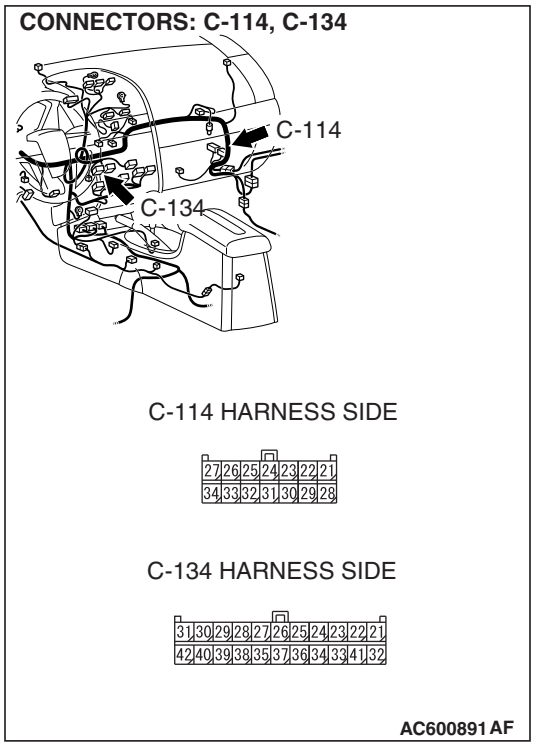
STEP 8. Check the wiring harness between CD player and CD changer connector C-134 (terminals 21, 22, 23, 25, 26, 32, 34, 35 and 37) and audio amplifier connector C-114 (terminals 24, 34, 27, 22, 21, 31, 32, 25 and 28).

- Check the wiring harness for open circuit and short circuit.

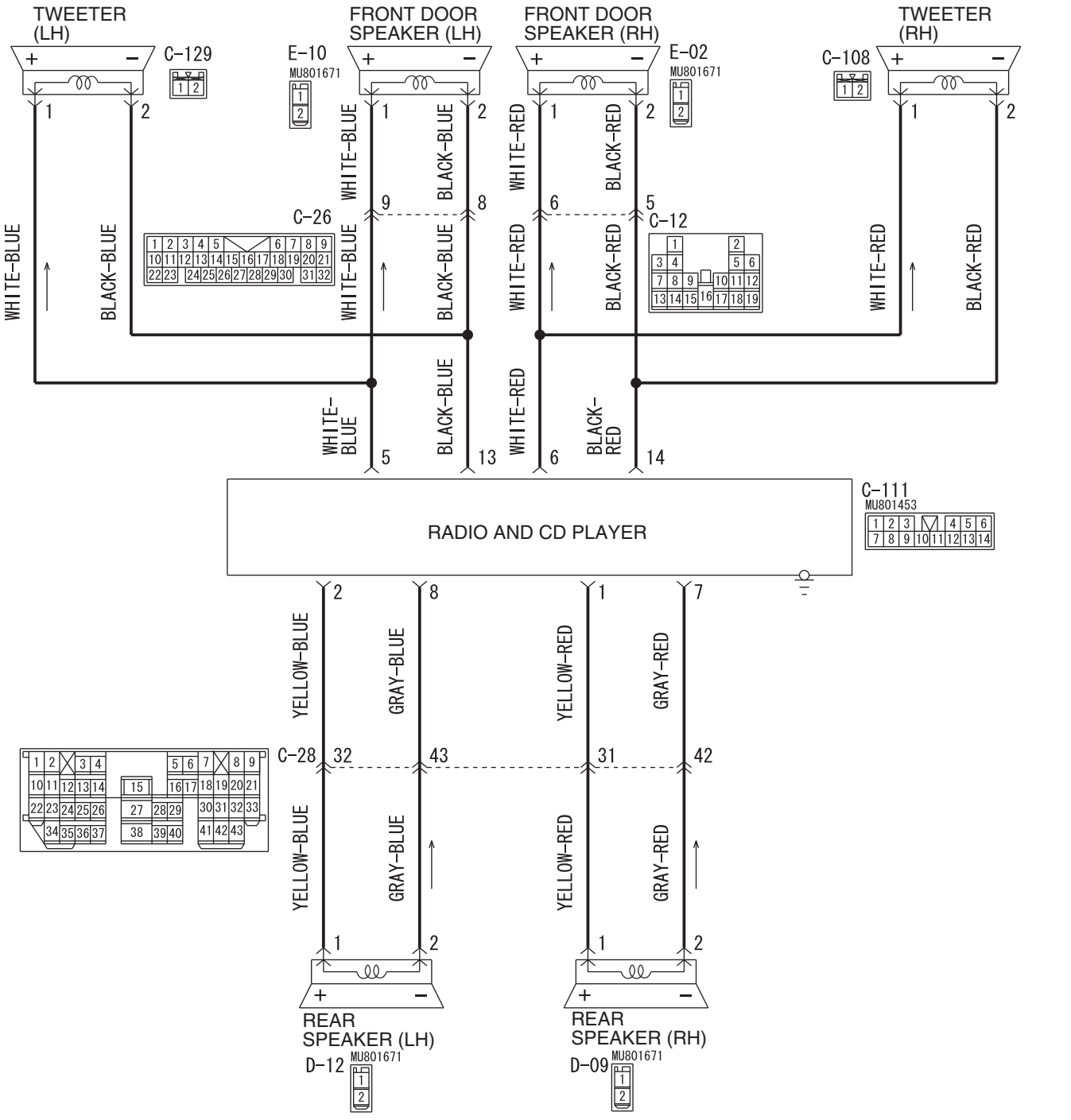
Q: Do the speakers sound normally?

YES : The procedure is complete.

NO : Repair or replace the audio amplifier.



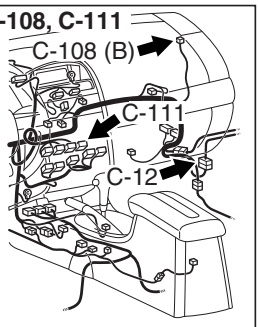
INSPECTION PROCEDURE 6: No Sound from One Speaker. <Vehicles without audio amplifier>



W8P54M011A

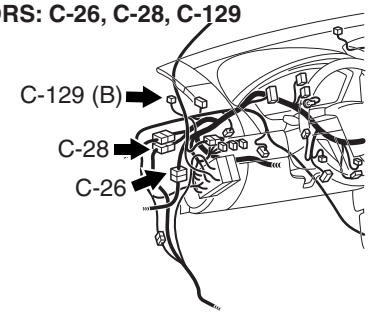
TSB Revision

CONNECTORS: C-12, C-108, C-111



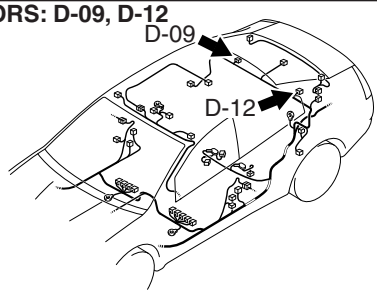
AC305233 DG

CONNECTORS: C-26, C-28, C-129



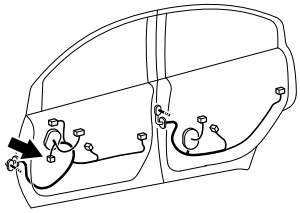
AC305231CY

CONNECTORS: D-09, D-12



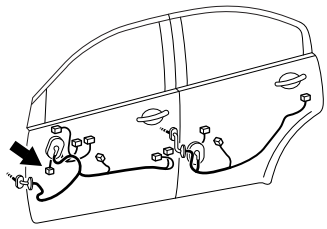
AC305268 AT

CONNECTOR: E-02



AC305333AM

CONNECTOR: E-10



AC305262AP

CIRCUIT OPERATION

The speakers sound according to audio signal output from the radio and CD player.

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 radio and CD player.

TSB Revision

DIAGNOSIS

STEP 1. Check which speaker has no sound on the vehicles with audio amplifier.

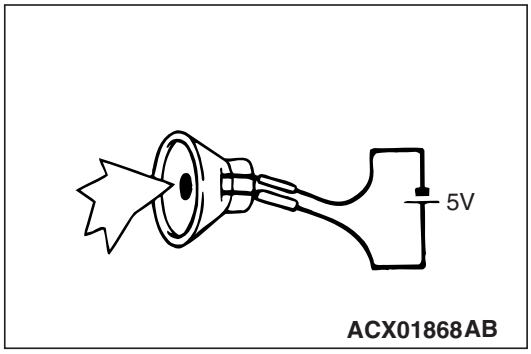
Determine which speaker does not sound.

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 speaker (LH) : Go to Step 14.
Rear speaker (RH) : Go to Step 17.

STEP 2. Check the tweeter (LH).

(1) Remove the tweeter (LH). Refer to P.54A-256.
(2) Check that the tweeter (LH) generates noise when a five-volt voltage is applied on the tweeter (LH) terminal.



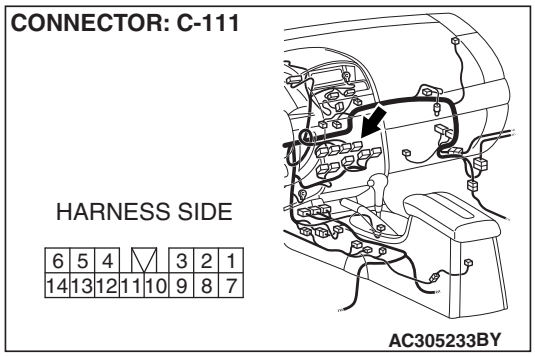
Q: Is the tweeter (LH) generating noise?

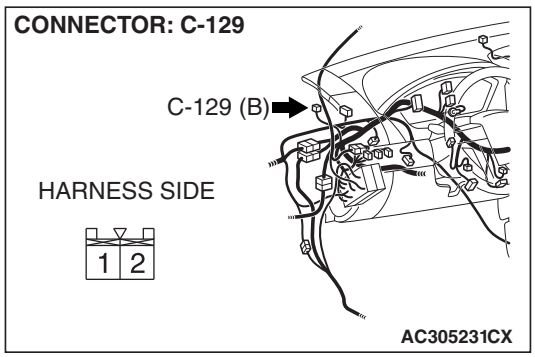
YES : Go to Step 3.
NO : Replace the tweeter (LH). The tweeter (LH) should sound.

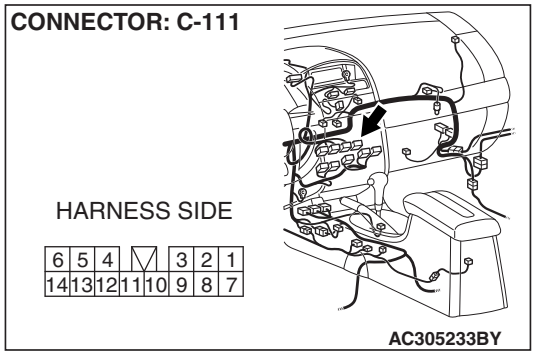
STEP 3. Check tweeter (LH) connector C-129 and radio and CD player connector C-111 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

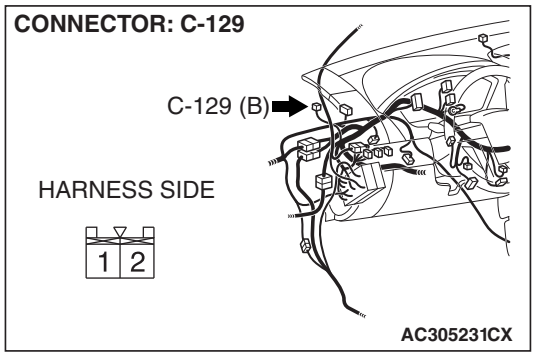
Q: Are harness connectors C-129 and C-111 in good condition?

YES : Go to Step 4.
NO : Repair or replace the component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The tweeter (LH) should sound.









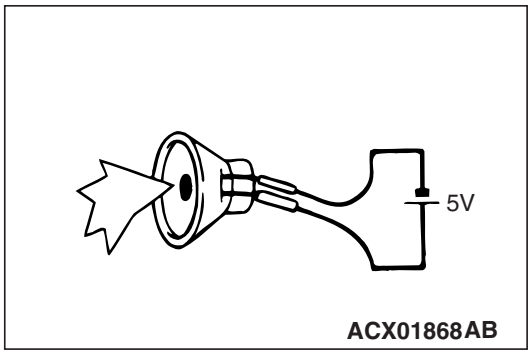
STEP 4. Check the wiring harness between tweeter (LH) connector C-129 (terminals 1 and 2) and radio and CD player connector C-111 (terminals 5 and 13).

- Check the wiring harness for open circuit and short circuit.

Q: Is the wiring harness between tweeter (LH) connector C-129 (terminals 1 and 2) and radio and CD player connector C-111 (terminals 5 and 13) in good condition?

YES : The procedure is complete.

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-256.

(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.

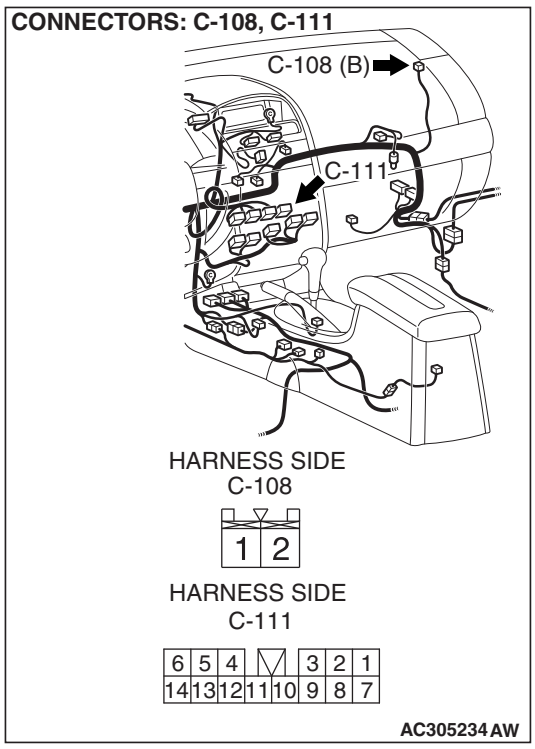
NO : Replace the tweeter (RH). The tweeter (RH) should sound.

STEP 6. Check tweeter (RH) connector C-108 and radio and CD player connector C-111 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are harness connectors C-108 and C-111 in good condition?

YES : Go to Step 7.

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



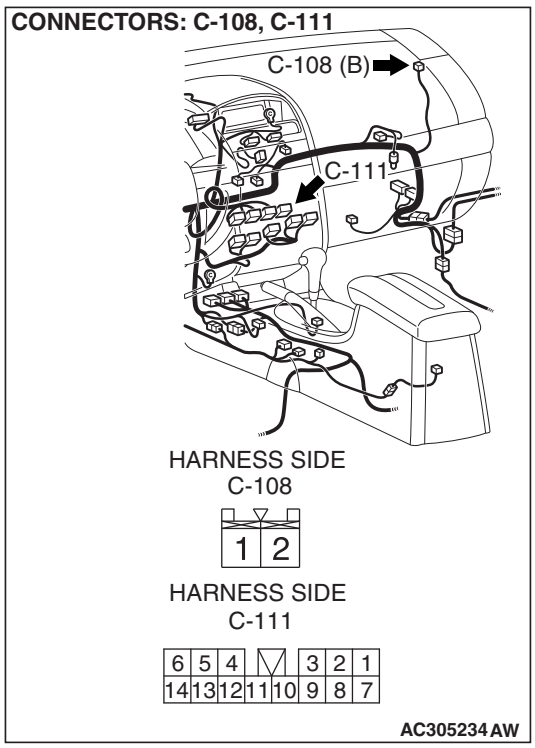
STEP 7. Check the wiring harness between tweeter (RH) connector C-108 (terminals 1 and 2) and radio and CD player connector C-111 (terminals 6 and 14).

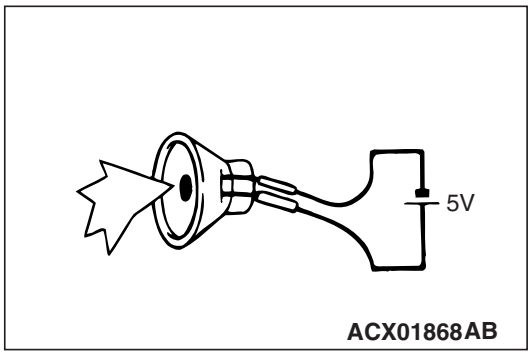
- Check the wiring harness for open circuit and short circuit.

Q: Is the wiring harness between tweeter (RH) connector C-108 (terminals 1 and 2) and radio and CD player connector C-111 (terminals 6 and 14) in good condition?

YES : The procedure is complete.

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-256.
(2) Check that the front door speaker (LH) generates noise when a five-volt voltage is applied on the front door speaker (LH) terminal.

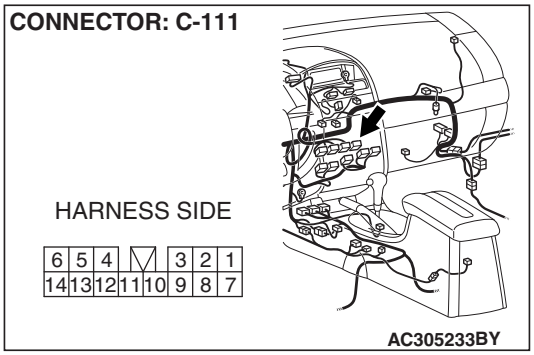
Q: Is the front door speaker (LH) generating noise?

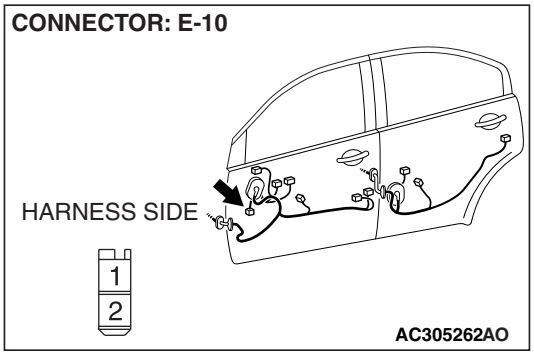
YES : Go to Step 9.
NO : Replace the front door speaker (LH). The front door speaker (LH) should sound.

STEP 9. Check front door speaker (LH) connector E-10 and radio and CD player connector C-111 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are harness connectors E-10 and C-111 in good condition?

YES : Go to Step 10.
NO : Repair or replace the component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The front door speaker (LH) should sound.

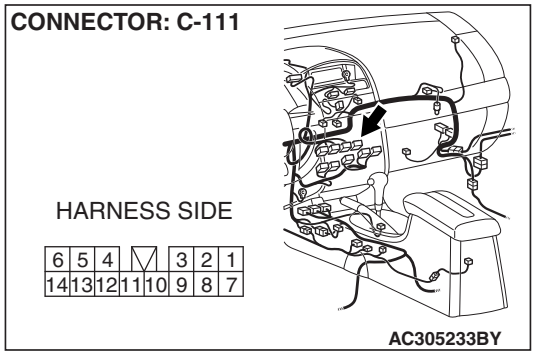


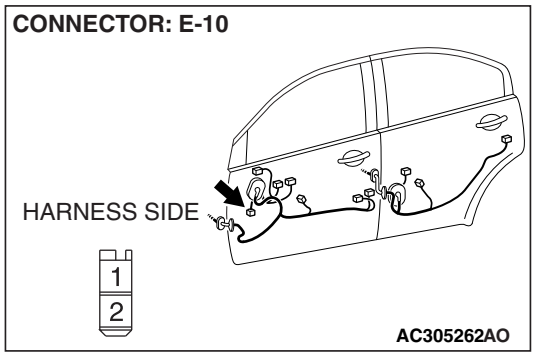


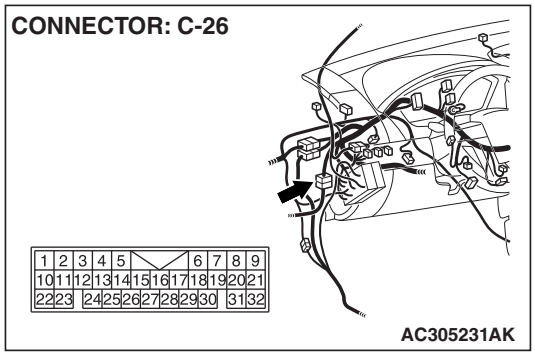
STEP 10. Check the wiring harness between front door speaker (LH) connector E-10 (terminals 1 and 2) and radio and CD player connector C-111 (terminals 5 and 13).

- Check the wiring harness for open circuit and short circuit.

NOTE:







Also check intermediate connector C-26 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-26 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-10 (terminals 1 and 2) and radio and CD player connector C-111 (terminals 5 and 13) in good condition?

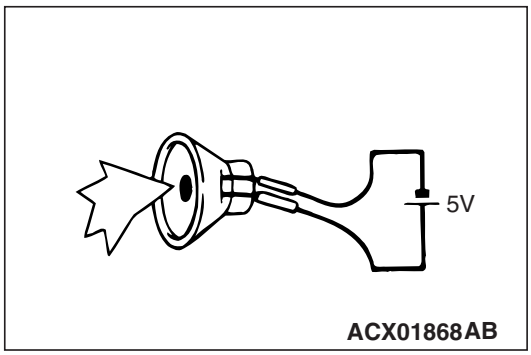
YES : The procedure is complete.

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-256.

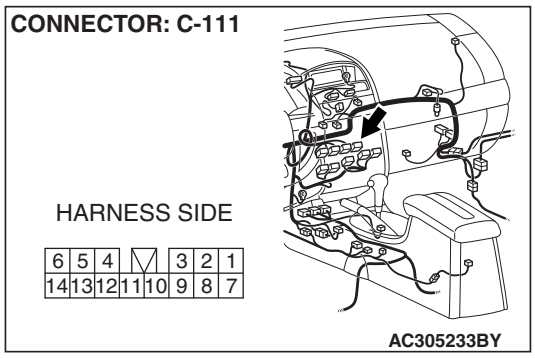
(2) Check that the front door speaker (RH) generates noise when a five-volt voltage is applied on the front door speaker (RH) terminal.

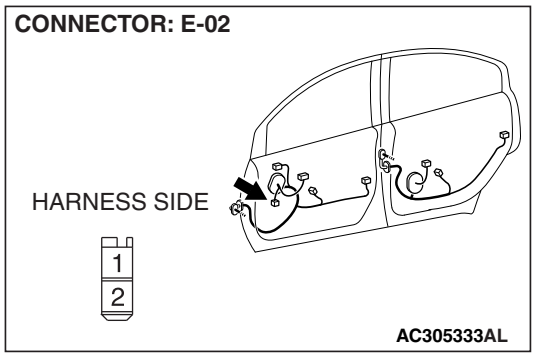


Q: Is the front door speaker (RH) generating noise?

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-02 and radio and CD player connector C-111 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are harness connectors E-02 and C-111 in good condition?

YES : Go to Step 13.

NO : Repair or replace the 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-02 (terminals 1 and 2) and radio and CD player connector C-111 (terminals 6 and 14).

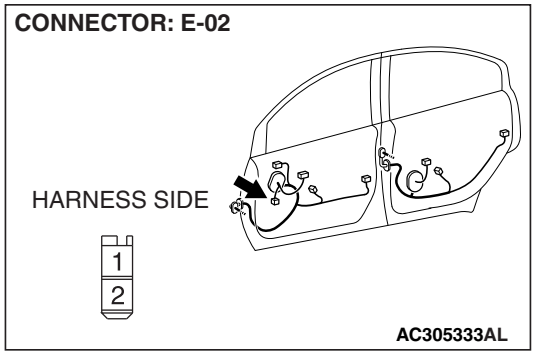
- Check the wiring harness for open circuit and short circuit.

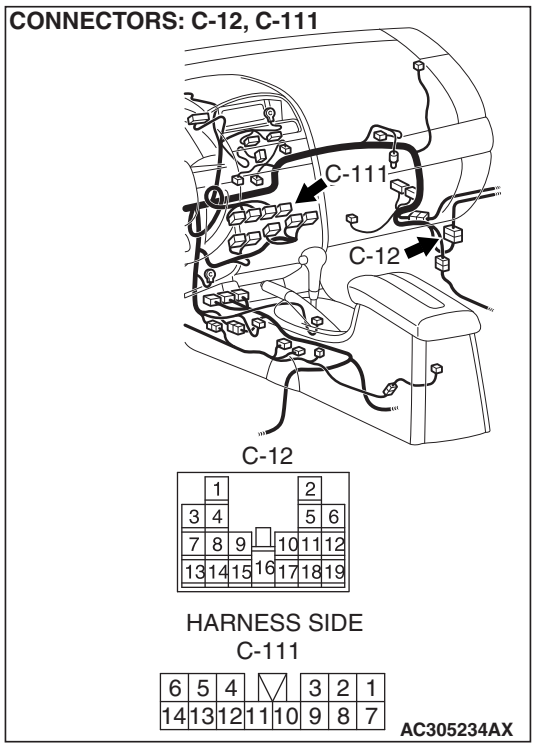
NOTE: Also check intermediate connector C-12 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-12 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between front door speaker (RH) connector E-02 (terminals 1 and 2) and radio and CD player connector C-111 (terminals 6 and 14) in good condition?

YES : The procedure is complete.

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





STEP 14. Check the rear speaker (LH).

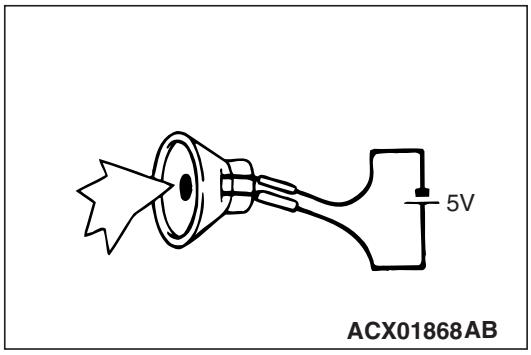
(1) Remove the rear speaker (LH). Refer to P.54A-256.

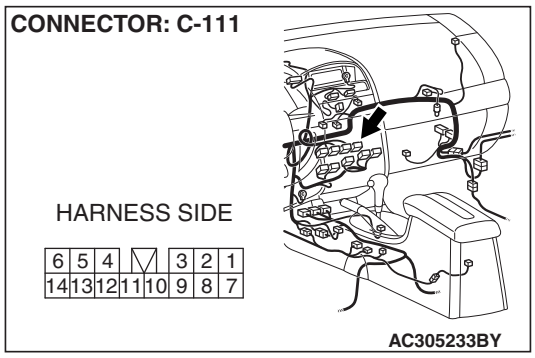
(2) Check that the rear speaker (LH) generates noise when a five-volt voltage is applied on the rear speaker (LH) terminal.

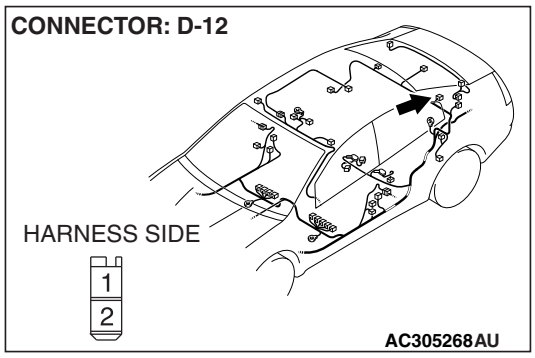
Q: Is the rear speaker (LH) generating noise?

YES : Go to Step 15.

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







STEP 15. Check rear speaker (LH) connector D-12 and radio and CD player connector C-111 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are harness connectors D-12 and C-111 in good condition?

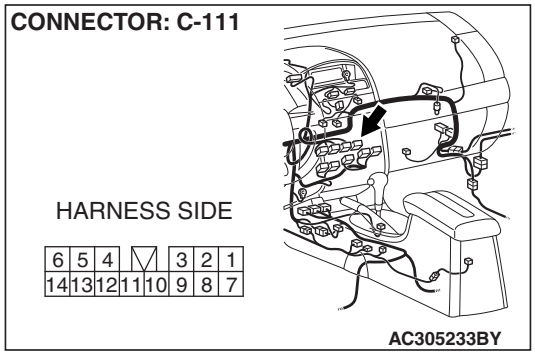
YES : Go to Step 16.

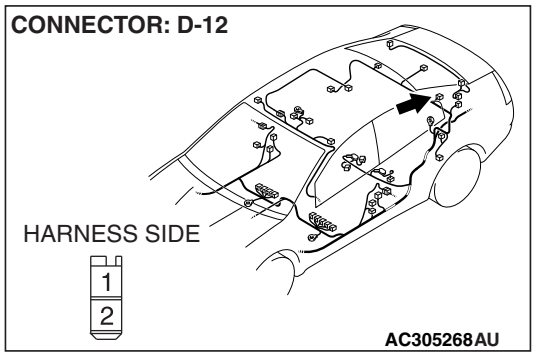
NO : Repair or replace the component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The rear speaker (LH) should sound.

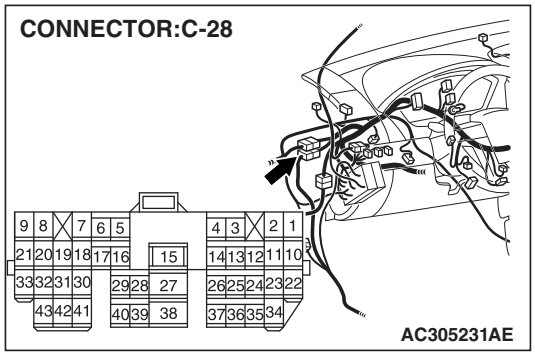
STEP 16. Check the wiring harness between rear speaker (LH) connector D-12 (terminals 1 and 2) and radio and CD player connector C-111 (terminals 2 and 8).

- Check the wiring harness for open circuit and short circuit.

NOTE:







Also check intermediate connector C-28 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-28 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 speaker (LH) connector D-12 (terminals 1 and 2) and radio and CD player connector C-111 (terminals 2 and 8) in good condition?

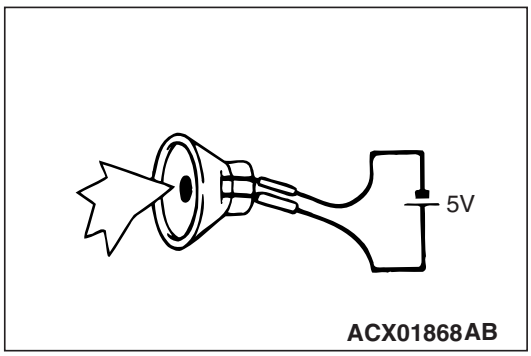
YES : Replace the radio and CD player. The rear speaker (LH) should sound.

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

STEP 17. Check the rear speaker (RH).

(1) Remove the rear speaker (RH). Refer to P.54A-256.

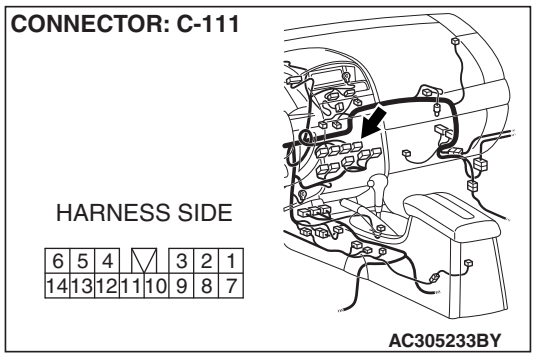
(2) Check that the rear speaker (RH) generates noise when a five-volt voltage is applied on the rear speaker (RH) terminal.

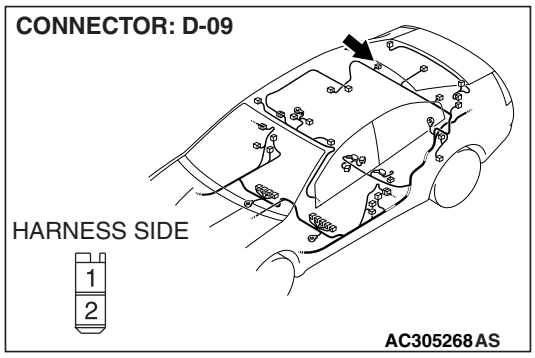


Q: Is the rear speaker (RH) generating noise?

YES : Go to Step 18.

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





STEP 18. Check rear speaker (RH) connector D-09 and radio and CD player connector C-111 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are harness connectors D-09 and C-111 in good condition?

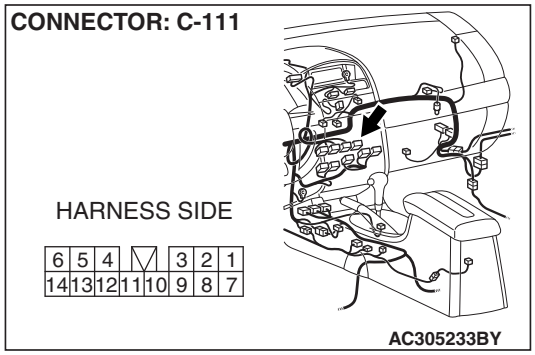
YES : Go to Step 19.

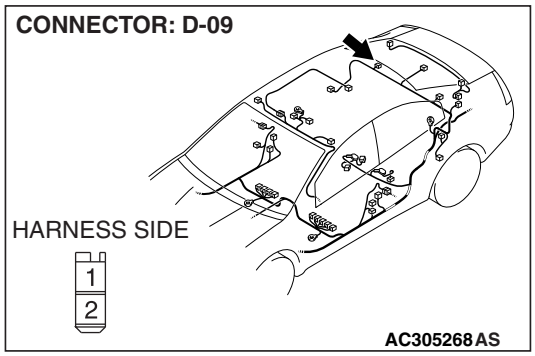
NO : Repair or replace the component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The rear speaker (RH) should sound.

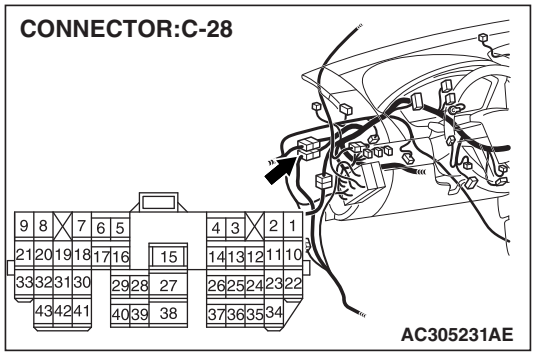
STEP 19. Check the wiring harness between rear speaker (RH) connector D-09 (terminals 1 and 2) and radio and CD player connector C-111 (terminals 1 and 7).

- Check the wiring harness for open circuit and short circuit.

NOTE:







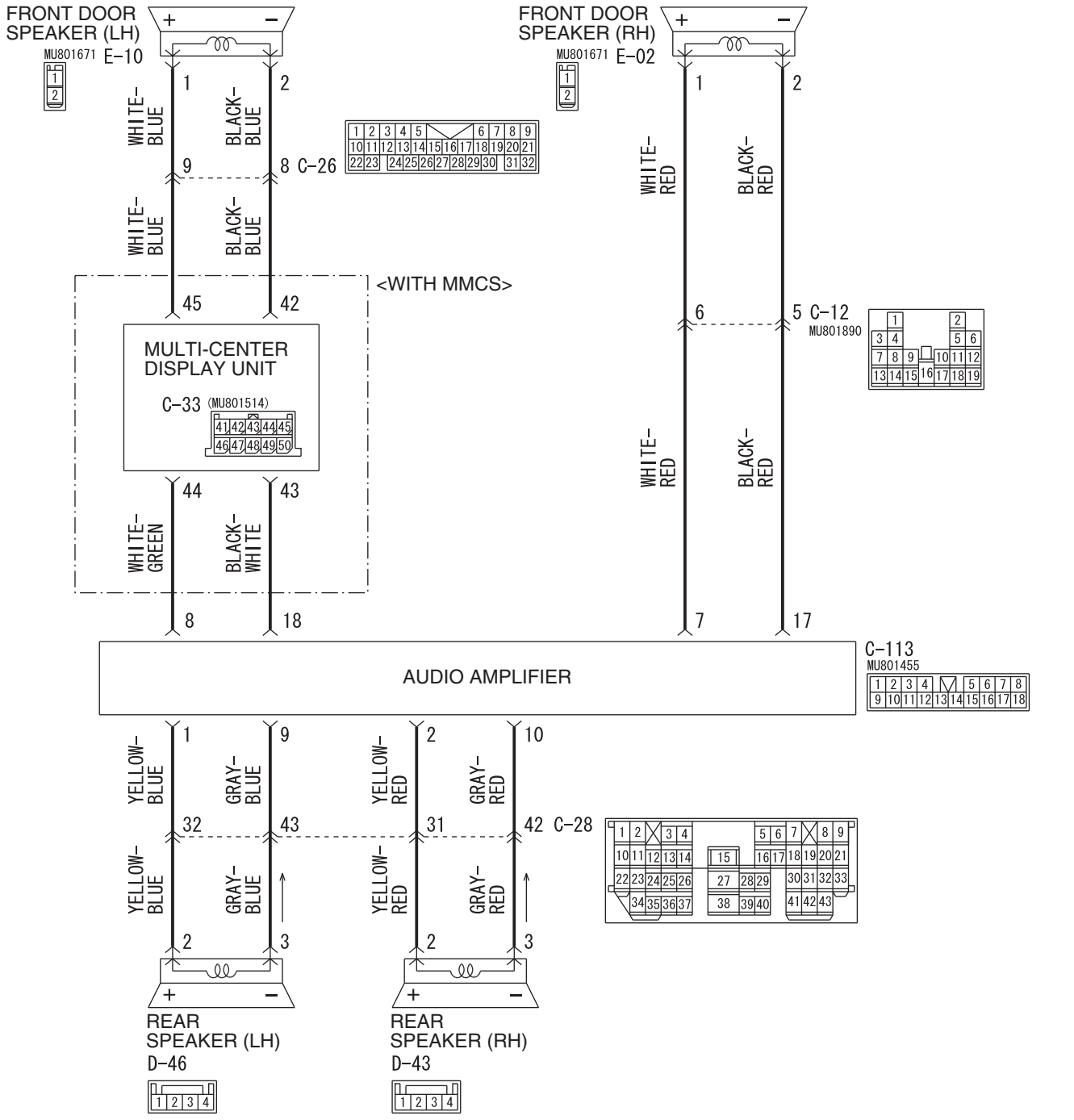
Also check intermediate connector C-28 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-28 is damaged, repair or replace the connectors as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between rear speaker (RH) connector D-09 (terminals 1 and 2) and radio and CD player connector C-111 (terminals 1 and 7) in good condition?

YES : Replace the radio and CD player. The rear speaker (RH) should sound.

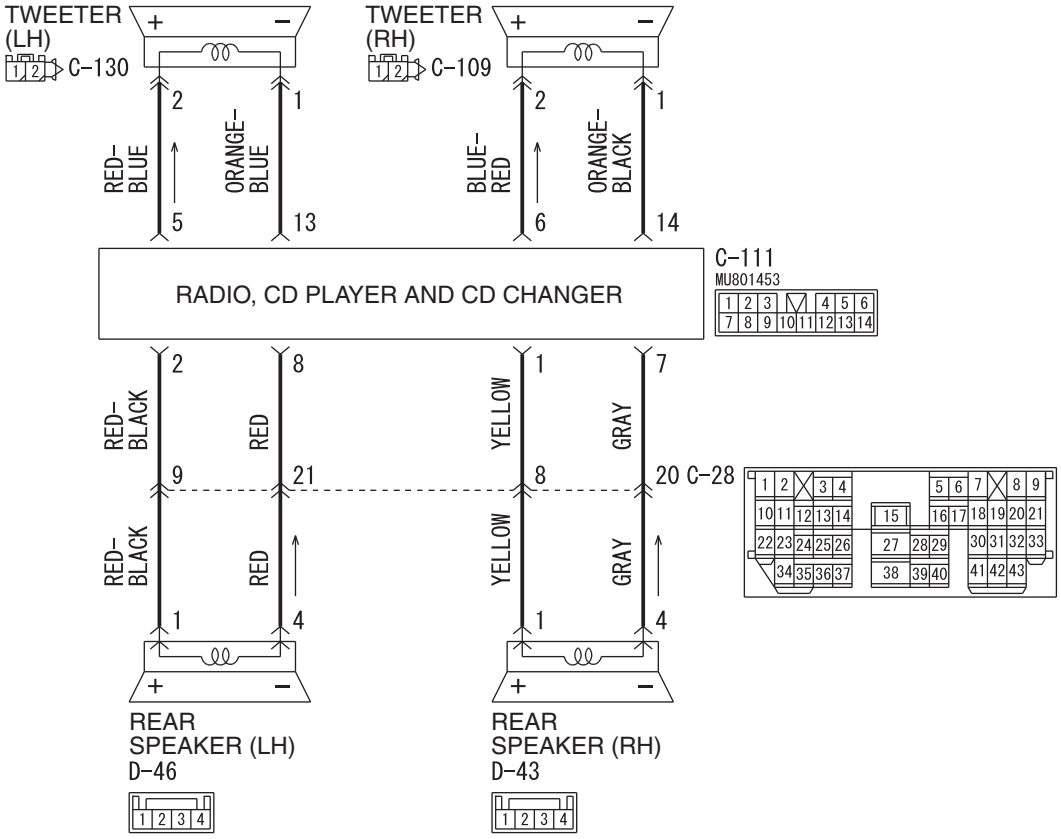
NO : Repair the wiring harness. The rear speaker (RH) should sound.

INSPECTION PROCEDURE 7: No Sound from One Speaker. <Vehicles with audio amplifier>



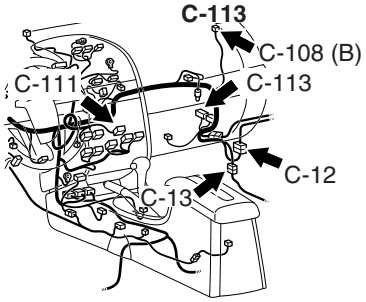
W8P54M012A

TSB Revision



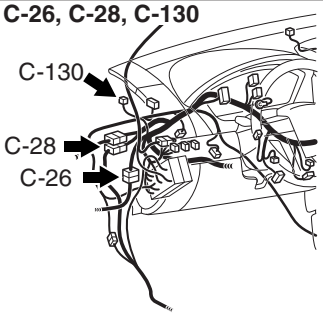
WAP54M035A

CONNECTORS: C-12, C-13, C-108, C-111, C-113



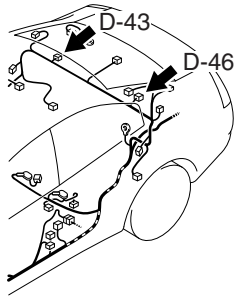
AC600893AM

CONNECTORS: C-26, C-28, C-130



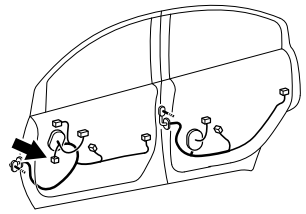
AC305231DA

CONNECTORS: D-43, D-46



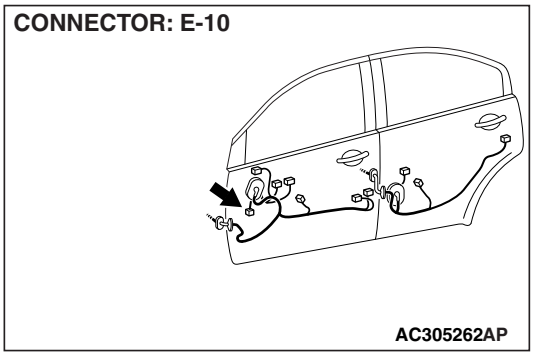
AC600915AF

CONNECTOR: E-02



AC305333AM

TSB Revision



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.

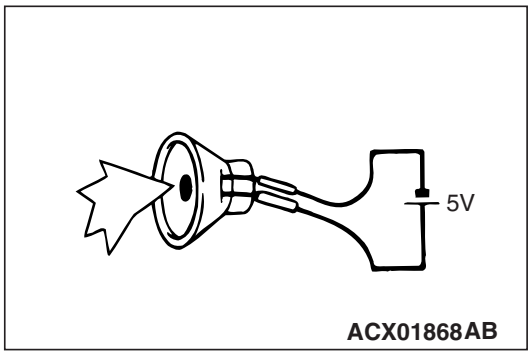
DIAGNOSIS

STEP 1. Check which speaker has no sound on the vehicles with audio amplifier.

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) <Vehicles without Mitsubishi multi communication system> : Go to Step 8.
Front door speaker (LH) <Vehicles with Mitsubishi multi communication system> : Carry out the troubleshooting for the navigation unit –Only the front left speaker does not sound (including the audio sound).
Front door speaker (RH) : Go to Step 11.
Rear speaker (LH)
<only the bass tone does not sound.> : Go to Step 14.
Rear speaker (RH)
<only the bass tone does not sound.> : Go to Step 17.
Rear speaker (LH)
<only the high tone does not sound.> : Go to Step 20.
Rear speaker (RH)
<only the high tone does not sound.> : Go to Step 23.

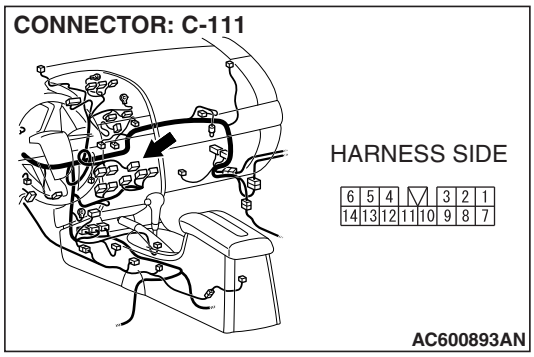


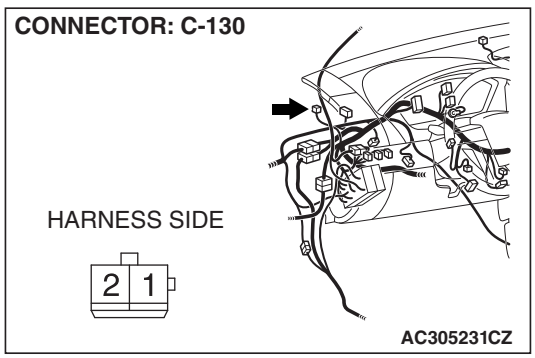
STEP 2. Check the tweeter (LH).

(1) Remove the tweeter (LH). Refer to P.54A-256.
(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.

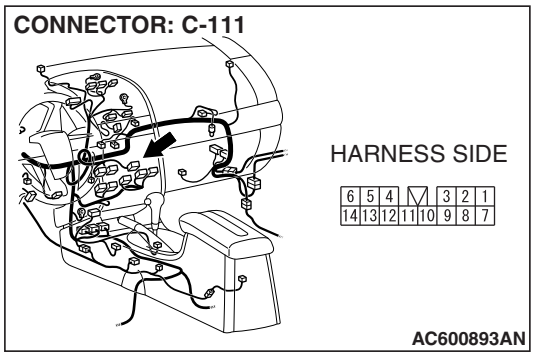




STEP 3. Check tweeter (LH) connector C-130 and radio, CD player and CD changer connector C-111 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are harness connectors C-130 and C-111 in good condition?

YES : Go to Step 4.
NO : Repair or replace the component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The tweeter (LH) should sound.



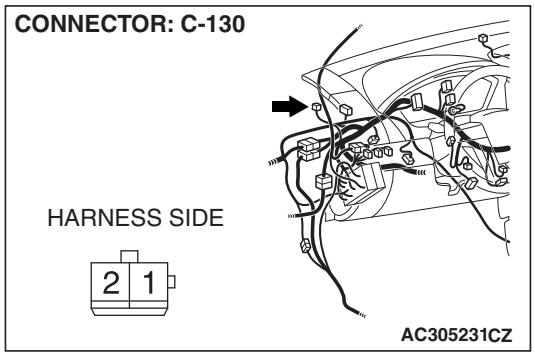
STEP 4. Check the wiring harness between tweeter (LH) connector C-130 (terminals 2 and 1) and radio, CD player and CD changer connector C-111 (terminals 5 and 13).

- Check the wiring harness for open circuit and short circuit.

Q: Is the wiring harness between tweeter (LH) connector C-130 (terminals 2 and 1) and radio, CD player and CD changer connector C-111 (terminals 5 and 13) in good condition?

YES : Replace the radio, CD player and CD changer. The tweeter (LH) should sound.

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



STEP 5. Check the tweeter (RH).

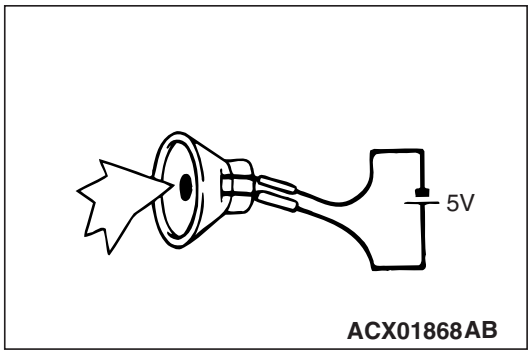
(1) Remove the tweeter (RH). Refer to P.54A-256.

(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.



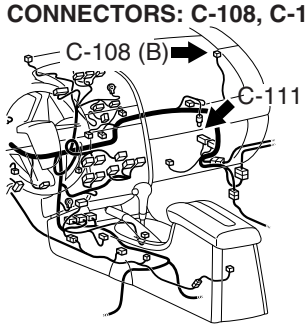
STEP 6. Check tweeter (RH) connector C-109 and audio radio, CD player and CD changer connector C-111 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are harness connectors C-109 and C-111 in good condition?

YES : Go to Step 7.

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

CONNECTORS: C-108, C-111



HARNESS SIDE
C-108

HARNESS SIDE
C-111

AC600891 AG

STEP 7. Check the wiring harness between tweeter (RH) connector C-109 (terminals 2 and 1) and radio, CD player and CD changer connector C-111 (terminals 6 and 14).

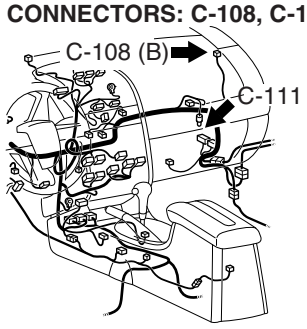
- Check the wiring harness for open circuit and short circuit.

Q: Is the wiring harness between tweeter (RH) connector C-109 (terminals 2 and 1) and radio, CD player and CD changer connector C-111 (terminals 6 and 14) in good condition?

YES : Replace the radio, CD player and CD changer. The tweeter (RH) should sound.

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

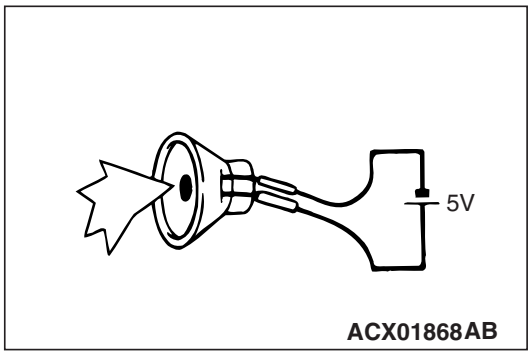
CONNECTORS: C-108, C-111



HARNESS SIDE
C-108

HARNESS SIDE
C-111

AC600891 AG



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

(1) Remove the front door speaker (LH). Refer to P.54A-256.
(2) Check that the front door speaker (LH) generates noise when a five-volt voltage is applied on the front door speaker (LH) terminal.

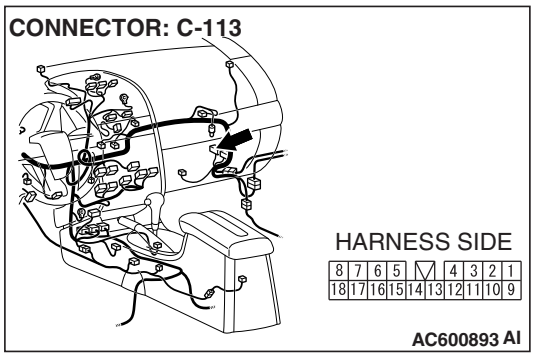
Q: Is the front door speaker (LH) generating noise?

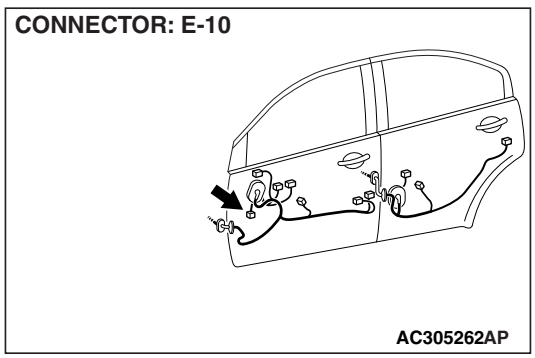
YES : Go to Step 9.
NO : Replace the front door speaker (LH). The front door speaker (LH) should sound.

STEP 9. Check front door speaker (LH) connector E-10 and audio amplifier connector C-113 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are harness connectors E-10 and C-113 in good condition?

YES : Go to Step 10.
NO : Repair or replace the component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The front door speaker (LH) should sound.

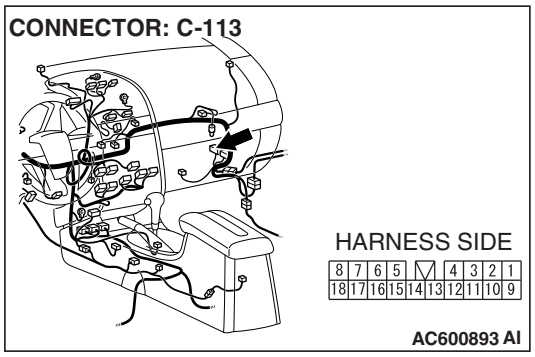


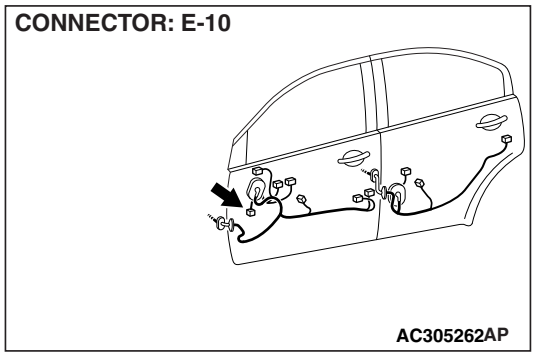


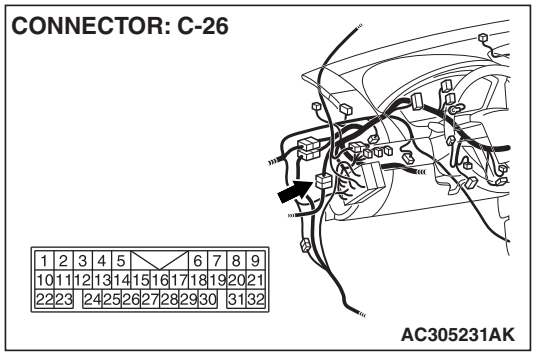
STEP 10. Check the wiring harness between front door speaker (LH) connector E-10 (terminals 1 and 2) and audio amplifier connector C-113 (terminals 8 and 18).

- Check the wiring harness for open circuit and short circuit.

NOTE:







Also check intermediate connector C-26 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-26 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-10 (terminals 1 and 2) and audio amplifier connector C-113 (terminals 8 and 18) in good condition?

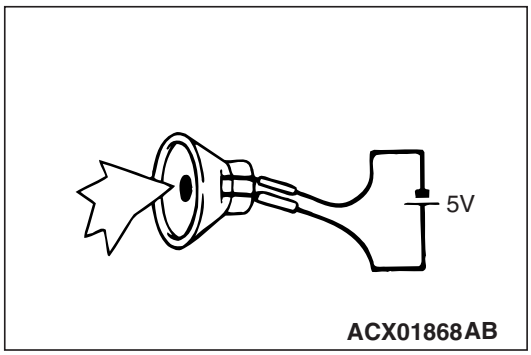
YES : Replace the audio amplifier. The front door speaker (LH) should sound.

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-256.

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

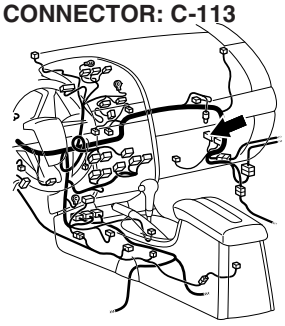


Q: Is the front door speaker (RH) generating noise?

YES : Go to Step 12.

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

CONNECTOR: C-113

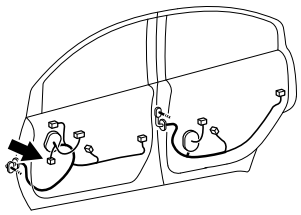


HARNESS SIDE

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

AC600893 AI

CONNECTOR: E-02



AC305333AM

STEP 12. Check front door speaker (RH) connector E-02 and audio amplifier connector C-113 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are harness connectors E-02 and C-113 in good condition?

YES : Go to Step 13.

NO : Repair or replace the 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-02 (terminals 1 and 2) and audio amplifier connector C-113 (terminals 7 and 17).

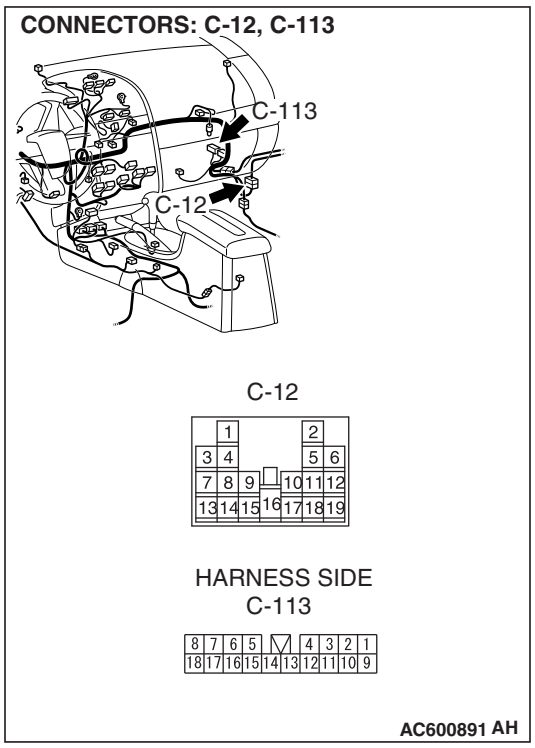
- Check the wiring harness for open circuit and short circuit.

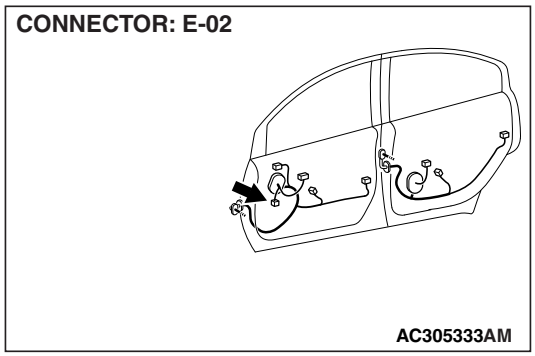
NOTE: Also check intermediate connector C-12 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-12 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between front door speaker (RH) connector E-02 (terminals 1 and 2) and audio amplifier connector C-113 (terminals 7 and 17) 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 speaker (LH).

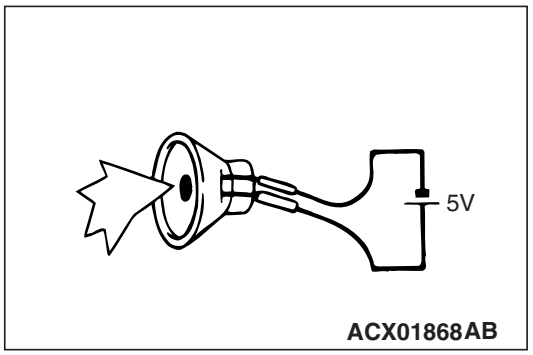
(1) Remove the rear speaker (LH). Refer to P.54A-256.

(2) Check that the rear speaker (LH) generates noise when a five-volt voltage is applied on the rear speaker (LH) terminal 2 and 3.

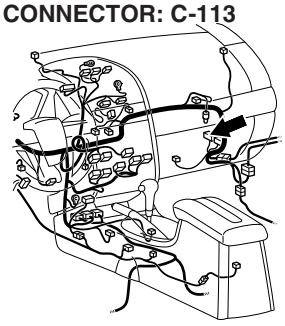
Q: Is the rear speaker (LH) generating noise?

YES : Go to Step 15.

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



CONNECTOR: C-113

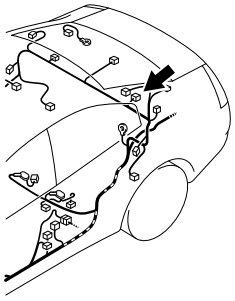


HARNESS SIDE

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

AC600893 AI

CONNECTOR: D-46



HARNESS SIDE

4	3	2	1

AC600915AE

STEP 15. Check rear speaker (LH) connector D-46 and audio amplifier connector C-113 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are harness connectors D-12 and C-113 in good condition?

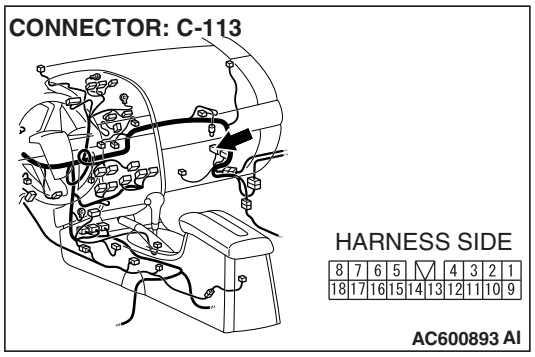
YES : Go to Step 16.

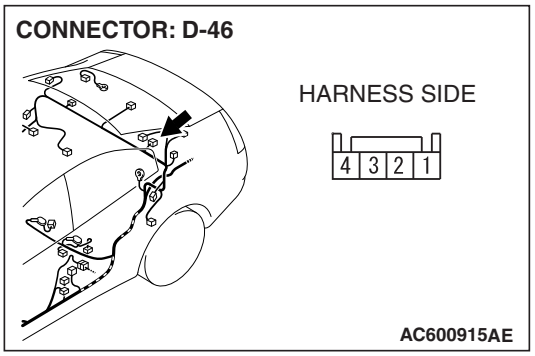
NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The rear speaker (LH) should sound.

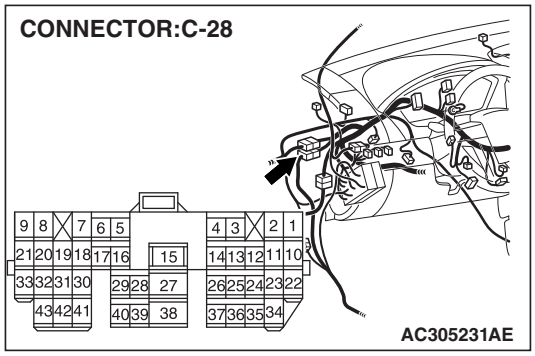
STEP 16. Check the wiring harness between rear speaker (LH) connector D-46 (terminals 2 and 3) and audio amplifier connector C-113 (terminals 1 and 9).

- Check the wiring harness for open circuit and short circuit.

NOTE:







Also check intermediate connector C-28 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-28 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 speaker (LH) connector D-46 (terminals 2 and 3) and audio amplifier connector C-113 (terminals 1 and 9) in good condition?

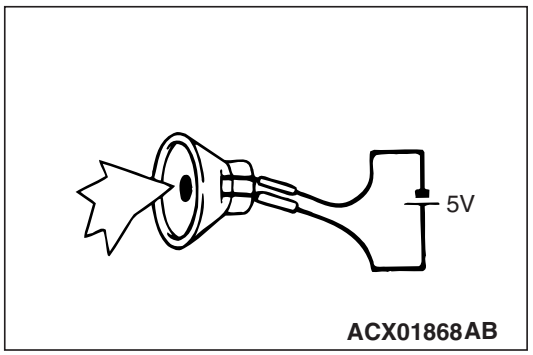
YES : Replace the audio amplifier. The rear speaker (LH) should sound.

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

STEP 17. Check the rear speaker (RH).

(1) Remove the rear speaker (RH). Refer to P.54A-256.

(2) Check that the rear speaker (RH) generates noise when a five-volt voltage is applied on the rear speaker (RH) terminal 2 and 3.



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

YES : Go to Step 18.

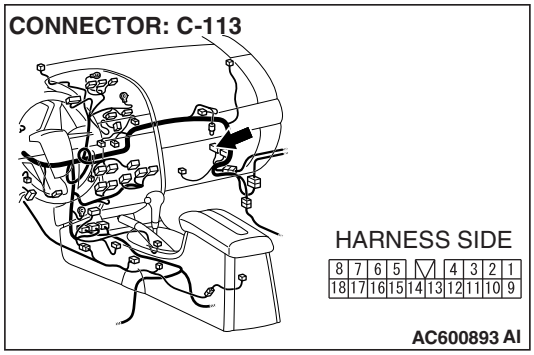
NO : Replace the rear speaker (RH). The rear speaker (RH) should sound.

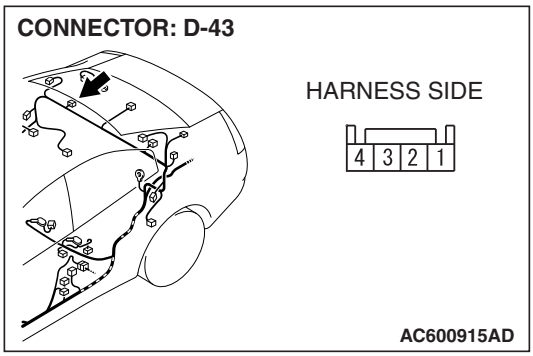
STEP 18. Check rear speaker (RH) connector D-43 and audio amplifier connector C-113 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are harness connectors D-43 and C-113 in good condition?

YES : Go to Step 19.

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





STEP 19. Check the wiring harness between rear speaker (RH) connector D-43 (terminals 2 and 3) and audio amplifier connector C-113 (terminals 2 and 10).

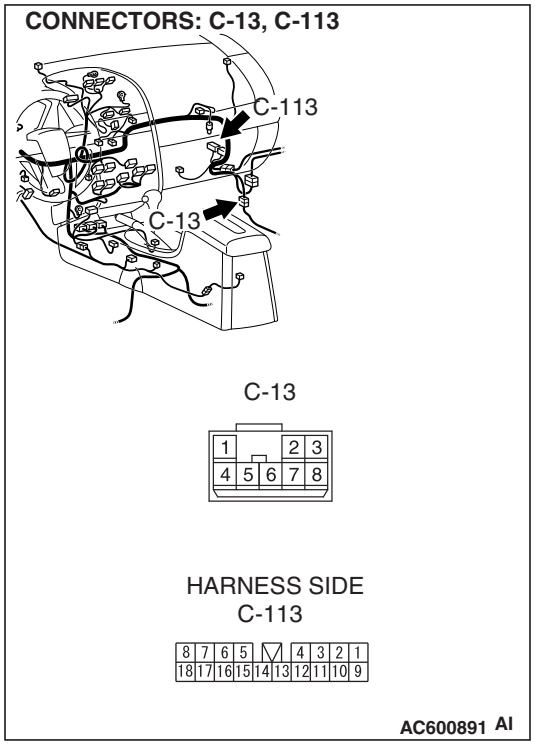
- Check the wiring harness for open circuit and short circuit.

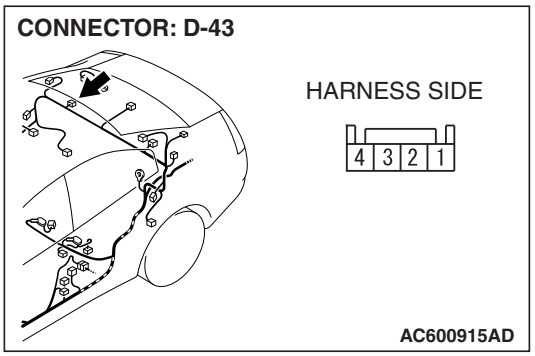
NOTE: Also check intermediate connector C-13 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-13 is damaged, repair or replace the connectors as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the wiring harness between rear speaker (RH) connector D-43 (terminals 2 and 3) and audio amplifier connector C-113 (terminals 2 and 10) in good condition?

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

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





STEP 20. Check the rear speaker (LH).

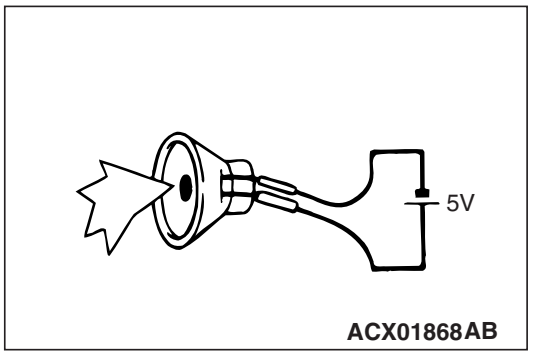
(1) Remove the rear speaker (LH). Refer to P.54A-256.

(2) Check that the rear speaker (LH) generates noise when a five-volt voltage is applied on the rear speaker (LH) terminal 1 and 4.

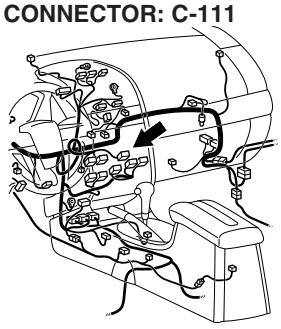
Q: Is the rear speaker (LH) generating noise?

YES : Go to Step 21.

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



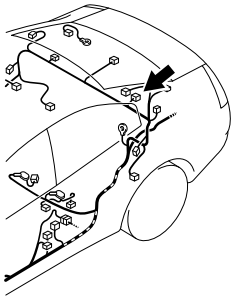
CONNECTOR: C-111



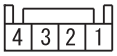
HARNESS SIDE

AC600893AN

CONNECTOR: D-46



HARNESS SIDE



AC600915AE

STEP 21. Check rear speaker (LH) connector D-46 and radio, CD player and CD changer connectors C-111 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are harness connectors D-46 and C-111 in good condition?

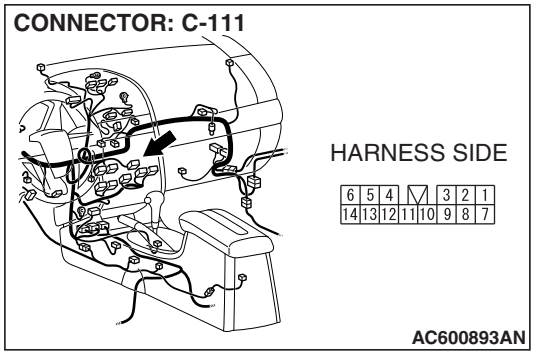
YES : Go to Step 22.

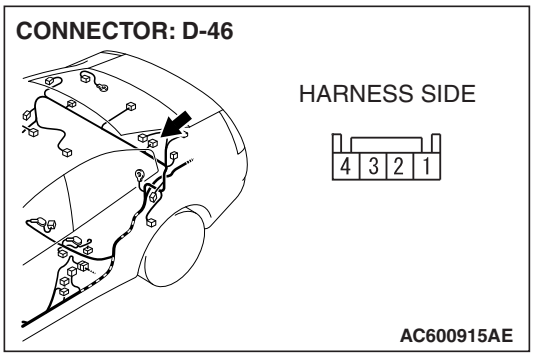
NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The rear speaker (LH) should sound.

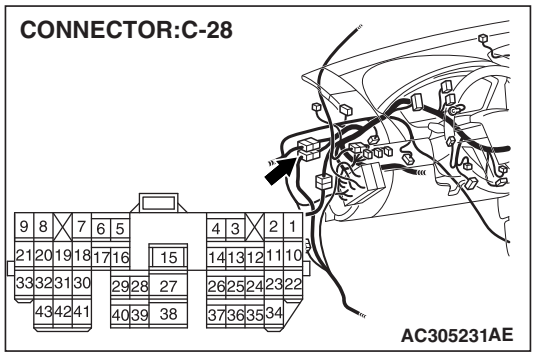
STEP 22. Check the wiring harness between rear speaker (LH) connector D-46 (terminals 1 and 4) and radio, CD player and CD changer connector C-111 (terminals 2 and 8).

- Check the wiring harness for open circuit and short circuit.

NOTE:







Also check intermediate connector C-28 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-28 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 speaker (LH) connector D-46 (terminals 1 and 4) and audio amplifier connector C-113 (terminals 2 and 8) in good condition?

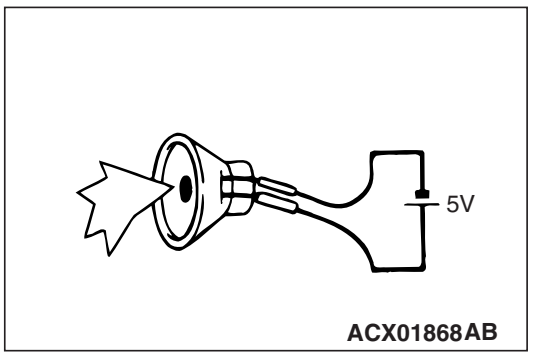
YES : Replace the radio, CD player and CD changer. The rear speaker (LH) should sound.

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

STEP 23. Check the rear speaker (RH).

(1) Remove the rear speaker (RH). Refer to P.54A-256.

(2) Check that the rear speaker (RH) generates noise when a five-volt voltage is applied on the rear speaker (RH) terminal 1 and 4.



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

YES : Go to Step 24.

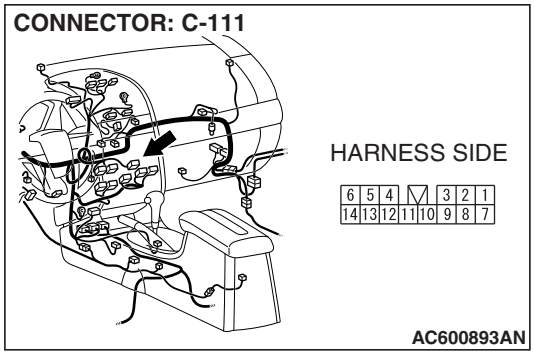
NO : Replace the rear speaker (RH). The rear speaker (RH) should sound.

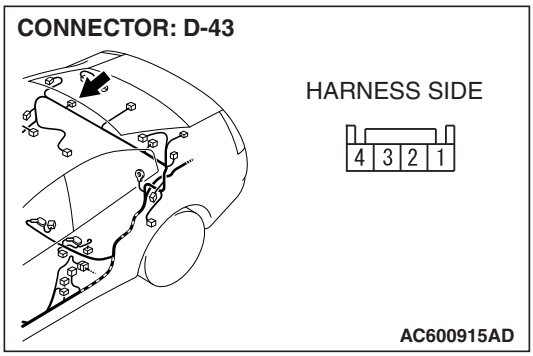
STEP 24. Check rear speaker (RH) connector D-43 and audio amplifier connector C-113 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are harness connectors D-43 and C-113 in good condition?

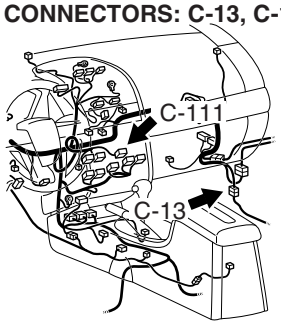
YES : Go to Step 25.

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

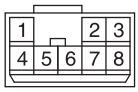




CONNECTORS: C-13, C-111



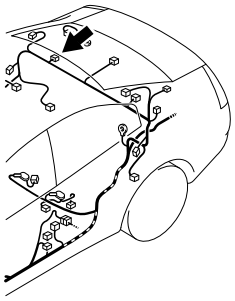
C-13



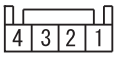
HARNESS SIDE
C-111

AC600891 AJ

CONNECTOR: D-43



HARNESS SIDE



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STEP 25. Check the wiring harness between rear speaker (RH) connector D-43 (terminals 1 and 4) and radio, CD player and CD changer connector C-111 (terminals 1 and 7).

- Check the wiring harness for open circuit and short circuit.

NOTE: Also check intermediate connector C-13 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-13 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 speaker (RH) connector D-43 (terminals 1 and 4) and radio, CD player and CD changer connector C-111 (terminals 1 and 7) in good condition?

YES : Replace the radio, CD player and CD changer radio, CD player and CD changer. The rear speaker (RH) should sound.

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