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**GROUP 54****CHASSIS  
ELECTRICAL****CONTENTS**

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## GROUP 54A

# CHASSIS ELECTRICAL

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# BATTERY

## ON-VEHICLE SERVICE

### BATTERY CHECK

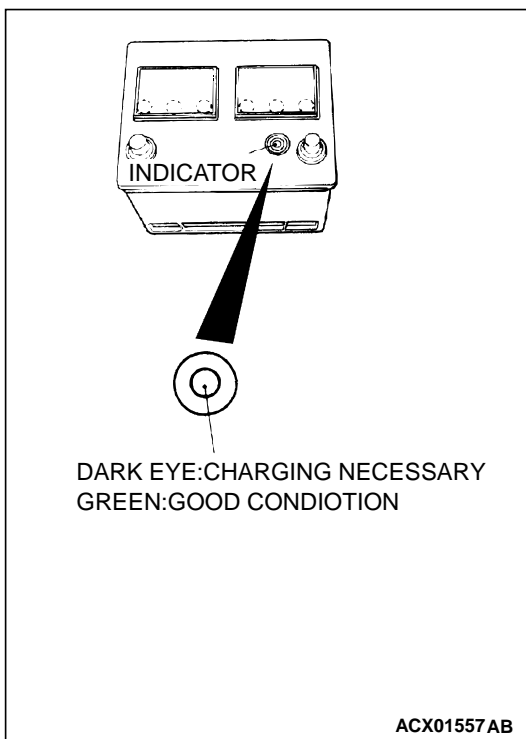
M1541001000126

**⚠ WARNING**

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

### BATTERY VISUAL INSPECTION (1)

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



### BATTERY VISUAL INSPECTION (2)

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

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

**⚠ WARNING**

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

2. Remove the battery from the vehicle.

3. Inspect battery carrier for damage caused by loss of acid from battery. If acid damage is present, it is necessary to clean area with a solution of clean warm water and baking soda. Scrub area with a stiff bristle brush. Wipe clean with a cloth moistened with ammonia or baking soda in water.
4. Clean the battery, especially the top with 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**

M1541001100101

**⚠ 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 55C° (131F°). Increase of electrolyte temperature above 55C ° (131F°) is harmful to the battery, causing deformation of battery cell, decrease in life of battery, etc.

**CHARGE RATE**

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

**Charge Rate Chart**

BATTERY	BCI Group size 86
Slow charging	5 amps 15 hours
	10 amps 7.5 hours
Fast charging	20 amps 3.75hours
	30 amps 2.5 hours

**BATTERY TESTING PROCEDURE**

M1541001200108

**STEP 1. Check the battery cables.**

Remove the negative cable, then the positive cable. Check for dirty or corroded connections.

**YES :** Clean the battery cables. Then go to Step 2.  
**NO :** Go to Step 2.

**Q: Are the battery cables dirty or have corroded connections?**

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**STEP 2. Check the battery post.**

Check for loose battery post.

**Q: Are the battery post faulty?**

**Yes** : Replace the battery. Then go to Step 4 .

**NO** : Go to Step 3 .

**STEP 3. Check the battery case and cover.**

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

**Q: Is the battery case or cover faulty?**

**YES** : Replace the battery. Then go to Step 4 .

**NO** : Go to Step 4 .

**STEP 4. Check the open circuit voltage.**

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

**Q: Is open circuit voltage 12.4 volts or more?**

**NO** : Go to Step 5 .

**YES** : Go to Step 6 .

**STEP 5. Charge battery.**

**Q: Charging the battery?**

**YES** : Charge the battery at 5 amps for 15 hours.  
Then re-test, go to Step 4 .

**NO** : Go to Step6.

**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?**

**NO** : Replace the battery. Then go to Step 4.

**YES** : The battery is normal.

**LOAD TEST RATE CHART**

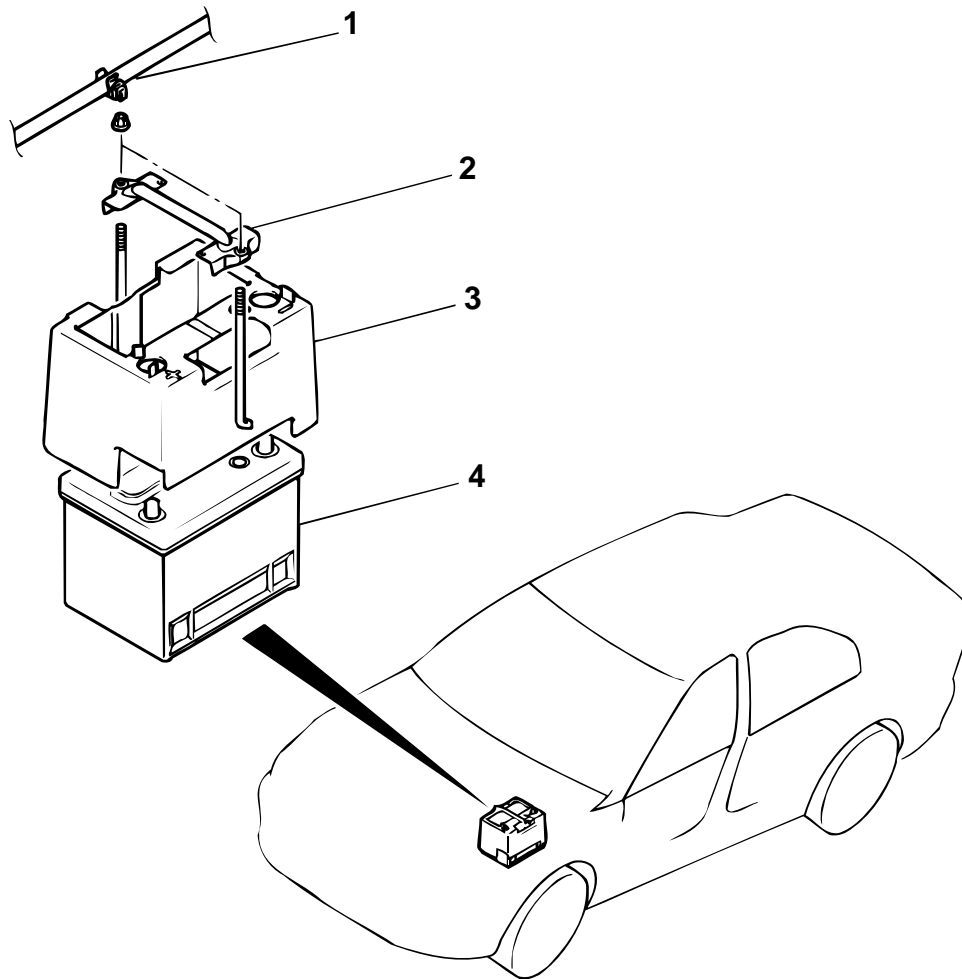
<b>Load test</b>	<b>252 amps</b>
Cranking ratio (0°F)	525 amps
Reserve capacity	90 minutes
Application	BCI Group size 86

**LOAD TEST CHART**

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

## REMOVAL AND INSTALLATION

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**REMOVAL STEPS**

1. ACCELERATOR CABLE CLAMP
2. BATTERY HOLDER

**REMOVAL STEPS**

3. BATTERY COVER
4. BATTERY

**IGNITION SWITCH****GENERAL DESCRIPTION****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.

M1543009900293

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

**Ignition key hole illumination light**

When the driver's door is opened (door switch ON) with the ignition key at "LOCK" (OFF), the ignition key hole illumination light will come on.

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When the driver's door is closed (door switch OFF) the ignition key hole illumination light will go out 30 seconds after the door has been closed.  
(The light goes out immediately if the door is locked through the keyless entry function.)

## immobilizer system

The immobilizer system consists of the ignition key, the key ring antenna, the immobilizer-ECU, and the PCM. The ignition key has a built-in transponder. The key ring antenna is installed on the steering lock key cylinder. Only the registered ignition key permits the

engine to start, therefore, the engine can never be started by means of a forged key or by connecting the ignition wiring directly. The system is significantly safe and reliable against theft. In addition, the driver has only to turn the ignition switch to the "ON" position to activate the immobilizer system. If the requirements for starting the engine are not satisfied, the engine will be immobilized. If the ignition key is lost or another ignition key is added, the encrypted code can be registered or erased by using scan tool MB991502.

## EQUIPMENT DIAGNOSIS

### IGNITION SWITCH DIAGNOSIS

The Ignition key reminder horn alarms are controlled by the Simplified Wiring System (SWS). For troubleshooting, refer to GROUP 54B, SWS Diagnosis [P.54B-9](#).

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### INTRODUCTION TO IMMOBILIZER SYSTEM DIAGNOSIS

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#### CAUTION

- The encrypted code should always be re-registered when replacing the immobilizer-ECU.
- If the immobilizer-ECU has been replaced with a new part, the password (vehicle secret code) which has been stored in the immobilizer-ECU for each vehicle will be replaced by a new password (secret code) specified by the customer.

The immobilizer system consists of the immobilizer-ECU, PCM, 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. In addition, if the immobilizer

system has immobilized the engine, MFI system DTC P1610 will be output. In this case, observe the immobilizer system troubleshooting. Then, if a malfunction is resolved, the MFI system DTC P1610 should not reset.

### IMMOBILIZER SYSTEM DIAGNOSTIC TROUBLESHOOTING STRATEGY

M1543006900175

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

1. Gather information about the problem from the customer.
2. Verify that the condition described by the customer exists.
3. Check the vehicle for any immobilizer system DTC.
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.00-8](#).
  - (2) If you cannot get the same immobilizer system DTC to set again, the malfunction is intermittent. Refer to GROUP 00, How to Use
5. If you can verify the condition but there are no immobilizer system DTCs, or the system cannot communicate with scan tool, refer to Symptom Chart and find the fault [P.54A-10](#).
6. If there is an immobilizer system DTC, record the number of the DTC, then erase the DTC from the memory using scan tool.
7. Recreate the immobilizer system DTC set conditions to see if the same immobilizer system DTC will set again.
  - (1) If the same immobilizer system DTC sets again, perform the diagnostic procedures for the DTC. Refer to Diagnostic Trouble Code Chart [P.54A-10](#).

Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunctions [P.00-8](#).

**IMMOBILIZER SYSTEM TROUBLE CODE  
DIAGNOSIS**

M1543007000090

**Retrieving and Erasing Immobilizer System  
Diagnostic Trouble Codes**

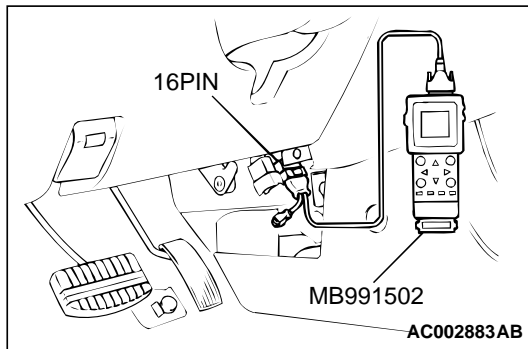
**Required Special Tool:**

MB991502: Scan Tool (MUT-II)

**⚠ CAUTION**

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

1. Connect scan tool MB991502 to data link connector (16 pin).
2. Turn the ignition switch to "ON" position.
3. Use scan tool MB991502 to check or erase immobilizer system diagnostic trouble codes.
4. Turn the ignition switch to "LOCK"(OFF) position.
5. Disconnect scan tool MB991502.



**DIAGNOSTIC TROUBLE CODE CHART**

M1543007100116

Follow the inspection chart that is appropriate for the diagnostic trouble code.

DIAGNOSTIC TROUBLE CODE NO.	DESCRIPTION	REFERENCE PAGE
11	Transponder communication system or radio interference of encrypted code	P.54A-11
12	Encrypted codes are not the same or are not registered	P.54A-14

NOTE: Diagnostic trouble code is not recorded.

**SYMPTOM CHART**

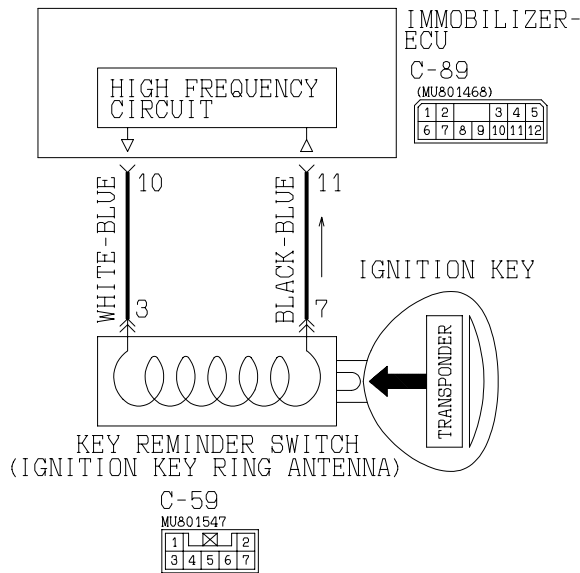
M1543007200232

SYMPTOMS	INSPECTION PROCEDURE NO.	REFERENCE PAGE
Communication with scan tool MB991502 is impossible	1	P.54A-15
The ignition key cannot be registered	2	P.54A-20
Engine does not start (Cranking but no initial combustion)	3	P.54A-21

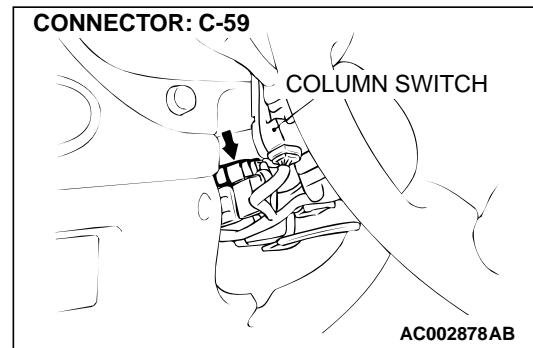
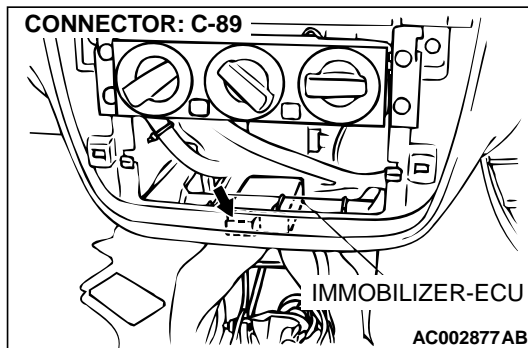
DIAGNOSTIC TROUBLE CODE PROCEDURES

DTC: 11 Transponder communication system or radio interference of encrypted code

Ignition Key Ring Antenna Circuit



AC003968AB



CIRCUIT OPERATION

The ignition key is powered by the ignition key ring antenna, and sends an encrypted code. The ignition key ring antenna receives the encrypted code, and determines whether the ignition key is a registered key or not.

DTC SET CONDITION

- If the engine is started while several ignition keys are in the vicinity, interference between the different keys may occur, which will cause this code to be generated.
- The encrypted code of the transponder is not sent to the immobilizer-ECU immediately after the ignition switch is turned to "ON" position.

NOTE: DTC 11 is always output together with MFI system DTC P1610.

TROUBLESHOOTING HINTS

- Radio interference of encrypted code
- Malfunction of transponder

- Malfunction of key reminder switch (ignition key ring antenna)
- Malfunction of immobilizer-ECU
- Damaged wiring harness of connectors

**DIAGNOSIS****Required Special Tools:**

- MB991223: Harness Set
- MB991502: Scan Tool

**STEP 1. Check that there is other key near the key in the ignition.**

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

- YES :** Move the other key well away from key being used.  
Confirm that diagnostic trouble code 11 is not output.
- 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 which encrypted code has been registered?**

- YES :** Replace the ignition key that does not work. Then register the password (secret code) and encrypted code. Confirm that diagnostic trouble code 11 is not output.
- NO :** Go to Step 3.

**STEP 3. Check that DTC11 or 12 is output.**

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

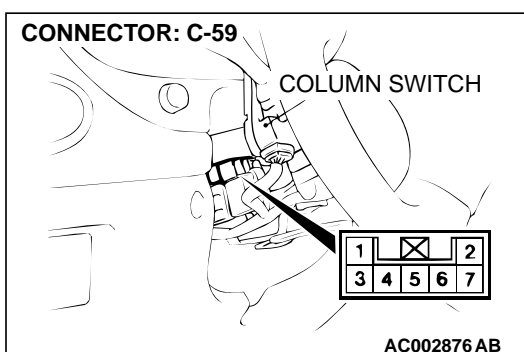
- DTC12 is output :** Refer to DTC 12 [P.54A-14](#).
- DTC11 is output :** Go to Step 4.

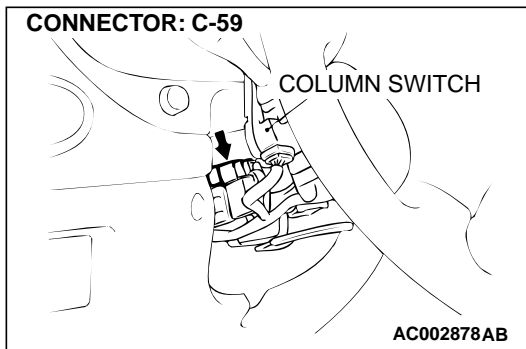
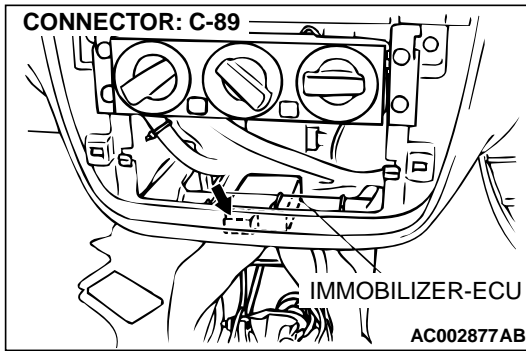
**STEP 4. Check the ignition key ring antenna by backprobing.**

Do not disconnect the ignition key ring antenna connector C-59 and check the resistance on the harness side connector between terminal number 3 and terminal number 7 by backprobing.

**Q: Is the resistance less than 2 ohms?**

- YES :** Go to Step 5.
- NO :** Replace the ignition key ring antenna. Confirm that diagnostic trouble code 11 is not output.

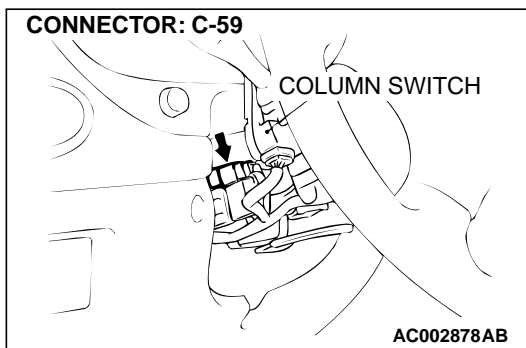
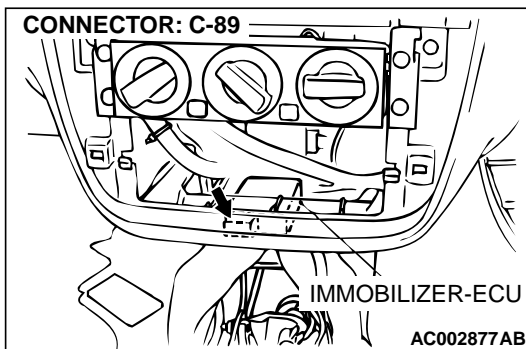




**STEP 5. Check immobilizer-ECU connector C-89 and ignition key ring antenna connector C-59 for damage.**  
**Q: Are immobilizer-ECU connector C-89 and ignition key ring antenna connector C-59 in good condition?**

**YES :** Go to Step 6.

**NO :** Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Confirm that diagnostic trouble code 11 is not output.



**STEP 6. Check the harness wires between immobilizer-ECU connector C-89 and ignition key ring antenna connector C-59.**

**Q: Are the harness wires between immobilizer-ECU connector C-89 and ignition key ring antenna connector C-59 in good condition?**

**YES :** Replace the immobilizer-ECU. Then register the password (secret code) and encrypted code (Refer to [P.54A-23](#).) Confirm that diagnostic trouble code 11 is not output.

**NO :** Repair them. Confirm that diagnostic trouble code 11 is not output.

**DTC12: Encrypted codes are not the same or not registered**

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**DTC SET CONDITION**

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

*NOTE: DTC 12 is always output together with MFI system DTC P1610.*

**TROUBLESHOOTING HINTS**

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

**DIAGNOSIS**

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**STEP 1. Check that the encrypted code was registered.**

**Q: Was the encrypted code registered?**

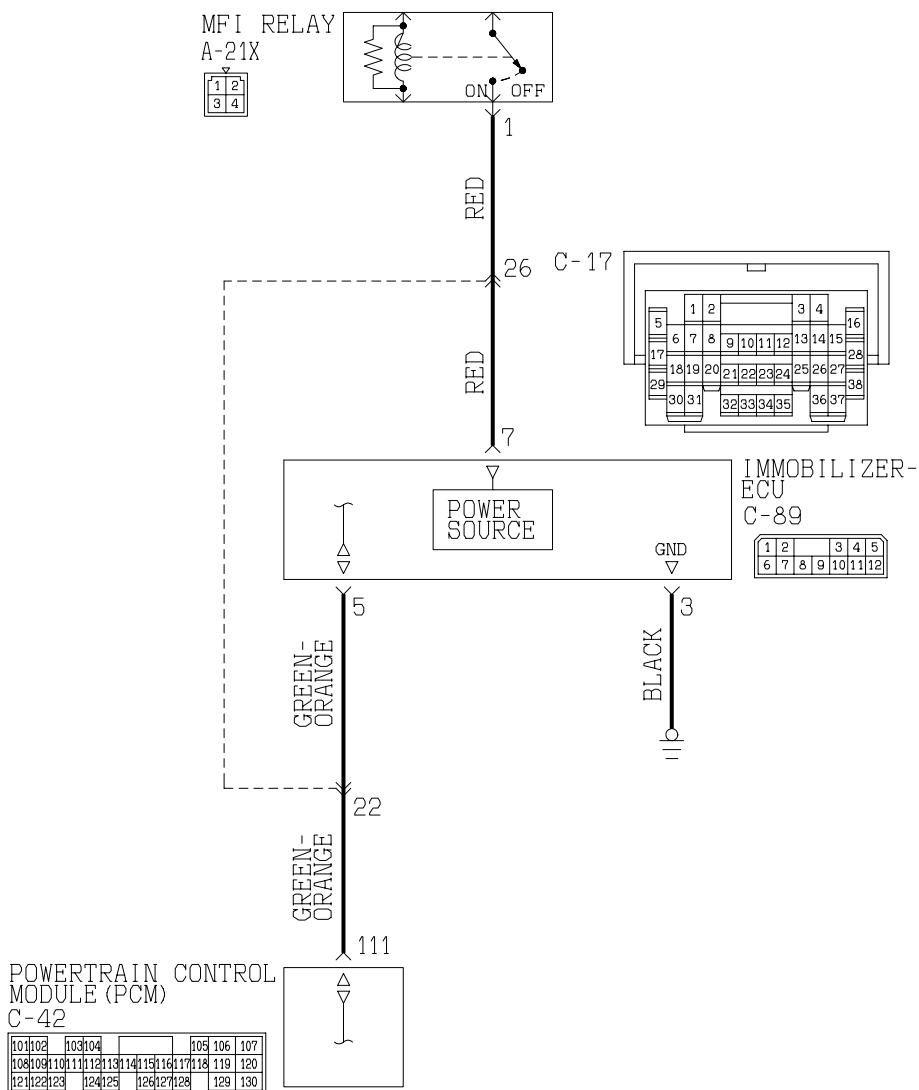
**YES** : Replace the immobilizer and then re-register the encrypted code (Refer to [P.54A-23.](#))

**NO** : Register the encrypted code (Refer to [P.54A-23.](#))

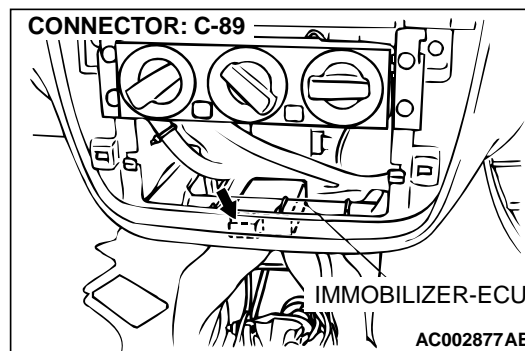
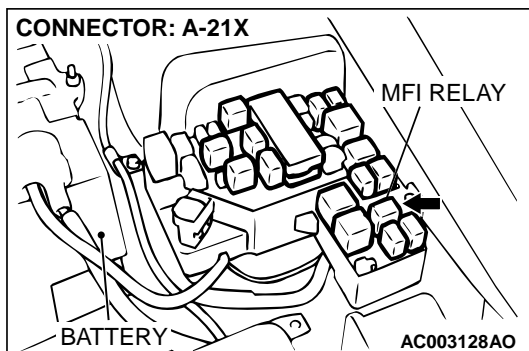
SYMPTOM PROCEDURES

Inspection Procedure 1: Communication with scan tool MB991502 is impossible.

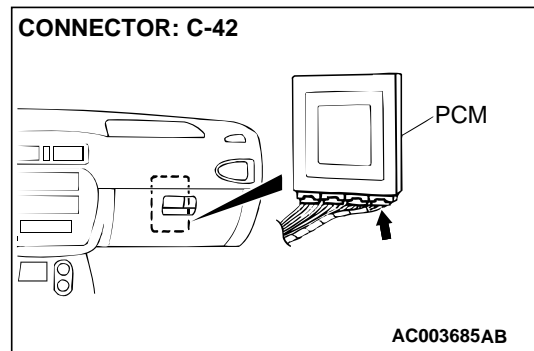
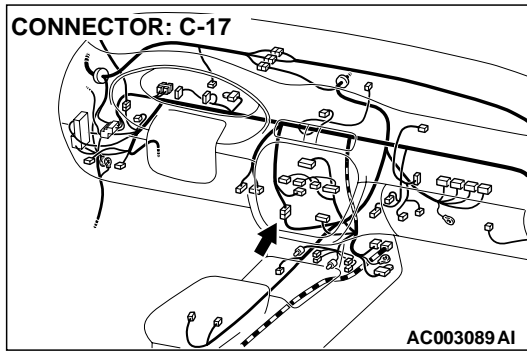
Immobilizer-ECU Power Supply, Ground and PCM Communication Line Circuit



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### CIRCUIT OPERATION

Immobilizer-ECU is energized when the ignition switch is turned "ON," and the MFI relay is turned on. The PCM transmits a signal from scan tool MB991502 to the immobilizer-ECU as it is. In the same way, a signal from the immobilizer-ECU is also transmitted to scan tool MB991502 as it is.

### TECHNICAL DESCRIPTION (COMMENT)

- This malfunction may be caused by a defective immobilizer-ECU or PCM, or a defect in the communication line between the immobilizer-ECU and PCM. If this malfunction appears when the MFI system and scan tool MB991502 can communicate each other, MFI system DTC P1610 will reset.

- If the MFI system is normal, the MFI relay can be determined as normal. In addition, if the MFI system and scan tool MB991502 can communicate each other, the circuits between the data link connector and the PCM can be determined as normal.

*NOTE: If this malfunction appears, MFI system DTC P1610 will be output.*

### TROUBLESHOOTING HINTS

- Malfunction of immobilizer-ECU
- Malfunction of PCM
- Damaged harness wires or connectors

### DIAGNOSIS

#### Required Special Tools:

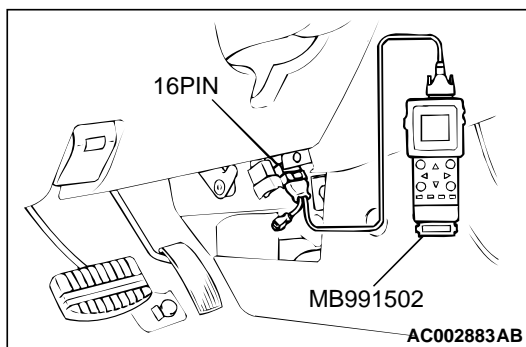
- MB991223: Harness Set
- MB991502: Scan Tool (MUT-II)

**STEP 1. Check that scan tool MB991502 can communicate with the MFI system and that the MFI system DTC other than P1610 resets.**

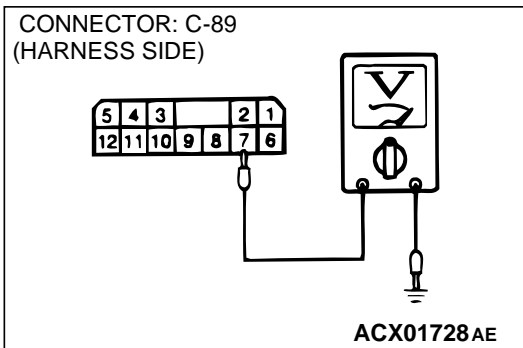
**Q: Can scan tool MB991502 communicate with the MFI system? Does MFI system DTC other than P1610 reset?**

**YES :** Go to Step 2 .

**NO :** Refer to GROUP 13A, Diagnosis [P.13A-5](#) or GROUP 13B, Diagnosis [P.13B-4](#).







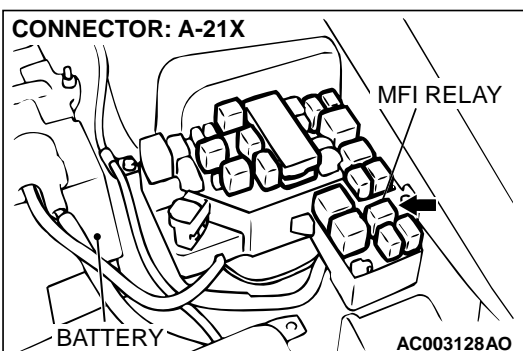
**STEP 2. Check the immobilizer-ECU power supply circuit by backprobing.**

- (1) Do not disconnect immobilizer-ECU connector C-89.
- (2) Turn the ignition switch to the "ON" position.
- (3) Measure the voltage between terminal 7 and ground by backprobing.

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

**YES :** Go to Step 5.

**NO :** Go to Step 3.

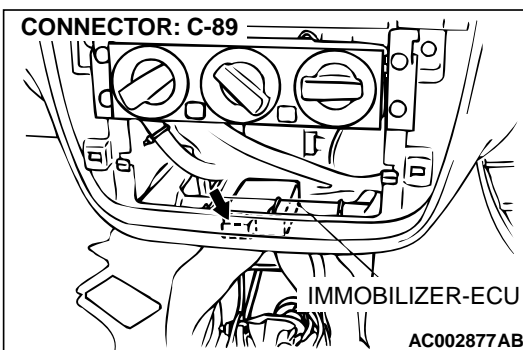


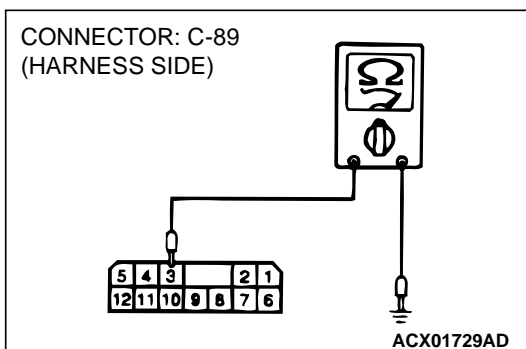
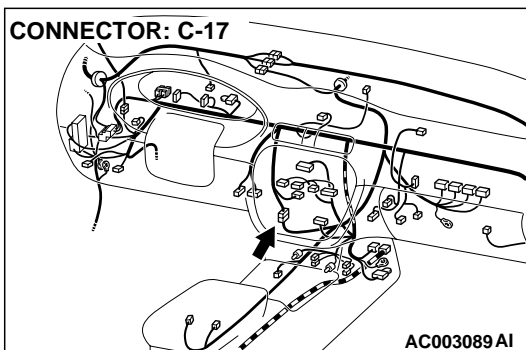
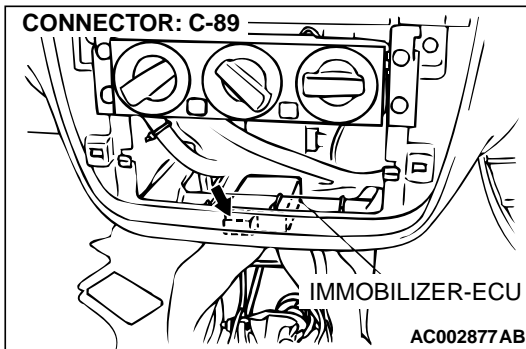
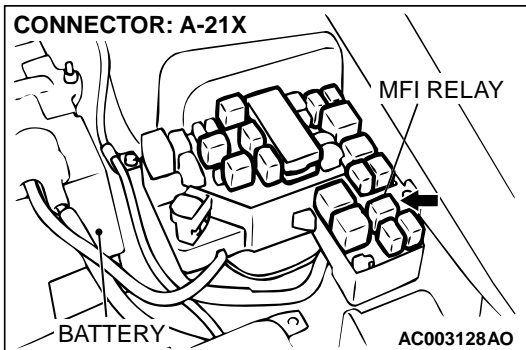
**STEP 3. Check immobilizer-ECU connector C-89 and MFI relay connector A-21X for damage.**

**Q: Are immobilizer-ECU connector C-89 and MFI relay connector A-21X damaged?**

**YES :** Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Confirm that scan tool MB991502 communicates normally.

**NO :** Go to Step 4.





**STEP 4. Check the harness wires between immobilizer-ECU connector C-89 and MFI relay connector A-21X.**

*NOTE: After checking intermediate connector C-17, check the wires. If intermediate connector C-17 is damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.*

**Q: Are the harness wires between immobilizer-ECU connector C-89 and MFI relay connector A-21X damaged?**

**YES :** Replace them. Confirm that scan tool MB991502 communicates normally.

**NO :** There is no action to be taken.

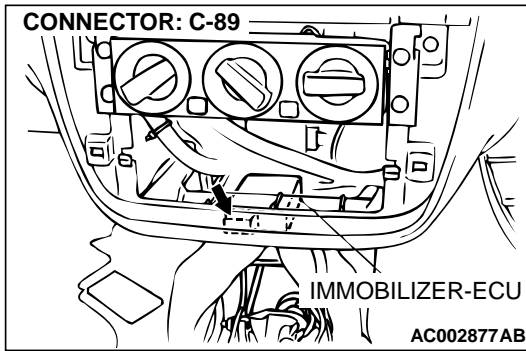
**STEP 5. Check the immobilizer-ECU ground circuit by backprobing.**

- (1) Do not disconnect immobilizer-ECU connector C-89.
- (2) Measure the resistance between terminal 3 and ground by backprobing.

**Q: Is the resistance less than 2 ohms?**

**YES :** Go to Step 7 .

**NO :** Go to Step 8 .

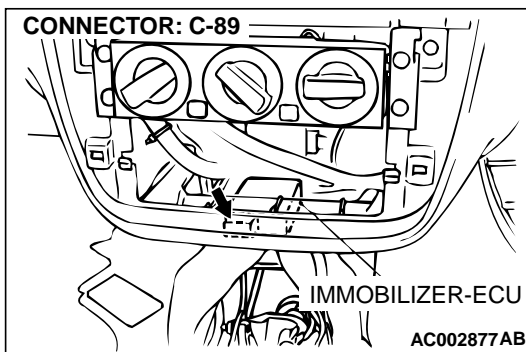


**STEP 6. Check immobilizer-ECU connector C-89 for damage.**

**Q: Is immobilizer-ECU connector C-89 in good condition?**

**YES :** Go to Step 7.

**NO :** Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Confirm that scan tool MB991502 communicates normally.

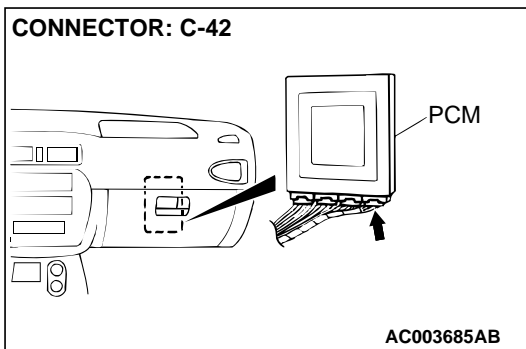


**STEP 7. Check the harness wire between immobilizer-ECU connector C-89 and ground.**

**Q: Is the harness wire between immobilizer-ECU connector C-89 and ground damaged?**

**YES :** Repair it. Confirm that scan tool MB991502 communicates normally.

**NO :** There is no action to be taken.

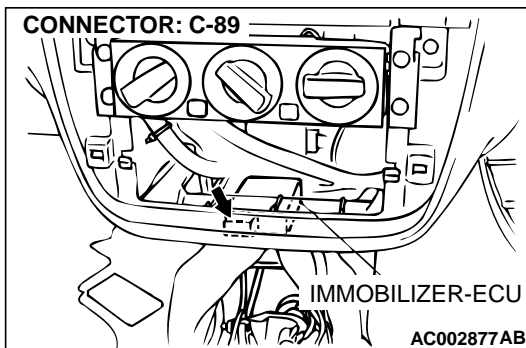


**STEP 8. Check the harness wires between immobilizer-ECU connector C-89 and PCM connector C-42.**

**Q: Are the harness wires between immobilizer-ECU connector C-89 and PCM connector C-42 damaged?**

**YES :** Repair them. Confirm that scan tool MB991502 communicates normally.

**NO :** Go to Step 9.



**STEP 9. Replace the immobilizer-ECU or PCM.**

Replace the immobilizer-ECU or PCM.

**Q: Did the communication with MUT-II become possible after replacing the immobilizer-ECU or the power train control module?**

**YES :** Register the password (secret code) and encrypted code (Refer to [P.54A-23](#).) Confirm that scan tool MB991502 communicates normally

**NO :** Go to Step 10.

**STEP 10. Recheck for malfunction**

**Q: Is a malfunction eliminated?**

**YES :** This diagnosis is complete. (If no malfunction are not 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.00-8](#).)

**NO :** Replace the immobilizer-ECU or PCM.

**Inspection Procedure 2: The ignition key cannot be registered.****TECHNICAL DESCRIPTION (COMMENT)**

The transponder built-in ignition key or the immobilizer-ECU is suspected to be defective.

**TROUBLESHOOTING HINTS**

- Malfunction of ignition key
- Malfunction of immobilizer-ECU

**DIAGNOSIS****Required Special Tools:**

- MB991223: Harness Set
- MB991502: Scan Tool

**STEP 1. Check the DTC 11.**

**Q: Does DTC11 reset?**

**YES :** Refer to [P.54A-11](#).

**NO :** Replace the ignition key that cannot be registered. Then re-register the encrypted code. Check that the ignition key can be registered. Then Go to Step 2.

**STEP 2. Recheck for malfunction**

**Q: Is a malfunction eliminated?**

**YES :** This diagnosis is complete. (If no malfunction are not 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.00-8](#).)

**NO :** Replace the immobilizer-ECU.

---

**Inspection Procedure 3: Engine does not start (Cranking but no initial combustion).**

---

**TECHNICAL DESCRIPTION (COMMENT)**

If the fuel injectors are not operating, there might be a problem with the MFI system in addition to a malfunction of the immobilizer system. It is normal for this to occur if an attempt is made to start the engine using a key that has not been properly registered.

**TROUBLESHOOTING HINTS**

- Malfunction of MFI system
- Malfunction of immobilizer-ECU

**DIAGNOSIS****Required Special Tools:**

- MB991223: Harness Set
- MB991502: Scan Tool

---

**STEP 1. Check the battery positive voltage.**

Measure the battery positive voltage during cranking.

**Q: Is the voltage 8 volts or more?**

**YES** : Go to Step 2.

**NO** : check the battery. Refer to [P.54A-5](#). The engine should start.

---

**STEP 2. Check the immobilizer system DTC and MFI system DTC.****Q: Which DTC resets, the immobilizer system DTC or the MFI system DTC?**

**Immobilizer system DTC** : Refer to [P.54A-10](#).

**MFI system DTC** : Refer to GROUP 13A, Diagnosis [P.13A-5](#) or GROUP 13B, Diagnosis [P.13B-4](#).

**No DTC** : Go to Step 3.

---

**STEP 3. Check the starting system.****Q: Does the engine start?**

**YES** : Go to Step 4.

**NO** : Refer to GROUP 13A, Diagnosis – Symptom Chart [P.13A-22](#) or GROUP 13B, Diagnosis – Symptom Chart [P.13B-22](#). If a malfunction is not resolved, replace the immobilizer-ECU. Then register the password (secret code) and encrypted code. (Refer to [P.54A-23](#).) The engine should start.

---

**STEP 4. Recheck for malfunction****Q: Is a malfunction eliminated?**

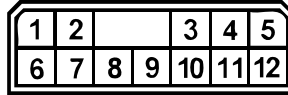
**YES** : This diagnosis is complete. (If no malfunction are not found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points-How to Cope with Intermittent Malfunction [P.00-8](#).)

**NO** : Replace the immobilizer-ECU.

CHECK AT IMMOBILIZER-ECU

M1543007600199

TERMINAL VOLTAGE CHECK



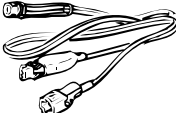
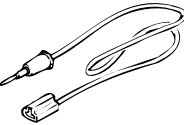



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TERMINAL NO.	SIGNAL	CHECKING REQUIREMENT	TERMINAL VOLTAGE
3	Immobilizer-ECU ground	Always	0V
5	PCM	-	-
7	Immobilizer-ECU power supply	Ignition switch: "LOCK" (OFF)	0V
		Ignition switch: "ON"	Battery positive voltage
10	Ignition key ring antenna	-	-
11	Ignition key ring antenna	-	-

SPECIAL TOOLS

M1543000600273

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
 B991502	MB991502 Scan tool (MUT-II)	MB991496-OD	<ul style="list-style-type: none"> <li>Immobilizer system check</li> <li>Encrypted code registration</li> </ul>
A  B  C  D  MB991223AC	MB991223 A:MB991219 B:MB991220 C:MB991221 D:MB991222 Harness set A:Test harness B:LED harness C:LED harness adapter D:Probe	MB991223	Making voltage and resistance measurements during troubleshooting A:Connect pin contact pressure inspection B:Power circuit inspection C:Power circuit inspection D:Commercial tester connection

## ON-VEHICLE SERVICE

### ENCRYPTED CODE REGISTRATION METHOD

M1543008100131

#### Required Special Tool:

- MB991502: Scan Tool (MUT-II)

#### CAUTION

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

If the ignition key, Immobilizer-ECU, powertrain control module is replaced or an ignition key is added, encrypted codes of all the ignition keys must be registered. (A maximum of eight different ignition key can be registered.) Moreover, when the immobilizer-ECU has been replaced, you will need to use scan tool MB991502 to register the immobilizer-ECU and input the vehicle secret code and to register the password (secret code) that the owner specifies into the immobilizer-ECU.

*NOTE: powertrain control module has an encrypted code for immobilizer-ECU, and the encrypted code is registered in the immobilizer-ECU and ignition key.*

### POINTS TO NOTE DURING OPERATION

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

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

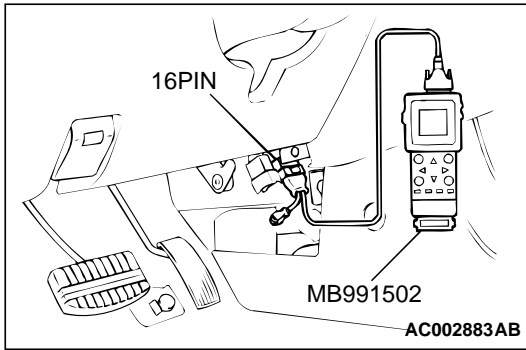
### KEY ID REGISTER

#### CAUTION

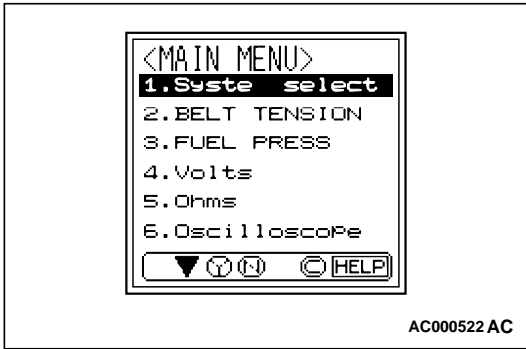
**To prevent damage to scan tool MB991502, always turn the ignition switch to "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.**

#### NOTE:

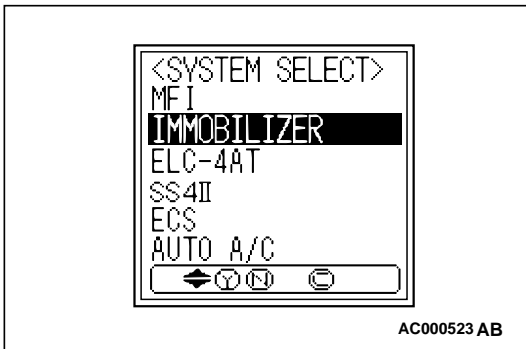
- *Using the key ID register function will cause all key IDs that have been previously registered in the immobilizer-ECU to be erased. All keys need to be registered. Those which have been registered before should be on hand before using this function.*
- *If registering more than one key, do not disconnect scan tool MB991502 halfway through the registration process.*
- *After registering key IDs, check that the engine can be started using all of the keys that have been registered. If the engine will not start, refer to Immobilizer System Diagnosis P.54A-9.*



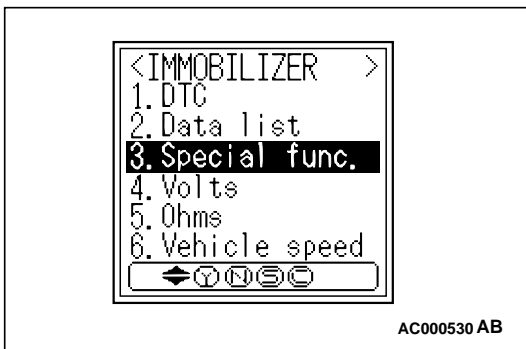
1. Connect scan tool MB991502 to data link connector (16 pin).
2. Turn the ignition switch to "ON" position.



3. At "System Select," press "YES"

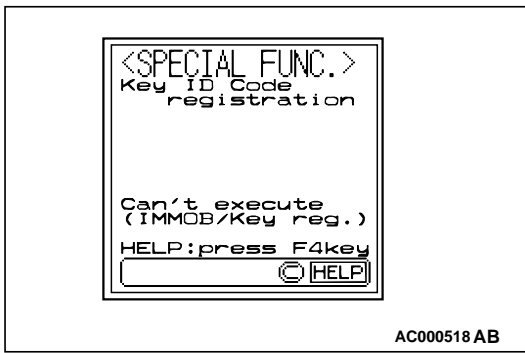


4. Select "Immobilizer," press "YES".

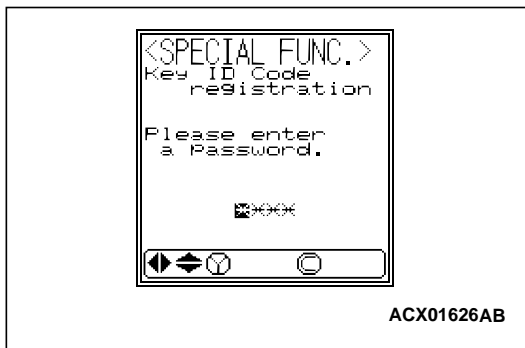
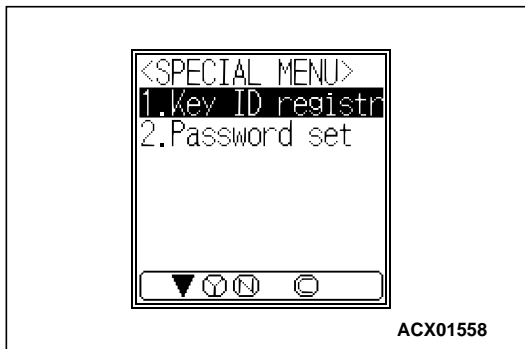


5. Select "Special Func,"press "YES".





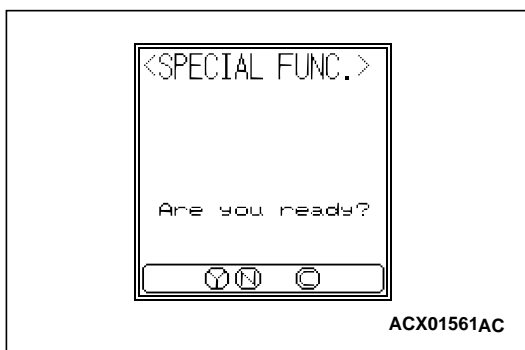
6. Select "key ID registr,"press "YES".  
If DTC 11 exists,"Can't execute" will be displayed.Check for DTC 11(Refer to [P.54A-10.](#))



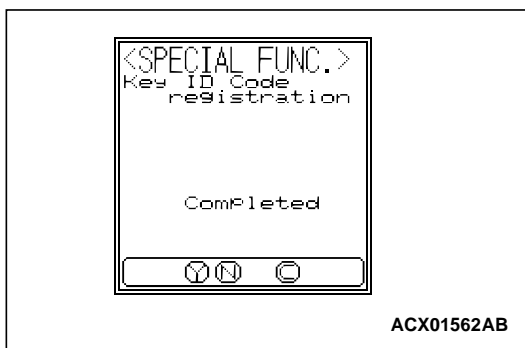
7. Input the password. Use the "UP" and "DOWN" keys to change the current password digit to a value between 0 and 9. Use the "LEFT" and "RIGHT" keys to move to a different password digit. Press the "YES" key to accept the password.

*NOTE: Four separate digits must be input to make up the password.*

If an incorrect password is input five times in a row, this screen is displayed and the Immobilizer-ECU switches to unauthorized operation, start-prevention mode.



8. Press the "YES" key to start key ID registration.



9. This will be displayed when the key ID registration is successful. If an error occurs during key ID registration, the message "Can't execute" will be displayed. If the key has already been registered, "Key ID has been registered" will be displayed.



10. The number of keys currently registered will be displayed. To register an additional key, replace the ignition key with the next key to be registered within five seconds and then press the "YES" key. Key ID registration screen will be displayed, then register another key.

*NOTE: A maximum of eight different keys can be registered. If key ID registration is complete, press the "NO" key.*

11. This completes the registration operation. Turn the ignition switch "LOCK" (OFF) and leave it off for approximately ten seconds.

12. Check that the engine can be started with each of the ignition keys.

13. Check that the immobilizer system DTC and MFI system DTC did not set.

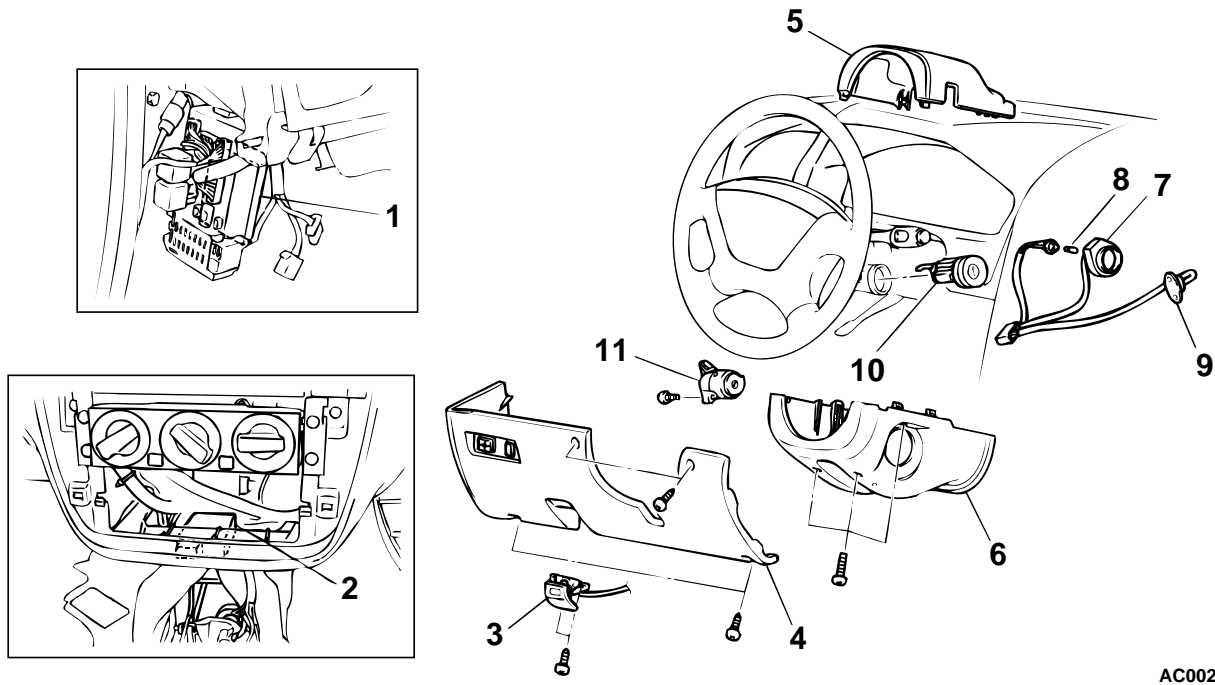
14. Turn the ignition switch to "LOCK" (OFF) position.

15. Disconnect scan tool MB991502.

## IGNITION SWITCH REMOVAL AND INSTALLATION

### REMOVAL AND INSTALLATION

M1543002100100



AC002879AB

- 1. ETACS-ECU (GROUP 42, KEYLESS ENTRY SYSTEM P.42-72.)
  - >>A<< 2. IMMOBILIZER-ECU
- IGNITION SWITCH REMOVAL STEPS**
- 3. HOOD LOCK RELEASE HANDLE
  - 4. DRIVER'S UNDERCOVER (REFER TO GROUP 52A, INSTRUMENT PANEL P.52A-11.)

<<A>>

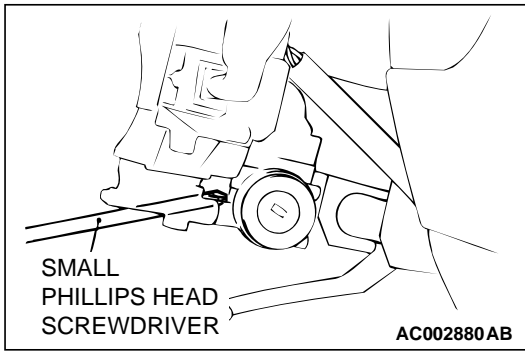
### IGNITION SWITCH REMOVAL STEPS (Continued)

- 5. COLUMN COVER, UPPER
- 6. COLUMN COVER, LOWER
- 7. KEY RING ANTENNA
- 8. BULB
- 9. KEY REMINDER SWITCH
- 10. STEERING LOCK CYLINDER
- 11. IGNITION SWITCH

**REMOVAL SERVICE POINT**

**<<A>> STEERING LOCK CYLINDER REMOVAL**

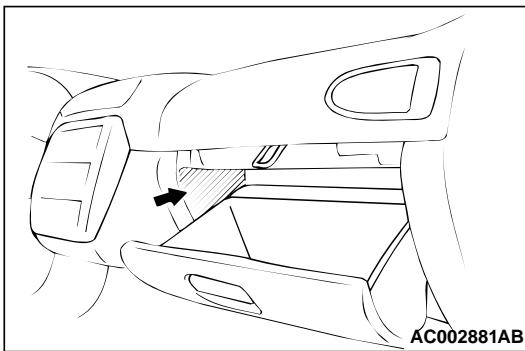
1. Insert the key in the steering lock cylinder and turn it to the "ACC" position.
2. Using a small Phillips head screwdriver, pull the steering lock cylinder toward you.



**INSTALLATION SERVICE POINT**

**>>A<< IMMOBILIZER-ECU INSTALLATION**

If the immobilizer-ECU is replaced, peel off the immobilizer serial number sticker from shown position. Then attach a new immobilizer-ECU identification sticker.

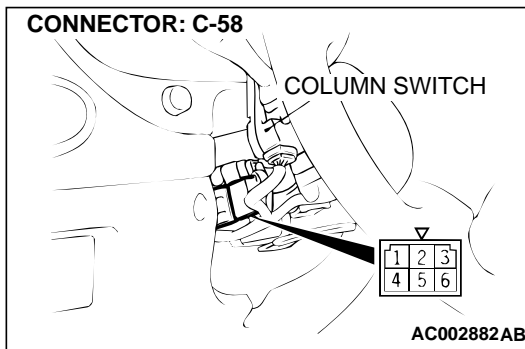


**IGNITION SWITCH INSPECTION**

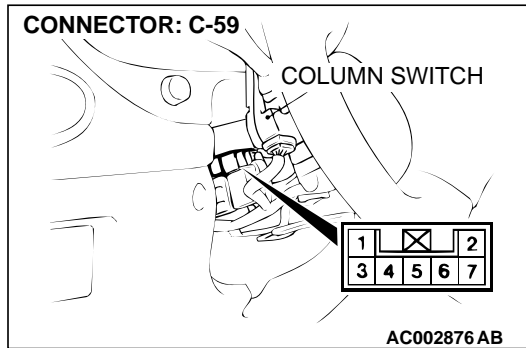
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**IGNITION SWITCH CONTINUITY CHECK**

Disconnect ignition switch connector C-58 without removing the ignition switch and steering lock cylinder. Then check the continuity.



SWITCH POSITION	TESTER CONNECTION	SPECIFIED CONNECTION
"LOCK"(OFF)	-	-
"ACC"	1-6	Continuity
"ON"	1-2-4-6	Continuity
"START"	1-2-3-5	Continuity



**KEY REMINDER SWITCH CHECK**

Disconnect key reminder switch connector C-59 without removing the key reminder switch and steering lock cylinder. Then check the continuity.

STATUS OF IGNITION KEY	TESTER CONNECTION	SPECIFIED CONNECTION
Removed	1-2(Illumination light) 4-6(Switch)	Continuity
Inserted	1-2(Illumination light)	Continuity

**Ignition key ring antenna check**

Check the continuity between terminal 3 and terminal 7.

**Standard value: 2 ohms or less**

**COMBINATION METERS ASSEMBLY AND VEHICLE SPEED SENSOR**

**INTRODUCTION TO COMBINATION METER DIAGNOSIS**

M1543009900312

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

**COMBINATION METER DIAGNOSTIC TROUBLESHOOTING STRATEGY**

M1543006900186

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

1. Gather information from the customer.

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

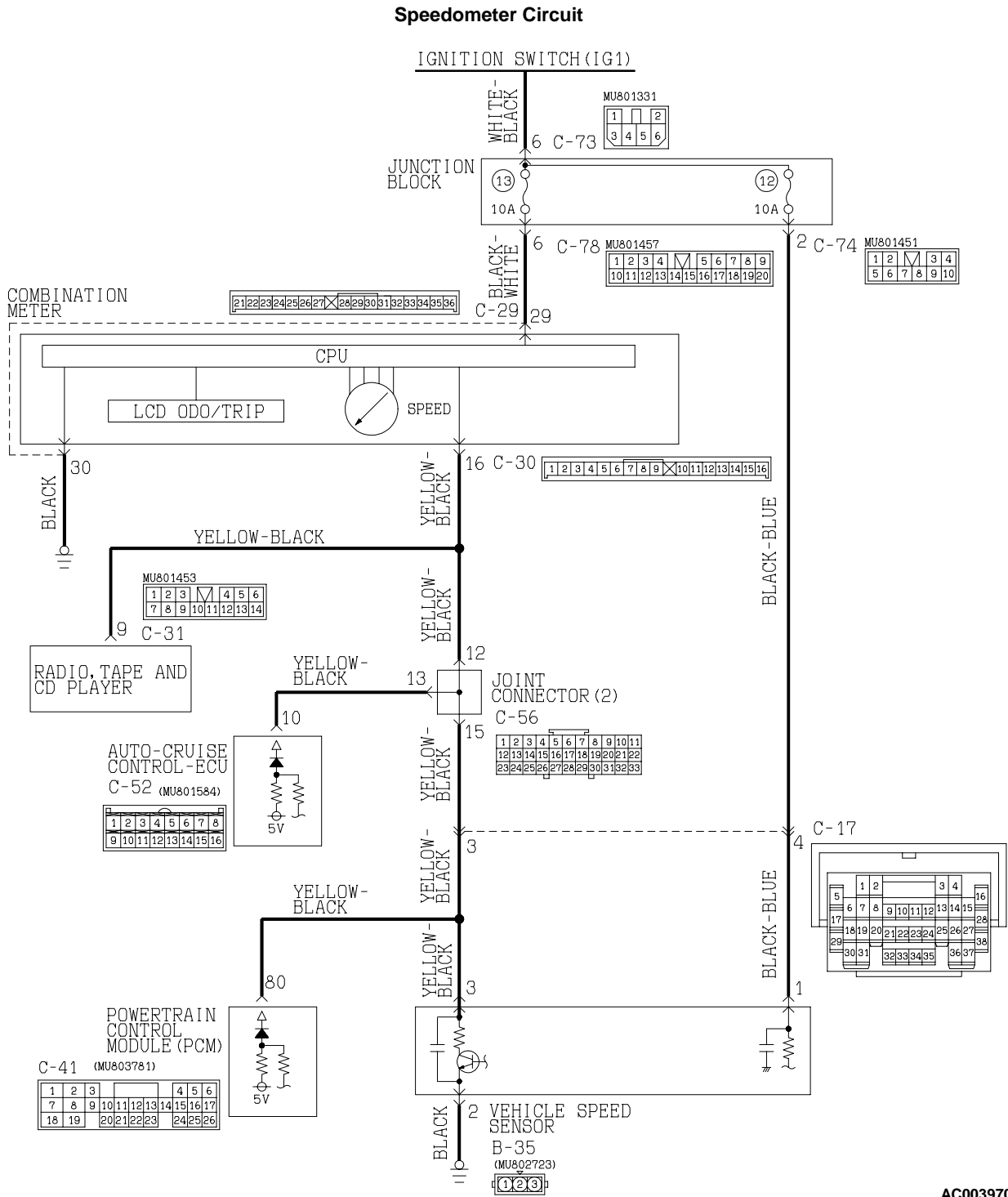
**SYMPTOM CHART**

M1543007200243

SYMPTOMS	INSPECTION PROCEDURE	REFERENCE PAGE
Speedometer does not work.	1	<a href="#">P.54A-29</a>
Tachometer does not work.	2	<a href="#">P.54A-45</a>
Fuel gauge does not work.	3	<a href="#">P.54A-51</a>
Engine coolant temperature gauge does not work.	4	<a href="#">P.54A-56</a>

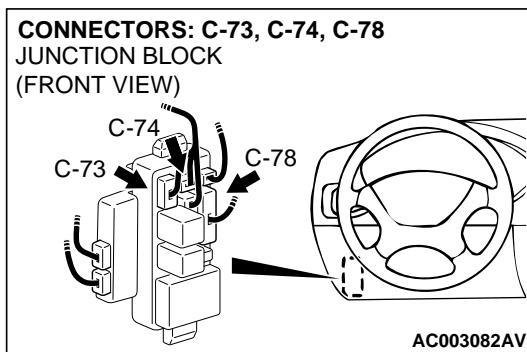
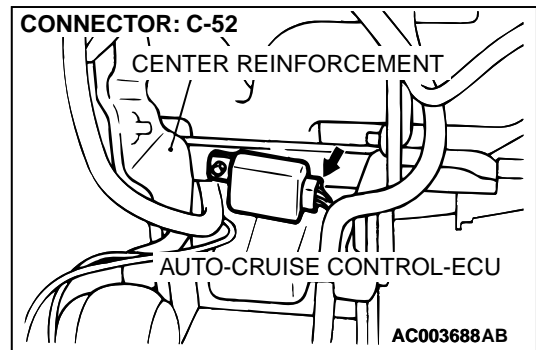
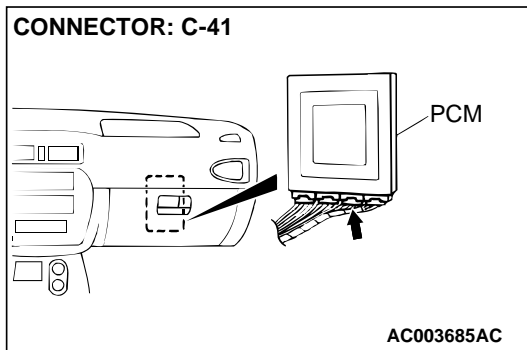
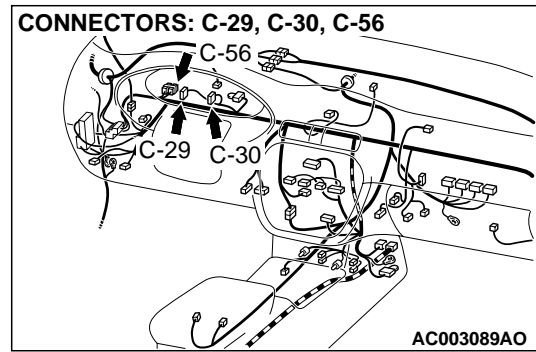
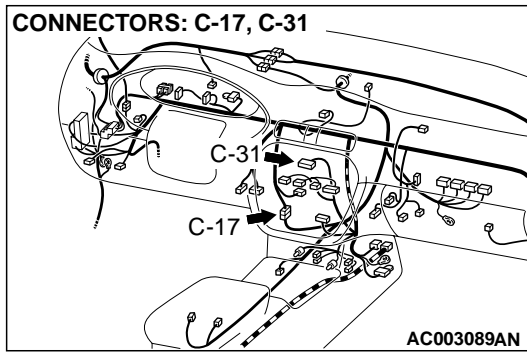
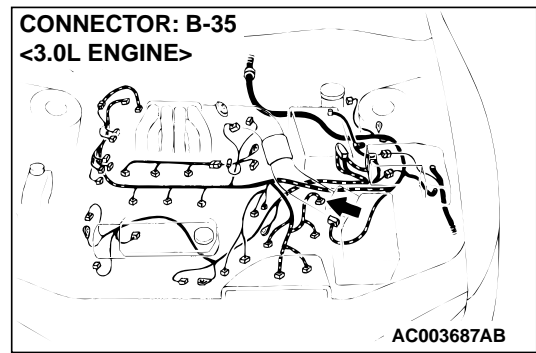
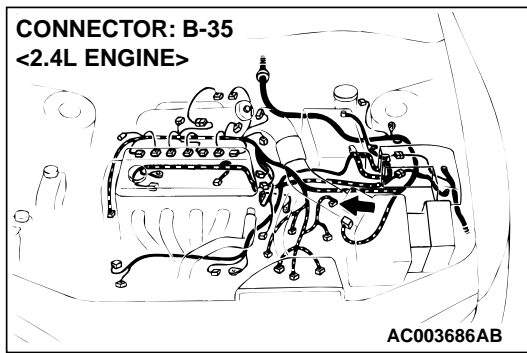
SYMPTOM PROCEDURES

Inspection Procedure 1: Speedometer does not work.



AC003970 AB

TSB Revision



**CIRCUIT OPERATION**

- The ignition switch (IG1) circuit is the power source for the speedometer and vehicle speed sensor.

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

**TECHNICAL DESCRIPTION (COMMENT)**

The cause may be a faulty vehicle speed sensor circuit system or a faulty speedometer. Vehicle speed sensor is also used by the powertrain control module (PCM), auto-cruise control-ECU.

**TROUBLESHOOTING HINTS**

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

**DIAGNOSIS**

**Required Special Tools:**

- MB991223: Harness Set
- MB991502: Scan Tool (MUT-II)

**⚠ CAUTION**

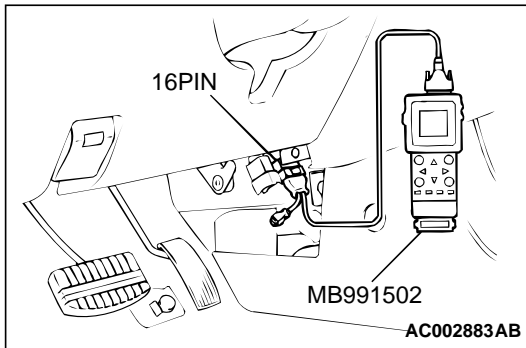
To prevent damage to scan tool always turn the ignition switch to "LOCK" (OFF) position before connecting or disconnecting scan tool.

**STEP 1. Check the vehicle speed sensor**

- (1) Connect scan tool MB991502 to the data link connector.
- (2) Turn the ignition switch to "ON" position.
- (3) Read the MFI system diagnostic trouble code.

**Q: Is MFI system DTC P0500 output?**

- YES :** Go to Step 12.  
**NO :** Go to Step 2.



**STEP 2. Check the odometer and trip odometer operation.**

**Q: Do the odometer and trip odometer work correctly?**

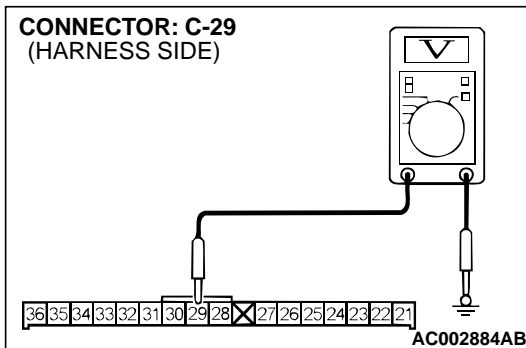
- YES :** Go to Step 9.  
**NO :** Go to Step 3.

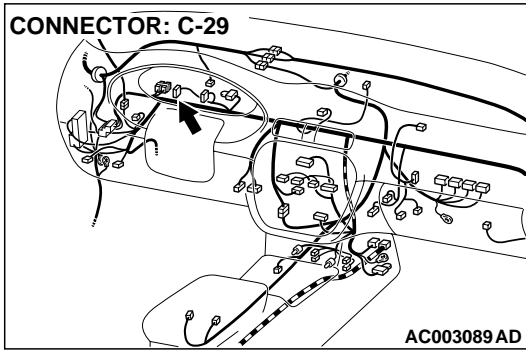
**STEP 3. Check the combination meter power supply circuit at the combination meter connector C-29.**

- (1) Disconnect the combination meter connector C-29.
- (2) Turn the ignition switch to "ON" position.
- (3) Measure the voltage between terminal 29 and ground.

**Q: Is the voltage 12 volts (battery positive voltage) between terminal 29 and ground?**

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



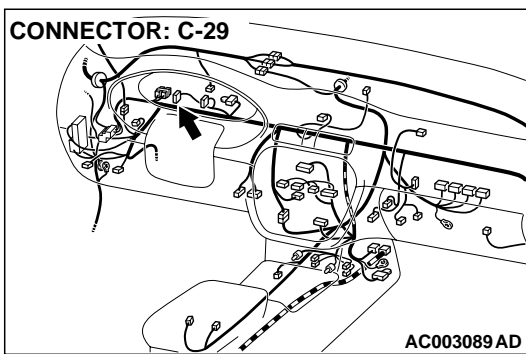


**STEP 4. Check the combination meter connector C-29 for damage.**

**Q: Is combination meter connector C-29 in good condition?**

**YES :** Go to Step 5.

**NO :** Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). The speedometer should work normally.



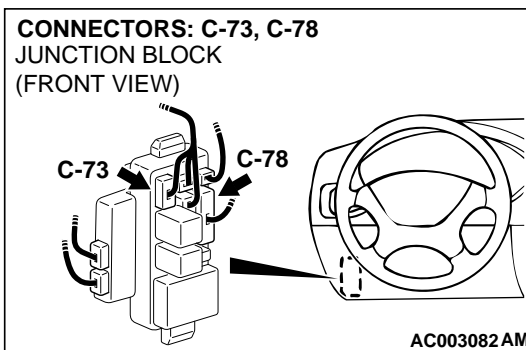
**STEP 5. Check the harness wires between combination meter connector C-29 and ignition switch (IG1).**

*NOTE: After checking junction block connectors C-73 and C-78, check the wires. If junction block connectors C-73 and C-78 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#).*

**Q: Is the harness wires between combination meter connector C-29 and ignition switch (IG1) in good condition?**

**YES :** There is no action to be taken.

**NO :** Repair them. The speedometer should work normally.



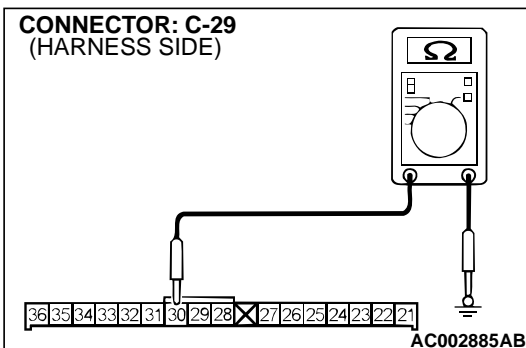
**STEP 6. Check the combination meter (speedometer) ground circuit at the combination meter connector C-29.**

- (1) Disconnect the combination meter connector C-29.
- (2) Measure the resistance between terminal 30 and ground.

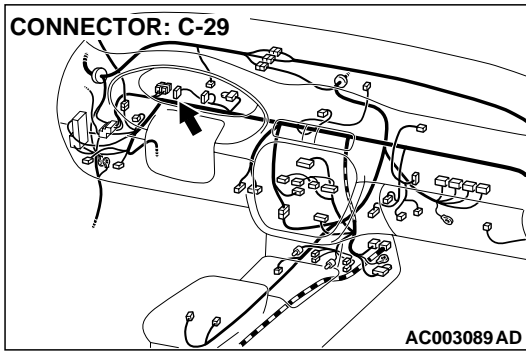
**Q: Is the resistance value less than 2 ohms?**

**YES :** Repair or repair the combination meter (printed-circuit board or speedometer and tachometer). The speedometer should work normally.

**NO :** Go to Step 7.





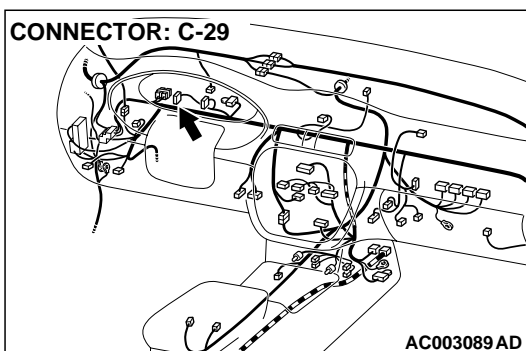


**STEP 7.** Check the combination meter connector C-29 for damage.

**Q:** Is combination meter connector C-29 in good condition?

**YES :** Go to Step 8.

**NO :** Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). The speedometer should work normally.

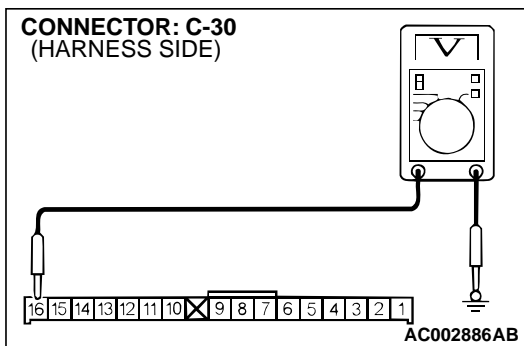
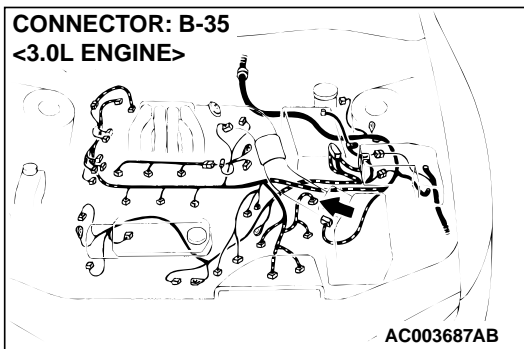
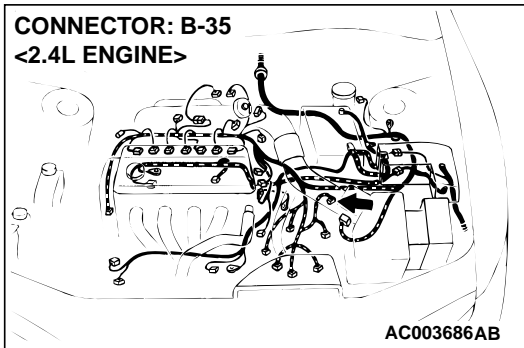


**STEP 8.** Check the harness wire between combination meter connector C-29 and ground.

**Q:** Is the harness wire between combination meter connector C-29 and ground in good condition?

**YES :** There is no action to be taken.

**NO :** Repair it. The speedometer should work normally.



**STEP 9. Check the combination meter vehicle speed sensor input signal circuit at the combination meter connector C-30.**

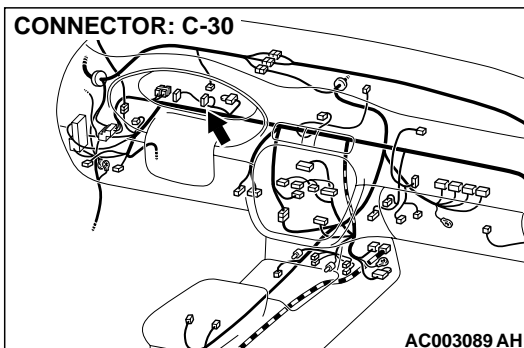
- (1) Disconnect the vehicle speed sensor connector B-35.
- (2) Disconnect the combination meter connector C-30.
- (3) Turn the ignition switch to "ON" position.

- (4) Measure the voltage between terminal 16 and ground.

**Q: Is the voltage approximately 5 volts?**

**YES :** Repair or repair the combination meter (printed-circuit board or speedometer and tachometer). The speedometer should work normally.

**NO :** Go to Step 10.

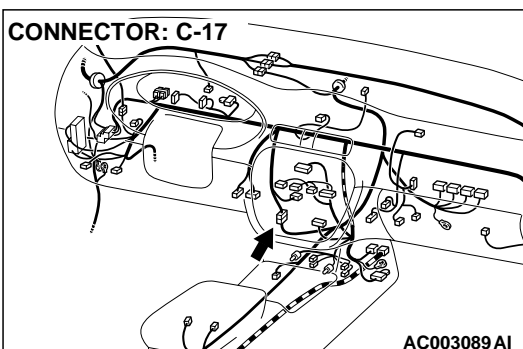
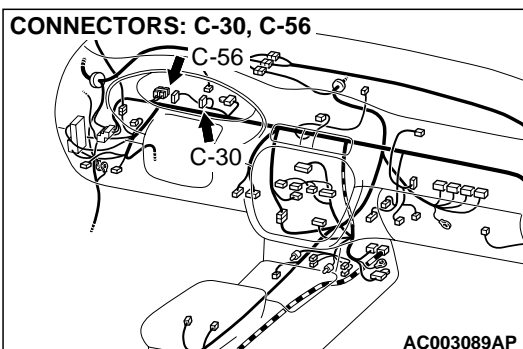
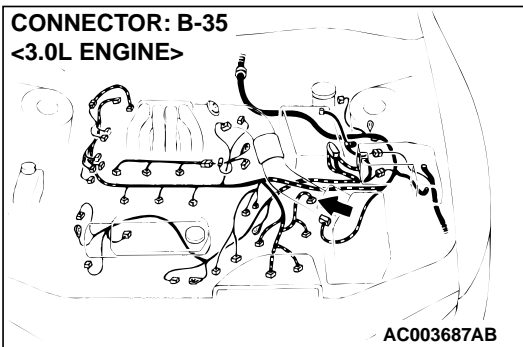
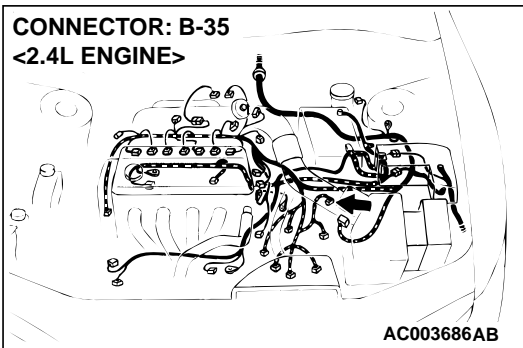


**STEP 10. Check the combination meter connector C-30 for damage.**

**Q: Is combination meter connector C-30 in good condition?**

**YES :** Go to Step 11.

**NO :** repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). The speedometer should work normally.



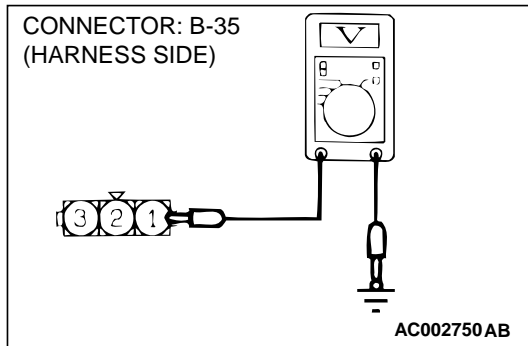
**STEP 11. Check the harness wires between combination meter connector C-30 and vehicle speed sensor connector B-35.**

*NOTE: After checking intermediate connector C-17, and joint connector C-56, check the wires. If intermediate connector C-17 and joint connector C-56 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.*

**Q: Are the harness wires between combination meter connector C-30 and vehicle speed sensor connector B-35 in good condition?**

**YES :** There is no action to be taken.

**NO :** repair them. The speedometer should work normally.



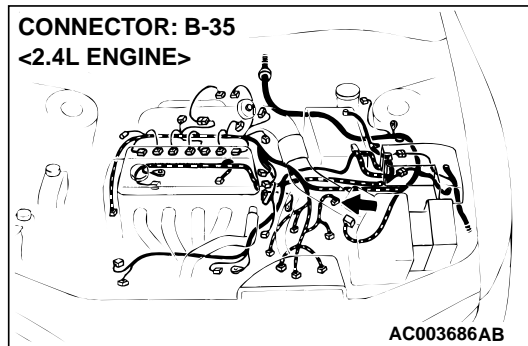
**STEP 12. Check the vehicle speed sensor power supply circuit at the vehicle speed meter connector B-35.**

- (1) Disconnect the vehicle speed sensor connector B-35.
- (2) Turn the ignition switch to "ON" position.
- (3) Measure the voltage between terminal 1 and ground.

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

**YES :** Go to Step 15.

**NO :** Go to Step 13.

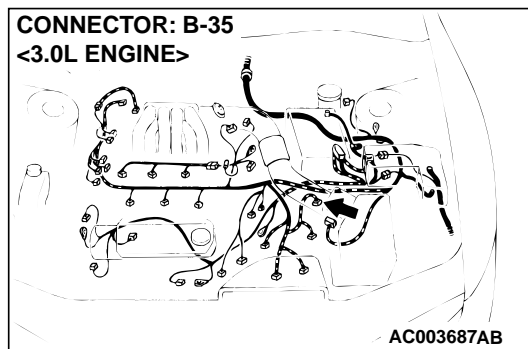


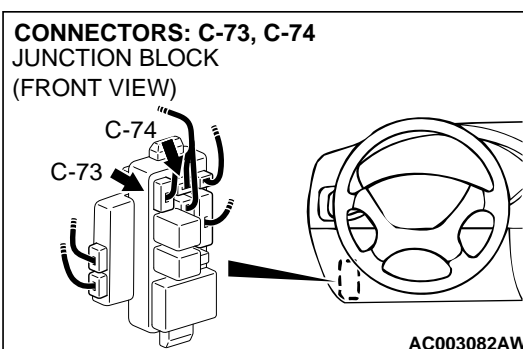
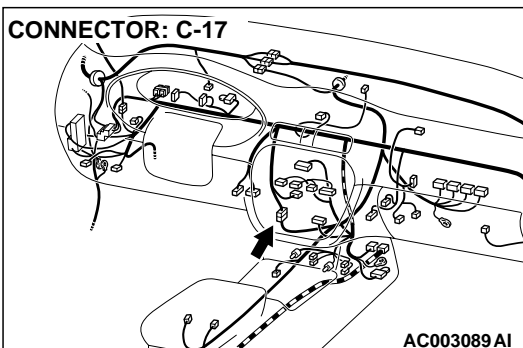
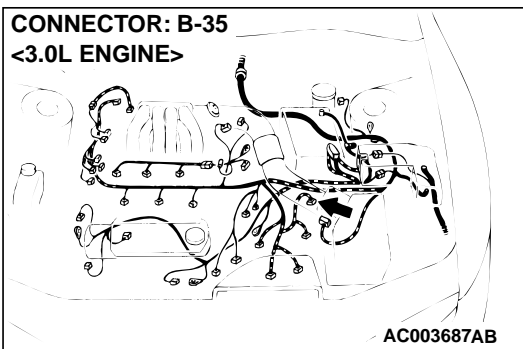
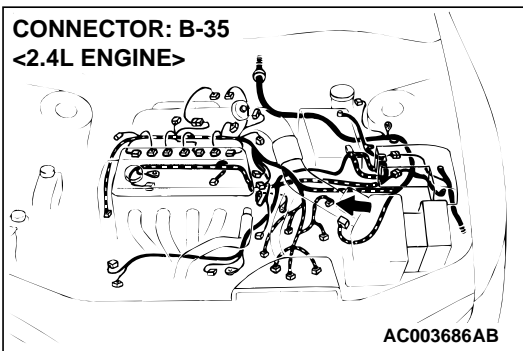
**STEP 13. Check the vehicle speed sensor connector B-35 damage.**

**Q: Is vehicle speed sensor connector B-35 in good condition?**

**YES :** Go to Step 14.

**NO :** Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). The speedometer should work normally.





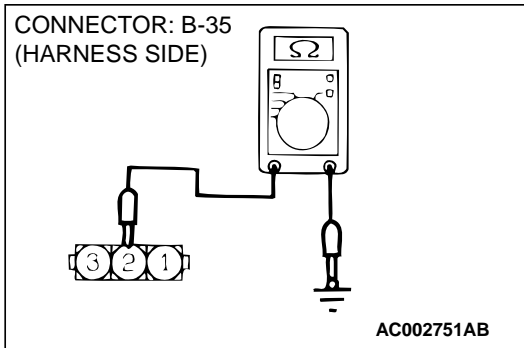
**STEP 14. Check the harness wires between vehicle speed sensor connector B-35 and ignition switch (IG1).**

**NOTE:** After checking junction block connectors C-73 and C-74, intermediate connector C-17, check the wires. If junction block connectors C-73 and C-74, intermediate connector C-17 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#).

**Q: Are the harness wires between vehicle speed sensor connector B-35 and ignition switch (IG1) in good condition?**

**YES :** There is no action to be taken.

**NO :** Repair them. The speedometer should work normally.



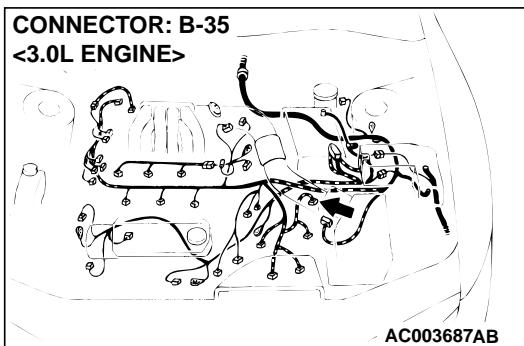
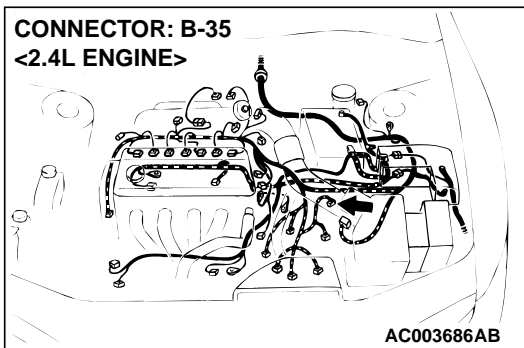
**STEP 15. Check the vehicle speed sensor ground circuit at the vehicle speed sensor connector B-35.**

- (1) Disconnect the vehicle speed sensor connector B-35.
- (2) Measure the resistance between terminal 2 and ground.

**Q: Is the resistance less than 2 ohms?**

**YES :** Go to Step 18.

**NO :** Go to Step 16.

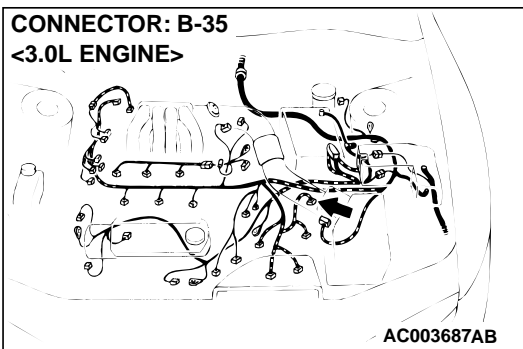
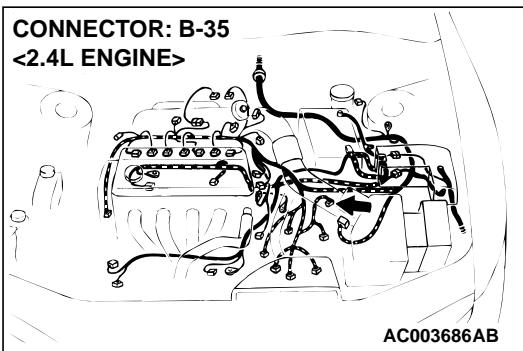


**STEP 16. Check the vehicle speed sensor connector B-35 for damage.**

**Q: Is vehicle speed connector B-35 in good condition?**

**YES :** Go to Step 17.

**NO :** Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). The speedometer should work normally.

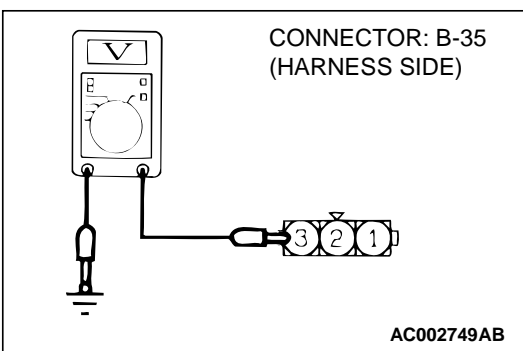


**STEP 17. Check the harness wire between vehicle speed sensor connector B-35 and ground.**

**Q: Is the harness wire between vehicle speed sensor connector B-35 and ground in good condition?**

**YES :** There is no action to be taken.

**NO :** Repair it. The speedometer should work normally.



**STEP 18. Check the vehicle speed sensor signal circuit at the vehicle speed sensor connector B-35.**

(1) Disconnect the vehicle speed sensor connector B-35.

(2) Turn the ignition switch to "ON"

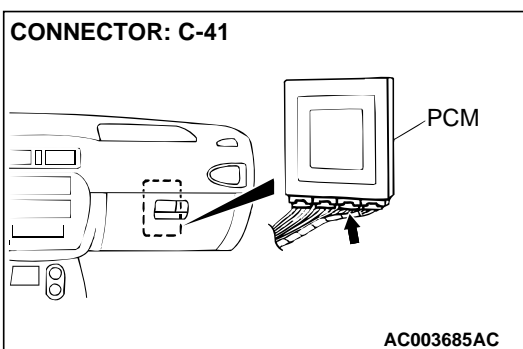
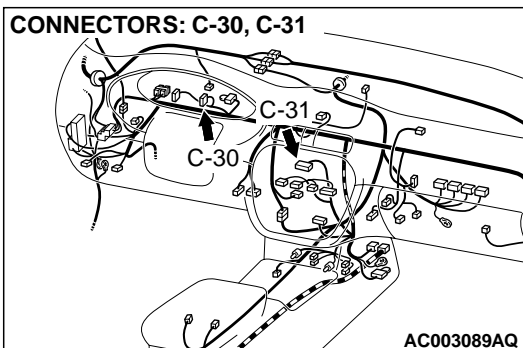
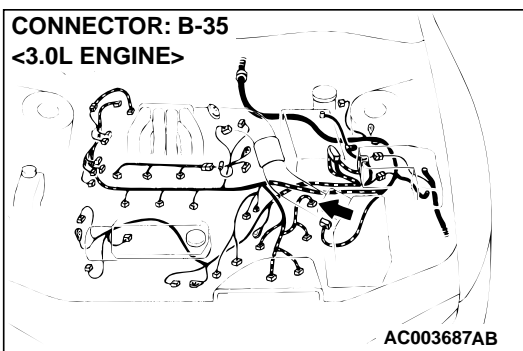
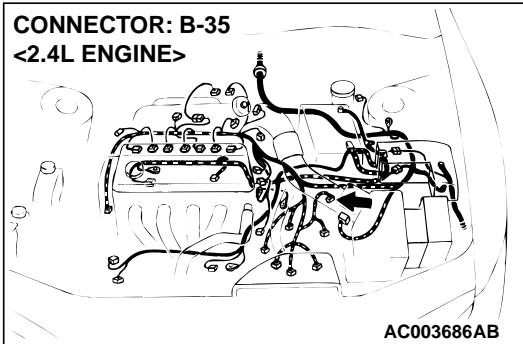
(3) Measure the voltage between terminal 3 and ground.

**Q: Is the voltage approximately 9 volts or more?**

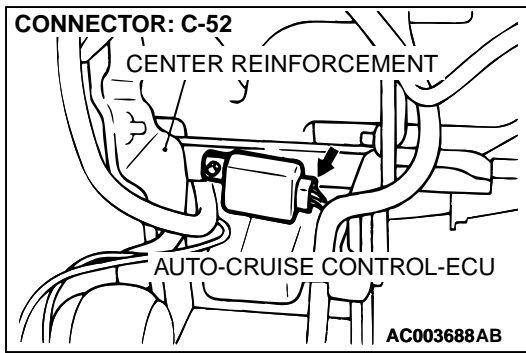
**More than approximately 9 volts :** Replace the vehicle speed sensor. The speedometer should work normally.

**Approximately 9 volts :** Go to Step 19 .

**STEP 19.** Check the vehicle speed sensor connector B-35, radio and tape player connector C-31, auto-cruise control-ECU connector C-52 <vehicles with auto-cruise control>, PCM connector C-41 and combination meter connector C-30.





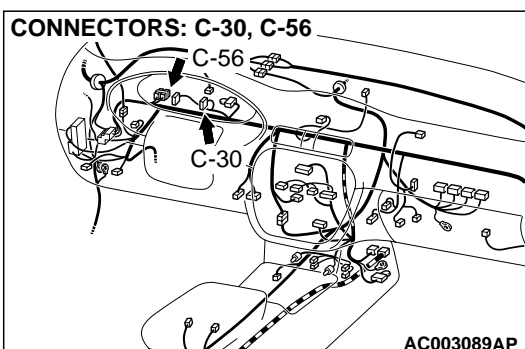
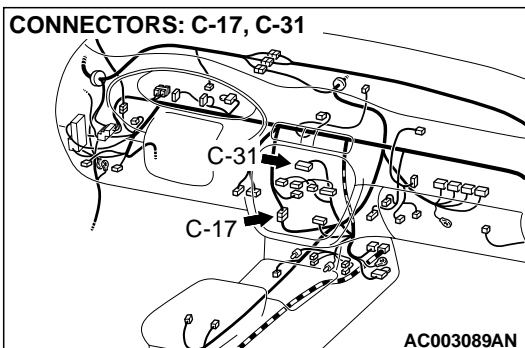
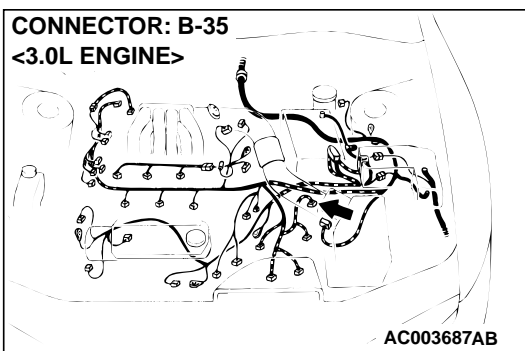
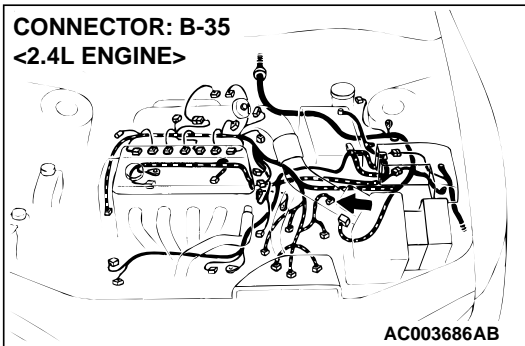


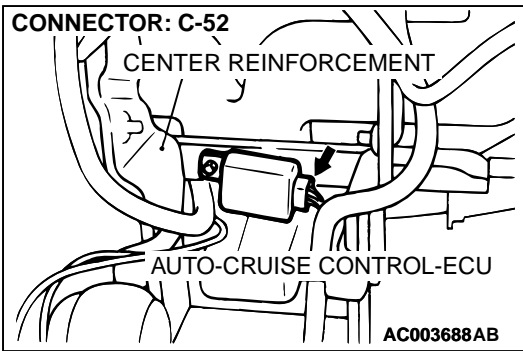
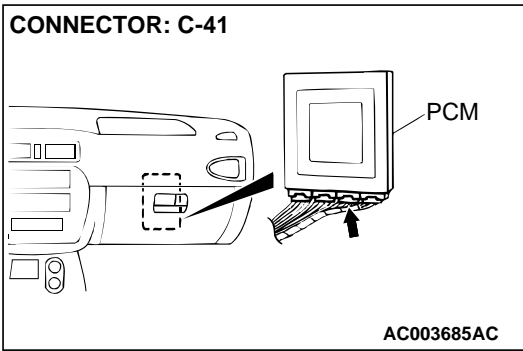
**Q:** Are vehicle speed sensor connector B-35, radio and tape player connector C-31, auto-cruise control-ECU connector C-52 <vehicles with auto-cruise control>, PCM connector C-41 and combination meter connector C-30 in good condition?

**YES :** Go to Step 20.

**NO :** Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). The speedometer should work normally.

**STEP 20.** Check the harness wires from vehicle speed sensor connector B-35 to radio and tape player connector C-31, auto-cruise control-ECU connector C-52 <vehicles with auto-cruise control>, PCM connector C-41 and combination meter connector C-30.



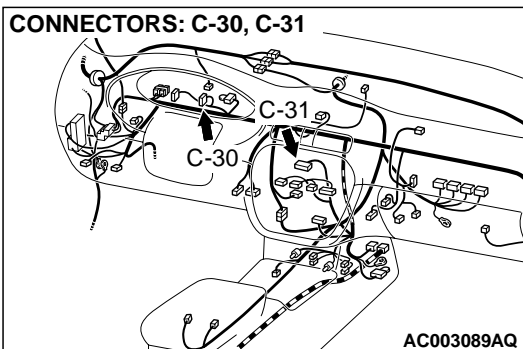


*NOTE: After checking joint connector C-56 and intermediate connector C-17, check the wires. If joint connector C-56 and intermediate connector C-17 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.*

**Q: Are the harness wires from vehicle speed sensor connector B-35 to radio and tape player connector C-31, auto-cruise control-ECU connector C-52 <vehicles with auto-cruise control>, PCM connector C-41 and combination meter connector C-30 in good condition?**

**YES :** Go to Step 21.

**NO :** Repair them. The speedometer should work normally.



**STEP 21. Check each equipment.**

Disconnect auto-cruise control-ECU connector C-31, auto-cruise control-ECU connector C-52 <vehicles with auto-cruise control> and combination meter connector C-30 in that order one by one. Then check that MFI system DTC P0500 does not reset under any conditions.

**⚠ CAUTION**

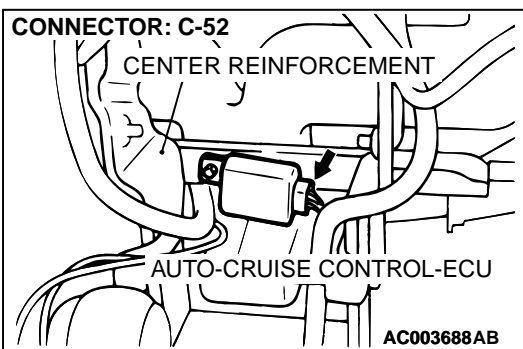
**To prevent damage to scan tool MB991502, always turn the ignition switch to "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.**

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

**Q: Does MFI system DTC P0500 reset when one of auto-cruise control-ECU or combination meter, PCM is disconnected?**

**YES :** Go to Step 22.

**NO :** Replace the auto-cruise control-ECU, combination meter or PCM where applicable. The speedometer should work normally.



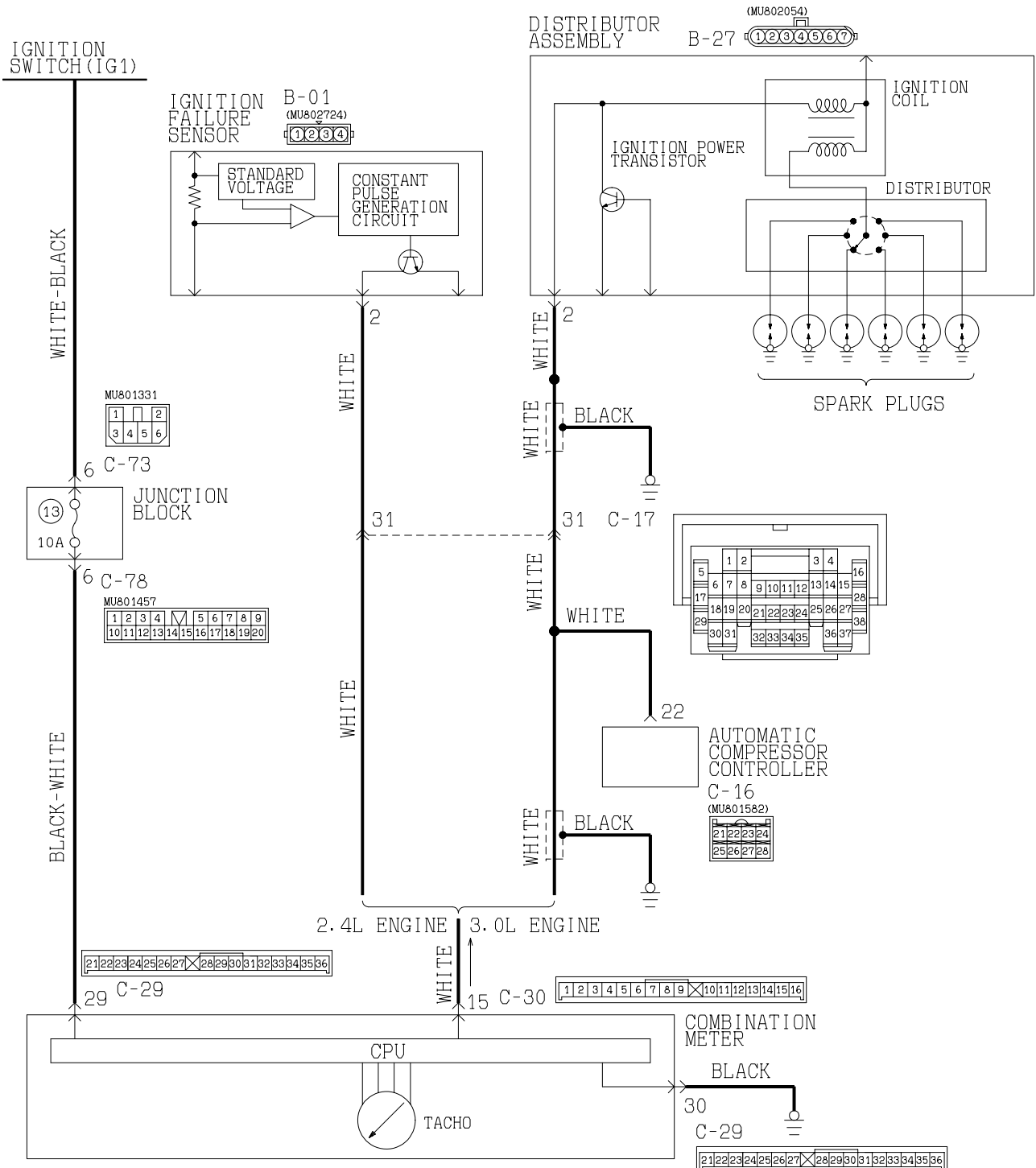
**STEP 22. Recheck for malfunction.****Q: Is a malfunction eliminated?**

**YES :** This diagnosis is complete.(If no malfunctions are not 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.00-8.](#))

**NO :** Replace the speedometer

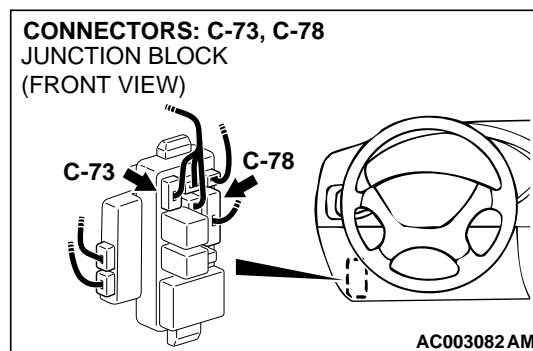
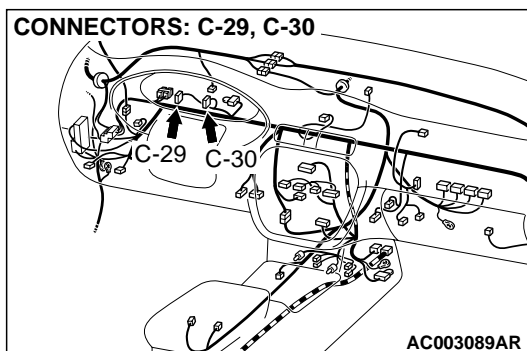
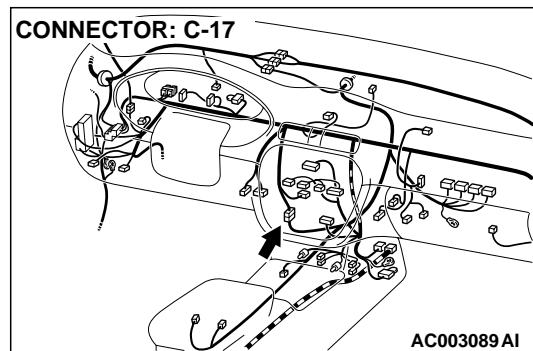
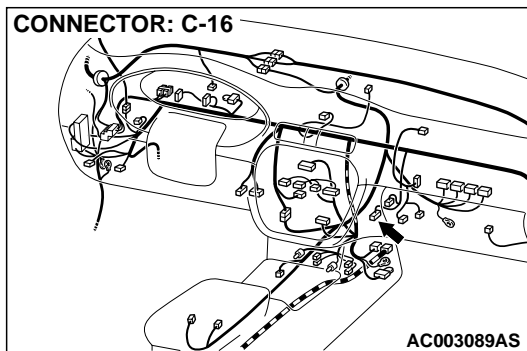
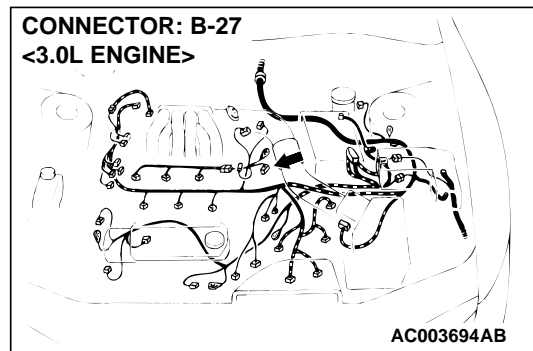
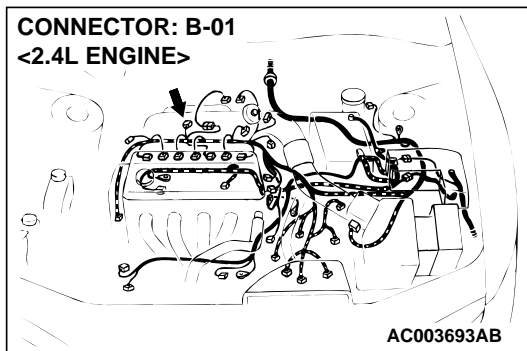
Inspection Procedure 2: Tachometer does not work.

Tachometer Circuit



AC003971AB

TSB Revision



### CIRCUIT OPERATION

- The tachometer power is supplied from the ignition switch (IG) circuit.
- For vehicles with 2.4L engine, the tachometer detects the ignition signal by the engine control module via the ignition failure sensor.
- For vehicles with 3.0L engine, the tachometer detects the ignition signal control via the distributor assembly.

### TECHNICAL DESCRIPTION (COMMENT)

The ignition signal may not be sent from the engine, or there may be a malfunction in the power supply or ground circuit.

### TROUBLESHOOTING HINTS

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

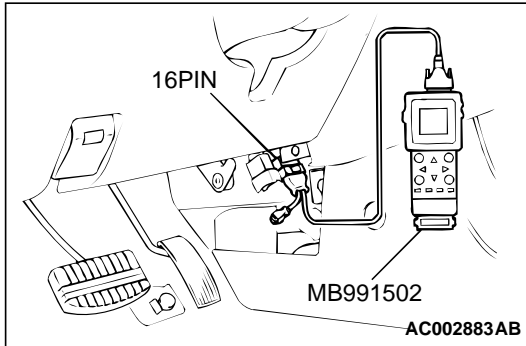
### DIAGNOSIS

#### Required Special Tools:

- MB991223: Harness Set
- MB991502: Scan Tool (MUT-II)

**⚠ CAUTION**

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



**STEP 1. Check the vehicle speed sensor**

- (1) Connect scan tool MB991502 to the data link connector.
- (2) Turn the ignition switch to "ON" position.
- (3) Read the MFI system diagnostic trouble code.

**Q: Is MFI system DTC P0300 output?**

**YES** : Refer to GROUP 13A, Diagnosis [P.13A-5](#) and GROUP 13B, Diagnosis [P.13B-4](#).

**NO** : Go to Step 2.

**STEP 2. Check the speedometer operation.**

**Q: Does the speedometer work normally?**

**YES** : Refer to Inspection Procedure [1P.54A-29](#).

**NO** : Go to Step 3.

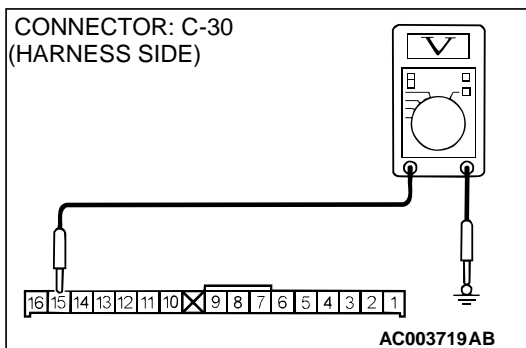
**STEP 3. Check the combination meter (tachometer) ground circuit at the combination meter connector C-30.**

- (1) Disconnect the combination meter connector C-30.
- (2) Measure the resistance between terminal 15 and ground.

**Q: Is the resistance less than 2 ohms?**

**YES** : Go to Step 5.

**NO** : Go to Step 4.



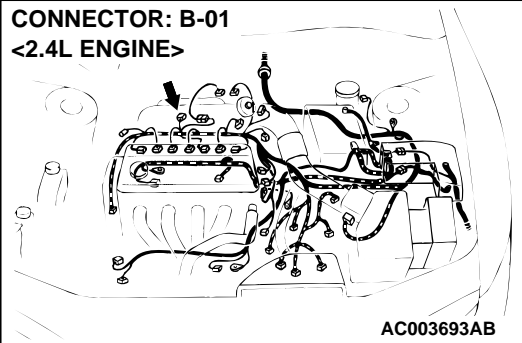
**STEP 4.** Check the ignition failure sensor connector B-01 <2.4L engine>, distributor assembly connector B-27 <3.0L engine>, automatic compressor controller connector C-16 <3.0L engine> and combination meter connector C-30 for damage.

**Q:** Is the ignition failure sensor connector B-01 <2.4L engine>, distributor assembly connector B-27 <3.0L engine>, automatic compressor controller connector C-16 <3.0L engine> and combination meter connector C-30 for damage in good condition?

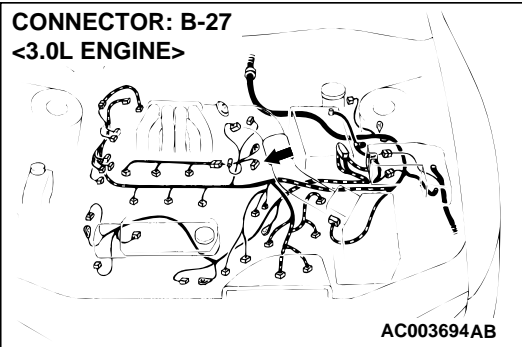
**YES :** Go to Step 5.

**NO :** Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). The tachometer should work normally.

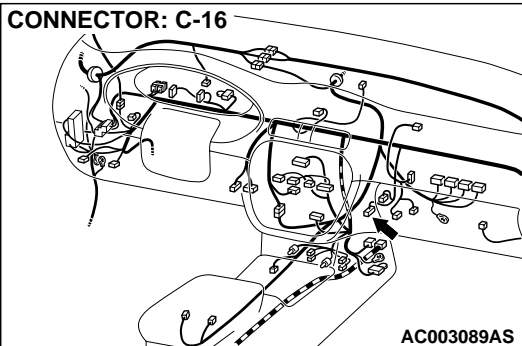
**CONNECTOR: B-01**  
**<2.4L ENGINE>**



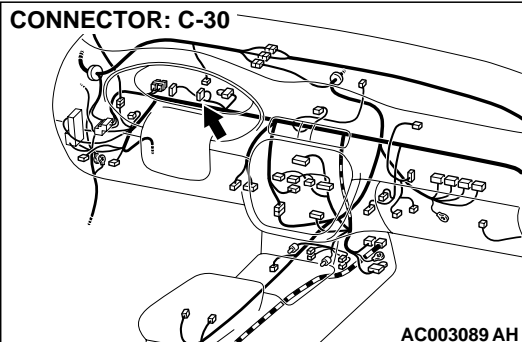
**CONNECTOR: B-27**  
**<3.0L ENGINE>**



**CONNECTOR: C-16**

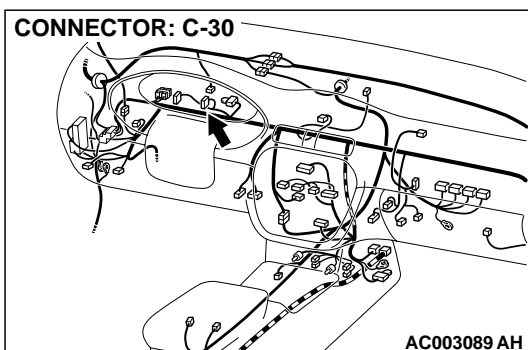
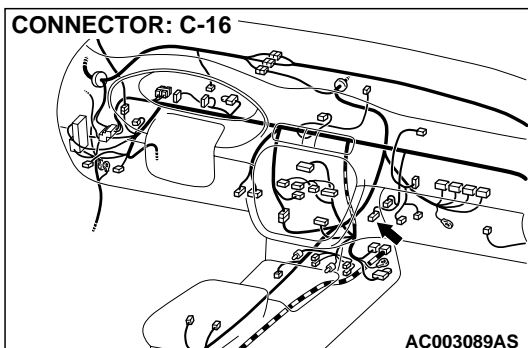
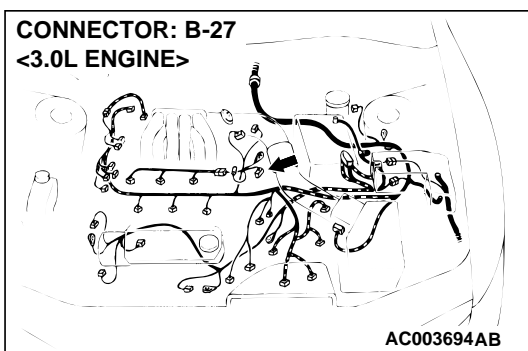
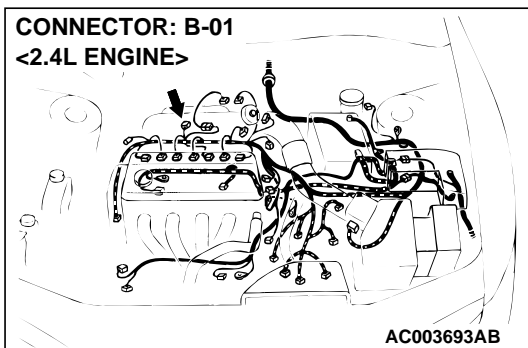


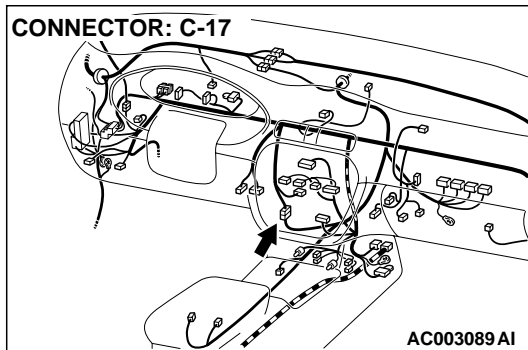
**CONNECTOR: C-30**





**STEP 5.** Check the harness wires from combination meter connector C-30 to ignition failure sensor connector B-01 <2.4L engine>, distributor assembly connector B-27 <3.0L engine>, automatic compressor controller connector C-16 <3.0L engine>.





*NOTE: After checking intermediate connector C-17, check the wires. If intermediate connector C-17 is damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.*

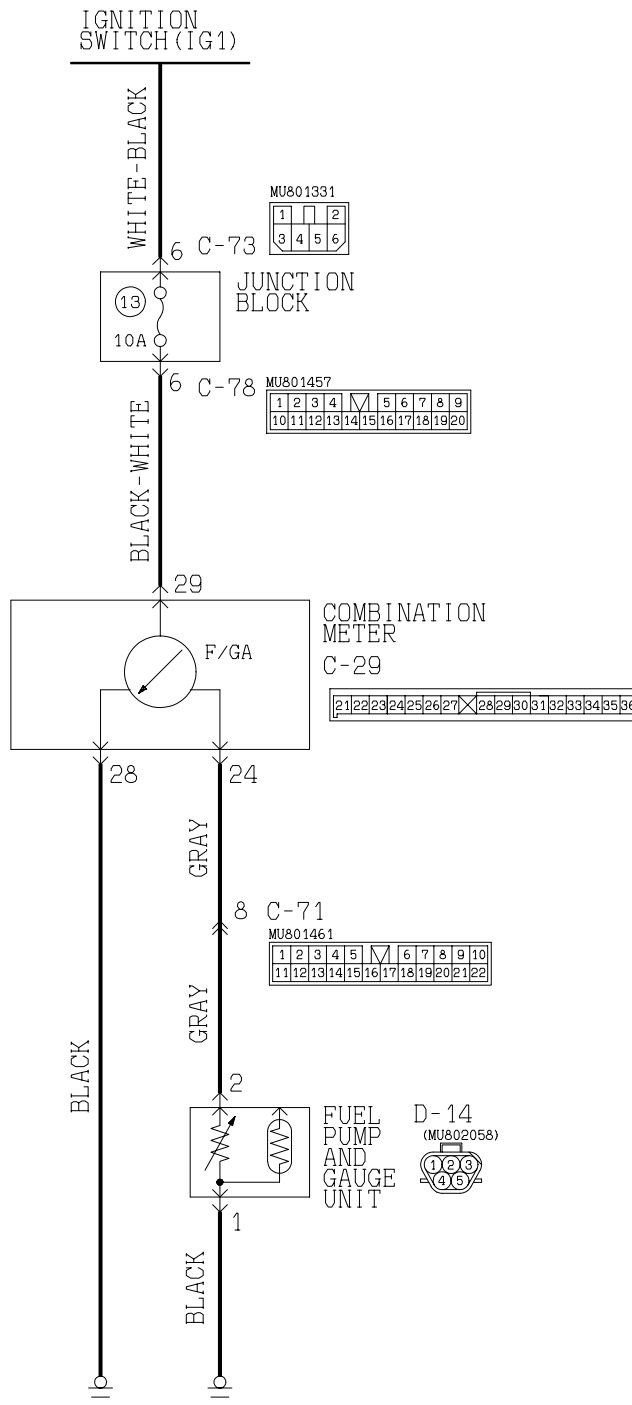
**Q: Is the harness wires from combination meter connector C-30 to ignition failure sensor connector B-01 <2.4L engine>, distributor assembly connector B-27 <3.0L engine>, automatic compressor controller connector C-16 <3.0L engine> in good condition?**

**YES :** There is no action to be taken.

**NO :** Repair it. The tachometer should work normally.

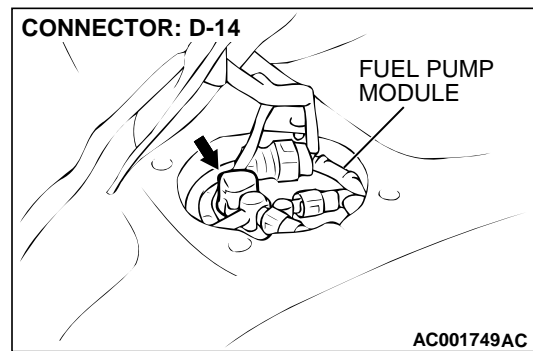
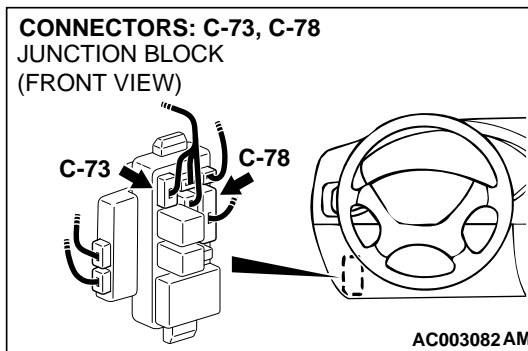
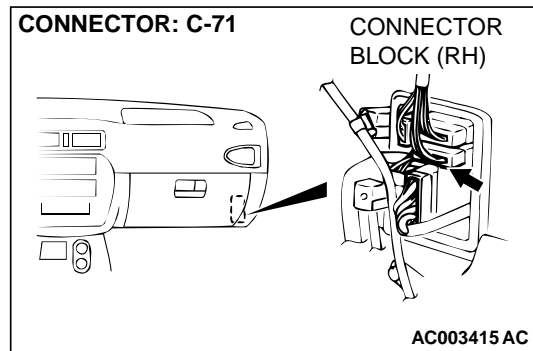
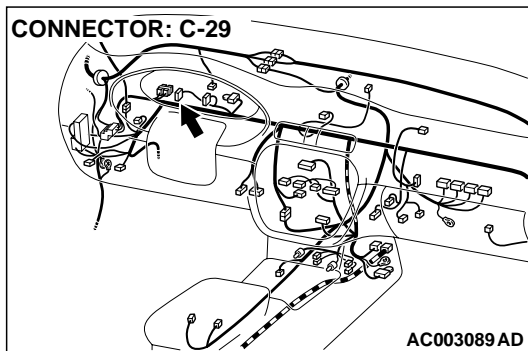
Inspection Procedure 3: Fuel gauge does not work.

Fuel Gauge Circuit



AC003972 AB

TSB Revision



### CIRCUIT OPERATION

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

### TECHNICAL DESCRIPTION (COMMENT)

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

### TROUBLESHOOTING

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

### DIAGNOSIS

**Required Special Tool:**  
MB991223: Harness Set

#### STEP 1. Check the speedometer operation.

**Q: Does the speedometer work normally?**

**YES :** Go to Step 2.

**NO :** Refer to Inspection Procedure 1P.54A-29.

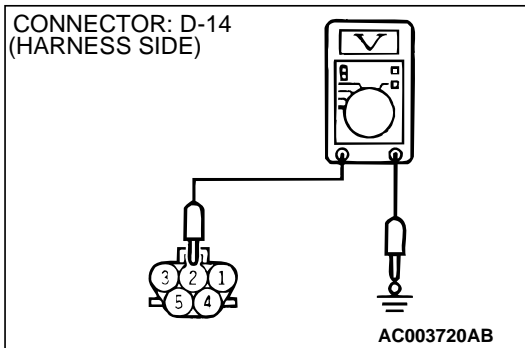
**STEP 2. Check the fuel pump module signal circuit at the fuel pump module connector D-14 by backprobing.**

- (1) Do not disconnect the fuel pump module connector D-14.
- (2) Turn the ignition switch to "ON" position.
- (3) Measure the voltage between terminal 2 and ground by backprobing.

**Q: Is the voltage approximately 5 volts or more?**

**YES :** Go to Step 5.

**NO :** Go to Step 3.

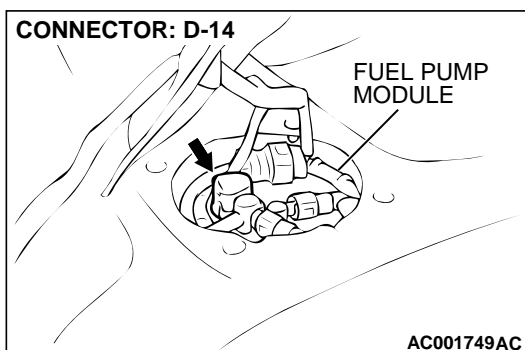
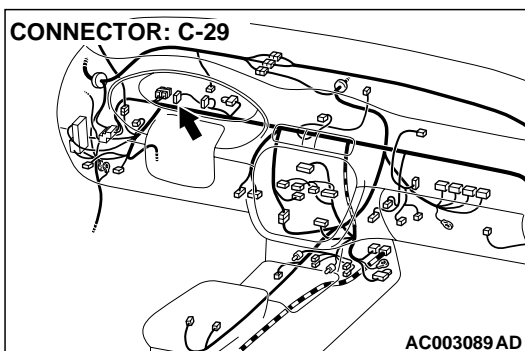


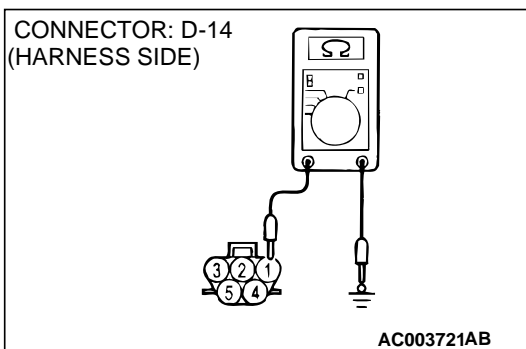
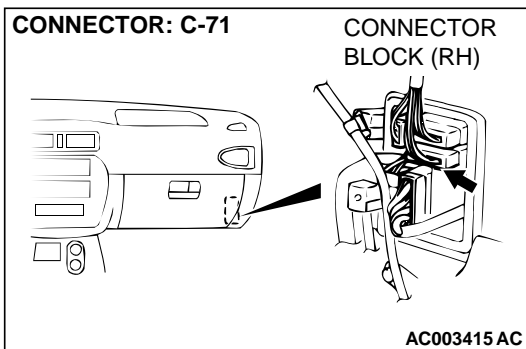
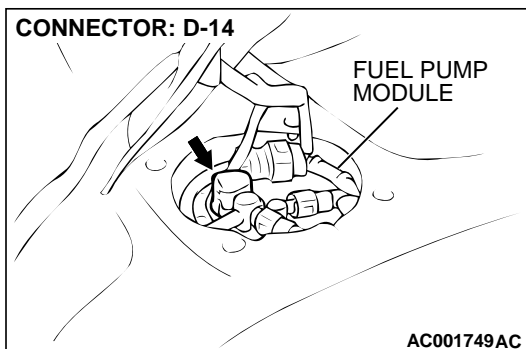
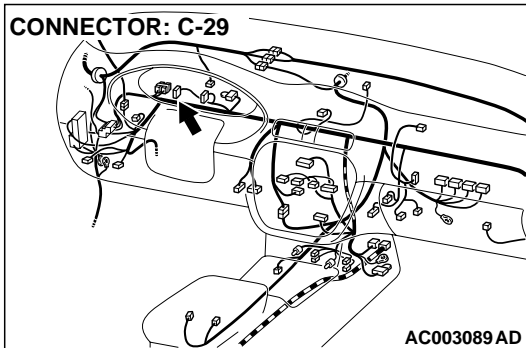
**STEP 3. Check the fuel pump module connector D-14 and combination meter connector C-29 for damage.**

**Q: Are fuel pump module connector D-14 and combination meter connector C-29 in good condition?**

**YES :** Go to Step 4.

**NO :** Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). The fuel gauge should work normally.





**STEP 4. Check the harness wires between fuel pump module connector D-14 and combination meter connector C-29.**

*NOTE: After checking intermediate connector C-71, check the wire. If intermediate connector C-71 is damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.*

**Q: Are the harness wires between fuel pump module connector D-14 and combination meter connector C-29 in good condition?**

**YES :** Repair or replace the combination meter (printed-circuit board or fuel gauge assembly). The fuel gauge should work normally.

**NO :** Repair them. The fuel gauge should work normally.

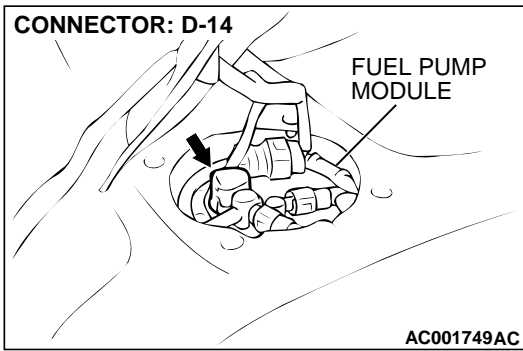
**STEP 5. Check the fuel pump module ground circuit at the fuel pump module connector D-14 by backprobing.**

- (1) Do not disconnect the fuel gauge unit connector D-14.
- (2) Measure the resistance between terminal 1 and ground by backprobing.

**Q: Is the resistance less than 2 ohms?**

**YES :** Go to Step 8.

**NO :** Go to Step 6.

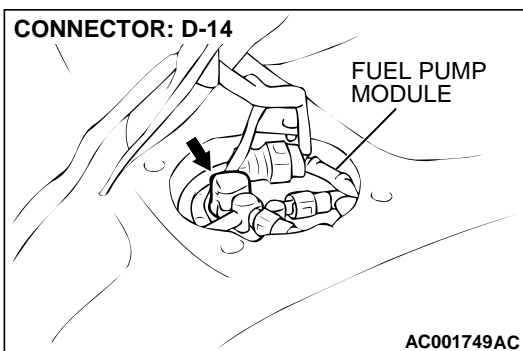


**STEP 6. Check the fuel pump module connector D-14 for damage.**

**Q: Is fuel gauge unit connector D-14 in good condition?**

**YES :** Go to Step 7.

**NO :** Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). The fuel gauge should work normally.

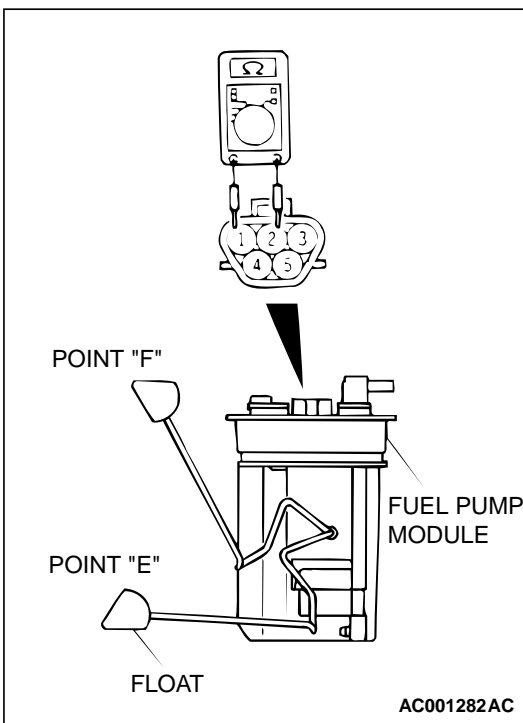


**STEP 7. Check the harness wire between fuel pump module connector D-14 and ground.**

**Q: Is the harness wire between fuel pump module connector D-14 and ground in good condition?**

**YES :** There is no action to be taken.

**NO :** Repair them. The fuel gauge should work normally.



**STEP 8. Check the fuel gauge unit.**

- (1) Remove the fuel pump module from the fuel tank. (Refer to GROUP 13C, Fuel Tank [P.13C-6](#).)
- (2) Check resistance value between terminals 2 and 1 is at standard value when the fuel gauge unit float is at point "F" (highest) and point "E" (lowest).
- (3) Check that the resistance value changes smoothly when the float moves slowly between point "F" (highest) and "E" (lowest).

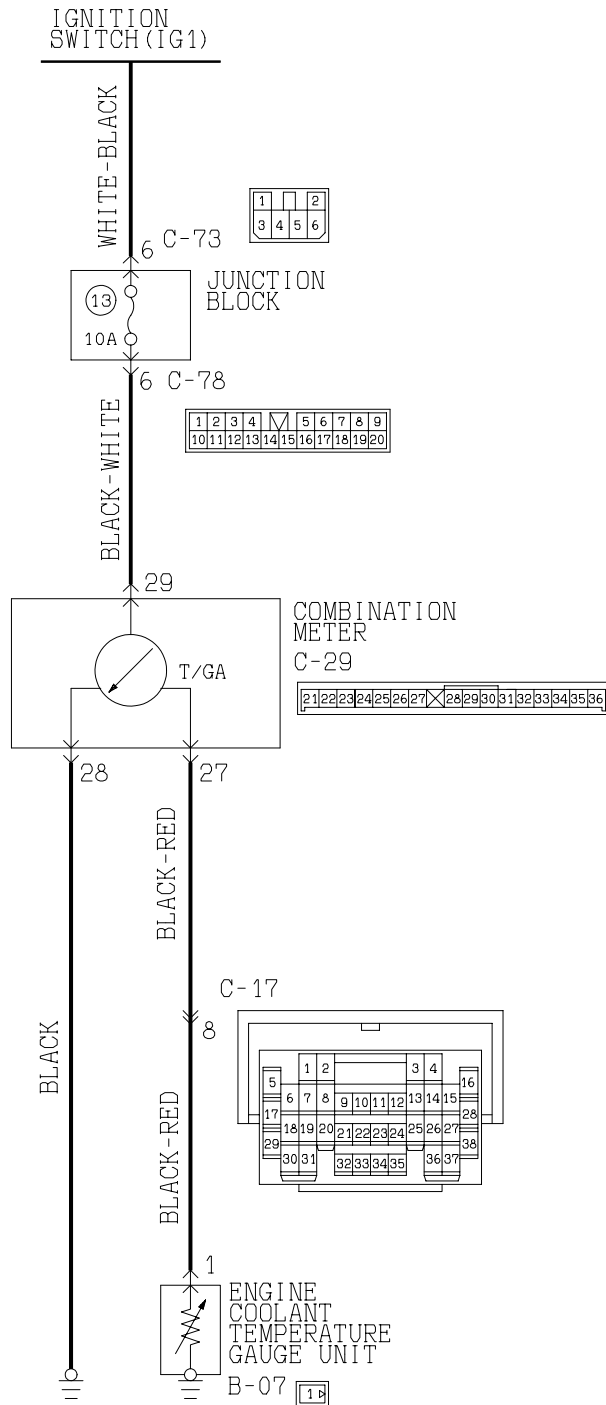
**Q: Is the resistance 3 – 5 ohms (at point "F") and 110 – 112 ohms (at point "E")?**

**YES :** Repair or replace the combination meter (printed-circuit board or fuel gauge assembly). The fuel gauge should work normally.

**NO :** Replace the fuel gauge unit. The fuel gauge should work normally.

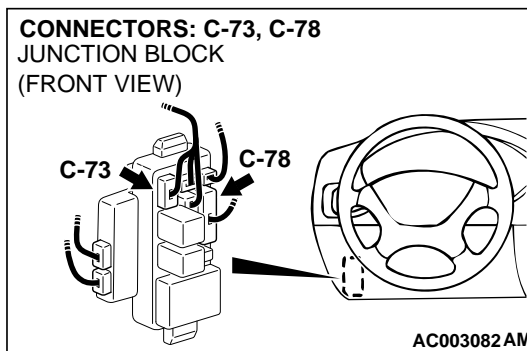
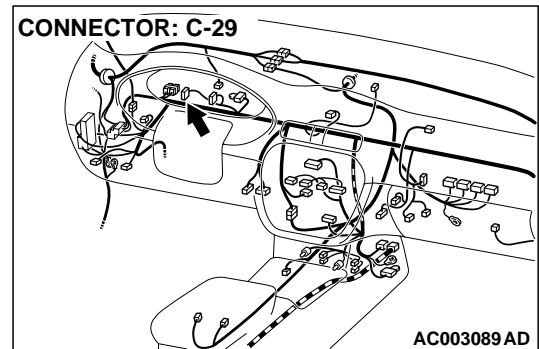
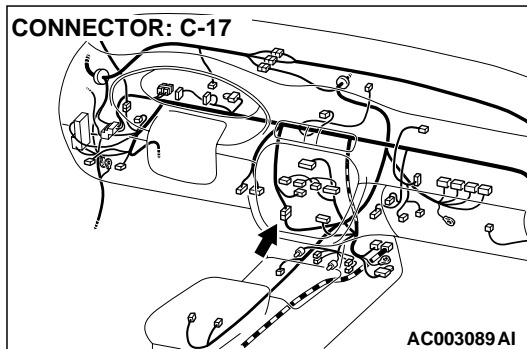
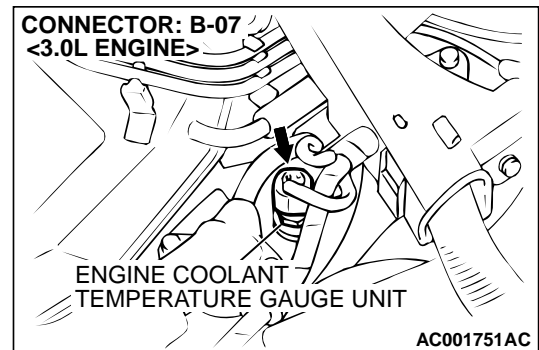
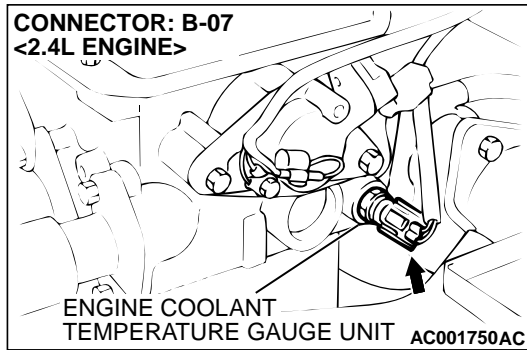
Inspection Procedure 4: Engine coolant temperature gauge does not work.

Engine Coolant Temperature Gauge Circuit



AC003968 AB





### CIRCUIT OPERATION

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

- The engine coolant temperature gauge moves the needle according to the circuit current.

### TECHNICAL DESCRIPTION (COMMENT)

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

### TROUBLESHOOTING

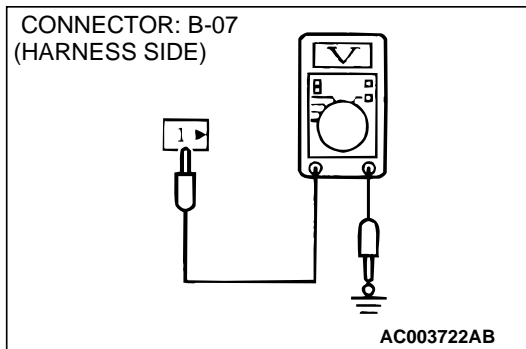
- Malfunction of the engine coolant temperature gauge unit
- Malfunction of the combination meter (printed-circuit board or engine coolant temperature gauge assembly)
- Damaged harness wires or connectors

### DIAGNOSIS

**Required Special Tool:**  
MB991223: Harness Set

**STEP 1. Check the speedometer operation.****Q: Does the speedometer work normally?****YES :** Go to Step 2.**NO :** Refer to Inspection Procedure 1P.54A-29.**STEP 2. Check the engine coolant temperature sensor signal circuit at the engine coolant temperature sensor connector B-07 by backprobing.**

- (1) Do not disconnect the engine coolant temperature sensor connector B-07.
- (2) Turn the ignition switch to "ON" position.
- (3) Measure the voltage between terminal 1 and ground by backprobing.

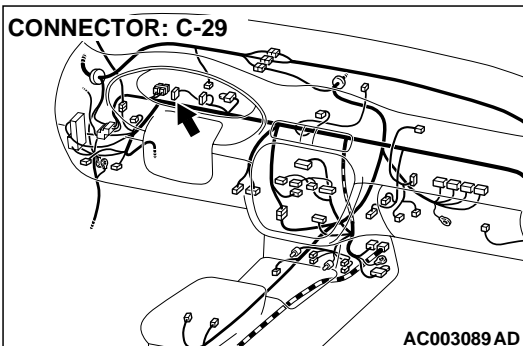
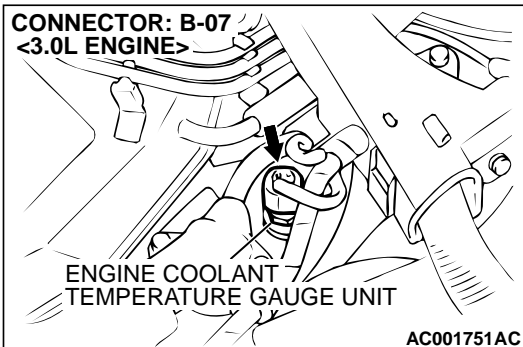
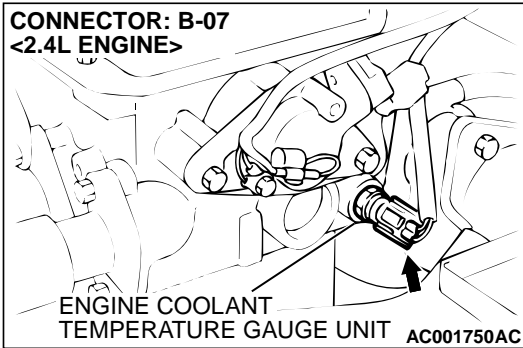
**Q: Is the voltage approximately 9 volts or more?****YES :** Go to Step 5.**NO :** Go to Step 3.

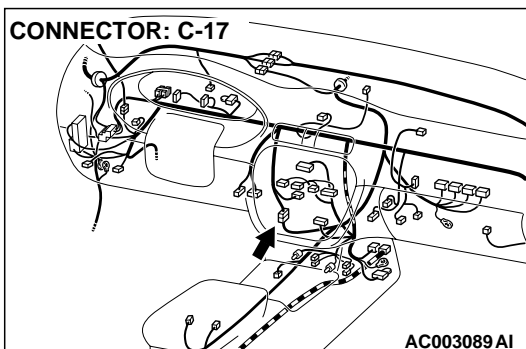
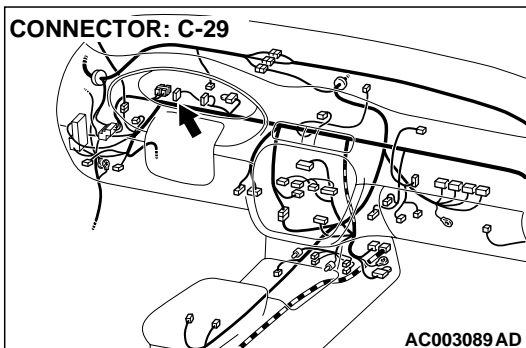
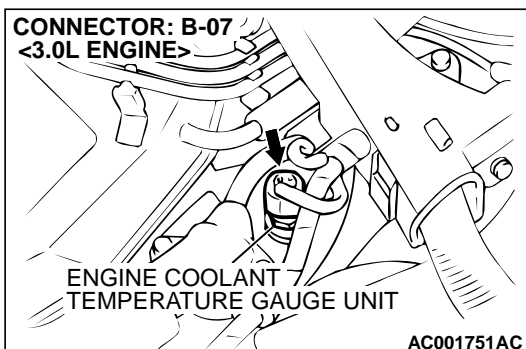
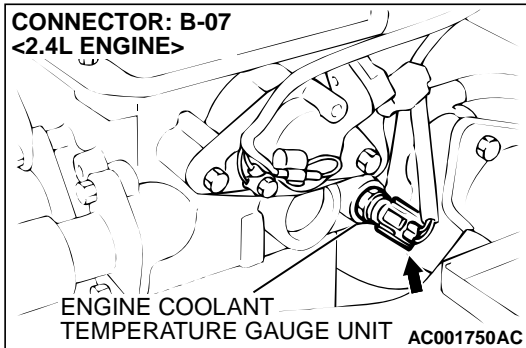
**STEP 3.** Check the engine coolant temperature sensor connector B-07 and combination meter connector C-29 for damage.

**Q:** Are engine coolant temperature sensor connector B-07 and combination meter connector C-29 in good condition?

**YES :** Go to Step 4.

**NO :** Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). The engine coolant temperature gauge should work normally.





**STEP 4.** Check the harness wires between engine coolant temperature sensor connector B-07 and combination meter connector C-29.

*NOTE:* After checking intermediate connector C-17, check the wire. If intermediate connector C-17 is damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#).

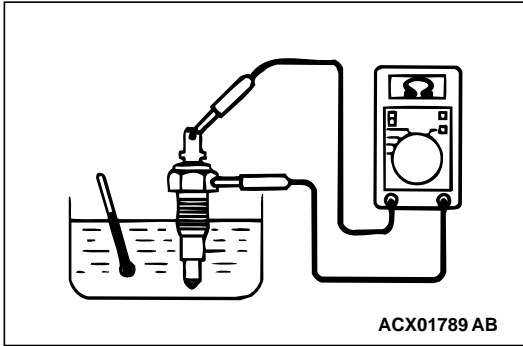
**Q:** Are the harness wires between engine coolant temperature sensor connector B-07 and combination meter connector C-29 in good condition?

**YES :** Repair or replace the combination meter (printed-circuit board or engine coolant temperature gauge assembly). The engine coolant temperature gauge should work normally.

**NO :** Repair them. The engine coolant temperature gauge should work normally.

**STEP 5. Check the engine coolant temperature gauge unit.**

- (1) Drain the engine coolant. (Refer to GROUP 00, Maintenance Service – Engine Coolant P.00-50.)
- (2) Remove the engine coolant temperature gauge unit.
- (3) Immerse the unit in 78°C (150° F) water to measure the resistance.

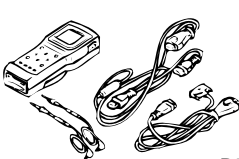

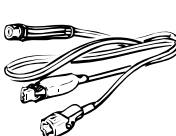
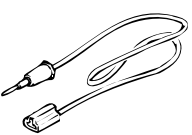



**Q: Is the resistance 104 ±13.5 ohms?**

- YES :** Repair or replace the combination meter (printed-circuit board or engine coolant temperature gauge assembly). The engine coolant temperature gauge should work normally.
- NO :** Replace the engine coolant temperature gauge unit. The engine coolant temperature gauge should work normally.

**SPECIAL TOOLS**

M1543000600284

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
 <p>B991502</p>	MB991502 Scan tool (MUT-II)	MB991496-OD	Reading MFI system diagnostic trouble code
<p>A</p>  <p>B</p>  <p>C</p>  <p>D</p>  <p>MB991223AC</p>	<p>MB991223</p> <p>A:MB991219</p> <p>B:MB991220</p> <p>C:MB991221</p> <p>D:MB991222</p> <p>Harness set</p> <p>A:Test harness</p> <p>B:LED harness</p> <p>C:LED harness adapter</p> <p>D:Probe</p>	MB991223	<p>Making voltage and resistance measurements during troubleshooting</p> <p>A:Connect pin contact pressure inspection</p> <p>B:Power circuit inspection</p> <p>C:Power circuit inspection</p> <p>D:Commercial tester connection</p>

**ON-VEHICLE SERVICE**

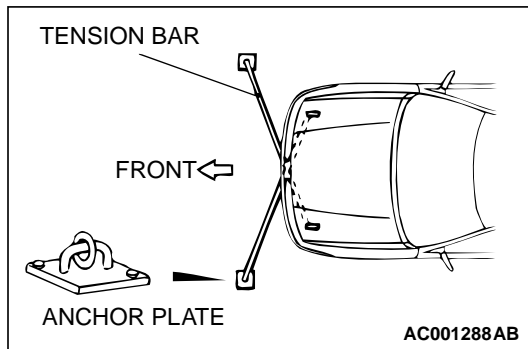
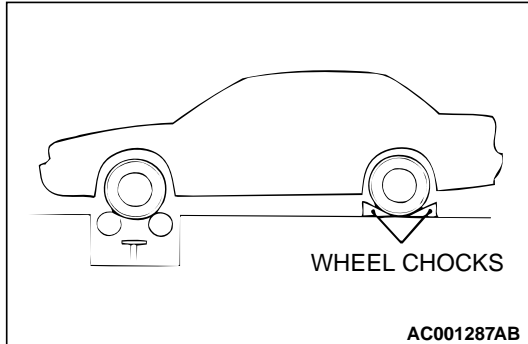
**SPEEDOMETER CHECK**

M1543000900100

**⚠ CAUTION**

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

1. Adjust the pressure of tires to the specified level. (Refer to GROUP 31, On-vehicle Service P.13C-6.)
2. Set the vehicle onto a speedometer tester and use wheel chocks to hold the rear wheels.

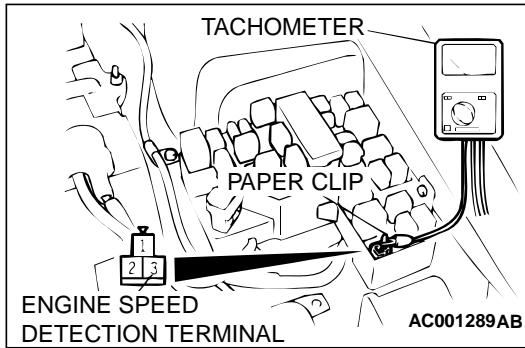


3. To prevent the front wheel from moving from side to side, attach tension bars to the tie-down hook, and secure both ends to anchor plates.
4. To prevent the vehicle from moving, attach a chain or wire to the rear retraction hook, and make sure the end of the chain or wire is secured.
5. Check if the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

**Standard value:**

<b>STANDARD INDICATION mph (km/h)</b>	<b>ALLOWANCE RANGE mph (km/h)</b>
20 (32)	19 – 22 (31 – 35)
40 (64)	38 – 44 (61 – 71)
60 (97)	57 – 66 (92 – 106)
80 (129)	76 – 88 (122 – 142)
100 (161)	94 – 110 (151 – 177)

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



## TACHOMETER CHECK

M1543001000100

1. Attach an external high quality tachometer to the engine speed detection connector on the harness side (such as with a paper clip).
- NOTE: For tachometer check, use an external high quality inductive tachometer.*
2. Compare the readings of the vehicle tachometer and the external tachometer at every engine speed, and check if the variations are within the standard values.

### Standard values:

- 700 r/min:  $\pm 100$  r/min
- 3,000 r/min:  $\pm 150$  r/min
- 5,000 r/min:  $\pm 250$  r/min
- 6,000 r/min:  $\pm 300$  r/min

## FUEL GAUGE UNIT CHECK

M1543001200104

Remove the fuel pump module and then remove the fuel gauge unit. (Refer to GROUP 13C, Fuel Tank P.13C-6.)

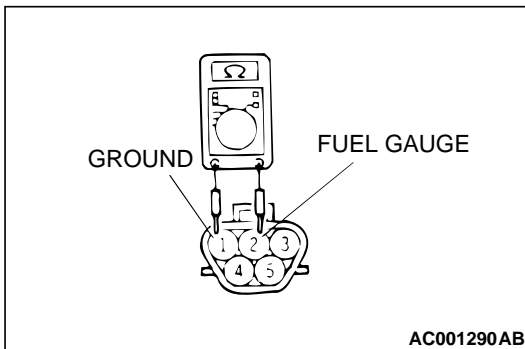
## FUEL GAUGE UNIT RESISTANCE

1. Check that resistance value between the fuel gauge terminal and ground terminal is at the standard value when the fuel gauge unit float is between point "F" (highest) and point "E" (lowest).

### Standard value:

- Point "F": 3 – 5 ohms
- Point "E": 110 – 112 ohms

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



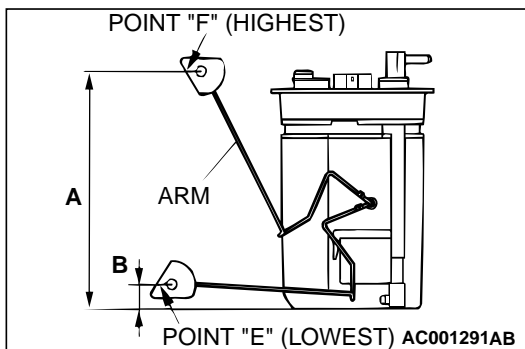
## FUEL GAUGE UNIT FLOAT HEIGHT

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

### Standard value:

- A: 180.3 mm (7.10 inches)
- B: 18.8 mm (0.74 inches)

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

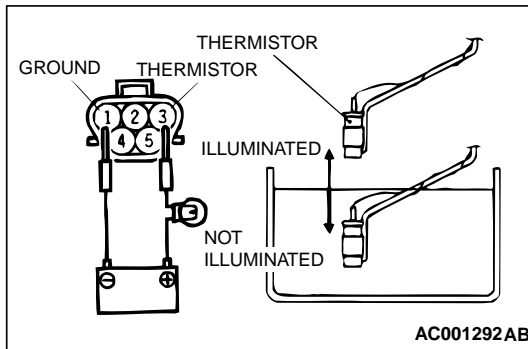


## THERMISTOR

**⚠ CAUTION**

After finishing this test, wipe the unit dry and install it in the fuel tank.

1. Connect the fuel gauge unit (thermistor) to the battery via a test light (12V – 3.4W). Immerse in water.
2. Condition is good if the light goes off when the thermistor is immersed in water and comes on when it is taken out of water.
3. If all check result is not correct, the fuel gauge unit is OK. If either check result is not correct, replace the fuel gauge unit.

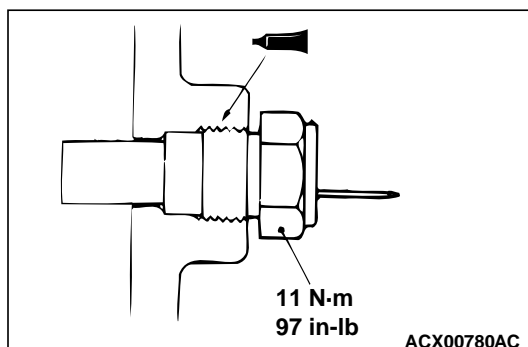
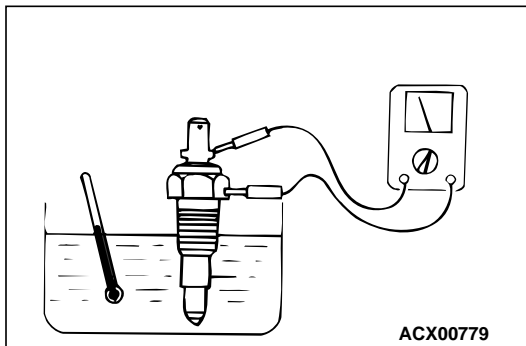
ENGINE COOLANT TEMPERATURE GAUGE UNIT  
CHECK

M1543001500105

1. Drain the engine coolant. (Refer to GROUP 00, Maintenance Service – Engine Coolant P.00-50.)
2. Remove the engine coolant temperature gauge unit.
3. Immerse the unit in 70°C (150°F) water to measure the resistance.

**Standard value: 104 ± 13.5 ohms**

4. If within the standard value, the sensor unit is OK. Reinstall it, then check the engine coolant temperature gauge (Refer to P.54A-66.) If not within the standard value, replace it.

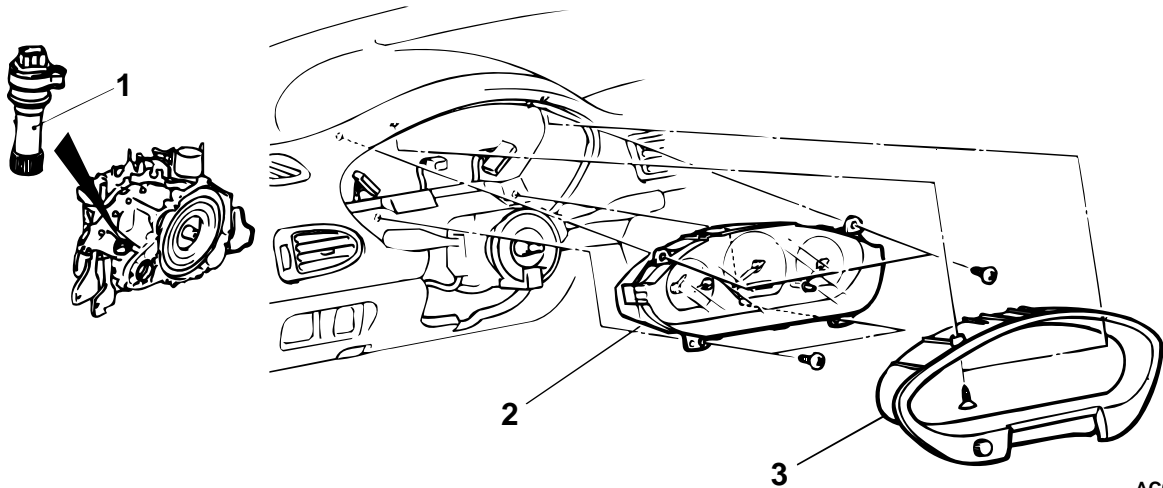


5. After checking, apply the 3M™ AAD part number 8731 Medium strength Blue or equivalent around the threads of the engine coolant temperature gauge unit.
6. Add engine coolant. (Refer to GROUP 00, Maintenance Service P.00E-2.)



## COMBINATION METERS ASSEMBLY AND VEHICLE SPEED SENSOR REMOVAL AND INSTALLATION

M1543002900140



AC002890AB

### VEHICLE SPEED SENSOR REMOVAL STEPS

- AIR CLEANER ASSEMBLY
- 1. VEHICLE SPEED SENSOR

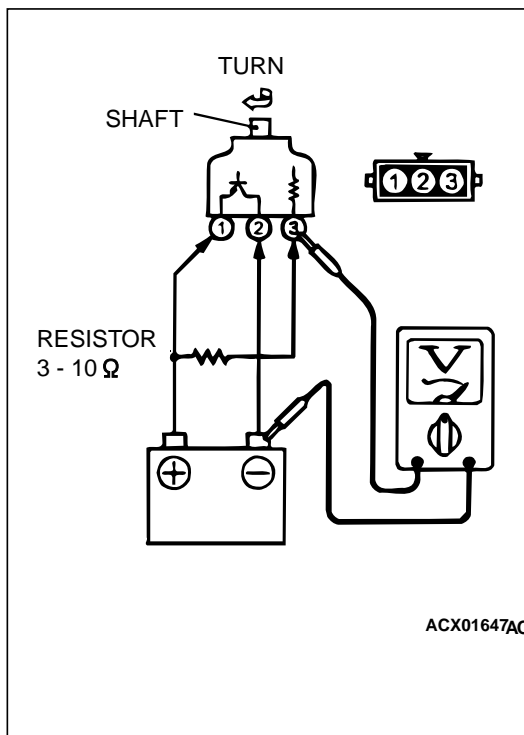
### COMBINATION METER REMOVAL STEPS

2. METER BEZEL
3. COMBINATION METER

## VEHICLES SPEED SENSOR CHECK

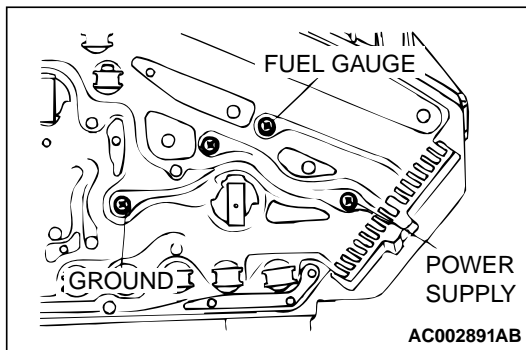
M1543006400103

1. Remove the vehicle speed sensor and connect a 3 – 10 kΩ resistor as shown in the illustration.
2. Turn the shaft of the vehicle speed sensor and check that there is voltage between terminals 2 – 3. (1 turn = 4 pulses)
3. If within the standard value, the vehicle speed sensor is OK. If not within the standard value, replace the vehicle speed sensor.



**FUEL GAUGE RESISTANCE CHECK**

M1543003000106

**⚠ CAUTION**

When inserting a testing probe into the power supply terminal, be careful not to touch the printed board.

1. Remove the power supply tightening screw.
2. Use an ohmmeter to measure the resistance value between the terminals.

**Standard value:**

**Power supply – Ground: Approximately 95 Ω**

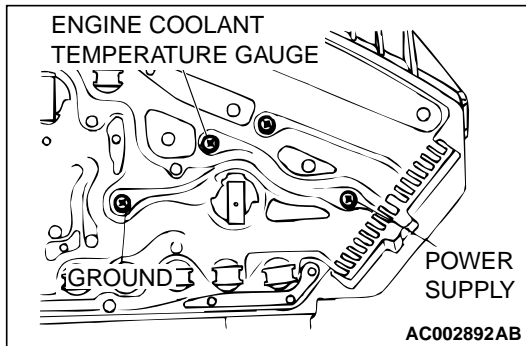
**Power supply – Fuel gauge: Approximately 87 Ω**

**Fuel gauge – Ground: Approximately 98 Ω**

3. If within the standard value, the fuel gauge is OK.
4. If not within the standard value, replace the fuel gauge and engine coolant temperature gauge.

**ENGINE COOLANT TEMPERATURE GAUGE RESISTANCE CHECK**

M1543013400042

**⚠ CAUTION**

When inserting a testing probe into the power supply terminal, be careful not to touch the printed board.

1. Remove the power supply tightening screw.
2. Use an ohmmeter to measure resistance value between the terminals.

**Standard value:**

**Power supply – Ground: Approximately 95 Ω**

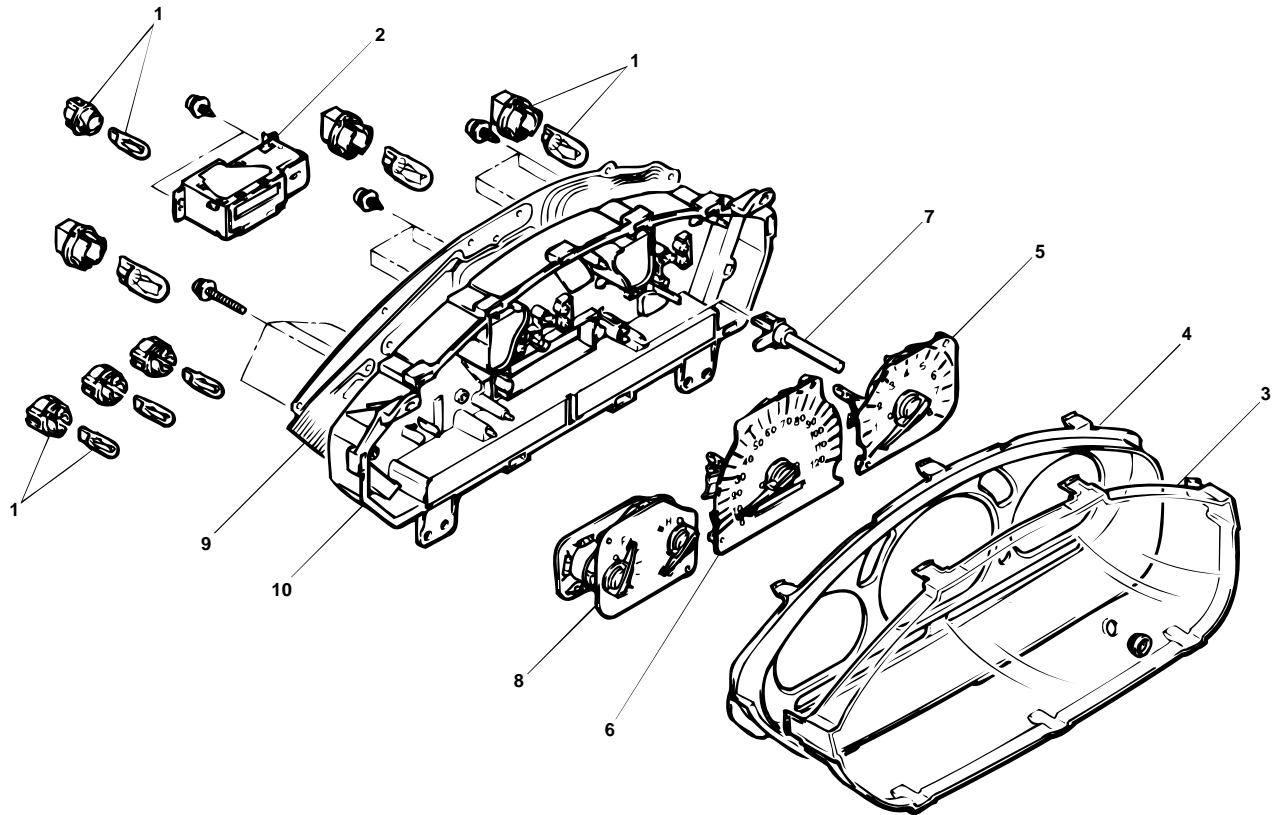
**Power supply – Engine coolant temperature gauge:  
Approximately 75 Ω**

**Engine coolant temperature gauge – Ground:  
Approximately 170 Ω**

3. If within the standard value, the engine coolant temperature gauge is OK.
4. If not within the standard value, replace the fuel gauge and engine coolant temperature gauge.

DISASSEMBLY AND REASSEMBLY

M1543003100103



AC002893AB

**DISASSEMBLY STEPS**

<<A>>

1. BULB AND SOCKET
2. ODOMETER AND TRIPMETER
3. METER GLASS
4. WINDOW PLATE

5. TACHOMETER
6. SPEEDOMETER
7. TRIP COUNTER RESET KNOB
8. FUEL GAUGE AND ENGINE COOL-  
ANT TEMPERATURE GAUGE
9. PRINTED-CIRCUIT BOARD
10. METER CASE

**DISASSEMBLY SERVICE POINT**

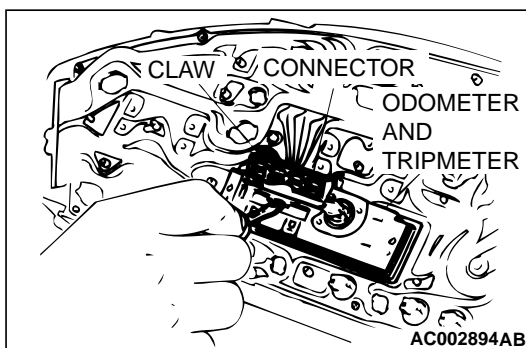
**⚠ CAUTION**

Be careful not to damage the printed-circuit board when using a flat-tipped screwdriver.

**<<A>> ODOMETER AND TRIPMETER REMOVAL**

Unfasten the claw in the connector using a flat-tipped screwdriver to disconnect the connector.

Then remove the printed circuit board position, and remove the odometer and tripmeter.



# HEADLIGHT, FRONT SIDE MARKER LIGHT AND POSITION LIGHT ASSEMBLY

## TAILLIGHT, HEADLIGHT AND TURN-SIGNAL LIGHT DIAGNOSIS

M1542000700277

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

## ON-VEHICLE SERVICE

### HEADLIGHT AIMING

M1542000900099

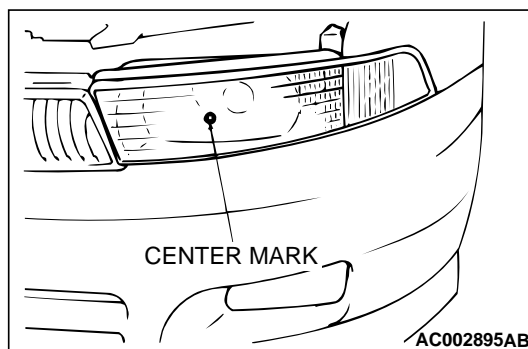
#### PRE-AIMING INSTRUCTIONS

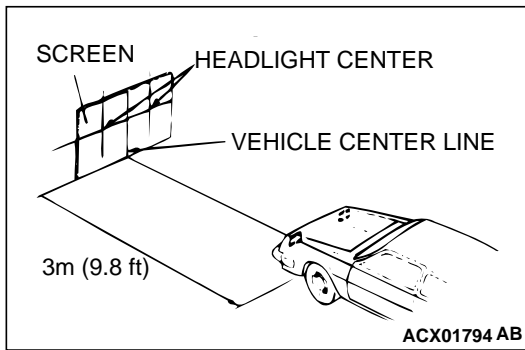
1. Inspect for badly rusted or faulty headlight assemblies.
2. These conditions must be corrected before a satisfactory adjustment can be made.
3. Place the vehicle on a level floor.
4. Bounce the front suspension through three (3) oscillations by applying the body weight to hood or bumper.
5. Inspect tire inflation, and adjust if necessary.
6. Rock vehicle sideways to allow vehicle to assume its normal position.
7. If the fuel tank is not full, place a weight in luggage room of vehicle to simulate weight of a full tank [3 kg (6.5 pounds) per gallon.]
8. There should be no other load in the vehicle other than driver or substituted weight of approximately 70 kg (150 pounds) placed in driver's position.
9. Thoroughly clean headlight lenses.

#### AIMING WITH SCREEN OR WALL

Headlight Aim preparation

1. Set the distance between the screen and the bulb center marks of the headlight as shown in the illustration.





2. 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) Position a horizontal tape or mark with reference to center line of headlight bulb.
  - (3) Position a vertical tape or mark on the screen with reference to the center line of each headlight bulb.

#### Visual Headlight Adjustment

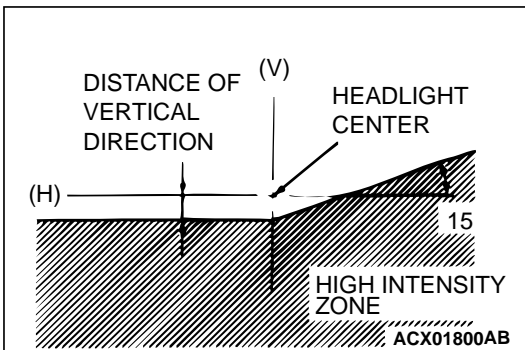
1. A properly aiming low-beam will on the aiming screen 3m (9.8 feet) in front the vehicle. The shaded area as shown in the illustration indicates high intensity zone.

*NOTE: 3m (9.8feet) in front of the vehicle must be the distance measured from the headlight center mark.*

#### Standard value:

**(Vertical direction) 21mm (0.8.inch) below horizontal (H)**

**(Horizontal direction) Position where the 15 degree angle sloping section intersects the vertical line (V)**



2. When adjusting headlight, disconnect the other headlight harness.

#### **CAUTION**

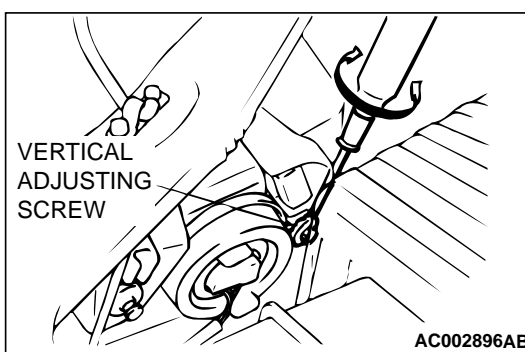
**Do not a headlight for more than three minutes or the plastic headlight lens will be deformed.**

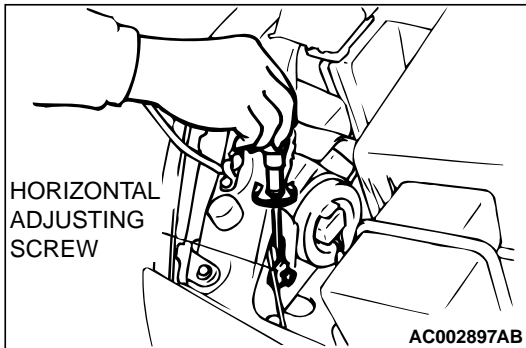
3. Turn the adjusting screws, adjust low-beam of the headlights to match the specified pattern on the aiming screen.

*NOTE: If the visual low-beam headlight adjustment is made, high beam adjustment is not necessary.*

#### Vertical Adjusting

1. Turn the adjusting screw so that the low-beam axis meets the standard value.
2. Check to see if the light distribution projected on the aiming screen is the same as the light distribution pattern described in Visual Headlight Adjustment.
3. If the differ, turn the vertical adjusting screw to adjust the vertical angle until the light distribution coincides with the correct lighting pattern.





#### Horizontal Adjusting

1. Check to see if the light distribution projected on the aiming screen is the same as the light distribution pattern described in Visual Headlight Adjustment.
2. If they differ, turn the horizontal adjusting screw to adjust the horizontal angle until the light distribution coincides with the correct lighting pattern.

### INTENSITY MEASUREMENT

M1542001000099

Using a photometer, and following its manufacturer's instruction manual, measure the headlight intensity and check to be sure that the limit value is satisfied.

**Limit: 20,000 cd or more**

*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 = Er<sup>2</sup> Where:**

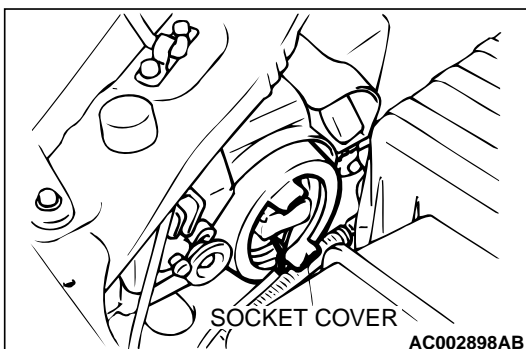
- I = intensity (cd)
- E = illumination (lux)
- r = distance (m) from headlights to illuminometer

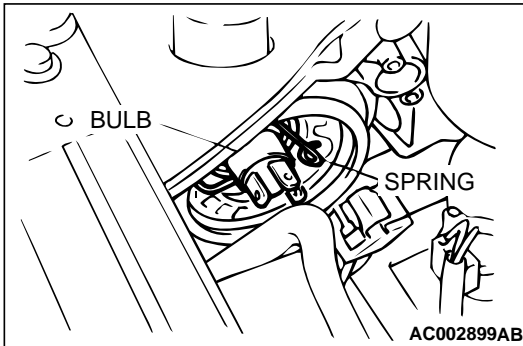
### BULB REPLACEMENT

M1542001300108

#### <Headlight Bulb>

1. Disconnect the connector.
2. Remove the socket cover.





**⚠ CAUTION**

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

3. Unhook the spring securing the bulb, and then remove the bulb.

**⚠ CAUTION**

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

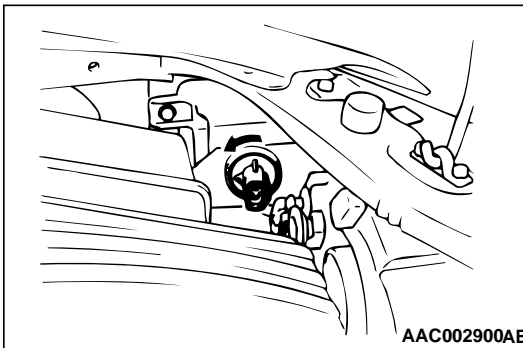
4. Install the spring and sealing cover securely after the bulb replacement, or the lens will be out of focus, or water will get inside the light unit.

**<Turn-signal Light and Position Light Bulb>**

1. Disconnect the connector.
2. Turn the bulb socket counter clockwise together with the bulb, and remove the bulb.

**⚠ CAUTION**

If the bulb socket is not securely installed, moisture will enter the lens.

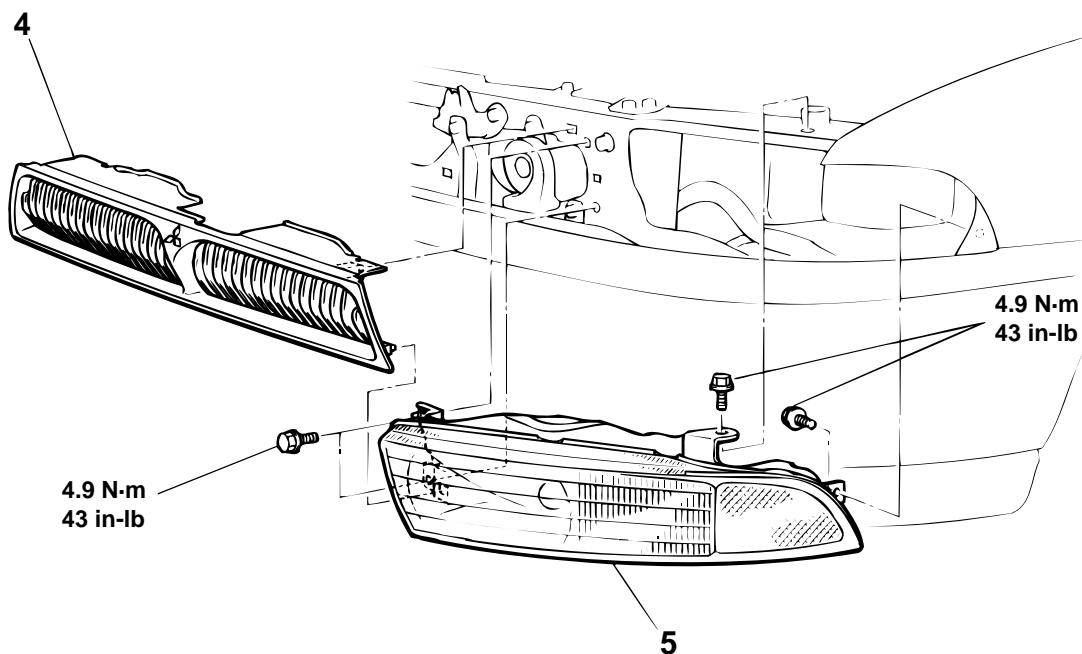
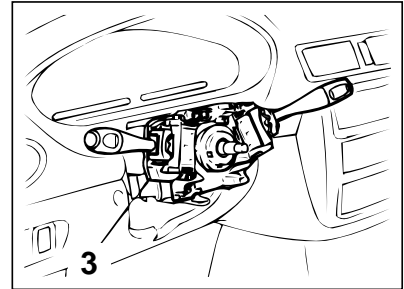
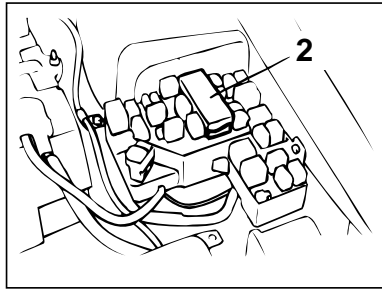
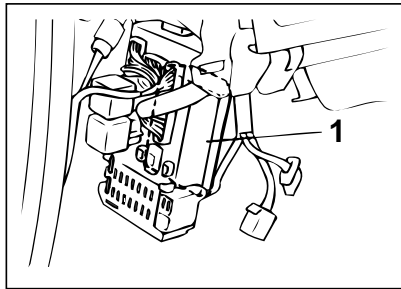


**HEADLIGHT AND FRONT COMBINATION LIGHT REMOVAL AND INSTALLATION**  
**REMOVAL AND INSTALLATION**

M1542002700080

**⚠ WARNING**

- Before removal of the air bag module, refer to **GROUP 52B, SRS Service Precautions and Air Bag Module and Clock Spring P.52B-15.**
- When removing and installing the steering wheel, do not let it bump against the air bag module.

**Post-installation operation**Headlight aiming adjustment (Refer to [P.54A-68.](#))

AC002901AB

1. ETACS-ECU (REFER TO GROUP 42, KEYLESS ENTRY SYSTEM [P.37A-20.](#))
2. FRONT-ECU
3. COLUMN SWITCH (REFER TO GROUP 37, STEERING WHEEL AND SHAFT [P.37A-20.](#))

&lt;&lt;A&gt;&gt;

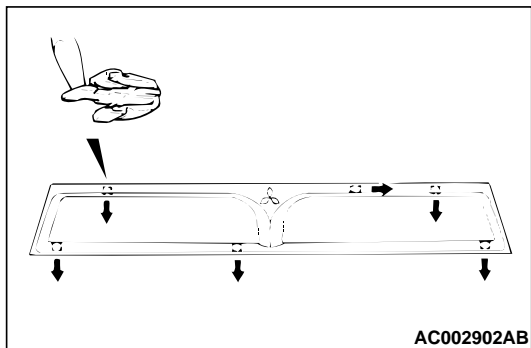
- HEADLIGHT REMOVAL STEPS**
4. RADIATOR GRILLE
  5. HEADLIGHT, FRONT TURN-SIGNAL LIGHT AND POSITION LIGHT ASSEMBLY



**REMOVAL SERVICE POINT**

**<<A>> RADIATOR GRILLE REMOVAL**

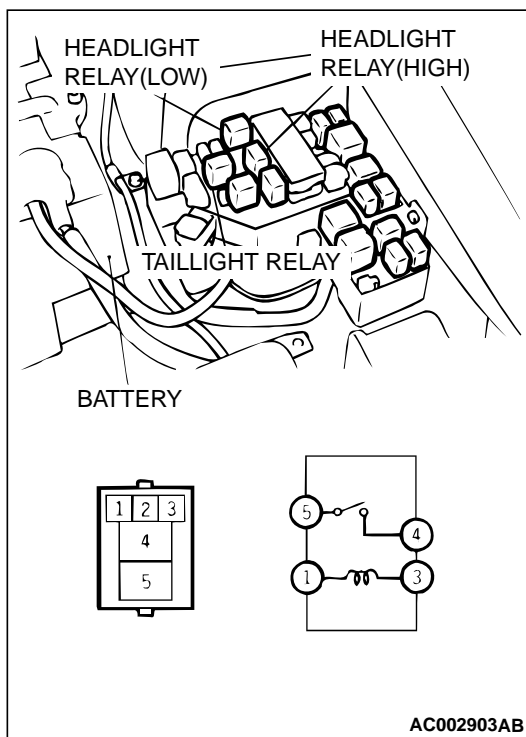
1. Remove the radiator grille by pushing all tabs of the radiator grille clips in the direction of the arrows with a flat-tipped screwdriver, then lightly pull the radiator grille toward you.
2. Removal the clips from the body, and install them to the radiator grille temporarily for reinstallation.



**INSPECTION**

M1542008200072

**HEADLIGHT RELAY(LOW),(HIGH) AND  
TAILLIGHT RELAY CHECK**



BATTERY VOLTAGE	TERMINAL NO. TO BE CONNECTED TO BATTERY	TERMINAL NO. TO PERFORM CONTINUITY TEST
Supplied	1-3	4-5
Not supplied	-	1-3

**FOG LIGHT**

**FOG LIGHT DIAGNOSIS**

M1542000700307

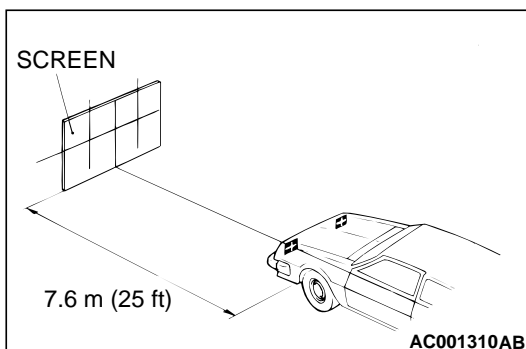
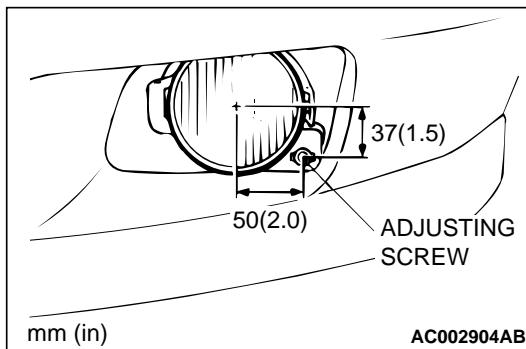
The fog lights are controlled by the Simplified Wiring System (SWS). For troubleshooting, refer to GROUP 54B, SWS Diagnosis [P.54B-9](#).

## ON-VEHICLE SERVICE

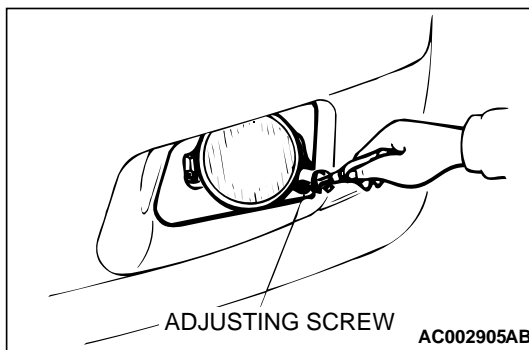
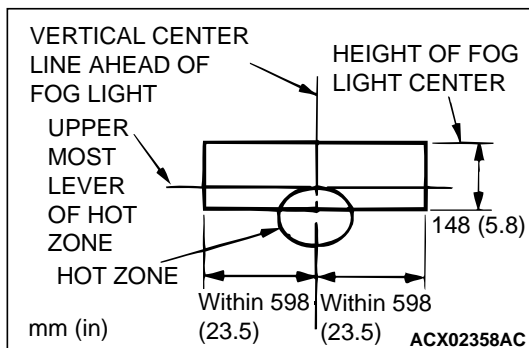
## FOG LIGHT AIMING

M1542001100104

1. Inspect for badly rusted or faulty fog light assemblies.
2. These conditions must be corrected before a satisfactory adjustment can be made.
3. Place the vehicle on a level floor.
4. Bounce the front suspension through three (3) oscillations by applying the body weight to the hood or bumper.
5. Inspect tire inflation, and adjust if necessary.
6. Rock the vehicle sideways to allow the vehicle to assume its normal position.
7. If 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.]
8. There should be no other load in the vehicle other than driver or substituted weight of approximately 70 kg (150 pounds) placed in driver's position.
9. Thoroughly clean the fog light lenses.
10. Measure the center of the fog lights as shown in the illustration.



11. Set the distance between the screen and the center of the fog lights as shown in the illustration.



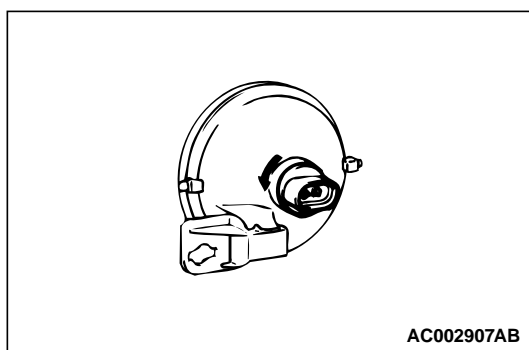
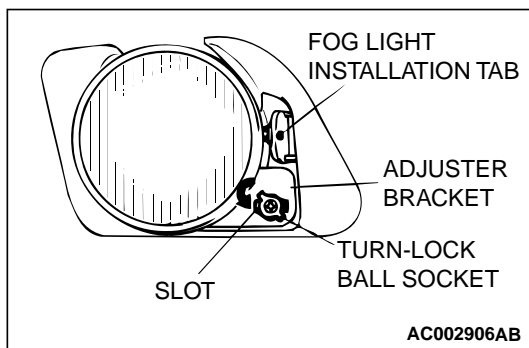
12. Check if the beam shining onto the screen is at the standard value.

**Standard value:**

**(Vertical direction): 148 mm (5.8 inches) below horizontal (H)**

**(Horizontal direction): Parallel to direction of vehicle travel**

*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**

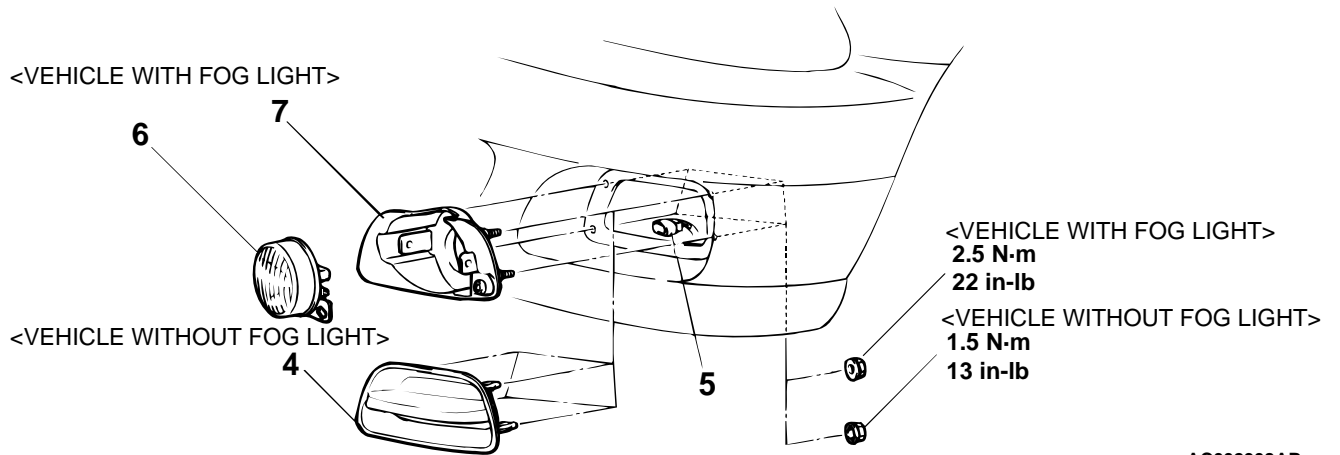
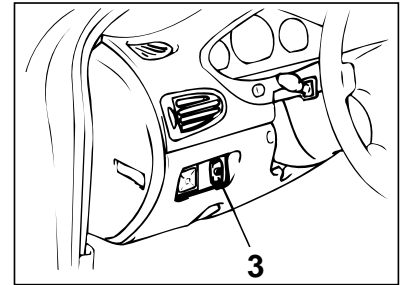
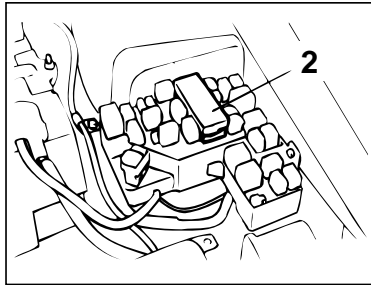
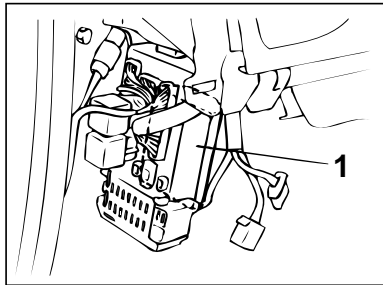
M1542001300119

1. Disconnect the fog light connector behind the bumper.
2. Align the turn-lock ball socket with the slot of the adjuster bracket by turning the turn-lock ball socket in the shown direction.
3. Expand the fog light installation tab carefully. Then withdraw the fog light toward you.
4. Remove the bulb by turning the socket in the shown direction shown.

**FOG LIGHT REMOVAL AND INSTALLATION**

**REMOVAL AND INSTALLATION**

M1542001500135



AC002908AB

1. ETACS-ECU (REFER TO GROUP 42,KEYLESS ENTRY SYSTEM P.52A-20.)
2. FRONT-ECU

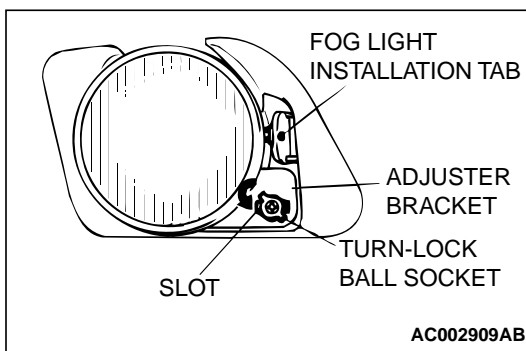
3. FOG LIGHT SWITCH
4. FOG LIGHT HOLE COVER
- FOG LIGHT REMOVAL STEPS**
5. FOG LIGHT CONNECTOR
6. FOG LIGHT BRACKET
7. FOG LIGHT

<<A>>

**REMOVAL SERVICE POINT**

**<<A>> FOG LIGHT REMOVAL**

Align the turn-lock ball socket with the slot of the adjuster bracket by turning the turn-lock ball socket in the shown direction.

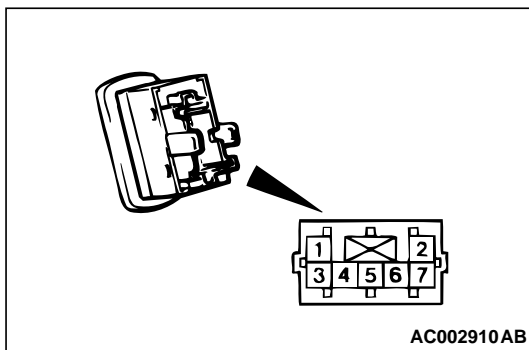


AC002909AB

INSPECTION

M1542007400095

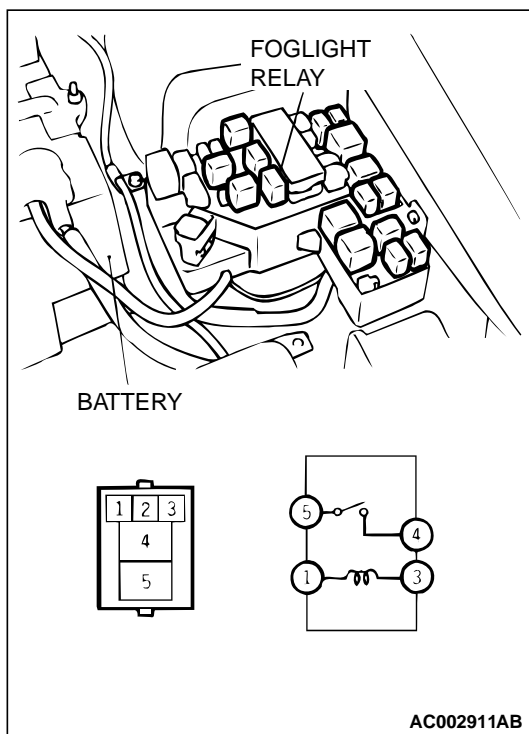
FOG LIGHT SWITCH CONTINUITY CHCK



SWITCH POSITION	TESTER CONNECTION	SPECIFIED CONDITION
Pressed	2-5 (Illumination light) 6-7 (Switch)	Continuity
Released	2-5 (Illumination light)	Continuity

FRONT FOG LIGHT RELAY CHECK

M1542007500100



BATTERY VOLTAGE	TERMINAL NO. TO BE CONNECTED TO BATTERY	TERMINAL NO. TO PERFORM CONTINUITY TEST
Supplied	1-3	4-5
Not supplied	-	1-3

REAR COMBINATION LIGHT

REAR COMBINATION LIGHT DIAGNOSIS

M1542000700318

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

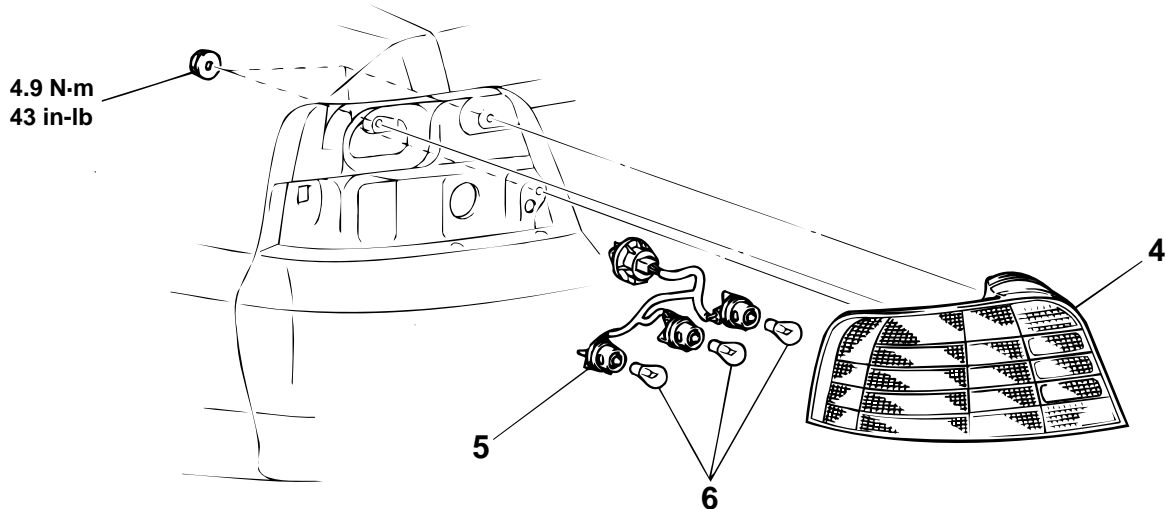
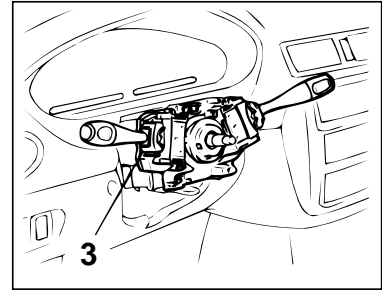
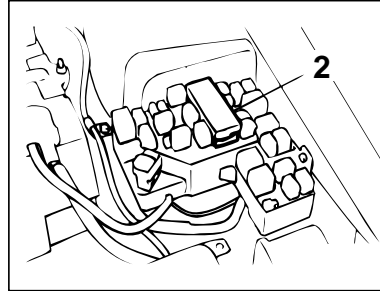
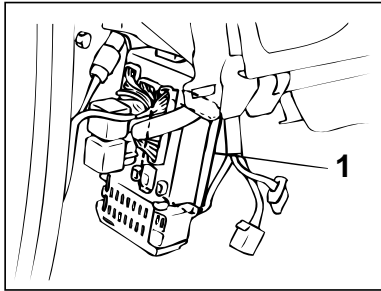
## REAR COMBINATION LIGHT REMOVAL AND INSTALLATION

## REMOVAL AND INSTALLATION

M1542003900139

**⚠ WARNING**

- Before removal of the air bag module, refer to GROUP 52B, SRS Service Precautions and Air Bag Module and Clock Spring P.52A-11.
- When removing and installing the steering wheel, do not let it bump against the air bag module.



AC002912 AB

1. ETACS-ECU (REFER TO GROUP 42, KEYLESS ENTRY SYSTEM P.52A-20.)
2. FRONT-ECU
3. COLUMN SWITCH (REFER TO GROUP 37, STEERING WHEEL AND SHAFT P.52A-20.)

**REAR COMBINATION LIGHT  
REMOVAL STEPS**

- TRUNK LID FLOOR CARPET ASSEMBLY
4. REAR COMBINATION LIGHT
  5. SOCKET ASSEMBLY
  6. BULB

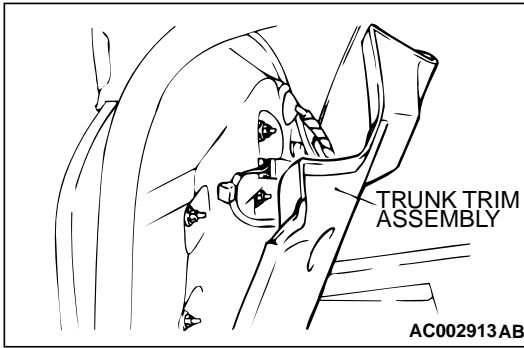
&lt;&lt;A&gt;&gt;

*NOTE: Remove the rear combination light assembly to access the bulb.*

**REMOVAL SERVICE POINT**

**<<A>> REAR COMBINATION LIGHT REMOVAL**

1. Remove the plastic stud cap, then turn up the trunk trim assembly as shown in the illustration. (Refer to GROUP 52A, Trims P.52A-20.)
2. Removal the rear combination light mounting nuts and disconnect the connector.
3. Remove the rear combination light.



**DOME LIGHT**

**INTRODUCTION**

**DOME LIGHT DIAGNOSIS**

The dome light is controlled by the Simplified Wiring System (SWS). For troubleshooting, refer to GROUP 54B, SWS Diagnosis P.54B-9.

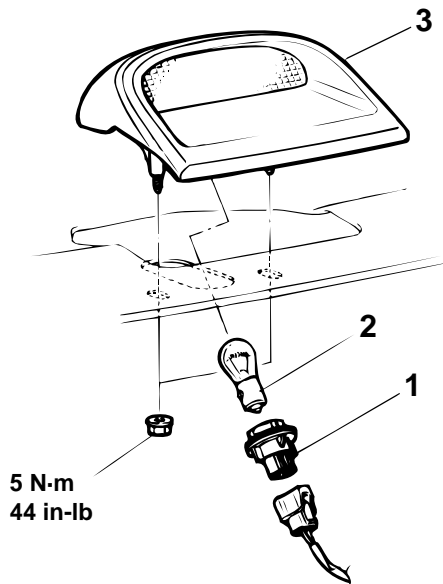
M1542000700329

**HIGH-MOUNTED STOPLIGHT**

**REMOVAL AND INSTALLATION**

M1542005100117

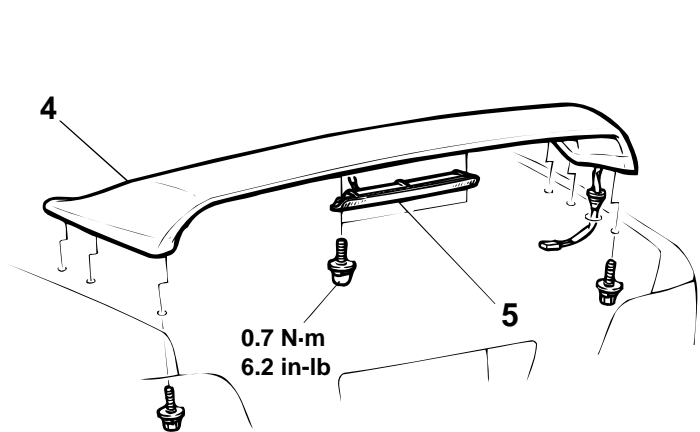
<REAR SHELF MOUNTED TYPE>



**REMOVAL STEP <REAR SHELF MOUNTED TYPE>**

1. SOCKET ASSEMBLY
2. BULB
3. HIGH-MOUNTED STOPLIGHT

<REAR SPOILER MOUNTED TYPE>



**REMOVAL STEP <REAR SPOILER MOUNTED TYPE>**

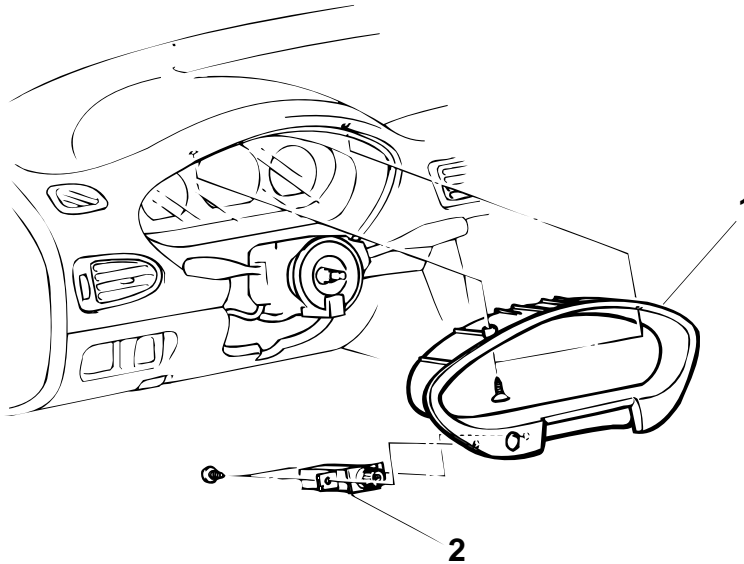
4. REAR SPOILER
5. HIGH-MOUNTED STOPLIGHT

AC002914AB

TSB Revision

**RHEOSTAT****REMOVAL AND INSTALLATION**

M154200600094

**RHEOSTAT REMOVAL STEPS**

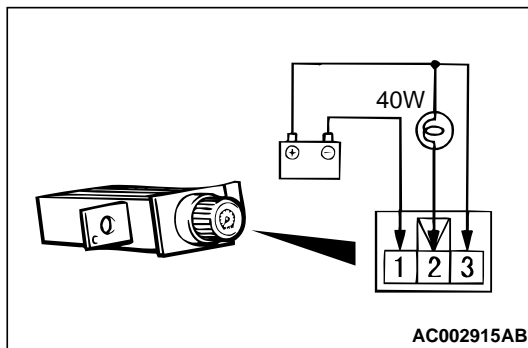
1. METER BEZEL
2. RHEOSTAT

AC002916AB

**INSPECTION**

M1542006100091

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



AC002915AB

**HAZARD WARNING LIGHT SWITCH****HAZARD WARNING LIGHT DIAGNOSIS**

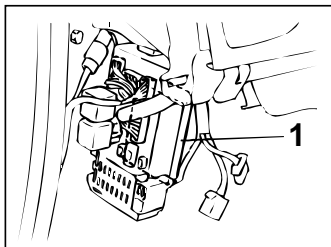
M1542000700330

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

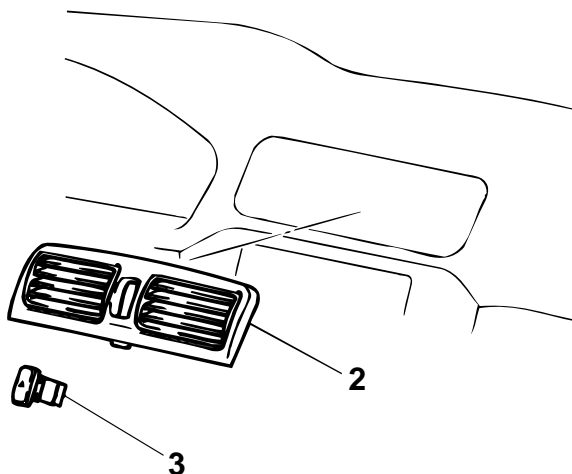


**POP-UP SWITCH AND FOG LIGHT SWITCH REMOVAL AND INSTALLATION  
REMOVAL AND INSTALLATION**

M1542006600115



1. ETACS-ECU (REFER TO GROUP 42, KEYLESS ENTRY SYSTEM P.52A-11.)



AC002917AB

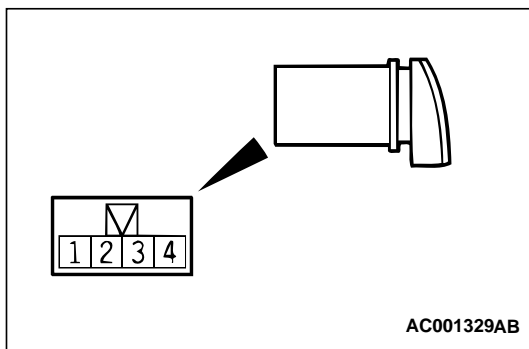
**HAZARD WARNING LIGHT SWITCH  
REMOVAL STEPS**

- RADIO, TAPE PLAYER AND CD PLAYER (REFER TO P.54A-150.)
- 2. CENTER OUTLET ASSEMBLY
- 3. HAZARD WARNING LIGHT SWITCH

**INSPECTION**

M1542006700101

**HAZARD WARNING LIGHT SWITCH CONTINUITY  
CHECK**



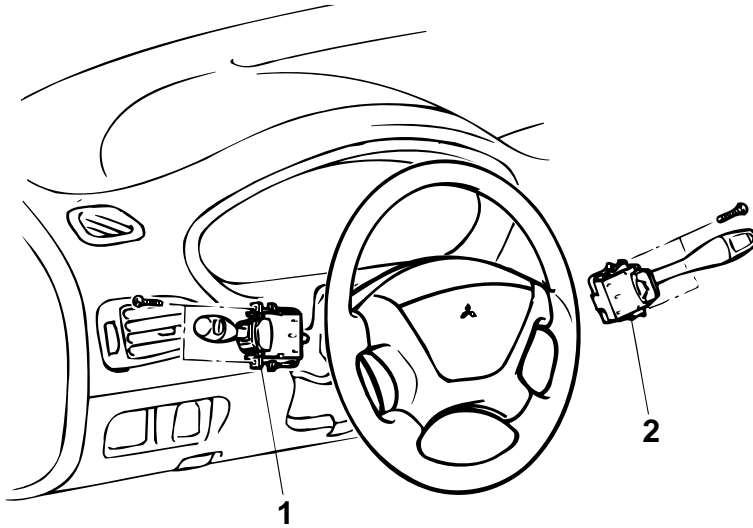
AC001329AB

SWITCH POSITION	TESTER CONNECTION	SPECIFIED CONDITION
Released	3 – 4 (Illumination)	Continuity
Pressed	1 – 2 (Switch) 3 – 4 (Illumination)	Continuity

# COLUMN SWITCH

## REMOVAL AND INSTALLATION

M1543009100156



### REMOVAL STEPS

- COLUMN COVER LOWER (REFER TO P.54A-26.)

AC002918AB

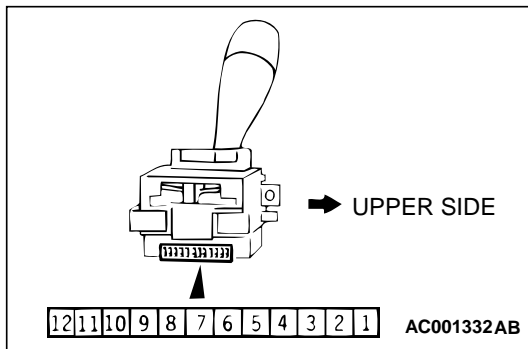
### REMOVAL STEPS (Continued)

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

## INSPECTION

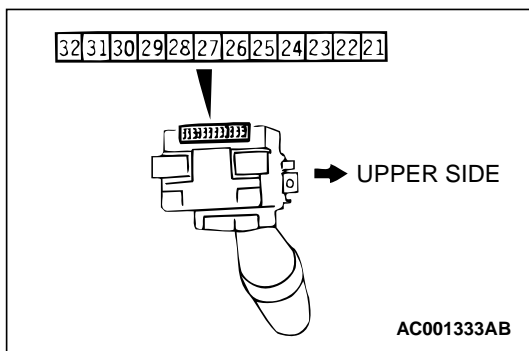
M1543008700155

### TURN-SIGNAL AND LIGHTING SWITCH CHECK



SWITCH POSITION	TESTER CONNECTION	SPECIFIED CONDITION
OFF	-	No continuity
Taillight switch ON	5-9	Continuity
Headlight switch ON	5-7-9	Continuity
Passing switch ON	2-12	Continuity
Dimmer switch ON	2-11-12	Continuity
Turn-signal light switch (LH) ON	1-2	Continuity
Turn-signal light switch (RH) ON	2-3	Continuity

**WINDSHIELD WIPER AND WINDSHIELD WASHER SWITCH CHECK**



SWITCH POSITION	TESTER CONNECTION	SPECIFIED CONDITION
OFF	-	No continuity
Windshield wiper mist switch ON	23-32	Continuity
Windshield intermittent wiper switch ON	23-31	Continuity
Windshield low-speed wiper switch ON	23-30	Continuity
Windshield high-speed wiper switch ON	21-23	Continuity
Windshield wiper switch ON	22-23	Continuity

Measure the resistance value at terminal numbers 27 and 28. The resistance value should rise smoothly from approximately 0 Ω ("FAST" position) to approximately 1 kW ("SLOW" position).

**HORN**

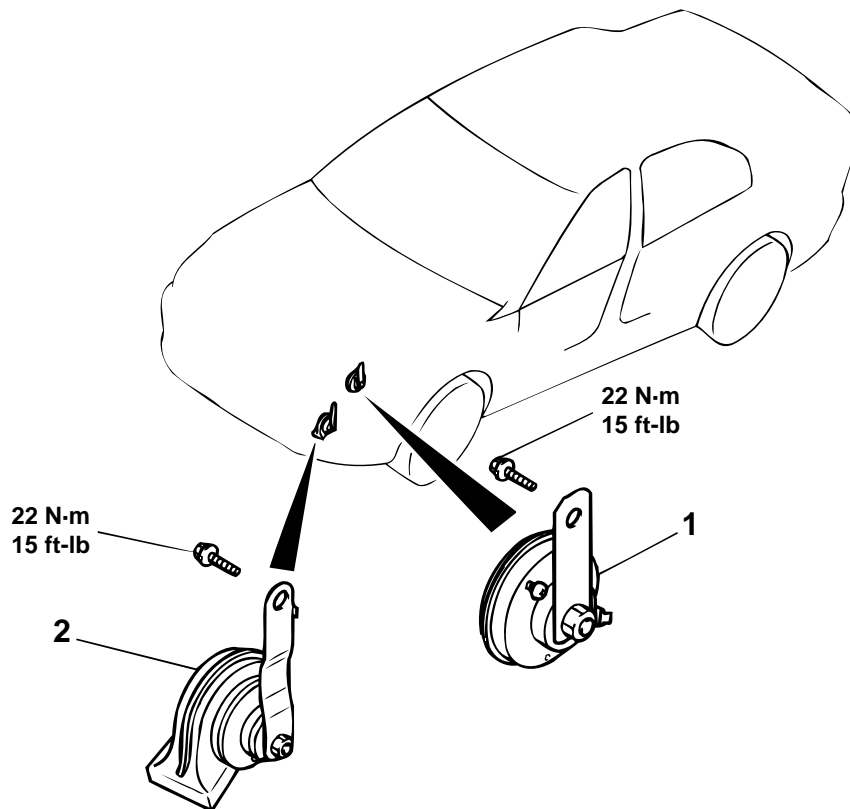
**DIAGNOSIS <VEHICLE WITH KEYLESS ENTRY SYSTEM OR THEFT ALARM SYSTEM>**

M1543000700311

The keyless entry system horn answerback and theft-alarm system are controlled by the Simplified Wiring System (SWS). For troubleshooting, refer to GROUP 54B, SWS Diagnosis [P.54B-9](#).

**HORN REMOVAL AND INSTALLATION****REMOVAL AND INSTALLATION**

M1543007900145



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**REMOVAL STEPS**

- AIR CLEANER (REFER TO GROUP 15, AIR CLEANER P.15-4.)

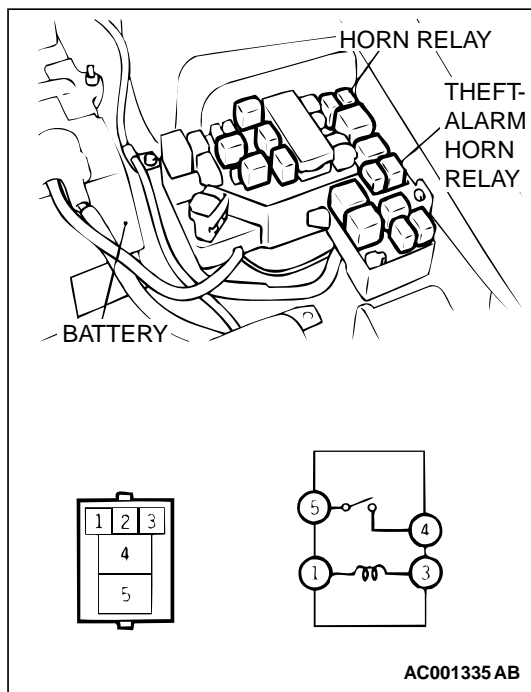
**REMOVAL STEPS (Continued)**

1. THEFT-ALARM HORN
2. HORN

INSPECTION

M1543008000112

HORN RELAY, THEFT-ALARM HORN RELAY  
CONTINUITY CHECK

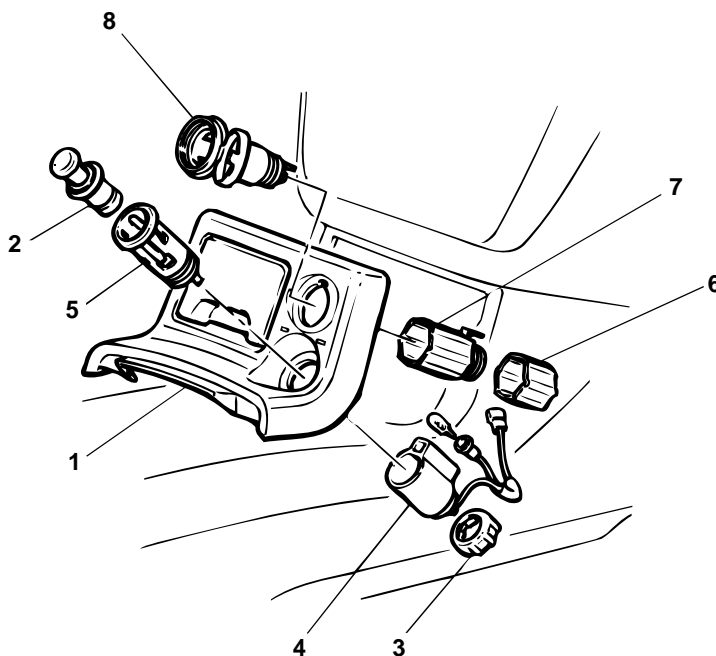


BATTERY VOLTAGE	TERMINAL NO. TO BE CONNECTED TO BATTERY	SPECIFIED CONDITION
Supplied	1-3	4-5
Not supplied	-	1-3

CIGARETTE LIGHTER, ACCESSORY SOCKET

REMOVAL AND INSTALLATION

M1543013500049



AC002920AB

TSB Revision

**CIGARETTE LIGHTER REMOVAL STEPS**

- SHIFT LEVER PANEL ASSEMBLY (REFER TO GROUP 52A, FLOOR CONSOLE P.52A-11.)
- 1. CENTER LOWER PANEL
- 2. PLUG
- 3. FIXING RING
- 4. CASE
- 5. CIGARETTE LIGHTER SOCKET

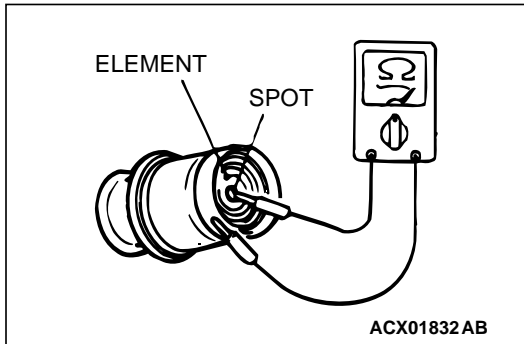
**ACCESSORY SOCKET REMOVAL STEPS**

- SHIFT LEVER PANEL ASSEMBLY (REFER TO GROUP 52A, FLOOR CONSOLE P.52A-11.)
- 1. CENTER LOWER PANEL ASSEMBLY
- 6. NUT
- 7. CASE
- 8. ACCESSORY SOCKET

**CIGARETTE LIGHTER INSPECTION**

M1543005700123

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

**RADIO WITH TAPE PLAYER AND CD PLAYER****GENERAL DESCRIPTION**

Anti-theft system

M1544000100033

After the power supply to the radio, tape player and CD player has been interrupted for one hour or more, the anti-theft system will prevent the radio, tape player and CD player from working, even if the power supply is restored.

**RADIO WITH TAPE PLAYER AND CD PLAYER, SPEAKER AND ANTENNA DIAGNOSIS****INTRODUCTION TO AUDIO SYSTEM DIAGNOSIS**

M1544004700059

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

**AUDIO SYSTEM DIAGNOSTIC TROUBLESHOOTING STRATEGY**

M1544004800119

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

1. Gather information from the customer.

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

**TROUBLE SYMPTOM CHART**

M1544004900116

<b>SYMPTOMS</b>		<b>INSPECTION PROCEDURE</b>	<b>REFERENCE PAGE</b>
When power switch is turned "ON," no power is available		1	<a href="#">P.54A-89</a>
No sound. <vehicles with seven speakers>		2	<a href="#">P.54A-93</a>
No sound from one speaker.		3	<a href="#">P.54A-97</a>
Sound volume is not changed if the vehicle speed is changed.		4	<a href="#">P.54A-123</a>
Noise	Noise appears at certain places when traveling (AM).	5	<a href="#">P.54A-127</a>
	Noise appears at certain places when traveling (FM).	6	<a href="#">P.54A-127</a>
	Mixed with noise, only at night (AM).	7	<a href="#">P.54A-128</a>
	Broadcasts can be heard but both AM and FM have a lot of noise.	8	<a href="#">P.54A-129</a>
	There is more noise on either AM or FM.	9	<a href="#">P.54A-129</a>
	There is noise when starting the engine.	10	<a href="#">P.54A-130</a>
	Some noise appears when there is vibration or shocks during traveling.	11	<a href="#">P.54A-132</a>
	Noise sometimes appears on FM during traveling.	12	<a href="#">P.54A-132</a>
	Ever-present noise.	13	<a href="#">P.54A-134</a>
Radio	There is noise but no reception for both AM and FM or no sound from AM, or no sound from FM.	14	<a href="#">P.54A-134</a>
	Poor reception.	15	<a href="#">P.54A-134</a>
	Distortion on AM or on both AM and FM.	16	<a href="#">P.54A-135</a>
	Distortion on FM only.	17	<a href="#">P.54A-136</a>
	Using the auto select function, too few automatic stations are selected.	18	<a href="#">P.54A-136</a>
	Preset stations are erased.	19	<a href="#">P.54A-137</a>

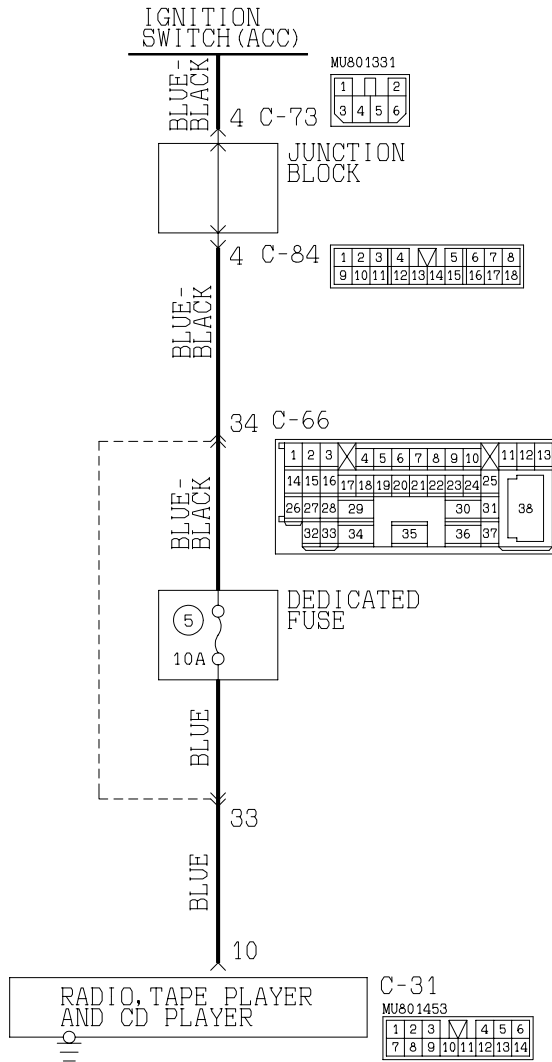
SYMPTOMS		INSPECTION PROCEDURE	REFERENCE PAGE
Tape player	Cassette tape can not be inserted.	20	<a href="#">P.54A-141</a>
	Sound quality is poor, or sound is weak.	21	<a href="#">P.54A-141</a>
	Cassette tape can not be ejected.	22	<a href="#">P.54A-141</a>
	Uneven revolution. tape speed is fast or slow.	23	<a href="#">P.54A-142</a>
	Automatic search does not work.	24	<a href="#">P.54A-142</a>
	Malfunction of the auto reverse.	25	<a href="#">P.54A-143</a>
	Tape gets caught in mechanism.	26	<a href="#">P.54A-143</a>
CD player, CD auto changer	CD can not be inserted.	27	<a href="#">P.54A-144</a>
	No sound (CD only).	28	<a href="#">P.54A-145</a>
	CD sound skips.	29	<a href="#">P.54A-145</a>
	Sound quality is poor.	30	<a href="#">P.54A-145</a>
	CD cannot be ejected.	31	<a href="#">P.54A-146</a>



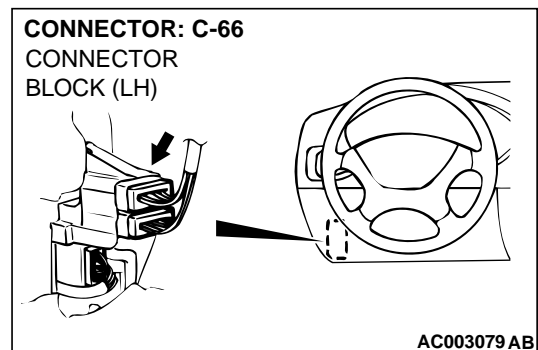
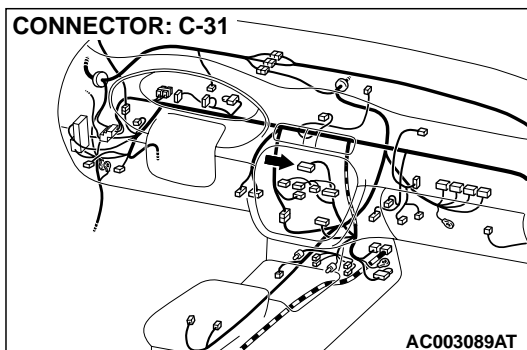
SYMPTOM PROCEDURES

Inspection Procedure 1: When power switch is turned "ON," no power is available.

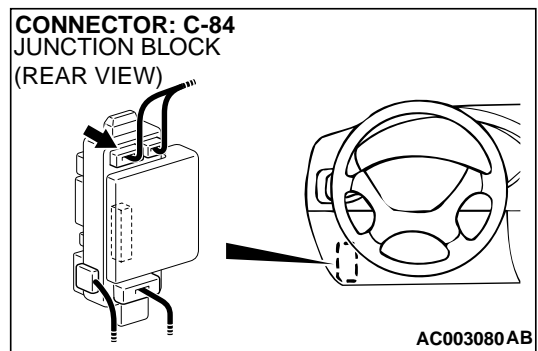
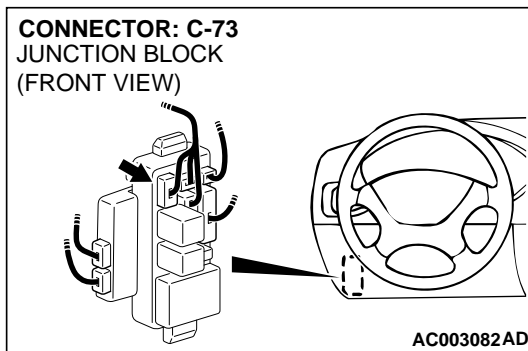
Radio, Tape Player and CD Player Power Supply Circuit



AC003974 AB



TSB Revision

**CIRCUIT OPERATION**

Power is supplied to the radio, tape player, CD player and CD auto changer when the ignition switch is at the "ACC" or "ON" position.

**TECHNICAL DESCRIPTION (COMMENT)**

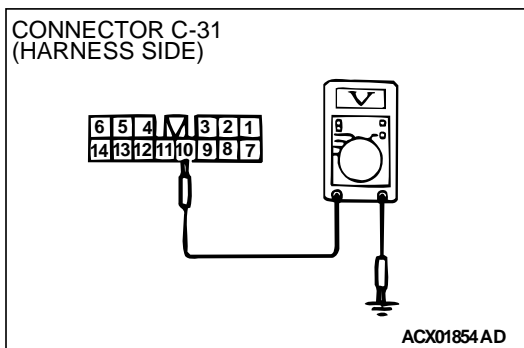
The cause is probably a faulty radio, tape player, CD player and CD auto changer power supply circuit system.

**TROUBLESHOOTING HINTS**

- Damaged harness wire or connector.
- Malfunction of the radio, tape player, CD player and CD auto changer.

**DIAGNOSIS****Required Special Tool:**

- MB991223: Harness set

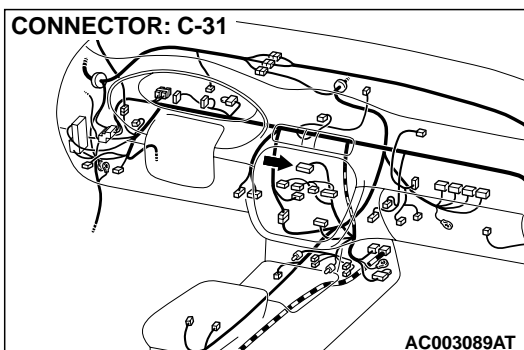
**STEP 1. Check the radio, tape player, CD player and CD auto changer power supply circuit by backprobing.**

- (1) Do not disconnect radio, tape player, CD player and CD auto changer connector C-31.
- (2) Turn the ignition switch to "ACC" position.
- (3) Measure the voltage between terminal 10 and ground by backprobing.

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

**YES :** Go to Step 4.

**NO :** Go to Step 2.

**STEP 2. Check radio, tape player, CD player and CD auto changer connector C-31 for damage.**

**Q: Are radio and CD player and CD auto changer connector C-31 in good condition?**

**YES :** Go to Step 3.

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

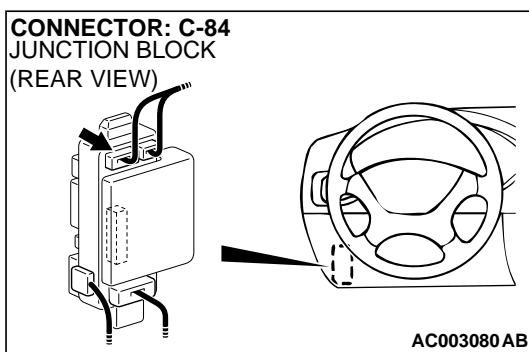
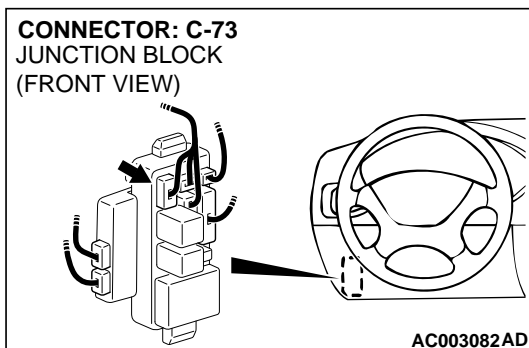
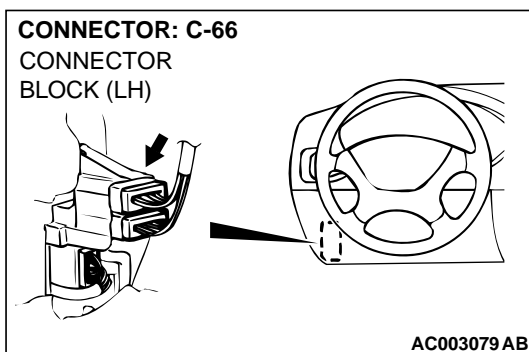
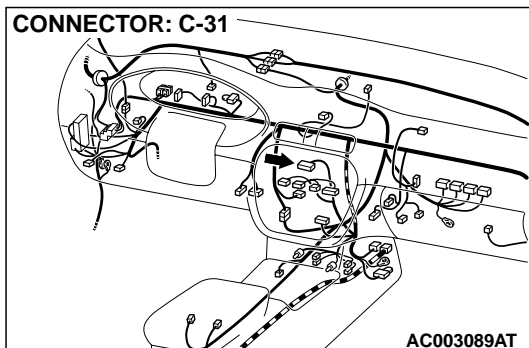
**STEP 3. Check the harness wires between radio, tape player, CD player and CD auto changer connector C-31 and ignition switch (ACC).**

*NOTE: After inspecting intermediate connector C-66 and junction block connectors C-73 and C-84, inspect the wire. If intermediate connector C-66 and junction block connectors C-73 and C-84 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.*

**Q: Are the harness wires between radio, tape player, CD player and CD auto changer connector C-31 and ignition switch (ACC) in good condition?**

**YES :** There is no action to be taken.

**NO :** repair them. If the power switch is turned on, the radio, tape player, CD player and CD auto changer should operate normally.



**STEP 4. Check that the radio, tape player, CD player, and the CD auto changer are installed correctly.**

*NOTE: The radio, tape player, CD player and CD auto changer are grounded to the instrument panel center reinforcement directly.*

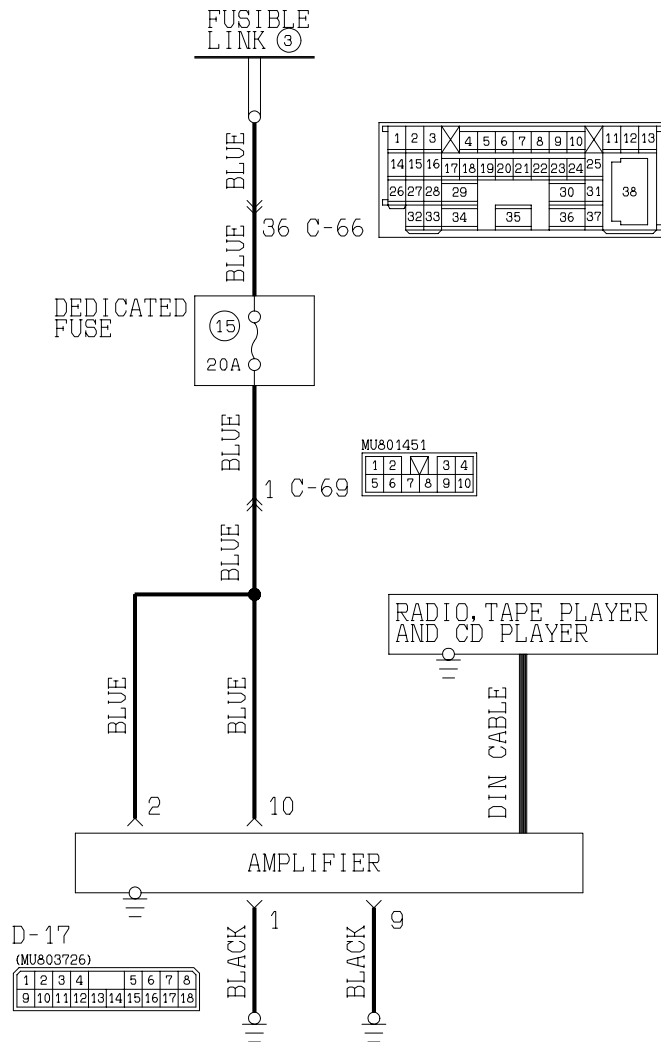
**Q: Are the radio, tape player, CD player and CD auto changer installed correctly?**

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

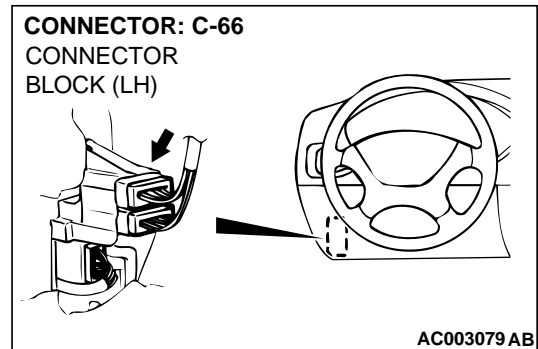
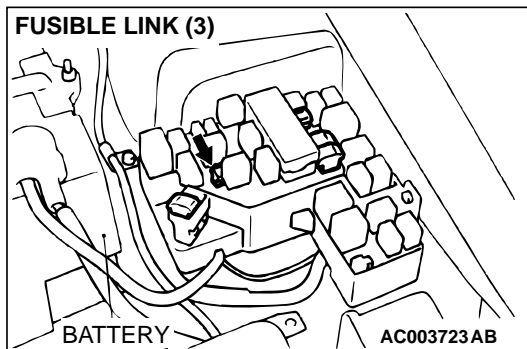
**NO :** Install properly. If the power switch is turned on, the radio, tape player, CD player and CD auto changer should operate normally.

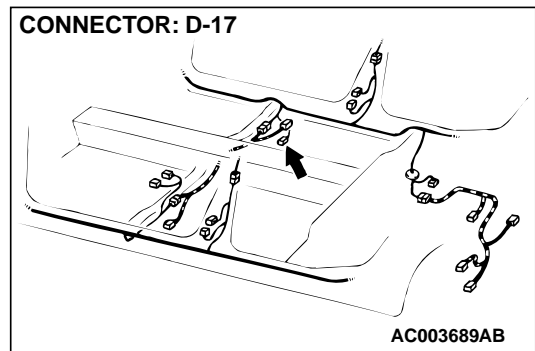
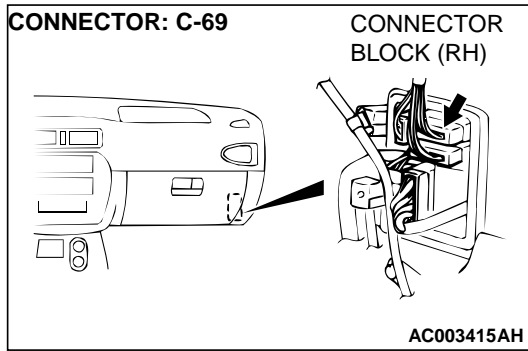
Inspection Procedure 2: No sound. <vehicles with amplifier>

Amplifier Power Supply Circuit



AC003975AB





**CIRCUIT OPERATION**

Power is supplied to the amplifier when the fusible link (3).

**TECHNICAL DESCRIPTION (COMMENT)**

The cause is probably a faulty amplifier power supply circuit system.

**TROUBLESHOOTING HINTS**

- Damaged harness wire or connector.
- Damaged DIN cable.
- Malfunction of the amplifier.
- Malfunction of the radio, tape player, CD player and CD auto changer.

**DIAGNOSIS**

**Required Special Tool:**

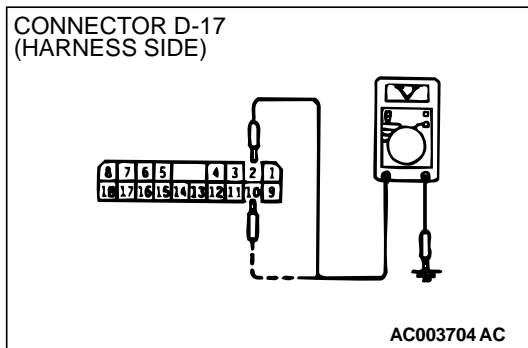
- MB991223: Harness set

**STEP 1. Check the amplifier power supply circuit by backprobing.**

- (1) Do not disconnect amplifier connector D-17.
- (2) Measure the voltages between terminal 2, 10 and ground by backprobing.

**Q: Are the voltages approximately 12 volts (battery positive voltage)?**

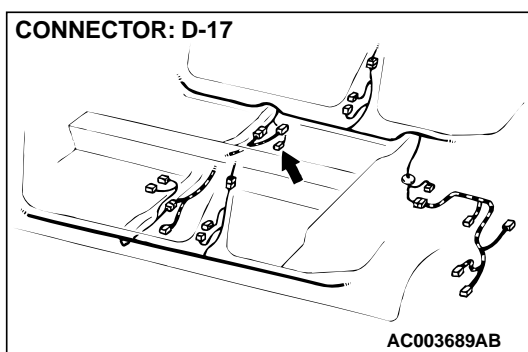
- YES :** Go to Step 4.  
**NO :** Go to Step 2.



**STEP 2. Check amplifier connector D-17 for damage.**

**Q: Is amplifier connector D-17 in good condition?**

- YES :** Go to Step 3.  
**NO :** Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The speakers should sound.



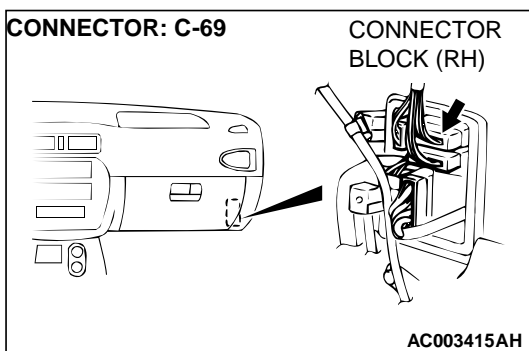
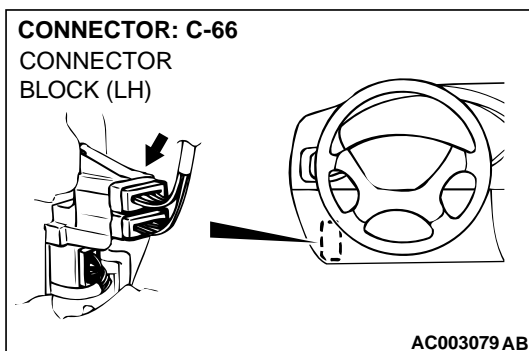
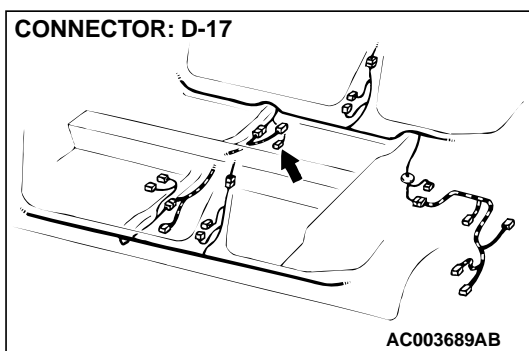
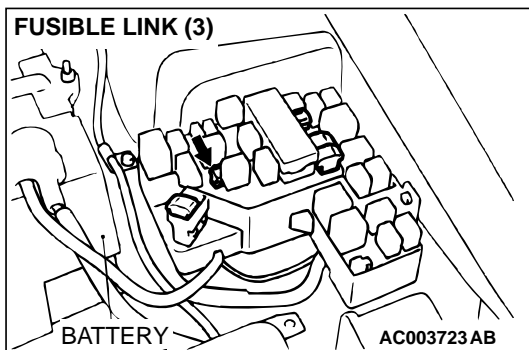
**STEP 3. Check the harness wires between amplifier connector D-17 and fusible link (3).**

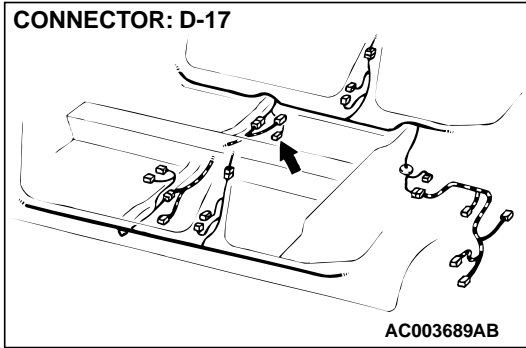
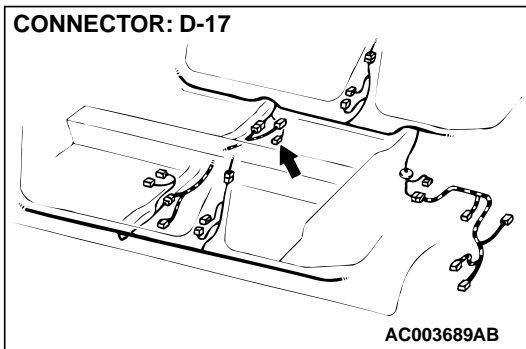
*NOTE: After inspecting intermediate connector C-66 and C-69, inspect the wires. If intermediate connector C-66 and C-69 are damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.*

**Q: Are the harness wires between amplifier connector D-17 and fusible link (3) in good condition?**

**YES :** There is no action to be taken.

**NO :** Repair them. The speakers should sound.

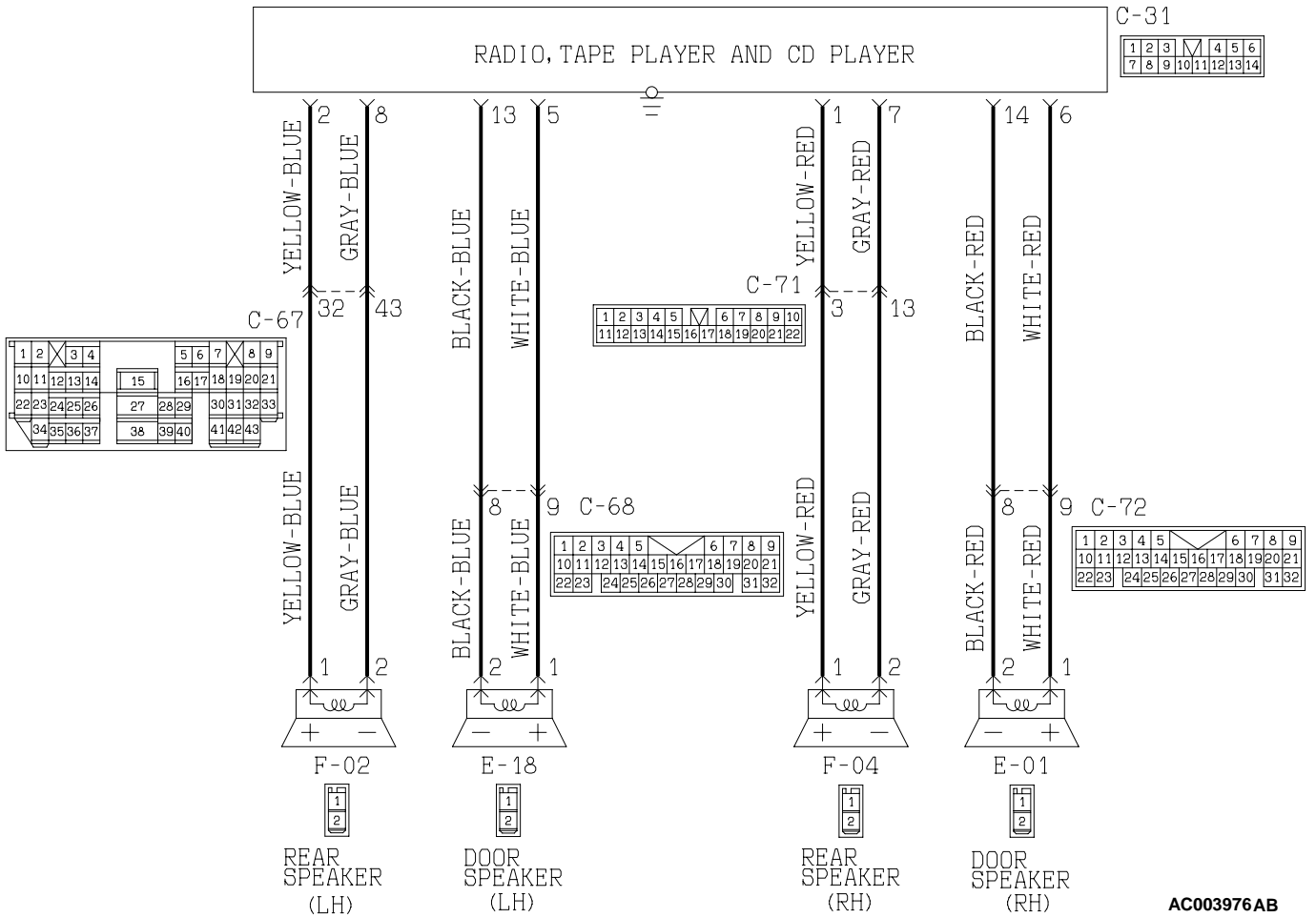


**STEP 4. Check amplifier connector D-17 for damage.****Q: Is amplifier connector D-17 in good condition?****YES :** Go to Step 5.**NO :** Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). The speakers should sound.**STEP 5. Check the harness wires between amplifier connector D-17 and ground.****Q: Are the harness wires between amplifier connector D-17 and ground in good condition?****YES :** Go to Step 6.**NO :** Repair them. The speakers should sound.**STEP 6. Check the DIN cable between amplifier and radio, tape player and CD auto changer.****Q: Are the DIN cable in good condition?****YES :** Repair or replace the amplifier or radio, tape player, CD player and CD auto changer. The speakers should sound.**NO :** Repair or replace it. The speakers should sound.

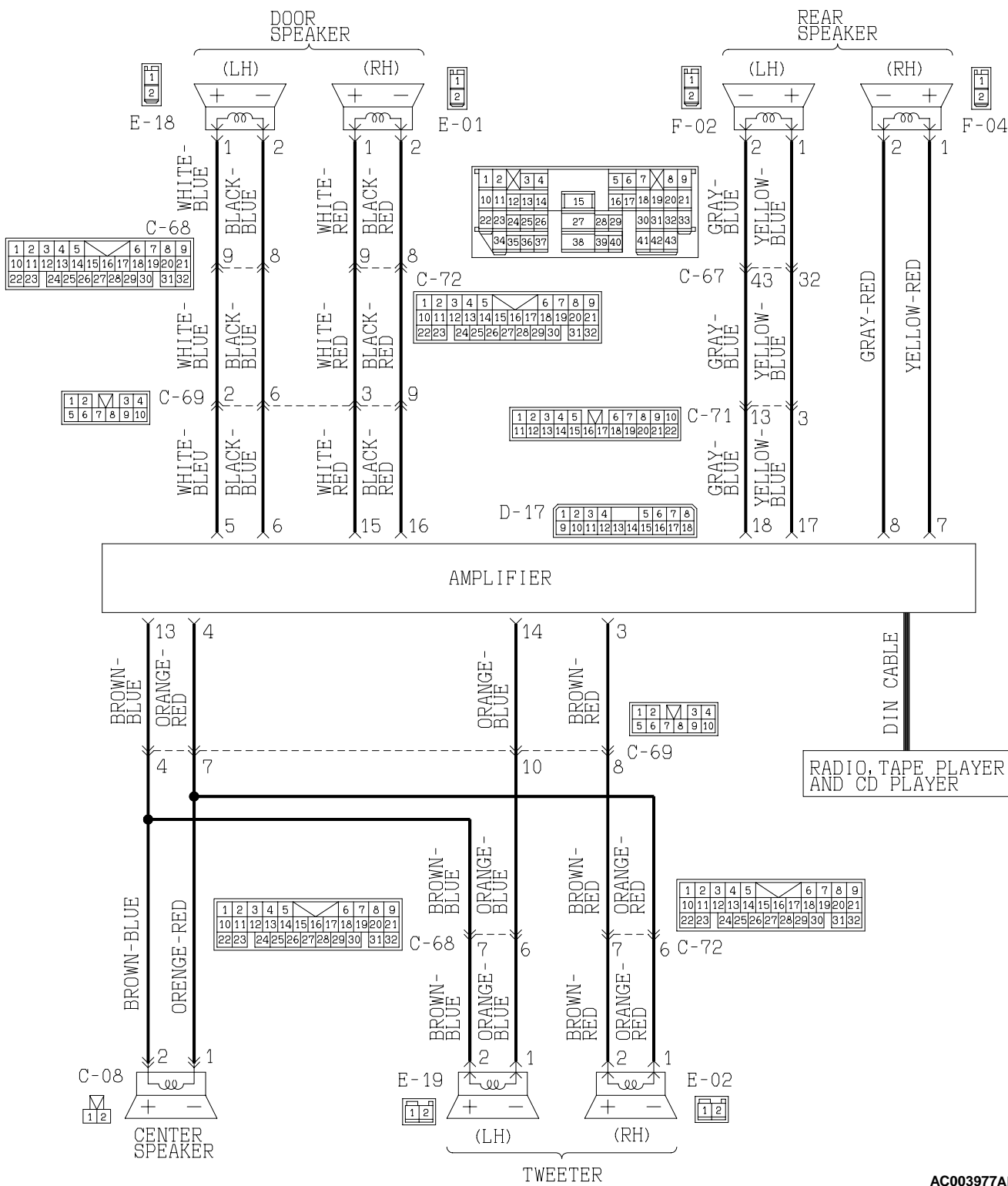


Inspection Procedure 3: No sound from one speaker.

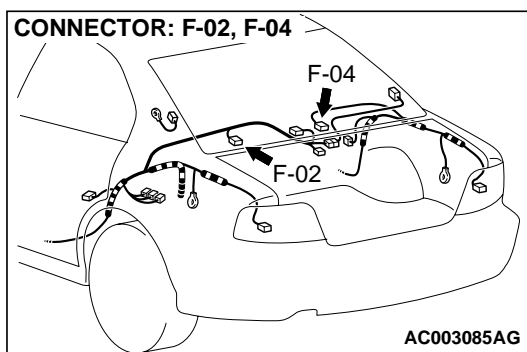
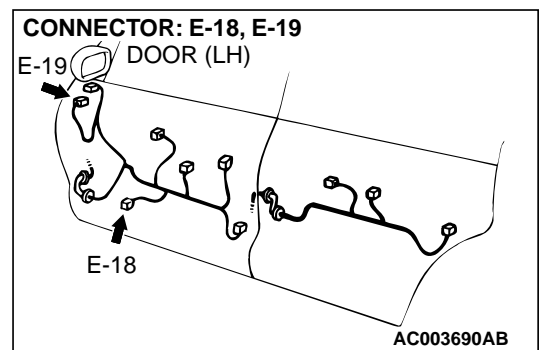
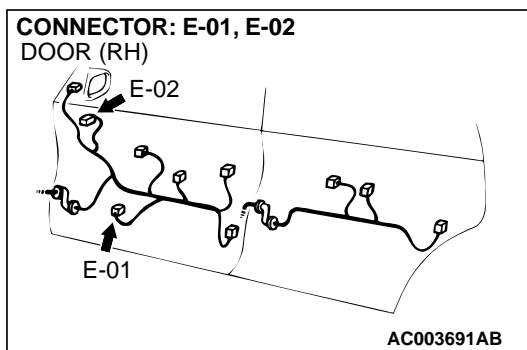
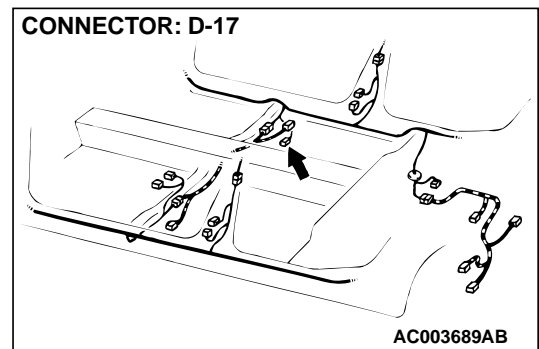
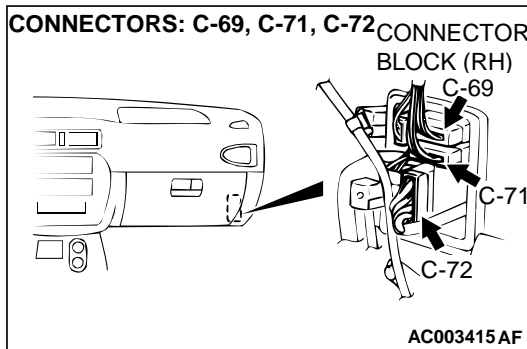
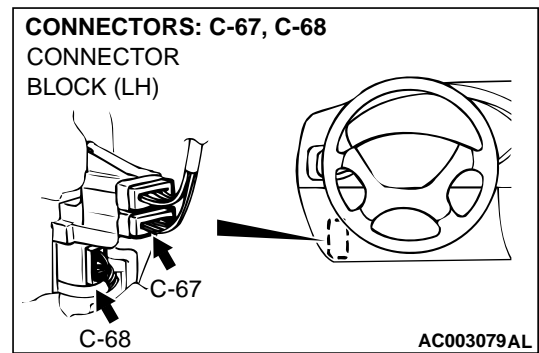
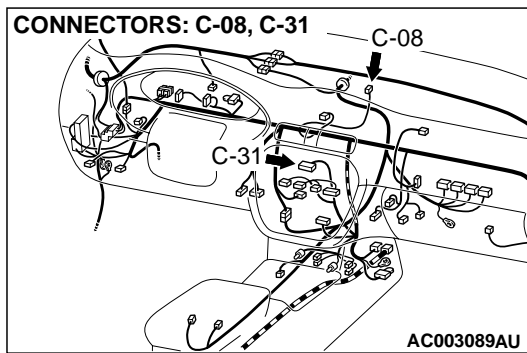
Speaker System Circuit <Vehicles with Four Speakers>



Speaker System Circuit <Vehicles with Seven Speakers>



AC003977AB



### CIRCUIT OPERATION

- <Vehicles with four speakers>
- The sound is heard from the speaker according to audio signal output from the radio, tape player and CD player.
- <Vehicles with seven speakers>

- The sound signals are sent from the radio, tape player and CD player into the 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 harness wire or connector.
- Malfunction of the radio, tape player and CD player.
- Malfunction of the amplifier <vehicles with seven speakers>.
- Malfunction of the DIN cable <vehicles with seven speakers>.

**DIAGNOSIS****STEP 1A. Check which speaker has no sound on the vehicles with four speakers.**

- (1) Use the speaker test to determine which speaker does not sound.

**Q: Which speaker has no sound on the vehicles with four speakers?**

**Door speaker (LH) :** Go to Step 2.

**Door speaker (RH) :** Go to Step 5.

**Rear speaker (LH) :** Go to Step 8.

**Rear speaker (RH) :** Go to Step 11.

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

- (1) Use the speaker test to determine which speaker does not sound.

**Q: Which speaker has no sound on the vehicles with seven speakers?**

**Door speaker (LH) :** Go to Step 15.

**Door speaker (RH) :** Go to Step 19.

**Rear speaker (LH) :** Go to Step 23.

**Rear speaker (RH) :** Go to Step 27.

**Tweeter (LH) :** Go to Step 31.

**Tweeter (RH) :** Go to Step 35.

**Center speaker :** GO to Step 39.

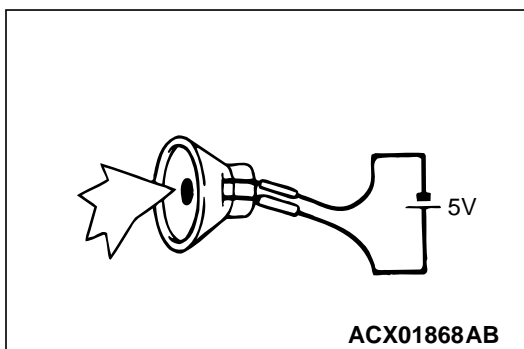
**STEP 2. Check the door speaker (LH).**

- (1) Remove the door speaker (LH).  
 (2) Check that the door speaker (LH) generates noise when a 5-volt voltage is applied on the door speaker (LH) terminal.

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

**YES :** Go to Step 3.

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

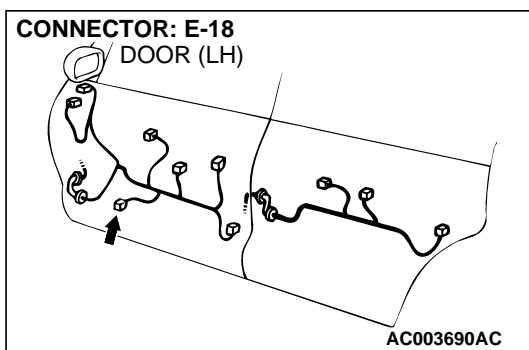
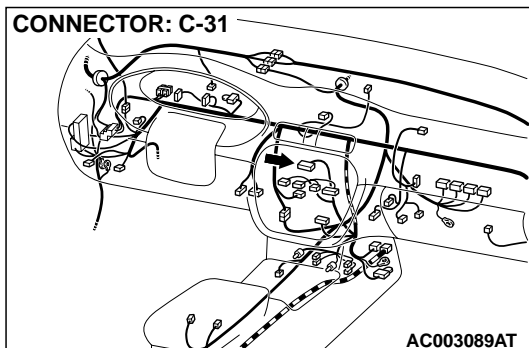


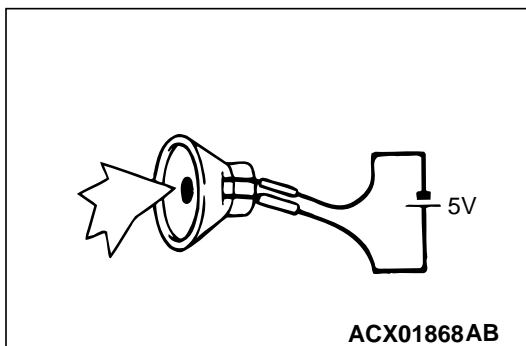
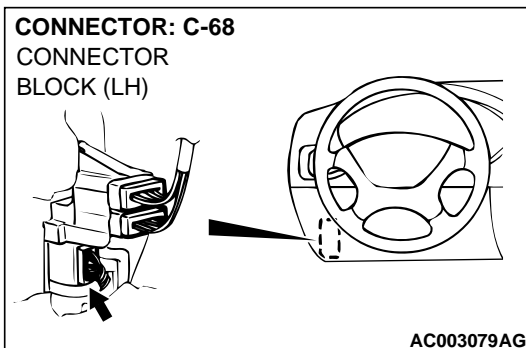
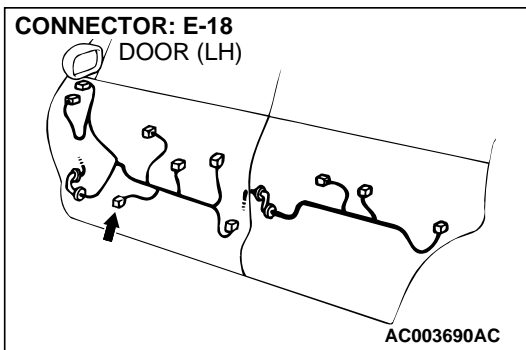
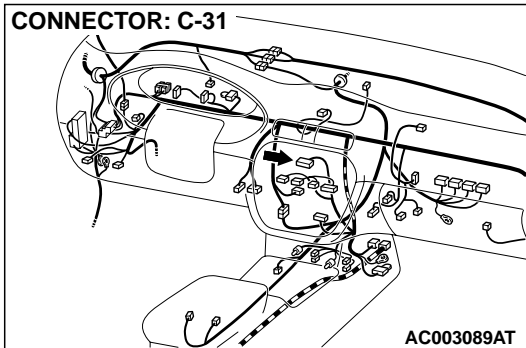
**STEP 3.** Check door speaker (LH) connector E-18 and radio, tape player and CD player connector C-31 for damage.

**Q:** Are harness connectors E-18 and C-31 in good condition?

**YES :** Go to Step 4.

**NO :** Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). The door speaker (LH) should sound.





**STEP 4. Check the harness wires between door speaker (LH) connector E-18 and radio, tape player and CD player connector C-31.**

*NOTE: After inspecting intermediate connector C-68, inspect the wire. If intermediate connector C-68 is damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.*

**Q: Are the harness wires between door speaker (LH) connector E-18 and radio, tape player and CD player connector C-31 in good condition?**

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

**NO :** Repair them. The door speaker (LH) should sound.

**STEP 5. Check the door speaker (RH).**

- (1) Remove the door speaker (RH).
- (2) Check that the door speaker (RH) generates noise when a 5-volt voltage is applied on the door speaker (RH) terminal.

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

**YES :** Go to Step 6.

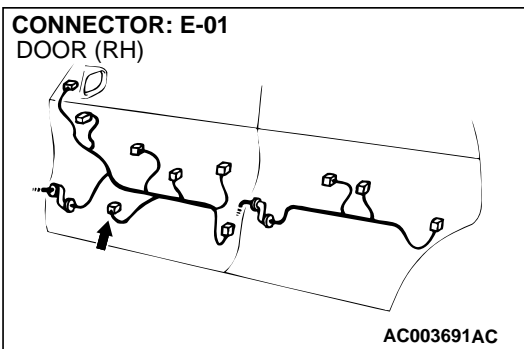
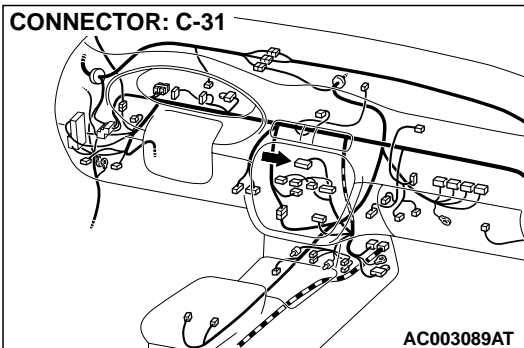
**NO :** Replace the door speaker (RH). The door speaker (RH) should sound.

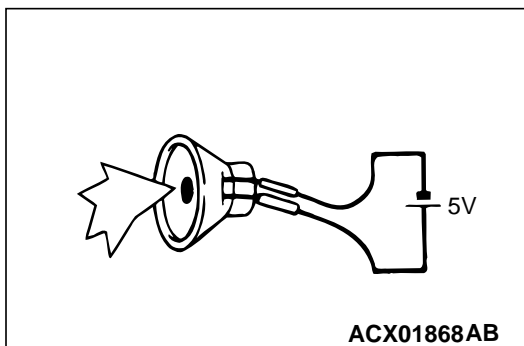
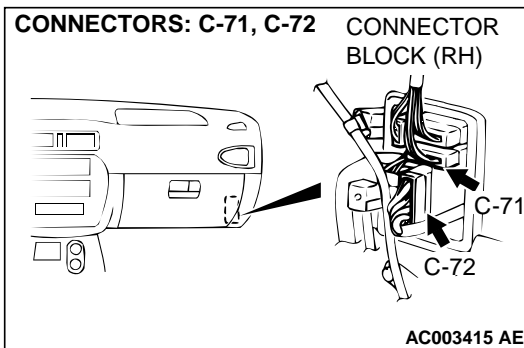
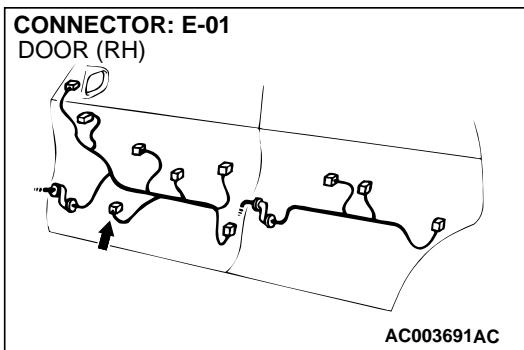
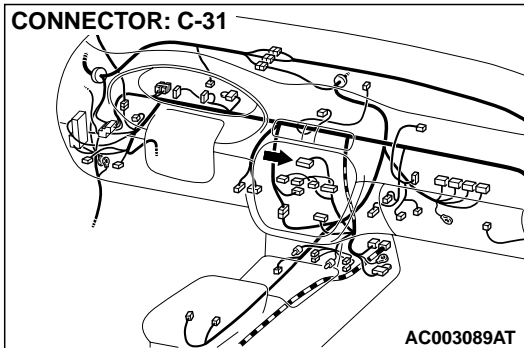
**STEP 6.** Check door speaker (RH) connector E-01 and radio, tape player and CD player connector C-31 for damage.

**Q:** Are harness connectors E-01 and C-31 in good condition?

**YES :** Go to Step 7.

**NO :** Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). The door speaker (RH) should sound.





**STEP 7. Check the harness wires between door speaker (RH) connector E-01 and radio, tape player and CD player connector C-31.**

*NOTE: After inspecting intermediate connector C-72, inspect the wire. If intermediate connector C-72 is damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.*

**Q: Are the harness wires between door speaker (RH) connector E-01 and radio, tape player and CD player connector C-31 in good condition?**

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

**NO :** Repair them. The door speaker (RH) should sound.

**STEP 8. Check the rear speaker (LH).**

- (1) Remove the rear speaker (LH).
- (2) Check that the rear speaker (LH) generates noise when a 5-volt voltage is applied on the rear speaker (LH) terminal.

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

**YES :** Go to Step 9.

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

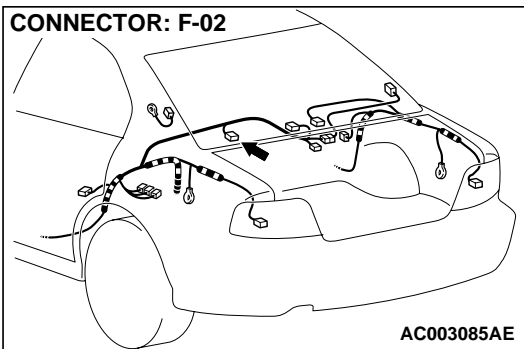
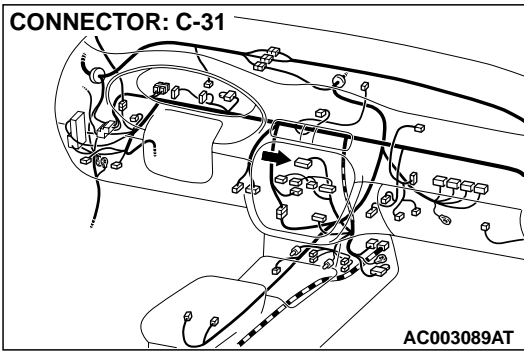


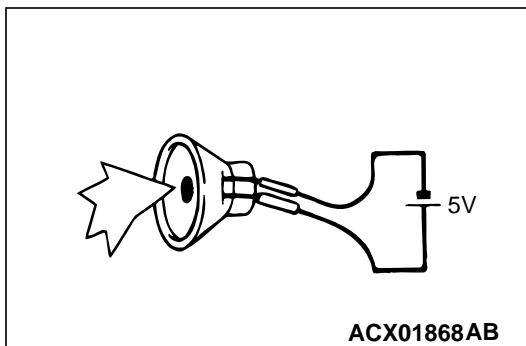
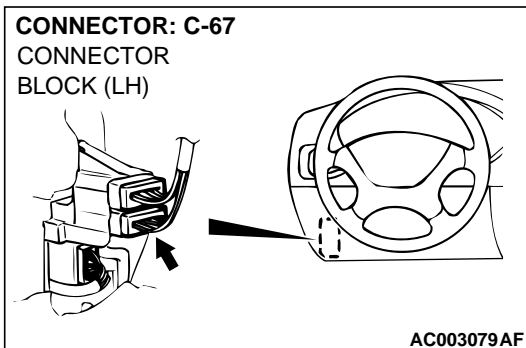
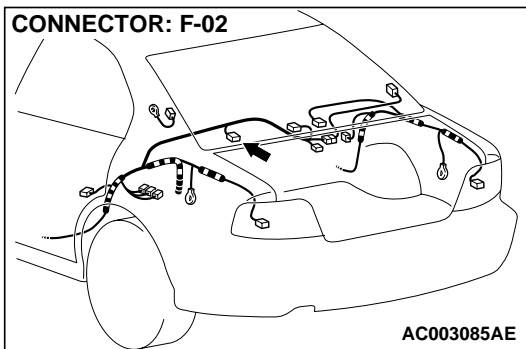
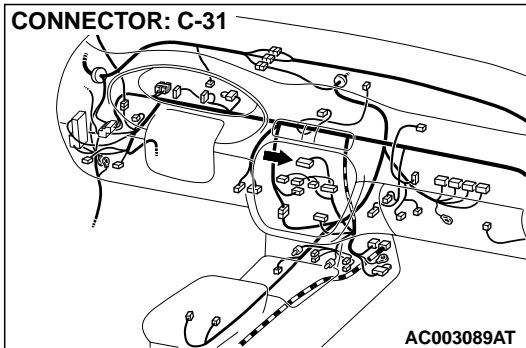
**STEP 9.** Check rear speaker (LH) connector F-02 and radio, tape player and CD player connector C-31 for damage.

**Q:** Are harness connectors F-02 and C-31 in good condition?

**YES :** Go to Step 10.

**NO :** Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). The rear speaker (LH) should sound.





**STEP 10. Check the harness wires between rear speaker (LH) connector F-02 and radio, tape player and CD player connector C-31.**

*NOTE: After inspecting intermediate connector C-67, inspect the wire. If intermediate connector C-67 damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.*

**Q: Are the harness wires between the rear door speaker (LH) connector F-02 and radio, tape player and CD player connector C-31 in good condition?**

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

**NO :** Repair them. The rear door speaker (LH) should sound.

**STEP 11. Check the rear speaker (RH).**

- (1) Remove the rear speaker (RH).
- (2) Check that the rear speaker (RH) generates noise when a 5-volt voltage is applied on the rear speaker (RH) terminal.

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

**YES :** Go to Step 12.

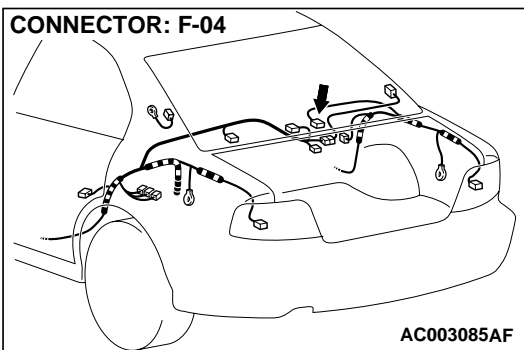
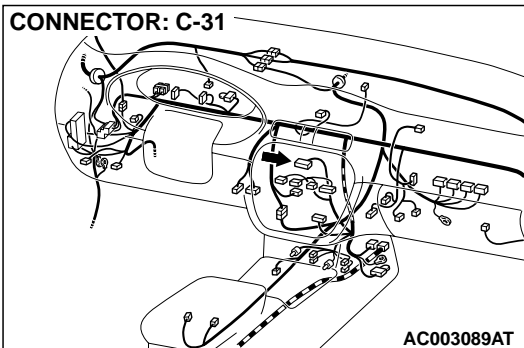
**NO :** Replace the rear speaker (RH). The rear speaker (RH) should sound.

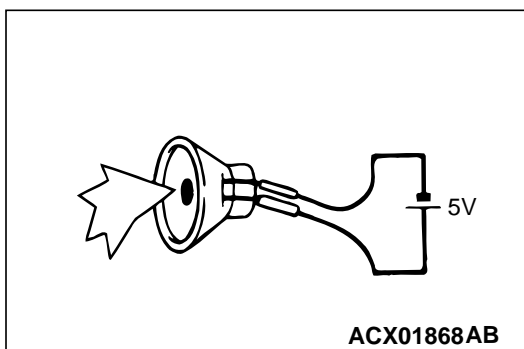
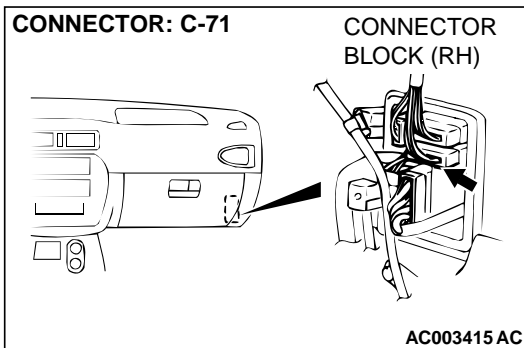
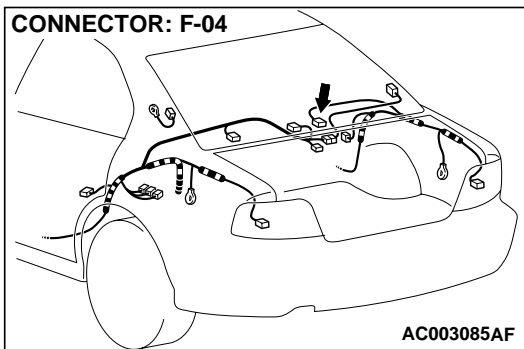
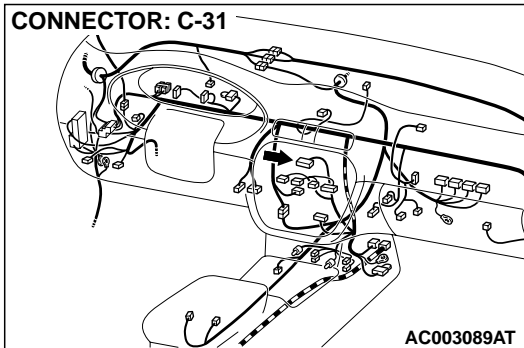
**STEP 12.** Check rear speaker (RH) connector F-04 and radio, tape player and CD player connector C-31 for damage

**Q:** Are harness connectors F-04 and C-31 in good condition?

**YES :** Go to Step 13.

**NO :** Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). The rear door speaker (RH) should sound.





**STEP 13. Check the harness wires between rear speaker (RH) connector F-04 and radio, tape player and CD player connector C-31.**

*NOTE: After inspecting intermediate connector C-71, inspect the wire. If intermediate connector C-71 is damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.*

**Q: Are the harness wires between rear speaker (RH) connector F-04 and radio, tape player and CD player connector C-31 in good condition?**

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

**NO :** Repair them. The rear speaker (RH) should sound.

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

- (1) Remove the door speaker (LH).
- (2) Check that the door speaker (LH) generates noise when a 5-volt voltage is applied on the door speaker (LH) terminal.

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

**YES :** Go to Step 16.

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

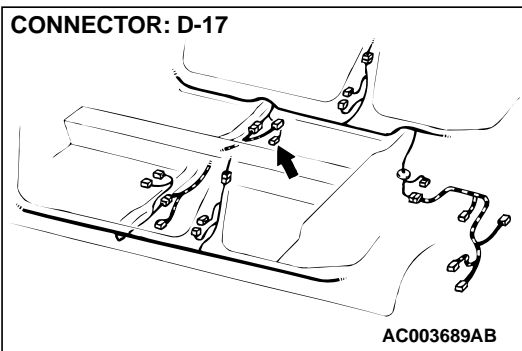
**STEP 16.** Check door speaker (LH) connector E-18 and radio and audio amplifier connector D-17 for damage.

**Q:** Are harness connectors D-17 and E-18 in good condition?

**YES :** Go to Step 17.

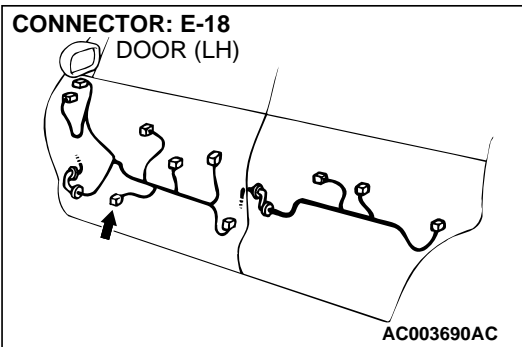
**NO :** Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). The door speaker (LH) should sound.

CONNECTOR: D-17



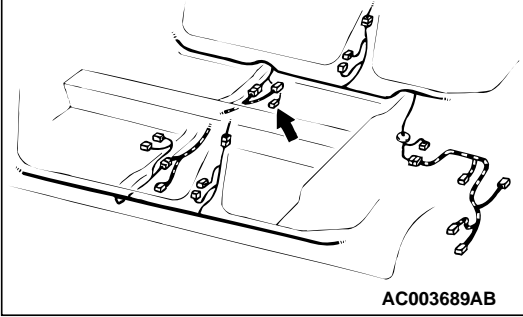
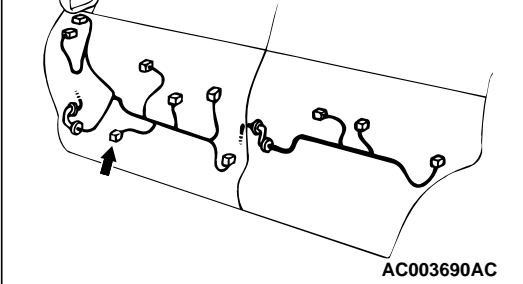
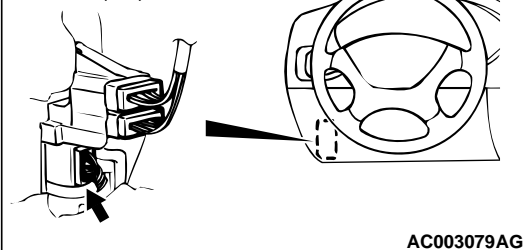
AC003689AB

CONNECTOR: E-18  
DOOR (LH)

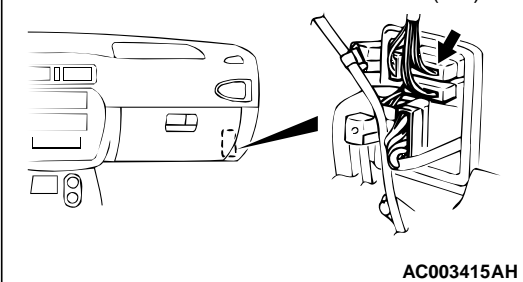


AC003690AC

CONNECTOR: D-17

CONNECTOR: E-18  
DOOR (LH)CONNECTOR: C-68  
CONNECTOR  
BLOCK (LH)

CONNECTOR: C-69

CONNECTOR  
BLOCK (RH)

**STEP 17. Check the harness wires between door speaker (LH) connector E-18 and amplifier connector D-17.**

*NOTE: After inspecting intermediate connectors C-68 and C-69, inspect the wire. If intermediate connectors C-68 and C-69 is damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.*

**Q: Are the harness wires between door speaker (LH) connector E-18 and amplifier connector D-17 in good condition?**

**YES :** Go to Step 18.

**NO :** Repair them. The door speaker (LH) should sound.

**STEP 18. Check the DIN cable between amplifier and radio, tape player and CD player.**

**Q: Is the DIN cable between amplifier and radio, tape player and CD player in good condition?**

**YES :** Repair or replace the amplifier or radio, tape player and CD player. The door speaker (LH) should sound.

**NO :** Repair or replace it. The door speaker (LH) should sound.

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

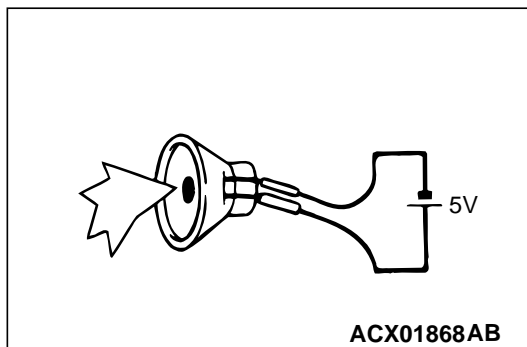
(1) Remove the door speaker (RH).

(2) Check that the door speaker (RH) generates noise when a 5-volt voltage is applied on the door speaker (RH) terminal.

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

**YES :** Go to Step 20.

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

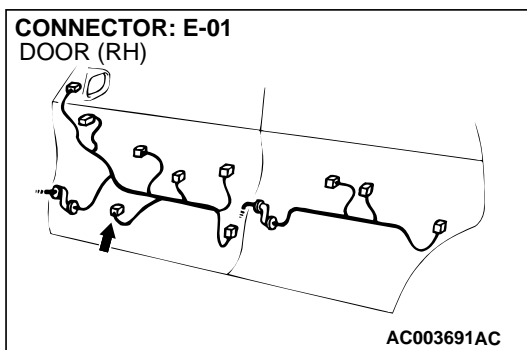
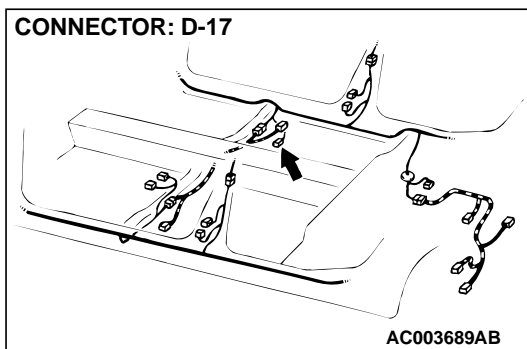


**STEP 20. Check door speaker (RH) connector E-01 and amplifier connector D-17 for damage.**

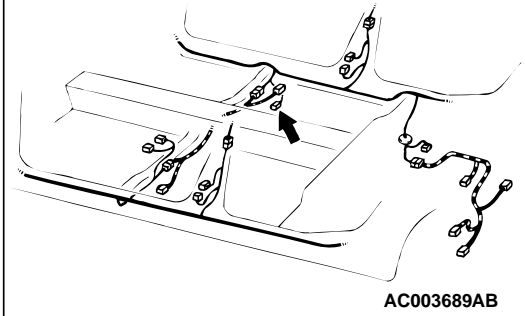
**Q: Are harness connectors D-17 and E-01 in good condition?**

**YES :** Go to Step 21.

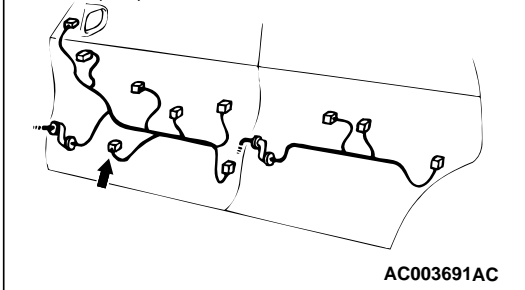
**NO :** Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). The door speaker (RH) should sound.



CONNECTOR: D-17

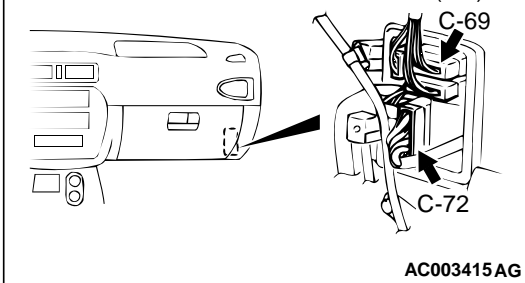


AC003689AB

CONNECTOR: E-01  
DOOR (RH)

AC003691AC

CONNECTORS: C-69, C-72

CONNECTOR  
BLOCK (RH)

AC003415AG

**STEP 21. Check the harness wires between door speaker (RH) connector E-01 and amplifier connector D-17.**

*NOTE: After inspecting intermediate connectors C-69 and C-72, inspect the wire. If intermediate connectors C-69 and C-72 is damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.*

**Q: Are the harness wires between door speaker (RH) connector E-01 and amplifier connector D-17 in good condition?**

**YES :** Go to Step 22.

**NO :** Repair them. The door speaker (RH) should sound.

**STEP 22. Check the DIN cable between amplifier and radio, tape player and CD player.**

**Q: Is the DIN cable in good condition?**

**YES :** Repair or replace the amplifier or radio, tape player and CD player. The door speaker (RH) should sound.

**NO :** Repair or replace it. The door speaker (RH) should sound.



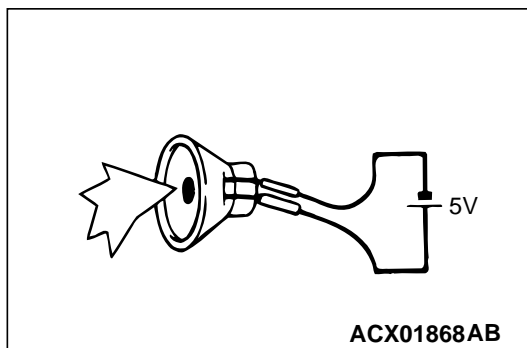
**STEP 23. Check the rear speaker (LH).**

- (1) Remove the rear door speaker (LH).
- (2) Check that the rear door speaker (LH) generates noise when a 5-volt voltage is applied on the rear speaker (LH) terminal.

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

**YES :** Go to Step 24.

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

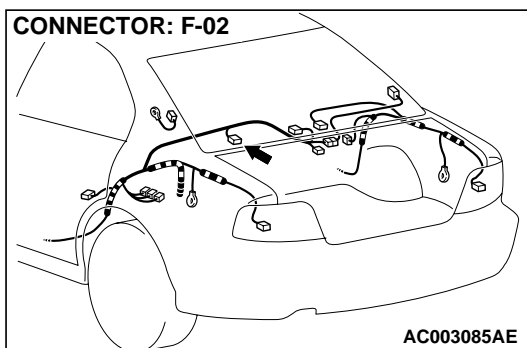
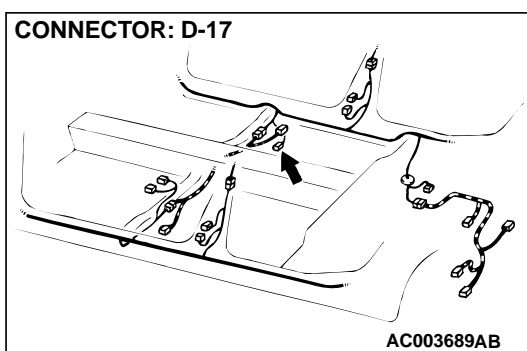


**STEP 24. Check rear speaker (LH) connector F-02 and amplifier connector D-17 for damage.**

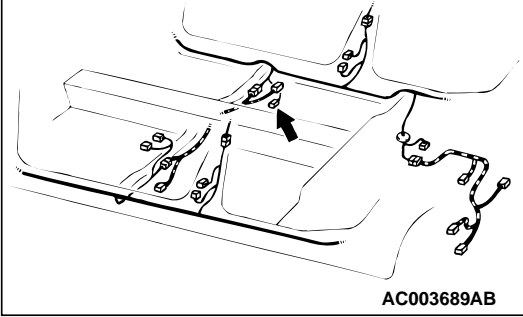
**Q: Are harness connectors D-17 and F-02 in good condition?**

**YES :** Go to Step 25.

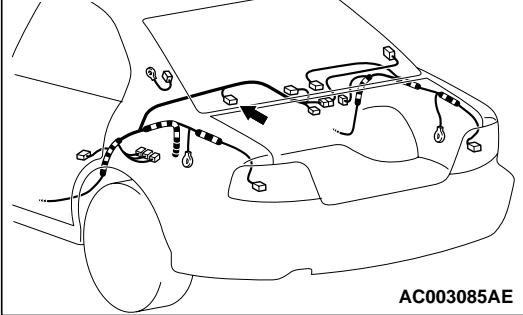
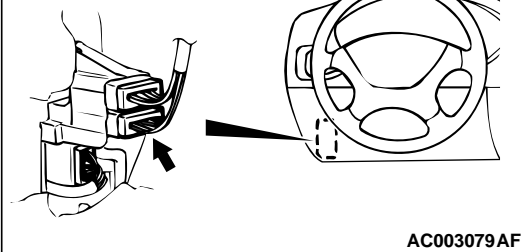
**NO :** Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). The rear speaker (LH) should sound.



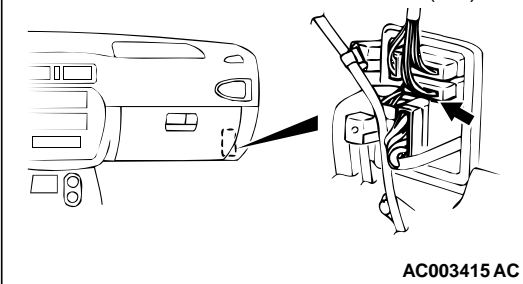
CONNECTOR: D-17



CONNECTOR: F-02

CONNECTOR: C-67  
CONNECTOR  
BLOCK (LH)

CONNECTOR: C-71

CONNECTOR  
BLOCK (RH)

**STEP 25. Check the harness wires between rear speaker (LH) connector F-02 and amplifier connector D-17.**

*NOTE: After inspecting intermediate connectors C-67 and C-71, inspect the wire. If intermediate connectors C-67 and C-71 is damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.*

**Q: Are the harness wires between rear speaker (LH) connector F-02 and amplifier connector D-17 in good condition?**

**YES :** Go to Step 26.

**NO :** Repair them. The rear door speaker (LH) should sound.

**STEP 26. Check the DIN cable between amplifier and radio, tape player and CD player.**

**Q: Is the DIN cable in good condition?**

**YES :** Repair or replace the amplifier or radio, tape player and CD player. The rear speaker (LH) should sound.

**NO :** Repair or replace it. The rear speaker (LH) should sound.

**STEP 27. Check the rear speaker (RH).**

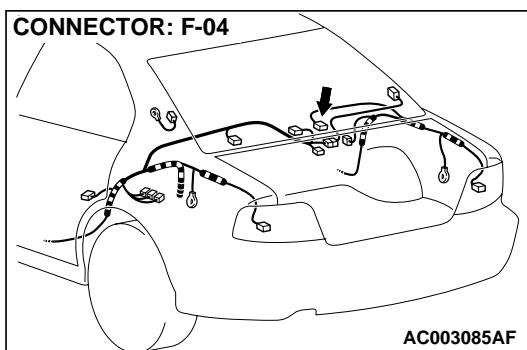
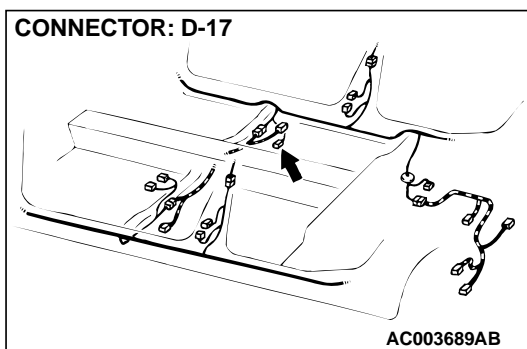
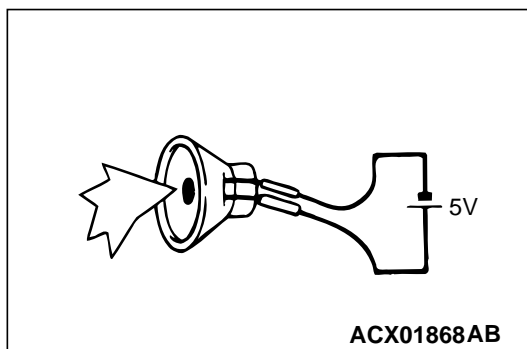
(1) Remove the rear speaker (RH).

(2) Check that the rear speaker (RH) generates noise when a 5-volt voltage is applied on the rear door speaker (RH) terminal.

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

**YES :** Go to Step 28.

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

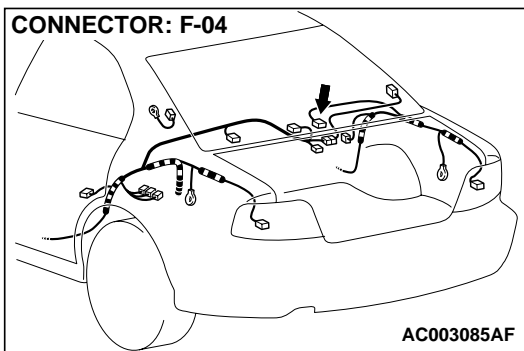
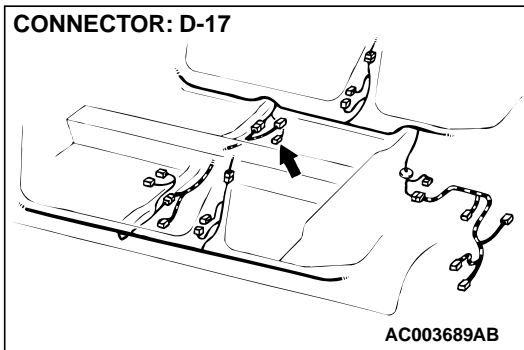


**STEP 28. Check rear speaker (RH) connector F-04 and amplifier connector D-17 for damage.**

**Q: Are harness connectors D-17 and F-04 in good condition?**

**YES :** Go to Step 29.

**NO :** Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). The rear speaker (RH) should sound.



**STEP 29. Check the harness wire between door speaker (RH) connector F-04 and audio amplifier connector D-17.**

**Q: Is the harness wire between rear speaker (RH) connector F-04 and amplifier connector D-17 in good condition?**

**YES :** Go to Step 30.

**NO :** Repair it. The rear speaker (RH) should sound.

**STEP 30. Check the DIN cable between amplifier and radio, tape player and CD player.**

**Q: Is the DIN cable in good condition?**

**YES :** Repair or replace the amplifier or radio, tape player and CD player. The rear speaker (RH) should sound.

**NO :** Repair or replace it. The rear speaker (RH) should sound.

**STEP 31. Check the tweeter (LH).**

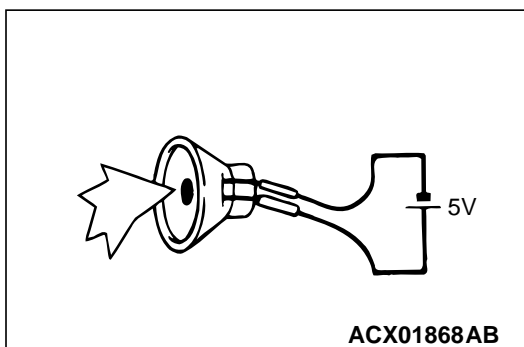
(1) Remove the tweeter (LH).

(2) Check that the tweeter (LH) generates noise when a 5-volt voltage is applied on the tweeter (LH) terminal.

**Q: Is the tweeter (LH) generating noise?**

**YES :** Go to Step 32.

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



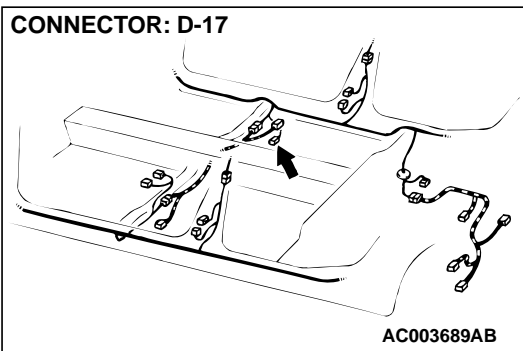
**STEP 32.** Check tweeter (LH) connector E-19 and amplifier connector D-17 for damage.

**Q:** Are harness connectors D-17 and E-19 in good condition?

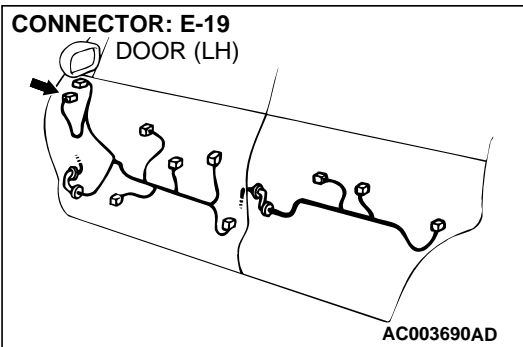
**YES :** Go to Step 33.

**NO :** Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). The tweeter (LH) should sound.

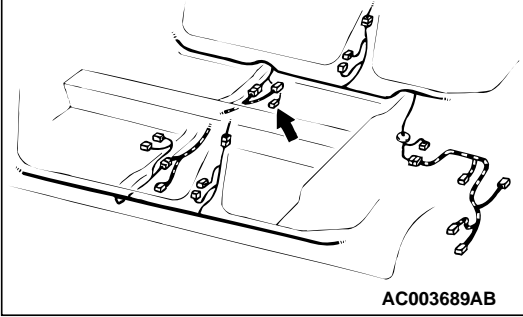
CONNECTOR: D-17



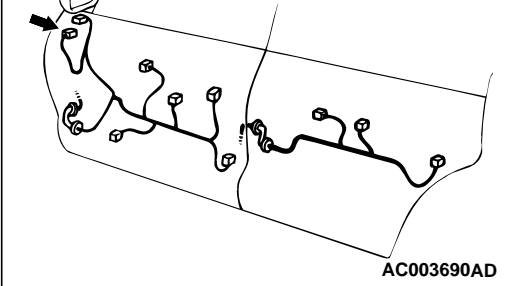
CONNECTOR: E-19  
DOOR (LH)



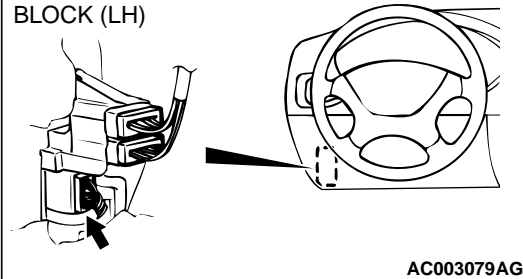
CONNECTOR: D-17



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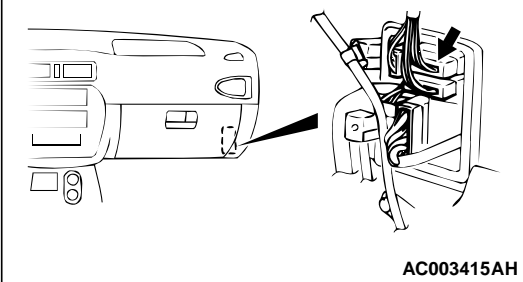
CONNECTOR: E-19  
DOOR (LH)

AC003690AD

CONNECTOR: C-68  
CONNECTOR  
BLOCK (LH)

AC003079AG

CONNECTOR: C-69

CONNECTOR  
BLOCK (RH)

AC003415AH

**STEP 33. Check the harness wires between tweeter (LH) connector E-19 and amplifier connector D-17.**

*NOTE: After inspecting intermediate connectors C-68 and C-69, inspect the wire. If intermediate connectors C-68 and C-69 is damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.*

**Q: Are the harness wires between tweeter (LH) connector E-19 and amplifier connector D-17 in good condition?**

**YES :** Go to Step 34 .

**NO :** Repair them. The tweeter (LH) should sound.

**STEP 34. Check the DIN cable between amplifier and radio, tape player and CD player.**

**Q: Is the DIN cable in good condition?**

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

**NO :** Repair or replace it. The tweeter (LH) should sound.

**STEP 35. Check the tweeter (RH).**

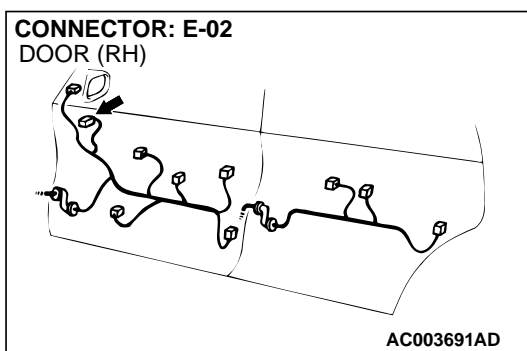
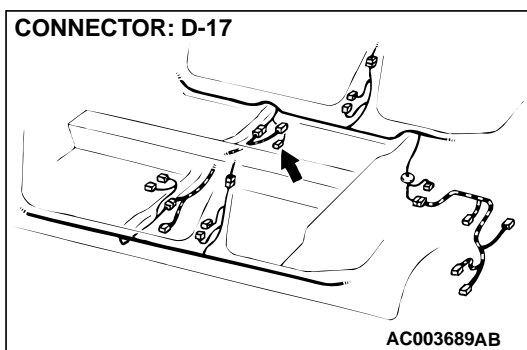
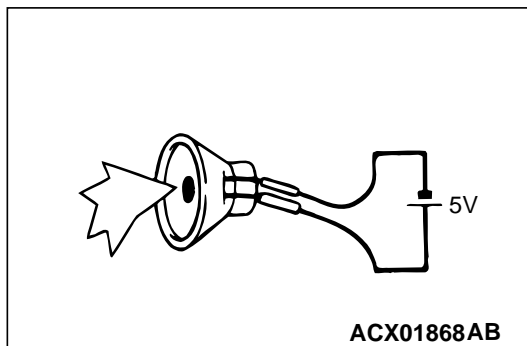
(1) Remove the tweeter (RH).

(2) Check that the tweeter (RH) generates noise when a 5-volt voltage is applied on the tweeter (RH) terminal.

**Q: Is the tweeter (RH) generating noise?**

**YES :** Go to Step 36 .

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



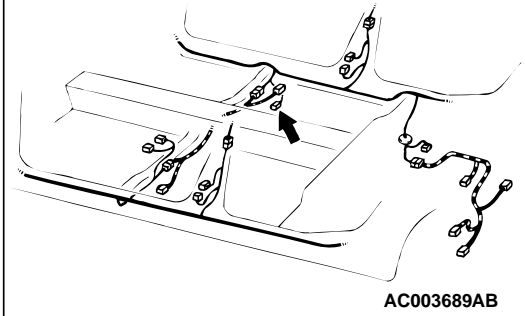
**STEP 36. Check tweeter (RH) connector E-02 and amplifier connector D-17 for damage.**

**Q: Are harness connectors D-17 and E-02 in good condition?**

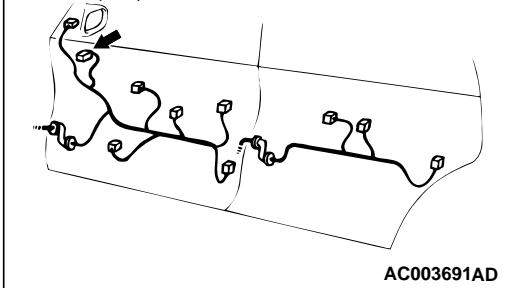
**YES :** Go to Step 37 .

**NO :** Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). The tweeter (RH) should sound.

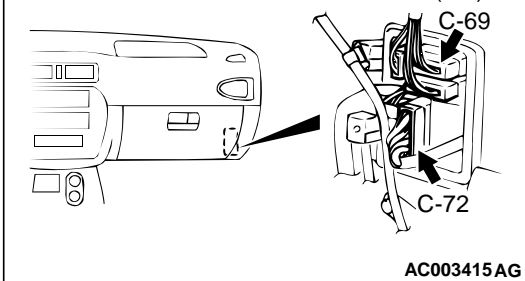
CONNECTOR: D-17



AC003689AB

CONNECTOR: E-02  
DOOR (RH)

AC003691AD

CONNECTORS: C-69, C-72  
CONNECTOR  
BLOCK (RH)

AC003415AG

**STEP 37. Check the harness wires between tweeter (RH) connector E-02 and amplifier connector D-17.**

*NOTE: After inspecting intermediate connectors C-69 and C-72, inspect the wire. If intermediate connectors C-69 and C-72 is damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.*

**Q: Are the harness wires between tweeter (RH) connector E-02 and amplifier connector D-17 in good condition?**

**YES :** Go to Step 38 .

**NO :** Repair them. The tweeter (RH) should sound.

**STEP 38. Check the DIN cable between amplifier and radio, tape player and CD player.**

**Q: Is the DIN cable in good condition?**

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



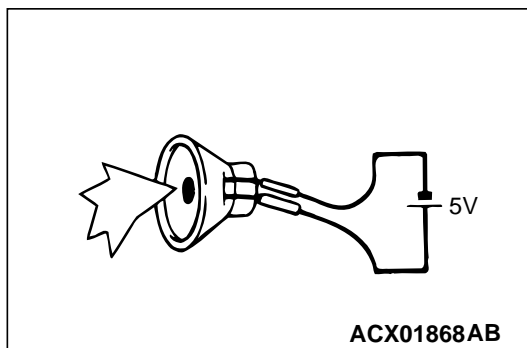
**STEP 39. Check the center speaker.**

- (1) Remove the center speaker.
- (2) Check that the center speaker generates noise when a 5-volt voltage is applied on the center speaker terminal.

**Q: Is the center speaker generating noise?**

**YES** : Go to Step 40 .

**NO** : Replace the center speaker. The center speaker should sound.

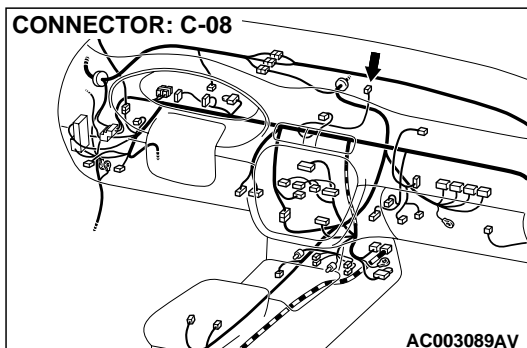
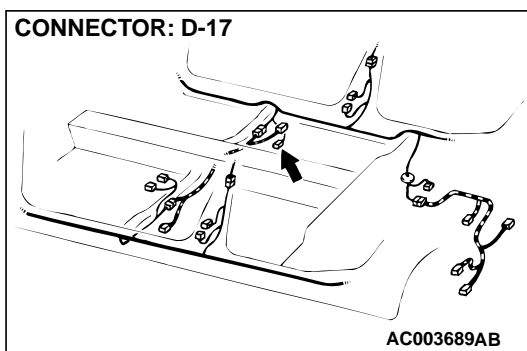


**STEP 40. Check center speaker connector C-08 and amplifier connector D-17 for damage.**

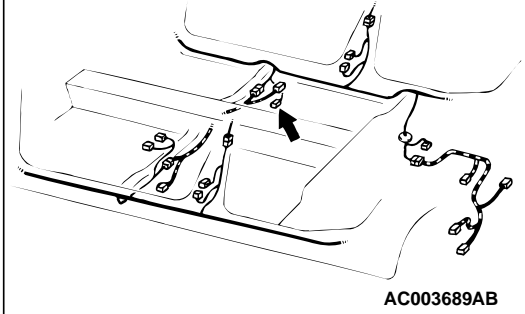
**Q: Are harness connectors D-17 and C-08 in good condition?**

**YES** : Go to Step 41 .

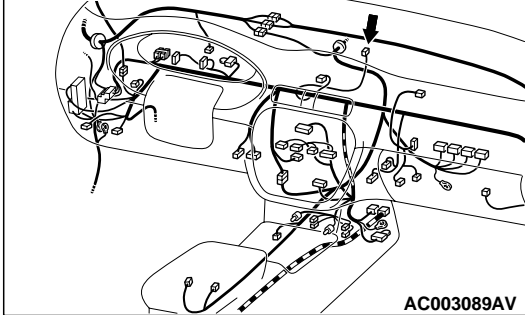
**NO** : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection. The tweeter (RH) should sound [P.00E-2](#).



CONNECTOR: D-17



CONNECTOR: C-08



**STEP 41. Check the harness wires center speaker connector C-08 and amplifier connector D-17.**

**Q: Are the harness wires between center speaker connector C-08 and amplifier connector D-17 in good condition?**

**YES :** Go to Step 42 .

**NO :** Repair them. The center speaker should sound.

**STEP 42. Check the DIN cable between amplifier and radio, tape player and CD player.**

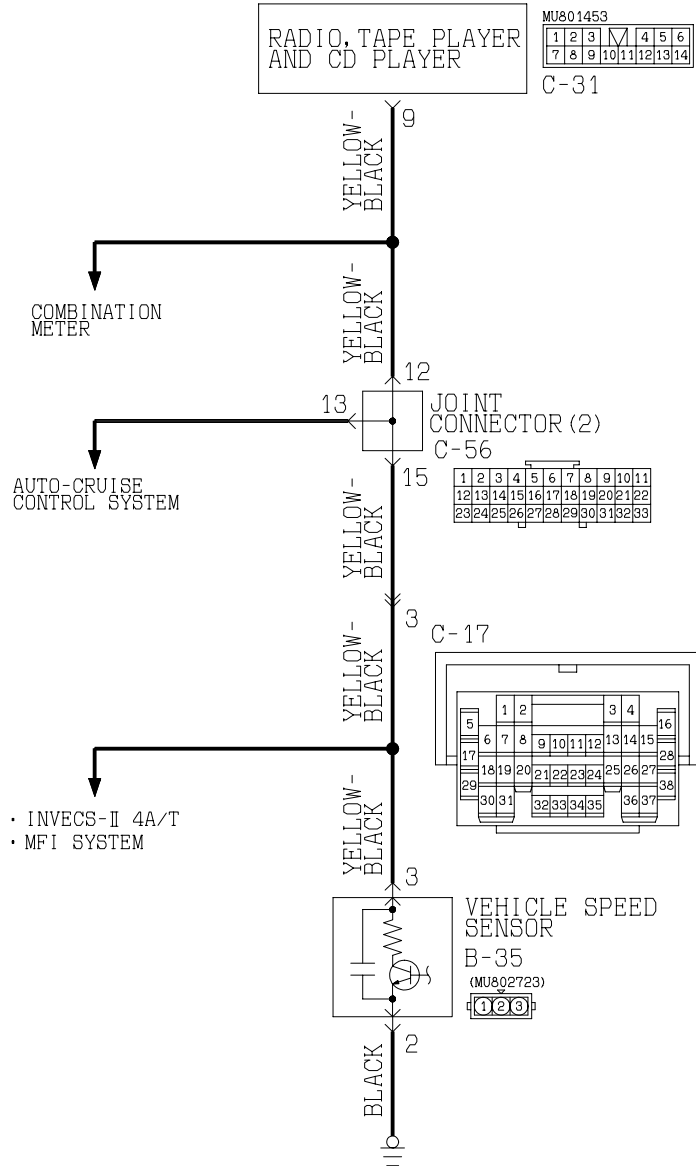
**Q: Is the DIN cable in good condition?**

**YES :** Repair or replace the amplifier or radio, tape player and CD player. The center speaker should sound.

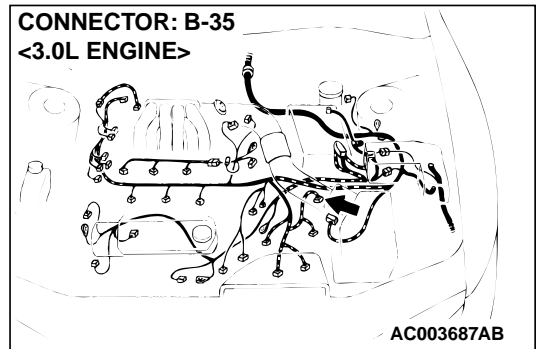
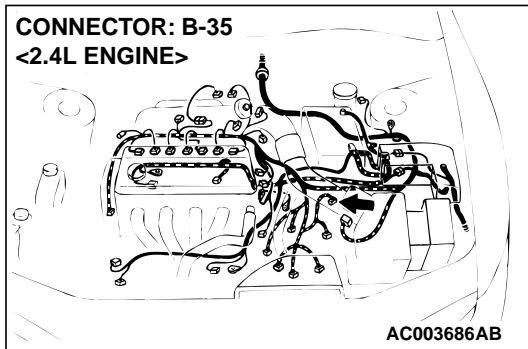
**NO :** Repair or replace it. The center speaker should sound.

Inspection Procedure 4: Sound volume is not changed if the vehicle speed is changed.  
<vehicles with amplifier>

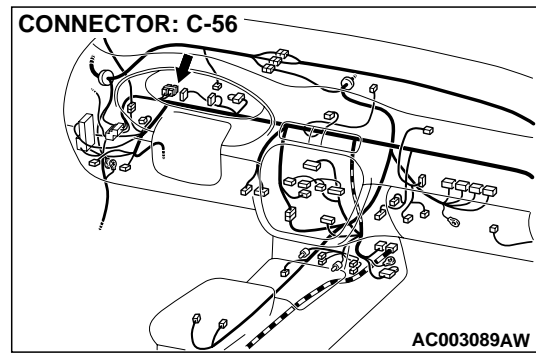
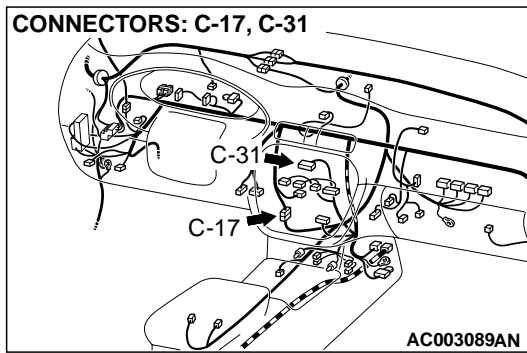
Radio, Tape Player and CD Player to Vehicle Speed Sensor Circuit



AC003978AB



TSB Revision



### SOUND VOLUME IS NOT CHANGED IF THE VEHICLE SPEED

If the vehicle speed signal is transmitted to the radio, tape player and CD player sound volume will be changed.

### TECHNICAL DESCRIPTION (COMMENT)

If the radio, tape player and CD player normally, the cause is probably a faulty radio, tape player and CD player to vehicle speed sensor circuit.

*NOTE: The vehicle speed signal is shared by the MFI system, automatic transaxle, combination meter. If a problem is not resolved, observe the troubleshooting. (Refer to GROUP 13A, Diagnosis P.13A-5, Refer to GROUP 13B, Diagnosis P.13B-4, refer to GROUP 23A, Automatic Transaxle Diagnosis P.23A-13.*

### TROUBLESHOOTING HINTS

- Damaged harness wire or connector.
- Malfunction of the vehicle speed sensor.
- Malfunction of the radio, tape player and CD player.

### DIAGNOSIS

#### Required Special Tools:

- MB991223: Harness set

#### STEP 1. Check the combination meter.

**Q:** Does the combination meter (speedometer) operate normally?

**YES :** Go to Step 2.

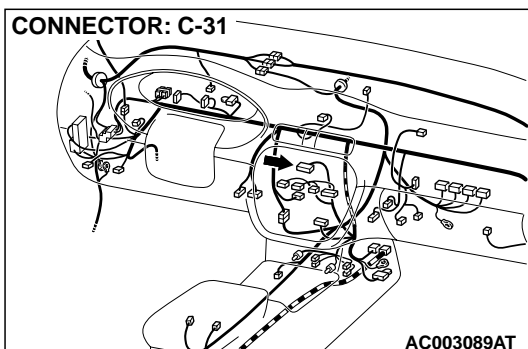
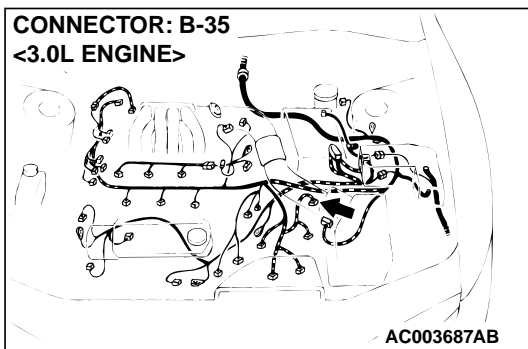
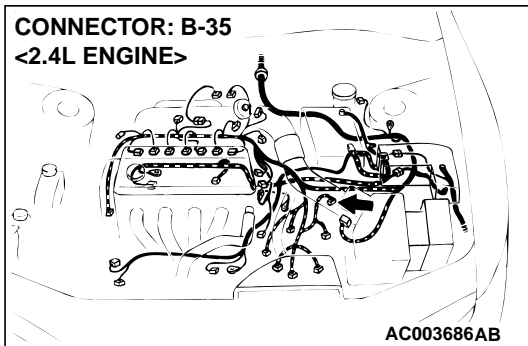
**NO :** Refer to [P.54A-28](#).

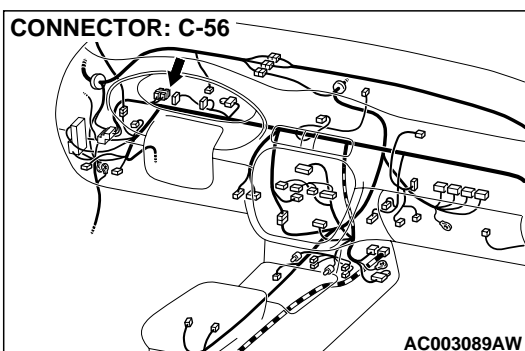
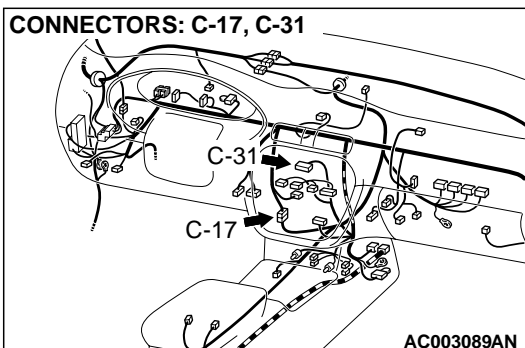
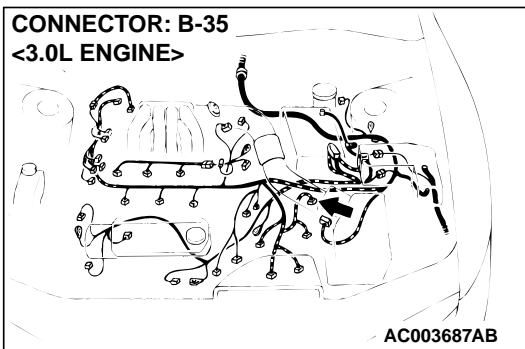
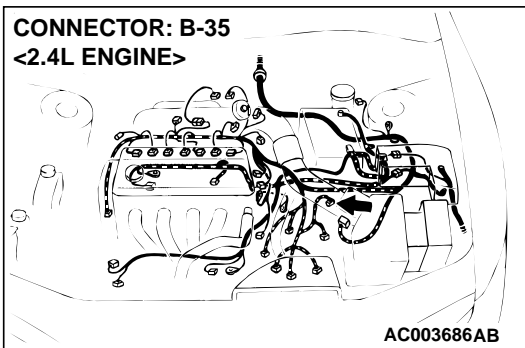
**STEP 2.** Check the radio, tape player and CD player connector C-31 and vehicle speed sensor connector B-35 for damage.

**Q:** Are radio, tape player and CD player connector C-31 and vehicle speed sensor connector B-35 in good condition?

**YES :** Go to Step 4 .

**NO :** Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). The sound volume should depend on vehicle speed.





**STEP 3.** Check the harness wires between radio, tape player and CD player connector C-31 and vehicle speed sensor connector B-35.

*NOTE:* After inspecting intermediate connector C-17 and C-56, inspect the wires. If intermediate connector C-17 and C-56 are damaged, repair or replace them. Refer to GROUP 00E, *Harness Connector Inspection* P.00E-2.

**Q:** Are the harness wires between radio, tape player and CD player connector C-31 and vehicle speed sensor connector B-35 in good condition?

**YES :** Repair or replace the radio, tape player and CD player. The sound volume should depend on vehicle speed.

**NO :** Repair them. The sound volume should depend on vehicle speed.

**Inspection Procedure 5: Noise appears at certain places when traveling (AM).**

**DIAGNOSIS**

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

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

**YES :** Go to Step 3 .

**NO :** Go to Step 2.

**STEP 2. After taking the following measures to prevent the noise, check that no noise appears.**

- (1) Change to a different station with a stronger wave to boost resistance to interference.
- (2) Suppress high tones to reduce noise.
- (3) Extend antenna completely.

**Q: Do the following measures eliminate the noise?**

**YES :** The following causes can be considered.

**NO :** Go to Step 4.

**STEP 3. Ask the owner about the state of the noise.**

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

**Q: Which is the noise, vehicle noise or external noise?**

**Vehicle noise :** It may not be possible to prevent noise if the signal is weak.

**External noise :** In almost all cases, prevention on the receiver side is impossible. Weak signals especially are susceptible to interference. Go to Step 4 .

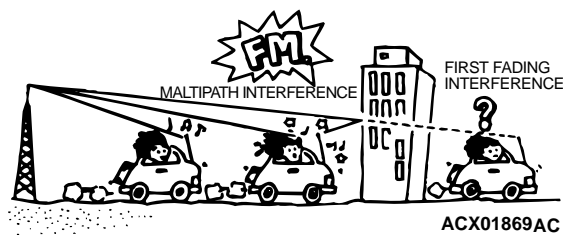
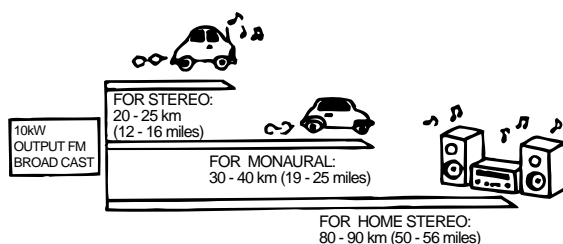
**STEP 4. Check that there is no noise.**

**Q: Does noise still exist?**

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

**NO :** Normal

**Inspection Procedure 6: Noise appears at certain places when traveling (FM).**



**DIAGNOSIS**

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

1. The signal becomes weak as the distance from the station's transmission antenna increases. This may depend on the signal strength of the transmitting station and intervening geographical formation of buildings. Generally speaking, the area of good reception is approximately 20 – 25 km (12 – 16 miles) for stereo reception, and 30 – 40 km (19 – 25 miles) for monaural reception.

2. The signal becomes weak when an area of shadow from the transmitting antenna (places where there are obstructions such as mountains or buildings between the station transmitter and the vehicle), and noise will appear. <This is called first fading, and gives a steady buzzing noise.>
  3. If a direct signal hits the antenna at the same time as a signal reflected by obstructions such as mountains or buildings, interference of the two signals will generate noise. During traveling, noise will appear each time the vehicle's antenna passes through this kind of obstructed area. The strength and interval of the noise varies according to the signal strength and the conditions of deflection. <This is called multipath noise, and is a repetitive buzzing.>
  4. Since FM stereo transmission and reception has a weaker field than monaural, it is often accompanied by a hissing noise.
- After taking measures to prevent the noise, check that no noise occurs.
5. Change to a different station with a stronger wave to boost resistance to interference.
  6. Suppress high tones to reduce noise.
  7. Extend antenna completely.
- If there is noise, the following causes can be considered.
8. If due to vehicle noise: It may not be possible to prevent noise if the signal is weak.
  9. If due to external noise: In almost all cases, prevention on the receiver side is impossible. Weak signals especially are susceptible to interference.
- If there is more noise than on radios in other vehicles, find out the noise condition and the name and frequency of the receiving stations from the owner, and consult with the radio manufacturer's service center.

---

### Inspection Procedure 7: Mixed with noise, only at night (AM).

---

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

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

*NOTE: Beat sound\*: Two signals close in frequency interfere with each other, creating a repetitious high-pitched sound. This sound is generated not only by sound signals but electrical waves as well.*

2. Factors due to vehicles noise: Generator noise may be a cause.

### DIAGNOSIS

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

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

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

---

#### STEP 2. Check that the following actions disappear the noise.

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

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

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

---

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

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

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



**Inspection Procedure 8: Broadcasts can be heard but both AM and FM have a lot of noise.**

**DIAGNOSIS**

**STEP 1. Check that the noise occurs when the engine is stopped or the engine is running.**

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

**When the engine is stopped :** Go to Step 2.

**When the engine is running :** Check the vehicle's noise suppressor. (Refer to Inspection Procedure 10 [P.54A-130.](#))

**STEP 2. Check that the following actions disappear the noise.**

- (1) Tune to a station with a stronger wave.
- (2) Extend the antenna completely (Mast antenna).
- (3) Adjust the sound quality to suppress high tones.

**Q: Is the noise eliminated?**

**YES :** Consult the radio manufacturer's service center.

**NO :** Go to Step 3.

**STEP 3. Check that the radio is correctly grounded.**

**Q: Is the radio correctly grounded?**

**YES :** Go to Step 4.

**NO :** Consult the radio manufacturer's service center.

**STEP 4. Check that the antenna plug is properly connected to the radio.**

**Q: Is the antenna plug properly connected to the radio?**

**YES :** Go to Step 7.

**NO :** Go to Step 5.

**STEP 5. Check that the noise is eliminated when the antenna plug is properly attached.**

**Q: Is the noise eliminated?**

**YES :** Consult the radio manufacturer's service center.

**NO :** Go to Step 6.

**STEP 6. Check that the antenna is in good condition and is properly mounted.**

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

**YES :** Consult the radio manufacturer's service center.

**NO :** Go to Step 7.

**STEP 7. Clean the antenna plug and ground wire mounting area. Mount the antenna securely.**

*NOTE: Noise encountered during FM reception only due to differences in FM and AM system, FM is not as susceptible as AM to interference from engines, power lines, lighting, etc. On the other hand, due to the characteristics of FM waves, there are sometimes cases of noise or distortion which are generated by typical noise interference (first fading and multipath). (Refer to Inspection Procedure 6 [P.54A-127.](#)) <Noise (hissing) occurs in weak signal areas such as mountainous regions, but this is not due to a problem with the radio.>*

*NOTE: Furthermore, the amount of interference will be comparatively less for vehicles equipped with a diversity antenna system\*. If there is an equivalent amount of distortion in vehicles or radios of the same type, then differences will be because of differences in antenna systems, and this should be explained to the user.*

*NOTE: Diversity antenna system\*: A system where two types of antenna (glass main antenna and glass sub antenna) are equipped and the antenna that provides the best reception can be selected.*

**Q: Is the antenna in good condition?**

**YES :** Consult the radio manufacturer's service center.

**NO :** Clean or repair it. Check the noise is eliminated. If the noise is not eliminated, consult the radio manufacturer's service center.

**Inspection Procedure 9: There is more noise on either AM or FM.**

**DIAGNOSIS**

There is much noise only on AM. Due to differences

in AM and FM systems, AM is more susceptible to noise interference.

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

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

**Q: Is there noise in the above states?**

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

**STEP 2. Continue to check for static; when static is detected, check for the conditions listed above.****Q: Is there noise in the state described in Step 1?**

- YES** : Go to Step 3.

**STEP 3. Check noise prevention on the radio side is difficult.****Q: Is the noise level worse than other radios?**

**YES** : Consult a service center. Noise encountered during FM reception only. Due to differences in FM and AM systems, FM is not as susceptible as AM to interference from engines, power lines, lighting, etc. On the other hand, due to the characteristics of FM waves, there are sometimes cases of noise or distortion which are generated by typical noise interference (first fading and multipath). (Refer to Inspection Procedure 8 P.54A-129.) <Noise (hissing) occurs in weak signal areas such as mountainous regions, but this is not due to Furthermore, the amount of interference will be comparatively less for vehicles equipped with a diversity antenna system\*. If there is an equivalent amount of distortion in vehicles or radios of the same type, then differences will be because of differences in antenna systems, and this should be explained to the user. a problem with the radio. >Furthermore, the amount of interference will be comparatively less for vehicles equipped with a diversity antenna system\*. If there is an equivalent amount of distortion in vehicles or radios of the same type, then differences will be because of differences in antenna systems, and this should be explained to the user.

**NO** : If the noise level is roughly the same as other radios, there is no action to be taken.

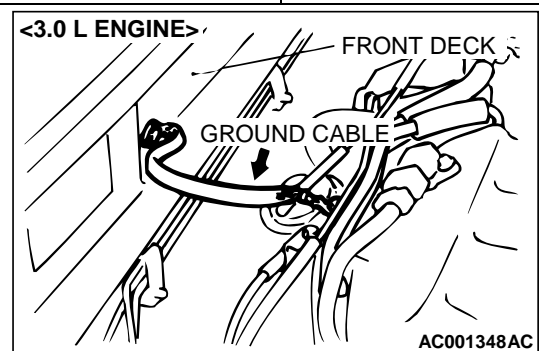
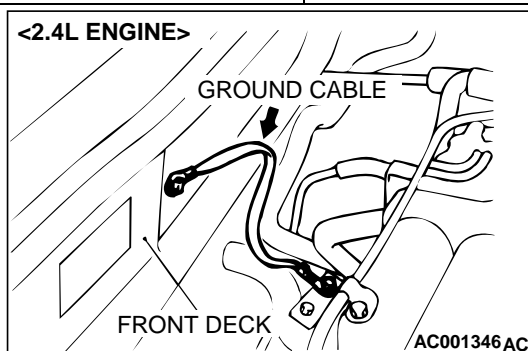
**Inspection Procedure 10: There is noise when starting the engine.****DIAGNOSIS****⚠ CAUTION**

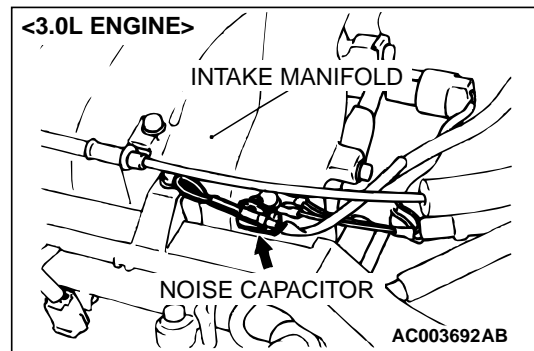
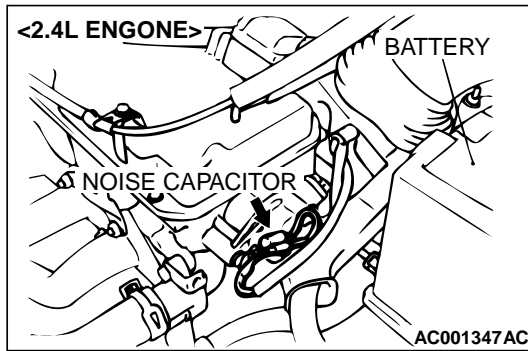
- Connecting a high tension cable to the noise filter may destroy the noise filter and should never be done.
- Check that there is no external noise. Since failure to do this may result in an incorrect diagnosis due to the inability to identify the noise source, this operation must be performed.
- Noise prevention should be performed by suppressing strong sources of noise step by step.

*NOTE: Capacitor: The capacitor does not pass DC current, but as the number of waves increases when it passes AC current, impedance (resistance against AC) decreases, and current flow is facilitated. A noise suppressing capacitor which take advantage of this property is inserted between the power line for the noise source and the ground. This suppresses noise by grounding the noise component (AC or pulse signal) to the body of the vehicle.*

*NOTE: Coil: The coil passes DC current, but impedance rises as the number of waves increases relative to the AC current. A noise suppressing coil which takes advantage of this property is inserted into the power line for the noise source, and works by preventing the noise component from flowing or radiating out of the line.*

NOISE TYPE SOUNDS ARE IN PARENTHESES	CONDITIONS	CAUSE	REMEDY
AM, FM: ignition noise (popping, snapping, cracking, buzzing)	<ul style="list-style-type: none"> <li>Increasing the engine speed causes the generator whine sound to speed up and the volume to decrease.</li> <li>Disappears when the ignition switch turned to "ACC".</li> </ul>	<ul style="list-style-type: none"> <li>Mainly due to the spark plugs</li> <li>Due to engine noise</li> </ul>	<ul style="list-style-type: none"> <li>Check or replace the ground cable.</li> <li>Check or replace the noise capacitor</li> </ul>
Other electrical components	-	Noise may occur as the electrical components become older.	Repair or replace the electrical components.
Static electricity (cracking, crinkling)	<ul style="list-style-type: none"> <li>Disappears when the vehicle is completely stopped.</li> <li>Severe when the clutch is engaged.</li> </ul>	Occurs when parts or wiring move for some reason and contact metal parts of the body.	Return parts or wiring to their proper position.
Static electricity (cracking, crinkling)	<ul style="list-style-type: none"> <li>Various noise are produced depending on the body part of the vehicle.</li> </ul>	Due to removal of the front hood, bumpers, exhaust pipe and muffler, suspension, etc.	Ground parts by bonding. Cases where the problem is not eliminated by a signal response to one area are common, due to several body parts being imperfectly grounded.






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**Inspection Procedure 11: Some noise appears when there is vibration or shocks during traveling.**


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**DIAGNOSIS**


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**STEP 1. Check that the connectors are properly connected.**

*NOTE: For the corresponding connectors, etc., refer to GROUP 90, Audio System <vehicles with four speakers P.90-132> or <vehicles with seven speakers P.90-134>.*

**Q: Are the connectors properly connected?**

**YES :** Go to Step 2.

**NO :** Check the condition of the connector. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Check that there is no noise.

---

**STEP 2. Check that noise appears when the radio switch is turned on while the vehicle is stopped.**

*NOTE: Static electricity noise: Body static electric from the shock absorber rubber bushings used to prevent vibration, tires, etc. occurs because of separation from the ground, causing a buzzing noise. Since no measures can be taken to discharge the static electricity of the vehicle body. Check that there is no noise.*

**Q: Does noise appear when the radio switch is turned on while the vehicle is stopped?**

**YES :** Go to Step 3.

**NO :** It may be static electricity noise.

---

**STEP 3. Check that the radio is correctly grounded.**
**Q: Is the radio correctly grounded?**

**YES :** Go to Step 4.

**NO :** Tighten the screw securely. Check that there is no noise.

---

**STEP 4. Check that the antenna is correctly grounded. (If noise appears when the antenna is moved, this means the ground is not securely connected.)**
**Q: Is the antenna correctly grounded?**

**YES :** Repair or replace the radio. Check that there is no noise.

**NO :** If rust is present on the antenna ground screw, clean off the rust and tighten the ground screw securely. Check that there is no noise.

---

**Inspection Procedure 12: Noise Sometimes Appears on FM During Traveling.**


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**Radio and CD Player Circuit**

Refer to GROUP 90, Audio System <vehicles with four speakers P.90-132> or <vehicles with seven

speakers P.90-134>.

## DIAGNOSIS

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### STEP 1. Retune the radio, and check that no noise appears.

**Q: Does the problem clear up when retuned?**

**YES :** Check that there is no noise.

**NO :** Go to Step 2.

---

### STEP 2. Check that the noise appears only in certain locations and only with certain stations.

*NOTE: Multipath noise and fading noise: Because of the frequency of FM waves in extremely high, it is highly susceptible to effects from geological formations and buildings. These effects disrupt the broadcast signal and obstruct reception in several ways.*

- **Multipath noise**

*This describes the echo that occurs when the broadcast signal is reflected by a large obstruction and enters the receiver with a slight time delay relative to the direct signal (repetitious buzzing).*

- **Fading noise**

*This is a buzzing noise that occurs when the broadcast beam is disrupted by obstructing objects and the signal strength fluctuates intricately within a narrow range.*

**Q: Does the problem appear only in certain locations and only with certain stations?**

**YES :** The effect of an electrical field condition (multipath noise, fading noise) could be the cause. Check that there is not noise.

**NO :** Go to Step 3.

---

### STEP 3. Check that the connectors are properly connected.

*NOTE: For the corresponding connectors, etc., refer to GROUP 90, Audio System <vehicles with four speakers P.90-132> or <vehicles with seven speakers P.90-134>.*

**Q: Are the connectors properly connected?**

**YES :** Go to Step 4.

**NO :** Check the condition of the connector. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Check that there is no noise.

---

### STEP 4. Check that noise appears when the radio switch is turned on while the vehicle is stopped.

*NOTE: Static electricity noise: Body static electric from the shock absorber rubber bushings used to prevent vibration, tires, etc. occurs because of separation from the ground, causing a buzzing noise. There is no measures to discharge the static electricity of the vehicle body. Check that there is no noise.*

**Q: Does noise appear when the radio switch is turned on while the vehicle is stopped?**

**YES :** Go to Step 5.

**NO :** It may be static electricity noise.

---

### STEP 5. Check that the radio is correctly grounded.

**Q: Is the radio correctly grounded?**

**YES :** Go to Step 6.

**NO :** Tighten the screw securely. Check that there is no noise.

---

### STEP 6. Check that the antenna is correctly grounded. (If noise appears when the antenna is moved, this means the ground is not securely connected.)

**Q: Is the antenna correctly grounded?**

**YES :** Repair or replace the radio. Check that there is no noise.

**NO :** If rust is present on the antenna ground screw, clean off the rust and tighten the ground screw securely. Check that there is no noise.

**Inspection Procedure 13: Ever-present Noise.****Diagnosis**

Noise is often created by the following factors, and often the radio is OK when it is checked individually.

- Traveling conditions of the vehicle
- Terrain of area traveled through
- Surrounding buildings
- Signal conditions
- Time period

For this reason, if there are still problems with noise even after the measures described in inspection procedure 8 to 15 have been taken, get information on the factors listed above as well as determining whether the problem occurs with AM or FM, the station names, frequencies, etc. and contact the radio manufacturer's service center.

**Inspection Procedure 14: There is noise but no reception for both AM and FM or no sound from AM, or no sound from FM.****DIAGNOSIS****STEP 1. Make sure that the check is being conducted under special electrical field conditions.**

Example: In an underground garage or inside a building.

**Q: Is the check being conducted under special electrical field conditions?**

**YES :** Go to Step 2.

**NO :** Go to Step 3.

**STEP 2. Check that proper performance is obtained when the vehicle is moved.**

**Q: Is proper performance obtained when the vehicle is moved?**

**YES :** The radio should sound normally.

**NO :** Go to Step 3.

**STEP 3. Check that tuning solve the problem.**

**Q: Does tuning solve the problem?**

**YES :** The radio should sound normally.

**NO :** Go to Step 4.

**STEP 4. Check the antenna plug and radio unit connected**

**Q: Are the antenna plug and radio unit properly connected?**

**YES :** Go to Step 5.

**NO :** Reconnect the antenna plug and radio unit properly. the radio should sound normally.

**STEP 5. Check that the problem disappear if another radio is used.**

**Q: Does the problem disappear if another radio is used?**

**YES :** Repair or replace the radio. The radio should sound normally.

**Inspection Procedure 15: Poor reception.****DIAGNOSIS****STEP 1. Make sure that the check is being conducted under special electrical field conditions.**

**Q: Is the check being conducted under special electrical field conditions (such as in an underground garage or inside a building)?**

**YES :** Go to Step 2.

**NO :** Go to Step 3.

---

**STEP 2. Check that proper performance is obtained when the vehicle is moved.**

**Q: Is proper performance obtained when the vehicle is moved?**

**YES :** Check that a poor reception is resolved.

**NO :** Go to Step 3.

---

**STEP 3. Check that tuning solves the problem.**

**Q: Does tuning solve the problem?**

**YES :** Check that a poor reception is resolved.

**NO :** Go to Step 4.

---

**STEP 4. Check that the problem is limited to the reception of a specific radio station from a specific position.**

*NOTE: Multipath noise and fading noise: Because the frequency of FM waves is extremely high, it is highly susceptible to effects from geological formations and buildings. These effects disrupt the broadcast signal and obstruct reception in several ways.*

- *Multipath noise*

*This describes the echo that occurs when the broadcast signal is reflected by a large obstruction and enters the receiver with a slight time delay relative to the direct signal (repetitious buzzing).*

- *Fading noise*

*This is a buzzing noise that occurs when the broadcast beam is disrupted by obstructing objects and the signal strength fluctuates intricately within a narrow range.*

**Q: Is the problem limited to the reception of a specific radio station from a specific position?**

**YES :** Go to Step 5.

**NO :** Check that a poor reception is resolved.

---

**STEP 5. Check that the antenna plug is connected to the radio properly.**

**Q: Is the antenna plug connected to the radio properly?**

**YES :** Go to Step 6.

**NO :** Reconnect the antenna plug and radio unit properly. Check that a poor reception is resolved.

---

**STEP 6. Check that the problem disappears when another radio is used.**

**Q: Does the problem disappear if another radio is used?**

**YES :** Repair or replace the radio. Check that a poor reception is resolved.

---

**Inspection Procedure 16: Distortion on AM or on both AM and FM.**

---

**DIAGNOSIS**

---

**STEP 1. Check how much distortion there is.**

**Q: How much distortion is there?**

**Occasional distortion :** Go to Step 2.

**Constant distortion :** Go to Step 3.

---

**STEP 2. Check that there is distortion near the radio station.**

**Q: Is there distortion near the radio station?**

**YES :** The antenna may receive too strong signal.

**NO :** Go to Step 3 .

---

**STEP 3. Check that the speaker cords are in contact with the cone paper.**

- Q: Are the speaker cords in contact with the cone paper?**  
**YES :** Move the cords away from the cone paper.  
 Check that a distortion is resolved.  
**NO :** Go to Step 4.

---

**STEP 4. Remove the speakers, and check for cone paper or foreign material.**

- Q: Is there cone paper or foreign material?**  
**YES :** Repair or replace the speakers. Check that a distortion is resolved.  
**NO :** Go to Step 5.

---

**STEP 5. Check for distortion with the speaker installed.**

- Q: Does a distortion occur?**  
**YES :** Install the speaker securely. Check that a distortion is resolved.  
**NO :** Repair or replace the radio. Check that a distortion is resolved.

---

**Inspection Procedure 17: Distortion on FM only.**

---

**DIAGNOSIS**

---

**STEP 1. Check that the distortion persists when the radio is turned to another station.**

- Q: Does the distortion persist when the radio is turned to another station?**  
**YES :** Go to Step 2.  
**NO :** The signal from that station is too weak.

---

**STEP 2. Check that the distortion increases or decreases when the vehicle is moved.**

- Q: Does distortion increase or decrease when the vehicle is moved?**  
**YES :** The cause may be multipath noise.  
**NO :** Repair or replace the radio. Check that a distortion is resolved.

---

**Inspection Procedure 18: Using the auto select function, too few automatic stations are selected.**

---

**DIAGNOSIS**

---

**STEP 1. Consider the number of radio stations. Check that there are enough radio stations in the area.**

- Q: Consider the number of radio stations. Are there enough in the area?**  
**YES :** Go to Step 2.  
**NO :** Confirm automatic selection selects the strongest signals in the area. If not, go to Step 3.

---

**STEP 2. Consider the distance to the radio stations. Check that the transmitting antennas are within 2miles.**

- Q: Consider the distance to the radio stations. Are the transmitting antennas within 2 miles?**  
**YES :** Go to Step 3.  
**NO :** Confirm automatic selection selects the strongest signals in the area. If not, go to Step 4.

---

**STEP 3. Make sure that the check is being conducted under special electrical field conditions.**

- Q: Is the check being conducted under special electrical field conditions (such as in an underground garage or inside a building)?**  
**YES :** Go to Step 4.  
**NO :** Go to Step 5.



**STEP 4. Check that proper performance is obtained when the vehicle is moved.**

**Q: Is proper performance obtained when the vehicle is moved?**

**YES :** The auto-select function should operate normally.

**NO :** Go to Step 5.

**STEP 5. Check that the antenna plug is connected to the radio properly.**

**Q: Is the antenna plug connected to the radio properly?**

**YES :** Go to Step 6.

**NO :** The antenna plug is reconnected to the radio properly. The auto-select function should operate normally.

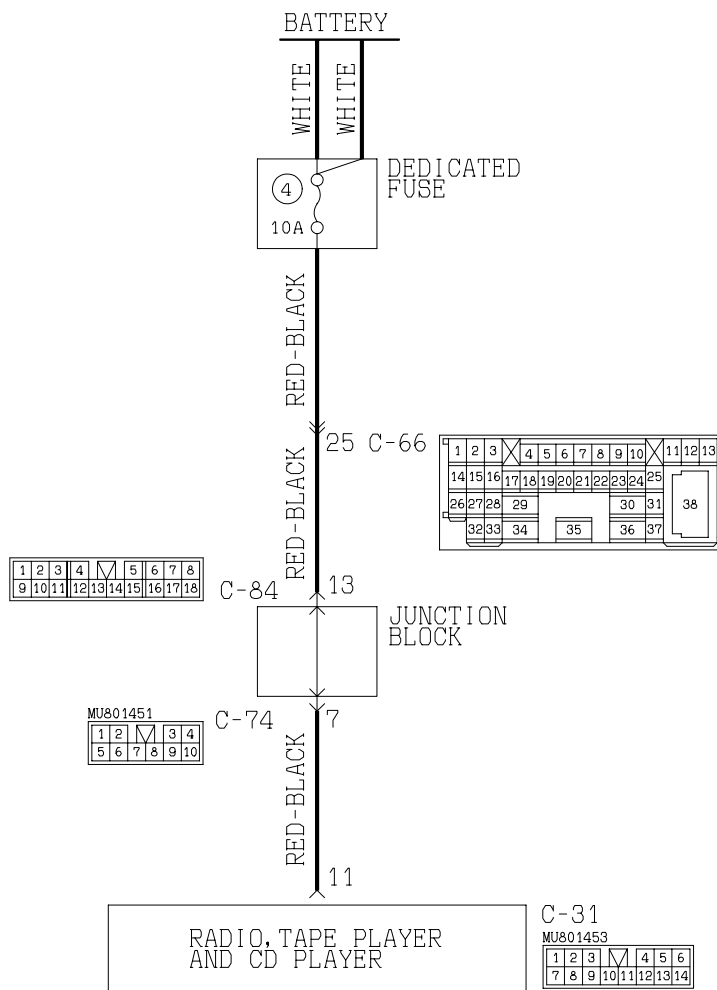
**STEP 6. Check that the problem disappears when another radio is used.**

**Q: Does the problem disappear if another radio is used?**

**YES :** Repair or replace the radio. The auto-select function should operate normally.

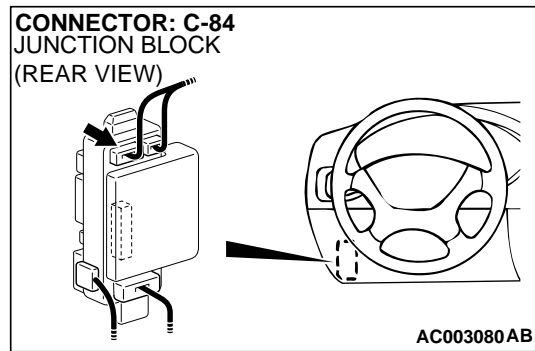
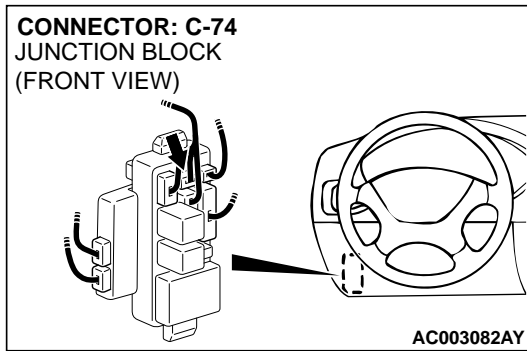
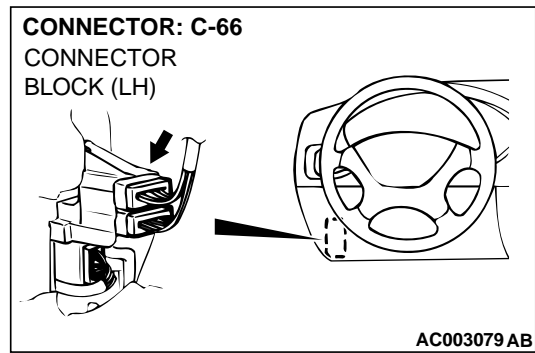
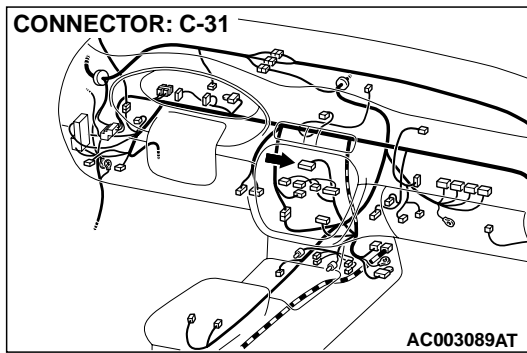
**Inspection Procedure 19: Preset station are erased.**

**Memory Backup Power Supply Circuit**



AC003979AB

TSB Revision



**CIRCUIT OPERATION**

The power is constantly supplied to the radio, tape player, CD player and CD auto changer.

**TECHNICAL DESCRIPTION (COMMENT)**

The cause is probably a faulty radio, tape player, CD player and CD auto changer memory backup power supply circuit system.

**TROUBLESHOOTING HINTS**

- Damaged harness wire or connector.
- Malfunction of the radio, tape player, CD player and CD auto changer.

**DIAGNOSIS**

**Required Special Tool:**

- MB991223: Harness set

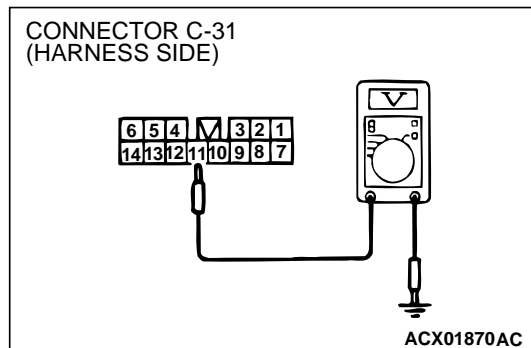
**STEP 1. Check the radio, tape player, CD player and CD auto changer memory backup power supply circuit by back probing.**

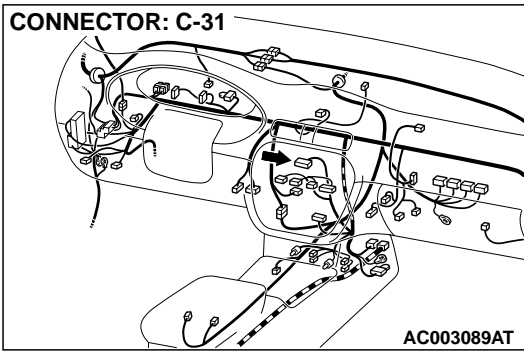
- (1) Do not disconnect radio, tape player, CD player and CD auto changer connector C-31.
- (2) Measure the voltage between terminal number 11 and ground by backprobing.

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

**YES :** Repair or replace the radio, tape player, CD player and CD auto changer. Check that a memory is retained.

**NO :** Go to Step 2 .



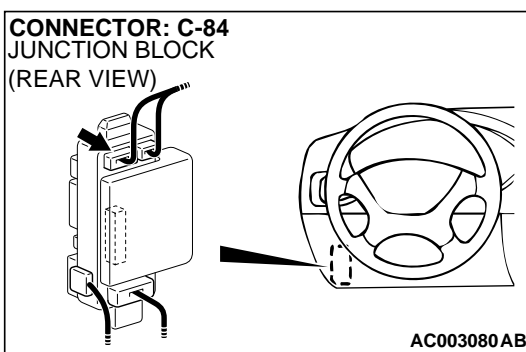
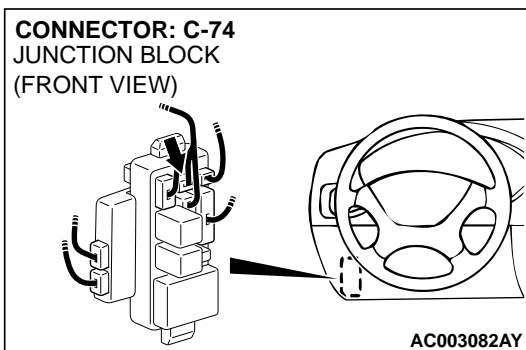
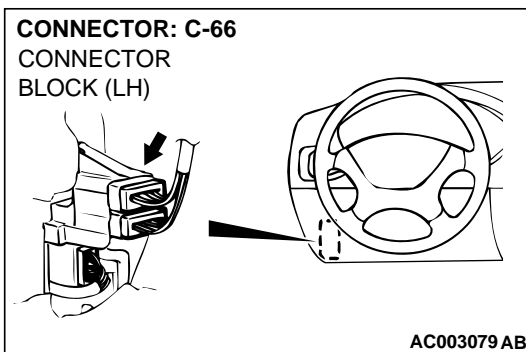
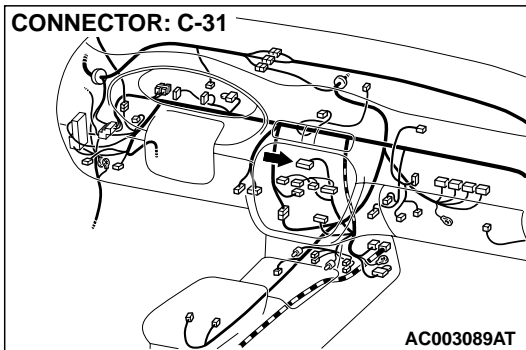


**STEP 2.** Check harness connector C-31 at the radio, tape player, CD player and CD auto changer for damage.

**Q:** Is harness connector C-31 in good condition?

**YES :** Go to Step 3 .

**NO :** Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that a memory is retained.



**STEP 3. Check the harness wires between radio, tape player, CD player connector C-31 and battery.**

*NOTE: After inspecting intermediate connector C-66 and junction block connectors C-74 and C-84, inspect the wire. If intermediate connector C-66 and junction block connectors C-74 and C-84 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#).*

**Q: Are the harness wires between the connector C-31 and battery in good condition?**

**YES :** Repair them. Check that a memory is retained.

**NO :** Repair or replace the radio, tape player, CD player. Check that a memory is retained.

---

**Inspection Procedure 20: Cassette tape can not be inserted.**

---

**DIAGNOSIS**

---

**STEP 1. Check that there are foreign objects inside the cassette player.**

*NOTE: Attempting to eliminate a foreign object (e.g., a coin or clip, etc.) in the cassette player may damage the mechanism. The player should be taken to a service dealer for repair.*

**Q: Are there any foreign objects inside the cassette player?**

**YES :** remove the object(s). A cassette tape should be inserted normally.

**NO :** Go to Step 2 .

---

**STEP 2. Check that the cassette player works when another tape is inserted.**

*NOTE: Check that the tape label is not loose, that the tape case is not deformed and that the tape is tightly wound. Also, tape with a length of C-120 or greater can often get caught in the mechanism and should not be used.*

**Q: Does the cassette player work if another tape is inserted?**

**YES :** The cassette tape used is defective. A cassette tape should be inserted normally.

**NO :** Repair or replace the cassette player. A cassette tape should be inserted normally.

---

**Inspection Procedure 21: Sound quality is poor, or sound is weak.**

---

**DIAGNOSIS**

---

**STEP 1. Check that the tape player works normally if the tape is changed.**

*NOTE: Check that the tape label is not loose, that the tape case is not deformed and that the tape is tightly wound. Also, tapes with a length of C-120 or greater can often get caught in the mechanism and should not be used.*

**Q: Does the tape player work normally if the tape is changed?**

**YES :** The tape used is defective.

**NO :** Go to Step 2 .

---

**STEP 2. Check that the player play OK if the tape player head is cleaned.**

**Q: Does the player play OK if the tape player head is cleaned?**

**YES :** The sound quality should return to normal.

**NO :** Go to Step 3 .

---

**STEP 3. Check that proper operation is obtained when the tape player is replaced.**

**Q: Is proper operation obtained when the tape player is replaced?**

**YES :** Repair or replace the tape player. The sound quality should return to normal.

**NO :** Repair or replace the speakers. The sound quality should return to normal.

---

**Inspection Procedure 22: Cassette tape can not be ejected.**

---

**DIAGNOSIS**

The problems covered here are all the result of the use of a bad tape (deformed or not properly tightened) or of a malfunction of the cassette player itself. Malfunctions involving the tape becoming caught in the mechanism and ruining the case are also possible, and attempting to force the tape out of the player can cause damage to the mechanism. The player should be taken to a service dealer for repair.

**Inspection Procedure 23: Uneven revolution. tape speed is fast or slow.****DIAGNOSIS**

**STEP 1. Check that the tape player work normally when the tape is changed.**

*NOTE: Check that the tape label is not loose, that the tape case is not deformed and that the tape is tightly wound. Also, tape with a length of C-120 or greater can often get caught in the mechanism and should not be used.*

**Q: Does the player work normally if the tape is changed?**

**YES :** The tape used is defective. The cassette tape speed should be stable.

**NO :** Go to Step 2.

**STEP 2. Check that there are foreign objects inside the tape player.**

*NOTE: Attempting to eliminate a foreign object (e.g., a coin or clip, etc.) out of the cassette player may damage the mechanism. The player should be taken to a service dealer for repair.*

**Q: Are there any foreign objects inside the cassette player?**

**YES :** The cassette tape speed should be stable.

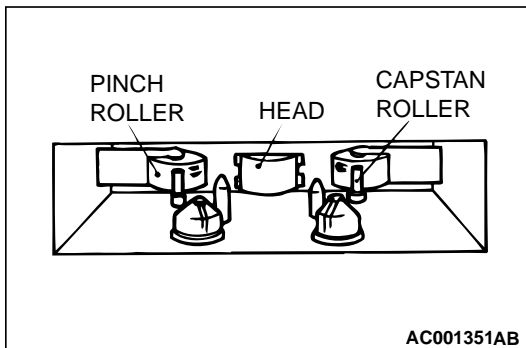
**NO :** Go to Step 3 .

**STEP 3. Check that the head or capstan roller is dirty.**

**Q: Is the head or capstan roller dirty?**

**YES :** Clean the head or capstan roller. The cassette tape speed should be stable.

**NO :** Repair or replace the tape player. The cassette tape speed should be stable.

**Inspection Procedure 24: Automatic search does not work.****DIAGNOSIS**

**STEP 1. Check that the "APS" (automatic search) button can be depressed properly.**

*NOTE: When the time between songs on a tape is less than three seconds, or when there is a three second period in the middle of a song in which the volume level is extremely low, the automatic search*

*function may not work properly.*

**Q: Can the "APS" (automatic search) button be depressed properly?**

**YES :** Go to Step 2 .

**NO :** The button is operated improperly. Replace or repair tape player. Check that the automatic search function operates normally.

---

**STEP 2. Check that the tape player works when the tape is changed.**

*NOTE: Ensure that the tape label is not loose, that the tape itself is not deformed and that the tape is tightly wound. Also, tapes of C-120 or greater length often get caught in the mechanism and should not be used.*

**Q: Does the tape player work if the tape is changed?**

**YES :** The tape used is defective.

**NO :** Repair or replace the tape player. Check that the automatic search function operates normally.

---

**Inspection Procedure 25: Malfunction of the auto reverse.**

---

**DIAGNOSIS**

---

**STEP 1. Check that the tape player works normally when the tape is changed.**

*NOTE: Ensure that the tape label is not loose, that the tape itself is not deformed and that the tape is tightly wound. Also, tape of C-120 or greater length often get caught in the mechanism and should not be used.*

**Q: Does the tape player work normally if the tape is changed?**

**YES :** The tape used is defective. The auto reverse function should operate normally.

**NO :** Go to Step 2.

---

**STEP 2. Check that the problem only occurs while the vehicle is being driven.**

**Q: Does the problem only occur while the vehicle is being driven?**

**YES :** Go to Step 3.

**NO :** Repair or replace the tape player. The auto reverse function should operate normally.

---

**STEP 3. Check that the tape player is properly installed to the vehicle.**

**Q: Is the tape player properly installed to the vehicle?**

**YES :** Repair or replace the tape player. The auto reverse function should operate normally.

**NO :** Repair the installation condition. The auto reverse function should operate normally.

---

**Inspection Procedure 26: Tape gets caught in mechanism.**

---

*NOTE: When the tape is caught in the mechanism, the tape case may not eject. When this occurs, do not try to force the tape out as this may damage the tape player mechanism. Take the cassette to a service dealer for repair.*

---

**DIAGNOSIS**

---

**STEP 1. Check that the tape player works normally if the tape is changed.**

*NOTE: Check that the tape label is not loose, that the tape itself is not deformed and that the tape is tightly wound. Also, tape with a length of C-120 or greater can often get caught in the mechanism and should not be used.*

**Q: Does the player work normally if the tape is changed?**

**YES :** The tape used is defective. The tape player should operate normally.

**NO :** Repair or replace the tape player. The tape player should operate normally.

---

**Inspection Procedure 27: CD can not be inserted.**

---

**DIAGNOSIS**

---

**STEP 1. Check that the shutter opens when a CD is inserted.**

*NOTE: If a CD is already loaded, does the shutter not open to allow insertion when another CD is inserted?*

**Q: Does the shutter open when a CD is inserted?**

**YES :** Go to Step 2.

**NO :** Take out the CD. Check that a CD can be inserted.

---

**STEP 2. Check that the CD is ejected from approximately 15 mm (0.6 inch) inside the insertion panel even though it can be inserted.**

*NOTE: If the key switch is not at "ACC" or "ON," the CD stops at depth of 15 mm(0.6 inch) below the panel surface even when it is inserted, and it will be rejected when pushed farther?*

**Q: Is the CD ejected from approximately 15 mm (0.6 inch) inside the insertion panel even though it can be inserted?**

**YES :** Go to Step 3.

**NO :** Check that a CD can be inserted.

---

**STEP 3. Check that "E" (error) is displayed even though the CD is inserted completely.**

*NOTE: Even though the CD is loaded, "E" (error) is sometimes displayed with the CD rejected because of vibration/shock or dew on the CD face or optical lens.*

**Q: Though the CD is inserted completely, is "E" (error) displayed and the CD ejected?**

**YES :** Go to Step 4.

**NO :** Check that a CD can be inserted.

---

**STEP 4A. Check the CD.****Q: Is the labeled side faced downward?**

**YES :** Insert the CD correctly.

**NO :** Replace the CD. Check that a CD can be inserted.

---

**STEP 4B. Check the CD.****Q: Is the recorded face of the CD dirty?**

**YES :** Replace the CD. Check that a CD can be inserted.

---

**STEP 4C. Check the CD.****Q: Is there dew on the recorded face of the CD?**

**YES :** Remove the dew.

**NO :** Replace the CD. Check that a CD can be inserted.



---

**Inspection Procedure 28: No sound. (CD only)**

---

**DIAGNOSIS**

---

**STEP 1. Check that the CD player plays properly if another CD is inserted.**

- Q: Does it play properly if another CD is inserted?**  
**YES :** The CD used is defective. The CD player should sound normally.  
**NO :** Go to Step 2 .

---

**STEP 2. Return it to the normal temperature, and recheck the operation. Check that the CD player operates properly.**

- Q: Return it to the normal temperature, and recheck the operation. Does it operate properly?**  
**YES :** The CD player should sound normally.  
**NO :** Repair or replace the CD player. The CD player should sound normally.

---

**Inspection Procedure 29: CD sound skips.**

---

**DIAGNOSIS**

---

**STEP 1. Malfunction occurrence state.**

- Q: When does a malfunction occur?**  
**While parking :** Go to Step 2.  
**While driving :** Stop vehicle, go to Step 4.

---

**STEP 2. Check that the CD face is scratched or dirty.**

- Q: Is the CD face scratched or dirty?**  
**YES :** CD is defective, or clean the CD. Check that a CD sound skip is resolved.  
**NO :** Go to Step 3.

---

**STEP 3. Check that the CD player plays properly if another CD is started.**

- Q: Does it play properly if another CD is inserted?**  
**YES :** CD is defective. Check that a CD sound skip is resolved.  
**NO :** Repair or replace the CD player. Check that a CD sound skip is resolved.

---

**STEP 4. Check that sound skips when the side of the CD player is tapped.**

*NOTE: Check by using a proper CD which is free from scratches, dirt or any other abnormality.*

- Q: Does sound skip when the side of the CD player is tapped?**  
**YES :** Securely mount the CD player. Check that a CD sound skip is resolved.  
**NO :** Check the sound skipping state in detail while driving, and then contact a service shop. Check that a CD sound skip is resolved.

---

**Inspection Procedure 30: Sound quality is poor.**

---

**DIAGNOSIS**

---

**STEP 1. Check that the CD player plays properly if another CD is inserted.**

- Q: Does it play properly if another CD is inserted?**  
**YES :** CD used is defective. The sound quality should return to normal.  
**NO :** Repair or replace the CD player. The sound quality should return to normal.

**Inspection Procedure 31: CD can not be ejected.****DIAGNOSIS**

**STEP 1. Check that the key switch (ignition key) is at "ACC" or "ON".**

**Q: Is the key switch (ignition key) at "ACC" or "ON?"**

**YES :** Go to Step 2 .

**NO :** Check the memory backup power supply circuit. Refer to Inspection Procedure 22

[P.54A-141.](#)

**STEP 2. Check that the combined amplifier or radio set is connected securely.**

**Q: Is the combined amplifier or radio set connected securely?**

**YES :** If the CD is not ejected, do not discard it, because the player may be damaged.

Therefore, contact a service shop for repairs. Check that a CD can be ejected normally.

**NO :** Connect the connectors securely. Check that a CD can be ejected normally.

**ON-VEHICLE SERVICE****PROCEDURE FOR INPUT OF ANTI-THEFT CODE FOR ANTI-THEFT SYSTEM**

M1544004400111

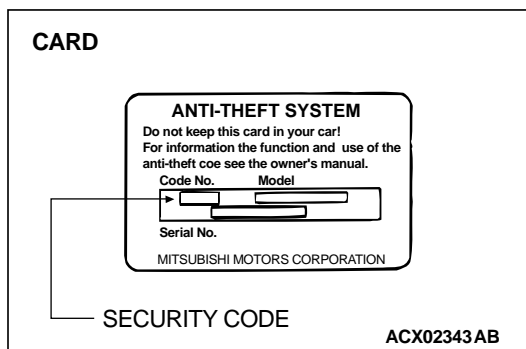
The radio, tape player and CD player do not work under the following conditions:

- Power supply to the radio, tape player and CD player has been suspended for more than an hour continuously by removing the cable from the battery terminal or disconnecting the harness connectors.
- The power supply to the radio, tape player and CD player has been suspended for more than an hour due to a blown fuse or discharged battery.
- The radio, tape player and CD player has been replaced.

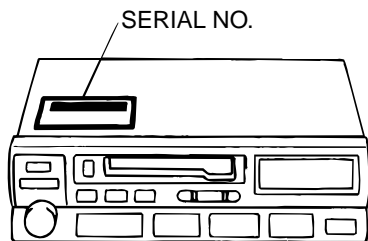
If the radio, tape player and CD player does not work for these conditions, enter the security code as follows:

1. Confirm the security code using any of the following methods.

(1) Use the security code indicated on the cards retained in the vehicle.



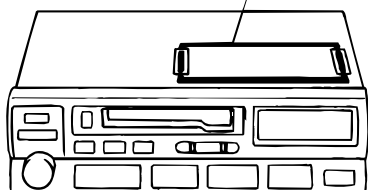
TYPICAL NAME CARD



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- (2) If the security code is unknown owing to the owner's loss of the card:
  - a. Remove the radio, tape player and CD player referring to P.54A-150.
  - b. Read the serial number stamped on the radio, tape player and CD player.
  - c. Look up the security code (anti-theft code table) corresponding to the serial number.

CARD



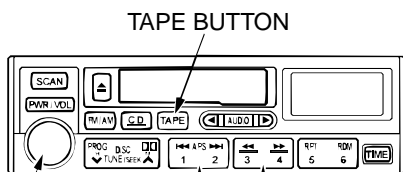
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- (3) When the radio, tape player and CD player is replaced:
 

Use the security code on the cards attached to the upper surface of the replacement radio, tape player and CD player.

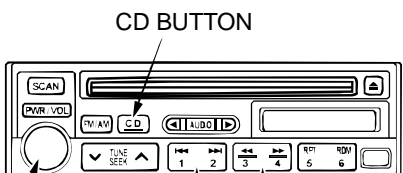
*NOTE: Deliver the two cards to the owner.*

TYPE 1



PWR BUTTON  
MEMORY SELECT  
BUTTON(1 TO 4)

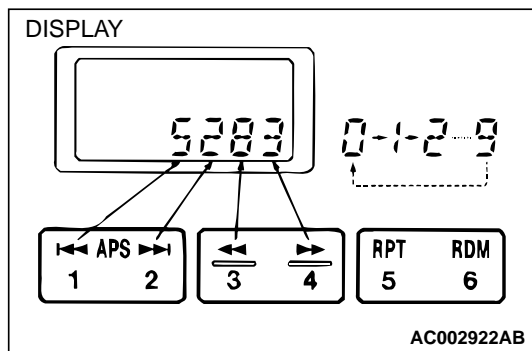
TYPE 2



PWR BUTTON  
MEMORY SELECT  
BUTTON(1 TO 4)

AC002921AB

2. Connect the radio to the vehicle harness.
3. Turn the ignition key to the "ACC" or "ON" position.
4. Press the "PWR" button, and "codE" will be displayed.



5. Press number 1 through number 4 memory select button to set the four-digit security code shown on the card. Every time each digit key is pressed, the figure changes as follows: 0 to 1 to 2 to 3 to 4 to 5 to 6 to 7 to 8 to 9 to 0
6. Press the "CD" button, and a beep will be heard. If entered correctly, the radio and tape player will work.
7. If the security code is not accepted, "Err" is displayed. In a few seconds, it will change to "codE." Then repeat steps 5 and 6.

*NOTE: NOTE: The anti-theft system will allow three attempts maximum to input the correct code.*

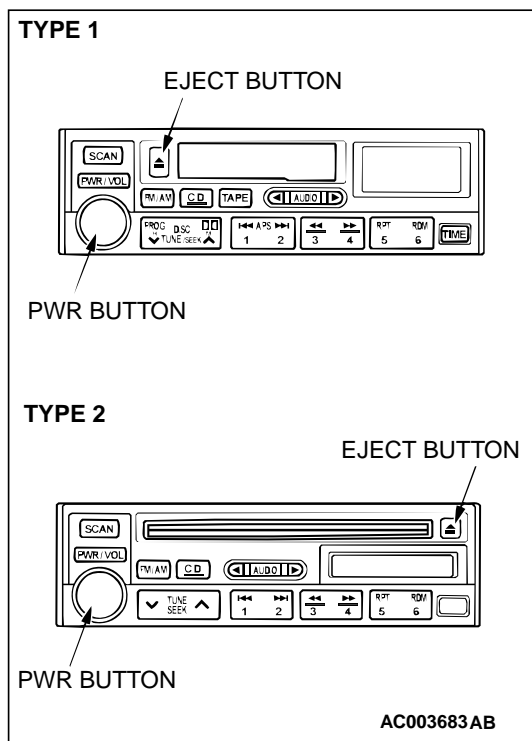
*NOTE: The second error is displayed as "2 Err." When the third error is made, "3 Err" is displayed and then the display changes to "oFF." If this should occur, the unit will not work any more.*

*NOTE: To input the security code again, turn the ignition switch to the "ACC" or "ON" position and wait for one hour when "oFF" is displayed. After "oFF" disappears on the display, press the "PWR" button and "codE" will be displayed. The security code can be input again.*

**Three-minute operation mode**

To facilitate replacement or check, the radio, tape player and CD player can be operated for three minutes without inputting the security code.

1. Press the "PWR" button and "EJECT" button together to operate the radio, tape player and CD player.
2. In three minutes the unit will not be able to work. Then the radio, tape player and CD player will be switched off.



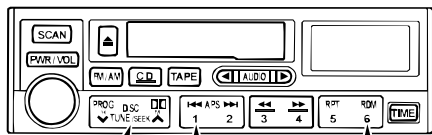
**SPEAKER TEST**

M1544005400084

Enter the speaker test mode according to the following steps:

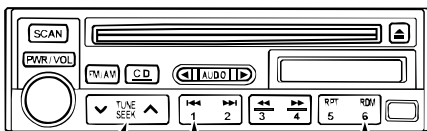
1. Turn the Ignition switch to "ACC" or "ON" position and switch off the radio, tape player, CD player and CD auto changer.

TYPE 1



TUNE/SEEK  
BUTTON MEMORYSELECT  
BUTTON (1,6)

TYPE 2



TUNE/SEEK  
BUTTON MEMORYSELECT  
BUTTON (1,6)

AC003684AB

2. Press the following buttons in that order within 60 seconds from step (1).
  - (1) Memory select "1" button
  - (2) "TUNE/SEEK (DOWN)" button
  - (3) "TUNE/SEEK (UP)" button
  - (4) Memory select "6" button

DOOR SPEAKER (LH)  
AND TWEETER (LH)



DOOR SPEAKER (RH)  
AND TWEETER (RH)



REAR SPEAKER (LH)



REAR SPEAKER (RH)



NOTE

□ : OFF

■ : ILLUMINATES


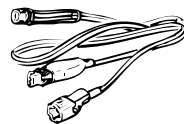
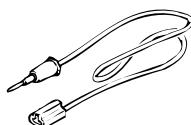

▨ : FLASHES

ACX01941AC

3. Check that the speaker, which is displayed on the display, sounds (If the memory select "6" button is pressed, the speaker will be changed).
4. If a button other than the memory select "6" button and "EJECT" button (tape or CD) is pressed, or the ignition switch is turned to "LOCK" (OFF) position, you will exit from the speaker test mode.

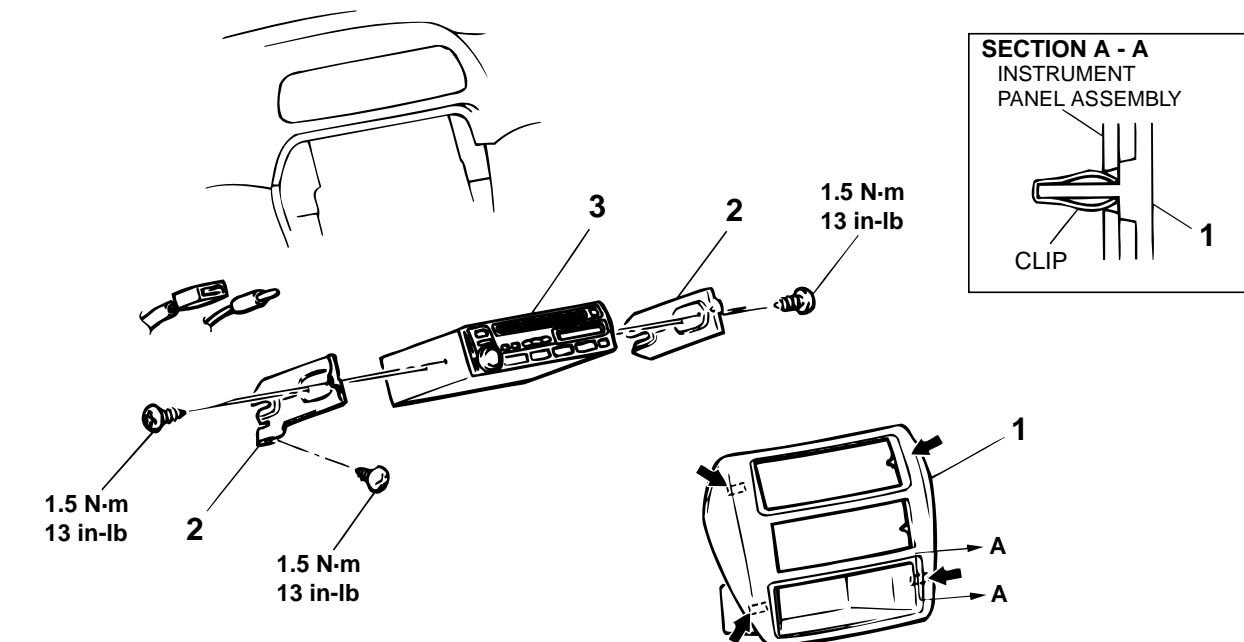
SPECIAL TOOLS

M1544000600113

TOOL	TOOL NUMBER AND NAME	SUPER SESSION	APPLICATION
<p>A</p>  <p>B</p>  <p>C</p>  <p>D</p>  <p>MB991223AC</p>	<p>MB991223 A:MB991219 B:MB991220 C:MB991221 D:MB991222 Harness set A:Test harness B:LED harness C:LED harness adapter D:Probe</p>	<p>MB991223</p>	<p>Making voltage and resistance measurements during troubleshooting A:Connect pin contact pressure inspection B:Powercircuit inspection C:Power circuit inspection D:Commercial tester connection</p>

RADIO WITH TAPE PLAYER AND CD PLAYER  
REMOVAL AND INSTALLATION

M1544001100069



NOTE  
← :CLIP POSITION

- RADIO REMOVAL STEPS**
1. CENTER PANEL ASSEMBLY

- RADIO REMOVAL STEPS (Continued)**
2. RADIO BRACKET
  3. RADIO, TAPE PLAYER AND CD PLAYER

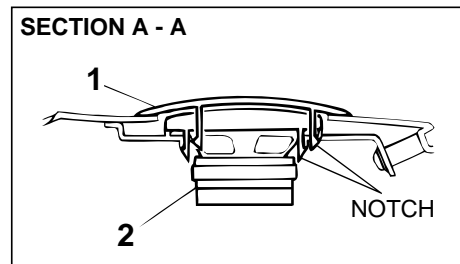
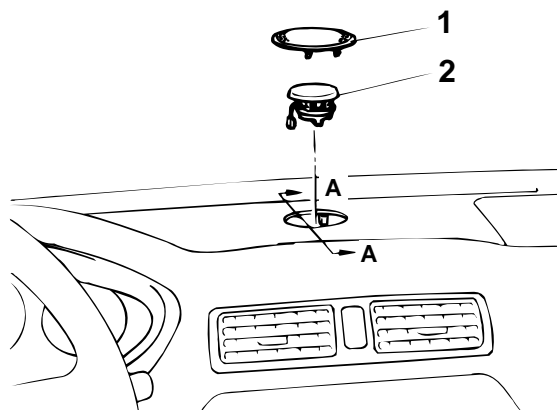
AC002923AB

## SPEAKER

### REMOVAL AND INSTALLATION

M1544002600120

#### SENER SPEAKER <VEHICLES WITH SEVEN SPEAKERS>

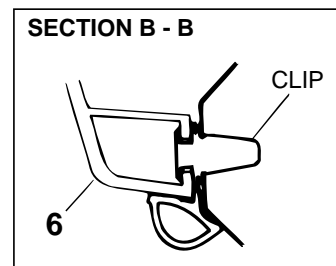
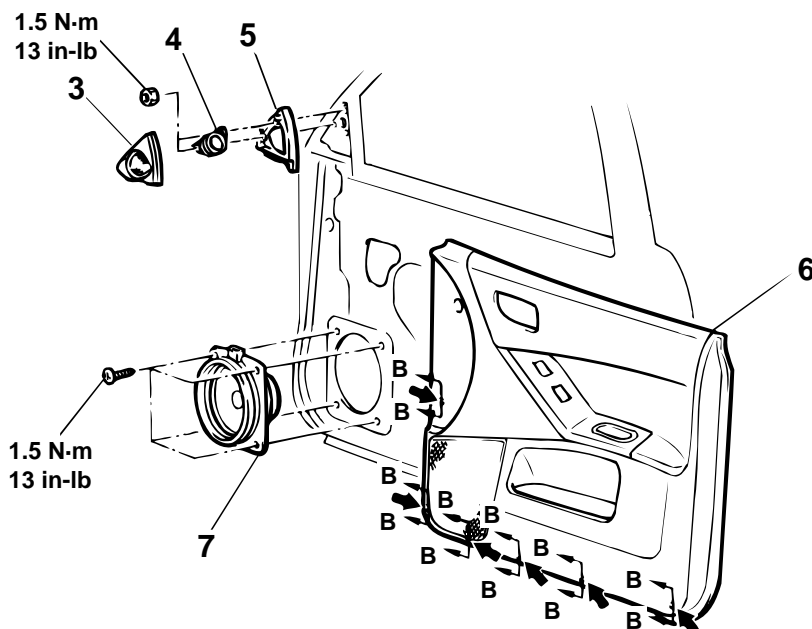


AC002924AB

#### REMOVAL STEPS

1. SPEAKER GARNISH
2. CENTER SPEAKER

#### DOOR SPEAKER AND TWEETER



#### NOTE

←:RESIN CLIP POSITION

AC002925AB

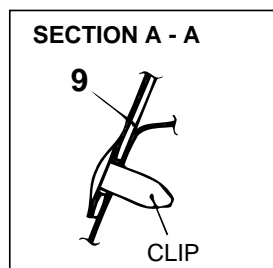
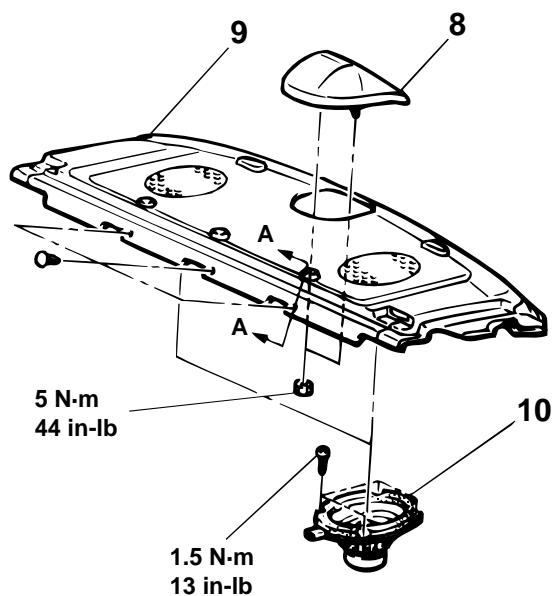
#### TWEETER REMOVAL STEPS <VEHICLES WITH SEVEN SPEAKERS>

3. TWEETER COVER
4. TWEETER
5. DELTA COVER BASE

#### DOOR SPEAKER REMOVAL STEPS

6. FRONT DOOR TRIM (REFER TO GROUP 42, DOOR TRIM, POWER WINDOW SWITCH AND WATERPROOF FILM P.42-54.)
7. FRONT DOOR SPEAKER

## REAR SPEAKER



AC002926AB

**REAR SPEAKER REMOVAL STEPS**

- REAR SEAT (REFER TO GROUP 52A, REAR SEAT [P.52A-20.](#))
- REAR PILLAR TRIM (REFER TO GROUP 52A, TRIMS [P.52A-12.](#))

**REAR SPEAKER REMOVAL STEPS**

8. HIGH-MOUNTED STOPLIGHT
9. REAR SHELF TRIM
10. REAR SPEAKER



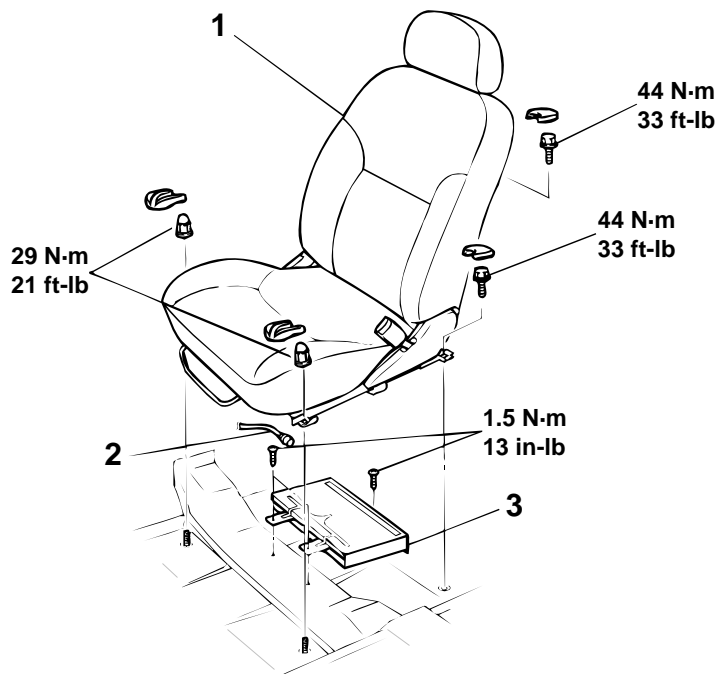
## AMPLIFIER

### REMOVAL AND INSTALLATION

M1544004100091

**⚠ WARNING**

Before removal of the seat equipped with the side air bag module, refer to **GROUP 52B, SRS Service Precautions P.52B-15**.



AC002927AB

#### REMOVAL STEPS

1. FRONT SEAT ASSEMBLY (RH)
2. DIN CABLE
3. AMPLIFIER

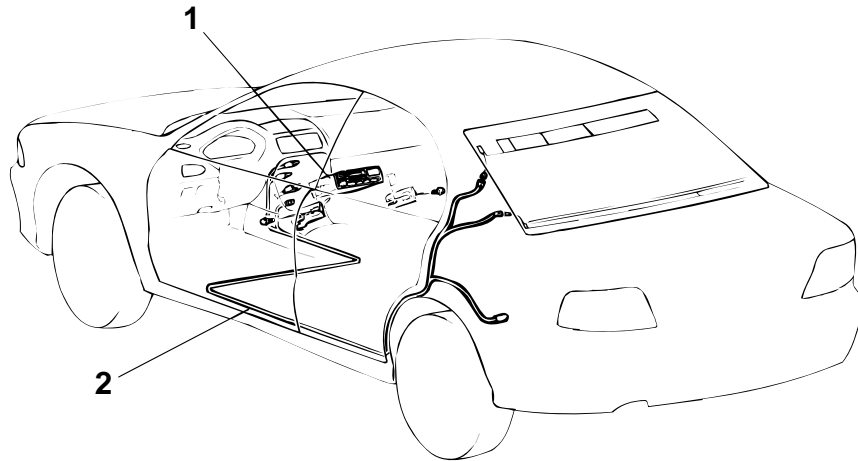
*NOTE: Install each seat assembly mounting bolt in every installation location, then tighten to the specified torque.*

## ANTENNA

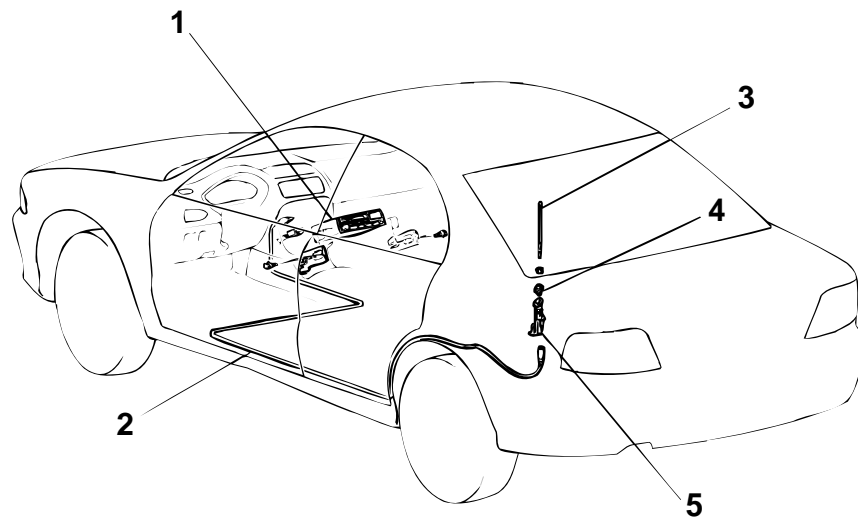
## ANTENNA REMOVAL AND INSTALLATION

M1544002900091

## &lt;GLASS ANTENNA&gt;



## &lt;MAST ANTENNA&gt;



AC002928AB

**ANTENNA FEEDER CABLE  
REMOVAL STEPS**

1. RADIO AND TAPE PLAYER
  - TRUNK TRIM ASSEMBLY (REFER TO GROUP 52A, TRIMS [P.52A-12.](#))
  - FRONT SEAT (REFER TO GROUP 52A, FRONT SEAT [P.52A-15.](#))
  - REAR SEAT (REFER TO GROUP 52A, REAR SEAT [P.52A-20.](#))
  - FLOOR CONSOLE (REFER TO GROUP 52A, FLOOR CONSOLE [P.52A-11.](#))
2. ANTENNA FEEDER CABLE

**MAST ANTENNA REMOVAL  
STEP**

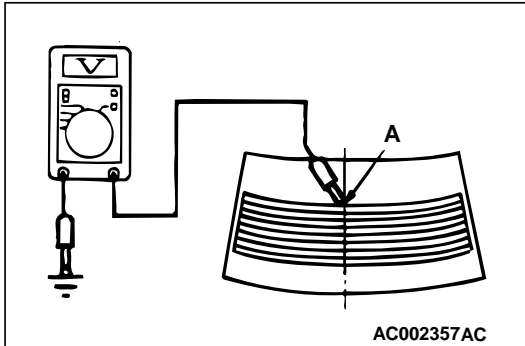
3. ANTENNA MAST
  - TRUNK TRIM ASSEMBLY (REFER TO GROUP 52A, TRIMS [P.52A-12.](#))
4. MOUNTING NUT
5. ANTENNA BASE

## REAR WINDOW DEFOGGER

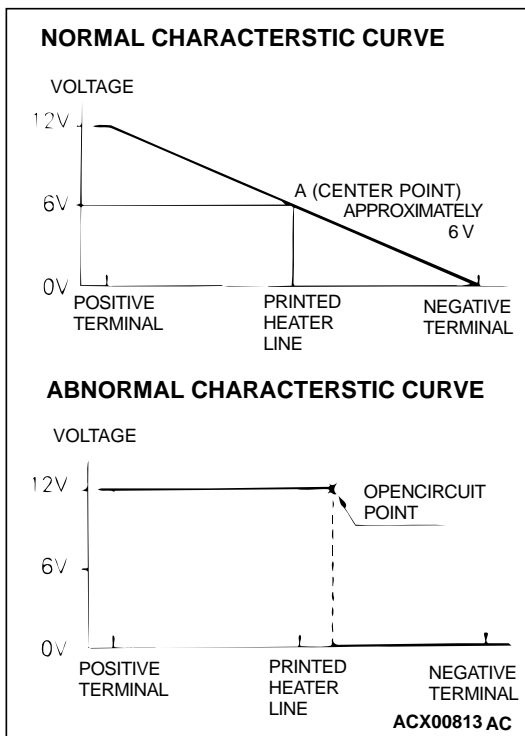
### ON-VEHICLE SERVICE

#### PRINTED-HEATER LINES CHECK

M1543001800098



1. Run engine at 2,000 r/min. Check heater element with battery at full.
2. Turn "ON" rear window defogger switch. Measure heater element voltage with circuit tester at rear window glass centre A. Condition is good if it indicates about 6 V.



3. If 12 V is indicated at A, there is a break in the negative terminals from A. Move test bar slowly to negative terminal to detect where voltage changes suddenly (0V).
4. If 0 V is indicated at A, there is a break in the positive terminals from A. Defect where the voltage changes suddenly (12 V) in the same method described above.

### REAR WINDOW DEFOGGER SWITCH

#### REMOVAL AND INSTALLATION

Refer to GROUP 55, Heater Control Assembly and Blower Switch Assembly [P.55-26](#).

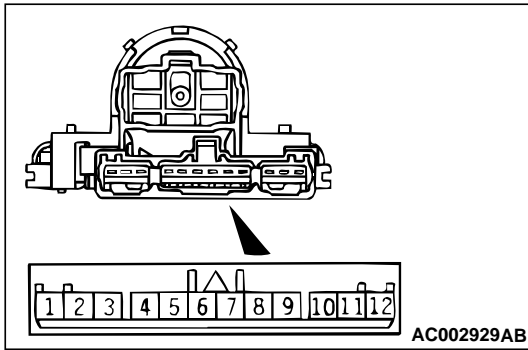
M1543006200109

#### REAR WINDOW DEFOGGER SWITCH INSPECTION

#### DEFOGGER SWITCH CONTINUITY CHECK

M1543006700029

Check continuity while battery voltage is applied between terminal 3 and 10

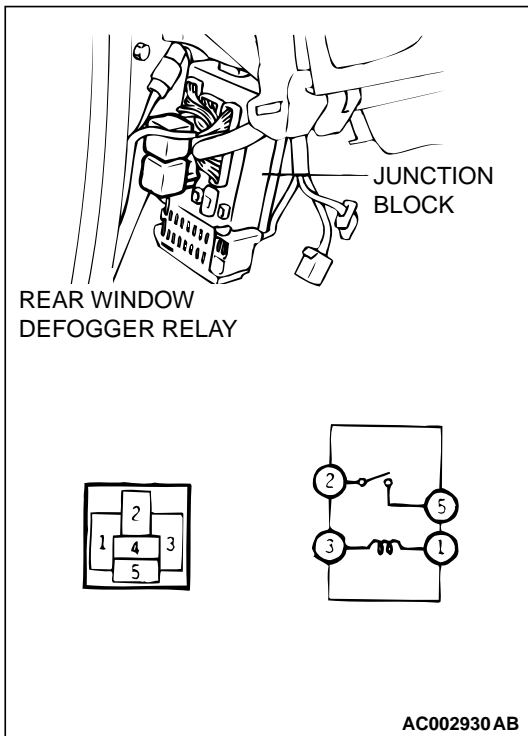


SWITCH POSITION	TESTER CONDITION	SPECIFIED CONDITION
OFF	3 – 11	Continuity
ON	3 – 11 3 – 12	Continuity

NOTE: After the defogger switch is turned on, there should be continuity between terminals 3 and 12 for approximately 9 to 13 minutes. Then the defogger switch should be turned off.

### REAR WINDOW DEFOGGER RELAY CONTINUITY CHECK

M1543006800082



BATTERY VOLTAGE	TERMINAL NO. TO BE CONNECTED TO BATTERY	SPECIFIED CONDITION
Supplied	1-3	2-5
Not supplied	-	1-3

## THEFT ALARM

### THEFT-ALARM SYSTEM DIAGNOSIS

#### INTRODUCTION TO THEFT-ALARM SYSTEM DIAGNOSIS

M1547002200024

The theft-alarm system is controlled by the Simplified wiring system (SWS). For troubleshooting, refer to GROUP 54B, SWS Diagnosis [P.54B-9](#).

## SPECIFICATIONS

## FASTENER TIGHTENING SPECIFICATIONS

M1541001600032

ITEMS	SPECIFICATIONS
Amplifier mounting screw	1.5 N·m (13 in-lb)
Engine coolant temperature gauge unit	11 N·m (97 in-lb)
Fog light bracket mounting nut	2.5 N·m (22 in-lb)
Fog light hole cover mounting nut	1.5 N·m (13 in-lb)
Front and rear speaker mounting screw	1.5 N·m (13 in-lb)
Front seat mounting nut	29 N·m (21 ft-lb)
Front seat mounting bolt	44 N·m (33 ft-lb)
Headlight, front turn-signal light and position light assembly mounting bolt	4.9 N·m (43 in-lb)
High-mounted stoplight mounting nut <Rear shelf mounted type>	5.0 N·m (44 in-lb)
High-mounted stoplight mounting screw <Rear spoiler mounted type>	0.7 N·m (6.2 in-lb)
Horn mounting bolt	22 N·m (15 ft-lb)
Radio and tape player mounting screw	1.5 N·m (13 in-lb)
Radio bracket mounting screw	1.5 N·m (13 in-lb)
Rear combination light mounting nut	4.9 N·m (43 in-lb)
Theft-alarm horn mounting bolt	22 N·m (15 ft-lb)
Tweeter mounting nut	1.5 N·m (13 in-lb)

## SERVICE SPECIFICATIONS

M1541000300038

## &lt;IMMOBILIZER SYSTEM&gt;

ITEM	STANDARD VALUE
Ignition key ring antenna resistance $\Omega$	2 or less

## &lt;COMBINATION METER&gt;

ITEMS	STANDARD VALUE	
Speedometer indication error mph (km/h)	20 (32)	19 – 22 (31 – 35)
	40 (64)	38 – 44 (61 – 71)
	60 (97)	57 – 66 (92 – 106)
	80 (129)	76 – 88 (122 – 142)
	100 (161)	94 – 110 (151 – 177)
Tachometer indication error r/min	700	$\pm 100$
	3,000	$\pm 150$
	5,000	$\pm 250$
	6,000	$\pm 300$
Fuel gauge unit resistance $\Omega$	Float point "F"	3 – 5
	Float point "E"	110 – 112
Fuel gauge unit float height mm (in)	A (Float point "F")	180.3 (7.10)
	B (Float point "E")	18.8 (0.74)

TSB Revision

ITEMS		STANDARD VALUE
Fuel gauge resistance $\Omega$	Power supply and ground	Approx. 95
	Power supply and fuel gauge	Approx. 87
	Fuel gauge and ground	Approx. 98
Engine coolant temperature gauge resistance $\Omega$	Power supply and ground	Approx. 95
	Power supply and engine coolant temperature gauge	Approx. 75
	Engine coolant temperature gauge and ground	Approx. 170
Engine coolant temperature gauge unit resistance $\Omega$		104 + 13.5

## &lt;FOG LIGHT&gt;

ITEMS		STANDARD VALUE	LIMIT
Fog light aiming	Vertical direction	148 mm (5.8 in) below horizontal (H)	-
	Horizontal direction	Parallel to direction of vehicle travel	-

## &lt;HEADLIGHT&gt;

ITEMS		STANDARD VALUE	LIMIT
Headlight aiming	Vertical direction	21 mm (0.8 in) below horizontal (H)	-
	Horizontal direction	Position where the 15° sloping section intersects the vertical line (V)	-
Headlight intensity cd		-	20,000 or more

## SEALANT

M1541000500032

## &lt;COMBINATION METER&gt;

ITEM	SPECIFIED SEALANT	REMARK
Engine coolant temperature gauge unit threaded portion	3M™ AAD part No. 8731 or equivalent	Drying sealant