

# GROUP 54A

# CHASSIS ELECTRICAL

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### **WARNING**

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

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

### **WARNING**

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

#### **NOTE**

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

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# BATTERY

## ON-VEHICLE SERVICE

### BATTERY CHECK

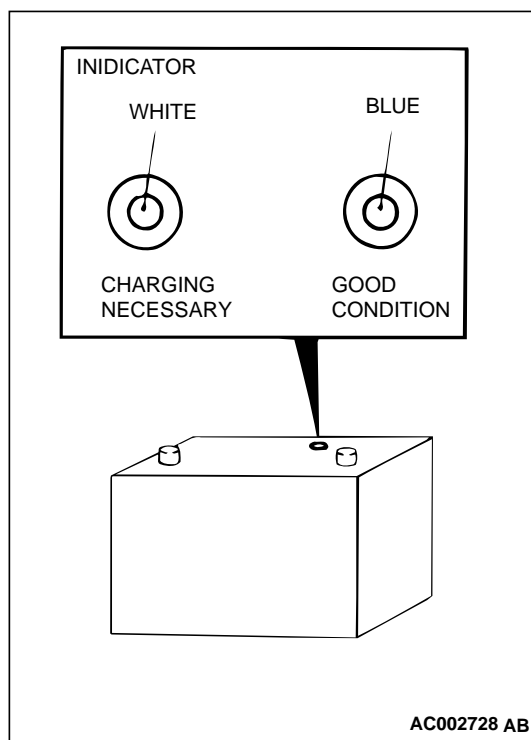
M1541001000267

**⚠ WARNING**

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

### BATTERY VISUAL INSPECTION (1)

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



### BATTERY VISUAL INSPECTION (2)

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

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

**⚠ WARNING**

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

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

4. Clean the battery, especially the top with 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

M1541001100253

### **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	75D23L (520amps)
Slow charging	5 amps 10.4 hours
	10 amps 5.2 hours
Fast charging	20 amps 2.6 hours
	30 amps 1.8hours

## BATTERY TEST

M1541001200250

### BATTERY TESTING PROCEDURE

#### STEP 1. Check the battery cables.

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

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

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

#### STEP 2. Check the battery post.

Check for loose battery post.

**Q: Are the battery 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 Step 6.

**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 CHART**

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

**LOAD TEST RATE CHART**

<b>Load test</b>	<b>260 amps</b>
Cranking ratio (0°F)	520 amps
Reserve capacity	118 minutes
Application	75D23L

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

M1543009900754

### DIAGNOSIS

#### IGNITION SWITCH DIAGNOSIS

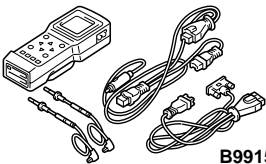
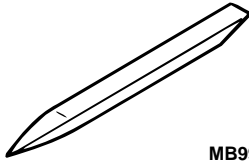
The Ignition key reminder tone alarm is controlled by the Simplified Wiring System (SWS). For troubleshooting, refer to GROUP 54B, SWS Diagnosis

[P.54Bb-2.](#)

M1543000700548

### SPECIAL TOOLS

M1543000600659

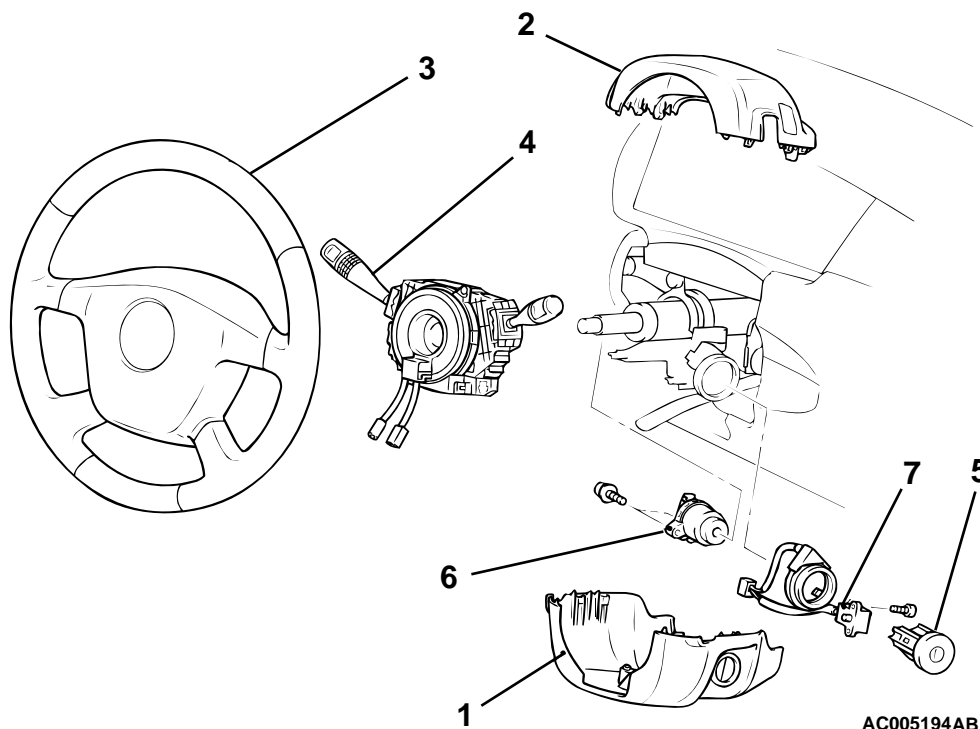
TOOL	TOOL NUMBER AND NAME	SUPERSESSSION	APPLICATION
 B991502	MB991502 Scan tool (MUT-II)	MB991496-OD	<ul style="list-style-type: none"><li>• Checking the ETACS-ECU input signals</li></ul>
 MB990784	MB990784 Ornament remover	General service tool	Removal of trim, etc.

## REMOVAL AND INSTALLATION

M1543002100252

**⚠ WARNING**

- Before removal of the air bag module, refer to **GROUP 52B, SRS Service Precautions and Air Bag Module and Clock Spring P.52Ba-16.**
- When removing and installing the steering wheel, do not let it bump against the air bag module.

**IGNITION SWITCH REMOVAL STEPS**

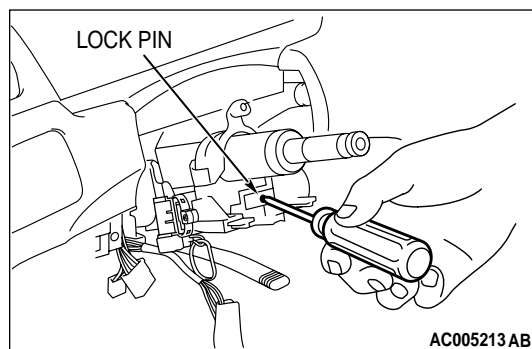
1. LOWER COLUMN COVER (REFER TO GROUP 52A - INSTRUMENT PANEL P.52A-2.)
2. UPPER COLUMN COVER (REFER TO GROUP 52A - INSTRUMENT PANEL P.52A-2.)

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

3. STEERING WHEEL (REFER TO GROUP 37A P.37A-20.)
4. CLOCK SPRING COLUMN SWITCH ASSEMBLY (REFER TO GROUP 37A - STEERING SHAFT P.37A-20.)
5. STEERING LOCK CYLINDER
6. IGNITION SWITCH
7. KEY REMINDER SWITCH

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

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



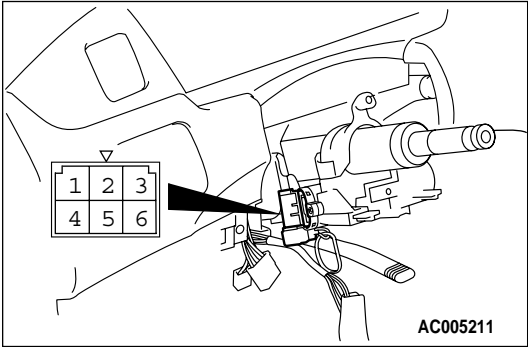


INSPECTION

M1543019501255

IGNITION SWITCH CONTINUITY CHECK

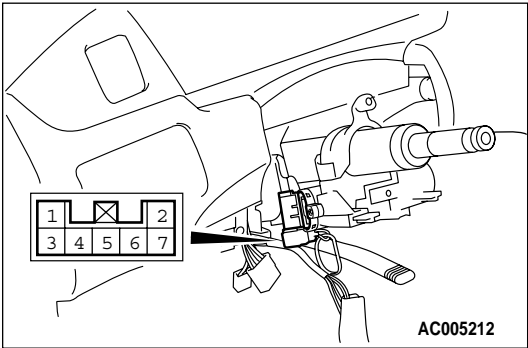
Disconnect ignition switch connector C-87 without removing the ignition switch and steering lock cylinder. Then check the continuity.



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

KEY REMINDER SWITCH AND IGNITION KEY RING ANTENNA CONTINUITY CHECK

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



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

2. Ignition key ring antenna check.  
Check for continuity between terminal 3 and terminal 7.  
**Standard value: two ohm or less**

COMBINATION METERS ASSEMBLY  
AND VEHICLE SPEED SENSOR

DIAGNOSIS

INTRODUCTION TO COMBINATION METER DIAGNOSIS

M1543009900765

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

TROUBLESHOOTING STRATEGY

M1543006900410

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.

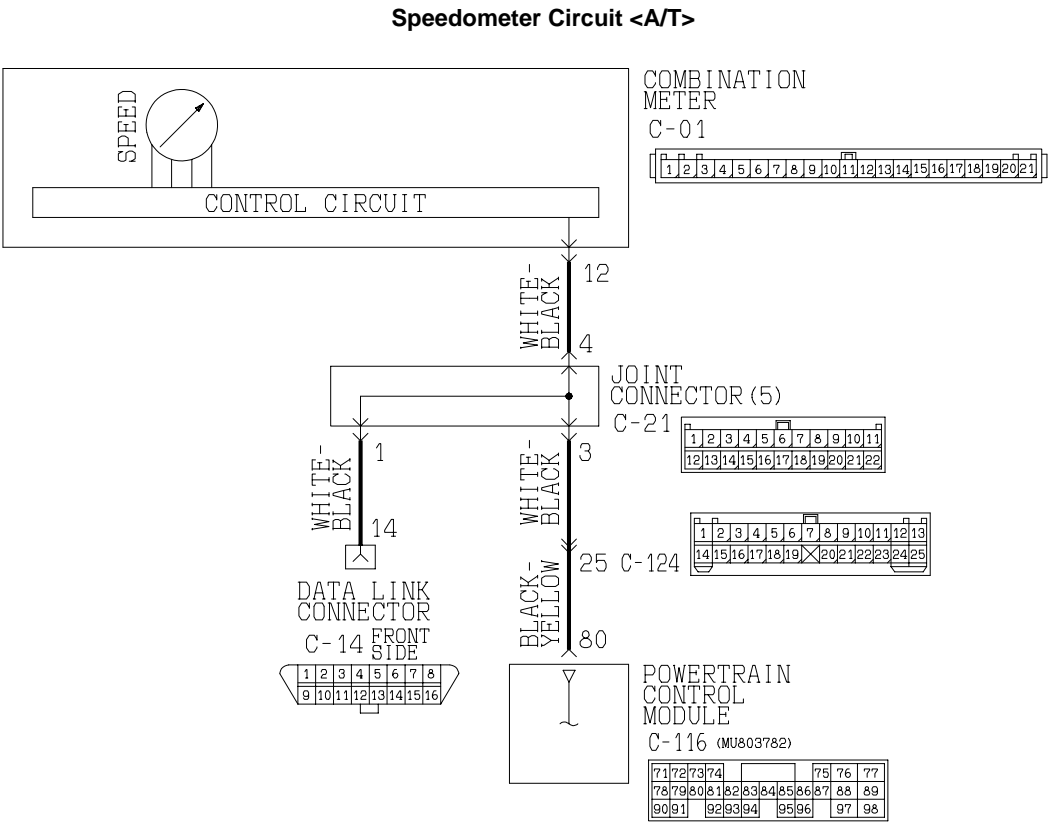
SYMPTOM CHART

M1543007200577

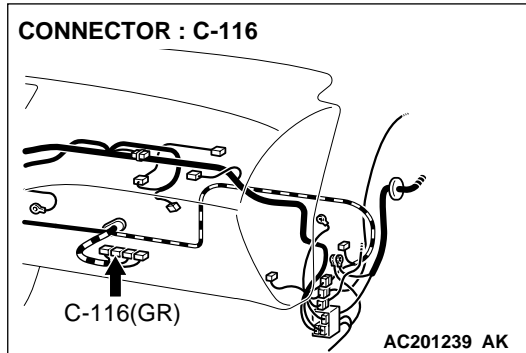
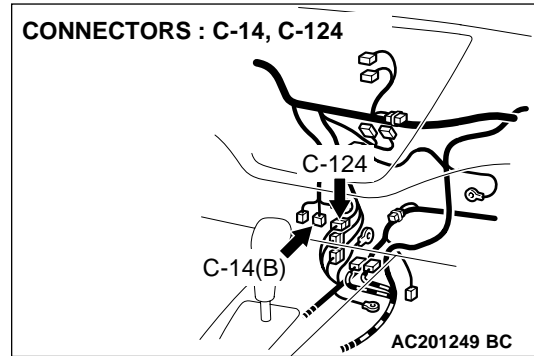
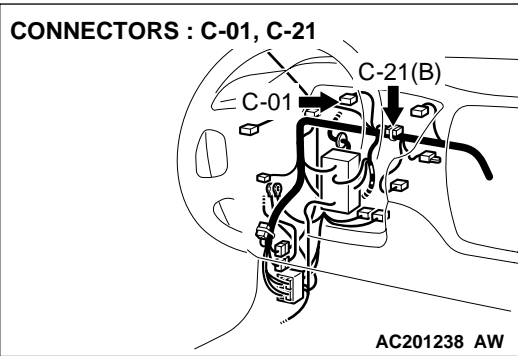
SYMPTOMS	INSPECTION PROCEDURE	REFERENCE PAGE
Speedometer does not work <A/T>.	1	P.54A-10
Speedometer does not work. <M/T>	2	P.54A-15
Tachometer does not work.	3	P.54A-19
Fuel gauge does not work.	4	P.54A-23
Engine coolant temperature gauge does not work.	5	P.54A-28
Combination meter does not work.	6	P.54A-32

SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: Speedometer does not Work. <A/T>



W3J11M02AA



### CIRCUIT OPERATION

- The ignition switch (IG1) circuit is the power source for the speedometer and output shaft speed sensor.
- The output shaft speed sensor is incorporated in the transaxle. The signals from the output shaft speed sensor are referenced for PCM to send a vehicle speed signal to the speedometer. The speedometer calculates the vehicle speed signal to operate the needle of the meter. At the same time, the travel distance is calculated.

### TECHNICAL DESCRIPTION (COMMENT)

The cause may be due to malfunction of the output shaft speed sensor circuitry, PCM or speedometer. Vehicle speed sensor is also used by the powertrain control module (PCM), auto-cruise control-ECU.

### TROUBLESHOOTING HINTS

- Malfunction of the output shaft speed sensor
- Malfunction of the combination meter (printed-circuit board or speedometer and tachometer)
- Malfunction of the PCM
- Damaged wiring harness or connectors

### DIAGNOSIS

#### Required Special Tools:

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

#### STEP 1. Check with other meter.

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

#### Q: Do all other meters operate?

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

NO <one of the meters do not operate.> : Refer to INSPECTION PROCEDURE 6 [P.54A-32](#).

**STEP 2.** Using scan tool MB991502, read the diagnostic trouble code (DTC).

**⚠ CAUTION**

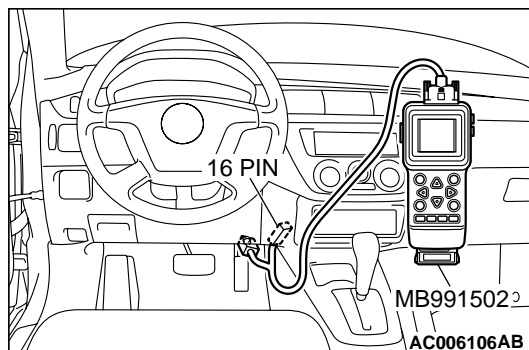
To prevent damage to scan tool always turn the ignition switch to "LOCK" (OFF) position before connecting or disconnecting scan tool.

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

**Q: Is DTC P0720 output?**

**YES :** Refer to GROUP 13A, Multiport Fuel Injection (MFI) Diagnosis [P.13Ab-19](#).

**NO :** Go to Step 3.

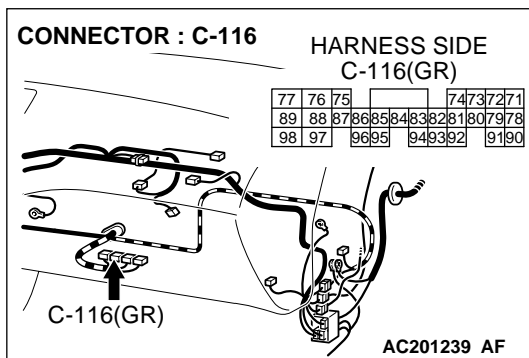
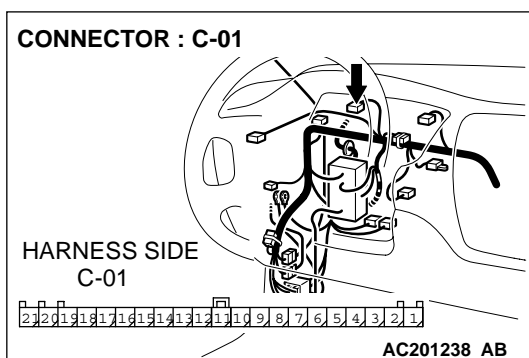


**STEP 3.** Check combination meter connector C-01 and PCM connector C-116 for damage.

**Q: Are combination meter connector C-01 and PCM connector C-116 in good condition?**

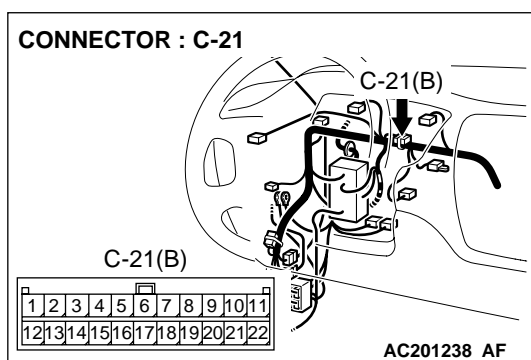
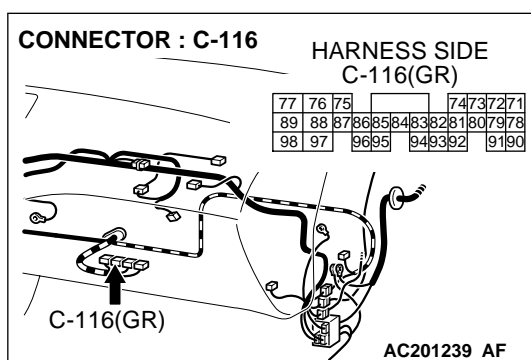
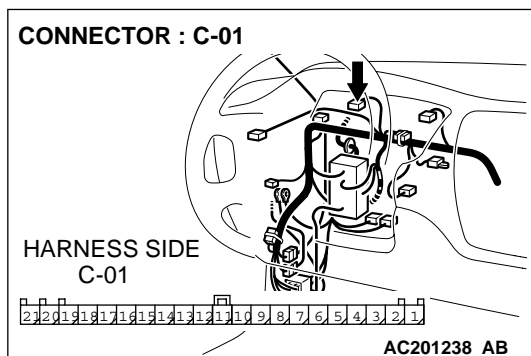
**YES :** Go to Step 4.

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



**STEP 4. Check the wiring harness between combination meter connector C-01 (terminal 12) and PCM connector C-116 (terminal 80).**

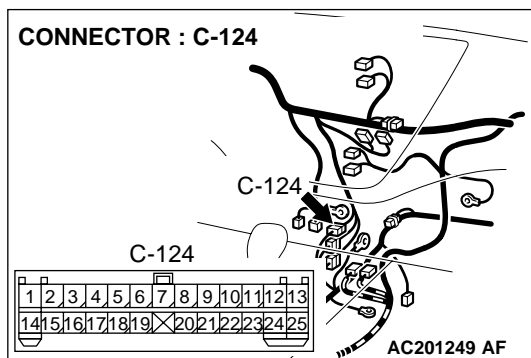
**NOTE:** Also check joint connector (5) C-21 and intermediate connector C-124. If joint connector (5) C-21 or intermediate connectors C-124 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.



**Q: Are the wiring harness between combination meter connector C-01 (terminal 12) and PCM connector C-116 (terminal 80) in good condition?**

**YES :** Go to Step 5.

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



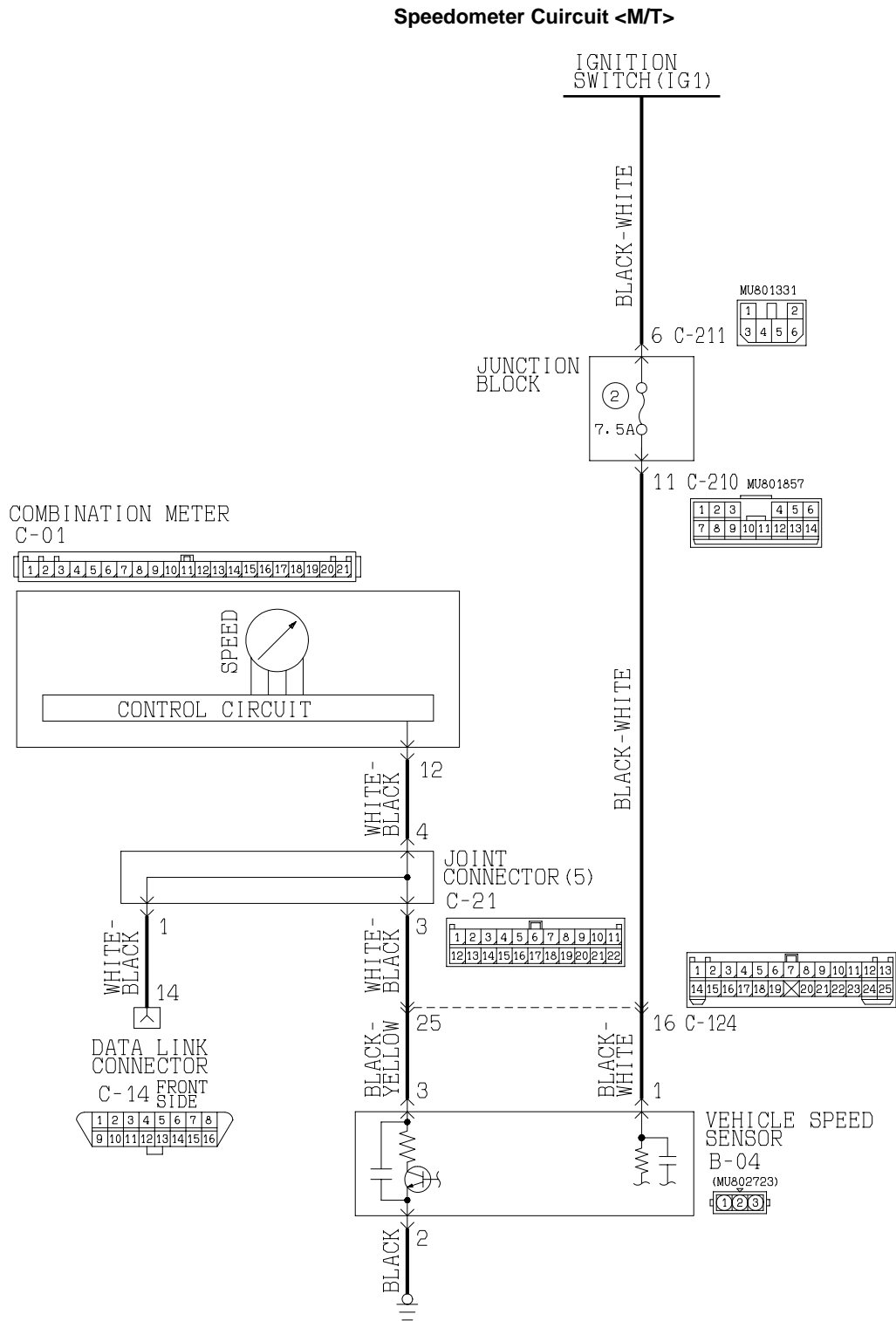
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**STEP 5. Check in auto-cruise control.****Q: Does auto-cruise control take effect?**

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

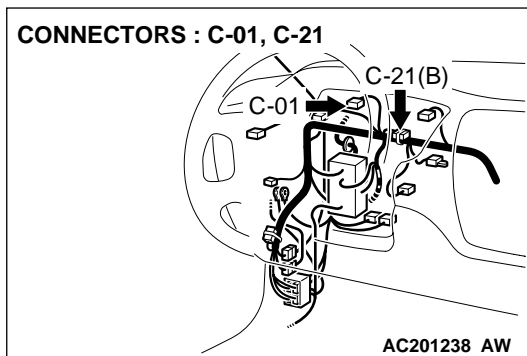
**NO :** Replace the PCM. The speedometer should work normally.

INSPECTION PROCEDURE 2: Speedometer does not Work. <M/T>



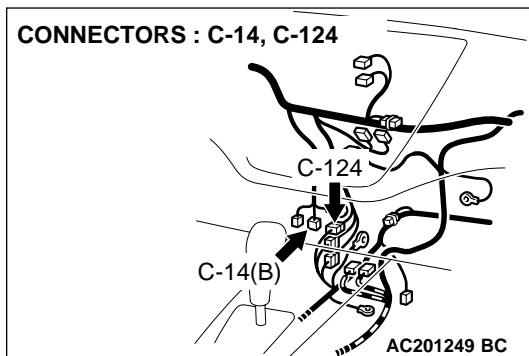
W3J11M01AA

CONNECTORS : C-01, C-21



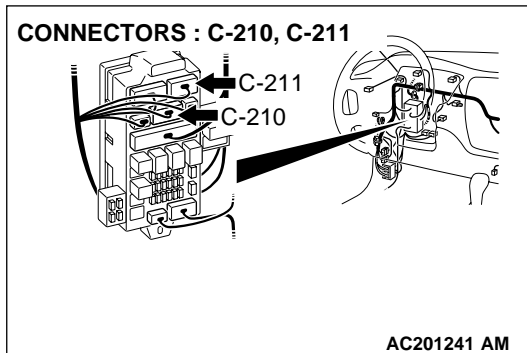
AC201238 AW

CONNECTORS : C-14, C-124



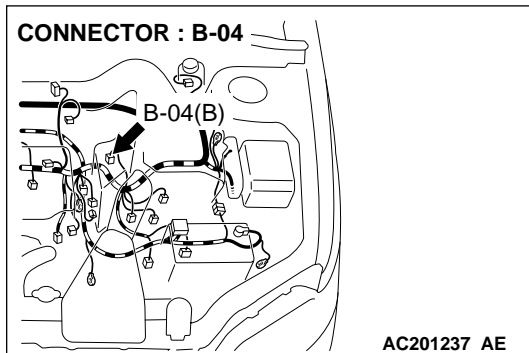
AC201249 BC

CONNECTORS : C-210, C-211



AC201241 AM

CONNECTOR : B-04



AC201237 AE

**CIRCUIT OPERATION**

- The ignition switch (IG1) circuit is the power source for the speedometer and vehicle speed sensor.
- The vehicle speed sensor are 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 to operate the needle of the meter. At the same time, the travel distance is calculated.

**TECHNICAL DESCRIPTION (COMMENT)**

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

**TROUBLESHOOTING HINTS**

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

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

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

**STEP 1. Check with other meter.**

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

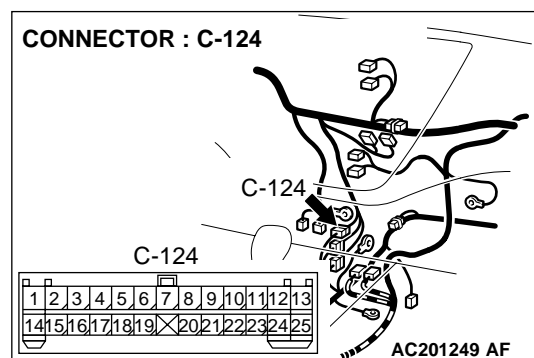
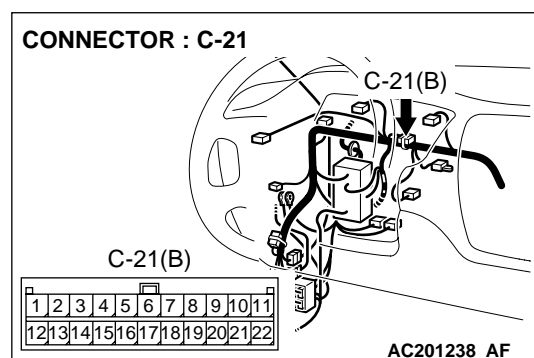
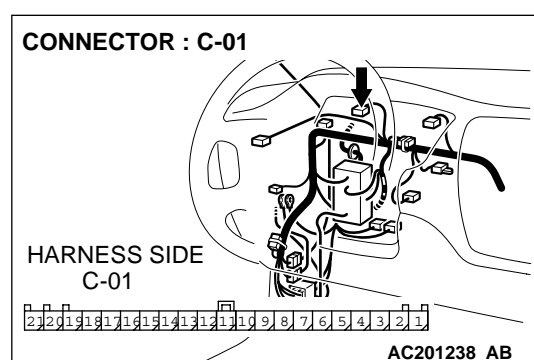
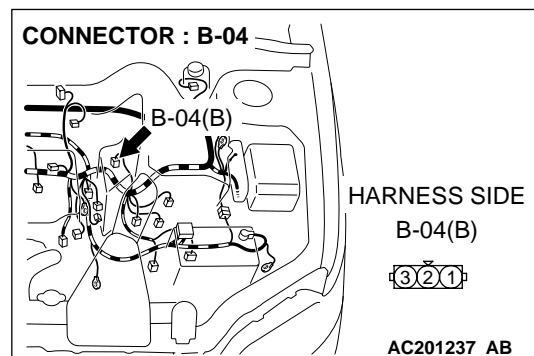
**Q: Do all other meters operate?**

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

**NO** <one of the meters do not operate.> : Refer to INSPECTION PROCEDURE 6 [P.54A-32](#).







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

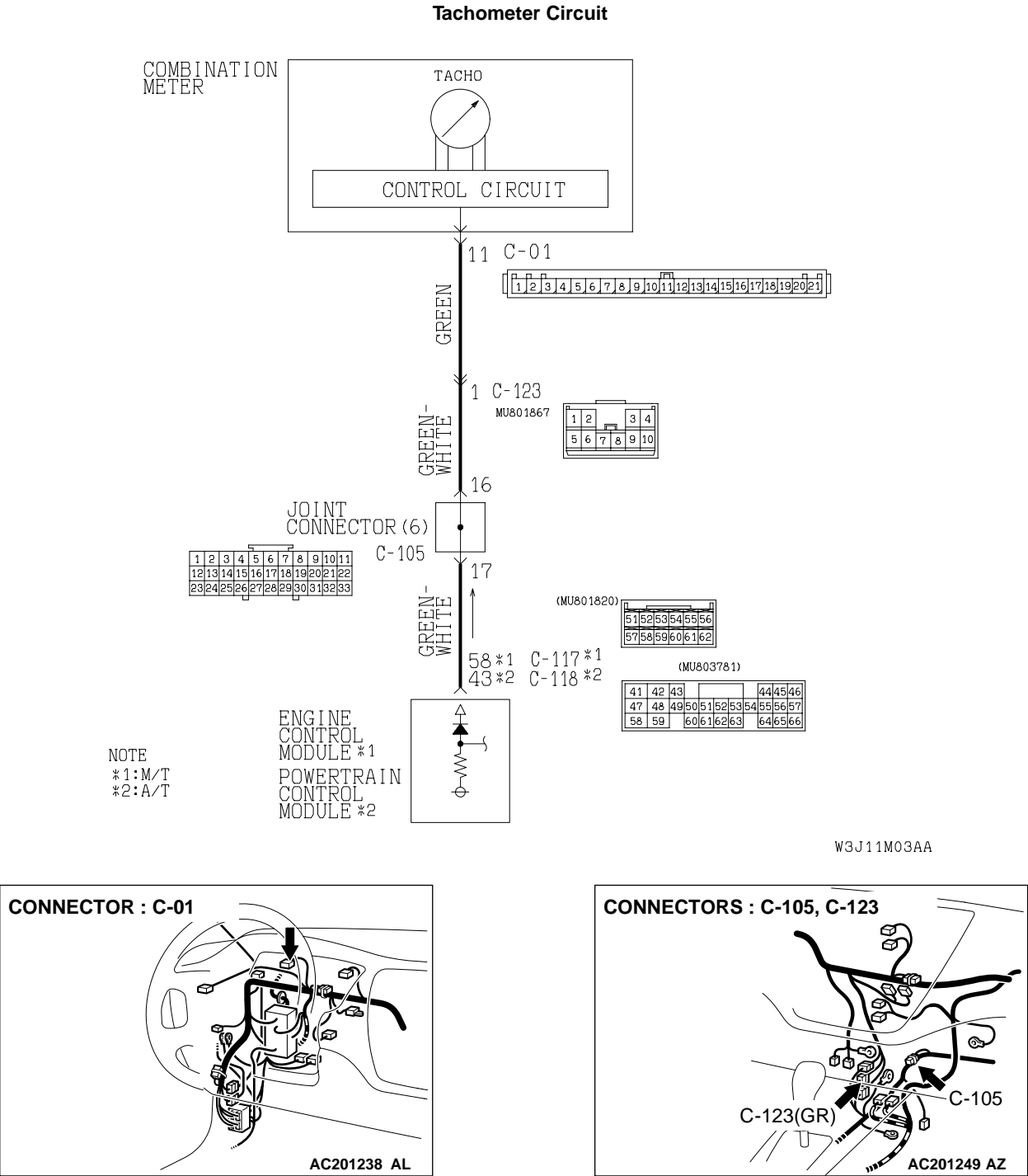
**NOTE:** Also check joint connector (5) C-21 and intermediate connector C-124. If joint connector (5) C-21 or intermediate connectors C-124 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

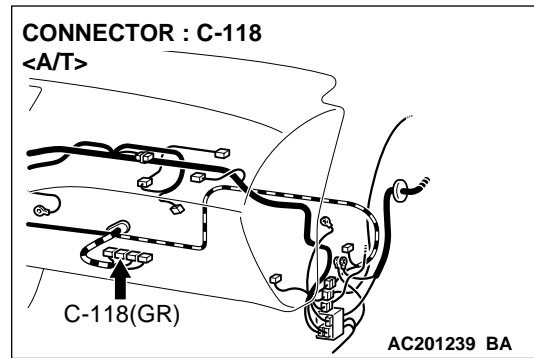
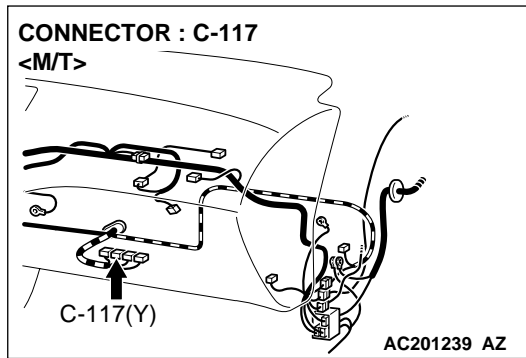
**Q: Are the wiring harness between combination meter connector C-01 (terminal 12) and vehicle speed sensor connector B-04 (terminal 3) in good condition?**

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

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

INSPECTION PROCEDURE 3: Tachometer does not Work.



**CIRCUIT OPERATION**

- The tachometer power is supplied from the ignition switch (IG) circuit.
- The tachometer calculates the engine revolution (r/min) according to the ECM <M/T> or PCM <A/T> signals to operate the needle.

**TECHNICAL DESCRIPTION (COMMENT)**

The cause is thought to be because ECM <M/T> or PCM <A/T> signals are not transmitted or due to combination meter error.

**TROUBLESHOOTING HINTS**

- Malfunction of the combination meter (printed circuit board or speedometer and tachometer)
- Malfunction of the ECM <M/T> or PCM <A/T>
- Damaged wiring harness or connectors

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

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

**STEP 1. Check with other meter.**

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

**Q: Do all other meters operate?**

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

**NO**< one of the meters do not operate >. : Refer to INSPECTION PROCEDURE 5 [P.54A-32](#).

**STEP 2. Using scan tool MB991502, read the diagnostic trouble code (DTC).****CAUTION**

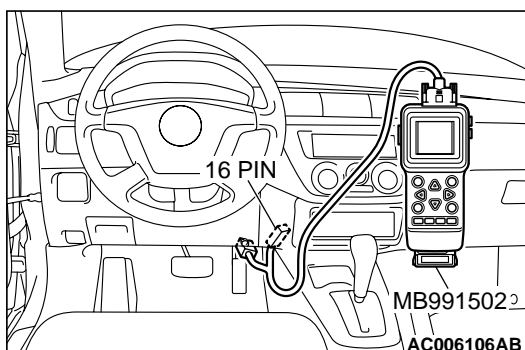
To prevent damage to scan tool MB991502, always turn the ignition switch to "LOCK" (OFF) position before connecting or disconnecting scan tool.

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

**Q: Is DTC output to the MFI system?**

**YES** : Refer to Group 13-Multiport Fuel Injection (MFI) Diagnosis [P.13Ab-19](#).

**NO** : Go to Step 3.

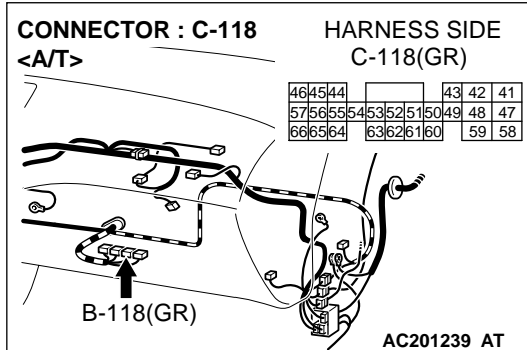
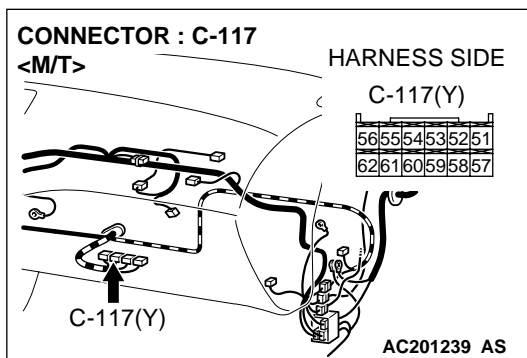
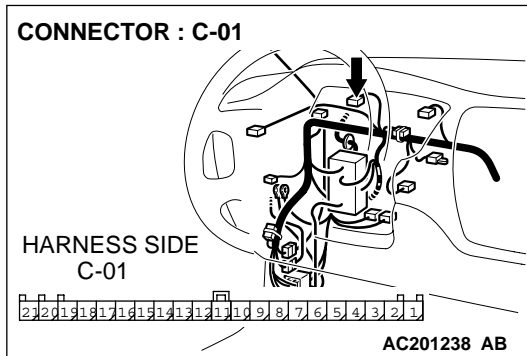


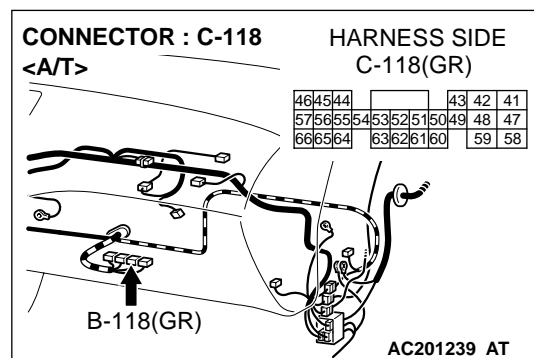
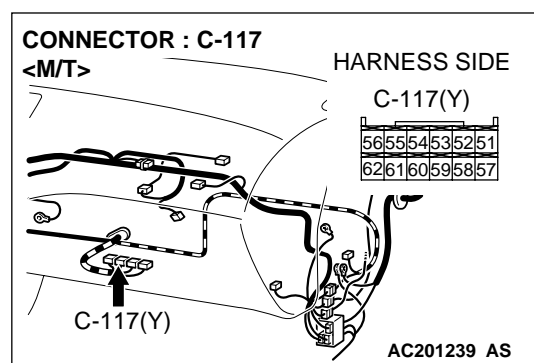
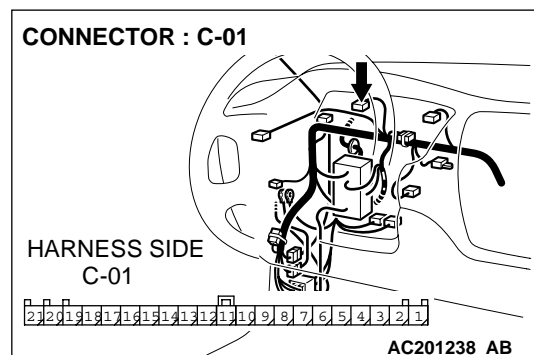
**STEP 3.** Check combination meter connector C-01 and ECM connector C-117 <M/T> or PCM connector C-118 <A/T> for damage.

**Q:** Are combination meter connector C-01 and ECM connector C-117 <M/T> or PCM connector C-118 <A/T> in good condition?

**YES :** Go to Step 4.

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





**STEP 4. Check the wiring harness between combination meter connector C-01 (terminal 11) and ECM connector C-117 <M/T> (terminal 58) or PCM connector C-118 <A/T> (terminal 43).**

**Q: Are the wiring harness between combination meter connector C-01 (terminal 11) and ECM connector C-117 <M/T> (terminal 58) or PCM connector C-118 <A/T> (terminal 43) in good condition?**

**YES :** Go to Step 5.

**NO :** Repair the wiring harness. The tachometer should work normally.

**STEP 5. Replace the combination meter and check.**

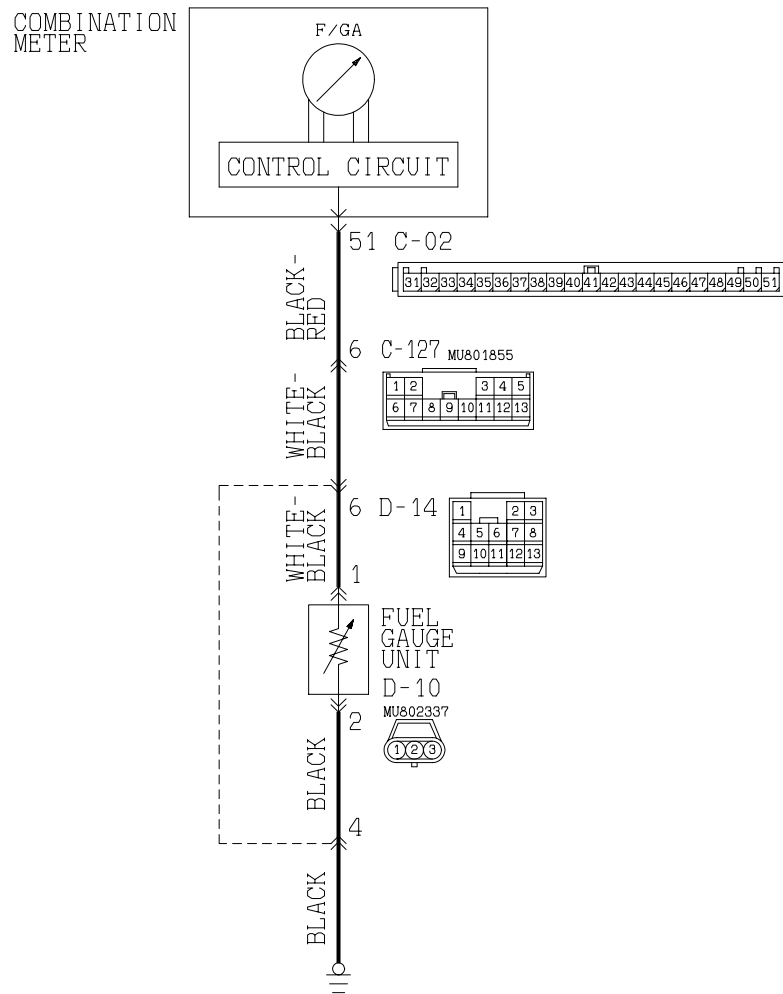
**Q: Does the tachometer operate?**

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

**NO :** Replace the PCM. The tachometer should work normally.

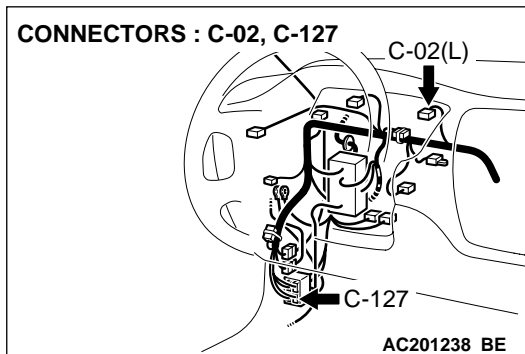
**INSPECTION PROCEDURE 4: Fuel Gauge does not Work.**

**Fuel Gauge Circuit**

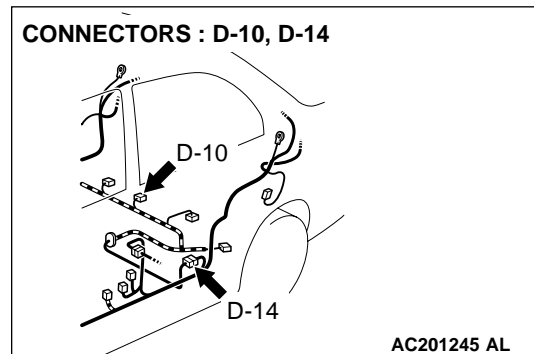


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**CONNECTORS : C-02, C-127**



**CONNECTORS : D-10, D-14**



**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)**

The cause is thought to be due to malfunction of the fuel gauge unit or combination meter.

**TROUBLESHOOTING HINTS**

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

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

MB991223: Harness Set

**STEP 1. Check with other meter.**

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

**Q: Do all other meters operate?**

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

**NO** <one of the meters do not operate.> : Refer to INSPECTION PROCEDURE 6 [P.54A-32](#).

**STEP 2. Check the fuel gauge unit.**

Check to see if the fuel gauge is normal. Refer to [P.54A-40](#).

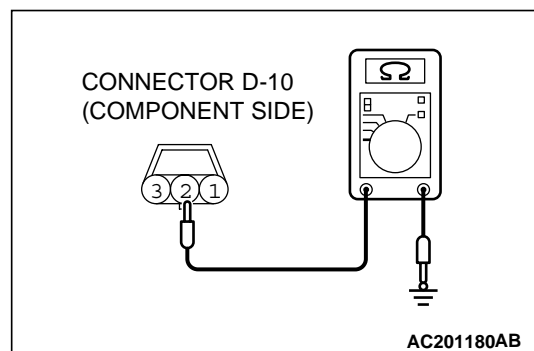
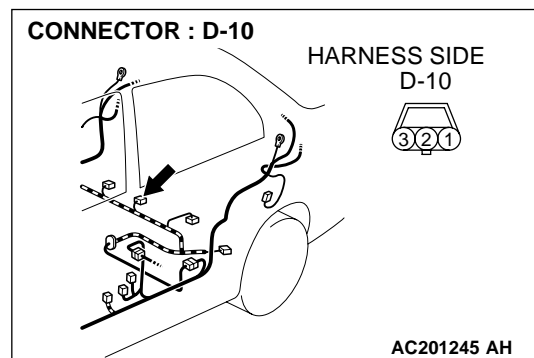
**Q: Is the fuel gauge unit normal?**

**YES** : Go to Step 3.

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

**STEP 3. Measure at fuel gauge unit connector D-10 in order to the ground circuit to the fuel gauge unit.**

(1) Disconnect fuel gauge unit connector D-10, and measure at the wiring harness side.



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

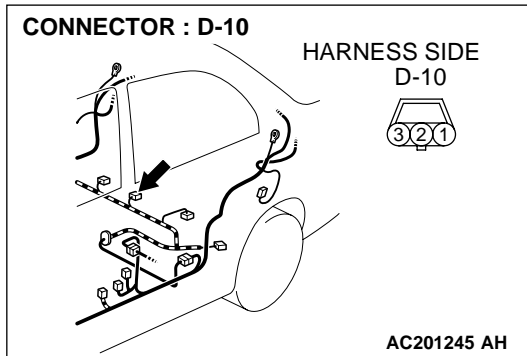
- The measured value should be 2 ohm or less.

**Q: Does the measured resistance value correspond with this range?**

**YES** : Go to Step 6.

**NO** : Go to Step 4.



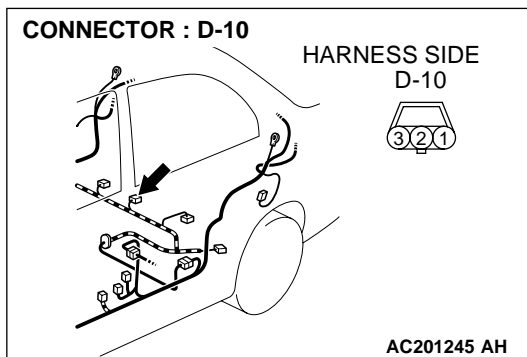


**STEP 4. Check fuel gauge unit connector D-10 for damage.**

**Q: Is fuel gauge unit connector D-10 in good condition?**

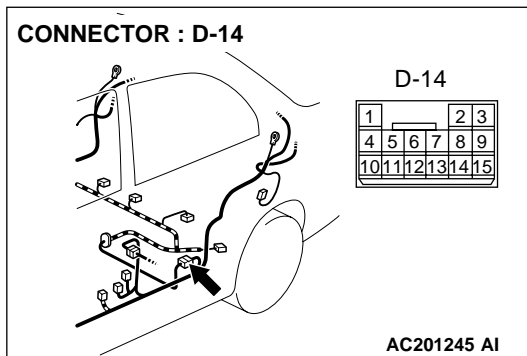
**YES :** Go to Step 6.

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



**STEP 5. Check the wiring harness between fuel gauge unit connector D-10 (terminal 2) and ground.**

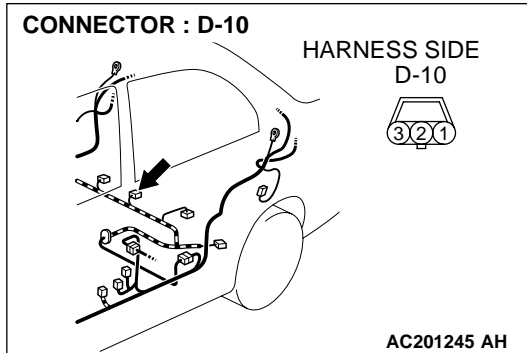
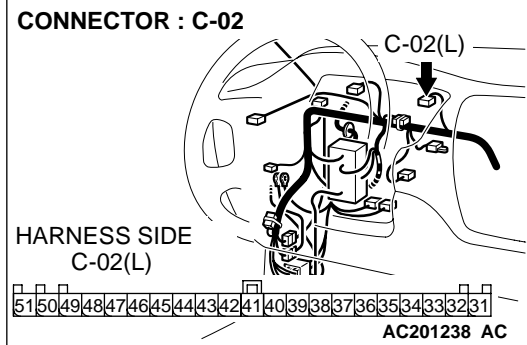
**NOTE:** Also check intermediate connector D-14. If intermediate connector D-14 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection [P.00E-2](#).



**Q: Is the wiring harness between fuel gauge unit connector D-10 (terminal 2) and ground in good condition?**

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

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



**STEP 6.** Check fuel gauge unit connector D-10 and combination meter connector C-02 for damage.

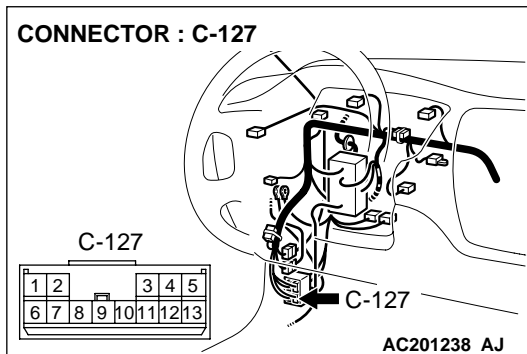
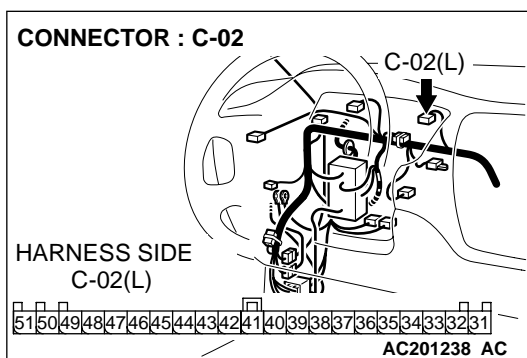
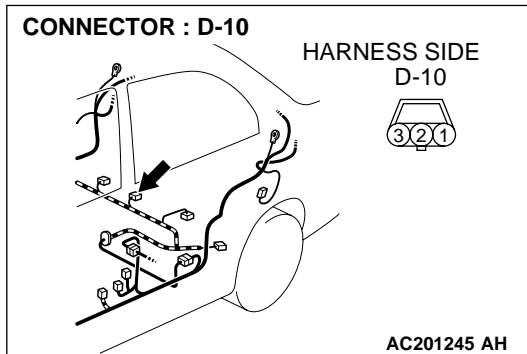
**Q:** Are fuel gauge unit connector D-10 and combination meter connector C-02 in good condition?

**YES :** Go to Step 8.

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

**STEP 7. Check the wiring harness between fuel gauge unit connector D-10 (terminal 1) and combination meter connector C-02 (terminal 51).**

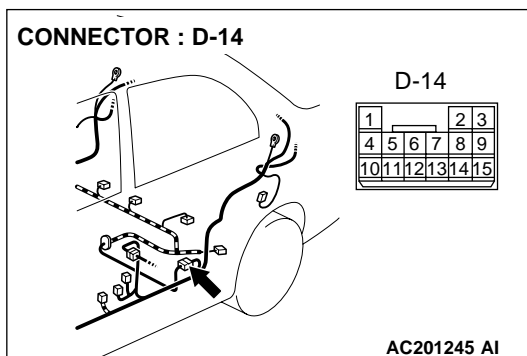
**NOTE:** Also check intermediate connectors C-127 and D-14. If intermediate connector C-127 or D-14 are damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection [P.00E-2](#).



**Q: Are the wiring harness between fuel gauge unit connector D-10 (terminal 1) and combination meter connector C-02 (terminal 51) in good condition?**

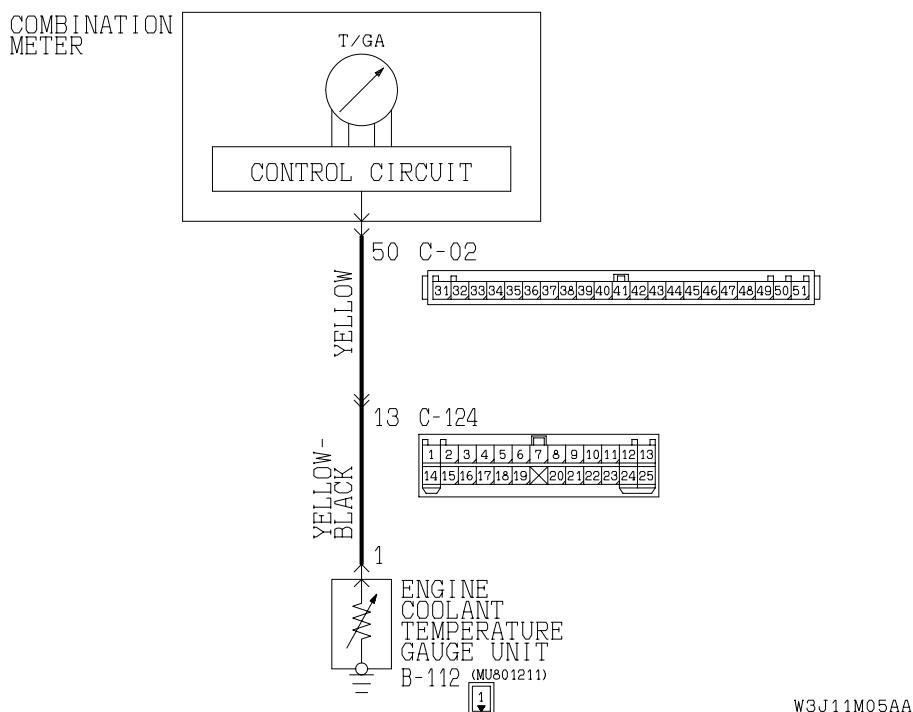
**YES :** Repair or replace the combination meter. The fuel gauge should work normally.

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

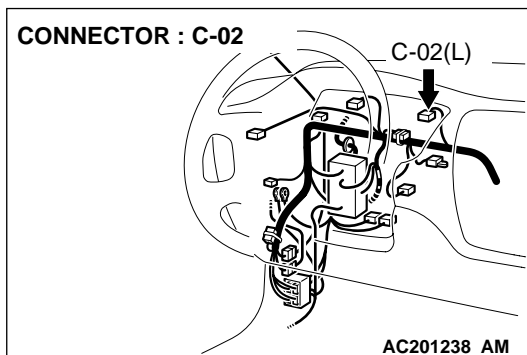


## INSPECTION PROCEDURE 5: Engine Coolant Temperature Gauge does not Work.

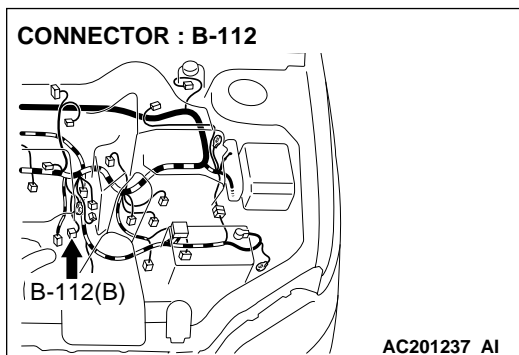
Engine Coolant Temperature Gauge Circuit



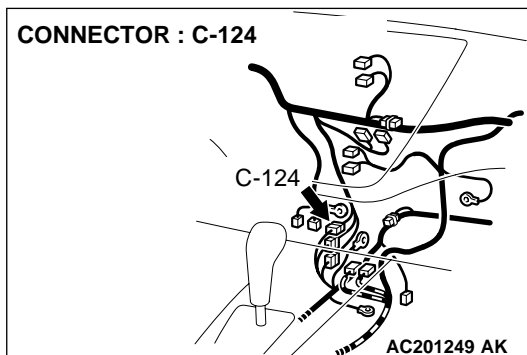
CONNECTOR : C-02



CONNECTOR : B-112



CONNECTOR : C-124



## 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)**

The cause is thought to be due to malfunction of engine coolant temperature gauge unit or the combination meter.

**TROUBLESHOOTING HINTS**

- Malfunction of the engine coolant temperature gauge unit
- Malfunction of the combination meter
- Damaged wiring harness or connectors

**DIAGNOSIS**

**Required Special Tool:**

MB991223: Harness Set

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**STEP 1. Check with other meter.**

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

**Q: Do all other meters operate?**

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

**NO**< one of the meters do not operate >. : Refer to INSPECTION PROCEDURE 6 [P.54A-32](#).

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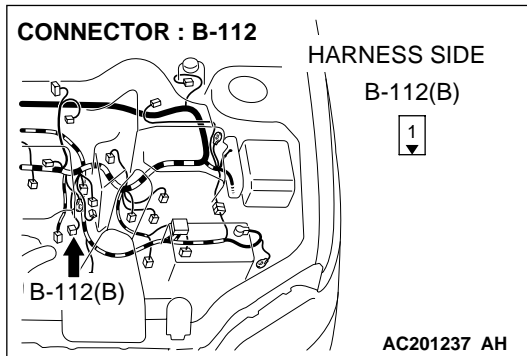
**STEP 2. Check the engine coolant temperature gauge unit.**

Check to see that the engine coolant temperature gauge unit operate normally. Refer to [P.54A-41](#).

**Q: Is the engine coolant temperature gauge unit normal?**

**YES** : Go to Step 3.

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

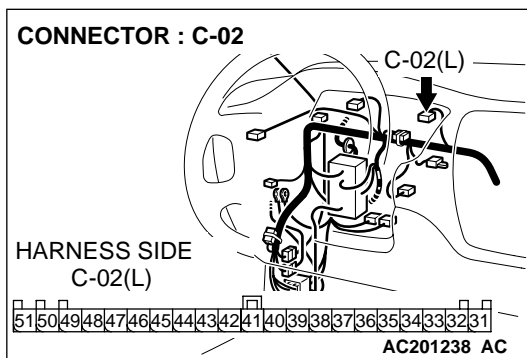


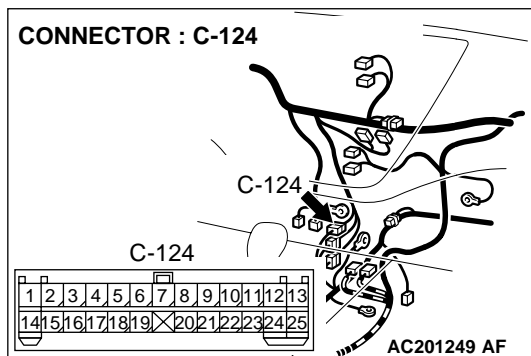
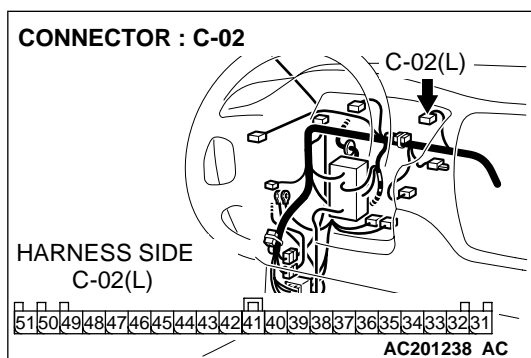
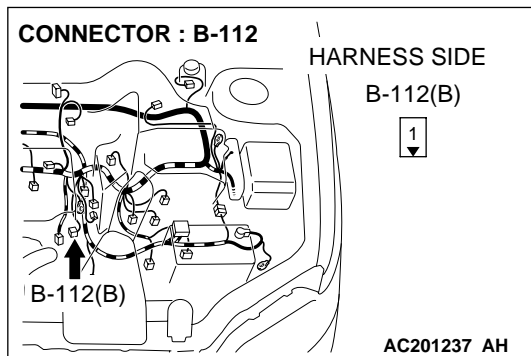
**STEP 3.** Check engine coolant temperature gauge unit connector B-112 and combination meter connector C-02 for damage.

**Q:** Are engine coolant temperature gauge unit connector B-112 and combination meter connector C-02 in good condition?

**YES :** Go to Step 4.

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





**STEP 4.** Check the wiring harness between engine coolant temperature gauge unit connector B-112 (terminal 1) and combination meter connector C-02 (terminal 50).

*NOTE:* Also check intermediate connector C-124. If intermediate connector C-124 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection [P.00E-2](#).

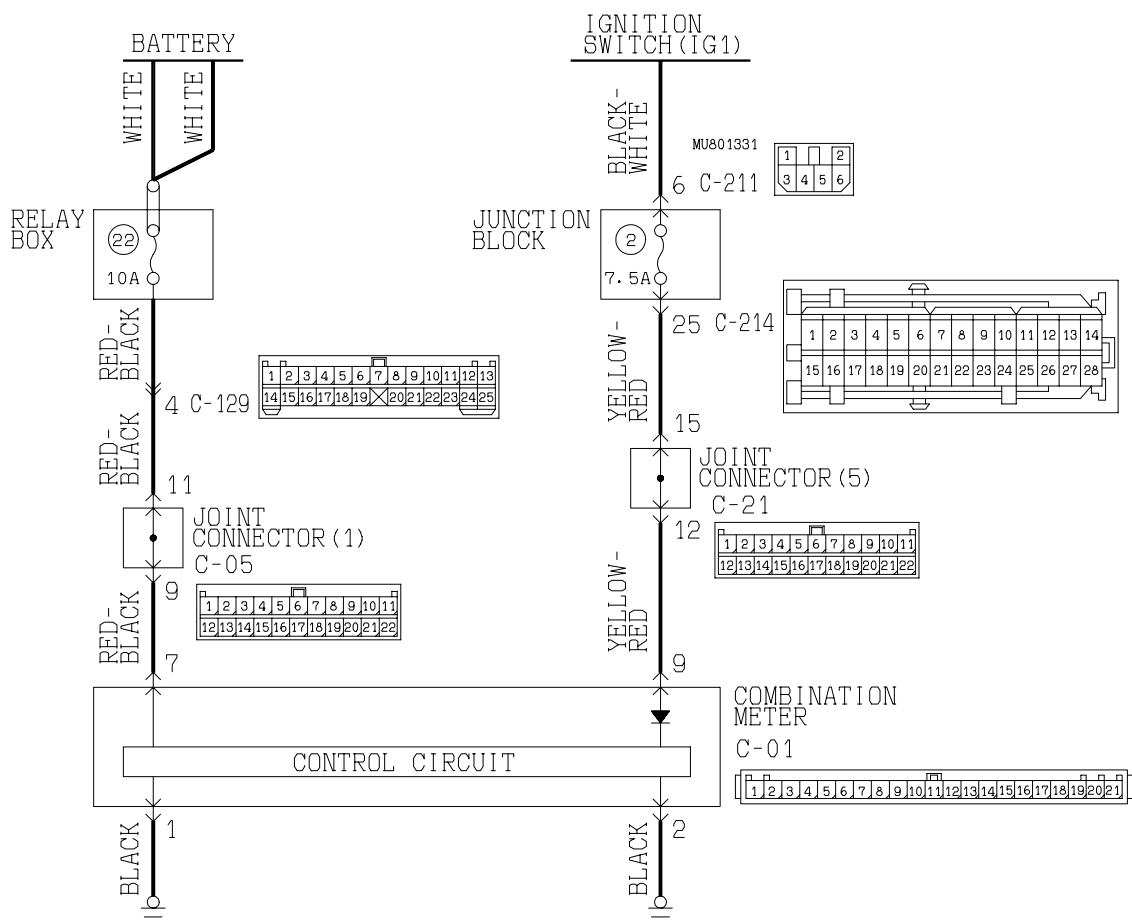
**Q:** Are the wiring harness between engine coolant temperature gauge unit connector B-112 (terminal 1) and combination meter connector C-02 (terminal 50) in good condition?

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

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

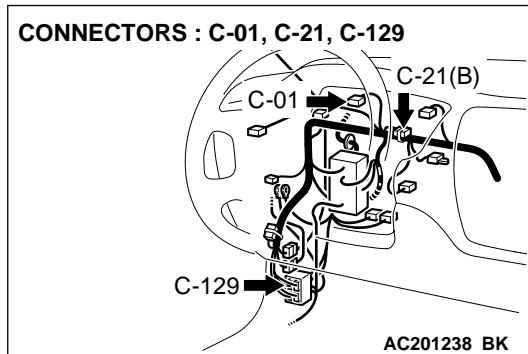
## INSPECTION PROCEDURE 6: Combination meter does not work.

## Combination Meter Power Supply Circuit

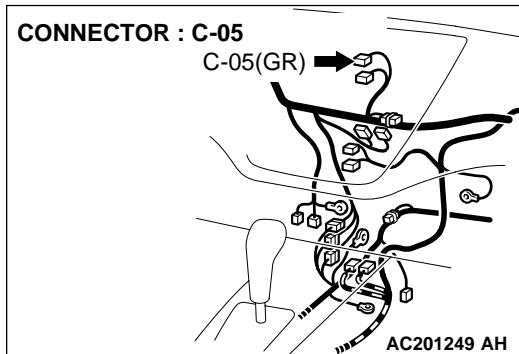


W3J11M06AA

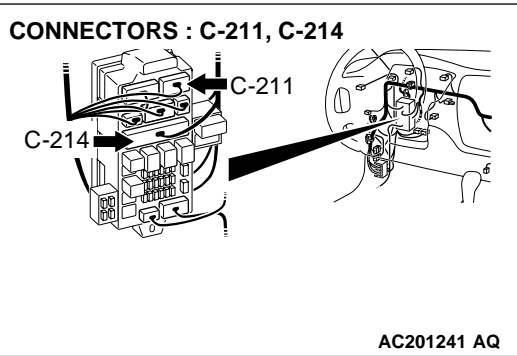
## CONNECTORS : C-01, C-21, C-129



## CONNECTOR : C-05







### CIRCUIT OPERATION

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

### TECHNICAL DESCRIPTION (COMMENT)

The cause is thought to be malfunction of the power, ground circuitry or combination meter.

### TROUBLESHOOTING HINTS

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

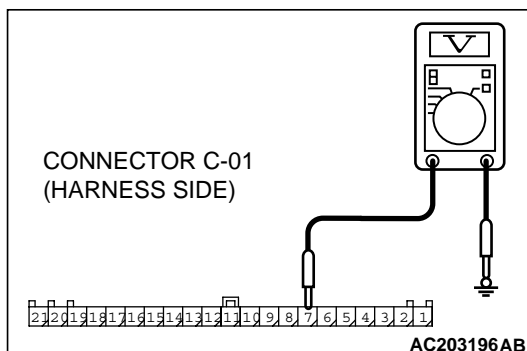
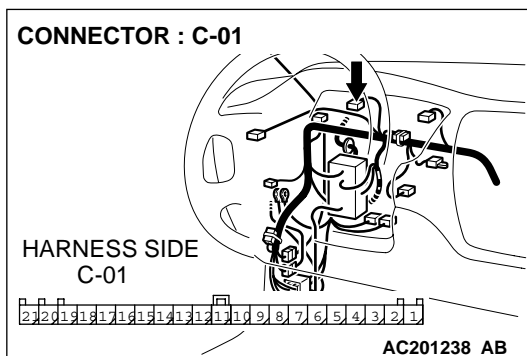
### DIAGNOSIS

#### Required Special Tools:

- MB991223: Harness Set

**STEP 1. Measure at combination meter connector C-01 in order to check the battery circuit of power supply system to the combination meter.**

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



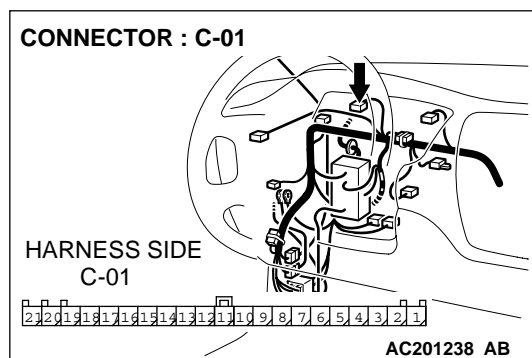
- (2) Measure the voltage between terminal 7 and ground.

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

**Q: Does the measured voltage correspond with this range?**

**YES :** Go to Step 4.

**NO :** Go to Step 2.

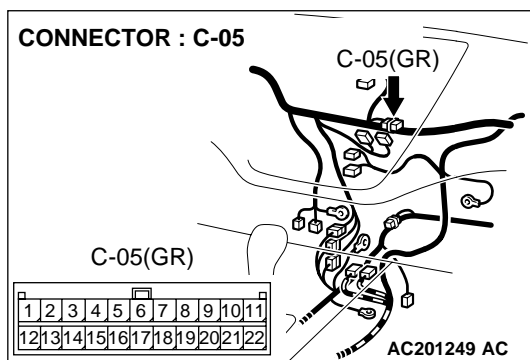
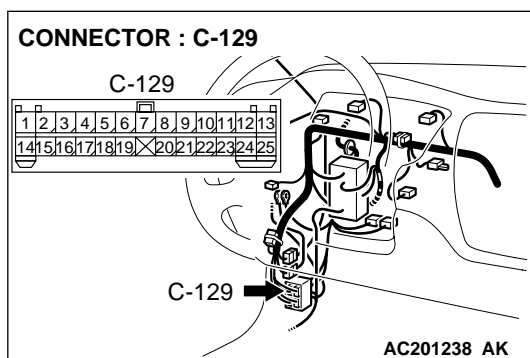
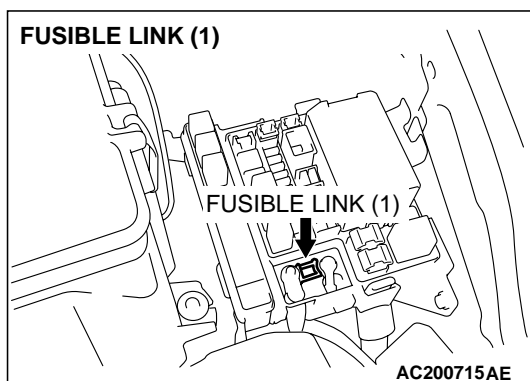
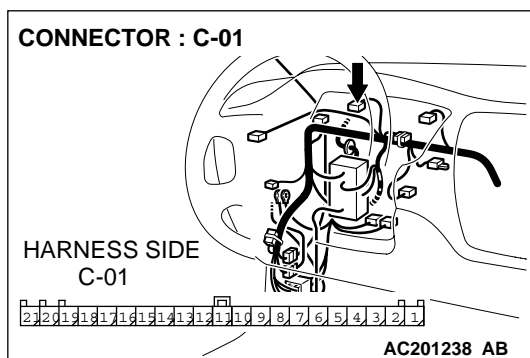


**STEP 2. Check combination meter connector C-01 for damage.**

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

**YES :** Go to Step 3.

**NO :** Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check to see that all meters operate.



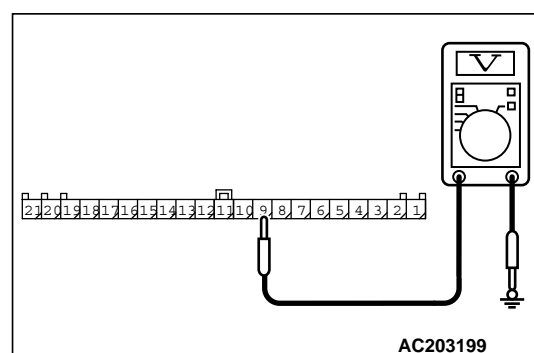
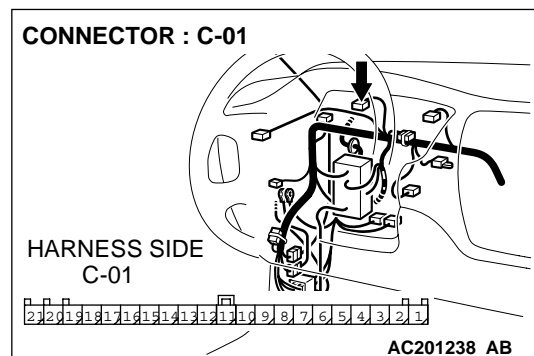
**STEP 3. Check the wiring harness between combination meter connector C-01 (terminal 7) and battery.**

**NOTE:** Also check intermediate connector C-129 and joint connector (1) C-05. If intermediate connectors C-129 or joint connector (1) C-05 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

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

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

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



**STEP 4. Measure at combination meter connector C-01 in order to check the battery circuit of power supply system to the combination meter.**

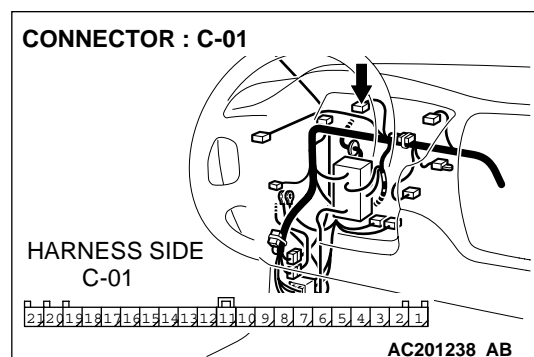
- (1) Disconnect combination meter connector C-01, and measure at the wiring harness side.
- (2) Turn the ignition switch to "ON" position.

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

**Q: Does the measured voltage correspond with this range?**

**YES :** Go to Step 7.

**NO :** Go to Step 5.



**STEP 5. Check combination meter connector C-01 for damage.**

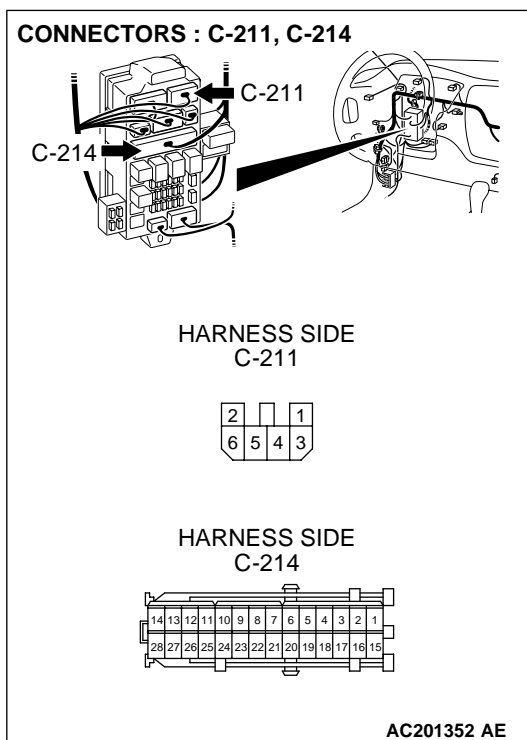
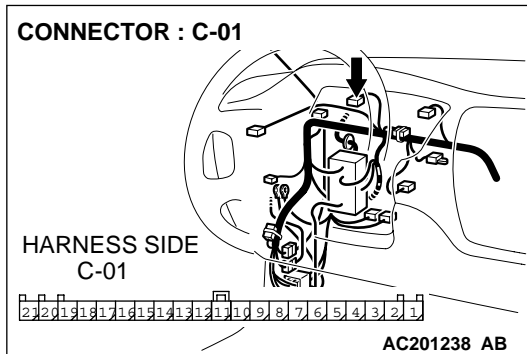
**Q: Is combination meter connector C-01 in good condition?**

**YES :** Go to Step 6.

**NO :** Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check to see that all meters operate.

**STEP 6. Check the wiring harness between combination meter connector C-01 (terminal 9) and ignition switch (IG1).**

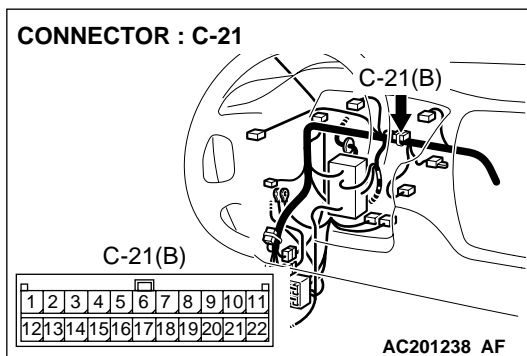
**NOTE:** Also check junction block connectors C-211, C-214 and joint connector (5) C-21. If junction block connectors C-211, C-214 or joint connector (5) C-21 are damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection [P.00E-2](#).

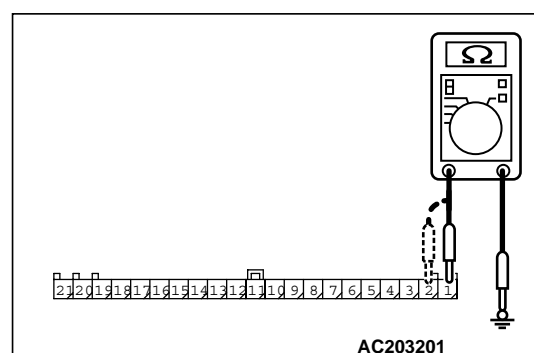
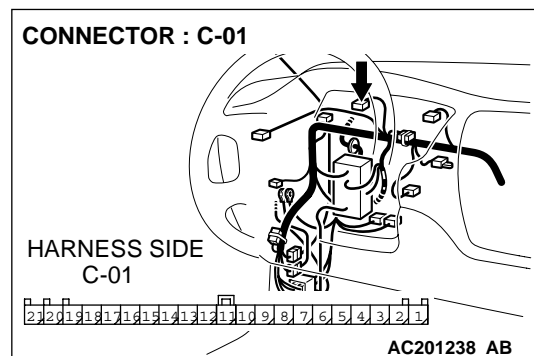


**Q: Are the wiring harness between combination meter connector C-01 (terminal 9) and ignition switch (IG1) in good condition?**

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

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





**STEP 7. Measure at combination meter connector C-01 in order to check the ground circuit to the combination meter.**

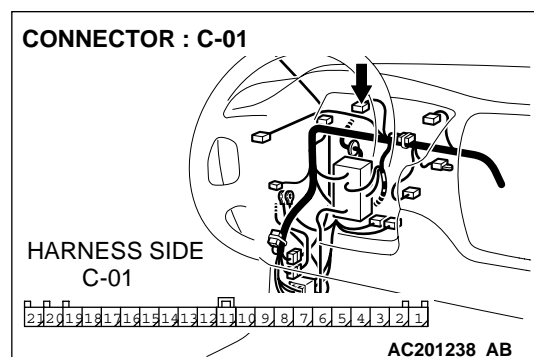
- (1) Disconnect combination meter connector C-01, and measure at the wiring harness side.

- (2) Measure the resistance between terminal 1 and ground.  
 • The measured value should be 2 ohm or less.
- (3) Measure the resistance between terminal 2 and ground.  
 • The measured value should be 2 ohm or less.

**Q: Does the measured voltage correspond with this range?**

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

**NO :** Go to Step 8.

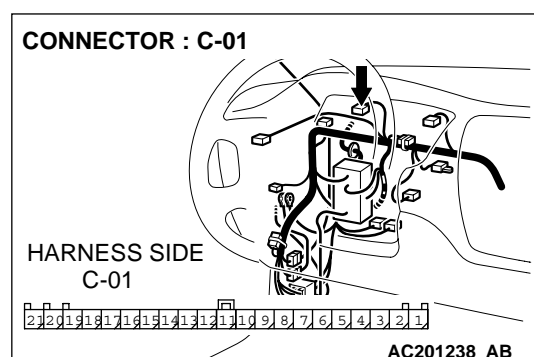


**STEP 8. Check combination meter connector C-01 for damage.**

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

**YES :** Go to Step 9.

**NO :** Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check to see that all meters operate.



**STEP 9. Check the wiring harness between combination meter connector C-01 (terminal 1 and 2) and ground.**

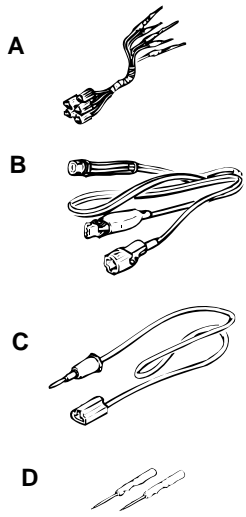
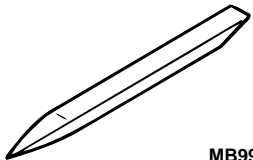
**Q: Are the wiring harness between combination meter connector C-01 (terminal 1 and 2) and ground in good condition?**

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

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

## SPECIAL TOOLS

M1543000600660

TOOL	TOOL NUMBER AND NAME	SUPERSESSSION	APPLICATION
 <p>MB991223AC</p>	<p>MB991223 Harness set</p> <p>A: MB991219 Test harness</p> <p>B: MB991220 LED harness</p> <p>C: MB991221 LED harness adapter</p> <p>D: MB991222 Probe</p>	General service tools	<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>
 <p>MB990784</p>	<p>MB990784 Ornament remover</p>	General service tool	Removal of meter bezel

## ON-VEHICLE SERVICE

### SPEEDOMETER CHECK

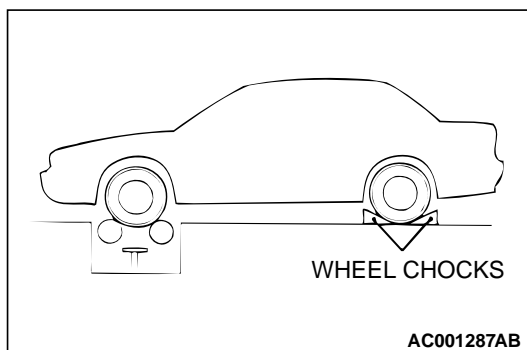
M1543000900229

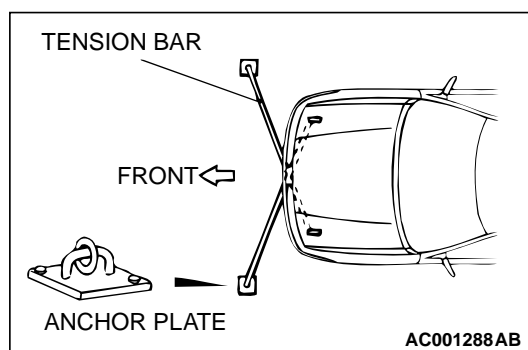
Adjust the pressure of tires to the specified level. (Refer to GROUP 31, On-vehicle Service [P.31-7](#).)

#### CAUTION

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

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



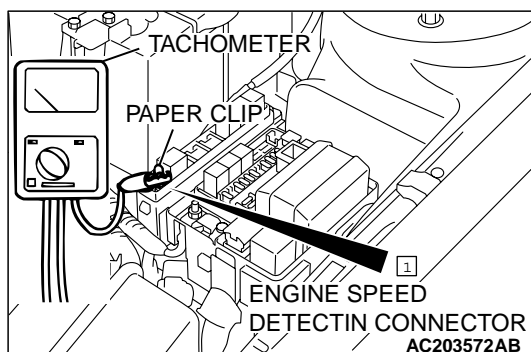


- To prevent the front wheel from moving from side to side, attach tension bars to the tie-down hook, and secure both ends to anchor plates.
- To prevent the vehicle from moving, attach a chain or wire to the rear retraction hook, and make sure the end of the chain or wire is secured.
- Check if the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

**Standard value:**

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

- 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**

M1543001000229

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

**Standard values:**

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

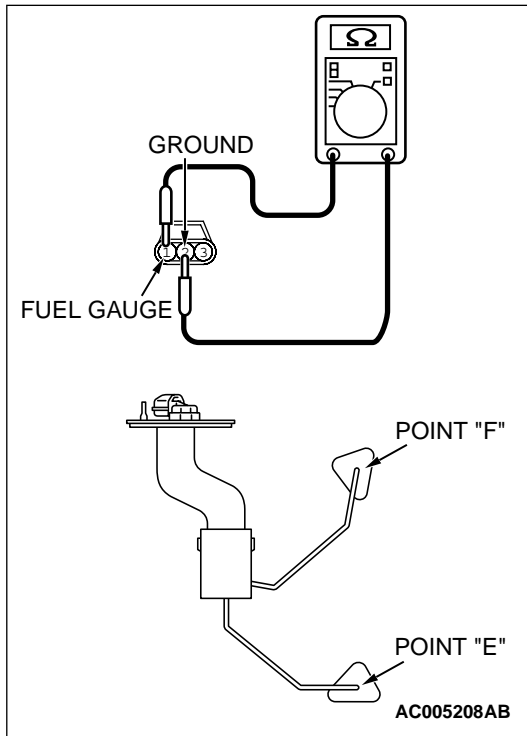
**FUEL GAUGE UNIT CHECK**

M1543001200212

Remove the fuel pump module and the remove the fuel gauge unit. (Refer to GROUP 13B, Fuel Tank [P.13B-11.](#))



## Fuel Gauge Unit Resistance



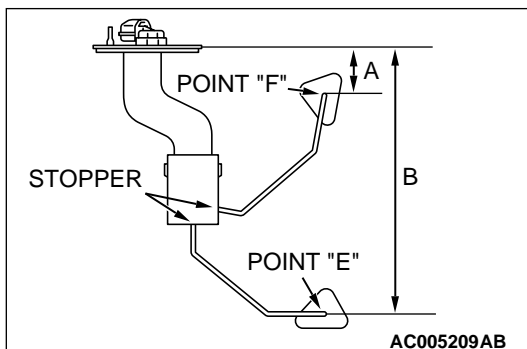
1. Check that resistance value between terminals 2 and 1 is at the standard value when the fuel gauge unit float is between point "F" (highest) and point "E" (lowest).

### Standard value:

- Point "F":  $3 \pm 0.8$  ohm
- Point "E":  $110 \pm 2.5$  ohm

2. Check that resistance value changes smoothly when the float moves slowly between point "F" (highest) and point "E" (lowest).
3. If all checks are correct, go to fuel 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:

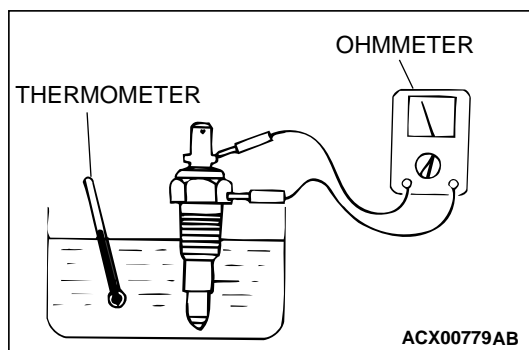
- A:  $24.1 \pm 2$  mm (0.95 inch)
- B:  $151.6 \pm 2$  mm (5.97 inches)

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

## ENGINE COOLANT TEMPERATURE GAUGE UNIT CHECK

M1543001500213

1. Drain the engine coolant. (Refer to GROUP 00, Maintenance Service – Engine Coolant [P.00-45](#).)
2. Remove the engine coolant temperature gauge unit.

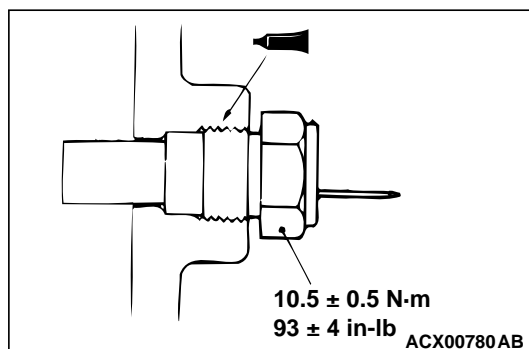


3. Put water temperature gauge unit into the hot water in specified temperature, and ensure that basic resistance is within standard value.

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

**Reference value:**

Temperature	Resistance Ω
50°C	230 ± 23
60°C	155 ± 15.5
80°C	73 ± 7.3



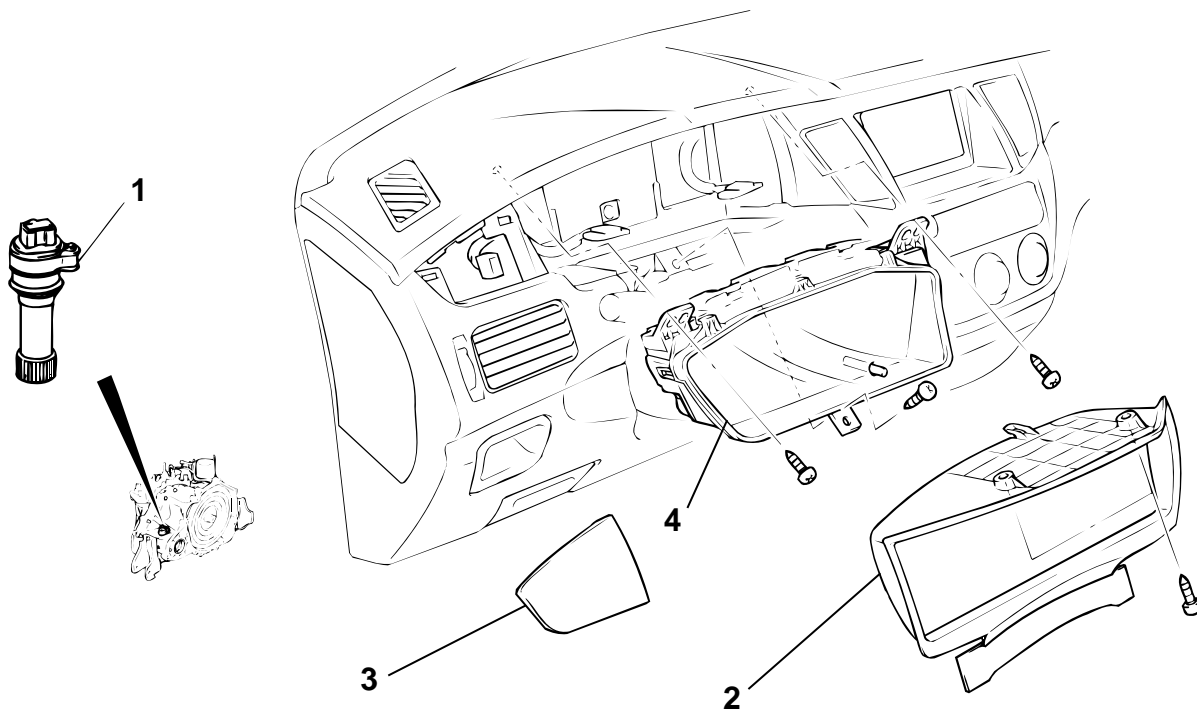
4. After inspection, apply specified sealant at threads of water temperature gauge unit, and tighten to the specified torque.

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

5. Refill coolant. (Refer to GROUP 00, Maintenance Service – Engine Coolant [P.00-45.](#))

## REMOVAL AND INSTALLATION

M1543002900258



AC005195AB

1. VEHICLE SPEED SENSOR

### COMBINATION METER REMOVAL STEPS

- METER BEZEL
- INSTRUMENT PANEL ORNAMENT
- COMBINATION METER

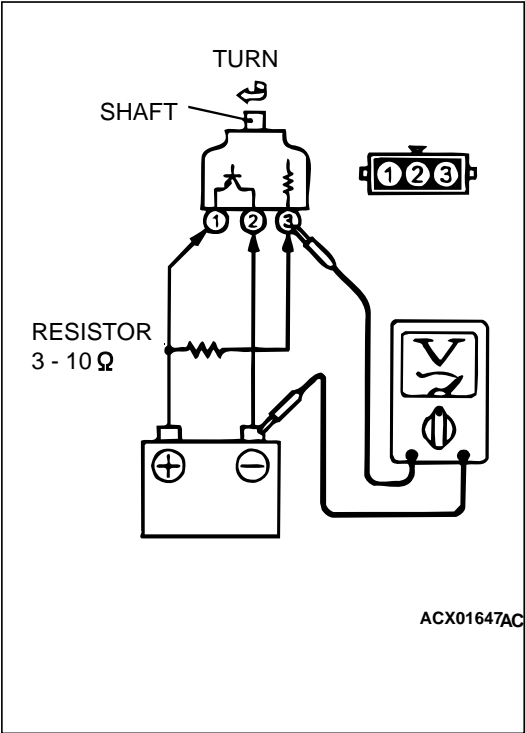
M1543019501266

INSPECTION

VEHICLE SPEED SENSOR CHECK <M/T>

1. Remove the vehicle speed sensor and connect a 3 – 10 kilohms 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.

**Standard value: 0 or Battery Voltage (1turn = 4pulses)**



OUTPUT SHAFT SPEED SENSOR CHECK <A/T>

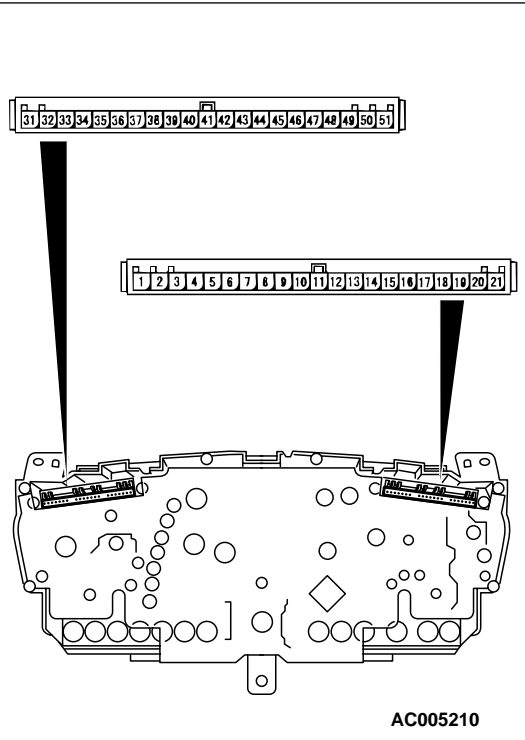
Refer to [P.23Ac-119](#).

COMBINATION METER INTERNAL RESISTANCE CHECK

Use circuit tester to measure combination meter internal resistance.

**Standard Value:**

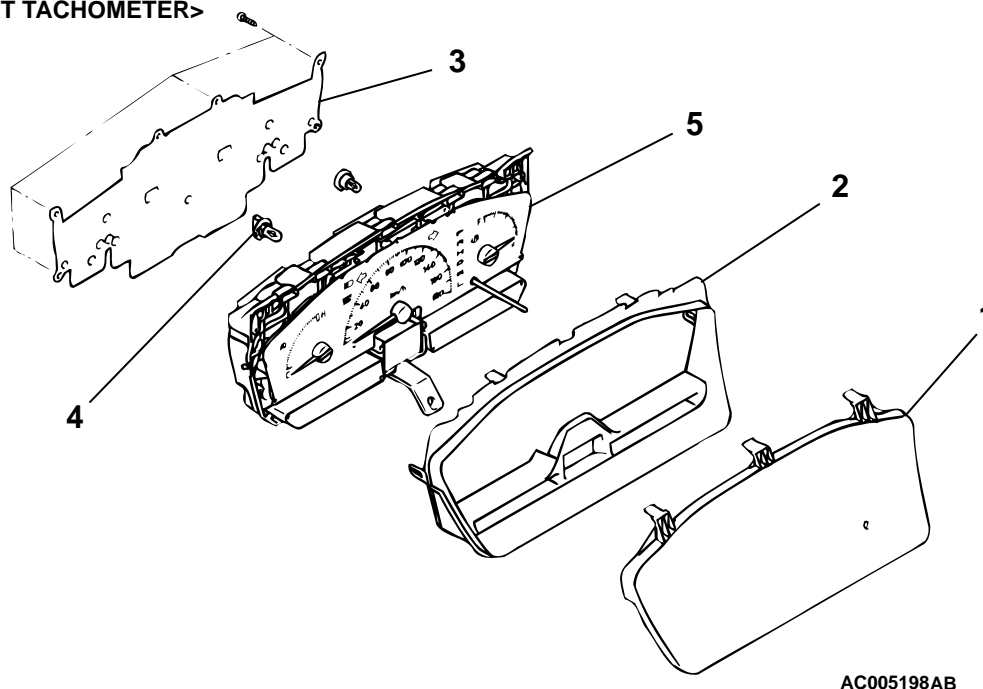
measuring terminal No.	Terminal name	Standard value (Ω)
1-21	Engine coolant temperature gauge to ground	233 ± 3
31-51	Fuel gauge to ground	181 ± 2



## DISASSEMBLY AND ASSEMBLY

M1543003100181

&lt;VEHICLE WITHOUT TACHOMETER&gt;



AC005198AB

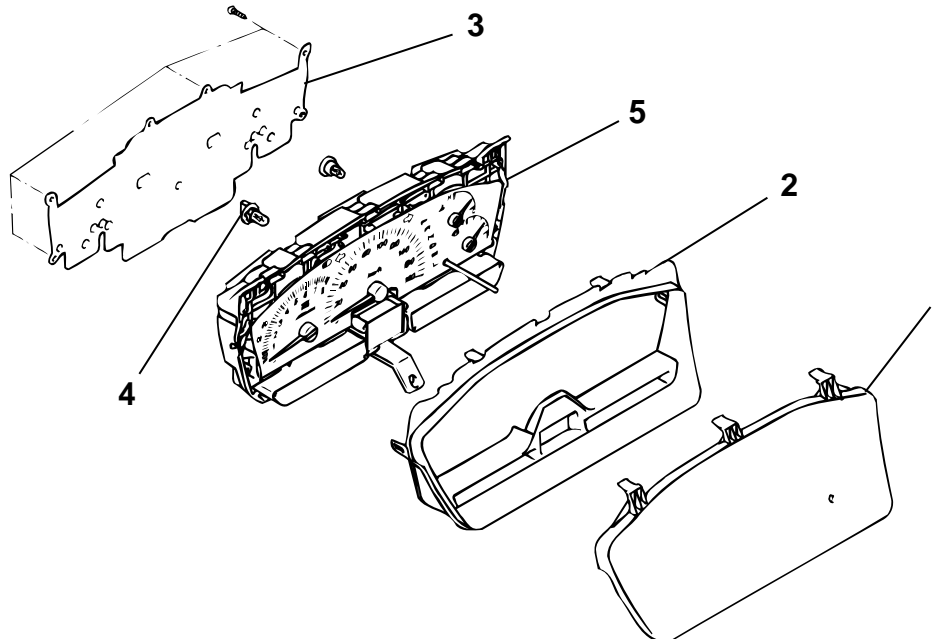
## DISASSEMBLY STEPS

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

## DISASSEMBLY STEPS (Continued)

4. BULB
5. METER ASSEMBLY

&lt;VEHICLE WITH TACHOMETER&gt;



AC005199AB

## DISASSEMBLY STEPS

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

## DISASSEMBLY STEPS (Continued)

4. BULB
5. METER ASSEMBLY

# HEADLIGHT, FRONT SIDE MARKER LIGHT AND POSITION LIGHT ASSEMBLY

## DIAGNOSIS

### HEADLIGHT DIAGNOSIS

M1542010500382

### INTRODUCTION

The headlights (including DRL) are controlled by the Simplified Wiring System (SWS). For troubleshooting, refer to GROUP 54B, SWS Diagnosis [P.54Bb-2](#).

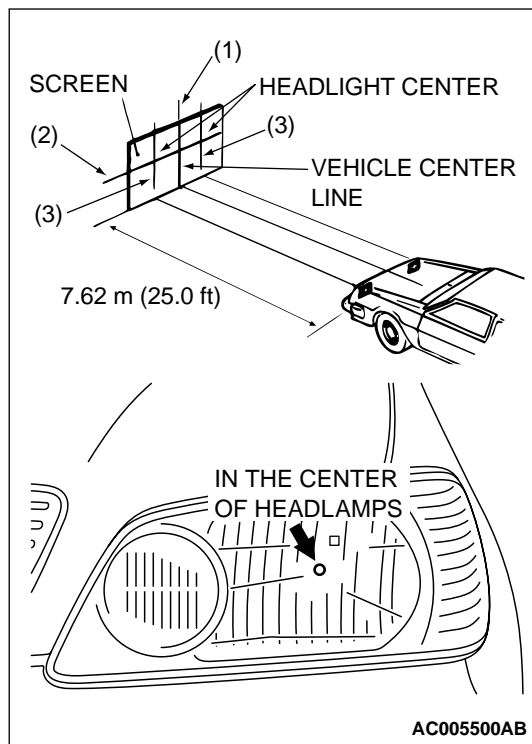
## ON-VEHICLE SERVICE

### HEADLIGHT AIMING

M1542000900259

#### PRE-AIMING INSTRUCTIONS

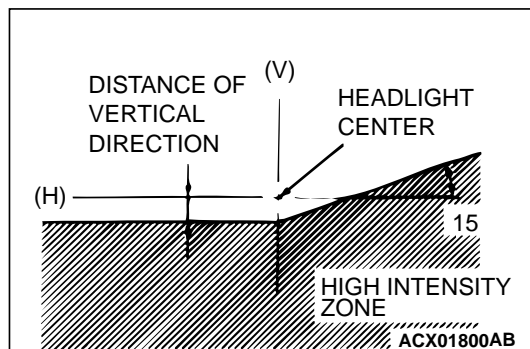
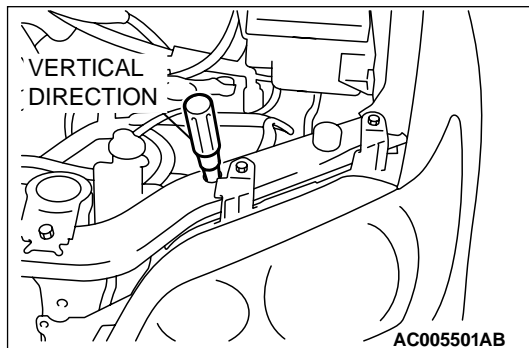
1. Inspect for badly rusted or faulty headlight assemblies.
2. These conditions must be corrected before a satisfactory adjustment can be made.
3. Inspect tire inflation, and adjust if necessary.
4. If the fuel tank is not full, place a weight in luggage room of vehicle to simulate weight of a full tank [3 kg (6.5 pounds) per gallon.]
5. There should be no other load in the vehicle other than driver or substituted weight of approximately 70 kg (150 pounds) placed in driver's position.
6. Thoroughly clean the headlight lenses.
7. Place the vehicle on a level floor, perpendicular to a flat screen 7.62m (25.0 feet) away from the bulb center-marks on the headlight lens.
8. Rock vehicle sideways to allow vehicle to assume its normal position.
9. Bounce the front suspension through three (3) oscillations by applying the body weight to hood or bumper.



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

## HEADLIGHT ADJUSTMENT

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



### Standard value:

(Vertical direction) Headlight center line  $\pm 53$  mm ( $\pm 2.1$  inches)

*NOTE: There is no horizontal aim adjustment. Horizontal aim is preset and does not require adjustment.*

3. When adjusting one headlight, disconnect the other headlight harness.

### **CAUTION**

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

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

## INTENSITY MEASUREMENT

M1542001000204

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

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

*NOTE: When measuring the intensity, maintain an engine speed of 2,000 r/min, with the battery fully charged.*

*There may be special local regulations pertaining to headlight intensity. Be sure to make any adjustments necessary to satisfy such regulations.*

*If an illuminometer is used to make the measurements, convert its values to photometer values by using the following formula.*

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

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

### **⚠ CAUTION**

1. **On the headlight not yet adjusted, perform aiming with connector removed and the lights switched off, if applicable. In addition, care should be taken to prevent a change of optical axis when connector is reconnected.**
2. **Plastic outer lens are equipped with headlights. When lens surface is covered with materials for not penetrating light, headlight operation time should be within 3 minutes. In addition, masking such as taping should not be performed.**

## BULB REPLACEMENT

M1542001300261

### Headlight Bulb

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

### **⚠ CAUTION**

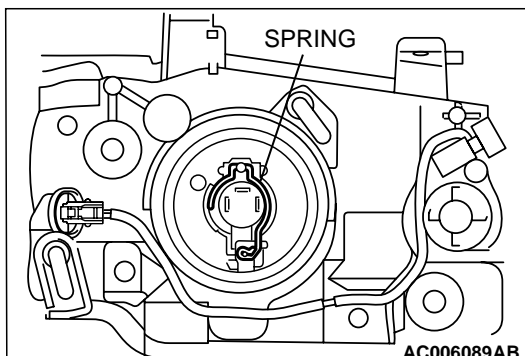
**Do not touch the surface of the bulb with hands or dirty gloves as the bulb may pop after a short time. If the surface does become dirty, clean it with alcohol or thinner, and let it dry thoroughly before installing.**

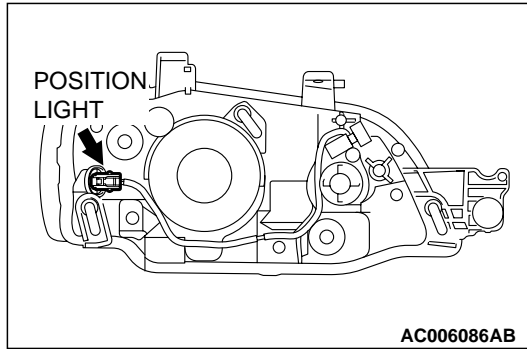
4. Unhook the spring securing the bulb, and then remove the bulb.

### **⚠ 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.**

5. 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.





### Position Light Bulb

1. Disconnect the connector.
2. Screw out the position light socket.

#### ⚠ CAUTION

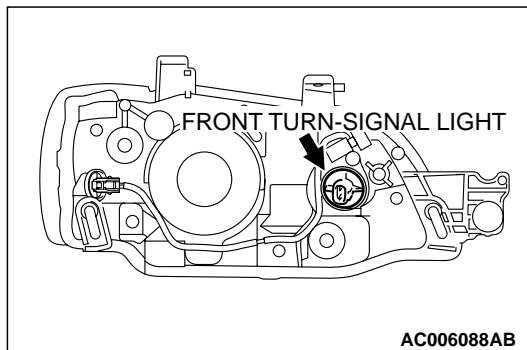
- As a principal, the position light can be removed as individual part. If not, remove the position light from the headlight and position light assembly, and then remove the position light from the headlight. Then replace the bulb.
- Do not touch the bulb surface bare-handed or with dirty gloves. If dirt is attached on surface of the bulb, immediately use alcohol or thinner to remove dirt, and install the bulb after well dried.

### Front Turn Signal Light bulb

Disconnect the connector, and screw out the front turn-signal light socket.

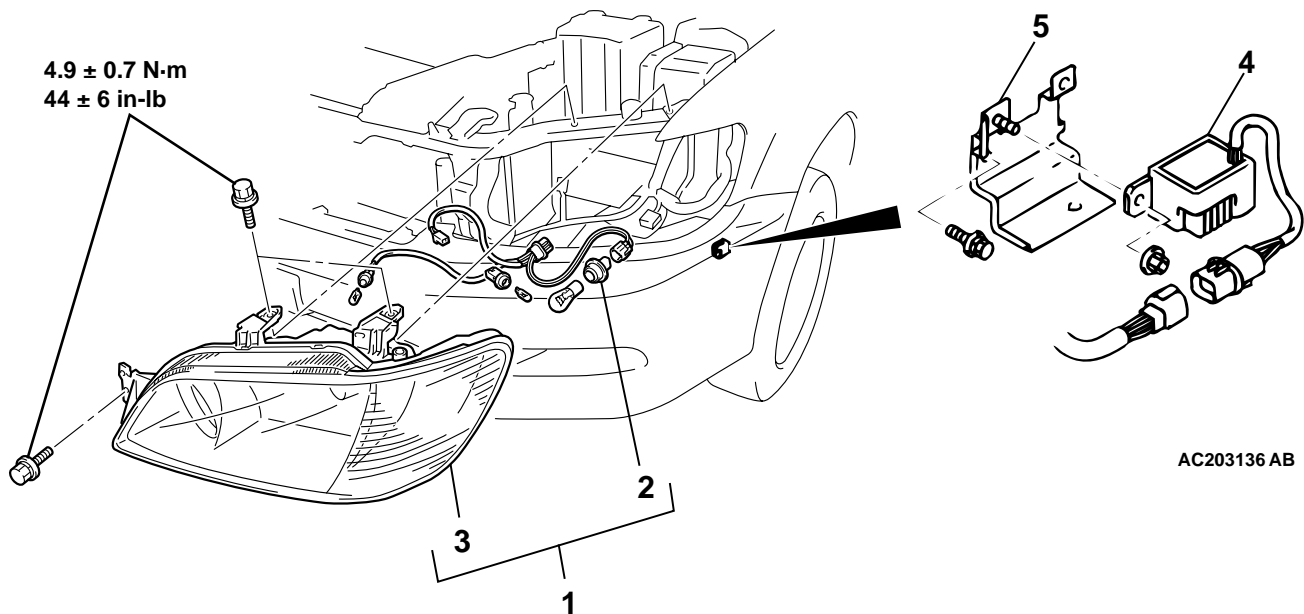
#### ⚠ CAUTION

Do not touch the bulb surface bare-handed or with dirty gloves. If dirt is attached on surface of the bulb, immediately use alcohol or thinner to remove dirt, and install the bulb after well dried.



## REMOVAL AND INSTALLATION

M1542002700165



#### HEADLIGHT REMOVAL STEPS

1. HEADLIGHT ASSEMBLY
2. SOCKET ASSEMBLY
3. HEADLIGHT BODY

#### DAYTIME RUNNING LIGHT ECU REMOVAL STEPS

- SPLASH SHIELD (REFER TO GROUP 42 P.51-13.)



## DAYTIME RUNNING LIGHT ECU

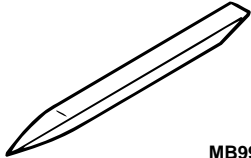
## REMOVAL STEPS (Continued)

4. DAY TIME RUNNING LIGHT ECU
5. DAY TIME RUNNING LIGHT ECU  
BRACKET

## TURN-SIGNAL LIGHT

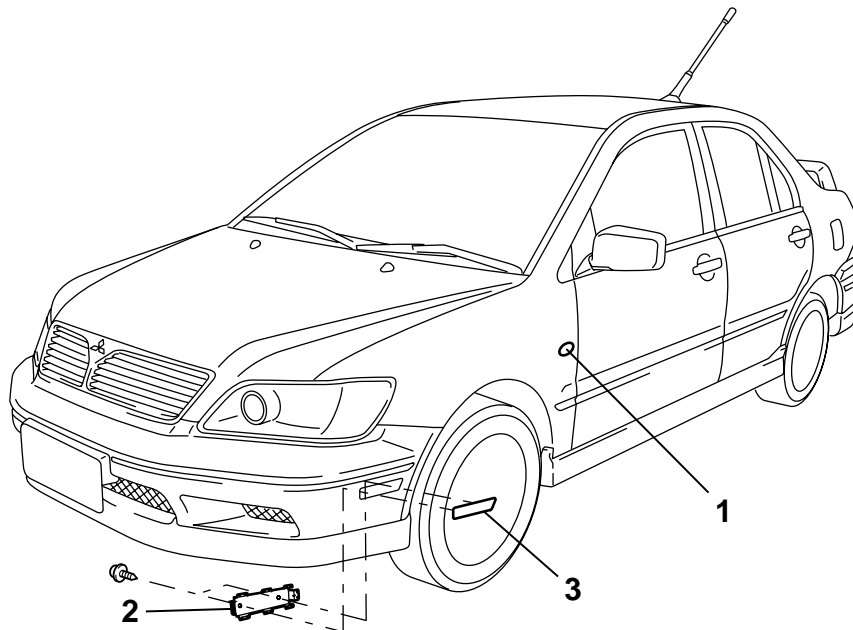
## SPECIAL TOOL

M1542000600247

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

## REMOVAL AND INSTALLATION

M1542003300041



AC005717AB

SIDE TURN SIGNAL LIGHT  
REMOVAL STEPS

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

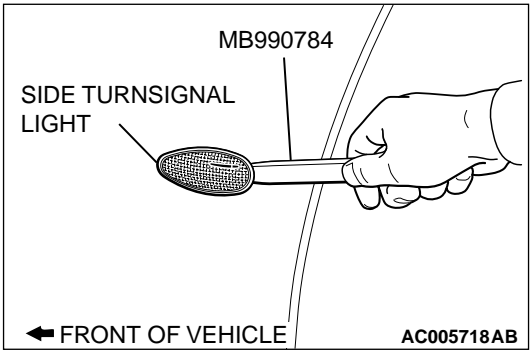
REFLEX REFLECTOR REMOVAL  
STEPS

- FRONT BUMPER ASSEMBLY  
(REFER TO GROUP 51, FRONT  
BUMPER ASSEMBLY [P.51-3.](#))
- 2. REFLEX REFLECTOR BRACKET
- 3. REFLEX REFLECTOR

REMOVAL SERVICE POINT

<<A>> SIDE TURN SIGNAL LIGHT REMOVAL

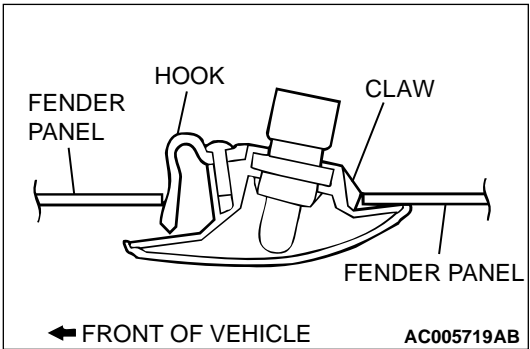
Use special tool MB990784, etc. to press and deflect the hook to vehicle front from fender, and unhook the pawls to remove the side turn-signal light.



INSTALLATION SERVICE POINT

>>A<< SIDE TURN SIGNAL LIGHT INSTALLATION

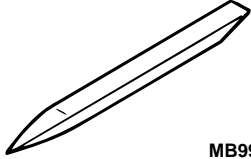
Insert the pawls into the fender panel and install the side turn-signal light.



REAR COMBINATION LIGHT

SPECIAL TOOL

M1542000600258

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

DIAGNOSIS

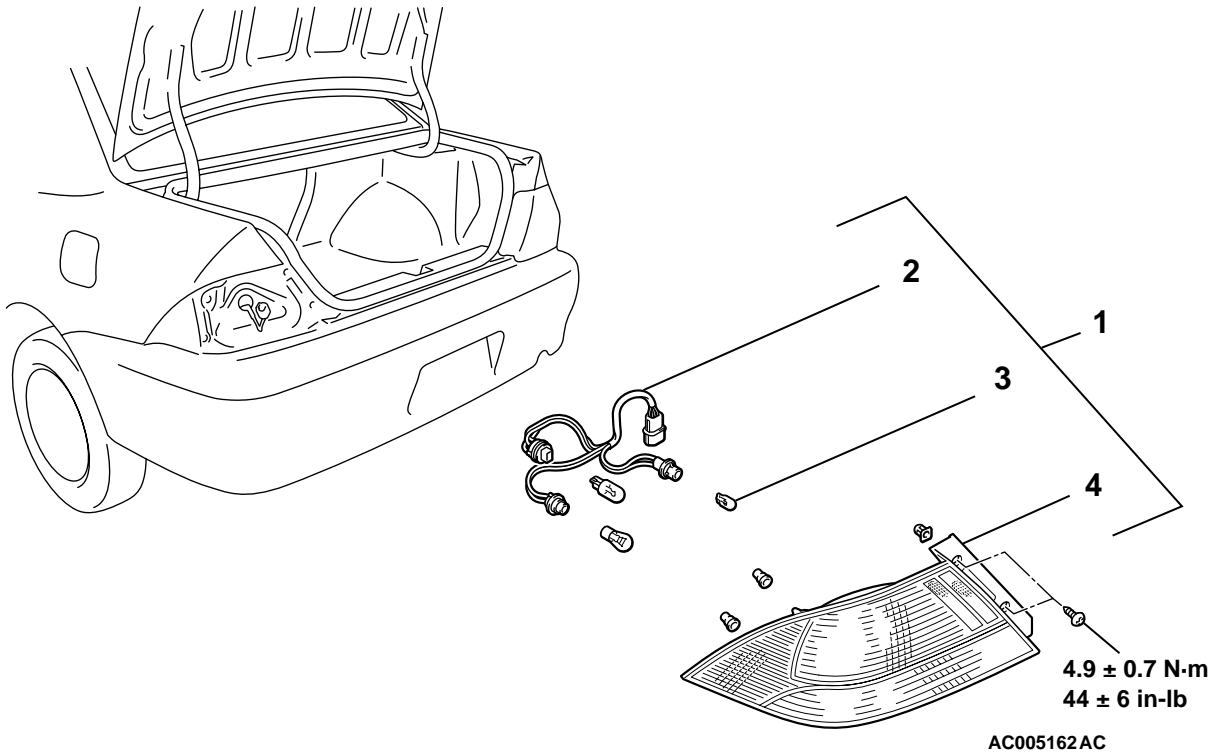
M1542000700675

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

[P.54Ba-5.](#)

## REMOVAL AND INSTALLATION

M1542003900269



### REMOVAL STEPS

1. REAR COMBINATION LAMP ASSEMBLY
2. SOCKET ASSEMBLY

### REMOVAL STEPS (Continued)

3. BULB
4. REAR COMBINATION LIGHT BODY

## DOME LIGHT

### LIGHTING SYSTEM DIAGNOSIS

#### DOME LIGHT DIAGNOSIS

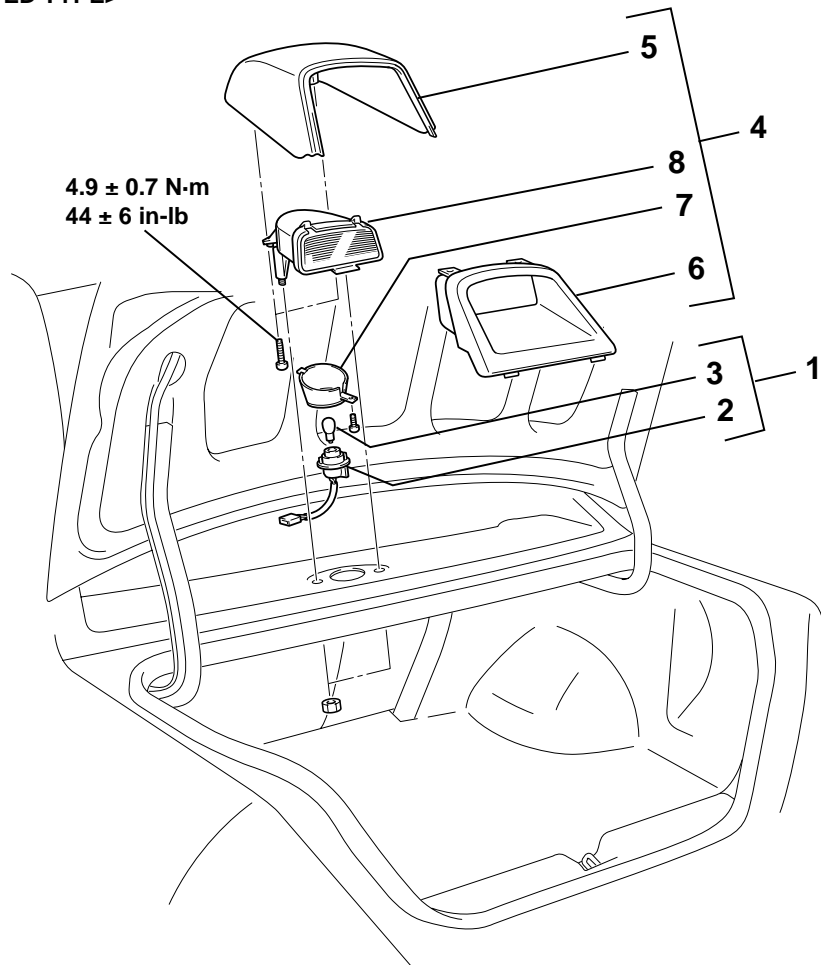
The dome light is controlled by the Simplified Wiring System (SWS). For troubleshooting, refer to GROUP 54B, SWS Diagnosis [P.54Bb-2](#).

M1542010500393

**HIGH-MOUNTED STOPLIGHT****REMOVAL AND INSTALLATION**

M1542005100247

&lt;REAR SHELF MOUNTED TYPE&gt;



AC005163 AE

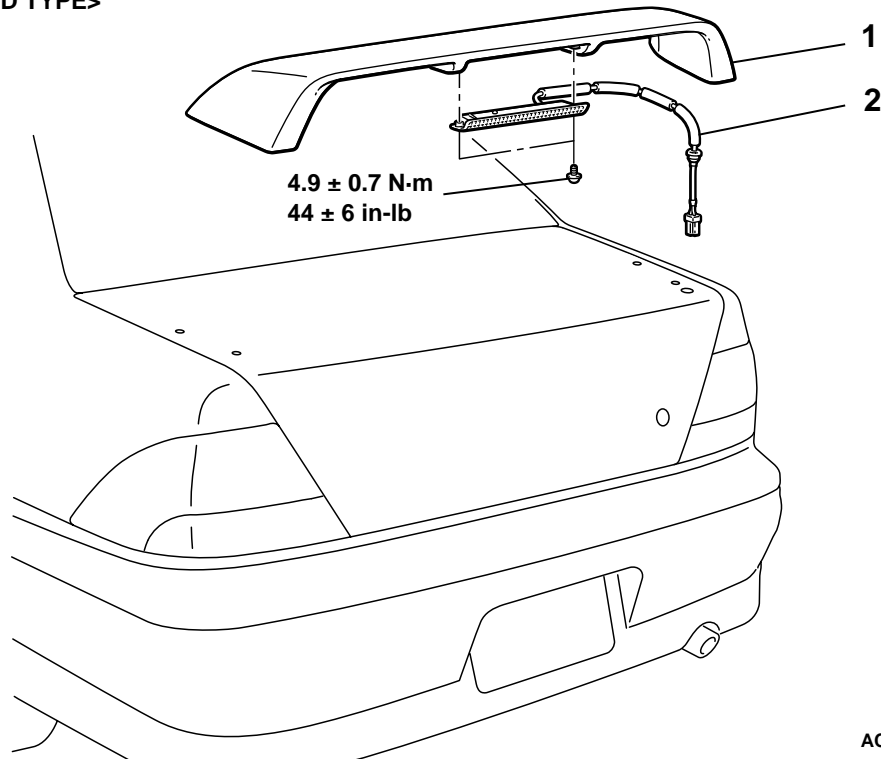
**REMOVAL STEPS**

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

**REMOVAL STEPS (Continued)**

5. HIGH-MOUNTED STOPLIGHT COVER (FRONT)
6. HIGH-MOUNTED STOPLIGHT COVER (REAR)
7. SOCKET HOLDER
8. HIGH-MOUNTED STOPLIGHT BODY

<REAR SPOILER MOUNTED TYPE>



**REMOVAL STEPS**

1. REAR SPOILER (REFER TO GROUP 51  
[P.51-18.](#))
2. HIGH MOUNTED STOPLIGHT

<<A>>

**REMOVAL SERVICE POINT**

**<<A>> HIGH-MOUNTED STOP LIGHT REMOVAL <WITH REAR SPOILER>**

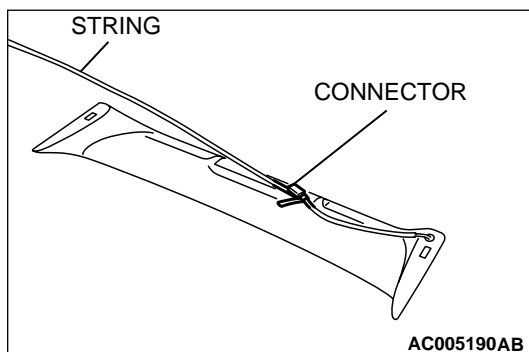
Use the following steps to easily route high-mounted stop light harness in the event of installation:

1. Tie a string on the high-mounted stop light harness (at the connector side).

**⚠ CAUTION**

**Ensure that the string is tightly tied.**

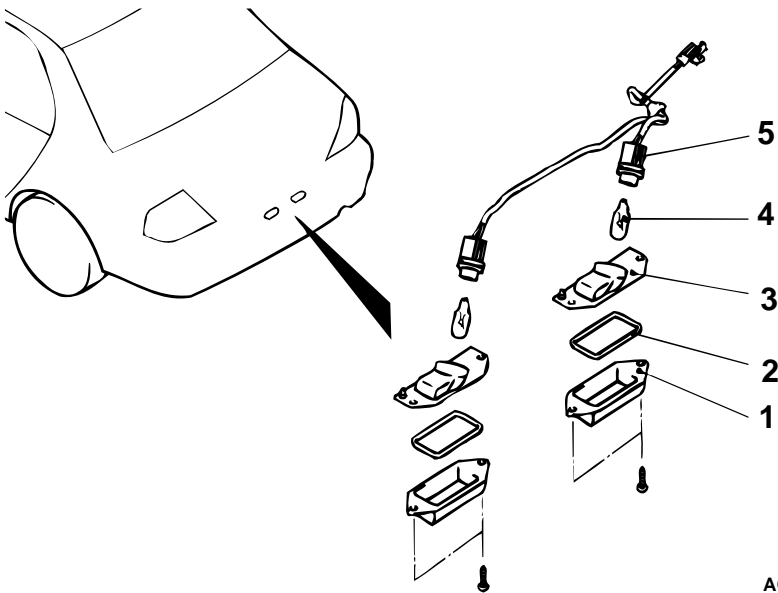
2. Carefully pull out the high-mounted stop light.



LICENSE PLATE LIGHT

REMOVAL AND INSTALLATION

M1542004200058



AC005497AB

LICENSE PLATE LIGHT  
REMOVAL STEPS

1. LICENSE PLATE LIGHT LENS
2. PACKING
3. LICENSE PLATE LIGHT BODY
4. BULB

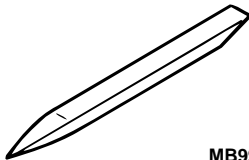
LICENSE PLATE LIGHT  
REMOVAL STEPS (Continued)

- REAR BUMPER(REFER TO GROUP 51, REAR BUMPER ASSEMBLY [P.51-7.](#))
- 5. SOCKET ASSEMBLY

HAZARD WARNING LIGHT SWITCH

SPECIAL TOOL

M1542000600269

TOOL	TOOL NUMBER AND NAME	SUPERSESSSION	APPLICATION
 <p>MB990784</p>	MB990784 Ornament remover	General service tool	Center panel assembly removal

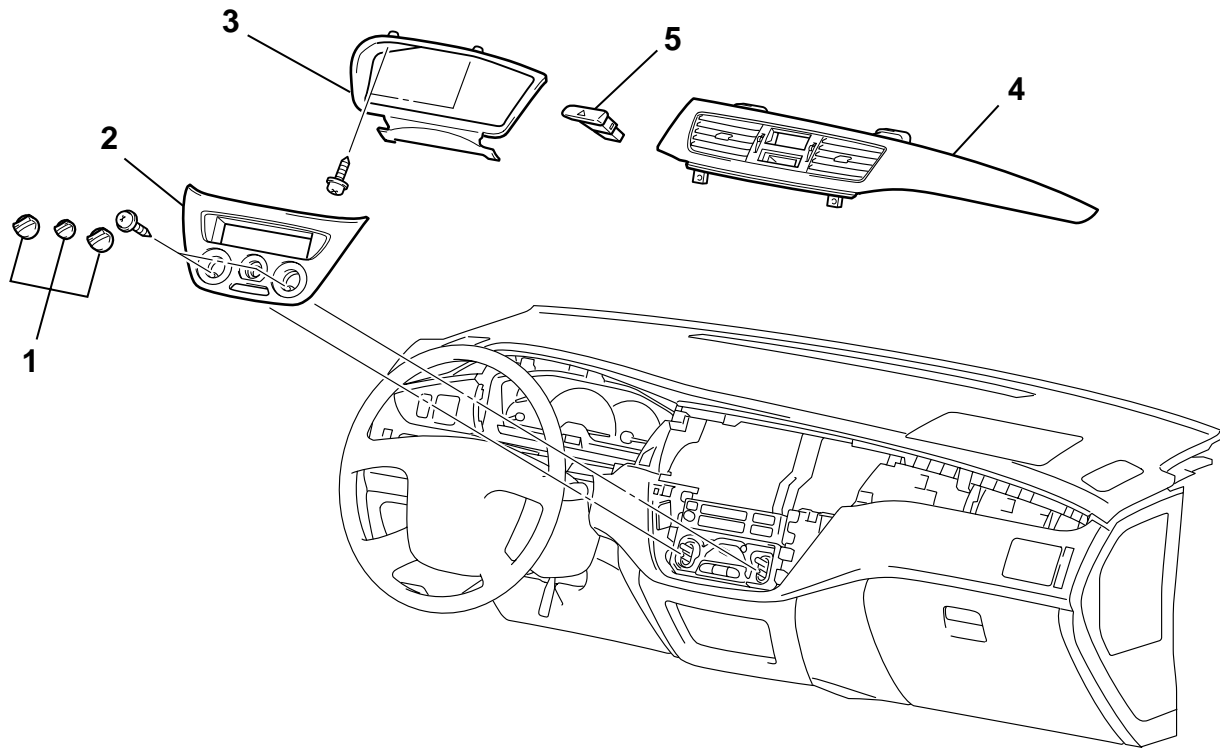
DIAGNOSIS

M1542000700686

The hazard warning lights are controlled by the Simplified Wiring System (SWS). For troubleshooting, refer to GROUP 54B, SWS Diagnosis [P.54Ba-5.](#)

## REMOVAL AND INSTALLATION

M1542006600278



AC005191AB

### HAZARD WARNING LIGHT SWITCH REMOVAL STEPS

1. KNOB ASSEMBLY (REFER TO GROUP 55, HEATER CONTROL ASSEMBLY, A/C SWITCH [P.55-85](#) .)
2. CENTER PANEL ASSEMBLY (REFER TO GROUP 52A INSTRUMENT PANEL [P.52A-2.](#))

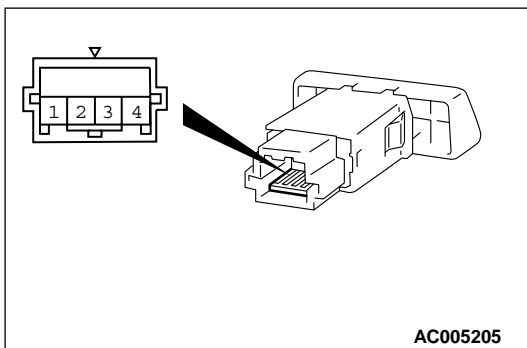
### HAZARD WARNING LIGHT SWITCH REMOVAL STEPS (Continued)

3. METER BEZEL (REFER TO [P.54A-42.](#))
4. CENTER AIR OUTLET PANEL (REFER TO GROUP 52A, INSTRUMENT PANEL [P.52A-2.](#))
5. HAZARD WARNING LIGHT SWITCH

## INSPECTION

M1542011200276

### HAZARD WARNING LIGHT SWITCH CONTINUITY CHECK

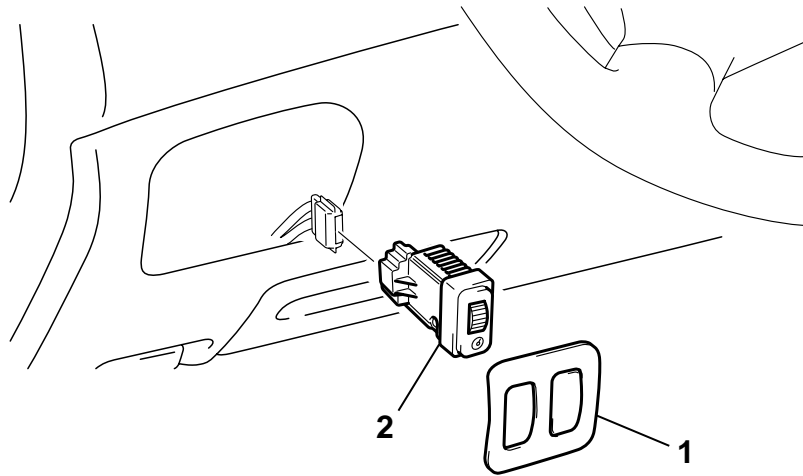


SWITCH POSITION	TESTER CONNECTION	SPECIFIED CONDITION
OFF	1 – 2	Open Circuit
ON	1 – 2	Less than 2 ohms

# RHEOSTAT

## REMOVAL AND INSTALLATION

M1542006000168



AC005720 AB

### RHEOSTAT REMOVAL STEPS

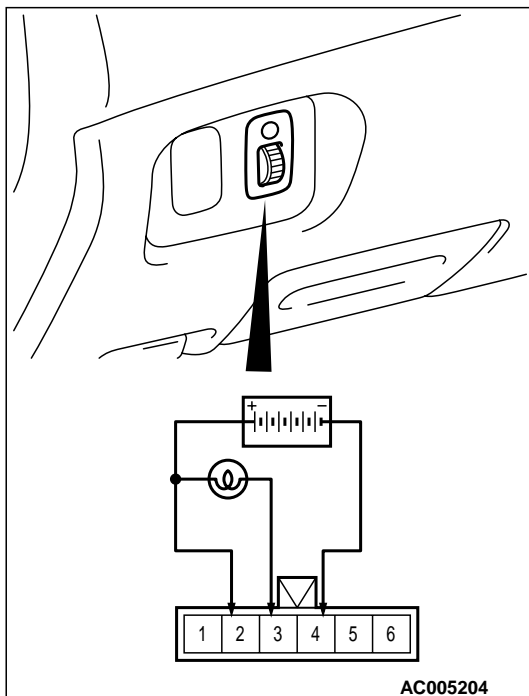
1. SWITCH PANEL
2. RHEOSTAT

## INSPECTION

M1543019501277

### RHEOSTAT CHECK

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

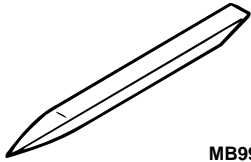




## COLUMN SWITCH

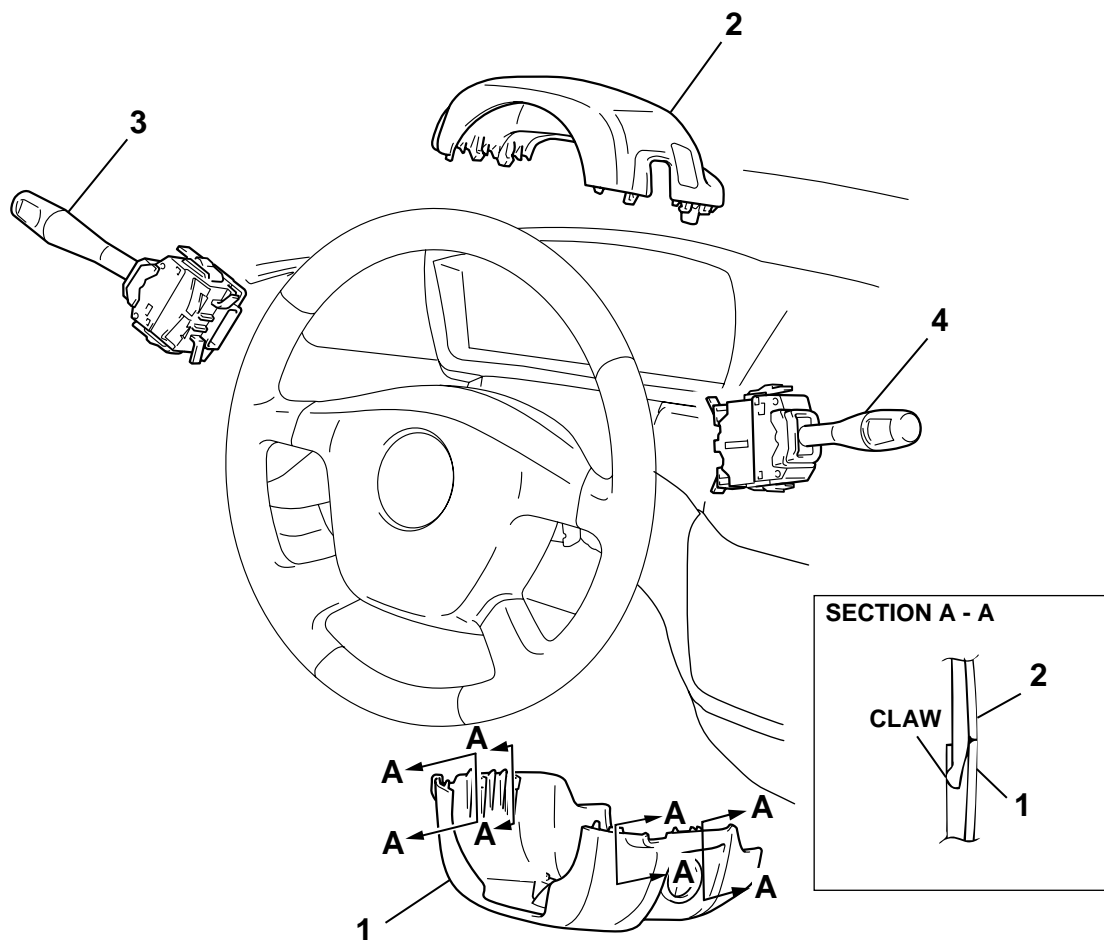
## SPECIAL TOOL

M1542000600270

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

## REMOVAL AND INSTALLATION

M1543009100242



AC005196AB

## REMOVAL STEPS

1. COLUMN COVER LOWER
2. COLUMN COVER UPPER

## REMOVAL STEPS (Continued)

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

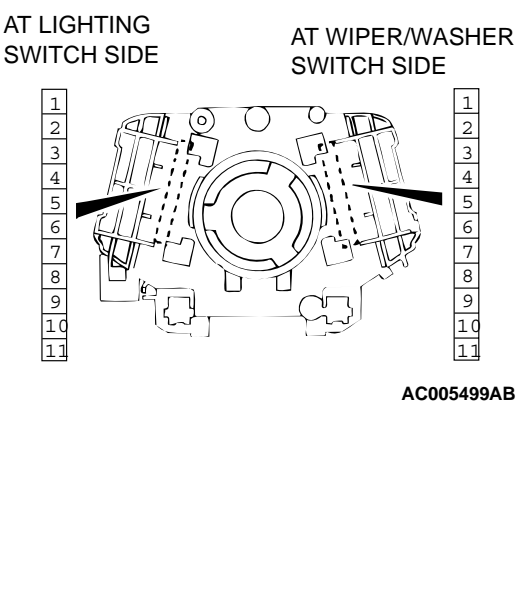
INSPECTION

M1543019501288

Integrated column ECU does not allow lighting switch continuity test. For inspection, troubleshooting in GROUP 54B should be performed [P.54Bb-2](#).

COLUMN SWITCH CONTINUITY CHECK (AT SWITCH BODY)

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



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

## HORN

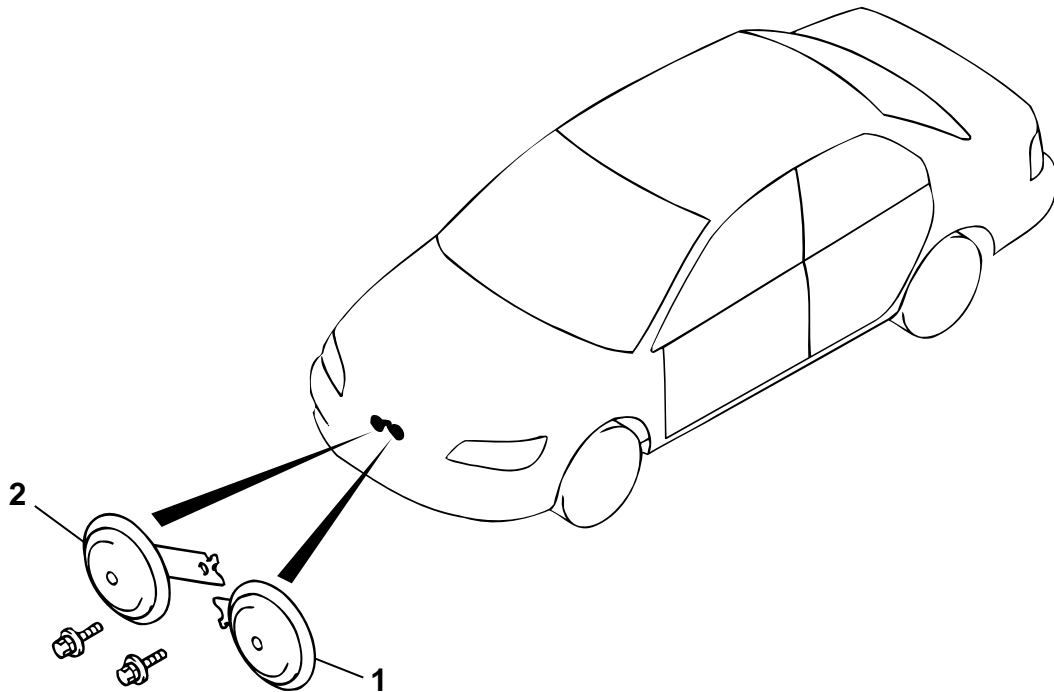
### DIAGNOSIS <VEHICLE WITH KEYLESS ENTRY SYSTEM>

M1543000700559

The keyless entry system horn answerback is controlled by the Simplified Wiring System (SWS). For troubleshooting, refer to GROUP 54B, SWS Diagnosis [P.54Bb-2](#).

### REMOVAL AND INSTALLATION

M1543007900253



AC005160AB

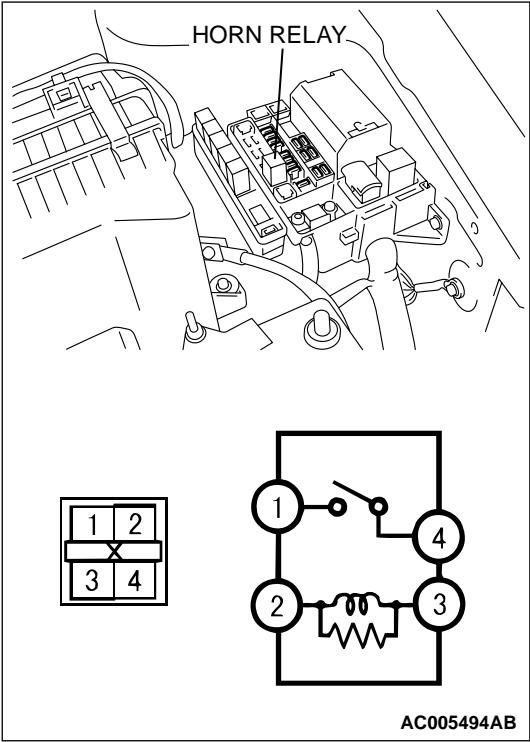
#### REMOVAL STEPS

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

INSPECTION

M1543019501299

HORN RELAY CONTINUITY CHECK

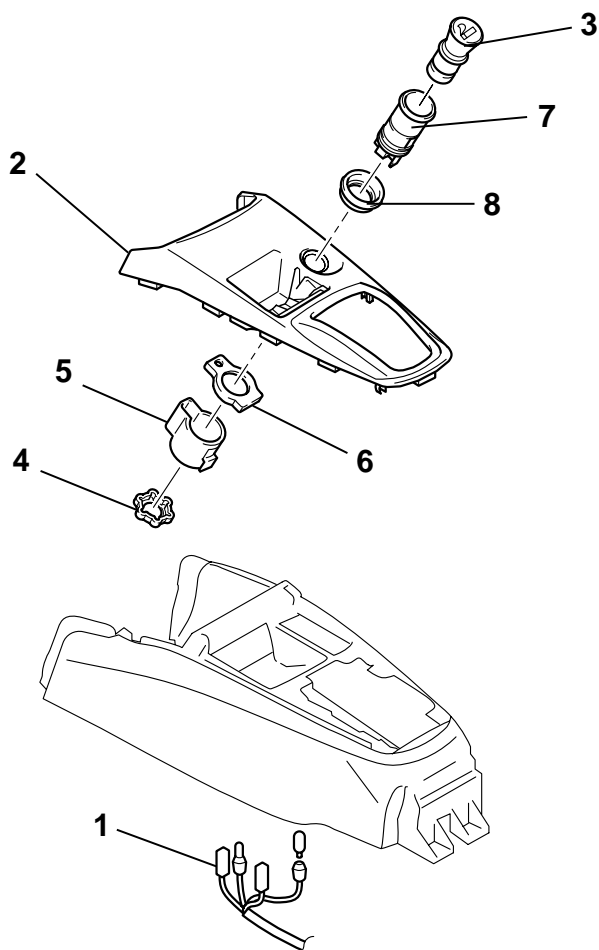


BATTERY VOLTAGE	TESTER CONNECTION	SPECIFIED CONDITION
Not applied	1 – 4	Open circuit
<ul style="list-style-type: none"><li>Connect terminal 2 to the positive battery terminal</li><li>Connect terminal 3 to the negative battery terminal</li></ul>	1 – 4	Less than 2 ohms

# CIGARETTE LIGHTER, ACCESSORY SOCKET

## REMOVAL AND INSTALLATION

M1543013500135



AC005712AC

### CIGARETTE LIGHTER REMOVAL STEPS

1. HARNESS
2. FRONT FLOOR CONSOLE (REFER TO GROUP52A, FRONT FLOOR CONSOLE [P.52A-7.](#))
3. PLUG

### CIGARETTE LIGHTER REMOVAL STEPS (Continued)

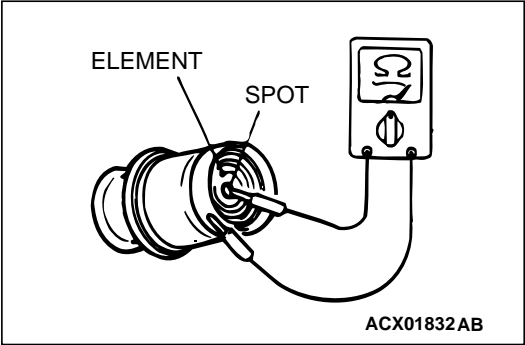
4. FIXING RING
5. SOCKET CASE
6. SOCKET WASHER
7. SOCKET
8. PROTECTOR

INSPECTION

M1543019501307

CIGARETTE LIGHTER CHECK

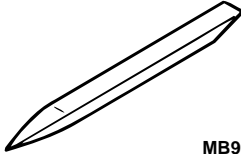
- Take out the plug, and check for a worn edge on the element spot connection, and for shreds of tobacco or other material on the element.
- Using an ohmmeter, check that the element resistance value is 1.7 ohms.



CLOCK

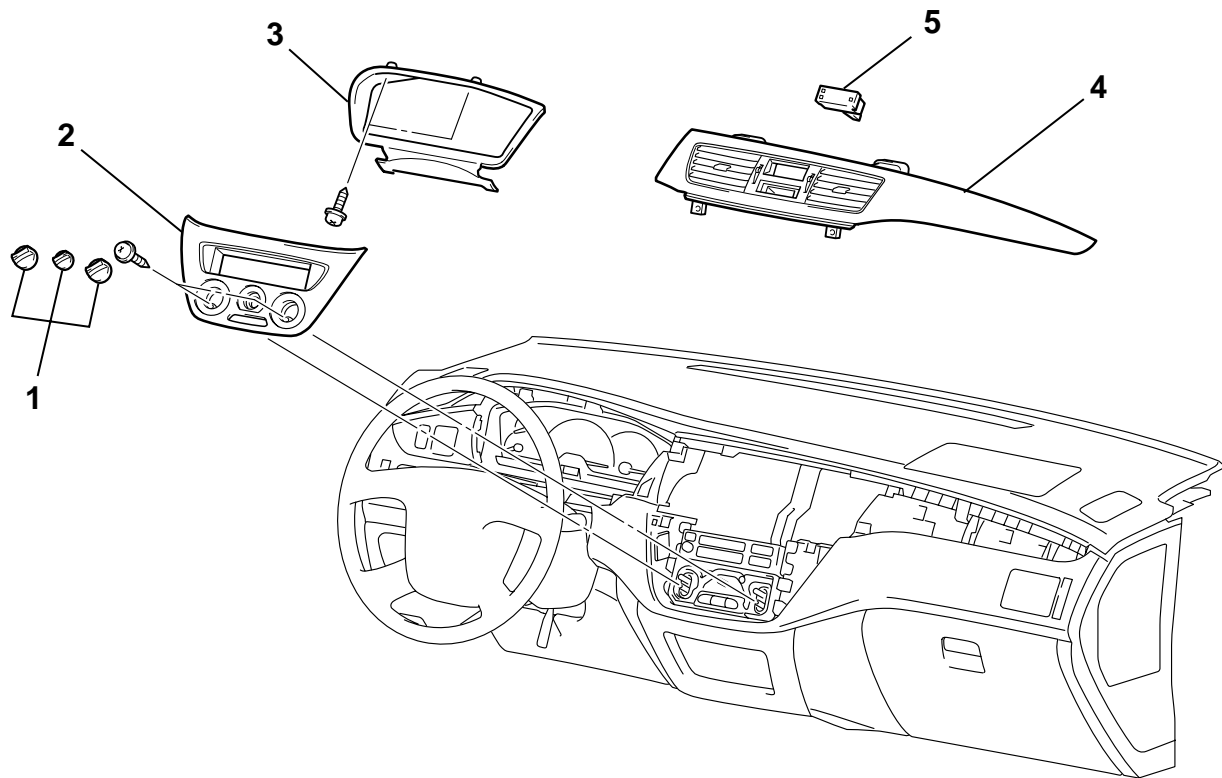
SPECIAL TOOL

M1542000600281

TOOL	TOOL NUMBER AND NAME	REPLACED BY MILLER TOOL NUMBER	APPLICATION
 MB990784	MB990784 Ornament remover	General service tool	Hood panel and center hood removal

## REMOVAL AND INSTALLATION

M1543005900075



AC005192AB

**CLOCK SWITCH REMOVAL STEPS**

1. KNOB ASSEMBLY (REFER TO GROUP 55, HEATER CONTROL ASSEMBLY AND A/C SWITCH P.55-85.)
2. CENTER PANEL ASSEMBLY (REFER TO GROUP 52A, INSTRUMENT PANEL P.52A-2.)

**CLOCK SWITCH REMOVAL STEPS**

3. METER BEZEL (REFER TO P.54A-42.)
4. CENTER AIR OUTLET PANEL (REFER TO GROUP 52A, INSTRUMENT PANEL P.52A-2.)
5. CLOCK

**RADIO AND TAPE PLAYER****DIAGNOSIS****INTRODUCTION TO AUDIO SYSTEM DIAGNOSIS**

M1543009900958

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.

**TROUBLESHOOTING STRATEGY**

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.

M1544004800283

## TROUBLE SYMPTOM CHART

M1544004900310

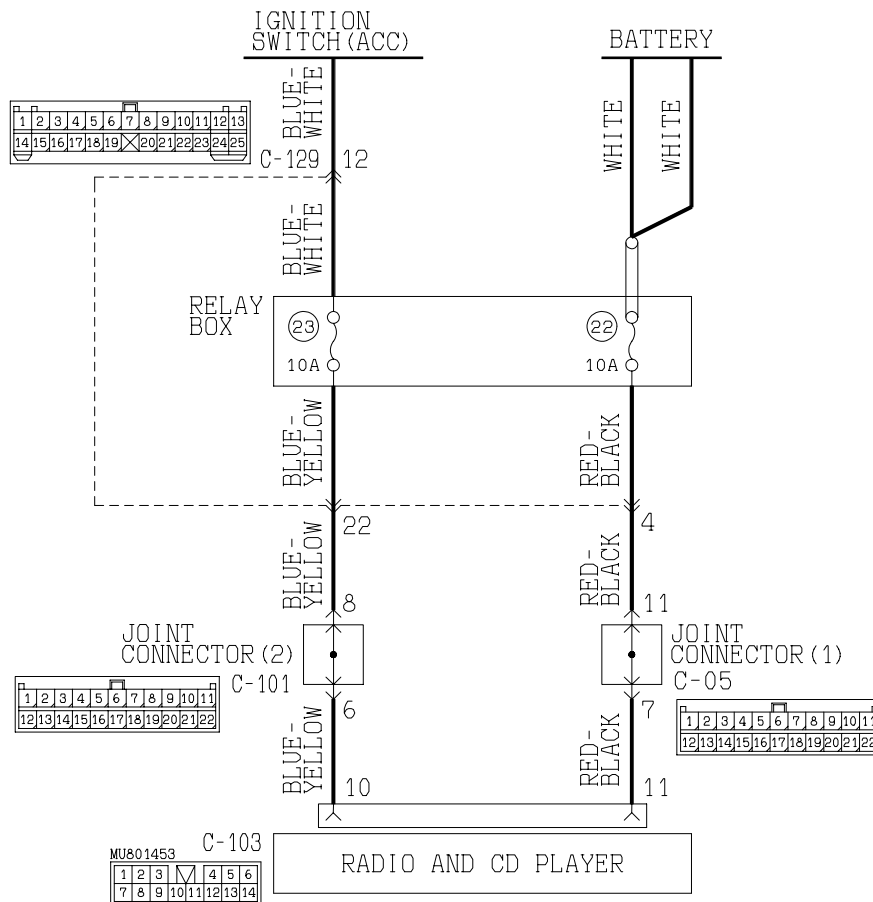
SYMPTOMS		INSPECTION PROCEDURE	REFERENCE PAGE
Power of radio and CD player does not turn ON when the ignition switch is in the "ACC" position or "ON" position.		1	P.54A-65
No sound from one speaker. <Vehicle without amplifier>		2	P.54A-70
CD auto changer does not operate.		3	P.54A-85
Noise	Noise appears at certain places when traveling (AM).	4	P.54A-85
	Noise appears at certain places when traveling (FM).	5	P.54A-86
	Mixed with noise, only at night (AM).	6	P.54A-87
	Broadcasts can be heard but both AM and FM have a lot of noise.	7	P.54A-87
	There is more noise on either AM or FM.	8	P.54A-89
	There is noise when starting the engine.	9	P.54A-90
	Some noise appears when there is vibration or shocks during traveling.	10	P.54A-91
	Noise sometimes appears on FM during traveling.	11	P.54A-92
	Ever-present noise.	12	P.54A-93
Radio	There is noise but no reception for both AM and FM or no sound from AM, or no sound from FM.	13	P.54A-93
	Poor reception.	14	P.54A-94
	Distortion on AM or on both AM and FM.	15	P.54A-95
	Distortion on FM only.	16	P.54A-95
	Using the auto select function, too few automatic stations are selected.	17	P.54A-96
	Preset stations are erased.	18	P.54A-97
CD player	CD can not be inserted.	19	P.54A-100
	No sound (CD only).	20	P.54A-100
	CD sound skips.	21	P.54A-101
	Sound quality is poor.	22	P.54A-101
	CD cannot be ejected.	23	P.54A-102



SYMPTOM PROCEDURES

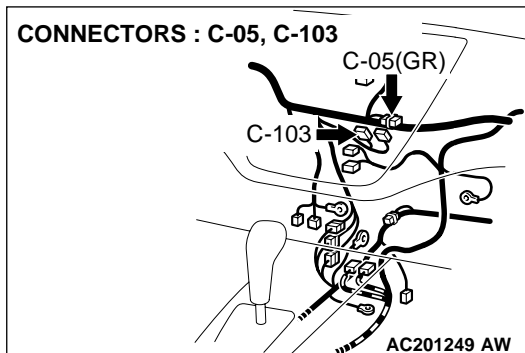
**INSPECTION PROCEDURE 1: Power of radio and CD player does not turn ON when the ignition switch is in the "ACC" position or "ON" position.**

Radio and CD Player supply Circuit

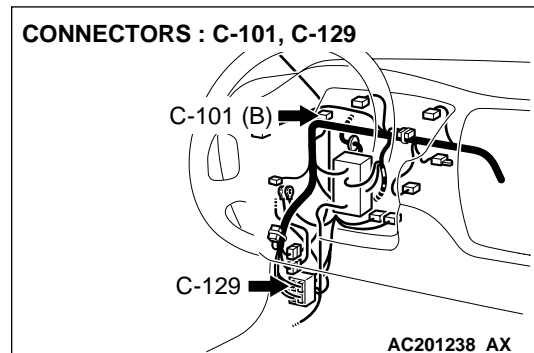


W3J11M07AA

CONNECTORS : C-05, C-103



CONNECTORS : C-101, C-129



**CIRCUIT OPERATION**

Power is supplied to the radio and CD player when the ignition switch is in the "ACC" position or "ON" position. When the previous ignition switch is in the "OFF" position by battery power, the "ON" or "OFF" state of the radio and CD player is saved.

**TECHNICAL DESCRIPTION (COMMENT)**

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

**TROUBLESHOOTING HINTS**

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

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

- MB991223: Harness set

**STEP 1. Check to see that the power turns ON when the power switch is turned ON.**

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

**Q: Is it possible to put the radio and CD player power in the "ON" position?**

**YES :** Go to Step 2.

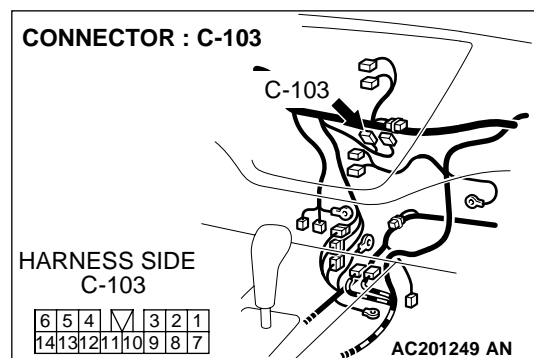
**NO :** Go to Step 5.

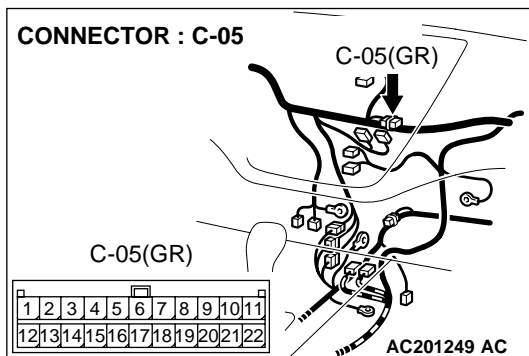
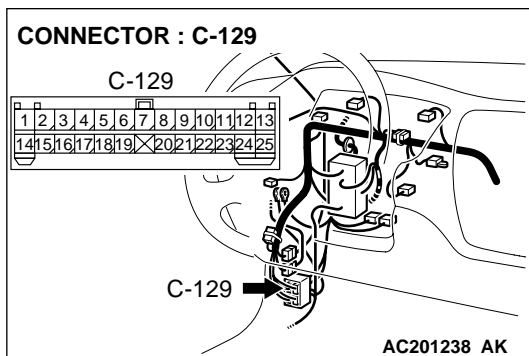
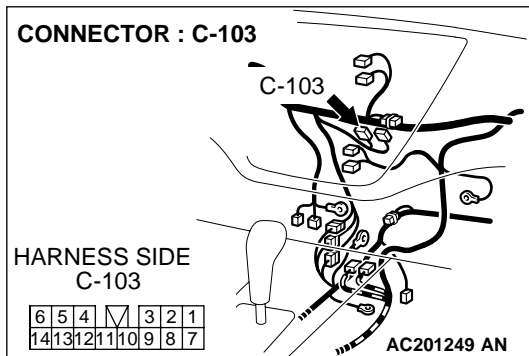
**STEP 2. Check radio and CD player connector C-103 for damage.**

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

**YES :** Go to Step 3.

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





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

**NOTE:** Also check intermediate connector C-129 and joint connector (1) C-05. If intermediate connector C-129 or joint connector (1) C-05 are damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

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

**YES :** Go to Step 4.

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

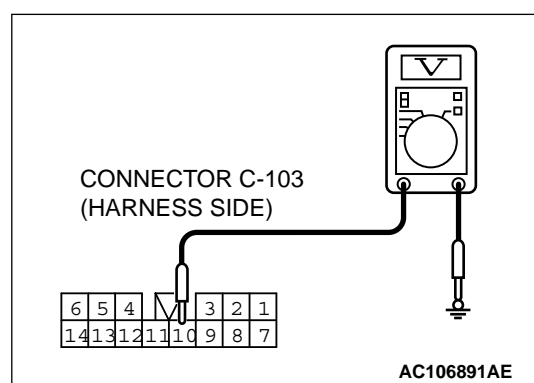
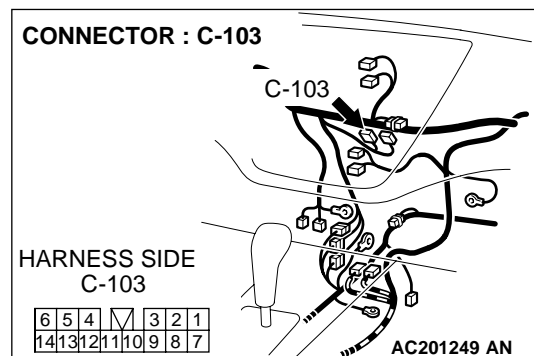
**STEP 4. Check the assembling state of the radio and CD player.**

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

**Q: Are the radio and CD player installed correctly?**

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

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



**STEP 5. Measure at radio and CD player connector C-103 in order to check the battery circuit of power supply system to the radio and CD player (ignition switch ACC).**

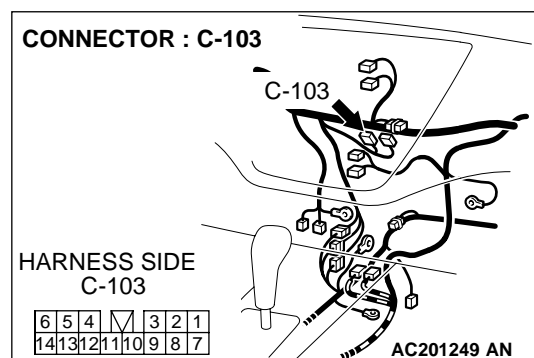
- (1) Disconnect radio and CD player connector C-103, and measure at the wiring harness side.
- (2) Turn the ignition switch to "ACC" position.

- (3) Measure the voltage between terminal 10 and ground by backprobing.
  - The measured value should be approximately 12 volts (battery positive voltage).

**Q: Does the measured voltage correspond with this range?**

**YES :** Go to Step 8.

**NO :** Go to Step 6.

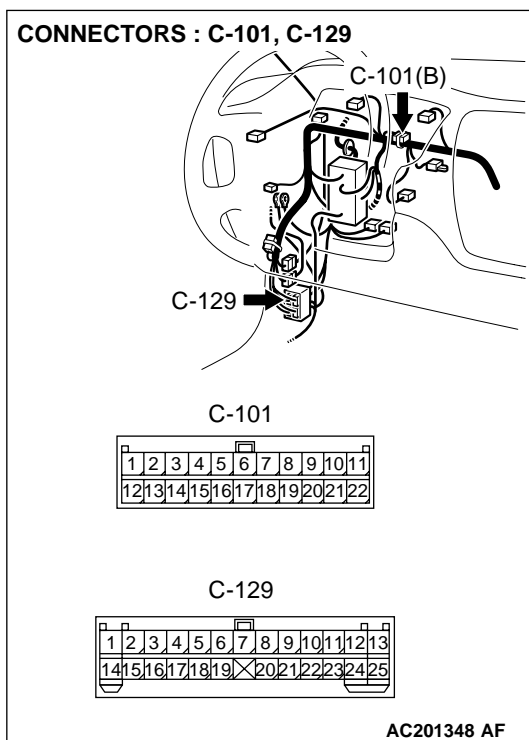
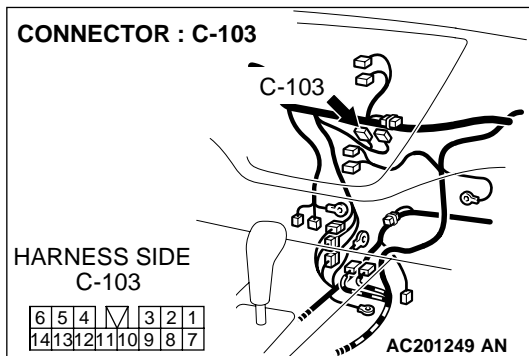


**STEP 6. Check radio and CD player connector C-103 for damage.**

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

**YES :** Go to Step 7.

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



**STEP 7. Check the wiring harness between radio and CD player connector C-103 (terminal 10) and ignition switch (ACC).**

**NOTE:** Also check intermediate connector C-129 and joint connector C-101. If intermediate connector C-129 or joint connector C-101 are damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.

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

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

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

**STEP 8. Check the assembling state of the radio and CD player.**

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

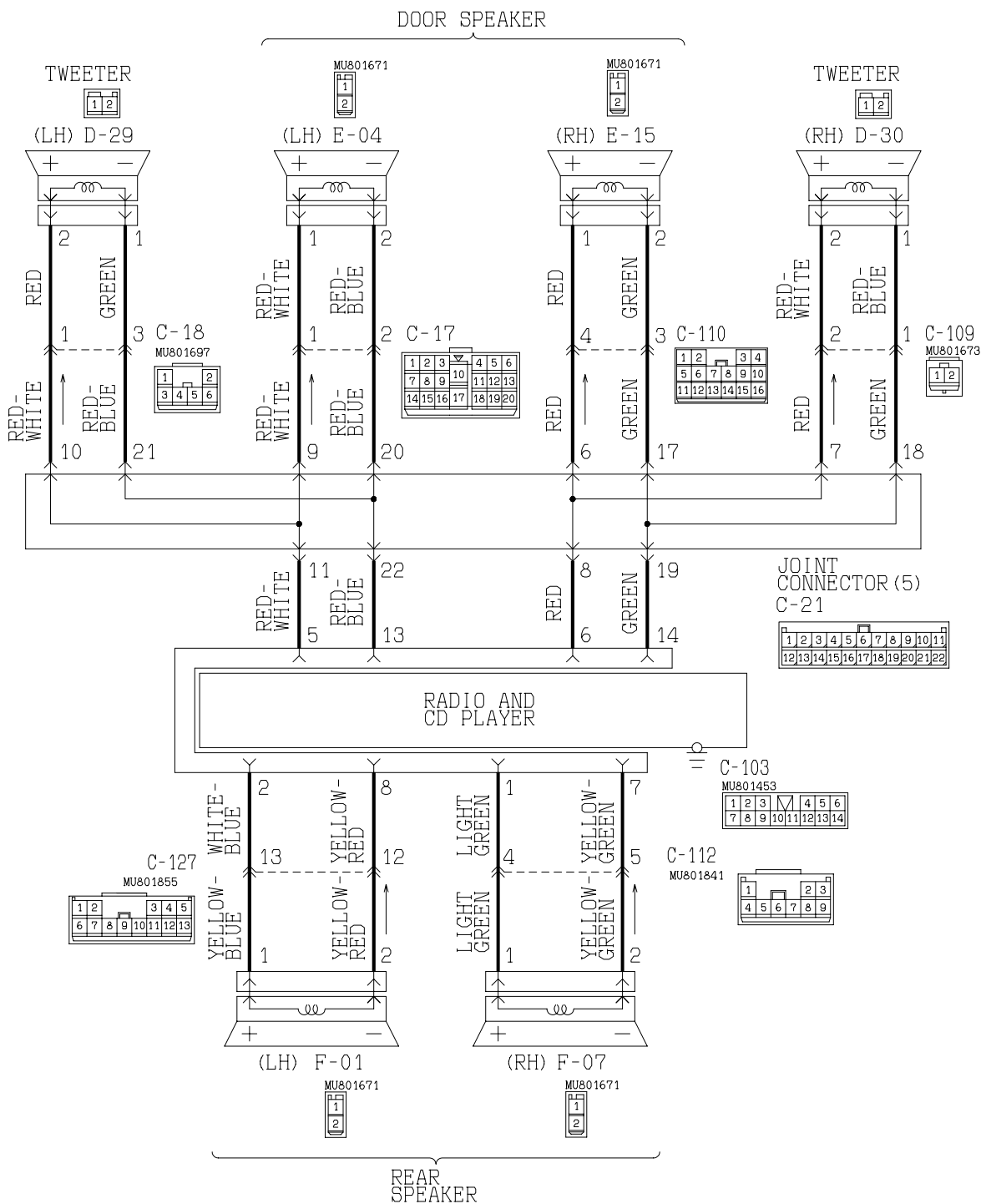
**Q: Are the radio and CD player installed correctly?**

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

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

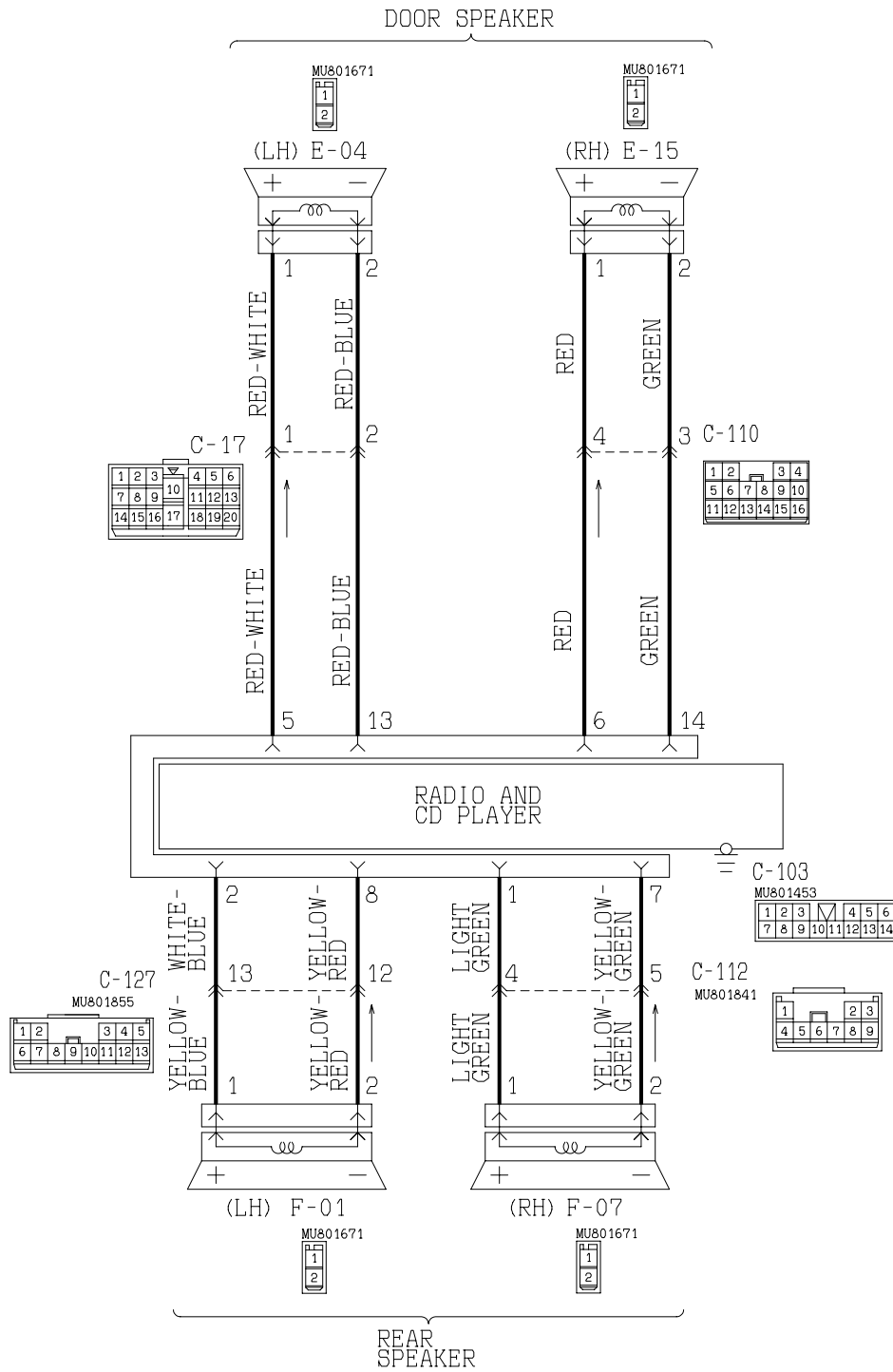
## INSPECTION PROCEDURE 2: No Sound from One Speaker.

Speaker System Circuit &lt;6 speaker&gt;



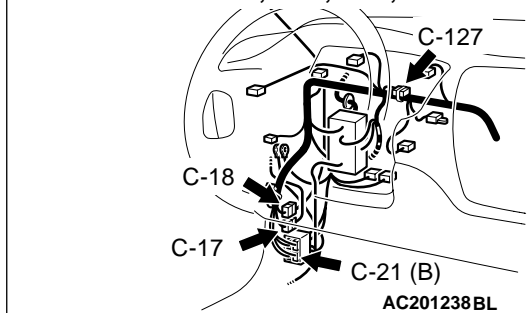
W3J11M08AA

Speaker System Circuit <4 speaker>

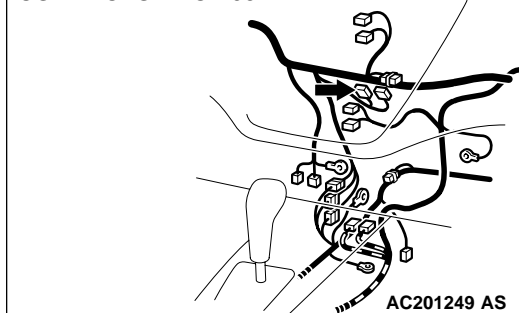


W3J11M09AA

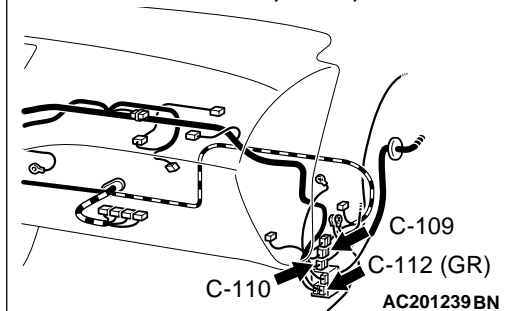
CONNECTORS : C-17, C-18, C-21, C-127



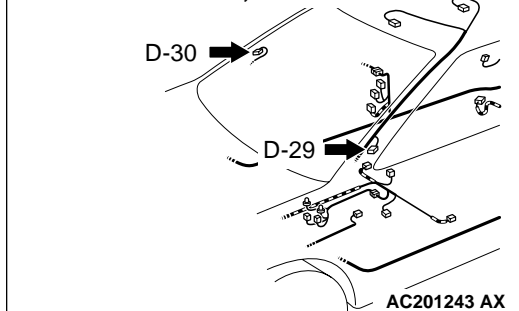
CONNECTOR : C-103



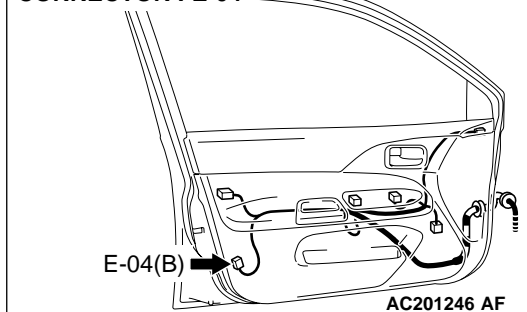
CONNECTORS : C-109, C-110, C-112



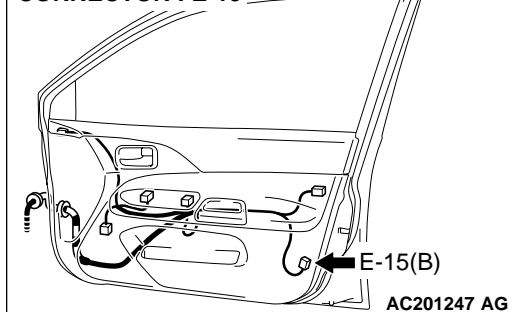
CONNECTOR : D-29, D-30



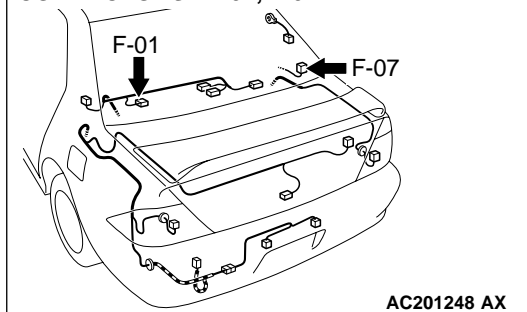
CONNECTOR : E-04



CONNECTOR : E-15



CONNECTORS : F-01, F-07

**CIRCUIT OPERATION**

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

**TECHNICAL DESCRIPTION (COMMENT)**

The cause is probably a faulty speaker circuit system.

**TROUBLESHOOTING HINTS**

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



## DIAGNOSIS

**STEP 1. Check to see which speaker the sound is not output from.**

Use the speaker test to determine which speaker does not sound.

**Q: Which speaker is not working?**

**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.

**Tweeter (LH) :** Go to Step 14.

**Tweeter (RH) :** Go to Step 17.

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

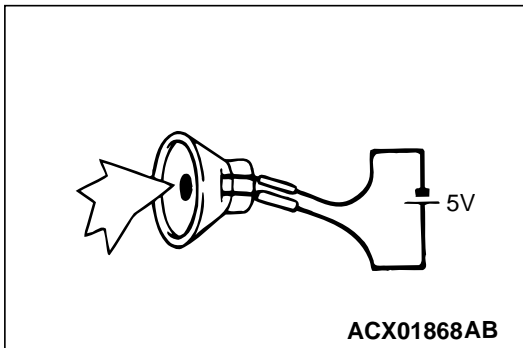
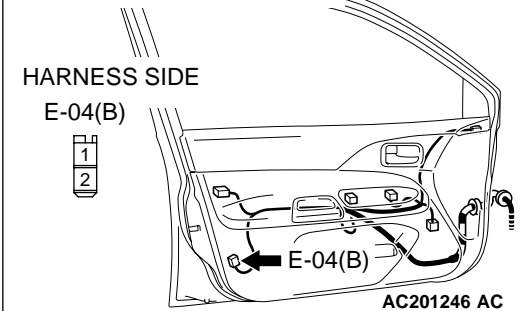
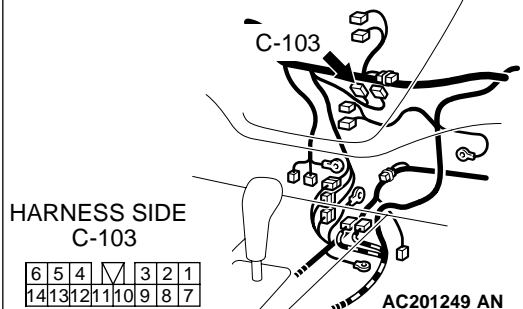
(1) Remove the door speaker (LH). Refer to [P.54A-107](#).

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

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

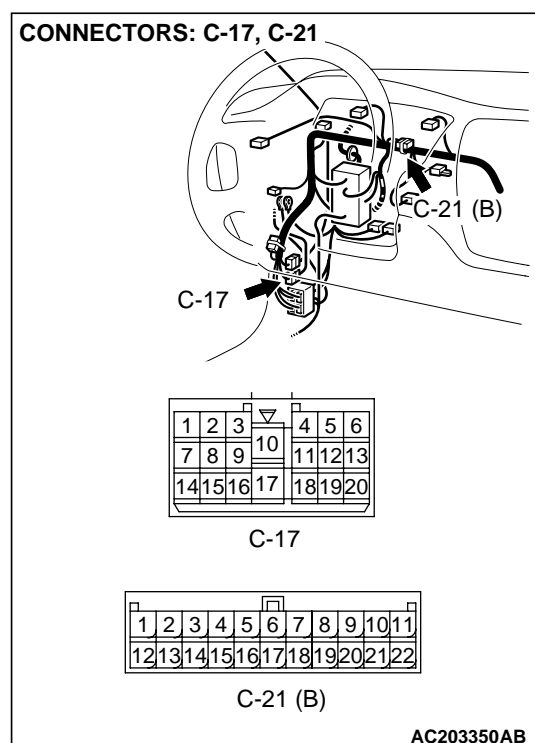
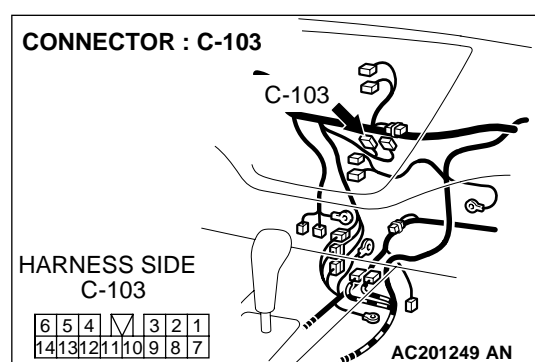
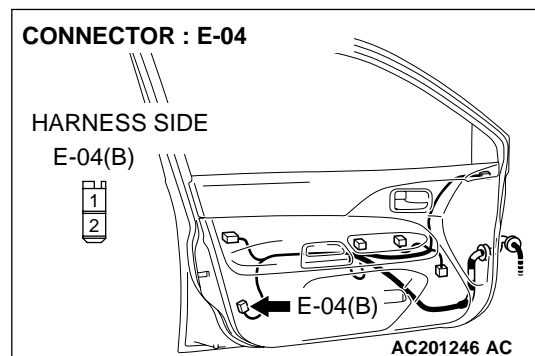
**YES :** Go to Step 3.

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

**CONNECTOR : E-04****CONNECTOR : C-103****STEP 3. Check door speaker (LH) connector E-04 and radio and CD player connector C-103 for damage.****Q: Are harness connectors E-04 and C-103 in good condition?**

**YES :** Go to Step 4.

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



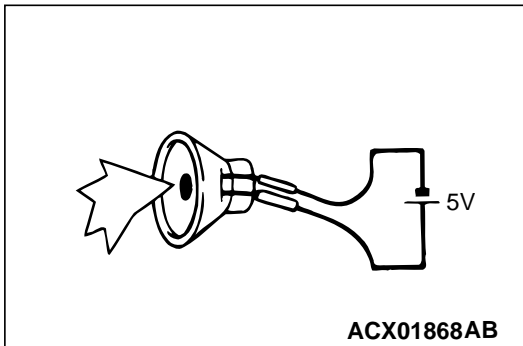
**STEP 4.** Check the wiring harness between door speaker (LH) connector E-04 (terminal 1 and 2) and radio and CD player connector C-103 (terminal 5 and 13).

**NOTE:** Also check intermediate connector C-17 or joint connector C-21 <vehicle with 6 speaker>. If intermediate connector C-17 or joint connector C-21 <vehicle with 6 speaker> are damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection [P.00E-2](#).

**Q:** Are the wiring harness between door speaker (LH) connector E-04 (terminal 1 and 2) and radio and CD player connector C-103 (terminal 5 and 13) in good condition?

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

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



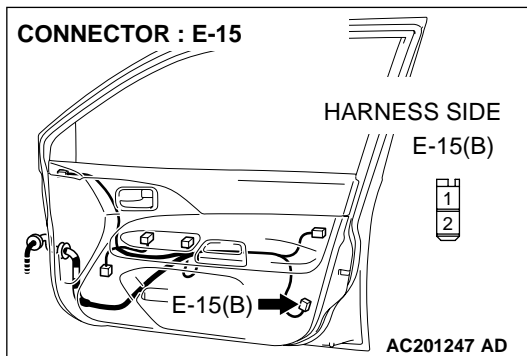
**STEP 5. Check the door speaker (RH).**

- (1) Remove the door speaker (RH). Refer to [P.54A-107](#).
- (2) Check that the door speaker (RH) generates noise when a five-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.

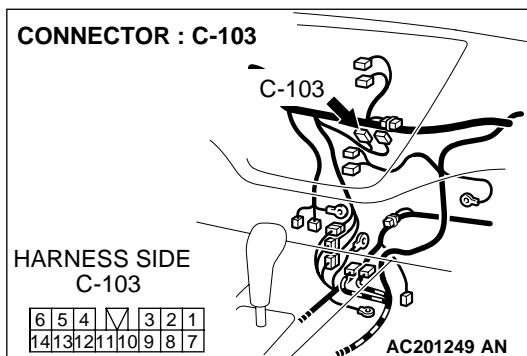


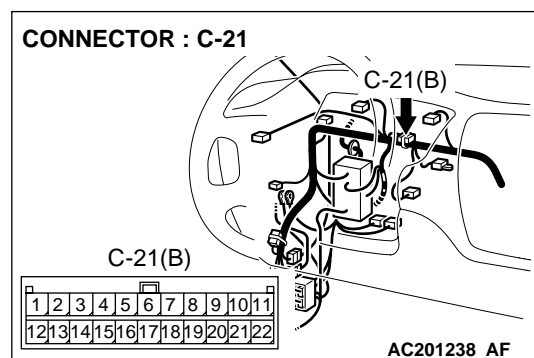
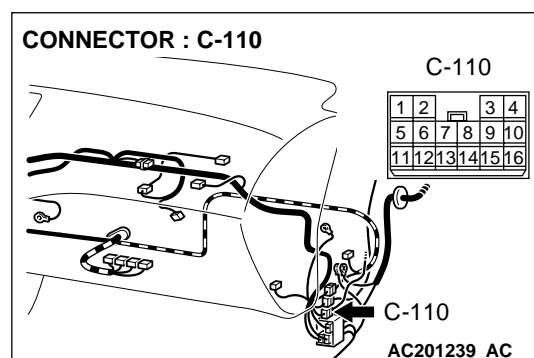
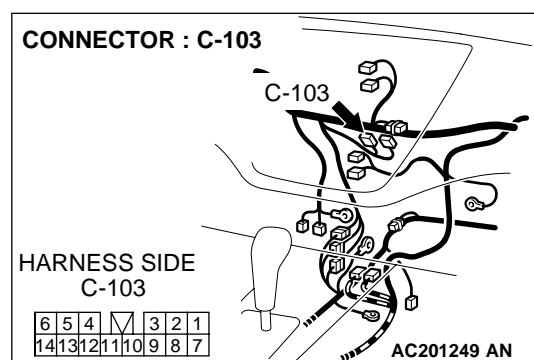
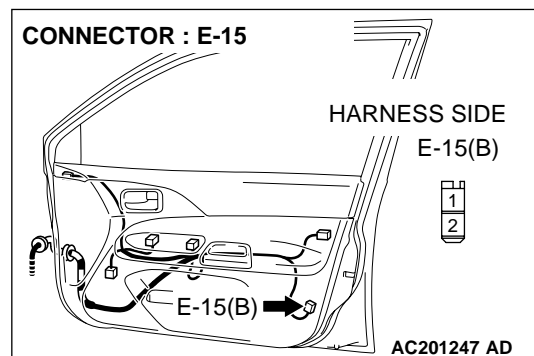
**STEP 6. Check door speaker (RH) connector E-15 and radio and CD player connector C-103 for damage.**

**Q: Are harness connectors E-15 and C-103 in good condition?**

**YES :** Go to Step 7.

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





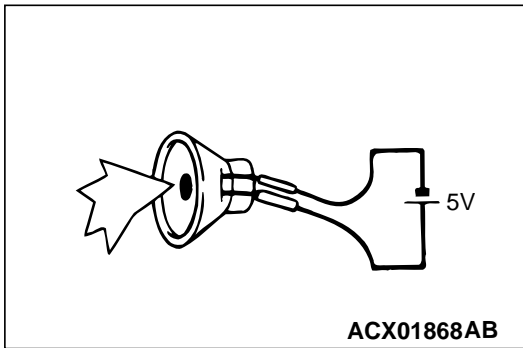
**STEP 7. Check the wiring harness between door speaker (RH) connector E-15 (terminal 1 and 2) and radio and CD player connector C-103 (terminal 6 and 14).**

*NOTE: Also check intermediate connector C-110 and joint connector (5) C-21 <vehicle with 6 speaker>. If intermediate connector C-110 or joint connector (5) C-21 <vehicle with 6 speaker> are damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection P.00E-2.*

**Q: Are the wiring harness between door speaker (RH) connector E-15 (terminal 1 and 2) and radio and CD player connector C-103 (terminal 6 and 14) in good condition?**

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

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



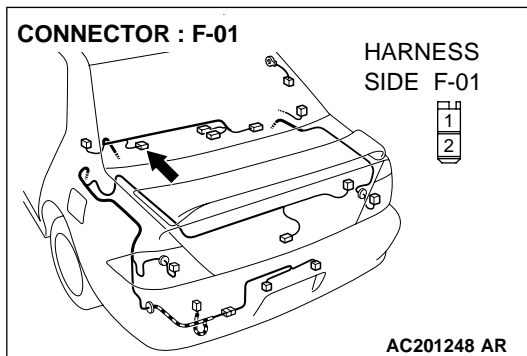
**STEP 8. Check the rear speaker (LH).**

- (1) Remove the rear speaker (LH). Refer to [P.54A-107](#).
- (2) Check that the rear speaker (LH) generates noise when a five-volt voltage is applied on the rear speaker (LH) terminal.

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

**YES :** Go to Step 9.

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

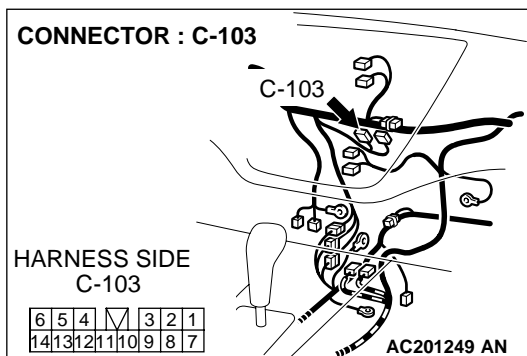


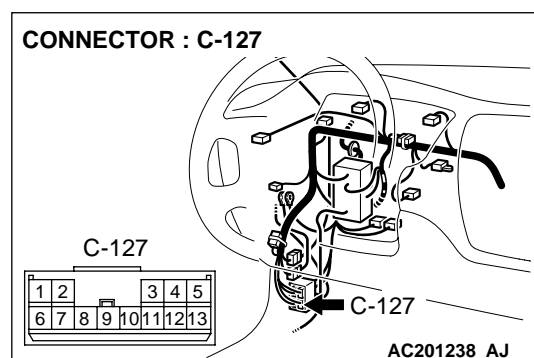
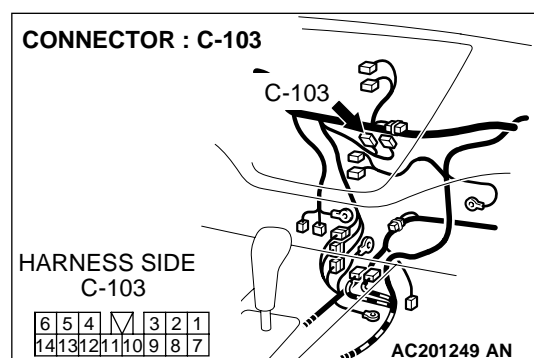
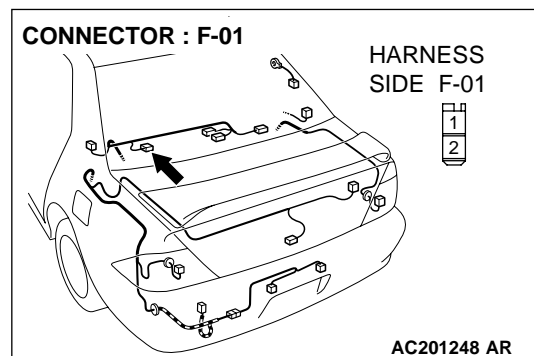
**STEP 9. Check rear speaker (LH) connector F-01 and radio and CD player connector C-103 for damage.**

**Q: Are harness connectors F-01 and C-103 in good condition?**

**YES :** Go to Step 10.

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





**STEP 10. Check the wiring harness between rear speaker (LH) connector F-01 (terminal 1 and 2) and radio and CD player connector C-103 (terminal 2 and 8).**

**NOTE:** Also check intermediate connector C-127. If intermediate connector C-127 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection [P.00E-2](#).

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

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

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

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

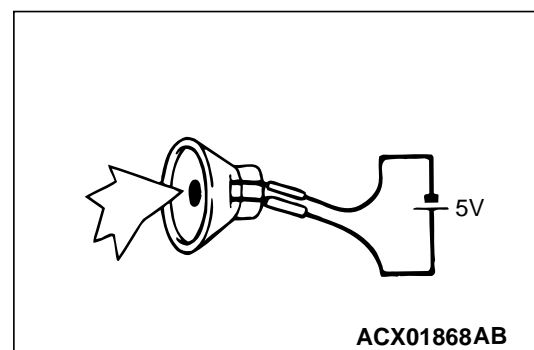
(1) Remove the rear speaker (RH). Refer to [P.54A-107](#).

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

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

**YES :** Go to Step 12.

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

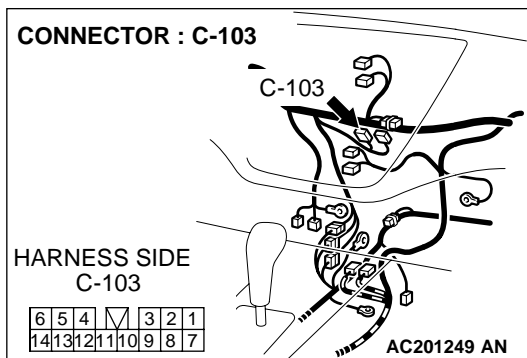
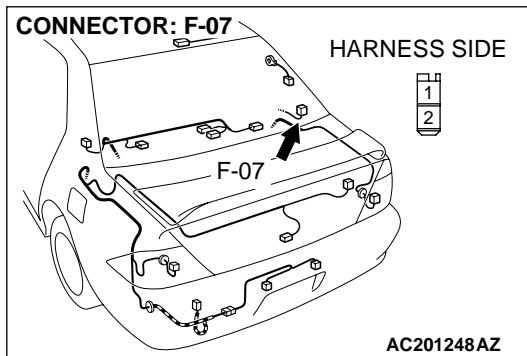


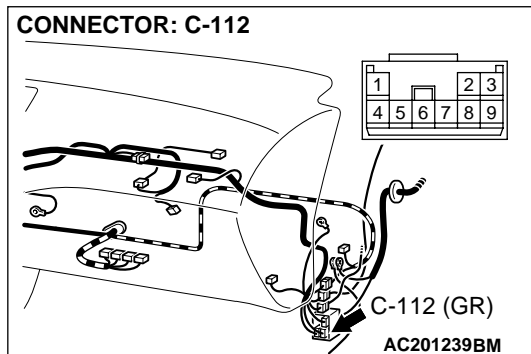
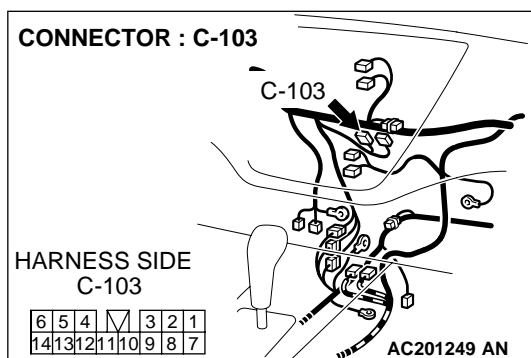
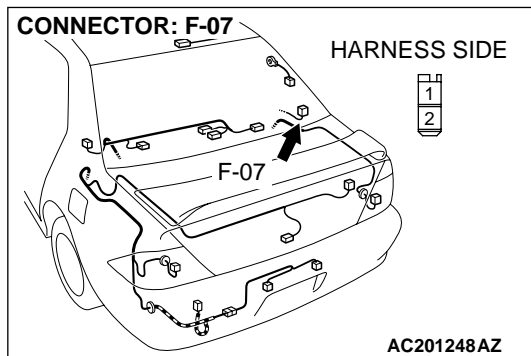
**STEP 12. Check rear speaker (RH) connector F-07 and radio and CD player connector C-103 for damage.**

**Q: Are harness connectors F-07 and C-103 in good condition?**

**YES :** Go to Step 13.

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





**STEP 13. Check the wiring harness between rear speaker (RH) connector F-07 (terminal 1 and 2) and radio and CD player connector C-103 (terminal 1 and 7).**

**NOTE:** Also check intermediate connector C-112. If intermediate connector C-112 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection [P.00E-2](#).

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

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

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

**STEP 14. Check the tweeter (LH).**

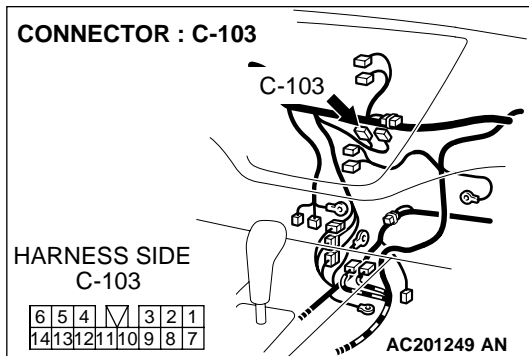
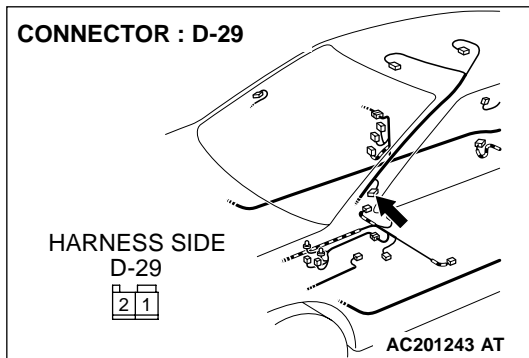
- (1) Remove the tweeter (LH).
- (2) Check that the tweeter (LH) generates noise when a five-volt voltage is applied on the tweeter (LH) terminal.

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

**YES :** Go to Step 15.

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



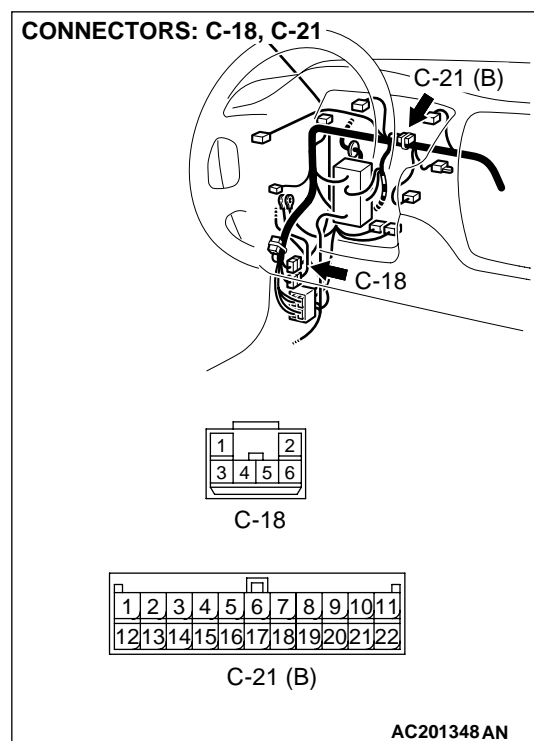
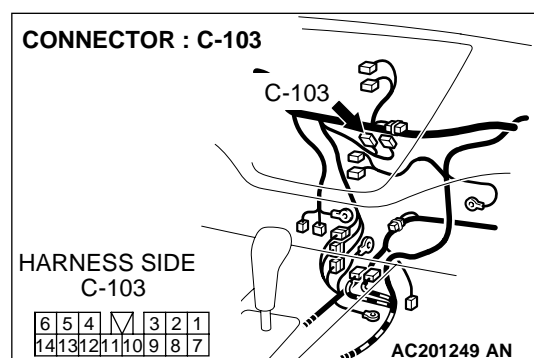
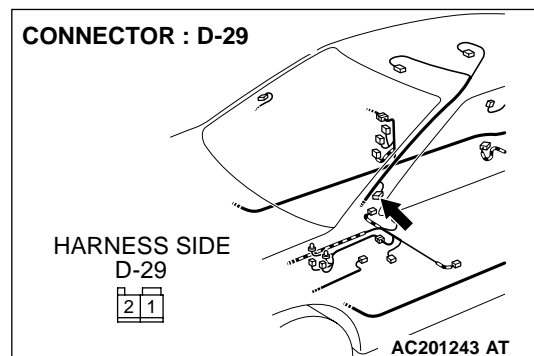


**STEP 15** Check tweeter (LH) connector D-29 and radio and CD player connector C-103 for damage.

**Q:** Are harness connectors D-29 and C-103 in good condition?

**YES :** Go to Step 16.

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



**STEP 16.** Check the harness wires between tweeter (LH) connector D-29 (terminal 1 and 2) and radio and CD player connector C-103 (terminal 13 and 5).

**NOTE:** After inspecting intermediate connector C-18 and joint connector C-21 <vehicle with 6 speaker>, inspect the wire. If intermediate connector C-18 or joint connector C-21 <vehicle with 6 speaker> are damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#).

**Q:** Are the harness wires between tweeter (LH) connector D-29 (terminal 1 and 2) and radio and CD player connector C-103 (terminal 13 and 5) in good condition?

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

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

**STEP 17. Check the tweeter (RH).**

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

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

**YES :** Go to Step 18.

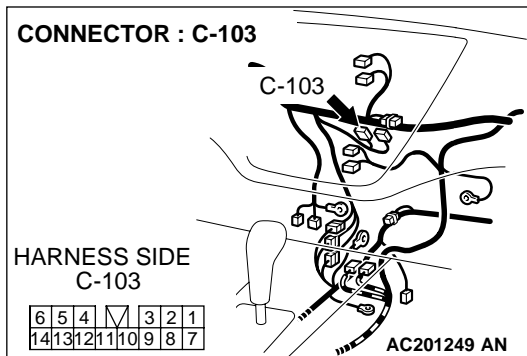
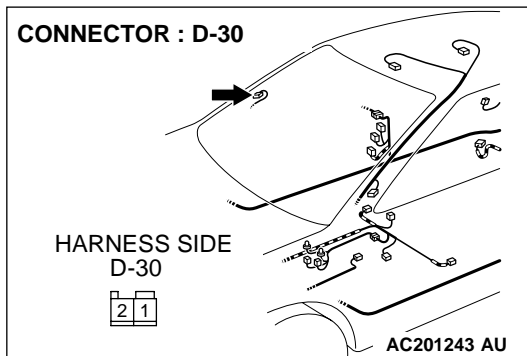
**NO :** Replace the tweeter (RH). The tweeter (RH) should sound.

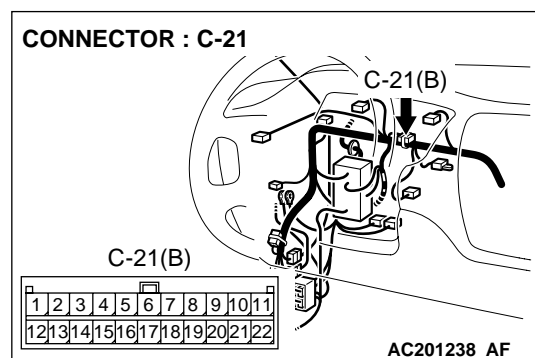
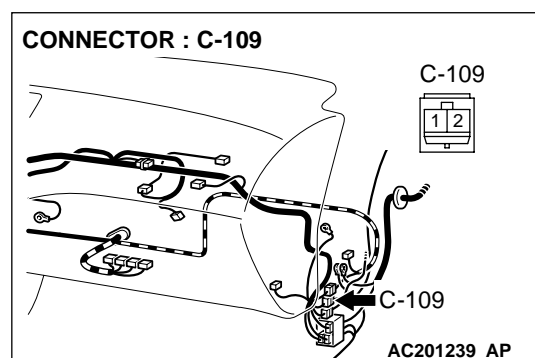
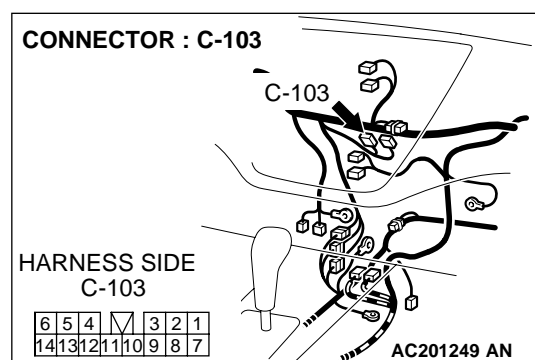
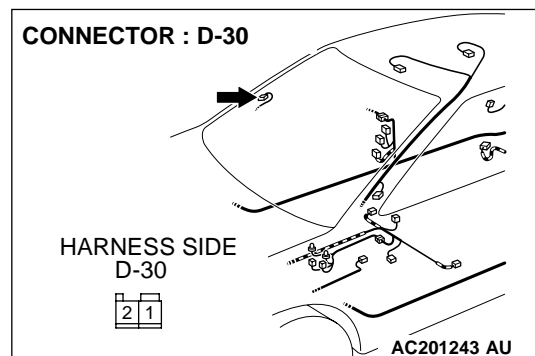
**STEP 18. Check tweeter (RH) connector D-30 and radio and CD player connector C-103 for damage.**

**Q: Are harness connectors D-30 and C-103 in good condition?**

**YES :** Go to Step 19.

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





**STEP 19.** Check the harness wires between tweeter (RH) connector D-30 (terminal 1 and 2) and radio and CD player connector C-103 (terminal 14 and 6).

**NOTE:** After inspecting intermediate connector C-109 and joint connector C-21 <vehicle with 6 speaker>, inspect the wire. If intermediate connector C-109 or joint connector C-21 <vehicle with 6 speaker> are damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#).

**Q:** Are the harness wires between tweeter (RH) connector D-30 (terminal 1 and 2) and radio and CD player connector C-103 (terminal 14 and 6) in good condition?

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

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

---

**INSPECTION PROCEDURE 3: CD Auto Changer does Not Operate.**

---

**TECHNICAL DESCRIPTION (COMMENT)**

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

**TROUBLESHOOTING HINTS**

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

**DIAGNOSIS**

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

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

---

**INSPECTION PROCEDURE 4: Noise Appears at Certain Places when Traveling (AM).**

---

---

**STEP 1. Check 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.

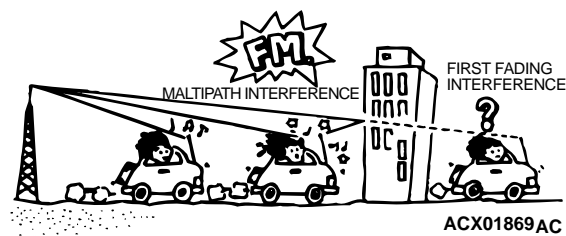
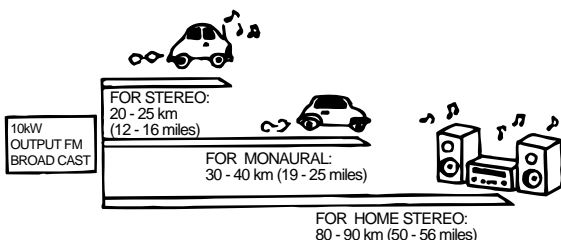
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**STEP 4. Check that there is no noise.**

**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 5: 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 6: 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: other electrical components noise may be a cause.

---

**DIAGNOSIS**

---

**STEP 1. Check that the noise 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 hat the following actions.**

- (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)?**

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

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

---

**INSPECTION PROCEDURE 7: Broadcasts can be Heard but Both AM and FM have a lot of Noise.**

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**DIAGNOSIS**

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**STEP 1. Check the state of the antenna.**

**Q: Is the mast antenna assembled?**

**YES :** Go to Step 2.

**NO :** Assemble the mast antenna. Check to see that the noise is gone.

---

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

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

**When the engine is stopped :** Go to Step 3.

**When the engine is running :** Check the vehicle's noise suppressor. (Refer to Inspection Procedure 11 [P.54A-90.](#))

---

**STEP 3. 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 4.

---

**STEP 4. Check that the radio is correctly grounded**

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

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

**YES :** Go to Step 5.

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

---

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

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

**YES :** Go to Step 7.

**NO :** Go to Step 6.

---

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

**Q: Is the noise eliminated?**

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

**NO :** Go to Step 7.

---

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

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

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

**NO :** Either repair or replace the antenna assembly. Check to see that the noise is gone.



---

**INSPECTION PROCEDURE 8: There is More Noise on Either AM or FM.**

---

**DIAGNOSIS**

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

---

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

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

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

**YES :** Go to Step 3.

**NO :** Go to Step 2.

---

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

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

**YES :** Noise prevention on the radio side is difficult. If the problem is particularly worse than other radios, consult a service center.

**NO :** Go to Step 3.

---

**STEP 3. 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-87.](#)) <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.

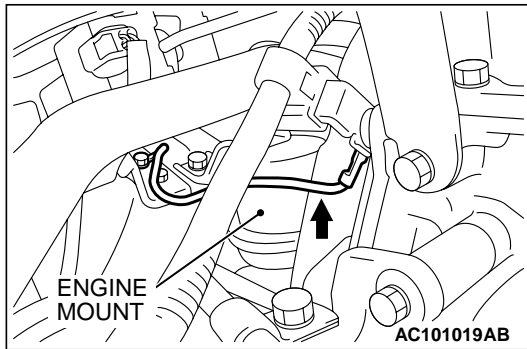
**INSPECTION PROCEDURE 9: There is Noise when Starting the Engine.****DIAGNOSIS****⚠ CAUTION**

- 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.



**INSPECTION PROCEDURE 10: Some Noise Appears When There is Vibration or Shocks During Traveling.**

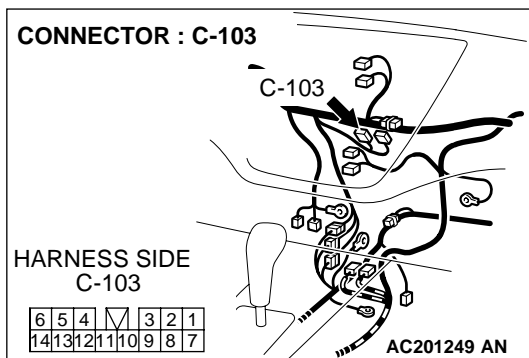
**DIAGNOSIS**

**STEP 1. Check radio and CD player connector C-103 for damage.**

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

**YES :** Go to Step 2.

**NO :** Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that there is no noise.



**STEP 2. Check that noise appear when the radio switch is turned on while the vehicle is stopped and the radio is tapped while tuned away from a station.**

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

**Q: Does noise appear when the radio switch is turned on while the vehicle is stopped and the radio is tapped while tuned away from a station?**

**YES :** Go to Step 3.

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

---

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

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

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

**YES :** Go to Step 4.

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

---

**STEP 4. Check by replacing radio and CD player.****Q: Are operations normal when using another radio and CD player?**

**YES :** Either repair or replace the radio and CD player. Check that there is no noise.

**NO :** Either repair or replace the antenna assembly. Check that there is no noise.

---

**INSPECTION PROCEDURE 11: Noise Sometimes Appears on FM during Traveling.**

---

**DIAGNOSIS**

---

**STEP 1. Check the state of the antenna.****Q: Is the mast antenna assembled?**

**YES :** Go to Step 2.

**NO :** Assemble the mast antenna. Check that there is no noise.

---

**STEP 2. The check after adjusting the radio.****Q: Readjust the radio. Is the noise eliminated?**

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

**NO :** Go to Step 3.

---

**STEP 3. Check with several broadcasting stations.**

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

- *Multipath noise*

*This describes the echo that occurs when the broadcast signal is reflected by a large obstruction and enters the receiver with a slight time delay relative to the direct signal (repetitious buzzing).*

- *Fading noise*

*This is a buzzing noise that occurs when the broadcast beam is disrupted by obstructing objects and the signal strength fluctuates intricately within a narrow range.*

**Q: Is the abnormality in reception generated only within a certain range?**

**YES :** The effect of an electrical field condition (multipath noise, fading noise) could be the cause. Check that there is not noise.

**NO :** Go to Step 4.

---

**STEP 4. Check that noise appears when the radio switch is turned on while the vehicle is stopped.**

*NOTE: Static electricity noise: Body static electric from the shock absorber rubber bushings used to prevent vibration, tires, etc. occurs because of separation from the ground, causing a buzzing noise. There 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 and the radio is tapped while tuned away from a station?**

**YES :** Go to Step 5.

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

---

**STEP 5. Check that the radio is correctly grounded.**

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

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

**YES :** Go to Step 6.

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

---

**STEP 6. Check by replacing radio and CD player.**

**Q: Are operations normal when using another radio and CD player?**

**YES :** Either repair or replace the radio and CD player. Check that there is no noise.

**NO :** Either repair or replace the antenna assembly. Check that there is no noise.

---

**INSPECTION PROCEDURE 12: Ever-Present Noise.**

---

**DIAGNOSIS**

Noise is often created by the following factors, and often the radio is OK when it is checked individually.

- Traveling conditions of the vehicle
- Terrain of area traveled through
- Surrounding buildings
- Signal conditions
- Time period

For this reason, if there are still problems with noise even after the measures described in inspection procedure 7 to 14 have been taken, get information on the factors listed above as well as determining whether the problem occurs with AM or FM, the station names, frequencies, etc. and contact the radio manufacturer's service center.

---

**INSPECTION PROCEDURE 13: There is Noise but No Reception for Both AM and FM or No Sound from AM, or No Sound from FM.**

---

**DIAGNOSIS**

---

**STEP 1. Check the state of the antenna.**

**Q: Is the mast antenna assembled?**

**YES :** Go to Step 2.

**NO :** Assemble the mast antenna. The radio should sound normally.

---

**STEP 2. Check to see if inspections are taking place in an area exposed to special electric fields.**

**Q: Are inspections taking place under special electric field conditions? (underground garage, inside a building, etc.)?**

**YES :** Go to Step 3.

**NO :** Go to Step 4.

---

**STEP 3. Relocate and check.**

Automatically receive in a good reception area that is not exposed to special electric fields.

**Q: Is reception of the strongest radio frequency possible within the area?**

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

**NO :** Go to Step 4.

---

**STEP 4. Tune then check.**

**Q: Did the sensitivity improve after tuning?**

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

**NO :** Go to Step 5.

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

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

**YES :** Go to Step 6.

**NO :** Thoroughly connect the antenna plug and the radio and CD player. The radio should sound normally.

**STEP 6. Check by replacing radio and CD player.**

**Q:** Are operations normal when using another radio and CD player?

**YES :** Either repair or replace the radio and CD player. The radio should sound normally.

**NO :** Either repair or replace the antenna assembly. The radio should sound normally.

**INSPECTION PROCEDURE 14: Poor Reception.****DIAGNOSIS****STEP 1. Check the state of the antenna.**

**Q:** Is the mast antenna assembled?

**YES :** Go to Step 2.

**NO :** Assemble the mast antenna. Check that a poor reception is resolved.

**STEP 2. Check to see if inspections are taking place in an area exposed to special electric fields.**

**Q:** Are inspections taking place under special electric field conditions? (underground garage, inside a building, etc.)?

**YES :** Go to Step 3.

**NO :** Go to Step 4.

**STEP 3. Relocate and check.**

Automatically receive in a good reception area that is not exposed to special electric fields.

**Q:** Is reception of the strongest radio frequency possible within the area?

**YES :** Check that a poor reception is resolved.

**NO :** Go to Step 4.

**STEP 4. Tune then check.**

**Q:** Did the sensitivity improve after tuning?

**YES :** Check that a poor reception is resolved.

**NO :** Go to Step 5.

**STEP 5. Check with several broadcasting stations.**

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

- *Multipath noise*

*This describes the echo that occurs when the broadcast signal is reflected by a large obstruction and enters the receiver with a slight time delay relative to the direct signal (repetitious buzzing).*

- *Fading noise*

*This is a buzzing noise that occurs when the broadcast beam is disrupted by obstructing objects and the signal strength fluctuates intricately within a narrow range.*

**Q:** Is the abnormality in reception generated only within a certain range?

**YES :** Check that a poor reception is resolved.

**NO :** Go to Step 6.

**STEP 6. Check the connection of the antenna plug and radio and CD player.**

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

**YES :** Go to Step 7.

**NO :** Thoroughly connect the antenna plug and the radio and CD player. Check that a poor reception is resolved.

---

**STEP 7. Check by replacing radio and CD player.**

**Q: Are operations normal when using another radio and CD player?**

**YES :** Either repair or replace the radio and CD player. Check that a poor reception is resolved.

**NO :** Either repair or replace the antenna assembly. Check that a poor reception is resolved.

---

**INSPECTION PROCEDURE 15: Distortion on AM or on Both AM and FM.**

---

**DIAGNOSIS**

---

**STEP 1. Check the degree in which distortion is generated.**

**Q: How much distortion is generated?**

**Occasional distortion :** Go to Step 2.

**Constant distortion :** Go to Step 3.

---

**STEP 2. Check by the transmission antenna.**

**Q: Is there distortion by the transmission antenna?**

**YES :** The input from the antenna is too big.

**NO :** Go to Step 3.

---

**STEP 3. Check how the speakers are setup.**

**Q: Are any cords coming in contact with the paper cones of the speakers?**

**YES :** Move the cords so that they do not come in contact with the paper cones of the speaker. Check that a distortion is resolved.

**NO :** Go to Step 4.

---

**STEP 4. Check the speakers.**

1. Remove the speakers.

2. Check to see if there is any ripping of the paper cones or any foreign obstacles in the paper cone.

**Q: Are the speakers normal?**

**YES :** Go to Step 5.

**NO :** Repair or replace the speakers. Check that a distortion is resolved.

---

**STEP 5. Check how the speakers are setup.**

**Q: Check to see if the speakers are setup in a deformed manner.**

**YES :** Correct the way the speakers are setup so they are securely setup. Check that a distortion is resolved.

**NO :** Repair or replace the radio and CD player. Check that a distortion is resolved.

---

**INSPECTION PROCEDURE 16: Distortion on FM Only.**

---

**DIAGNOSIS**

---

**STEP 1. Check with another broadcasting station.**

**Q: Is there distortion when turning to another broadcasting station?**

**YES :** Go to Step 2.

**NO :** The signal from that station is too weak.

---

**STEP 2. Relocate the reception area and check.**

**Q: When relocating the reception area does the distortion increase or decrease?**

**YES :** The cause may be multipath noise.

**NO :** Repair or replace the radio and CD player. Check that a distortion is resolved.

---

**INSPECTION PROCEDURE 17: Using the Auto Select Function, Too Few Automatic Stations are Selected.**

---

**DIAGNOSIS**

---

**STEP 1. Check the state of the antenna.****Q: Is the mast antenna assembled?****YES :** Go to Step 2.**NO :** Assemble the mast antenna. The auto-select function should operate normally.

---

**STEP 2. Check the number of radio stations.****Q: Are there sufficient numbers of radio stations within the area?****YES :** Go to Step 3.**NO :** Go to Step 4.

---

**STEP 3. Check the distance from the transmission antenna.****Q: Is there a transmission antenna within a range of 2 miles?****YES :** Go to Step 5.**NO :** Go to Step 4.

---

**STEP 4. The check if there are not that many radio stations and when there is no transmission antenna in the vicinity.**

Execute automatic selection and check to see that the strongest radio frequency is receivable within the area.

**Q: Is reception of the strongest radio frequency possible within the area?****YES :** There is no action to be taken.**NO :** Go to Step 5.

---

**STEP 5. Check to see if inspections are taking place in an area exposed to special electric fields.****Q: Are inspections taking place under special electric field conditions? (underground garage, inside a building, etc.)?****YES :** Go to Step 6.**NO :** Go to Step 7.

---

**STEP 6. Relocate and check.**

Automatically receive in a good reception area that is not exposed to special electric fields.

**Q: Is reception of the strongest radio frequency possible within the area?****YES :** There is no action to be taken.**NO :** Go to Step 7.

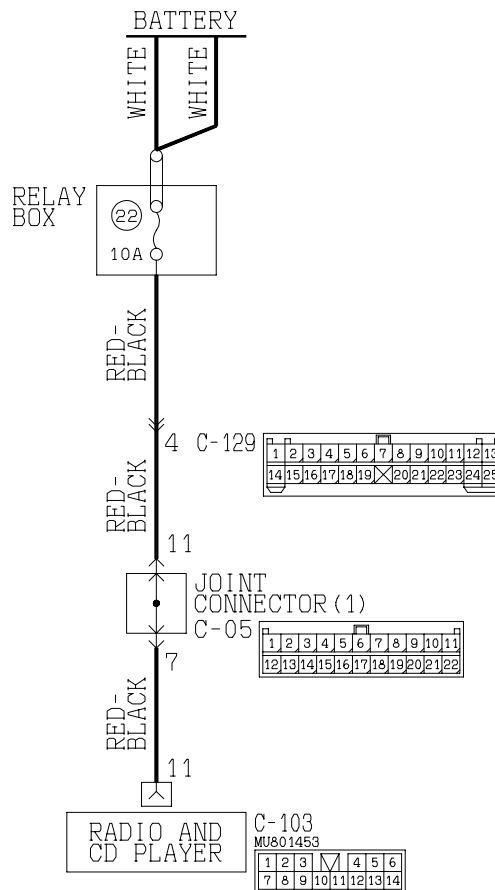
---

**STEP 7. Check the connection of the antenna plug and radio and CD player.****Q: Is the antenna plug thoroughly connected to the radio and CD player?****YES :** Repair or replace the radio and CD player. The auto-select function should operate normally.**NO :** Thoroughly connect the antenna plug and the radio and CD player. The auto-select function should operate normally.

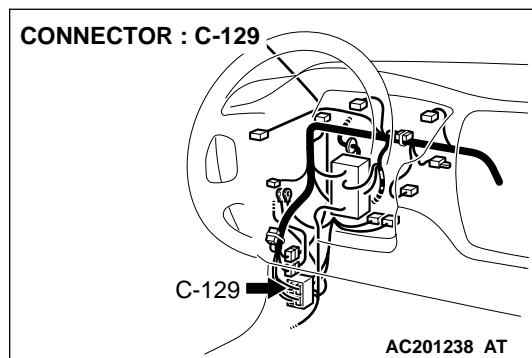
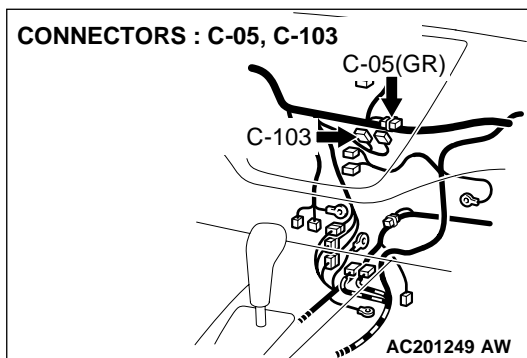


INSPECTION PROCEDURE 18: Preset Station are Erased.

Memory Backup Power Supply Circuit



W3J11M10AA



CIRCUIT OPERATION

The power is constantly supplied to the radio and CD player.

TECHNICAL DESCRIPTION (COMMENT)

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

TROUBLESHOOTING HINTS

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

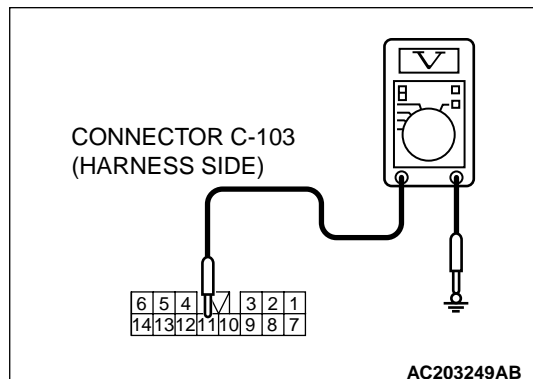
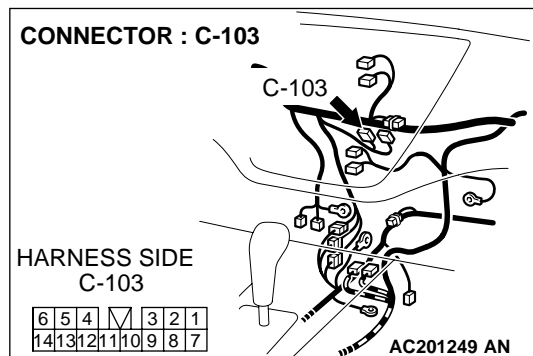
## DIAGNOSIS

## Required Special Tool:

- MB991223: Harness set

**STEP 1. Check at radio and CD player connector C-103 in order to check the power supply circuit to the radio and CD player (through the battery).**

(1) Do not disconnect radio and CD player connector C-103.



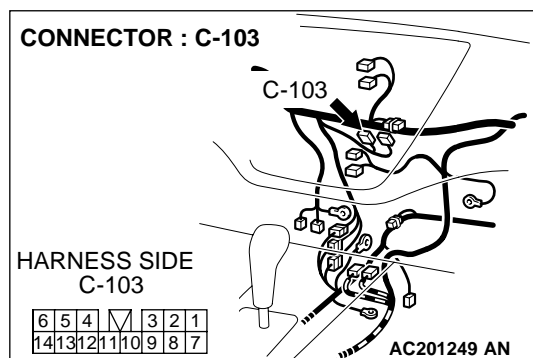
(2) Measure the voltage between terminal number 11 and ground.

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

**Q: Does the measured voltage correspond with this range?**

**When YES <radio and CD player does not execute memory save then.> :** Either repair or replace the radio and CD player. Check that a memory is retained.

**NO :** Go to Step 2.

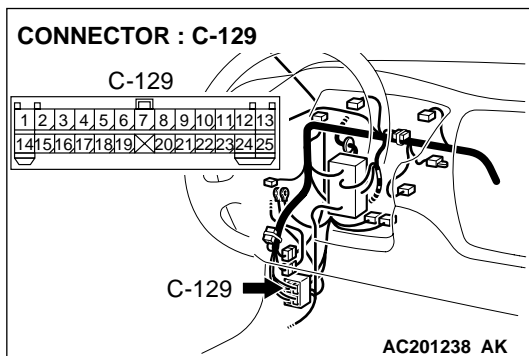
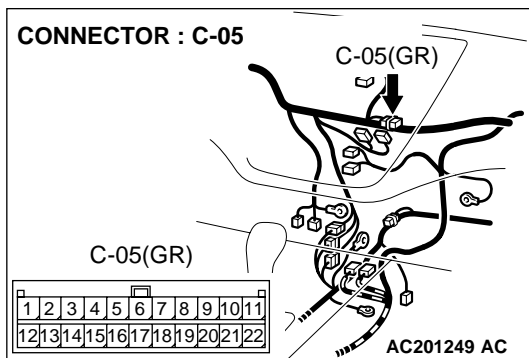
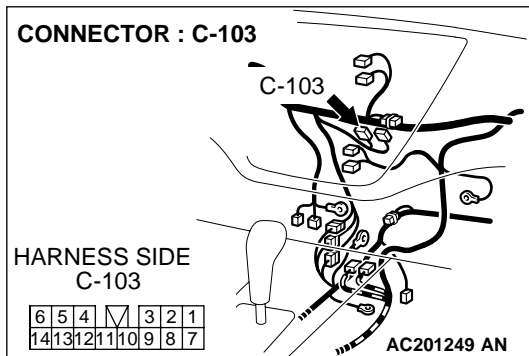


**STEP 2. Check radio and CD player connector C-103 for damage.**

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

**YES :** Go to Step 3 .

**NO :** Repair or replace the connector. Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Check that a memory is retained.



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

**NOTE:** Also check joint connector C-05 and intermediate connector C-129. If joint connector C-05 or intermediate connectors C-129 is damaged, repair or replace the connector as described in GROUP 00E, Harness Connector Inspection

[P.00E-2.](#)

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

**YES :** Repair or replace the radio and CD player. Check that a memory is retained.

**NO :** Repair the wiring harness. Check that a memory is retained.

---

**INSPECTION PROCEDURE 19: CD can Not be Inserted.**

---

**DIAGNOSIS**

---

**STEP1. Check that a CD has been already loaded.****Q: Has a CD been already loaded?****NO :** Go to Step 2.**YES :** Take out the CD (If the CD can not be ejected, refer to INSPECTION PROCEDURE 24 [P.54A-102](#).) Check that a CD can be inserted.

---

**STEP 2. Check how a CD is inserted.**

- Ensure that the ignition switch is at "ACC" or "ON".

*NOTE: If you try to load a CD when the ignition switch is at the positions other than "ACC" or "ON", the CD will not be inserted completely and then rejected.*

**Q: If you try to load the CD, does the CD stops halfway and then rejected?****YES :** Refer to INSPECTION PROCEDURE 24 [P.54A-102](#).**NO :** Go to Step 3.

---

**STEP3. Check after the CD is loaded.**

*NOTE: Even though the CD is loaded, "E" (error) is sometimes displayed with the CD rejected because of vibration/shock or dew on the CD face or optical lens.*

**Q: Though the CD is inserted completely, is "E" (error) displayed and the CD ejected?****YES :** Go to Step 4.**NO :** There is no action to be taken.

---

**STEP 4. Check the CD.**

Check the CD for the conditions below:

- Is the CD loaded with its label facing down?
- Is the recorded face dirty or scratched?
- Is there dew on the recorded face?

**Q: Is the CD in good condition?****YES :** Go to Step 5.**NO :** The original CD is defective. Check that a CD can be inserted.

---

**STEP 5. Check again using a normal CD, which is not dirty or scratched.**

- Load another normal CD.
- Check that the CD player recognizes and play the CD.

**Q: When you substitute another normal CD, is the CD loaded correctly?****YES :** The original CD is defective. Check that a CD can be inserted.**NO :** Replace or repair the CD player. Check that a CD can be inserted.

---

**INSPECTION PROCEDURE 20: No Sound. (CD only)**

---

**DIAGNOSIS**

---

**STEP 1. Check again using a normal CD, which is not dirty or scratched.****Q: When you substitute another normal CD, is the CD played normally?****YES :** The original CD is defective. The CD player should sound normally.**NO :** Go to Step 2.

---

**STEP 2. Check power supply to the CD player when the ignition switch is at "ACC" or "ACC".****Q: Is the radio and CD player energized when the ignition switch is turned to the "ACC" or "ON" position?****YES :** Replace or repair the CD player. The CD player should sound normally.**NO :** Check the memory backup power supply circuit. Refer to Inspection Procedure 1 [P.54A-65](#).

---

**INSPECTION PROCEDURE 21: CD Sound Skips.**

---

**DIAGNOSIS**

---

**Step 1. Check the state in which the sound on the CD jumps.**

**Q: Does the sound jump when the car is parked?**

**YES :** Go to Step 2.

**NO :** Go to Step 4.

---

**Step 2. Check the surface of the CD.**

**Q: Are there any scratches or soiling on the CD?**

**YES :** The CD is defective if there are any scratches. Clean the CD surface if it is dirty. Check that a CD sound skip is resolved.

**NO :** Go to Step 3.

---

**Step 3. Check when replacing with a CD that can be played normally without any scratches or soiling.**

**Q: Does the CD play normally when replaced with a CD that is not scratched or dirty and can play normally?**

**YES :** Defective CD used. Check that a CD sound skip is resolved.

**NO :** Go to Step 4.

---

**Step 4. Check by tapping the radio and CD player.**

*NOTE: Check by using a proper CD which is free from scratches, dirt or any other abnormality.*

**Q: Does the sound jump when tapping the radio and CD player?**

**YES :** Securely mount the radio and CD player.

Check that a CD sound skip is resolved.

**NO :** Either repair or replace the radio and CD player. (Take the following measures if a servicing shop is closeby).

1. Investigate in detail the state when the sound jumps while driving the car.

2. Describe the state to the service shop for consultation.

3. Either repair or replace the radio and CD player according to the instructions of the service shop.

Check that a CD sound skip is resolved.

---

**INSPECTION PROCEDURE 22: Sound Quality is Poor.**

---

**DIAGNOSIS**

---

**Check to see that the CD can be played normally and that it is free of any scratches or soiling.**

Replace with better sound quality CD.

**Q: Is the sound quality better replacing the CD with a clean CD without any scratches that can be played?**

**YES :** Defective CD used. The sound quality should return to normal.

**NO :** Either repair or replace the radio and CD player. The sound quality should return to normal.

## INSPECTION PROCEDURE 23: CD can not be ejected.

## DIAGNOSIS

Check the power of ignition switch "ACC".

**Q:** Does the radio and CD player power turn ON when the ignition switch is in the "ACC" or "ON" position?


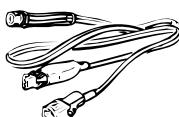
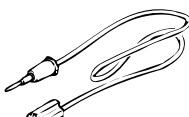

**YES :** Either repair or replace the radio and CD player. Check that a CD can be ejected normally.

**NO :** Check the memory backup power supply circuit. Refer to Inspection Procedure 1

[P.54A-65.](#)

## SPECIAL TOOLS

M1544000600209

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
    MB991223AC	MB991223 A: MB991219 B: MB991220 C: MB991221 D: MB991222 Harness set A: Test harness B: LED harness C: LED harness adapter D: Probe	General service tools	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

## PROCEDURE FOR INPUT OF ANTI-THEFT CODE FOR ANTI-THEFT SYSTEM

M1544004400199

The radio and CD player do not work under the following conditions:

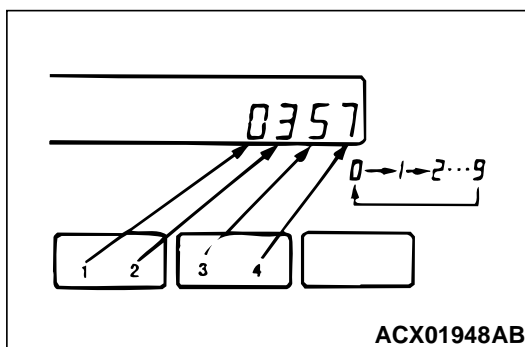
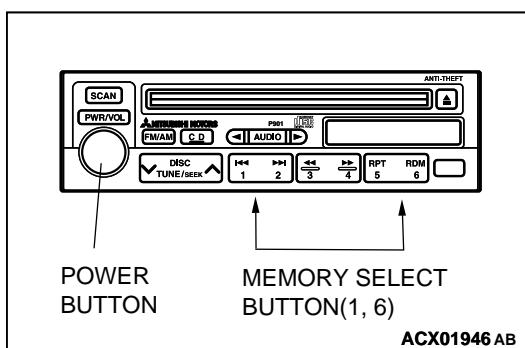
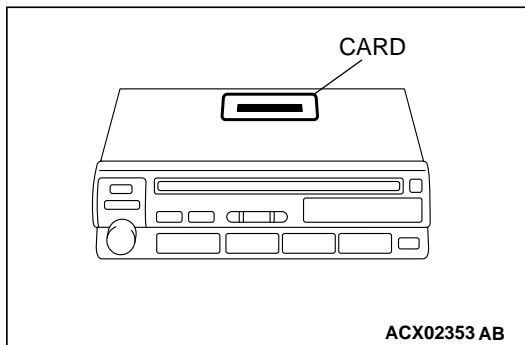
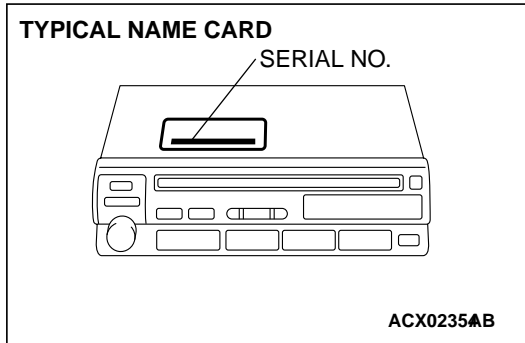
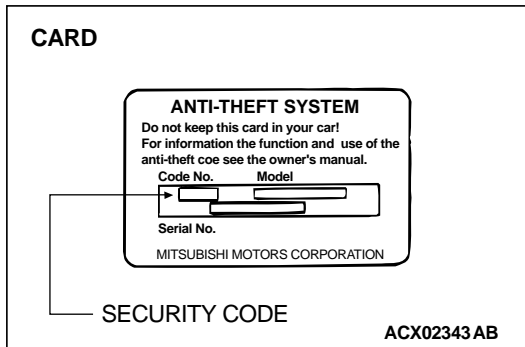
Power supply to the radio and CD player has been suspended for more than an hour continuously by removing the cable from the battery terminal or disconnecting the harness connectors. The power supply to the radio and CD player has been suspended for more than an hour due to a blown fuse or discharged battery.

If the radio and CD player does not work for these conditions, enter the security code as follows:

The radio and CD player has been replaced.

1. Confirm the security code using any of the following methods.

- (1) Use the security code indicated on the cards retained in the vehicle.



- (2) If the security code is unknown owing to the owner's loss of the card:

- a. Remove the radio and CD player referring to [P.54A-106](#).
- b. Read the serial number stamped on the radio and CD player.
- c. Look up the security code (anti-theft code table) corresponding to the serial number.

- (3) When the radio and CD player is replaced: Use the security code on the cards attached to the upper surface of the replacement radio and CD player.

*NOTE: Deliver the two cards to the owner.*

2. Connect the radio to the vehicle harness.
3. Turn the ignition key to the "ACC" or "ON" position.

4. Press the "PWR" button, and "codE" will be displayed.

5. Press number 1 through number 4 memory select button to set the four-digit security code shown on the card. Every time each digit key is pressed, the figure changes as follows: 0 to 1 to 2 to 3 to 4 to 5 to 6 to 7 to 8 to 9 to 0

6. Press the "CD" button, and a beep will be heard. If entered correctly, the radio and will work.

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.

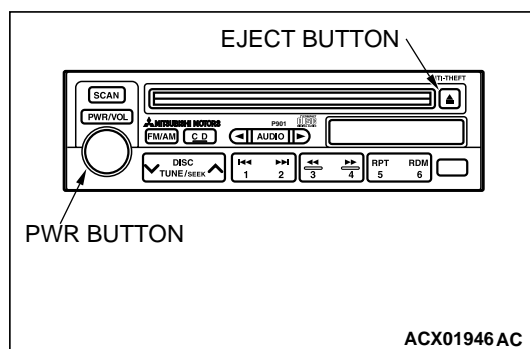
*NOTE:*

- **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 and CD player can be operated for three minutes without inputting the security code.

1. Press the "PWR" button and "EJECT" button together to operate the radio and CD player.
2. In three minutes the unit will not be able to work. Then the radio and CD player will be switched off.

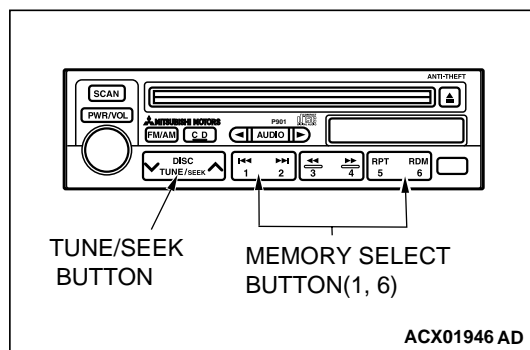


### SPEAKER TEST

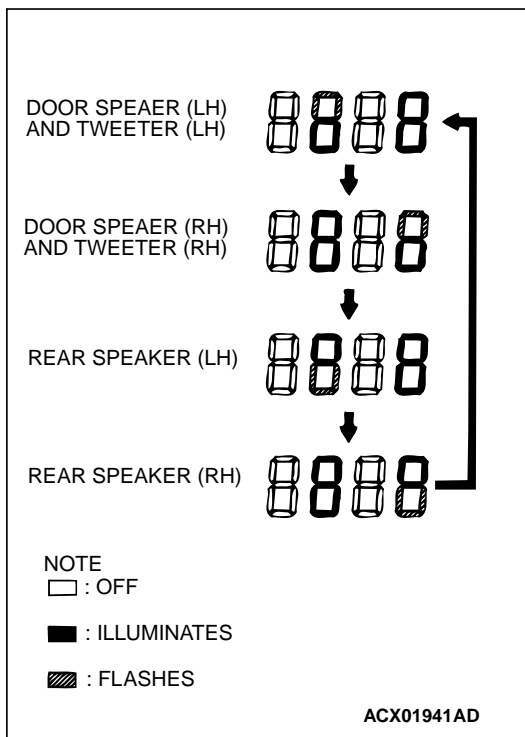
M1544005400158

Enter the speaker test mode according to the following steps:

1. Turn the Ignition switch to the "ACC" or "ON" position and switch off the radio and CD player.
2. Press the following buttons in that order within sixty seconds from step (1).
  - (1) Memory select "1" button
  - (2) "TUNE/SEEK (DOWN)" button
  - (3) "TUNE/SEEK (UP)" button
  - (4) Memory select "6" button



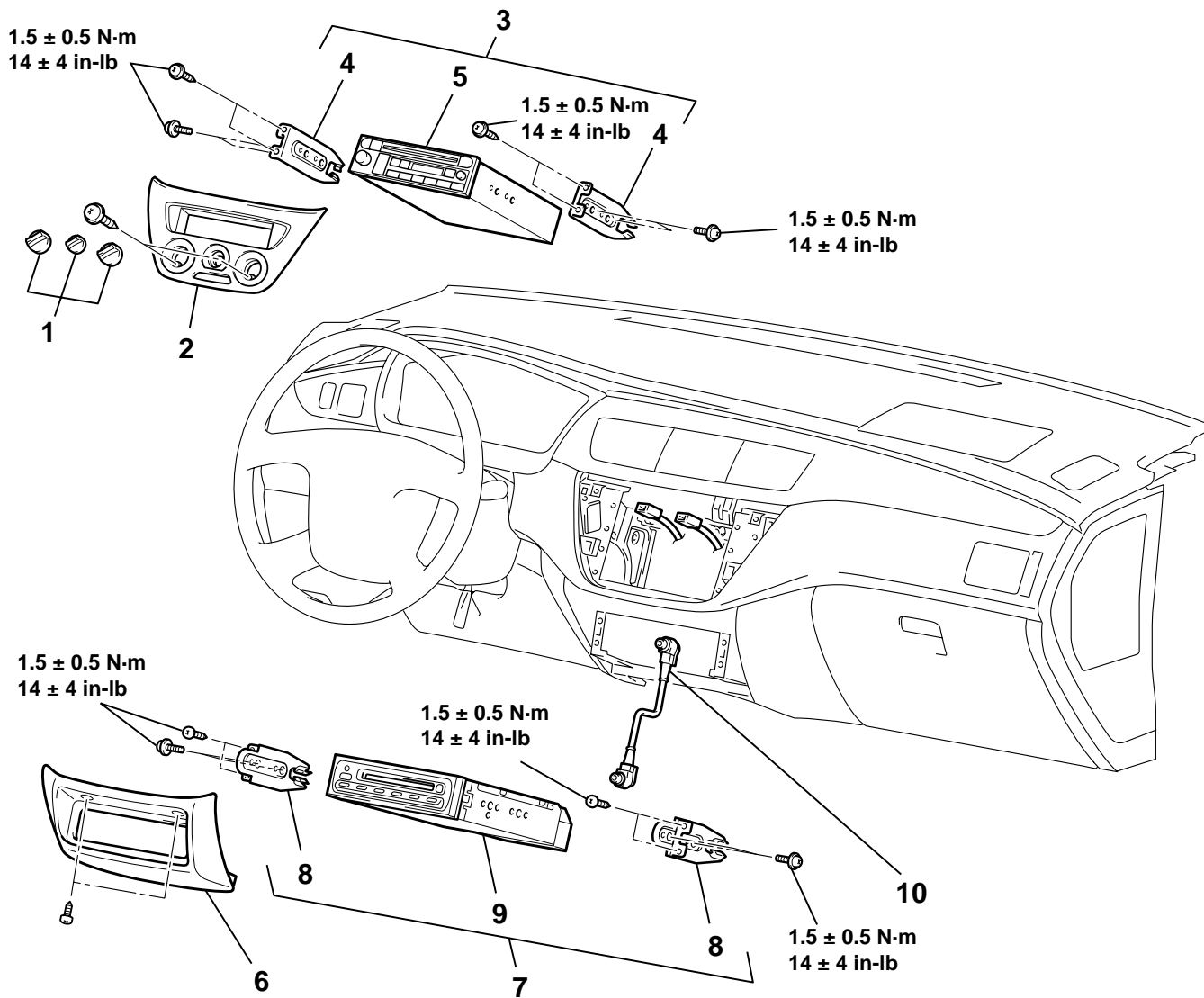




3. Check that the speaker, which is displayed on the multi-center display, sounds (If the memory select "6" button is pressed, the speaker will be changed).
4. If a button other than the memory select "6" button and "EJECT" button is pressed, or the ignition switch is turned to "LOCK" (OFF) position, you will exit from the speaker test mode.

## REMOVAL AND INSTALLATION

M1544001400208



AC005159AB

**RADIO REMOVAL STEPS**

1. KNOB ASSEMBLY (REFER TO GROUP 55, HEATER CONTROL ASSEMBLY, A/C SWITCH [P.55-85](#).)
2. CENTER PANEL ASSEMBLY (REFER TO GROUP 52A, INSTRUMENT PANEL [P.52A-2](#).)
3. RADIO AND CD PLAYER ASSEMBLY
4. RADIO BRACKET
5. RADIO AND CD PLAYER

**CD AUTO CHANGER REMOVAL STEPS**

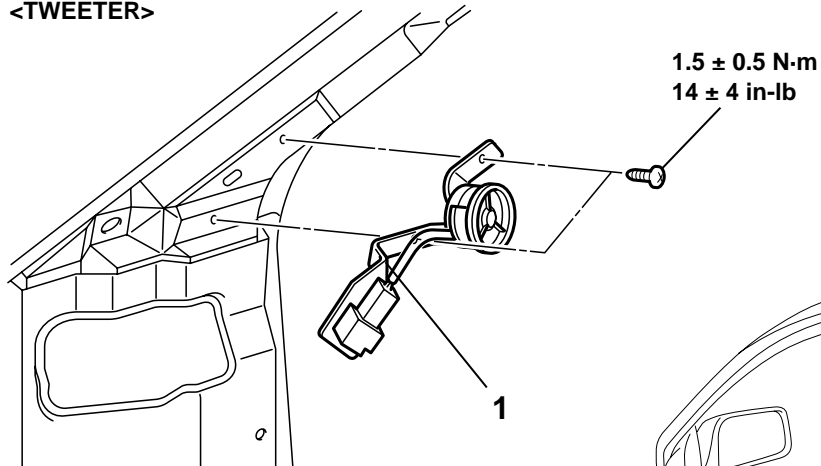
6. CENTER LOWER CASE (REFER TO GROUP 52A, INSTRUMENT PANEL [P.52A-2](#).)
7. CD AUTO CHANGER ASSEMBLY
8. CD AUTO CHANGER BRACKET
9. CD AUTO CHANGER
5. DIN CABLE

# SPEAKER

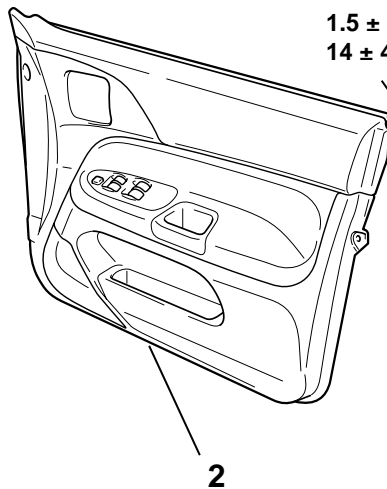
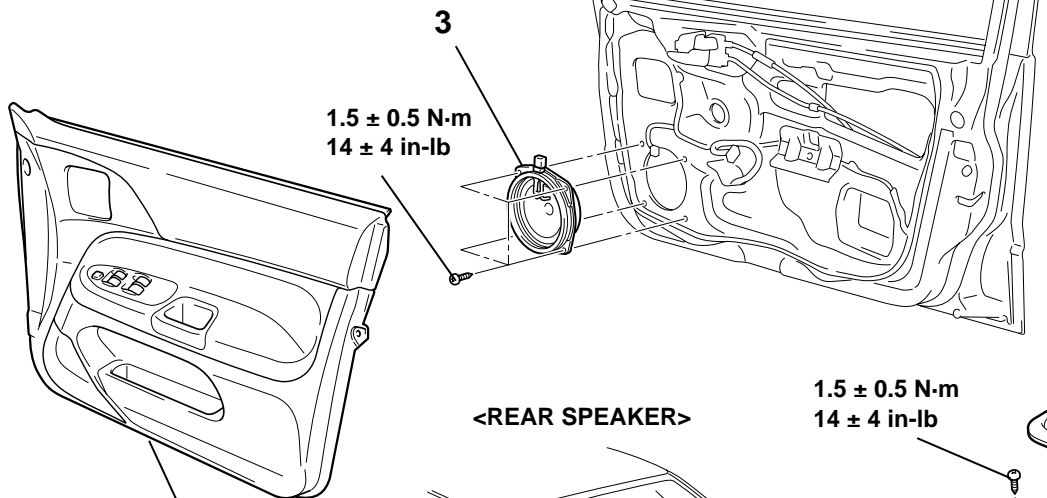
## REMOVAL AND INSTALLATION

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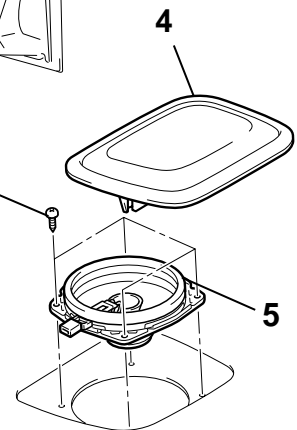
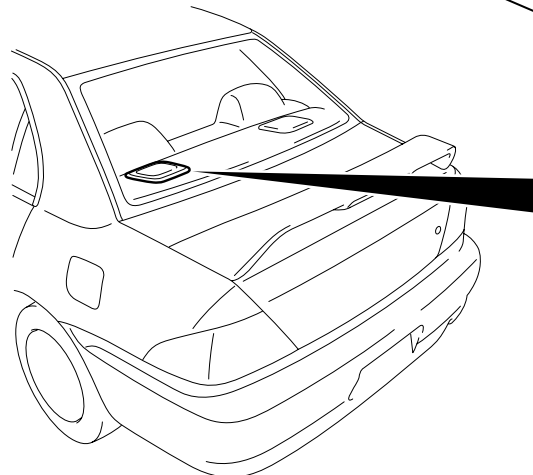
### <TWEETER>



### <FRONT SPEAKER>



### <REAR SPEAKER>



AC101020AB

#### TWEETER REMOVAL STEPS

- FRONT PILLAR TRIM (REFER TO GROUP 52A, TRIMS [P.52A-11.](#))
- 1. TWEETER

#### FRONT SPEAKER REMOVAL STEPS

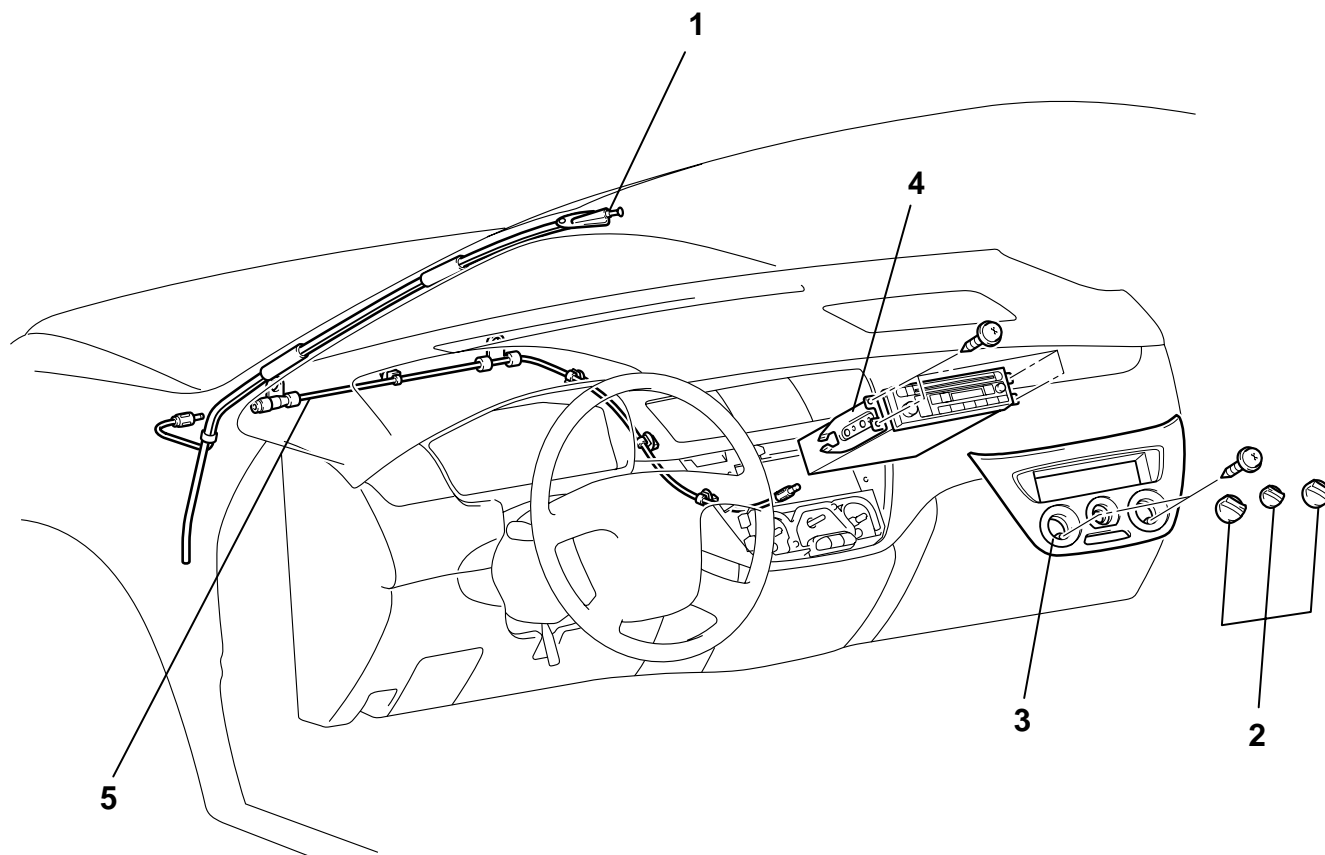
2. DOOR TRIM (REFER TO GROUP 42 DOOR TRIM AND WATERPROOF FILM [P.42-37.](#))
3. FRONT DOOR SPEAKER

#### REAR SPEAKER REMOVAL STEPS

4. REAR SPEAKER GARNISH
5. REAR SPEAKER

**ANTENNA****REMOVAL AND INSTALLATION <FRONT PILLAR-MOUNTED TYPE>**

M1544002900284



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

**ANTENNA REMOVAL STEPS**

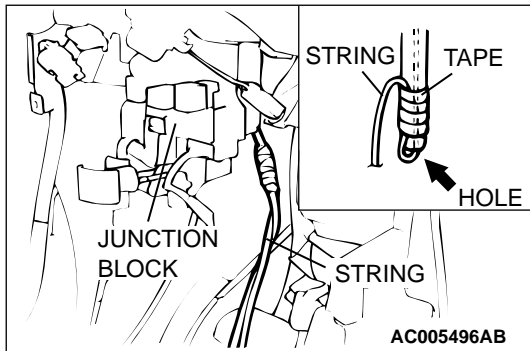
1. ANTENNA BASE
2. KNOB ASSEMBLY (REFER TO GROUP 55, HEATER CONTROL ASSEMBLY AND A/C SWITCH [P.55-85.](#))
3. CENTER PANEL ASSEMBLY (REFER TO GROUP 52A, INSTRUMENT PANEL [P.52A-2.](#))

**ANTENNA REMOVAL STEPS**

4. RADIO AND CD PLAYER OR CD AUTO CHANGER (REFER TO [P.54A-106.](#))
  - INSTRUMENT UNDER COVER (REFER TO GROUP 52A, INSTRUMENT PANEL [P.52A-2.](#))
  - INSTRUMENT PANEL (REFER TO GROUP 52A [P.52A-2.](#))
5. ANTENNA FEEDER CABLE

**REMOVAL SERVICE POINT****<<A>> ANTENNA BASE REMOVAL**

Use the following steps to easily route the antenna feeder cable in the event of installation:



1. Tie a string at the top end of the feeder cable.
2. Pull out the feeder cable until the pipe end of the antenna base is visible.
3. Insert the string into the hole at the pipe end of antenna base, and wrap vinyl tape on the string.

**CAUTION**

**Tape should be wrapped so that the string cannot be removed.**

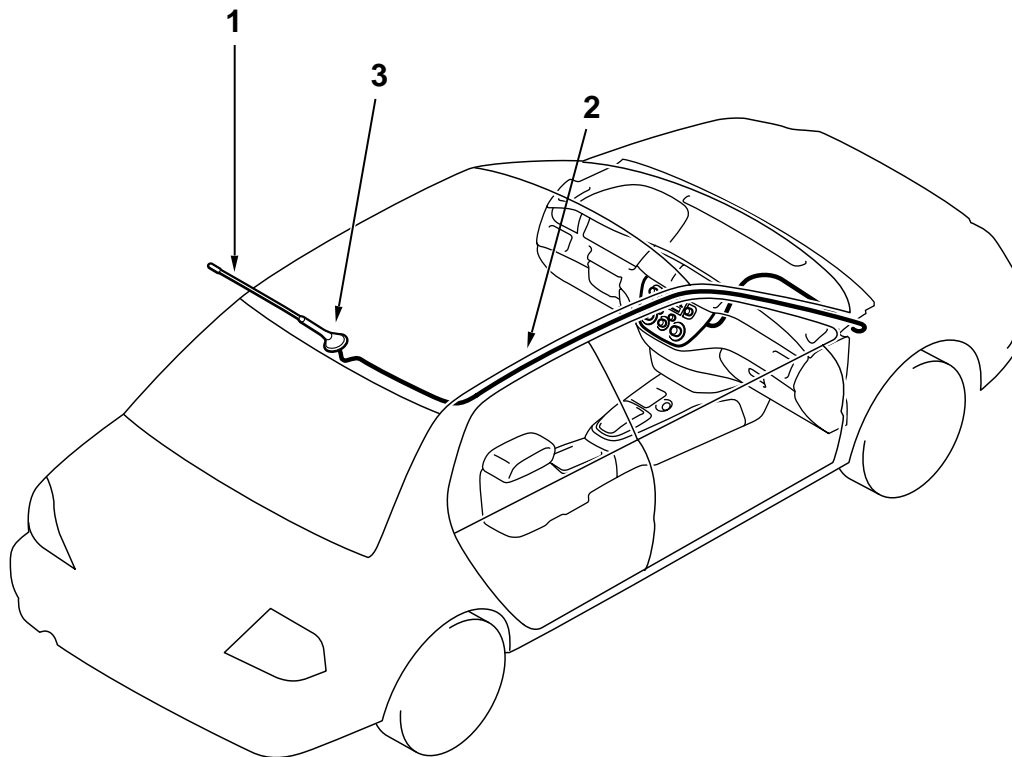
4. Gradually pull out remove the antenna base.

**REMOVAL AND INSTALLATION <ROOF-MOUNTED TYPE>**

M1544002900295

**Pre-removal and Post-installation Operation**

- Front Pillar Trim, Rear Trim and Lower/Upper Center Pillar Trim Removal and Installation (Refer to GROUP 52A - Trim [P.52A-11.](#))
- Assist Strap Removal and Installation (Refer to GROUP 52A - Headlining [P.52A-14.](#))
- Front Dome Light and Rear Dome Light Removal and Installation
- Headlining Removal and Installation (Refer to GROUP 52A - Headlining [P.52A-14.](#))



1. ROOF ANTENNA POLE.

AC005156AB

**ANTENNA FEEDER CABLE  
REMOVAL STEPS**

2. ROOF ANTENNA BASE.
  - INSTRUMENT PANEL (REFER TO GROUP 52A, INSTRUMENT PANEL [P.52A-2.](#))
3. ANTENNA FEEDER CABLE

## REAR WINDOW DEFOGGER

### GENERAL DESCRIPTION

M1543000100137

#### OPERATION

##### Rear Defogger operation

- The defogger relay turns ON if the defogger switch built-in the A/C-ECU is turned ON when the ignition switch is in the "ON" position. When the defogger relay turns ON, power is supplied to the defogger and the defogger is activated. The defogger comes with a timer function that causes the defogger switch to automatically turn OFF in about 11 minutes after the defogger switch is turned ON.

### DIAGNOSIS

#### REAR WINDOW DEFOGGER DIAGNOSIS

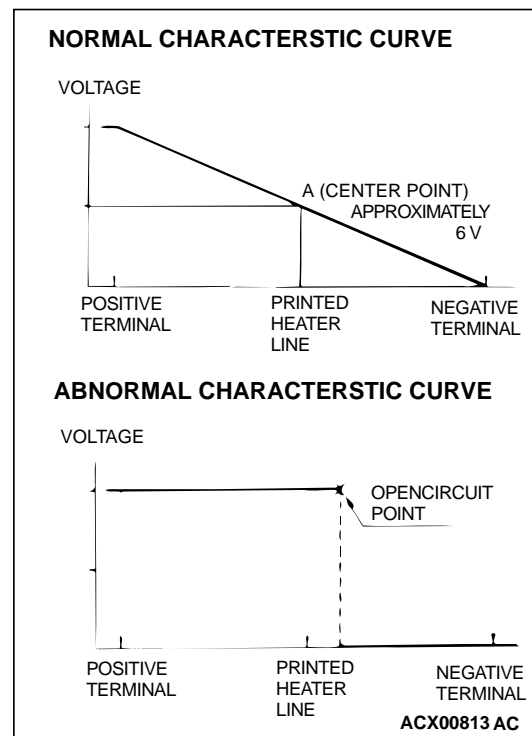
M1543000700667

The rear window defogger is controlled by the A/C-ECU. For troubleshooting, refer to GROUP 55, Manual A/C Diagnosis [P.55-5](#).

### ON-VEHICLE SERVICE

#### PRINTED-HEATER LINES CHECK

M1543001800173



1. Run engine at 2,000 r/min. Check heater element with battery at full.
2. Turn "ON" rear window defogger switch. Measure heater element voltage with circuit tester at rear window glass center A. Condition is good if it indicates about 6 V.
3. If 12 V is indicated at A, there is a break in the negative terminals from A. Move test bar slowly to negative terminal to detect where voltage changes suddenly (0V).
4. If 0 V is indicated at A, there is a break in the positive terminals from A. Defect where the voltage changes suddenly (12 V) in the same method described above.

### REMOVAL AND INSTALLATION

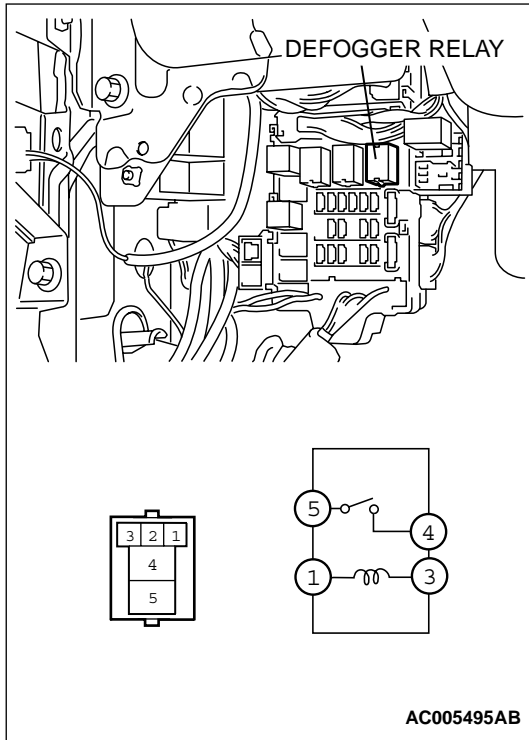
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Refer to GROUP 55, Heater Control Assembly and Blower Switch Assembly [P.55-85](#).

## INSPECTION

M1543019501318

## DEFOGGER RELAY CHECK



BATTERY VOLTAGE	TERMINAL NO. TO BE CONNECTED TO BATTERY	SPECIFIED CONDITION
Not applied	5 – 4	Open circuit
<ul style="list-style-type: none"> <li>Connect terminal 3 to the positive battery terminal</li> <li>Connect terminal 1 to the negative battery terminal</li> </ul>	5 – 4	Less than 2 ohms

## SPECIFICATIONS

## FASTENER TIGHTENING SPECIFICATIONS

M1544004600160

ITEMS	SPECIFICATIONS
Door speaker mounting screw	1.5 ± 0.5 N·m (14 ± 4 in-lb)
Engine coolant temperature gauge unit	10.5 ± 0.5 N·m (93 ± 4 in-lb)
Headlight mounting bolt	4.9 ± 0.7 N·m (44 ± 6 in-lb)
High-mounted stop light mounting bolt <Rear shelf mounted type>	4.9 ± 0.7 N·m (44 ± 6 in-lb)
High-mounted stop light mounting bolt <Rear spoiler mounted type>	2.5 ± 0.4 N·m (22 ± 4 in-lb)
Radio, tape player, CD player and CD auto changer mounting screw	1.5 ± 0.5 N·m (14 ± 4 in-lb)
Radio bracket mounting bolt	1.5 ± 0.5 N·m (14 ± 4 in-lb)
Rear combination light mounting nut	4.9 ± 0.7 N·m (44 ± 6 in-lb)
Rear speaker mounting screw	1.5 ± 0.5 N·m (14 ± 4 in-lb)
Tweeter mounting nut	1.5 ± 0.5 N·m (14 ± 4 in-lb)

## SERVICE SPECIFICATIONS

M1543000300153

## &lt;COMBINATION METER&gt;

ITEMS		STANDARD VALUE
Speedometer indication allowance range 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 allowance range r/min	700	+120
	3,000	– 100 +225
	5,000	– 125 +325
	6,000	– 125 +375
Fuel gauge unit resistance $\Omega$	Float point "F"	$3 \pm 0.8$
	Float point "E"	$110 \pm 2.5$
Fuel gauge unit float height mm (in)	A (Float point "F")	$24.1 \pm 2$ (0.95)
	B (Float point "E")	$151.6 \pm 2$ (5.97)
Engine coolant temperature gauge unit resistance $\Omega$		$104 + 13.5$
Combination meter internal resistance $\Omega$	Water temperature gauge to ground	$233 \pm 3$
	Fuel gauge to earth	$181 \pm 2$

## &lt;HEADLIGHT&gt;

ITEMS		STANDARD VALUE	LIMIT
Headlight aiming	Vertical direction	Headlight center line 53 mm (2.1 inches)	–
Headlight intensity cd		–	40,000 or more

## SEALANTS AND ADHESIVE

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## &lt;COMBINATION METER&gt;

ITEM	SPECIFIED SEALANT	REMARK
Engine coolant temperature gauge unit threaded portion	3M™ ADD part No. 2310 or equivalent	Drying sealant