GROUP 54

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

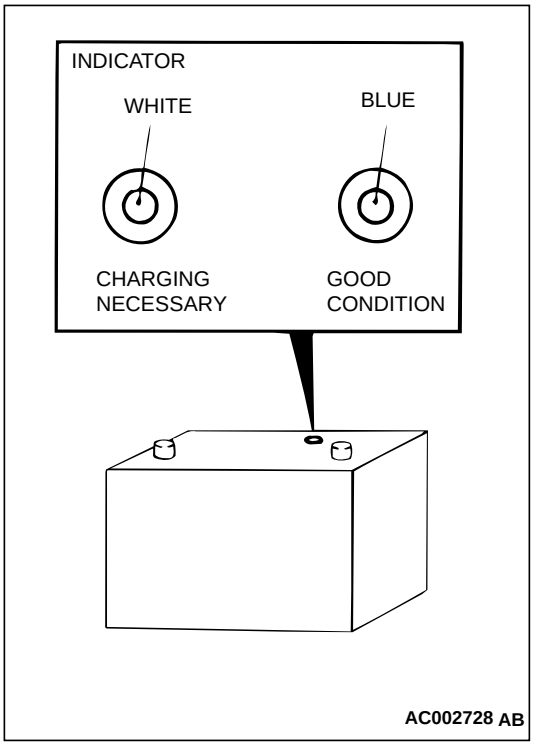
BATTERY CHECK

M1541001000319

⚠ ***WARNING***

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

BATTERY VISUAL INSPECTION (1)



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

BATTERY VISUAL INSPECTION (2)

Make sure ignition switch is in "LOCK" (OFF) position and all battery 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 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

M1541001100305

⚠ ***WARNING***

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

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

CHARGE RATE

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

Charge Rate Chart

BATTERY	**75D23R (520 amps)**	**80D26R (582 amps)**
Slow charging	5 amps 10.4 hours	5 amps 12 hours
	10 amps 5.2 hours	10 amps 16 hours
Fast charging	20 amps 2.5 hours	20 amps 2.5 hours
	30 amps 1.5 hours	30 amps 1.5 hours*

*NOTE: *: Time which elapses before the engine can be started.*

BATTERY TEST

M1541001200302

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

STEP 5. Charge the battery.

Q: Charging the battery?
YES : Charge the battery at 5 amps for 10.4 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?
YES : The battery is normal.
NO : Replace the battery. Then go to Step 4.

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

Load test	300 amps	300 amps
Cranking ratio [−18°C (0°F)]	520 amps	582 amps
Reserve capacity	118 minutes	133 minutes
Application	75D23R	80D26R

IGNITION SWITCH

IGNITION SWITCH AND IMMOBILIZER SYSTEM

M1543009900903

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

Ignition key hole illumination light
If the driver's door is opened when the ignition key is not inserted in the ignition key cylinder or the ignition switch is at "ACC" or "LOCK" (OFF) position, the ignition key hole will be illuminated. Then, after the driver's door is closed, the key hole will be extinguished in approximately 15 seconds.

Immobilizer system
The immobilizer system consists of the ignition key, the key ring antenna, the immobilizer-ECU, and the PCM. The ignition key has a built-in transponder. The key ring antenna is installed on the steering lock key cylinder. Only the registered ignition key permits the engine to start, therefore, the engine can never be started by means of a forged key or by connecting the ignition wiring directly. The system is significantly safe and reliable against theft. In addition, the driver has only to turn the ignition switch to the "ON" position to activate the immobilizer system. If the requirements for starting the engine are not satisfied, the engine will be immobilized. If the ignition key is lost or another ignition key is added, the encrypted code can be registered or erased by using scan tool. If the ignition switch is turned to the "ON" position by using the ignition key, which does not include the transponder, includes an unregistered transponder, or has an incorrect ID code, "SECURITY" indicator inside the combination meter will flash.

IGNITION SWITCH DIAGNOSIS

M1543009900914

INTRODUCTION TO IGNITION SWITCH DIAGNOSIS

An ETACS-ECU is mounted in all vehicles. This ETACS-ECU controls the ignition key reminder and ignition key hole illumination light timer. The ignition key reminder tone alarm alerts the driver that the ignition key has not been removed. If any of the following symptoms occur, there is a malfunction:

- The tone alarm does not stop sounding when the ignition key is turned to the "ON" position.
- The tone alarm does not stop sounding when the ignition key is removed.
- The tone alarm does not sound when the ignition key is inserted (turned to the "OFF" position) and the driver's door is opened.

The ignition key hole illumination light timer illuminates the ignition switch for certain conditions. If any of the following symptoms occur, there is a malfunction:

- The ignition key hole illumination light does not go off.
- The ignition key hole illumination light does not illuminate when the driver's door is opened.
- The ignition key hole illumination light does not go out when the ignition key is turned to the "ON" position.

IGNITION SWITCH DIAGNOSTIC TROUBLESHOOTING STRATEGY

M1543006900487

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

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

SYMPTOM CHART

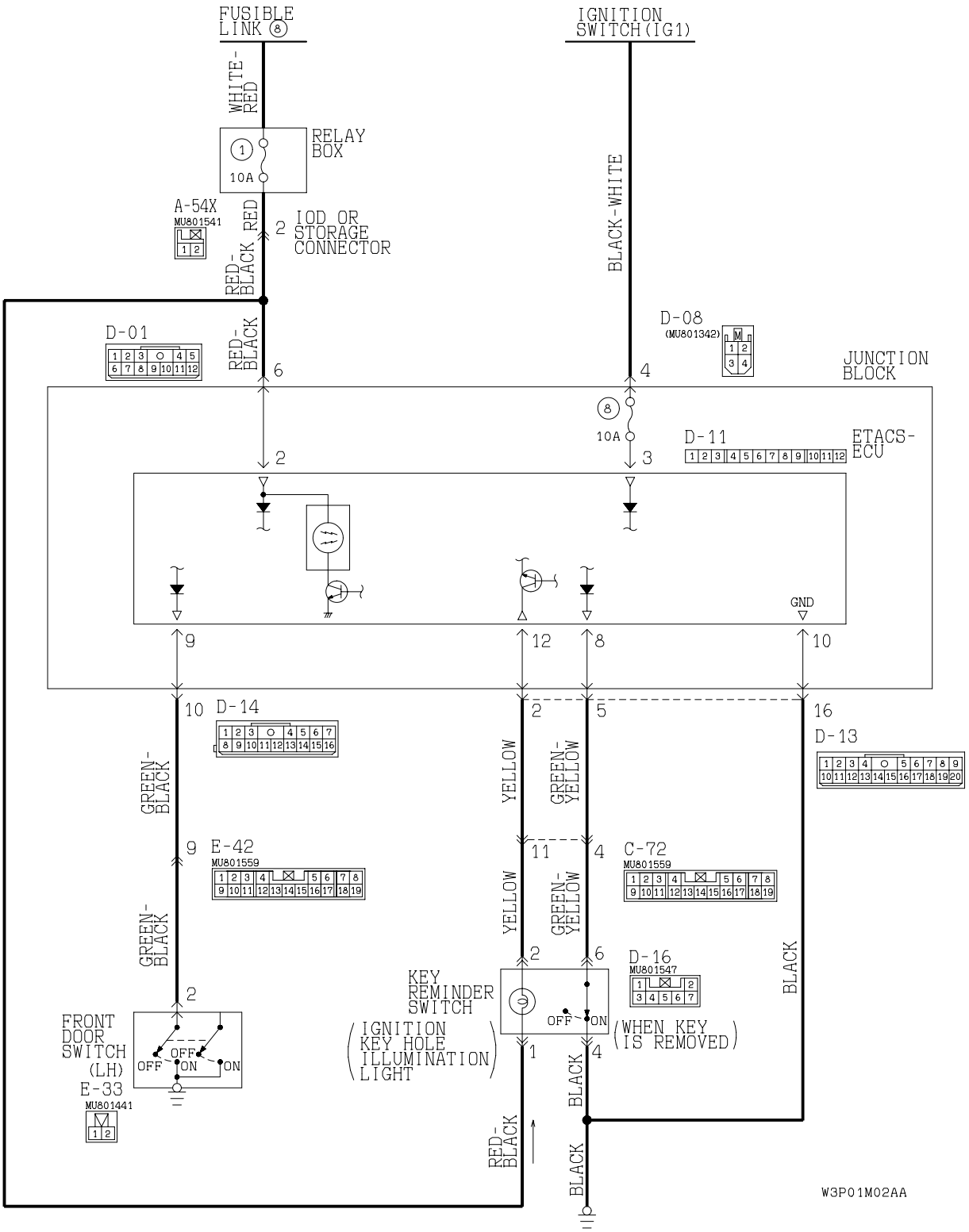
M1543007200674

SYMPTOM		INSPECTION PROCEDURE NO.	REFERENCE PAGE
Ignition key hole illumination light system	When the driver's side door is opened, the ignition key hole illumination light does not illuminate.	1	P.54-9
	The ignition key hole illumination light does not go out.	2	P.54-18
	The ignition key hole illumination light does not go out when the ignition key is turned to the "ON" position (However, it goes out after 15 seconds.)	3	P.54-22
Ignition key reminder tone alarm	The ignition key reminder tone alarm does not stop sounding when the ignition key is turned to the "ON" position (The tone alarm stops sounding by closing the driver's door.)	3	P.54-22
	The ignition key reminder tone alarm does not stop sounding by removing the ignition key. (The tone alarm stops sounding by closing the driver's door.)	4	P.54-25
	The ignition key reminder tone alarm does not sound when the ignition key is inserted and the driver's door is opened. (The ignition key is turned to "OFF".)	5	P.54-30

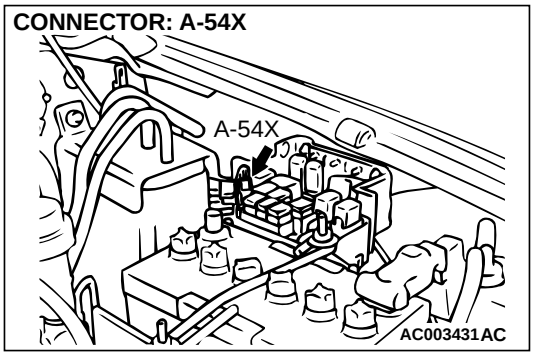
SYMPTOM PROCEDURES

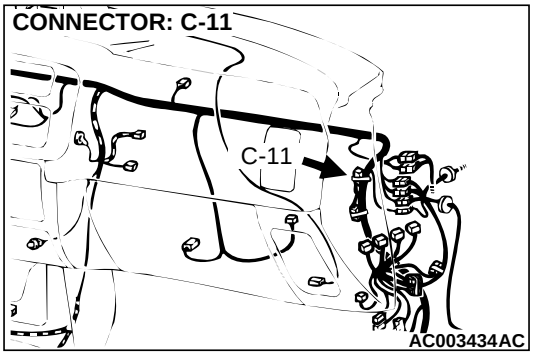
INSPECTION PROCEDURE 1: When the Driver's Side Door is Opened, the Ignition Key Hole Illumination Light does not Illuminate.

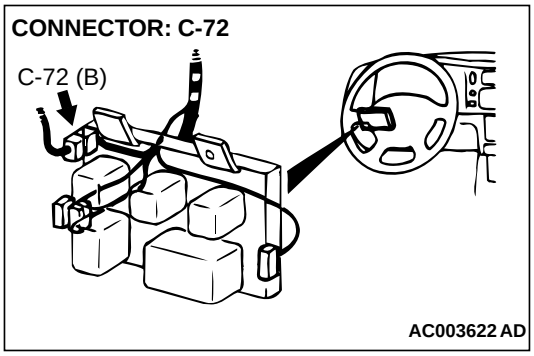
Ignition Key Hole Illumination Circuit

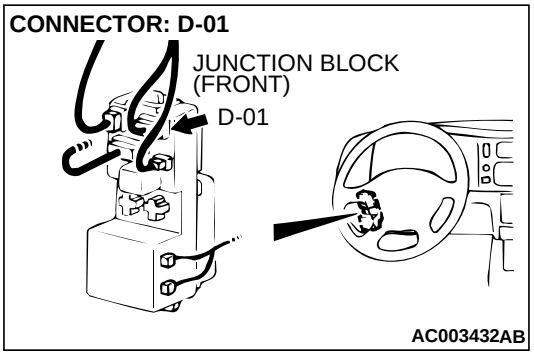


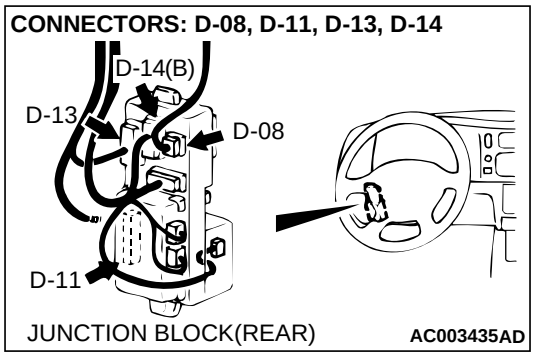
TSB Revision

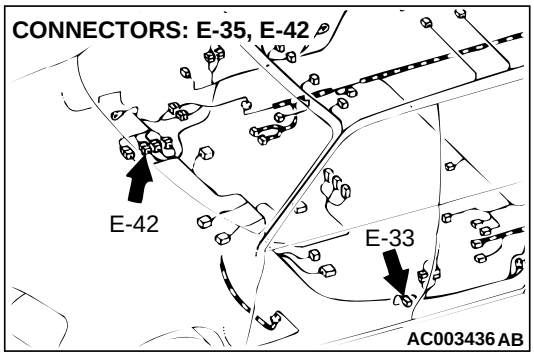


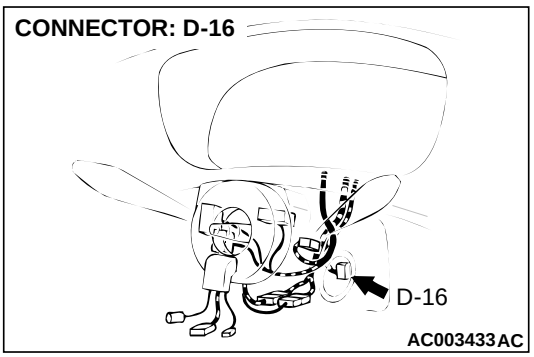












CIRCUIT OPERATION

- The ETACS-ECU monitors the ignition switch by detecting voltage from the ignition switch.
- The ETACS-ECU judges that the driver's side door is opened or closed by detecting voltage from the front door switch (LH).
- When the driver's door is opened (door switch on), the ignition key hole illumination light will illuminate. When the driver's door is closed (door switch off), the ignition key hole illumination light will go out within 15 seconds.

TSB Revision

TECHNICAL DESCRIPTION (COMMENT)

The cause is probably a malfunction in the key hole illumination light circuit system or input signal from the driver's side door switch.

TROUBLESHOOTING HINTS

- Malfunction of the driver's side door switch
- Malfunction of the key hole illumination light
- Damaged harness wire or connector
- Malfunction of the ETACS-ECU

DIAGNOSIS

Required Special Tools:

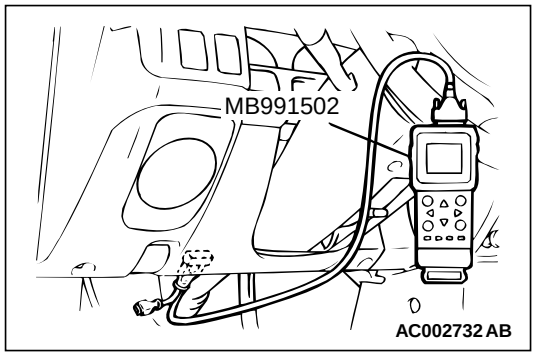
- MB991529: Diagnostic Trouble Code Check Harness
- MB991502: Scan Tool (MUT-II)

STEP 1. Check the input signal (by using pulse check).

Check the ETACS-ECU input signal (driver's side door) by using scan tool MB991502.

⚠ CAUTION

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



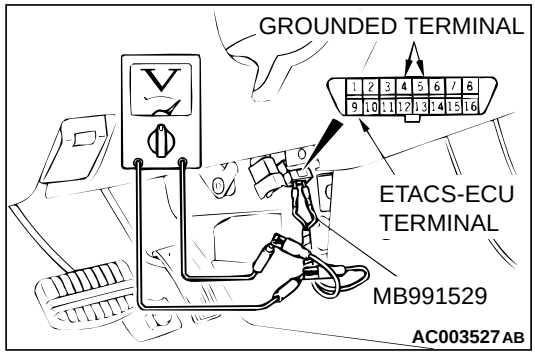
(1) Connect scan tool MB991502 to the data link connector.
(2) Check that the tone alarm of scan tool MB991502 sounds when the driver's side door is opened.

Q: Does the tone alarm of scan tool MB991502 sound when the input signal enters?

YES : Replace the ETACS-ECU. Check that the malfunction is eliminated.
NO : Go to Step 3.

STEP 2. Check the input signal from the driver's side door switch (by using a voltmeter).

Check the input signals from the following switches:

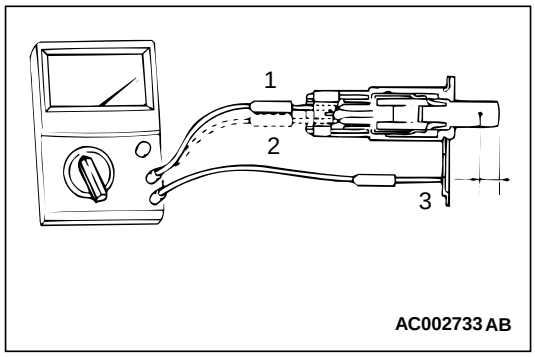


(1) Use special tool MB991529 to connect a voltmeter between ground terminal 4 or 5 and ETACS-ECU terminal 9 of the data link connector.
(2) Check that the voltmeter indicator deflects once when the input signal enters.

Q: Does the voltmeter indicator deflect?

YES : Replace the ETACS-ECU. Check that the malfunction is eliminated.
NO : Go to Step 3.

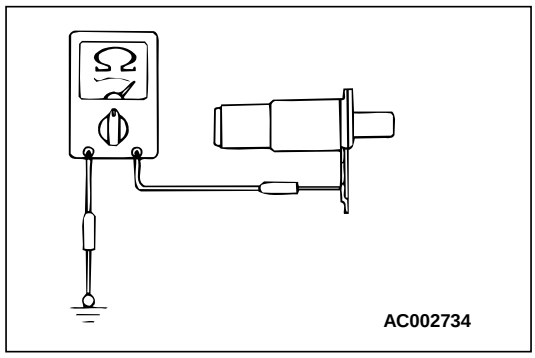
STEP 3. Check the driver's side door switch.
Remove the driver's side door switch. Refer to GROUP 42, Door P.42-103.



SWITCH POSITION	TESTER CONNECTION	SPECIFIED CONDITION
Released (ON)	1 – 2, 1 – 3, 2 – 3	Less than 2 ohms
Depressed (OFF)	1 – 2, 1 – 3, 2 – 3	Open circuit

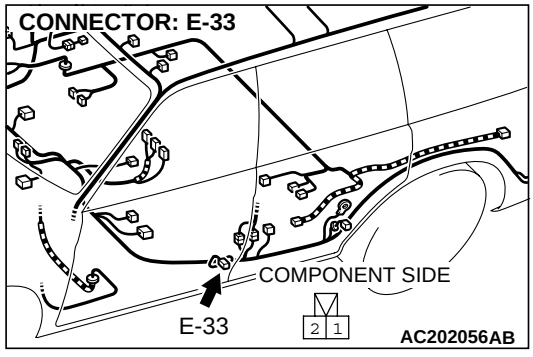
Q: Is the driver's side door switch in good condition?
YES : Go to Step 4.
NO : Replace it. Check that the malfunction is eliminated.

STEP 4. Check the driver's side door switch ground circuit
Measure the resistance between the driver's side door switch body (metal section) and ground.
- The measured value should be 2 ohms or less.

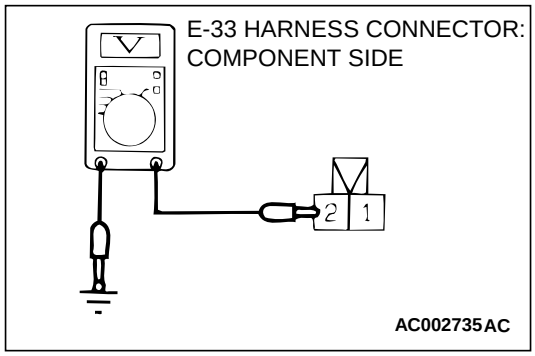


Q: Does the measured resistance value correspond with this range?
YES : Go to Step 5.
NO : Repair the harness wire or connector. Then go to Step 6.

STEP 5. Check driver's side door switch connector E-33 for loose, corroded or damaged terminals, or terminals pushed back in the connector.



Q: Is driver's side door switch connector E-33 damaged?
YES : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The tachometer should work normally.
NO : Go to Step 6.



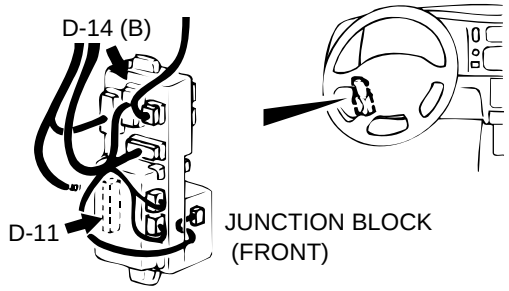
STEP 6. Check the driver's side door switch connector E-33.

(1) Disconnect the driver's side door switch connector E-33 and the harness side.
(2) Measure the voltage between terminal 2 and ground.
- The measured value should be approximately 5 volts.

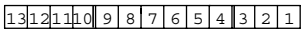
Q: Does the measured voltage correspond with this range?

YES : There is no action to be taken.
NO : Go to Step 7.

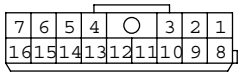
CONNECTORS: D-11, D-14



D-11 COMPONENT SIDE



D-14 COMPONENT SIDE



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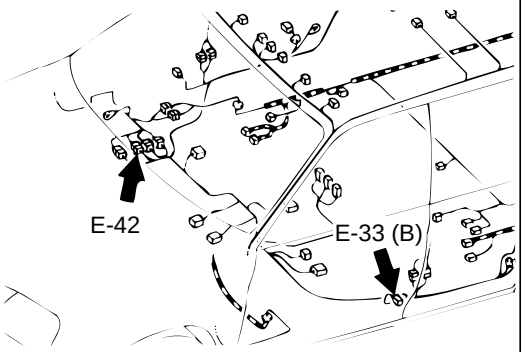
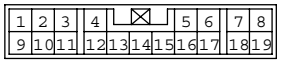
CONNECTORS: E-33, E-42



E-42



COMPONENT SIDE

AC201940AC

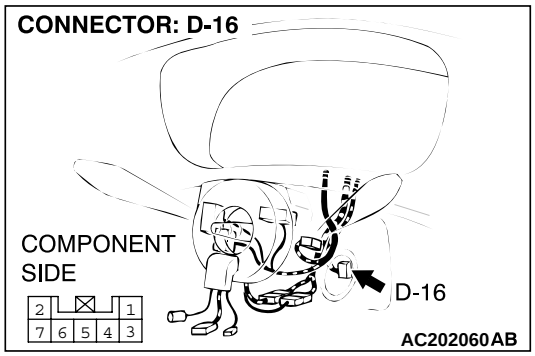
STEP 7. Check the harness wires between driver's side door switch connector E-33 (terminal No.2) and ETACS connector D-11 (terminal No.9).

NOTE: After inspecting junction block connector D-14 and intermediate connector E-42, inspect the wire. If junction block connector D-14 and intermediate connector E-42 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wires between driver's side door switch connector E-33 (terminal No.2) and ETACS connector D-11 (terminal No.9) in good condition?

YES : Go to Step 8.

NO : Repair them. Then check that the malfunction is eliminated.

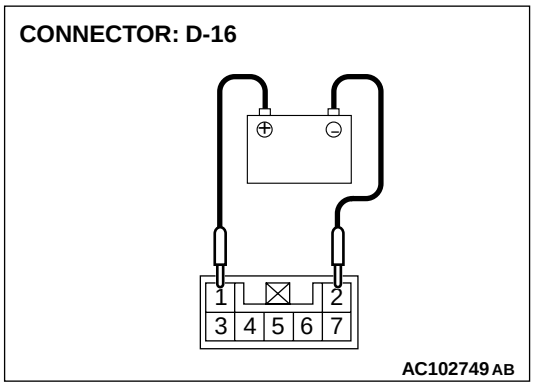


STEP 8. Check the ignition key hole illumination light input.

(1) Remove the driver's under cover (Refer to P.52A-32.)
(2) Remove the lower and upper column covers (Refer to P.52A-32.)
(3) Disconnect wiring connector D-16 from the key reminder switch and measure at the switch side.
(4) Connect a vehicle battery as shown, and then check the ignition key hole illumination light illuminates.

Q: Does the situation key hole illumination light illuminate?

YES : Go to Step 9.
NO : Replace the key reminder switch.

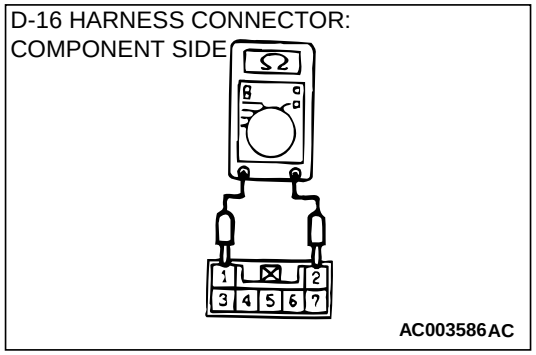


STEP 9. Check the power supply for the ignition key hole illumination light.

(1) Disconnect the key reminder switch connector D-16 and measure at the harness side.
(2) Measure the voltage between terminal 1 and ground.
- The measured value should be approximately 12 volts (battery positive voltage).

Q: Is the measured voltage within this specified range?

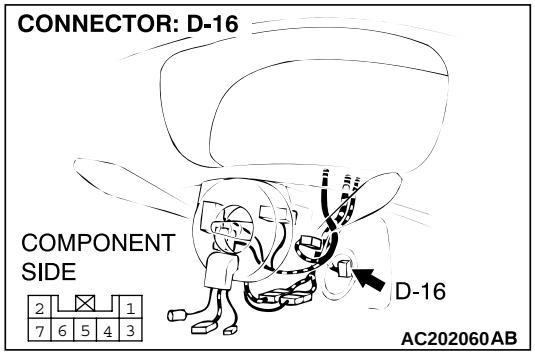
YES : Go to Step 11.
NO : Go to Step 10.



STEP 10. Check connector D-16 at the key reminder switch for damage.

Q: Is key reminder switch connector D-16 in good condition?

YES : Go to Step 11.
NO : Replace it. Then check that the malfunction is eliminated.



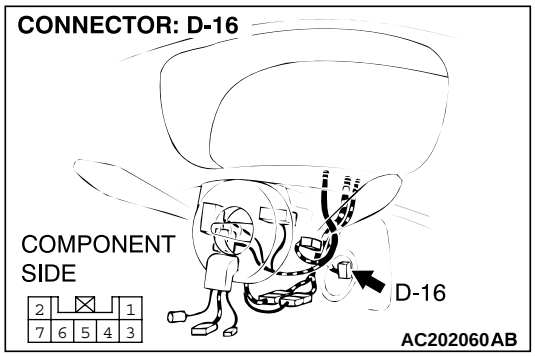
STEP 11. Check the harness wires between fusible link number 8 and key reminder switch connector D-16 (terminal No.1).

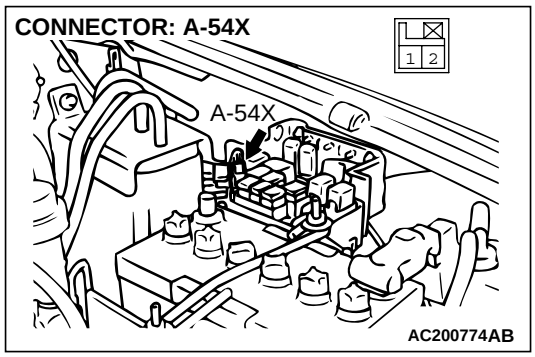
NOTE: After inspecting IOD storage connector A-54X, inspect the wire. If IOD storage connector A-54X is damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wires between fusible link number 8 and key reminder switch connector D-16 (terminal No.1) in good condition?

YES : Go to Step 12.

NO : Repair or replace them. Then check that the malfunction is eliminated.



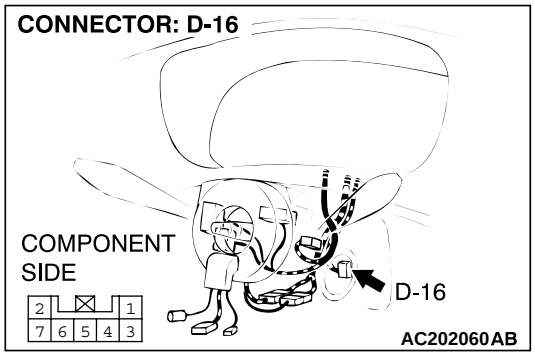


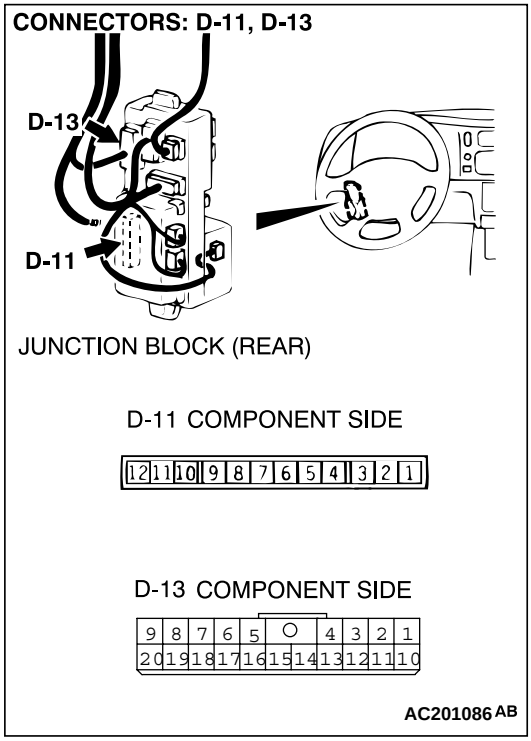
STEP 12. Check the harness wires between key reminder switch connector D-16 (terminal No.2 and 6) and ETACS-ECU connector D-11 (terminal No.8 and 12).

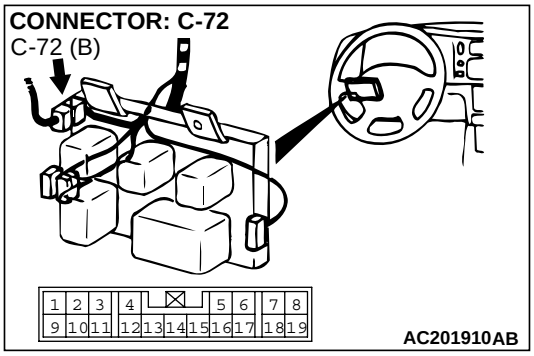
NOTE: After inspecting intermediate connector C-72, junction block D-13, inspect the wire. If intermediate connector C-72, junction block D-13 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

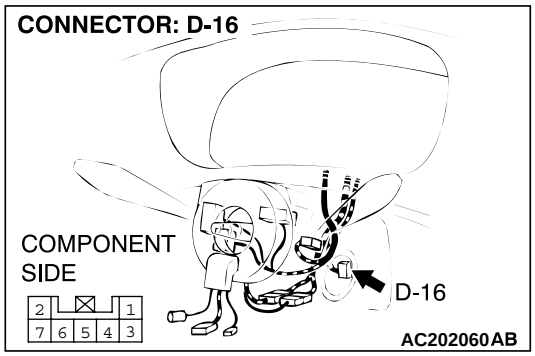
Q: Are the harness wires between key reminder switch connector D-16 (terminal No.2 and 6) and ETACS-ECU connector D-11 (terminal No.8 and12) in good condition?

YES : Replace the ETAS-ECU.
NO : Go to Step 13.









STEP 13. Check for continuity between terminals (except terminal No. 4 and No. 6) of key reminder switch connector D-16.

(1) Measure at key reminder switch connector D-16 without disconnecting the connector.
(2) Check that there is no continuity between key reminder switch terminal No. 4 and each terminal (except terminal No. 6), as well as between key reminder switch terminal No.6 and each terminal (except terminal No. 4).

Q: Does continuity exist between terminals?

YES : Replace the key reminder switch. If the functions, which are described in "CIRCUIT OPERATION", work normally, the input signal from the key reminder switch should be normal.

NO : Go to Step 14.

STEP 14. Recheck for malfunction.

Q: Is a malfunction eliminated?

YES : This procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Point – How to Cope with Intermittent Malfunction P.00-6.)

NO : Go to Step 1.

INSPECTION PROCEDURE 2: The Ignition Key Hole Illumination Light does not Go Out.

CIRCUIT OPERATION
Refer to Inspection Procedure 1 P.54-9.

TECHNICAL DESCRIPTION (COMMENT)
The cause is probably a short circuit n the harness or a defective ETACS-ECU.

TROUBLESHOOTING HINTS
- Damaged harness wire or connector
- Malfunction of the ETACS-ECU

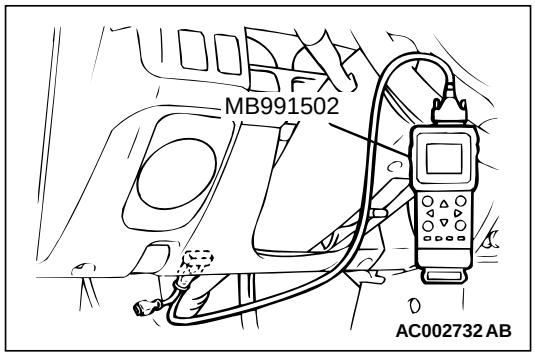
DIAGNOSIS

Required Special Tools:
- MB991529: Diagnostic Trouble Code Check Harness
- MB991502: Scan Tool (MUT-II)

TSB Revision

STEP 1. Check the input signal (by using pulse check).
Check the ETACS-ECU input signal (driver's side door switch) by using scan tool MB994502.

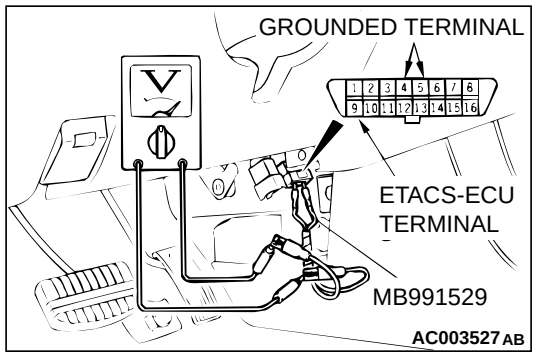
⚠ CAUTION
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.



(1) Connect scan tool MB991502 to the data link connector.
(2) Check that the tone alarm of scan tool MB991502 sounds when the driver's side door is opened.

Q: Does the tone alarm of scan tool MB991502 sound when the input signal enters?
YES : Replace the ETACS-ECU. Check that the malfunction is eliminated.
NO : Go to Step 3.

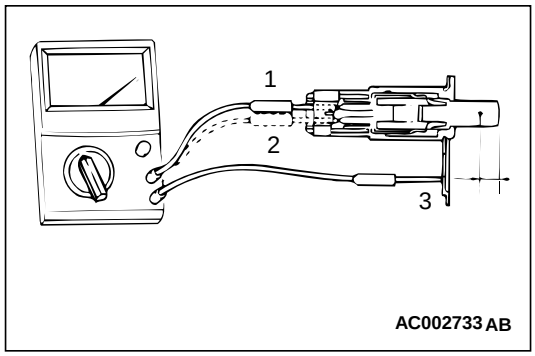
STEP 2. Check the input signal from the driver's side door switch (by using a voltmeter).
Check the input signals from the following switches:



(1) Use special tool MB991529 to connect a voltmeter between ground terminal 4 or 5 and ETACS-ECU terminal 9 of the data link connector.
(2) Check that the voltmeter indicator deflects once when the input signal enters.

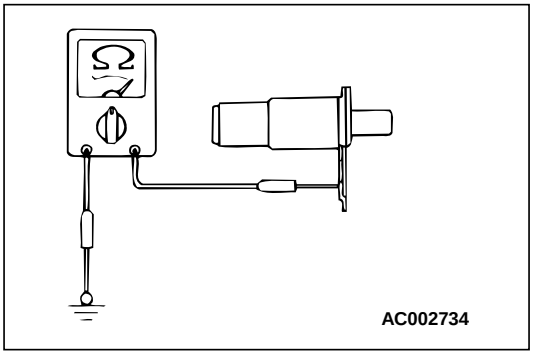
Q: Does the voltmeter indicator deflect?
YES : Replace the ETACS-ECU. Check that the malfunction is eliminated.
NO : Go to Step 3.

STEP 3. Check the driver's side door switch.
Remove the driver's side door switch. Refer to GROUP 42, Door P.42-103.



SWITCH POSITION	TESTER CONNECTION	SPECIFIED CONDITION
Released (ON)	1 – 2, 1 – 3, 2 – 3	Less than 2 ohms
Depressed (OFF)	1 – 2, 1 – 3, 2 – 3	Open circuit

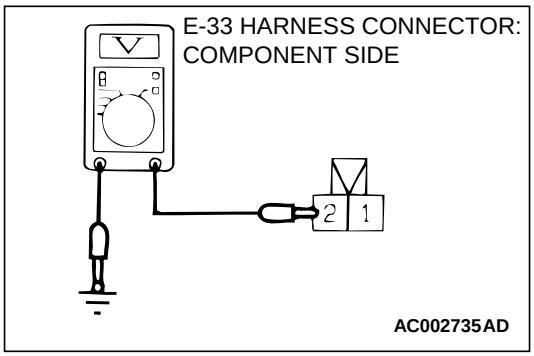
Q: Is the driver's side door switch in good condition?
YES : Go to Step 4.
NO : Replace it. Check that the malfunction is eliminated.



STEP 4. Check the driver's side door switch ground circuit.
Measure the resistance between the driver's side door switch body (metal section) and ground.
- The measured value should be 2 ohms or less.

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

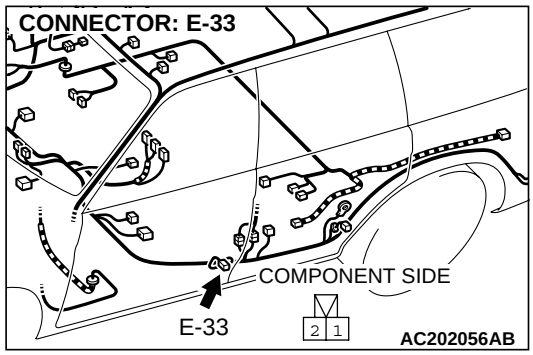
YES : Go to Step 5.
NO : Repair the harness wire or connector.



STEP 5. Check the driver's side door switch connector E-33 input circuit
(1) Disconnect the driver's side door switch connector E-33 and the harness side.
(2) Measure the voltage between terminal 2 and ground.
- The measured value should be approximately 5 volts.

Q: Does the measured voltage correspond with this range?

YES : There is no action to be taken.
NO : Go to Step 6.

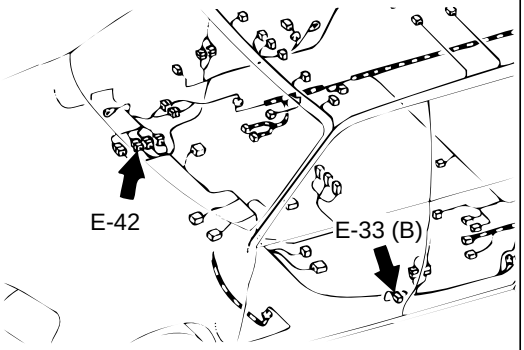


STEP 6. Check driver's side door switch connector E-33 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

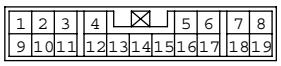
Q: Is driver's side door switch connector E-33 in good condition?

YES : Go to Step 7.
NO : Repair them. Then check that the malfunction is eliminated.

CONNECTORS: E-33, E-42



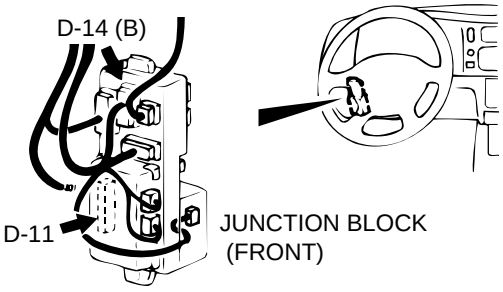
E-42



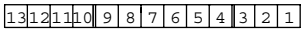
COMPONENT SIDE

AC201940AC

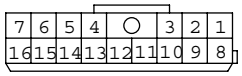
CONNECTORS: D-11, D-14



D-11 COMPONENT SIDE



D-14 COMPONENT SIDE



AC201939AB

STEP 7. Check the harness wires between the driver's side door switch connector E-33 (terminal No.2) and ETACS-ECU connector D-11 (terminal No.9).

NOTE: After inspecting intermediate connector E-42, junction block D-14, inspect the wire. If intermediate connector E-42, junction block D-14 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wires between the driver's side door switch connector E-33 (terminal No.2) and ETACS-ECU connector D-11 (terminal No.9) in good condition?

YES : Replace the ETAS-ECU.

NO : Go to Step 8.

STEP 8. Recheck for malfunction.

Q: Is a malfunction eliminated?

YES : The procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Point – How to Cope with Intermittent Malfunction P.00-6.)

NO : Go to Step 1.

INSPECTION PROCEDURE 3: The Ignition Key Hole Illumination Light does not Go out when the Ignition Key is Turned to the "ON" Position. (However, it Goes out after 15 Seconds.) The Ignition Key Reminder Tone Alarm does not Stop Sounding when the Ignition Key is Turned to the "ON" Position (The Tone Alarm Stops Sounding by Closing the Driver's Door.)

CIRCUIT OPERATION

Refer to Inspection Procedure 1 P.54-9 for the circuit operations other than those below.

- When the driver's door is opened without removing the ignition key, the tone alarm will sound intermittently to remind that the ignition key has not been removed.

TECHNICAL DESCRIPTION (COMMENT)

The input signal from the ignition switch may be defective, or the ETACS-ECU may be defective. If the fuse No.1 in relay box is blown, the harness may be short circuited.

TROUBLESHOOTING HINTS

- Damaged harness wire or connector
- Malfunction of the ETACS-ECU

DIAGNOSIS

Required Special Tools:

- MB991529: Diagnostic Trouble Code Check Harness
- MB991502: Scan Tool (MUT-II)

STEP 1. Check the input signal (by using pulse check).

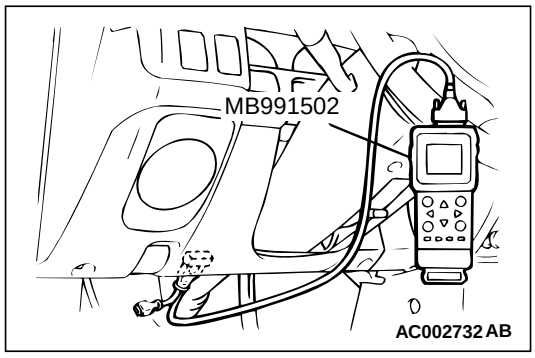
Check the ETACS-ECU input signal (ignition switch position signal) by using scan tool MB991502.

⚠ CAUTION

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

(1) Connect scan tool MB991502 to the data link connector.

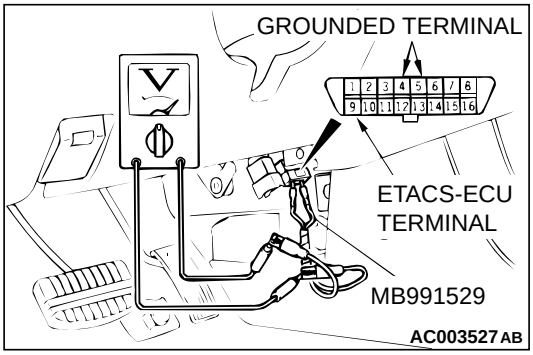
(2) Check that the tone alarm of scan tool MB991502 sounds when the ignition key is moved from the "LOCK" position to the "ON" position.



Q: Does the tone alarm of scan tool MB991502 sound when the input signal enters?

YES : Replace the ETACS-ECU. Check that the malfunction is eliminated.

NO : Go to Step 3.



STEP 2. Check the input signal from the ignition switch (by using a voltmeter).

Check the input signals from the following switches:

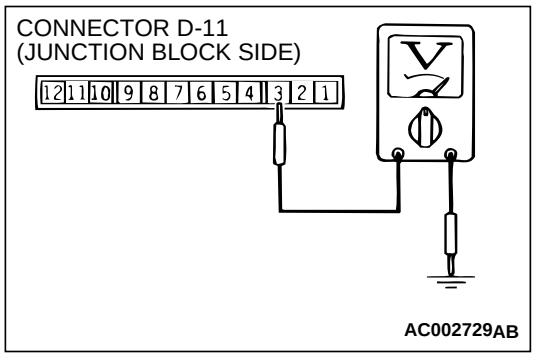
(1) Use special tool MB991529 to connect a voltmeter between ground terminal 4 or 5 and ETACS-ECU terminal 9 of the data link connector.

(2) Check that the voltmeter indicator deflects once when the ignition key is moved from the "LOCK" position to the "ON" position.

Q: Does the voltmeter indicator deflect?

YES : Replace the ETACS-ECU. Check that the malfunction is eliminated.

NO : Go to Step 3.



STEP 3. Check the ignition switch circuit.

(1) Disconnect ETACS-ECU connector D-11 and measure at the junction block side.

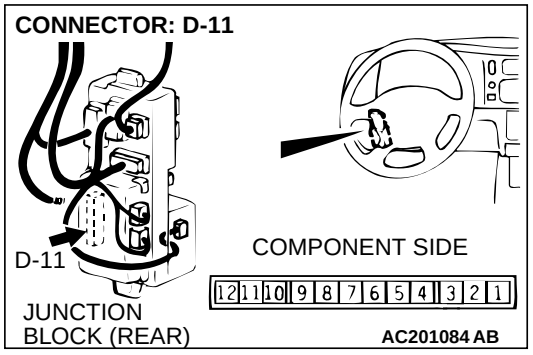
(2) Turn the ignition switch "ON".

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

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

YES : Replace the ETACS-ECU. Check that the malfunction is eliminated.

NO : Go to Step 4.

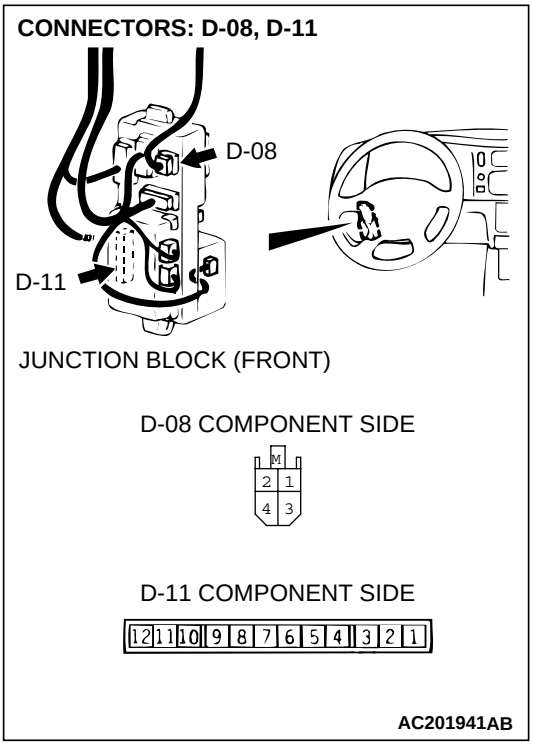


STEP 4. Check ETACS-ECU connector D-11 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is ETACS-ECU connector D-11 in good condition?

YES : Go to Step 5.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 5. Check the harness wires between the ignition switch (IG1) and ETACS-ECU connector D-11 (terminal No.3).

NOTE: After inspecting junction block D-08, inspect the wire. If junction block D-08 is damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wires between the ignition switch (IG1) and ETACS-ECU connector D-11 (terminal No.3) in good condition?

YES : Go to Step 6.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

STEP 6. Recheck for malfunction.

Q: Is a malfunction eliminated?

YES : The procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Point – How to Cope with Intermittent Malfunction P.00-6.)

NO : Go to Step 1.

INSPECTION PROCEDURE 4: The Ignition Key Reminder Tone Alarm does not Stop Sounding by Removing the Ignition Key. (The Tone Alarm Stops Sounding by Closing the Driver's Door.)

CIRCUIT OPERATION
Refer to Inspection Procedure 1 for circuit operation P.54-9.

TECHNICAL DESCRIPTION (COMMENT)
It is possible that there is a malfunction of the input signal from the key reminder switch or the ETACS-ECU.

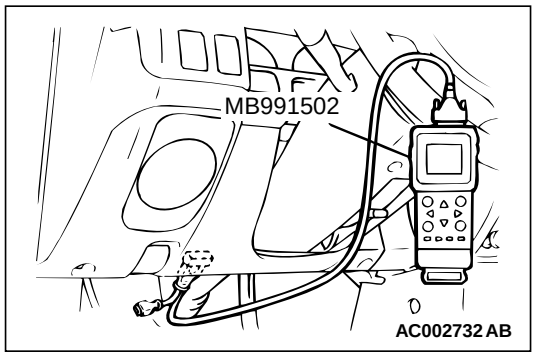
TROUBLESHOOTING HINTS
- Damaged harness wire or connector
- Malfunction of the ETACS-ECU
- Malfunction of the key reminder switch

DIAGNOSIS

Required Special Tools:
- MB991529: Diagnostic Trouble Code Check Harness
- MB991502: Scan Tool (MUT-II)

STEP 1. Check the input signal (by using pulse check).
Check the ETACS-ECU input signal (ignition switch position) by using scan tool MB991502.

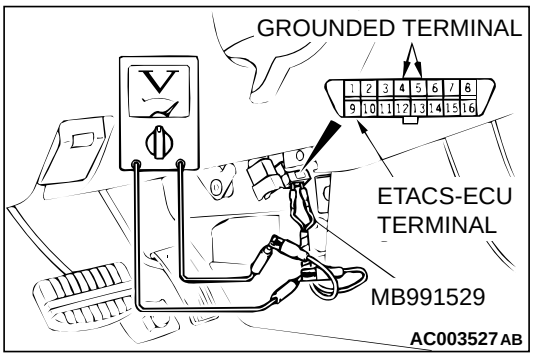
⚠ CAUTION
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.



(1) Connect scan tool MB991502 to the data link connector.
(2) Check that the tone alarm of scan tool MB991502 sounds when the ignition key is moved from the "LOCK" (OFF) position to the "ON" position.

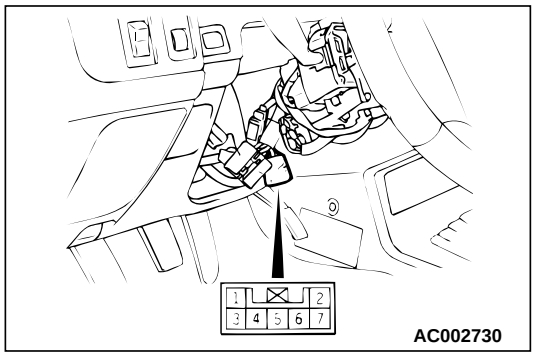
Q: Does the tone alarm of scan tool MB991502 sound when the input signal enters?
YES : Replace the ETACS-ECU. Check that the malfunction is eliminated.
NO : Go to Step 3.

STEP 2. Check the input signal from the ignition switch (by using a voltmeter).
Check the input signals from the following switches:



(1) Use special tool MB991529 to connect a voltmeter between ground terminal 4 or 5 and ETACS-ECU terminal 9 of the data link connector.
(2) Check that the voltmeter indicator deflects once when the ignition key is moved from the "LOCK" position to the "ON" position.

Q: Does the voltmeter indicator deflect?
YES : Replace the ETACS-ECU. Check that the malfunction is eliminated.
NO : Go to Step 3.



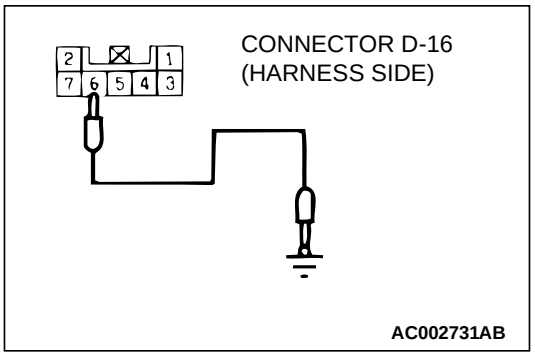
STEP 3. Measure the continuity of the key reminder switch.

(1) Remove the driver's side under cover P.52A-32.
(2) Remove the column covers, lower and upper P.52A-32.
(3) Disconnect wiring connector D-16 from the key reminder switch and measure at the key reminder switch side.
(4) Measure the resistance between terminal numbers 4 and 6.

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

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

YES : Go to Step 4.
NO : Replace the key reminder switch. Then check that the malfunction is eliminated.

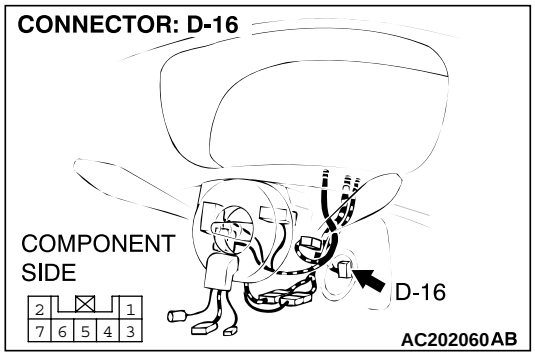


STEP 4. Check the input signal from the key reminder switch.

Check that the tone alarm stops sounding when terminal number 6 is grounded.

Q: Does the tone alarm stop sounding?

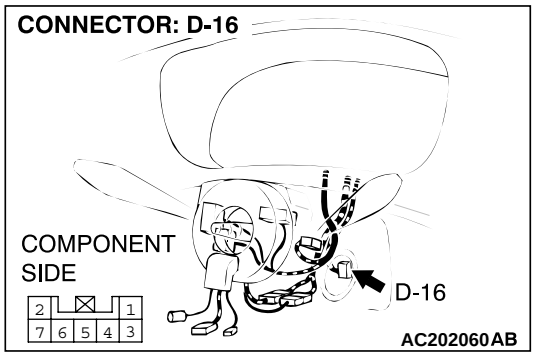
YES : Go to Step 5.
NO : Go to Step 6.



STEP 5. Check key reminder switch connector D-16 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is key reminder switch connector D-16 in good condition?

YES : Go to Step 6.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

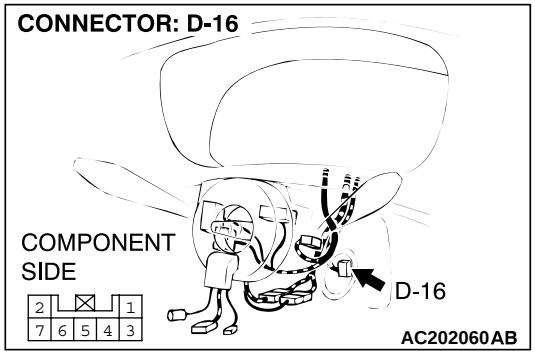


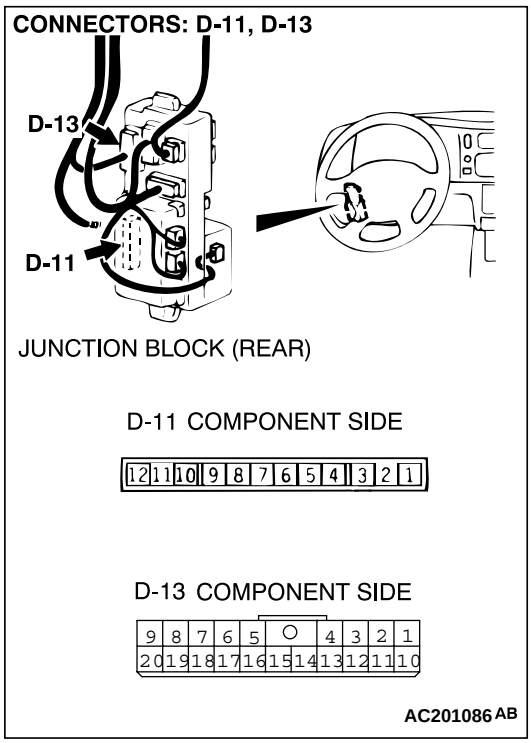
STEP 6. Check the harness wire between key reminder switch connector D-16 and body ground.

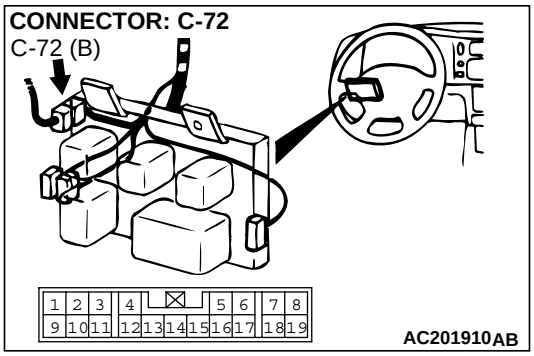
Q: Is the harness wire between key reminder switch D-16 (terminal No.4) and body ground damaged?

YES : Replace the ETACS-ECU. Then go to Step 7.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.







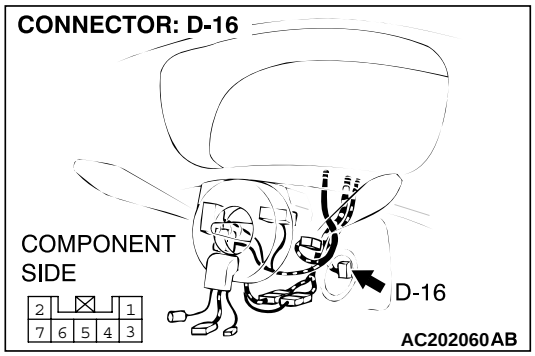
STEP 7. Check the harness wire between key reminder switch connector D-16 (terminal No.2 and 6) and ETACS-ECU connector D-11 (terminal No.8 and 12).

NOTE: After checking intermediate connector C-72 and D-13, check the wires. If intermediate connector C-72 and D-13 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the harness wire between key reminder switch D-16 (terminal No.2 and 6) and ETACS-ECU connector D-11 (terminal No.8 and 12) in good condition?

YES : Go to Step 8.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 8. Check for continuity between terminals (except No. 4 and No. 6) of key reminder switch connector D-16.

(1) Measure at key reminder switch connector D-16 without disconnecting the connector.

(2) Check that there is no continuity between key reminder switch terminal No. 4 and each terminal (except terminal No. 6), as well as between key reminder switch terminal No.6 and each terminal (except terminal No. 4).

Q: Does continuity exist between terminals?

YES : Replace the key reminder switch. If the functions, which are described in "CIRCUIT OPERATION", work normally, the input signal from the key reminder switch should be normal.

NO : Go to Step 9.

STEP 9. Recheck for malfunction.

Q: Is a malfunction eliminated?

YES : The procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Point – How to Cope with Intermittent Malfunction P.00-6.)

NO : Go to Step 1.

INSPECTION PROCEDURE 5: The Ignition Key Reminder Tone Alarm does not Sound when the Ignition Key is Inserted and the Driver's Door is Opened. (The Ignition Key is Turned to "OFF" Position.)

CIRCUIT OPERATION
Refer to Inspection Procedure 1 for the circuit operation P.54-9.

TECHNICAL DESCRIPTION (COMMENT)
It is possible that there is a malfunction of the input signal from the door switch or the key reminder switch if the ignition key hole illumination light does not illuminate.

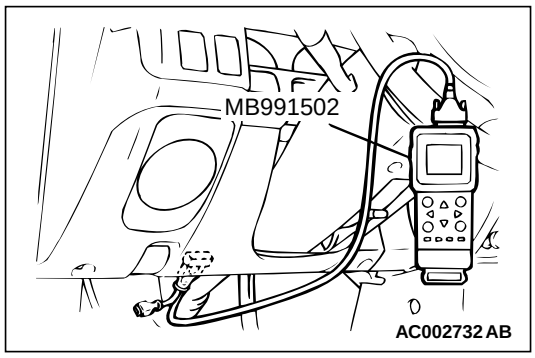
TROUBLESHOOTING HINTS
- Damaged harness wire or connector
- Malfunction of the ETACS-ECU
- Malfunction of the driver's side door switch

DIAGNOSIS

Required Special Tools:
- MB991529: Diagnostic Trouble Code Check Harness
- MB991502: Scan Tool (MUT-II)

STEP 1. Check the input signal (by using pulse check).
Check the ETACS-ECU input signal (driver's side door switch) by using scan tool MB991502.

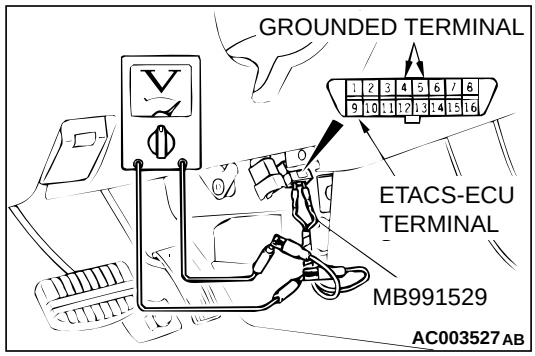
⚠ CAUTION
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.



(1) Connect scan tool MB991502 to the data link connector.
(2) Check that the tone alarm of scan tool MB991502 sounds when the driver's side door is opened.

Q: Does the tone alarm of scan tool MB991502 sound when the input signal enters?
YES : Replace the ETACS-ECU. Check that the malfunction is eliminated.
NO : Go to Step 3.

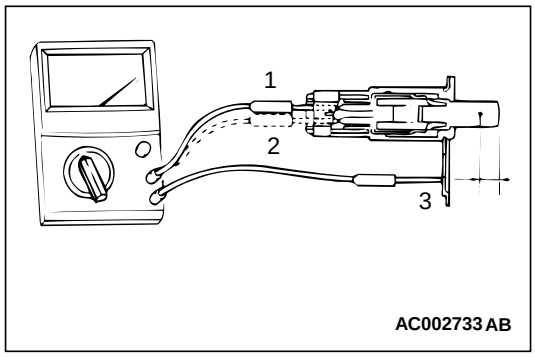
STEP 2. Check the input signal from the driver's side door switch (by using a voltmeter).
Check the input signals from the following switches:



(1) Use special tool MB991529 to connect a voltmeter between ground terminal 4 or 5 and ETACS-ECU terminal 9 of the data link connector.
(2) Check that the voltmeter indicator deflects once when the input signal enters.

Q: Does the voltmeter indicator deflect?
YES : Replace the ETACS-ECU. Check that the malfunction is eliminated.
NO : Go to Step 3.

TSB Revision



STEP 3. Check the driver's side door switch.

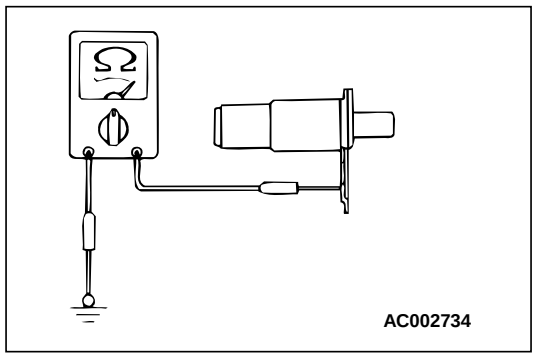
Remove the driver's side door switch. Refer to GROUP 42, Door P.42-103.

SWITCH POSITION	TESTER CONNECTION	SPECIFIED CONDITION
Released (ON)	1 – 2, 1 – 3, 2 – 3	Less than 2 ohms
Depressed (OFF)	1 – 2, 1 – 3, 2 – 3	Open circuit

Q: Is the driver's side door switch in good condition?

YES : Go to Step 4.

NO : Replace it. Check that the malfunction is eliminated.



STEP 4. Check the driver's side door switch ground circuit.

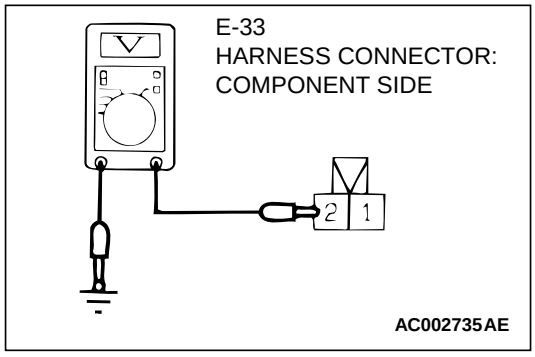
Measure the resistance between the driver's side door switch body (metal section) and ground.

- The measured value should be 2 ohms or less.

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

YES : Go to Step 5.

NO : Repair the harness wire or connector. Then check that the malfunction is eliminated.



STEP 5. Check driver's side door switch connector E-33 input circuit.

(1) Disconnect the driver's side door switch connector E-33 and the harness side.

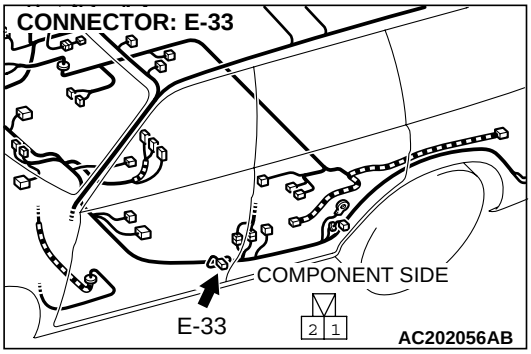
(2) Measure the voltage between terminal 2 and ground.

- The measured value should be approximately 5 volts.

Q: Does the measured voltage correspond with this range?

YES : There is no action to be taken.

NO : Go to Step 6.



STEP 6. Check driver's side door switch connector E-33 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is driver's side door switch connector E-33 damaged?

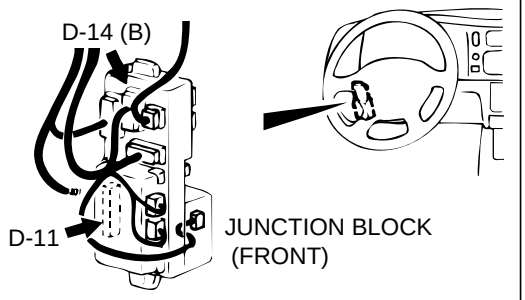
YES : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The tachometer should work normally.

NO : Go to Step 7.

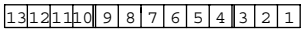
STEP 7. Check the harness wires between driver's side door switch connector E-33 and ETACS connector D-11.

NOTE: After inspecting junction block connector D-14 and intermediate connector E-42, inspect the wire. If junction block connector D-14 and intermediate connector E-42 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

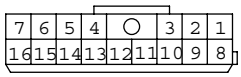
CONNECTORS: D-11, D-14



D-11 COMPONENT SIDE

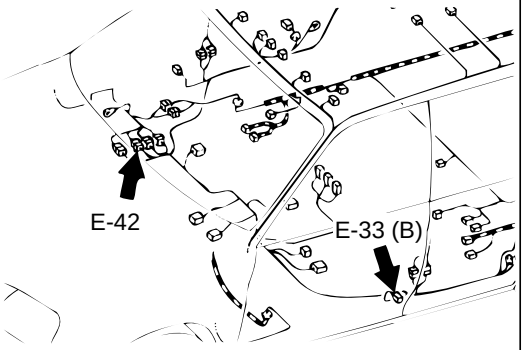


D-14 COMPONENT SIDE

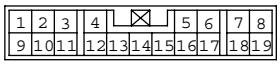


AC201939 AB

CONNECTORS: E-33, E-42



E-42



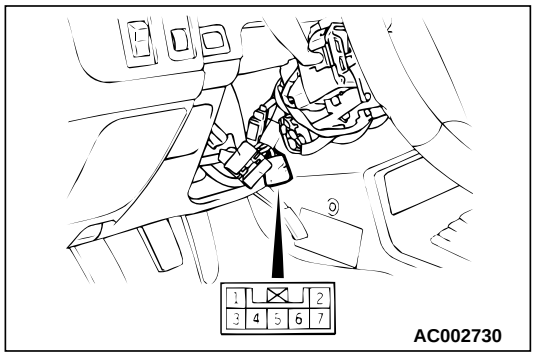
COMPONENT SIDE

AC201940 AC

Q: Are the harness wires between driver's side door switch connector E-33 and ETACS connector D-11 in good condition?

YES : Go to Step 8.

NO : Repair them. Then check that the malfunction is eliminated.



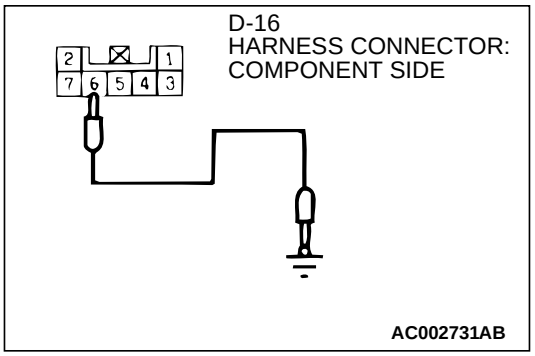
STEP 8. Check for continuity of the key reminder switch.

(1) Remove the driver's side under cover. Refer to P.52A-32.
(2) Remove the column covers, lower and upper.
(3) Disconnect wiring connector D-16 from the key reminder switch and measure at the key reminder switch side.
(4) Measure the resistance between terminal numbers 4 and 6.

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

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

YES : Go to Step 9.
NO : Replace the key reminder switch. Then check that the malfunction is eliminated.

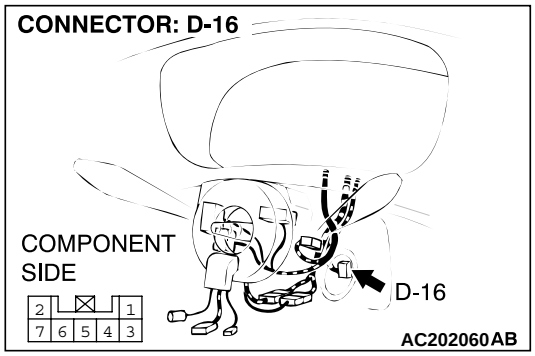


STEP 9. Check the input signal from the key reminder switch.

Check that the tone alarm stops sounding when terminal number 6 is grounded.

Q: Does the tone alarm stop sounding?

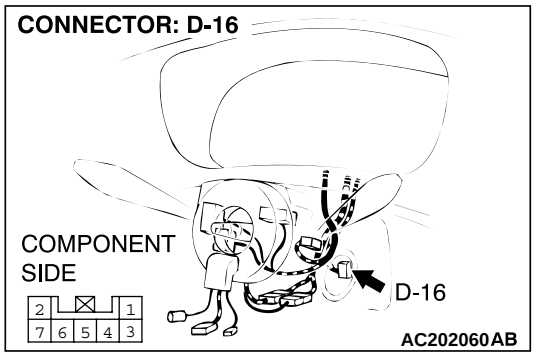
YES : Go to Step 10.
NO : Go to Step 11.



STEP 10. Check key reminder switch connector D-16 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is the key reminder switch connector D-16 in good condition?

YES : Go to Step 11.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

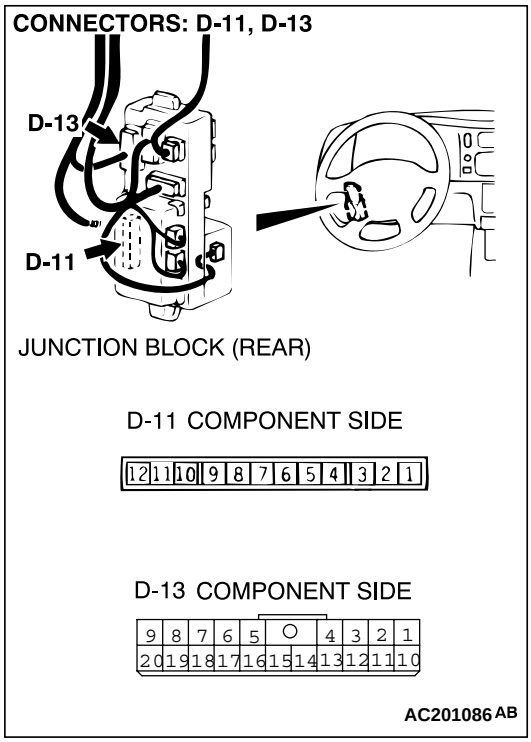


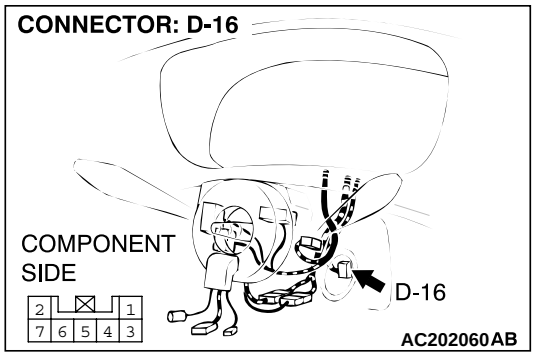
STEP 11. Check the harness wire between key reminder switch connector D-16 (terminal No.4) and body ground.

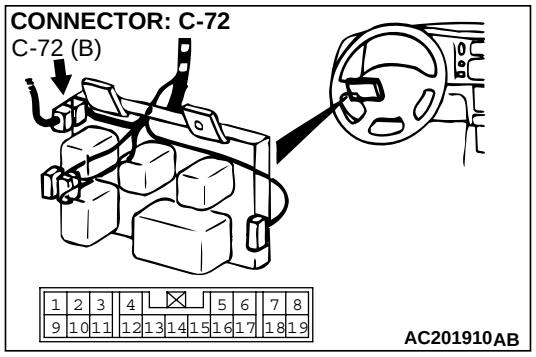
Q: Is the resistance wire between key reminder switch D-16 and body ground in good condition?

YES : Replace the ETACS-ECU. Then go to Step 12.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.







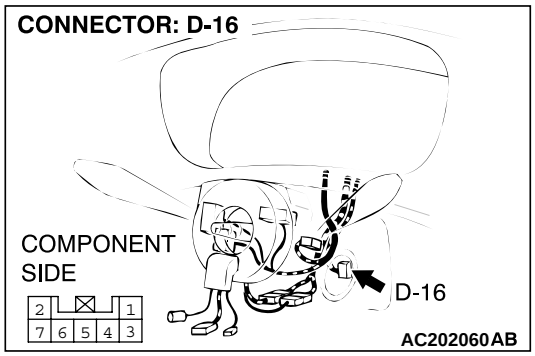
STEP 12. Check the harness wire between key reminder switch connector D-16 (terminal No.2 and 6) and ETACS-ECU connector D-11(terminal No.8 and 12).

NOTE: After checking intermediate connector C-72 and D-13, check the wires. If intermediate connector C-72 and D-13 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the harness wire between key reminder switch D-16 and ETACS-ECU connector D-11 in good condition?

YES : Go to Step 13.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 13. Check for continuity between terminals (except No. 4 and No. 6) of key reminder switch connector D-16.

(1) Measure at key reminder switch connector D-16 without disconnecting the connector.

(2) Check that there is no continuity between key reminder switch terminal No. 4 and each terminal (except terminal No. 6), as well as between key reminder switch terminal No.6 and each terminal (except terminal No. 4).

Q: Does continuity exist between terminals?

YES : Replace the key reminder switch. If the functions, which are described in "CIRCUIT OPERATION", work normally, the input signal from the key reminder switch should be normal.

NO : Go to Step 14.

STEP 14. Recheck for malfunction.

Q: Is a malfunction eliminated?

YES : The procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Point P.00-6.

NO : Go to Step 1.

IMMOBILIZER SYSTEM DIAGNOSIS

M1543009900925

INTRODUCTION TO IMMOBILIZER SYSTEM DIAGNOSIS

⚠ CAUTION

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

The immobilizer system consists of the immobilizer-ECU, powertrain control module, ignition key and ignition key ring antenna. If the engine cannot be started by using a registered ignition key, one of these components may be defective. In addition, if the immobilizer system has immobilized the engine, MFI system DTC P1610 will be output. In this case, observe the immobilizer system troubleshooting. Then, if a malfunction is resolved, the MFI system DTC P1610 should not reset.

IMMOBILIZER SYSTEM DIAGNOSTIC TROUBLESHOOTING STRATEGY

M1543006900498

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

1. Gather information about the problem from the customer.
2. Verify that the condition described by the customer exists.
3. Check the vehicle for any immobilizer system DTC.
4. If you cannot verify the condition and there are no immobilizer system DTCs, the malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/inspection Service Points - How to Cope with Intermittent Malfunctions P.00E-5.
5. If you can verify the condition but there are no immobilizer system DTCs, or the system cannot communicate with scan tool MB991502, refer to Symptom Chart and find the fault P.54-45.
6. If there is an immobilizer system DTC, record the number of the DTC, then erase the DTC from the memory using scan tool MBB991502.
7. Recreate the immobilizer system DTC set conditions to see if the same immobilizer system DTC will set again.
   (1) If the same immobilize system DTC sets again, perform the diagnostic procedures for the DTC. Refer to Diagnostic Trouble Code Chart P.54-38.
   (2) If you cannot get the same immobilizer system DTC to set again, the malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunctions P.00-6.

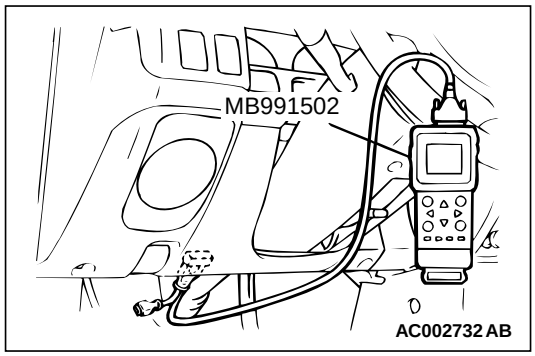
IMMOBILIZER SYSTEM TROUBLE CODE DIAGNOSIS

M1543007000250

Retrieving and Erasing Immobilizer System Diagnostic Trouble Codes

Required Special Tool:

- MB991502: Scan Tool (MUT-II)



⚠ CAUTION

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

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

DIAGNOSTIC TROUBLE CODE CHART

M1543007100268

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

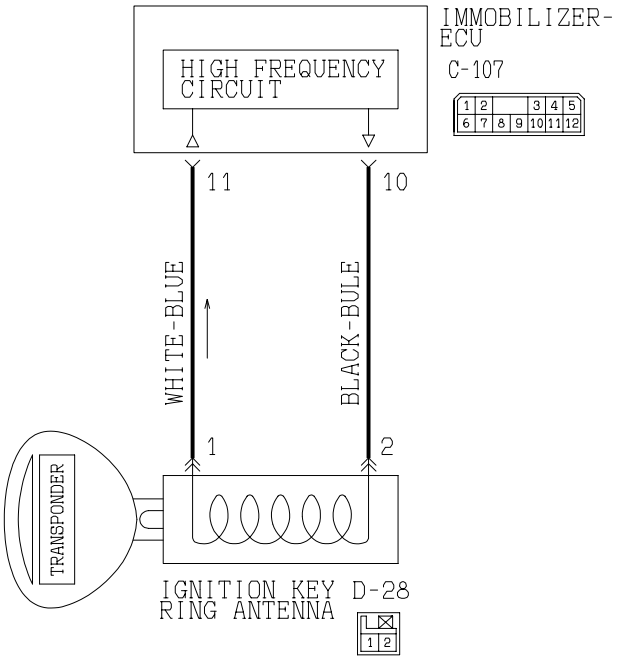
DIAGNOSTIC TROUBLE CODE NO.	DESCRIPTION	REFERENCE PAGE
11	Transponder communication system or radio interference of encrypted code	Refer to P.54-40.
12	Encrypted codes are not the same or are not registered	Refer to P.54-44.

NOTE: Diagnostic trouble code is not recorded.

DIAGNOSTIC TROUBLE CODE PROCEDURES

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

Ignition Key Ring Antenna Circuit



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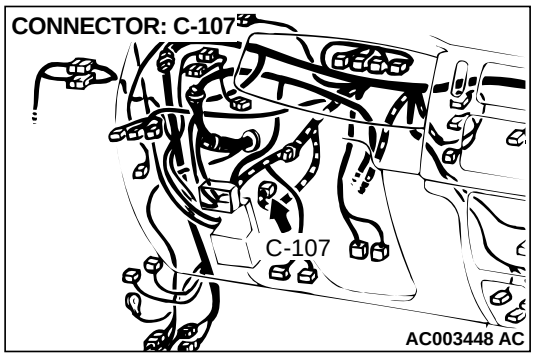
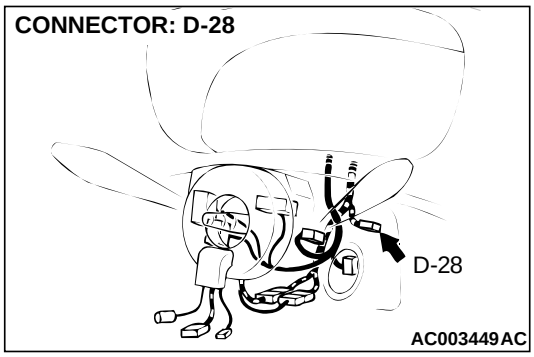
AC004092 AB





CIRCUIT OPERATION

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

DTC SET CONDITION

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

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

TSB Revision

TROUBLESHOOTING HINTS

- Radio interference of encrypted code
- Malfunction of transponder
- Malfunction of ignition key ring antenna
- Malfunction of immobilizer-ECU
- Damaged wiring harness of connectors

DIAGNOSIS

Required Special Tools:

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

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

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

YES : Move the other key well away from key being used. Confirm that diagnostic trouble code 11 is not output.

NO : Go to Step 2.

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

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

YES : Replace the ignition key that does not work. Then register the password (secret code) and encrypted code P.00E-2. Confirm that diagnostic trouble code 11 is not output.

NO : Go to Step 3.

STEP 3. Using scan tool MB991502, read the diagnostic trouble code.

Check that DTC 11 or DTC 12 is output.

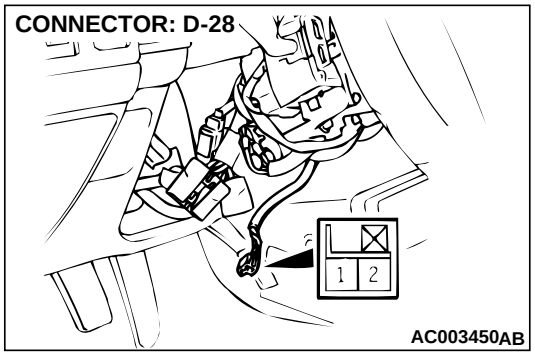
Q: Which DTC is output, DTC 11 or 12?

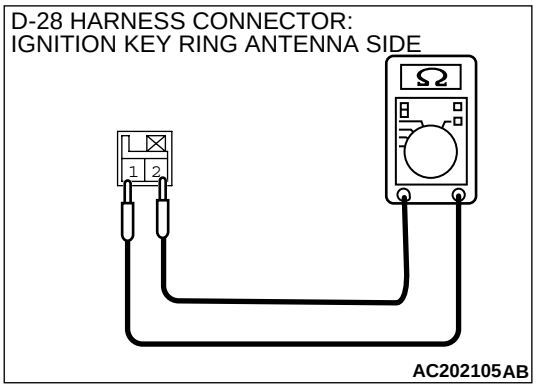
DTC 12 is output : Refer to DTC 12 P.54-44.

DTC 11 is output : Go to Step 4.

STEP 4. Check the ignition key ring antenna.

(1) Disconnect ignition key ring antenna connector D-28.





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

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

YES : Go to Step 5.

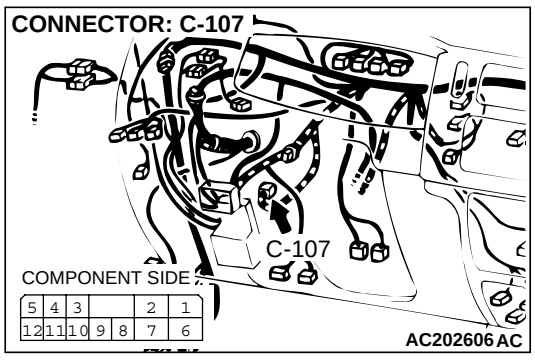
NO : Replace the ignition key ring antenna. Confirm that diagnostic trouble code 11 is not output.

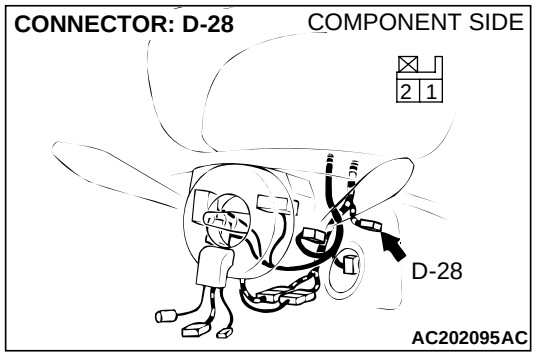
STEP 5. Check immobilizer-ECU connector C-107 and ignition key ring antenna connector D-28 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

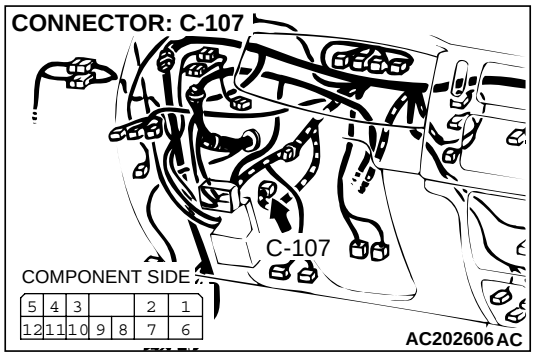
Q: Are immobilizer-ECU connector C-107 and ignition key ring antenna connector D-28 in good condition?

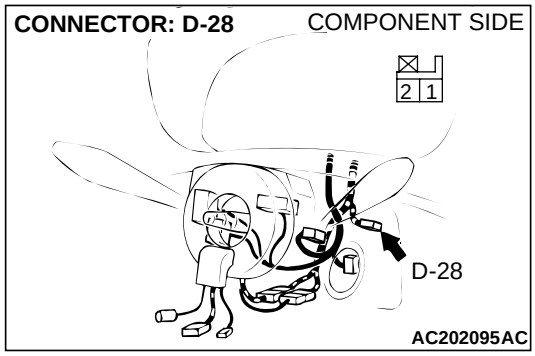
YES : Go to Step 6.

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









STEP 6. Check the harness wires between immobilizer-ECU connector C-107 (terminal No.10 and 11) and ignition key ring antenna connector D-28 (terminal No.1 and 2).

Q: Are the harness wires between immobilizer-ECU connector C-107 (terminal No.10 and 11) and ignition key ring antenna connector D-28 (terminal No.1 and 2) in good condition?

YES : Replace the immobilizer-ECU. Then register the password (secret code) and encrypted code P.54-58. Confirm that diagnostic trouble code 11 is not output.

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

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

DTC SET CONDITION

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

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

TROUBLESHOOTING HINTS

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

DIAGNOSIS

STEP 1. Check that the encrypted code was registered.

Q: Was the encrypted code registered?

YES : Replace the immobilizer and then re-register the encrypted code (Refer to P.54-58.)

NO : Register the encrypted code (Refer to P.54-58.)

SYMPTOM CHART

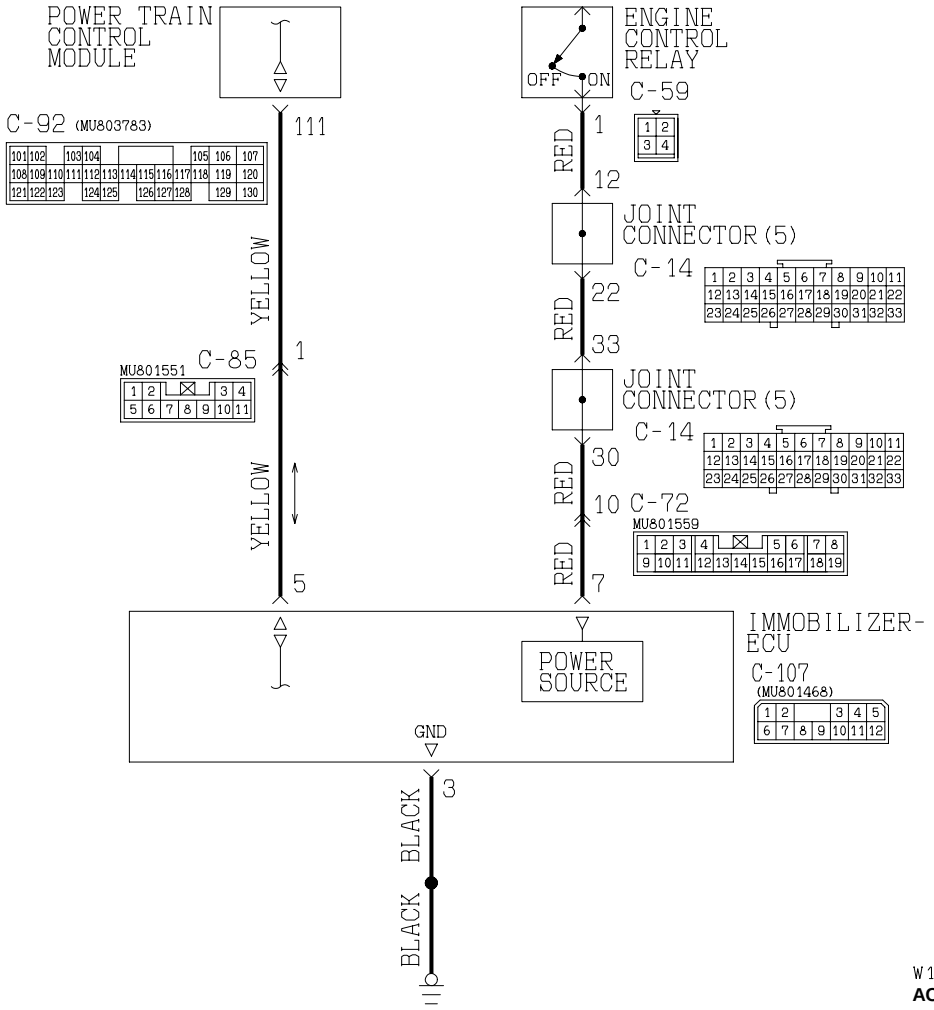
M1543007200685

SYMPTOM	INSPECTION PROCEDURE NO.	REFERENCE PAGE
Communication with scan tool MB991502 is impossible.	1	P.54-45
Registering the ignition key is impossible.	2	P.54-51
The "SECURITY" indicator does not illuminate.	3	P.54-52
Engine does not start (Cranking but no initial combustion).	4	P.54-56

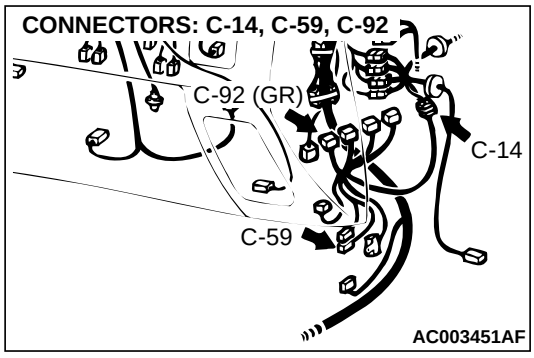
SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: Communication with Scan Tool MB991502 is Impossible.

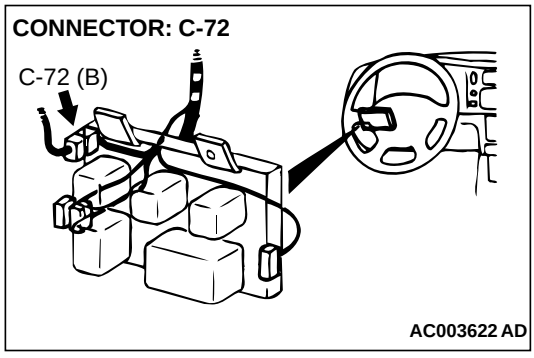
Immobilizer-ECU Power Supply, Ground and PCM Communication Line Circuit



W1P01M00A
AC004093AB

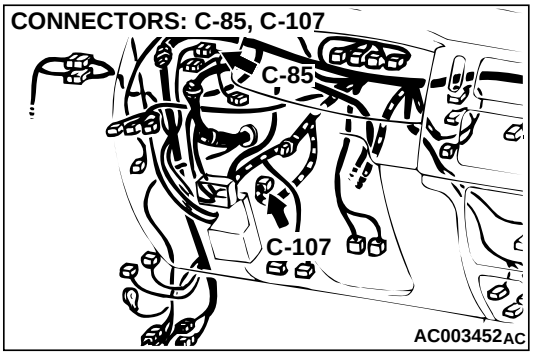


AC003451AF



AC003622 AD

TSB Revision



CIRCUIT OPERATION

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

TECHNICAL DESCRIPTION (COMMENT)

- This malfunction may be caused by a defective immobilizer-ECU, powertrain control module, or a defect in the communication line between the immobilizer-ECU and powertrain control module. If this malfunction appears when the MFI system and scan tool MB991502 can communicate each other, MFI system DTC P1610 will reset.
- If the MFI system is normal, the MFI relay can be determined as normal. In addition, if the MFI system and scan tool MB991502 can communicate each other, the circuits between the data link connector and the powertrain control module can determined as normal.

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

TROUBLESHOOTING HINTS

- Malfunction of immobilizer-ECU
- Malfunction of powertrain control module
- Damaged harness wires or connectors

DIAGNOSIS

Required Special Tools:

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

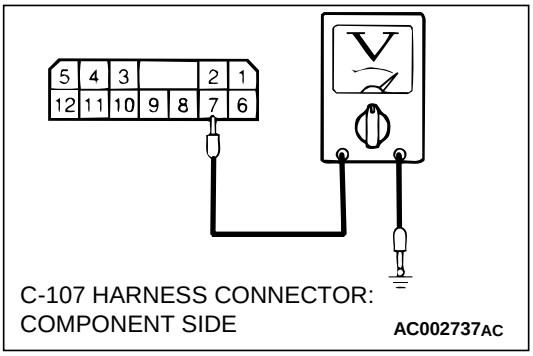
STEP 1. Check MFI diagnostic trouble code.

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

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

YES : Go to Step 2.

NO : Refer to GROUP 13A, Diagnosis P.13Ab-21.



C-107 HARNESS CONNECTOR: COMPONENT SIDE
AC002737AC

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

(1) Do not disconnect immobilizer-ECU connector C-107.
(2) Turn the ignition switch to the "ON" position.
(3) Measure the voltage between terminal 7 and ground by backprobing.
- The measured value should be approximately 12 volts (battery positive voltage).

Q: Does the measured voltage correspond with this range?

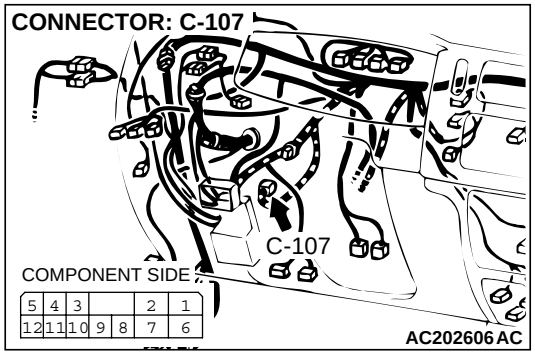
YES : Go to Step 5.
NO : Go to Step 3.

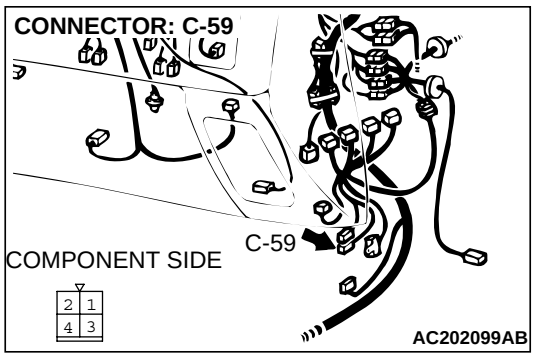
STEP 3. Check immobilizer-ECU connector C-107 and engine control relay connector C-59 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

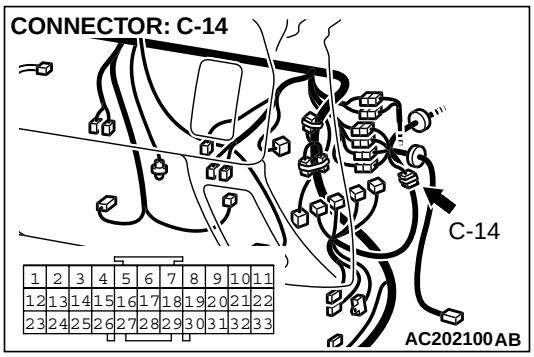
Q: Are immobilizer-ECU connector C-107 and engine control relay connector C-59 in good condition?

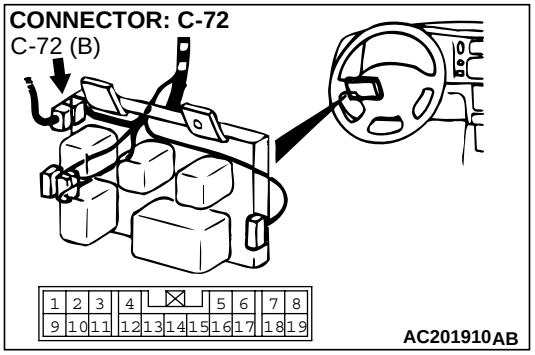
YES : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Confirm that scan tool MB991502 communicates normally.

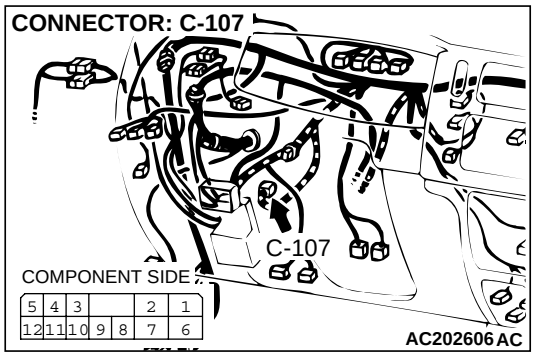
NO : Go to Step 4.











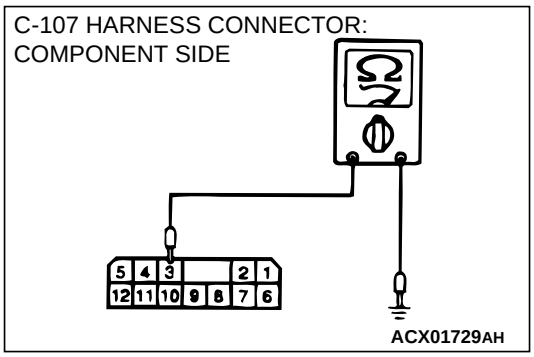
STEP 4. Check the harness wires between immobilizer-ECU connector C-107 (terminal No. 7) and MFI relay connector C-59 (terminal No.1).

NOTE: After checking intermediate connector C-72 and joint connector C-14, check the wires. If intermediate connector C-72 and joint connector C-14 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wires between immobilizer-ECU connector C-107 (terminal No.7) and MFI relay connector C-59 (terminal No.1) damaged?

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

NO : There is no action to be taken.



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

(1) Do not disconnect immobilizer-ECU connector C-107.

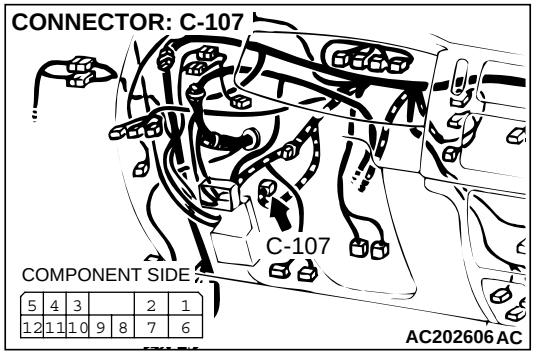
(2) Measure the resistance between terminal 3 and ground by backprobing.

- The measured value should be 2 ohms or less.

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

YES : Go to Step 6.

NO : Go to Step 8.

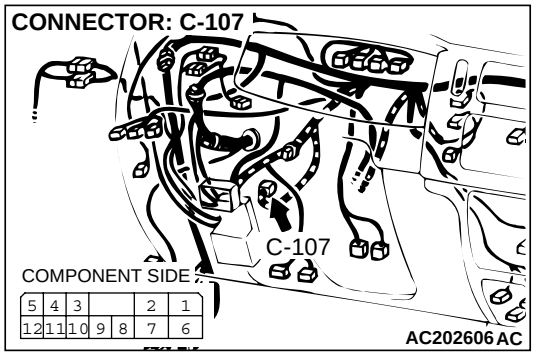


STEP 6. Check immobilizer-ECU connector C-107 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is immobilizer-ECU connector C-107 in good condition?

YES : Go to Step 7.

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

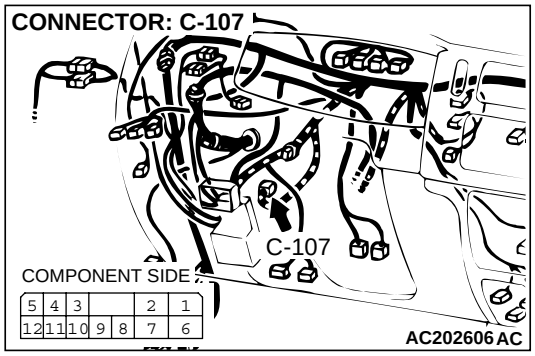


STEP 7. Check the harness wire between immobilizer-ECU connector C-107 (terminal No.3) and ground.

Q: Is the harness wire between immobilizer-ECU connector C-107 and ground damaged?

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

NO : There is no action to be taken.

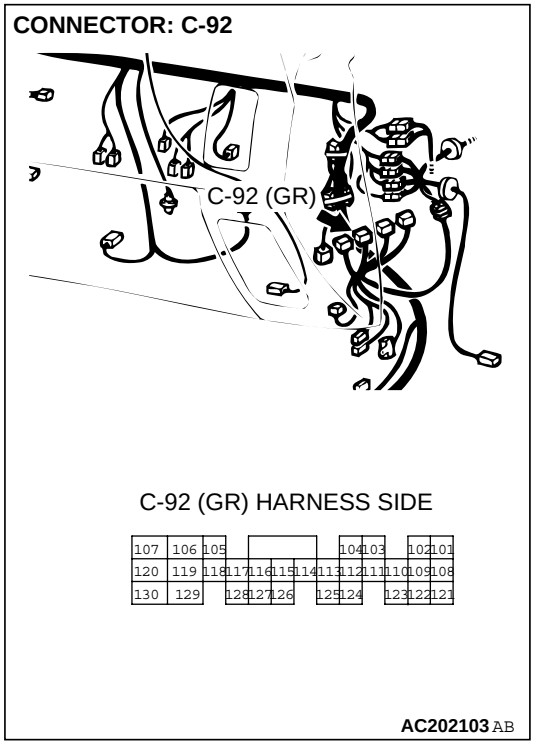


STEP 8. Check the harness wires between immobilizer-ECU connector C-107 (terminal No.5) and powertrain control module connector C-92 (terminal No.111).

Q: Are the harness wires between immobilizer-ECU connector C-107 (terminal No.5) and powertrain control module connector C-92 (terminal No.111) damaged?

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

NO : Go to Step 9.



STEP 9. Replace the immobilizer-ECU or powertrain control module.

Replace the immobilizer-ECU or powertrain control module.

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

YES : Register the password (secret code) and encrypted code P.54-58. Confirm that scan tool MB991502 communicates normally.

NO : Go to Step 10.

STEP 10. Recheck for malfunction.

Q: Is a malfunction eliminated?

YES : The procedure is complete. (If no malfunction are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00E-2.)

NO : Replace the immobilizer-ECU or powertrain control module.

INSPECTION PROCEDURE 2: Registering the Ignition Key is Impossible.

TECHNICAL DESCRIPTION (COMMENT)

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

TROUBLESHOOTING HINTS

- Malfunction of ignition key
- Malfunction of immobilizer-ECU

DIAGNOSIS

Required Special Tools:

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

STEP 1. Check the DTC 11.

Q: Does DTC11 reset?

YES : Refer to P.13Ab-21.

NO : Replace the ignition key that cannot be registered. Then re-register the encrypted code. (Refer to P.54-39.) Check that the ignition key can be registered. Then go to Step 2.

STEP 2. Recheck for malfunction.

Q: Is a malfunction eliminated?

YES : The procedure is complete. (If no malfunction are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.)

NO : Replace the immobilizer-ECU.

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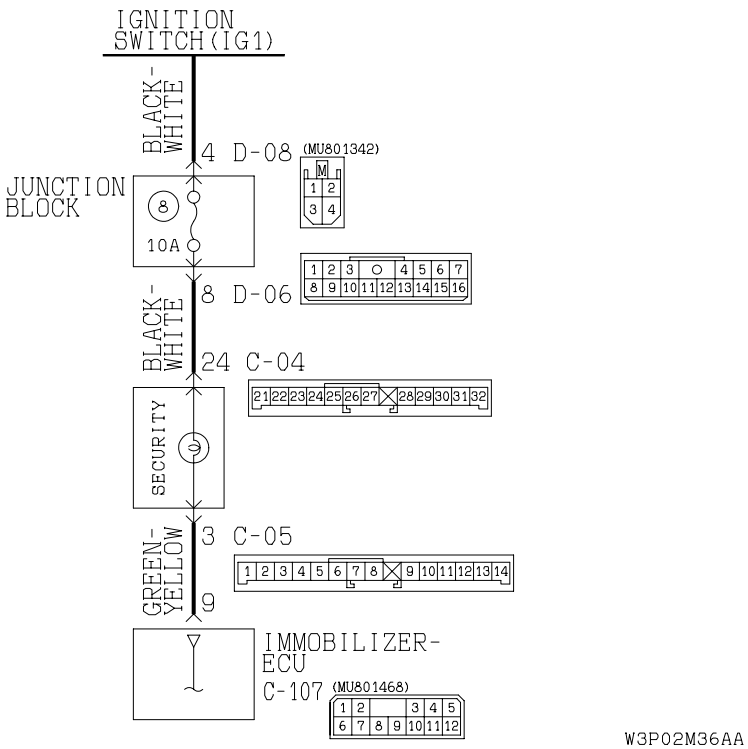
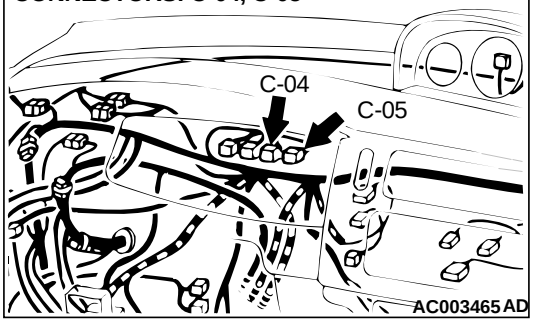
INSPECTION PROCEDURE 3: The "SECURITY" Indicator Light does not Illuminate.

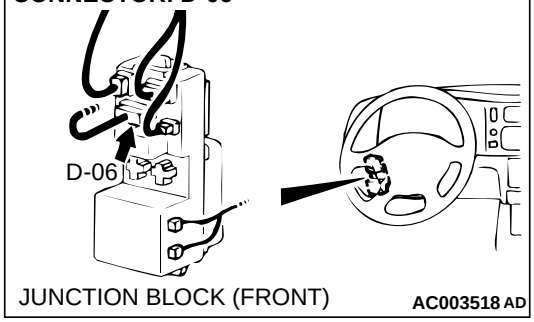
The "SECUIRITY" Indicator Light Circuit



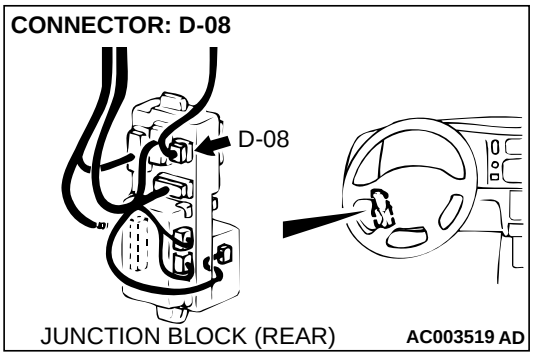
CONNECTORS: C-04, C-05



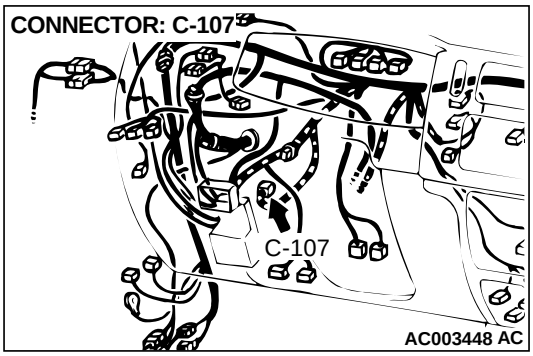
CONNECTOR: D-06



CONNECTOR: D-08



CONNECTOR: C-107



CIRCUIT OPERATION

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

TECHNICAL DESCRIPTION (COMMENT)

There may be burned out bulb of the "SECURITY" indicator light or a malfunction of the combination meter (printed-circuit board) or immobilizer-ECU.

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NOTE: The "SECURITY" indicator light is shared by the theft-alarm system. If a problem can not be resolved, observe the theft-alarm system trouble-shooting P.54-247.

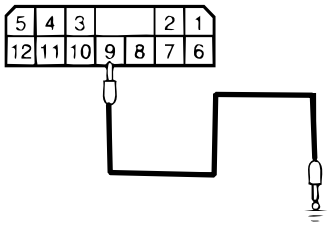
TROUBLESHOOTING HINTS

- Burned out bulb of "SECURITY" indicator light
- Malfunction of combination meter (printed-circuit board)
- Malfunction of immobilizer-ECU
- Damaged harness wires or connectors

DIAGNOSIS

Required Special Tools:

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



C-107 HARNESS CONNECTOR: COMPONENT SIDE AC002739 AF

STEP 1. Check the "SECURITY" indicator light circuit of immobilizer-ECU connector C-107.

(1) Remove the immobilizer-ECU and measure at the harness side.
(2) Connect terminal 9 to the ground.
(3) Ignition switch "ON" position.

Q: Is the only "SECURITY" indicator light illuminate? (other indicator lights are in good condition)

YES : Replace the immobilizer-ECU. Then register the password (secret code) and encrypted code P.54-58.
NO : Go to Step 2.

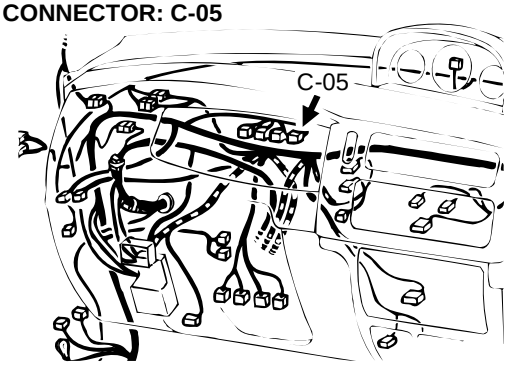
STEP 2. Check the "SECURITY" indicator light.

(1) Remove the combination meter and remove the "SECURITY" indicator light bulb.
(2) Check the bulb.

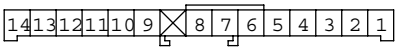
Q: Is the "SECURITY" indicator light damaged?

YES : Replace it.
NO : Go to Step 3.

CONNECTOR: C-05



C-05 HARNESS CONNECTOR



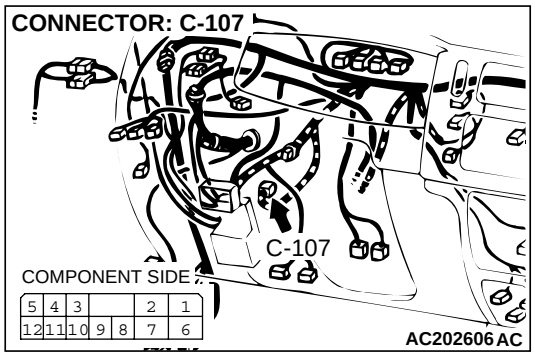
AC201843 AB

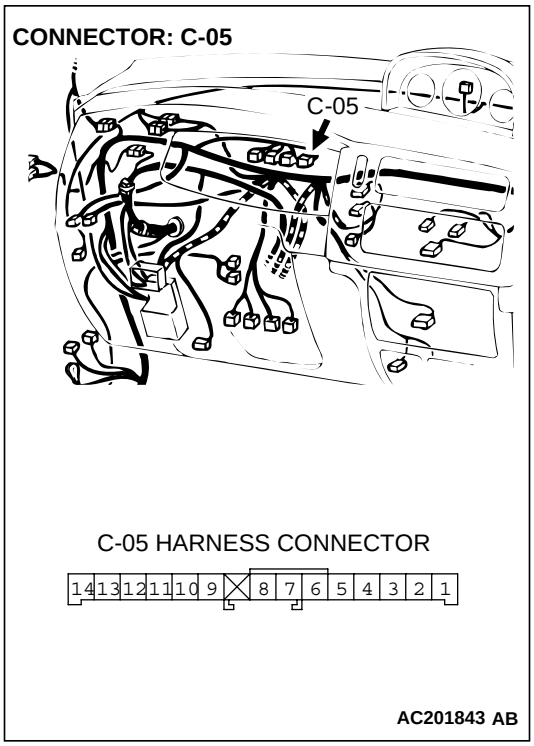
STEP 3. Check combination meter connector C-05 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is combination meter connector C-05 in good condition?

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

NO : Go to Step 4.





STEP 4. Check the harness wires between immobilizer-ECU connector C-107 and combination meter connector C-05.

Q: Are immobilizer-ECU connector C-107 and combination meter connector C-05 damaged?

YES : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

NO : Repair the combination meter (printed-circuit board) P.54-110. Then go to Step 5.

STEP 5. Recheck for malfunction.

Q: Is a malfunction eliminated?

YES : The procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Point – How to Cope with Intermittent Malfunction P.00-6.)

NO : Go to Step 1.

INSPECTION PROCEDURE 4: Engine does not Start (Cranking but no Initial Combustion).

TECHNICAL DESCRIPTION (COMMENT)

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

TROUBLESHOOTING HINTS

- Malfunction of MFI system
- Malfunction of immobilizer-ECU

DIAGNOSIS

Required Special Tools:

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

STEP 1. Check the battery positive voltage.

Measure the battery positive voltage during cranking.

Q: Is the voltage 8 volts or more?

YES : Go to Step 2.

NO : Check the battery. Refer to P.54-58. The engine should start.

STEP 2. Check for any diagnostic trouble code.

Check the immobilizer system diagnostic trouble code and MFI system diagnostic trouble code.

Q: Which DTC resets, the immobilizer system DTC or the MFI system DTC?

Immobilizer system DTC : Refer to P.54-39.

MFI system DTC : Refer to GROUP 13A, Diagnosis P.13Ab-21.

No DTC : Go to Step 3.

STEP 3. Check the starting system.

Q: Does the engine start?

YES : Go to Step 4.

NO : Refer to GROUP 13A, Diagnosis – Symptom Chart P.13Ab-25. If a malfunction is not resolved, replace the immobilizer-ECU. Then register the password (secret code) and encrypted code. (Refer to P.54-58.) The engine should start.

STEP 4. Recheck for malfunction.

Q: Is a malfunction eliminated?

YES : The procedure is complete. (If no malfunction are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.)

NO : Replace the immobilizer-ECU.

DATA LIST REFERENCE TABLE

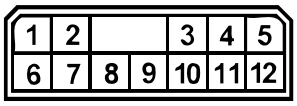
M1543007300239

MUT-II SCAN TOOL DISPLAY	ITEM NO.	INSPECTION ITEM	INSPECTION REQUIREMENT	NORMAL CONDITION
KEY REGISTERED	01	Key has been registered	-	Number of registered ignition keys

CHECK AT IMMOBILIZER-ECU

M1543007600348

TERMINAL VOLTAGE CHECK



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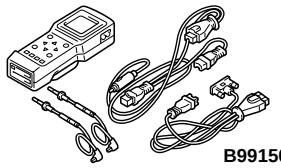
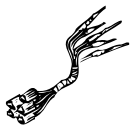
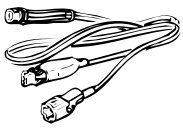
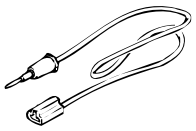
TERMINAL NO.	SIGNAL	CHECKING REQUIREMENT	TERMINAL VOLTAGE
3	Immobilizer-ECU ground	Always	0V
5	Powertrain control module	–	–
7	Immobilizer-ECU power supply	Ignition switch: "LOCK" (OFF)	0V
		Ignition switch: "ON"	Battery positive voltage
9	"SECURITY" indicator control	"SECURITY" indicator light is not illuminated	Battery positive voltage
		"SECURITY" indicator light is illuminated	2 volts or less
10	Ignition key ring antenna	–	–
11	Ignition key ring antenna	–	–

SPECIAL TOOLS

M1543000600886

TOOL	TOOL NUMBER AND NAME	REPLACED BY MILLER TOOL NUMBER	APPLICATION
 B991502	MB991502 Scan tool (MUT-II)	DRB-III W/CH8425	• Immobilizer system check • Encrypted code registration
A  B  C  D  MB991223AC	MB991223 A: MB991219 B: MB991220 C: MB991221 D: MB991222 Harness set A: Test harness B: LED harness C: LED harness adapter D: Probe	General service tool (jumper)	Making voltage and resistance measurements during troubleshooting A: Connect pin contact pressure inspection B: Power circuit inspection C: Power circuit inspection D: Commercial tester connection

ON-VEHICLE SERVICE

ENCRYPTED CODE REGISTRATION METHOD

M1543008100313

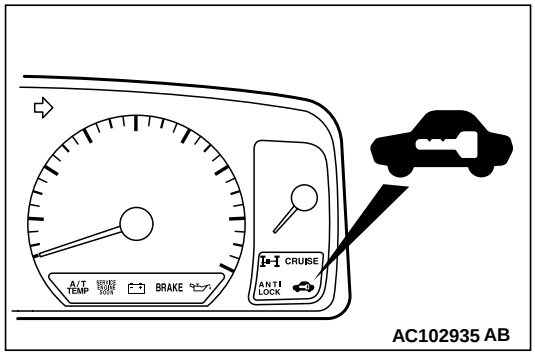
Required Special Tool:

- MB991502: Scan Tool (MUT-II)

⚠ CAUTION

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

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



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

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

POINTS TO NOTE DURING OPERATION

If none of the functions can be used, check the diagnostic trouble codes, and after carrying out any necessary repairs, repeat the operation.
If an incorrect password is input five times in a row, the immobilizer-ECU judges that an unauthorized operation is being attempted. Start-prevention mode will be set, and engine operation will stop and all special functions will be disabled. If the ignition switch is turned to "ON" position and left in that position for approximately 20 minutes, "Unauthorized operation, start-prevention mode" will be cancelled.

KEY ID REGISTER

All ignition keys can be registered with scan tool MB991502. Additional ignition keys can be registered with or without scan tool MB991502.
If an ignition key is registered using scan tool MB991502, no registered ignition keys must be lost.

Registration with scan tool MB991502

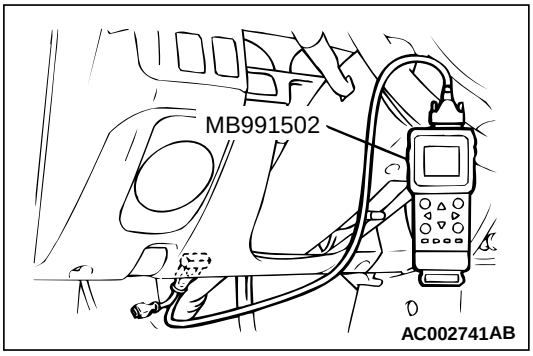
⚠ CAUTION

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

NOTE: Using the key ID register function will cause all key IDs that have been previously registered in the immobilizer-ECU to be erased. All keys need to be registered. Those which have been registered before should be on hand before using this function.

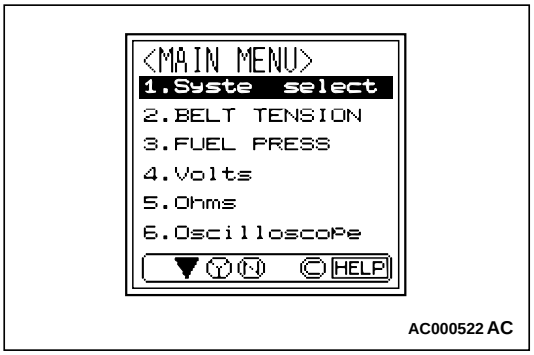
NOTE: If registering more than one key, do not disconnect scan tool MB991502 halfway through the registration process.

NOTE: After registering key IDs, check that the engine can be started using all of the keys that have been registered. If the engine will not start, refer to Immobilizer System Diagnosis *P.54-39.*



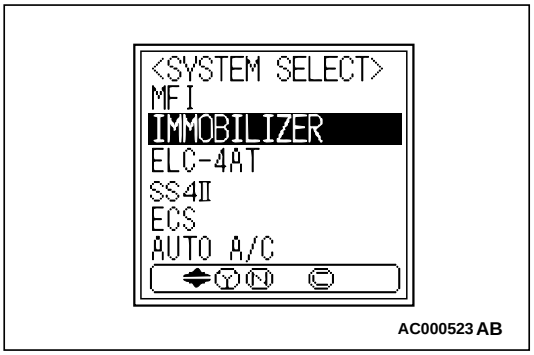
AC002741AB

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



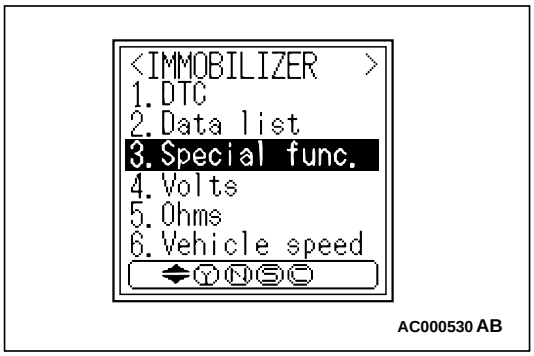
AC000522 AC

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



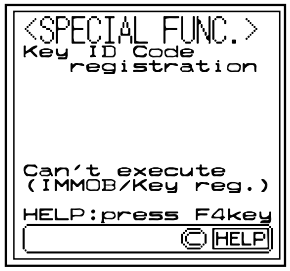
AC000523 AB

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



AC000530 AB

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



AC000518 AB

6. Select "key ID registr," press "YES".
If DTC 11 exists, "Can't execute" will be displayed. Check for DTC 11 (Refer to P.54-39.)

AC101475

ACX01626AB

7. Input the password. Use the "UP" and "DOWN" keys to change the current password digit to a value between 0 and 9. Use the "LEFT" and "RIGHT" keys to move to a different password digit. Press the "YES" key to accept the password.
NOTE: Four separate digits must be input to make up the password.

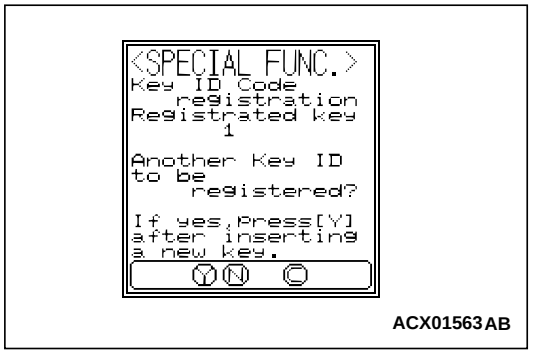
If an incorrect password is input five times in a row, this screen is displayed and the Immobilizer-ECU switches to unauthorized operation, start-prevention mode.

ACX01561AC

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

ACX01562AB

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



ACX01563AB

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

    NOTE: A maximum of eight different keys can be registered.

If key ID registration is complete, press the "NO" key.

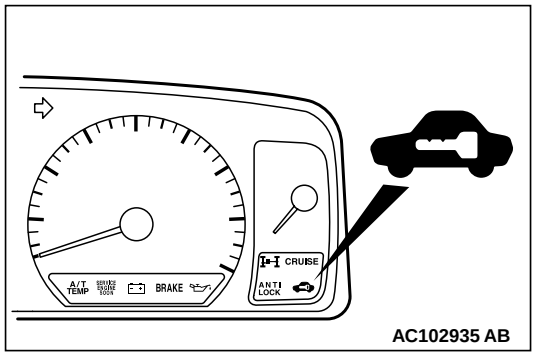
11. This completes the registration operation. Turn the ignition switch "LOCK" (OFF) and leave it off for approximately ten seconds.
12. Check that the engine can be started with each of the ignition keys.
13. Check that the immobilizer system DTC and MFI system DTC did not set.
14. Turn the ignition switch to the "LOCK" (OFF) position.
15. Disconnect scan tool MB991502.

Registration of additional key(s) without using the scan tool

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

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

1. Turn on the ignition switch by using the first registered key (key A), and wait for five seconds.
2. Within 30 seconds, remove the key.
3. Within seven seconds after the ignition switch has been turned to the "LOCK" (OFF), insert the second registered key (key B) and turn on the ignition switch again. Now the theft-alarm indicator light should blink twice for one second. If it does not blink, you has failed to register. Repeat from step 1.
4. Turn on the key B. Within 30 seconds, remove the key.
5. Within seven seconds after the ignition switch has been turned to the "LOCK" (OFF) position, turn on the ignition switch by using a new key.
6. The immobilizer-ECU identifies the new key to accept or reject it, and operates the theft-alarm indicator (See the table below).



AC102935AB

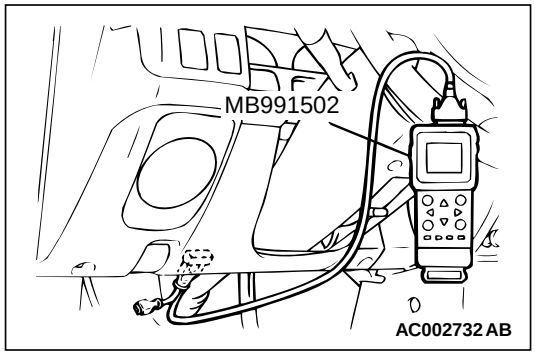
The new key is:	Registration is:	Additional registration mode:	Theft-alarm indicator:
Not registered yet	Accepted	Continues	Comes on for 3 seconds after the ECU judges that the key has not been registered yet.
Already registered	Rejected	Continues	Comes on for 3 seconds after the ECU judges that the key has already been registered
Read error	Rejected	Continues	Blinks three times after the ECU has failed to identify the key.
Eight ignition keys have been registered	Rejected	Continues	Does not come on and blink

7. A maximum of eight ignition keys can be registered to one vehicle (If you attempt to register the ninth key, the immobilizer-ECU rejects the key). Follow the procedure below to register another new key.
   (1) Within 30 seconds after the new key has been registered on step 6, remove the key.
   (2) Within seven seconds after the ignition switch has been turned to the "LOCK" (OFF), insert another new key and turn on the ignition switch.
   (3) To register more other ignition key(s), repeat steps 1 and 2.
8. If any of the following conditions are satisfied, the additional key registration mode will terminate:
   - The ignition switch has been on for more than 30 seconds.
   - After the ignition key has been turned to the "LOCK" (OFF), the engine control relay is turned off.
   - The scan tool has started communicating with vehicle systems.
9. After the registration mode has terminated, the additionally registered key(s) should allow you to start the engine.

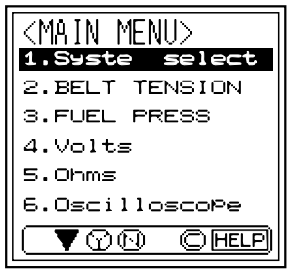
TRANSPONDER LOCK CHECK

M1543024100034

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

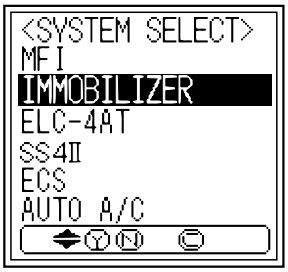


1. Connect scan tool MB991502 to data link connector (16 pins).
2. Turn the ignition switch to "ON" position.



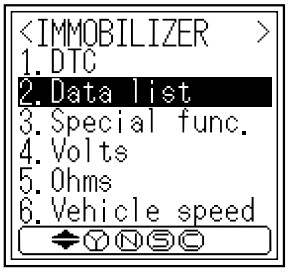
AC000522 AC

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



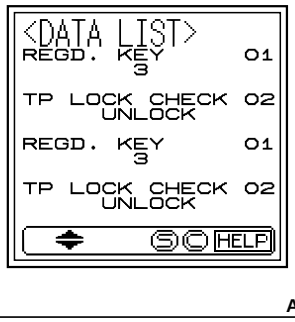
AC000523 AB

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



AC106459

5. Select "Data list" press "YES".



AC106460

6. Confirm "TP LOCK CHECK."

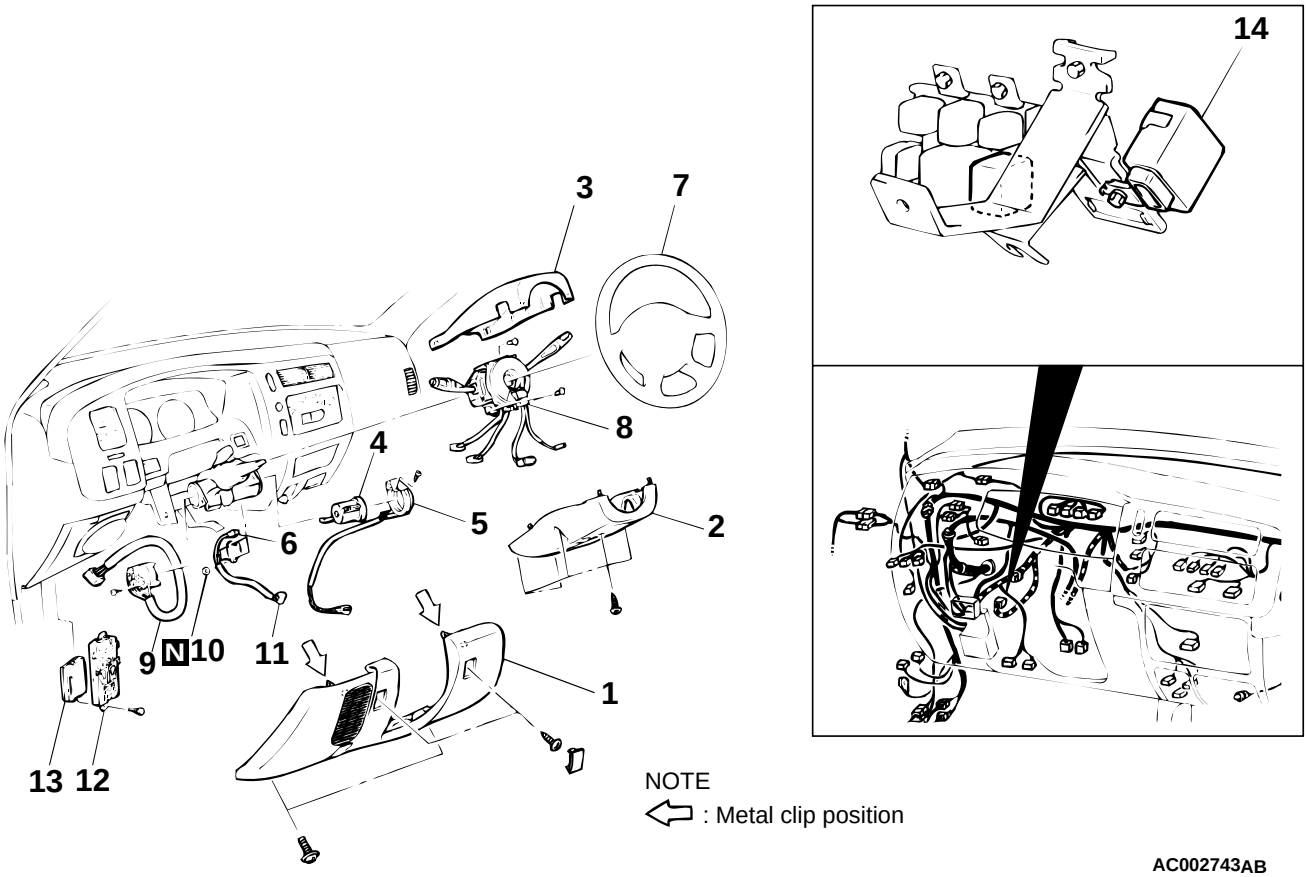
TP LOCK CHECK	IGNITION KEY:	JUDGMENT OF IGNITION KEY
UNLOCK	Can be overwritten	Correct
LOCK	Can not be overwritten	Incorrect

REMOVAL AND INSTALLATION

M1543002100285

⚠ ***WARNING***

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



NOTE
⇦ : Metal clip position

AC002743AB

STEERING LOCK CYLINDER AND KEY HOLE ILLUMINATION LIGHT REMOVAL STEPS

1. KNEE PROTECTOR ASSEMBLY
2. COLUMN COVER, LOWER
3. COLUMN COVER, UPPER

<<A>> 4. STEERING LOCK CYLINDER

<<B>> 5. IGNITION KEY RING ANTENNA

6. KEY HOLE ILLUMINATION LIGHT

ETACS-ECU REMOVAL STEPS

1. KNEE PROTECTOR ASSEMBLY
12. JUNCTION BLOCK
13. ETACS-ECU

IGNITION SWITCH AND KEY REMINDER SWITCH REMOVAL STEPS

1. KNEE PROTECTOR ASSEMBLY
2. COLUMN COVER, LOWER
3. COLUMN COVER, UPPER
7. STEERING WHEEL (REFER TO GROUP 37A, STEERING WHEEL AND SHAFT P.37A-23.)

>>A<< 8. COLUMN SWITCH ASSEMBLY

9. IGNITION SWITCH
10. PUSH NUT
11. KEY REMINDER SWITCH

IMMOBILIZER-ECU REMOVAL STEPS

1. KNEE PROTECTOR ASSEMBLY
14. IMMOBILIZER-ECU

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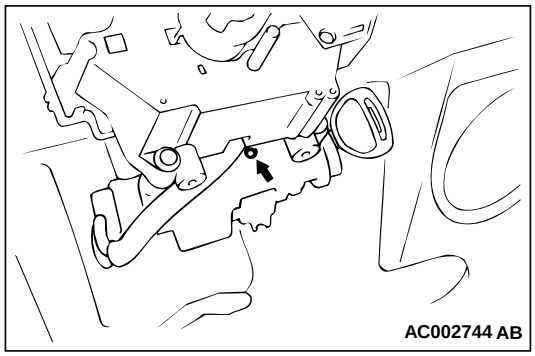
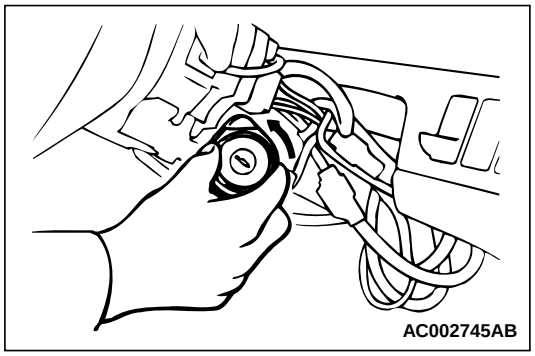
REMOVAL SERVICE POINTS



<<A>> STEERING LOCK CYLINDER REMOVAL

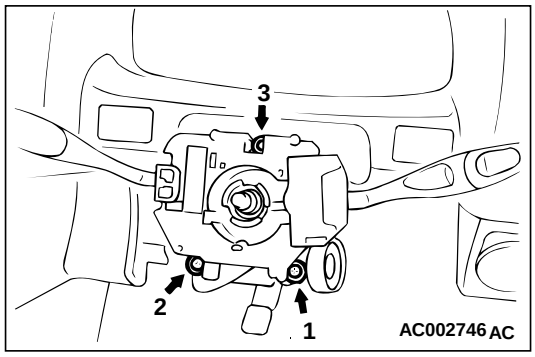
1. Insert the key in the steering lock cylinder and turn it to the "ACC" position.
2. Using a Phillips-head screwdriver (small) or similar tool, push the lock pin of the steering lock cylinder inward and then pull the steering lock cylinder toward you.



<<B>> IGNITION KEY RING ANTENNA REMOVAL

Turn the ignition key ring antenna to the left and remove it.

INSTALLATION SERVICE POINT



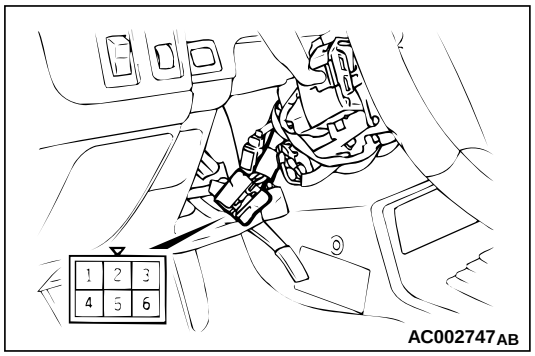
>>A<< COLUMN SWITCH ASSEMBLY INSTALLATION

Tighten the column switch assembly mounting screws to the specified torque in the order of 1, 2 and 3.

INSPECTION

M1543019501545

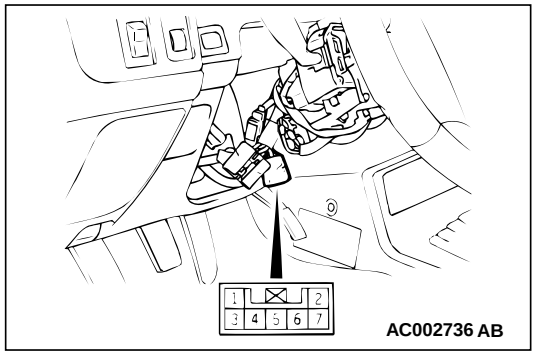
IGNITION SWITCH CONTINUITY CHECK



1. Remove the driver's side under cover.
2. Remove the column cover lower and upper.
3. Disconnect the wiring connector from the ignition switch.
4. Operate the switch and check the continuity between the terminals.

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

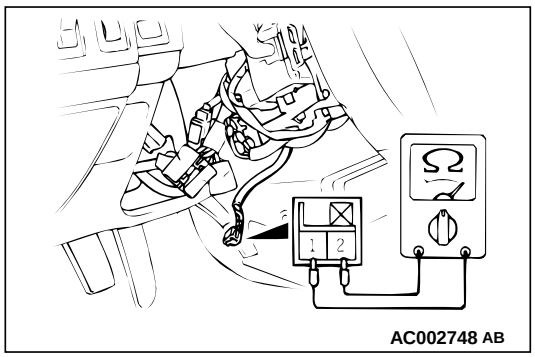
KEY REMINDER SWITCH CHECK



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

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

IGNITION KEY RING ANTENNA CHECK



Measure the continuity between terminal 1 and terminal 2.

Standard value: Should be less than 2 ohms

COMBINATION METERS ASSEMBLY AND VEHICLE SPEED SENSOR

INTRODUCTION TO COMBINATION METER DIAGNOSIS

M1543009900936

An electrical speedometer and tachometer and fuel gauge and engine coolant temperature gauge are mounted on all vehicles. If the speedometer or tachometer or fuel gauge or engine coolant temperature gauge does not function, there may be trouble in the electrical system.

EQUIPMENT DIAGNOSIS

COMBINATION METER DIAGNOSTIC TROUBLESHOOTING STRATEGY

M1543006900506

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 that the malfunction is eliminated.

TROUBLE SYMPTOM CHART

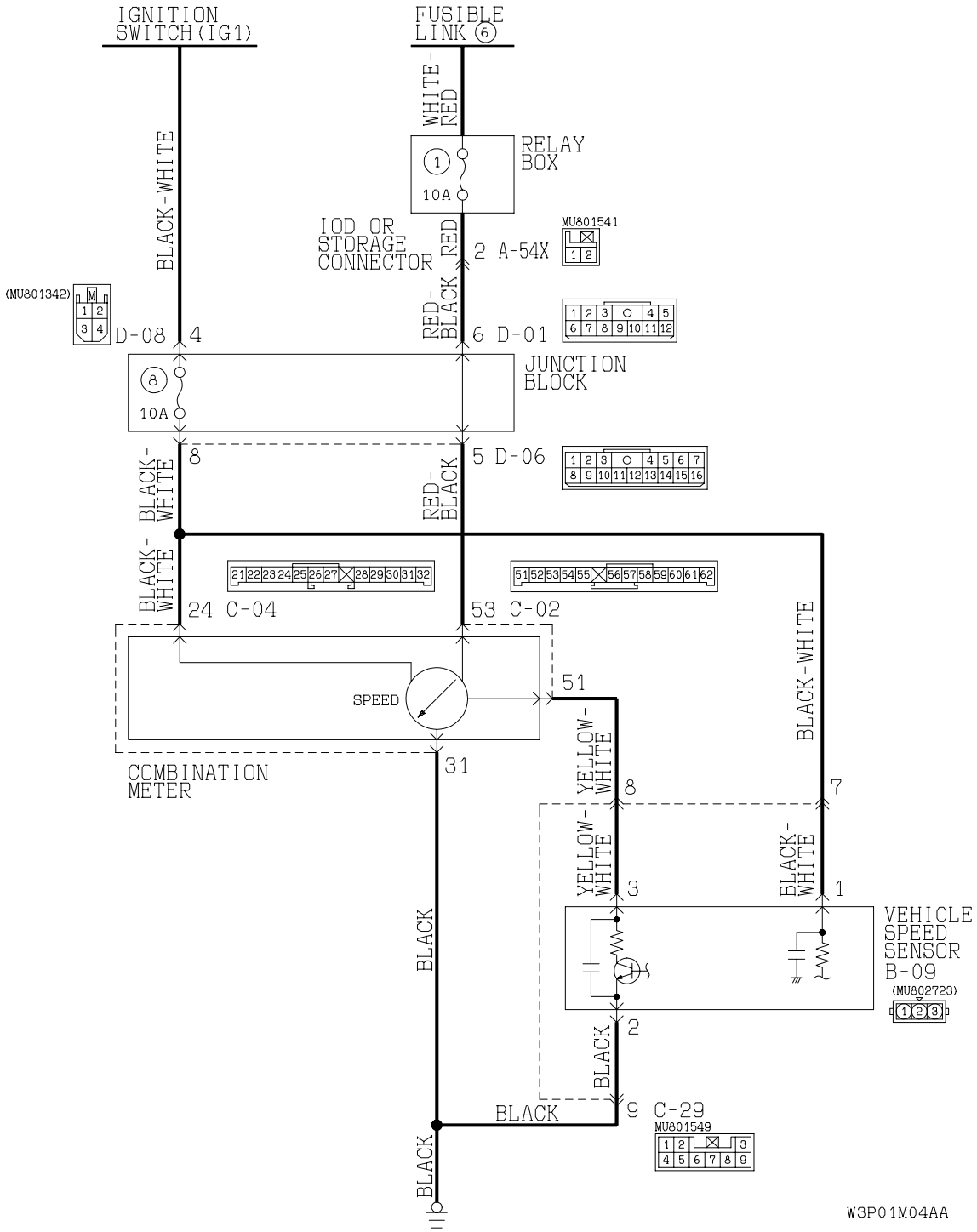
M1543007200696

SYMPTOM	INSPECTION PROCEDURE	REFERENCE PAGE
Speedometer does not work.	1	P.54-69
Tachometer does not work.	2	P.54-83
Fuel gauge does not work.	3	P.54-92
Engine coolant temperature gauge does not work.	4	P.54-98

SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: Speedometer does not Work.

Speedometer Circuit



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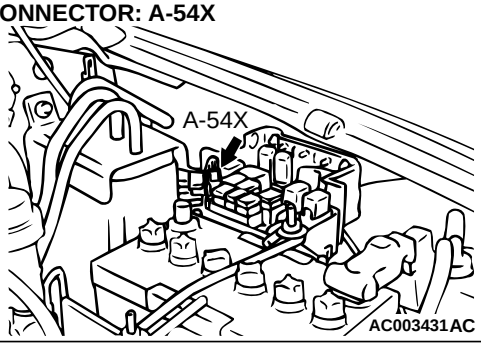
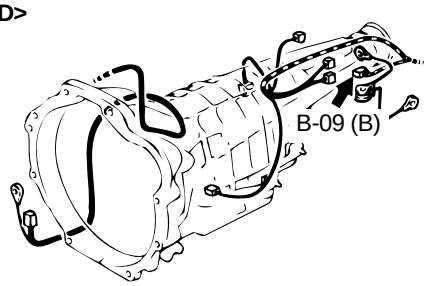
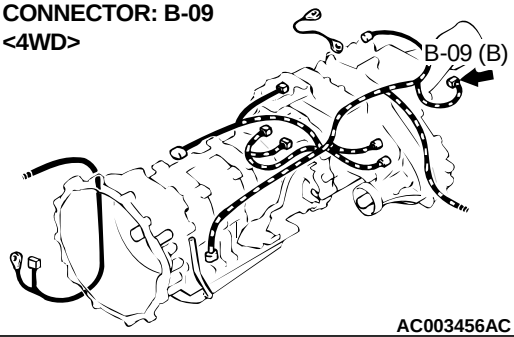
CONNECTOR: A-54X



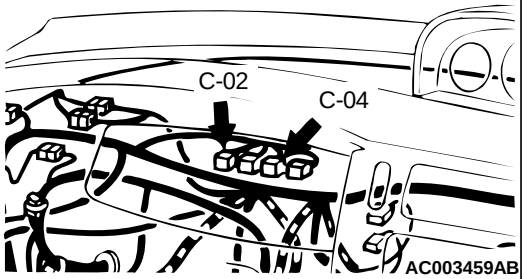
CONNECTOR: B-09
<RWD>



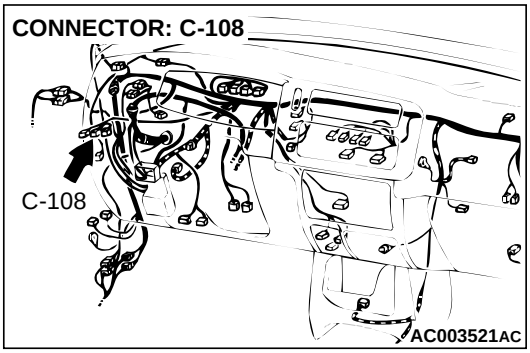
CONNECTOR: B-09
<4WD>



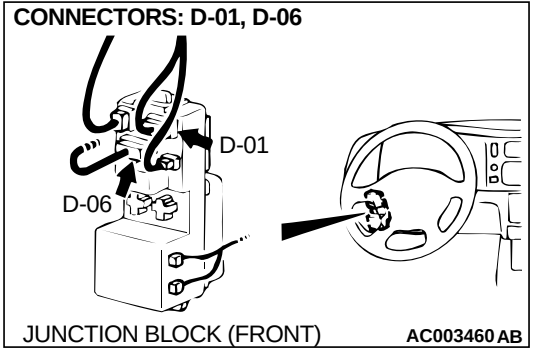
CONNECTORS: C-02, C-04



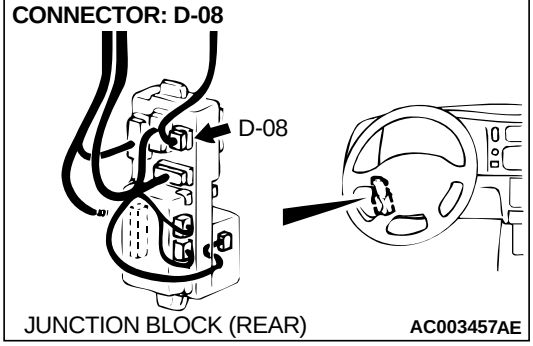
CONNECTOR: C-108



CONNECTORS: D-01, D-06



CONNECTOR: D-08



CIRCUIT OPERATION

- The ignition switch (IG1) circuit is the power source for the speedometer and vehicle speed sensor.
- Current flowing through fusible link number 8 is the backup power source.
- The vehicle speed sensor is installed on the transmission. Four pulses are generated with one turn of the vehicle speed sensor shaft. These pulse signals are input into the speedometer. The speedometer calculates the pulse signals that are input, and operates the indicator. At the same time, the travel distance is calculated.

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TECHNICAL DESCRIPTION (COMMENT)

The cause may be a defective vehicle speed sensor circuit system or a defective speedometer. Vehicle speed sensor is also used by the powertrain control module (PCM).

TROUBLESHOOTING HINTS

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

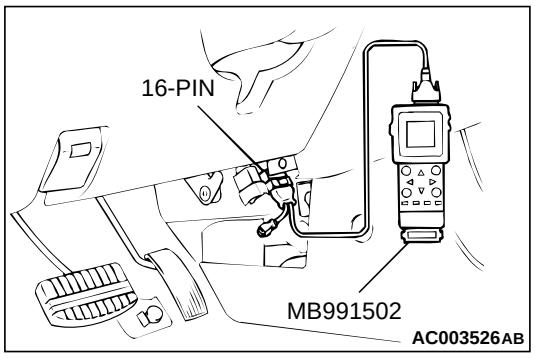
DIAGNOSIS

Required Special Tools:

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

⚠ CAUTION

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



STEP 1. Check the MFI system diagnostic trouble code.

(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 MFI system DTC P0500 output?

YES : Go to Step 15.
NO : Go to Step 2.

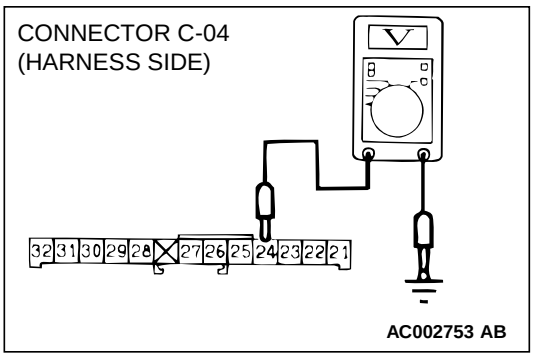
STEP 2. Check the odometer and trip odometer operation.

Q: Do the odometer and trip odometer work correctly?

YES : Go to Step 12.
NO : Go to Step 3.

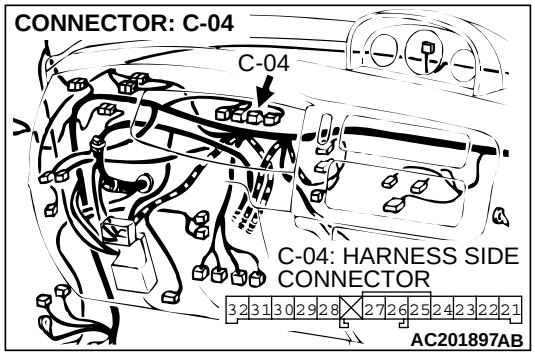
STEP 3. Check the combination meter power supply circuit at the combination meter connector C-04.

(1) Disconnect the combination meter connector C-04.
(2) Turn the ignition switch to the "ON" position.
(3) Measure the voltage between terminal 24 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 6.
NO : Go to Step 4.

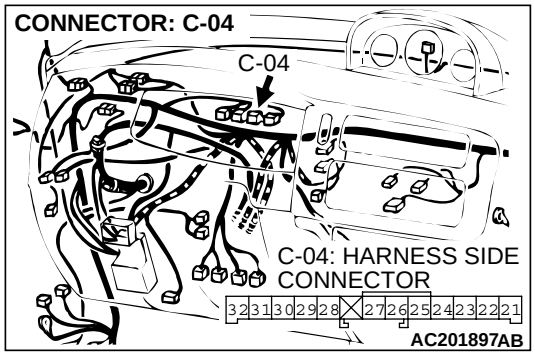


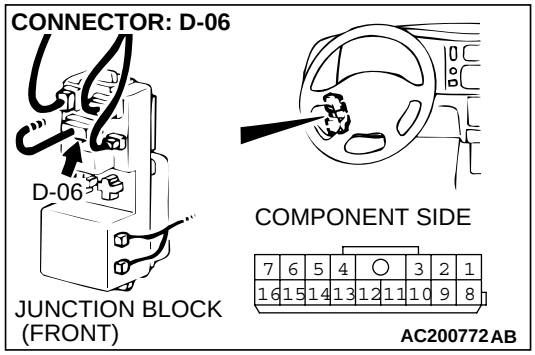
STEP 4. Check combination meter connector C-04 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

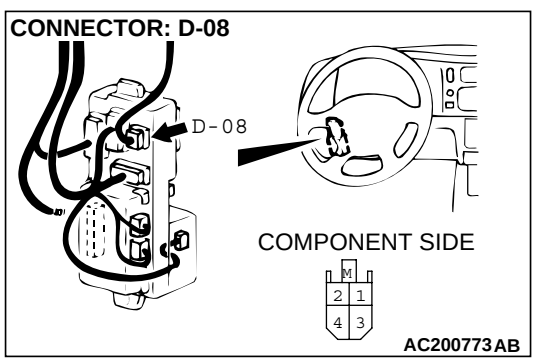
Q: Is combination meter connector C-04 in good condition?

YES : Go to Step 5.

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







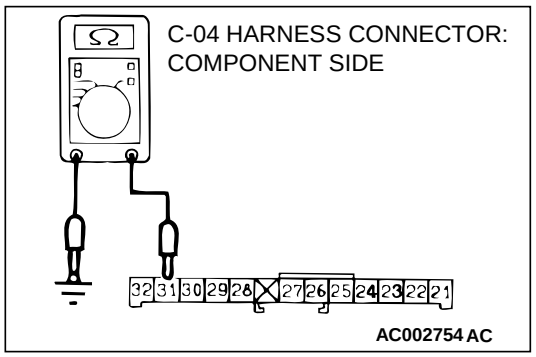
STEP 5. Check the harness wires between combination meter connector C-04 (terminal No.24) and ignition switch (IG1).

NOTE: After checking junction block connectors D-06 and D-08, check the wires. If junction block connectors D-06 and D-08 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the harness wires between combination meter connector C-04 (terminal No.24) and ignition switch (IG1) in good condition?

YES : There is no action to be taken.

NO : Repair them. The speedometer should work normally.

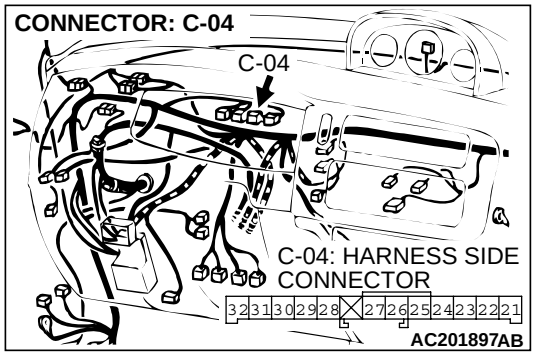


STEP 6. Check the combination meter (speedometer) ground circuit at the combination meter connector C-04.

(1) Disconnect the combination meter connector C-04.
(2) Measure the resistance between terminal 31 and ground.
- The measured value should be 2 ohms or less.

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

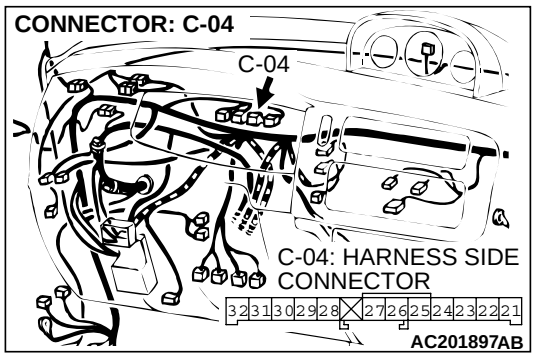
YES : Go to Step 9.
NO : Go to Step 7.



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

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

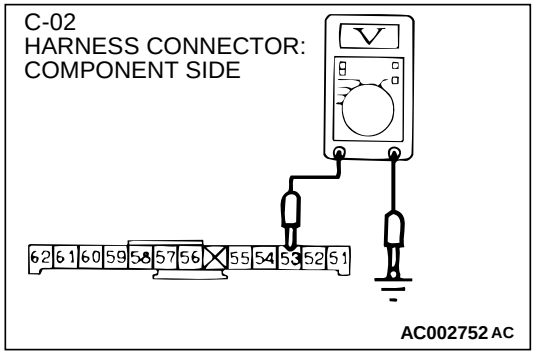
YES : Go to Step 8.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The speedometer should work normally.



STEP 8. Check the harness wire between combination meter connector C-04 (terminal No.31) and ground.

Q: Is the harness wire between combination meter connector C-04 and ground in good condition?

YES : There is no action to be taken.
NO : Repair it. The speedometer should work normally.

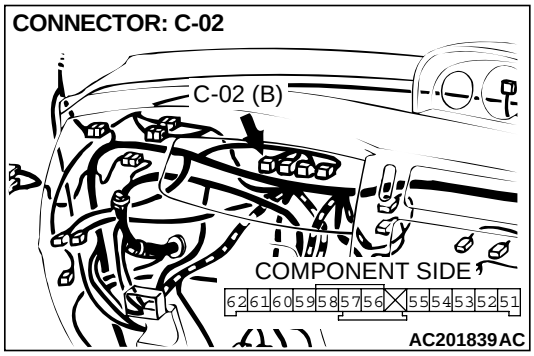


STEP 9. Check the combination meter power supply circuit at combination meter connector C-02.

(1) Disconnect combination meter connector C-02.
(2) Measure the voltage between terminal 53 and ground.
- The measured value should be approximately 12 volts (battery positive voltage).

Q: Does the measured voltage correspond with this range?

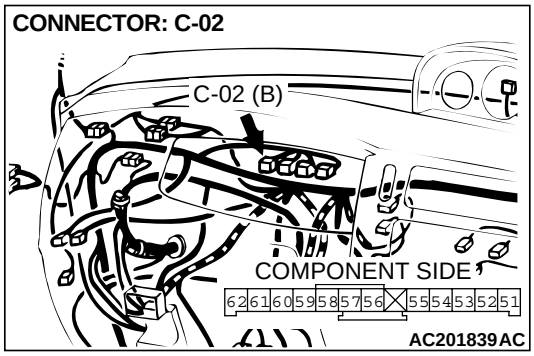
YES : Go to Step 12.
NO : Go to Step 10.

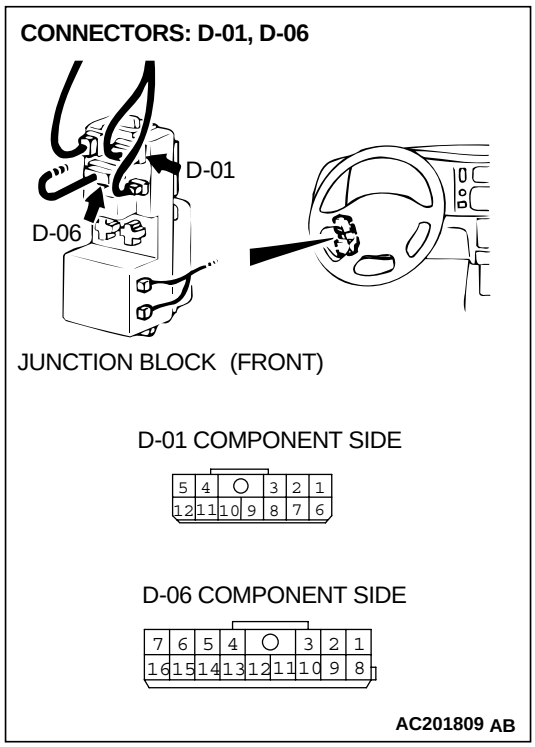


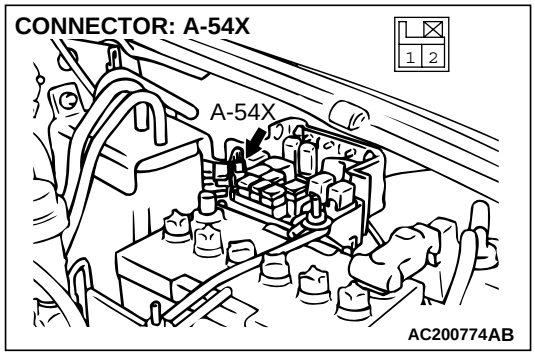
STEP 10. Check combination meter connector C-02 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

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

YES : Go to Step 11.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The speedometer should work normally.







STEP 11. Check the harness wires between combination meter connector C-02 (terminal No.53) and fusible link number 8.

NOTE: After checking junction block connectors D-01 and D-06 and IOD or storage connector A-54X, check the wires. If junction block connectors D-01 and D-06 and IOD or storage connector A-54X are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

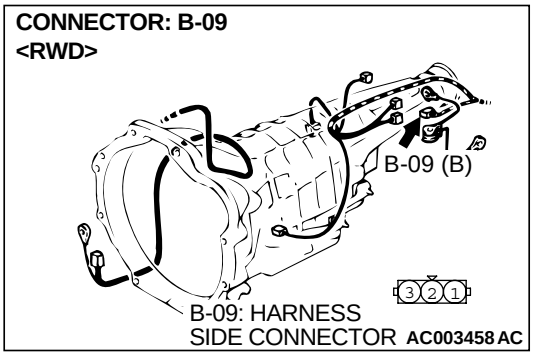
Q: Are the harness wires between combination meter connector C-02 (terminal No.53) and fusible link number 8?

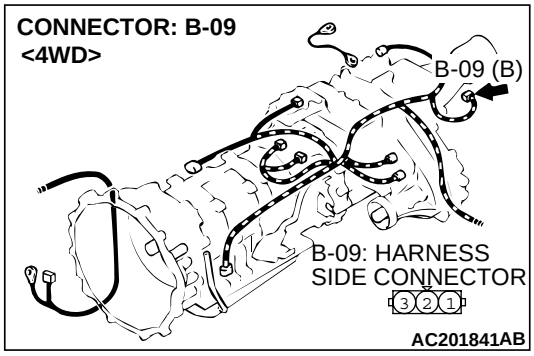
YES : There is no action to be taken.

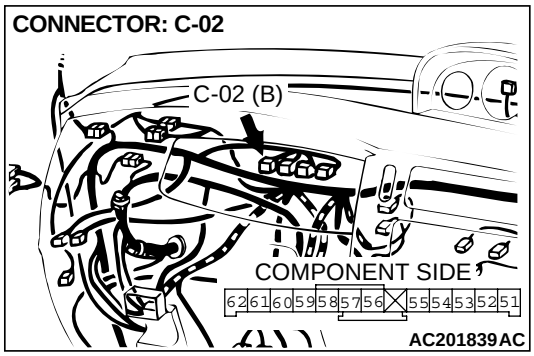
NO : Repair them. The speedometer should work normally.

STEP 12. Check the combination meter vehicle speed sensor input signal circuit at combination meter connector C-02.

(1) Do not disconnect vehicle speed sensor connector B-09.





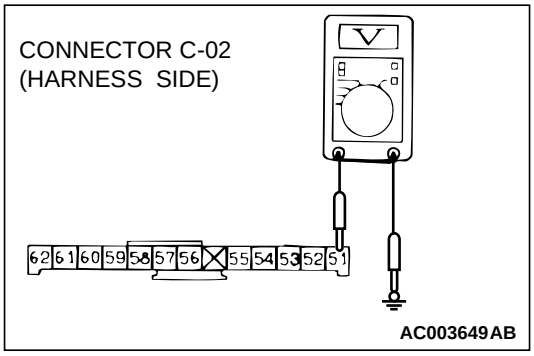


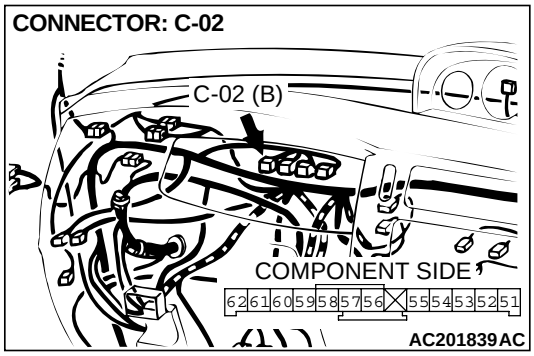
(2) Disconnect combination meter connector C-02.
(3) Turn the ignition switch to the "ON" position.
(4) Measure the voltage between terminal 51 and ground.
- The measured value should be approximately 5 volts.

Q: Does the measured voltage correspond with this range?

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

NO : Go to Step 13.





STEP 13. Check combination meter connector C-02 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

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

YES : Go to Step 14.

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

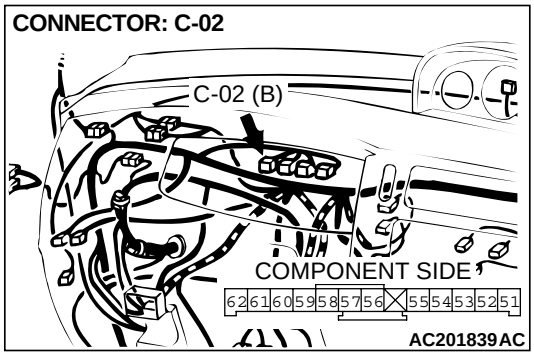
STEP 14. Check the harness wires between combination meter connector C-02 and vehicle speed sensor connector B-09.

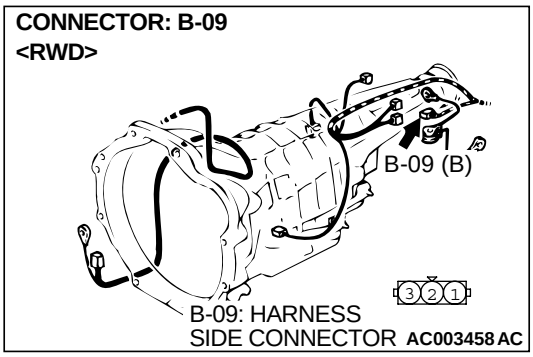
NOTE: After checking intermediate connector C-29, check the wires. If intermediate connector C-29 is damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

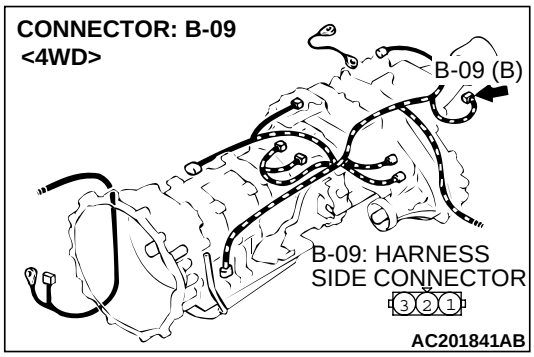
Q: Are the harness wires between combination meter connector C-02 and vehicle speed sensor connector B-09 in good condition?

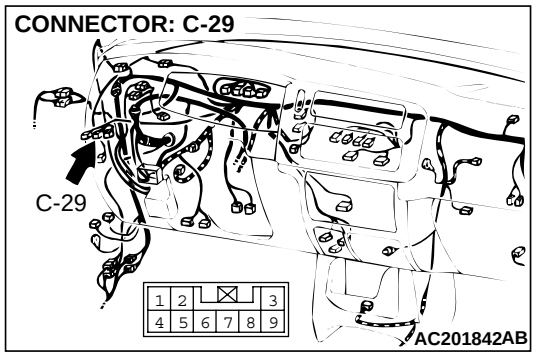
YES : There is no action to be taken.

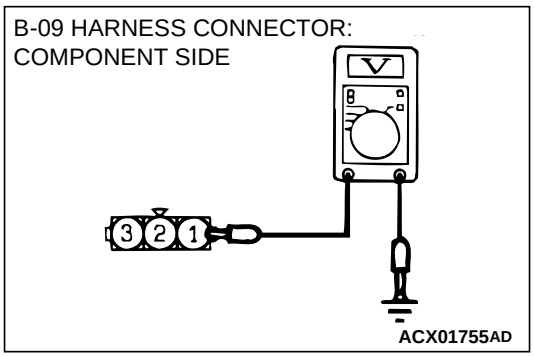
NO : Repair them. The speedometer should work normally.









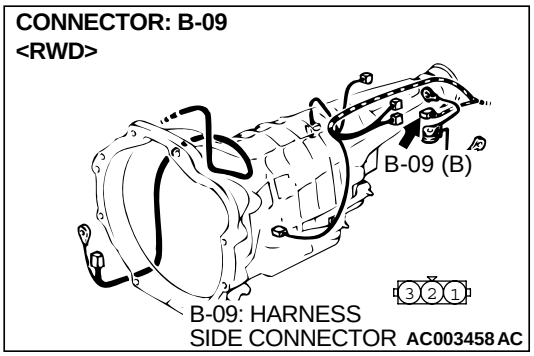


STEP 15. Measure the voltage at the vehicle speed sensor power supply circuit.

(1) Disconnect the vehicle speed sensor connector B-09.
(2) Turn the ignition switch to the "ON" position.
(3) Measure the voltage between terminal 1 and ground.
- The measured value should be approximately 12 volts (battery positive voltage).

Q: Does the measured voltage correspond with this range?

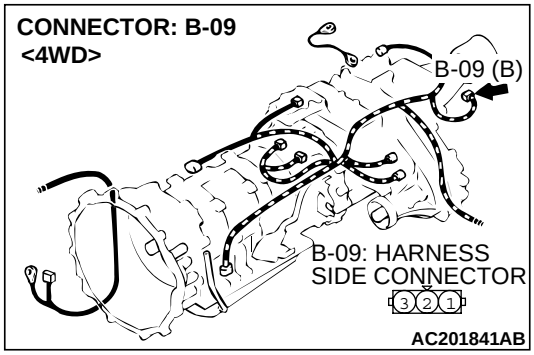
YES : Go to Step 18.
NO : Go to Step 16.



STEP 16. Check vehicle speed sensor connector B-09 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is vehicle speed sensor connector B-09 in good condition?

YES : Go to Step 17.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The speedometer should work normally.



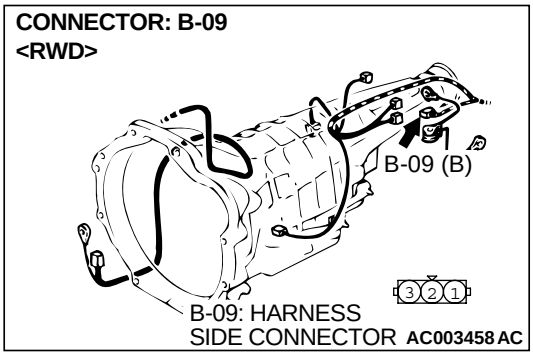
STEP 17. Check the harness wires between vehicle speed sensor connector B-09 (terminal No.1) and ignition switch (IG1).

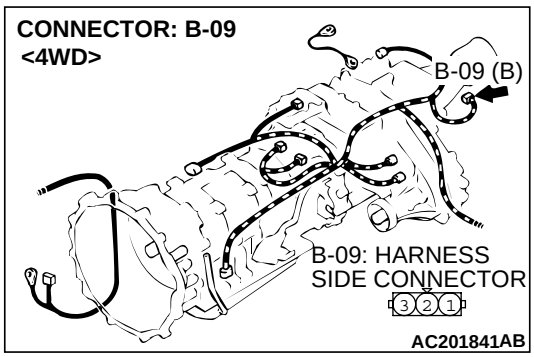
NOTE: After checking junction block connectors D-06 and D-08, check the wires. If junction block connectors D-06 and D-08 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

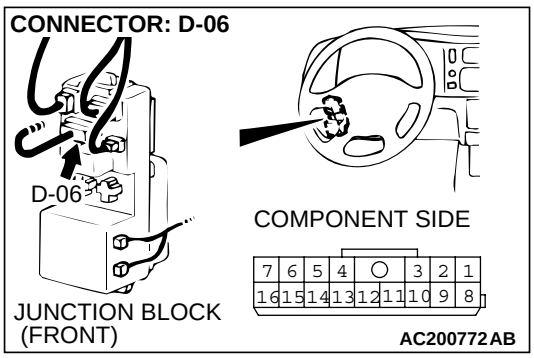
Q: Are the harness wires between vehicle speed sensor connector B-09 (terminal No.1) and ignition switch (IG1) in good condition?

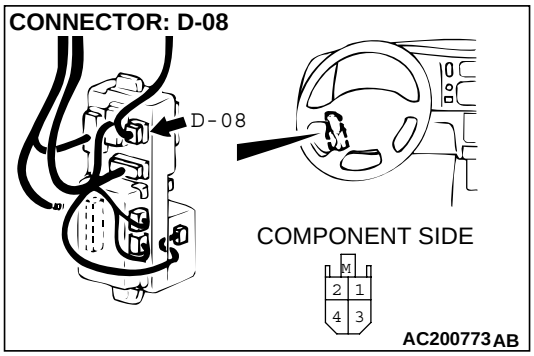
YES : There is no action to be taken.

NO : Repair them. The speedometer should work normally.

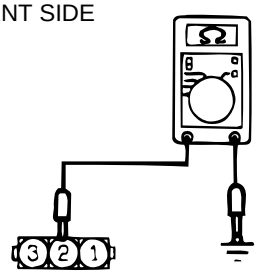








B-09 HARNESS CONNECTOR: COMPONENT SIDE



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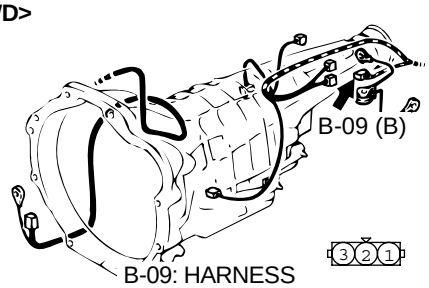
STEP 18. Check the resistance at the vehicle speed sensor ground circuit.

(1) Disconnect the vehicle speed sensor connector B-09.
(2) Measure the resistance between terminal 2 and ground.
- The measured value should be 2 ohms or less.

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

YES : Go to Step 21.
NO : Go to Step 19.

CONNECTOR: B-09 <RWD>



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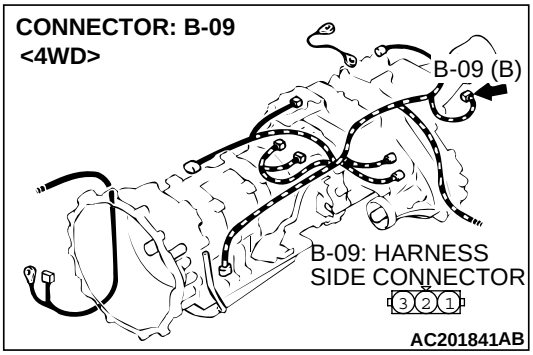
STEP 19. Check vehicle speed sensor connector B-09 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is vehicle speed connector B-09 in good condition?

YES : Go to Step 20.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The speedometer should work normally.

CONNECTOR: B-09 <4WD>



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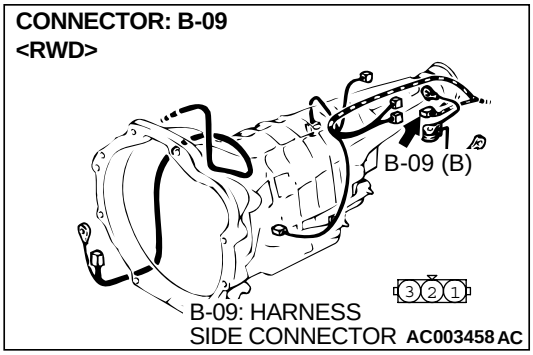
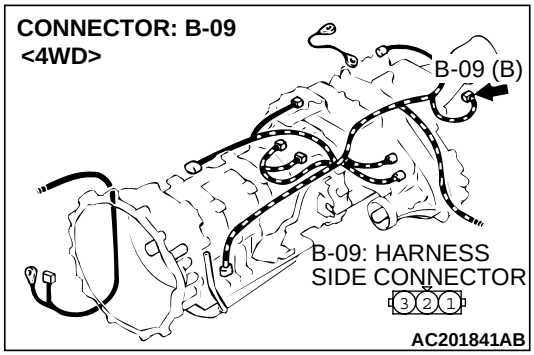
STEP 20. Check the harness wire between vehicle speed sensor connector B-09 (terminal No.2) and ground.

Q: Is the harness wire between vehicle speed sensor connector B-09 (terminal No.2) and ground in good condition?

YES : There is no action to be taken.

NO : Repair it. The speedometer should work normally.





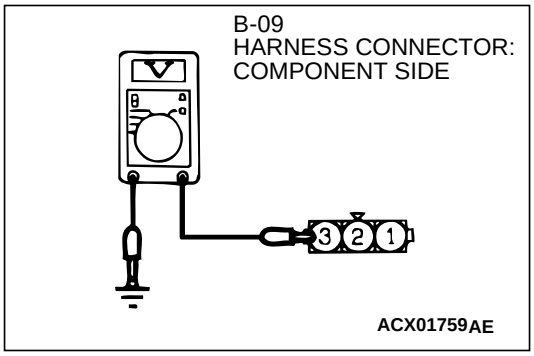
STEP 21. Check the vehicle speed sensor input signal circuit at the vehicle speed sensor connector B-09.

(1) Disconnect vehicle speed sensor connector B-09.
(2) Turn the ignition switch to the "ON" position.
(3) Measure the voltage between terminal 3 and ground.
- The measured value should be approximately 9 volts (battery positive voltage).

Q: Does the measured voltage correspond with this range?

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

Approximately nine volts : Go to Step 22.



STEP 22. Recheck for malfunction.

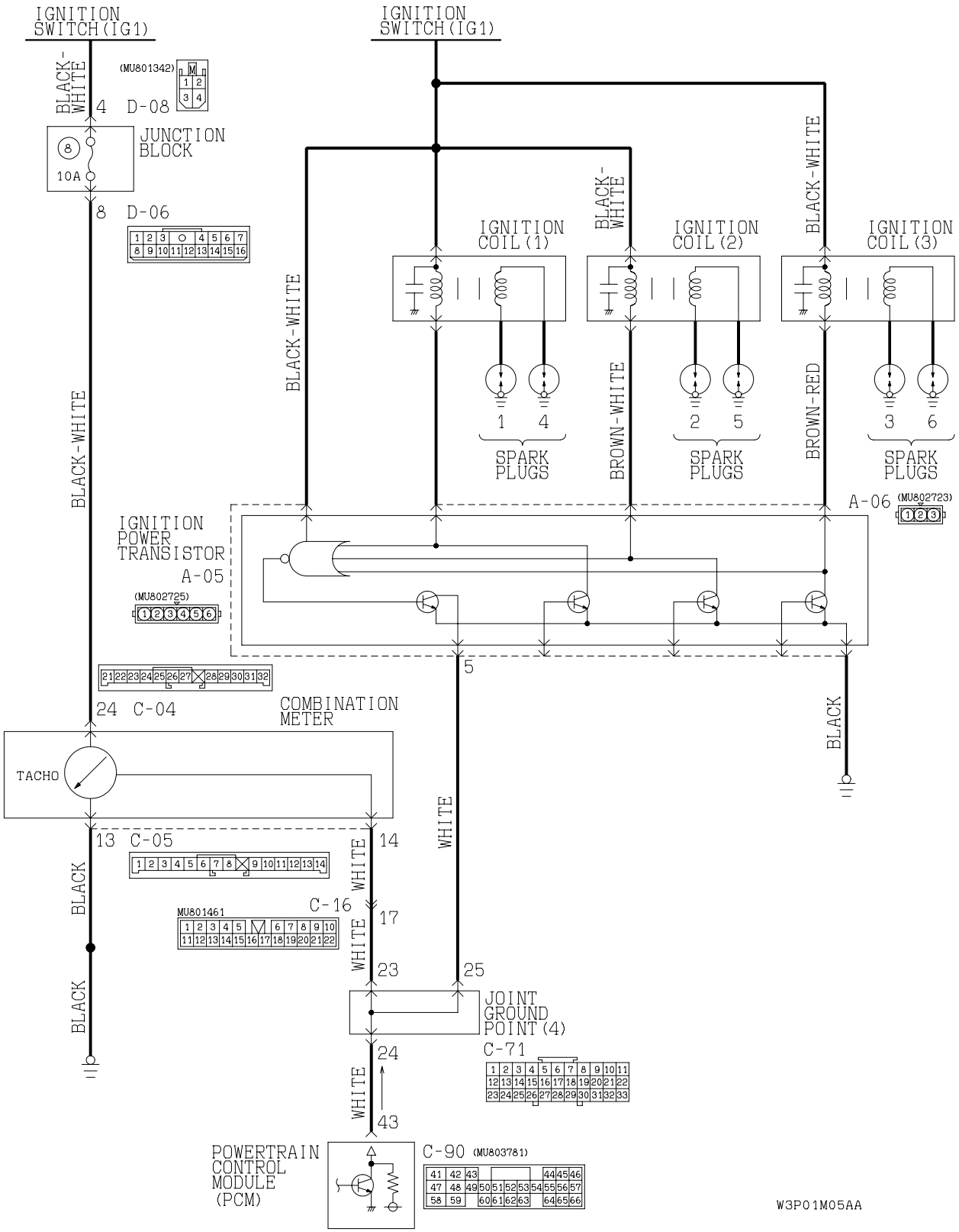
Q: Is a malfunction eliminated?

YES : The procedure is complete. If no malfunctions are found in all steps, an intermittent malfunction is suspected (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6).

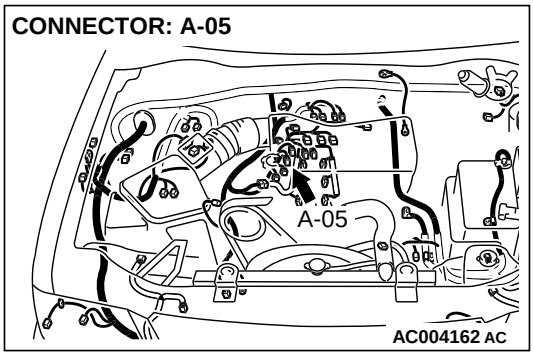
NO : Replace the speedometer.

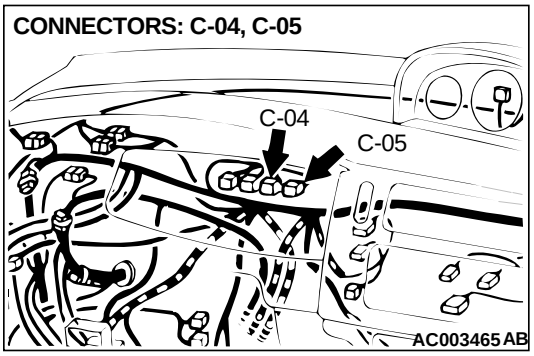
INSPECTION PROCEDURE 2: Tachometer does not Work.

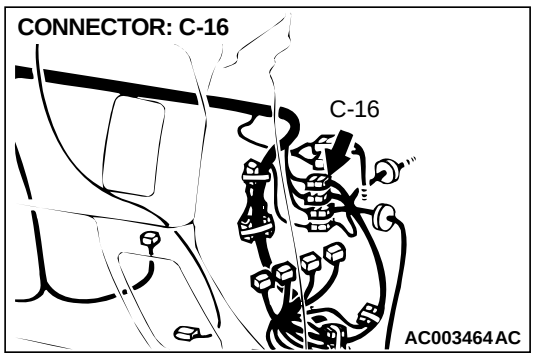
Tachometer Circuit

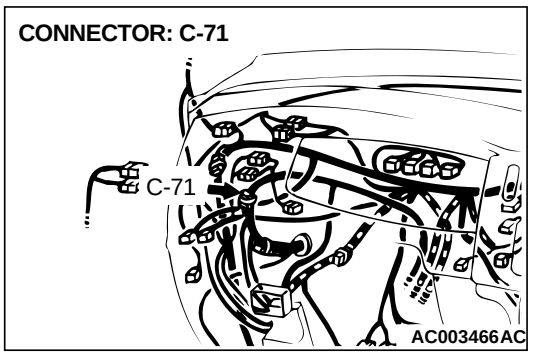


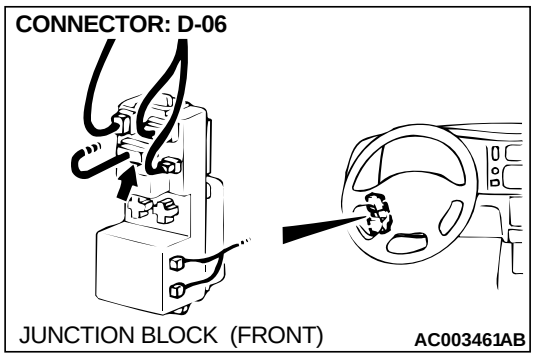
TSB Revision

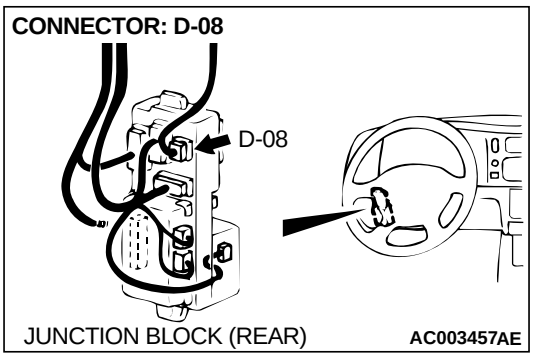












CIRCUIT OPERATION

- The tachometer power is supplied from the ignition switch (IG1) circuit.
- The tachometer detects the ignition signal by the ignition power transistor.

TECHNICAL DESCRIPTION (COMMENT)

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

TROUBLESHOOTING HINTS

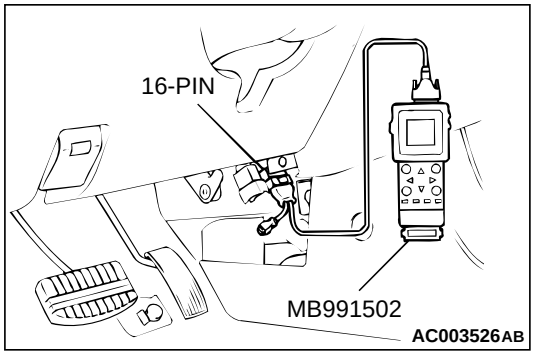
- Malfunction of the combination meter (printed circuit board or tachometer)
- Damaged harness wires or connectors

DIAGNOSIS

Required Special Tools:

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

TSB Revision



STEP 1. Check MFI diagnostic trouble code.

⚠ CAUTION

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

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

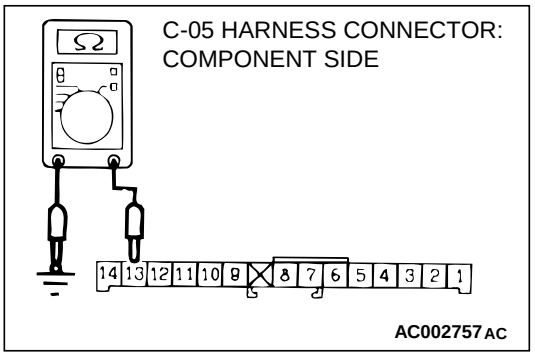
Q: Is MFI system diagnosis code output?

YES : Refer to GROUP 13A, MFI diagnosisP.13Ab-2.
NO : Go to Step 2.

STEP 2. Check the speedometer operation.

Q: Does the speedometer work normally?

YES : Refer to Inspection Procedure 1 P.54-69.
NO : Go to Step 3.



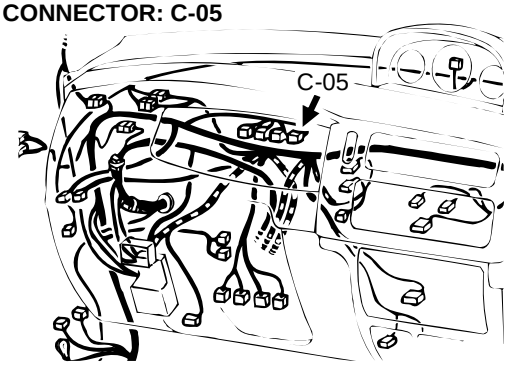
STEP 3. Check the combination meter (tachometer) ground circuit at combination meter connector C-05.

(1) Disconnect combination meter connector C-05.
(2) Measure the resistance between terminal 13 and ground.
- The measured value should be 2 ohms or less.

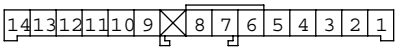
Q: Does the measured resistance value correspond with this range?

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

CONNECTOR: C-05



C-05 HARNESS CONNECTOR



AC201843 AB

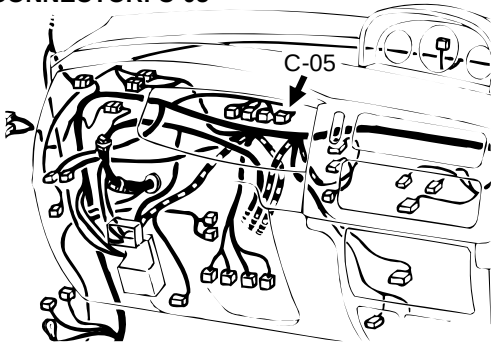
STEP 4. Check combination meter connector C-05 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is combination meter connector C-05 in good condition?

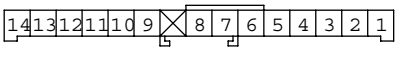
YES : Go to Step 5.

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

CONNECTOR: C-05



C-05 HARNESS CONNECTOR



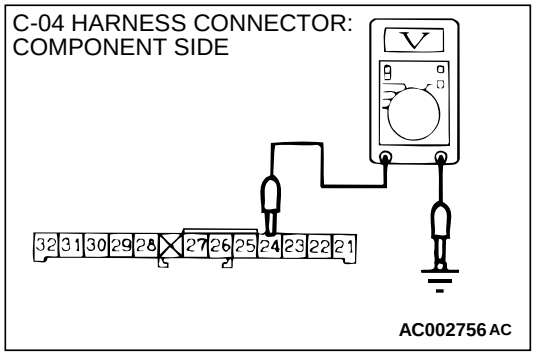
AC201843 AB

STEP 5. Check the harness wires between combination meter connector C-05 (terminal No.14) and ground.

Q: Are the harness wires between combination meter connector C-05 (terminal No.14) and ground in good condition?

YES : There is no action to be taken.

NO : Repair them. The tachometer should work normally.

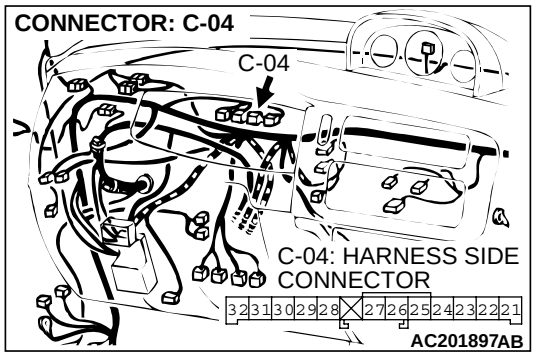


STEP 6. Check the ignition signal input circuit at combination meter connector C-04.

(1) Disconnect combination meter connector C-04.
(2) Start the engine and run at idle.
(3) Measure the voltage between terminal 24 and ground by back probing.
The measured value should be approximately 10 volts.

Q: Does the measured voltage correspond with this range?

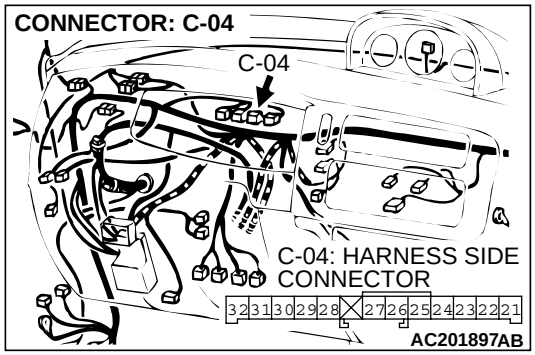
YES : Repair or replace the combination meter (printed-circuit board or speedometer and tachometer).
NO : Go to Step 7.



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

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

YES : Go to Step 8.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The tachometer should work normally.



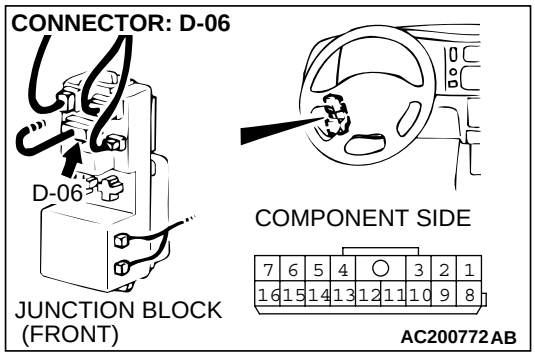
STEP 8. Check the harness wires between combination meter connector C-04 (terminal No.24) and ignition switch (IG1).

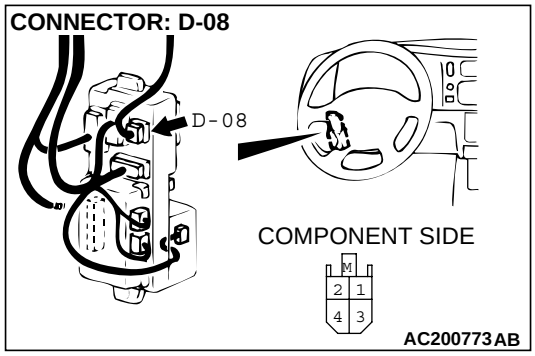
NOTE: After checking junction block connector D-06 and D-08, check the wires. If junction block connector D-06 and D-08 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wires between combination meter connector C-04 (terminal No.24) and ignition switch (IG1) in good condition?

YES : Go to Step 9.

NO : Repair them. The tachometer should work normally.





STEP 9. Check the circuit at ignition power transistor connector A-05.

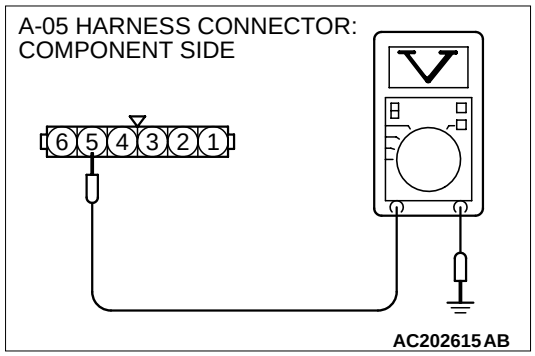
(1) Disconnect connector A-05 and measure at the harness side.
(2) Turn the ignition switch to the "ON" position.
(3) Measure the voltage between terminal 5 and ground.
- Voltage should be four volts or more.

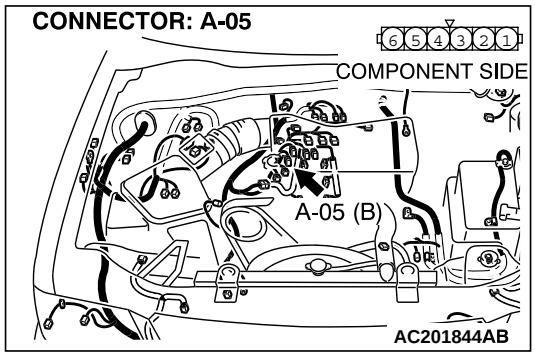
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Does the measured voltage correspond with this range?

YES : Replace the ignition power transistor. Then confirm that the malfunction symptom is eliminated.

NO : Go to Step 10.



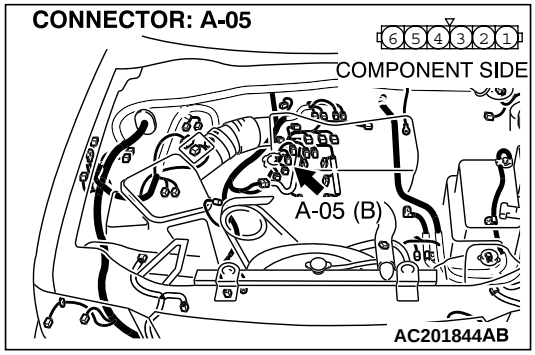


STEP 10. Check ignition power transistor connector A-05 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is combination meter connector A-05 in good condition?

YES : Go to Step 11.

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

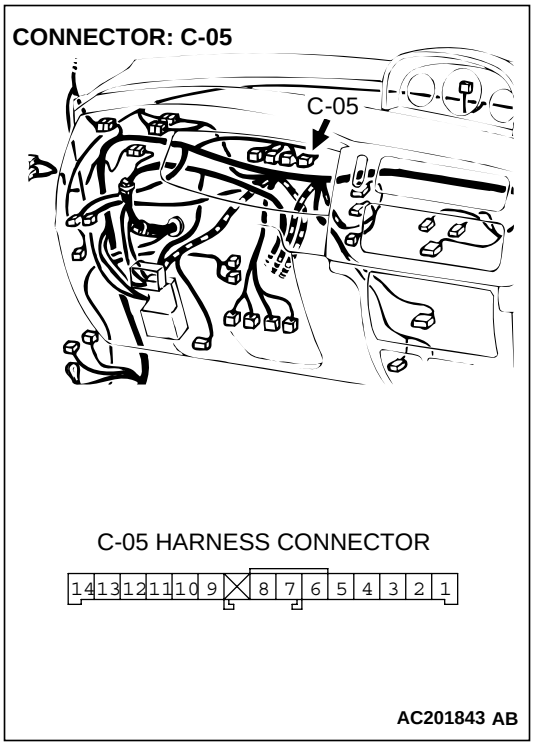


STEP 11. Check ignition power transistor connector A-05 and combination meter connector C-05 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

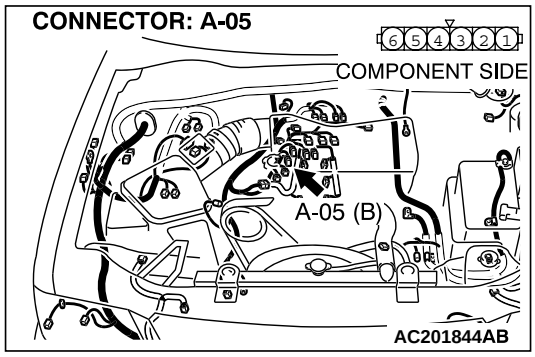
Q: Are ignition power transistor connector A-05 and combination meter connector C-05 in good condition?

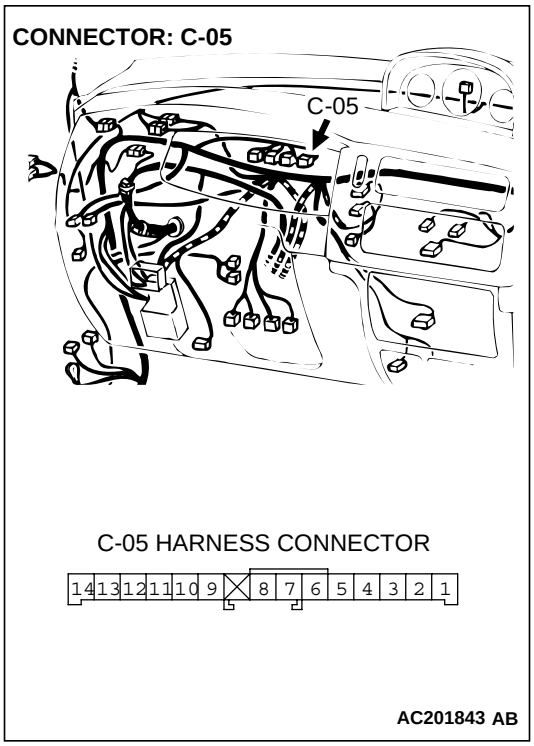
YES : Go to Step 12.

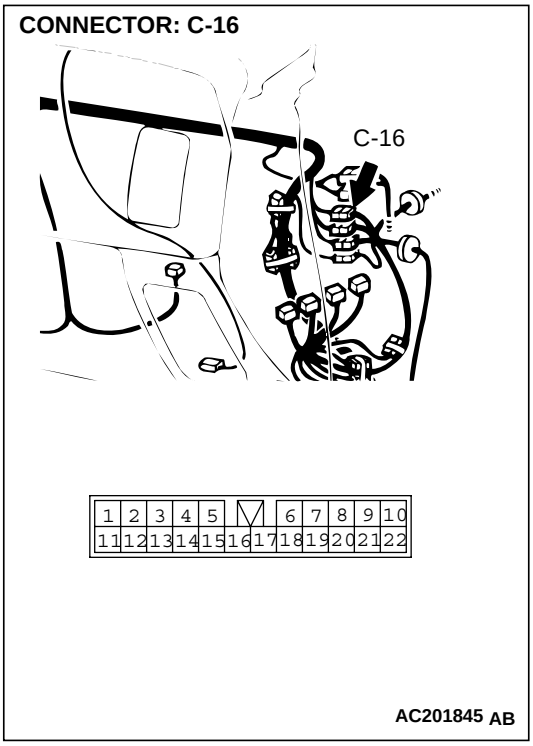
NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The tachometer should work normally.



STEP 12. Check the harness wire between combination meter connector C-05 (terminal No.14) and ignition power transistor connector A-05 (terminal No.5).







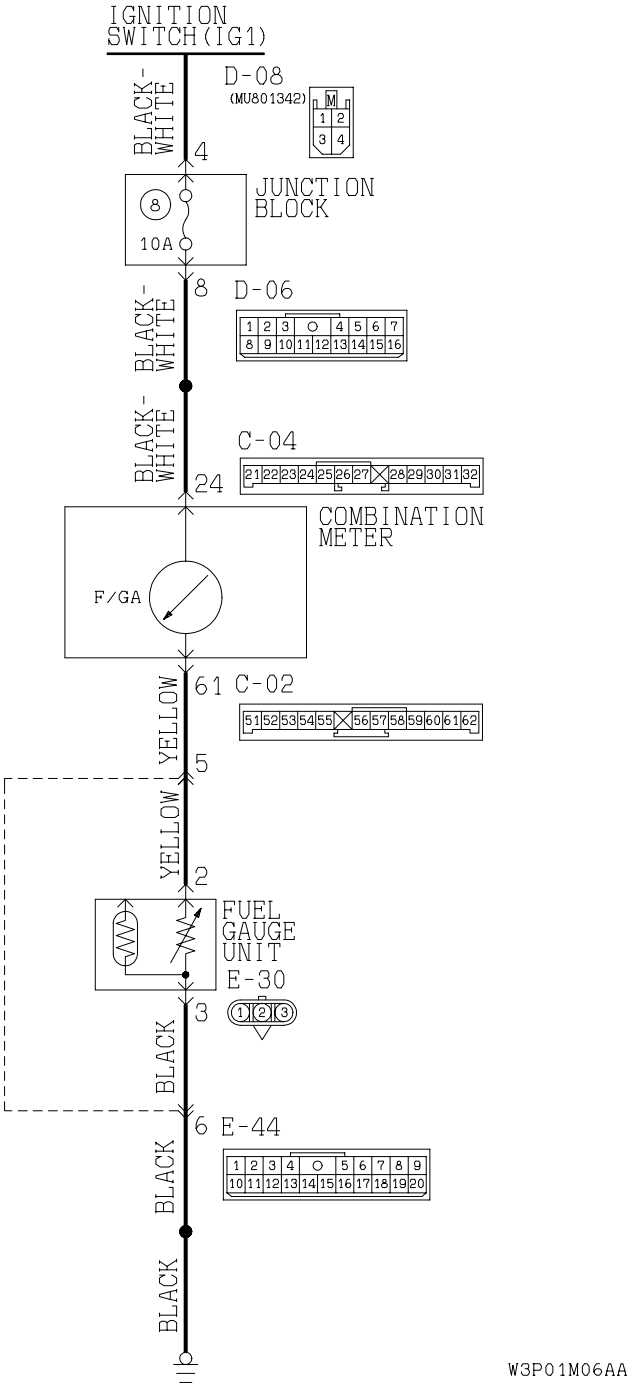
NOTE: After checking intermediate connector C-16 and joint connector (4) C-71, check the wires. If intermediate connector C-16 and joint connector (4) C-71 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

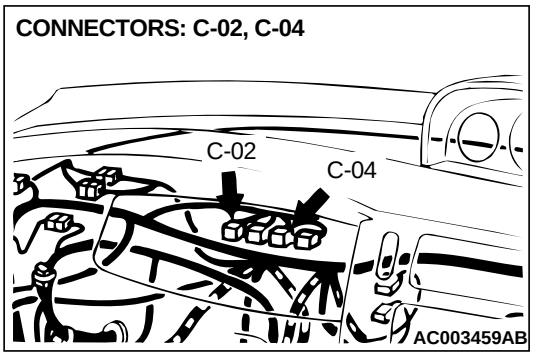
Q: Is the harness wire between combination meter connector C-05 (terminal No.14) and ignition power transistor connector A-05 (terminal No.5) in good condition?

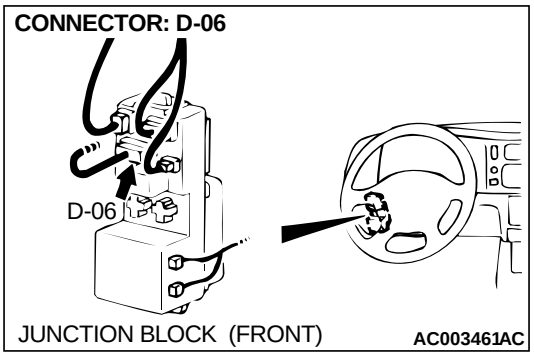
YES : There is no action to be taken.
NO : Repair it. The tachometer should work normally.

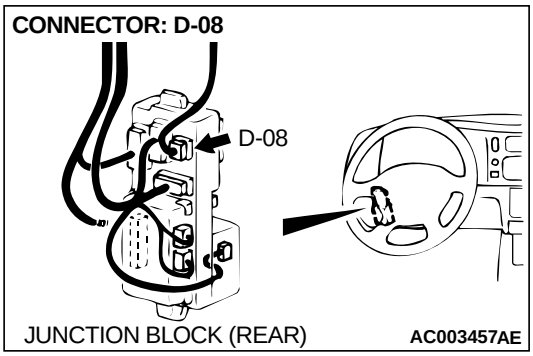
INSPECTION PROCEDURE 3: Fuel Gauge does not Work.

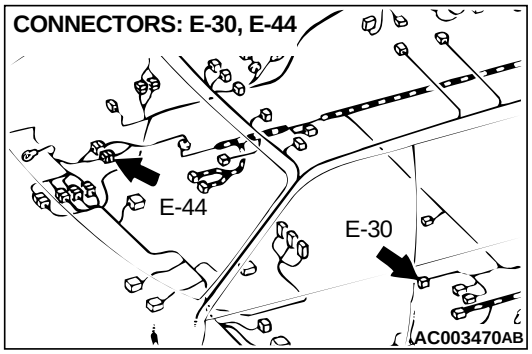
Fuel Gauge Circuit











CIRCUIT OPERATION

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

TECHNICAL DESCRIPTION (COMMENT)

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

TROUBLESHOOTING

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

DIAGNOSIS

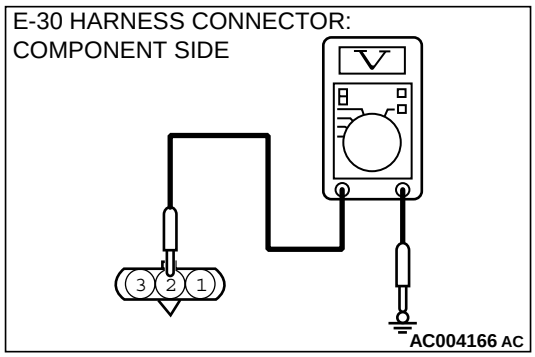
Required Special Tool:

- MB991223: Harness Set

STEP 1. Check the speedometer operation.

Q: Does the speedometer work normally?

YES : Go to Step 2.
NO : Refer to Inspection Procedure 1 P.54-69.

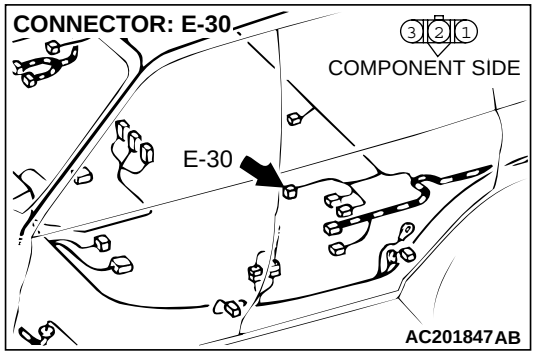


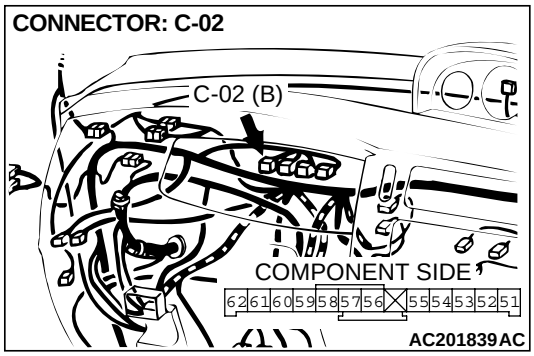
STEP 2. Check the fuel gauge unit signal circuit at fuel gauge unit connector E-30.

(1) Disconnect fuel gauge unit connector E-30.
(2) Turn the ignition switch to the "ON" position.
(3) Measure the voltage between terminal 2 and ground.
- The measured value should be approximately 5 volts (battery positive voltage).

Q: Does the measured voltage correspond with this range?

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





STEP 3. Check fuel gauge unit connector E-30 and combination meter connector C-02 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are fuel gauge unit connector E-30 and combination meter connector C-02 in good condition?

YES : Go to Step 4.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The fuel gauge should work normally.

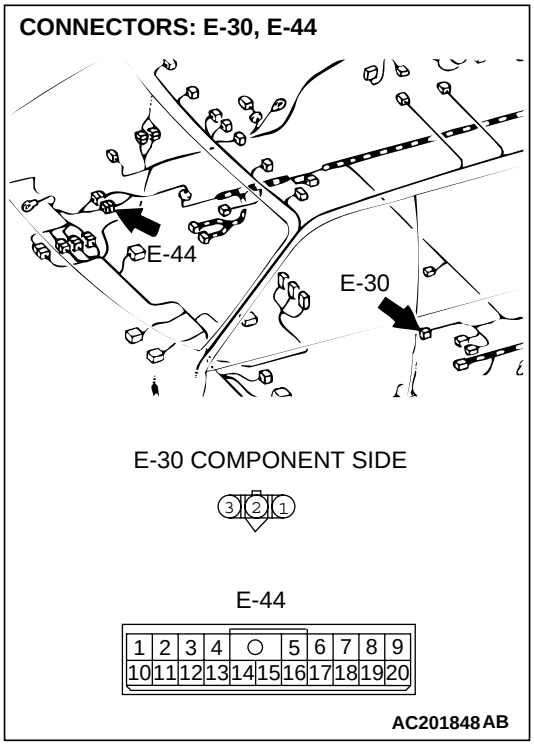
STEP 4. Check the harness wires between fuel gauge unit connector E-30 (terminal No.2) and combination meter connector C-02 (terminal No.61).

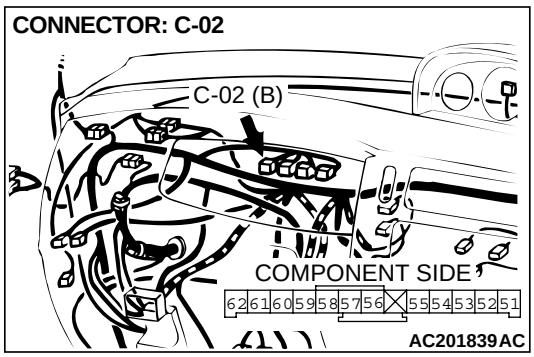
NOTE: After checking intermediate connector E-44, check the wire. If intermediate connector E-44 is damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wires between fuel gauge unit connector E-30 (terminal No.2) and combination meter connector C-02 (terminal No.61) in good condition?

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

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





STEP 5. Check the fuel gauge unit ground circuit at fuel gauge unit connector E-30.

(1) Disconnect fuel gauge unit connector E-30.

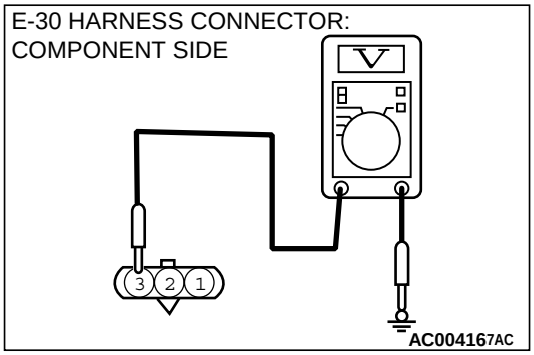
(2) Measure the resistance between terminal 3 and ground.

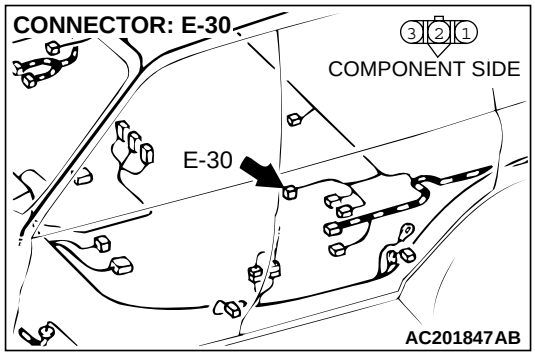
- The measured value should be 2 ohms or less.

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

YES : Go to Step 8.

NO : Go to Step 6.



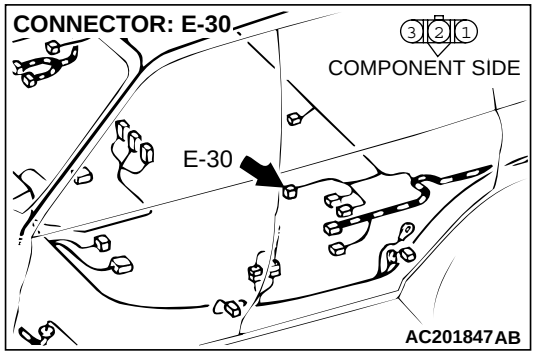


STEP 6. Check the fuel gauge unit connector E-30 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is fuel gauge unit connector E-30 in good condition?

YES : Go to Step 7.

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

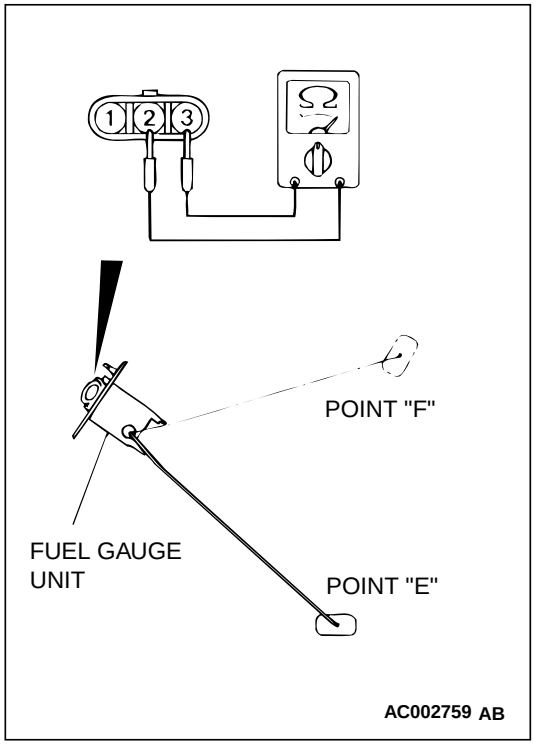


STEP 7. Check the harness wire between fuel gauge unit connector E-30 (terminal No.3) and ground.

Q: Is the harness wire between fuel gauge unit connector E-30 (terminal No.3) and ground in good condition?

YES : There is no action to be taken.

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



STEP 8. Check the fuel gauge unit.

(1) Remove the fuel gauge unit from the fuel tank. Refer to GROUP 13C, Fuel Tank P.13B-9.

(2) Check resistance value between terminals 2 and 3 is at standard value when the fuel gauge unit float is at point "F" (highest) and point "E" (lowest).

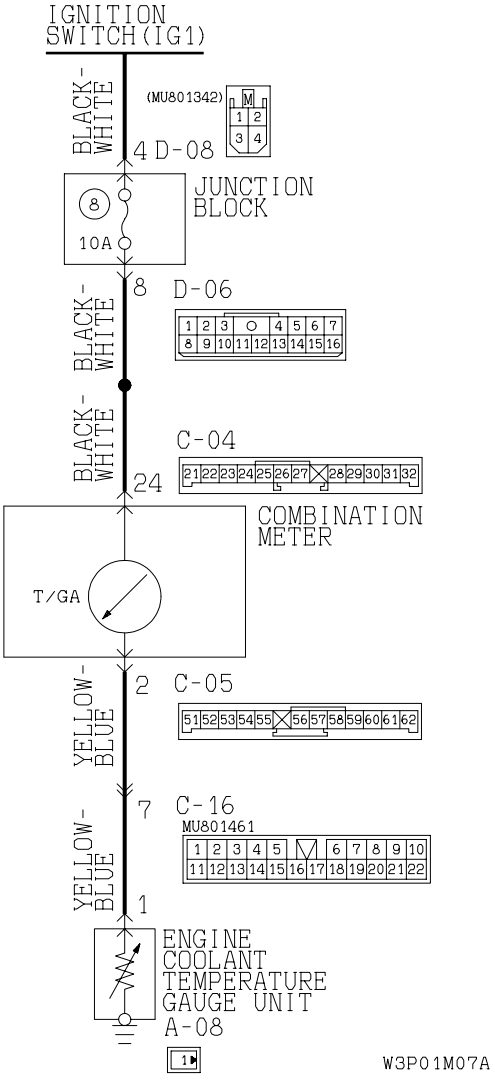
(3) Check that the resistance value changes smoothly when the float moves slowly between point "F" (highest) and "E" (lowest).

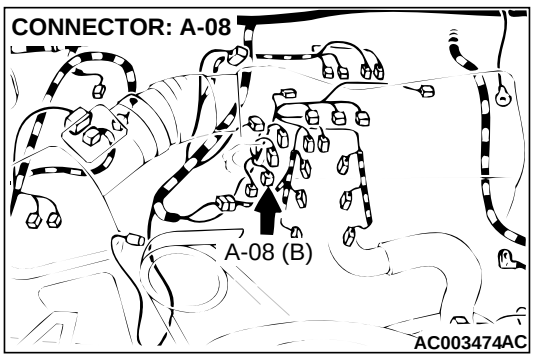
Q: Is the resistance 1 – 5 ohms (at point "F") and 103 – 117 ohms (at point "E")?

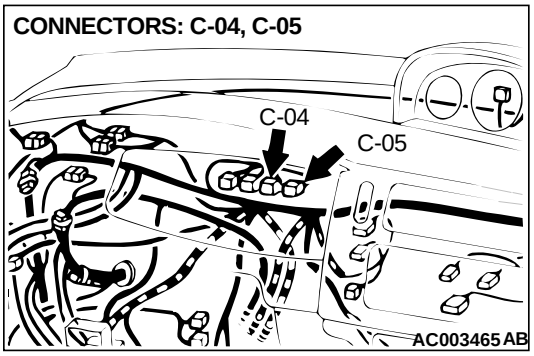
YES : Repair or replace the combination meter (printed-circuit board or fuel gauge assembly). The fuel gauge should work normally.

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

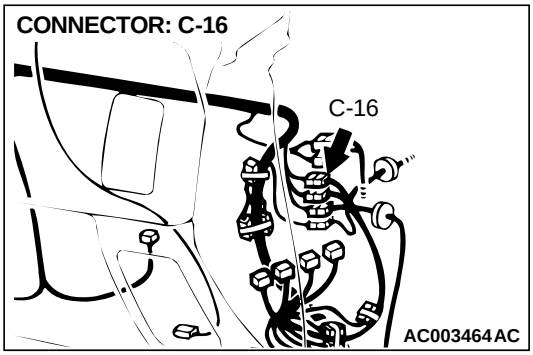
INSPECTION PROCEDURE 4: Engine Coolant Temperature Gauge does not Work.

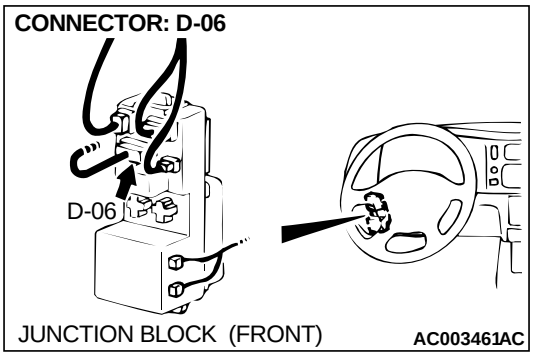


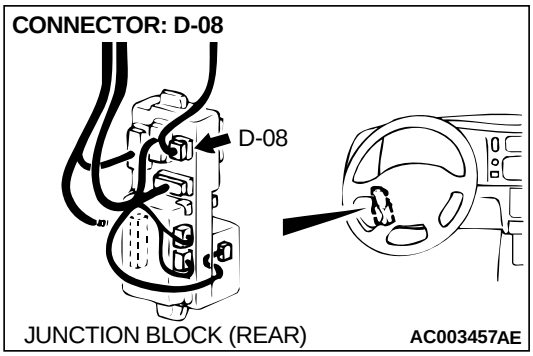




TSB Revision







CIRCUIT OPERATION

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

TECHNICAL DESCRIPTION (COMMENT)

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

TROUBLESHOOTING

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

DIAGNOSIS

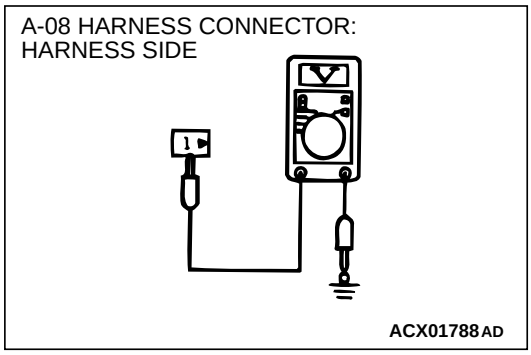
Required Special Tool:

- MB991223: Harness Set

STEP 1. Check the speedometer operation.

Q: Does the speedometer work normally?

YES : Go to Step 2.
NO : Refer to Inspection Procedure 1 P.54-69.

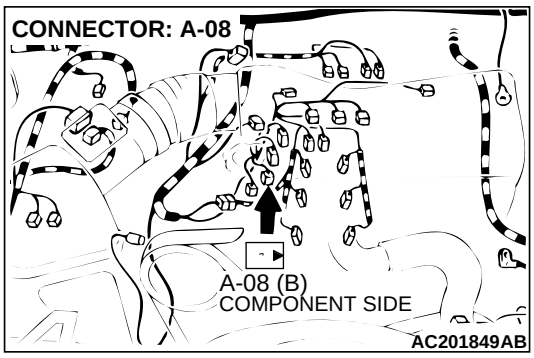


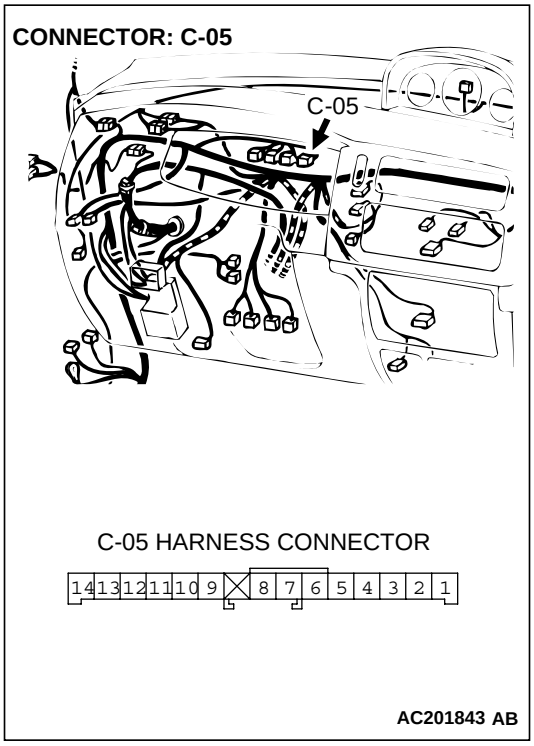
STEP 2. Check the engine coolant temperature sensor signal circuit at the engine coolant temperature sensor connector A-08 by backprobing.

(1) Do not disconnect the engine coolant temperature sensor connector A-08.
(2) Turn the ignition switch to the "ON" position.
(3) Measure the voltage between terminal 1 and ground by backprobing.
The measured value should be approximately nine volts.

Q: Does the measured voltage correspond with this range?

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



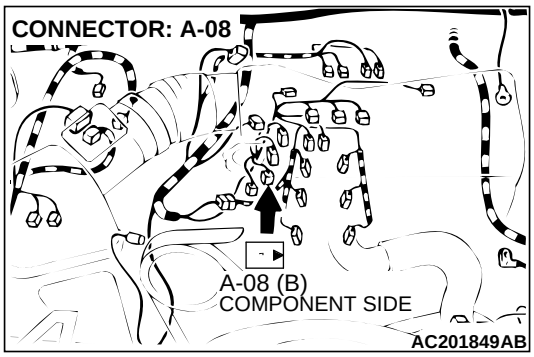


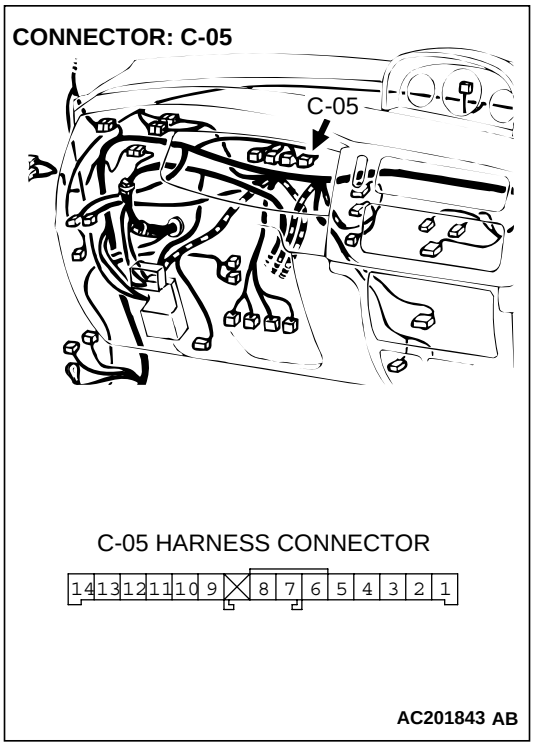
STEP 3. Check engine coolant temperature sensor connector A-08 (terminal No.1) and combination meter connector C-05 (terminal No.2) for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are engine coolant temperature sensor connector A-08 (terminal No.1) and combination meter connector C-05 (terminal No.2) in good condition?

YES : Go to Step 4.

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





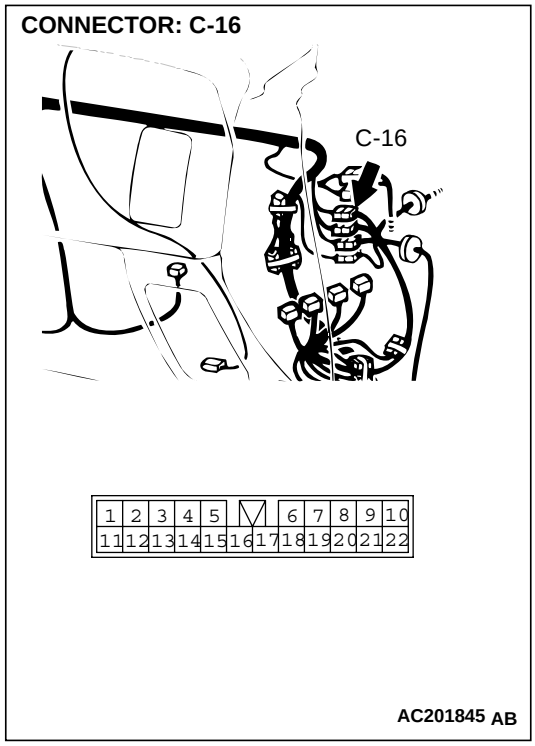
STEP 4. Check the harness wires between engine coolant temperature sensor connector A-08 (terminal No.1) and combination meter connector C-05 (terminal No.2).

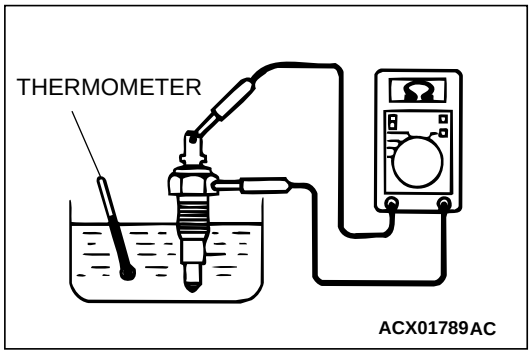
NOTE: After checking intermediate connector C-16, check the wire. If intermediate connector C-16 is damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wires between engine coolant temperature sensor connector A-08 (terminal No.1) and combination meter connector C-05 (terminal No.2) in good condition?

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

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





STEP 5. Measure the engine coolant temperature gauge unit.

(1) Drain the engine coolant. Refer to GROUP 00, Maintenance Service – Engine Coolant P.00-47.
(2) Remove the engine coolant temperature gauge unit.
(3) Immerse the unit in 78° C (158°F) water to measure the resistance.
- The measured value should be 104 ± 13.5 ohms.

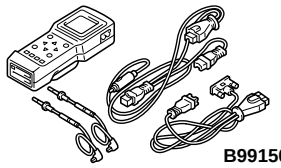
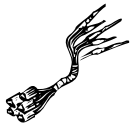
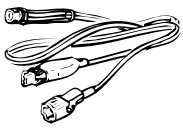
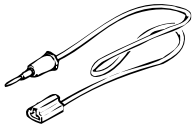
Q: Does the measured resistance value correspond with this range?

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

NO : Replace the engine coolant temperature gauge unit. The engine coolant temperature gauge should work normally.

SPECIAL TOOLS

M1543000600897

TOOL	TOOL NUMBER AND NAME	REPLACED BY MILLER TOOL NUMBER	APPLICATION
 B991502	MB991502 Scan tool (MUT-II)	DRB-III (Scan tool)	Reading MFI system diagnostic trouble code
A  B  C  D  MB991223AC	MB991223 A: MB991219 B: MB991220 C: MB991221 D: MB991222 Harness set A: Test harness B: LED harness C: LED harness adapter D: Probe	General service tool (jumper)	Making voltage and resistance measurements during troubleshooting A: Connect pin contact pressure inspection B: Power circuit inspection C: Power circuit inspection D: Commercial tester connection

ON-VEHICLE SERVICE

SPEEDOMETER CHECK

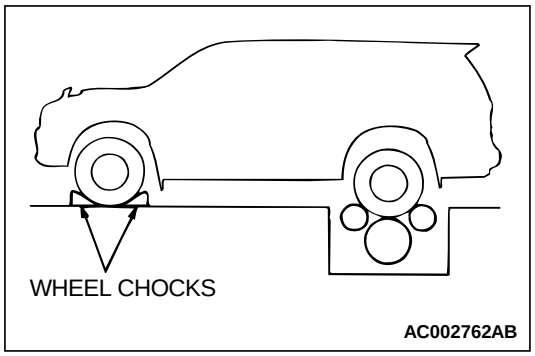
M1543000900274

Adjust the pressure of tires to the specified level. Refer to GROUP 31, On-vehicle Service P.31-7.

⚠ CAUTION

Place the transfer shift lever to "2H" position.

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



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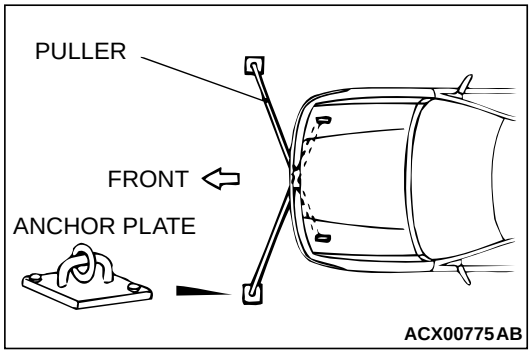


2. To prevent the sideward shaking of the front wheel, attach the puller on the towing hook and the tie down hook at front side and connect its both ends to the anchor plate.
3. To prevent the jumping out of the vehicle, attach the chain and the wire whose both ends are tightly fixed to the rear towing hook.

⚠ CAUTION

Do not increase/decrease speed rapidly while testing.

4. Check if the speedometer indicator range is within the standard values.

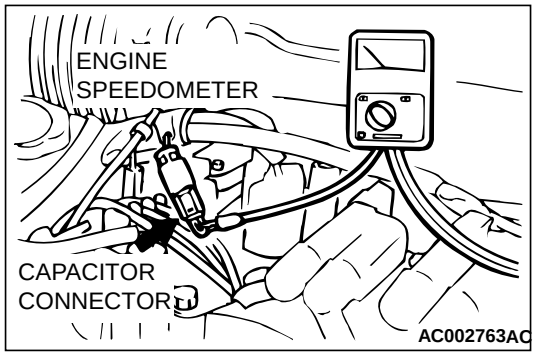
Standard value:

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)

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

TACHOMETER CHECK

M1543001000274



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

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

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

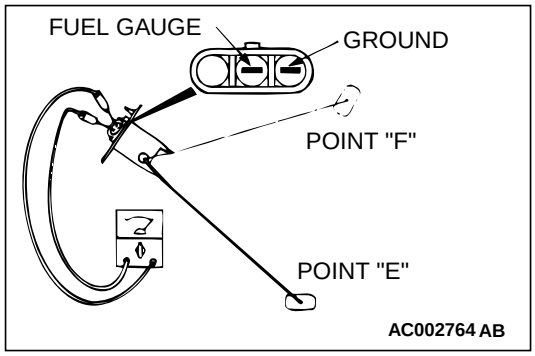
Standard values:

- **700 r/min: ±100 r/min**
- **3,000 r/min: ±150 r/min**
- **5,000 r/min: ±250 r/min**
- **6,000 r/min: ±300 r/min**

FUEL GAUGE UNIT CHECK

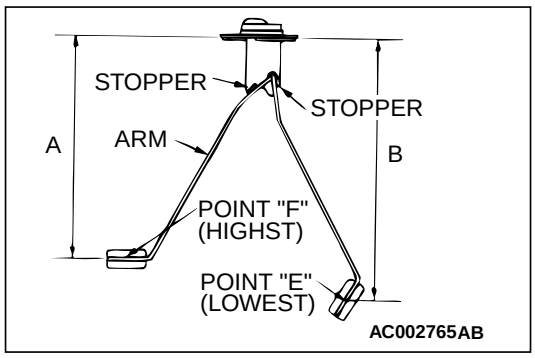
M1543001200267

Remove the fuel gauge unit from fuel tank. (Refer to GROUP 13C, Fuel Tank P.13B-9.)



Fuel Gauge Unit Resistance

1. Check that resistance value between the fuel gauge terminal and ground terminal is at the standard value when the fuel gauge unit float is between point F (highest) and point E (lowest).
   Standard value:
   - **Point "F": 1 – 5 Ω**
   - **Point "E": 103 – 117 Ω**
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

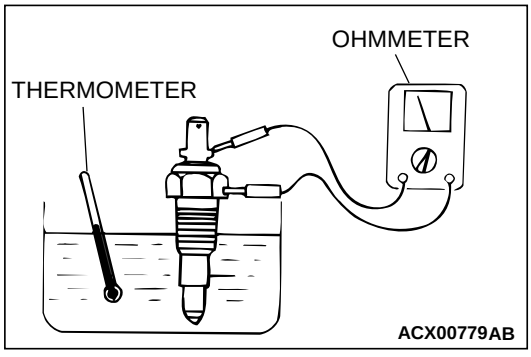
1. Move the float and measure height A at point and B at point.
   Standard value:
   - **A: 214 mm (8.42 inches)**
   - **B: 251 mm (9.88 inches)**
2. Adjust the float arm to the standard value, then go to the thermistor check.

ENGINE COOLANT TEMPERATURE GAUGE UNIT CHECK

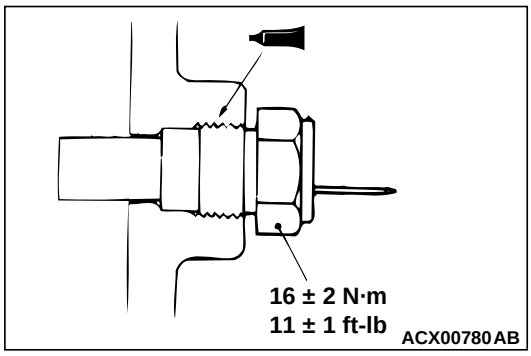
M1543001500268

1. Drain the engine coolant. (Refer to GROUP 00, Maintenance Service – Engine Coolant P.00-50.)
2. Remove the engine coolant temperature gauge unit.
3. Immerse the unit in 70°C (158°F) water to measure the resistance.
   Standard value: 104 ± 13.5 Ω
   Reference value

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



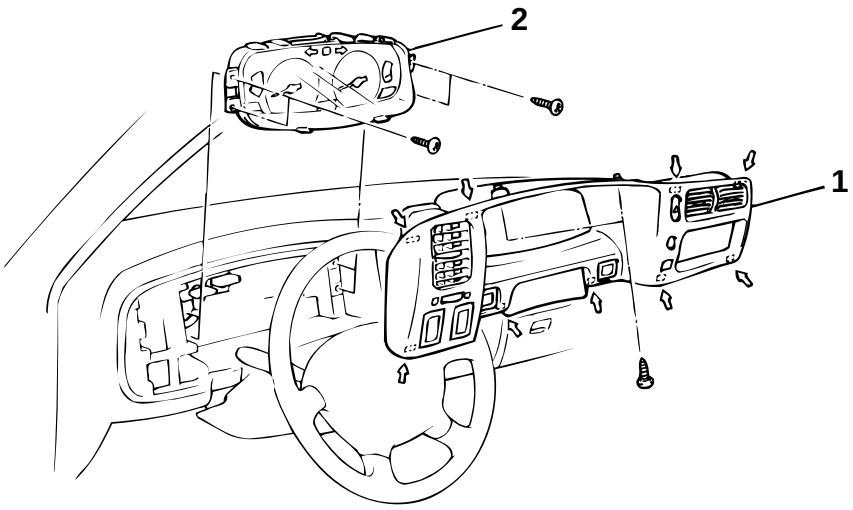
4. If within the standard value, the sensor is OK. Reinstall it, then check the engine coolant temperature gauge (Refer to P.54-108). If not within the standard value, replace it.



5. After checking, apply the 3M™AAD part number 8731 or equivalent around the threads of the engine coolant temperature gauge unit.
6. Add engine coolant. (Refer to GROUP 00, Maintenance Service – Engine Coolant P.00-50.)

REMOVAL AND INSTALLATION

M1543002900300



NOTE
⇦: Metal clip position

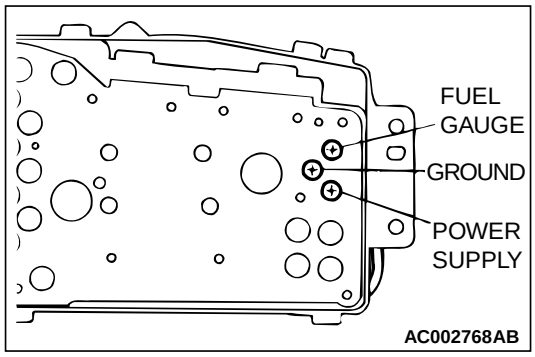
COMBINATION METER REMOVAL STEPS

1. METER BEZEL
2. COMBINATION METER

INSPECTION

M1543019501556

FUEL GAUGE RESISTANCE CHECK



⚠ CAUTION

When inserting the test probe into the power supply terminal, be careful not to touch the printer board.

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

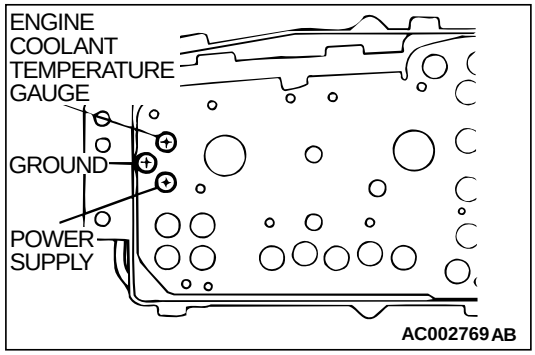
   Standard value:

   Power supply – **Ground: 192 Ω**

   Power supply – **Fuel gauge: 107 Ω**

   Fuel gauge – **Ground: 85 Ω**
3. If within the standard value, the fuel gauge is OK.
   If not within the standard value, replace the fuel gauge.

ENGINE COOLANT TEMPERATURE GAUGE RESISTANCE CHECK



⚠ CAUTION

When inserting the test probe into the power supply terminal, be careful not to touch the printer board.

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

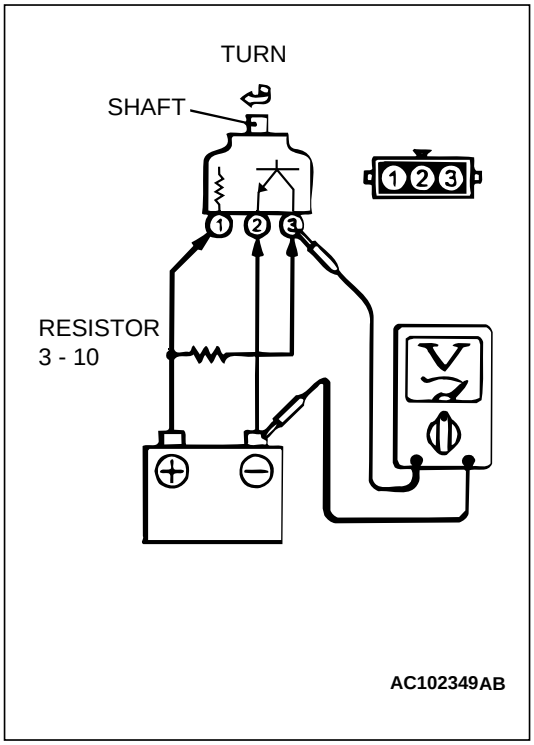
   Standard value:

   Power supply – **Ground: 191 Ω**

   Power supply – **Engine coolant temperature gauge: 103 Ω**

   Engine coolant temperature gauge – **Ground: 88 Ω**
3. If within the standard value, the engine coolant temperature gauge is OK.
   If not within the standard value, replace the engine coolant temperature gauge.

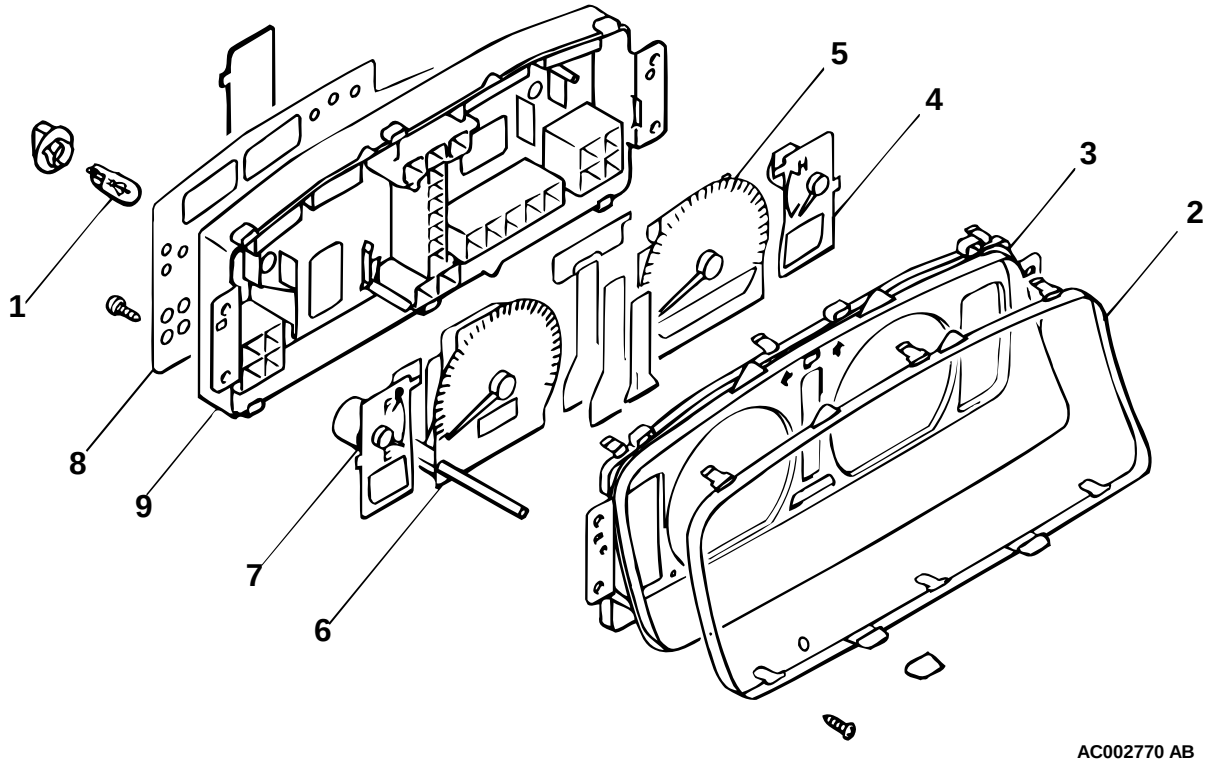
VEHICLE SPEED SENSOR CHECK



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

DISASSEMBLY AND ASSEMBLY

M1543003100233



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DISASSEMBLY STEPS

1. BULB
2. METER GLASS
3. WINDOW PLATE
4. ENGINE COOLANT TEMPERATURE GAUGE
5. TACHOMETER

DISASSEMBLY STEPS (Continued)

6. SPEEDOMETER
7. FUEL GAUGE
8. PRINTED CIRCUIT BOARD
9. METER CASE

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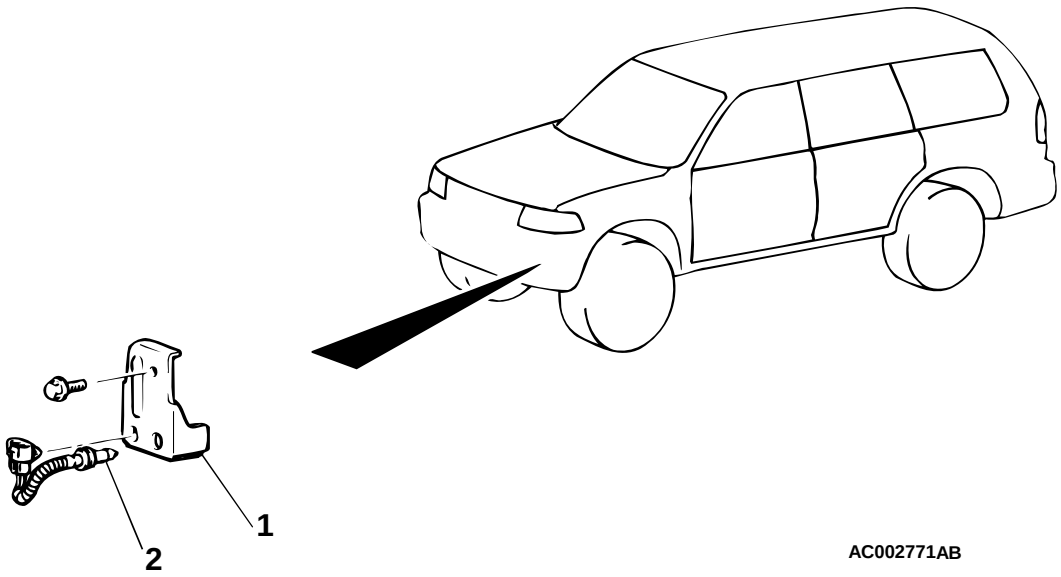
AMBIENT TEMPERATURE SENSOR

REMOVAL AND INSTALLATION

M1543009500046



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REMOVAL STEPS

- INTERCOOLER GRILL (REFER TO P.54-143.)
- FOG LIGHT (REFER TO P.54-143.)

REMOVAL STEPS (Continued)

1. BRACKET
2. AMBIENT TEMPERATURE SENSOR

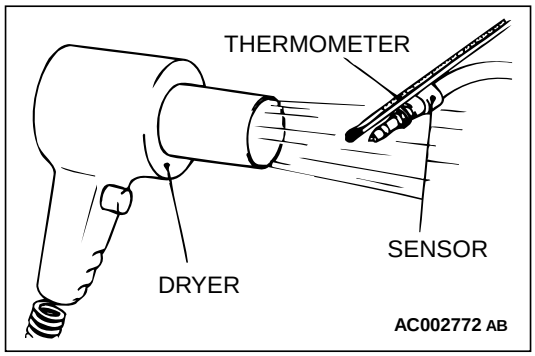
TSB Revision

HEADLIGHT

INSPECTION

M1543019501567

AMBIENT TEMPERATURE SENSOR CHECK



Check the internal resistance of the ambient temperature sensor are at the standard values at temperature of 20°C (68°F) and 40°C (104°F).

Standard value:

Approximately 1,200 Ω [at 20°C (68°F)]

Approximately 500 Ω [at 40°C (104°F)]

LIGHTING SYSTEM DIAGNOSIS

INTRODUCTION TO LIGHT REMINDER ALARM DIAGNOSIS

M1542010500490

A ETACS-ECU is mounted in all vehicles. ETACS-ECU has a light reminder tone alarm function. The light reminder tone alarm function alerts the driver that the lights have not been turned off. If the following symptoms occur, the system may be malfunctioning.

- When the tone alarm does not stop sounding when the ignition key is turned to the "ON" position.
- When the tone alarm does not stop sounding when the lighting switch is turned "OFF."
- When the tone alarm does not stop sounding when the driver's door is closed.
- When the tone alarm does not sound when the ignition key is inserted ("OFF" position), the lighting switch is turned to the "ON" position (HEAD" or "TAIL" position), and the river's door is opened.

LIGHT REMINDER ALARM DIAGNOSIS TROUBLESHOOTING STRATEGY

M1542010600118

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 light reminder alarm 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. Confirm that the malfunction is eliminated.

SYMPTOM CHART

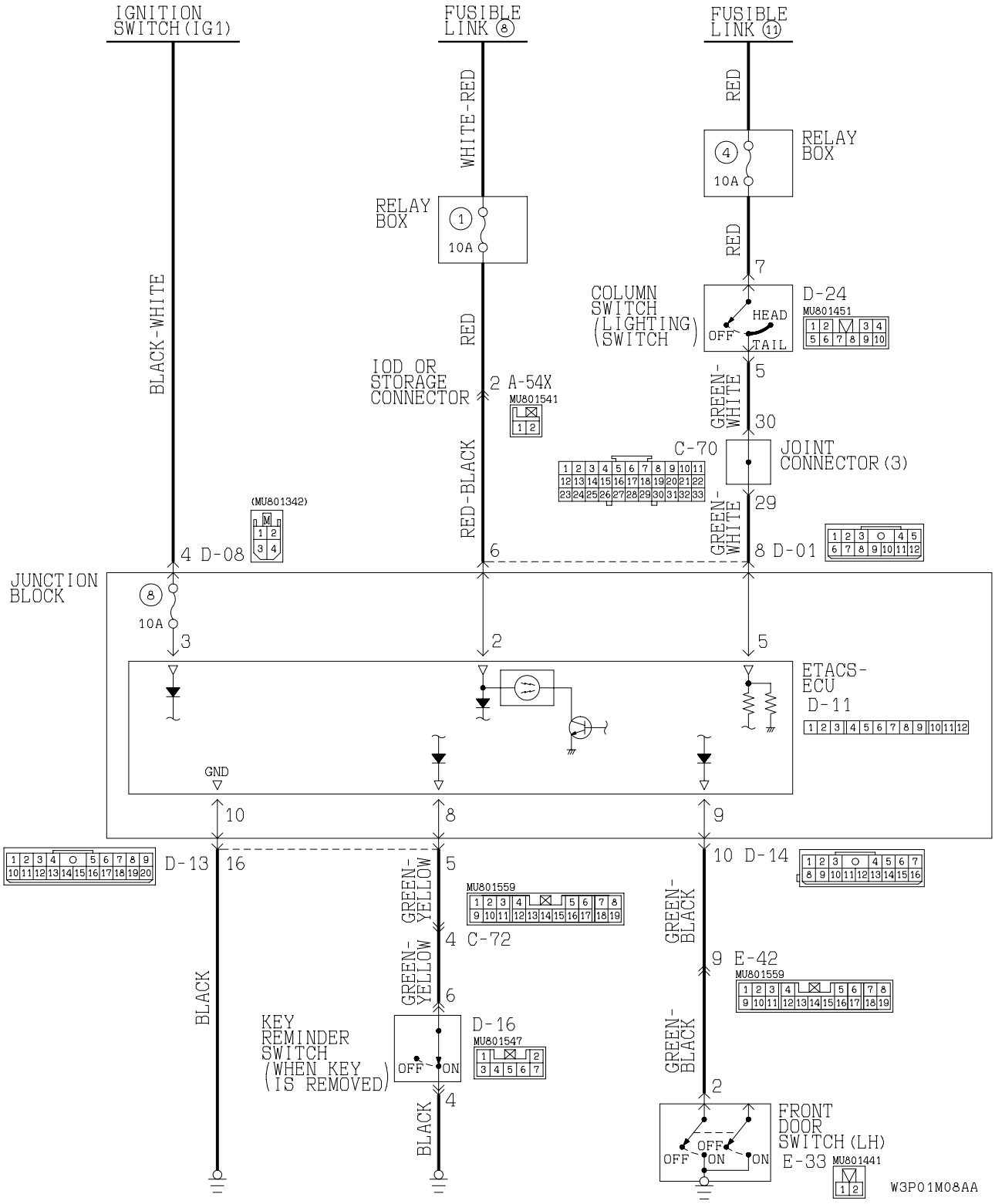
M1542009100197

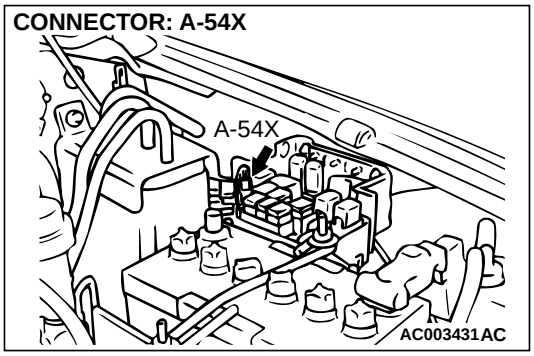
SYMPTOM	INSPECTION PROCEDURE	REFERENCE PAGE
Light reminder tone alarm function does not work normally.	1	P.54-113
Day time running light function does not illuminate <Vehicles for Canada>.	2	P.54-126

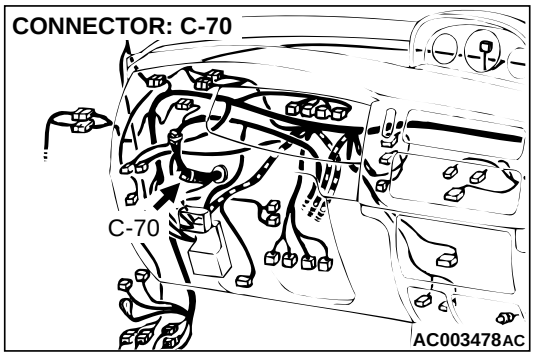
SYMPTOM PROCEDURES

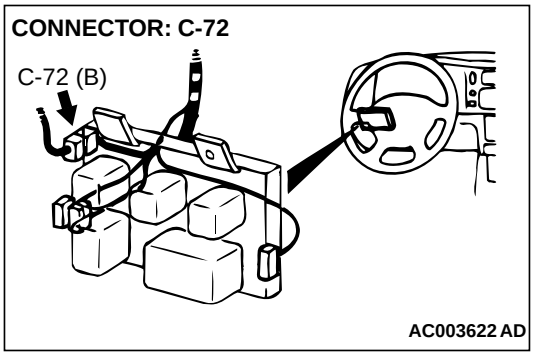
INSPECTION PROCEDURE 1: Light Reminder Tone Alarm Function does not Work Normally.

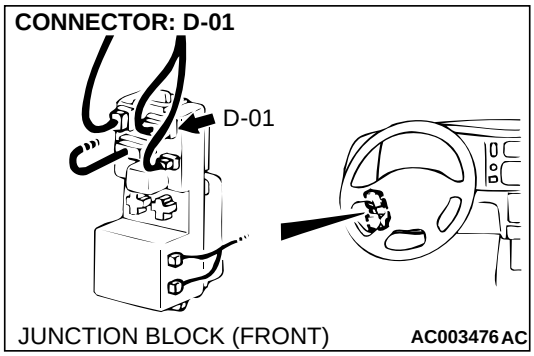
Light Reminder Tone Alarm Circuit

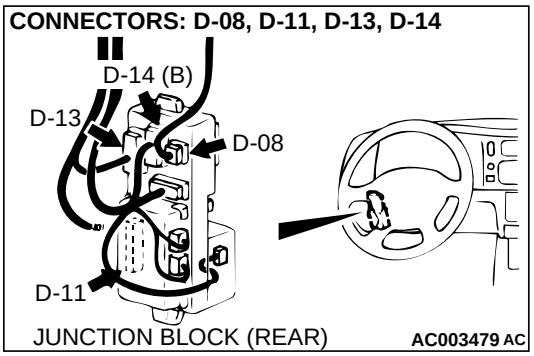


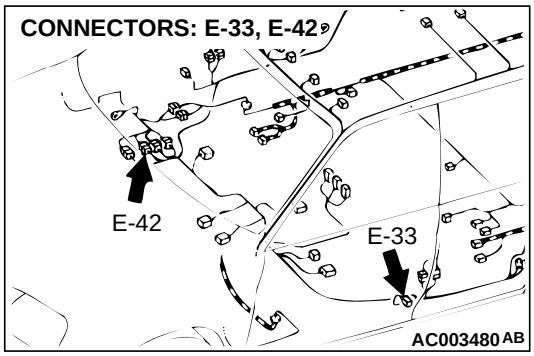


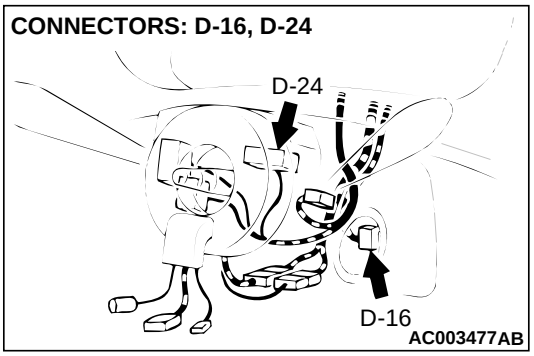












CIRCUIT OPERATION

- The ETACS-ECU judges the state of the ignition switch by detecting voltage from the ignition switch.
- The ETACS-ECU judges whether the driver's side door is opened or closed by defecting the front door switch (LH) signal.
- The ETACS-ECU judges whether the ignition switch in inserted or removed by defecting the key reminder switch signal.
- The ETACS-ECU judges the state of the column switch (lighting switch) by defecting voltage from the column switch (lighting switch).

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- When the river's door is opened (door switch on) with the lighting switch in the on ("TAIL" or "HEAD") position, the tone alarm will sound continuously to remind the driver that the lights (taillights or headlights) are on.

TECHNICAL DESCRIPTION (COMMENT)
The cause is probably an abnormal signal from the lighting switch or a defective driver's side door switch.

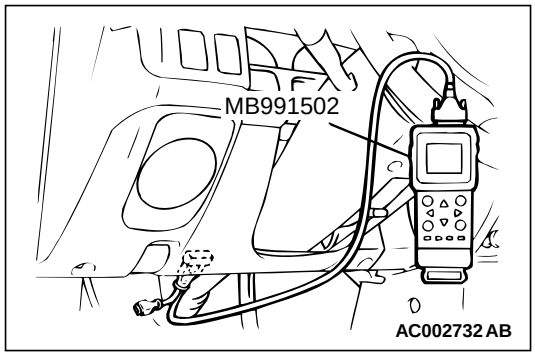
TROUBLESHOOTING HINTS
- Malfunction of the driver's side door switch
- Damaged harness or connector
- Malfunction of the ETACS-ECU

DIAGNOSIS

Required Special Tools:
- MB991223: Test Harness Set
- MB991502: Scan Tool (MUT-II)
- MB991529: Diagnostic Trouble Code Check Harness

STEP 1. Check the input signal (by using pulse check).
Check the input signal from the driver's side door switch by using scan tool MB991502.

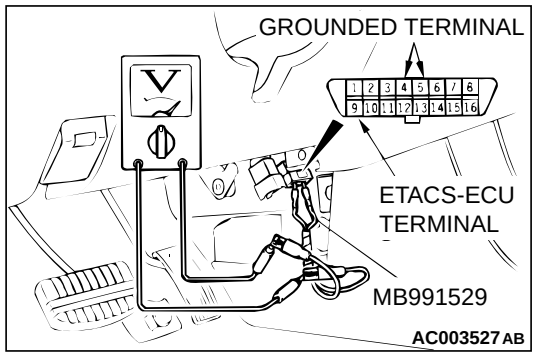
⚠ CAUTION
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.



(1) Connect scan tool MB991502 to the data link connector.
(2) Check that the tone alarm of scan tool MB991502 sounds when the driver's side door is opened.

Q: Does the tone alarm of scan tool MB991502 sound when the input signal enters?
YES : Replace the ETACS-ECU. Check that the malfunctions are eliminated.
NO : Go to Step 3.

STEP 2. Check the input signal from the driver's side door switch (by using a voltmeter).
Check the input signals from the following switches:



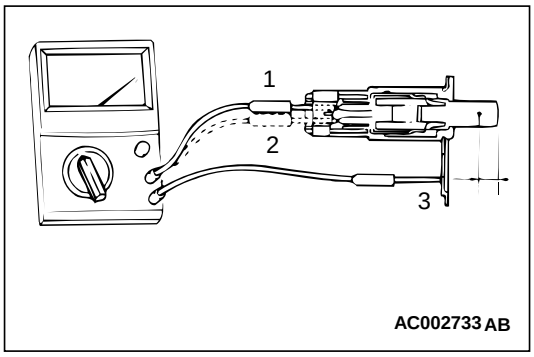
(1) Use special tool MB991529 to connect a voltmeter between ground terminal 4 or 5 and ETACS-ECU terminal 9 of the data link connector.
(2) Check that the voltmeter indicator deflects once when the input signal enters.

Q: Does the voltmeter indicator deflect?
YES : Replace the ETACS-ECU. Check that the malfunctions are eliminated.
NO : Go to Step 3.

STEP 3. Check the driver's side door switch.

1.Remove the driver's side door switch. Refer to GROUP 42, Door P.42-103.

2.Follow the table to check the driver's side door switch continuity.



SWITCH POSITION	TESTER CONNECTION	SPECIFIED CONDITION
Released (ON)	1 – 2, 1 – 3, 2 – 3	Less than 2 ohms
Depressed (OFF)	1 – 2, 1 – 3, 2 – 3	Open circuit

Q: Is the driver's side door switch in good condition?

YES : Go to Step 4.

NO : Replace it. Check that the malfunction is eliminated.

STEP 4. Check the driver's side door switch ground circuit.

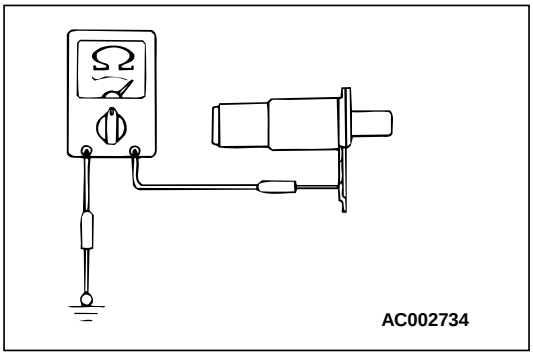
Measure the resistance between the driver's side door switch body (metal section) and ground.

- The measured value should be 2 ohms or less.

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

YES : Go to Step 5.

NO : Repair the harness wire or connector. Then go to Step 6.

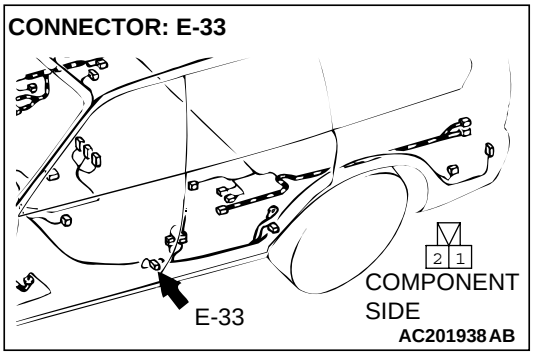


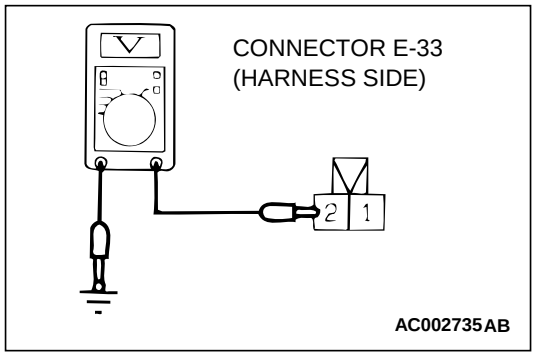
STEP 5. Check driver's side door switch connector E-33 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is driver's side door switch connector E-33 damaged?

YES : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The tachometer should work normally.

NO : Go to Step 6.





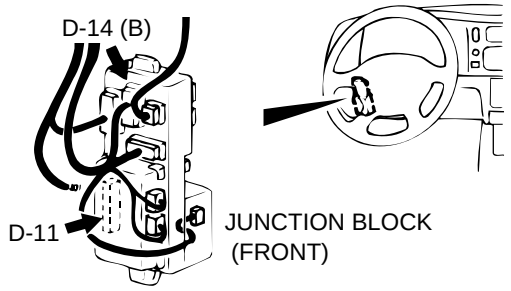
STEP 6. Check driver's side door switch connector E-33 input circuit.

(1) Disconnect driver's side door switch connector E-33 and the harness side.
(2) Measure the voltage between terminal 2 and ground.
- The measured value should be approximately 5 volts.

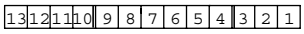
Q: Does the measured voltage correspond with this range?

YES : There is no action to be taken.
NO : Go to Step 7.

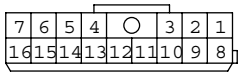
CONNECTORS: D-11, D-14



D-11 COMPONENT SIDE

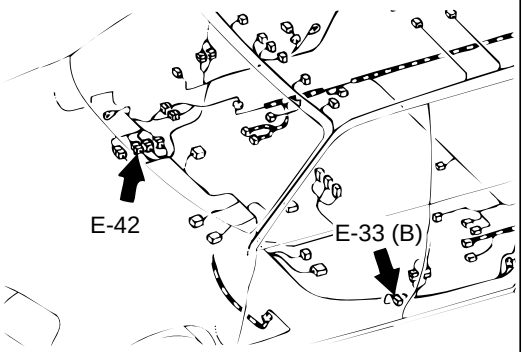


D-14 COMPONENT SIDE

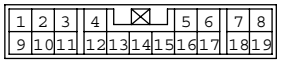


AC201939AB

CONNECTORS: E-33, E-42



E-42



COMPONENT SIDE

AC201940AC

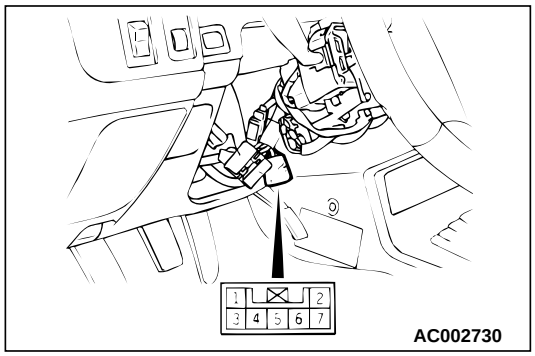
STEP 7. Check the harness wires between driver's side door switch connector E-33 (terminal No.2) and ETACS-ECU connector D-11 (terminal No.9).

NOTE: After inspecting junction block connector D-14 and intermediate connector E-42, inspect the wire. If junction block connector D-14 and intermediate connector E-42 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wires between driver's side door switch connector E-33 (terminal No.2) and ETACS-ECU connector D-11 (terminal No.9) in good condition?

YES : Go to Step 8.

NO : Repair the harness wires. Then check that the malfunction is eliminated.



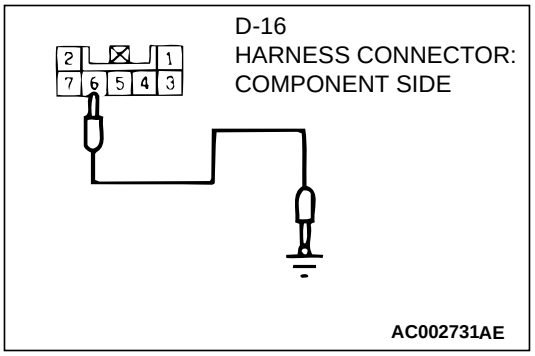
STEP 8. Check for continuity of the key reminder switch.

(1) Remove the driver's side under cover.
(2) Remove the column covers, lower and upper.
(3) Disconnect wiring connector D-16 from the key reminder switch and measure at the key reminder switch side.
(4) Follow the table below to measure the resistance between terminal numbers 4 and 6.

IGNITION KEY POSITION	IGNITION KEY REMINDER SWITCH CONNECTOR D-16 TERMINAL NO.	SPECIFIED CONDITION
Pulled out	4 – 6	Less than 2 ohms
Inserted	4 – 6	Open circuit

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

YES : Go to Step 9.
NO : Replace the key reminder switch. Then check that the malfunction is eliminated.

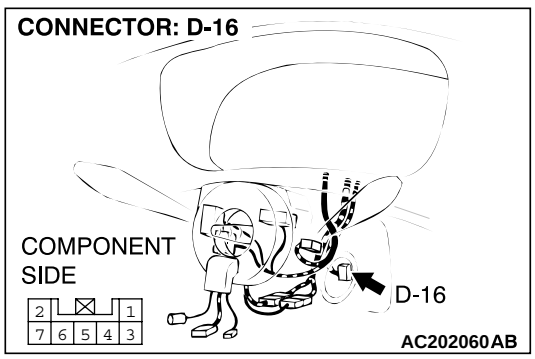


STEP 9. Check the input signal from the key reminder switch.

Check that the tone alarm stops sounding when terminal number 6 is grounded.

Q: Does the tone alarm stop sounding?

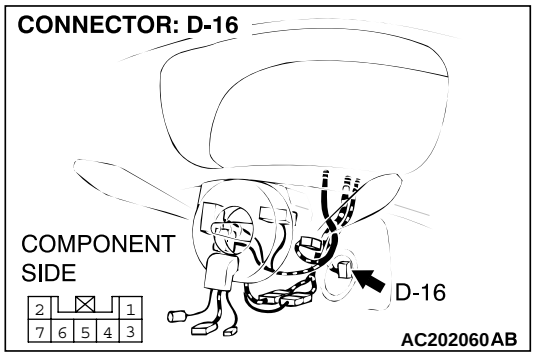
YES : Go to Step 10.
NO : Go to Step 11.



STEP 10. Check key reminder switch connector D-16 for damage for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is key reminder switch connector D-16 in good condition?

YES : Go to step 11.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

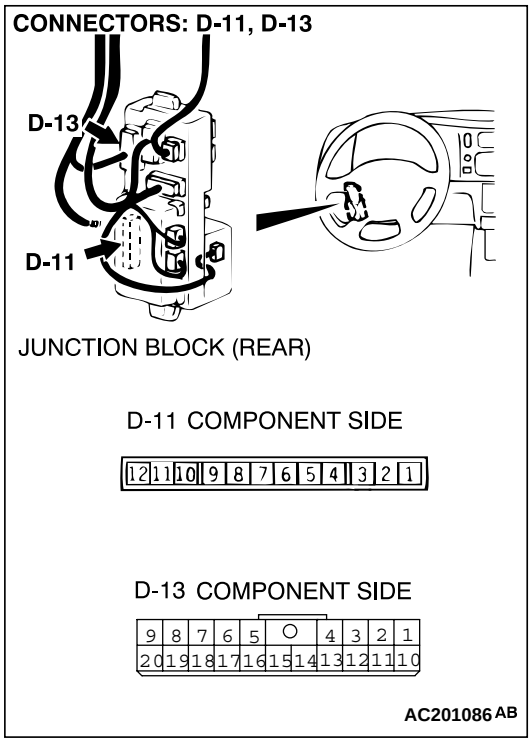


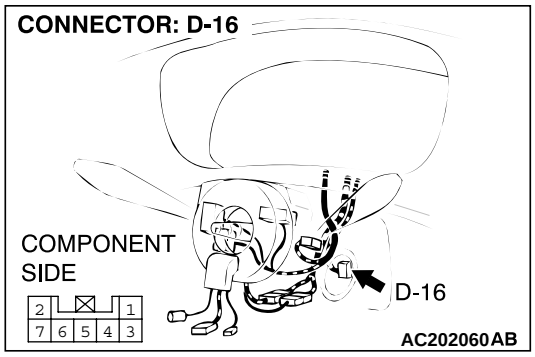
STEP 11. Check the harness wire between key reminder switch connector D-16 (terminal No.4) and body ground.

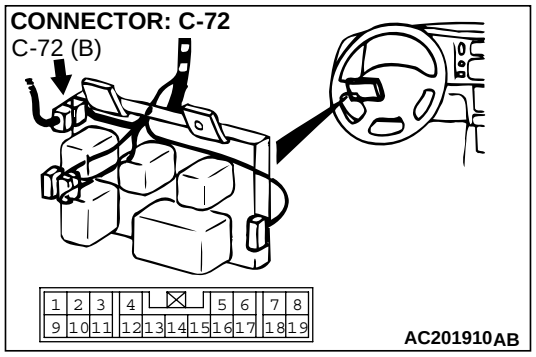
Q: Is the resistance wire between key reminder switch D-16 (terminal No.4) and body ground in good condition?

YES : Replace the ETACS-ECU. Then go to Step 12.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.







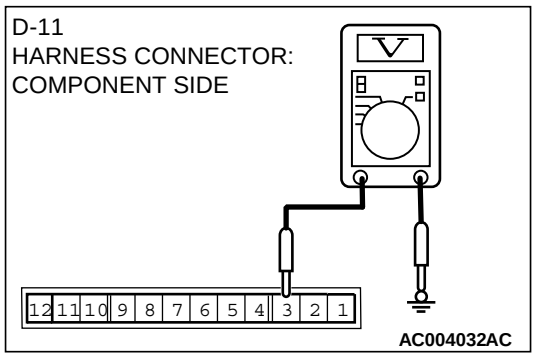
STEP 12. Check the harness wire between key reminder switch connector D-16 (terminal No.6) and ETACS-ECU connector D-11 (terminal No.8).

NOTE: After checking intermediate connector C-72 and D-13, check the wires. If intermediate connector C-72 and D-13 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the harness wire between key reminder switch D-16 (terminal No.6) and ETACS-ECU connector D-11 (terminal No.8) in good condition?

YES : Go to Step 13.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

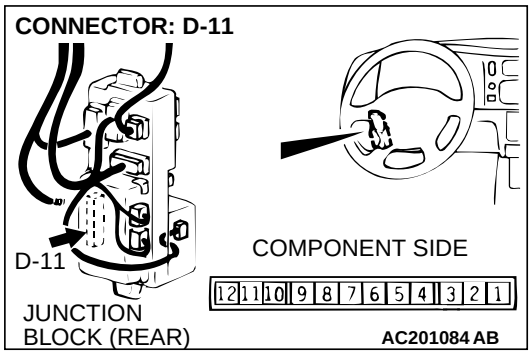


STEP 13. Measure the voltage at the input signal from the ignition switch.

(1) Remove the ETACS-ECU and measure at the junction block side (connector D-11).
(2) Turn the ignition switch "ON."
(3) Measure the voltage between terminal number 3 and body ground.
- The measured value should be approximately 12 volts (battery positive voltage).

Q: Does the measured voltage correspond with this range?

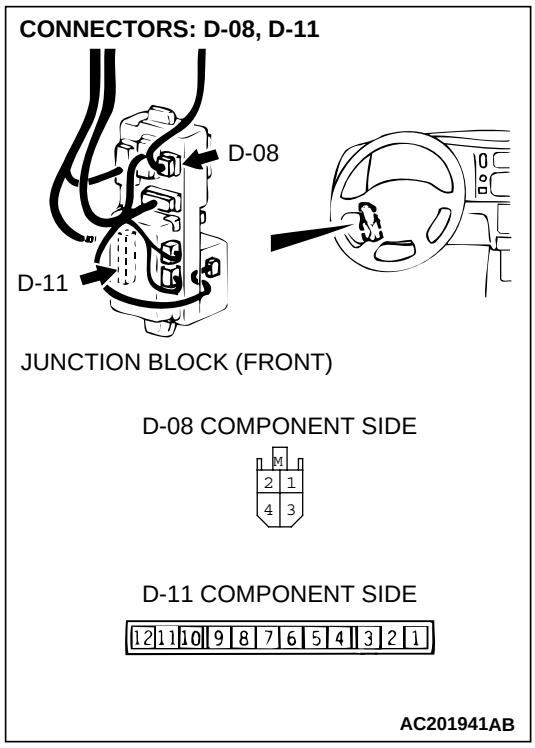
YES : Check that the malfunction is eliminated.
NO : Go to Step 14.



STEP 14. Check ETACS-ECU connector D-11 for damage for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is ETACS-ECU connector D-11 in good condition?

YES : Go to step 15.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



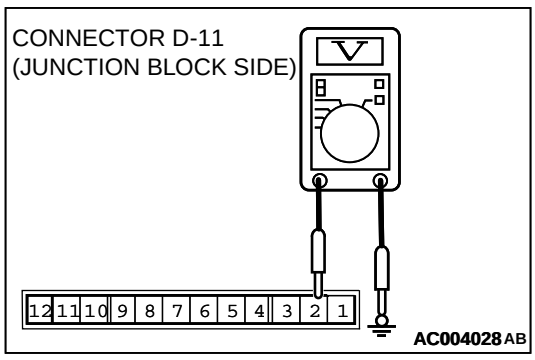
STEP 15. Check the harness wire between ETACS-ECU connector D-11 (terminal No.3) and ignition switch (IG1).

NOTE: After checking junction block connector D-08, check the wires. If junction block connector D-08 is damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the harness wire between ETACS-ECU connector D-11 (terminal No.4) and ignition switch (IG1)?.

YES : Replace the ETACS-ECU. Then go to Step 16.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 16. Measure the voltage at the input signal from the fusible link number 8.

(1) Remove the ETACS-ECU and measure at the junction block side (connector D-11).

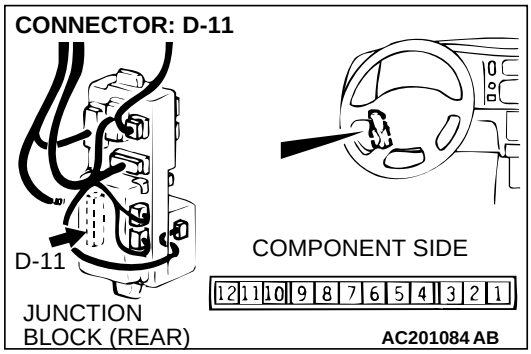
(2) Measure the voltage between terminal number 2 and body ground.

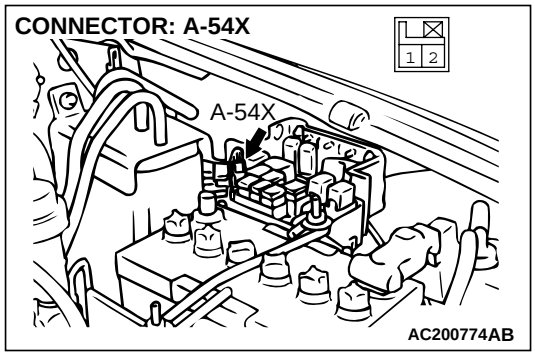
- The measured value should be approximately 12 volts (battery positive voltage).

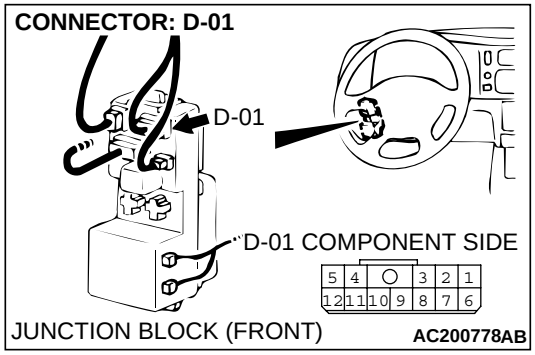
Q: Does the measured voltage correspond with this range?

YES : Check that the malfunction eliminated.

NO : Go to Step 17.







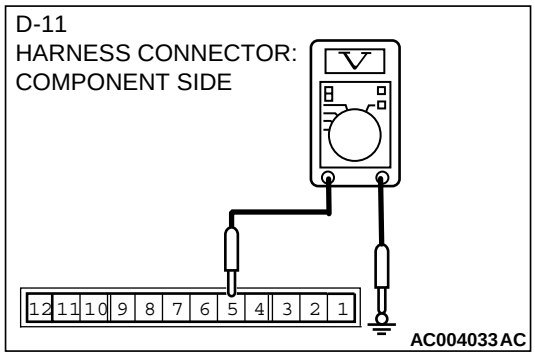
STEP 17. Check harness wire between ETACS-ECU connector D-11 (terminal No.2) and fusible link number 8.

NOTE: After checking junction block connector D-01 and IOD storage connector A-54X, check the wires. If junction block connector D-01 and IOD storage connector A-54X are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the harness wire between ETACS-ECU connector D-11 (terminal No.2) and fusible link number 8?

YES : Go to Step 18.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



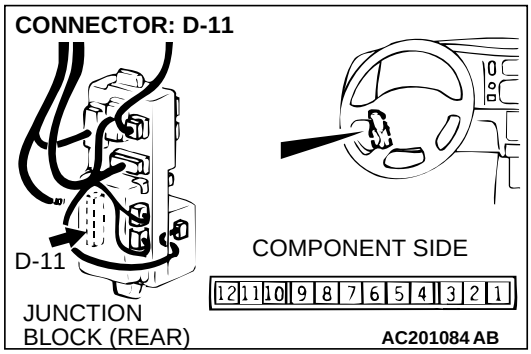
STEP 18. Measure the voltage at the input signal from the column switch (lighting switch).

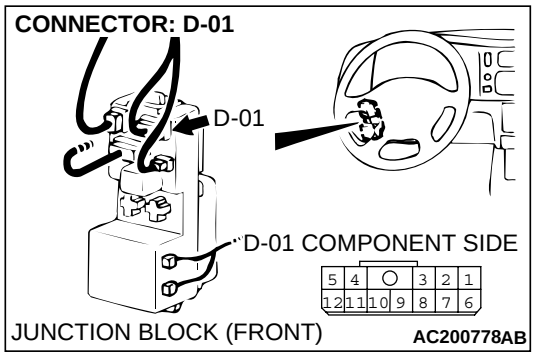
(1) Remove the ETACS-ECU and measure at the junction block side (connector D-11).
(2) Turn the lighting switch on ("TAIL" or "HEAD" position).
(3) Measure the voltage between terminal number 5 and body ground.
- The measured value should be approximately 12 volts (battery positive voltage).

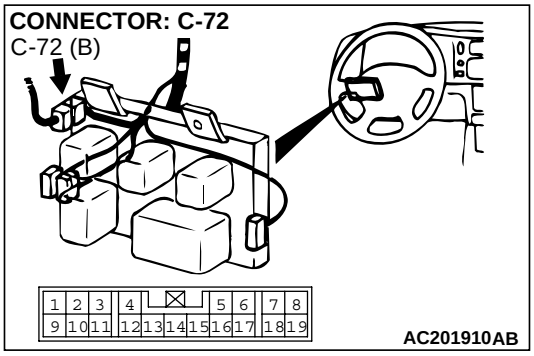
Q: Does the measured voltage correspond with this range?

YES : Check that the malfunction eliminated.

NO : Go to Step 19.







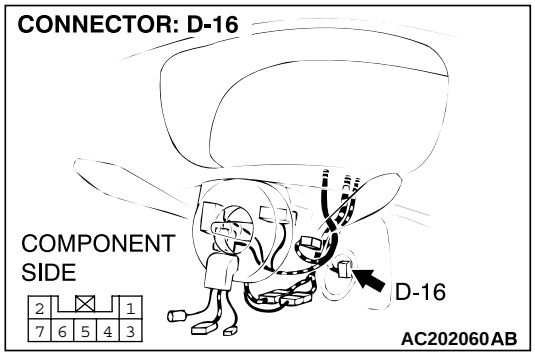
STEP 19. Check the harness wire between ETACS-ECU connector D-11 (terminal No.5) and column switch.

NOTE: After checking junction block connector D-01 and joint connector (3) C-72, check the wires. If junction block connector D-01 and joint connector (3) C-72 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the harness wire between ETACS-ECU connector D-11 (terminal No.5) and column switch?

YES : Go to Step 20.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 20. Check for continuity between terminals (except No. 4 and No. 6) of key reminder switch connector D-16.

(1) Measure at key reminder switch connector D-16 without disconnecting the connector.

(2) Check that there is no continuity between key reminder switch terminal No. 4 and each terminal (except terminal No. 6), as well as between key reminder switch terminal No.6 and each terminal (except terminal No. 4).

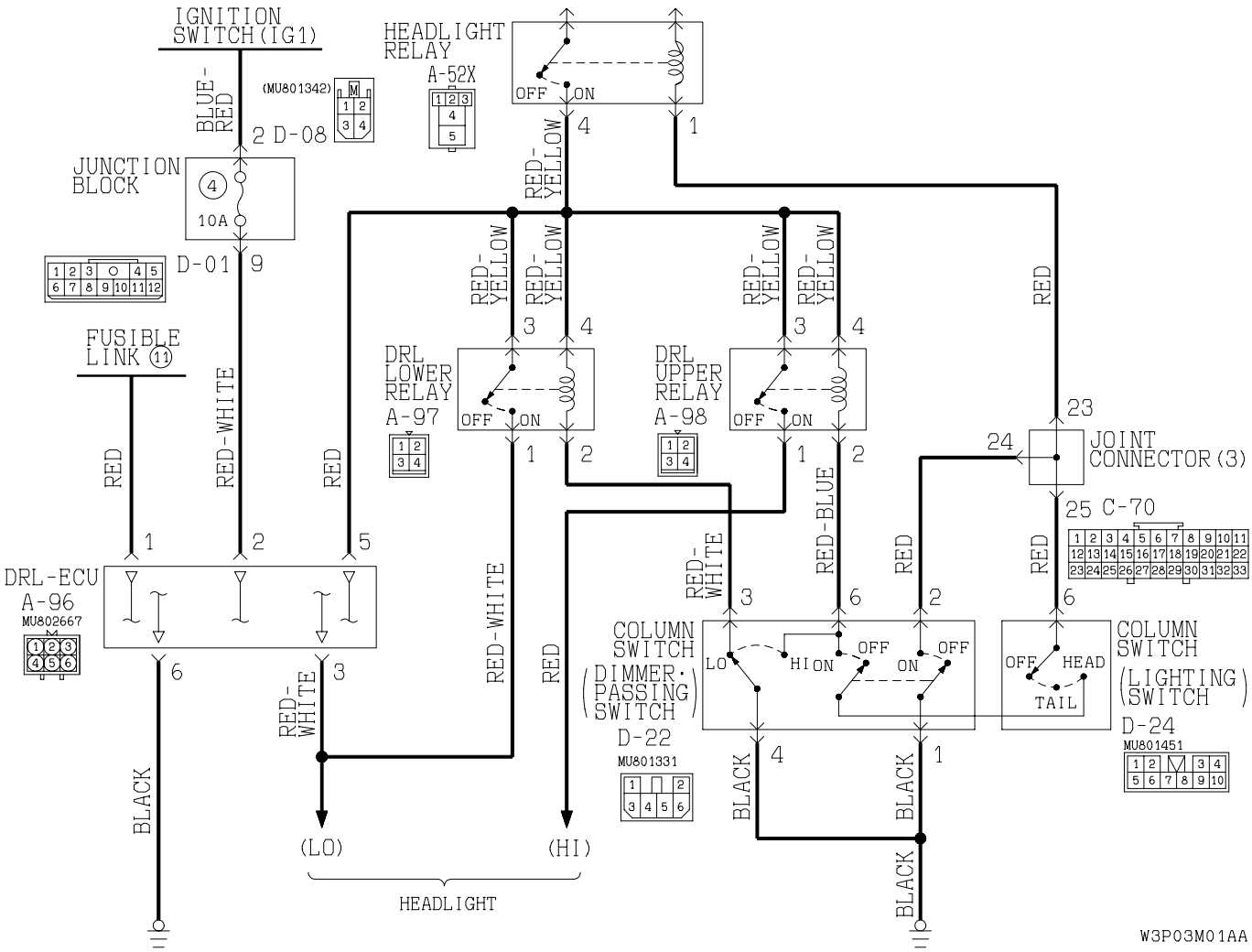
Q: Does continuity exist between terminals?

YES : Replace the key reminder switch. If the functions, which are described in "CIRCUIT OPERATION", work normally, the input signal from the key reminder switch should be normal.

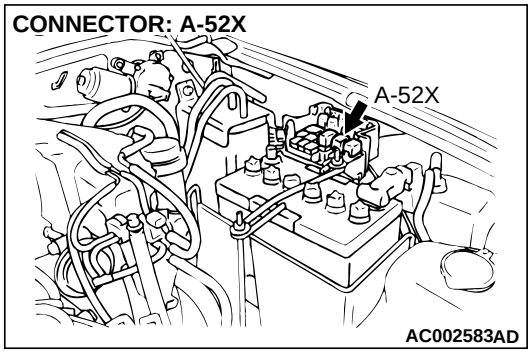
NO : Replace the ETACS-ECU. If the functions, which are described in "CIRCUIT OPERATION", work normally, the input signal from the key reminder switch should be normal.

INSPECTION PROCEDURE 2: Daytime Running Light Function does not Illuminate. <Vehicles for Canada>

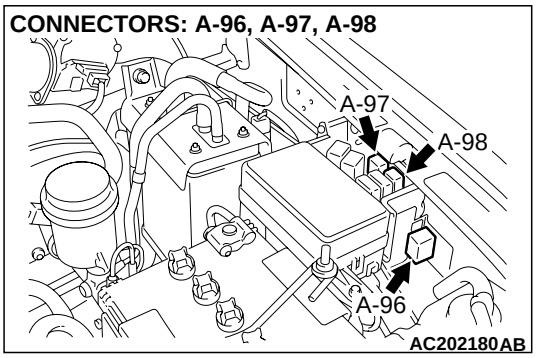
Day Time Running Light Circuit



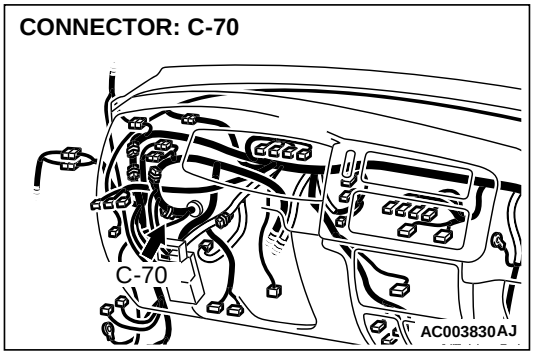
CONNECTOR: A-52X

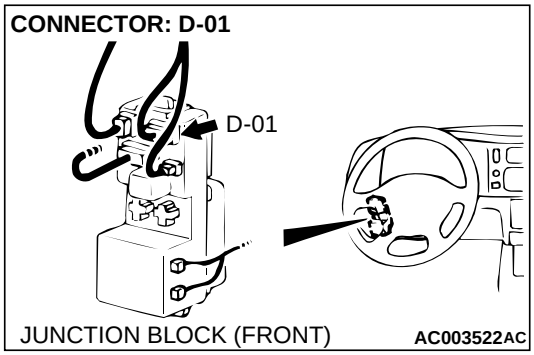


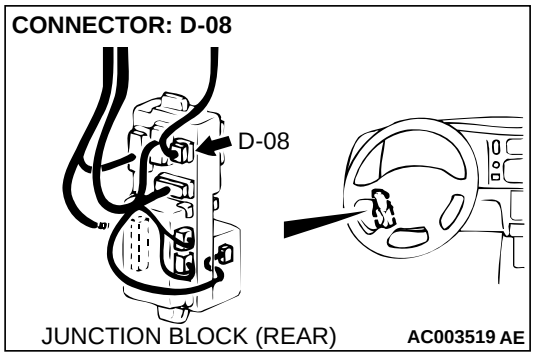
CONNECTORS: A-96, A-97, A-98

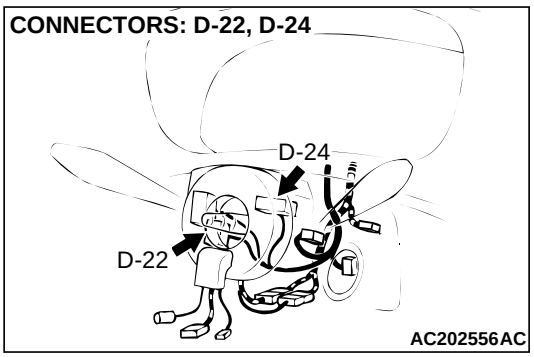


TSB Revision









CIRCUIT OPERATION

If the ignition switch is turned to the "ON" position, and battery positive voltage will be applied from the daytime running light-ECU to the headlights.
Daytime running light-ECU terminal No.3 sends a constant voltage to the headlights at a constant frequency. This causes the headlights to dim more than normal low-beam.
When the lighting switch is turned to the "HEAD" position or the passing switch is turned on, daytime running light-ECU terminal No.3 ceases the voltage supply. This causes the headlights to illuminate at normal low-beam.

TECHNICAL DESCRIPTION (COMMENT)

The cause may be a faulty daytime running light circuit or a faulty daytime running light-ECU.

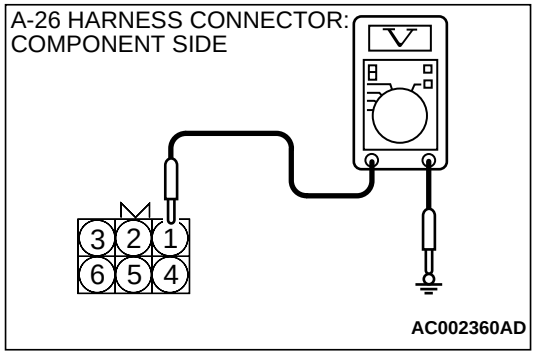
TROUBLESHOOTING HINTS

- Malfunction of the daytime running light-ECU
- Malfunction of the daytime running light relay
- Damaged harness wires or connectors

DIAGNOSIS

Required Special Tool:

- MB991223: Harness Set

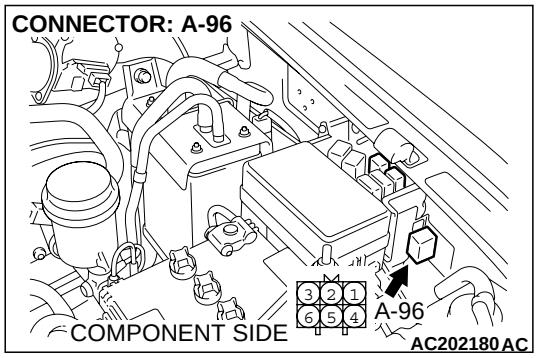


STEP 1. Check the daytime running light-ECU power supply (battery) circuit at daytime running light-ECU connector A-96.

(1) Disconnect daytime running light connector A-96.
(2) Measure the voltage between terminal 1 and ground.

Q: Is the voltage 12 volts (battery positive voltage) between terminal 1 and ground?

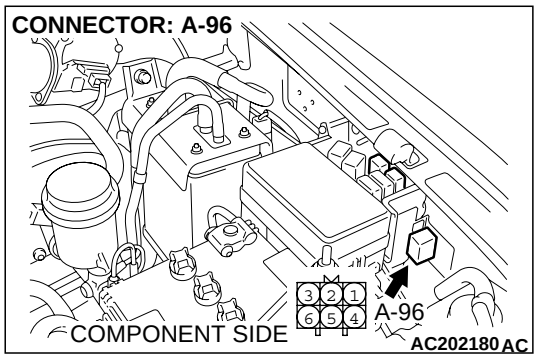
YES : Go to Step 3
NO : Go to Step 2.



STEP 2. Check daytime running light-ECU connector A-96 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

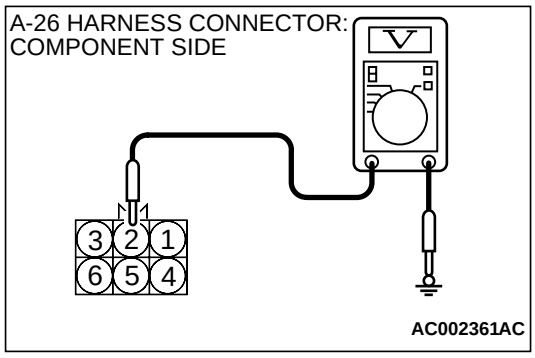
YES : Go to Step 3.
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 3. Check the harness wires between daytime running light-ECU connector A-96 (terminal No.1) and fusible link No. 11.

Q: Are the harness wires between daytime running light-ECU connector A-96 (terminal No.1) and fusible link No. 11 in good condition?

YES : Go to step 4.
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

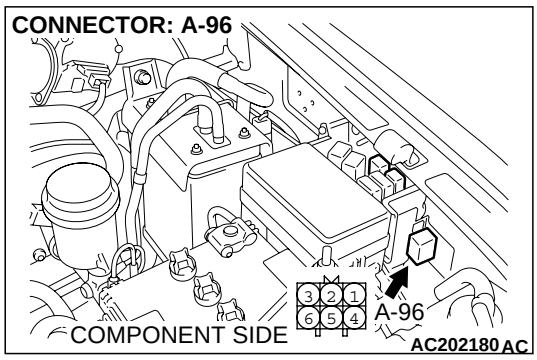


STEP 4. Check the daytime running light-ECU power supply circuit (IG2) at the daytime running light-ECU connector A-96.

(1) Disconnect the daytime running light-ECU.
(2) Turn the ignition switch "ON" position.
(3) Measure the resistance between terminal 2 and ground.

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

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

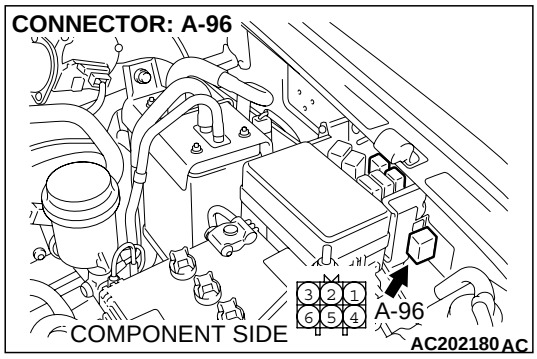


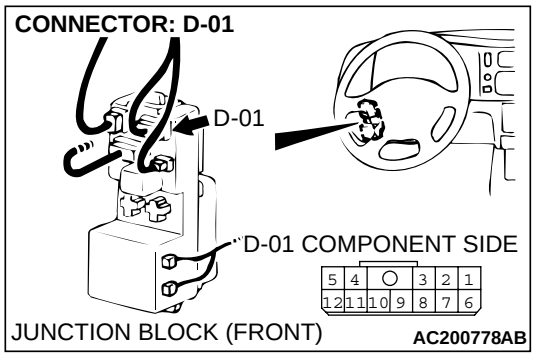
STEP 5. Check the connector between daytime running light-ECU connector A-96 and ignition switch for loose, corroded or damaged terminals, or terminals pushed back in the connector.

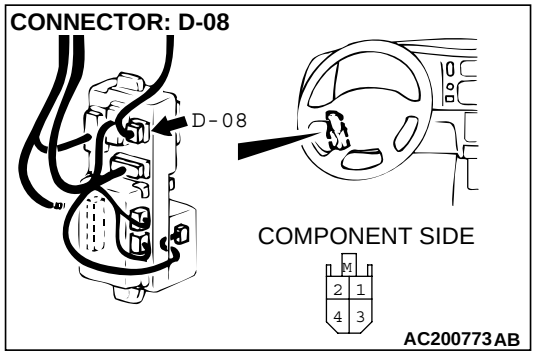
NOTE: After checking junction block connector D-01 and D-08, check the wires. If junction block connector D-01 and D-08 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 6 .
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.







STEP 6. Check the harness wire between daytime running light-ECU connector A-96 (terminal No.2) and ignition switch.

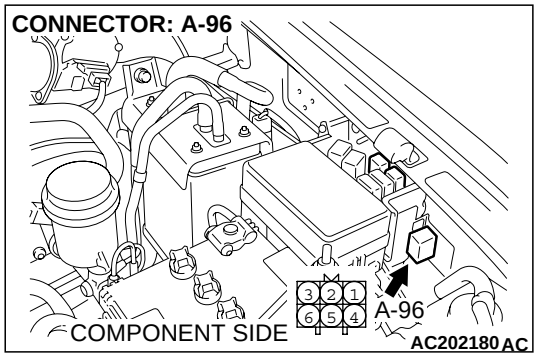
NOTE: After checking junction block connector D-01 and D-08, check the wires. If junction block connector D-01 and D-08 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wire between daytime running light-ECU connector A-26 (terminal No.2) and ignition switch in good condition?

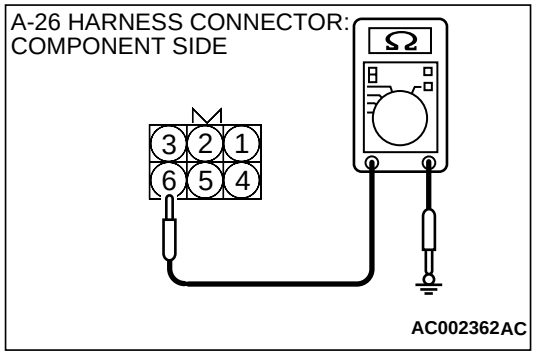
YES : Go to Step 7.

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

STEP 7. Check the daytime running light ground circuit at daytime running light connector A-96.



(1) Disconnect daytime running light connector A-96.

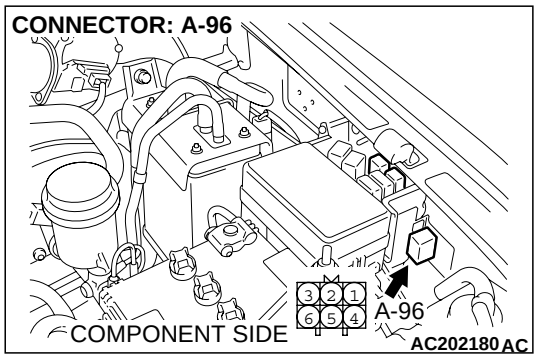


(2) Measure the resistance between terminal 6 and ground.

Q: Is resistance between terminal 6 and ground less than 2 ohms?

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

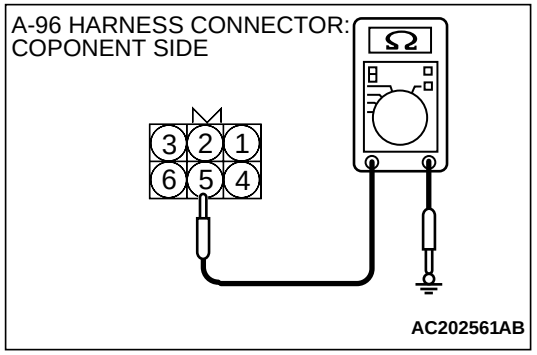
STEP 8. Check the daytime running light-ECU lighting switch input circuit at daytime running light-ECU A-96.

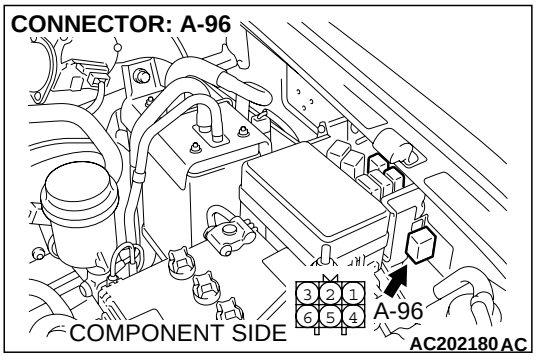


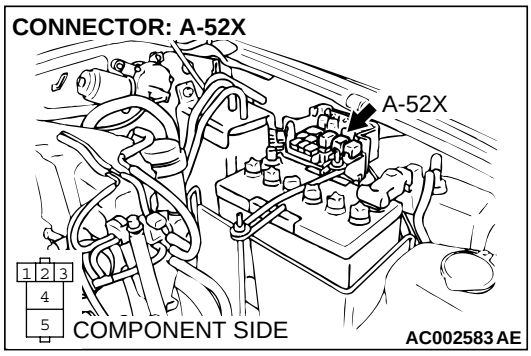
(1) Disconnect the daytime running light-ECU.
(2) Turn the lighting switch "HEAD" position or passing switch "ON".
(3) Measure the voltage between terminal 5 and ground.

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

YES : Go to Step 9.
NO : Go to Step 10.





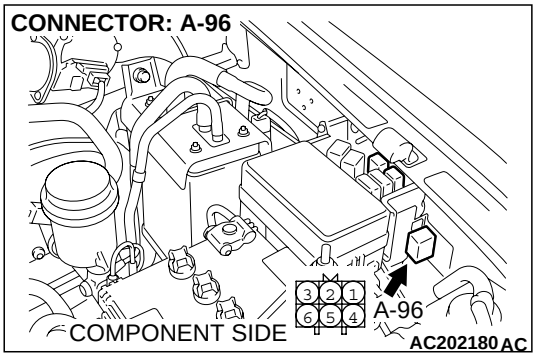


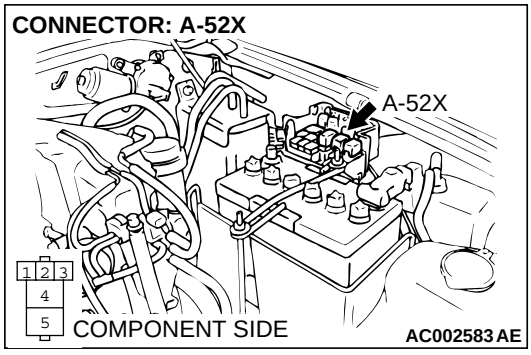
STEP 9. Check the connector between daytime running light-ECU connector A-96 and headlight relay connector A-52X for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is connector between daytime running light-ECU connector A-96 and headlight relay connector A-52X in good condition?

YES : Go to Step 10 .

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



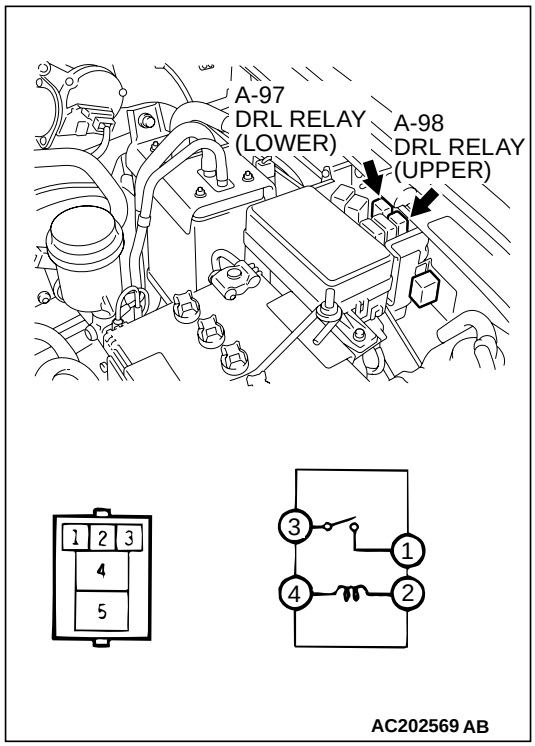


STEP 10. Check the harness wire between daytime running light-ECU connector A-96 (terminal No.5) and headlight relay connector A-52X

Q: Is harness wire between daytime running light-ECU connector A-96 (terminal No.5) and headlight relay connector A-52X in good condition?

YES : Go to Step 11 .

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



STEP 11. Check the daytime running light relay (lower) and (upper).

(1) Disconnect the daytime running light relay (lower) and (upper).

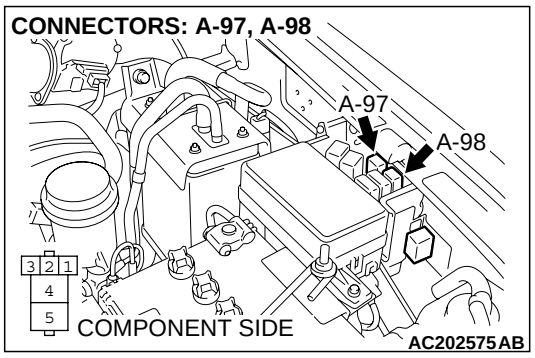
(2) Follow the table below to check for continuity of the daytime running light relay.

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

Q: Is the resistance less than 2 ohms?

YES : Go to Step 12 .

NO : Replace the DRL relay (lower) or (upper).

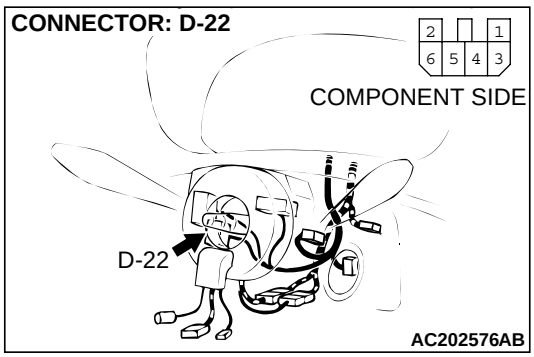


STEP 12. Check the connector between DRL relay (lower) connector A-97, DRL relay (upper) connector A-98 and column switch connector D-22 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are connector between DRL relay (lower) connector A-97, DRL relay (upper) connector A-98 and column switch connector D-22 in good condition?

YES : Go to Step 13.

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

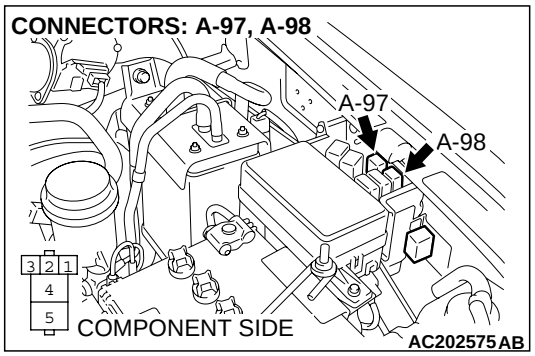


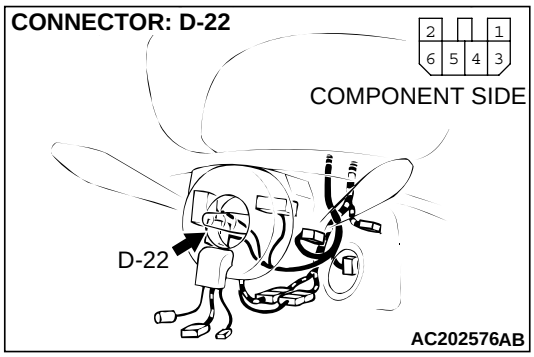
STEP 13. Check the harness wires between DRL relay (lower) connector A-97 (terminal No.1 and 2), DRL relay (upper) connector A-98 (terminal No.2) and column switch connector D-22 (terminal No.3 and 6)for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are harness wires between DRL relay (lower) connector A-97, DRL relay (upper) connector A-98 and column switch connector D-22 in good condition?

YES : Replace the daytime running light-ECU.

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





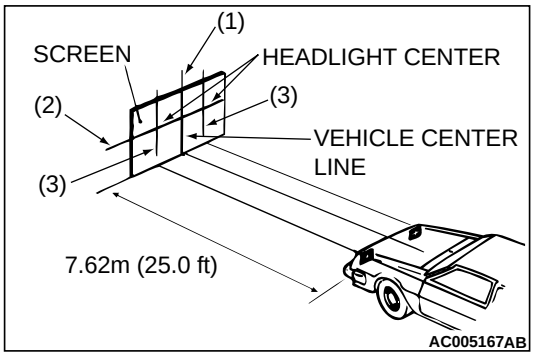
ON-VEHICLE SERVICE

HEADLIGHT AIMING

M1542000900301

PRE-AIMING INSTRUCTIONS

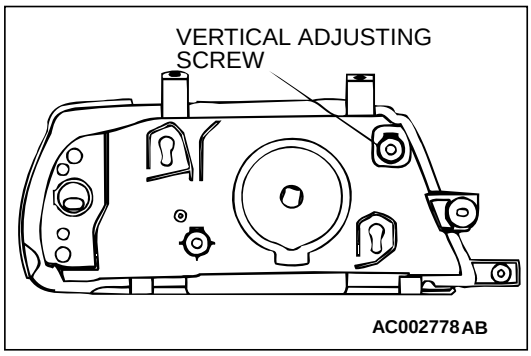
1. Inspect for badly rusted or faulty headlight assemblies.
2. These conditions must be corrected before a satisfactory adjustment can be made.
3. Inspect tire inflation, and adjust if necessary.
4. If the fuel tank is not full, place a weight in luggage room of vehicle to simulate weight of a full tank [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 headlight lenses.
7. Place the vehicle on a level floor, perpendicular to a flat screen 7.62 m (25.0 feet) away from the bulb center-marks on the headlight lens.
8. Rock vehicle sideways to allow vehicle to assume its normal position.

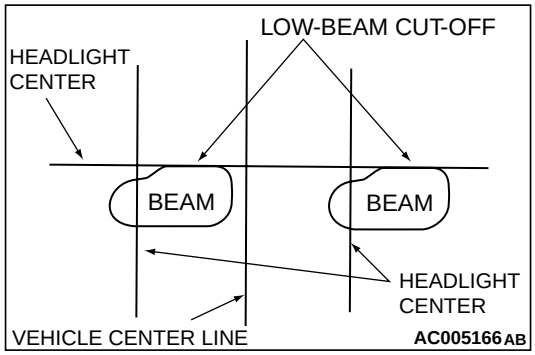


9. Bounce the front suspension through three (3) oscillations by applying the body weight to hood or bumper.
10. Four lines of adhesive tape (or equivalent markings) are required on screen or wall:
    (1) Position a vertical tape or mark so that it is aligned with the vehicle center line.
    (2) Measure 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 will project on the screen upper edge of the beam (cut-off).
2. Turn the adjusting screws to achieve the specified low-beam cut-off location on the aiming screen.





Standard value:
(Vertical direction) Horizontal center line ± 50mm (± 2.0 inches)

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

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

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

LUMINOUS INTENSITY MEASUREMENT

M1542001000259

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

Limit: 40,000 cd or more

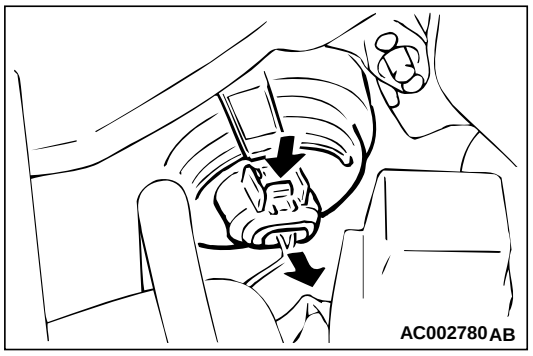
NOTE: When measuring the intensity, maintain an engine speed of 2,000 r/min, with the battery fully charged.
There may be special local regulations pertaining to headlight intensity. Be sure to make any adjustments necessary to satisfy such regulations.
If an illuminometer is used to make the measurements,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

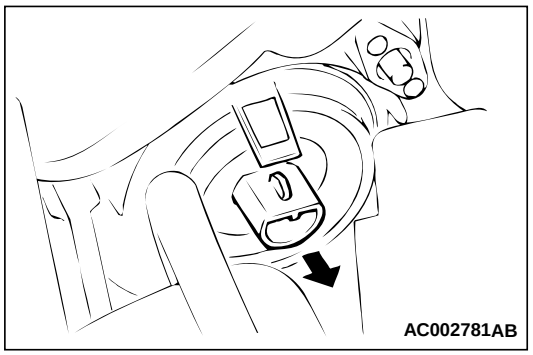
I = Er2 Where:

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

REPLACEMENT OF REPLACEABLE BULB

M1542001300335





1. When replacing the right side headlight bulb, remove the resonator.
2. Disconnect the connector.
3. Remove the locking cap by turning it counterclockwise.

⚠ 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.

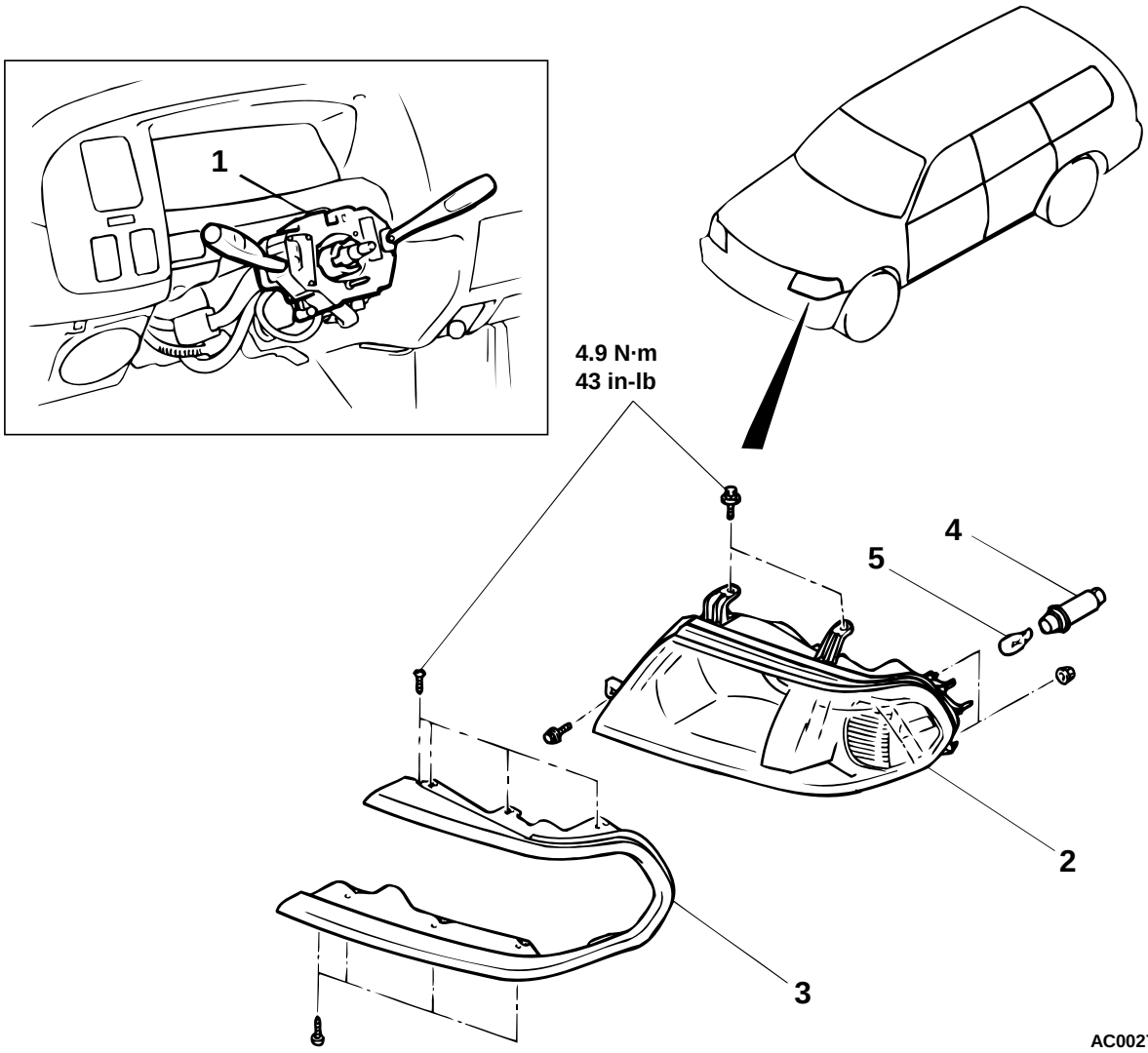
4. Remove the light socket, and then remove the bulb.

REMOVAL AND INSTALLATION

M1542001800103

⚠ WARNING

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



1. COLUMN SWITCH <LIGHTING SWITCH AND DIMMER/PASSING SWITCH> (REFER TO GROUP 37A, STEERING WHEEL AND SHAFT P.37A-23.)

HEADLIGHT REMOVAL STEPS

- RADIATOR GRILL (REFER TO GROUP 51, GRILL, MOLDING AND GARNISH P.51-6.)
- SPLASH SHIELD (REFER TO GROUP 42, FENDER P.42-8.)

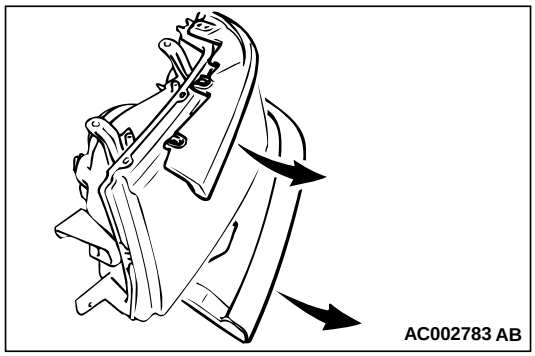
2. HEADLIGHT

<<A>>

3. HEADLIGHT BEZEL
4. BULB SOCKET
5. BULB

TSB Revision

REMOVAL SERVICE POINT


AC002783 AB

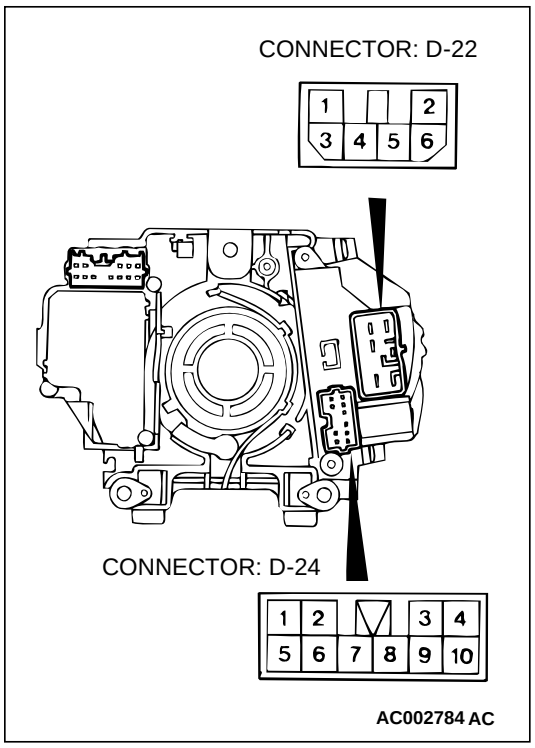
<<A>> HEADLIGHT BEZEL REMOVAL

Using care not to damage the engagement with the headlight, remove the headlight bezel little by little starting from the body center.

INSPECTION

M1542011200317

LIGHTING SWITCH AND DIMMER/PASSING SWITCH CONTINUITY CHECK

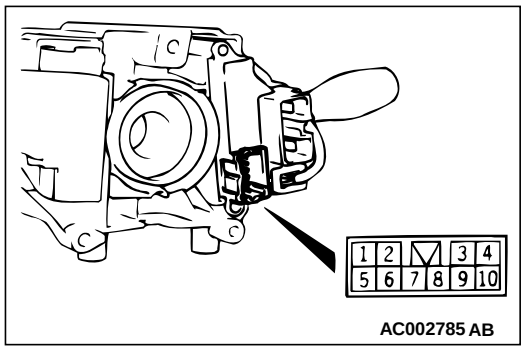


SWITCH POSITION		TESTER CONNECTION	SPECIFIED CONDITION
Lighting switch	OFF	–	–
	TAIL	Connector D-24 terminal No.5 and 7	Less than 2 ohms
	HEAD	• Connector D-24 terminal No.5 and 7 • Connector D-22 terminal No.1 and connector No. D-24 terminal No.6	Less than 2 ohms

SWITCH POSITION		TESTER CONNECTION	SPECIFIED CONDITION
Dimmer/Passing switch	LOWER	Connector D-22 terminal No.3 and 4	Less than 2 ohms
	UPPER	Connector D-22 terminal No.4 and 5	Less than 2 ohms
	PASSING	• Connector D-22 terminal No.1 and 2 • Connector D-22 terminal No.3 and 4 • Connector D-22 terminal No.3 and 4 and 6*	Less than 2 ohms

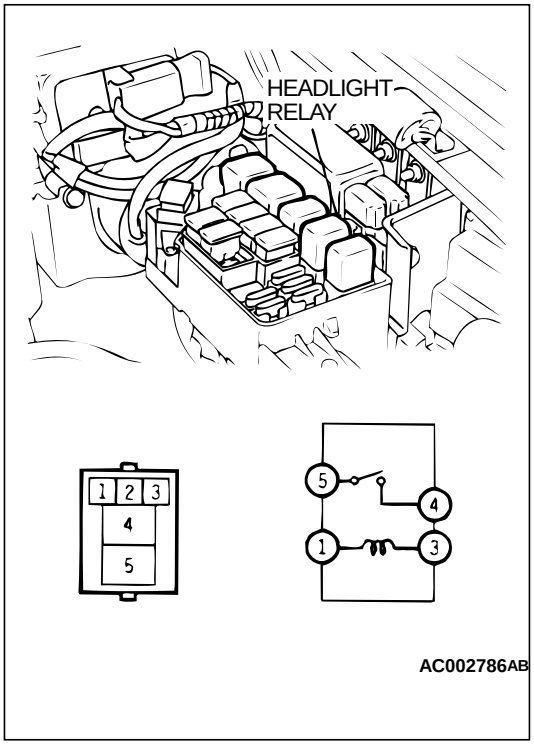
*NOTE: * indicates continuity with the dimmer switch in the lower beam position.*

TURN-SIGNAL LIGHT SWITCH CONTINUITY CHECK



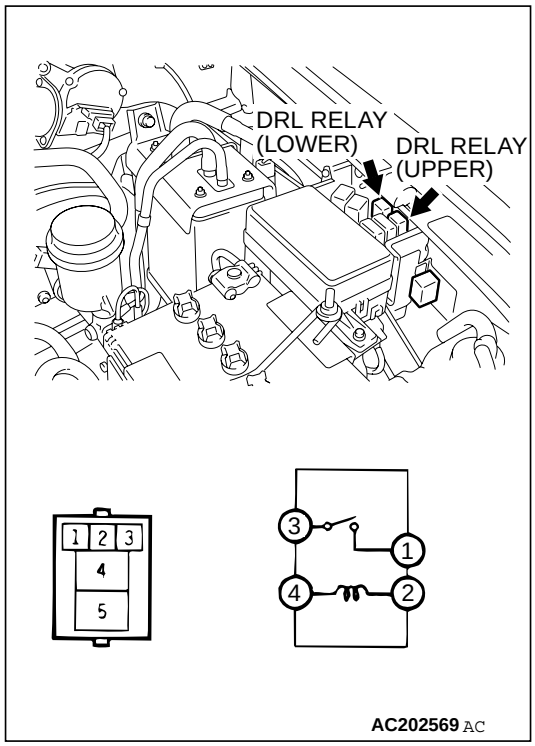
SWITCH POSITION		TESTER CONNECTION	SPECIFIED CONDITION
Turn-signal light switch	RH	8 – 9	Less than 2 ohms
	OFF	8 – 9 3 – 8 3 – 9	Open circuit
	LH	3 – 8	Less than 2 ohms

HEADLIGHT RELAY CHECK



BATTERY VOLTAGE	TESTER CONNECTION	SPECIFIED CONDITION
Not applied	4 – 5	Open circuit
• Connect terminal 3 to the positive battery terminal • Connect terminal 1 to the negative battery terminal	4 – 5	Less than 2 ohms

DRL RELAY (LOWER AND UPPER) CHECK



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

FOG LIGHT

LIGHTING SYSTEM DIAGNOSIS

INTRODUCTION TO FOG LIGHT DIAGNOSIS

M1542010500508

If the fog light cannot be on, the fuse fog light relay or fog light switch may be faulty.

FOG LIGHT DIAGNOSTIC TROUBLESHOOTING STRATEGY

M1542010600129

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 fog light fault.

1. Gather information from the customer.
2. Verify that the condition described by the customer exists.

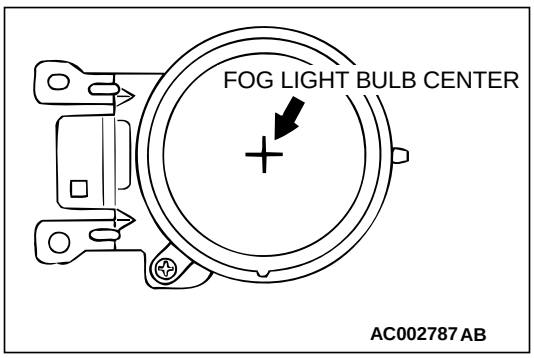
ON-VEHICLE SERVICE

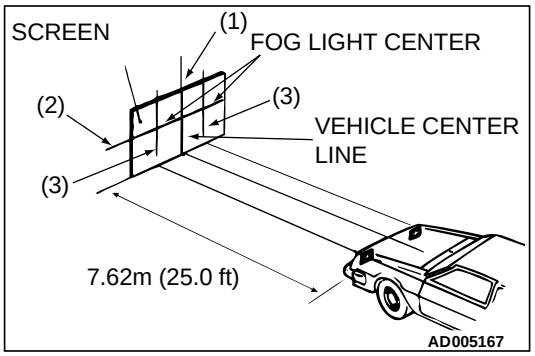
FOG LIGHT AIMING

M1542001100267

PRE-AIMING INSTRUCTIONS

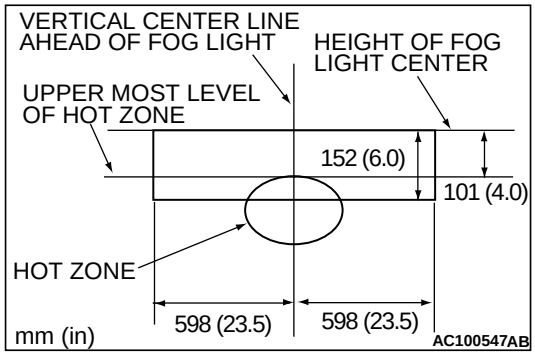
1. Inspect for badly rusted or faulty headlight assemblies.
2. These conditions must be corrected before a satisfactory adjustment can be made.
3. Inspect tire inflation, and adjust if necessary.
4. If the fuel tank is not full, place a weight in luggage room of vehicle to simulate weight of a full tank [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 fog light lenses.
7. Place the vehicle on a level floor, perpendicular to a flat screen 7.62 m (25.0 feet) away from the bulb center-marks on the fog light 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. Measure the center of the fog lights as shown in the illustration.





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

FOG LIGHT ADJUSTMENT

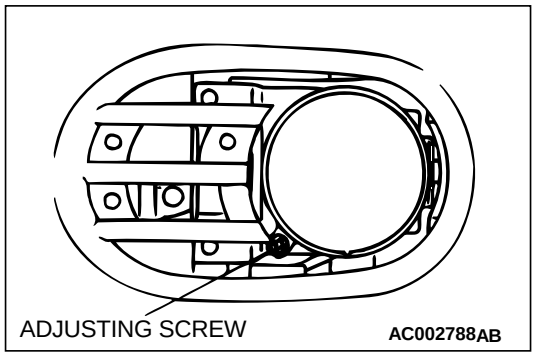


1. The fog light will project on the screen upper edge of the high intensity zone.
2. Turn the adjusting screws to achieve the specified upper edge of the high intensity zone on the aiming screen.

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

Limit:
(Vertical direction): Top of the hot zone should be 15.24 cm (1.14°) in maximum downward from the height of the fog light center.

NOTE: The horizontal direction is non-adjustable. If the deviation of the light beam axis exceeds the standard value, check for improper/defective mounting location.

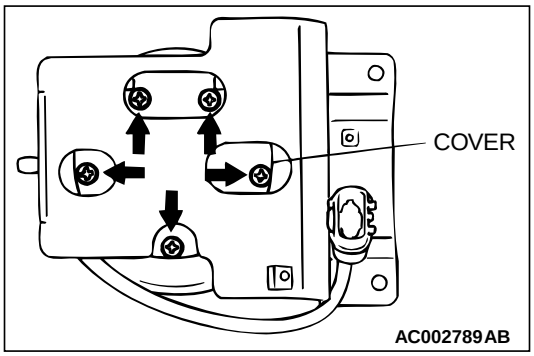


⚠ CAUTION
When making the aiming adjustment, be sure to block the beam of those lights which are not being adjusted.

BULB REPLACEMENT

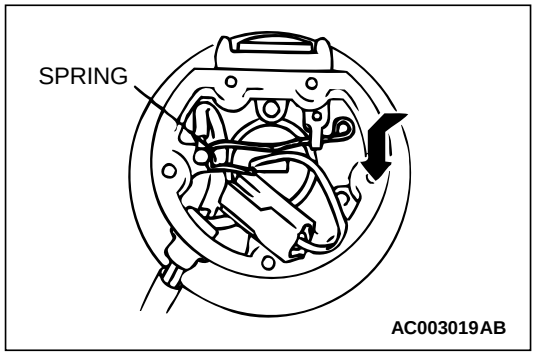
M1542001300346

1. Remove the fog light.
2. Loosen the shown screws to remove the cover.



⚠ CAUTION

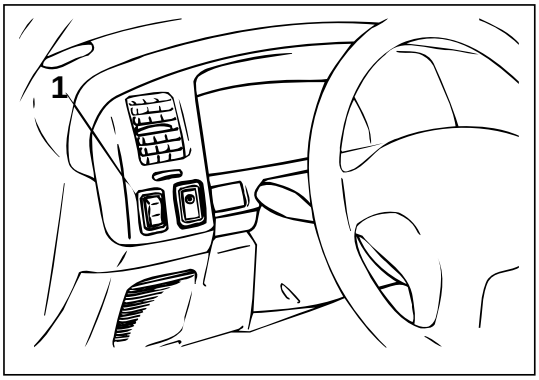
- **Do not touch the surface of the bulb with hands or dirty gloves. If the surface does become dirty, clean it with alcohol or thinner, and let it dry thoroughly before installing.**
- **Improper installation of the under cover causes a unit. Make sure that the under cover is installed properly.**

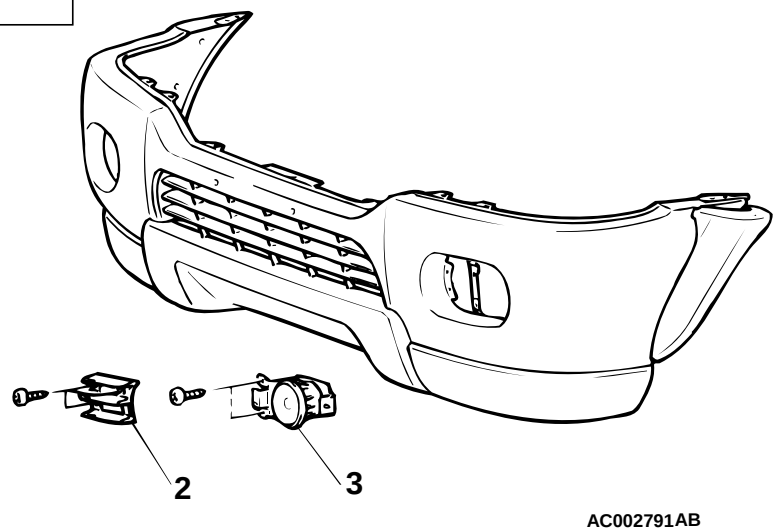


3. Unlock the spring which secures the bulb and then remove the bulb.

REMOVAL AND INSTALLATION

M1542001500287





1. FOG LIGHT SWITCH

FOG LIGHT REMOVAL STEPS

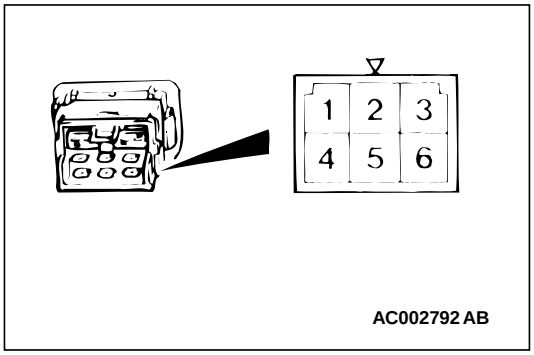
2. INTERCOOLER GRILL
3. FOG LIGHT

TSB Revision

INSPECTION

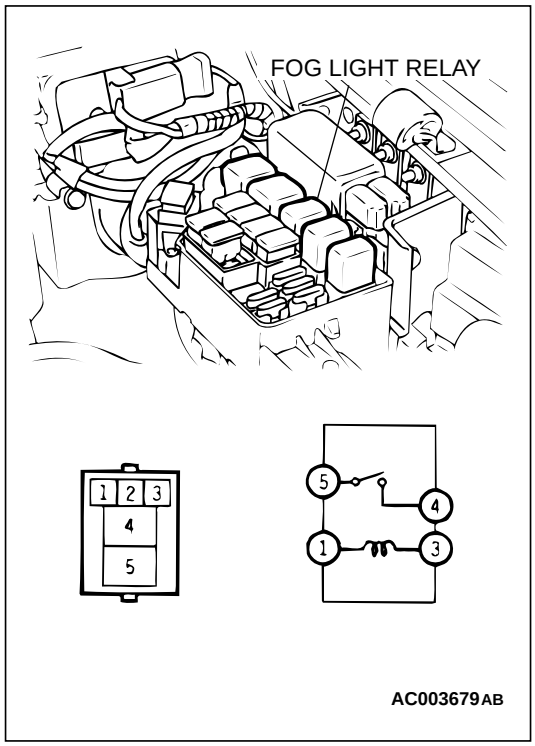
M1542011200328

FOG LIGHT SWITCH CONTINUITY CHECK



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

FOG LIGHT RELAY CHECK



BATTERY VOLTAGE	TESTER CONNECTION	SPECIFIED CONDITION
Not applied	4 – 5	Open circuit
• Connect terminal 3 to the positive battery terminal • Connect terminal 1 to the negative battery terminal	4 – 5	Less than 2 ohms

REAR COMBINATION LIGHT

REAR COMBINATION LIGHT DIAGNOSIS

M1542000700802

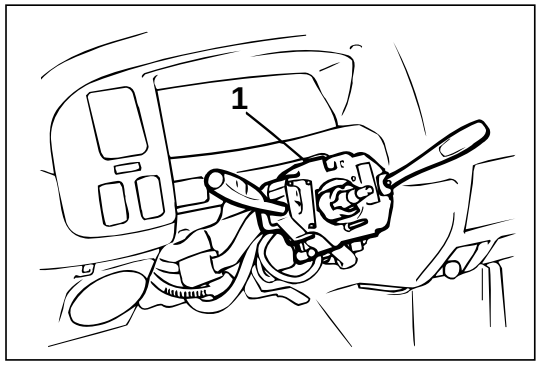
The taillights are controlled by the light reminder alarm function of the ETACS-ECU. For troubleshooting, refer to Headlight, Light Reminder Alarm Diagnosis-symptom Chart P.54-113.

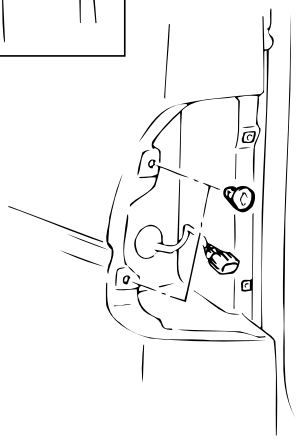
REMOVAL AND INSTALLATION

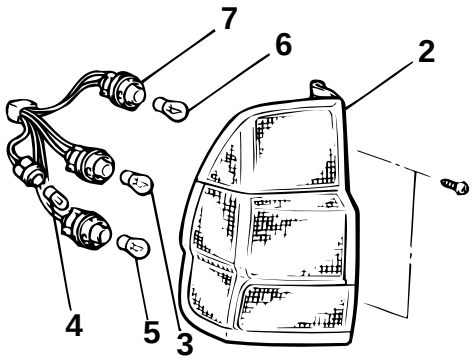
M1542003900311

⚠ ***WARNING***

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







AC002793 AB

1. COLUMN SWITCH <LIGHTING SWITCH AND TURN-SIGNAL LIGHT SWITCH> (REFER TO GROUP 37A, STEERING WHEEL AND SHAFT P.37A-23.)

REAR COMBINATION LIGHT REMOVAL STEPS

2. REAR COMBINATION LIGHT
3. BULB (FOR TAIL AND STOPLIGHT)
4. BULB (FOR SIDE MARKER LIGHT)
5. BULB (FOR BACKUP LIGHT)
6. BULB (FOR TURN-SIGNAL LIGHT)
7. BULB SOCKET ASSEMBLY

INSPECTION

M1542011200339

LIGHTING SWITCH AND TURN-SIGNAL LIGHT SWITCH CONTINUITY CHECK

Refer to P.54-138.

TSB Revision

DOME LIGHT

LIGHTING SYSTEM DIAGNOSIS

INTRODUCTION TO DOME LIGHT AND CARGO SPACE LIGHT DIAGNOSIS <VEHICLES WITH KEYLESS ENTRY SYSTEM>

M1542010500519

With the dome light switch and cargo space light switch in the "ROOM" position, the ETACS-ECU controls the dome light and cargo space light operation as follows:

- When a door is opened from outside or inside [with the ignition switch turned to "LOCK" (OFF)]: When a door is opened, the ETACS-ECU causes the dome light and cargo space light to be illuminated at the 100% intensity. When the door is closed, it dims out the dome light to 65% intensity and approximately 30 seconds later, turns out the light completely. During this period (timer controlled period), the dome light and cargo space light goes out if the ignition switch is turned "ON" or the doors are locked.
- When a door is opened or closed with the ignition switch in the "ON" position: The dome light and cargo space light illuminates at 100% intensity when a door is opened and turned out when it is closed.
- When no door is opened and the ignition key is removed: When the ignition key is removed with all the doors closed, the dome light and cargo space light are illuminated at an intensity of 100% and turned out approximately 30 seconds later. During that time (time-controlled period), the dome light and cargo space light goes out if the ignition key inserted and turned to "ON" or the door locking system is activated.
- Dome light's and cargo space light's answerback operation in response to door lock control by keyless entry system: To allow the driver to ascertain the result of the door locking/unlocking control action by the use of the keyless entry system, the ETACS-ECU causes the dome light and cargo space light to blink twice when the doors are locked through the system and to illuminate for approximately15 seconds when the doors are locked. The dome light's and cargo space light's answerback operation in response to a keyless entry by operation of the hazard warning lights.

DOME LIGHT AND CARGO SPACE LIGHT DIAGNOSTIC TROUBLESHOOTING STRATEGY <VEHICLES WITH KEYLESS ENTRY SYSTEM>

M1542010600130

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 dome light and cargo space light fault.

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

SYMPTOM CHART

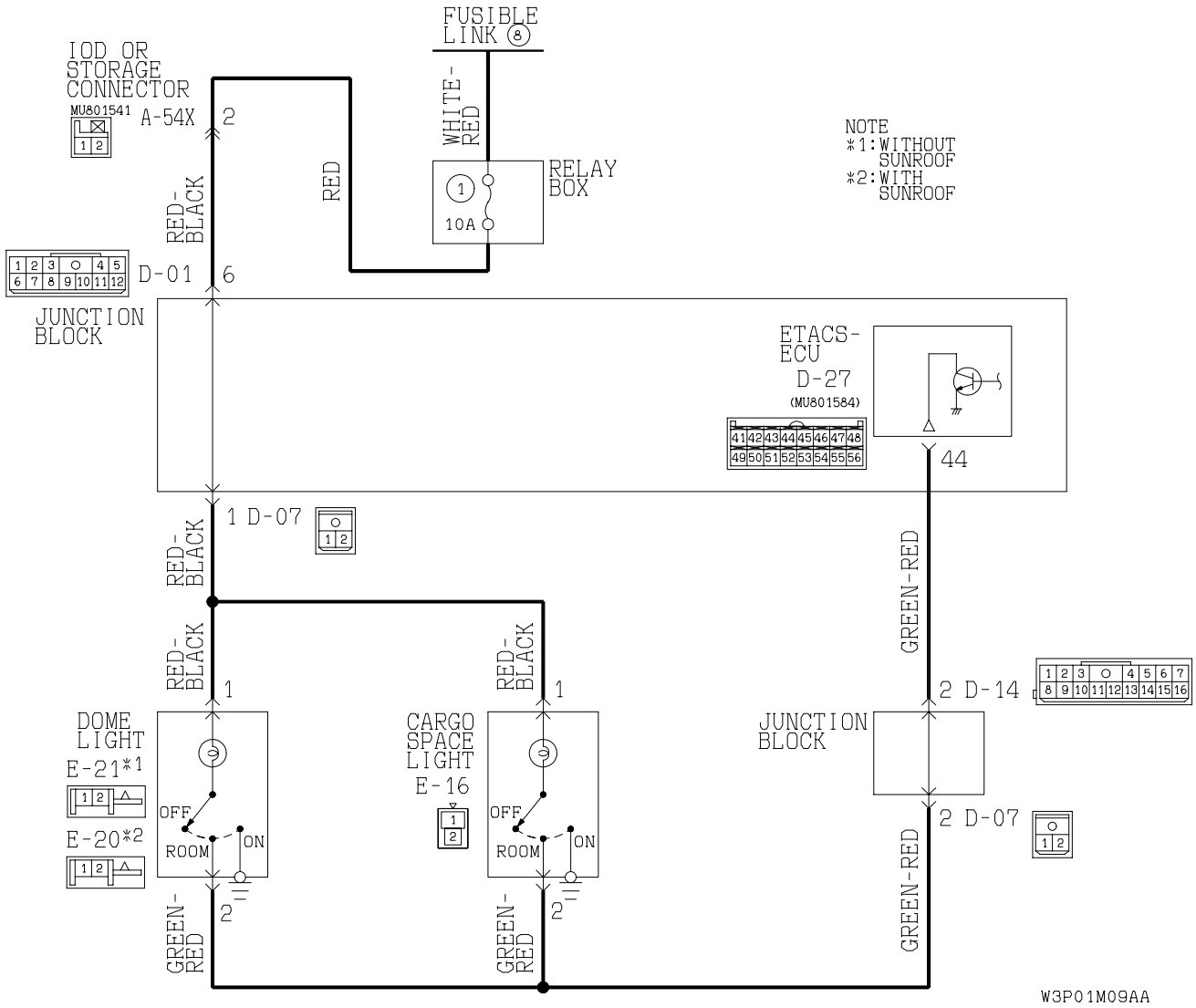
M1542009100205

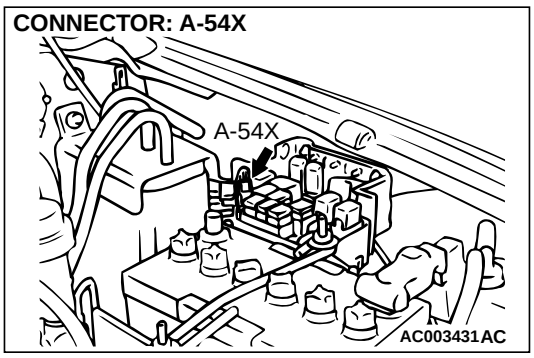
SYMPTOM	INSPECTION PROCEDURE	REFERENCE PAGE
The dome light and cargo space light does not illuminate.	1	P.54-147
The dome light and cargo space light dimming function does not work normally.	2	P.54-154

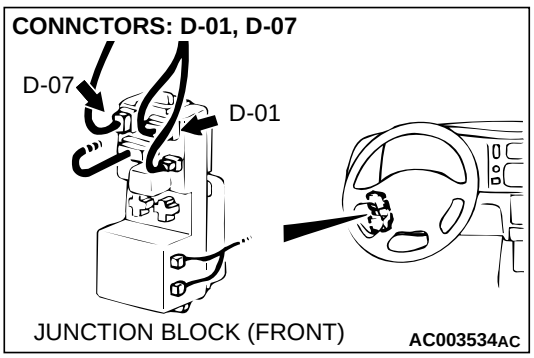
SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: The Dome Light and Cargo Space Light does not Illuminate.

Dome Light and Cargo Space Light Drive Circuit







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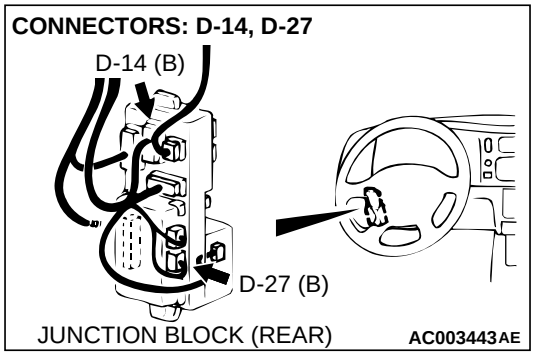
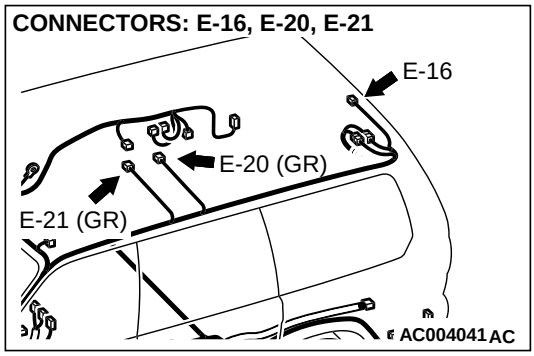




CIRCUIT OPERATION

The dome light and cargo space light dimming function and keyless entry system answerback function illuminate the dome light and cargo space light when the dome light and cargo space light switch is at "ROOM" control operation position.

TECHNICAL DESCRIPTION (COMMENT)

The dome light and cargo space light does not illuminate at all, the dome light and cargo space light bulb may be burned out, or the power supply circuit or the ETACS-ECU may be defective.

TROUBLESHOOTING HINTS

- Malfunction of the dome light
- Malfunction of the cargo space light
- Damaged harness wires or connectors

DIAGNOSIS

Required Special Tools:
MB991223: Test Harness Set

STEP 1. Check the trouble symptom.

Q: Do the dome light and cargo space light illuminate when the dome light and cargo space light switch is set to "ON" position?

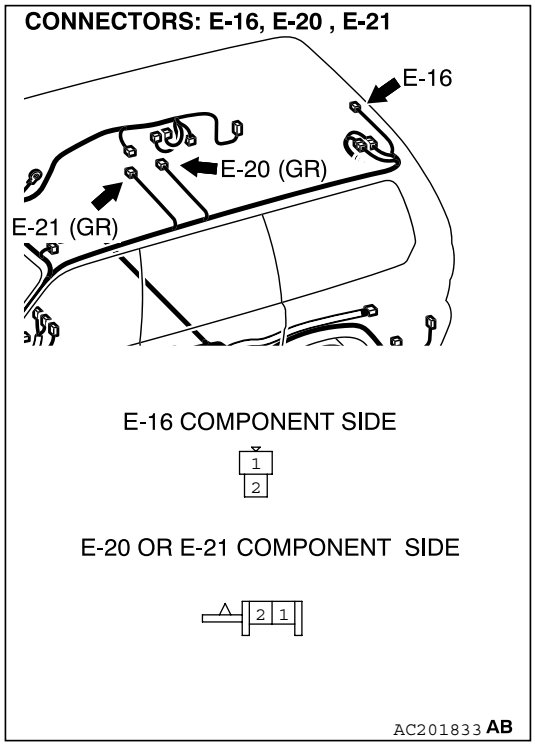
YES : Go to Step 2.
NO : Go to Step 4.

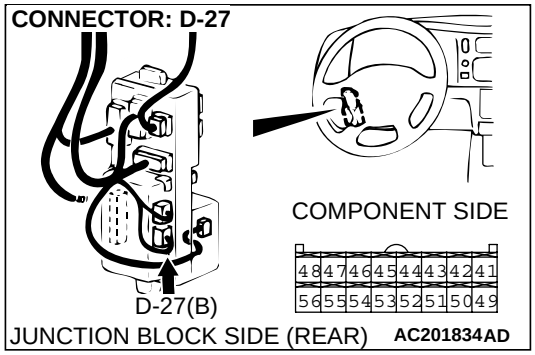
STEP 2. Check dome light connector E-20 <vehicles with sunroof> or E-21 <vehicles without sunroof>, cargo space light connector E-16 and ETACS-ECU connector D-27 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are dome light connector E-20 <vehicles with sunroof> or E-21 <vehicles without sunroof>, cargo space light connector E-16 and ETACS-ECU connector D-27 in good condition?

YES : Go to Step 3.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The dome light should illuminate.





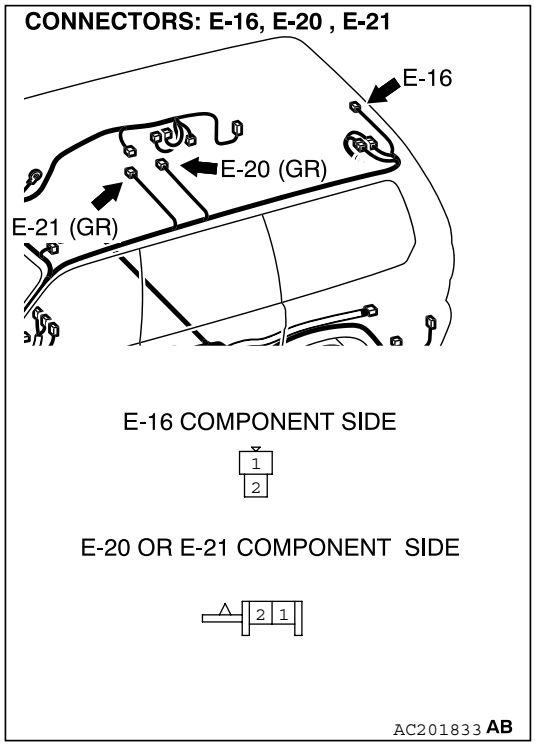
STEP 3. Check the harness wires between dome light connector E-20 (terminal No.2) <vehicles with sunroof> or E-21 terminal No.2) <vehicles without sunroof>, cargo space light connector E-16 (terminal No.2) and ETACS-ECU connector D-27 (terminal No.44).

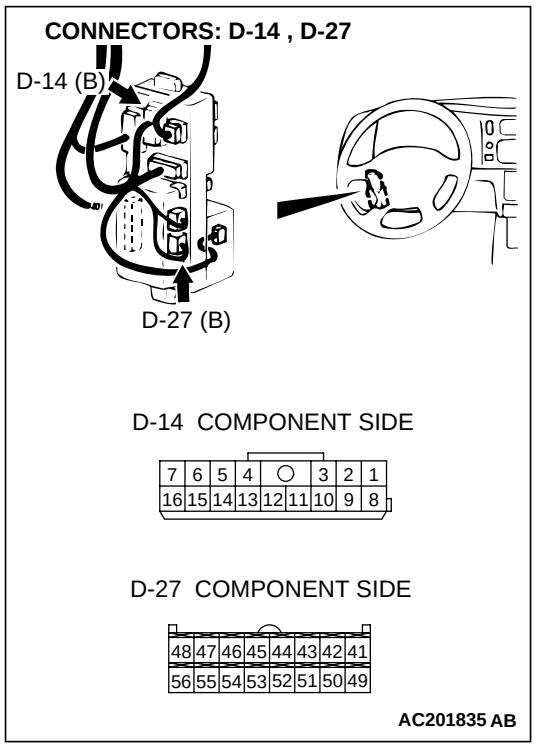
NOTE: After checking junction block connector D-07 and D-14, check the wires. If junction block connector D-07 and D-14 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

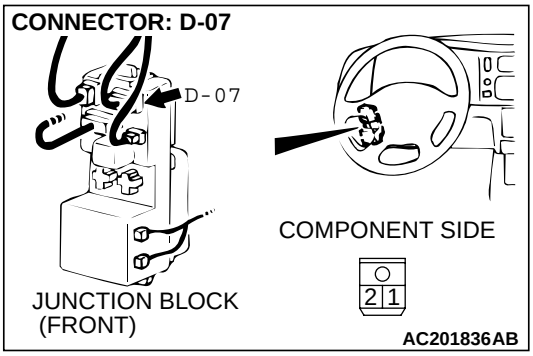
Q: Are the harness wires between dome light connector E-20 (terminal No.2) <vehicles with sunroof> or E-21 (terminal No.2) <vehicles without sunroof>, cargo space light connector E-16 (terminal No.2) and ETACS-ECU connector D-27 (terminal No.44) in good condition?

YES : Replace the ETACS-ECU. The dome light and cargo space light should illuminate.

NO : Repair them. The dome light and cargo space light should illuminate.







STEP 4. Check the dome light bulb or cargo space light bulb.

Q: Is the dome light bulb or cargo space light bulb in good condition?

YES : Go to Step 5.

NO : Replace it. The dome light and cargo space light should illuminate.

STEP 5. Check the dome light and cargo space light power supply circuit at dome light connector E-20 <vehicles with sunroof> or E-21 <vehicles without sunroof> and cargo space light connector E-16.

(1) Disconnect dome light connector E-20 <vehicles with sunroof> or E-21 <vehicles without sunroof>, cargo space light connector E-16 and measure at the harness side.

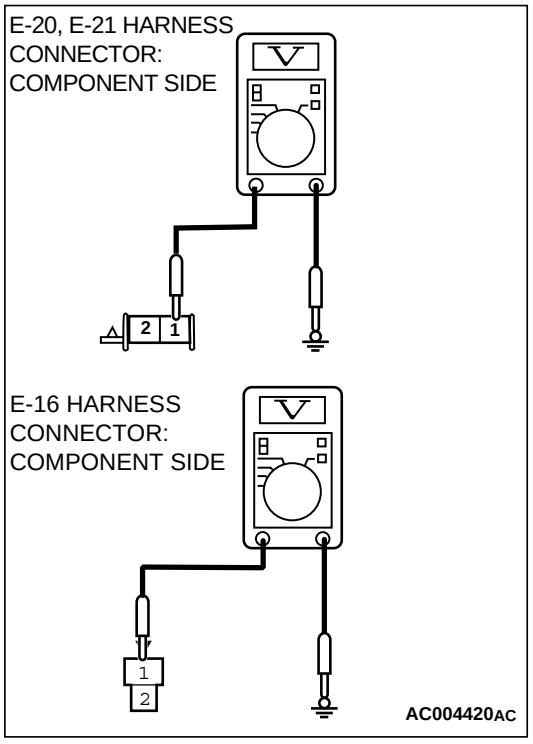
(2) Measure the voltage between terminal 1 and ground.

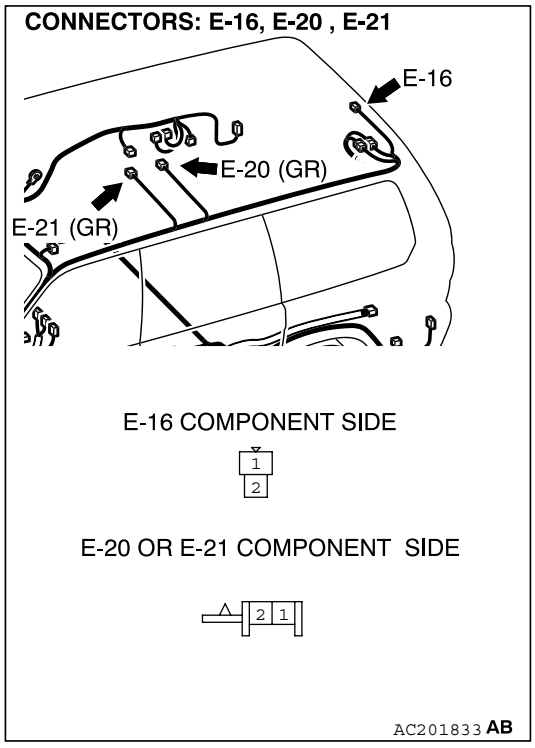
- The measured value should be approximately 12 volts (battery positive voltage).

Q: Does the measured voltage correspond with this range?

YES : Replace the dome light or cargo space light. The dome light and cargo space light should illuminate.

NO : Go to Step 6.





STEP 6. Check dome light connector E-20 <vehicles with sunroof> or E-21 <vehicles without sunroof>, cargo space light connector E-16 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is dome light connector E-20 <vehicles with sunroof> or E-21 <vehicles without sunroof> cargo space light connector E-16 in good condition?

YES : Go to Step 7.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The dome light and cargo space light should illuminate.

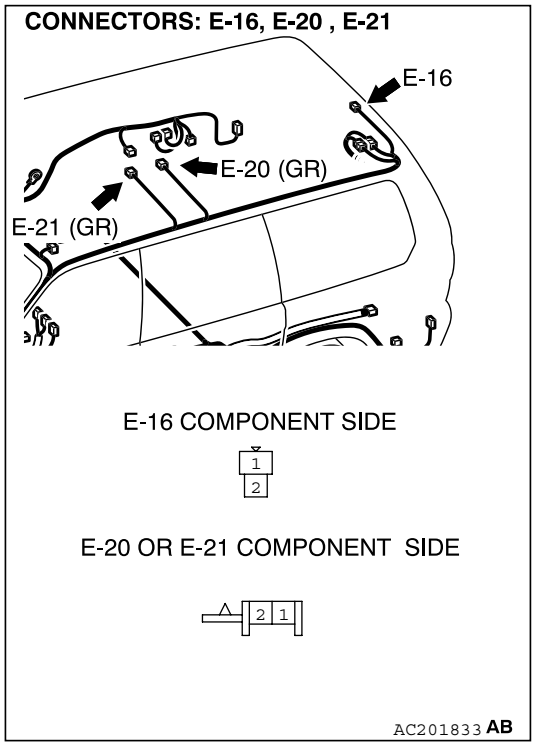
STEP 7. Check the harness wires between dome light connector E-20 (terminal No.1) <vehicles with sunroof> or E-21 (terminal No.1) <vehicles without sunroof>, cargo space light connector E-16 (terminal No.1) and fusible link number 8.

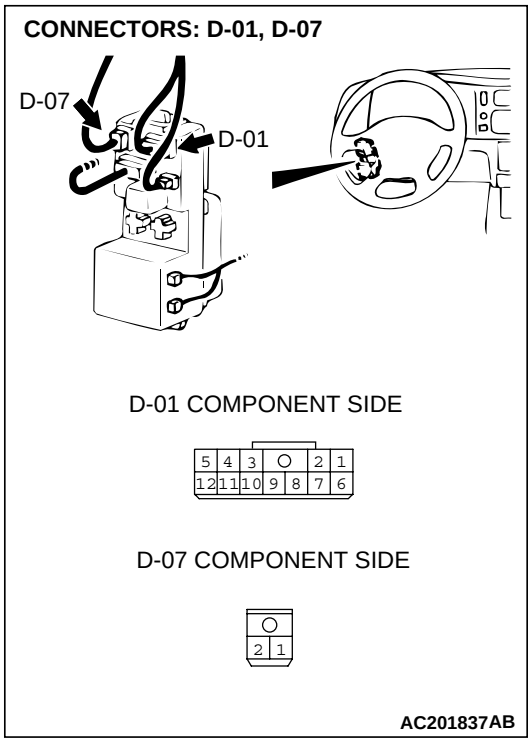
NOTE: After checking junction block connector D-01 and D-07, IOD or storage connector A-54X, check the wires. If junction block connector D-01 and D-07, IOD or storage connector A-54X are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

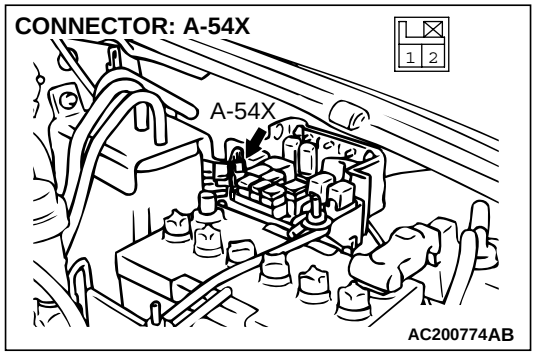
Q: Are the harness wires between dome light connector E-20 (terminal No.1) <vehicles with sunroof> or E-21 (terminal No.1) <vehicles without sunroof>, cargo space light connector E-16 (terminal No.1) and fusible link number 8 in good condition?

YES : Go to Step 8.

NO : Repair them. The dome light and cargo space light should illuminate.







STEP 8. Recheck for malfunction.

Q: Is a malfunction eliminated?

YES : The procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Point – How to Cope with Intermittent Malfunction P.00-6.)

NO : Go to Step 1.

INSPECTION PROCEDURE 2: Dome Light and Cargo Space Light Dimming Function does not Work Normally.

TECHNICAL DESCRIPTION (COMMENT)

The ETACS-ECU dims the dome light and cargo space light according to the input signals from the following switches:

- Ignition switch (IG1)
- Key reminder switch
- Door switches
- Driver's door lock actuator switch

If the dome light and cargo space light does not be dimmed normally, the relevant input signal circuit or the ETACS-ECU may be defective.

TROUBLESHOOTING HINTS

- Malfunction of the key reminder switch
- Malfunction of the door switches
- Malfunction of the driver's door lock actuator switch
- Malfunction of the ETACS-ECU
- Damaged harness wires or connectors

DIAGNOSIS

Required Special Tools:

- MB991223: Test Harness Set
- MB991502: Scan Tool (MUT-II)
- MB991529: Diagnostic Trouble Code Check Harness

STEP 1. Check the ETACS-ECU power supply circuit.

Do all of the following functions work when the ignition switch is turned to the "LOCK" (OFF) position?

- Ignition key reminder tone alarm function
- Light reminder tone alarm function
- Central door locking system
- Ignition key hole illumination light
- Theft-alarm system

Q: Do any of the functions work?

YES : Go to Step 2 <when using scan tool MB991502> or 3 <when using a voltmeter>.

NO : Check the ETACS-ECU battery circuit. Refer to Inspection Procedure P-1 (P.54-284).

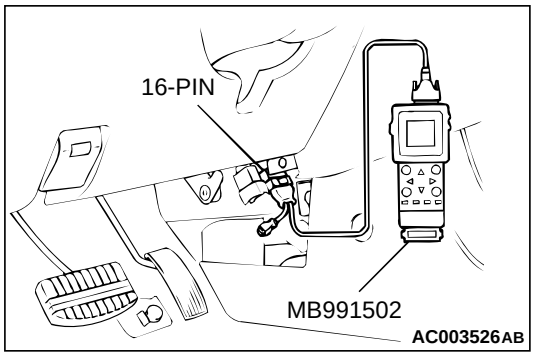
STEP 2. Check the input signal (by using pulse check).

Check the input signals from the following switches:

- Ignition switch (IG1)
- Key reminder switch
- All door switch
- Liftgate switch

⚠ CAUTION

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



(1) Connect scan tool MB991502 to the data link connector.
(2) Check that the tone alarm of scan tool MB991502 sounds when the input signal enters.

Q: Does the tone alarm of scan tool MB991502 sound when the input signal enters?

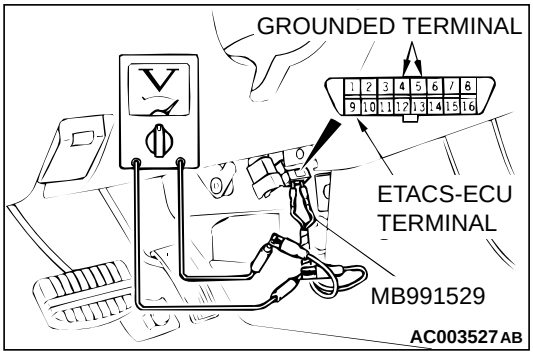
YES : Replace the ETACS-ECU. The dome light and cargo space light dimming function should work normally.

NO : Check the relevant input signal circuit. Refer to P.54-147.

STEP 3. Check the input signal (by using a voltmeter).

Check the input signals from the following switches:

- Ignition switch (IG1)
- Key reminder switch
- All door switch
- Liftgate switch



(1) Use special tool MB991529 to connect a voltmeter between ground terminal 4 or 5 and ETACS-ECU terminal 9 of the data link connector.
(2) Check that the voltmeter indicator deflects once when the input signal enters.

Q: Does the voltmeter indicator deflect?

YES : Replace the ETACS-ECU. The dome light and cargo space light dimming function should work normally.

NO : Check the relevant input signal circuit.

TSB Revision

HIGH-MOUNTED STOPLIGHT

REMOVAL AND INSTALLATION

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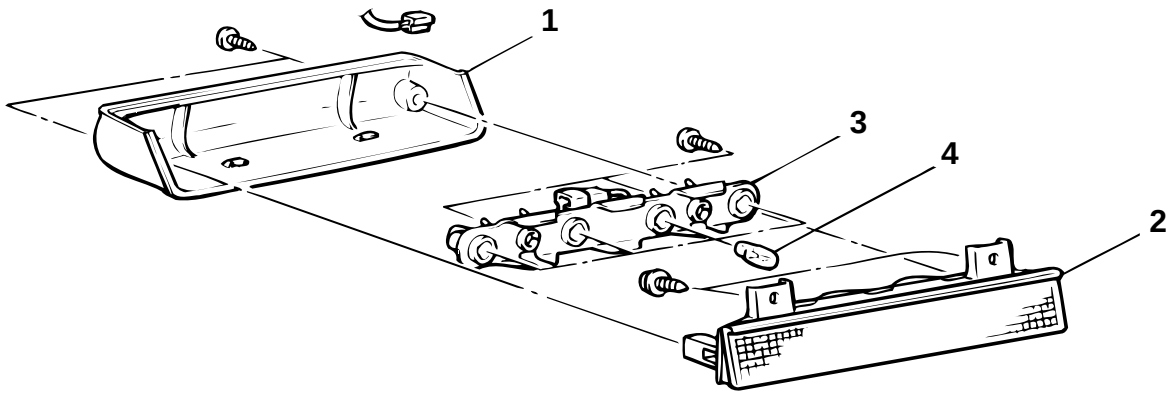

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REMOVAL STEPS
1. COVER
2. HIGH-MOUNTED STOPLIGHT UNIT

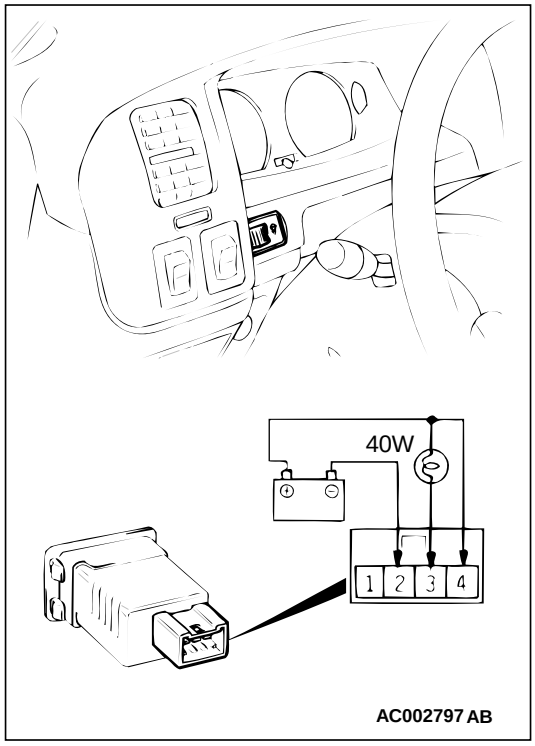
REMOVAL STEPS (Continued)
3. BULB SOCKET
4. BULB

RHEOSTAT

INSPECTION

M1542006100198

RHEOSTAT CHECK

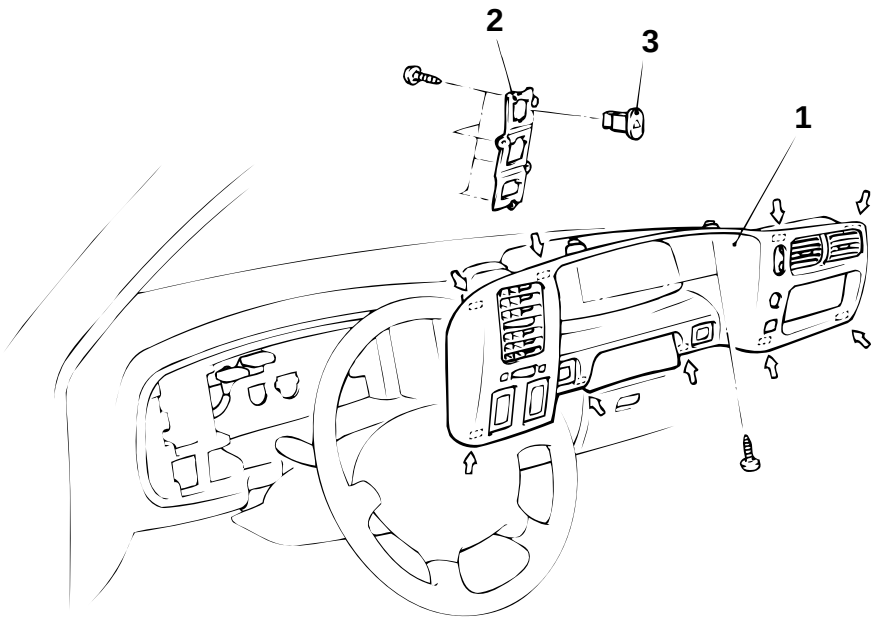


1. Connect the battery and the test bulb (40W) as shown in the illustration.
2. Operate the rheostat, and if brightness changes smoothly without switching off, rheostat function is normal.

HAZARD WARNING LIGHT SWITCH

REMOVAL AND INSTALLATION

M1542006600308



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NOTE
⇦: Metal clip position

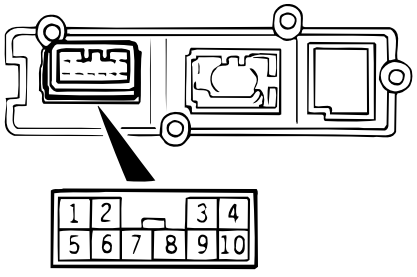
REMOVAL STEPS
1. METER BEZEL ASSEMBLY

REMOVAL STEPS (Continued)
2. SWITCH HOLDER
3. HAZARD WARNING LIGHT SWITCH

INSPECTION

M1542006700220

HAZARD WARNING LIGHT SWITCH CONTINUITY CHECK



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SWITCH POSITION	TESTER CONNECTION	SPECIFIED CONDITION
Released	5 – 7	Less than 2 ohms
Pressed	1 – 2, 1 – 4, 2 – 4, 5 – 6	Less than 2 ohms

TSB Revision

HORN

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

M1543000700623

The keyless entry system horn answerback and theft-alarm system are controlled by the ETACS-ECU. For troubleshooting, refer to Theft-Alarm System, Diagnosis P.54-247.

REMOVAL AND INSTALLATION

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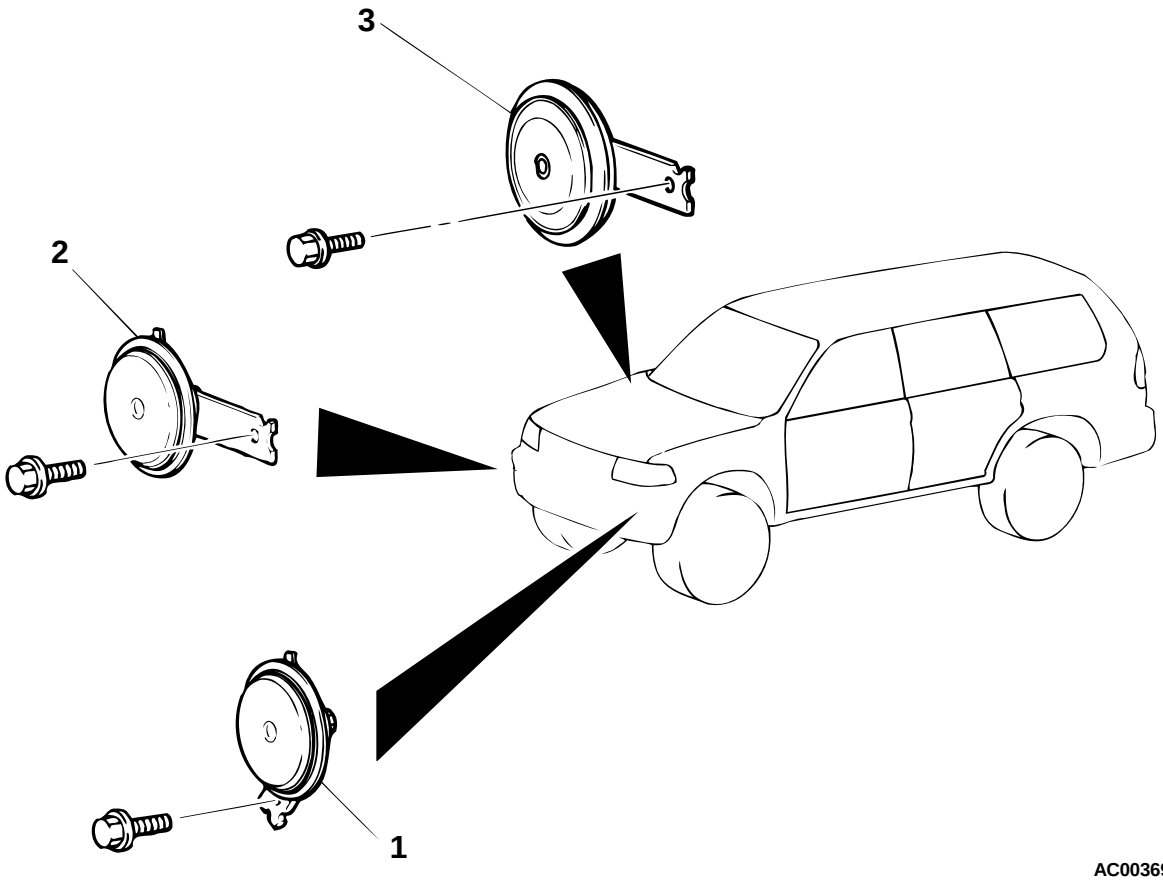

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HORN (STANDARD TYPE) REMOVAL STEPS

- RADIATOR GRILL (REFER TO GROUP 51, GRILL AND GARNISH P.51-6.)

1. HORN (LOW SOUND)
2. HORN (HIGH SOUND)

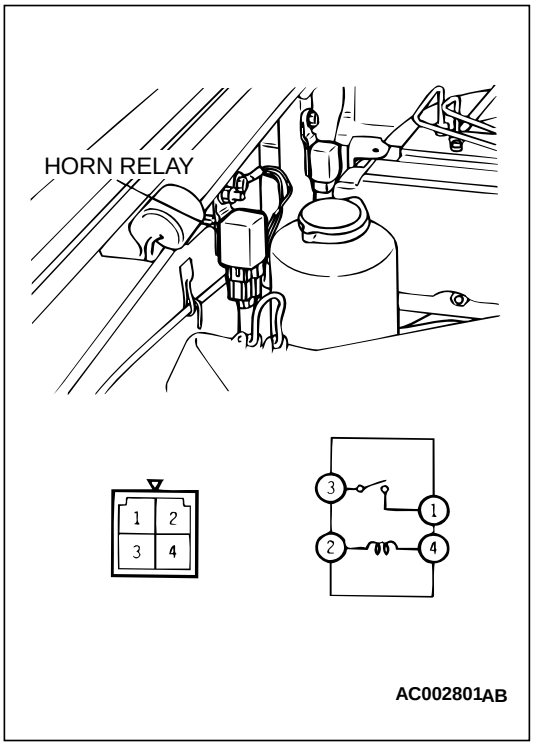
HORN (FOR KEYLESS ENTRY SYSTEM AND THEFT-ALARM SYSTEM) REMOVAL STEPS

3. HORN (FOR KEYLESS ENTRY SYSTEM AND THEFT-ALARM SYSTEM)

INSPECTION

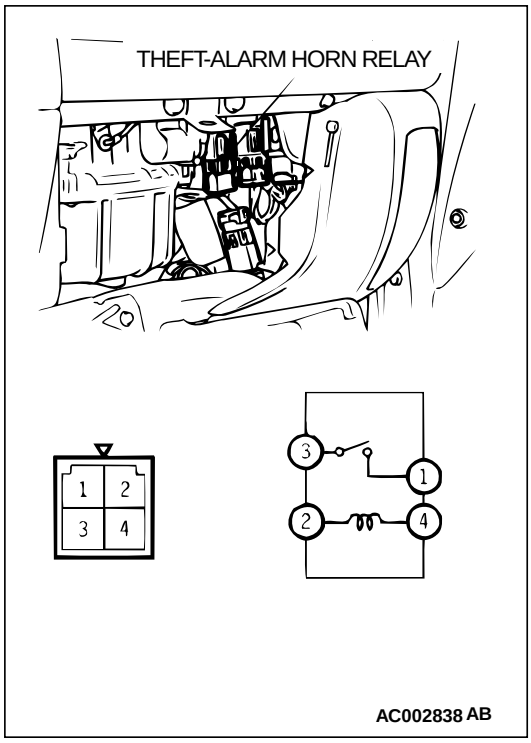
M1543019501578

HORN RELAY CONTINUITY CHECK



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

THEFT-ALARM HORN RELAY CONTINUITY CHECK

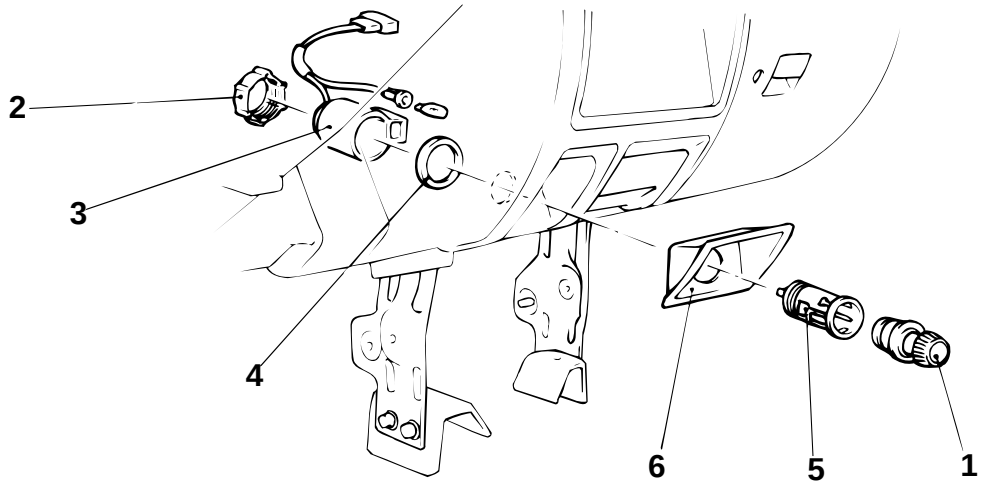


BATTERY VOLTAGE	TESTER CONNECTION	SPECIFIED CONDITION
Not applied	1 – 3	Open circuit
• Connect terminal 2 to the positive battery terminal • Connect terminal 4 to the negative battery terminal	1 – 3	Less than 2 ohms

CIGARETTE LIGHTER

REMOVAL AND INSTALLATION

M1543013500180



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CIGARETTE LIGHTER REMOVAL STEPS

- FRONT FLOOR CONSOLE ASSEMBLY (REFER TO GROUP 52A, FLOOR CONSOLE P.52A-35.)

1. PLUG
2. FIXING RING

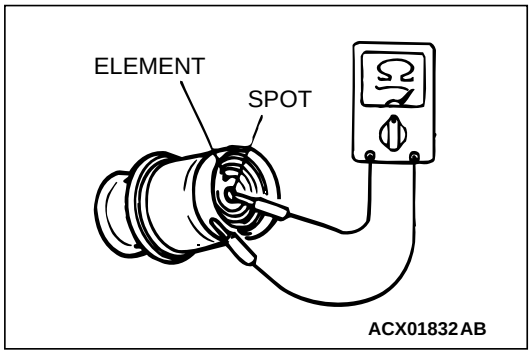
CIGARETTE LIGHTER REMOVAL STEPS (Continued)

3. SOCKET CASE
4. SOCKET WASHER
5. SOCKET
6. PROTECTOR

INSPECTION

M1543019501589

CIGARETTE LIGHTER CHECK



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- 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 ohm.

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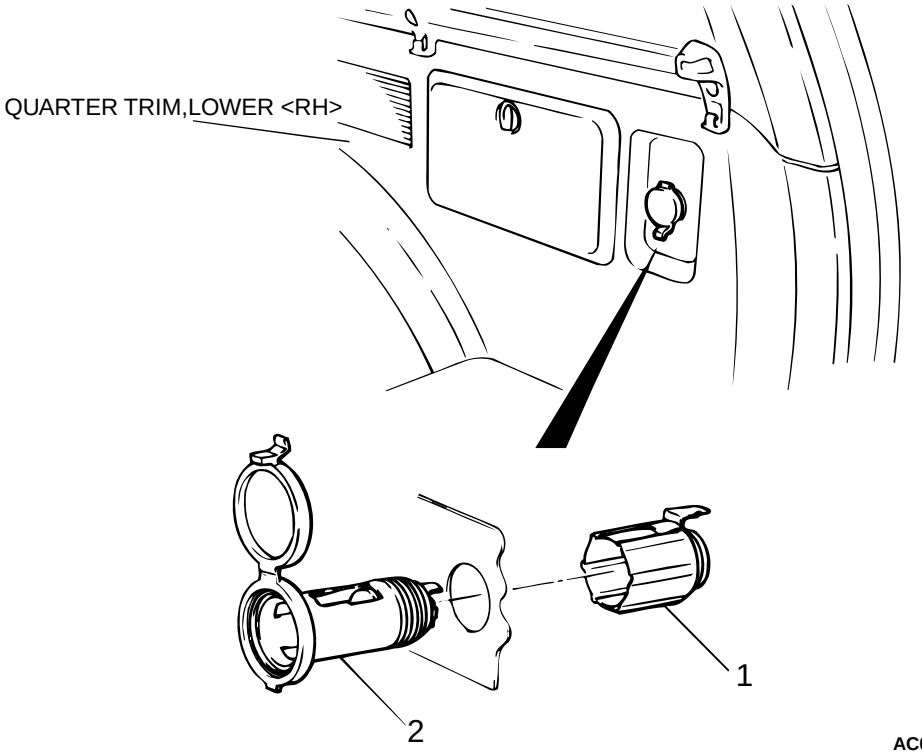
ACCESSORY SOCKET

REMOVAL AND INSTALLATION

M1543008900126



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REMOVAL STEPS

- QUARTER TRIM, LOWER <RH> (REFER TO GROUP 52A, TRIMS P.52A-36.)

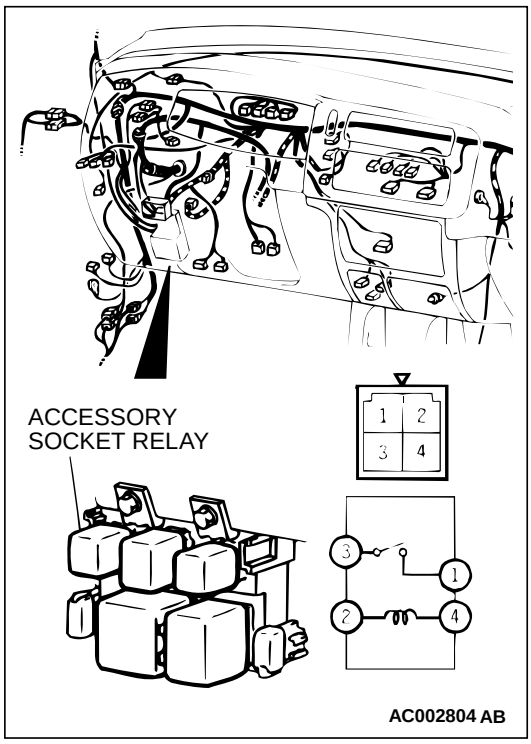
REMOVAL STEPS (Continued)

1. OUTER CASE
2. SOCKET

INSPECTION

M1543019501590

ACCESSORY SOCKET RELAY CONTINUITY CHECK



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

RADIO AND TAPE PLAYER

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

INTRODUCTION TO AUDIO SYSTEM DIAGNOSIS

M1543009900947

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

M1544004800272

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 that the malfunction is eliminated.

SYMPTOM CHART

M1544004900309

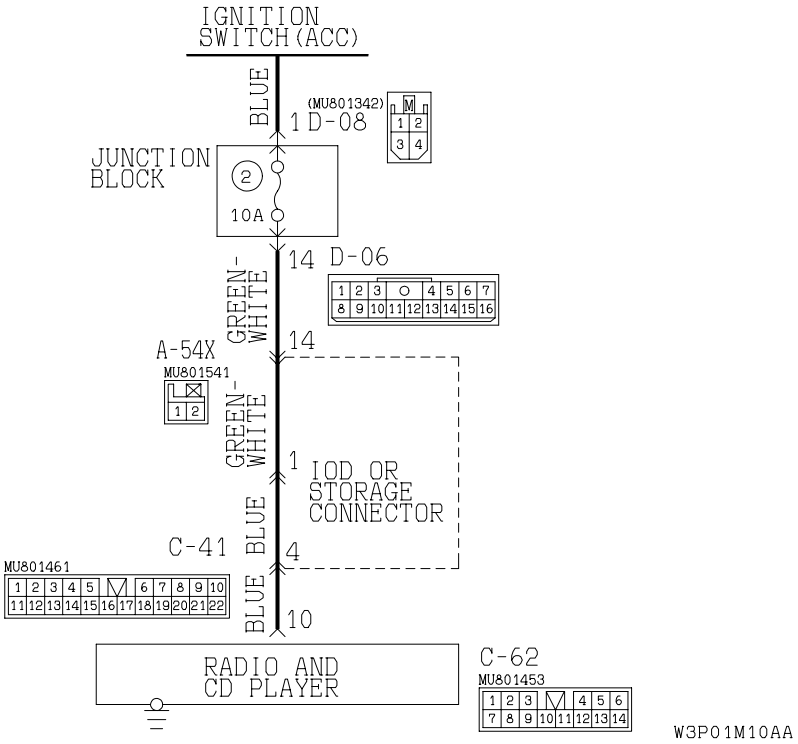
SYMPTOM		INSPECTION PROCEDURE	REFERENCE PAGE
When power switch is turned "ON," no power is available.		1	P.54-165
No sound. <vehicles with amplifier>		2	P.54-170
No sound from one speaker.		3	P.54-176
Noise	Noise appears at certain places when traveling (AM).	4	P.54-203
	Noise appears at certain places when traveling (FM).	5	P.54-203
	Mixed with noise, only at night (AM).	6	P.54-204
	Broadcasts can be heard but both AM and FM have a lot of noise.	7	P.54-205
	There is more noise on either AM or FM.	8	P.54-206
	There is noise when starting the engine.	9	P.54-207
	Some noise appears when there is vibration or shocks during traveling.	10	P.54-209
	Noise sometimes appears on FM during traveling.	11	P.54-210
	Ever-present noise.	12	P.54-211
Radio	There is noise but no reception for both AM and FM or no sound from AM, or no sound from FM.	13	P.54-211
	Poor reception.	14	P.54-212
	Distortion on AM or on both AM and FM.	15	P.54-213
	Distortion on FM only.	16	P.54-213
	Using the auto select function, too few automatic stations are selected.	17	P.54-214
	Preset stations are erased.	18	P.54-215

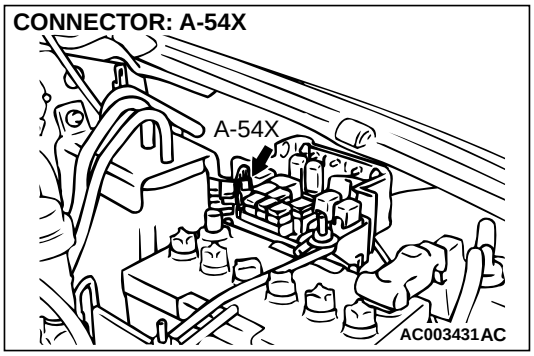
SYMPTOM		INSPECTION PROCEDURE	REFERENCE PAGE
CD player	CD can not be inserted.	19	P.54-218
	No sound (CD only).	20	P.54-219
	CD sound skips.	21	P.54-219
	Sound quality is poor.	22	P.54-219
	CD cannot be ejected.	23	P.54-220
Motor antenna	Motor antenna won't extend or retract.	24	P.54-221
	Motor antenna extends and retracts but does not receive any radio signal.	25	P.54-231

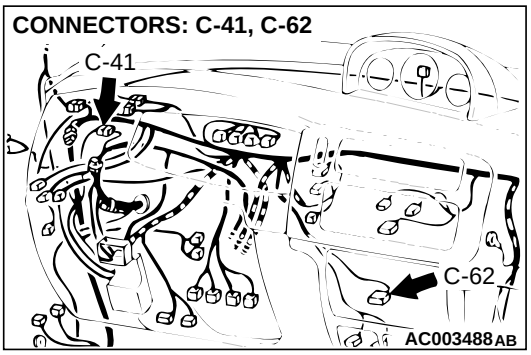
SYMPTOM PROCEDURES

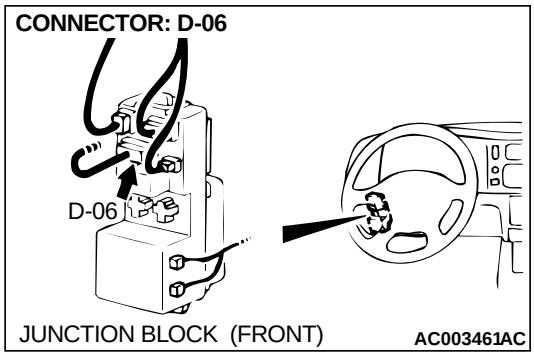
INSPECTION PROCEDURE 1: When Power Switch is Turned "ON," No Power is Available.

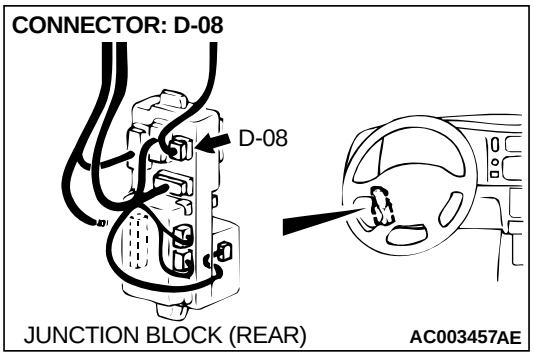
Radio and CD Player Power Supply Circuit











CIRCUIT OPERATION

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

TECHNICAL DESCRIPTION (COMMENT)

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

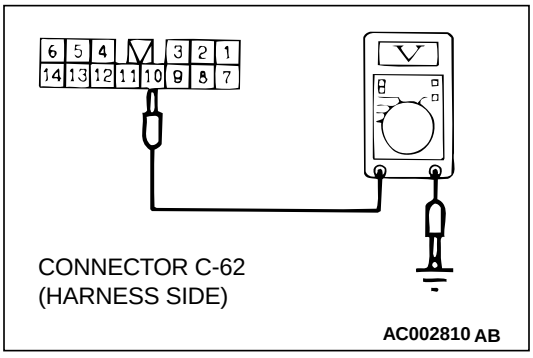
TROUBLESHOOTING HINTS

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

DIAGNOSIS

Required Special Tool:

- MB991223: Harness set

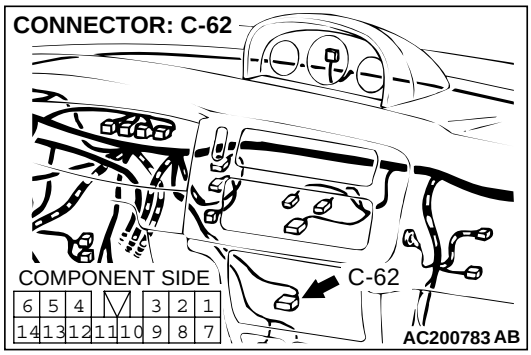


STEP 1. Check the radio and CD player power supply circuit by backprobing.

(1) Do not disconnect radio and CD player connector C-62.
(2) Turn the ignition switch to the "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 4.
NO : Go to Step 2.

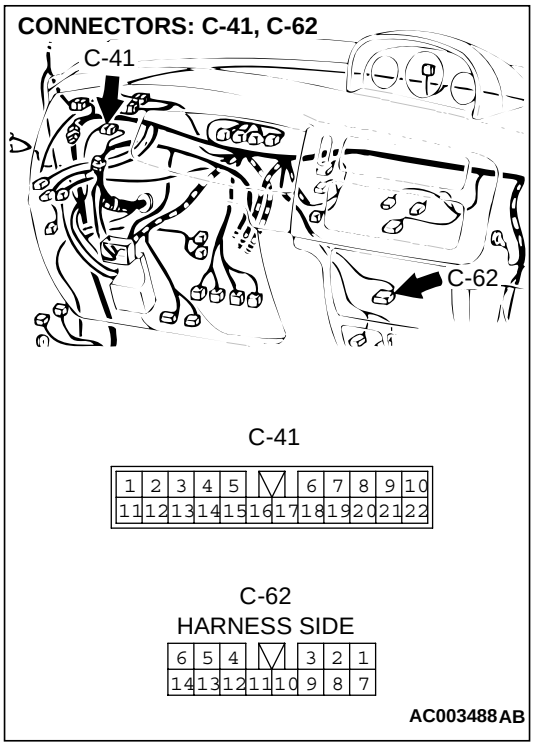


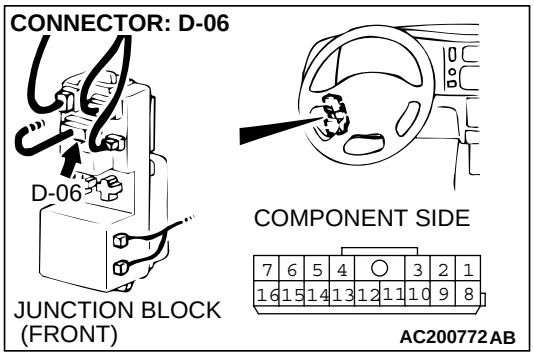
STEP 2. Check radio and CD player connector C-62 for damage.

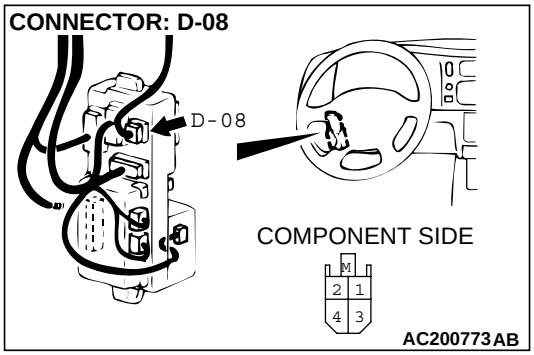
Q: Is radio and CD player connector C-62 in good condition?

YES : Go to Step 3.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.52A-35. If the power switch is turned on, the radio and CD player should operate normally.







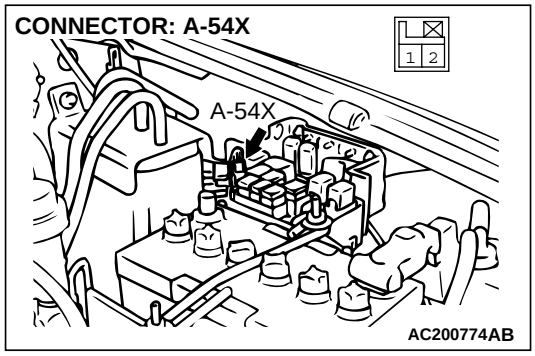
STEP 3. Check the harness wires between radio and CD player connector C-62 (terminal No.10) and ignition switch (ACC).

NOTE: After inspecting intermediate connector C-41, IOD or storage connector A-54X and junction block connectors D-06 and D-08, inspect the wire. If intermediate connector C-41, IOD or storage connector A-54X and junction block connectors D-06 and D-08 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wires between radio and CD player connector C-62 (terminal No.10) and ignition switch (ACC) in good condition?

YES : There is no action to be taken.

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



STEP 4. Check that the radio and CD player are installed correctly.

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 : Go to Step 5.

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

STEP 5. Recheck for malfunction.

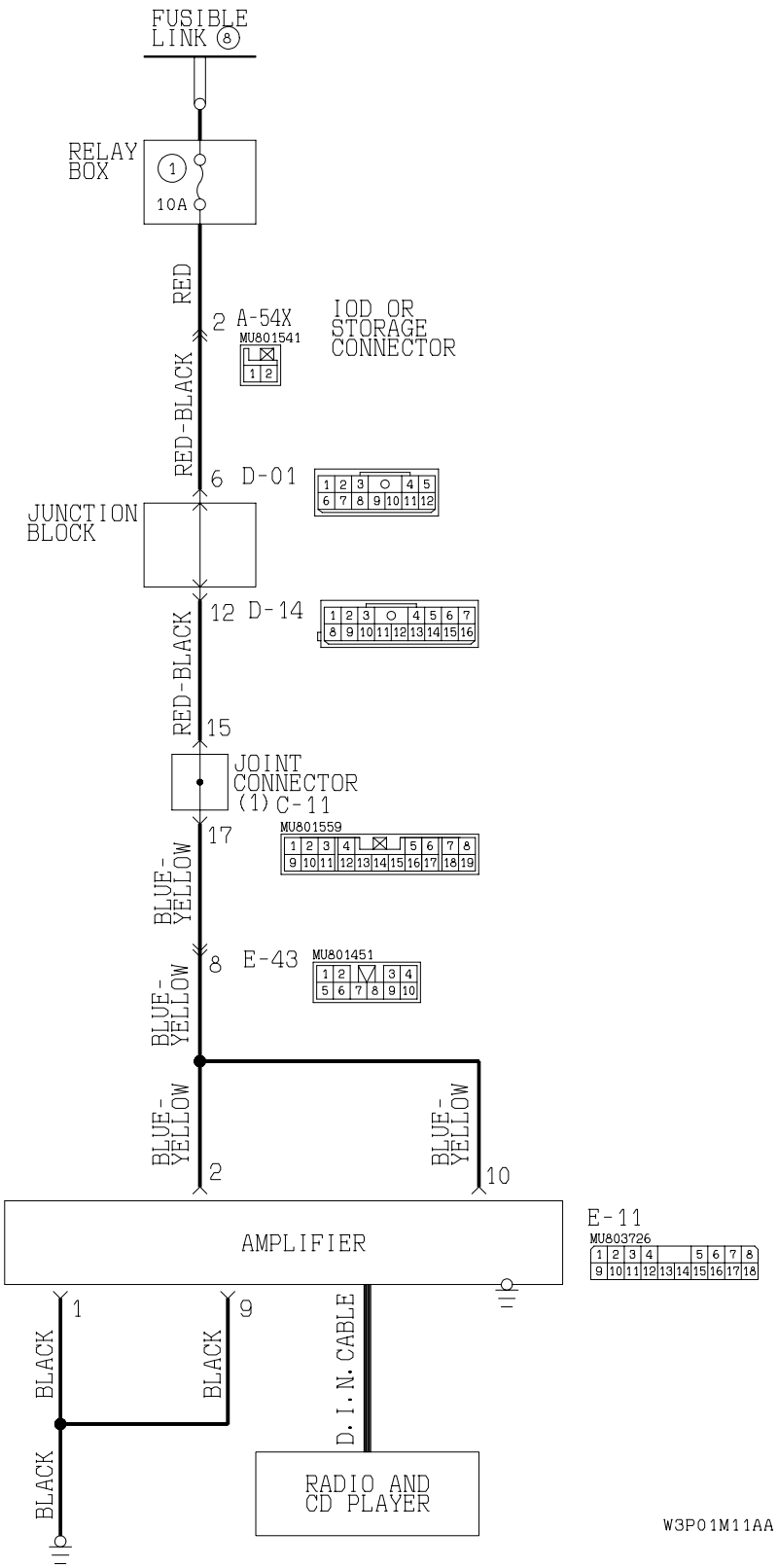
Q: Is a malfunction eliminated?

YES : The procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Point – How to Cope with Intermittent Malfunction P.00-6.)

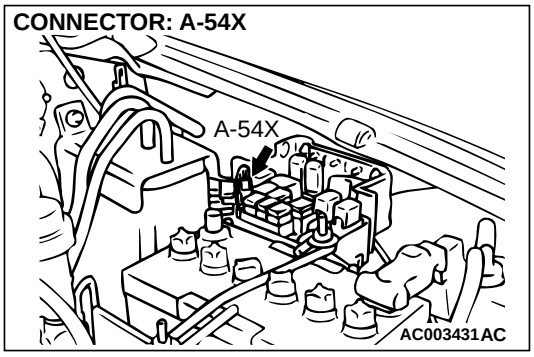
NO : Go to Step 1.

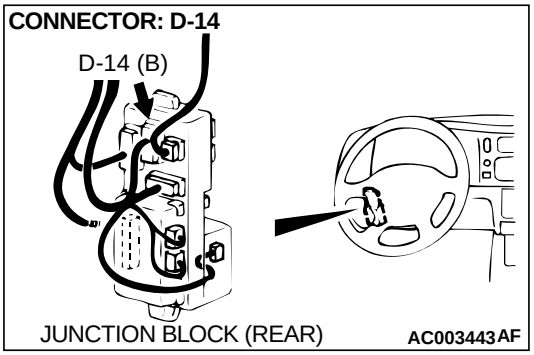
INSPECTION PROCEDURE 2: No Sound. <Vehicles with Amplifier>

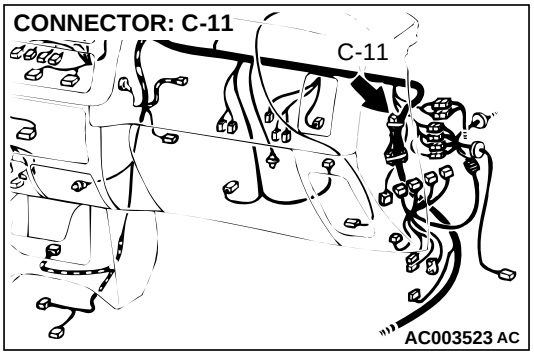
Amplifier Power Supply Circuit

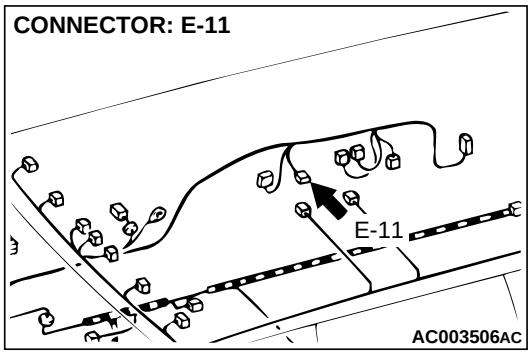


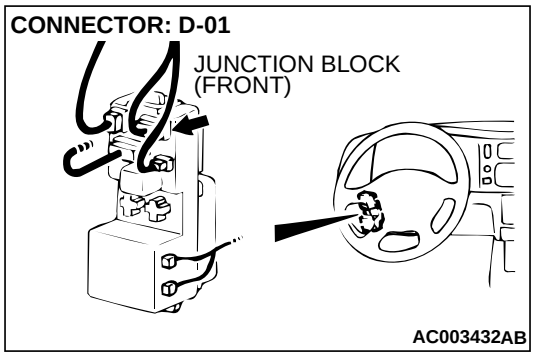
TSB Revision

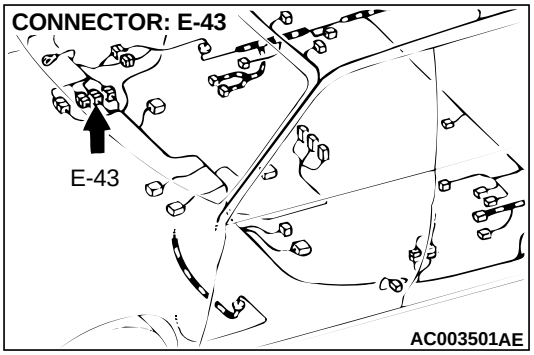












CIRCUIT OPERATION

Power is supplied to the amplifier when the fusible link (8).

TECHNICAL DESCRIPTION (COMMENT)

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

TROUBLESHOOTING HINTS

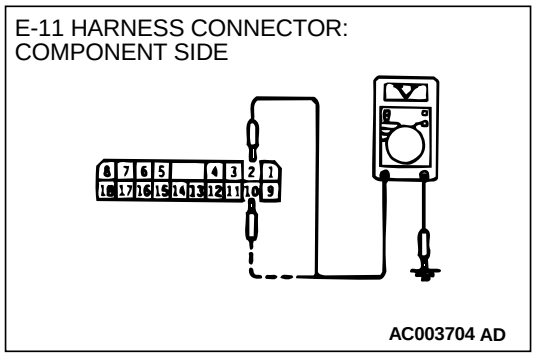
- Damaged harness wire or connector
- Damaged DIN cable
- Malfunction of the amplifier
- Malfunction of the radio, tape player and CD player

DIAGNOSIS

Required Special Tool:

- MB991223: Harness set

TSB Revision

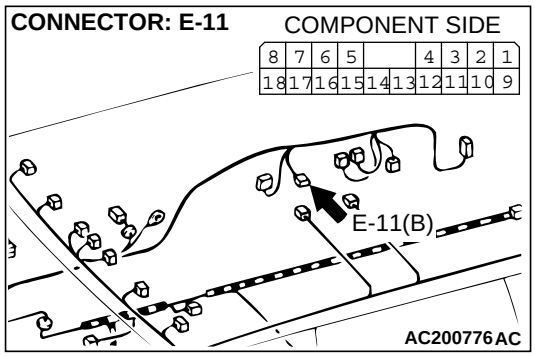


STEP 1. Measure the voltage at the amplifier power supply circuit.

(1) Disconnect amplifier connector E-11.
(2) Measure the voltages between terminal 2, 10 and ground.
- The measured value should be approximately 12 volts (battery positive voltage).

Q: Does the measured voltage correspond with this range?

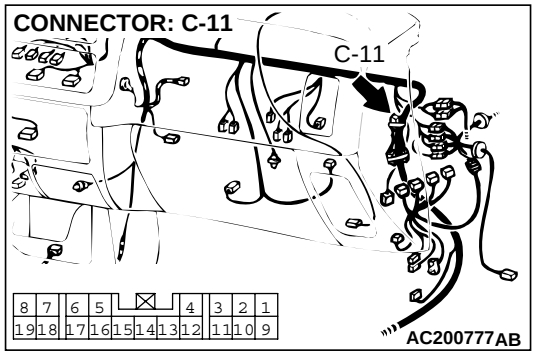
YES : Go to Step 4.
NO : Go to Step 2.

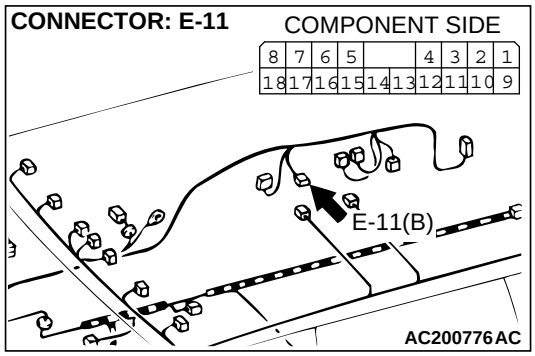


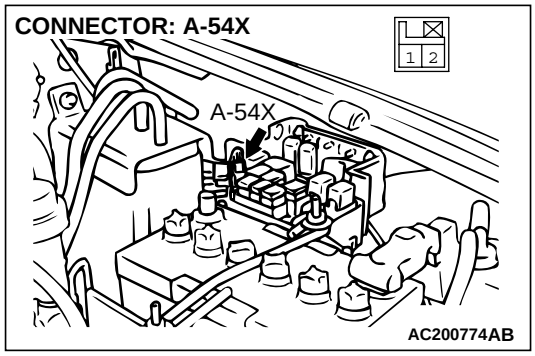
STEP 2. Check amplifier connector E-11 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

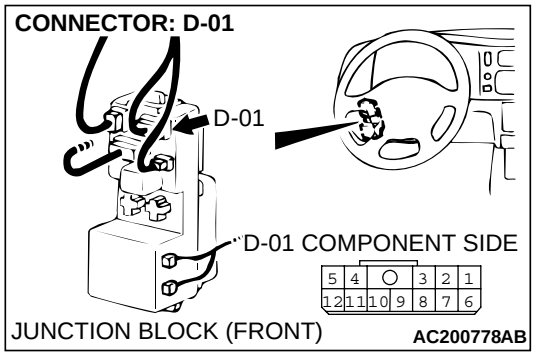
Q: Is amplifier connector E-11 in good condition?

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







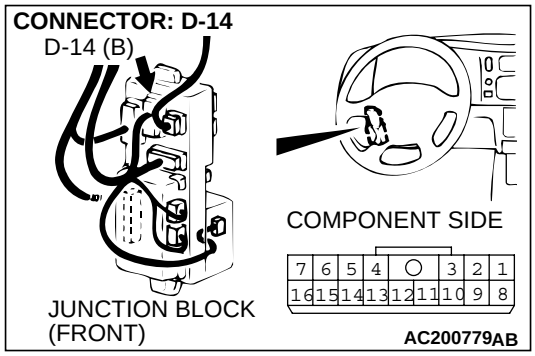


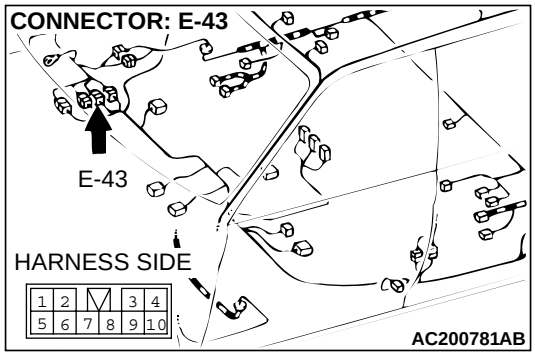
STEP 3. Check the harness wires between amplifier connector E-11 (terminal No.2 and No.10) and fusible link (8).

NOTE: After inspecting intermediate connector C-11, E-43, junction block D-01, D-14 and IOD or storage connector A-54X, inspect the wires. If intermediate connector C-11, E-43, junction block D-01, D-14 and IOD or storage connector A-54X are damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.52A-44.

Q: Are the harness wires between amplifier connector E-11 (terminal No.2 and No.10) and fusible link (8) in good condition?

YES : There is no action to be taken.
NO : Repair them.



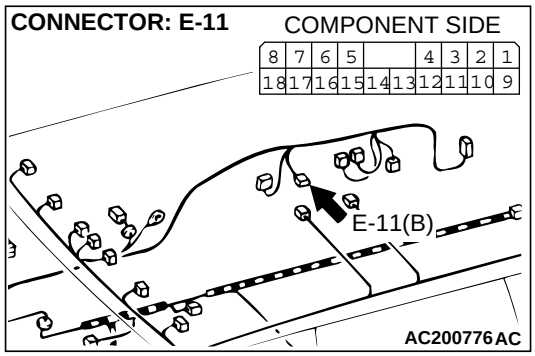


STEP 4. Check amplifier connector E-11 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is amplifier connector E-11 in good condition?

YES : Go to Step 5.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.36-2. The speakers should sound.

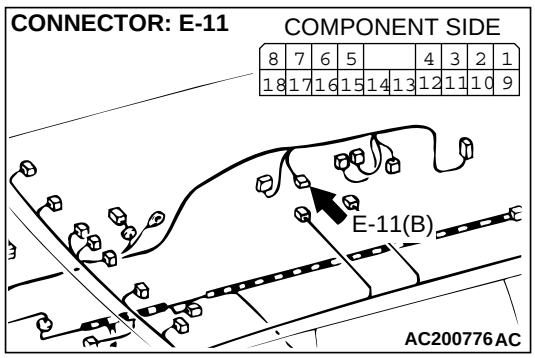


STEP 5. Check the harness wires between amplifier connector E-11 (terminal No.1 and No.9) and ground.

Q: Are the harness wires between amplifier connector E-11 (terminal No.1 and No.9) and ground in good condition?

YES : Go to Step 6.

NO : Repair them.



STEP 6. Check the DIN cable between amplifier and radio, tape player and CD Player.

Q: Are the DIN cable in good condition?

YES : Go to Step 7.
NO : Repair or replace it.

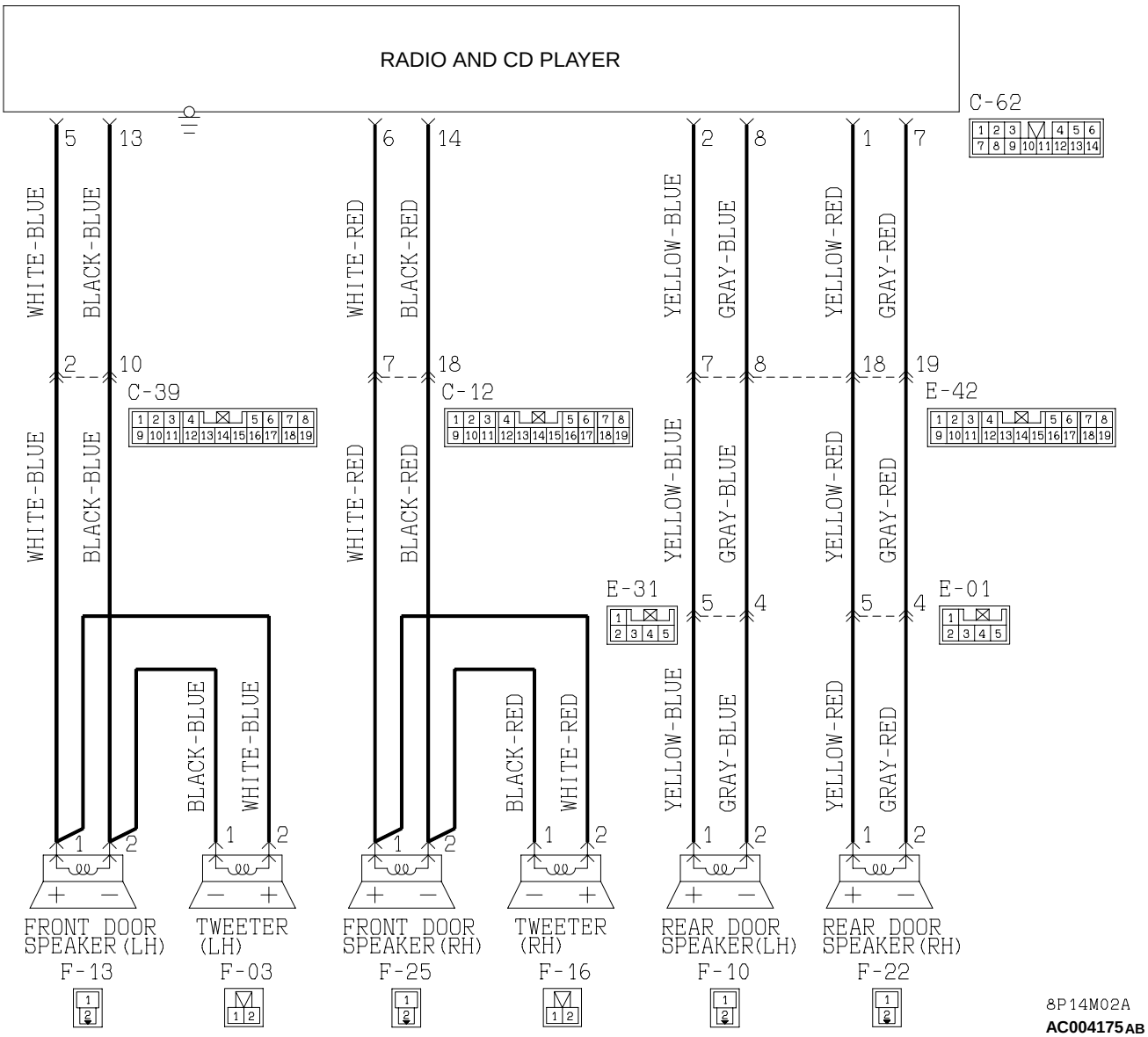
STEP 7. Recheck for malfunction.

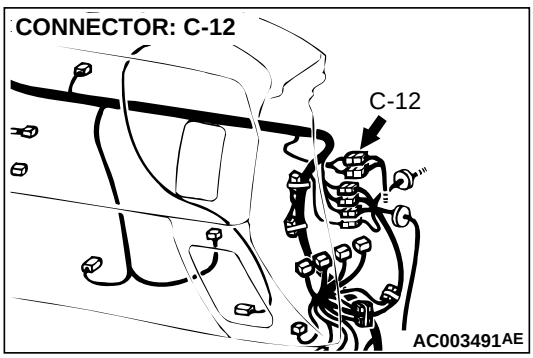
Q: Is a malfunction eliminated?

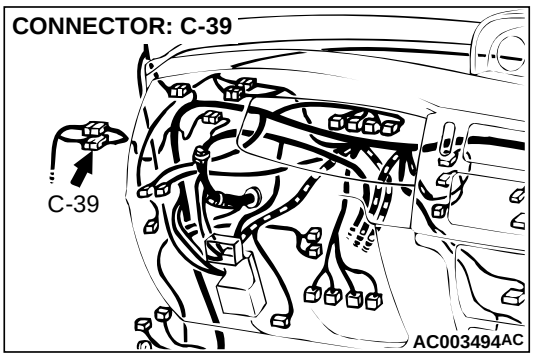
YES : The procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Point – How to Cope with Intermittent Malfunction P.00-6.)
NO : Go to Step 1.

INSPECTION PROCEDURE 3: No Sound from One Speaker.

Speaker System Circuit <Vehicles Without Amplifier>

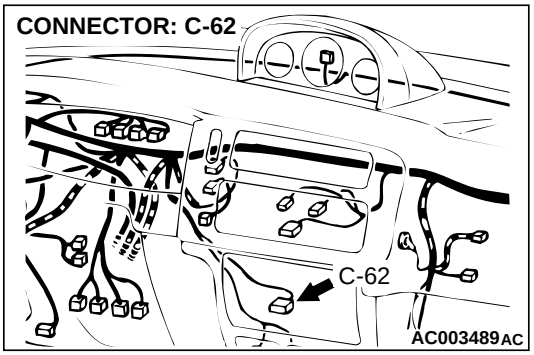




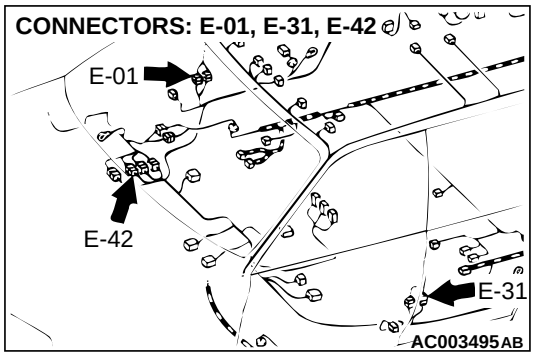


TSB Revision

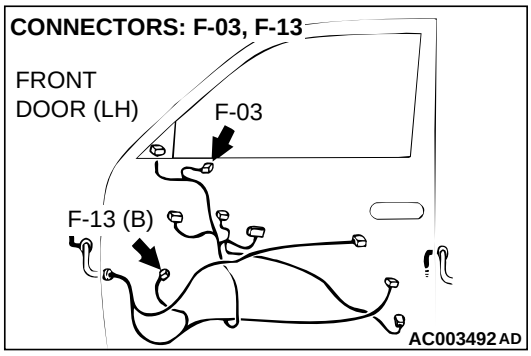
CONNECTOR: C-62



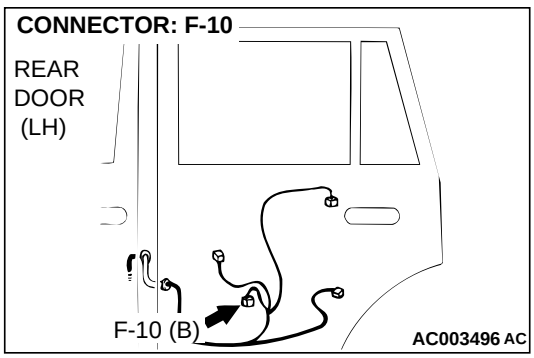
CONNECTORS: E-01, E-31, E-42



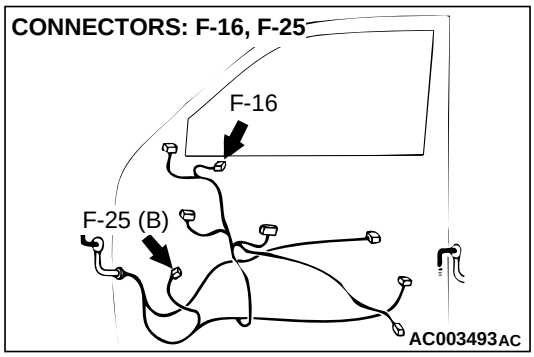
CONNECTORS: F-03, F-13



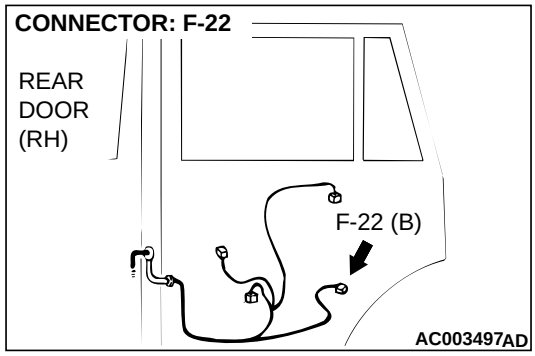
CONNECTOR: F-10



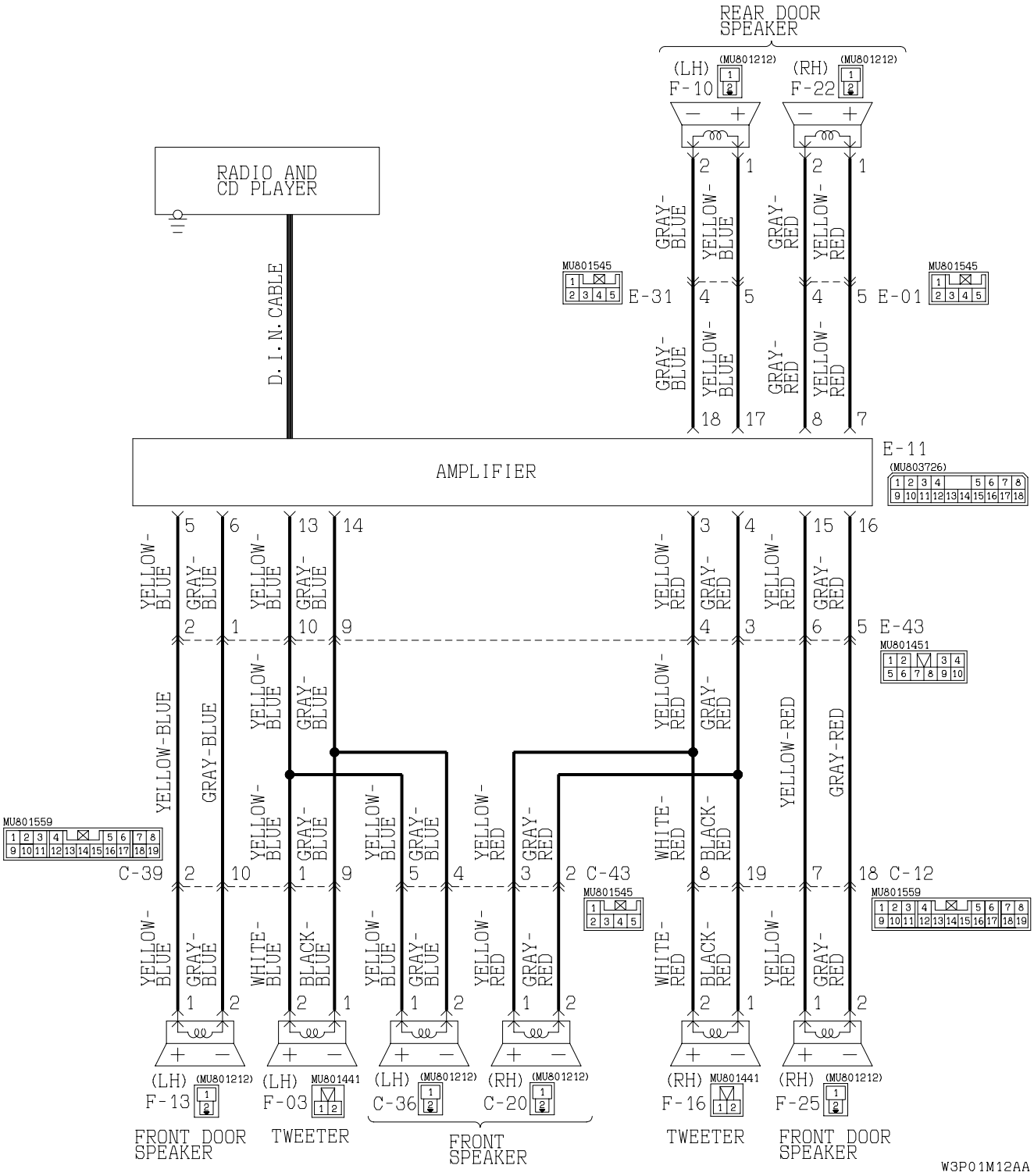
CONNECTORS: F-16, F-25

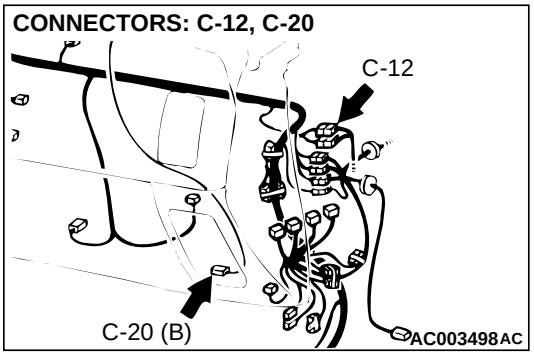


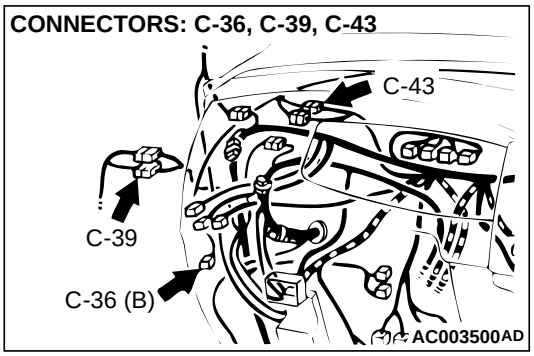
CONNECTOR: F-22

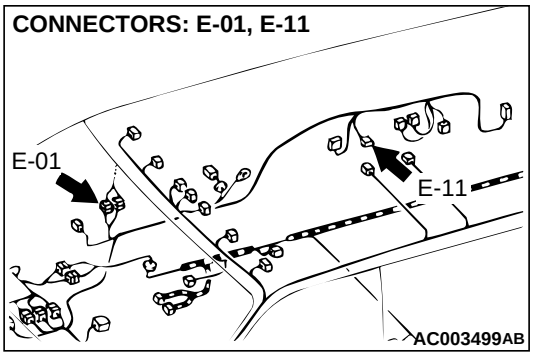


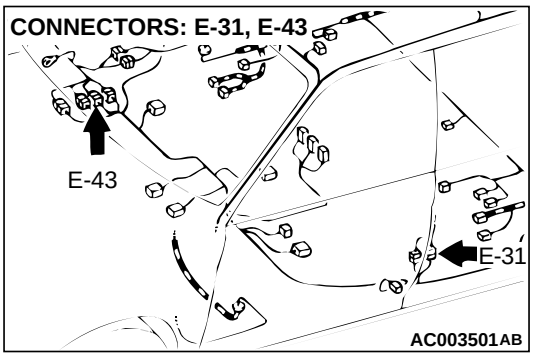
Speaker System Circuit <Vehicles Without Amplifier>

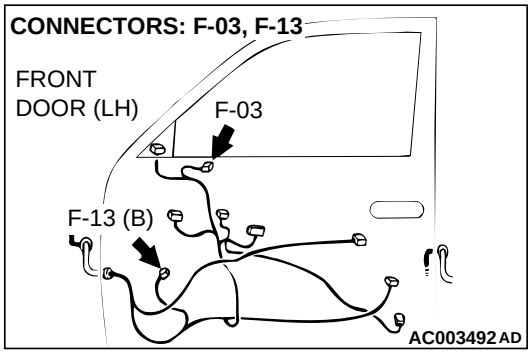


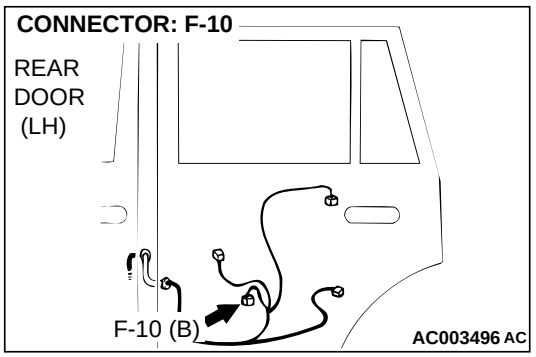


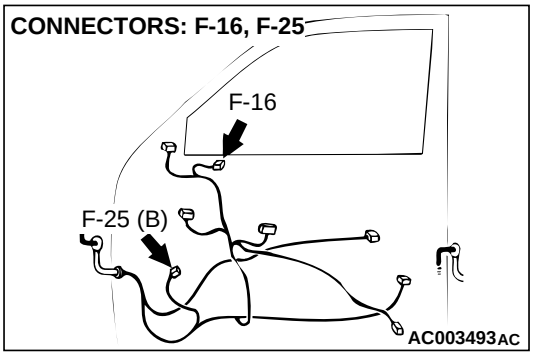


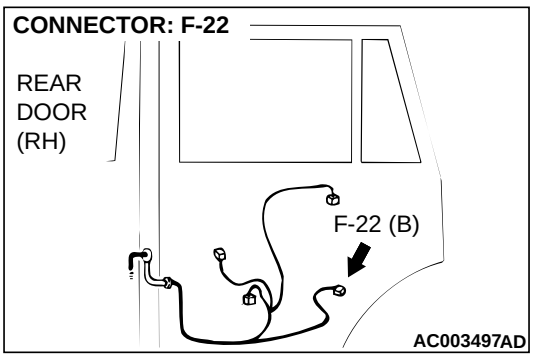












CIRCUIT OPERATION

<Vehicles without amplifier>
The sound is heard from the speaker according to audio signal output from the radio and CD player.

<Vehicles with amplifier>
The sound signals are sent from the radio and CD player into the amplifier. After the signals are amplified and filtered, the sound signals are sent to the speaker.

TECHNICAL DESCRIPTION (COMMENT)
The cause is probably a faulty speaker circuit system.

TSB Revision

TROUBLESHOOTING HINTS

- Malfunction of the speaker
- Damaged harness wire or connector
- Malfunction of the radio and CD player
- Malfunction of the amplifier <vehicles with amplifier>
- Malfunction of the DIN cable <vehicles with amplifier>

DIAGNOSIS

STEP 1A. Check which speaker has no sound on the vehicles without amplifier.

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

Q: Which speaker has no sound on the vehicles without amplifier?

Front door speaker (LH) and/or tweeter (LH) : Go to Step 2.
Front door speaker (RH) and /or tweeter (RH) : Go to Step 7.
Rear door speaker (LH) : Go to Step 12.
Rear door speaker (RH) : Go to Step 17.

STEP 1B. Check which speaker has no sound on the vehicles with amplifier.

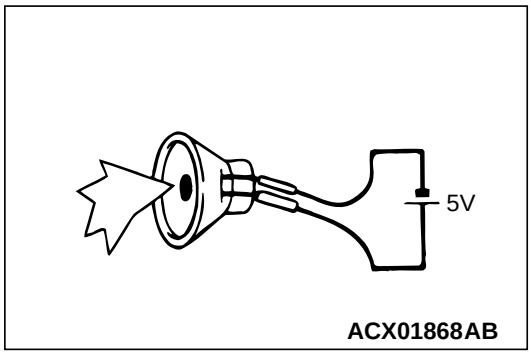
(1) Use the speaker test to determine which speaker does not sound.

Q: Which speaker has no sound on the vehicles with amplifier?

Front speaker (LH) and /or tweeter (LH) : Go to Step 22
Front speaker (RH) and /or tweeter (RH) : Go to Step 27
Front door speaker (LH) : Go to Step 32.
Front door speaker (RH) : Go to Step 37.
Rear door speaker (LH) : Go to Step 42.
Rear door speaker (RH) : Go to Step 47.

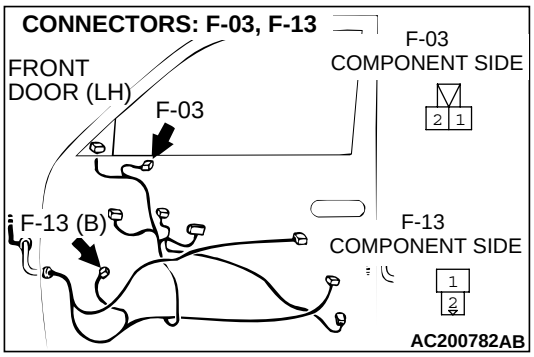
STEP 2. Check the speaker.

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



Q: Is the speaker generating noise?

YES : Go to Step 3.
NO : Replace the speaker. The speaker should sound.

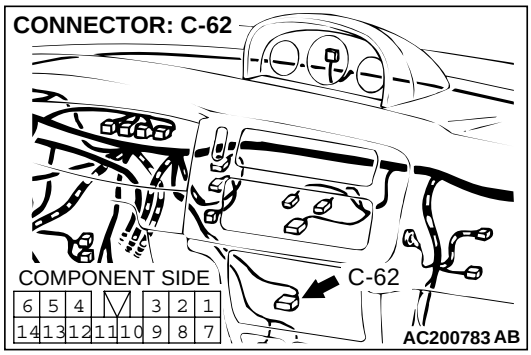


STEP 3. Check tweeter (LH) connector F-03 and/or front door speaker (LH) connector F-13 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are harness connectors F-03 and F-13 in good condition?

YES : Go to Step 4.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The front door speaker (LH) and/or tweeter (LH) should sound.



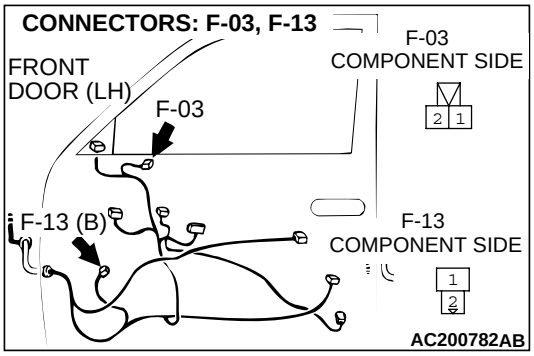
STEP 4. Check the harness wires between radio and CD player connector C-62 (terminal No.5 and 13) and tweeter (LH) connector F-03 (terminal No.1 and 2) and/or front door speaker (LH) connector F-13 (terminal No.1 and 2).

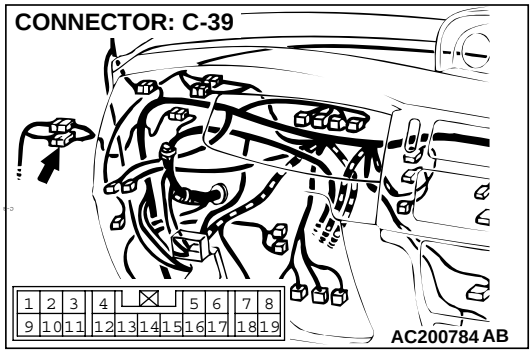
NOTE: After inspecting intermediate connector C-39, inspect the wire. If intermediate connector C-39 is damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

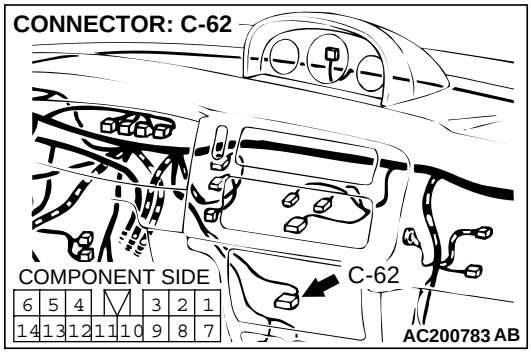
Q: Are the harness wires between radio and CD player connector C-62 (terminal No.5 and 13) and tweeter (LH) connector F-03 (terminal No.1 and 2) and/or front door speaker (LH) connector F-13 (terminal No.1 and 2) in good condition?

YES : Go to Step 5.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The front door speaker (LH) and/or tweeter (LH) should sound.







STEP 5. Check the radio and CD player connector C-62 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is the radio and CD player connector C-62 in good condition?

YES : Go to Step 6.

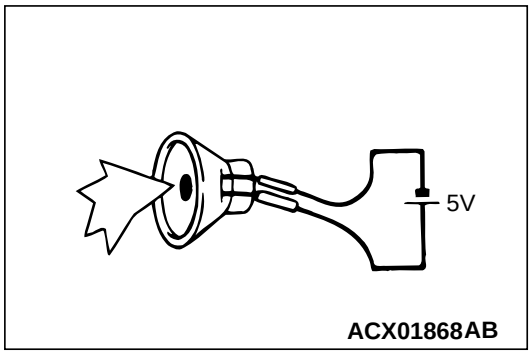
NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The front door speaker (LH) and/or tweeter (LH) should sound.

STEP 6. Recheck for malfunction.

Q: Is a malfunction eliminated?

YES : This procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Point – How to Cope with Intermittent Malfunction P.00-6.)

NO : Go to Step 2.



STEP 7. Check the speaker.

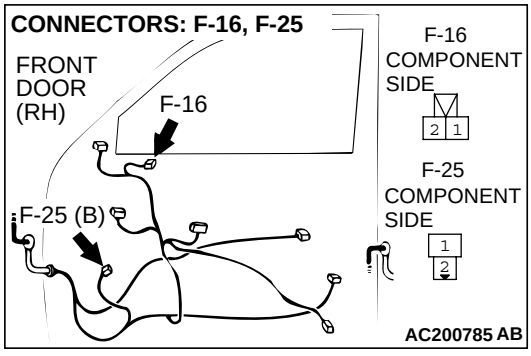
(1) Remove the speaker.

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

Q: Is the speaker generating noise?

YES : Go to Step 8.

NO : Replace the speaker. The speaker should sound.



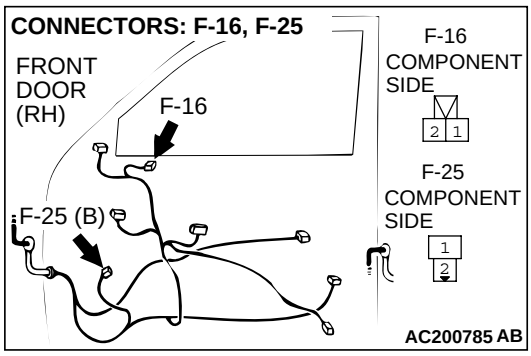
STEP 8. Check tweeter (RH) connector F-16 and/or front door speaker (RH) connector F-25 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

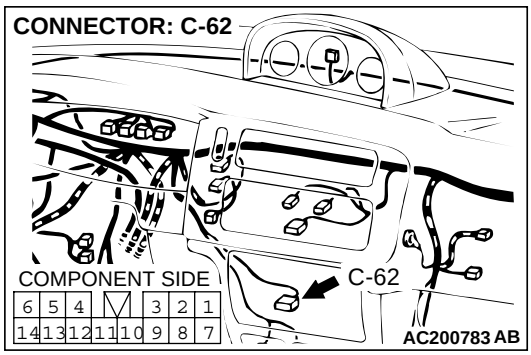
Q: Is tweeter (RH) connector F-16 and/or front door speaker (RH) connector F-25 in good condition?

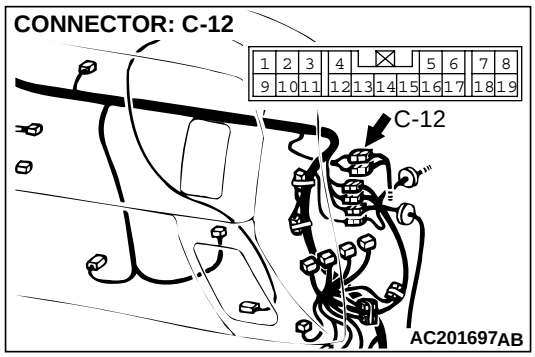
YES : Go to Step 9.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The front door speaker (RH) and/or tweeter (RH) should sound.

TSB Revision







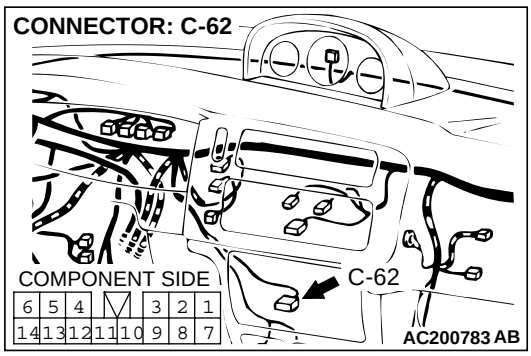
STEP 9. Check the harness wires between radio and CD player connector C-62 (terminal No.6 and 14) and tweeter (RH) connector F-16 (terminal No.1 and 2) and/or front door speaker (RH) connector F-25 (terminal No.1 and 2).

NOTE: After inspecting intermediate connector C-12, inspect the wire. If intermediate connector C-12 is damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are harness wires between radio and CD player connector C-62 (terminal No.6 and 14) and tweeter (RH) connector F-16 (terminal No.1 and 2) and/or front door speaker (RH) connector F-25 (terminal No.1 and 2) in good condition?

YES : Go to Step 10.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 10. Check radio and CD player connector C-62 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is radio and CD player connector C-62 in good condition?

YES : Go to Step 11.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

STEP 11. Recheck for malfunction.

Q: Is a malfunction eliminated?

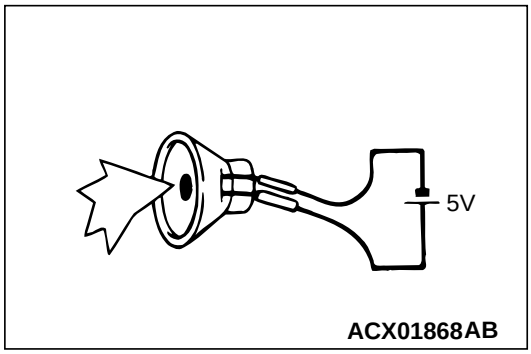
YES : The procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Point – How to Cope with Intermittent Malfunction P.00-6.)

NO : Go to Step 7.

STEP 12. Check the speaker.

(1) Remove the rear speaker.

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



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

YES : Go to Step 13.

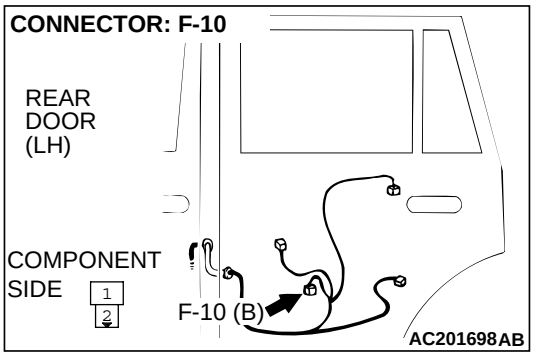
NO : Replace the speaker.

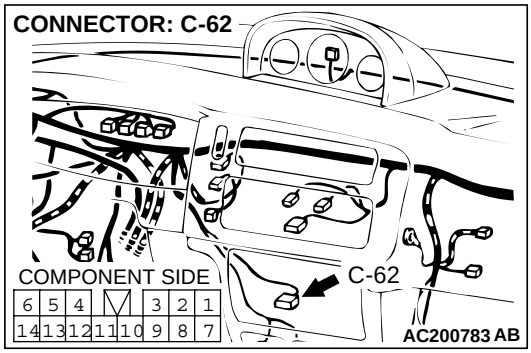
STEP 13. Check rear door speaker (LH) connector F-10 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

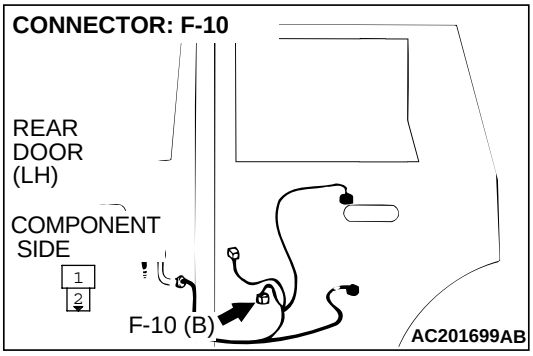
Q: Is rear door speaker (LH) connector F-10 in good condition?

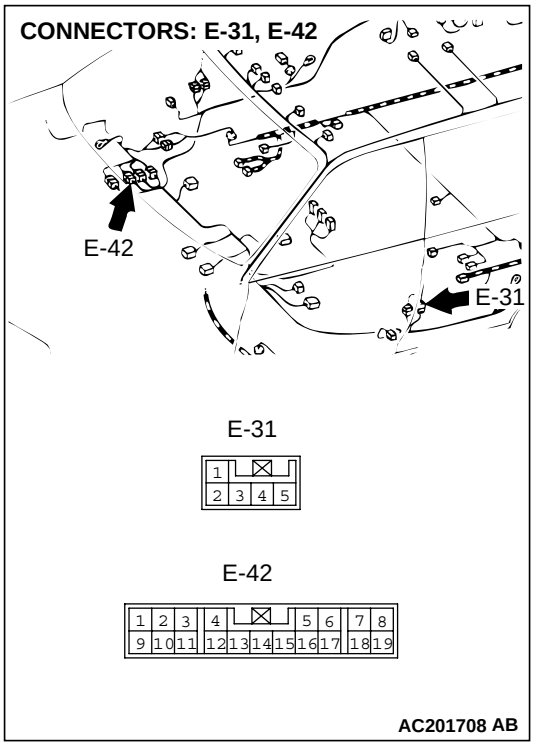
YES : Go to Step 14.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The speaker should sound.









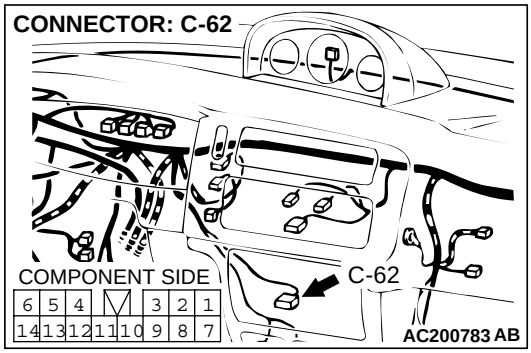
STEP 14. Check the harness wires between radio and CD player connector C-62 (terminal No.2 and 8) and rear door speaker (LH) connector F-10 (terminal No.1 and 2).

NOTE: After inspecting intermediate connector E-31 and E-42, inspect the wire. If intermediate connector E-31 and E-42 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wires between radio and CD player connector C-62 (terminal No.2 and 8) and rear door speaker (LH) connector F-10 (terminal No.1 and 2) in good condition?

YES : Go to Step 15.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 15. Check radio and CD player connector C-62 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is radio and CD player connector C-62 in good condition?

YES : Go to Step 16.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

STEP 16. Recheck for malfunction.

Q: Is a malfunction eliminated?

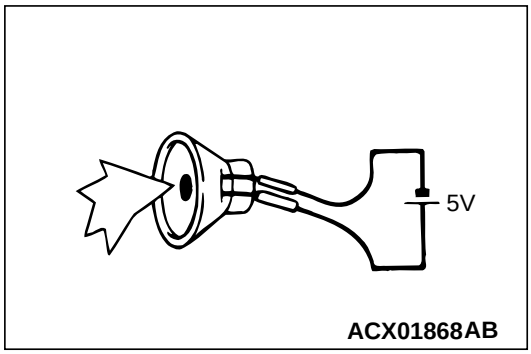
YES : This procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Point – How to Cope with Intermittent Malfunction P.00-6.)

NO : Go to Step 12.

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

(1) Remove the rear door speaker (RH).

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



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

YES : Go to Step 18.

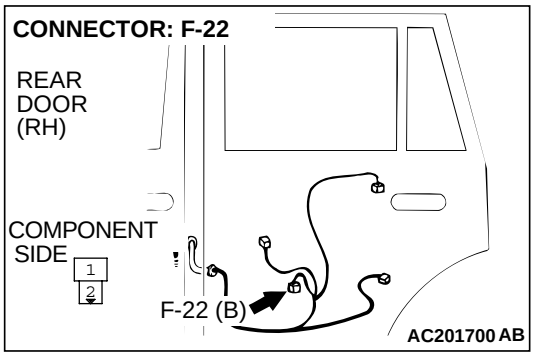
NO : Replace the rear door speaker (RH). The rear door speaker (RH) should sound.

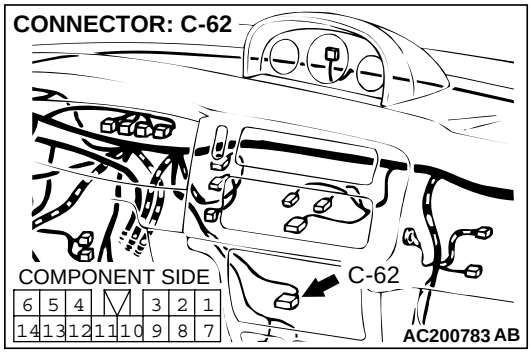
STEP 18. Check rear door speaker (RH) connector F-22 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

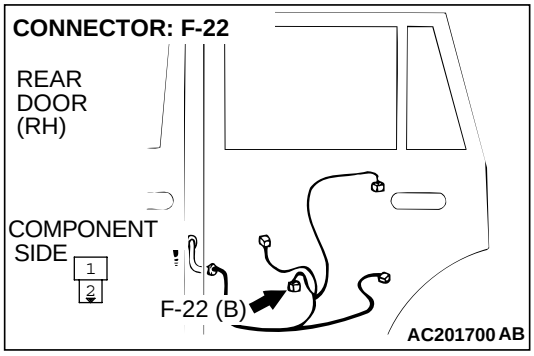
Q: Is rear door speaker (RH) connector F-22 in good condition?

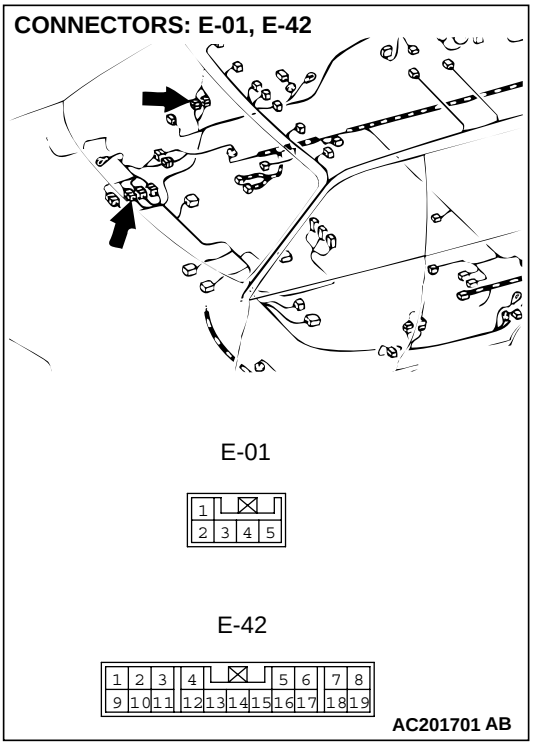
YES : Go to Step 19.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.









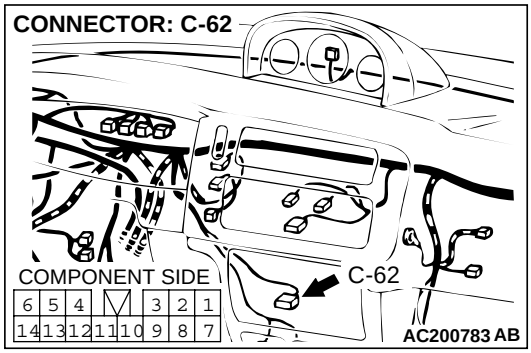
STEP 19. Check the harness wires between radio and CD player connector C-62 (terminal No.1 and 7) and rear door speaker (RH) connector F-22 (terminal No.1 and 2).

NOTE: After inspecting intermediate connectors E-01, E-42, inspect the wire. If intermediate connectors E-01, E-42 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wires between radio and CD player connector C-62 (terminal No.1 and 7) and rear door speaker (RH) connector F-22 (terminal No.1 and 2) in good condition?

YES : Go to Step 20.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 20. Check radio and CD player connector C-62 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is radio and CD player connector C-62 in good condition?

YES : Go to Step 21.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

STEP 21. Recheck for malfunction.

Q: Is a malfunction eliminated?

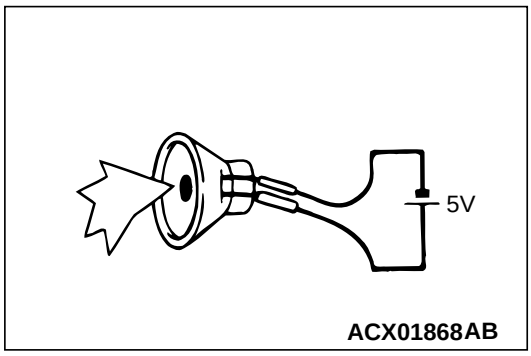
YES : The procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Point – How to Cope with Intermittent Malfunction P.00-6.)

NO : Go to Step 17.

STEP 22. Check the Front speaker (LH) and /or tweeter (LH).

(1) Remove the front speaker (LH) and /or tweeter (LH).

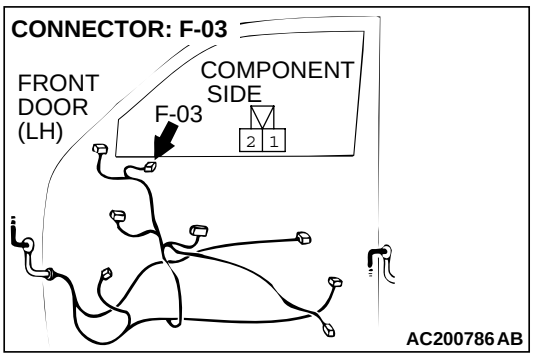
(2) Check that the front speaker (LH) and /or tweeter (LH) generates noise when a five-volt voltage is applied on the speaker terminal.

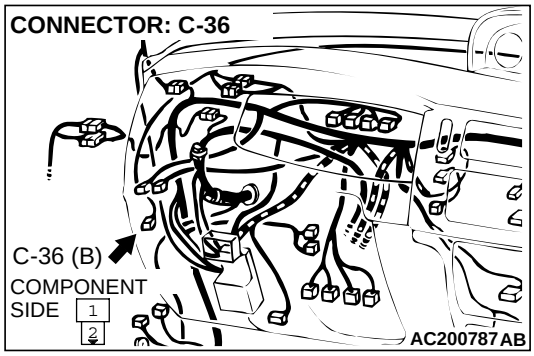


Q: Is the Front speaker (LH) and /or tweeter (LH) generating noise?

YES : Go to Step 23.

NO : Replace the front speaker (LH) and /or tweeter (LH).



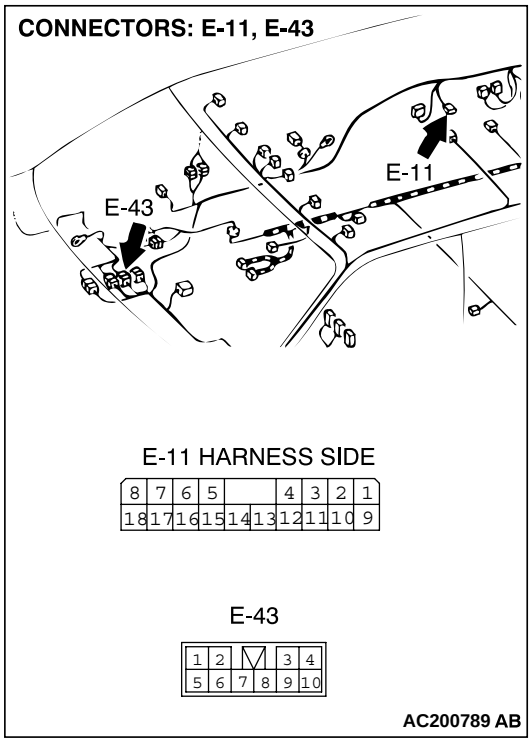


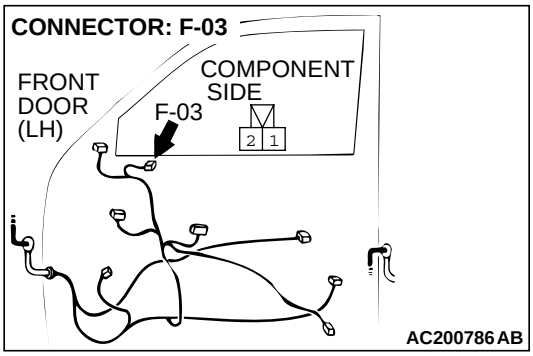
STEP 23. Check tweeter (LH) connector F-03 and/or front speaker (LH) connector C-36 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are tweeter (LH) connector F-03 and/or front speaker (LH) connector C-36 in good condition?

YES : Go to Step 24.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





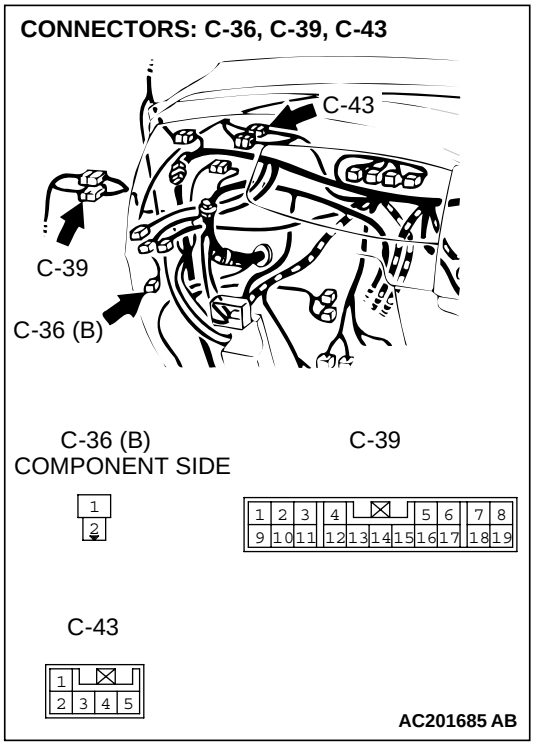
STEP 24. Check the harness wires between amplifier connector E-11 (terminal No.13 and14) and tweeter (LH) connector F-03 (terminal No. 1 and 2) and/or front speaker (LH) connector C-36 (terminal No.1 and 2).

NOTE: After inspecting intermediate connectors C-39, E-43 and C-43, inspect the wire. If intermediate connectors C-39, E-43 and C-43 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wires between amplifier connector E-11 (terminal No.13 and 14) and tweeter (LH) connector F-03 (terminal No.1 and 2) and/or front speaker (LH) connector C-36 (terminal No.1 and 2) in good condition?

YES : Go to Step 25.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

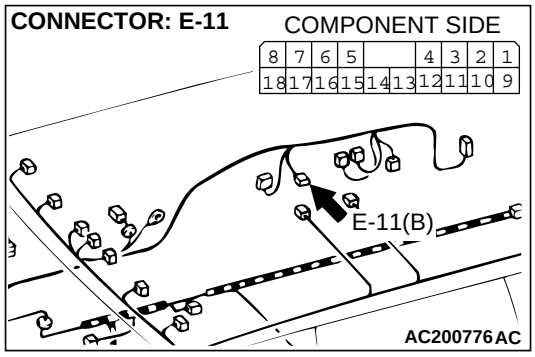


STEP 25. Check amplifier connector E-11 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is amplifier connector E-11 for in good condition?

YES : Go to Step 26.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

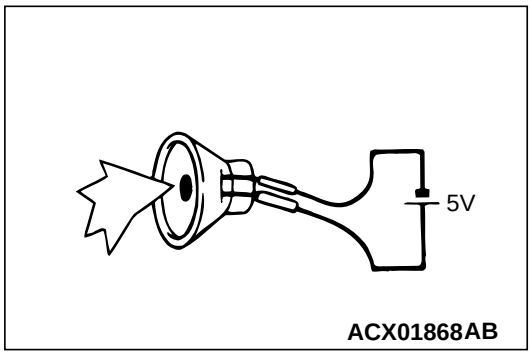


STEP 26. Recheck for malfunction.

Q: Is a malfunction eliminated?

YES : This procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Point – How to Cope with Intermittent Malfunction P.00-6.)

NO : Go to Step 22.



STEP 27. Check the front door speaker (RH) and /or tweeter (RH).

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

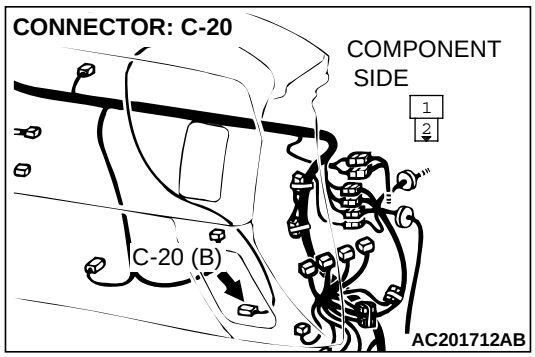
Q: Is the front door speaker (RH) and /or tweeter (RH) generating noise?

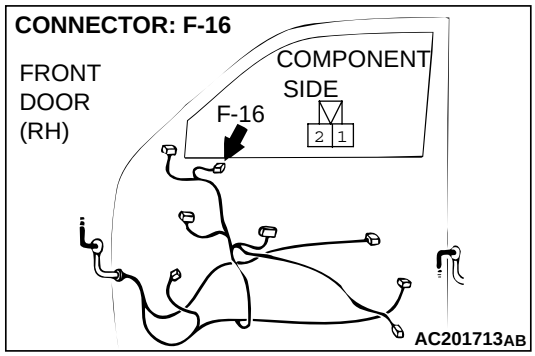
YES : Go to Step 28.
NO : Replace the front door speaker (RH) and /or tweeter (RH). The front door speaker (RH) and /or tweeter (RH) should sound.

STEP 28. Check tweeter (RH) connector F-16 and/or front speaker (RH) connector C-20 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are tweeter (RH) connector F-16 and/or front speaker (RH) connector C-20 in good condition?

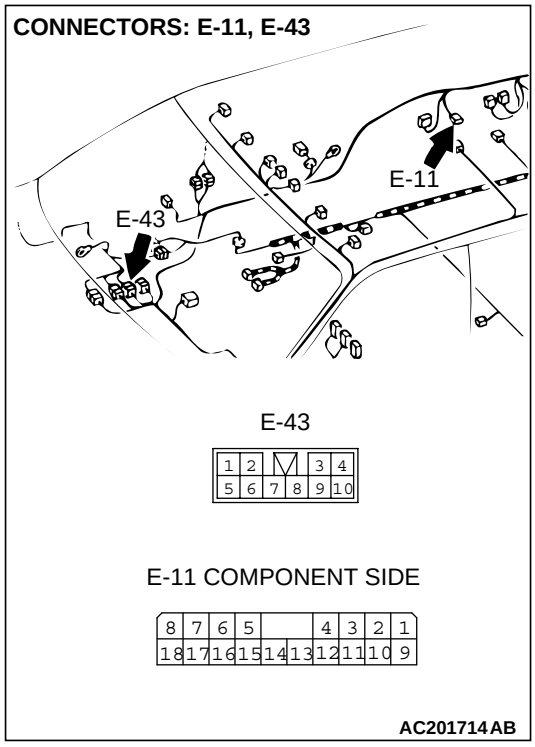
YES : Go to Step 29.
NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

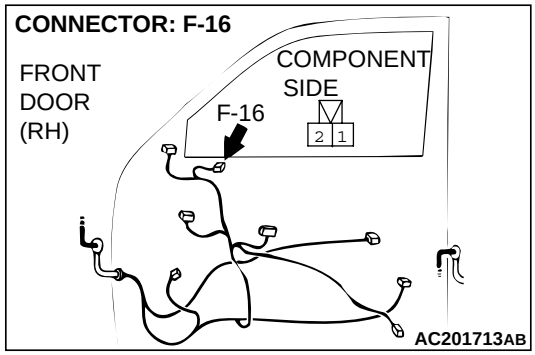


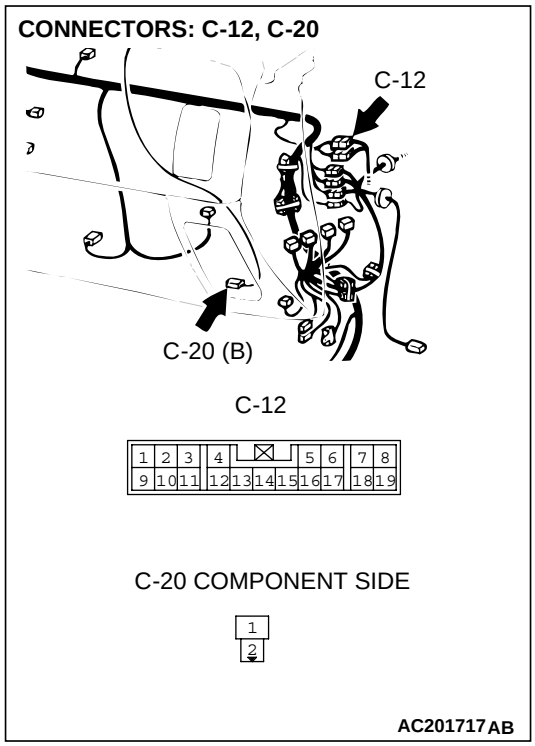


STEP 29. Check the harness wires between amplifier connector E-11 (terminal No.3 and 4) and tweeter (RH) connector F-16 (terminal No.1 and 2) and/or front speaker (RH) connector C-20 (terminal No.1 and 2).

NOTE: After inspecting intermediate connectors C-12, C-43 and E-43, inspect the wire. If intermediate connectors C-12, C-43 and E-43 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



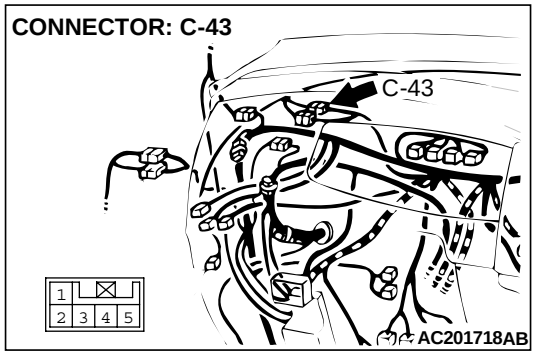




Q: Are the harness wires between amplifier connector E-11 (terminal No.3 and 4) and tweeter (RH) connector F-16 (terminal No.1 and 2) and/or front speaker (RH) connector C-20 (terminal No.1 and 2) in good condition?

YES : Go to Step 30.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

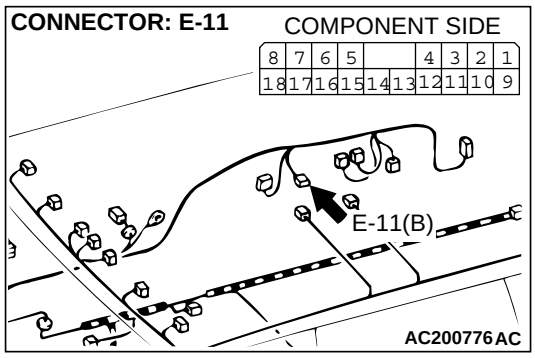


STEP 30. Check amplifier connector E-11 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is the amplifier connector E-11 in good condition?

YES : Go to Step 31.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 31. Recheck for malfunction.

Q: Is a malfunction eliminated?

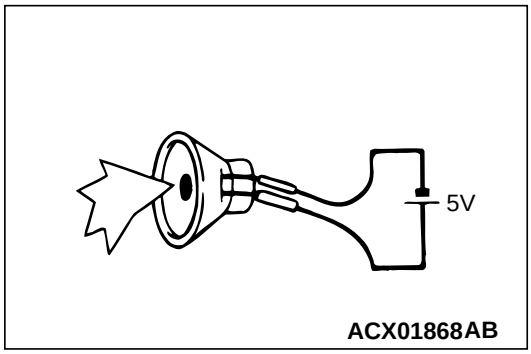
YES : This procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Point – How to Cope with Intermittent Malfunction P.00-6.)

NO : Go to Step 27.

STEP 32. Check the front door speaker (LH).

(1) Remove the door speaker (LH).

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



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

YES : Go to Step 33.

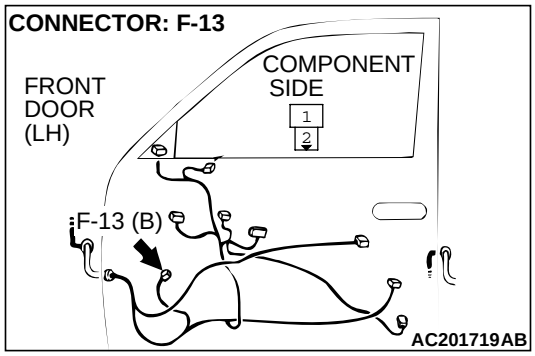
NO : Replace the front door speaker (LH). The front door speaker (LH) should sound.

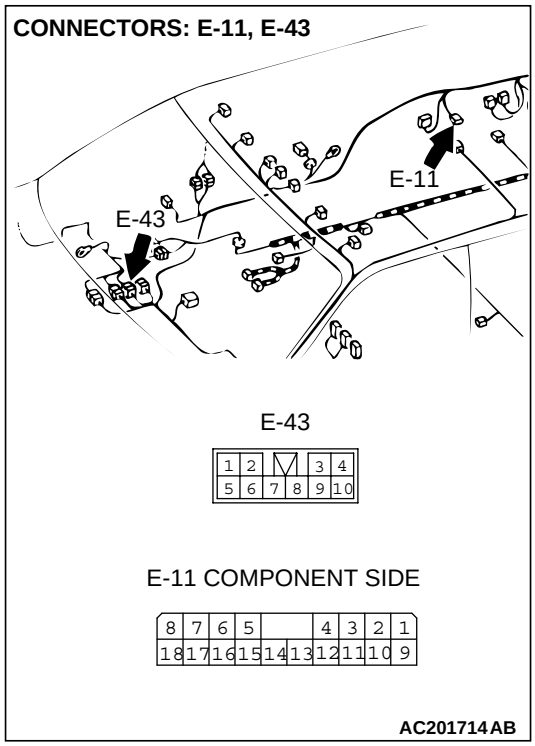
STEP 33. Check front door speaker (LH) connector F-13 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are front door speaker (LH) connector F-13 in good condition?

YES : Go to Step 34.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





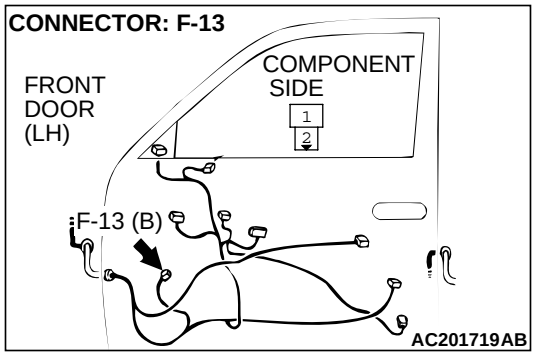
STEP 34. Check the harness wires between amplifier connector E-11 (terminal No.5 and 6) and front door speaker (LH) connector F-13 (terminal No.1 and 2).

NOTE: After inspecting intermediate connectors C-39 and E-43, inspect the wire. If intermediate connectors C-39 and E-43 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wires between amplifier connector E-11 and front door speaker (LH) connector F-13 in good condition?

YES : Go to Step 35.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

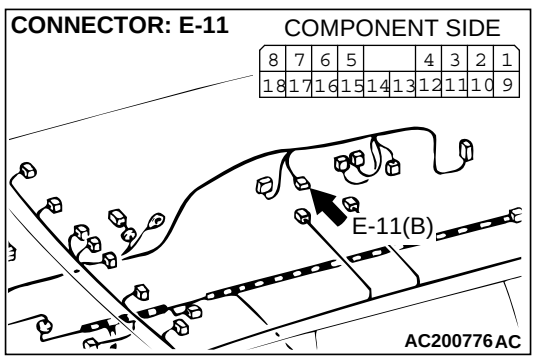


STEP 35. Check amplifier connector E-11 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is the amplifier connector E-11 in good condition?

YES : Go to Step 36.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 36. Recheck for malfunction.

Q: Is a malfunction eliminated?

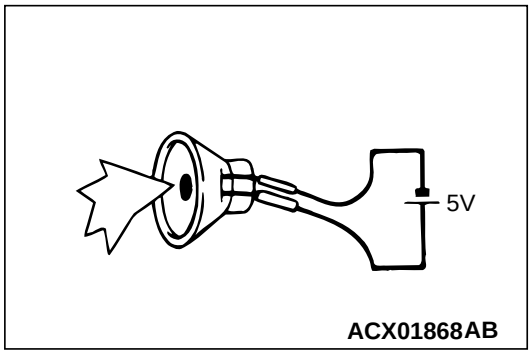
YES : This procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Point – How to Cope with Intermittent Malfunction P.00-6.)

NO : Go to Step 32.

STEP 37. Check the front door speaker (RH).

(1) Remove the front door speaker (RH).

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



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

YES : Go to Step 38.

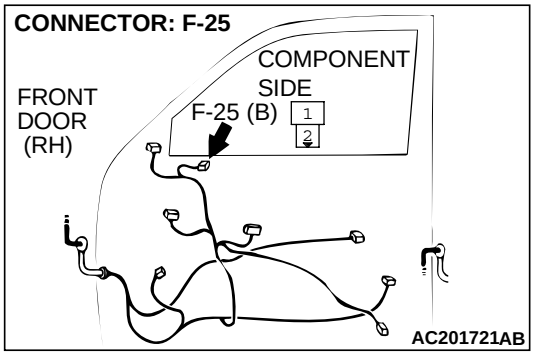
NO : Replace the front door speaker (RH). The front door speaker (RH) should sound.

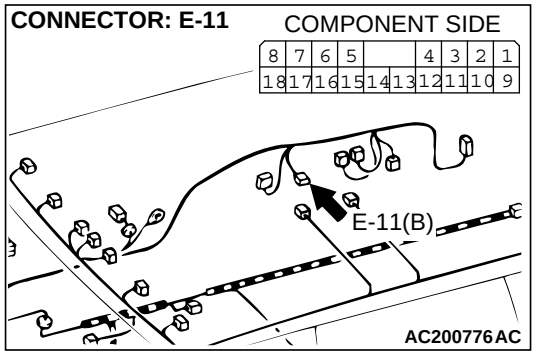
STEP 38. Check front door speaker (RH) connector F-25 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

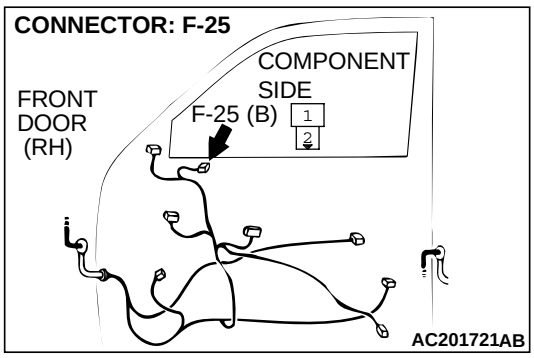
Q: Is the front door speaker (RH) connector F-25 in good condition?

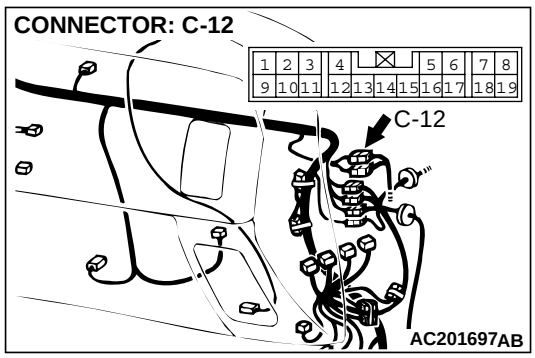
YES : Go to Step 39.

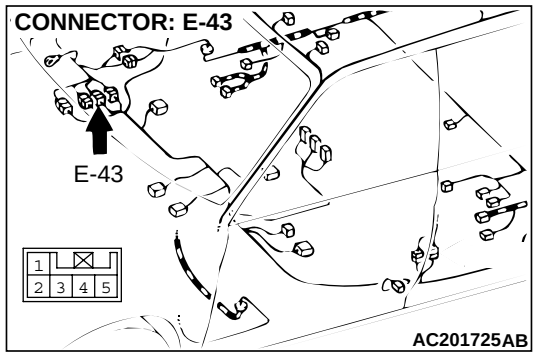
NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.











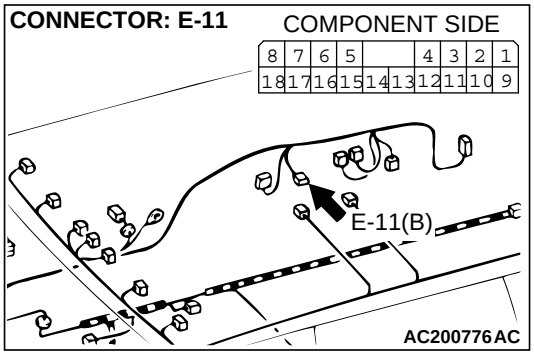
STEP 39. Check the harness wires between amplifier connector E-11 (terminal No.15 and 16) and front door speaker (RH) connector F-25 (terminal No. 1 and 2).

NOTE: After inspecting intermediate connectors C-12 and E-43, inspect the wire. If intermediate connectors C-12 and E-43 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wires between amplifier connector E-11 and front door speaker (RH) connector F-25 in good condition?

YES : Go to Step 40.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 40. Check amplifier connector E-11 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is the amplifier connector E-11 in good condition?

YES : Go to Step 41.

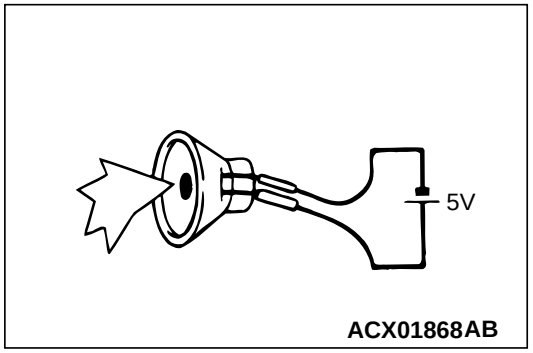
NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

STEP 41. Recheck for malfunction.

Q: Is a malfunction eliminated?

YES : This procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Point – How to Cope with Intermittent Malfunction P.00-6.)

NO : Go to Step 37.



STEP 42. Check the rear door speaker (LH).

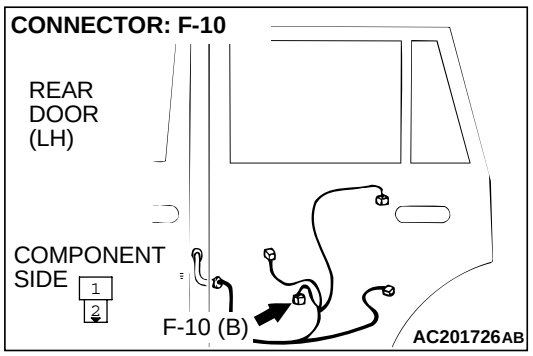
(1) Remove the rear door speaker (LH).

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

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

YES : Go to Step 43.

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

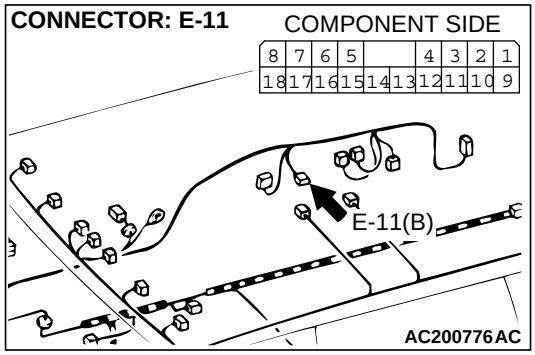


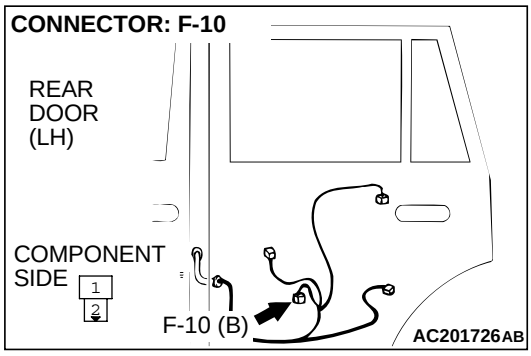
STEP 43. Check rear door speaker (LH) connector F-10 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

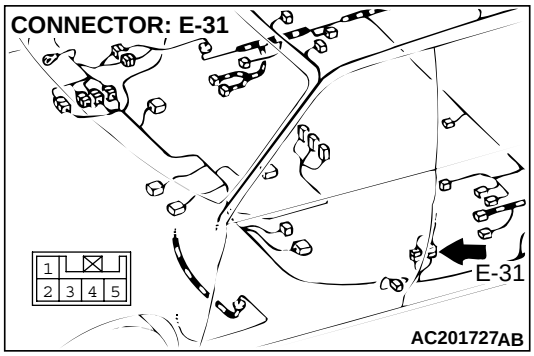
Q: Is rear door speaker (LH) connector F-10 in good condition?

YES : Go to Step 44.

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







STEP 44. Check the harness wires between amplifier connector E-11 (terminal No.17 and 18) and rear door speaker (LH) connector F-10 (terminal No.1 and 2).

NOTE: After inspecting intermediate connectors E-31, inspect the wire. If intermediate connectors E-31 is damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wires between amplifier connector E-11 (terminal No.17 and 18) and rear door speaker (LH) connector F-10 (terminal No.1 and 2) in good condition?

YES : Go to Step 45.

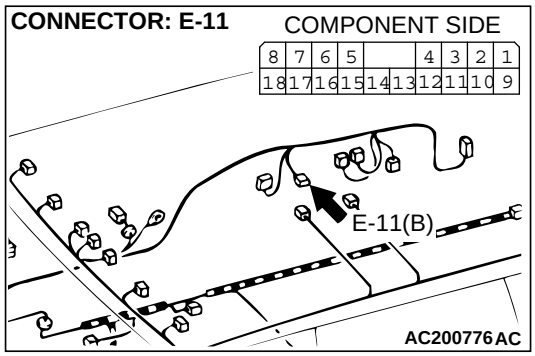
NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

STEP 45. Check amplifier connector E-11 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is the amplifier connector E-11 in good condition?

YES : Go to Step 46.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 46. Recheck for malfunction.

Q: Is a malfunction eliminated?

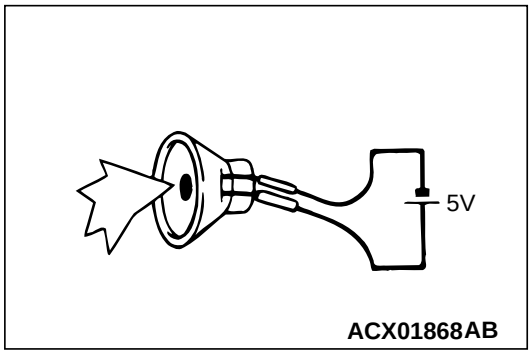
YES : This procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Point – How to Cope with Intermittent Malfunction P.00-6.)

NO : Go to Step 42.

STEP 47. Check the rear door speaker (RH).

(1) Remove the rear door speaker (RH).

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



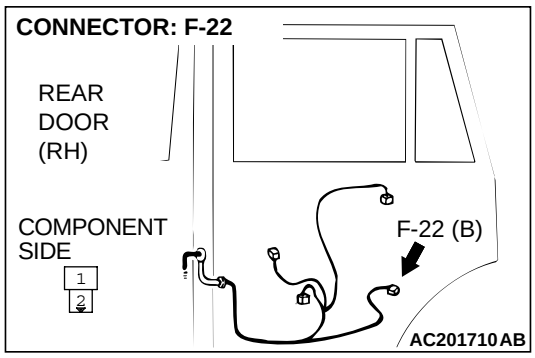
Q: Is rear door speaker generating noise?

YES : Go to Step 48.

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

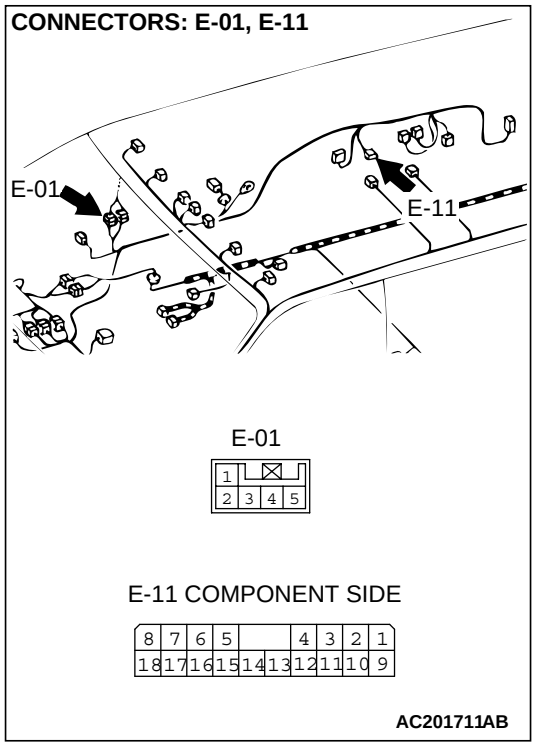
STEP 48. Check rear door speaker (RH) connector F-22 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

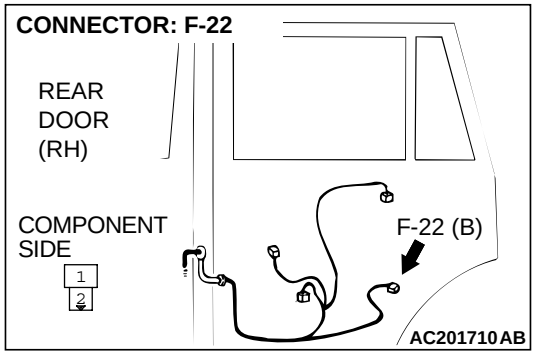
Q: Is rear door speaker (RH) connector F-22 in good condition?



YES : Go to Step 49.

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





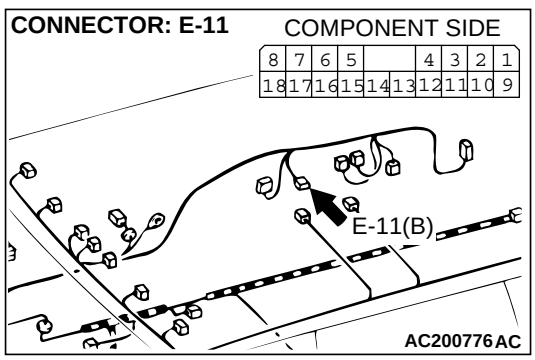
STEP 49. Check the harness wires between amplifier connector E-11 (terminal No.7 and 8) and rear door speaker (RH) connector F-22 (terminal No.1 and 2).

NOTE: After inspecting intermediate connectors E-01, inspect the wire. If intermediate connector E-01 is damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wires between amplifier connector E-11 (terminal No.7 and 8) and rear door speaker (RH) connector F-22 (terminal No.1 and 2) in good condition?

YES : Go to Step 50.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 50. Check amplifier connector E-11 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is the amplifier connector E-11 in good condition?

YES : Go to Step 51.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

STEP 51. Recheck for malfunction.

Q: Is a malfunction eliminated?

YES : This procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Point – How to Cope with Intermittent Malfunction P.00-6.)

NO : Go to Step 47.

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

DIAGNOSIS

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

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

YES : Go to Step 3.

NO : Go to Step 2.

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

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

Q: Do the following measures eliminate the noise?

YES : The following causes can be considered.

NO : Go to Step 4.

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

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

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

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

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

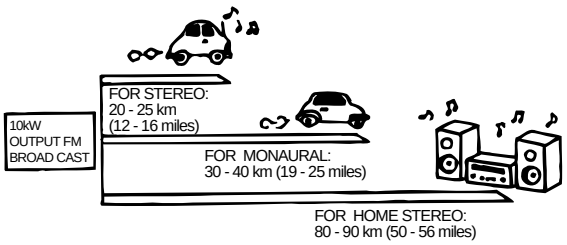
STEP 4. Check that there is no noise.

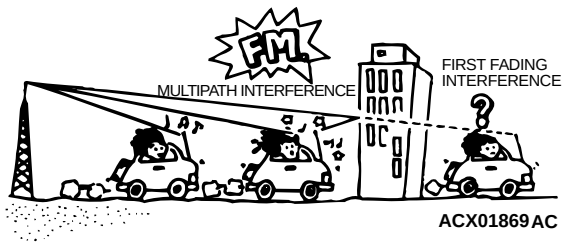
Q: Does noise still exist?

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

NO : Normal.

INSPECTION PROCEDURE 5: Noise Appears at Certain Places when Traveling (FM).





TSB Revision

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: Generator noise may be a cause.

DIAGNOSIS

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

Q: Is the noise still obvious even when the lights are off?
YES : Go to Step 2.
NO : Go to Step 3.

STEP 2. Check that the following actions disappear the noise.
(1) Tune to a station with a stronger wave.
(2) Tune to a station with a stronger wave without completely extending the antenna (Mast antenna).

Q: Is there more noise than on radio in other vehicles?
YES : Consult the radio manufacturer's service center.
NO : Check that there is no noise.

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

Q: Does the noise fade away when the vehicle harness is moved any from the radio (If the harness is not in the proper position)?
NO : If there is more noise than other radios, consult the radio manufacturer's service center.

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

DIAGNOSIS

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

Q: Does noise occur when the engine is stopped or the engine is running?
When the engine is stopped : Go to Step 2.
When the engine is running : Check the vehicle's noise suppressor. (Refer to Inspection Procedure 9 P.54-207.)

STEP 2. Check that the following actions disappear the noise.
(1) Tune to a station with a stronger wave.
(2) Extend the antenna completely (Mast antenna).
(3) Adjust the sound quality to suppress high tones.

Q: Is the noise eliminated?
YES : Consult the radio manufacturer's service center.
NO : Go to Step 3.

STEP 3. Check that the radio is correctly grounded.

Q: Is the radio correctly grounded?
YES : Go to Step 4.
NO : Consult the radio manufacturer's service center.

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

Q: Is the antenna plug properly connected to the radio?
YES : Go to Step 7.
NO : Go to Step 5.

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

Q: Is the noise eliminated?
YES : Consult the radio manufacturer's service center.
NO : Go to Step 6.

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

Q: Is the antenna in good condition and is it properly mounted?
YES : Consult the radio manufacturer's service center.
NO : Go to Step 7.

STEP 7. Clean the antenna plug and ground wire mounting area. Mount the antenna securely. On a vehicles with a motor antenna, check the antenna. (Refer to Inspection Procedure 34 or 35.)

NOTE: Noise encountered during FM reception only due to differences in FM and AM system, FM is not as susceptible as AM to interference from engines, power lines, lighting, etc. On the other hand, due to the characteristics of FM waves, there are sometimes cases of noise or distortion which are gener-

ated by typical noise interference (first fading and multipath). (Refer to Inspection Procedure 8.) <Noise (hissing) occurs in weak signal areas such as mountainous regions, but this is not due to a problem with the radio.>

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

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

Q: Is the antenna in good condition?
YES : Consult the radio manufacturer's service center.
NO : Clean or repair it. Check that the noise is eliminated. If the noise is not eliminated, consult the radio manufacturer's service center.

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.

NOTE: 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.) <Noise (hissing) occurs in weak signal areas such as mountainous regions, but this is not due to 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.

Q: Is the noise level worse than other radios?
YES : Consult a service center.
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

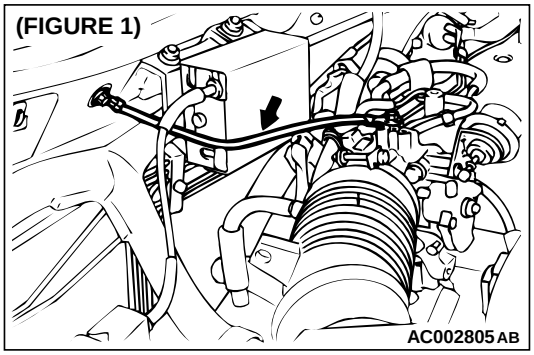
- **Connecting a high tension cable to the noise filter may destroy the noise filter and should never be done.**
- **Check that there is no external noise. Since failure to do this may result in an incorrect diagnosis due to the inability to identify the noise source, this operation must be performed.**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

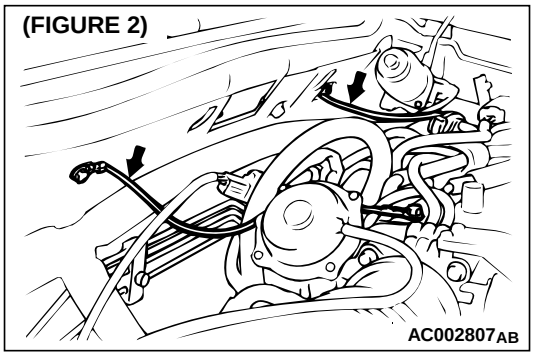
NOTE: Coil: The coil passes DC current, but impedance rises as the number of waves increases relative to the AC current. A noise suppressing coil which takes advantage of this property is inserted into the power line for the noise source, and works by preventing the noise component from flowing or radiating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

NOISE TYPE SOUNDS ARE IN PARENTHESES	CONDITION	CAUSE	REMEDY
AM, FM: ignition noise (popping, snapping, cracking, buzzing)	• Increasing the engine speed causes the generator whine sound to speed up and the volume to decrease • Disappears when the ignition switch turned to "ACC" position.	• Mainly due to the spark plugs • Due to engine noise	• Check or replace the ground cable. (Refer to figure 1, 2, 3 and 4) • Check or replace the noise capacitor. (Refer to figure 5.)
Other electrical components	-	• Noise may occur as the electrical components become older.	• Repair or replace the electrical components.
Static electricity (cracking, crinkling)	• Disappears when the vehicle is completely stopped. • Severe when the clutch is engaged.	• Occurs when parts or wiring move for some reason and contact metal parts of the body.	• Return parts or wiring to their proper position.
Static electricity (cracking, crinkling)	• Various noise are produced depending on the body part of the vehicle.	• Due to removal of the front hood, bumpers, exhaust pipe and muffler, suspension, etc.	• Ground parts by bonding. • Cases where the problem is not eliminated by a signal response to one area are common, due to several body parts being imperfectly grounded.

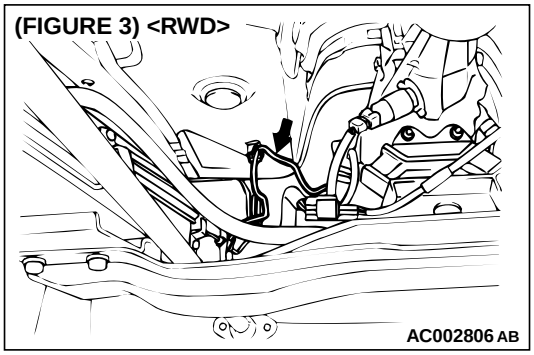
(FIGURE 1)



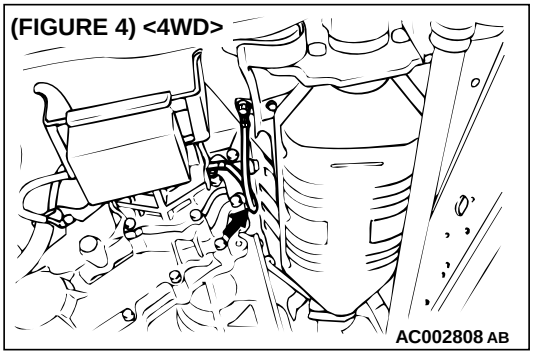
(FIGURE 2)



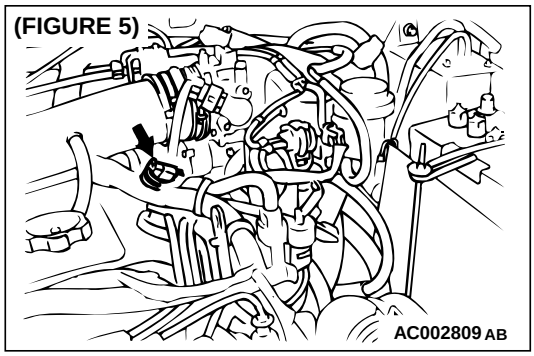
(FIGURE 3) <RWD>



(FIGURE 4) <4WD>



(FIGURE 5)



INSPECTION PROCEDURE 10: Some Noise Appears when there is Vibration or Shocks during Traveling.

DIAGNOSIS

STEP 1. Check that the connectors are properly connected.

NOTE: For the corresponding connectors, etc., refer to GROUP 90, Radio and Tape Player <vehicles without amplifier P.90-130.> or <vehicles with amplifier P.90-132. >

Q: Are the connectors properly connected?
YES : Go to Step 2.
NO : Check the condition of the connector. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Check that there is no noise.

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

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

Q: Does noise appear when the radio switch is turned on while the vehicle is stopped and the radio is tapped while tuned away from a station?
YES : Go to Step 3.
NO : It may be static electricity noise.

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STEP 3. Check that the radio is correctly grounded.

Q: Is the radio correctly grounded?
YES : Go to Step 4.
NO : Tighten the screw securely. Check that there is no noise.

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

Q: Is the antenna correctly grounded?
YES : Repair or replace the radio. Check that there is no noise.
NO : If rust is present on the antenna ground screw, clean off the rust and tighten the ground screw securely. Check that there is no noise.

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

Radio and CD Player Circuit
Refer to GROUP 90, Radio and Tape Player <vehicles without amplifier P.90-130> or <vehicles with amplifier P.90-132>.

DIAGNOSIS

STEP 1. Retune the radio, and check that there is no noise.

Q: Does the problem clear up when returned?
YES : Check that there is no noise.
NO : Go to Step 2.

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

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

- *Multipath noise*
  This describes the echo that occurs when the broadcast signal is reflected by a large obstruction and enters the receiver with a slight time delay relative to the direct signal (repetitious buzzing).
- *Fading noise*
  This is a buzzing noise that occurs when the broadcast beam is disrupted by obstructing objects and the signal strength fluctuates intricately within a narrow range.

Q: Does the problem appear only in certain locations and only with certain stations?
YES : The effect of an electrical field condition (multipath noise, fading noise) could be the cause. Check that there is not noise.
NO : Go to Step 3.

STEP 3. Check that the connectors are properly connected.

NOTE: For the corresponding connectors, etc., refer to GROUP 90, Radio and Tape Player <vehicles without amplifier P.90-130.> or <vehicles with amplifier P.90-132.>.

Q: Are the connectors properly connected?
YES : Go to Step 4.
NO : Check the condition of the connector. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Check that there is no noise.

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

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

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

Q: Is the radio correctly grounded?
YES : Go to Step 6.
NO : Tighten the screw securely. Check that there is no noise.

STEP 6. Check that the antenna is correctly grounded. (If noise appears when the antenna is moved, this means the ground is not securely connected.)

Q: Is the antenna correctly grounded?
YES : Repair or replace the radio. Check that there is no noise.
NO : If rust is present on the antenna ground screw, clean off the rust and tighten the ground screw securely. Check that there is no noise.

INSPECTION PROCEDURE 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. Make sure that the check is being conducted under special electrical field conditions.
Example: In an underground garage or inside a building.

Q: Is the check being conducted under special electrical field conditions?
YES : Go to Step 2.
NO : Go to Step 3.

STEP 2. Check that proper performance is obtained when the vehicle is moved.

Q: Is proper performance obtained when the vehicle is moved?
YES : The radio should sound normally.
NO : Go to Step 3.

STEP 3. Check that tuning solves the problem.

Q: Does tuning solve the problem?
YES : The radio should sound normally.
NO : Go to Step 4.

STEP 4. Check that the antenna plug and radio unit are properly connected.

Q: Are the antenna plug and radio unit properly connected?
YES : Go to Step 5.
NO : Reconnect the antenna plug and radio unit properly. The radio should sound normally.

STEP 5. Check that the problem disappear if another radio is used.

Q: Does the problem disappear if another radio is used?
YES : Repair or replace the radio. The radio should sound normally.
NO : Either repair or replace the antenna assembly. The radio should sound normally.

INSPECTION PROCEDURE 14: Poor Reception.

DIAGNOSIS

STEP 1. Make sure that the check is being conducted under special electrical field conditions.

Q: Is the check being conducted under special electrical field conditions (such as in an underground garage or inside a building)?
YES : Go to Step 2.
NO : Go to Step 3.

STEP 2. Check that proper performance is obtained when the vehicle is moved.

Q: Is proper performance obtained when the vehicle is moved?
YES : Check that a poor reception is resolved.
NO : Go to Step 3.

STEP 3. Check that tuning solves the problem.

Q: Does tuning solve the problem?
YES : Check that a poor reception is resolved.
NO : Go to Step 4.

STEP 4. Check that the problem is limited to the reception of a specific radio station from a specific position.

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

- *Multipath noise*
  This describes the echo that occurs when the broadcast signal is reflected by a large obstruction and enters the receiver with a slight time delay relative to the direct signal (repetitious buzzing).
- *Fading noise*
  This is a buzzing noise that occurs when the broadcast beam is disrupted by obstructing objects and the signal strength fluctuates intricately within a narrow range.

Q: Is the problem limited to the reception of a specific radio station from a specific position?
YES : Go to Step 5.
NO : Check that a poor reception is resolved.

STEP 5. Check that the antenna plug is connected to the radio properly.

Q: Is the antenna plug connected to the radio properly?
YES : Go to Step 6.
NO : Reconnect the antenna plug and radio unit properly. Check that a poor reception is resolved.

STEP 6. Check that the problem disappears when another radio is used.

Q: Does the problem disappear if another radio is used?
YES : Repair or replace the radio. Check that a poor reception is resolved.
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 how much distortion there is.

Q: How much distortion is there?
Occasional distortion : Go to Step 2.
Constant distortion : Go to Step 3.

STEP 2. Check that there is distortion near the radio station.

Q: Is there distortion near the radio station?
YES : The antenna may receive too strong signal.
NO : Go to Step 3.

STEP 3. Check that the speaker cords are in contact with the cone paper.

Q: Are the speaker cords in contact with the cone paper?
YES : Move the cords away from the cone paper. Check that a distortion is resolved.
NO : Go to Step 4.

STEP 4. Remove the speakers, and check for torn cone paper or foreign material.

Q: Is there torn cone paper or foreign material?
YES : Repair or replace the speakers. Check that a distortion is resolved.
NO : Go to Step 5.

STEP 5. Check for distortion with the speaker installed.

Q: Does a distortion occur?
YES : Install the speaker securely. Check that a distortion is resolved.
NO : Repair or replace the radio. Check that a distortion is resolved.

INSPECTION PROCEDURE 16: Distortion on FM Only.

DIAGNOSIS

STEP 1. Check that the distortion persists when the radio is turned to another station.

Q: Does the distortion persist when the radio is turned to another station?
YES : Go to Step 2.
NO : The signal from that station is too weak.

STEP 2. Check that the distortion increases or decreases when the vehicle is moved.

Q: Does distortion increase or decrease when the vehicle is moved?
YES : The cause may be multipath noise.
NO : Repair or replace the radio. Check that a distortion is resolved.

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

DIAGNOSIS

STEP 1. Consider the number of radio stations. Check that there are enough in the area.

Q: Consider the number of radio stations. Are there enough in the area?
YES : Go to Step 2.
NO : Confirm automatic selection selects the strongest signals in the area. If not, go to Step 3.

STEP 2. Consider the distance to the radio stations. Check that the transmitting antennas are within 2 miles.

Q: Consider the distance to the radio stations. Are the transmitting antennas within 2 miles?
YES : Go to Step 3.
NO : Confirm automatic selection selects the strongest signals in the area. If not, go to Step 4.

STEP 3. Make sure that the check is being conducted under special field conditions.

Q: Is the check being conducted under special electrical field conditions (such as in an underground garage or inside a building)?
YES : Go to Step 4.
NO : Go to Step 5.

STEP 4. Check that proper performance is obtained when the vehicle is moved.

Q: Is proper performance obtained when the vehicle is moved?
YES : The auto-select function should operate normally.
NO : Go to Step 5.

STEP 5. Check that the antenna plug is connected to the radio properly.

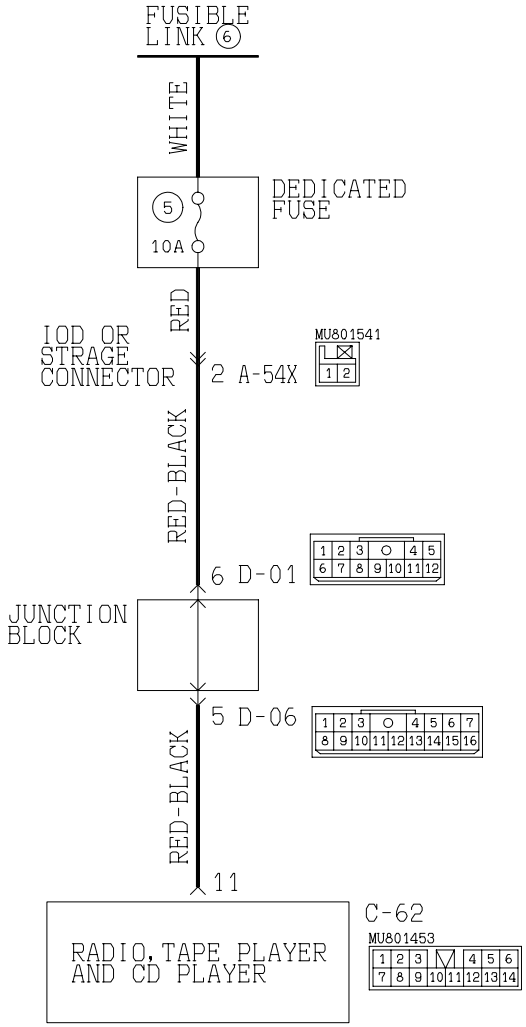
Q: Is the antenna plug connected to the radio properly?
YES : Go to Step 6.
NO : The antenna plug is reconnected to the radio properly. The auto-select function should operate normally.

STEP 6. Check that the problem disappears when another radio is used.

Q: Does the problem disappear if another radio is used?
YES : Repair or replace the radio. The auto-select function should operate normally.
NO : Move the vehicle in an area with good radio signals. Then go to Step 1.

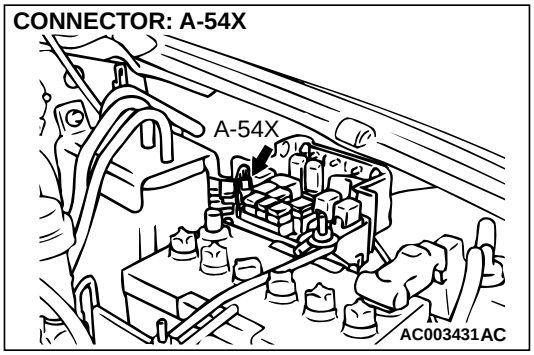
INSPECTION PROCEDURE 18: Preset Station are Erased.

Memory Backup Power Supply Circuit

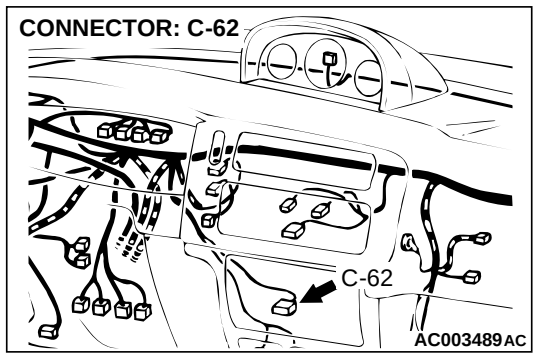


W1P03M03AA
AC004256AC

CONNECTOR: A-54X



CONNECTOR: C-62



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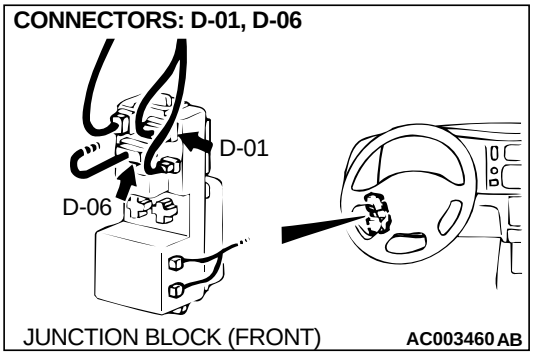


CIRCUIT OPERATION

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

TECHNICAL DESCRIPTION (COMMENT)

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

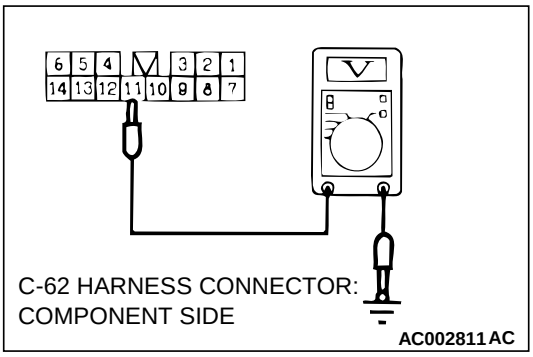
TROUBLESHOOTING HINTS

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

DIAGNOSIS

Required Special Tool:

- MB991223: Harness set

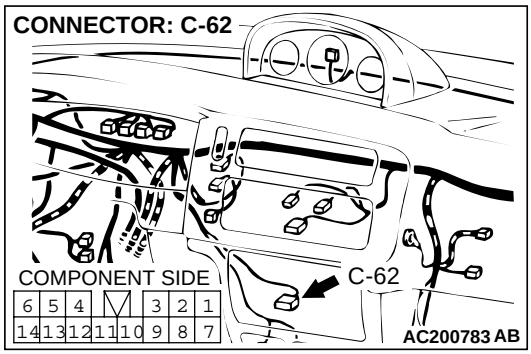


STEP 1. Check the radio, tape player and CD player memory backup power supply circuit.

(1) Do not disconnect radio, tape player and CD player C-62.
(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?

YES : Repair or replace the radio, tape player and CD player. Check that a memory is retained.
NO : Go to Step 2.



STEP 2. Check harness connector C-62 at the radio, tape player and CD player for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is harness connector C-62 in good condition?

YES : Go to Step 3.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.52A-35. Check that a memory is retained.

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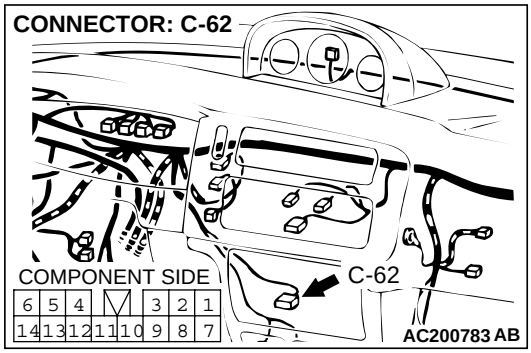
STEP 3. Check the harness wires between radio, tape player, CD player connector C-62 (terminal No.11) and fusible link number 6.

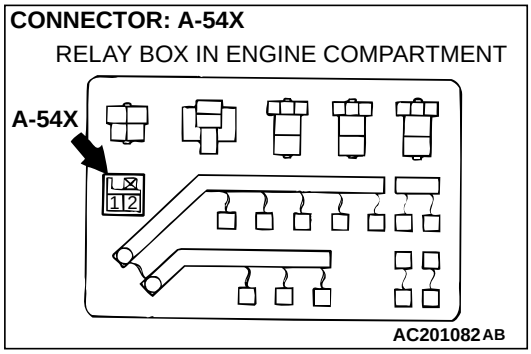
NOTE: After inspecting junction block D-01 and D-06, IOD or storage connector A-54X, inspect the wire. If junction block D-01 and D-06, IOD or storage connector A-54X are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.52A-44.

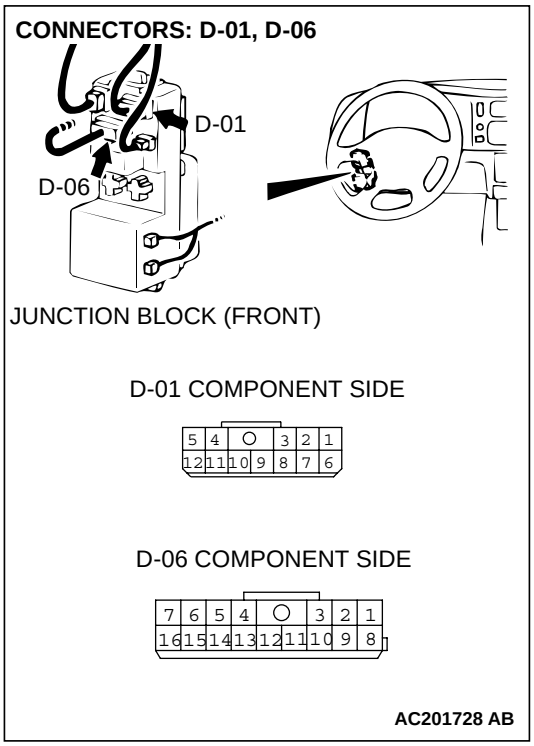
Q: Are the harness wires between the connector C-62 (terminal No.11) and fusible link number 6 in good condition?

YES : Go to Step 4.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.52A-35.







STEP 4. Recheck for malfunction.

Q: Is a malfunction eliminated?

YES : This procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Point – How to Cope with Intermittent Malfunction P.00-6.)

NO : Go to Step 1.

INSPECTION PROCEDURE 19: CD can not be Inserted.

DIAGNOSIS

STEP 1. Check that the shutter opens when a CD is inserted.

Q: Does the shutter open when a CD is inserted?

YES : Go to Step 2.

NO : Take out the CD. Check that a CD can be inserted.

STEP 2. Check that the CD is ejected from approximately 15 mm (0.6 inch) inside the insertion panel even though it can be inserted.

NOTE: If the key switch is not at "ACC" or "ON," the CD stops at depth of 15 mm(0.6 inch) below the panel surface even when it is inserted, and it will be rejected when pushed farther.

Q: Is the CD ejected from approximately 15 mm (0.6 inch) inside the insertion panel even though it can be inserted?

YES : Go to Step 3.

NO : Check that a CD can be inserted.

STEP 3. Check that "E" (error) is displayed even though the CD is inserted completely.

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

Q: Though the CD is inserted completely, is "E" (error) displayed and the CD ejected?

YES : Go to Step 4.

NO : Check that a CD can be inserted.

STEP 4A. Check the CD.

Q: Is the labeled side faced downward?

YES : Insert the CD correctly.

NO : Replace the CD. Check that a CD can be inserted.

STEP 4B. Check the CD.

Q: Is the recorded face of the CD dirty?

YES : Clean the CD.

NO : Replace the CD. Check that a CD can be inserted.

STEP 4C. Check the CD.

Q: Is there dew on the recorded face of the CD?

YES : Remove the dew.

NO : Replace the CD. Check that a CD can be inserted.

INSPECTION PROCEDURE 20: No sound. (CD only)

DIAGNOSIS

STEP 1. Check that the CD player plays properly if another CD is inserted.

Q: Does it play properly if another CD is inserted?
YES : The CD used is defective. The CD player should sound normally.
NO : Go to Step 2.

STEP 2. Return it to the normal temperature, and recheck the operation. Check that the CD player operates properly.

Q: Return it to the normal temperature, and recheck the operation. Does it operate properly?
YES : The CD player should sound normally.
NO : Repair or replace the CD player. The CD player should sound normally.

INSPECTION PROCEDURE 21: CD Sound Skips.

DIAGNOSIS

STEP 1. Malfunction occurrence state.

Q: When does a malfunction occur?
While parking : Go to Step 2.
While driving : Stop vehicle, go to Step 4.

STEP 2. Check that the CD face scratched or dirty.

Q: Is the CD face scratched or dirty?
YES : CD is defective, or clean the CD. Check that a CD sound skip is resolved.
NO : Go to Step 3.

STEP 3. Check that the CD player plays properly if another CD is started.

Q: Does it play properly if another CD is inserted?
YES : CD is defective. Check that a CD sound skip is resolved.
NO : Repair or replace the CD player. Check that a CD sound skip is resolved.

STEP 4. Check that sound skips when the side of the CD player is tapped.

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

Q: Does sound skip when the side of the CD player is tapped?
YES : Securely mount the CD player. Check that a CD sound skip is resolved.
NO : Check the sound skipping state in detail while driving, and then contact a service shop. Check that a CD sound skip is resolved.

INSPECTION PROCEDURE 22: Sound Quality is Poor.

DIAGNOSIS

STEP 1. Check that the CD player plays properly if another CD is inserted.

Q: Does it play properly if another CD is inserted?
YES : CD used is defective. The sound quality should return to normal.
NO : Repair or replace the CD player. The sound quality should return to normal.

INSPECTION PROCEDURE 23: CD can not be Ejected.

DIAGNOSIS

STEP 1. Check that the key switch (ignition key) is at "ACC" or "ON".

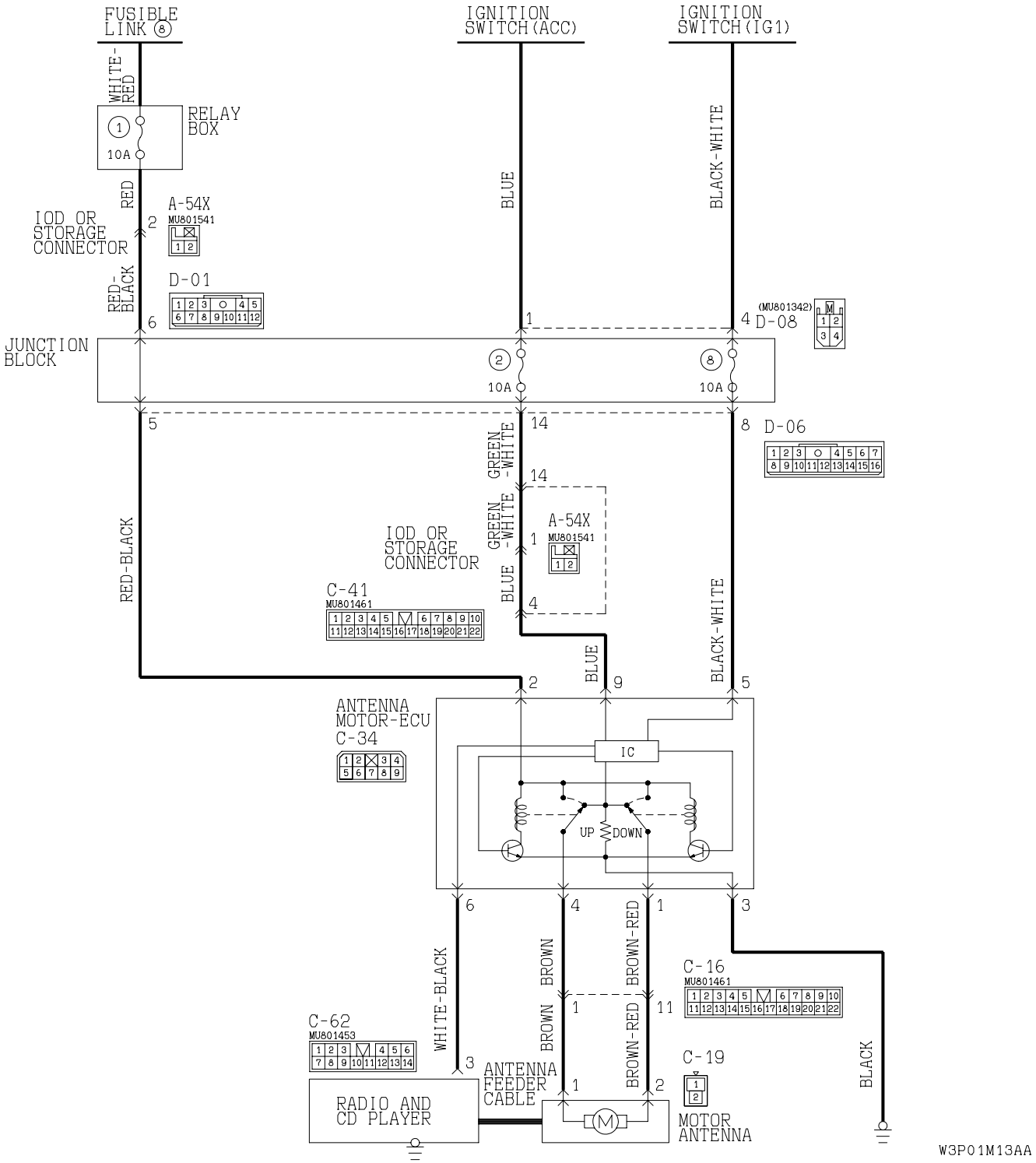
Q: Is the key switch (ignition key) at "ACC" or "ON?"
- **YES :** Go to Step 2.
- **NO :** Check the memory backup power supply circuit. Refer to Inspection Procedure 21.

STEP 2. Check that the combined amplifier or radio set connected securely?

Q: Is the combined amplifier or radio set connected securely?
- **YES :** If the CD is not ejected, do not discard it, because the player may be damaged. Therefore, contact a service shop for repairs. Check that a CD can be ejected normally.
- **NO :** Connect the connectors securely. Check that a CD can be ejected normally.

INSPECTION PROCEDURE 24: Motor Antenna won't Extend or Retract.

Motor Antenna Drive Circuit



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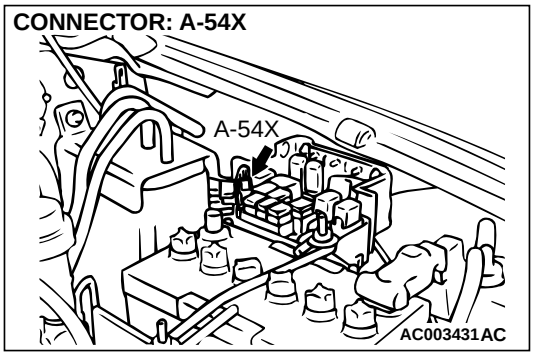

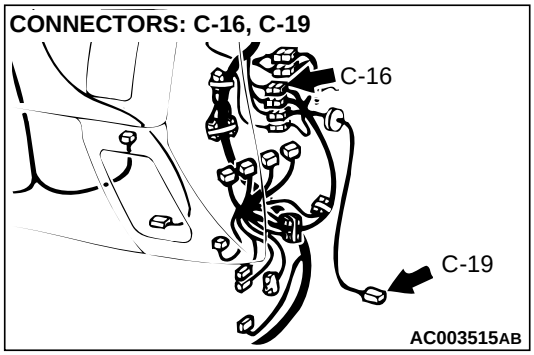

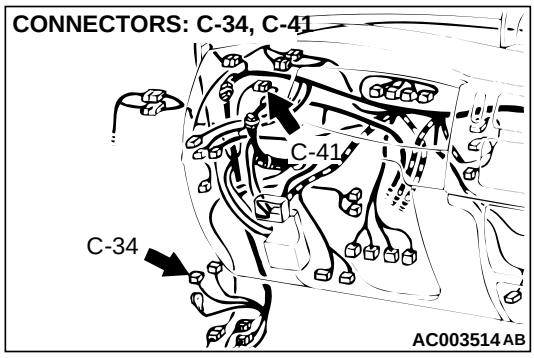

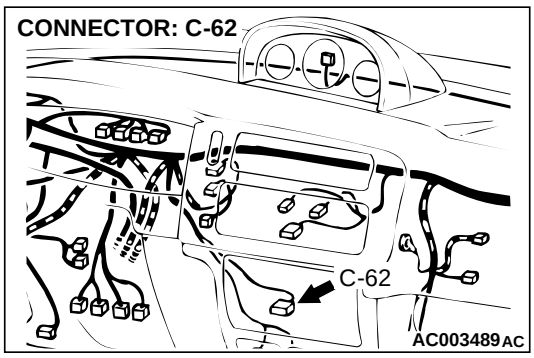

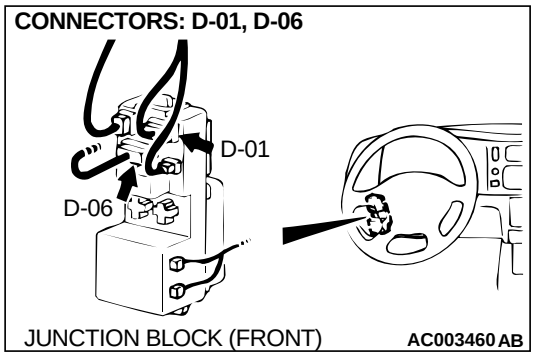

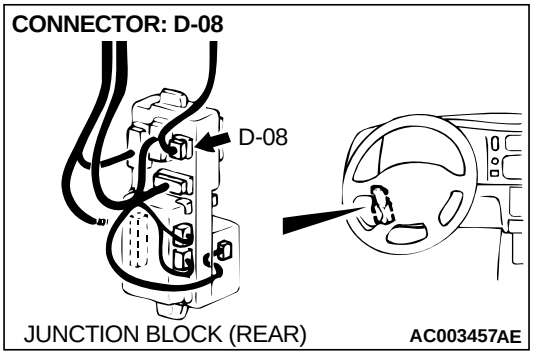

CIRCUIT OPERATION

The antenna motor-ECU extends or retracts the antenna when the radio switch is turned on or off with the ignition switch in the "ACC" or "ON" position.

TECHNICAL DESCRIPTION (COMMENT)

The cause is probably a defective motor antenna circuit system.

TROUBLESHOOTING HINTS

- Malfunction of the motor antenna
- Malfunction of the antenna motor-ECU
- Malfunction of the radio and CD player
- Damaged harness wire or connector

DIAGNOSIS

STEP 1. Clean and polish the surface of the antenna pole, and then check the trouble symptom.

Q: Is a malfunction eliminated?

YES : The procedure is complete.
NO : Go to Step 2.

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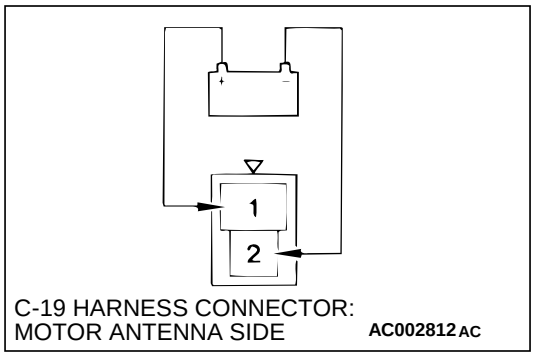
STEP 2. Clean the antenna.

Q: Is a the antenna bent?

YES : Repair the bend or replace the antenna pole.
NO : Go to Step 3.

STEP 3. Check the motor antenna's motor.

(1) Disconnect motor antenna connector C-19.
(2) Check that the antenna pole rise when the positive side of the battery is connected to terminal number 1 or motor antenna connector C-19 and the negative side of the battery is connected to terminal number 2. Check that the antenna pole lowers when the connection is reversed.

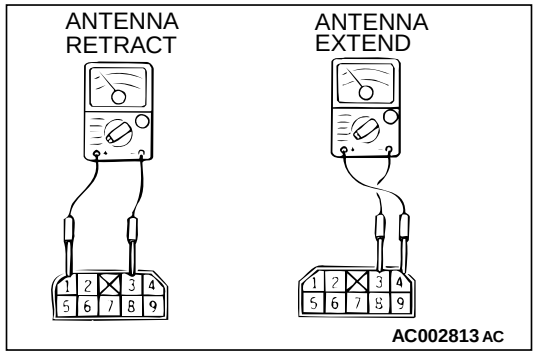


Q: Is the motor in good condition?

YES : Go to Step 4.
NO : Replace the motor antenna.

STEP 4. Check the antenna motor-ECU.

(1) Remove the antenna motor-ECU mounting bolts.
(2) Operate the radio switch when the ignition switch is turned to the "ACC" or "ON" position. Measure the voltage between the terminals while the antenna is attempting to extend or retract.



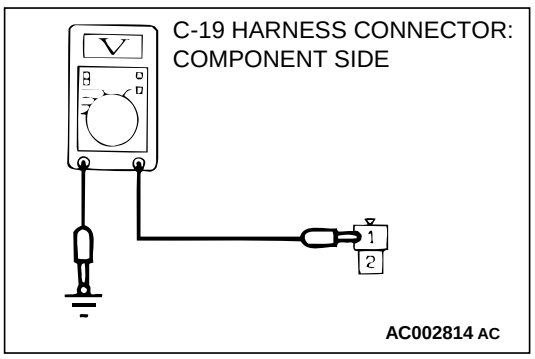
ANTENNA OPERATION DIRECTION	TERMINAL NO. TO BE CONNECTED TO BATTERY	SPECIFIED CONDITION
While lowering	1 – 3	10 – 13 volts
While rising	4 – 3	10 – 13 volts

Q: Is the antenna motor-ECU in good condition?

YES : Go to Step 5.
NO : Replace the antenna motor-ECU.

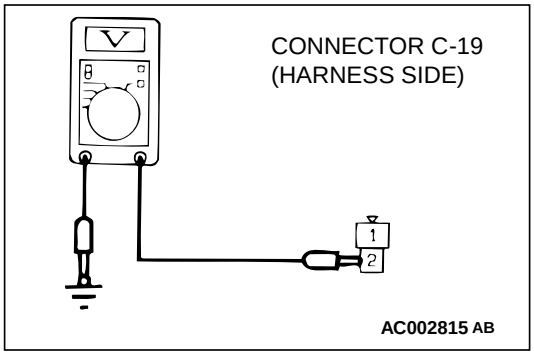
STEP 5. Measure the voltage at motor antenna power supply circuit (motor antenna extension side).

(1) Disconnect motor antenna connector C-19 and measure at the harness side.
(2) Turn the ignition switch "ON."
(3) Turn the radio switch "ON."
(4) Measure the voltage between terminal number 1 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 6.
NO : Go to Step 7.



STEP 6. Measure the voltage at motor antenna power supply circuit (motor antenna retraction side).

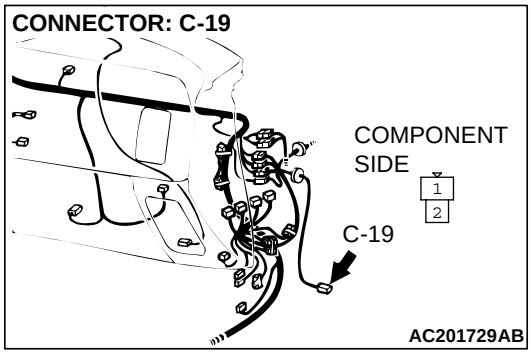
Measure the voltage between terminal number 2 and ground.

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

Q: Does the measured voltage correspond with this range?

YES : Motor antenna is normal. Check that the malfunction is eliminated.

NO : Go to Step 7.



STEP 7. Check harness connector C-19 at the motor antenna for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is motor antenna connector C-19 in good condition?

YES : Go to Step 8.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

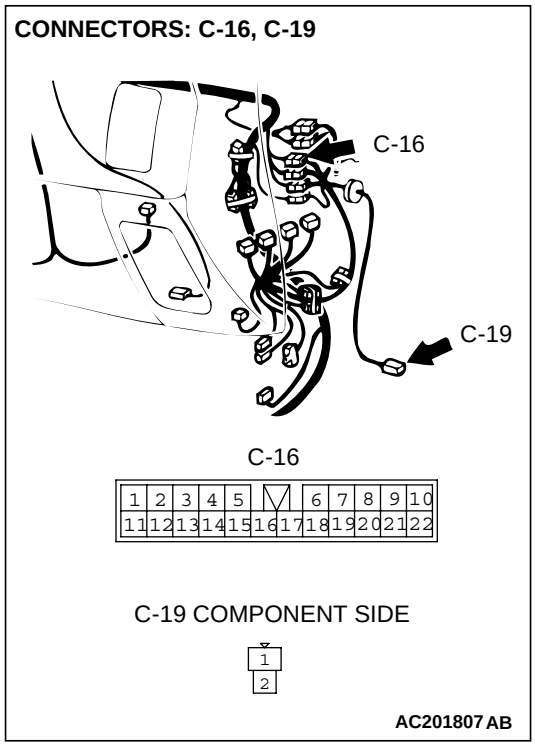
STEP 8. Check the harness wires between motor antenna connector C-19 (terminal No. 1 and 2) and antenna motor-ECU connector C-34 (terminal No. 1 and 4).

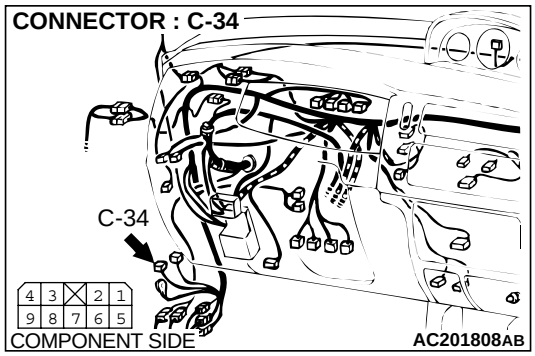
NOTE: After inspecting intermediate connector C-16, inspect the wire. If intermediate connector C-16 is damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wires between motor antenna connector C-19 (terminal No. 1 and 2) and antenna motor-ECU connector C-34 (terminal No. 1 and 4) in good condition?

YES : Go to Step 9.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



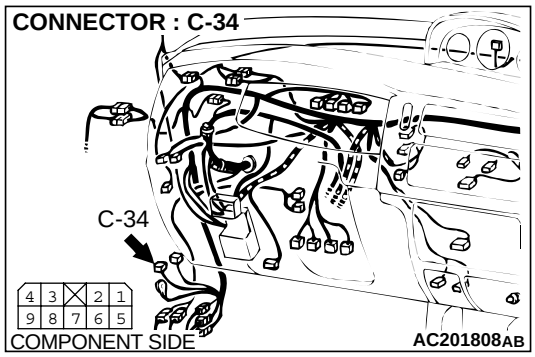


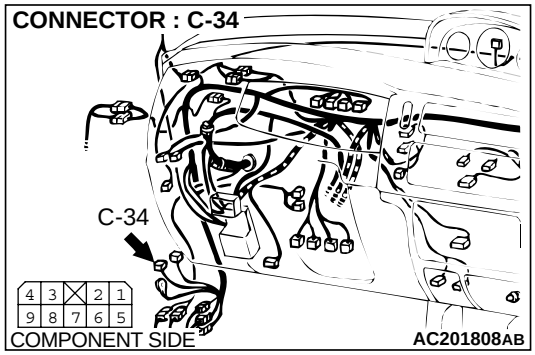
STEP 9. Check antenna motor-ECU connector C-34 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

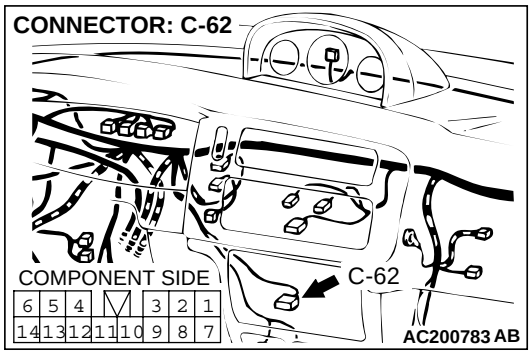
Q: Is antenna motor-ECU connector C-34 in good condition?

YES : Go to Step 10.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





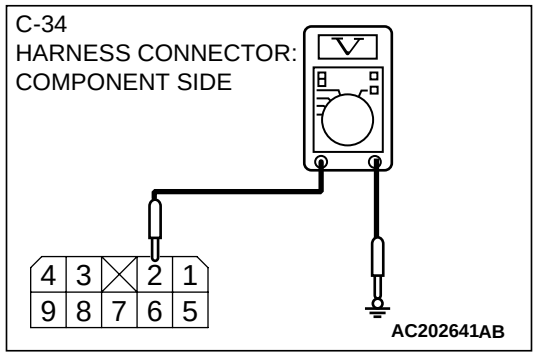


STEP 10. Check the harness wires between antenna motor-ECU connector C-34 (terminal No. 6) and radio and CD player connector C-62 (terminal No.3).

Q: Are the harness wires between antenna motor-ECU connector C-34 (terminal No. 6) and radio and CD player connector C-62 (terminal No.3) in good condition?

YES : Go to Step 11.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 11. Measure the voltage at the antenna motor-ECU power supply circuit. (Fusible link number 8)

(1) Disconnect antenna motor-ECU connector C-34 and measure at harness side.

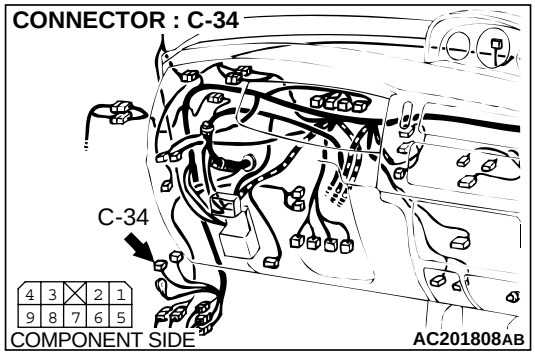
(2) Measure the voltage between terminal number 2 and ground.

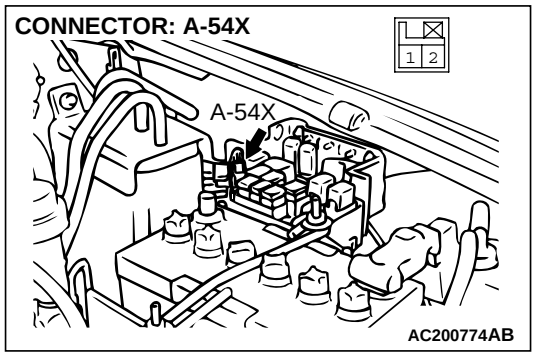
- The measured value should be approximately 12 volts (battery positive voltage).

Q: Does the measured voltage correspond with this range?

YES : Go to Step 13.

NO : Go to Step 12.





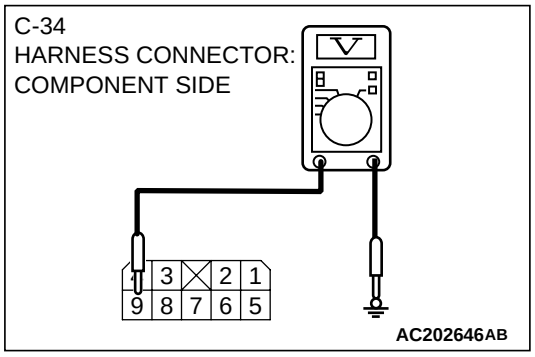
STEP 12. Check the harness wires between fusible link number 8 and antenna motor-ECU connector C-34 (terminal No.1 and 2).

NOTE: After inspecting junction block connectors D-01, D-06 and IOD or storage connector A-54X, inspect the wire. If junction block connectors D-01, D-06 and IOD or storage connector A-54X are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wires between fusible link number 6 and antenna motor-ECU connector C-34 in good condition?

YES : Go to Step 13.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 13. Measure the voltage at the antenna motor-ECU power supply circuit. (Ignition switch "ACC")

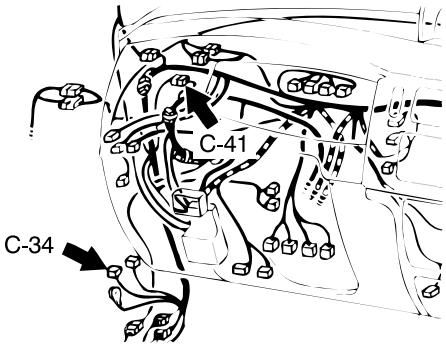
(1) Disconnect antenna motor-ECU connector C-34 and measure at harness side.
(2) Turn the ignition switch to the "ACC" position.
(3) Measure the voltage between terminal number 9 and ground.
- The measured value should be approximately 12 volts (battery positive voltage).

Q: Does the measured voltage correspond with this range?

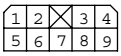
YES : Go to Step 15.

NO : Go to Step 14.

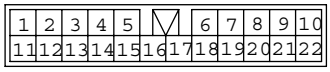
CONNECTORS: C-34, C-41



C-34 COMPONENT SIDE

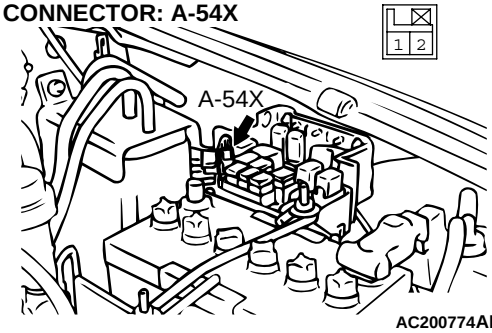


C-41



AC201810AB

CONNECTOR: A-54X



AC200774AB

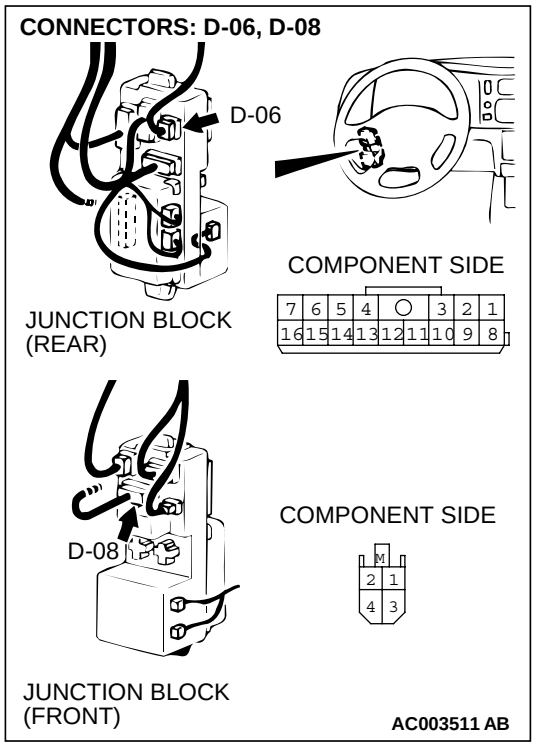
STEP 14. Check the harness wires between ignition switch "ACC" and antenna motor-ECU connector C-34 (terminal No. 9).

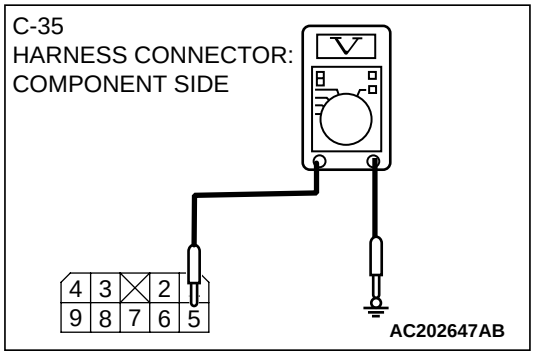
NOTE: After inspecting intermediate connector C-41, junction block connectors D-06, D-08 and IOD or storage connector A-54X, inspect the wire. If intermediate connector C-41, junction block connectors D-06, D-08 and IOD or storage connector A-54X are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wires between ignition switch "ACC" and antenna motor-ECU connector C-34 (terminal No. 9) in good condition?

YES : Go to Step 15.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





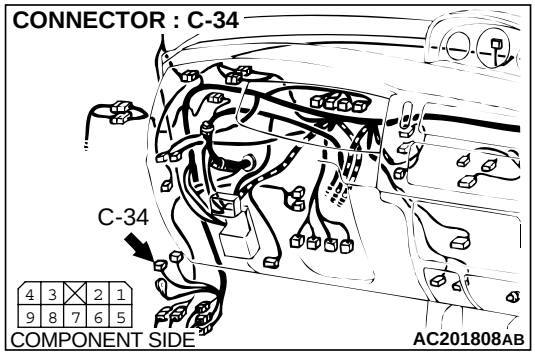
STEP 15. Measure the voltage at the antenna motor-ECU power supply circuit. [Ignition switch "ON" (IG1)]

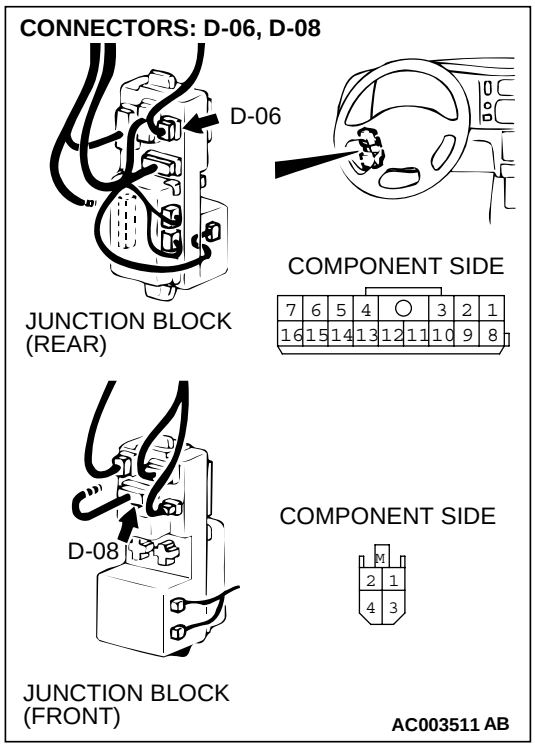
(1) Disconnect antenna motor-ECU connector C-34 and measure at harness side.
(2) Turn the ignition switch to the "ON" position.
(3) Measure the voltage between terminal number 5 and ground.
- The measured value should be approximately 12 volts (battery positive voltage).

Q: Does the measured voltage correspond with this range?

YES : Antenna motor-ECU power circuit is normal. Check that the malfunction is eliminated.

NO : Go to Step 16.





STEP 16. Check the harness wires between ignition switch "ON" and antenna motor-ECU connector C-34 (terminal No. 5).

NOTE: After inspecting junction block connectors D-06, D-08, inspect the wire. If junction block connectors D-06, D-08 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wires between ignition switch "ON" and antenna motor-ECU connector C-34 (terminal No.5) in good condition?

YES : Go to Step 17.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

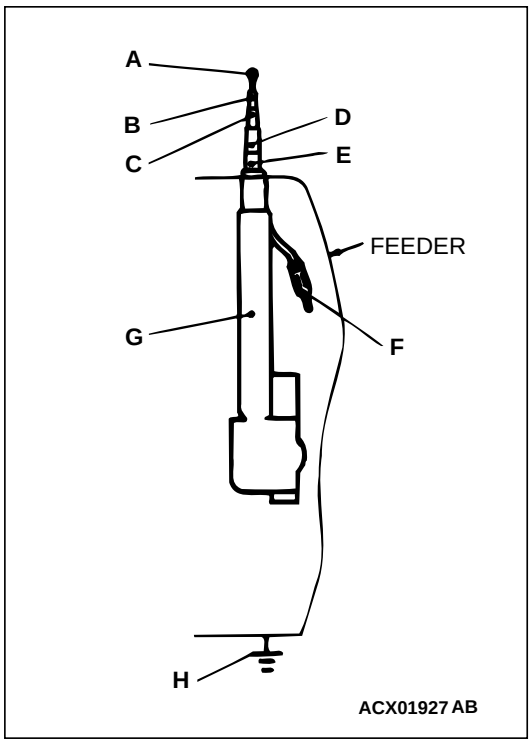
STEP 17. Recheck for malfunction.

Q: Is a malfunction eliminated?

YES : This procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Point – How to Cope with Intermittent Malfunction P.00-6.

NO : Go to Step 1.

INSPECTION PROCEDURE 25: Motor Antenna Extends and Retracts but does not Receive Radio Signal.



DIAGNOSIS

STEP 1. Is the antenna normal?

Q: Is there continuity on the circuits from F to A, B, C, D and E, the circuit from G to H?

YES : Go to Step 2.

NO : Repair or replace the antenna. Then check that the malfunction is eliminated.

STEP 2. Check the motor antenna.

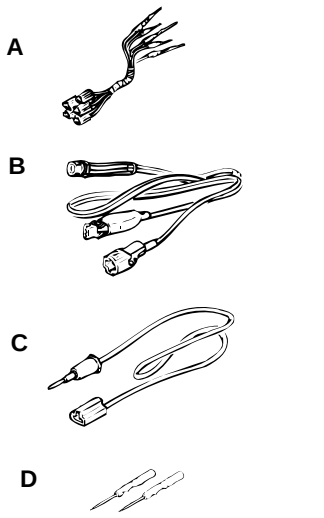
Q: Does the antenna operate normally when a new antenna assembly is directly install to the radio?

YES : Replace the motor antenna assembly.

NO : Radio and tape player may be defective. Carry out troubleshooting of the radio and CD player P.54-164.

SPECIAL TOOL

M1544000600276

TOOL	TOOL NUMBER AND NAME	REPLACED THE MILLER TOOL NUMBER	APPLICATION
A B C D  MB991223AC	MB991223 A: MB991219 B: MB991220 C: MB991221 D: MB991222 Harness set A: Test harness B: LED harness C: LED harness adapter D: Probe	General service tool (jumper)	Making voltage and resistance measurements during troubleshooting A: Connect pin contact pressure inspection B: Power circuit inspection C: Power circuit inspection D: Commercial tester connection

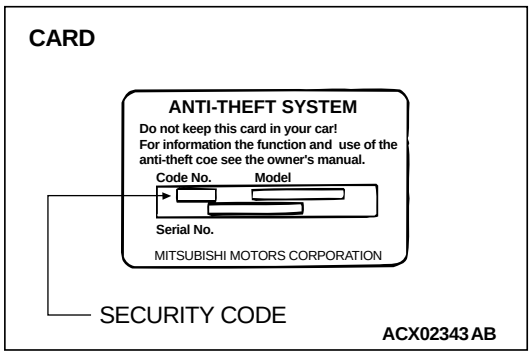
ON-VEHICLE SERVICE

PROCEDURE FOR INPUT OF SECURITY CODE FOR ANTI-THEFT SYSTEM

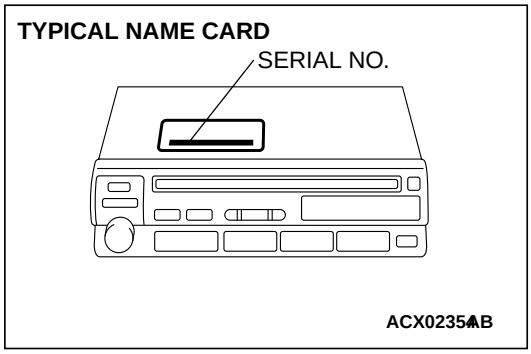
M1544004400218

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.

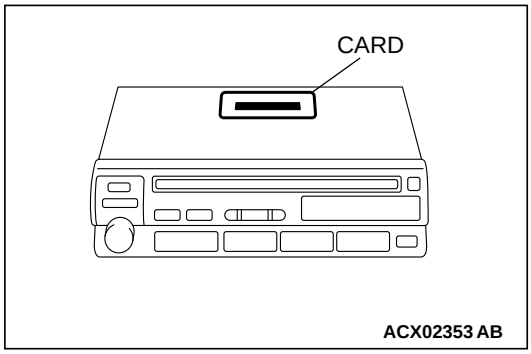
1. Confirm the security code using any of the following methods.
   (1) Use the security code indicated on the cards retained in the vehicle.



TSB Revision



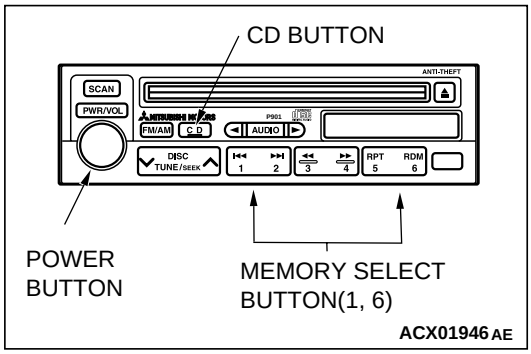
(2) If the security code is unknown owing to the owner's loss of the card:
   a. Remove the radio and CD player referring to P.34-3.
   b. Read the serial number stamped on the radio and CD player.
   c. Look up the security code (anti-theft code table) corresponding to the serial number.



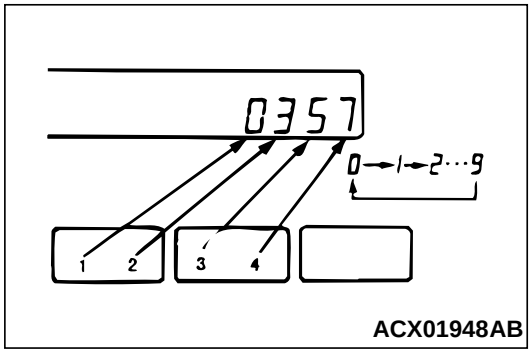
(3) When the radio and CD player is replaced: Use the security code on the cards attached to the upper surface of the replacement radio and CD player.

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.



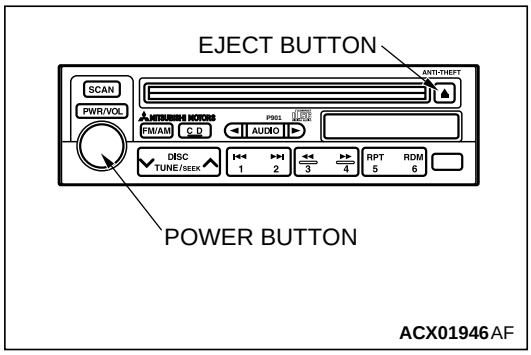
4. Press the "PWR" button, and "CODE" will be displayed.



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 tape player will work.
7. If the security code is not accepted, "1Err" is displayed. In a few seconds, it will change to "CODE." Then repeat steps 5 and 6.

   NOTE:
   - *The anti-theft system will allow three attempts maximum to input the correct code.*
   - *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.*
   - *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 and changes into "CODE" the security code can be input again.*

TSB Revision



Three-minute operation mode

To facilitate replacement or check, the radio with tape and CD player can be operated for three minutes without inputting the security code.

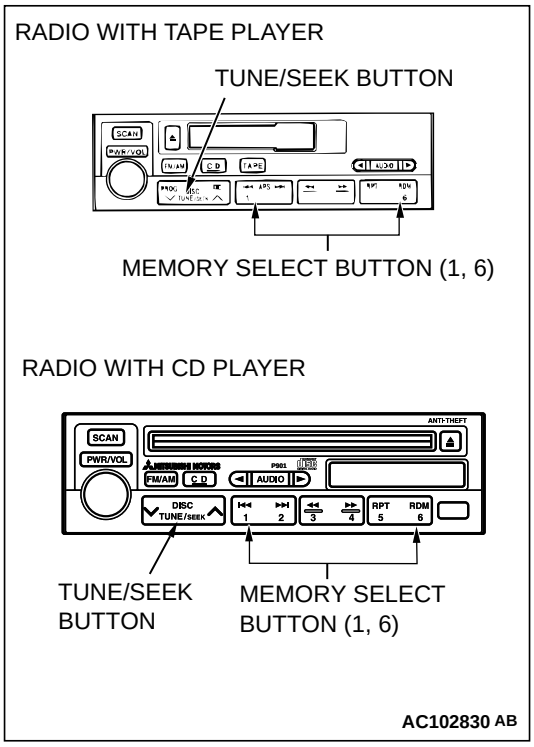
1. Press the "PWR" button and "EJECT" button together to operate the radio with tape and CD player.
2. In three minutes the unit will not be able to work. Then the radio with tape and CD player will be switched off.

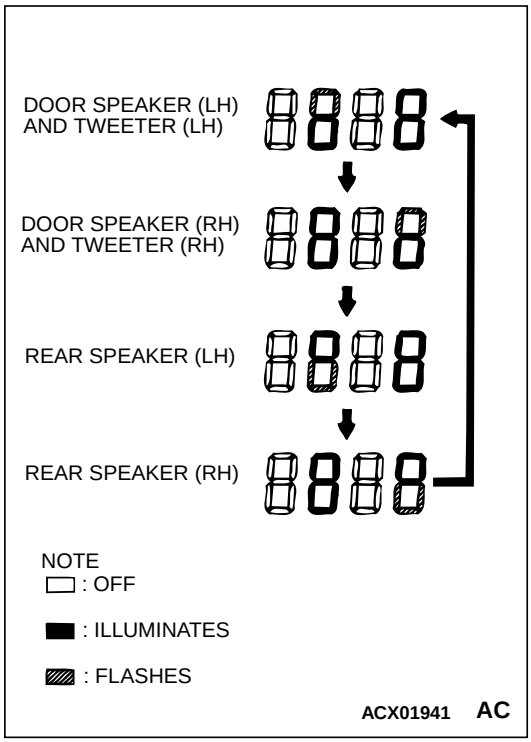
SPEAKER TEST

M1544005400181

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 with tape or 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



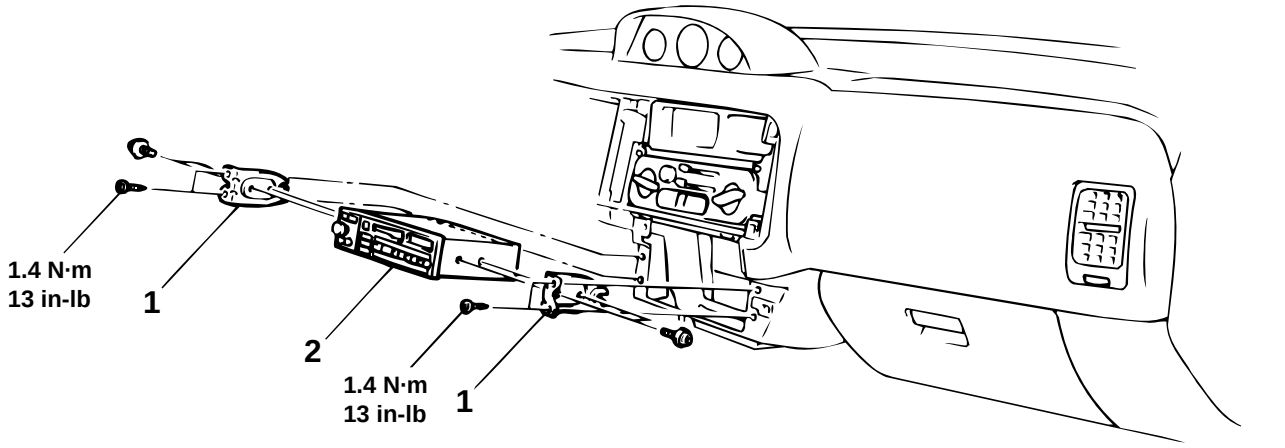


3. Check that the speaker, which is displayed on the multi-center display, sounds (If the memory select "6" button is pressed, the speaker will be changed).
4. If a button other than the memory select "6" button and "EJECT" button (tape or CD) is pressed, or the ignition switch is turned to "LOCK" (OFF)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

REMOVAL AND INSTALLATION

M1544001400242

Pre-removal and Post-installation Operation
- Front Floor Console Assembly Removal and Installation (Refer to GROUP 52A, Floor Console P.52A-35.)
- Driver's Side Under Cover, Meter Bezel Assembly, Glove Box Assembly, Center Under Cover Removal and Installation (Refer to GROUP 52A, Instrument Panel P.52A-32.)



AC002822AB

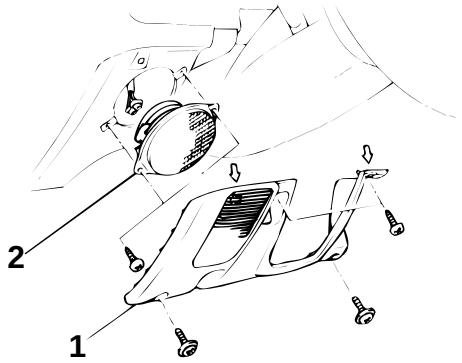
RADIO REMOVAL STEPS
1. RADIO BRACKET
2. RADIO AND CD PLAYER

SPEAKER

REMOVAL AND INSTALLATION

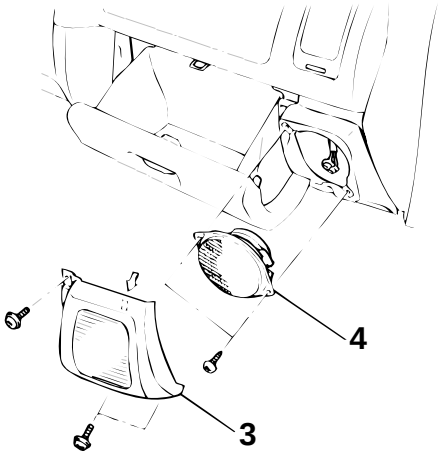
M1544002600313

DRIVER' SIDE



NOTE
⇦ : Metal clip position

PASSENGER'S SIDE

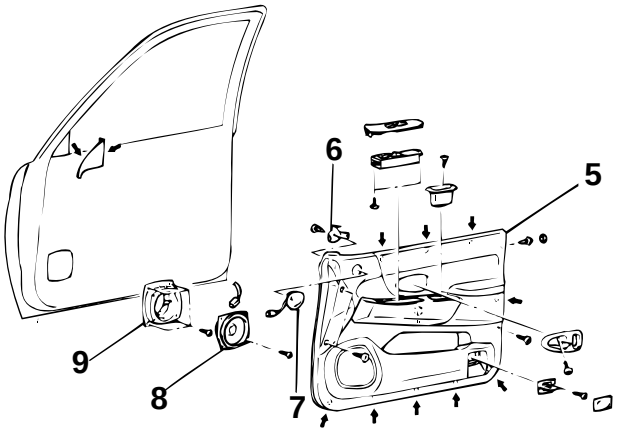


AC002824 AB

REMOVAL STEPS <DRIVER'S SIDE>
1. KNEE PROTECTOR ASSEMBLY
2. SPEAKER

REMOVAL STEPS <PASSENGER'S SIDE>
3. CORNER COVER
4. SPEAKER

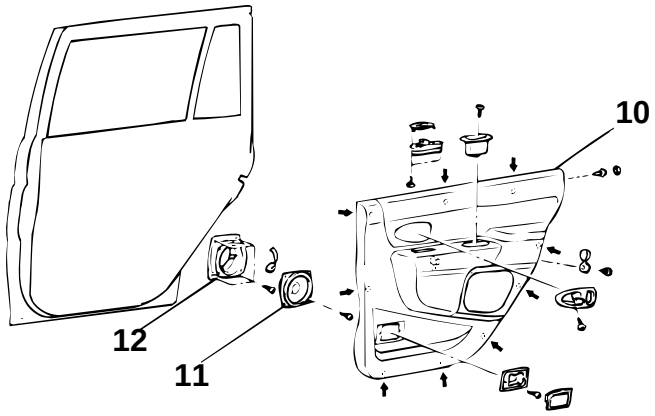
<FRONT DOOR SPEAKER>



NOTE
⬅ : Resin clip position

FRONT DOOR SPEAKER REMOVAL STEPS
5. FRONT DOOR TRIM (REFER TO GROUP 42, DOOR TRIM AND WATERPROOF FILM P.42-105.)
6. SPEAKER BRACKET
7. TWEETER
8. SPEAKER
9. SPEAKER BRACKET

<REAR DOOR SPEAKER>



AC002825 AB

REAR DOOR SPEAKER REMOVAL STEPS
10. REAR DOOR TRIM (REFER TO GROUP 42, DOOR TRIM AND WATERPROOF FILM P.42-105.)
11. SPEAKER
12. SPEAKER COVER

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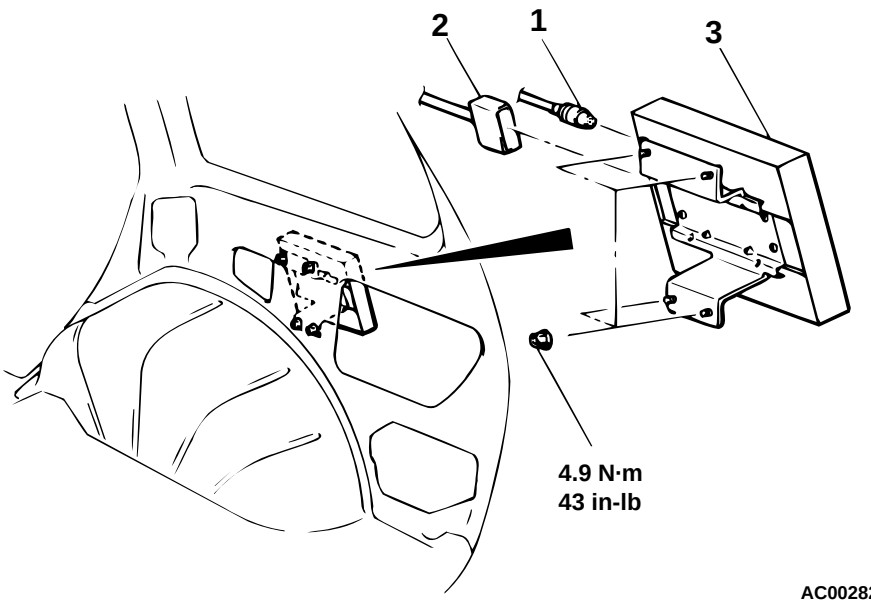
AMPLIFIER

REMOVAL AND INSTALLATION

M1544004100217



REMOVAL STEPS

- QUARTER TRIM LOWER (REFER TO GROUP 52A, TRIM P.52A-36.)

1. DIN CABLE

REMOVAL STEPS (Continued)

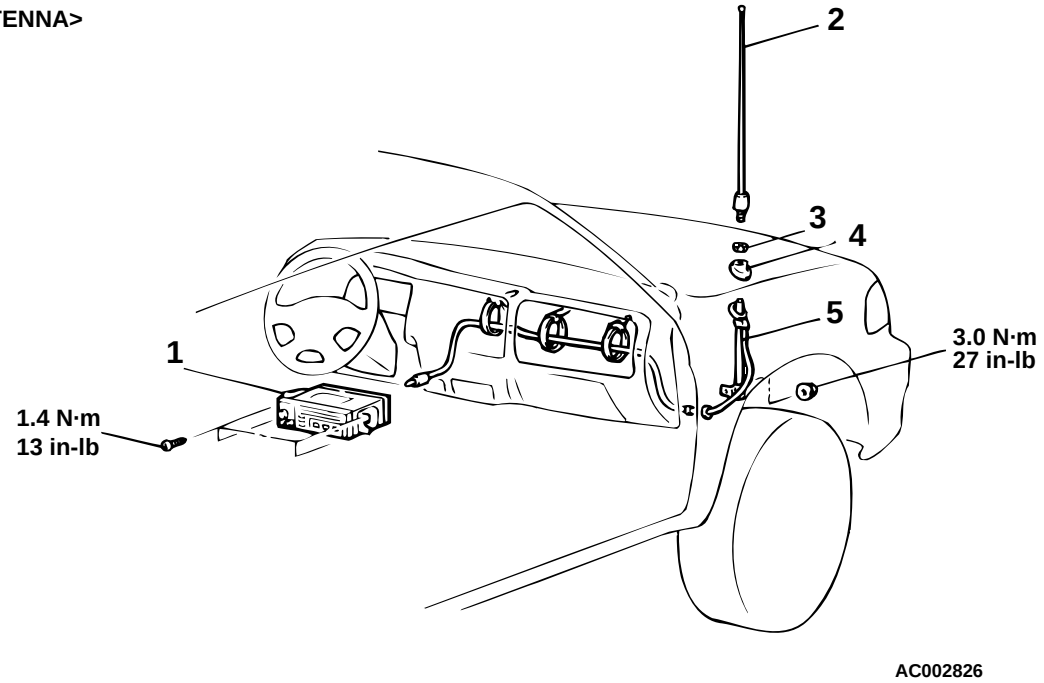
2. HARNESS CONNECTOR
3. AMPLIFIER

ANTENNA

REMOVAL AND INSTALLATION

M1544002900358

<MAST ANTENNA>



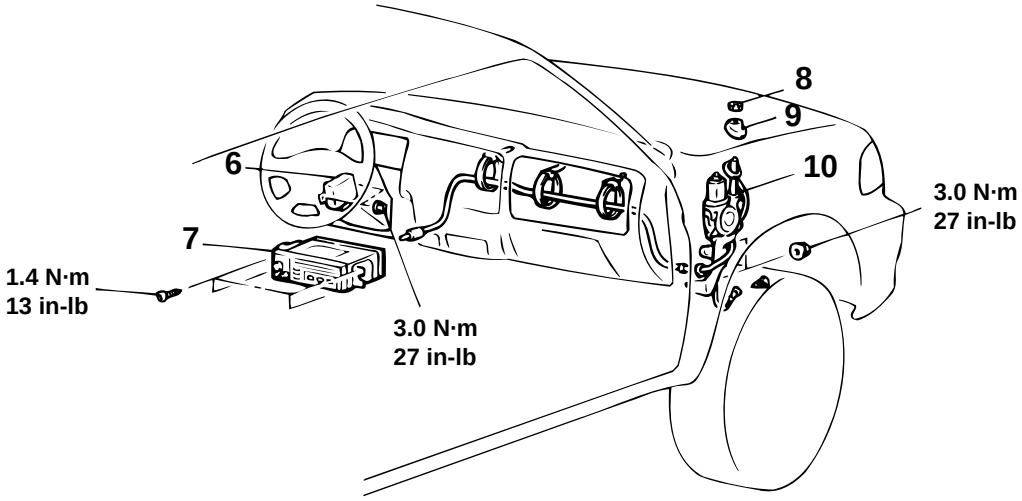
MAST ANTENNA REMOVAL STEPS

1. RADIO AND CD PLAYER (REFER TO P.54-236.)
2. MAST ANTENNA
3. MOUNTING NUT
4. BASE

- FENDER (REFER TO GROUP 42, FENDER P.42-8.)

<<A>> 5. MAST ANTENNA BODY

<MOTOR ANTENNA>



AC002827 AB

6. ANTENNA MOTOR-ECU

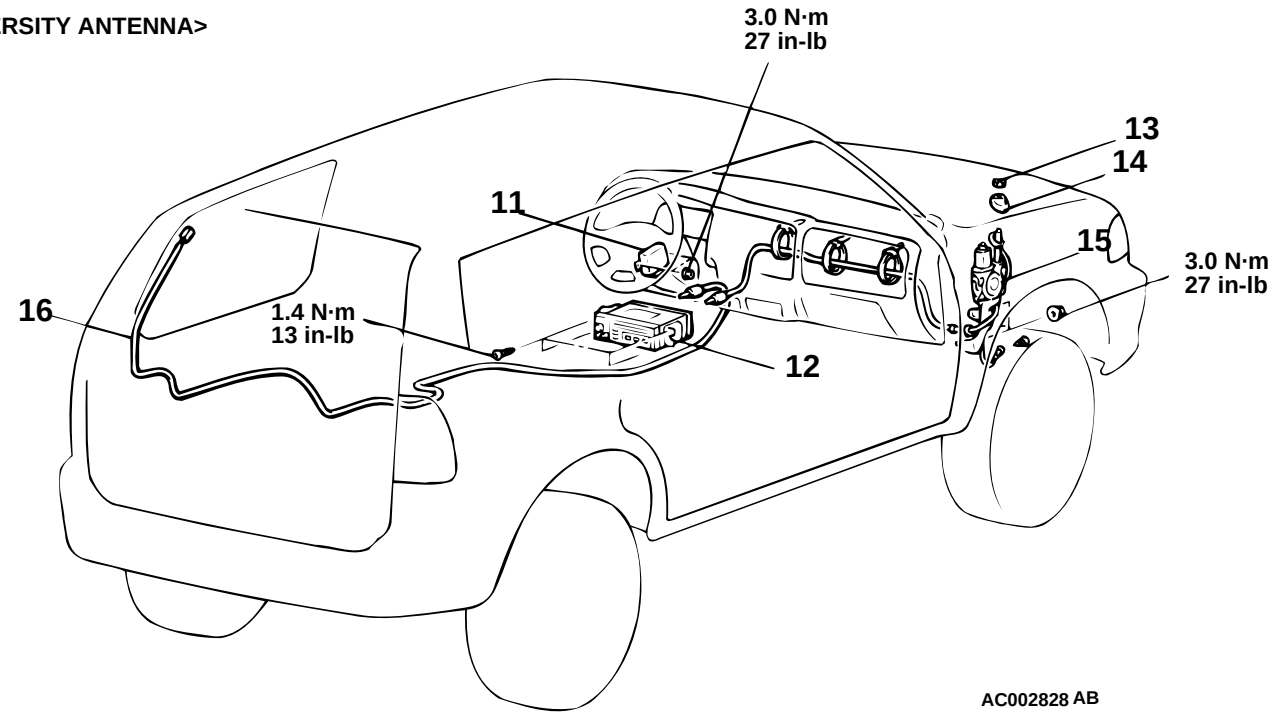
MOTOR ANTENNA REMOVAL STEPS

7. RADIO AND TAPE PLAYER (REFER TO P.54-236.)
8. RING NUT
9. BASE

- FENDER (REFER TO GROUP 42, FENDER P.42-8.)

<<A>> 10. MOTOR ANTENNA ASSEMBLY

<DIVERSITY ANTENNA>



11. ANTENNA MOTOR-ECU

MOTOR ANTENNA REMOVAL STEPS

12. RADIO AND CD PLAYER (REFER TO P.54-236.)
13. RING NUT
14. BASE
    - FENDER (REFER TO GROUP 42, FENDER P.42-8.)

<<A>> 15. MOTOR ANTENNA ASSEMBLY

ANTENNA FEEDER CABLE (FOR QUARTER GLASS ANTENNA) REMOVAL STEPS

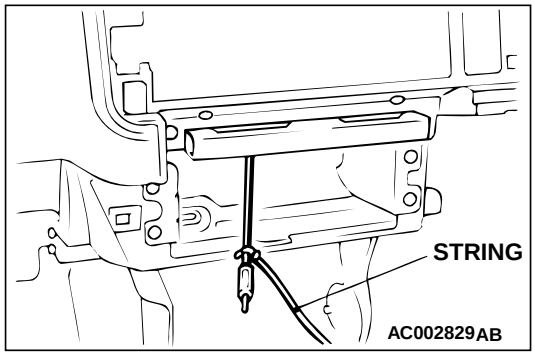
- FLOOR CONSOLE (REFER TO GROUP 52A, FLOOR CONSOLE P.52A-35.)
- FRONT SEAT ASSEMBLY (REFER TO GROUP 52A, FRONT SEAT P.52A-39.)
- REAR SEAT ASSEMBLY (REFER TO GROUP 52A, REAR SEAT P.52A-47.)
- QUARTER TRIM, UPPER AND LOWER (REFER TO GROUP 52A, TRIMS P.52A-36.)

16. ANTENNA FEEDER CABLE (FOR QUARTER GLASS ANTENNA.)

REMOVAL SERVICE POINT

<<A>> MAST ANTENNA OR MOTOR ANTENNA ASSEMBLY REMOVAL

To make installation easy, tie a string on the feeder cable of the mast antenna or motor antenna assembly and pull.

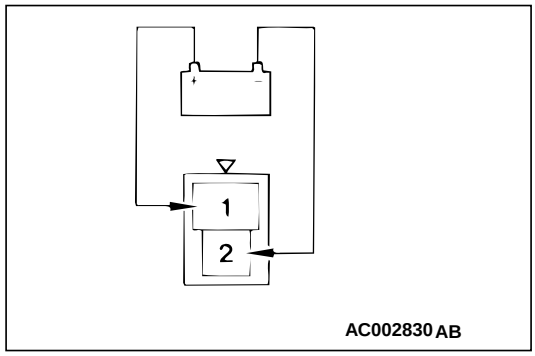


INSPECTION

M1543019501608

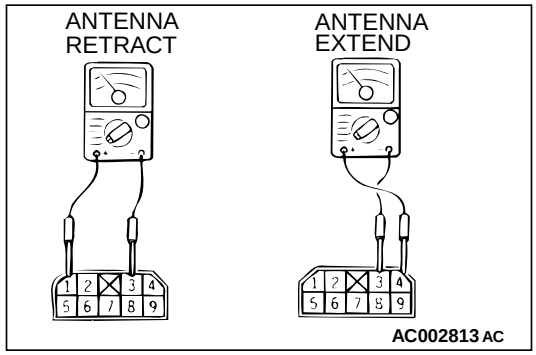
MOTOR ANTENNA CHECK

Disconnect the antenna motor-ECU connector. Check that the antenna extends when the positive terminal of the battery is connected to terminal number 1 and the negative terminal of the battery is connected to terminal number 2. Check that the antenna retracts when the connection is reversed.



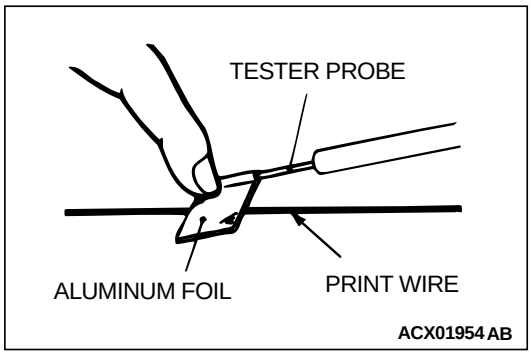
ANTENNA MOTOR-ECU CHECK

1. Remove the antenna motor-ECU mounting bolts.
2. Operate the radio switch when the ignition switch is turned to the "ACC" or "ON" position. Measure the voltage between the terminals while the antenna is attempting to extend or retract.



ANTENNA OPERATION DIRECTION	TERMINAL NO. TO BE CONNECTED TO BATTERY	SPECIFIED CONDITION
While lowering	1 – 3	10 – 13 volts
While rising	4 – 3	10 – 13 volts

GLASS ANTENNA CHECK



1. Wrap an aluminum foil around the tester probe a shown.

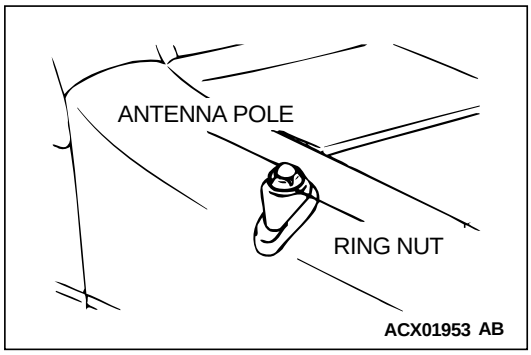
⚠ CAUTION

Be careful not to damage the print wire.

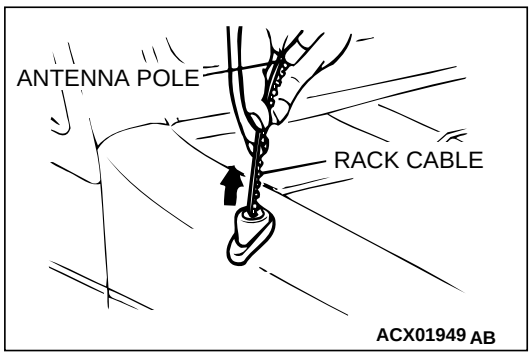
2. Check continuity while pressing the aluminum foil along the antenna print wire.

ANTENNA POLE REPLACEMENT

M1544000900170

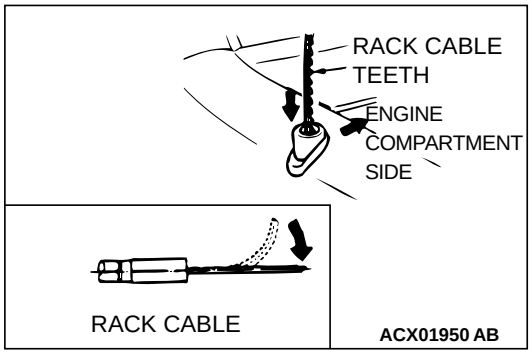


1. Remove the ring nut.

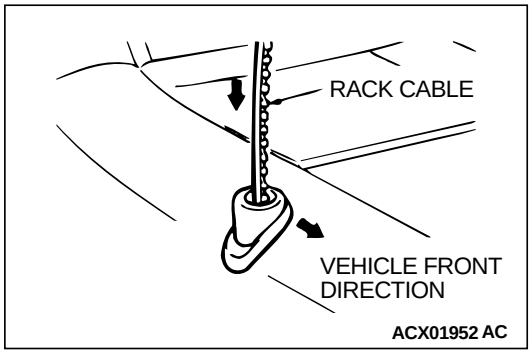


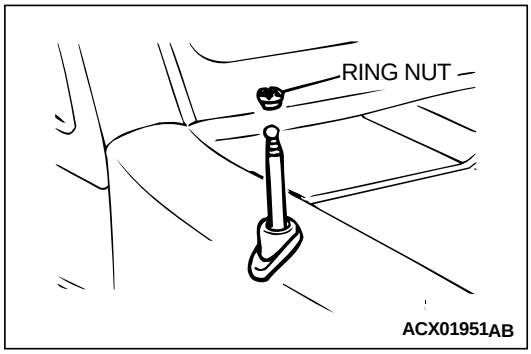
2. After setting the ignition switch to the "ACC" or "ON," turn the radio switch on. Extend the antenna pole and remove it together with the rack cable.
3. Pull the antenna out the farthest end.

   NOTE: If the motor end side of the rack cable is bent, straighten it out.



4. Face the teeth side of the rack cable toward the engine compartment, and feed the rack cable into the motor assembly.





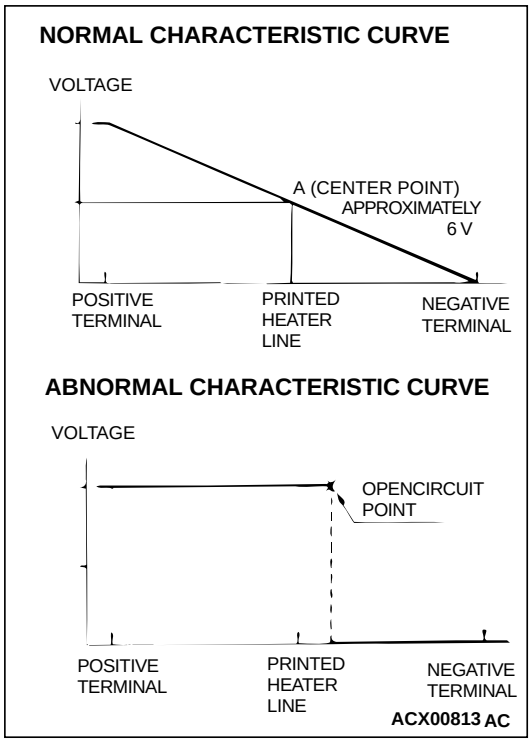
5. Turn the teeth side of the rack cable toward the front of the vehicle (90 degree angle to the right), and engage the rack cable with the motor gears.
6. Pull lightly on the rack cable. If there is no resistance and it comes out, it is not engaged with the motor gears. Check that the end of the rack gear is not bent again, and then repeat steps (3) and (4) above again.
7. Set up the antenna pole vertically, and turn the radio off to wind in the rack cable. The antenna pole will be pulled into the motor antenna as the rack cable is wound in.
8. After tightening the ring nut, turn the radio on and off and check the operation of the antenna pole.

REAR WINDOW DEFOGGER

ON-VEHICLE SERVICE

PRINTED-HEATER LINES CHECK

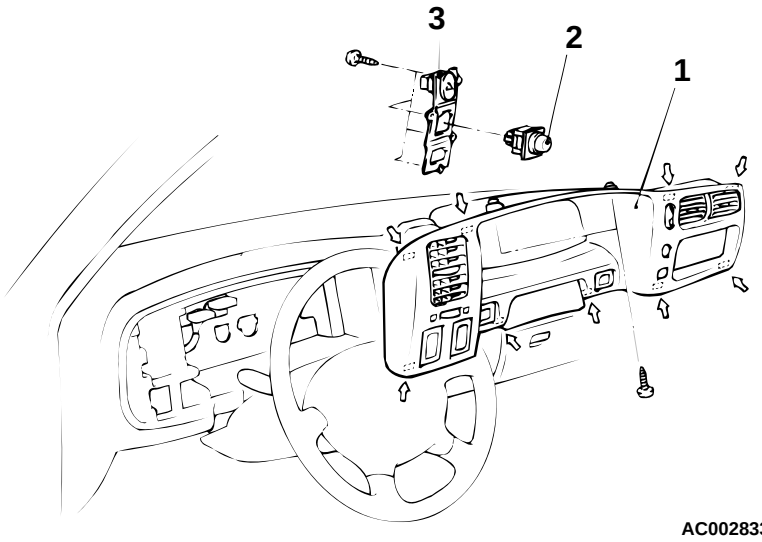
M1543001800203



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

REMOVAL AND INSTALLATION

M1543006200206



AC002833 AB

NOTE
⇦: Metal clip position

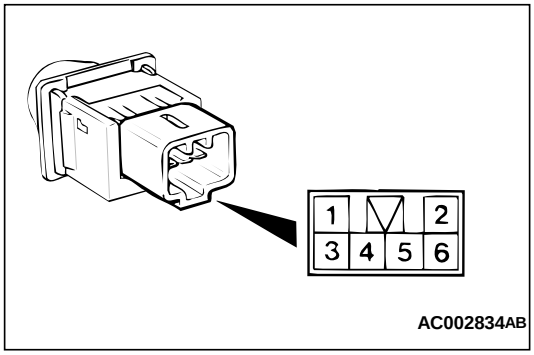
REMOVAL STEPS
1. METER BEZEL ASSEMBLY

REMOVAL STEPS (Continued)
2. SWITCH HOLDER
3. REAR WINDOW DEFOGGER SWITCH

INSPECTION

M1543019501619

REAR WINDOW DEFOGGER SWITCH CONTINUITY CHECK



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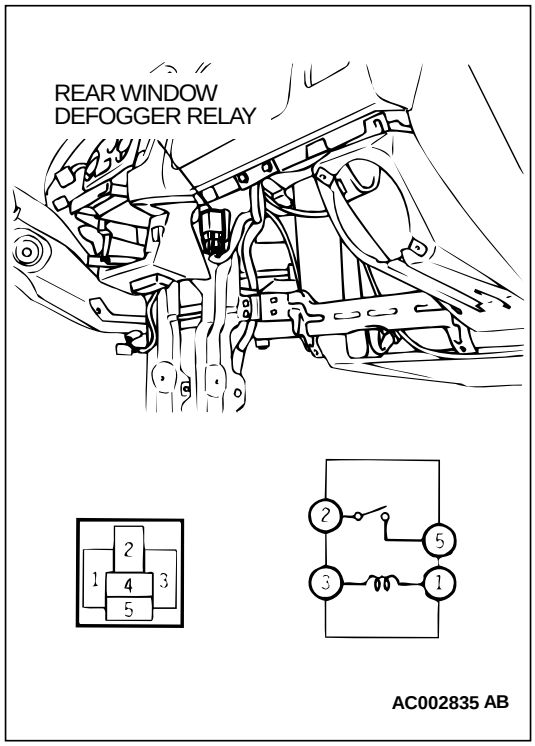
SWITCH POSITION	TESTER CONNECTION	SPECIFIED CONDITION
At the "OFF" position	3 - 4	Open circuit
At the "ON" position	3 - 4	Less than 2 ohms

REAR WINDOW DEFOGGER RELAY CONTINUITY CHECK



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

THEFT ALARM

THEFT-ALARM SYSTEM DIAGNOSIS

INTRODUCTION TO THEFT-ALARM SYSTEM DIAGNOSIS

M1547002200079

Theft-alarm system

When the theft-alarm system has been armed by the correct sequence for locking the doors (including the transmitter of the keyless entry system) if then a door, liftgate or hood is opened in an unauthorized way, the horn will sound and headlight flash intermittently for period of 180 seconds, thus providing an audible warning signal.

Panic Alarm Function

With the theft alarm function armed, pressing the panic button on the keyless entry system transmitter causes the theft alarm horn to sound for about 180 seconds in an attempt to prevent theft. The alarm is turned off by pressing any switch on the transmitter.

TROUBLE SYMPTOM CHART

M1543007200704

SYMPTOM	INSPECTION PROCEDURE	REFERENCE PAGE
Theft-alarm system is not armed (security indicator light does not illuminate).	1.	P.54-248
The horn does not sound when the theft-alarm-system is triggered.	2.	P.54-255
The headlight do not flash when the theft-alarm system is triggered.	3.	P.54-263
The panic alarm function does not work.	4.	P.54-263

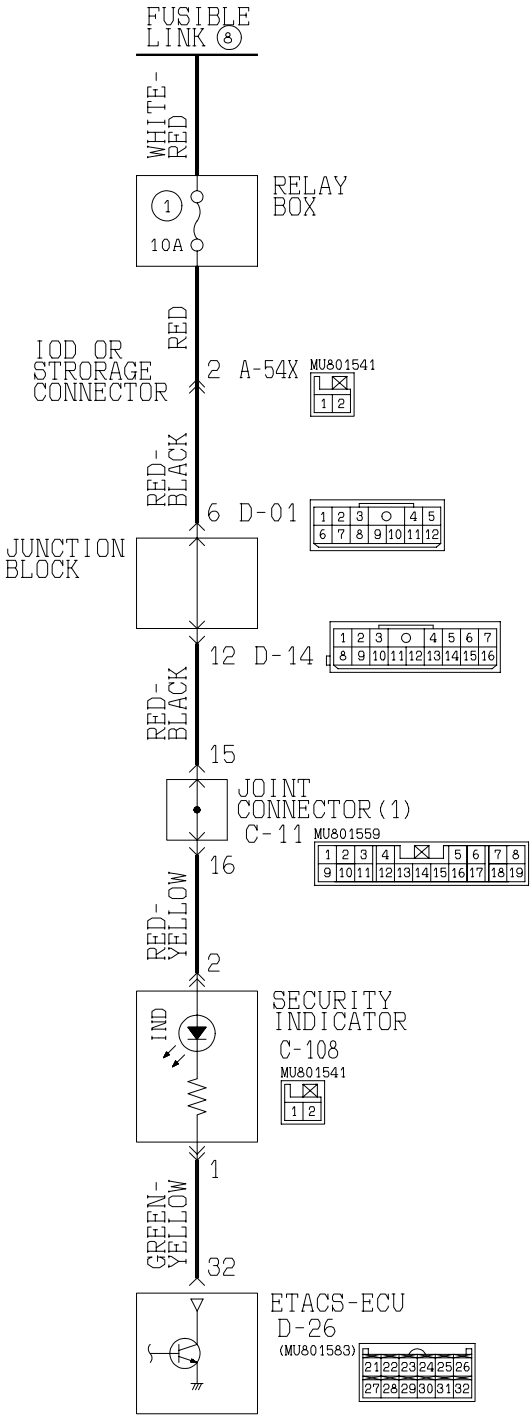
If a malfunction was found with the input signal check, refer to following table and inspect.

SYMPTOM	INSPECTION PROCEDURE	REFERENCE PAGE
Scan tool MB991502 communication is not possible.	5	P.54-268
The key reminder switch is not sent to the ETACS-ECU.	6.	P.54-274
The hood switch is not input.	7.	P.54-279
The driver's or passenger's door switch is not input.	-	GROUP 42, Door – Door Assembly P.42-104
The driver's or passenger's door lock actuator switch is not input.	-	GROUP 42, Door – Door Assembly P.42-104
The liftgate switch is not input.	-	GROUP 42, Liftgate – Liftgate Handle and Latch P.42-123
The gate lock key cylinder switch is not input.	-	GROUP 42, Liftgate – Liftgate Handle and Latch P.42-123

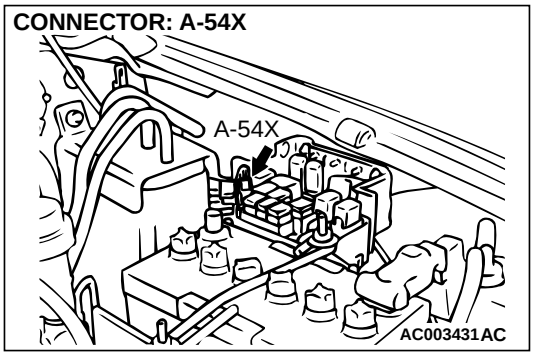
SYMPTOM PROCEDURES

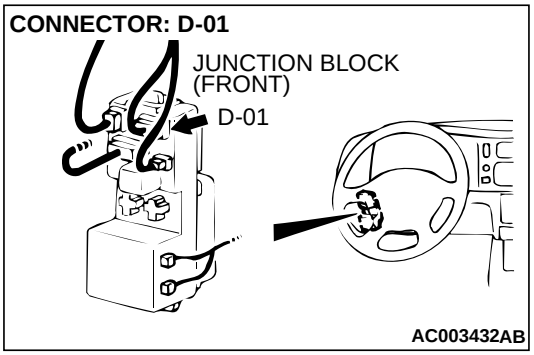
INSPECTION PROCEDURE 1: Theft-alarm System is not Armed (Security Indicator Light does not Illuminate).

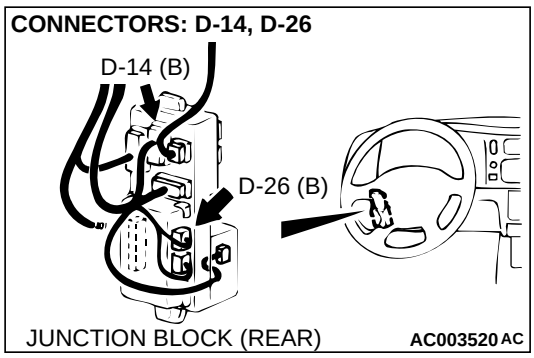
Security Indicator Circuit

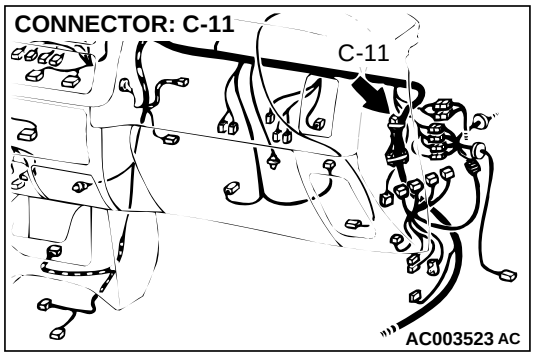


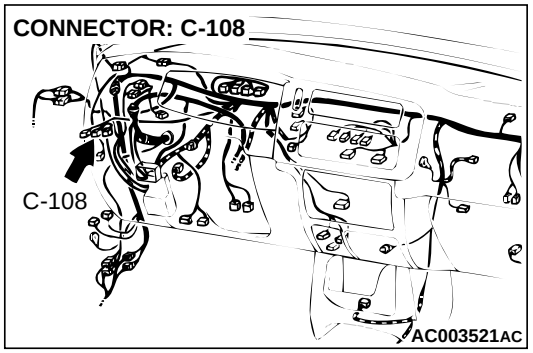
W3P01M14AA











CIRCUIT OPERATION

The theft-alarm system will be armed after the doors are locked and then the security indicator light has illuminated for approximately 18 seconds.

TECHNICAL DESCRIPTION (COMMENT)

The ETACS-ECU arms the theft-alarm system according to the input signals from the following switches:

- Ignition key reminder switch
- Driver's and passenger's door switch
- Door switches
- Driver's and passenger's door key cylinder switch
- Driver's and front passenger's door lock actuator switch
- Liftgate switch
- Gate lock key cylinder switch
- Transmitter

If the theft-alarm system is armed normally, the relevant input signal circuit(s), the theft-alarm indicator light or the ETACS-ECU may be defective.

TROUBLESHOOTING HINTS

- Malfunction of the security indicator
- Malfunction of the ignition key reminder switch
- Malfunction of the driver's or passenger's door switch
- Malfunction of the driver's or passenger's door lock key cylinder switch
- Malfunction of the driver's or passenger's door lock actuator switch
- Malfunction of the liftgate switch
- Malfunction of the gate lock key cylinder switch
- Malfunction of the transmitter
- Malfunction of the ETACS-ECU
- Damaged harness wires or connectors

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DIAGNOSIS

Required Special Tools:

- MB991223: Test Harness Set
- MB991502: Scan Tool (MUT-II)
- MB991529: Diagnostic Trouble Code Check Harness

STEP 1. Check the ETACS-ECU power supply circuit.

Do all of the following functions work when the ignition switch is turned to the "LOCK" (OFF) position?

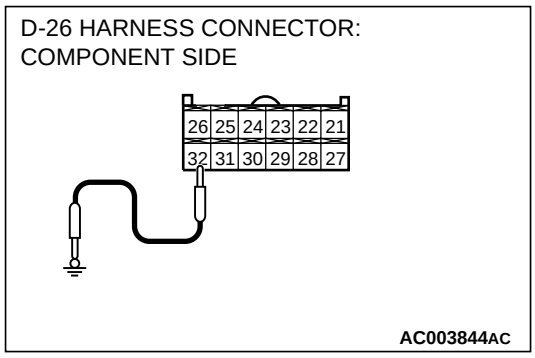
- Ignition key reminder tone alarm function
- Light reminder tone alarm function
- Central door locking system
- Hazard warning light
- Dome light dimming function
- Power window timer function

Q: Do any of the functions work?

YES : Go to Step 2.
NO : Check the ETACS-ECU battery circuit. Refer to Inspection Procedure 6.

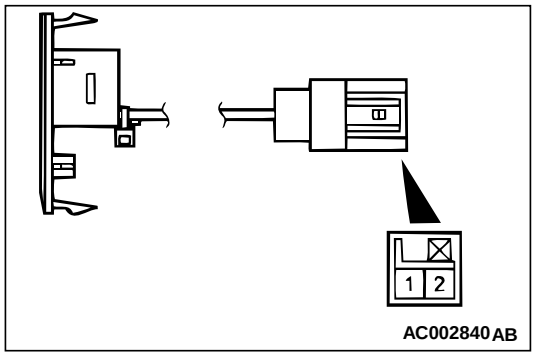
STEP 2. Check the security indicator circuit at the ETACS-ECU connector D-26.

(1) Disconnect the ETACS-ECU connector D-26 and measure at the harness side.
(2) Connect terminal 32 to the ground.



Q: Does the security indicator light illuminate?

YES : Go to Step 8.
NO : Go to Step 3.



STEP 3. Check the security indicator light bulb.

1.Remove the security indicator light.

2.Follow the table below to check the security indicator light.

BATTERY VOLTAGE	TERMINAL NO. TO BE CONNECTED TO BATTERY	SPECIFIED CONDITION
Supplied	• Connect terminal 1 to the positive battery terminal • Connect terminal 2 to the negative battery terminal	Illuminate

Q: Is the security indicator light in good condition?

YES : Go to Step 4.

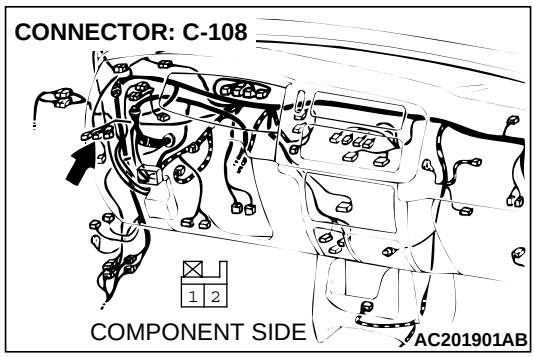
NO : Replace it. The security indicator light should illuminate, and the theft-alarm system should be armed normally.

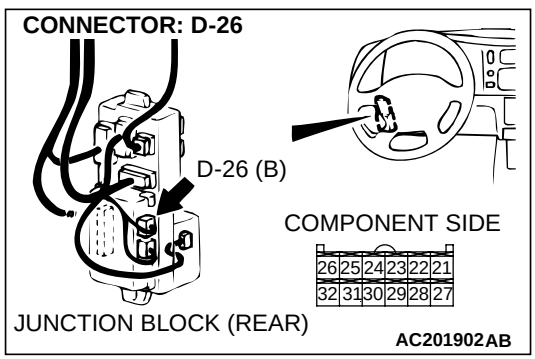
STEP 4. Check security indicator connector C-108 and ETACS-ECU connector D-26 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

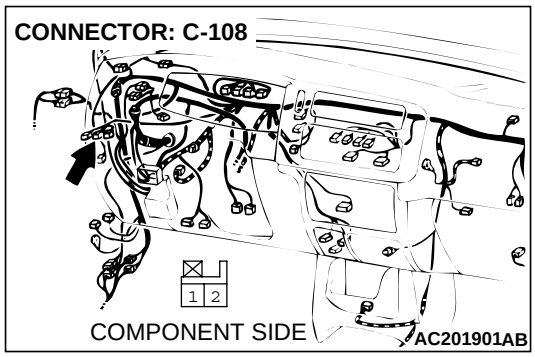
Q: Are security indicator connector C-108 and ETACS-ECU connector D-26 in good condition?

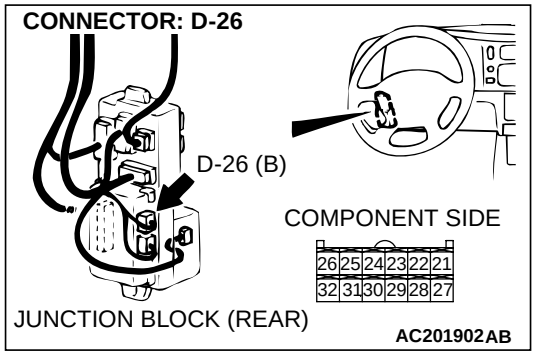
YES : Go to Step 5.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.







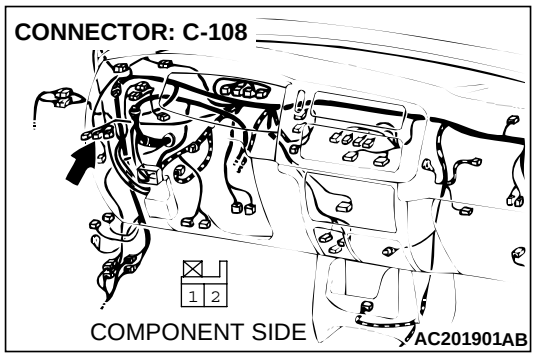


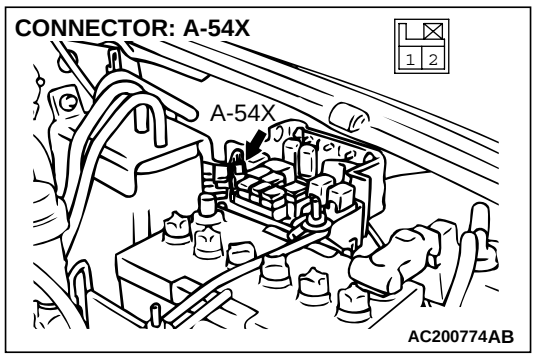
STEP 5. Check the harness wire between security indicator connector C-108 and ETACS-ECU connector D-26.

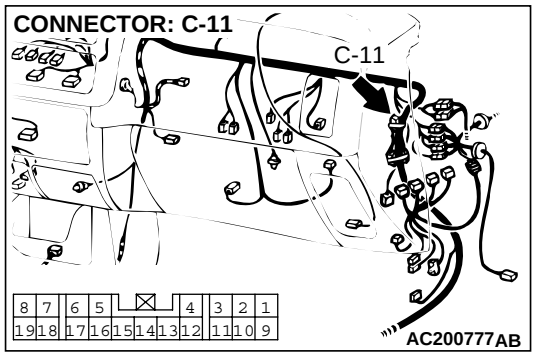
Q: Are the harness wire between security indicator connector C-108 (terminal No.1) and ETACS-ECU connector D-26 (terminal No.32) in good condition?

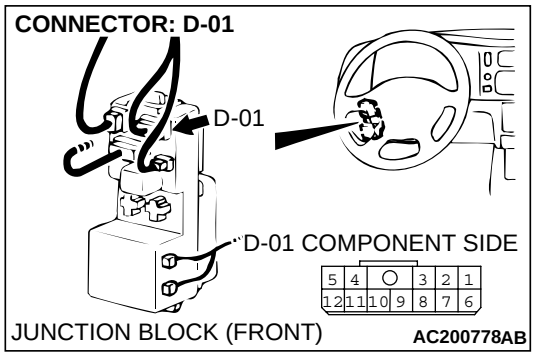
YES : Go to Step 6.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.









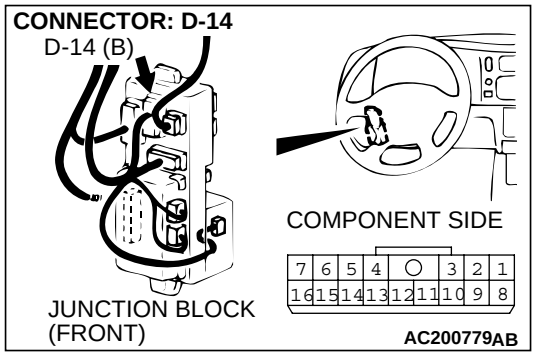
STEP 6. Check the harness wire between security indicator connector C-108 (terminal No.2) and fusible link number 8.

NOTE: After checking junction block connector D-01 and D-14, joint connector C-11 and IOD or storage connector A-54X, check the wires. If junction block connector D-01 and D-14, joint connector C-11 and IOD or storage connector A-54X are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wire between security indicator connector C-108 (terminal No.2) and fusible link number 8. in good condition?

YES : Go to Step 7 or 8.

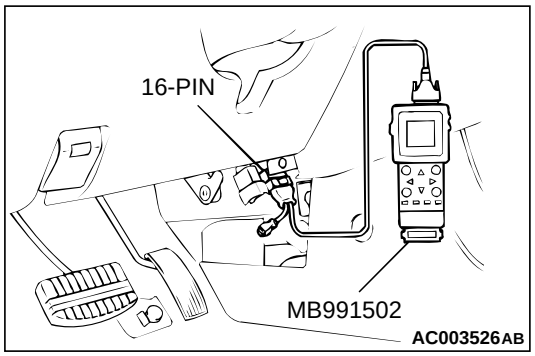
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 7. Check the input signal (by using pulse check).

⚠ CAUTION

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



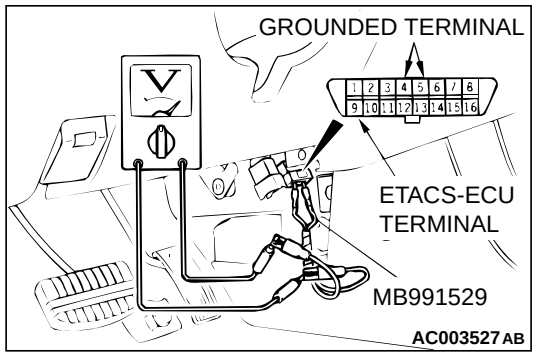
(1) Connect scan tool MB991502 to the data link connector.
(2) Inspect the following inputs.
- Key reminder switch
- Driver's and passenger's door switch
- Driver's and passenger's door lock key cylinder switch
- Driver's and passenger's door lock actuator switch
- Liftgate switch
- Gate lock key cylinder switch

Q: Does the tone alarm of scan tool MB991502 sound when the input signal enters?

YES : Replace the ETACS-ECU. Check that the malfunctions eliminated.
NO : Check the faulty input circuit. Refer to Inspection Procedure 8 P.54-284.

STEP 8. Check the input signal (by using a voltmeter).

Check the input signals from the following switches:



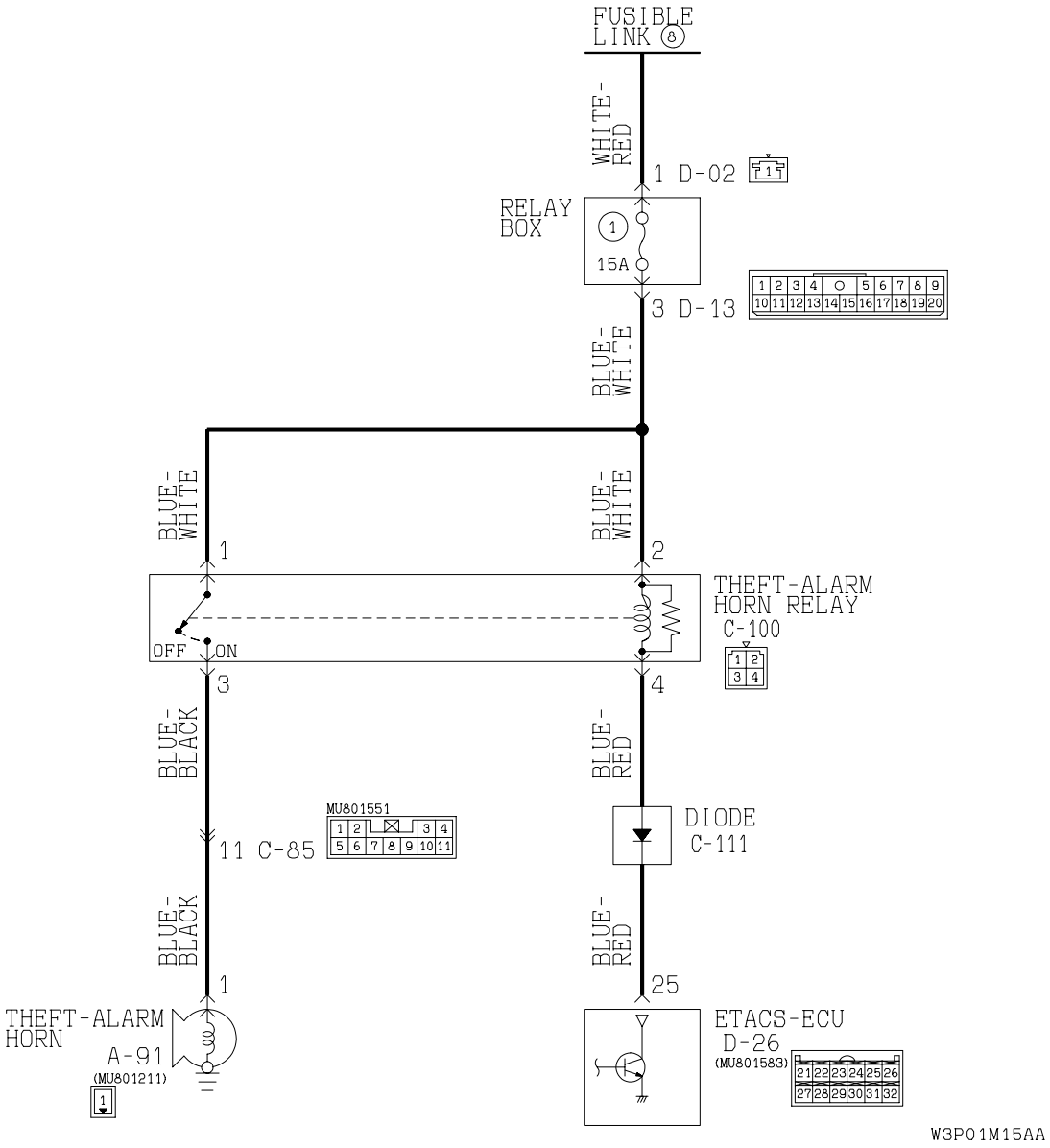
(1) Use special tool MB991529 to connect a voltmeter between ground terminal 4 or 5 and ETACS-ECU terminal 9 of the data link connector.
(2) Check that the voltmeter indicator deflects once when the input signal.
- Key reminder switch
- Driver's and passenger's door switch
- Driver's and passenger's door lock key cylinder switch
- Driver's and passenger's door lock actuator switch
- Liftgate switch
- Gate lock key cylinder switch

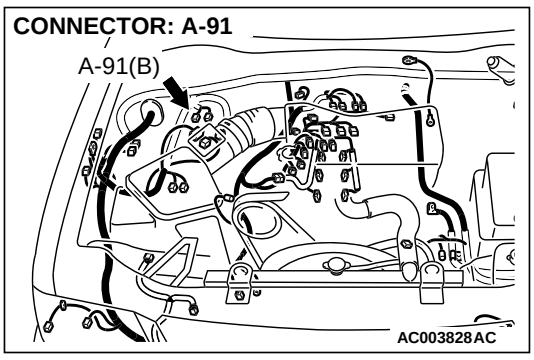
Q: Does the voltmeter indicator deflect?

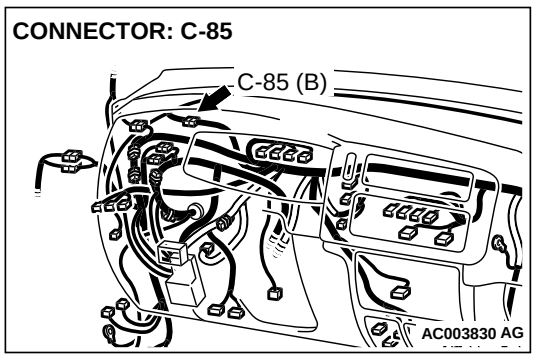
YES : Replace the ETACS-ECU. Check that the malfunctions eliminated.
NO : Check the faulty input circuit. Refer to Symptom Chart 8 P.54-284.

INSPECTION PROCEDURE 2: Horn does not Sound when the Theft-alarm is Triggered.

Theft-Alarm Horn Drive Circuit







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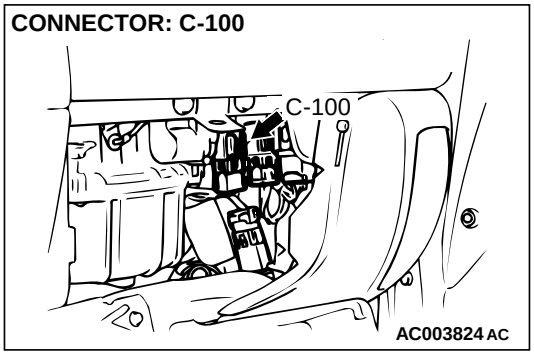
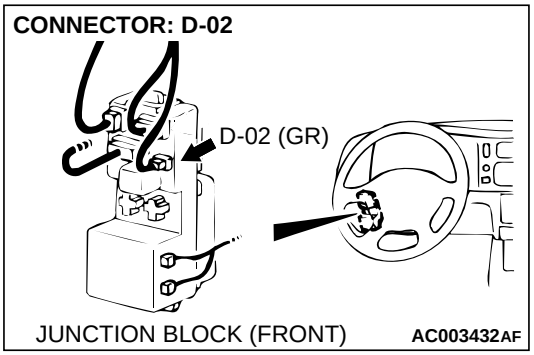
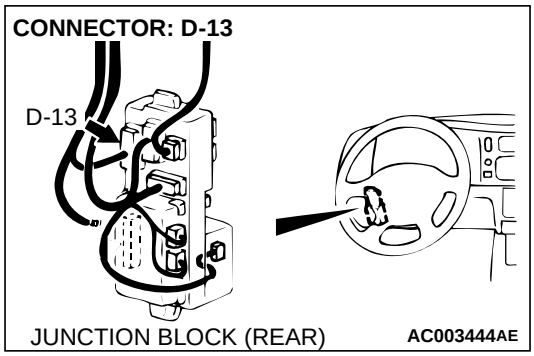
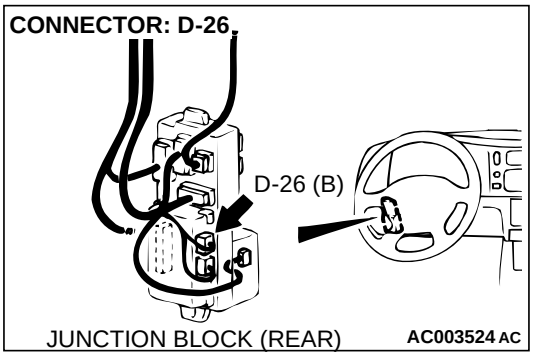








CIRCUIT OPERATION

The ETACS-ECU will sound the theft-alarm horn and horn if the theft-alarm system or the keyless entry system answerback is triggered.

TECHNICAL DESCRIPTION (COMMENT)

The theft-alarm horn is shared by the keyless entry system. If the theft-alarm horn sounds normally through the keyless entry system answerback, the ETACS-ECU may be defective.

TROUBLESHOOTING HINTS

- Malfunction of the theft-alarm horn
- Malfunction of the theft-alarm horn relay
- Malfunction of the ETACS-ECU
- Damaged harness wires or connectors

DIAGNOSIS

Required Special Tool:

- MB991223: Test Harness Set

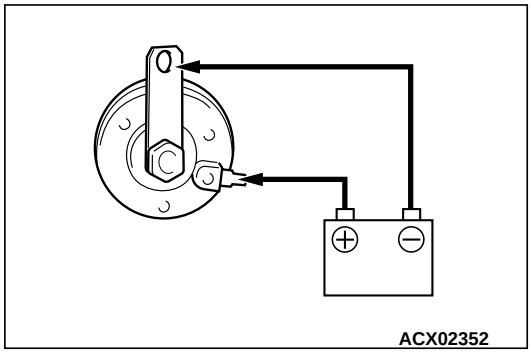
STEP 1. Check the keyless entry system horn answerback.

Activate the keyless entry system horn answerback. (Refer to GROUP 42, Keyless Entry System – On-vehicle Service – Enabling/disabling the Answerback Function.)

Q: Does the horn answerback function work?

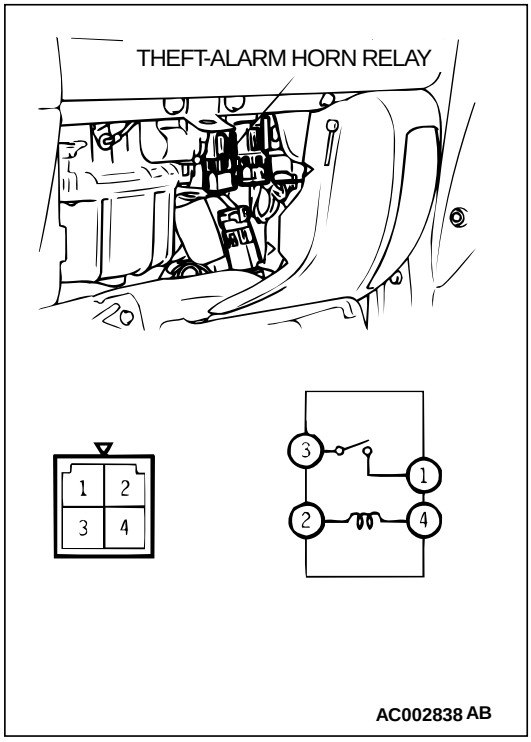
YES : Replace the ETACS-ECU. The theft-alarm horn should sound when the theft-alarm system is triggered.

NO : Go to Step 2.



STEP 2. Check the theft-alarm horn.
Connect the battery as shown and check that the theft-alarm horn sounds.

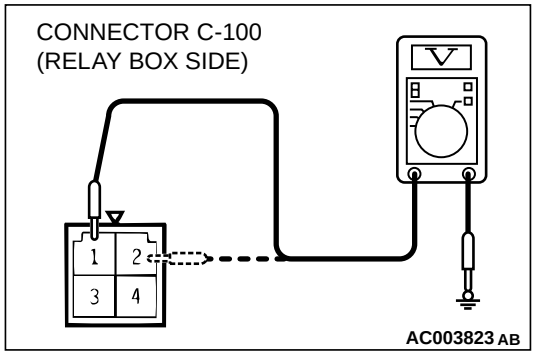
Q: Is the theft-alarm horn in good condition?
YES : Go to Step 3.
NO : Replace it. The theft-alarm horn should sound when the theft-alarm system is triggered.



STEP 3. Check the theft-alarm horn relay.
Follow the table below to check the theft-alarm horn relay operation.

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

Q: Is the theft-alarm horn relay in good condition?
YES : Go to Step 4.
NO : Replace it. The theft-alarm horn should sound when the theft-alarm system is triggered.



STEP 4. Measure the theft-alarm horn relay power supply voltage at the theft-alarm horn relay connector C-100.
(1) Disconnect the theft-alarm horn relay connector C-100 and measure at the relay box side.
(2) Measure the voltages between terminals 1, 2 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.

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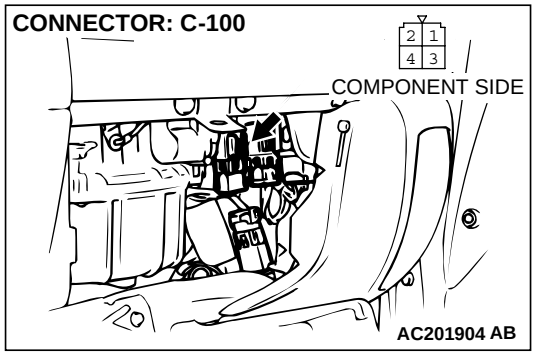
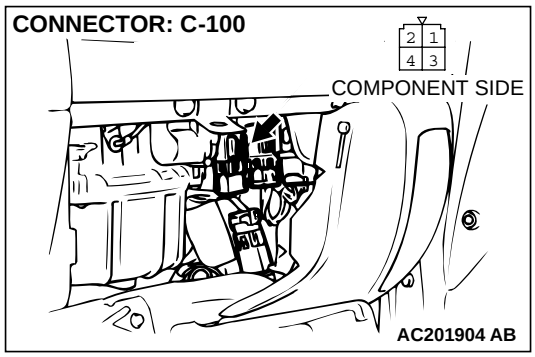


STEP 5. Check theft-alarm horn relay connector C-100 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is theft-alarm horn relay connector C-100 in good condition?

YES : Go to Step 6.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The theft-alarm horn should sound when the theft-alarm system is triggered.



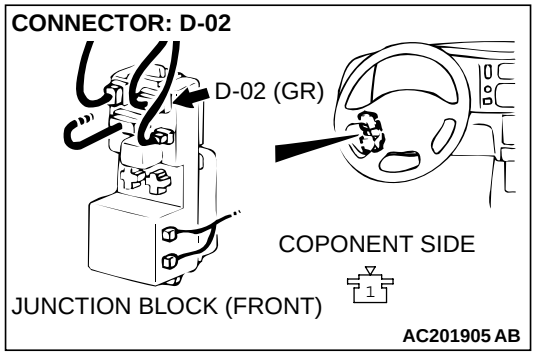
STEP 6. Check the harness wires between theft-alarm horn relay connector C-100 (terminal No.2) and fusible link (8).

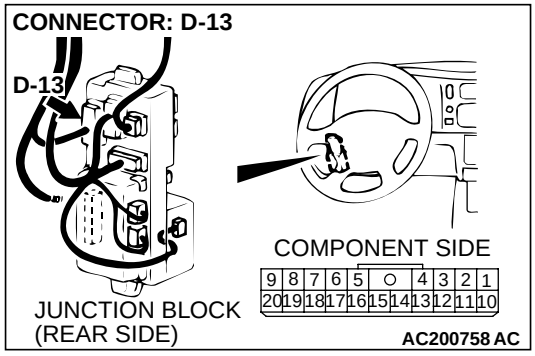
NOTE: After checking junction block connector D-02 and D-13, check the wires. If junction block connector D-02 and D-13 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

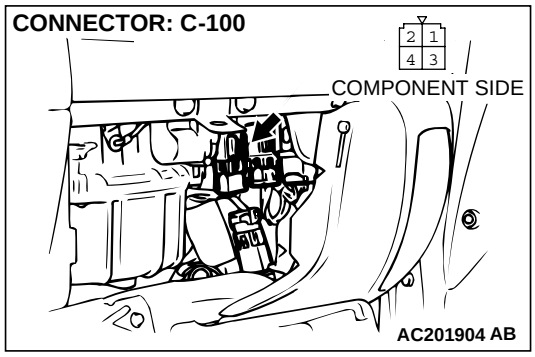
Q: Are the harness wires between theft-alarm horn relay connector C-100 (terminal No.2) and fusible link (8) in good condition?

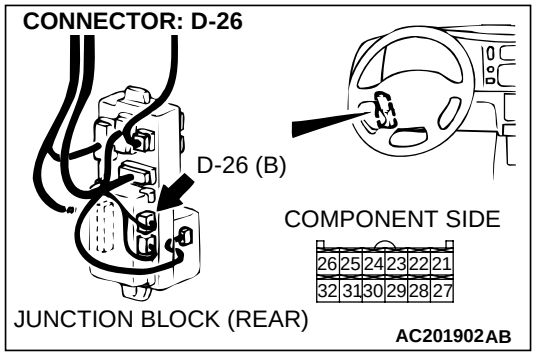
YES : There is no action to be taken.

NO : Repair them. The theft-alarm horn should sound when the theft-alarm system is triggered.







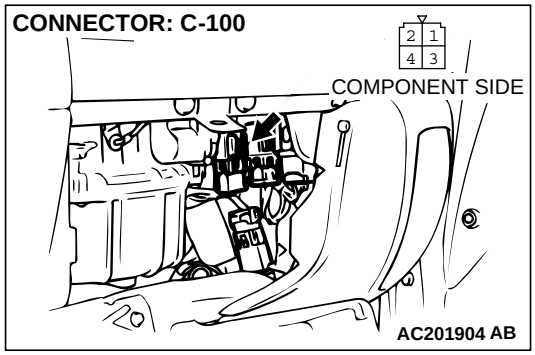


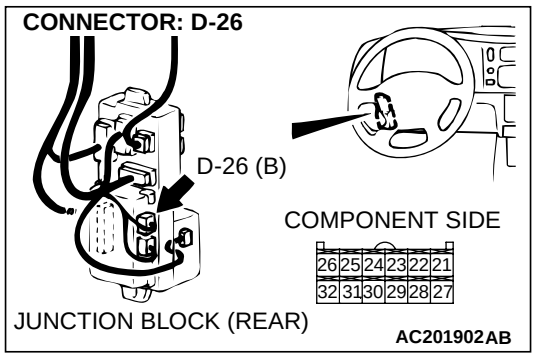
STEP 7. Check theft-alarm horn relay connector C-100 and ETACS-ECU connector D-26 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

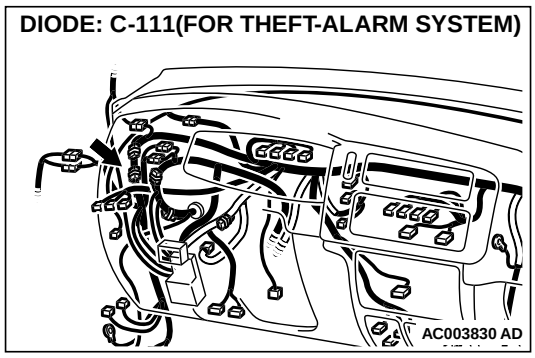
Q: Are theft-alarm horn relay connector C-100 and ETACS-ECU connector D-26 in good condition?

YES : Go to Step 8.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The theft-alarm horn should sound when the theft-alarm system is triggered.







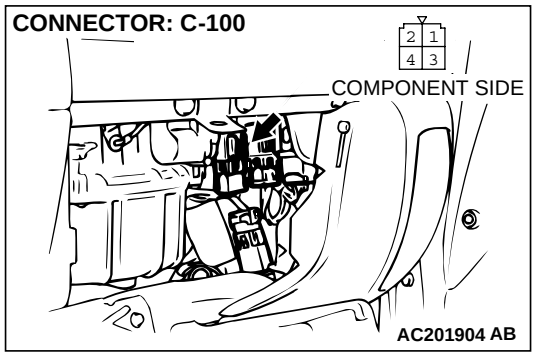
STEP 8. Check the harness wires between theft-alarm horn relay connector C-100 (terminal No.4) and ETACS-ECU connector D-26 (terminal No.25).

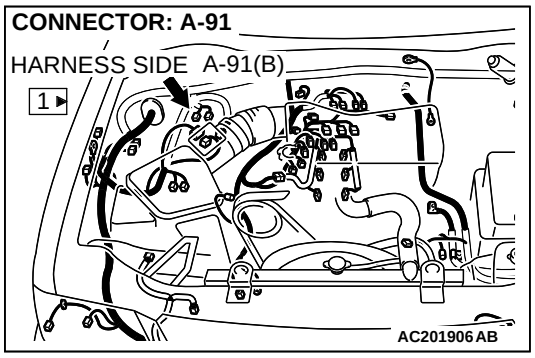
NOTE: After checking diode C-111 (for theft-alarm system), check the wires. If diode C-111 (for theft-alarm system) is damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wires between theft-alarm horn relay connector C-100 (terminal No.4) and ETACS-ECU connector D-26 (terminal No.25) in good condition?

YES : Go to Step 9.

NO : Repair them. The theft-alarm horn should sound when the theft-alarm system is triggered.



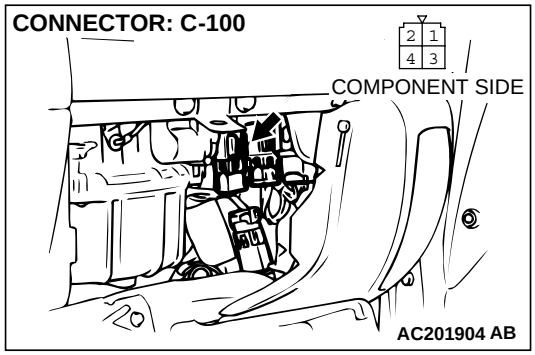


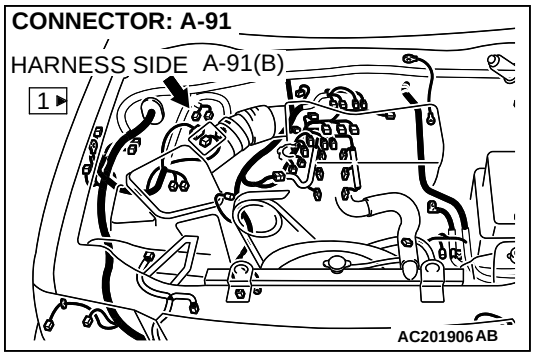
STEP 9. Check theft-alarm horn relay connector C-100 and theft-alarm horn connector A-91 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

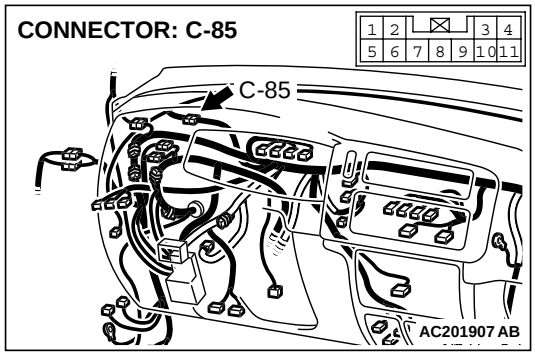
Q: Are theft-alarm horn relay connector C-100 and theft-alarm horn connector A-91 in good condition?

YES : Go to Step 10.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The theft-alarm horn should sound when the theft-alarm system is triggered.







STEP 10. Check the harness wire between theft-alarm horn relay connector C-100 (terminal No.3) and theft-alarm horn connector A-91 (terminal No.1).

NOTE: After checking intermediate connector C-85, check the wires. If intermediate connector C-85 is damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Is the harness wire between horn relay connector C-100 (terminal No.3) and theft-alarm horn connector A-91 (terminal No.1) in good condition?

YES : Go to Step 11.

NO : Repair it. The theft-alarm horn should sound when the theft-alarm system is triggered.

STEP 11. Check that the theft-alarm horn is installed properly.

NOTE: The theft-alarm horn is grounded to the body through the installation bolts.

Q: Is the theft-alarm horn installation in good condition?

YES : Go to Step 12.

NO : Repair it. The theft-alarm horn should sound when the theft-alarm system is triggered.

STEP 12. Recheck for malfunction.

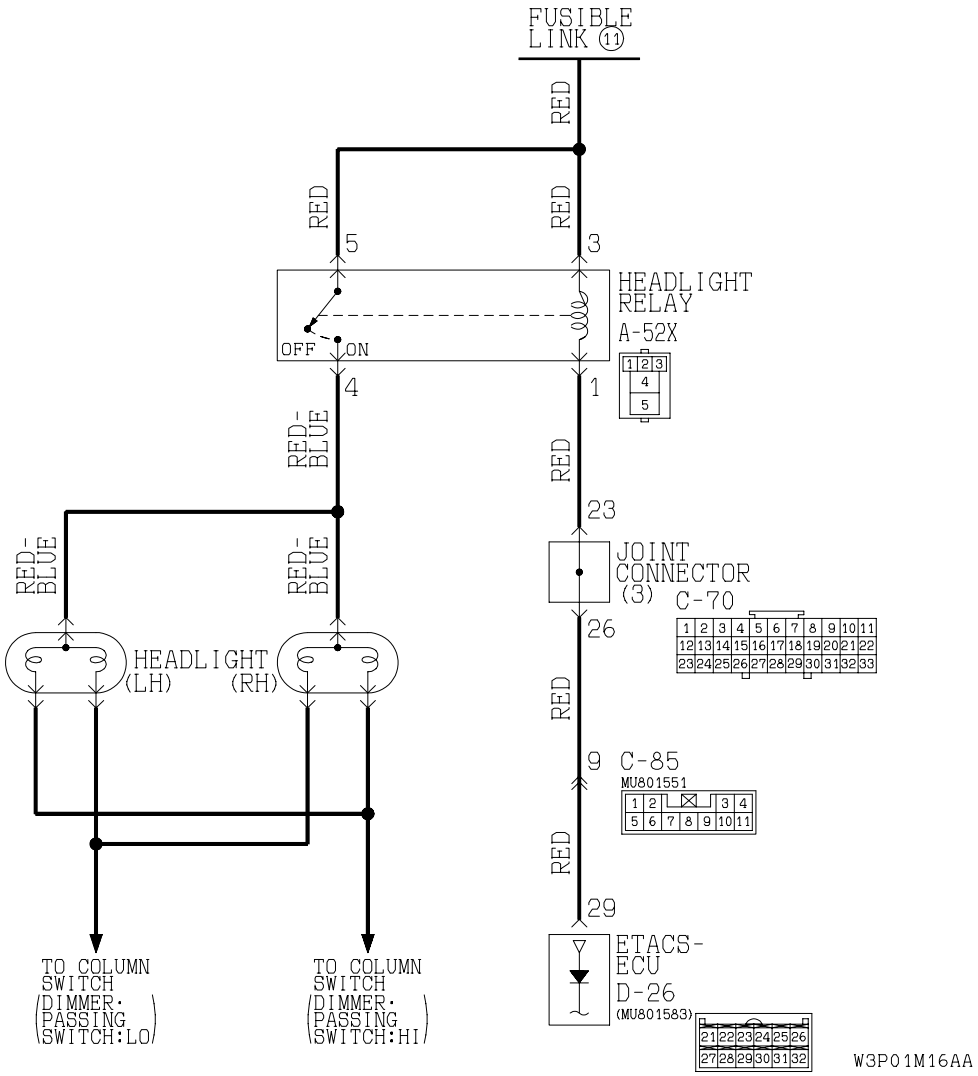
Q: Is a malfunction eliminated?

YES : This procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Point – How to Cope with Intermittent Malfunction P.00-6.)

NO : Go to Step 1.

INSPECTION PROCEDURE 3: Headlights do not Flash when the Theft-alarm System is Triggered.

Headlight Drive Circuit



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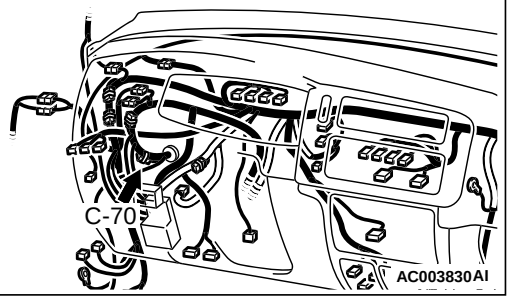
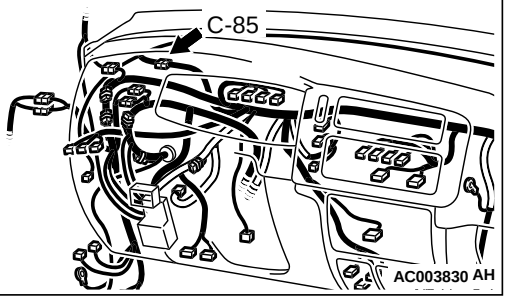
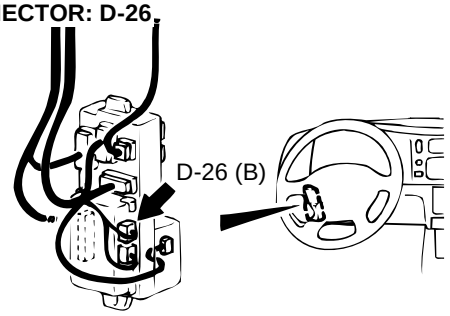
CONNECTOR: C-70



CONNECTOR: C-85



CONNECTOR: D-26



TECHNICAL DESCRIPTION (COMMENT)

If the headlights work normally, the ETACS-ECU may be defective.

TROUBLESHOOTING HINTS

- Malfunction of the ETACS-ECU
- Damaged harness wires or connectors

DIAGNOSIS

STEP 1. Check the headlight operation.

Q: Do the headlights illuminate normally?

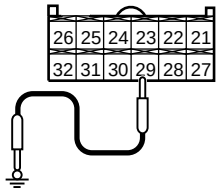
YES : Go to Step 2.

NO : Check the headlight circuit P.90-50.

STEP 2. Check the ETACS-ECU.

(1) Disconnect the ETACS-ECU connector D-26 and measure at the harness side.
(2) Lighting switch OFF position.
(3) Check that the headlight illuminates when terminal number 29 and ground.

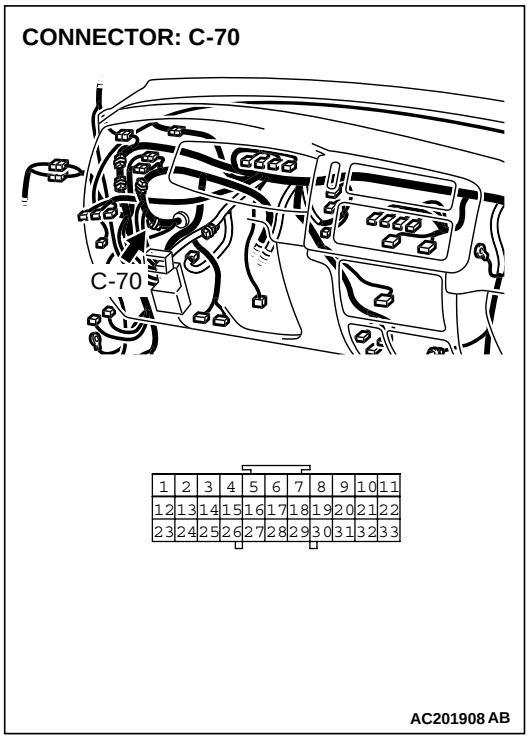
D-26 HARNESS CONNECTOR:
COMPONENT SIDE

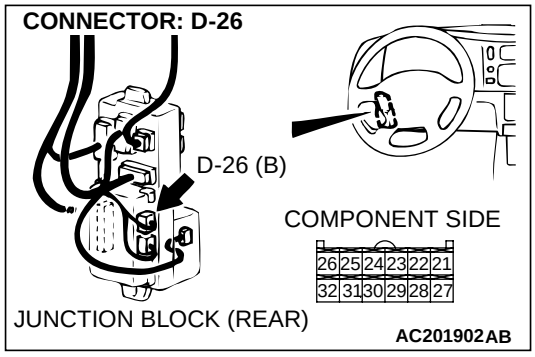


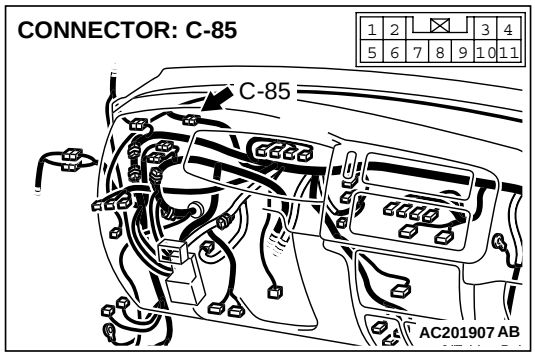
Q: Do the headlights illuminates?

YES : Replace the ETACS-ECU. There is no action to be taken.

NO : Go to Step 3.







STEP 3. Check the harness wires between joint connector C-70 (terminal No.26) and ETACS-ECU connector D-26 (terminal No.29).

NOTE: After checking intermediate connector C-85, check the wires. If intermediate connector C-85 is damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wires between joint connector C-70 (terminal No.26) and ETACS-ECU connector D-26 (terminal No.29) in good condition?

YES : Go to Step 4.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The headlights are flash when the theft-alarm system is triggered.

STEP 4. Recheck for malfunction.

Q: Is a malfunction eliminated?

YES : This procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Point – How to Cope with Intermittent Malfunction P.00-6.)

NO : Go to Step 1.

INSPECTION PROCEDURE 4: Panic Alarm Function does not Work.

TECHNICAL DESCRIPTION (COMMENT)

If the keyless entry system is normal, the ETACS-ECU is defective.

TROUBLESHOOTING HINTS

- Malfunction of the ETACS-ECU
- Damaged harness wires or connectors

DIAGNOSIS

Required Special Tools:

- MB991223: Test Harness Set
- MB991502: Scan Tool (MUT-II)
- MB991529: Diagnostic Trouble Code Check Harness

STEP 1. Check the keyless entry system.

Q: Does the keyless entry system work normally?

YES : Go to Step 2 <when using scan tool MB991502> or 3 <when using a voltmeter>.

NO : Solve the problem first. Refer to GROUP 42. Keyless Entry System – Diagnosis P.42-125.

STEP 2. Check the input signal (by using pulse check).

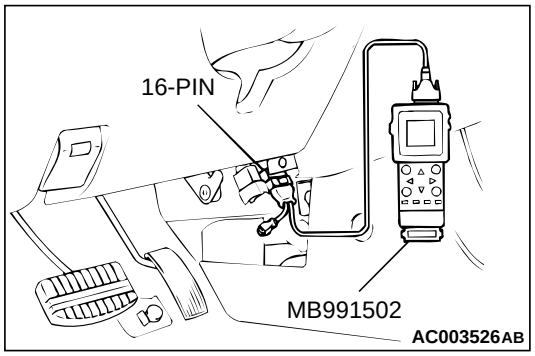
Check the input signals from the transmitter "PANIC" switch.

⚠ CAUTION

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

(1) Connect scan tool MB991502 to the data link connector.

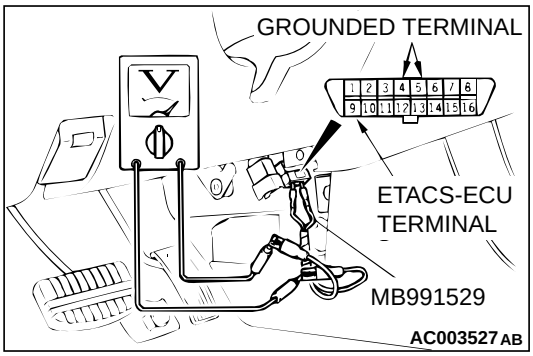
(2) Check that the tone alarm of scan tool MB991502 sounds when the input signal enters.



Q: Does the tone alarm of scan tool MB991502 sound when the input signal enters?

YES : Replace the ETACS-ECU. The panic alarm should work normally.

NO : Check the transmitter input signal circuit. Refer to GROUP 42, Keyless Entry System – Diagnosis P.42-125.



STEP 3. Check the input signal (by using a voltmeter).

Check the input signals from the transmitter "PANIC" switch.

(1) Use special tool MB991529 to connect a voltmeter between ground terminal 4 or 5 and ETACS-ECU terminal 9 of the data link connector.

(2) Check that the voltmeter indicator deflects once when the input signal enters.

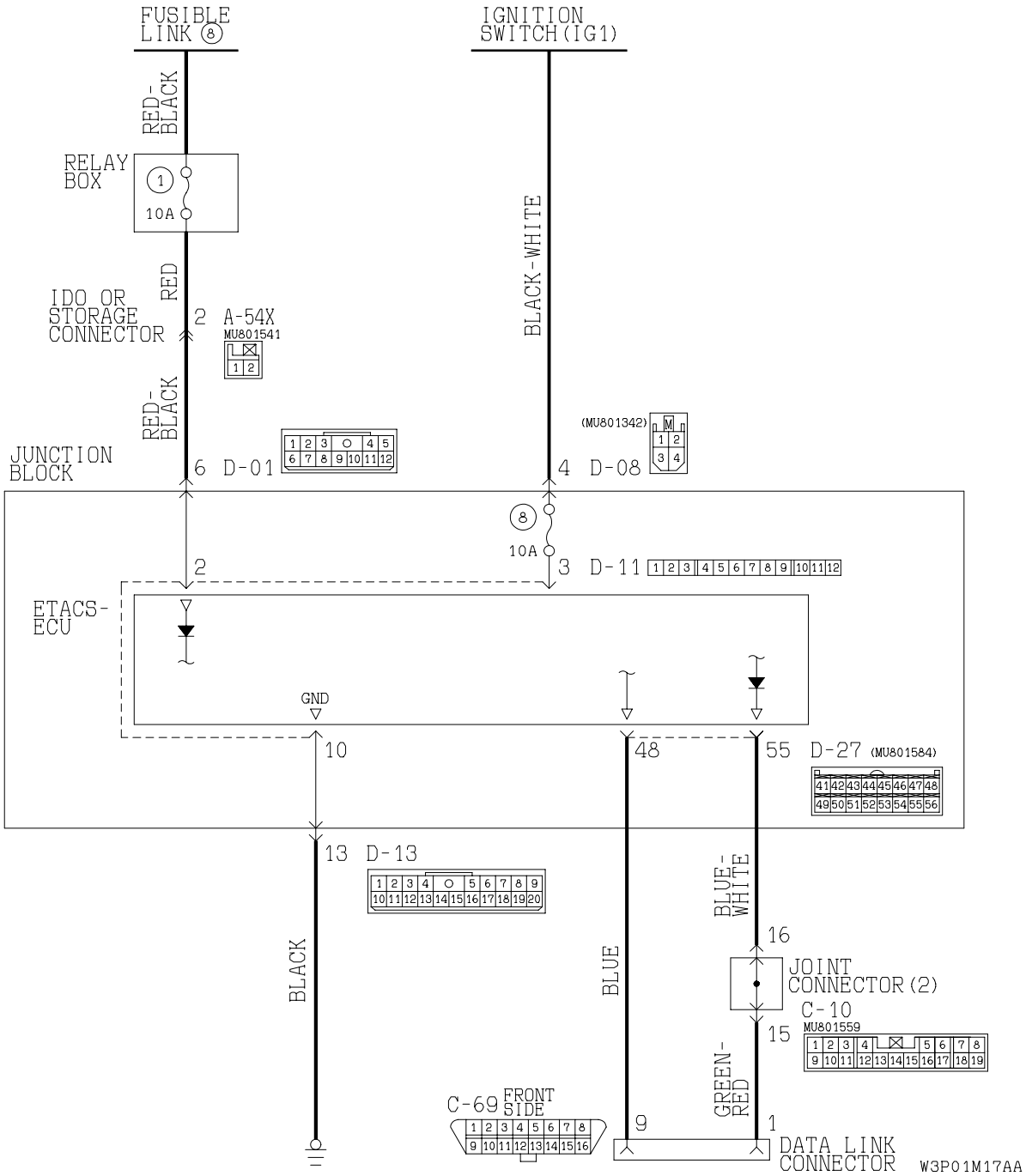
Q: Does the voltmeter indicator deflect?

YES : Replace the ETACS-ECU. The panic alarm should work normally.

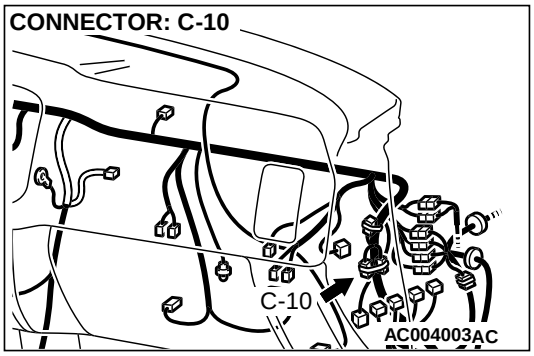
NO : Check the transmitter input signal circuit. Refer to GROUP 42, Keyless Entry System – Diagnosis P.42-125.

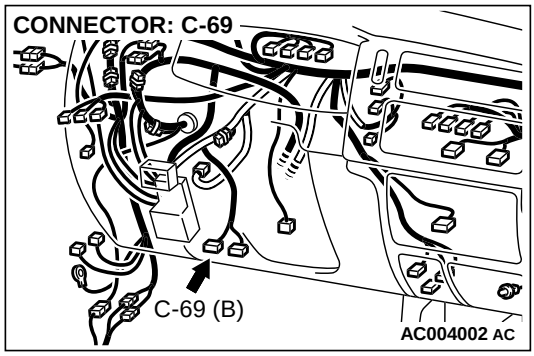
INSPECTION PROCEDURE 5: Scan Tool MB991502 Communication is not Possible.

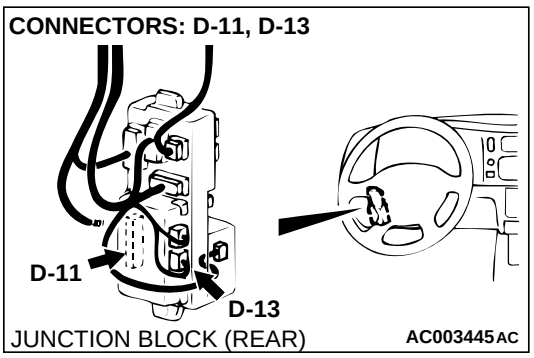
ETCS-ECU Power Supply and Scan Tool Communication Circuit



TSB Revision







CIRCUIT OPERATION
The ETACS-ECU receives switch signals from the data link connector.

TECHNICAL DESCRIPTION (COMMENT)
The harness wires between the ETACS-ECU power supply line or the ETACS-ECU and the data link connector may be defective.

TROUBLESHOOTING HINTS
- Malfunction of the ETACS-ECU
- Damaged harness wires or connectors

DIAGNOSIS

Required Special Tools:
- MB991223: Harness Set
- MB991502: Scan Tool (MUT-II)
- MB991529: Diagnostic Trouble Code Check Harness

STEP 1. Check the communication with other systems.

Q: Can the scan tool communicate with no systems?

YES : Refer to GROUP 13A, Diagnosis P.13Ad-2.

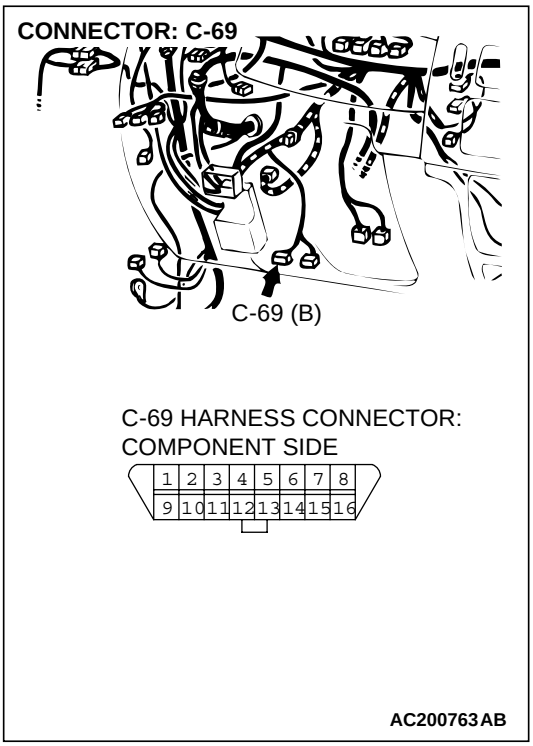
NO (can not communicate with switch signal only) : Go to Step 2.

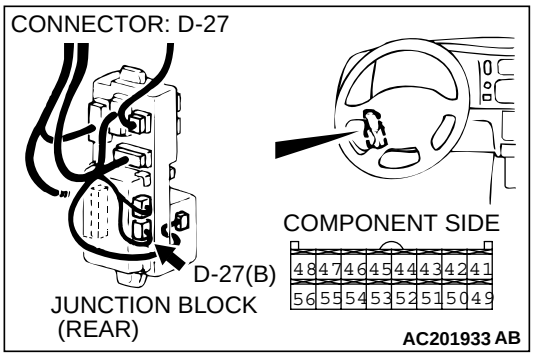
STEP 2. Check the ignition switch positions.

Q: Can scan tool MB991502 communicate with the ETACS-ECU with the ignition switch at any position other than "ON"?

YES : Go to Step 3.

NO : Check the ETACS-ECU battery circuits. Refer to Inspection Procedure 8 (P.54-284).



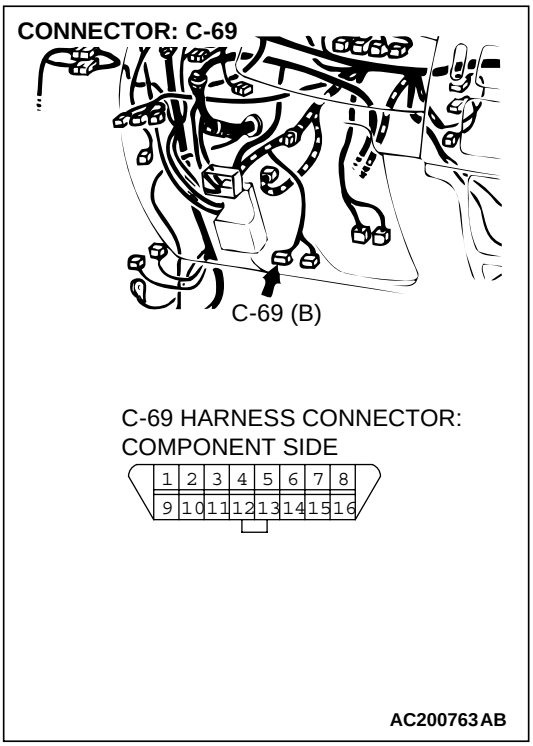


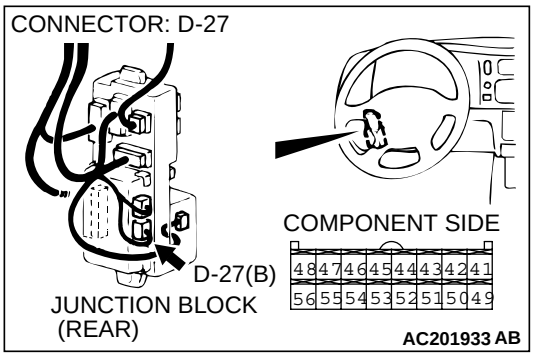
STEP 3. Check data link connector C-69 and ETACS-ECU connector D-27 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are data link connector C-69 and ETACS-ECU connector D-27 in good condition?

YES : Go to Step 4.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Scan tool MB991502 should communicate with switch signals.





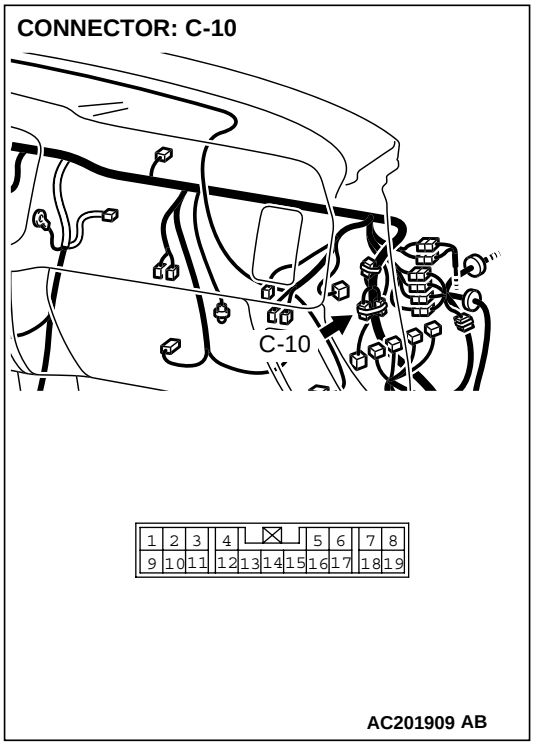
STEP 4. Check the harness wires between data link connector C-69 (terminal No.1 and 9) and ETACS-ECU connector D-27 (terminal No.48 and 55).

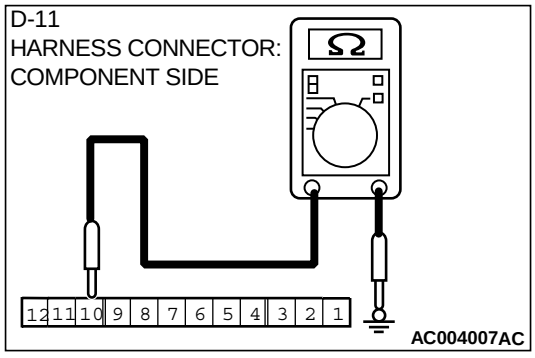
NOTE: After checking joint connector C-10, check the wires. If joint connector C-10 is damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wires between data link connector C-69 (terminal No.1 and 9) and ETACS-ECU connector D-27 (terminal No.48 and 55) in good condition?

YES : Go to Step 5.

NO : Repair them. Scan tool MB991502 should communicate with the switch signals.



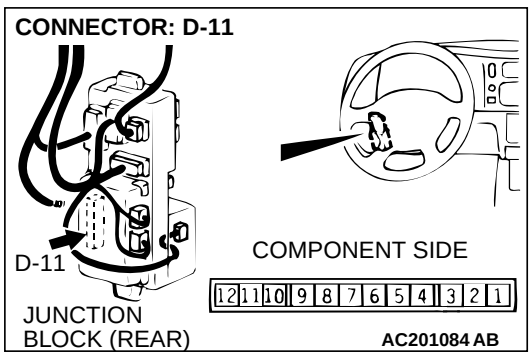


STEP 5. Measure the resistance at the ETACS-ECU ground circuit.

(1) Disconnect ETACS-ECU connector D-11 and measure at the harness side.
(2) Measure the resistance between terminal 10 and ground.
- The measured value should be 2 ohms or less.

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

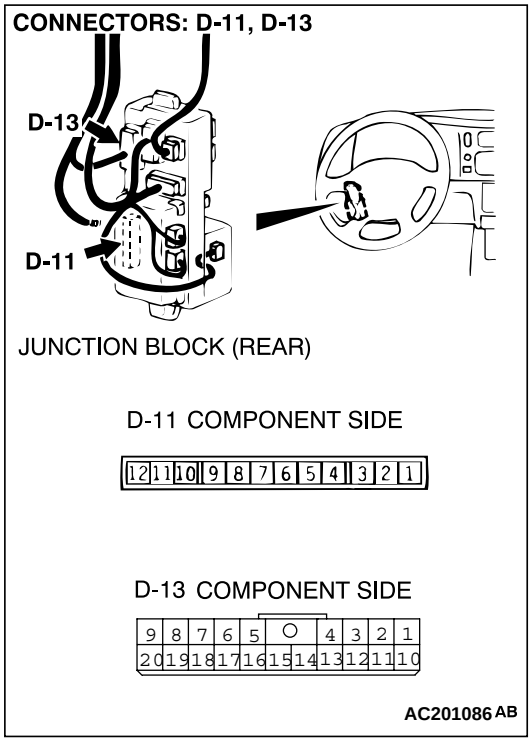
YES : Replace the ETACS-ECU. Scan tool MB991502 should communicate with the switch signals.
NO : Go to Step 6.



STEP 6. Check ETACS-ECU connector D-11 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is ETACS-ECU connector D-11 in good condition?

YES : Go to Step 7.
NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Scan tool MB991502 should communicate with the switch signals.



STEP 7. Check the harness wires between ETACS-ECU connector D-11 and ground.

NOTE: After checking junction block connector D-13, check the wires. If junction block connector D-13 is damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wires between ETACS-ECU connector D-11 and ground in good condition?

YES : Go to Step 8.

NO : Repair them. Scan tool MB991502 should communicate with the switch signals.

STEP 8. Recheck for malfunction.

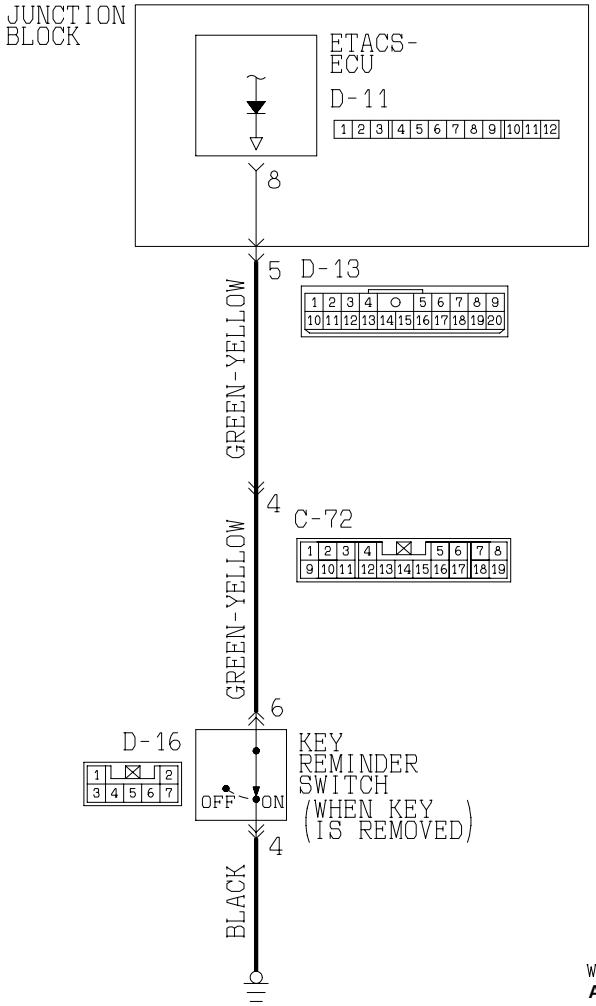
Q: Is a malfunction eliminated?

YES : This procedures is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Point – How to Cope with Intermittent Malfunction P.00-6.)

NO : Go to step 1.

INSPECTION PROCEDURE 6: The Key Reminder Switch Signal is not Sent to the ETACS-ECU.

Key Reminder Switch Input Signal Circuit



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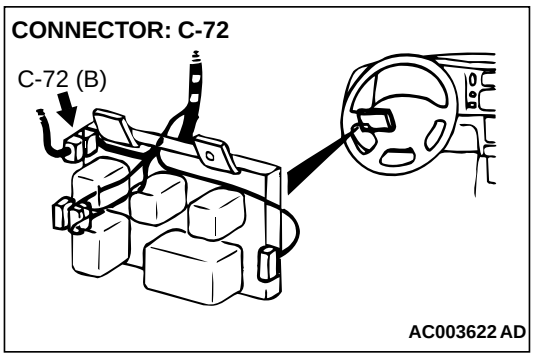

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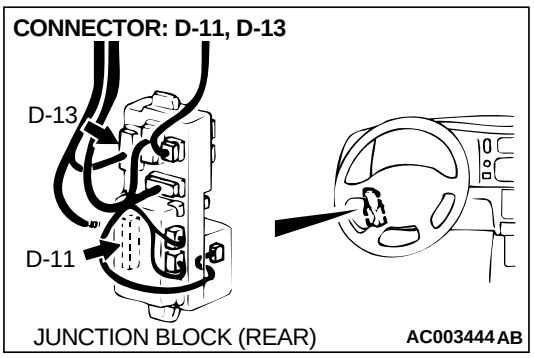

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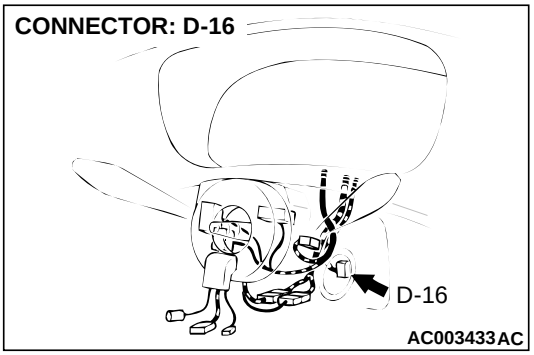


CIRCUIT OPERATION

The ETACS-ECU receives the input signal from the key reminder switch, and then judges the operation of each function.

TECHNICAL DESCRIPTION (COMMENT)

The key reminder switch input signal is used for judging the operation of the following functions. Thus, if there is a malfunction, these functions may not operate correctly.

- Ignition key tone alarm function
- Forgotten key prevention function
- Dome light dimming function
- Keyless entry system
- Theft-alarm function

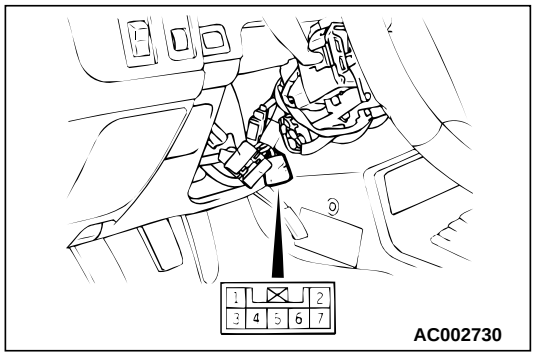
TROUBLESHOOTING HINTS

- Malfunction of the key reminder switch
- Malfunction of the ETACS-ECU
- Damaged harness wires or connectors

DIAGNOSIS

Required Special Tools:

- MB991223: Test Harness Set
- MB991502: Scan Tool (MUT-II)
- MB991529: Diagnostic Trouble Code Check Harness



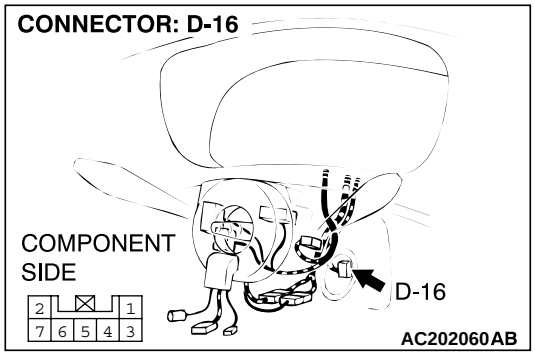
STEP 1. Check the key reminder switch.

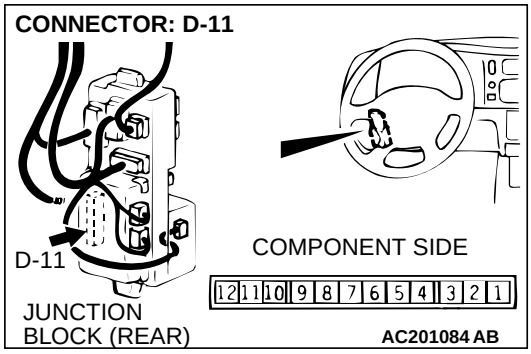
(1) Remove the driver's side under cover.
(2) Remove the column cover lower and upper.
(3) Disconnect the wiring connector from the key reminder switch.
(4) Check for continuity between the terminal when the ignition key is pulled out and inserted into the steering lock cylinder.

SWITCH POSITION	TESTER CONNECTION	SPECIFIED CONDITION
Removed	4 – 6	Less than 2 ohms
Inserted	4 – 6	Open circuit

Q: Is key reminder switch in good condition?

YES : Go to Step 2.
NO : Replace the ignition key reminder switch.



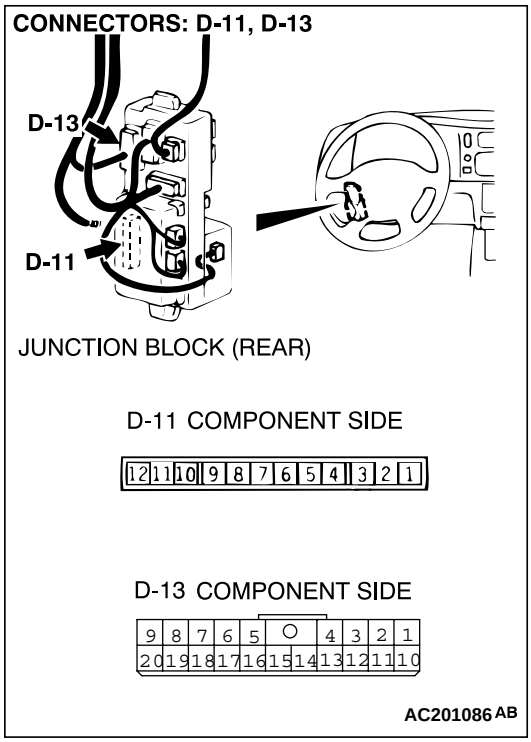


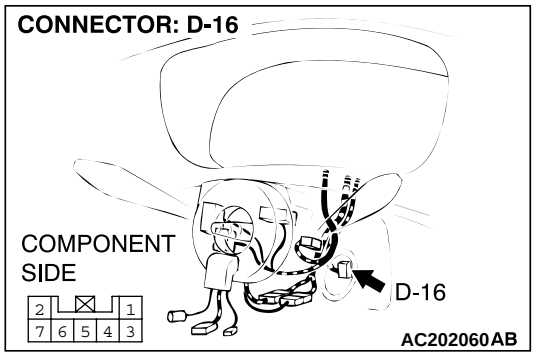
STEP 2. Check key reminder switch connector D-16 and ETACS-ECU connector D-11 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

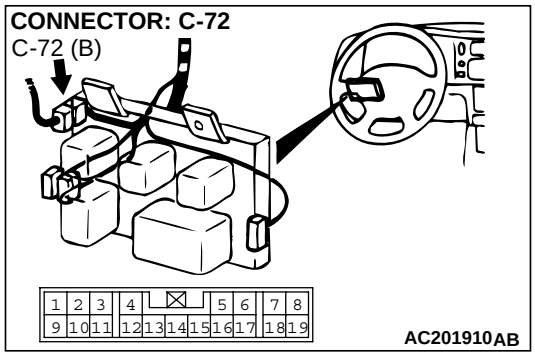
Q: Are key reminder switch connector D-16 and ETACS-ECU connector D-11 in good condition?

YES : Go to Step 3.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.







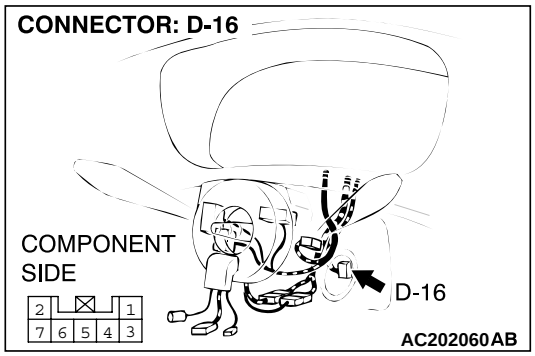
STEP 3. Check the harness wires between key reminder switch connector D-16 (terminal No.6) and ETACS-ECU connector D-11 (terminal No.8) for damage.

NOTE: After checking intermediate connector C-72 and junction block connector D-13, check the wires. If intermediate connector C-72 and junction block connector D-13 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wires between key reminder switch connector D-16 (terminal No.6) and ETACS-ECU connector D-11 (terminal No.8) in good condition?

YES : Go to Step 4.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 4. Check for continuity between terminals (except No. 4 and No. 6) of key reminder switch connector D-16.

(1) Measure at key reminder switch connector D-16 without disconnecting the connector.

(2) Check that there is no continuity between key reminder switch terminal No. 4 and each terminal (except terminal No. 6), as well as between key reminder switch terminal No.6 and each terminal (except terminal No. 4).

Q: Does continuity exist between terminals?

YES : Replace the key reminder switch. If the functions, which are described in "CIRCUIT OPERATION", work normally, the input signal from the key reminder switch should be normal.

NO : Go to Step 5.

STEP 5. Recheck for malfunction.

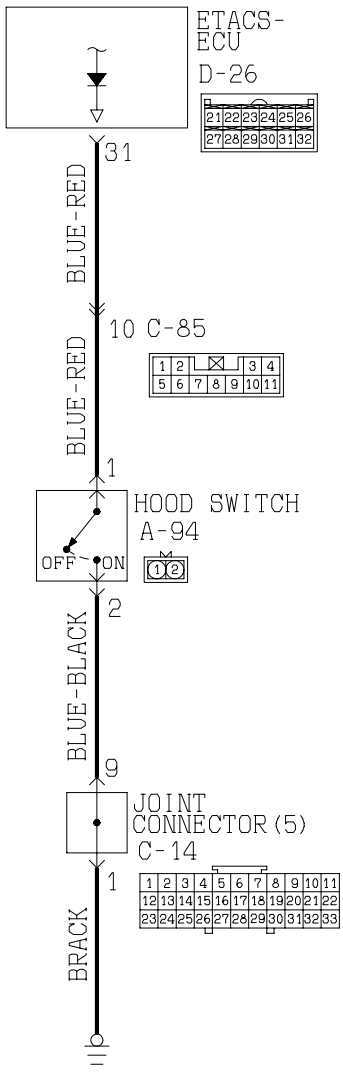
Q: Is a malfunction eliminated?

YES : This procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Point – How to Cope with Intermittent Malfunction P.00-6.)

NO : Go to Step 1.

INSPECTION PROCEDURE 7: The Hood Switch is not Input.

Hood Switch Input Circuit



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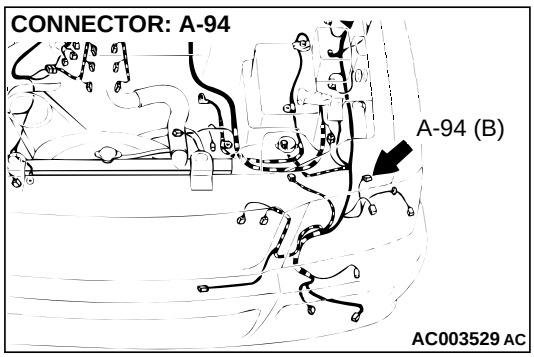

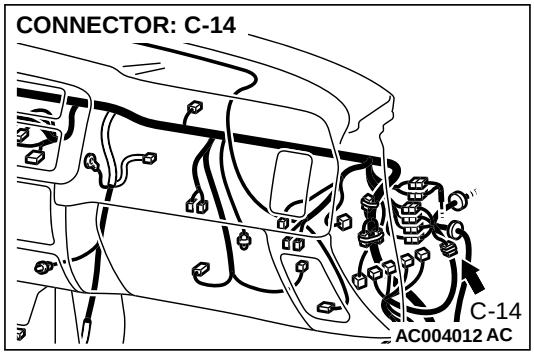

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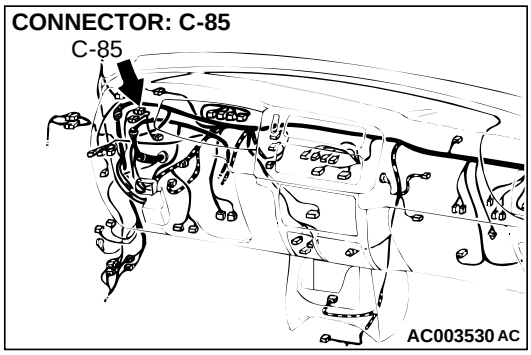
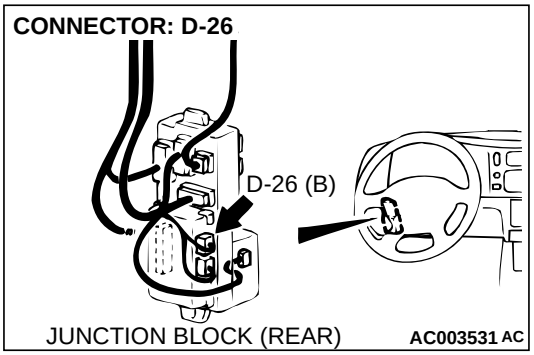




CIRCUIT OPERATION

The ETACS-ECU receives the input signal from the hood switch, and then judges the operation of each function.

TECHNICAL DESCRIPTION (COMMENT)

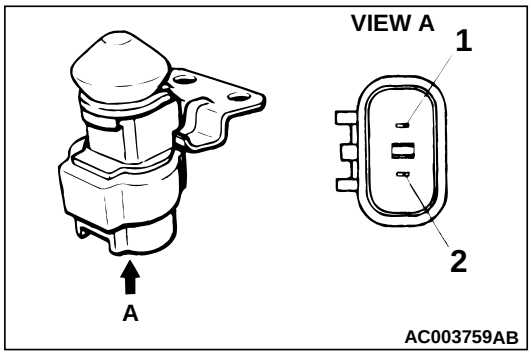
The hood switch input signal is used for judging the operation of the theft-alarm function, so if there is a malfunction, these functions may not operate correctly.

- Malfunction of the hood switch
- Malfunction of the ETACS-ECU
- Damaged harness wires and connectors

DIAGNOSIS

Required Special Tools:

- MB991223: Test Harness Set
- MB991502: Scan Tool (MUT-II)
- MB991529: Diagnostic Trouble Code Check Harness



STEP 1. Check the hood switch.

(1) Remove the hood switch.

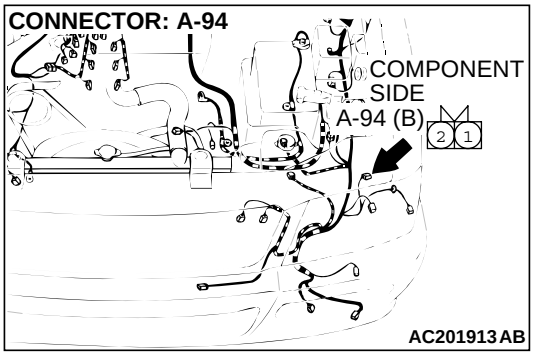
(2) Check for continuity between the hood switch.

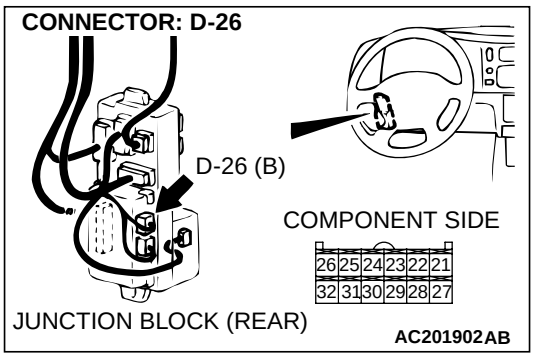
SWITCH POSITION	TESTER CONNECTION	SPECIFIED CONDITION
Hood switch unpressed	1 – 2	Less than 2 ohms
Hood switch depressed	1 – 2	Open circuit

Q: Is hood switch in good condition?

YES : Go to Step 2.

NO : Replace the hood switch.



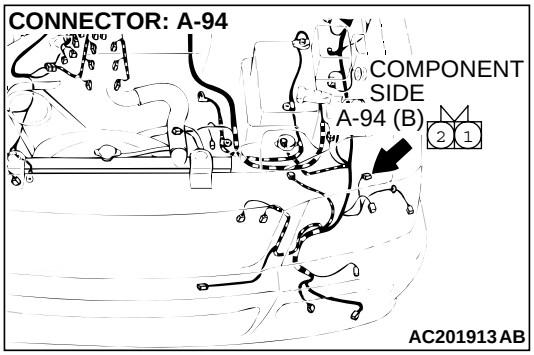


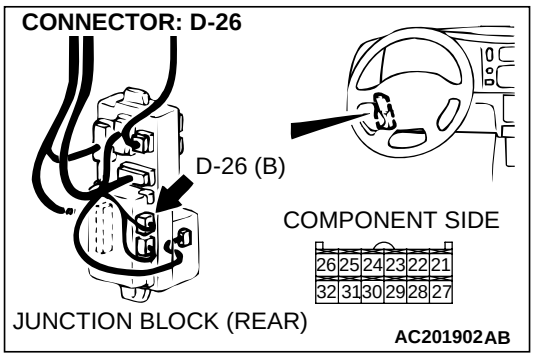
STEP 2. Check hood switch connector A-94 and ETACS-ECU connector D-26 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

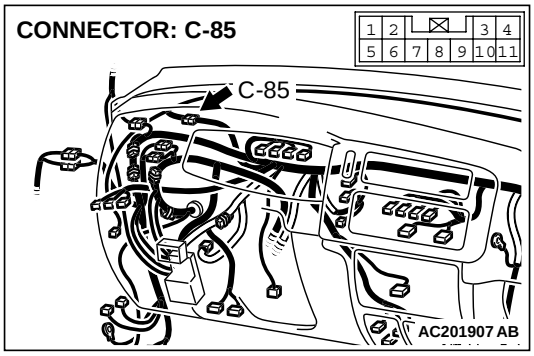
Q: Are hood switch connector A-94 and ETACS-ECU connector D-26 in good condition?

YES : Go to Step 3.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.







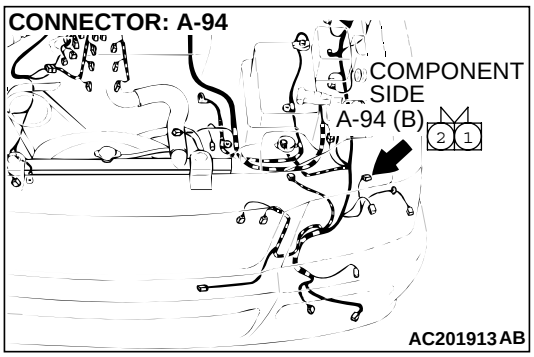
STEP 3. Check the harness wires between hood switch connector A-94 (terminal No.1) and ETACS-ECU connector D-26 (terminal No.31) for damage.

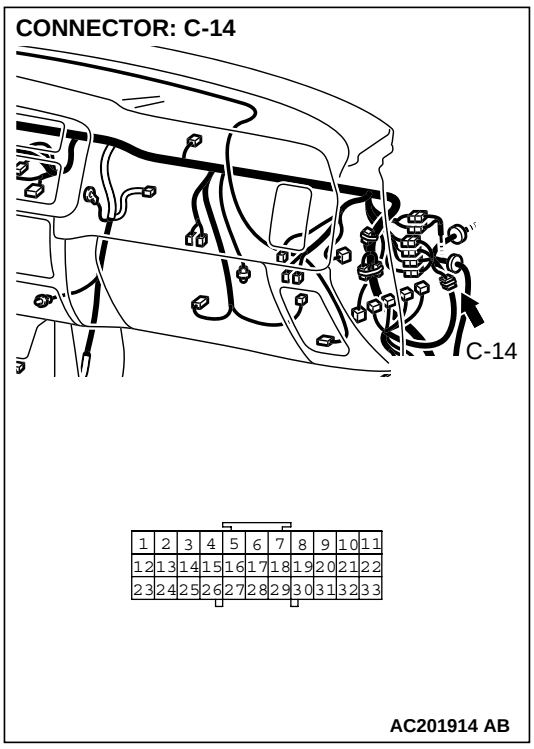
NOTE: After checking intermediate connector C-85, check the wires. If intermediate connector C-85 is damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wires between hood switch connector A-94 (terminal No.1) and ETACS-ECU connector D-26 (terminal No.31) in good condition?

YES : Go to Step 4.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





STEP 4. Check the harness wires between hood switch connector A-94 (terminal No.2) and ground.

NOTE: After checking joint connector (5) C-14, check the wires. If joint connector (5) C-14 is damaged, repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

Q: Are the harness wires between hood switch connector A-94 (terminal No.2) and ground in good condition?

YES : Go to Step 5.

NO : Repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

STEP 5. Recheck for malfunction.

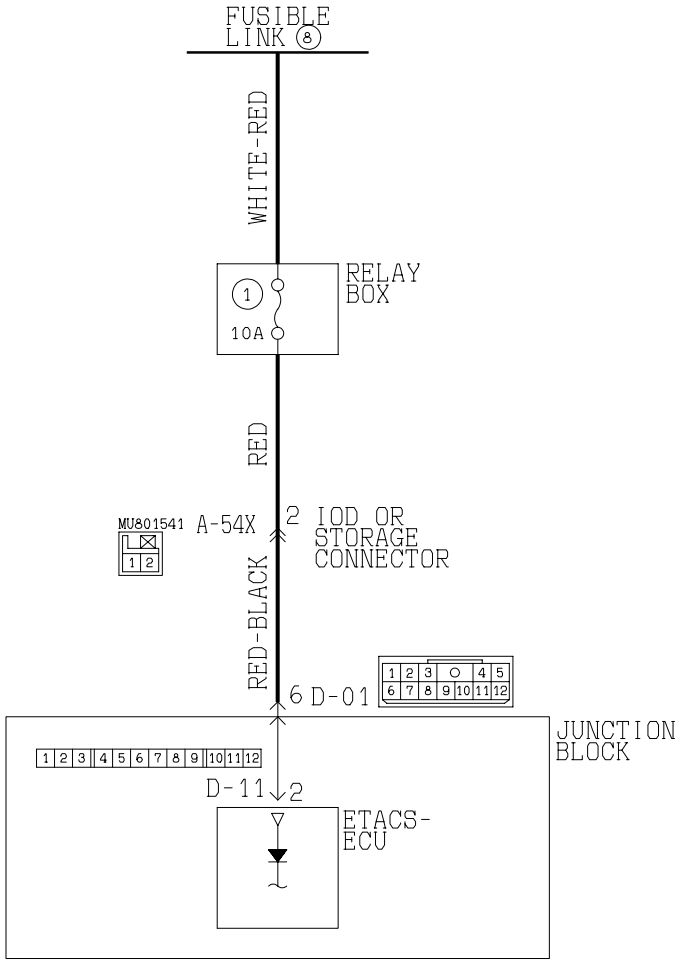
Q: Is a malfunction eliminated?

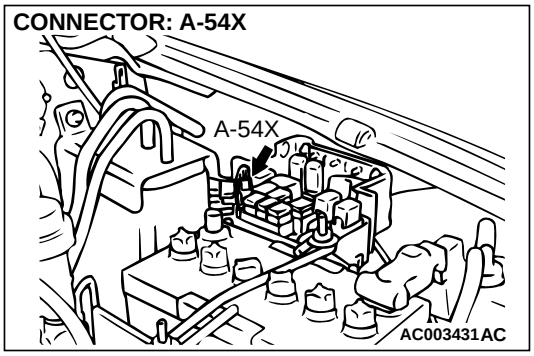
YES : This procedure is complete. (If no malfunctions are found in all steps, an intermittent malfunction is suspected. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Point – How to Cope with Intermittent Malfunction P.00-6.)

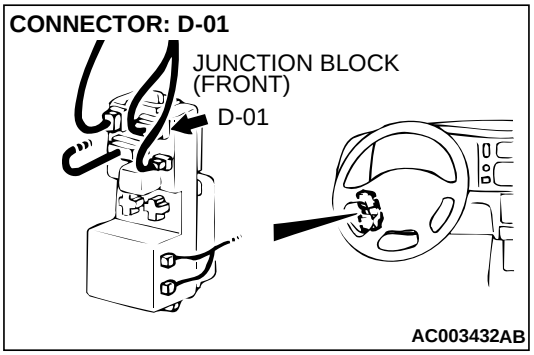
NO : Go to Step 1.

INSPECTION PROCEDURE 8: Check the Circuit (Power Supply Line) from the Battery to the ETACS-ECU.

ETACS-ECU'S Battery Circuit







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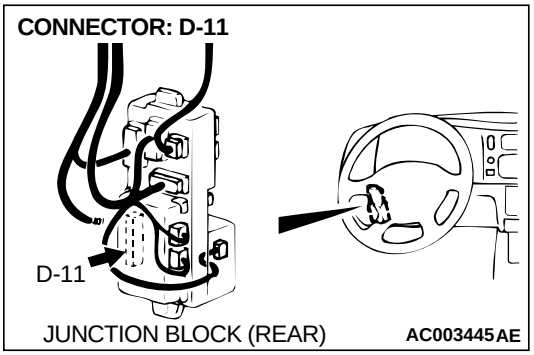


CIRCUIT OPERATION

Refer to ETACS-ECU Power Supply and Scan Tool Communication Circuit P.54-45. The ETACS-ECU is always energized by the battery.

TECHNICAL DESCRIPTION (COMMENT)

If that power supply circuit is defective, the circuit flowing through the ignition switch (IG1) will function as a backup circuit. In this case, the following is at "LOCK" (OFF) position.

- Light reminder tone alarm function
- Ignition key reminder tone alarm function
- Central door locking system
- Dome light dimming function
- Theft alarm system

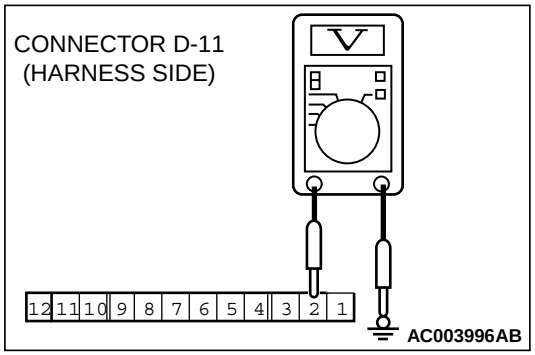
TROUBLESHOOTING HINTS

- Malfunction of the ETACS-ECU
- Damaged harness wires or connectors

DIAGNOSIS

Required Special Tools:

- MB991223: Test Harness Set



STEP 1. Measure the voltage at ETACS-ECU power supply.

(1) Disconnect ETACS-ECU connector D-11 and measure the harness side.

(2) Measure the Voltage between terminal 2 and ground.

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

Q: Does the measured voltage correspond with this range?

YES : Replace the ETACS-ECU. The functions, which are described in the "Technical Description (comment)," should work normally.

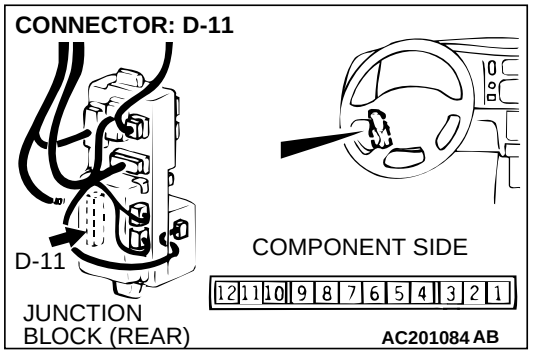
NO : Go to Step 2.

STEP 2. Check ETACS-ECU connector D-11 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is ETACS-ECU connector D-11 in good condition?

YES : Go to Step 3.

NO : Repair or replace it. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. The functions, which are described in the "Technical Description (comment)," should work normally.



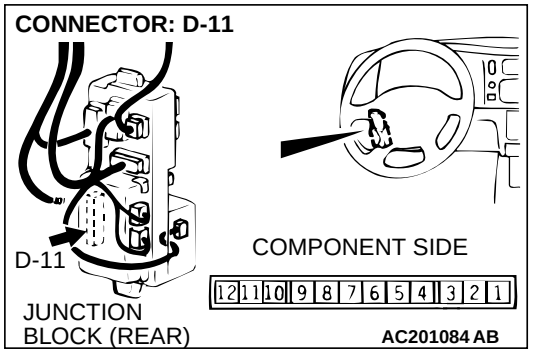
STEP 3. Check the harness wires between ETACS-ECU connector D-11 (terminal No.2) and fusible link No.8.

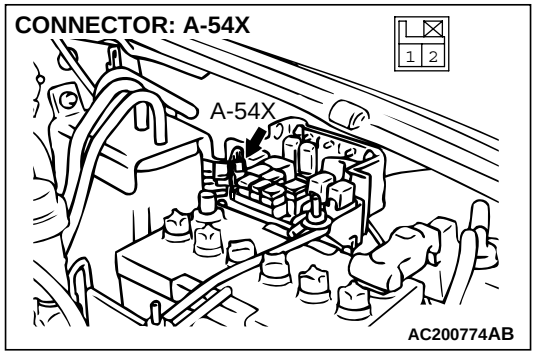
NOTE: After checking junction block connector D-01 and OD or storage connector A-54X, check the wires. If junction block connector D-01 and OD or storage connector A-54X are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

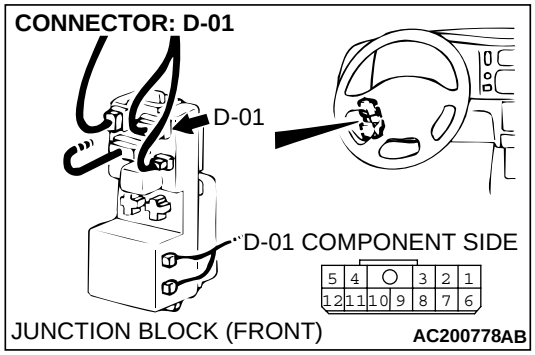
Q: Are the harness wires between ETACS-ECU connector D-11 (terminal No.2) and fusible link No.8 in good condition?

YES : There is no action to be taken.

NO : Repair them. The functions, which are described in the "Technical Description (comment)," should work normally.

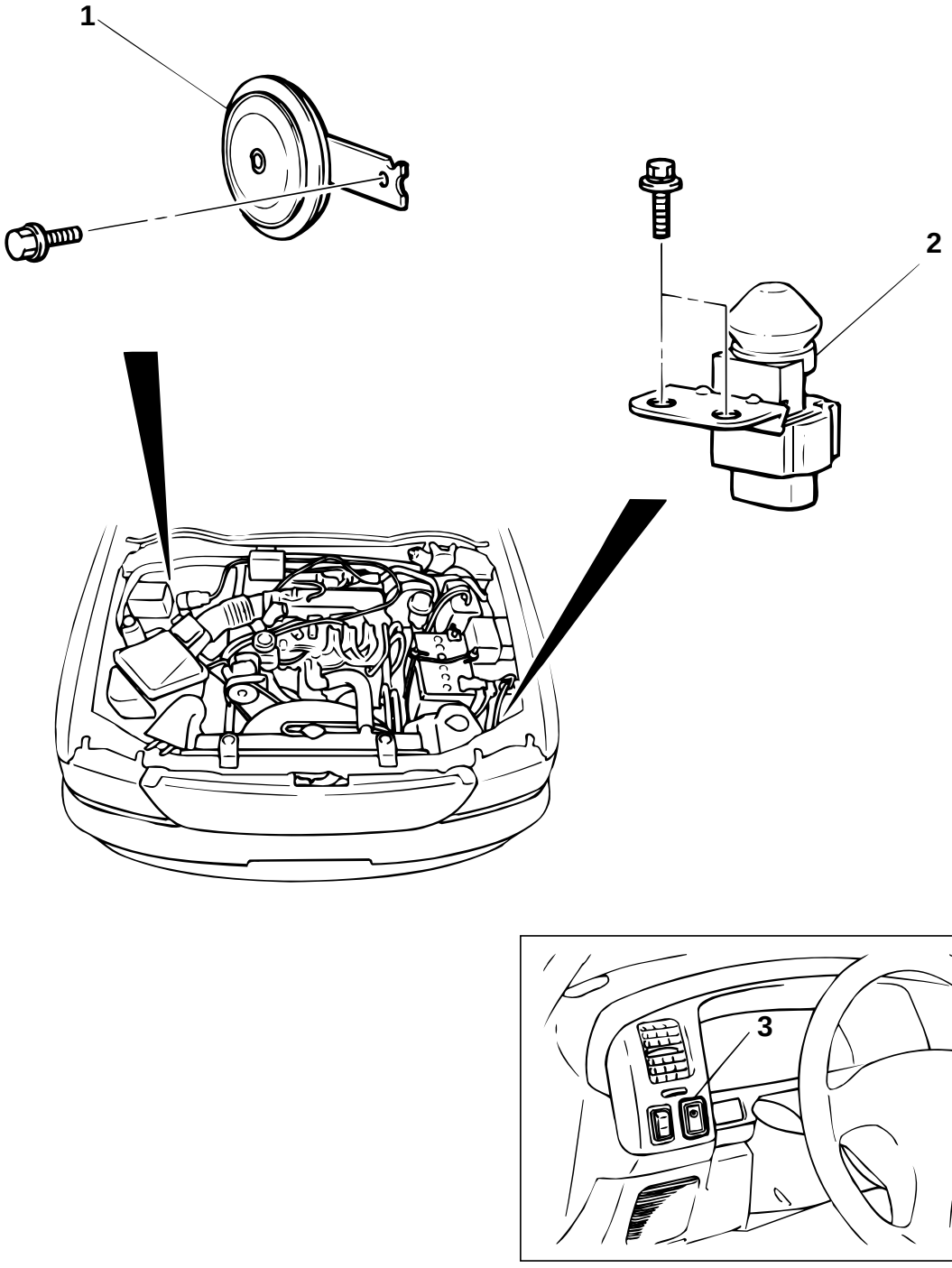






REMOVAL AND INSTALLATION

M1547001000179



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REMOVAL STEPS

1. THEFT-ALARM HORN
2. HOOD SWITCH
3. SECURITY INDICATOR

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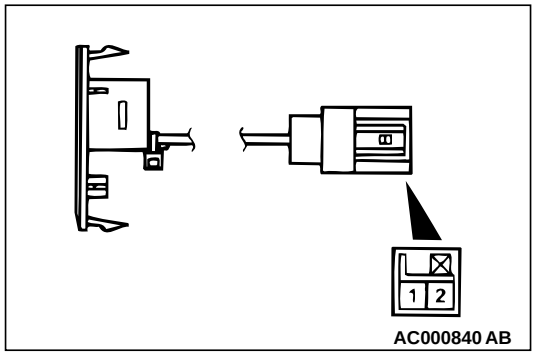
INSPECTION

M1547002500025

SECURITY INDICATOR CONTINUITY CHECK



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BATTERY VOLTAGE	TESTER CONNECTION	SPECIFIED CONDITION
Supplied	• Connect terminal 1 to the positive battery terminal • Connect terminal 2 to the negative battery terminal	Illuminate

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

M1544004600201

ITEM	SPECIFICATION
Amplifier mounting nut	4.9 N·m (43 in-lb)
Antenna motor-ECU mounting nut	3.0 N·m (27 in-lb)
Column switch mounting screw	25 N·m (18 ft-lb)
Headlight mounting bolt	4.9 N·m (43 in-lb)
Motor antenna mounting bolt	3.0 N·m (27 in-lb)
Radio bracket mounting screw	1.4 N·m (13 in-lb)
Mast antenna body mounting bolt	3.0 N·m (27 in-lb)

SERVICE SPECIFICATIONS

M1543000300175

<IMMOBILIZER SYSTEM>

ITEM	STANDARD VALUE
Ignition key ring antenna resistance Ω	2 or less

<COMBINATION METER>

ITEM		STANDARD VALUE
Speedometer indication 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)
Tachometer indication error r/min	700	+100
	3,000	+150
	5,000	+250
	6,000	+300

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ITEM		STANDARD VALUE
Fuel gauge unit resistance Ω	Float point "F"	1 – 5
	Float point "E"	103 – 117
Fuel gauge unit float height mm (in)	A (Float point "F")	214.1 (8.43)
	B (Float point "E")	251.2 (9.89)
Engine coolant temperature gauge unit resistance Ω		104 ± 13.5
Fuel gauge resistance MΩ	Power supply and ground	Approximately 1 or more
	Power supply and fuel gauge	Approximately 1 or more
	Fuel gauge and ground	Approximately 1 or more
Engine coolant temperature gauge resistance Ω	Power supply and ground	191
	Power supply and engine coolant temperature gauge	103
	Engine coolant temperature gauge and ground	88

<HEADLIGHT>

ITEM		STANDARD VALUE	LIMIT
Headlight aiming	Vertical direction	Headlight center line ± 50mm (2.1 in)	–
Headlight intensity cd [When a screen is set 18.3m (60.0 feet) ahead of the vehicle]		-	40,000 or more

<FOG LIGHT>

ITEM		STANDARD VALUE	LIMIT
Fog light aiming	Vertical direction	151 mm (5.9 in) below horizontal (H)	–
	Horizontal direction	Parallel to direction of vehicle travel	–

SEALANT

M1543000500168

<COMBINATION METER>

ITEM	SPECIFIED SEALANT	REMARK
Engine coolant temperature gauge unit threaded portion	3M™ AAD part No. 8731 or equivalent	Drying sealant

NOTES