

## GROUP 54C

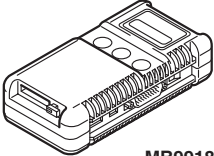
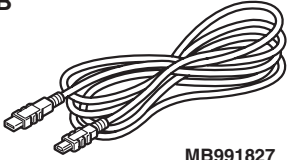
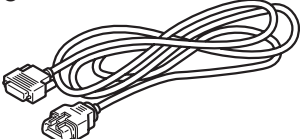
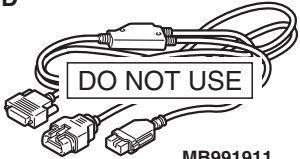
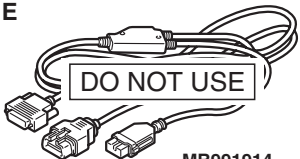
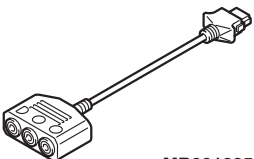
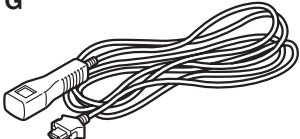
# CONTROLLER AREA NETWORK (CAN)


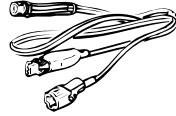
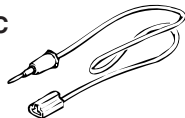
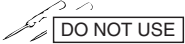
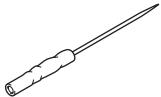
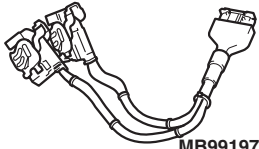
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**SPECIAL TOOL**


M1548304200217

TOOL	TOOL NUMBER AND NAME	SUPERSESION	APPLICATION
<p><b>A</b></p>  <p>MB991824</p> <p><b>B</b></p>  <p>MB991827</p> <p><b>C</b></p>  <p>MB991910</p> <p><b>D</b></p>  <p>MB991911</p> <p><b>E</b></p>  <p>MB991914</p> <p><b>F</b></p>  <p>MB991825</p> <p><b>G</b></p>  <p>MB991826 MB991958</p>	<p>MB991958 A: MB991824 B: MB991827 C: MB991910 D: MB991911 E: MB991914 F: MB991825 G: MB991826</p> <p>Scan tool (MUT-III sub assembly)</p> <p>A: Vehicle communication interface (V.C.I.) B: MUT-III USB cable C: MUT-III main harness A (Vehicles with CAN communication system) D: MUT-III main harness B (Vehicles without CAN communication system) E: MUT-III main harness C (for Daimler Chrysler models only) F: MUT-III measurement adapter G: MUT-III trigger harness</p>	<p>MB991824-KIT</p>	<p>CAN bus diagnostics</p> <p><b>⚠ CAUTION</b> For vehicles with CAN communication, use MUT-III main harness A to send simulated vehicle speed. If you connect MUT-III main harness B instead, the CAN communication does not function correctly.</p> <p><i>NOTE: G: MB991826 MUT-III Trigger Harness is not necessary when pushing V.C.I. ENTER key.</i></p>

TOOL	TOOL NUMBER AND NAME	SUPERSESION	APPLICATION
<p>A </p> <p>B </p> <p>C </p> <p>D  MB991223AZ</p>	<p>MB991223 A: MB991219 B: MB991220 C: MB991221 D: MB991222</p> <p>Harness set A: Test harness B: LED harness C: LED harness adaptor D: Probe</p>	<p>General service tools</p>	<p>Continuity check and voltage measurement at harness wire or connector for loose, corroded or damaged terminals, or terminals pushed back in the connector.</p> <p>A: Connector pin contact pressure inspection B: Power circuit inspection C: Power circuit inspection D: Commercial tester connection</p>
<p> MB992006</p>	<p>MB992006 Extra fine probe</p>	<p>–</p>	<p>Continuity check and voltage measurement at harness wire or connector for loose, corroded or damaged terminals, or terminals pushed back in the connector.</p>
<p> MB991970</p>	<p>MB991970 ABS check harness</p>	<p>–</p>	<p>Measure the voltage and resistance at the ABS-ECU &lt;vehicles without traction control system&gt; or ABS/TCL-ECU &lt;vehicles with traction control system&gt;</p>

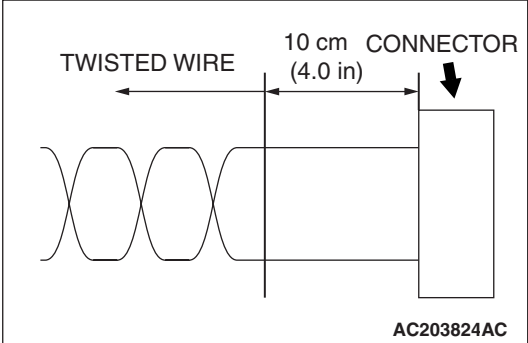
## TEST EQUIPMENT

M1548304300173

TEST EQUIPMENT	NAME	USE
<p> AC000019</p>	<p>Digital multimeter</p>	<p>Checking CAN bus circuit (for resistance and voltage measurements)</p>

## SERVICE PRECAUTIONS

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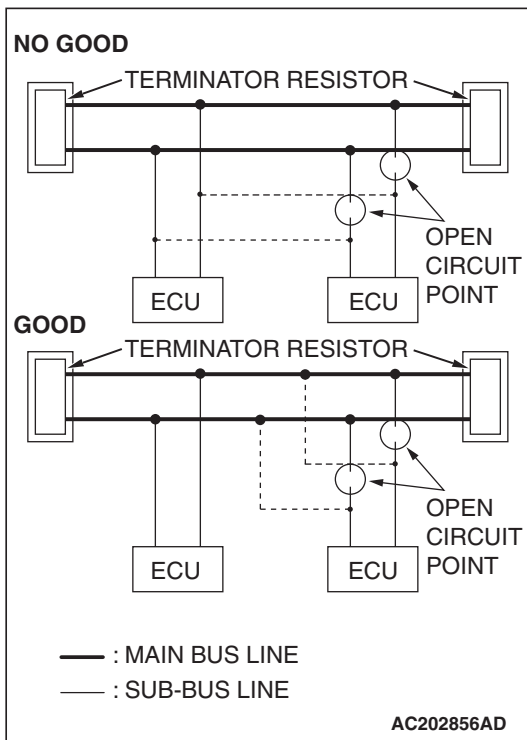
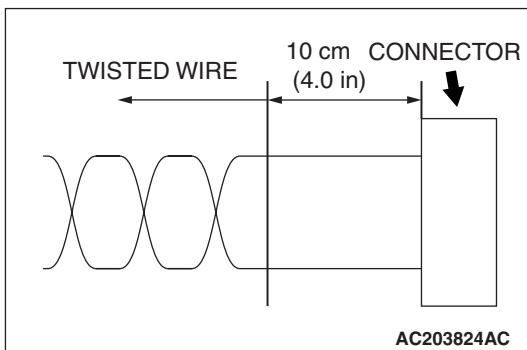
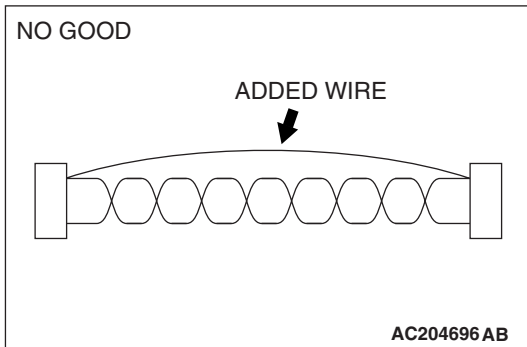
WARNINGS IN DIAGNOSIS SECTION	DETAILS REGARDING WARNINGS
<p><b>⚠ CAUTION</b> When servicing a CAN bus line, ground yourself by touching a metal object such as an unpainted water pipe. If you fail to do so, a component connected to the CAN bus line may be damaged.</p>	-
<p><b>⚠ CAUTION</b> A digital multimeter should be used.</p>	<p>When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipment connected through the CAN communication lines, may be damaged.</p>
<p><b>⚠ CAUTION</b> Disconnect the negative battery terminal.</p>	<p>Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, a component connected through the CAN communication lines may be damaged.</p>
<p><b>⚠ CAUTION</b> The test wiring harness should be used.</p>	<p>Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.</p>
<p><b>⚠ CAUTION</b> The strand end of the twisted wire should be within 10 cm (4.0 inches) from the connector.</p>	 <p>If you repair the wire due to a defective connector or its terminal or harness wire, you should cut the wire so that the strand end of the twisted wire should be within 10 cm (4.0 inches) from the connector as shown. If it exceeds 10 cm (4.0 inches), twist the wiring harness just like the original twisted wire. If the strand end exceeds 10 cm (4.0 inches), a communication error may be caused.</p>
<p><b>⚠ CAUTION</b> Strictly observe the specified wiring harness repair procedure.</p>	<p>When you repair a CAN bus line, observe the precautions on how to repair the CAN bus line strictly (Refer to <a href="#">P.54C-5</a>). If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.</p>

# PRECAUTIONS ON HOW TO REPAIR THE CAN BUS LINES

M1548301900176

## PRECAUTIONS ON HOW TO REPAIR THE CAN BUS LINES

- If the CAN\_L or CAN\_H line on the main bus line or sub-bus line is repaired, replace all the twisted wires between the end connectors. If the wiring harness is partially repaired, or only CAN\_L or CAN\_H line is repaired, noise suppression is deteriorated, causing a communication error.
- If the connector or wire on the main bus line or the sub-bus wire is replaced, the strand end of the twisted wire should be within 10 cm (4.0 inches) from the connector. If it exceeds 10 cm (4 inches), twist the wiring harness just like the original twisted wire. If the strand end exceeds 10 cm (4 inches), noise suppression is deteriorated, causing a communication error.
- If a sub-bus line is repaired, splice a new wire directly into the main bus line. If a new wire is spliced into the sub-bus line, which is connected to another device, the CAN communication will be disabled.



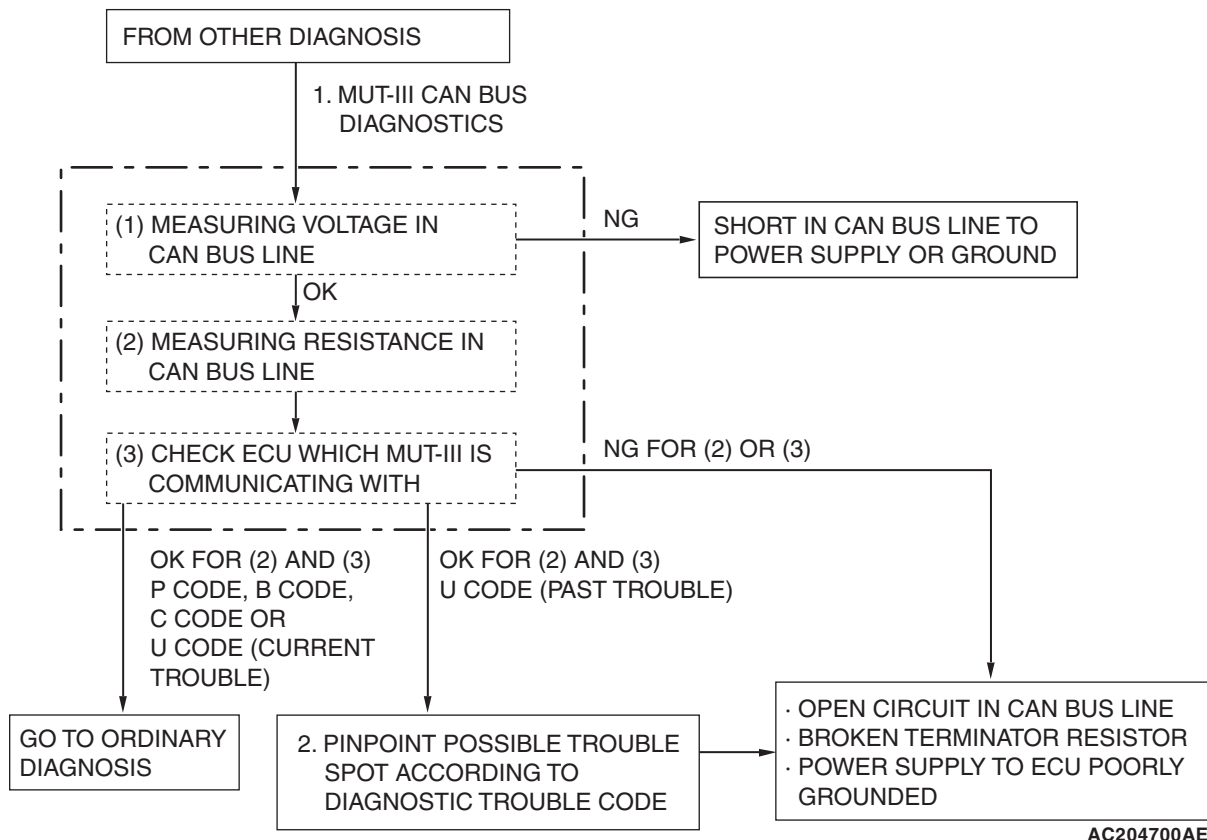
## PRECAUTIONS ON HOW TO REPAIR THE TERMINATOR RESISTOR

If one-side of the terminator resistors is broken, the CAN communication will continue, although noise suppression is deteriorated. In this case, no DTC may be set. Check the system regardless of whether a DTC is set or not. If damage is found, replace the terminator resistor.

## EXPLANATION ABOUT THE SCAN TOOL (MUT-III) CAN BUS DIAGNOSTICS

M1548300100177

Scan tool MB991958 CAN bus diagnostics carries out the three checks below automatically, and then displays the current condition of the CAN bus lines according to the check results.



AC204700AE

1. Scan tool CAN bus diagnostics

Scan tool MB991958 diagnoses CAN bus lines in accordance with the following strategy.

(1) Measuring voltage in CAN bus line

Diagnoses the power supply (such as wires of higher voltage than CAN communication line) and grounding (such as wires of lower voltage than CAN communication line) of CAN bus lines for short circuit by measuring the voltages between the CAN\_L line or H line and body ground.

MEASURE THE VOLTAGE	NORMAL VALUE	MEASUREMENT VALUE	TROUBLE WHEN THE MEASUREMENT VALUE DOES NOT MEET THE NORMAL VALUE	NOTE
Between the CAN_L line and body ground	1.0 V or more and 4.0 V or less	Less than 1.0 V	Short to ground of the CAN_L line	If the CAN_L or H line is shorted to ground or power supply, a DTC may not be set.
		More than 4.0 V	A short to the power supply of the CAN_L line	
Between the CAN_H line and body ground	1.0 V or more and 4.0 V or less	Less than 1.0 V	Short to ground of the CAN_H line	
		More than 4.0 V	A short to the power supply of the CAN_H line	

(2) Measuring resistance in CAN bus line

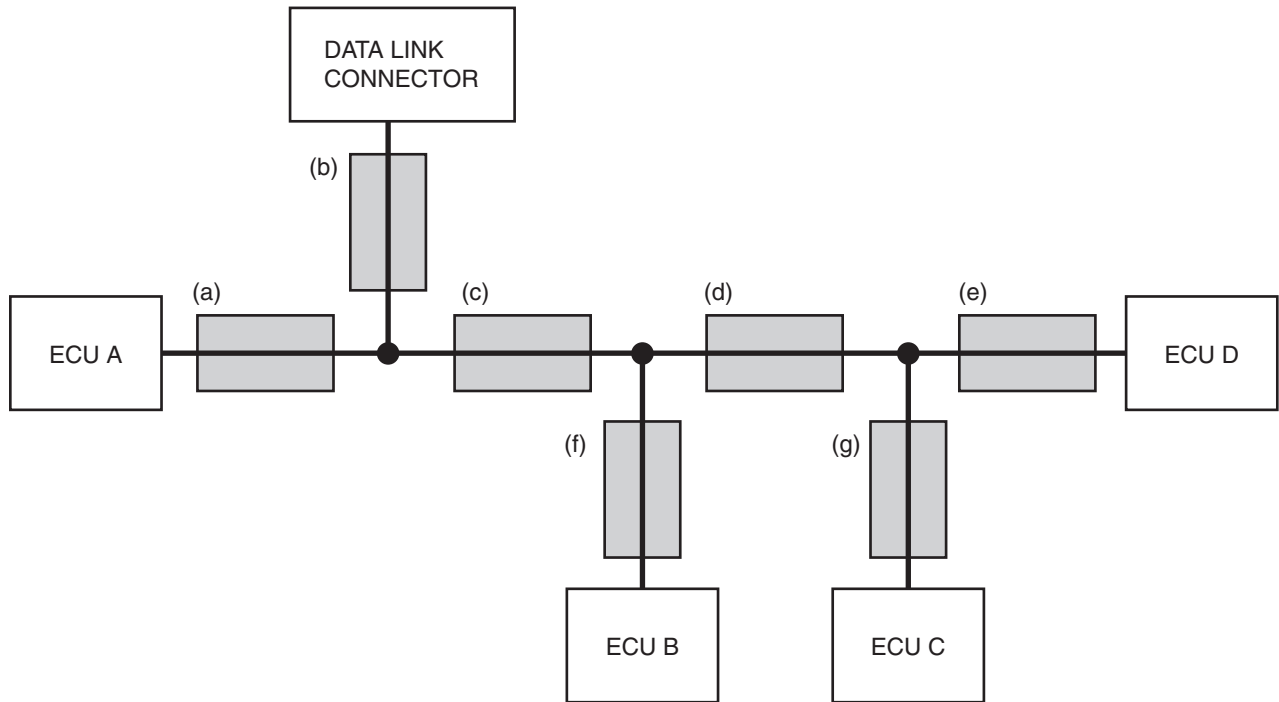
Checks the terminator resistors (incorporated in the combination meter, the engine control module (ECM) <M/T> or the powertrain control module (PCM) <A/T>), which are connected to each end of a CAN bus line, for breakage and a CAN bus main line for open circuit by measuring the resistance value between a CAN\_L line and H line.

NORMAL VALUE	MEASUREMENT VALUE	TROUBLE WHEN THE MEASUREMENT VALUE DOES NOT MEET THE NORMAL VALUE	NOTE
60 ± 10 Ω	120 ± 20 Ω	Trouble in a CAN main bus line or terminator resistor	If only one terminator resistor is broken at either side, the CAN communication will continue although noise suppression is deteriorated. If a CAN main bus line is open circuit, the CAN communication is suspended at that open circuit point.
	No continuity	Trouble in CAN main bus line or between the data link connector and main bus line	–
	2 ohms or less	CAN bus line (between CAN_L and H lines) is shorted	If a CAN bus line is shorted, all ECUs cease communicating each other (This fail-safe function is called "Bus off").
	Other than above	Poorly engaged connector	–

(3) Checking the communication condition of ECUs

Scan tool MB991958 narrows down troubles in circuit by itself. Its strategy is as follows:

REFERENCE CIRCUIT



AC204741 AC

ECU WHICH CAN NOT COMMUNICATE WITH THE SCAN TOOL	POSSIBLE TROUBLE SPOT	LOGIC FOR DETERMINING DOWN TROUBLE SPOT	
ECU A	CAN bus line (a) and power supply system to ECU A	ECU A communicates with scan tool MB991958 via CAN bus lines (a) and (b). Scan tool MB991958 judges that CAN bus line (b) is normal, because it can communicate with other ECUs. Possible trouble may be present in CAN bus line (a) or the power supply system to ECU A.	<p>AC204742 AZ</p>

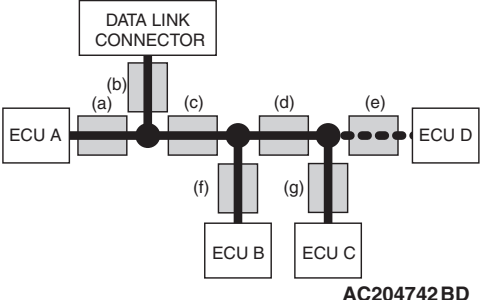
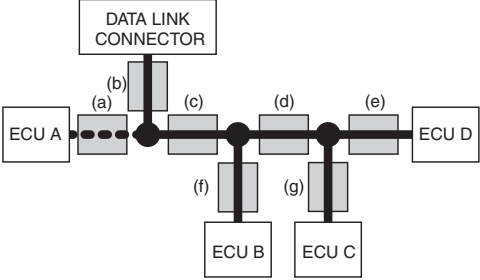
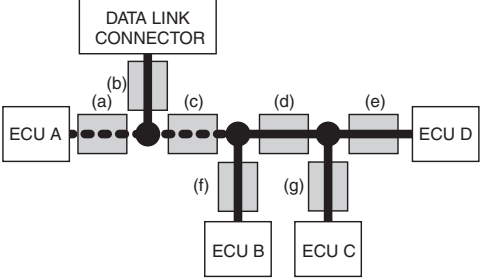


ECU WHICH CAN NOT COMMUNICATE WITH THE SCAN TOOL	POSSIBLE TROUBLE SPOT	LOGIC FOR DETERMINING DOWN TROUBLE SPOT	
ECU C	CAN bus line (g) and power supply system to ECU C	<p>ECU C communicates with scan tool MB991958 via CAN bus lines (b), (c), (d) and (g). Scan tool MB991958 judges that CAN bus lines (b), (c) and (d) are normal, because it can communicate with ECUs B and D. Possible trouble may be present in CAN bus line (g) or the power supply system to ECU C.</p>	<p align="right">AC204742 BA</p>
ECU C and ECU D	Trouble in CAN bus line (d)	<p>ECUs C and D communicate with scan tool MB991958 via CAN bus lines (b), (c), (d), (e) and (g). Scan tool MB991958 judges that CAN bus lines (b) and (c) are normal, because it can communicate with ECU B. Possible trouble may be present in CAN bus line (d), (e) or (g) or the power supply system to ECU D. CAN bus line (d) is shared by ECUs C and D when they communicate with scan tool MB991958, so CAN bus line (d) is suspected as ultimate cause. CAN bus line (g) or (e) and power supply systems to ECU C or D are also suspected as second cause.</p>	<p align="right">AC204742 BB</p>
ECU B and ECU D	CAN bus line (e) or (f) or power supply system to ECU B or D	<p>ECUs C and D communicate with scan tool MB991958 via CAN bus lines (b), (c), (d), (e) and (g). Scan tool MB991958 judges that CAN bus lines (b), (c) and (d) are normal, because it can communicate with ECU C. Possible trouble may be present in CAN bus line (f) or (e) or the power supply system to ECU B or D.</p>	<p align="right">AC204742 BC</p>

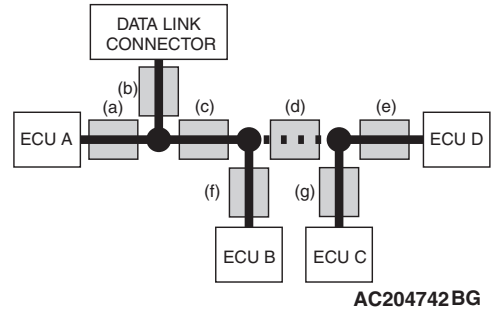
2. If DTC code related to CAN communication is set as past trouble, isolate opens as described below.

*NOTE: If you pinpoint trouble spot according to DTC code, you should use time-out DTC code. DTC code related to failure information is set when the data to be set contains an error, so CAN bus line itself is probably normal.*

*NOTE: Time-out DTC codes are stored in each ECU memory individually. Therefore, it is possible that these DTC codes have not been set simultaneously. If the trouble spot cannot be found when you diagnose by judging from multiple DTC codes, check the communication lines between each ECU.*

DTC CODE TO BE SET	POSSIBLE TROUBLE SPOT	LOGIC FOR DETERMINING TROUBLE SPOT
Time-out DTC code associated with ECU D is stored in ECU A, ECU B and ECU C  Time-out DTC code associated with ECUs A, B and C is stored in ECU D  "Bus off" DTC code is stored in ECU D	Trouble in CAN bus line (e) and power supply system to ECU D	When time-out DTC code associated with ECU D is stored in ECU A, B and C, or time-out DTC code associated with ECUs A, B and C is stored in ECU D, or "bus off" DTC code is stored in ECU D, CAN bus line (e) is suspected. When DTC code is not stored in ECU D, the power supply to ECU D is suspected.  <p style="text-align: right;">AC204742 BD</p>
Time-out DTC code associated with ECU A is stored in ECUs B, C and D  Time-out DTC code associated with ECUs B, C and D is stored in ECU A	Trouble in CAN bus line (a) and power supply system to ECU A	When time-out DTC code associated with ECU A is stored in ECUs B, C and D, or time-out DTC code associated with ECUs B, C and D is stored in ECU A, or "bus off" DTC code is stored in ECU A, CAN bus line (a) or (c) is suspected. When DTC code is not stored in ECU A, the power supply to ECU A is suspected.  <p style="text-align: right;">AC204742 BE</p>
"Bus off" DTC code is stored in ECU A		 <p style="text-align: right;">AC204742 BF</p>

DTC CODE TO BE SET	POSSIBLE TROUBLE SPOT	LOGIC FOR DETERMINING TROUBLE SPOT
Time-out DTC codes associated with ECUs C and D are stored in ECU A and ECU B	Trouble in CAN bus line (d)	If time-out DTC codes associated with ECUs C and D are stored in ECUs A and B, or time-out codes associated with ECUs A and B are stored in ECUs C and D, CAN bus line (d) is suspected. CAN bus line (g) or (e) and power supply systems to ECU C or D are also suspected as second cause.
Time-out DTC codes associated with ECUs A and B are stored in ECU C and ECU D		



# DIAGNOSTIC TROUBLE CODE DIAGNOSIS

M1548304500069

## ON-BOARD DIAGNOSTICS

The CAN is a communication method which the ECUs use in order to communicate each other. The CAN-related diagnostic trouble codes will be stored in the following ECUs, which use the CAN communication.

- ECM <M/T> or PCM <A/T>

- ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system>
- ETACS-ECU
- A/C-ECU
- SRS-ECU
- Combination meter

## HOW TO CONNECT THE SCAN TOOL (MUT-III)

### Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991910: MUT-III Main Harness A

### **⚠ CAUTION**

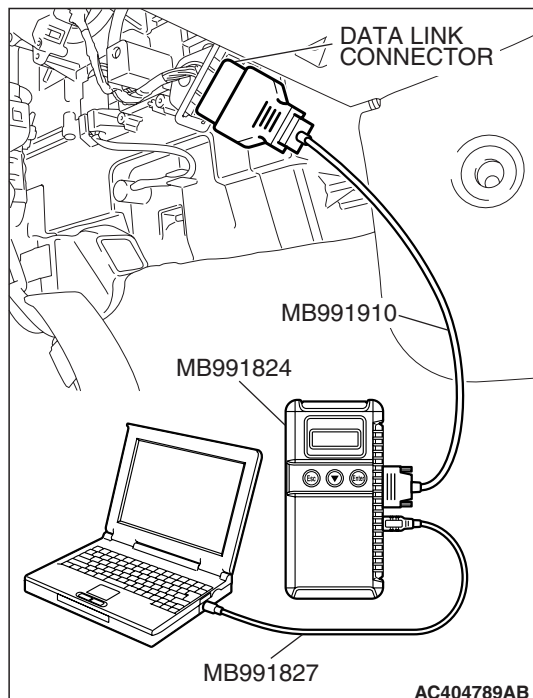
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

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

*NOTE: When special tool MB991824 is energized, special tool MB991824 indicator light will be illuminated in a green color.*

7. Start the MUT-III system on the personal computer.

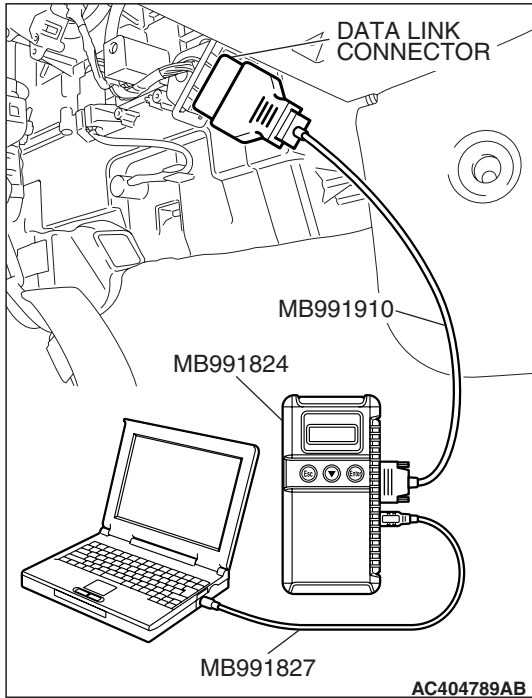
*NOTE: Disconnecting scan tool MB991958 is the reverse of the connecting sequence, making sure that the ignition switch is at the "LOCK" (OFF) position.*



## HOW TO DIAGNOSE THE CAN BUS LINE

### Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991910: MUT-III Main Harness A



**CAUTION**

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

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

# DIAGNOSIS

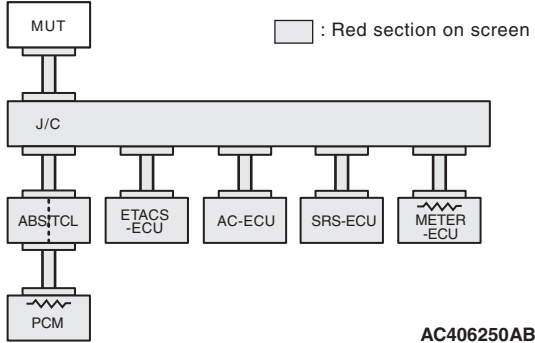
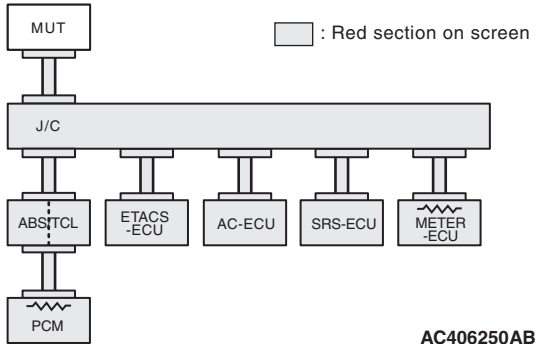
## CAN BUS DIAGNOSTICS TABLE

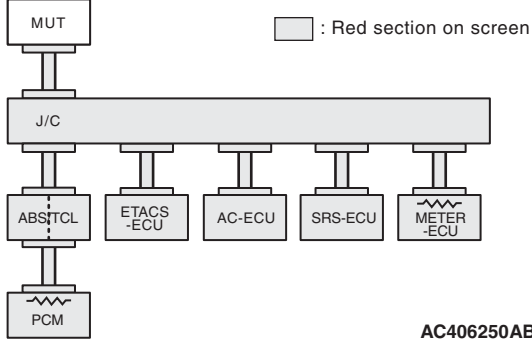
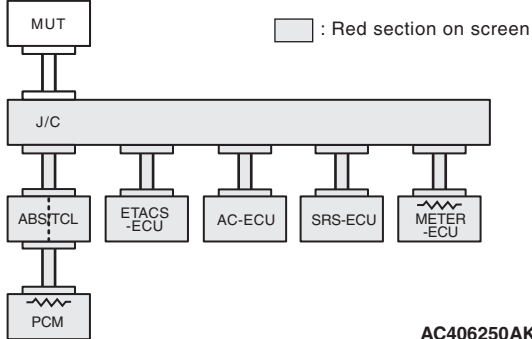
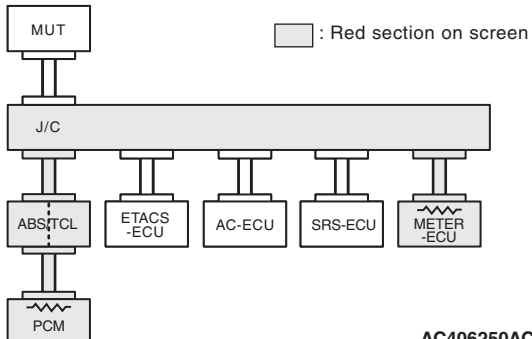
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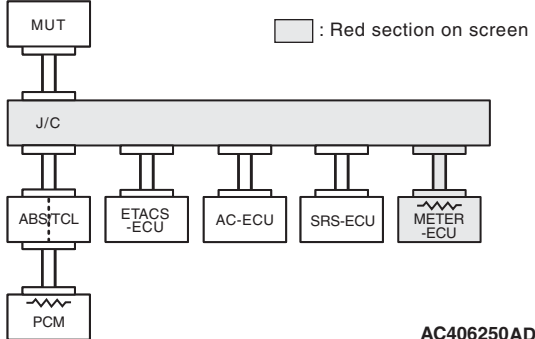
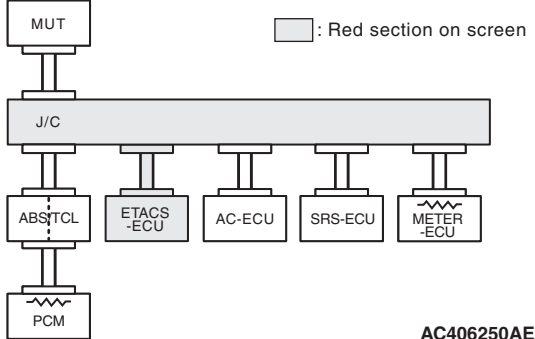
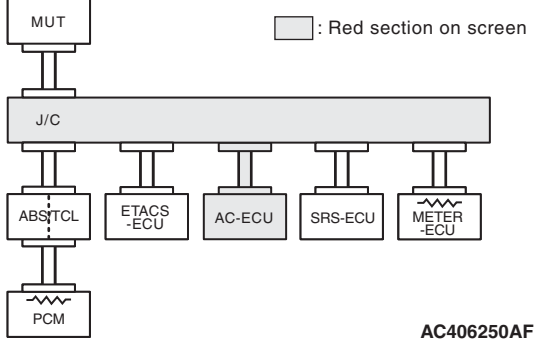
This diagnosis applies only to the CAN bus lines. If a different system is defective, proceed to the applicable diagnosis section for each system. Observe the diagnosis procedure below only when the CAN bus line is defective.

**CAUTION**

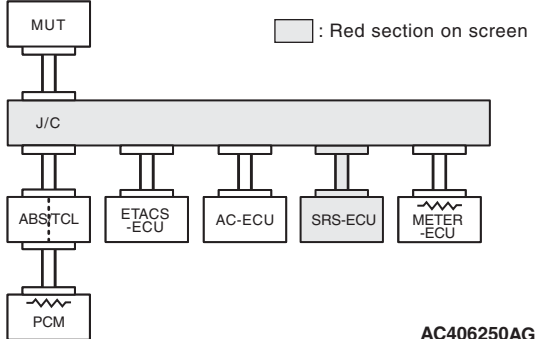
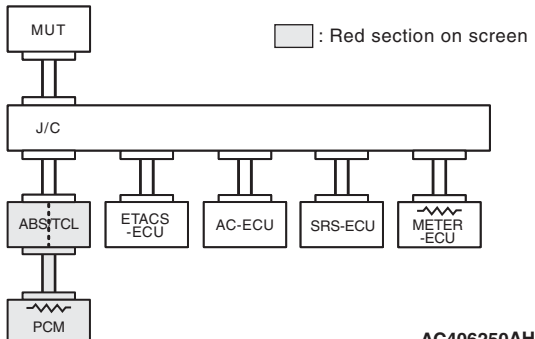
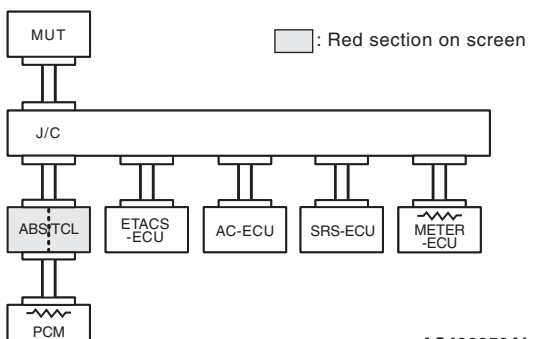
During diagnosis, a DTC code associated with another system may be set when the ignition switch is turned on with connector(s) disconnected. After completing the repair, confirm all systems for DTC code(s). If DTC code(s) are set, erase them all.

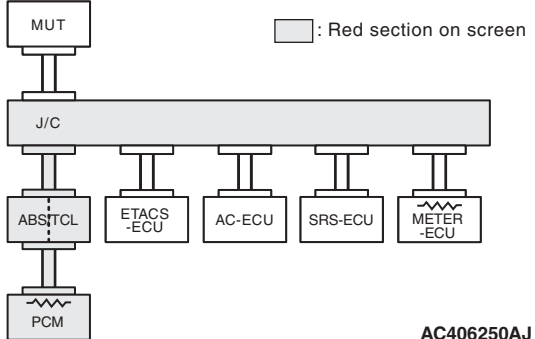
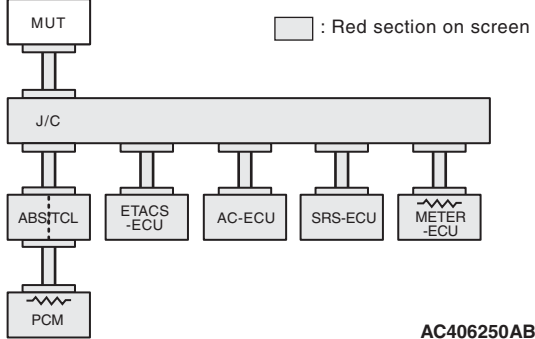
SCAN TOOL SCREEN	DIAGNOSIS DETAIL	REFERENCE PAGE
<p>&lt;Comment&gt; Short circuit to battery in red displayed area is estimated.</p>  <p style="text-align: right;">AC406250AB</p>	<p>Diagnostic Item 1 Diagnose shorts in the power supply to CAN bus line</p>	<p>P.54C-19</p>
<p>&lt;Comment&gt; Grounding in red displayed area is estimated.</p>  <p style="text-align: right;">AC406250AB</p>	<p>Diagnostic Item 2 Diagnose shorts in the ground to CAN bus line</p>	<p>P.54C-42</p>

SCAN TOOL SCREEN	DIAGNOSIS DETAIL	REFERENCE PAGE
<p>&lt;Comment&gt; Short circuit between CAN_H and CAN_L in red displayed area is estimated.</p>  <p align="center">AC406250AB</p>	<p>Diagnostic Item 3 Diagnose shorts between CAN_H and L lines</p>	<p><a href="#">P.54C-66</a></p>
<p>&lt;Comment&gt; Disconnection in red displayed area is estimated.</p>  <p align="center">AC406250AK</p>		
<p>&lt;Comment&gt; Disconnection or terminating resistance in red displayed area is estimated.</p>  <p align="center">AC406250AC</p>	<p>Diagnostic Item 4 Diagnose the terminator resistors</p>	<p><a href="#">P.54C-85</a></p>

SCAN TOOL SCREEN	DIAGNOSIS DETAIL	REFERENCE PAGE
<p>&lt;Comment&gt; Harness disconnection or loose connection in red displayed area is estimated.</p>  <p style="text-align: right;">AC406250AD</p>	<p>Diagnostic Item 5 Diagnose when the scan tool cannot receive the data sent by combination meter.</p>	<p>P.54C-90</p>
<p>&lt;Comment&gt; Harness disconnection or loose connection in red displayed area is estimated.</p>  <p style="text-align: right;">AC406250AE</p>	<p>Diagnostic Item 6 Diagnose when the scan tool cannot receive the data sent by ETACS-ECU.</p>	<p>P.54C-95</p>
<p>&lt;Comment&gt; Harness disconnection or loose connection in red displayed area is estimated.</p>  <p style="text-align: right;">AC406250AF</p>	<p>Diagnostic Item 7 Diagnose when the scan tool cannot receive the data sent by A/C-ECU.</p>	<p>P.54C-100</p>



SCAN TOOL SCREEN	DIAGNOSIS DETAIL	REFERENCE PAGE
<p>&lt;Comment&gt; Harness disconnection or loose connection in red displayed area is estimated.</p>  <p align="center">AC406250AG</p>	<p>Diagnostic Item 8 Diagnose when the scan tool cannot receive the data sent by SRS-ECU.</p>	<p><a href="#">P.54C-106</a></p>
<p>&lt;Comment&gt; Harness disconnection or loose connection in red displayed area is estimated.</p>  <p align="center">AC406250AH</p>	<p>Diagnostic Item 9 Diagnose when the scan tool cannot receive the data sent by the ECM &lt;M/T&gt; or the PCM &lt;A/T&gt;.</p>	<p><a href="#">P.54C-111</a></p>
<p>&lt;Comment&gt; Harness disconnection or loose connection in red displayed area is estimated.</p>  <p align="center">AC406250AI</p>	<p>Diagnostic Item 10 Diagnose when the scan tool cannot receive the data sent by ABS-ECU &lt;vehicles without traction control system&gt; or ABS/TCL-ECU &lt;vehicles with traction control system&gt;.</p>	<p><a href="#">P.54C-120</a></p>

SCAN TOOL SCREEN	DIAGNOSIS DETAIL	REFERENCE PAGE
<p>&lt;Comment&gt; Harness disconnection or loose connection in red displayed area is estimated.</p>  <p style="text-align: right;">AC406250AJ</p>	<p>Diagnostic Item 11 Diagnose when the scan tool cannot receive the data sent by the ECM &lt;M/T&gt; or the PCM &lt;A/T&gt; and ABS-ECU &lt;vehicles without traction control system&gt; or ABS/TCL-ECU &lt;vehicles with traction control system&gt;.</p>	<p>P.54C-121</p>
<p>&lt;Comment&gt; Malfunction in red displayed area is estimated. Please refer to service manual and inspect with 'CAN Detail Diagnosis'.</p>  <p style="text-align: right;">AC406250AB</p>	<p>Diagnostic Item 12 Diagnose CAN bus lines thoroughly</p>	<p>P.54C-131</p>

*NOTE: If the screen other than above is displayed, troubles are present at two or more spots. In this case, diagnose CAN bus lines by referring to the trouble spot pinpoint procedures.*

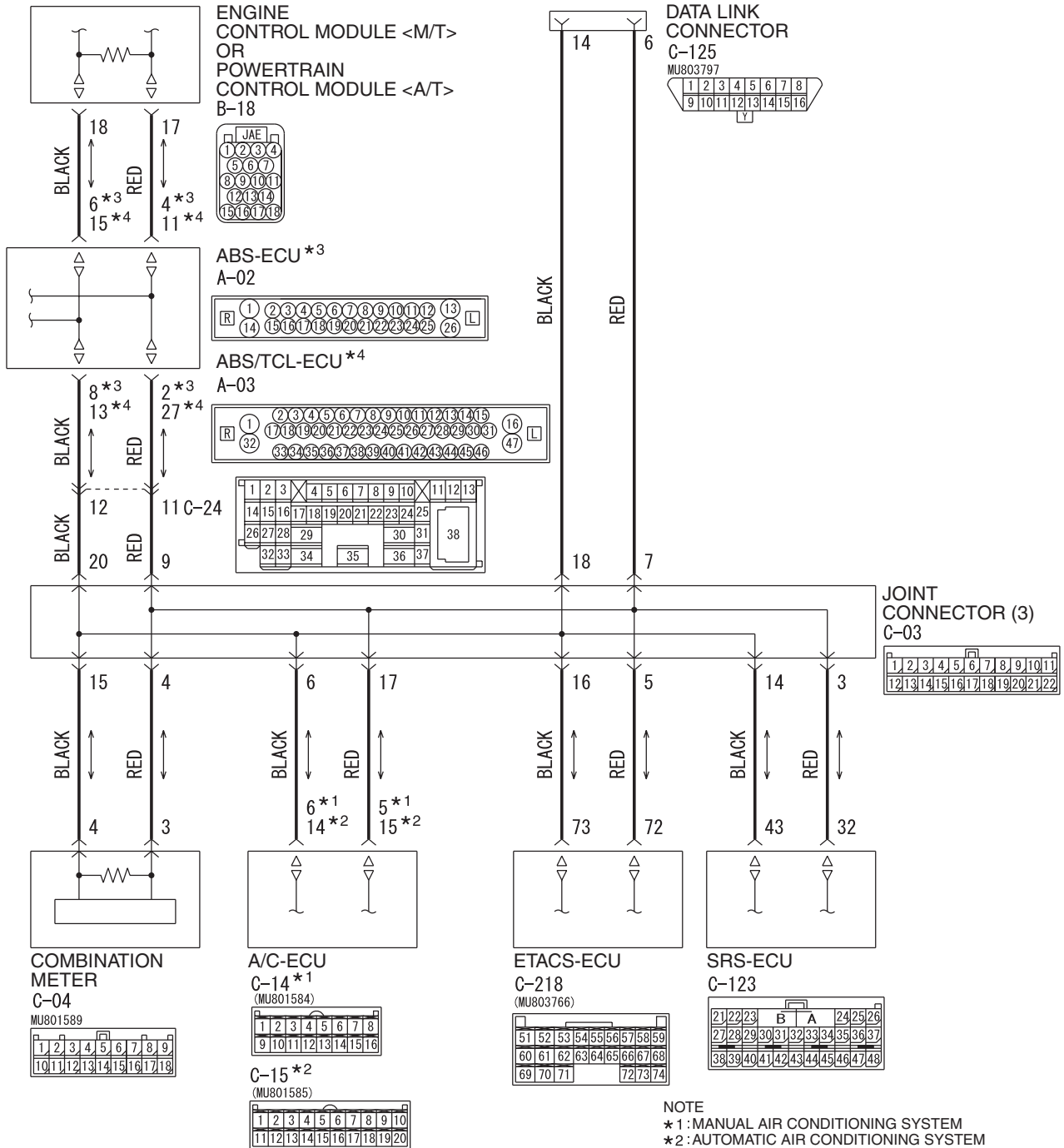
*NOTE: If a trouble cannot be solved after performing the diagnosis other than item 4, diagnose CAN bus line thoroughly.*

CAN BUS DIAGNOSTICS

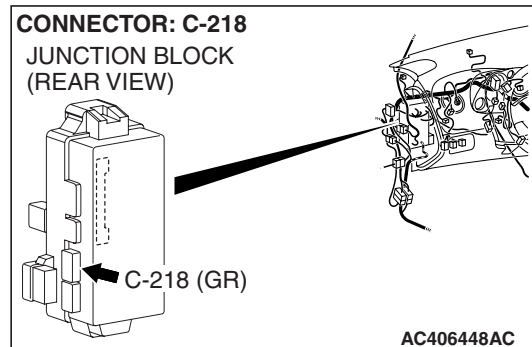
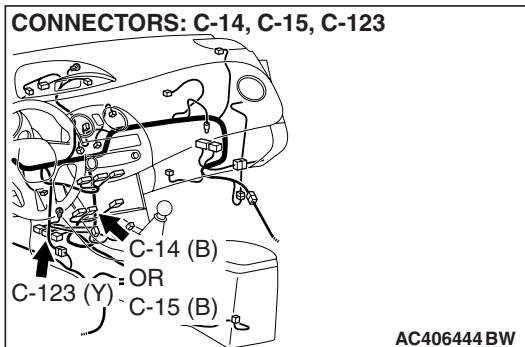
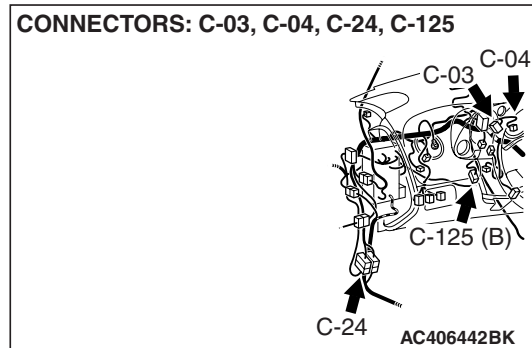
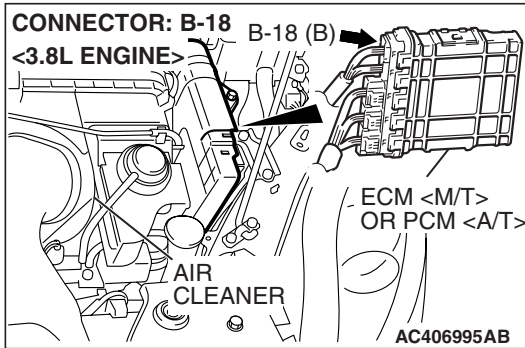
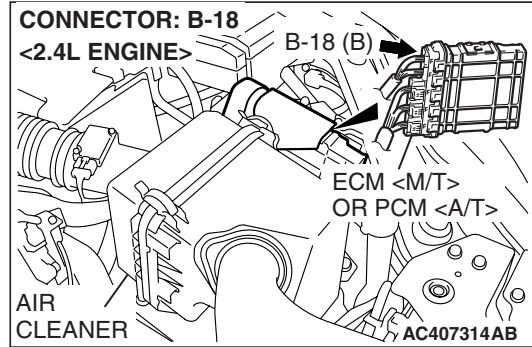
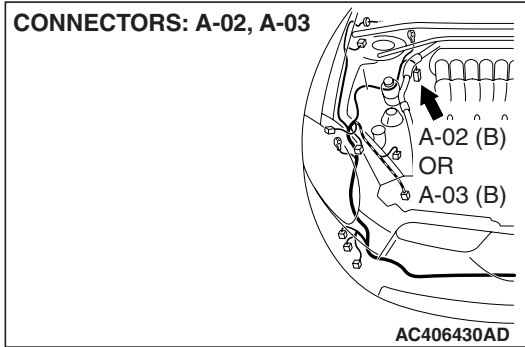
DIAGNOSTIC ITEM 1: Diagnose shorts in the power supply to CAN bus line

**CAUTION**

When servicing a CAN bus line, ground yourself by touching a metal object such as an unpainted water pipe. If you fail to do so, a component connected to the CAN bus line may be damaged.



- NOTE
- \*1: MANUAL AIR CONDITIONING SYSTEM
  - \*2: AUTOMATIC AIR CONDITIONING SYSTEM
  - \*3: VEHICLES WITHOUT TRACTION CONTROL SYSTEM
  - \*4: VEHICLES WITH TRACTION CONTROL SYSTEM



## FUNCTION

when diagnosing the CAN bus lines, the scan tool MB991958 measures the voltage of CAN\_H and CAN\_L line and detects the short to power supply or ground.

## TROUBLE JUDGEMENT CONDITIONS

The scan tool MB991958 judges the trouble when it is impossible to receive the periodically sent data and the voltage of CAN\_H or CAN\_L line is more than 4.0 volts.

## TROUBLESHOOTING HINTS

- The wiring harness may be defective (CAN bus lines for a short to the power supply, combination meter, ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system>, or open circuit in the SRS-ECU ground line).
- Short to power supply of the connector
- Each ECU may be defective (short to power supply in the ECU)

## DIAGNOSIS

### Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable

- MB991910: MUT-III Main Harness A
- MB991970: ABS Check Harness

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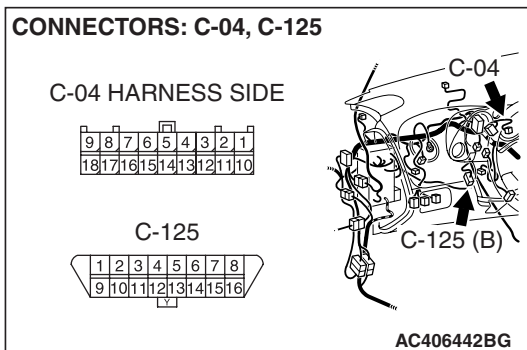
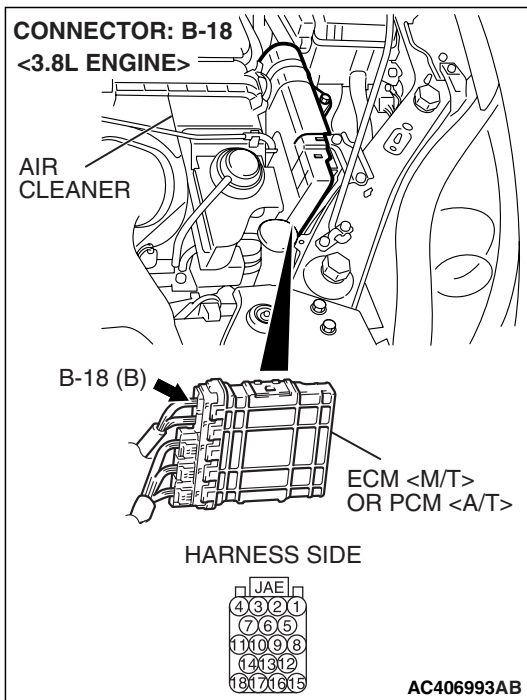
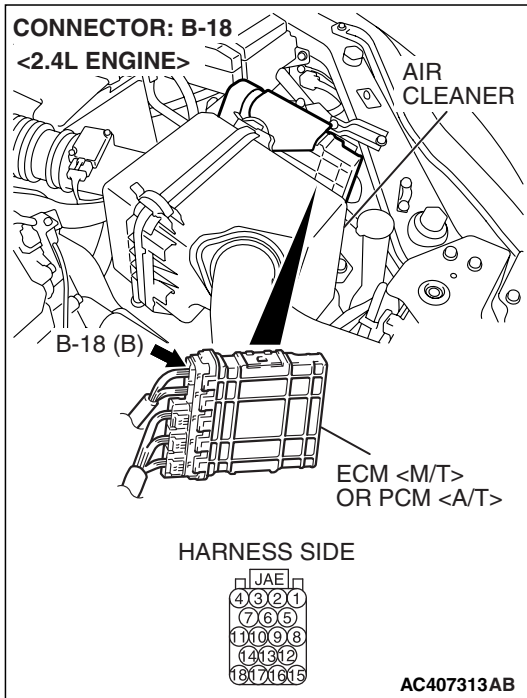
**STEP 1. Check the CAN bus lines for a short to the power supply. Measure the voltage at data link connector C-125.**

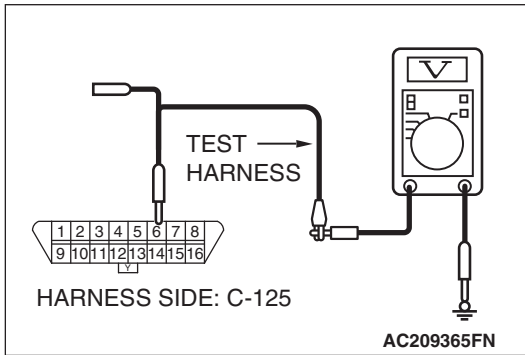
** CAUTION**

- A digital multimeter should be used. For details refer to [P.54C-4](#).
- The test wiring harness should be used. For details refer to [P.54C-4](#).

*NOTE: This inspection allows you to check that there is a short to power supply in either CAN\_H line or CAN\_L line.*

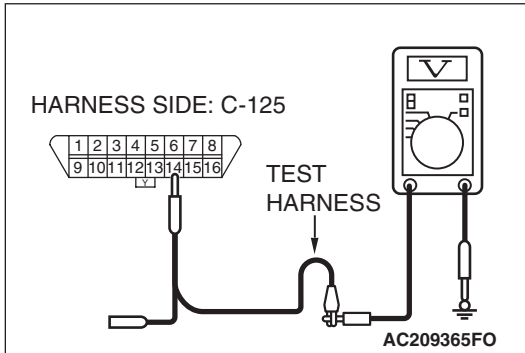
- (1) Disconnect ECM <M/T> or PCM <A/T> connector B-18 and combination meter connector C-04, and measure the voltage at the harness side of data link connector C-125.
- (2) Turn the ignition switch to the "ON" position.





- (3) Measure the voltage between data link connector terminal 6 (CAN\_H) and body ground.

**OK: 4.0 volts or less**



- (4) Measure the voltage between data link connector terminal 14 (CAN\_L) and body ground.

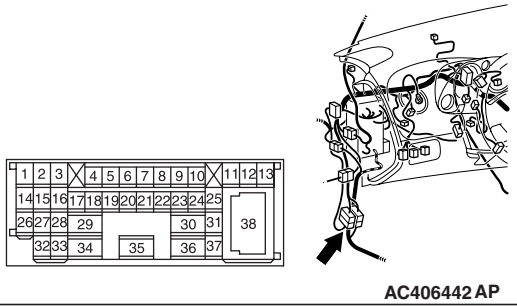
**OK: 4.0 volts or less**

**Q: Is the check result normal?**

**YES** : Go to Step 14.

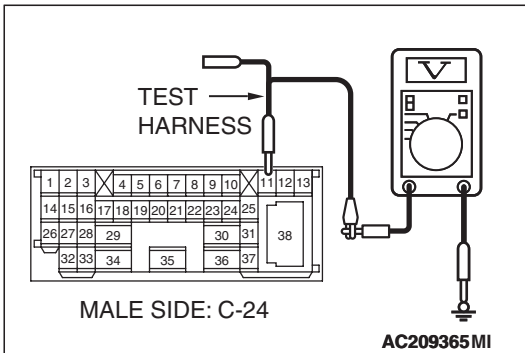
**NO** : Go to Step 2.

CONNECTOR: C-24



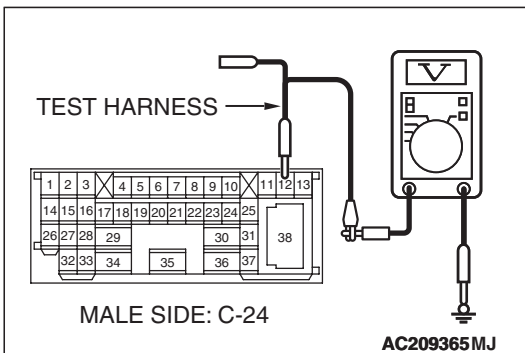
**STEP 2. Check the CAN line of the front wiring harness for a short to the power supply. Measure the voltage at intermediate connector C-24.**

- (1) Disconnect intermediate connector C-24, and measure the voltage at the male side (at front wiring harness side).
- (2) Turn the ignition switch to the "ON" position.



- (3) Measure the voltage between intermediate connector terminal 11 (CAN\_H) and body ground.

**OK: 4.0 volts or less**



- (4) Measure the voltage between intermediate connector terminal 12 (CAN\_L) and body ground.

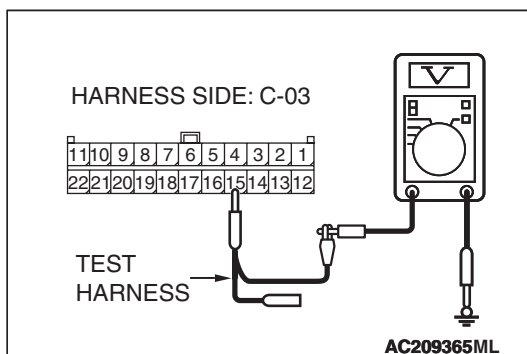
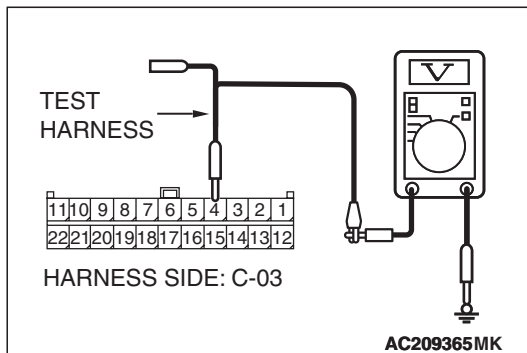
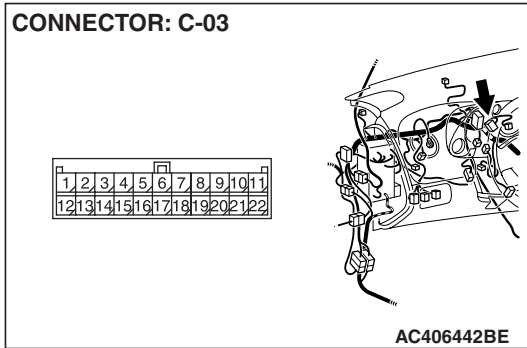
**OK: 4.0 volts or less**

**Q: Is the check result normal?**

**YES :** Go to Step 3.

**NO :** Go to Step 11.





**STEP 3. Check the CAN line between joint connector (3) and the combination meter for a short to the power supply. Measure the voltage at joint connector (3) C-03.**

(1) Disconnect joint connector (3) C-03, and measure the voltage at the wiring harness side of joint connector (3) C-03.

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

(3) Measure the voltage between joint connector (3) terminal 4 (CAN\_H) and body ground.

**OK: 4.0 volts or less**

(4) Measure the voltage between joint connector (3) terminal 15 (CAN\_L) and body ground.

**OK: 4.0 volts or less**

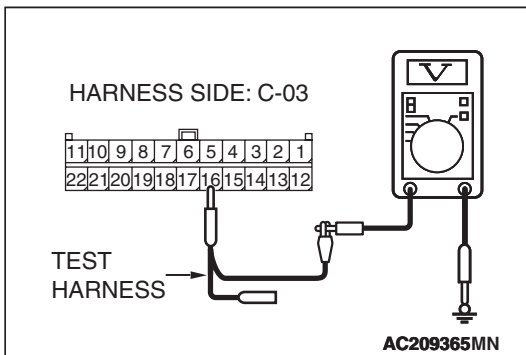
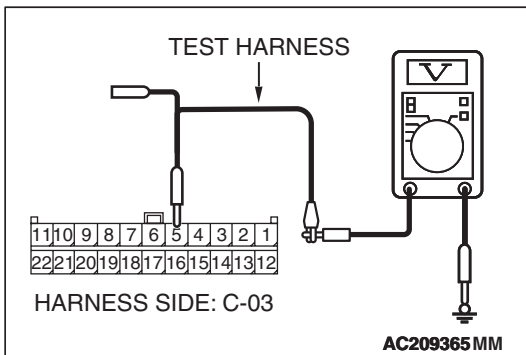
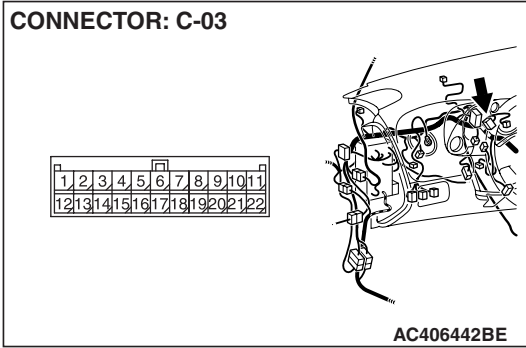
**CAUTION**

Strictly observe the specified wiring harness repair procedure. For details refer to [P.54C-5](#).

**Q: Is the check result normal?**

**YES :** Go to Step 4.

**NO :** Repair the wiring harness between joint connector (3) and the combination meter connector.



**STEP 4. Check the CAN line between joint connector (3) and the ETACS-ECU connector for a short to the power supply. Measure the voltage at joint connector (3) C-03.**

- (1) Disconnect joint connector (3) C-03, and measure the voltage at the wiring harness side of joint connector (3) C-03.
- (2) Turn the ignition switch to the "ON" position.
- (3) Measure the voltage between joint connector (3) terminal 5 (CAN\_H) and body ground.

**OK: 4.0 volts or less**

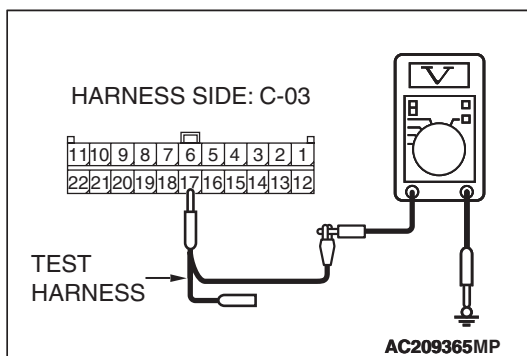
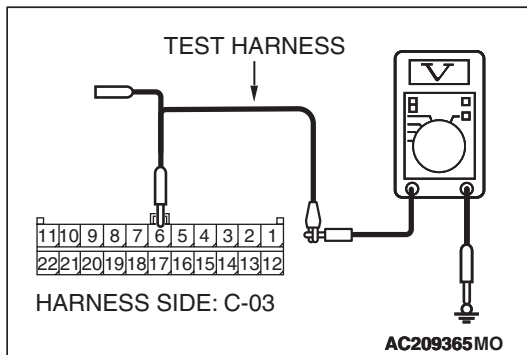
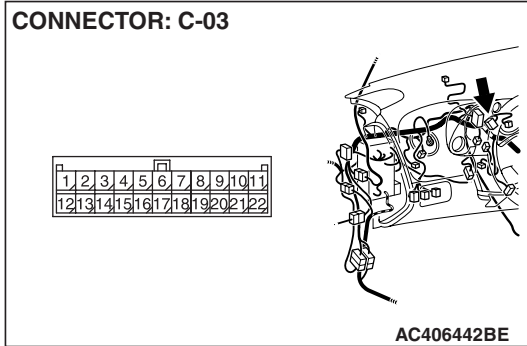
- (4) Measure the voltage between joint connector (3) terminal 16 (CAN\_L) and body ground.

**OK: 4.0 volts or less**

**Q: Is the check result normal?**

**YES :** Go to Step 5.

**NO :** Go to Step 8.



**STEP 5. Check the CAN line between joint connector (3) and the A/C-ECU connector for a short to the power supply. Measure the voltage at joint connector (3) C-03.**

- (1) Disconnect joint connector (3) C-03, and measure the voltage at the wiring harness side of joint connector (3) C-03.
- (2) Turn the ignition switch to the "ON" position.
- (3) Measure the voltage between joint connector (3) terminal 6 (CAN\_H) and body ground.

**OK: 4.0 volts or less**

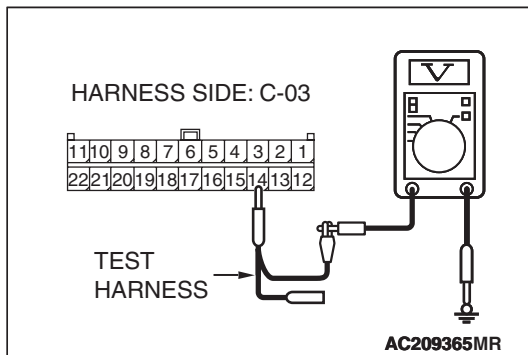
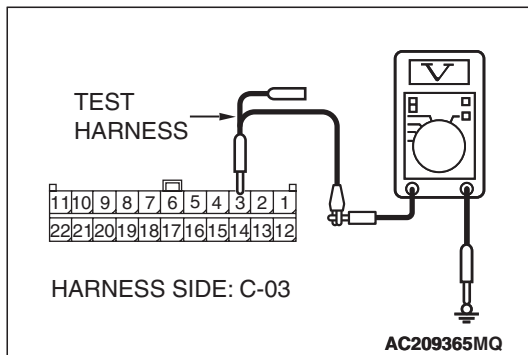
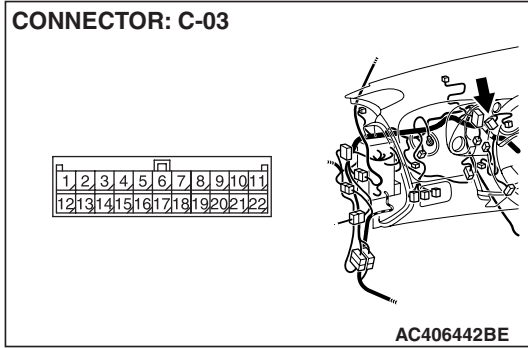
- (4) Measure the voltage between joint connector (3) terminal 17 (CAN\_L) and body ground.

**OK: 4.0 volt or less**

**Q: Is the check result normal?**

**YES :** Go to Step 6.

**NO :** Go to Step 9.



**STEP 6. Check the CAN line between joint connector (3) and the SRS-ECU connector for short to the power supply. Measure the voltage at joint connector (3) C-03.**

(1) Disconnect joint connector (3) C-03, and measure the voltage at the wiring harness side of joint connector (3) C-03.

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

(3) Measure the voltage between joint connector (3) terminal 3 (CAN\_H) and body ground.

**OK: 4.0 volts or less**

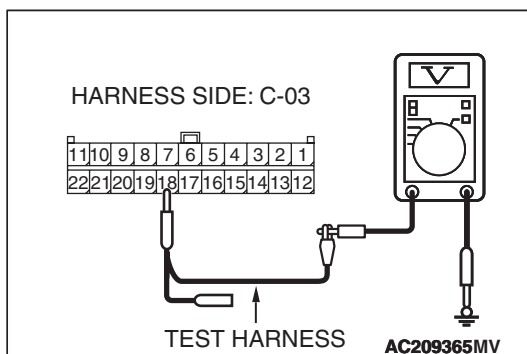
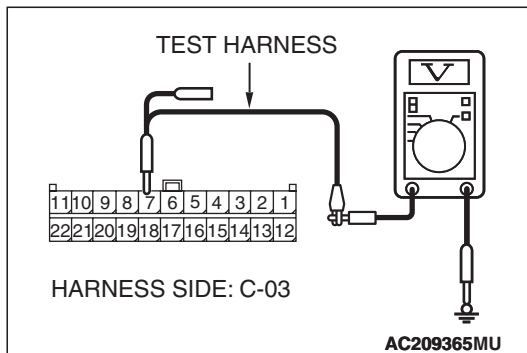
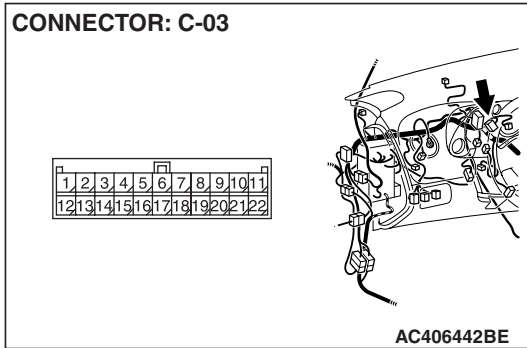
(4) Measure the voltage between joint connector (3) terminal 14 and body ground.

**OK: 4.0 volt or less**

**Q: Is the check result normal?**

**YES :** Go to Step 7.

**NO :** Go to Step 10.



**STEP 7. Check the CAN line between joint connector (3) and the data link connector for a short to the power supply. Measure the voltage at joint connector (3) C-03.**

(1) Disconnect joint connector (3) C-03, and measure the voltage at the wiring harness side of joint connector (3) C-03.

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

(3) Measure the voltage between joint connector (3) terminal 7 (CAN\_H) and body ground.

**OK: 1.0 volt or less**

(4) Measure the voltage between joint connector (3) terminal 18 (CAN\_L) and body ground.

**OK: 1.0 volt or less**

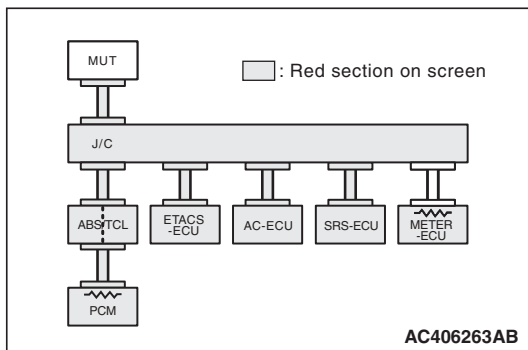
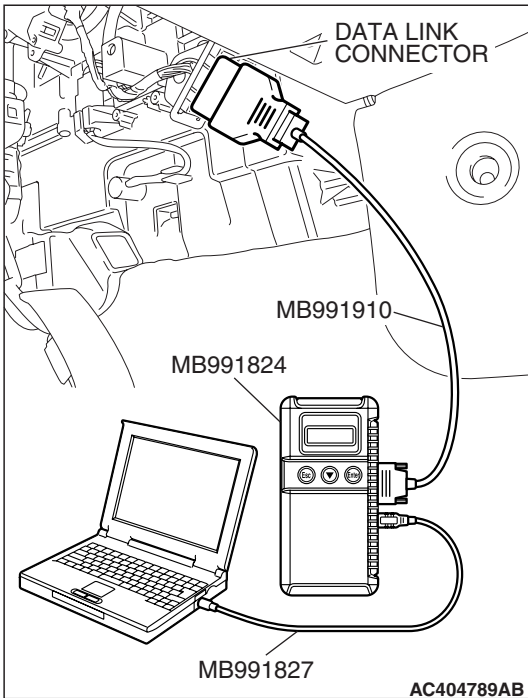
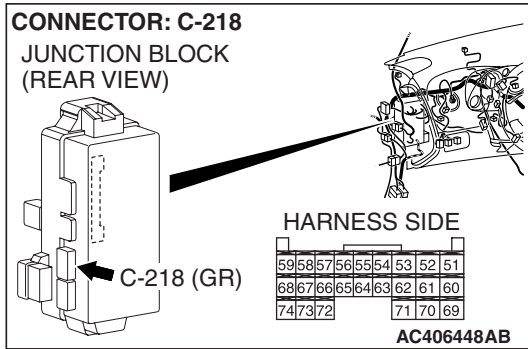
**CAUTION**

Strictly observe the specified wiring harness repair procedure. For details refer to [P.54C-5](#).

**Q: Is the check result normal?**

**YES :** Repair the wiring harness between joint connector (3) and the intermediate connector, or the intermediate connector.

**NO :** Repair the wiring harness between joint connector (3) and the data link connector, or the data link connector.



**STEP 8. Check the ETACS-ECU for a short to the power supply.**

(1) Disconnect ETACS-ECU connector C-218.

**CAUTION**

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

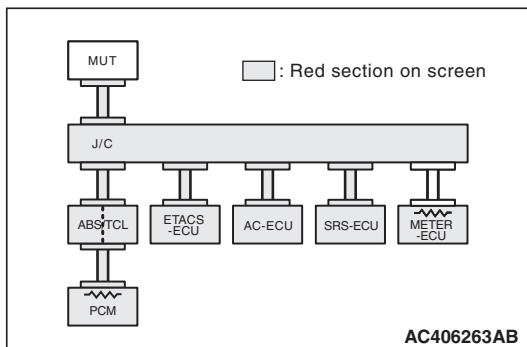
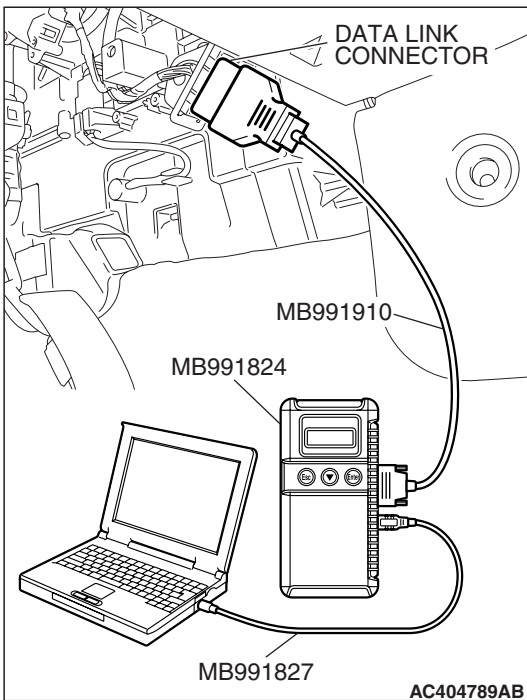
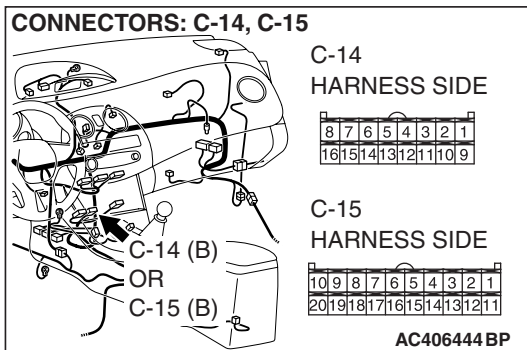
(2) Connect scan tool MB991958 to the data link connector.

(3) Diagnose CAN bus lines, and check if scan tool MB991958 screen is as shown in the illustration.

**Q: Does scan tool MB991958 screen correspond to the illustration?**

**YES :** Repair the wiring harness between joint connector (3) and the ETACS-ECU connector.

**NO :** Check the ETACS-ECU connector, and repair if necessary. If the ETACS-ECU connector is in good condition, replace the ETACS-ECU. When the ETACS-ECU is replaced, register the encrypted code. Refer to GROUP 54A, Encrypted Code Registration Criteria Table P.54A-13.



**STEP 9. Check the A/C-ECU for a short to the power supply.**

- (1) Disconnect A/C-ECU connector C-14 <manual air conditioning system> or C-15 <automatic air conditioning system>.

**CAUTION**

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

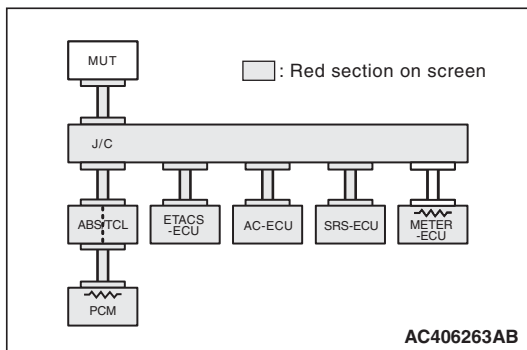
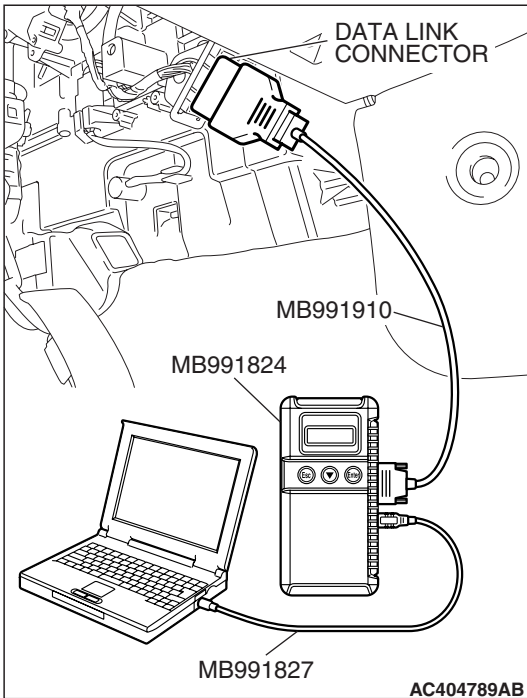
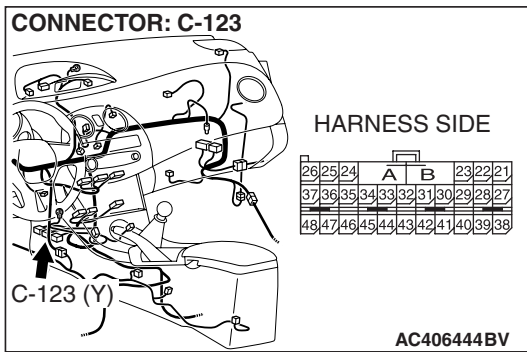
- (2) Connect scan tool MB991958 to the data link connector.

- (3) Diagnose CAN bus lines, and check if scan tool MB991958 screen is as shown in the illustration.

**Q: Does scan tool MB991958 screen correspond to the illustration?**

**YES :** Repair the wiring harness between joint connector (3) and the A/C-ECU connector.

**NO :** Check the A/C-ECU connector, and repair if necessary. If the A/C-ECU connector is in good condition, replace the A/C-ECU.



**STEP 10. Check the SRS-ECU for a short to the power supply.**

(1) Disconnect SRS-ECU connector C-123.

**CAUTION**

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

(2) Connect scan tool MB991958 to the data link connector.

(3) Diagnose CAN bus lines, and check if scan tool MB991958 screen is as shown in the illustration.

**Q: Does scan tool MB991958 screen correspond to the illustration?**

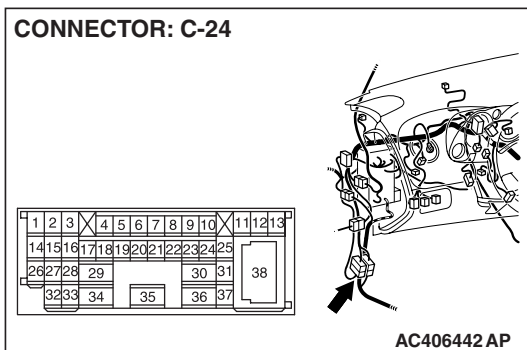
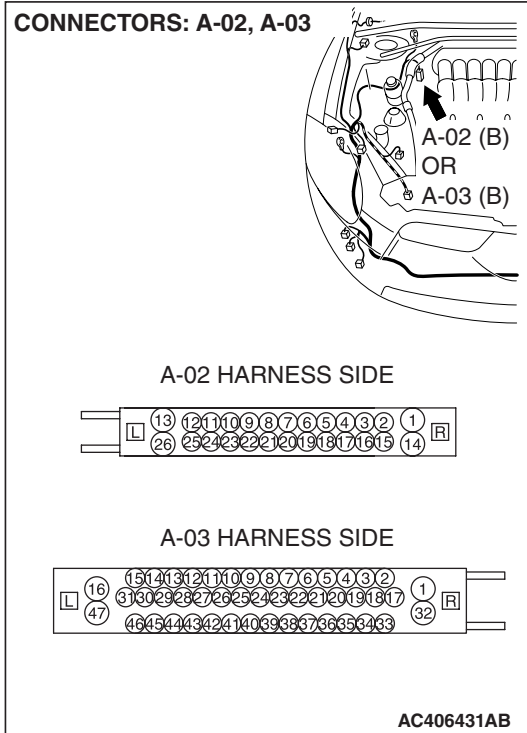
**YES :** Repair the wiring harness between joint connector (3) and the SRS-ECU connector.

**NO :** Check the SRS-ECU connector, and repair if necessary. If the SRS-ECU connector is in good condition, refer to GROUP 52B, Supplemental restraint system –SRS Air Bag Diagnosis P.52B-376.



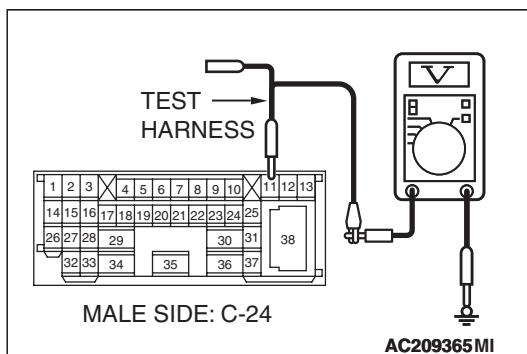
**STEP 11. Check the CAN line between intermediate connector C-24 and ABS-ECU connector <vehicles without traction control system> or ABS/TCL-ECU <vehicles with TLC> connector for a short to the power supply. Measure the voltage at intermediate connector C-24.**

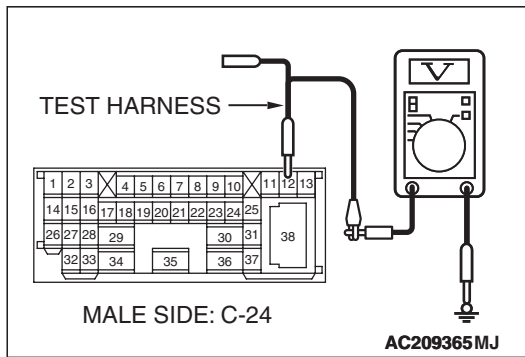
- (1) Disconnect intermediate connector C-24 and ABS-ECU connector A-02 <vehicles without traction control system> or ABS/TCL-ECU connector A-03 <vehicles with traction control system>, and measure the voltage at the male side of intermediate connector C-24 (at front wiring harness side).
- (2) Turn the ignition switch to the "ON" position.



- (3) Measure the voltage between intermediate connector terminal 11 (CAN\_H) and body ground.

**OK: 1.0 volt or less**





- (4) Measure the voltage between intermediate connector terminal 12 (CAN\_L) and body ground.

**OK: 1.0 volt or less**

**CAUTION**

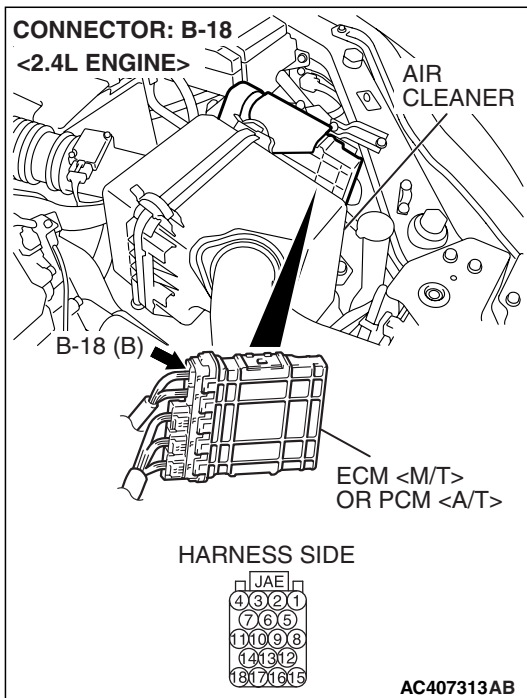
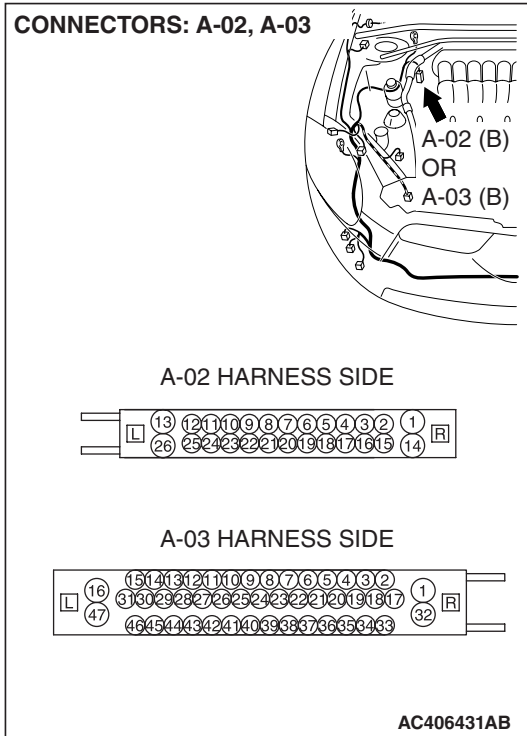
Strictly observe the specified wiring harness repair procedure. For details refer to [P.54C-5](#).

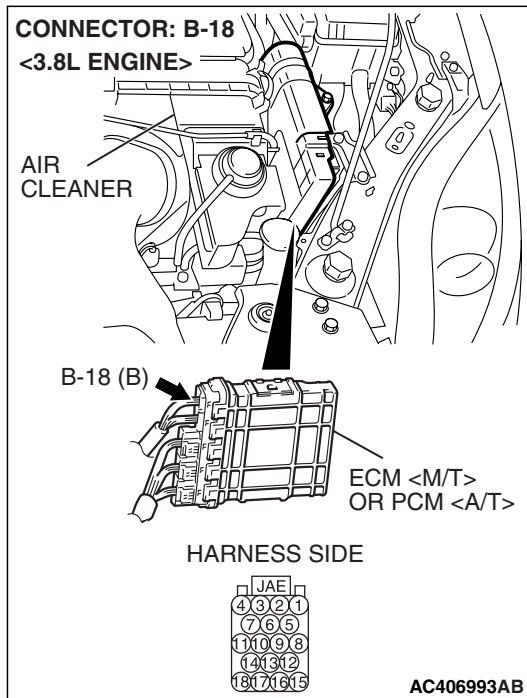
**Q: Is the check result normal?**

**YES** : Go to Step 12.

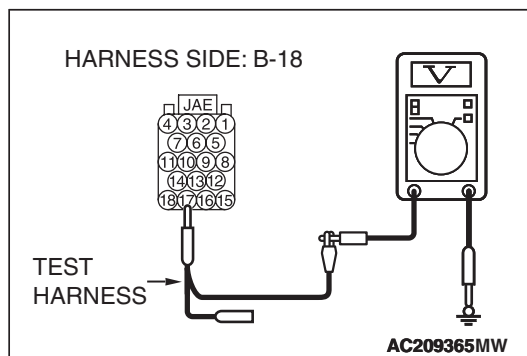
**NO** : Repair the wiring harness.

**STEP 12.** Check the CAN line between the ECM <M/T> or PCM <A/T> connector and ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> connector for a short to the power supply. Measure voltage at ECM <M/T> or PCM <A/T> connector B-18.



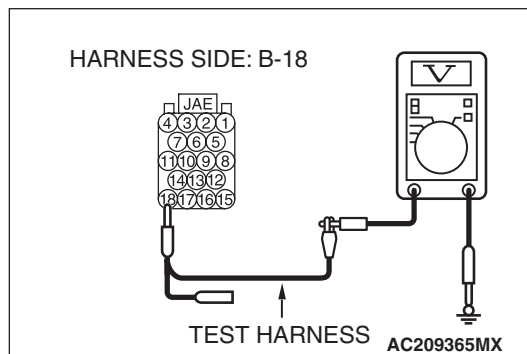


- (1) Disconnect ECM <M/T> or PCM <A/T> connector B-18 and ABS-ECU connector A-02 <vehicles without traction control system> or ABS/TCL-ECU connector A-03 <vehicles with traction control system>, and measure the voltage at the harness side of ECM <M/T> or PCM <A/T> connector B-18.
- (2) Turn the ignition switch to the "ON" position.



- (3) Measure the voltage between ECM <M/T> or PCM <A/T> connector terminal 17 (CAN\_H) and body ground.

**OK: 1.0 volt or less**



- (4) Measure the voltage between ECM <M/T> or PCM <A/T> connector terminal 18 (CAN\_L) and body ground.

**OK: 1.0 volt or less**

**CAUTION**

Strictly observe the specified wiring harness repair procedure. For details refer to [P.54C-5](#).

**Q: Is the check result normal?**

**YES** : Go to Step 13.

**NO** : Repair the wiring harness between ECM <M/T> or PCM <A/T> connector and ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> connector.

**STEP 13. Retest the system.**

**⚠ CAUTION**

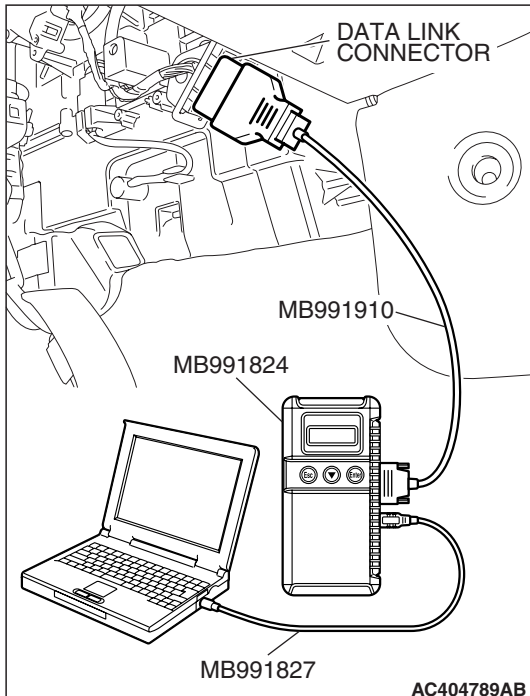
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

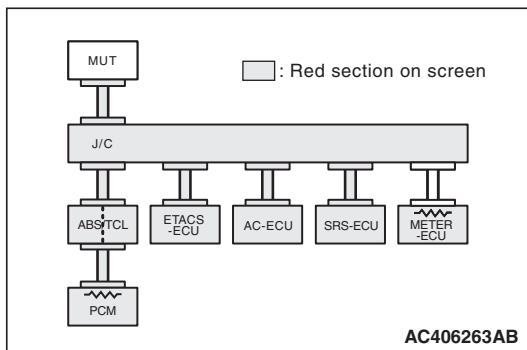
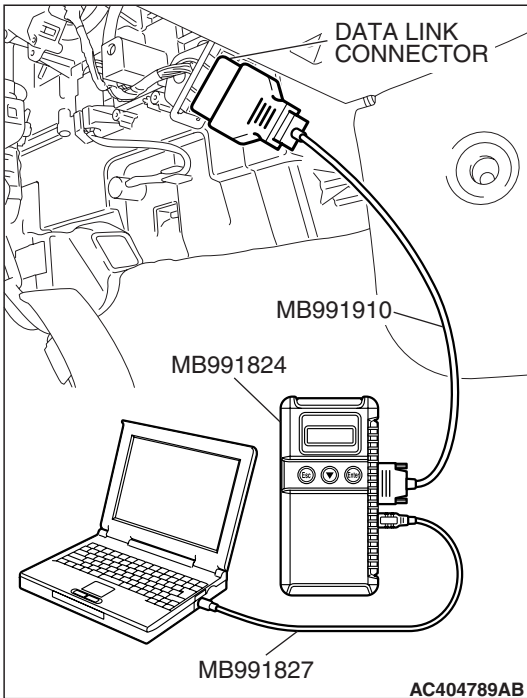
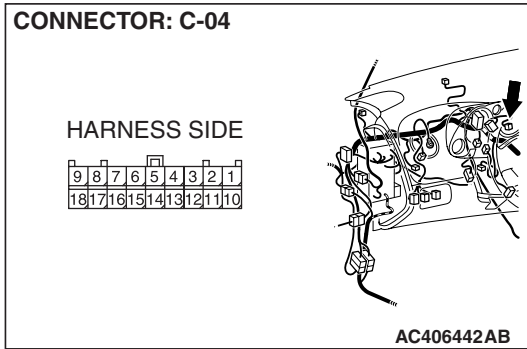
- (1) Connect scan tool MB991958 to the data link connector.
- (2) Diagnose CAN bus lines, and check if scan tool MB991958 screen shows normal state.

**Q: Is the check result normal?**

**YES :** Intermittent malfunction.

**NO :** Check the ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> connector, and repair if necessary. If the ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> connector is in good condition, refer to GROUP 35B, Anti-skid Braking System –Diagnosis [P.35B-119](#).





**STEP 14. Check the combination meter for a short to the power supply.**

(1) Disconnect combination meter connector C-04.

**CAUTION**

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

(2) Connect scan tool MB991958 to the data link connector.

(3) Diagnose CAN bus lines, and check if scan tool MB991958 screen is as shown in the illustration.

**Q: Does scan tool MB991958 screen correspond to the illustration?**

**YES :** Go to Step 15.

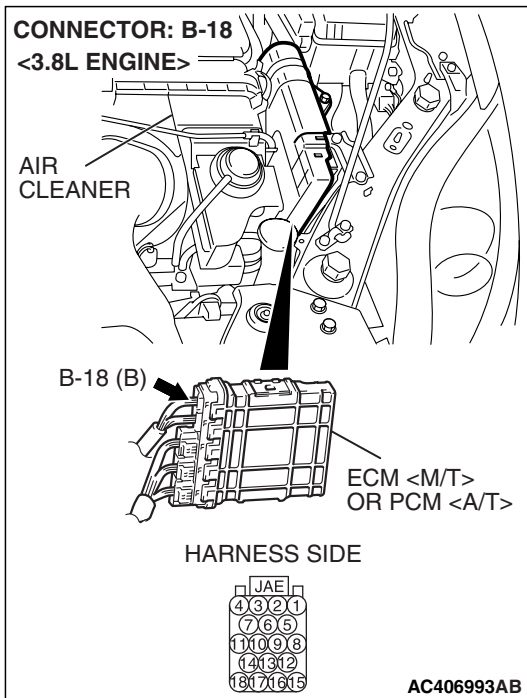
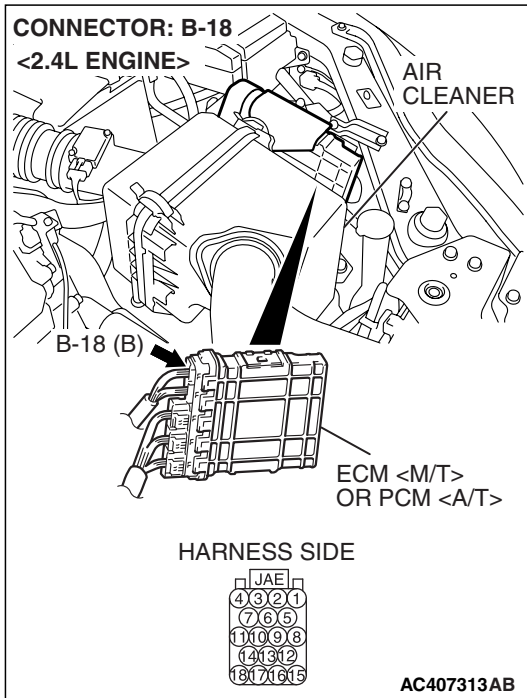
**NO :** Go to Step 16.

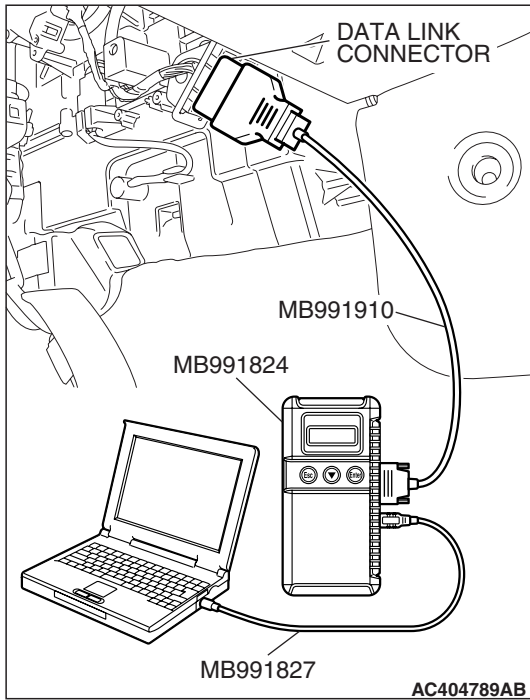
**STEP 15. Check the ECM <M/T> or PCM <A/T> connector for a short to the power supply.**

(1) Disconnect ECM <M/T> or PCM <A/T> connector B-18.

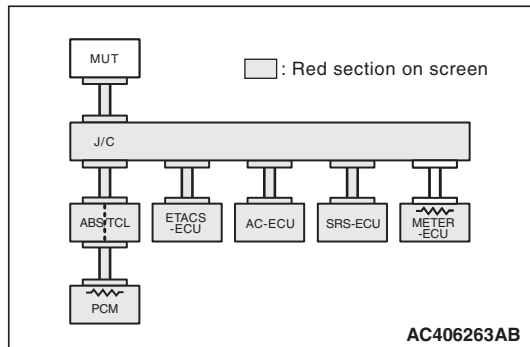
**CAUTION**

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





(2) Connect scan tool MB991958 to the data link connector.



(3) Diagnose CAN bus lines, and check if scan tool MB991958 screen is as shown in the illustration.

**Q: Does scan tool MB991958 screen correspond to the illustration?**

**YES :** Intermittent malfunction.

**NO :** Go to Step 17.



**STEP 16. Retest the system.**

**⚠ CAUTION**

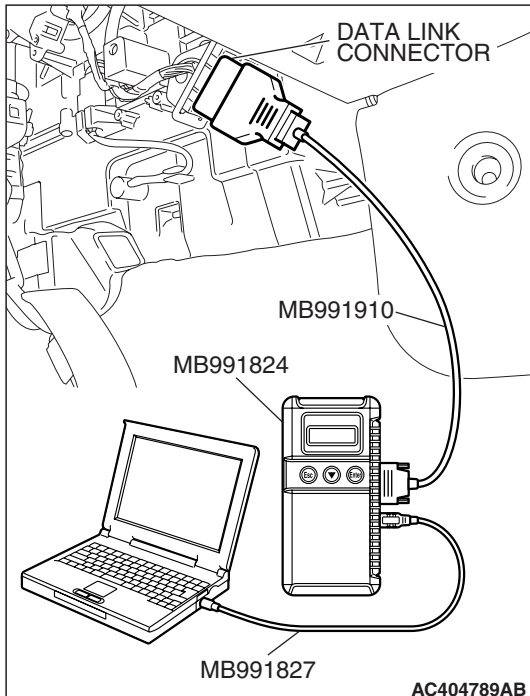
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Diagnose CAN bus lines, and check if scan tool MB991958 screen shows normal state.

**Q: Is the check result normal?**

**YES :** Intermittent malfunction.

**NO :** Check the combination meter connector, and repair if necessary. If the combination meter connector is in good condition, refer to GROUP 54A, Chassis Electrical –Combination Meter –Troubleshooting P.54A-96.



**STEP 17. Retest the system.**

**⚠ CAUTION**

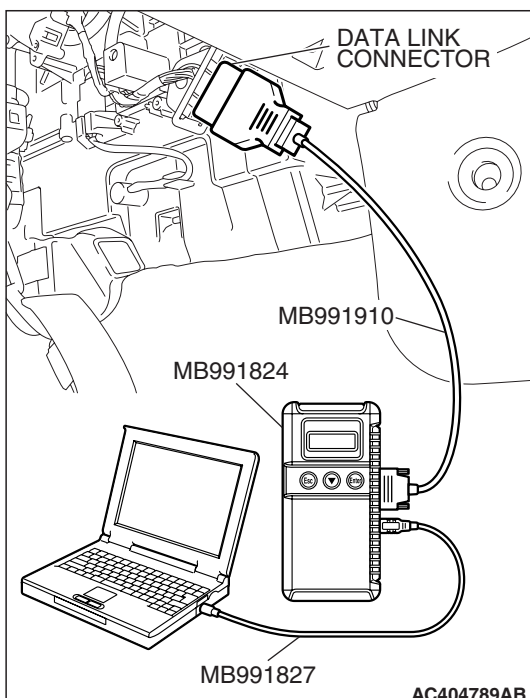
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Diagnose CAN bus lines, and check if scan tool MB991958 screen shows normal state.

**Q: Is the check result normal?**

**YES :** Intermittent malfunction.

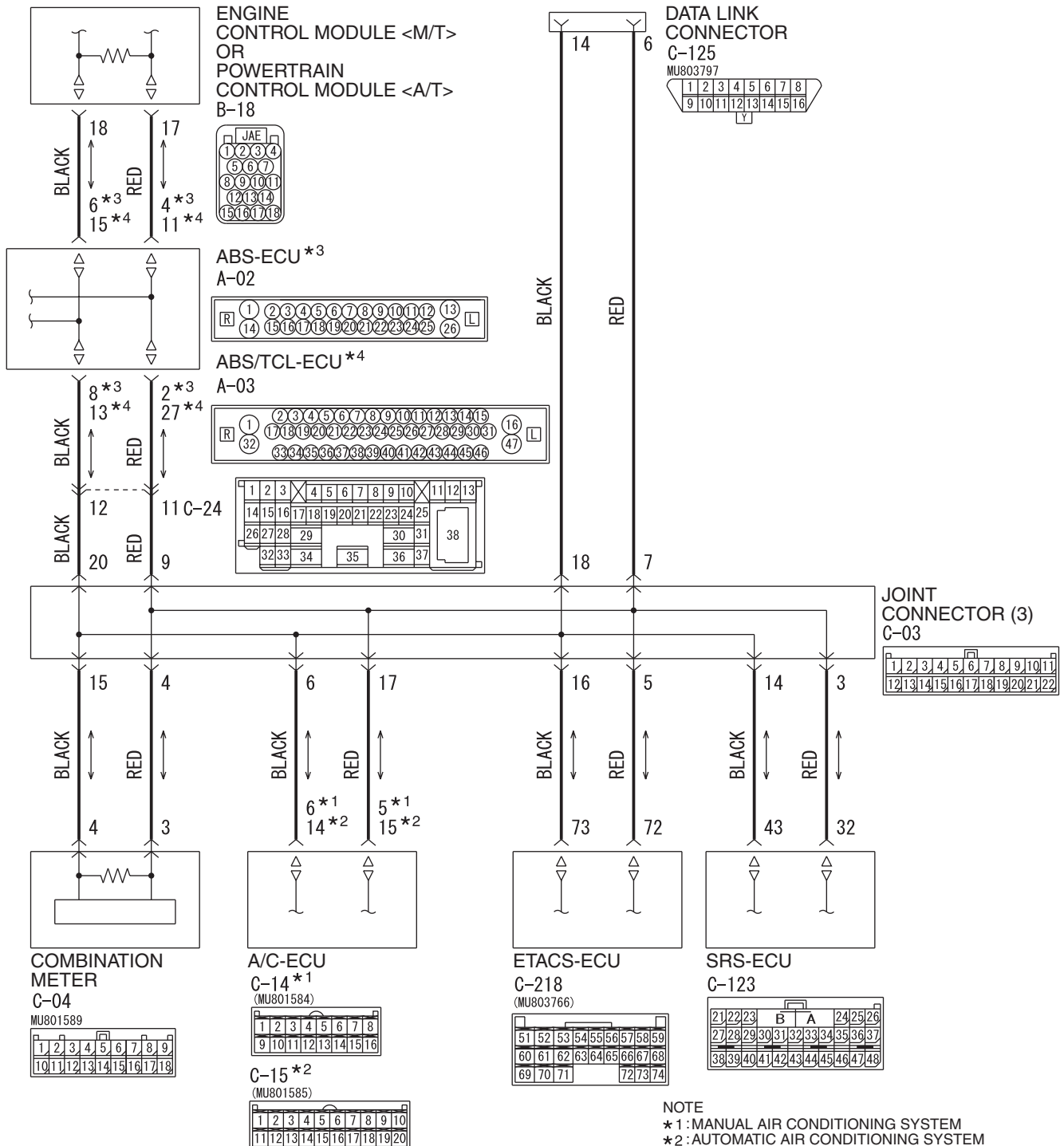
**NO :** Check the ECM <M/T> or PCM <A/T> connector, and repair if necessary. If the ECM <M/T> or PCM <A/T> connector is in good condition, replace the ECM <M/T> or PCM <A/T>. When the ECM <M/T> or PCM <A/T> is replaced, register the encrypted code. Refer to GROUP 54A, Encrypted Code Registration Criteria Table P.54A-13.

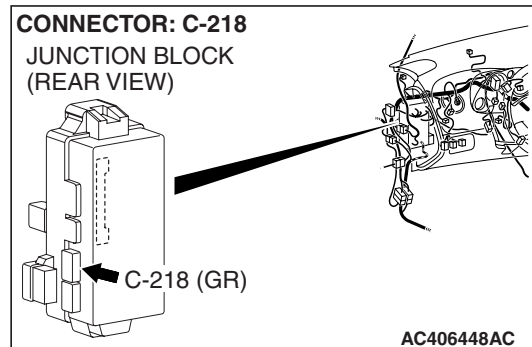
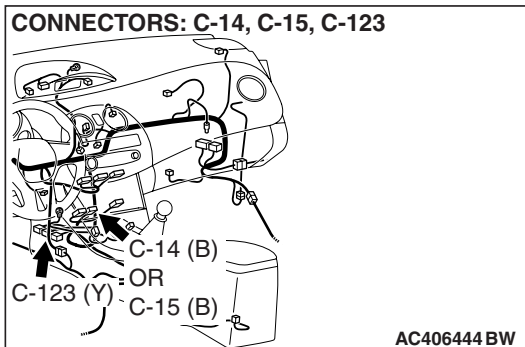
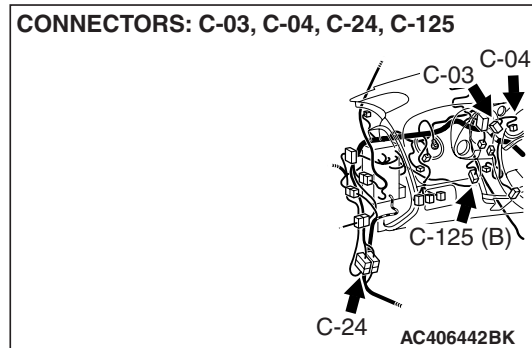
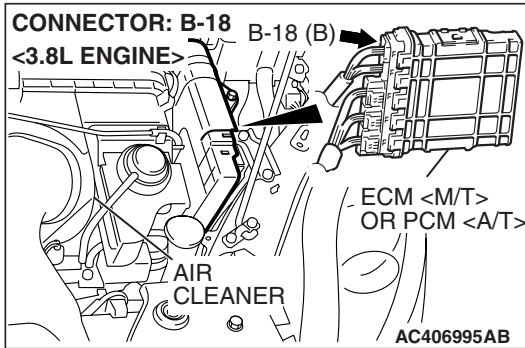
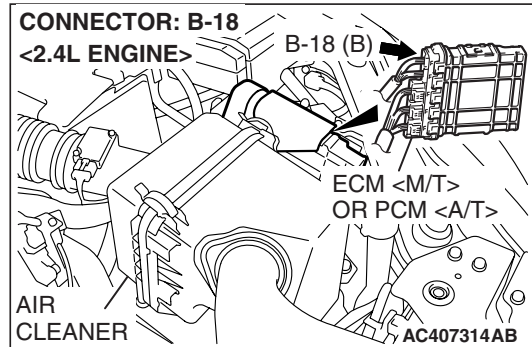
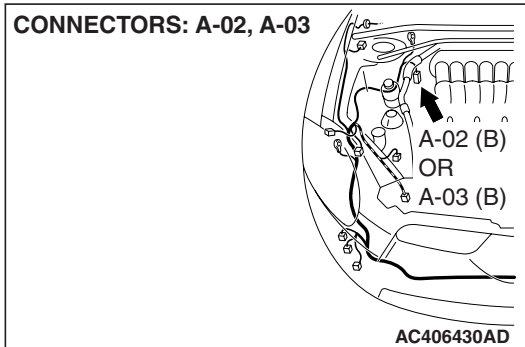


DIAGNOSTIC ITEM 2: Diagnose shorts in the ground to CAN bus line

**CAUTION**

When servicing a CAN bus line, ground yourself by touching a metal object such as an unpainted water pipe. If you fail to do so, a component connected to the CAN bus line may be damaged.





## FUNCTION

when diagnosing the CAN bus lines, the scan tool MB991958 measures the voltage of CAN\_H and CAN\_L line and detects the short to power supply or ground.

## TRUBLE JUDGEMENT CONDITIONS

The scan tool MB991958 judges the trouble when it is impossible to receive the periodically sent data and the voltage of CAN\_H or CAN\_L line is less than 1.0 volt.

## TROUBLESHOOTING HINTS

- The wiring harness may be defective (CAN bus lines or the wiring harness between the data link connector and joint connector (3) for short to ground)
- The connectors may be defective (short to ground in the connector)
- Each ECU may be defective (short to ground in the ECU)

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

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991910: MUT-III Main Harness A
- MB991970: ABS Check Harness

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**STEP 1. Check the CAN bus lines for short to ground. Measure the resistance at data link connector C-125.**

**⚠ CAUTION**

- A digital multimeter should be used. For details refer to [P.54C-4](#).
- The test wiring harness should be used. For details refer to [P.54C-4](#).

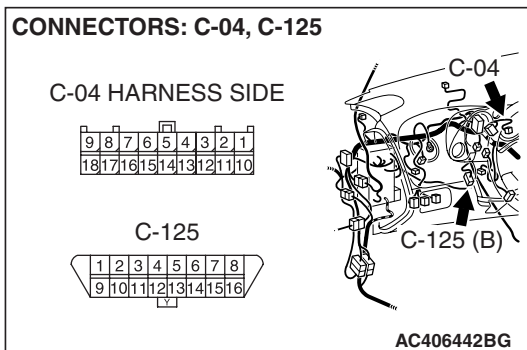
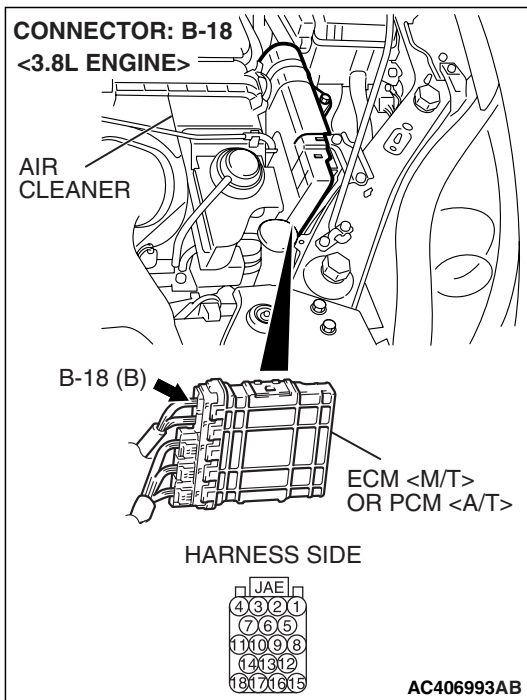
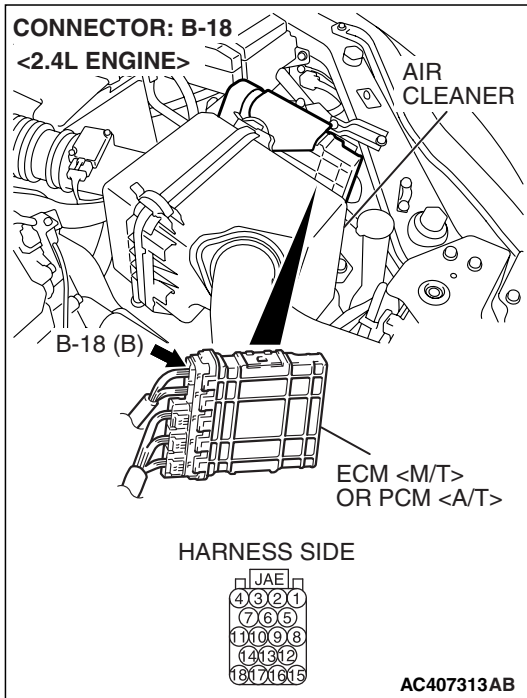
*NOTE: This inspection allows you to check that there is a short to ground in either CAN\_H line or CAN\_L line.*

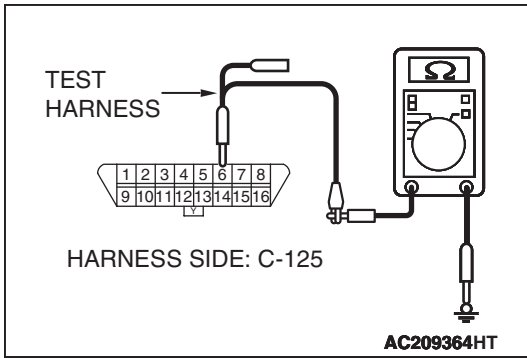
**⚠ CAUTION**

**Disconnect the negative battery terminal. For details refer to [P.54C-4](#).**

(1) Disconnect the negative battery terminal.

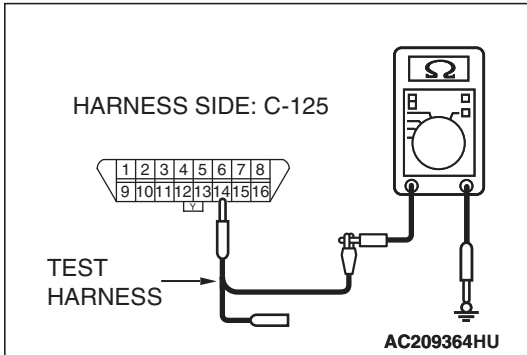
- (2) Disconnect ECM <M/T> or PCM <A/T> connector B-18 and combination meter connector C-04, and measure the resistance at the harness side of data link connector C-125.





- (3) Measure the resistance between data link connector terminal 6 (CAN\_H) and body ground.

**OK: 1 k $\Omega$  or more**



- (4) Measure the resistance between data link connector terminal 14 (CAN\_L) and body ground.

**OK: 1 k $\Omega$  or more**

**Q: Is the check result normal?**

**YES :** Go to Step 14.

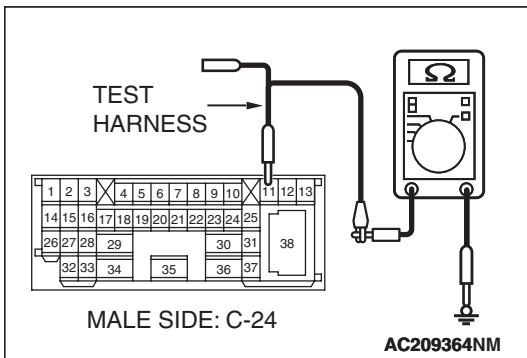
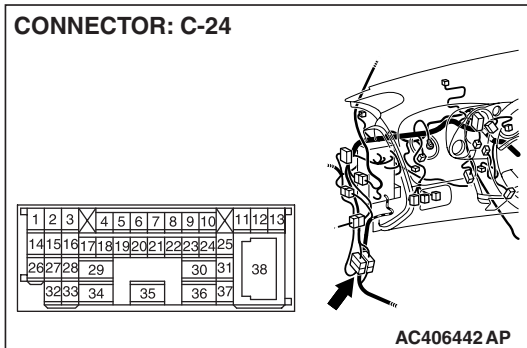
**NO :** Go to Step 2.

**STEP 2. Check the CAN bus line of the front wiring harness for short to ground. Measure the resistance at intermediate connector C-24.**

**⚠ CAUTION**

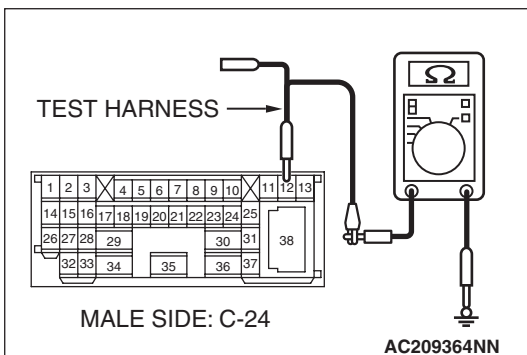
**Disconnect the negative battery terminal. For details refer to P.54C-4.**

- (1) Disconnect the negative battery terminal.
- (2) Disconnect intermediate connector C-24, and measure the resistance at the male side (at front wiring harness side).



- (3) Measure the resistance between intermediate connector terminal 11 (CAN\_H) and body ground.

**OK: 1 kΩ or more**



- (4) Measure the resistance between intermediate connector terminal 12 (CAN\_L) and body ground.

**OK: 1 kΩ or more**

**Q: Is the check result normal?**

**YES :** Go to Step 3.

**NO :** Go to Step 11.

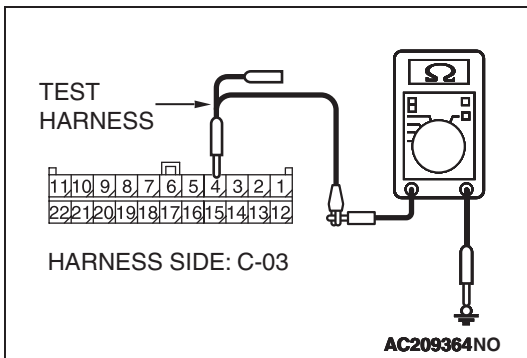
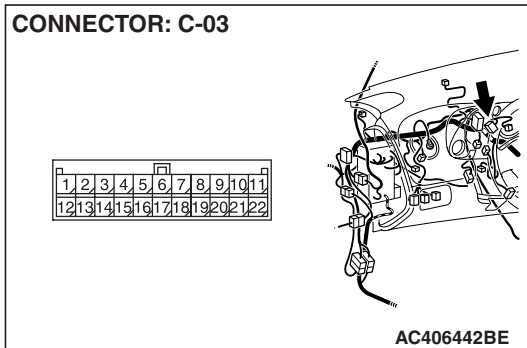


**STEP 3. Check the CAN line between joint connector (3) and the combination meter for short to ground. Measure the resistance at joint connector (3) C-03.**

**⚠ CAUTION**

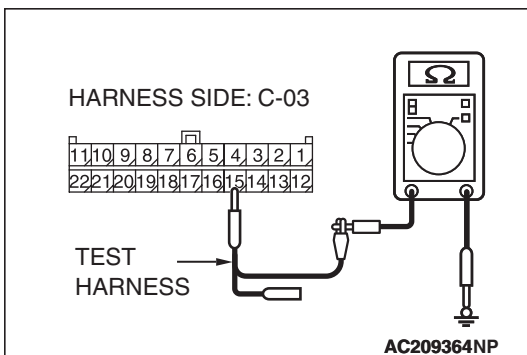
**Disconnect the negative battery terminal. For details refer to P.54C-4.**

- (1) Disconnect the negative battery terminal.
- (2) Disconnect joint connector (3) C-03, and measure the resistance at the wiring harness side of joint connector (3) C-03.



- (3) Measure the resistance between joint connector (3) terminal 4 (CAN\_H) and body ground.

**OK: 1 kΩ or more**



- (4) Measure the resistance between joint connector (3) terminal 15 (CAN\_L) and body ground.

**OK: 1 kΩ or more**

**⚠ CAUTION**

**Strictly observe the specified wiring harness repair procedure. For details refer to P.54C-5.**

**Q: Is the check result normal?**

**YES** : Go to Step 4.

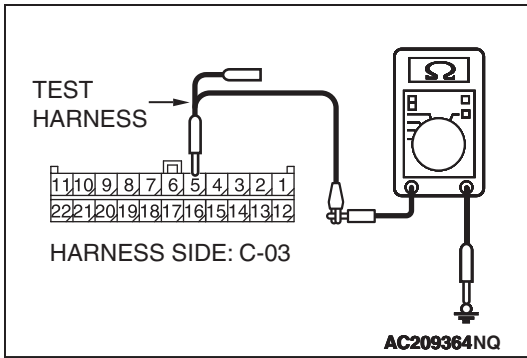
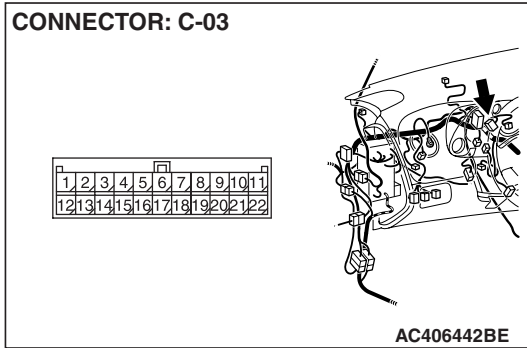
**NO** : Repair the wiring harness between joint connector (3) and the combination meter connector.

**STEP 4. Check the CAN line between joint connector (3) and the ETACS-ECU connector for short to ground. Measure the resistance at joint connector (3) C-03.**

**⚠ CAUTION**

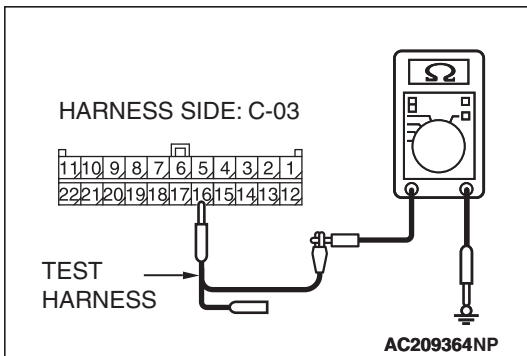
**Disconnect the negative battery terminal. For details refer to P.54C-4.**

- (1) Disconnect the negative battery terminal.
- (2) Disconnect joint connector (3) C-03, and measure the resistance at the wiring harness side of joint connector (3) C-03.



- (3) Measure the resistance between joint connector (3) terminal 5 (CAN\_H) and body ground.

**OK: 1 kΩ or more**



- (4) Measure the resistance between joint connector (3) terminal 16 (CAN\_L) and body ground.

**OK: 1 kΩ or more**

**Q: Is the check result normal?**

**YES :** Go to Step 5.

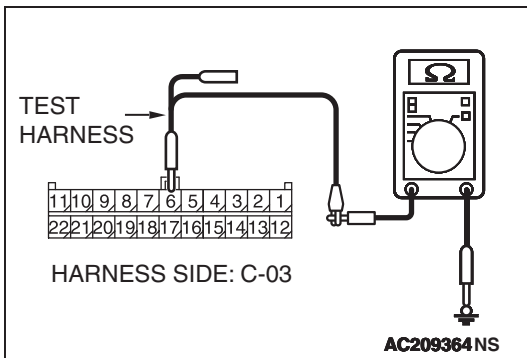
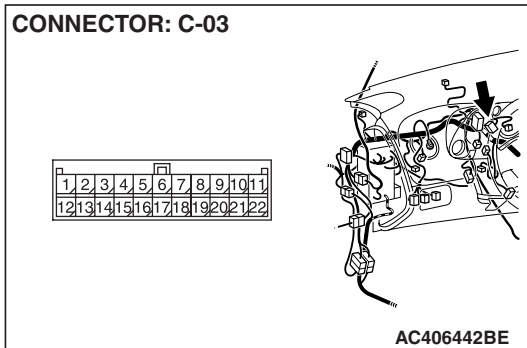
**NO :** Go to Step 8.

**STEP 5. Check the CAN line between joint connector (3) and the A/C-ECU connector for short to ground. Measure the resistance at joint connector (3) C-03.**

**⚠ CAUTION**

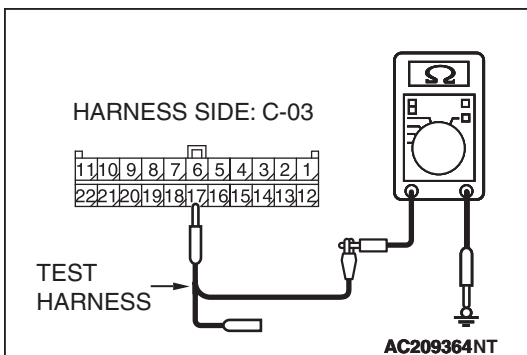
**Disconnect the negative battery terminal. For details refer to P.54C-4.**

- (1) Disconnect the negative battery terminal.
- (2) Disconnect joint connector (3) C-03, and measure the resistance at the wiring harness side of joint connector (3) C-03.



- (3) Measure the resistance between joint connector (3) terminal 6 (CAN\_H) and body ground.

**OK: 1 kΩ or more**



- (4) Measure the resistance between joint connector (3) terminal 17 (CAN\_L) and body ground.

**OK: 1 kΩ or more**

**Q: Is the check result normal?**

**YES :** Go to Step 6.

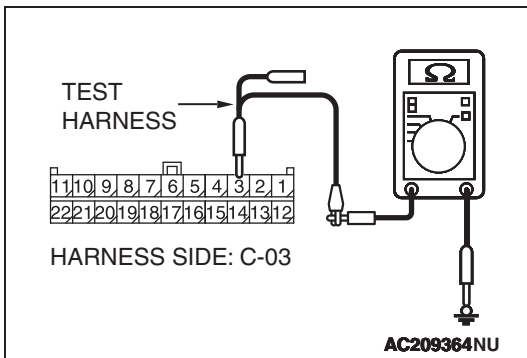
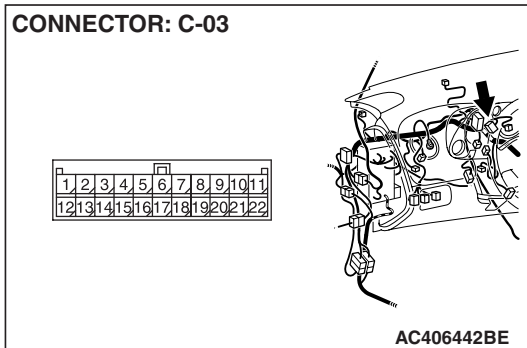
**NO :** Go to Step 9.

**STEP 6. Check the CAN line between joint connector (3) and the SRS-ECU connector for short to ground. Measure the resistance at joint connector (3) C-03.**

**⚠ CAUTION**

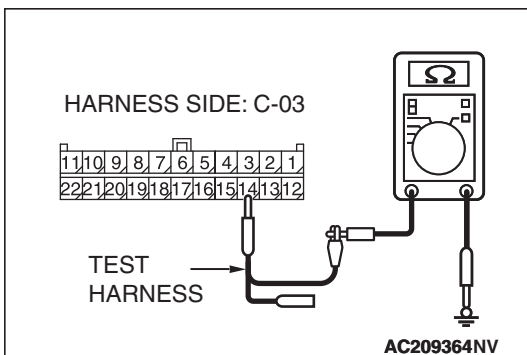
**Disconnect the negative battery terminal. For details refer to P.54C-4.**

- (1) Disconnect the negative battery terminal.
- (2) Disconnect joint connector (3) C-03, and measure the resistance at the wiring harness side of joint connector (3) C-03.



- (3) Measure the resistance between joint connector (3) terminal 3 and body ground.

**OK: 1 kΩ or more**



- (4) Measure the resistance between joint connector (3) terminal 14 and body ground.

**OK: 1 kΩ or more**

**Q: Does the resistance measure 1 kΩ or more?**

**YES :** Go to Step 7.

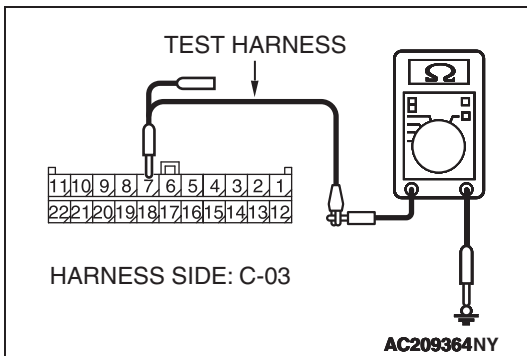
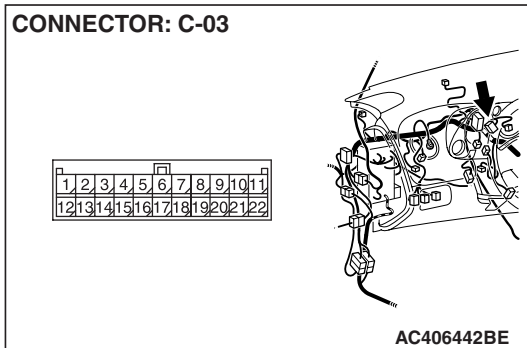
**NO :** Go to Step 10.

**STEP 7. Check the CAN line between joint connector (3) and the data link connector for short to ground. Measure the resistance at joint connector (3) C-03.**

**⚠ CAUTION**

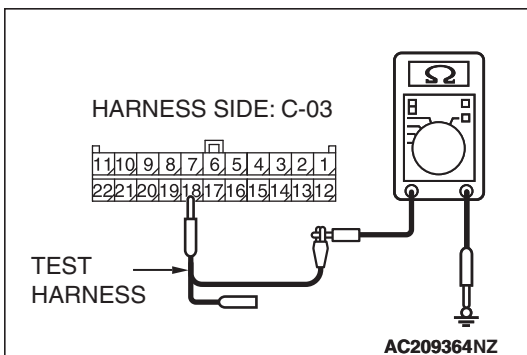
**Disconnect the negative battery terminal. For details refer to P.54C-4.**

- (1) Disconnect the negative battery terminal.
- (2) Disconnect joint connector (3) C-03, and measure the resistance at the wiring harness side of joint connector (3) C-03.



- (3) Measure the resistance between joint connector (3) terminal 7 (CAN\_H) and body ground.

**OK: 1 kΩ or more**



- (4) Measure the resistance between joint connector (3) terminal 18 (CAN\_L) and body ground.

**OK: 1 kΩ or more**

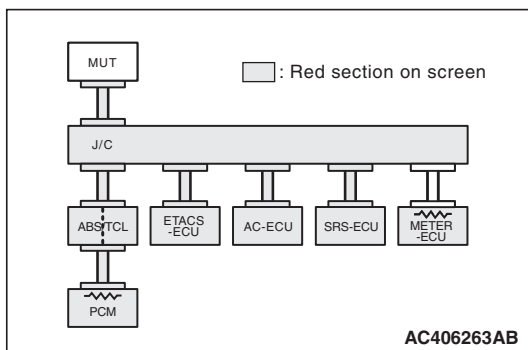
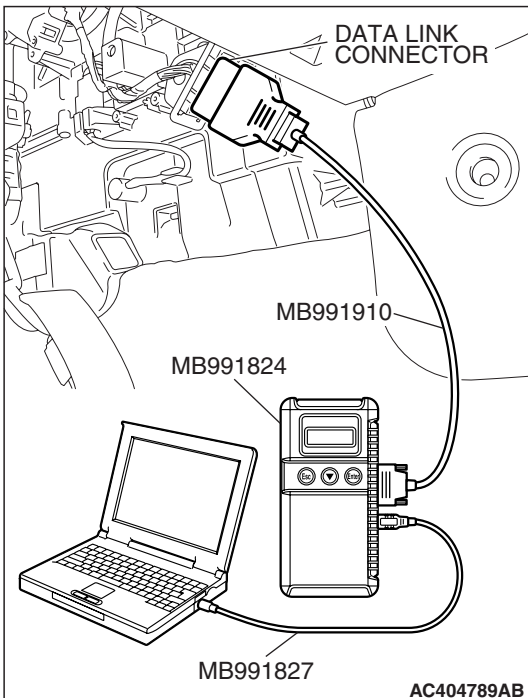
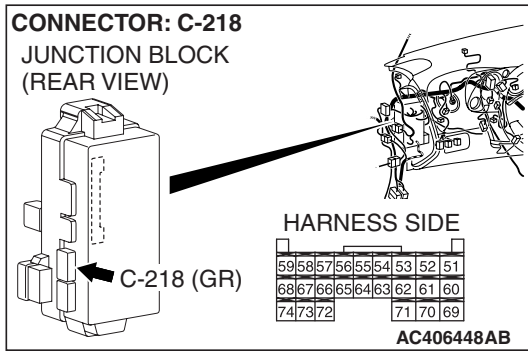
**⚠ CAUTION**

**Strictly observe the specified wiring harness repair procedure. For details refer to P.54C-5.**

**Q: Does the resistance measure 1 kΩ or more?**

**YES :** Repair the wiring harness between joint connector (3) and the intermediate connector.

**NO :** Repair the wiring harness between joint connector (3) and the data link connector.



**STEP 8. Check the ETACS-ECU for a short to ground.**

(1) Disconnect ETACS-ECU connector C-218.

**CAUTION**

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

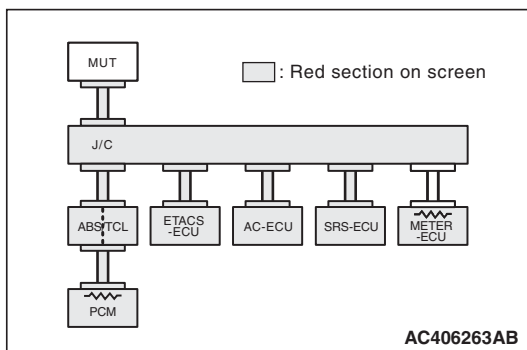
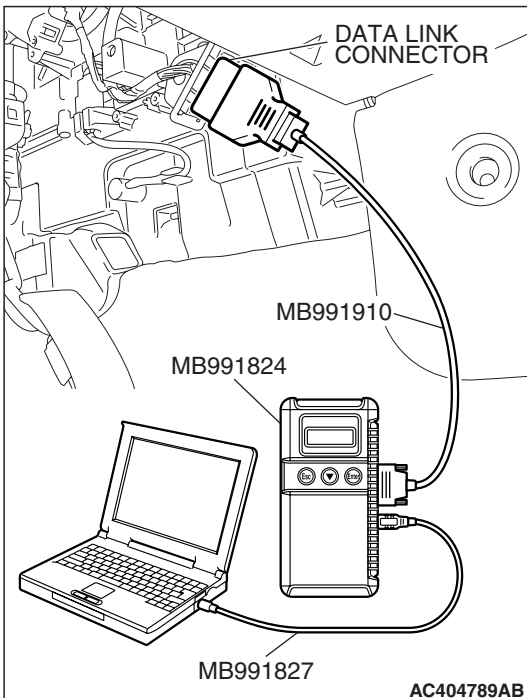
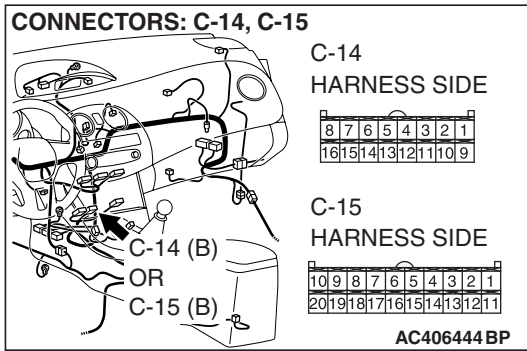
(2) Connect scan tool MB991958 to the data link connector.

(3) Diagnose CAN bus lines, and check if scan tool MB991958 screen is as shown in the illustration.

**Q: Does scan tool MB991958 screen correspond to the illustration?**

**YES :** Repair the wiring harness between joint connector (3) and the ETACS-ECU connector.

**NO :** Check the ETACS-ECU connector, and repair if necessary. If the ETACS-ECU connector is in good condition, replace the ETACS-ECU. When the ETACS-ECU is replaced, register the encrypted code. Refer to GROUP 54A, Encrypted Code Registration Criteria Table P.54A-13.



**STEP 9. Check the A/C-ECU for a short to ground.**

- (1) Disconnect A/C-ECU connector C-14 <manual air conditioning system> or C-15 <automatic air conditioning system>.

**CAUTION**

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

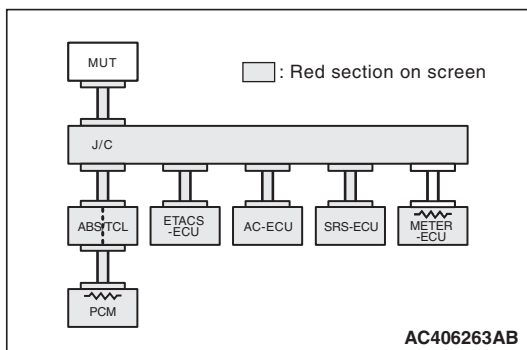
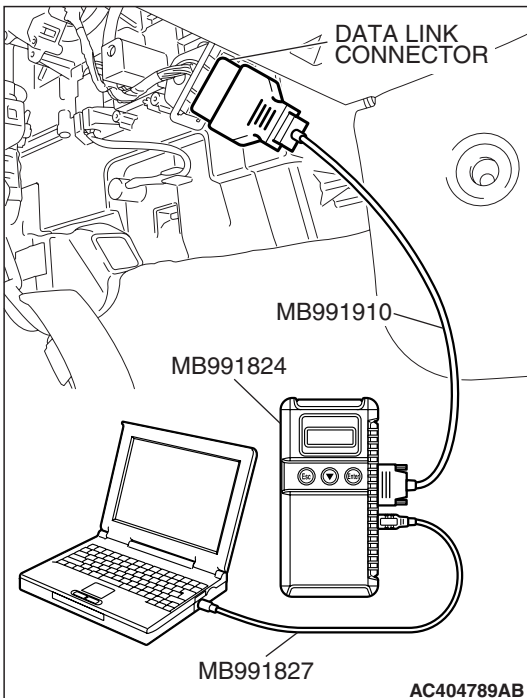
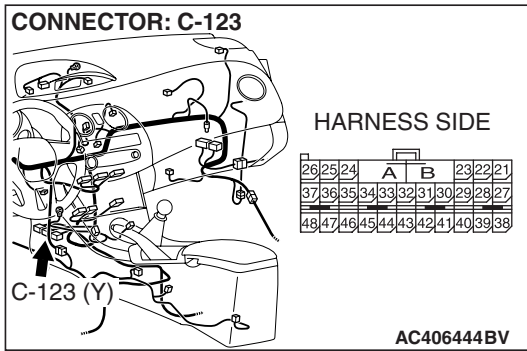
- (2) Connect scan tool MB991958 to the data link connector.

- (3) Diagnose CAN bus lines, and check if scan tool MB991958 screen is as shown in the illustration.

**Q: Does scan tool MB991958 screen correspond to the illustration?**

**YES :** Repair the wiring harness between joint connector (3) and the A/C-ECU connector.

**NO :** Check the A/C-ECU connector, and repair if necessary. If the A/C-ECU connector is in good condition, replace the A/C-ECU.



**STEP 10. Check the SRS-ECU for a short to ground.**

(1) Disconnect SRS-ECU connector C-123.

**CAUTION**

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

(2) Connect scan tool MB991958 to the data link connector.

(3) Diagnose CAN bus lines, and check if scan tool MB991958 screen is as shown in the illustration.

**Q: Does scan tool MB991958 screen correspond to the illustration?**

**YES :** Repair the wiring harness between joint connector (3) and the SRS-ECU connector.

**NO :** Check the SRS-ECU connector, and repair if necessary. If the SRS-ECU connector is in good condition, replace the SRS-ECU.

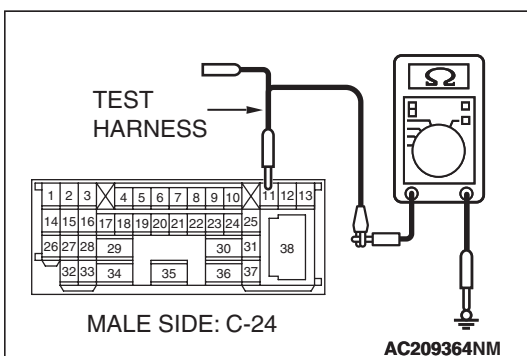
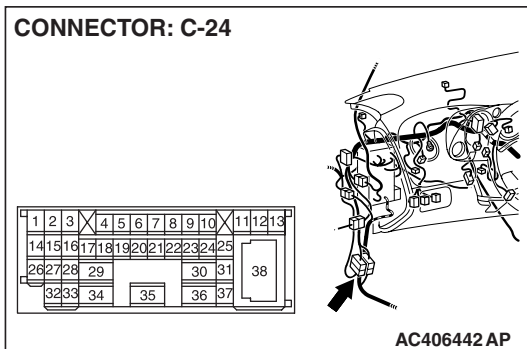
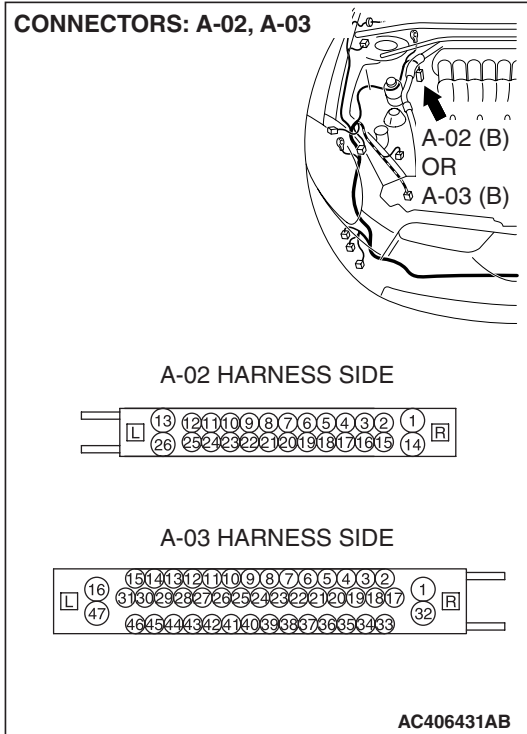


**STEP 11. Check the CAN line between intermediate connector C-24 and ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> connector for a short to ground. Measure the resistance at intermediate connector C-24.**

**⚠ CAUTION**

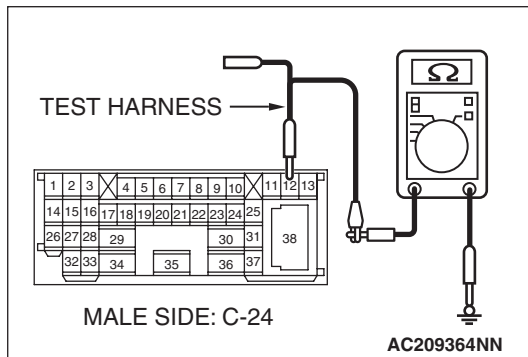
**Disconnect the negative battery terminal. For details refer to P.54C-4.**

- (1) Disconnect the negative battery terminal.
- (2) Disconnect intermediate connector C-24 and ABS-ECU connector A-02 <vehicles without traction control system> or ABS/TCL-ECU connector A-03 <vehicles with traction control system>, and measure the resistance at the male side of intermediate connector C-24 (at front wiring harness side).



- (3) Measure the resistance between intermediate connector terminal 11 (CAN\_H) and body ground.

**OK: 1 kΩ or more**



- (4) Measure the resistance between intermediate connector terminal 12 (CAN\_L) and body ground.

**OK:** 1 k $\Omega$  or more

**CAUTION**

Strictly observe the specified wiring harness repair procedure. For details refer to [P.54C-5](#).

**Q:** Is the check result normal?

**YES :** Go to Step 12.

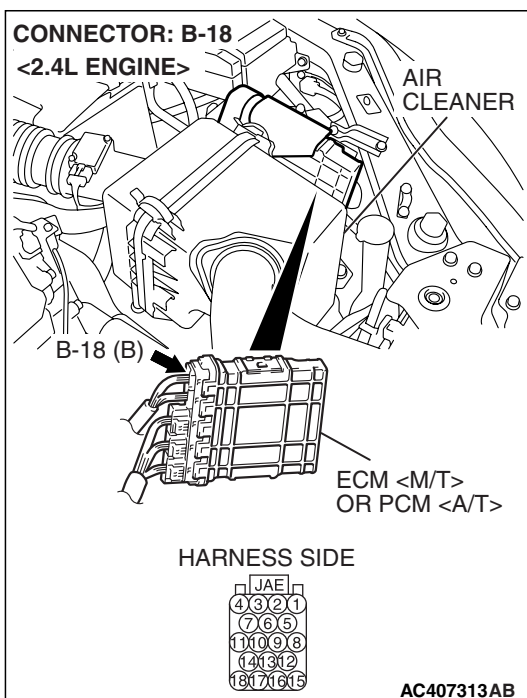
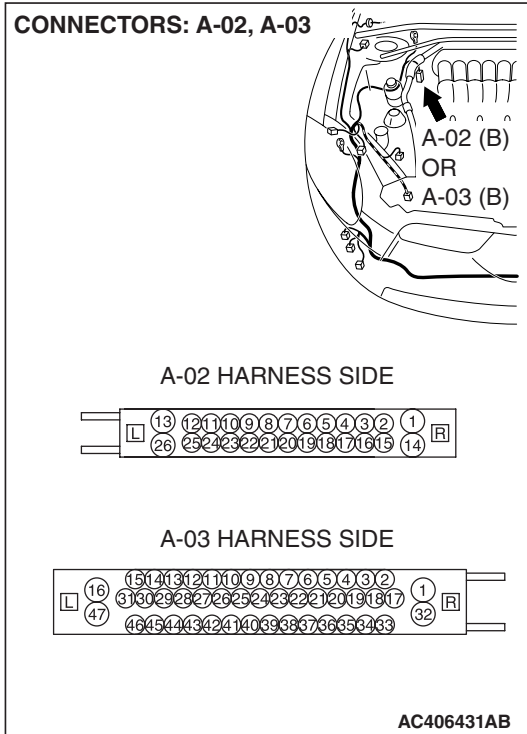
**NO :** Repair the wiring harness.

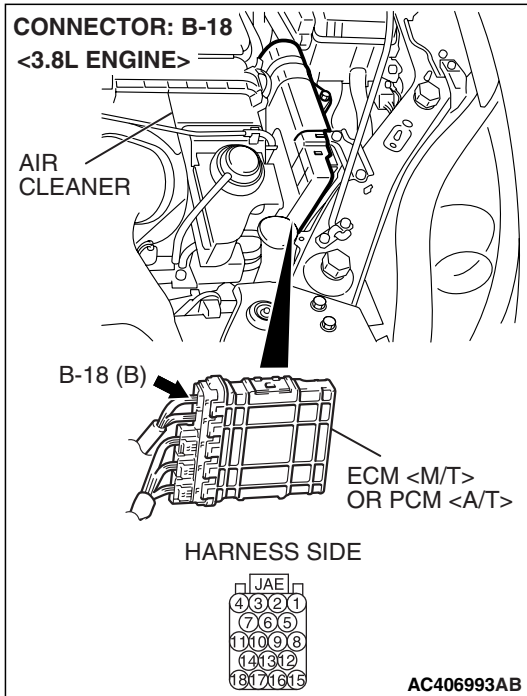
**STEP 12.** Check the CAN line between the ECM <M/T> or PCM <A/T> connector and ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> connector for a short to ground. Measure the resistance at ECM <M/T> or PCM <A/T> connector B-18.

**CAUTION**

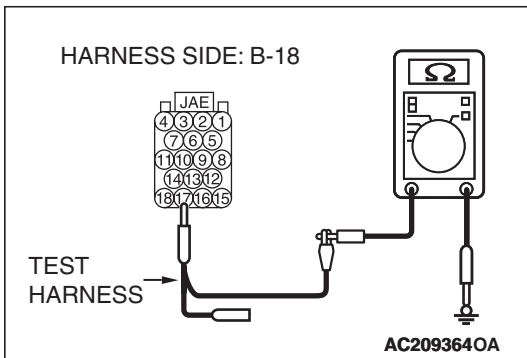
Disconnect the negative battery terminal. For details refer to [P.54C-4](#).

(1) Disconnect the negative battery terminal.



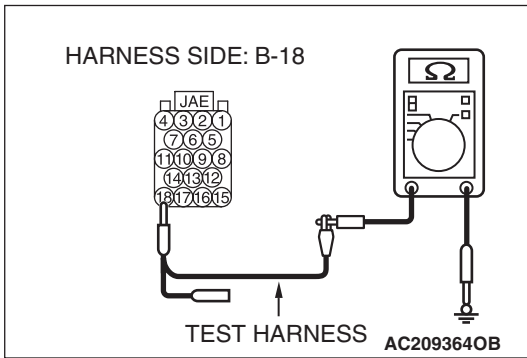


(2) Disconnect ECM <M/T> or PCM <A/T> connector B-18 and ABS-ECU connector A-02 <vehicles without traction control system> or ABS/TCL-ECU connector A-03 <vehicles with traction control system>, and measure the resistance at the harness side of ECM <M/T> or PCM <A/T> connector B-18.



(3) Measure the resistance between ECM <M/T> or PCM <A/T> connector terminal 17 and body ground.

**OK: 1 kΩ or more**



(4) Measure the resistance between ECM <M/T> or PCM <A/T> connector terminal 18 and body ground.

**OK: 1 kΩ or more**

**CAUTION**

Strictly observe the specified wiring harness repair procedure. For details refer to [P.54C-5](#).

**Q: Is the check result normal?**

**YES :** Go to Step 13.

**NO :** Repair the wiring harness between ECM <M/T> or PCM <A/T> connector and ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> connector.

**STEP 13. Retest the system.**

**⚠ CAUTION**

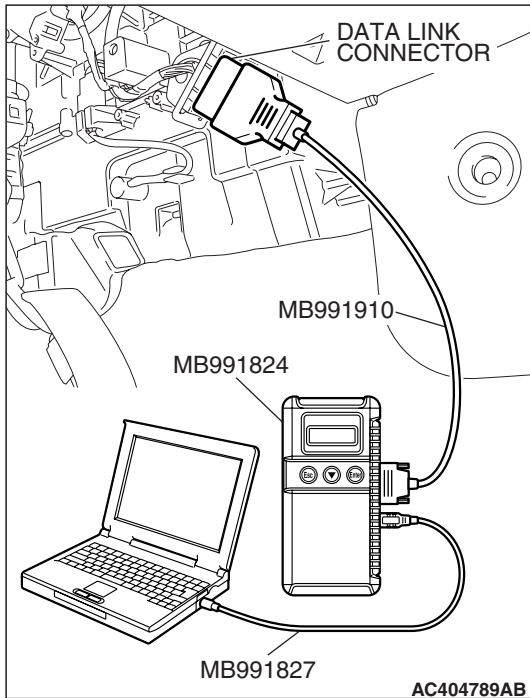
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

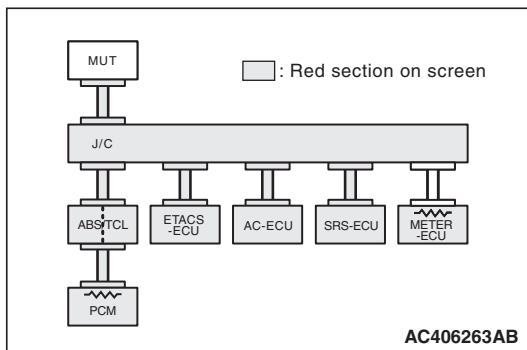
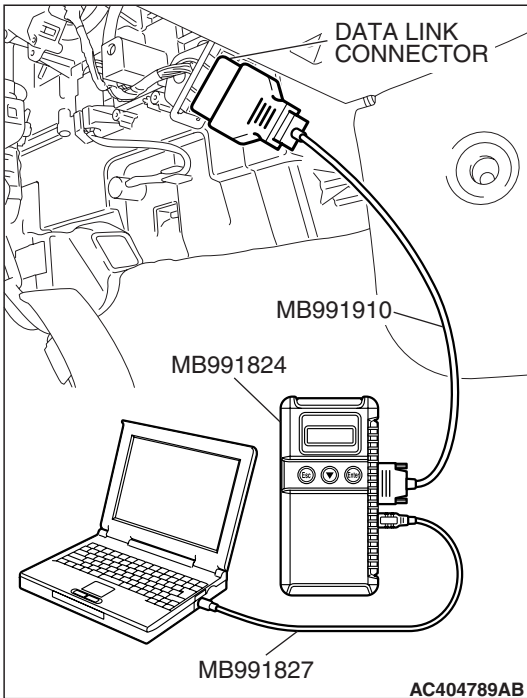
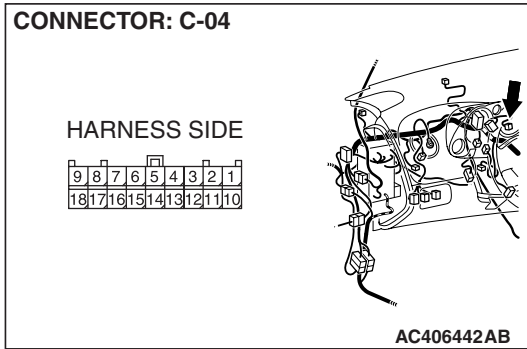
- (1) Connect scan tool MB991958 to the data link connector.
- (2) Diagnose CAN bus lines, and check if scan tool MB991958 screen shows normal state.

**Q: Is the check result normal?**

**YES :** Intermittent malfunction.

**NO :** Check the ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> connector, and repair if necessary. If the ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> connector is in good condition, replace the ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system>.





**STEP 14. Check the combination meter for a short to ground.**

(1) Disconnect combination meter connector C-04.

**CAUTION**

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

(2) Connect scan tool MB991958 to the data link connector.

(3) Diagnose CAN bus lines, and check if scan tool MB991958 screen is as shown in the illustration.

**Q: Does scan tool MB991958 screen correspond to the illustration?**

**YES :** Go to Step 15.

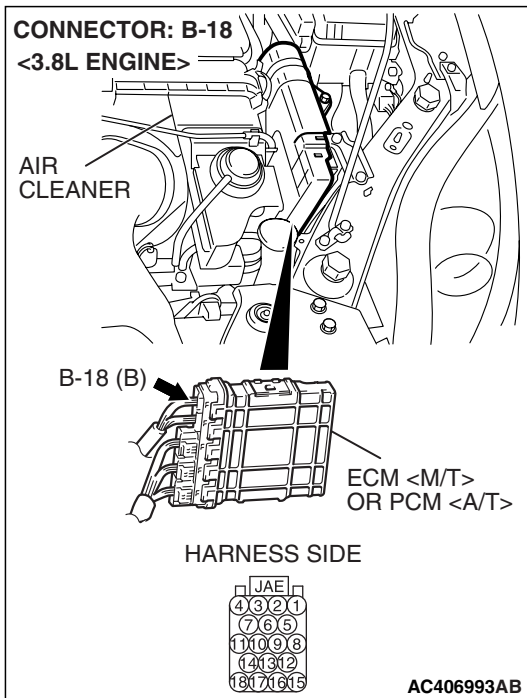
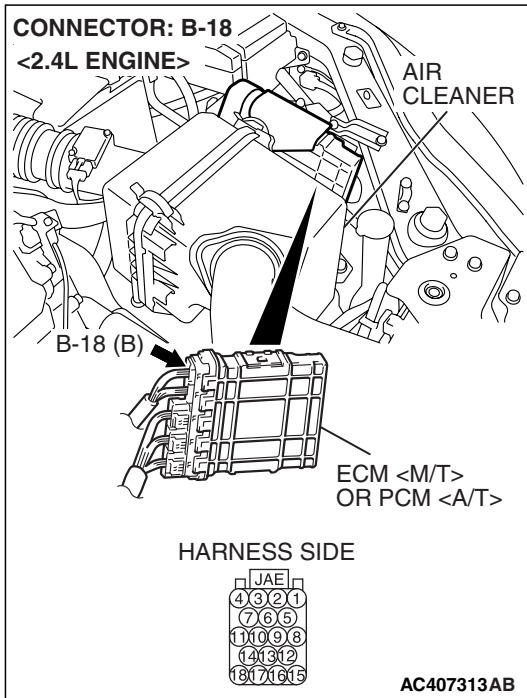
**NO :** Go to Step 16.

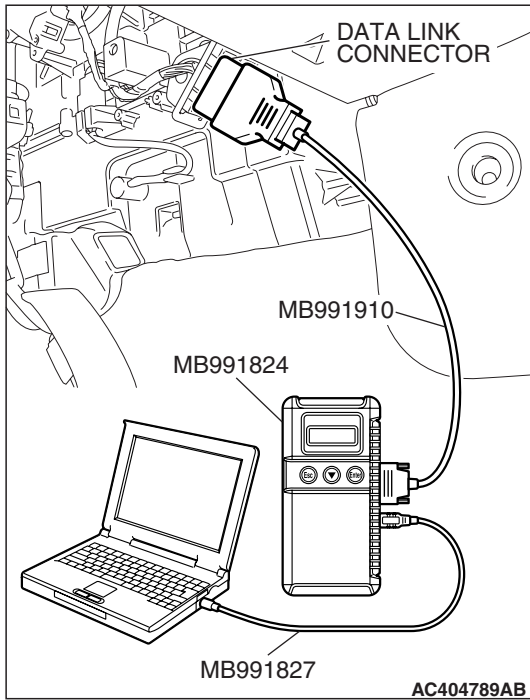
**STEP 15. Check the ECM <M/T> or PCM <A/T> for a short to ground.**

(1) Disconnect ECM <M/T> or PCM <A/T> connector B-18.

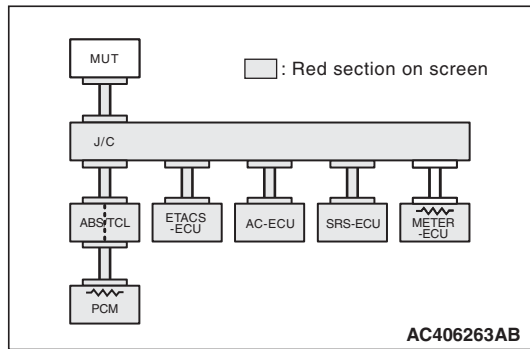
**CAUTION**

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





(2) Connect scan tool MB991958 to the data link connector.



(3) Diagnose CAN bus lines, and check if scan tool MB991958 screen is as shown in the illustration.

**Q: Does scan tool MB991958 screen correspond to the illustration?**

**YES :** Intermittent malfunction.

**NO :** Go to Step 17.



**STEP 16. Retest the system.**

**⚠ CAUTION**

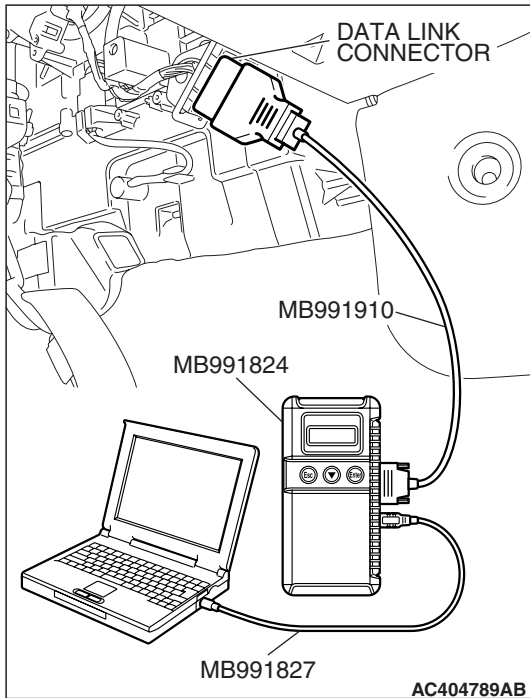
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Diagnose CAN bus lines, and check if scan tool MB991958 screen shows normal state.

**Q: Is the check result normal?**

**YES :** Intermittent malfunction.

**NO :** Check the combination meter connector, and repair if necessary. If the combination meter connector is in good condition, replace the combination meter.



**STEP 17. Retest the system.**

**⚠ CAUTION**

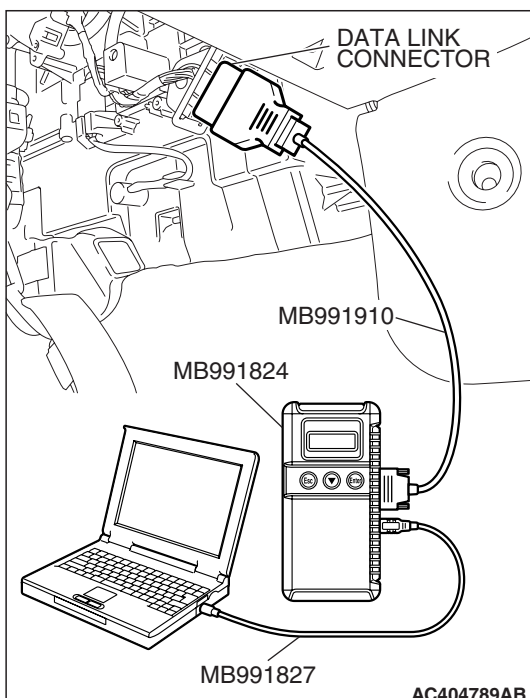
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Diagnose CAN bus lines, and check if scan tool MB991958 screen shows normal state.

**Q: Is the check result normal?**

**YES :** Intermittent malfunction.

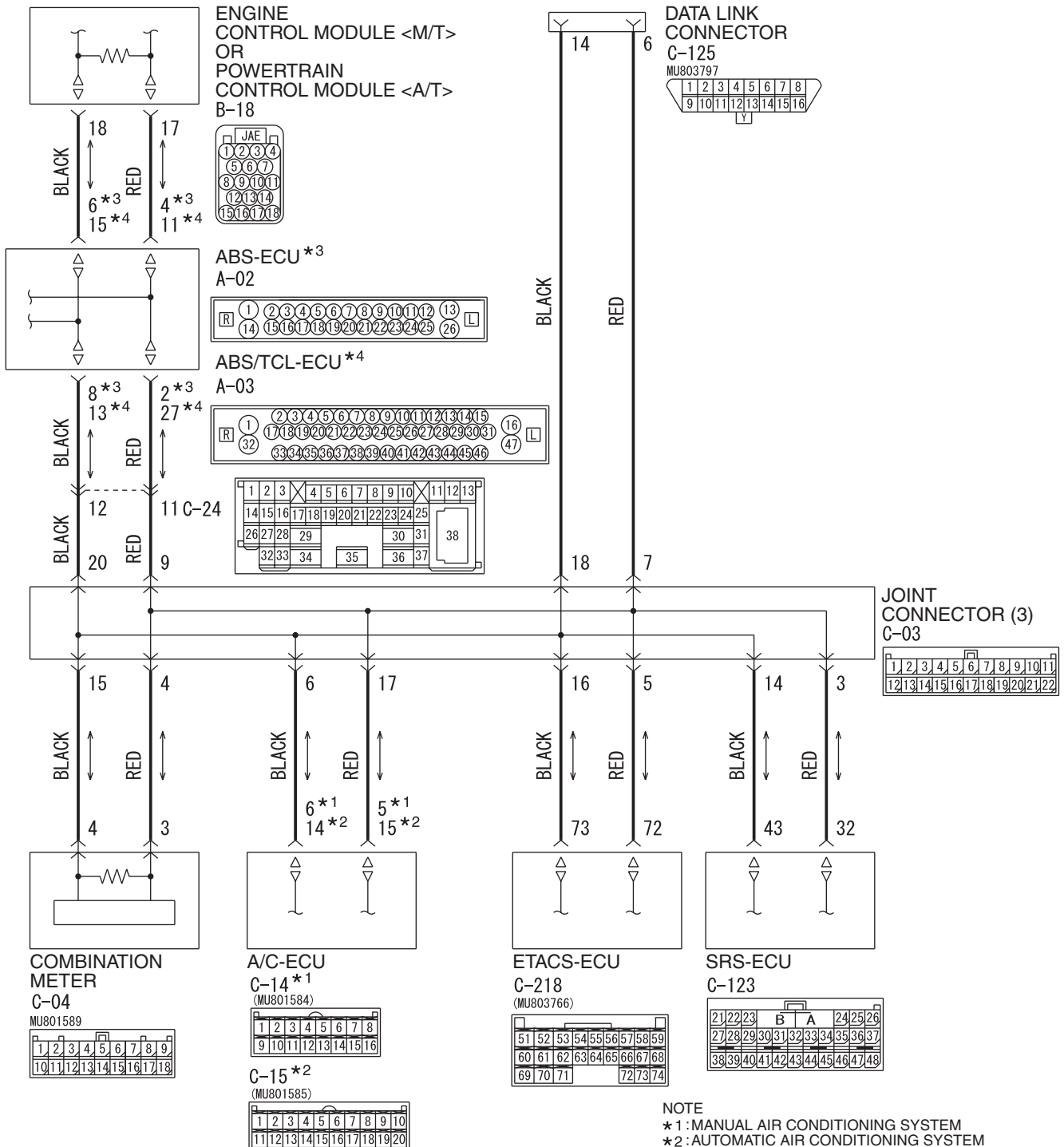
**NO :** Check the ECM <M/T> or PCM <A/T> connector, and repair if necessary. If the ECM <M/T> or PCM <A/T> connector is in good condition, replace the ECM <M/T> or PCM <A/T>. When the ECM <M/T> or PCM <A/T> is replaced, register the encrypted code. Refer to GROUP 54A, Encrypted Code Registration Criteria Table P.54A-13.

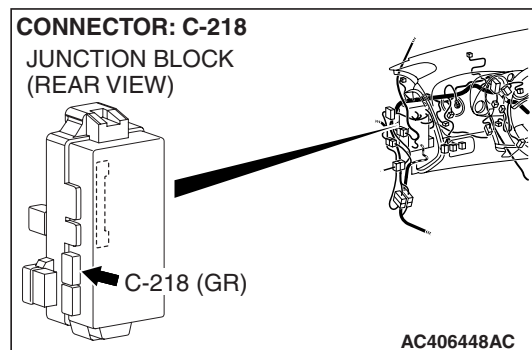
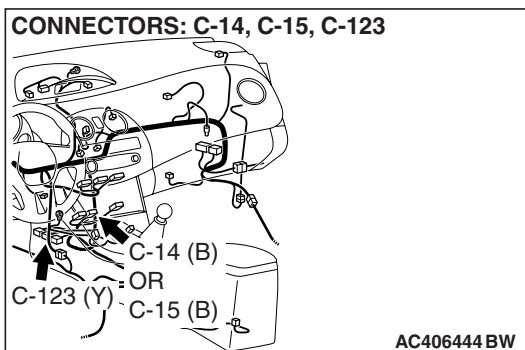
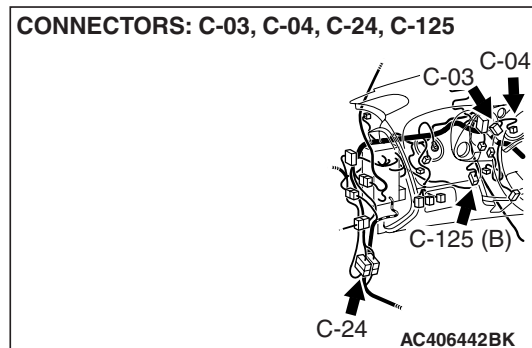
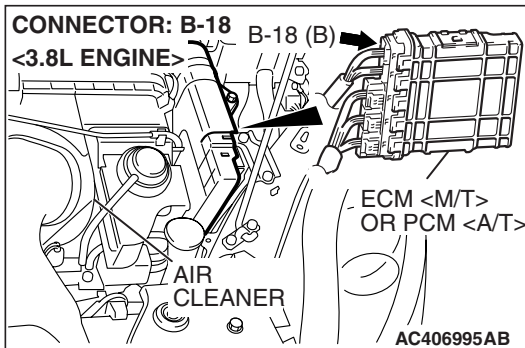
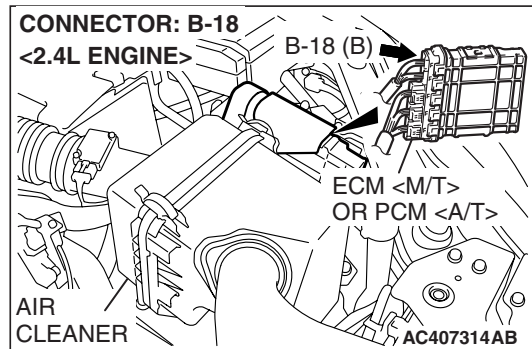
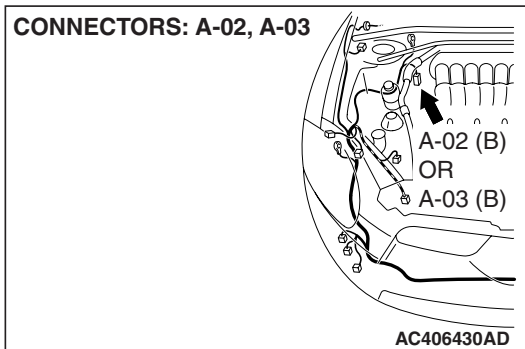


DIAGNOSTIC ITEM 3: Diagnose shorts between CAN\_H and L lines

**CAUTION**

When servicing a CAN bus line, ground yourself by touching a metal object such as an unpainted water pipe. If you fail to do so, a component connected to the CAN bus line may be damaged.





## FUNCTION

The scan tool MB991958 judges a short between CAN\_H and CAN\_L line when all data from ECU cannot be received while checking periodically sent data from each ECU even if the voltage is normal.

## TRUBLE JUDGEMENT CONDITIONS

The scan tool MB991958 judges the trouble when it is impossible to send and receive the all ECU periodically sent data and the voltage of CAN\_H and CAN\_L line is 4.0 volts or less and 1.0 volt or more.

## TROUBLESHOOTING HINTS

- The wiring harness may be defective [a short between CAN\_H and CAN\_L line, open circuit between the data link connector and the joint connector (3) or open circuit between the combination meter connector and the joint connector (3)]

*NOTE: The scan tool MB991958 cannot receive all the periodically sent data from each ECU by the open circuit of harness between the data link connector and the joint connector (3). In addition, the scan tool MB991958 measures the voltage itself and shows 2.5 volts due to the open circuit of harness. Therefore, it is judged as a short between CAN\_H and CAN\_L line.*

- The connector may be defective (short in the connector)
- Each ECU may be defective (short between CAN\_H and CAN\_L line)

**DIAGNOSIS**

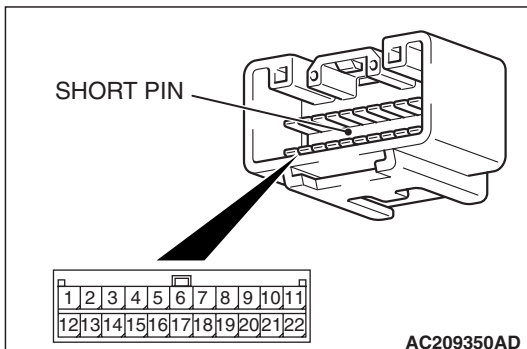
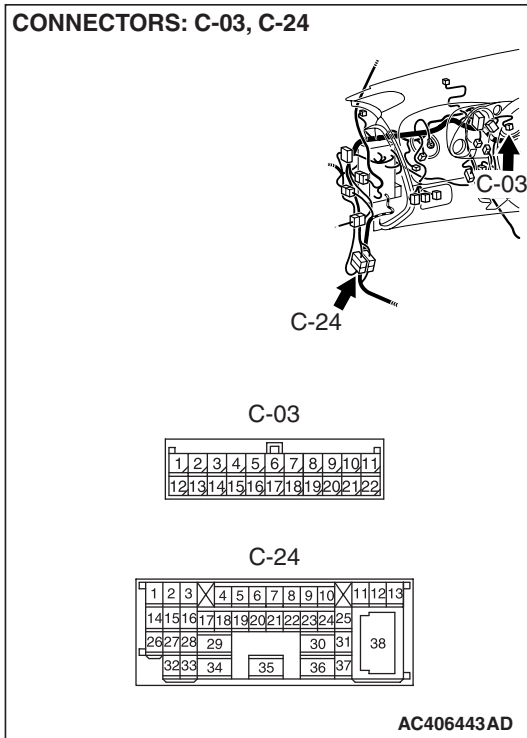
**Required Special Tools:**

- MB991223: Harness Set
- MB992006: Extra fine probe
- MB991970: ABS Check Harness

**STEP 1. Check joint connector (3) C-03 and intermediate connector C-24.**

**⚠ CAUTION**

The strand end of the twisted wire should be within 10 cm (4.0 inches) from the connector. For details refer to [P.54C-4](#).



Visually check if there is a short between lines due to the foreign obstacles or deformation of short pin in the connector.

**Q: Is the check result normal?**

**YES :** Go to Step 2.

**NO :** Repair the connector, or replace the joint connector (3).

**STEP 2.** Check the lines between the CAN\_H and L lines of the front wiring harness for a short circuit. Measure the resistance at intermediate connector C-24.

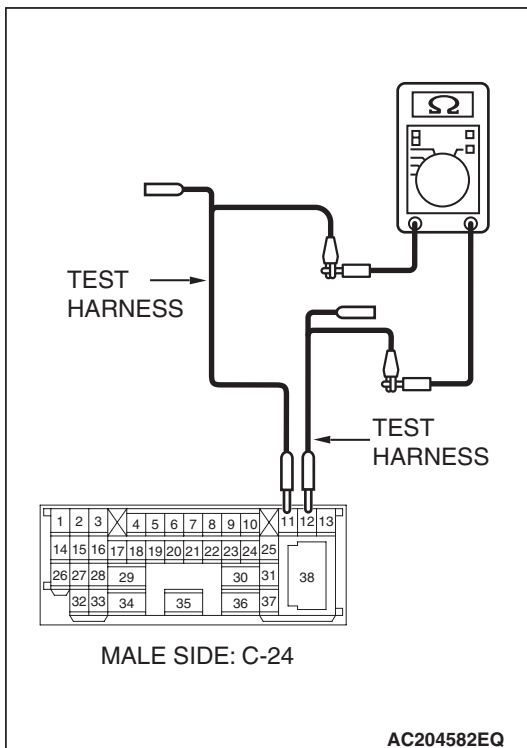
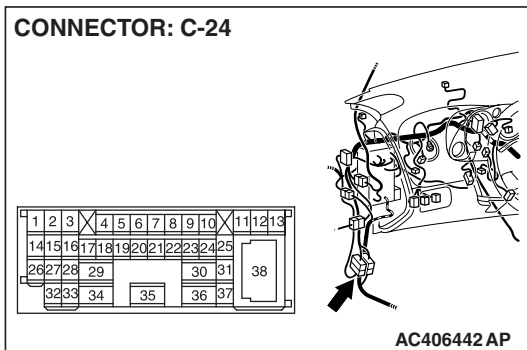
**CAUTION**

- A digital multimeter should be used. For details refer to [P.54C-4](#).
- The test wiring harness should be used. For details refer to [P.54C-4](#).

**CAUTION**

**Disconnect the negative battery terminal.** For details refer to [P.54C-4](#).

- (1) Disconnect the negative battery terminal.
- (2) Disconnect intermediate connector C-24, and measure the resistance at the male side (at front wiring harness side).



- (3) Measure the resistance between intermediate connector terminals 11 and 12.

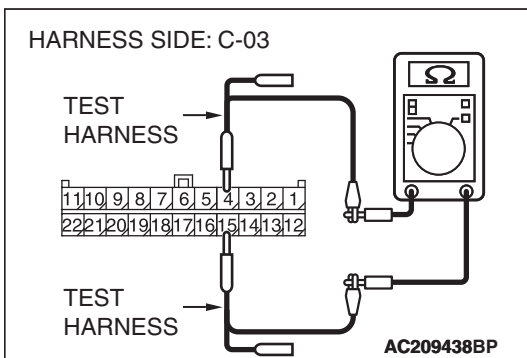
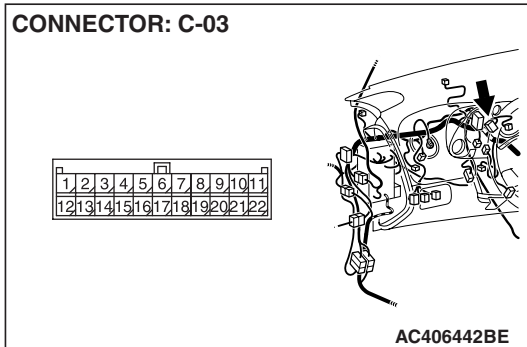
**OK: 120 ± 20 ohms**

**Q: Is the check result normal?**

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

**STEP 3. Check the CAN\_H and L lines between joint connector (3) and the combination meter for a short circuit. Measure the resistance at joint connector (3) C-03.**

- (1) Disconnect the negative battery terminal.
- (2) Disconnect joint connector (3) C-03, and measure the resistance at the wiring harness side of joint connector (3) C-03.



- (3) Measure the resistance between joint connector (3) terminals 4 and 15.

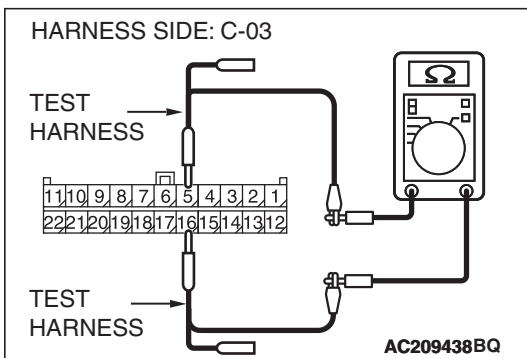
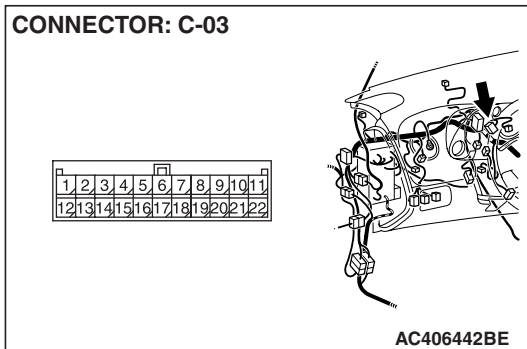
**OK: 120 ± 20 ohms**

**Q: Is the check result normal?**

- YES :** Go to Step 4.  
**NO :** Go to Step 8.

**STEP 4. Check the CAN\_H and L lines between joint connector (3) and the ETACS-ECU for a short circuit. Measure the resistance at joint connector (3) C-03.**

- (1) Disconnect the negative battery terminal.
- (2) Disconnect joint connector (3) C-03, and measure the resistance at the wiring harness side of joint connector (3) C-03.



- (3) Measure the resistance between joint connector (3) terminals 5 and 16.

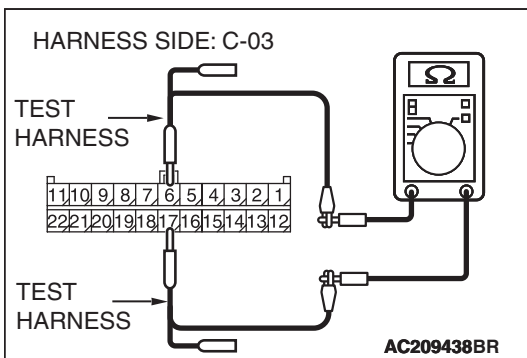
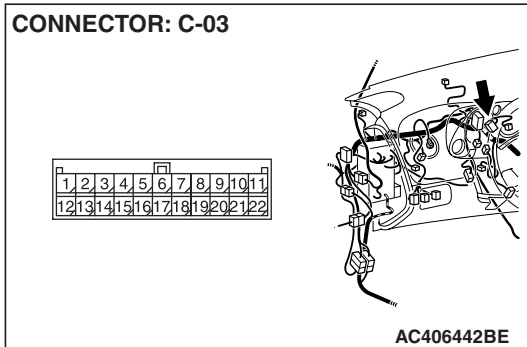
**OK: 1 kΩ or more**

**Q: Is the check result normal?**

- YES :** Go to Step 5.  
**NO :** Go to Step 9.

**STEP 5. Check the CAN\_H and L lines between joint connector (3) and the A/C-ECU for a short circuit. Measure the resistance at joint connector (3) C-03.**

- (1) Disconnect the negative battery terminal.
- (2) Disconnect joint connector (3) C-03, and measure the resistance at the wiring harness side of joint connector (3) C-03.



- (3) Measure the resistance between joint connector (3) terminals 6 and 17.

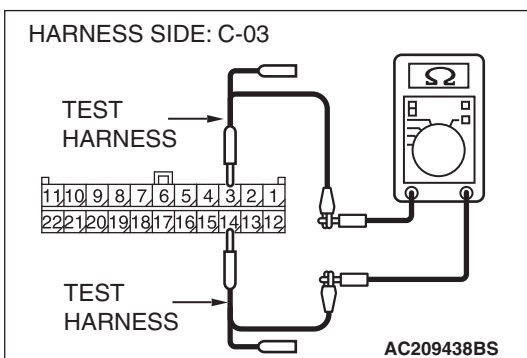
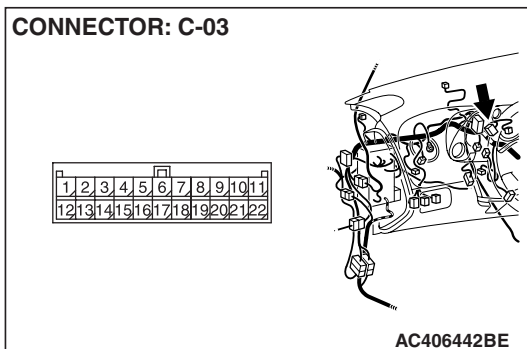
**OK: 1 kΩ or more**

**Q: Is the check result normal?**

- YES :** Go to Step 6.  
**NO :** Go to Step 10.

**STEP 6. Check the CAN\_H and L lines between joint connector (3) and the SRS-ECU for a short circuit. Measure the resistance at joint connector (3) C-03.**

- (1) Disconnect the negative battery terminal.
- (2) Disconnect joint connector (3) C-03, and measure the resistance at the wiring harness side of joint connector (3) C-03.



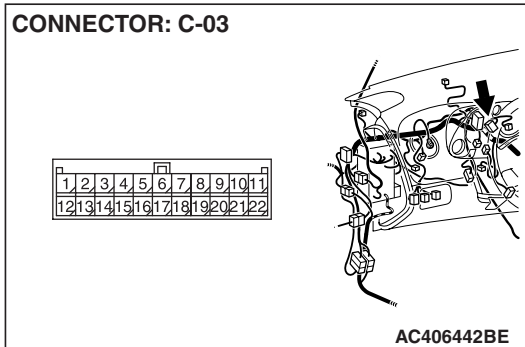
- (3) Measure the resistance between joint connector (3) terminals 3 and 14.

**OK: 1 kΩ or more**

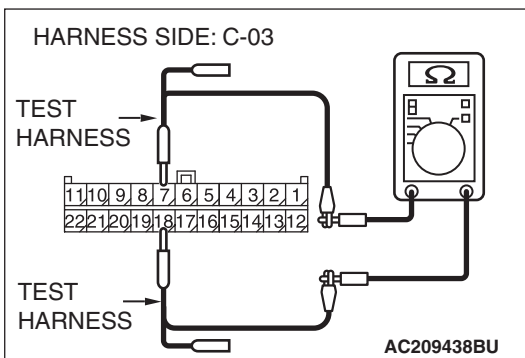
**Q: Is the check result normal?**

- YES :** Go to Step 7.  
**NO :** Go to Step 11.

## CONNECTOR: C-03



## HARNESS SIDE: C-03



**STEP 7. Check the CAN\_H and L lines between joint connector (3) and the data link connector for a short circuit. Measure the resistance at joint connector (3) C-03.**

- (1) Disconnect the negative battery terminal.
- (2) Disconnect joint connector (3) C-03, and measure the resistance at the wiring harness side of joint connector (3) C-03.

- (3) Measure the resistance between joint connector (3) terminals 7 and 18.

**OK: 1 kΩ or more**

**Q: Is the check result normal?**

**YES :** Repair the wiring harness between joint connector (3) and the intermediate connector.

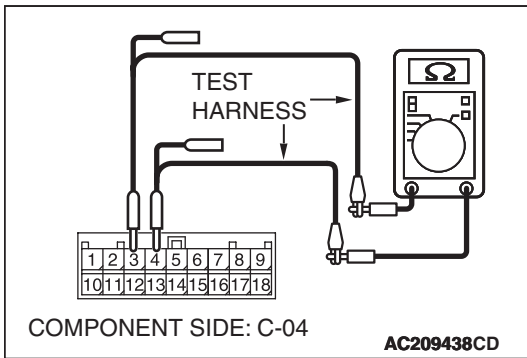
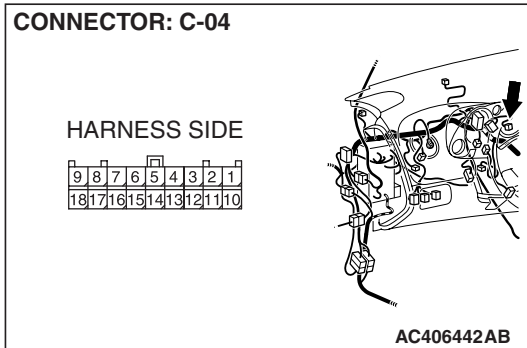
**NO :** Repair the wiring harness between joint connector (3) and the data link connector.



**STEP 8. Check the combination meter for short circuit.  
Measure the resistance at combination meter connector C-04.**

*NOTE: The failure could be caused by the open circuit of harness between combination meter and joint connector (3), therefore, check the open circuit as well as the short.*

- (1) Disconnect the negative battery terminal.
- (2) Disconnect combination meter C-04, and measure the resistance at the component side of combination meter connector C-04.



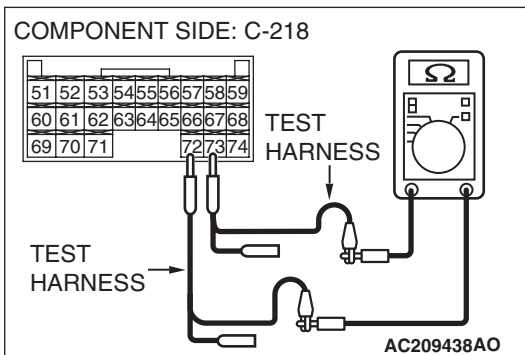
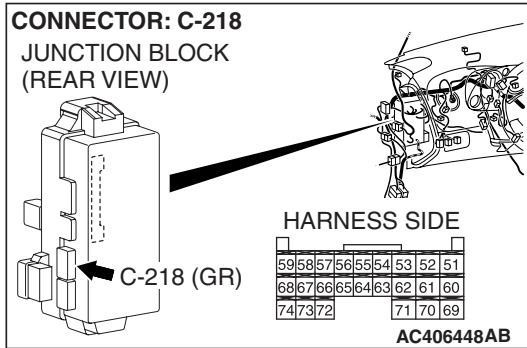
- (3) Measure the resistance between combination meter connector terminals 3 and 4.

**OK: 120 ± 20 ohms**

**Q: Is the check result normal?**

**YES :** Check the combination meter connector, and repair if necessary. Repair the open circuit of harness between the joint connector (3) and the combination meter connector or the short between lines if the combination meter connector is normal.

**NO :** Check the combination meter connector, and repair if necessary. If the combination meter connector is in good condition, replace the combination meter.



**STEP 9. Check the ETACS-ECU for short circuit. Measure the resistance at ETACS-ECU connector C-218.**

- (1) Disconnect the negative battery terminal.
- (2) Disconnect ETACS-ECU connector C-218, and measure the resistance at the component side of ETACS-ECU connector C-218.

- (3) Measure the resistance between ETACS-ECU connector terminals 72 and 73.

**OK: 1 k $\Omega$  or more**

**Q: Is the check result normal?**

**YES :** Check the ETACS-ECU connector, and repair if necessary. If the ETACS-ECU connector is in good condition, repair the wiring harness between joint connector (3) and the ETACS-ECU connector.

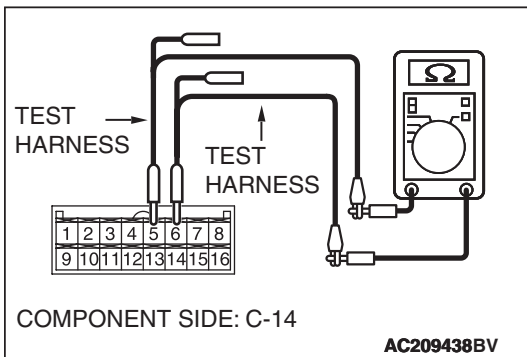
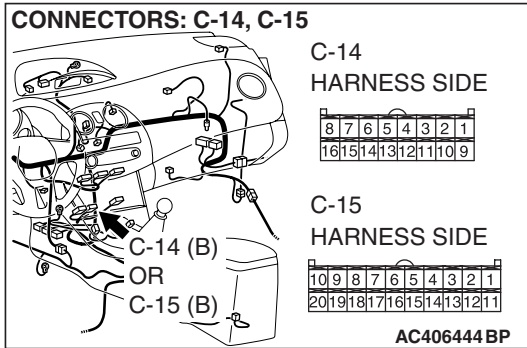
**NO :** Check the ETACS-ECU connector, and repair if necessary. If the ETACS-ECU connector is in good condition, replace the ETACS-ECU. When the ETACS-ECU is replaced, register the encrypted code. Refer to GROUP 54A, Encrypted Code Registration Criteria Table [P.54A-13](#).

**STEP 10. Check the A/C-ECU for short circuit. Measure the resistance at A/C-ECU connector C-14 <manual air conditioning system> or C-15 <automatic air conditioning system>.**

**⚠ CAUTION**

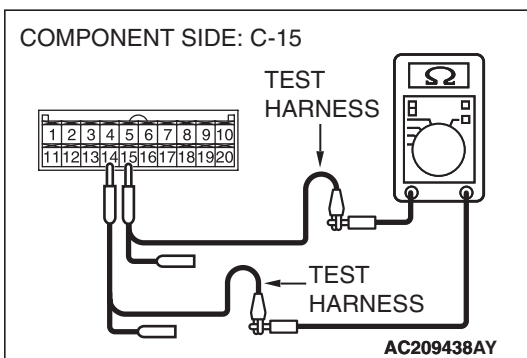
**A digital multimeter should be used. For details refer to P.54C-4.**

- (1) Disconnect the negative battery terminal.
- (2) Disconnect A/C-ECU connector C-14 <manual air conditioning system> or C-15 <automatic air conditioning system>, and measure the resistance at the component side of A/C-ECU connector C-14 <manual air conditioning system> or C-15 <automatic air conditioning system>.



- (3) Measure the resistance between A/C-ECU connector terminals 5 and 6. <manual air conditioning system>

**OK: 1 kΩ or more**



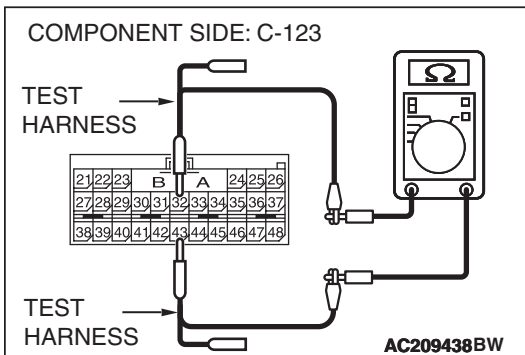
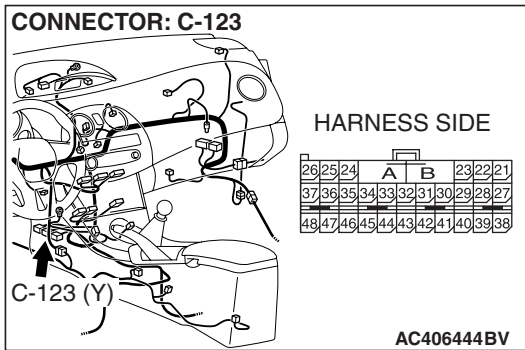
- (4) Measure the resistance between A/C-ECU connector terminals 14 and 15. <automatic air conditioning system>

**OK: 1 kΩ or more**

**Q: Is the check result normal?**

**YES :** Check the A/C-ECU connector, and repair if necessary. If the A/C-ECU connector is in good condition, repair the wiring harness between joint connector (3) and the A/C-ECU connector.

**NO :** Check the A/C-ECU connector, and repair if necessary. If the A/C-ECU connector is in good condition, replace the A/C-ECU.



**STEP 11. Check the SRS-ECU for short circuit. Measure the resistance at SRS-ECU connector C-123.**

- (1) Disconnect the negative battery terminal.
- (2) Disconnect SRS-ECU connector C-123, and measure the resistance at the component side of SRS-ECU connector C-123.

- (3) Measure the resistance between SRS-ECU connector terminals 32 and 43.

**OK: 1 k $\Omega$  or more**

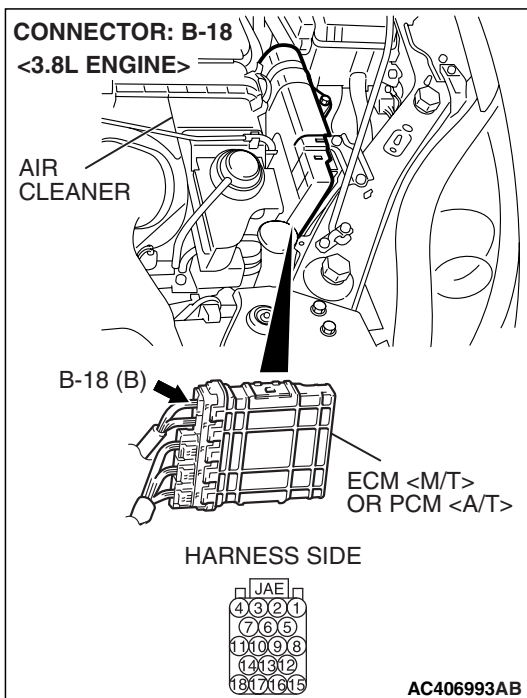
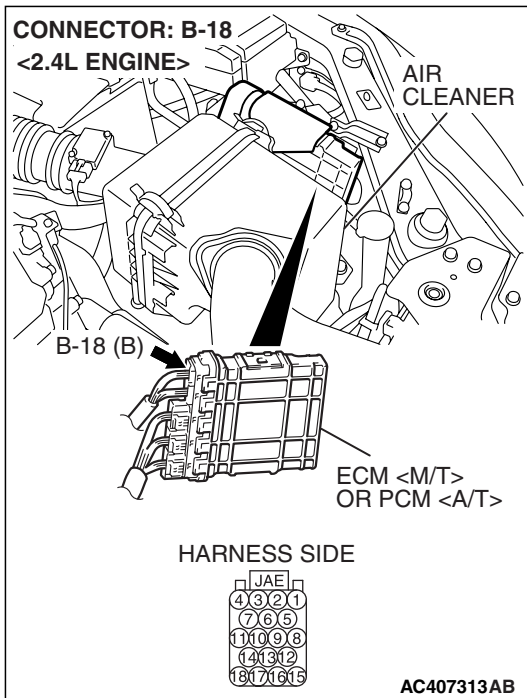
**Q: Is the check result normal?**

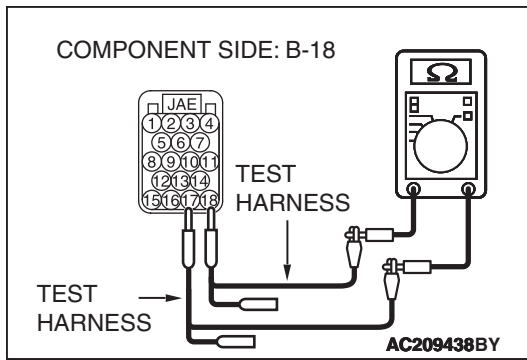
**YES :** Check the SRS-ECU connector, and repair if necessary. If the SRS-ECU connector is in good condition, repair the wiring harness between joint connector (3) and SRS-ECU connector.

**NO :** Check the SRS-ECU connector, and repair if necessary. If the SRS-ECU connector is in good condition, replace the SRS-ECU.

**STEP 12. Check the ECM <M/T> or PCM <A/T> for short circuit. Measure the resistance at ECM <M/T> or PCM <A/T> connector B-18.**

- (1) Disconnect the negative battery terminal.
- (2) Disconnect ECM <M/T> or PCM <A/T> connector B-18, and measure the resistance at the component side of ECM <M/T> or PCM <A/T> connector B-18.





- (3) Measure the resistance between ECM <M/T> or PCM <A/T> connector terminals 17 and 18.

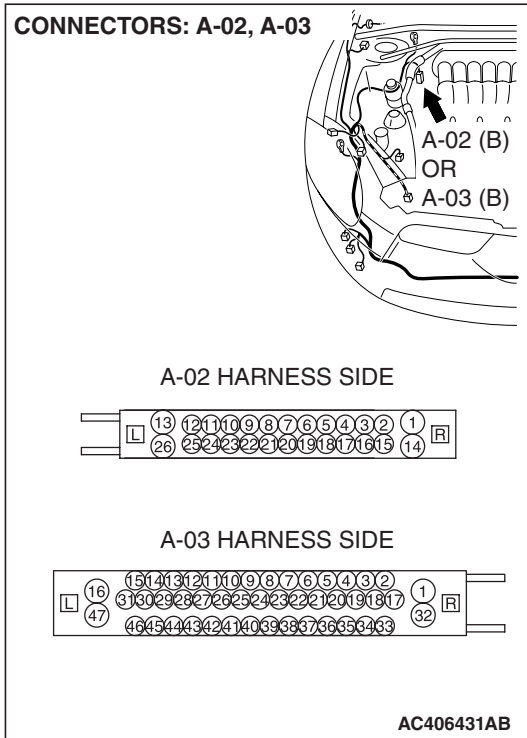
**OK:  $120 \pm 20$  ohms**

**Q: Is the check result normal?**

- YES :** Check the ECM <M/T> or PCM <A/T> connector, and repair if necessary. If the ECM <M/T> or PCM <A/T> connector is in good condition, go to Step 13.
- NO :** Check the ECM <M/T> or PCM <A/T> connector, and repair if necessary. If the ECM <M/T> or PCM <A/T> connector is in good condition, replace the ECM <M/T> or PCM <A/T>. When the ECM <M/T> or PCM <A/T> is replaced, register the encrypted code. Refer to GROUP 54A, Encrypted Code Registration Criteria Table [P.54A-13](#).

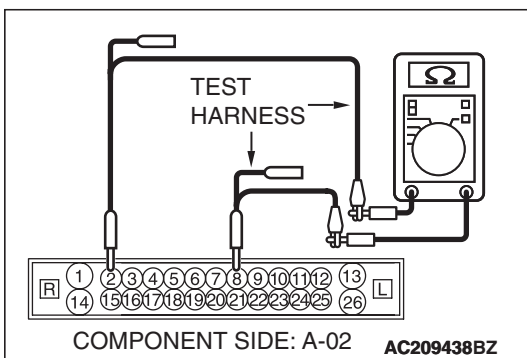
**STEP 13. Check the ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> for short circuit. Measure the resistance at ABS-ECU connector A-02 <vehicles without traction control system> or ABS/TCL-ECU connector A-03 <vehicles with traction control system>.**

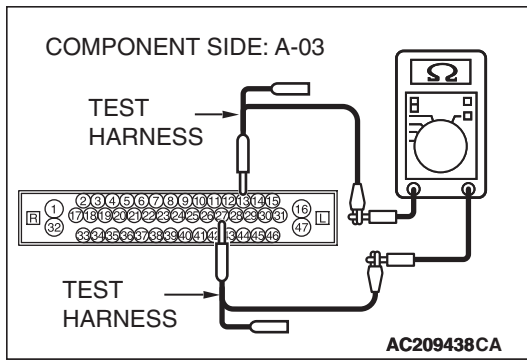
- (1) Disconnect the negative battery terminal.
- (2) Disconnect ABS-ECU connector A-02 <vehicles without traction control system> or ABS/TCL-ECU connector A-03 <vehicles with traction control system>, and measure the resistance at the component side of ABS-ECU connector A-02 <vehicles without traction control system> or ABS/TCL-ECU connector A-03 <vehicles with traction control system>.



- (3) Measure the resistance between ABS-ECU connector terminals 2 and 8. <vehicles without traction control system>

**OK: 1 k $\Omega$  or more**





- (4) Measure the resistance between ABS/TCL-ECU connector terminals 13 and 27. <vehicles with traction control system>

**OK: 1 k $\Omega$  or more**

**Q: Is the check result normal?**

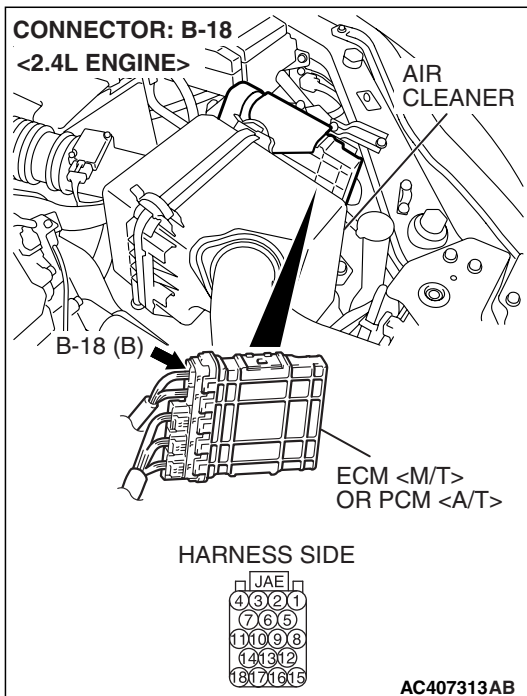
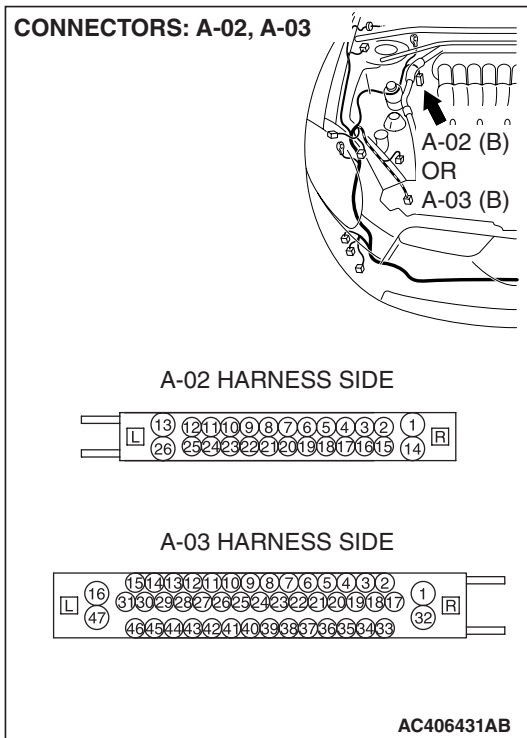
**YES :** Check the ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> connector, and repair if necessary. If the ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> connector is in good condition, go to Step 14.

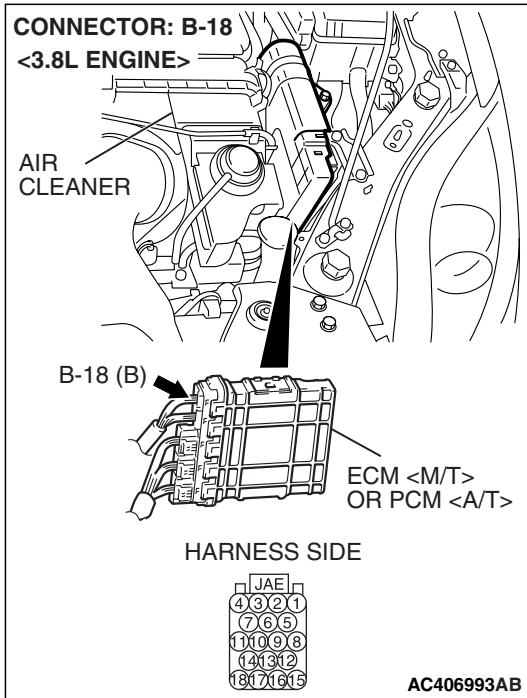
**NO :** Check the ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> connector, and repair if necessary. If the ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> connector is in good condition, replace the ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system>.



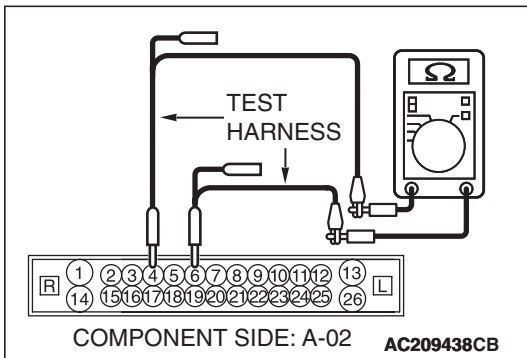
**STEP 14.** Check the CAN\_L and H lines between the ECM <M/T> or PCM <A/T> connector and the ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> connector for a short circuit. Measure the resistance at ABS-ECU connector A-02 <vehicles without traction control system> or ABS/TCL-ECU connector A-03 <vehicles with traction control system>.

(1) Disconnect the negative battery terminal.



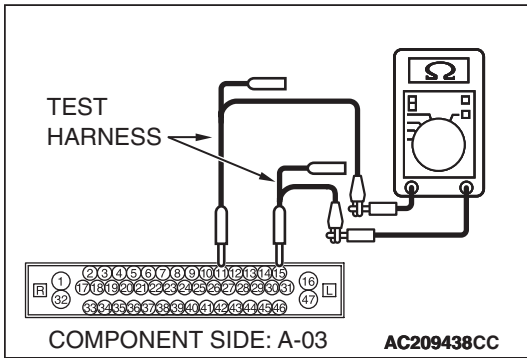


- (2) Disconnect ECM connector <M/T> or PCM connector <A/T> B-18 and ABS-ECU connector A-02 <vehicles without traction control system> or ABS/TCL-ECU connector A-03 <vehicles with traction control system>, and measure the resistance at the harness side of ABS-ECU connector A-02 <vehicles without traction control system> or ABS/TCL-ECL connector A-03 <vehicles with traction control system>.



- (3) Measure the resistance between ABS-ECU connector terminals 4 and 6. <vehicles without traction control system>

**OK: 1 kΩ or more**



- (4) Measure the resistance between ABS/TCL-ECU connector terminals 11 and 15. <vehicles with traction control system>

**OK: 1 kΩ or more**

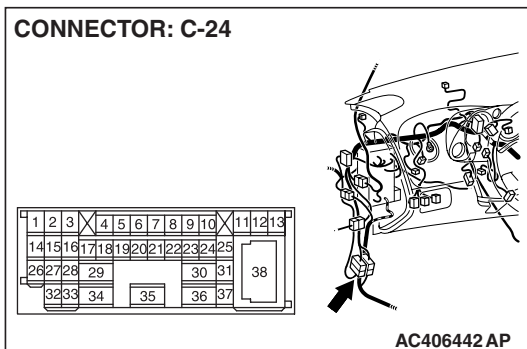
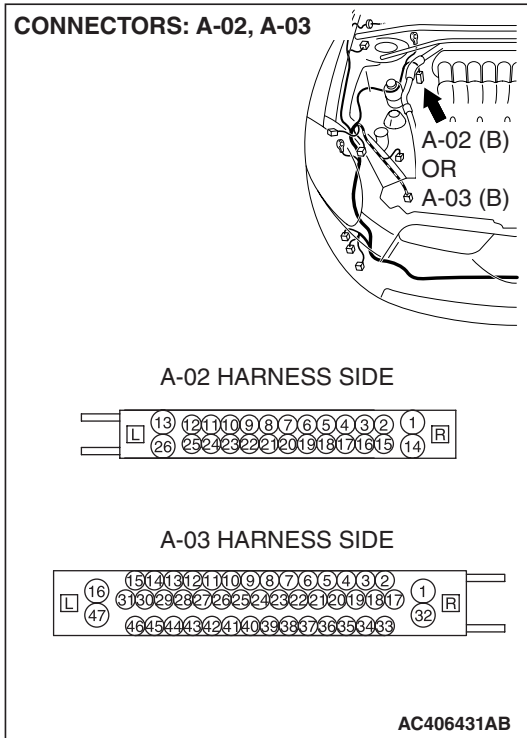
**Q: Is the check result normal?**

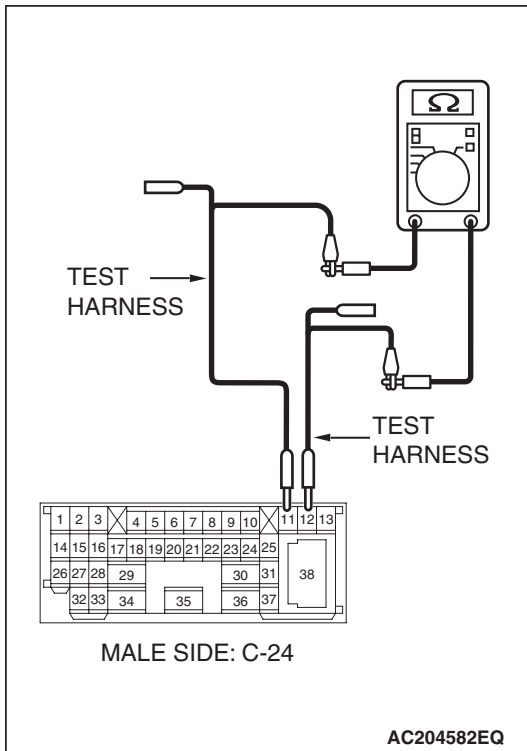
**YES :** Go to Step 15.

**NO :** Repair the wiring harness between ECM connector <M/T> or PCM connector <A/T> and ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> connector.

**STEP 15. Check the CAN\_L and H lines between the ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> connector and the intermediate connector for a short circuit. Measure the resistance at intermediate connector C-24.**

- (1) Disconnect the negative battery terminal.
- (2) Disconnect intermediate connector C-24 and ABS-ECU connector A-02 <vehicles without traction control system> or ABS/TCL-ECU connector A-03 <vehicles with traction control system>, and measure the resistance at the male side of intermediate connector C-24 (at front wiring harness side).





- (3) Measure the resistance between intermediate connector terminals 11 and 12.

**OK: 1 kΩ or more**

**Q: Is the check result normal?**

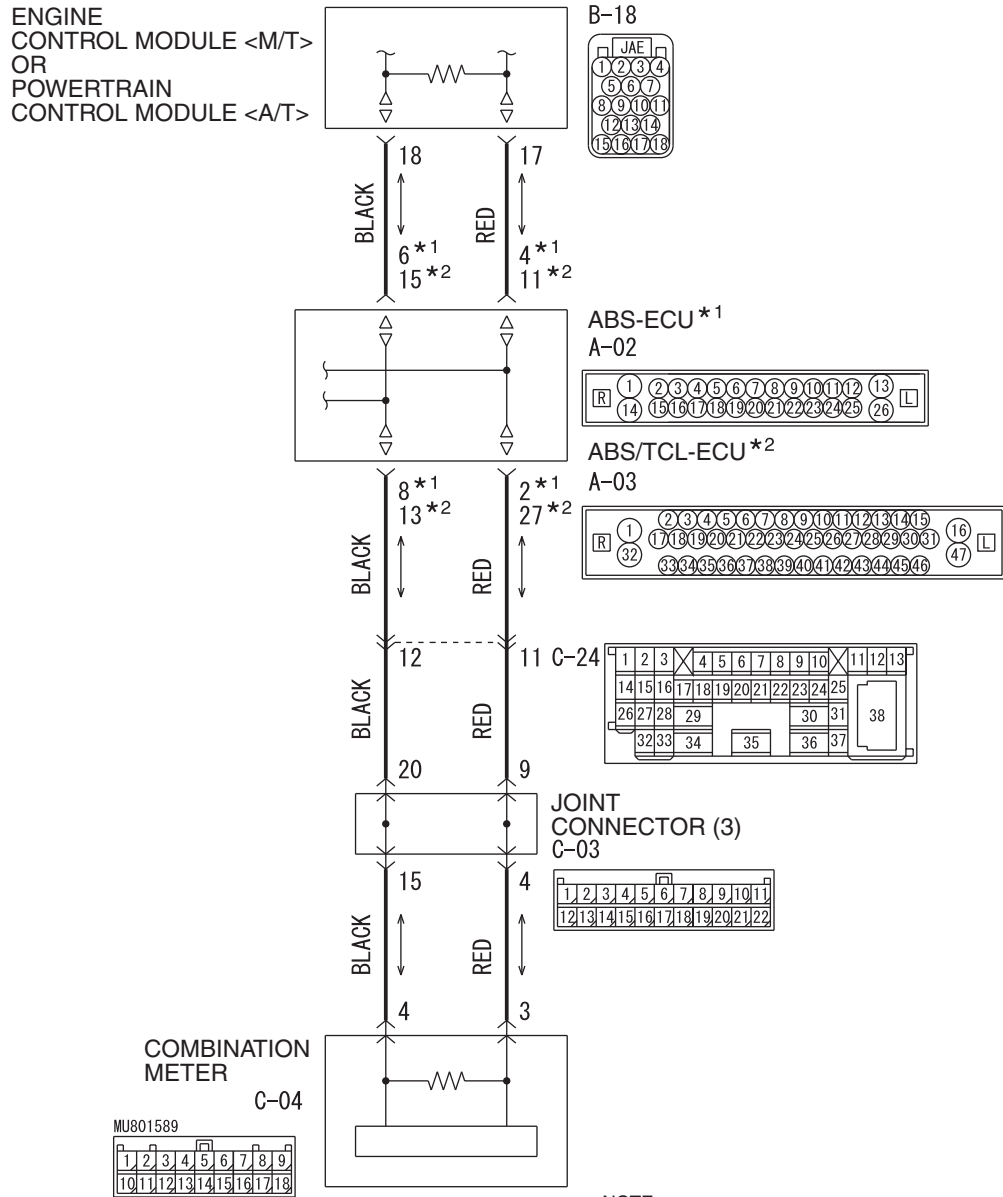
**YES :** Repair the wiring harness between joint connector (3) and data link connector.

**NO :** Repair the wiring harness between intermediate connector C-24 and ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> connector.

**DIAGNOSTIC ITEM 4: Diagnose the terminator resistors**

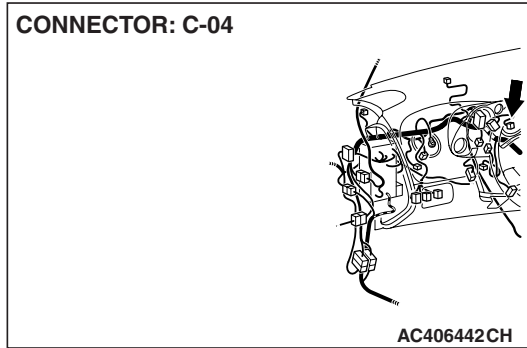
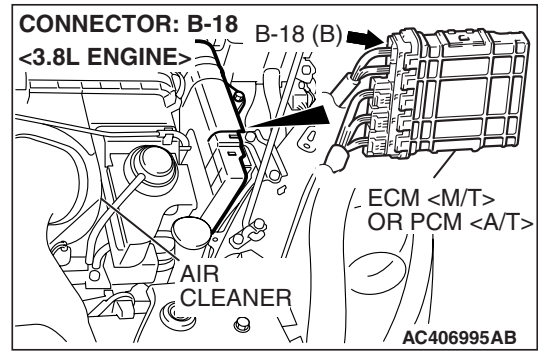
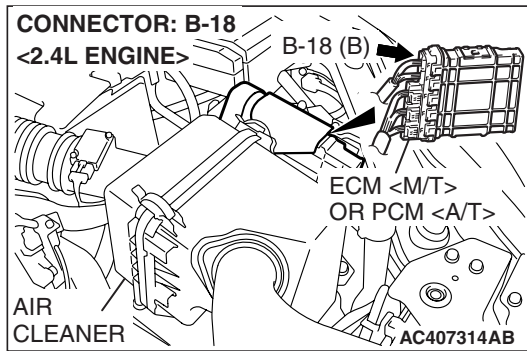
**⚠ CAUTION**

When servicing a CAN bus line, ground yourself by touching a metal object such as an unpainted water pipe. If you fail to do so, a component connected to the CAN bus line may be damaged.



NOTE  
 \*1 : VEHICLES WITHOUT TRACTION CONTROL SYSTEM  
 \*2 : VEHICLES WITH TRACTION CONTROL SYSTEM

W6P54M001A



## FUNCTION

The resistance in the communication errors condition cannot be measured by the CAN bus diagnostics, therefore, judge the terminator resistor only when receiving the each ECU periodically sent data normally.

## TROUBLE JUDGEMENT CONDITIONS

The scan tool MB991958 judges the trouble when the periodically sent data from each ECU can be received normally but the resistance value between CAN\_H and CAN\_L line is other than from 50 ohms to 70 ohms.

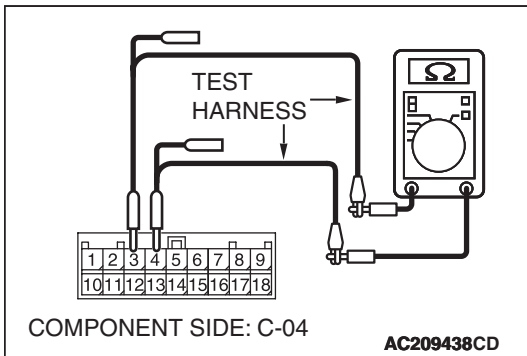
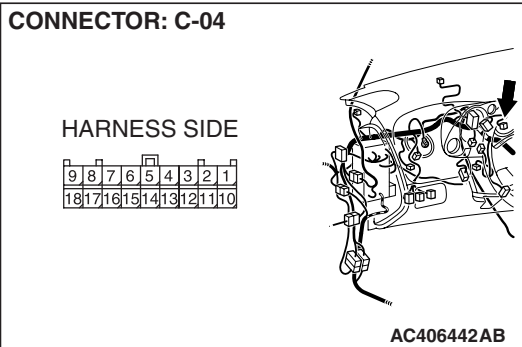
## TROUBLESHOOTING HINTS

- The combination meter may be defective (malfunction of the terminator resistor)
- The ECM <M/T> or PCM <A/T> may be defective (malfunction of the terminator resistor)
- The wiring harness may be defective (larger resistance of harness between the combination meter and the ECM <M/T> or PCM <A/T>)

## DIAGNOSIS

### Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra fine probe



**STEP 1. Check the terminator resistor inside the combination meter. Measure the resistance at combination meter connector C-04.**

**⚠ CAUTION**

**A digital multimeter should be used. For details refer to P.54C-4.**

(1) Disconnect combination meter C-04, and measure the resistance at the component side of combination meter connector C-04.

(2) Measure the resistance between combination meter connector terminals 3 and 4.

**OK:  $120 \pm 20$  ohms**

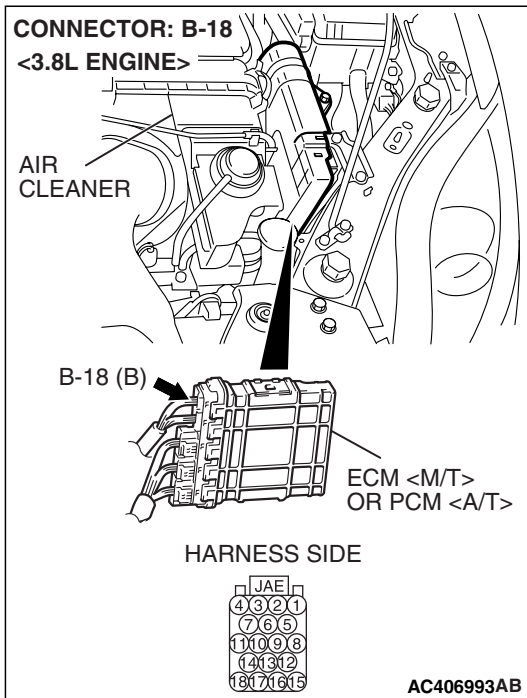
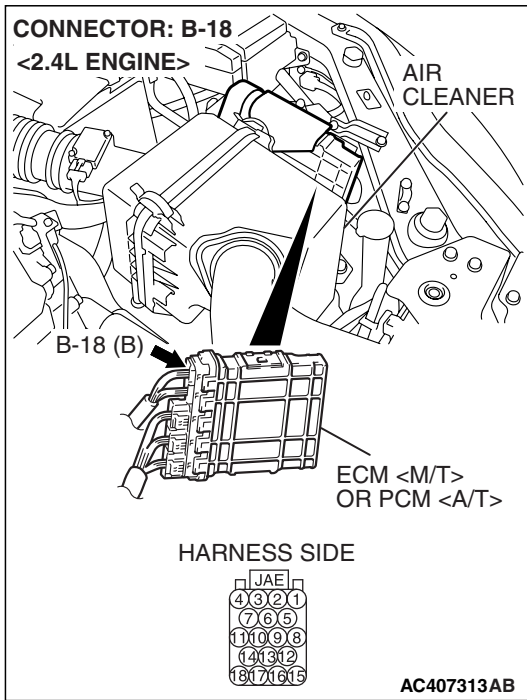
**Q: Does the resistance measure  $120 \pm 20$  ohms?**

**YES :** Go to Step 2.

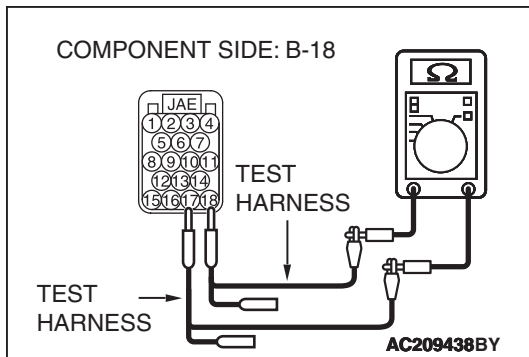
**NO :** Replace the combination meter.

**STEP 2. Check the terminator resistor inside the ECM <M/T> or PCM <A/T>. Measure the resistance at ECM <M/T> or PCM <A/T> connector B-18.**

- (1) Disconnect ECM <M/T> or PCM <A/T> connector B-18, and measure the resistance at the component side of ECM <M/T> or PCM <A/T> connector B-18.







(2) Measure the resistance between ECM <M/T> or PCM <A/T> connector terminals 17 and 18.

**OK:  $120 \pm 20$  ohms**

**Q: Does the resistance measure  $120 \pm 20$  ohms?**

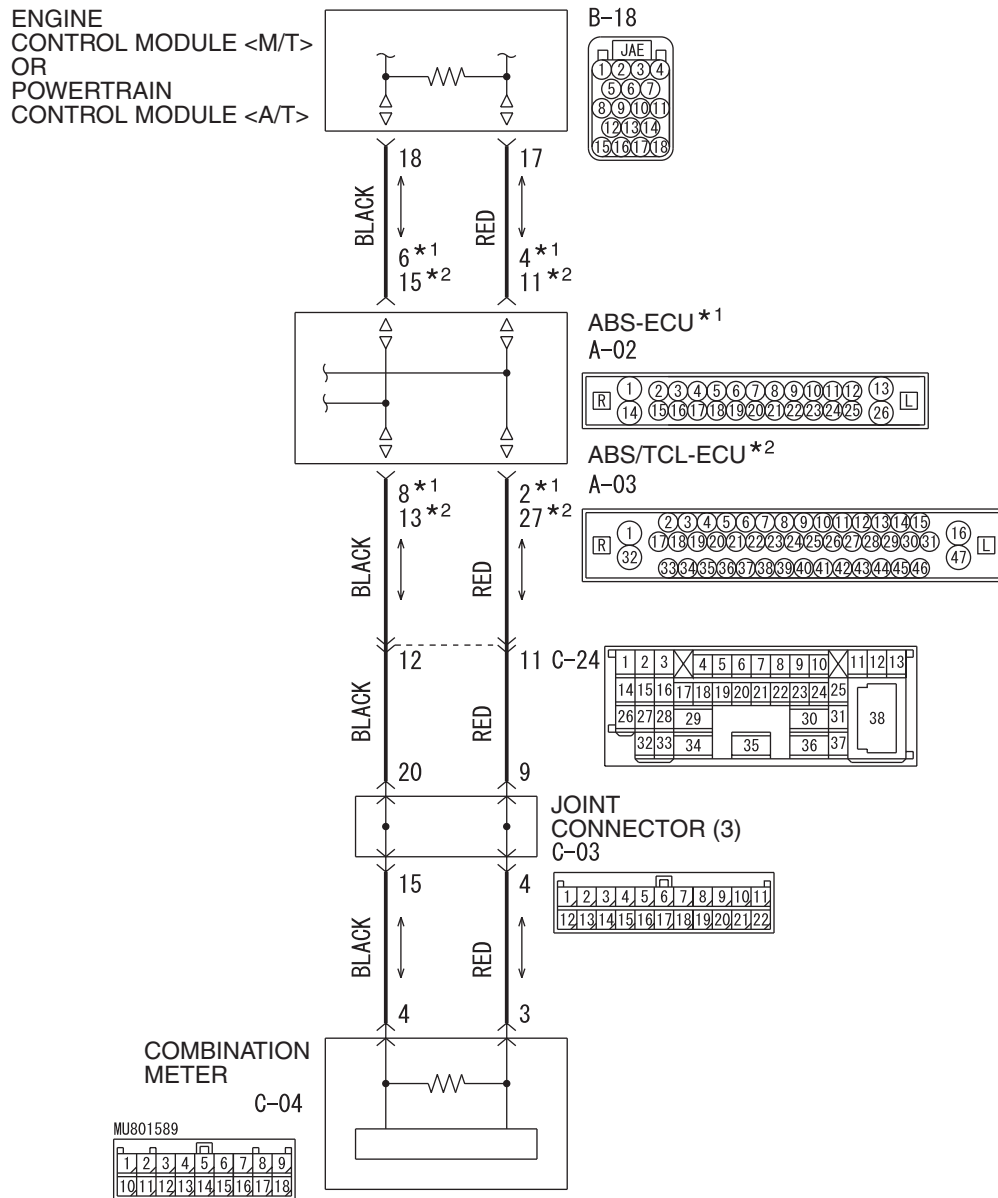
**YES :** Repair the wiring harness between combination meter connector and the ECM <M/T> or PCM <A/T> connector.

**NO :** Replace the ECM <M/T> or PCM <A/T>. When the ECM <M/T> or PCM <A/T> is replaced, register the encrypted code. Refer to GROUP 54A, Encrypted Code Registration Criteria Table [P.54A-13](#).

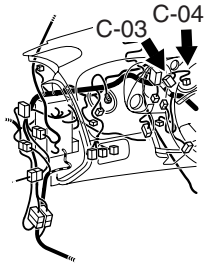
**DIAGNOSTIC ITEM 5: Diagnose when the scan tool cannot receive the data sent by combination meter.**

**CAUTION**

When servicing a CAN bus line, ground yourself by touching a metal object such as an unpainted water pipe. If you fail to do so, a component connected to the CAN bus line may be damaged.



CONNECTORS: C-03, C-04



AC406442CI

## FUNCTION

The diagnostic result demonstrates that "the scan tool cannot receive the sent data from the combination meter" when the scan tool MB991958 checks the periodically sent data from each ECU and cannot receive the combination meter data only.

## TRUBLE JUDGEMENT CONDITIONS

Scan tool MB991958 judges the trouble when the periodically sent data from combination meter cannot be received and sent.

## TROUBLESHOOTING HINTS

- The wiring harness may be defective [open circuit between combination meter and joint connector (3)]
- The connector may be defective [poor connection of joint connector (3) or combination meter connector]
- Power supply circuit malfunction of the combination meter
- The combination meter may be defective

## DIAGNOSIS

### Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra fine probe

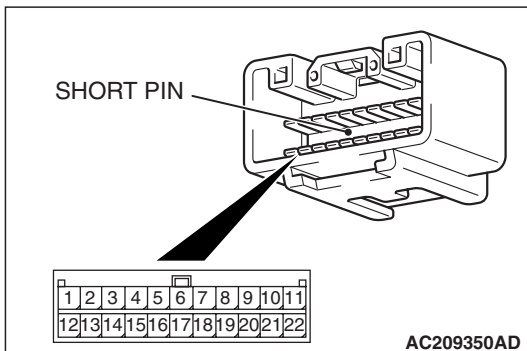
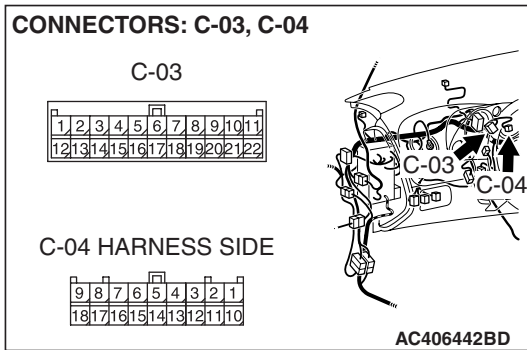
**STEP 1. Check joint connector (3) C-03 and combination meter connector C-04 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

Check the joint connector at the wiring harness side for loose, corroded or damaged terminals, or terminals pushed back in the connector, and also check the short pin behind the connector for corrosion, deformation and delamination.

**Q: Are joint connector (3) C-03 and combination meter connector C-04 in good condition?**

**YES :** Go to Step 2.

**NO :** Repair the damaged parts. Replace the joint connector as necessary.

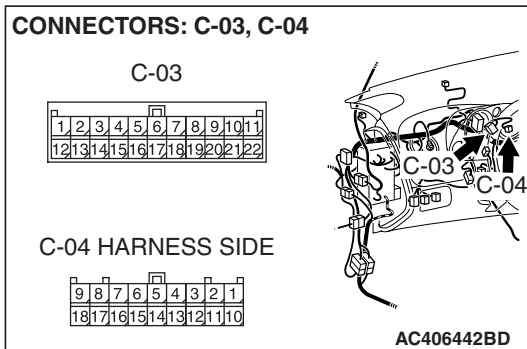


**STEP 2. Check the CAN bus lines between joint connector (3) and the combination meter. Measure the resistance between joint connector (3) C-03 and combination meter connector C-04.**

**⚠ CAUTION**

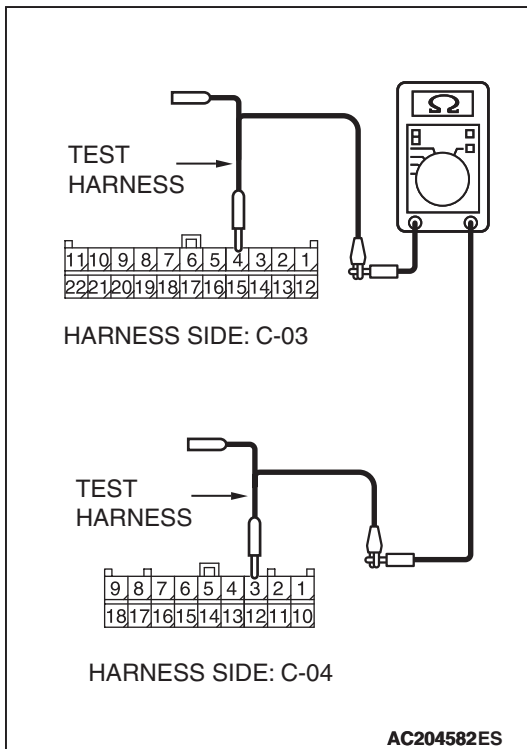
- A digital multimeter should be used. For details refer to [P.54C-4](#).
- The test wiring harness should be used. For details refer to [P.54C-4](#).

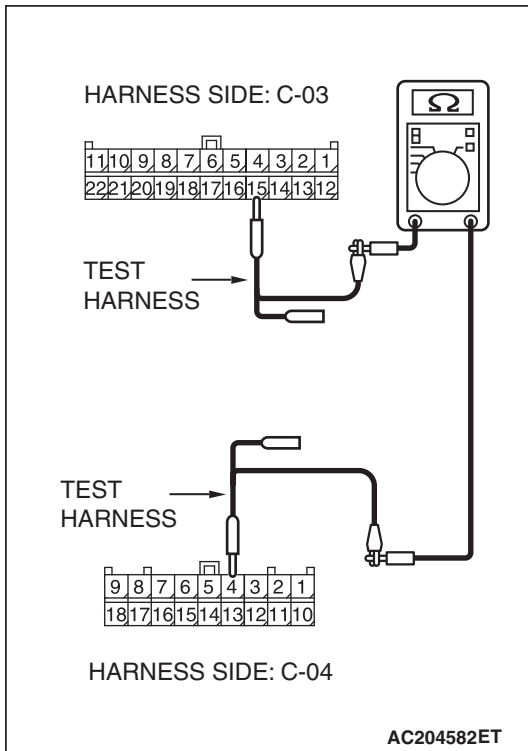
(1) Disconnect joint connector (3) C-03 and combination meter connector C-04, and measure the resistance between each wiring harness side connector.



(2) Measure the resistance between joint connector (3) terminal 4 and combination meter connector terminal 3.

**OK: 2 ohms or less**





- (3) Measure the resistance between joint connector (3) terminal 15 and combination meter connector terminal 4.

**OK: 2 ohms or less**

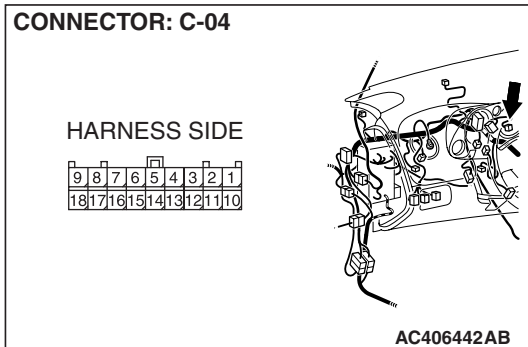
**CAUTION**

Strictly observe the specified wiring harness repair procedure. For details refer to [P.54C-5](#).

**Q: Do all the resistances measure 2 ohms or less?**

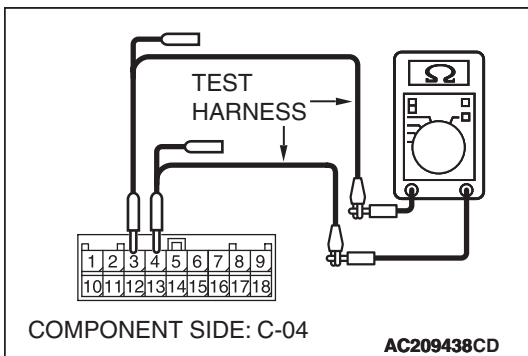
**YES :** Go to Step 3.

**NO :** Repair the wiring harness between joint connector (3) and the combination meter connector.



**STEP 3. Check the terminator resistor inside the combination meter. Measure the resistance at combination meter connector C-04.**

- (1) Disconnect combination meter C-04, and measure the resistance at the component side of combination meter connector C-04.



- (2) Measure the resistance between combination meter connector terminals 3 and 4.

**OK: 120 ± 20 ohms**

**Q: Does the resistance measure 120 ± 20 ohms?**

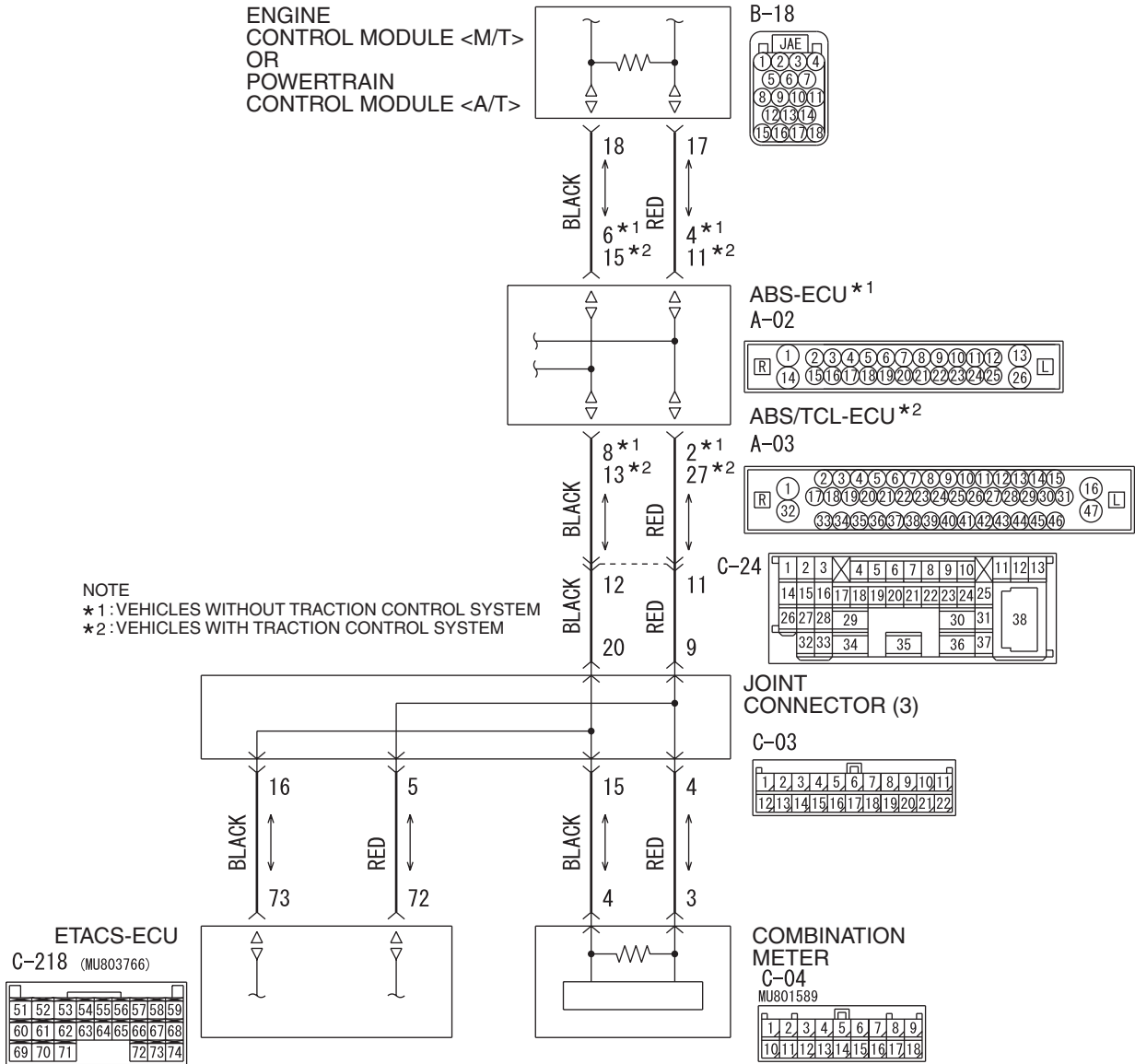
**YES :** Refer to GROUP 54A, Chassis Electrical – Combination Meter – Troubleshooting [P.54A-96](#).

**NO :** Replace the combination meter.

**DIAGNOSTIC ITEM 6: Diagnose when the scan tool cannot receive the data sent by ETACS-ECU.**

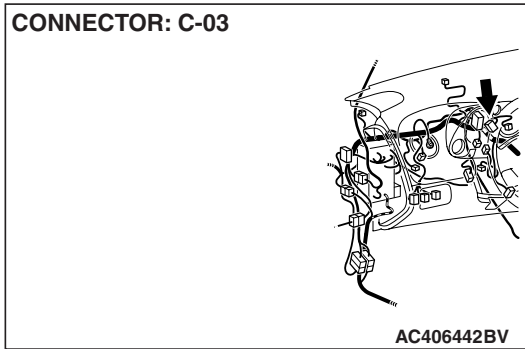
**CAUTION**

When servicing a CAN bus line, ground yourself by touching a metal object such as an unpainted water pipe. If you fail to do so, a component connected to the CAN bus line may be damaged.

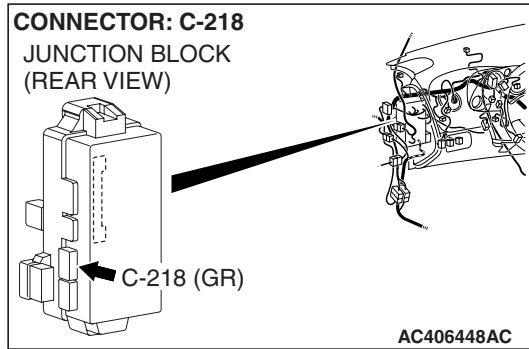


W6P54M002A

CONNECTOR: C-03



CONNECTOR: C-218

JUNCTION BLOCK  
(REAR VIEW)**FUNCTION**

The diagnostic result demonstrates that "the scan tool cannot receive the sent data from the ETACS-ECU" when the scan tool MB991958 checks the periodically sent data from each ECU and cannot receive the ETACS-ECU data only.

**TRUBLE JUDGEMENT CONDITIONS**

Scan tool MB991958 judges the trouble when the periodically sent data from ETACS-ECU cannot be received and sent.

**TROUBLESHOOTING HINTS**

- The wiring harness may be defective [open circuit between ETACS-ECU and joint connector (3)]
- The connector may be defective [poor connection of joint connector (3) or ETACS-ECU connector]
- Power supply circuit malfunction of the ETACS-ECU
- The ETACS-ECU may be defective

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

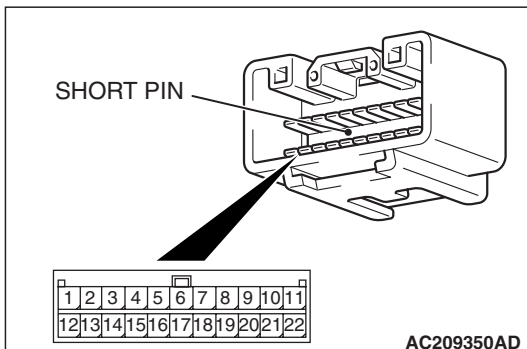
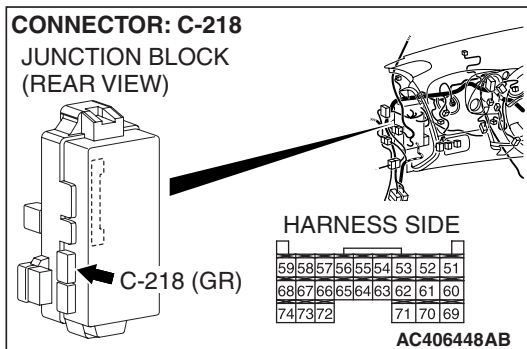
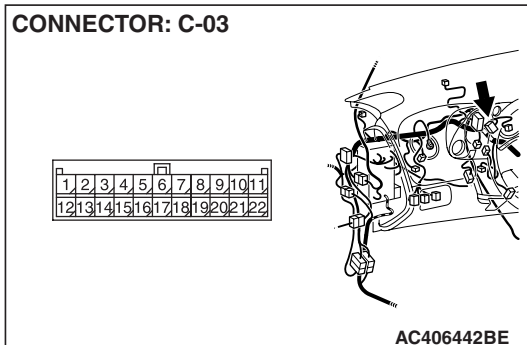
- MB991223: Harness Set
- MB992006: Extra fine probe



**STEP 1.** Check joint connector (3) C-03 and ETACS-ECU connector C-218 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

**⚠ CAUTION**

The strand end of the twisted wire should be within 10 cm (4.0 inches) from the connector. For details refer to [P.54C-4](#).



Check the joint connector at the wiring harness side for loose, corroded or damaged terminals, or terminals pushed back in the connector, and also check the short pin behind the connector for corrosion, deformation and delamination.

**Q: Are joint connector (3) C-03 and ETACS-ECU connector C-218 in good condition?**

**YES :** Go to Step 2.

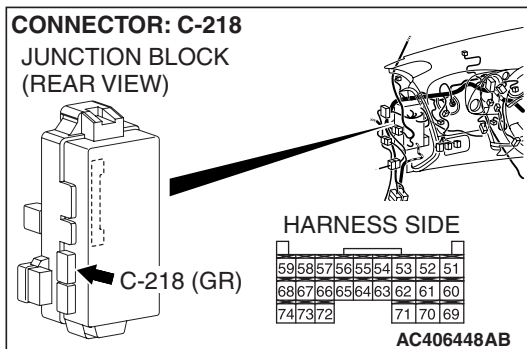
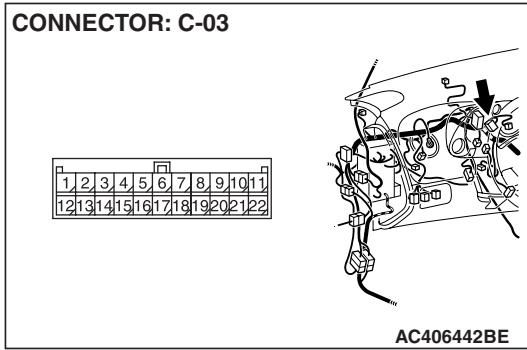
**NO :** Repair the damaged parts. Replace the joint connector as necessary.

**STEP 2. Check the CAN bus lines between joint connector (3) and the ETACS-ECU. Measure the resistance between joint connector (3) C-03 and ETACS-ECU connector C-218.**

**⚠ CAUTION**

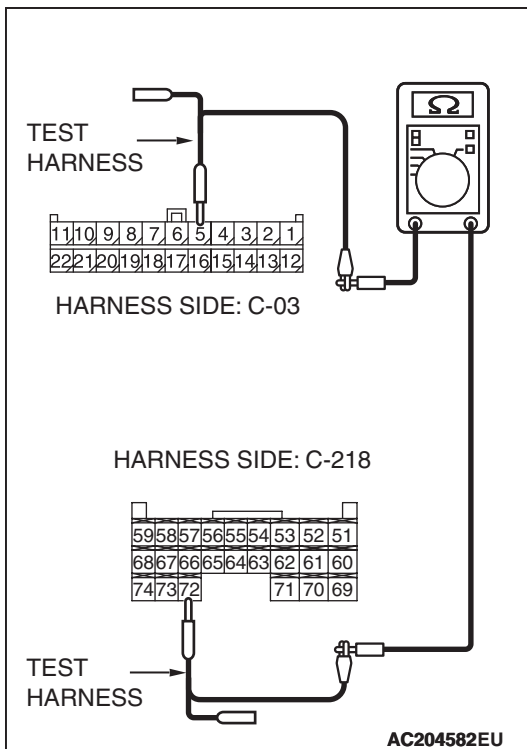
- A digital multimeter should be used. For details refer to [P.54C-4](#).
- The test wiring harness should be used. For details refer to [P.54C-4](#).

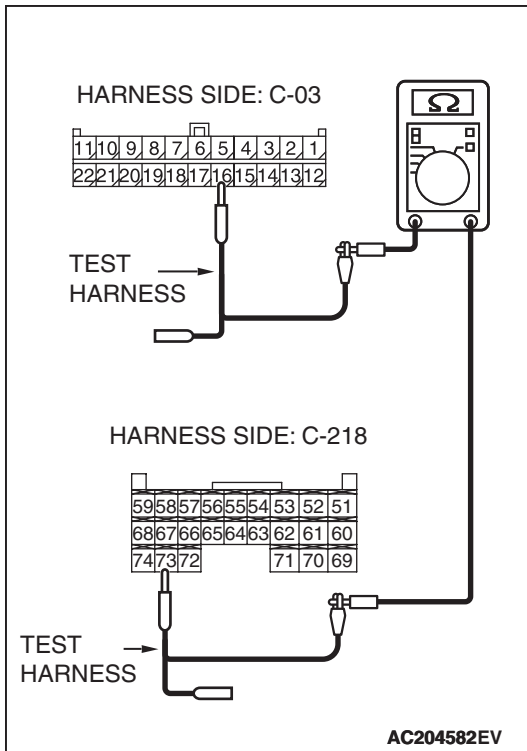
(1) Disconnect joint connector (3) C-03 and ETACS-ECU connector C-218, and measure the resistances at the wiring harness sides of joint connector (3) C-03 and ETACS-ECU connector C-218.



(2) Measure the resistance between joint connector (3) terminal 5 and ETACS-ECU connector terminal 72.

**OK: 2 ohms or less**





(3) Measure the resistance between joint connector (3) terminal 16 and ETACS-ECU connector terminal 73.

**OK: 2 ohms or less**

**CAUTION**

Strictly observe the specified wiring harness repair procedure. For details refer to [P.54C-5](#).

**Q: Do all the resistances measure 2 ohms or less?**

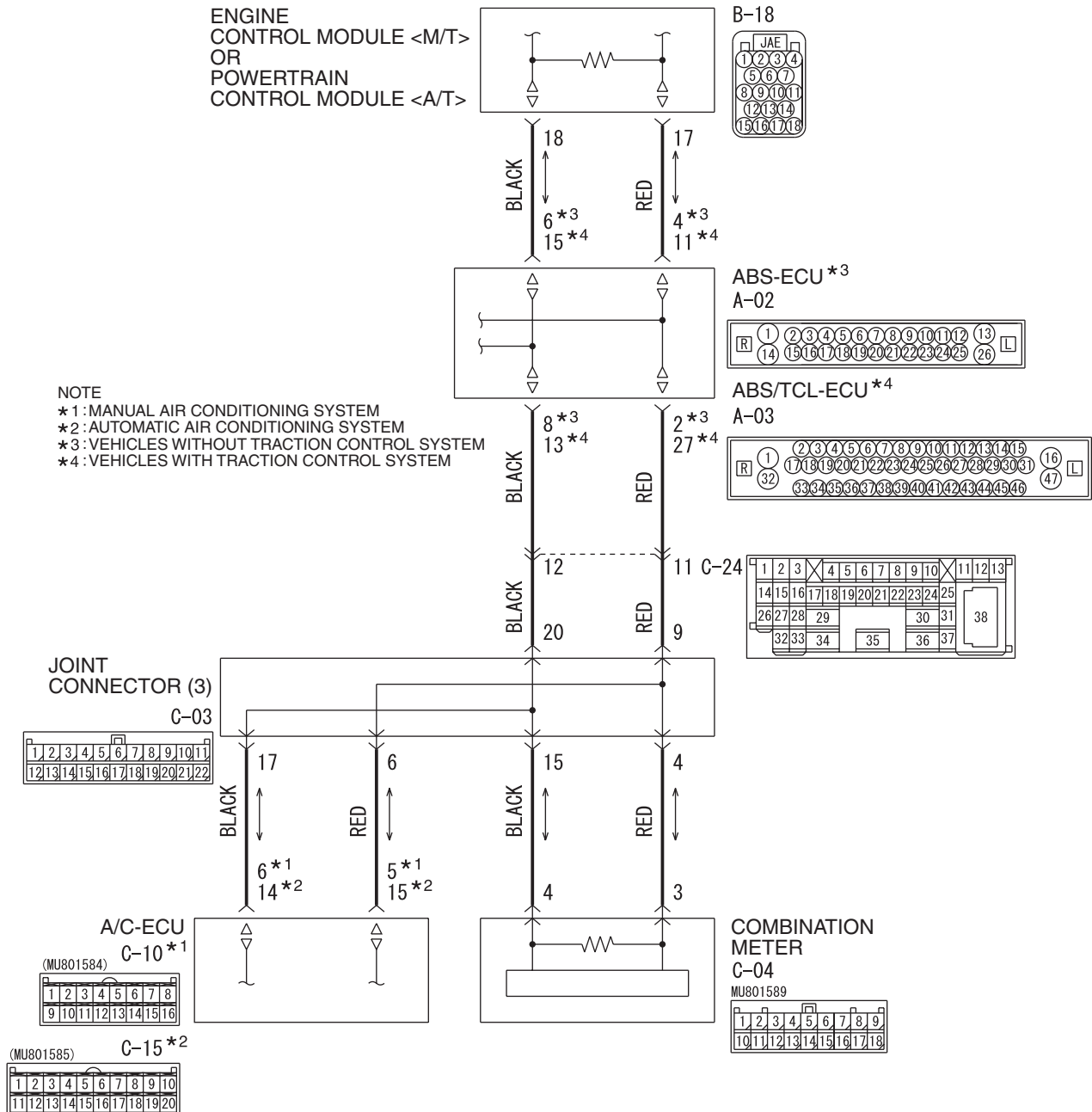
**YES** : Diagnose the SWS. Refer to GROUP 54B, Symptom procedures [P.54B-78](#).

**NO** : Repair the wiring harness between joint connector (3) and the ETACS-ECU connector.

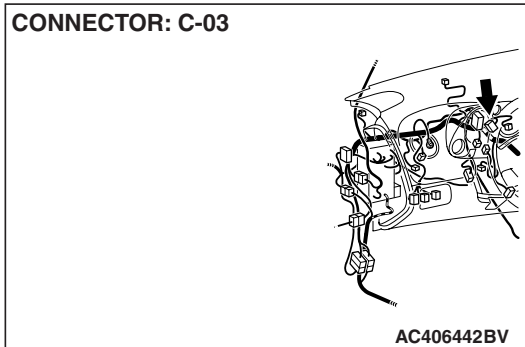
DIAGNOSTIC ITEM 7: Diagnose when the scan tool cannot receive the data sent by A/C-ECU.

**CAUTION**

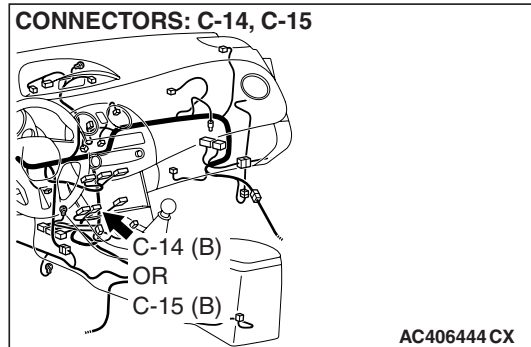
When servicing a CAN bus line, ground yourself by touching a metal object such as an unpainted water pipe. If you fail to do so, a component connected to the CAN bus line may be damaged.



CONNECTOR: C-03



CONNECTORS: C-14, C-15



## FUNCTION

The diagnostic result demonstrates that "the scan tool cannot receive the sent data from the A/C-ECU" when the scan tool MB991958 checks the periodically sent data from each ECU and cannot receive the A/C-ECU data only.

## TRUBLE JUDGEMENT CONDITIONS

Scan tool MB991958 judges the trouble when the periodically sent data from A/C-ECU cannot be received and sent.

## TROUBLESHOOTING HINTS

- The wiring harness may be defective [open circuit between A/C-ECU and joint connector (3)]
- The connector may be defective [poor connection of joint connector (3) or A/C-ECU connector]
- Power supply circuit malfunction of the A/C-ECU
- The A/C-ECU may be defective

## DIAGNOSIS

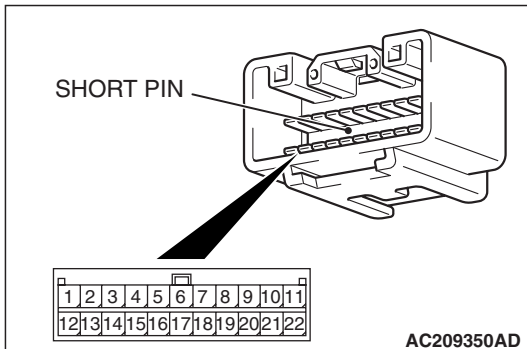
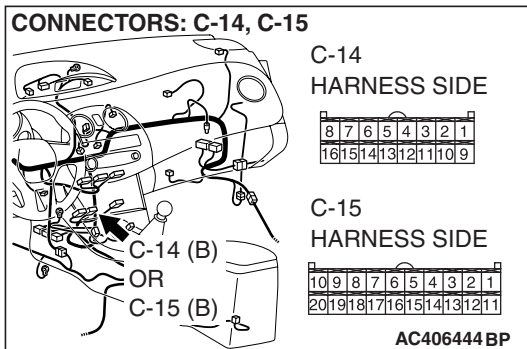
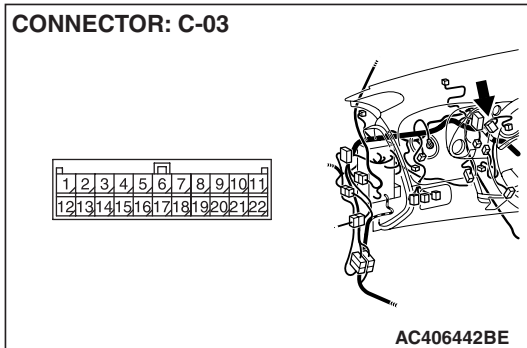
### Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra fine probe

**STEP 1.** Check joint connector (3) C-03 and A/C-ECU connector C-14 <manual air conditioning system> or C-15 <automatic air conditioning system> for loose, corroded or damaged terminals, or terminals pushed back in the connector.

**⚠ CAUTION**

The strand end of the twisted wire should be within 10 cm (4.0 inches) from the connector. For details refer to [P.54C-4](#).



Check the joint connector at the wiring harness side for loose, corroded or damaged terminals, or terminals pushed back in the connector, and also check the short pin behind the connector for corrosion, deformation and delamination.

**Q:** Are joint connector (3) C-03 and A/C-ECU connector C-14 <manual air conditioning system> or C-15 <automatic air conditioning system> in good condition?

**YES :** Go to Step 2.

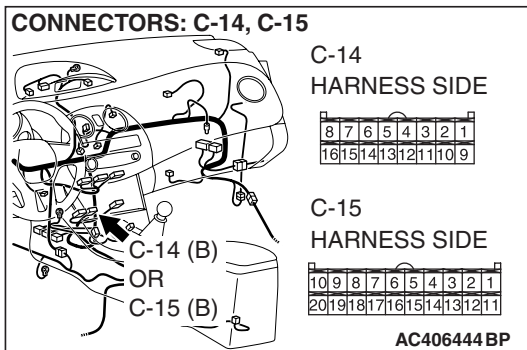
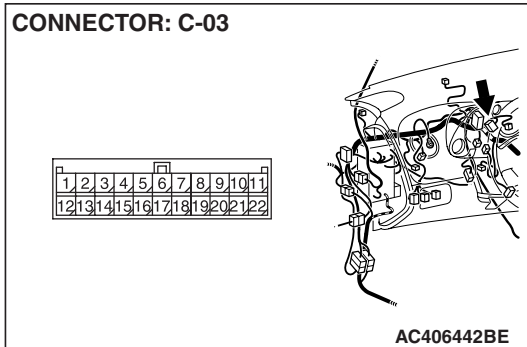
**NO :** Repair the damaged parts. Replace the joint connector as necessary.

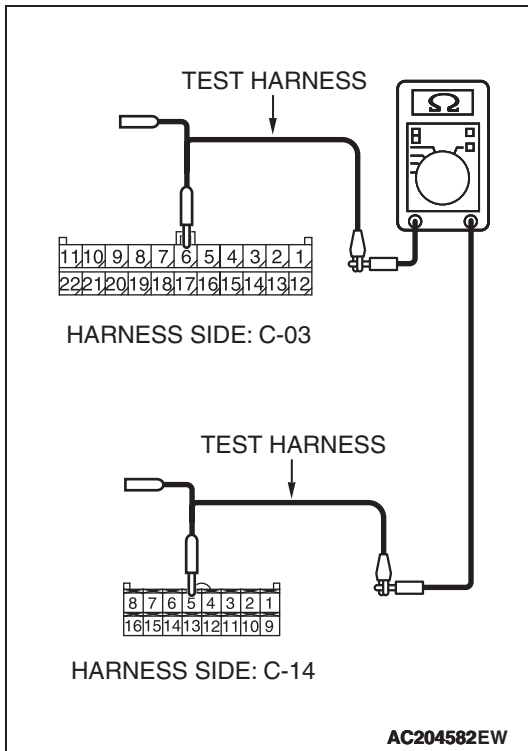
**STEP 2.** Check the CAN bus lines between joint connector (3) and the A/C-ECU. Measure the resistance between joint connector (3) C-02 and A/C-ECU connector C-10 <manual air conditioning system> or C-15 <automatic air conditioning system>.

**⚠ CAUTION**

- A digital multimeter should be used. For details refer to [P.54C-4](#).
- The test wiring harness should be used. For details refer to [P.54C-4](#).

- (1) Disconnect joint connector (3) C-03 and A/C-ECU connector C-14 <manual air conditioning system> or C-15 <automatic air conditioning system>, and measure the resistances at the wiring harness sides of joint connector (3) C-03 and A/C-ECU connector C-14 <manual air conditioning system> or C-15 <automatic air conditioning system>.



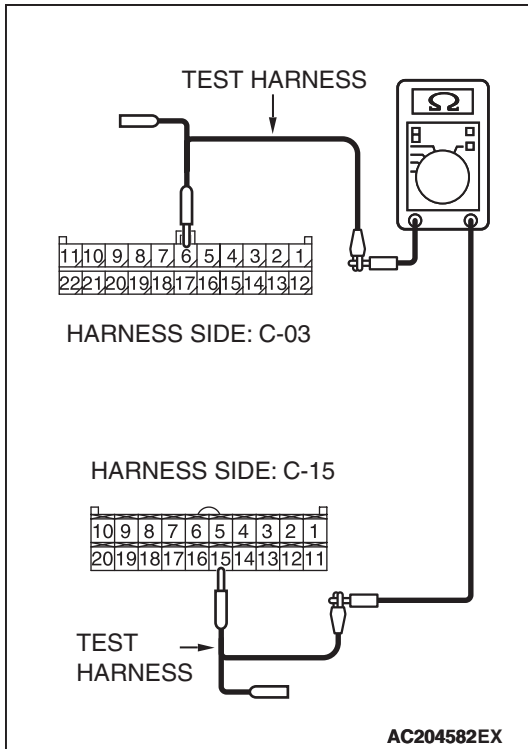


- (2) Measure the resistance between joint connector (3) terminal 6 and A/C-ECU connector terminal 5 <manual air conditioning system> or 15 <automatic air conditioning system>.

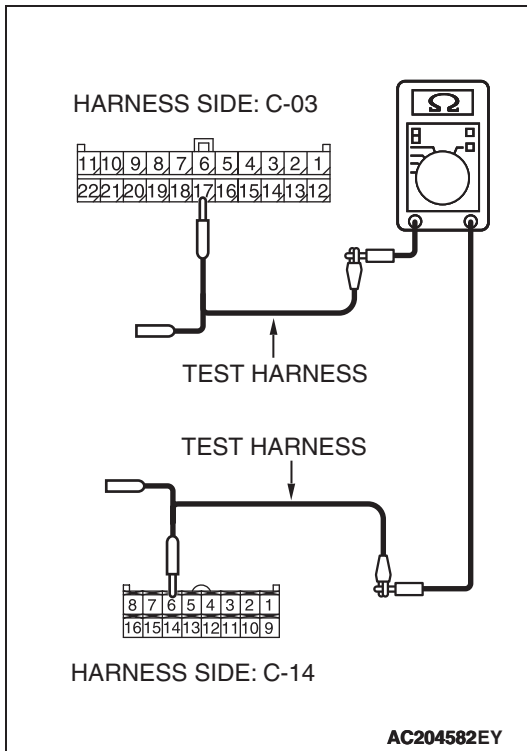
**OK: 2 ohms or less**

**CAUTION**

Strictly observe the specified wiring harness repair procedure. For details refer to [P.54C-5](#).







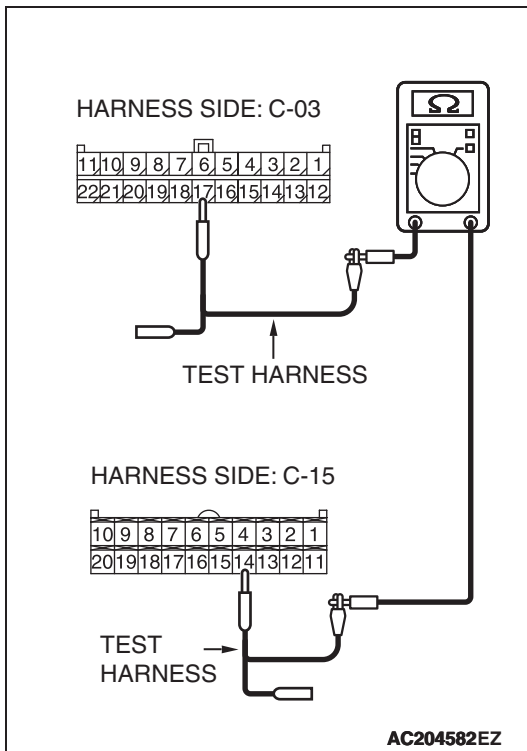
- (3) Measure the resistance between joint connector (3) terminal 17 and A/C-ECU connector terminal 6 <manual air conditioning system> or 14 <automatic air conditioning system>.

**OK: 2 ohms or less**

**Q: Do all the resistances measure 2 ohms or less?**

**YES :** Diagnose the air conditioning system. Refer to GROUP 55A, Manual A/C diagnosis P.55A-99 <manual air conditioning system> or GROUP 55B, Auto A/C diagnosis P.55B-107 <automatic air conditioning system>.

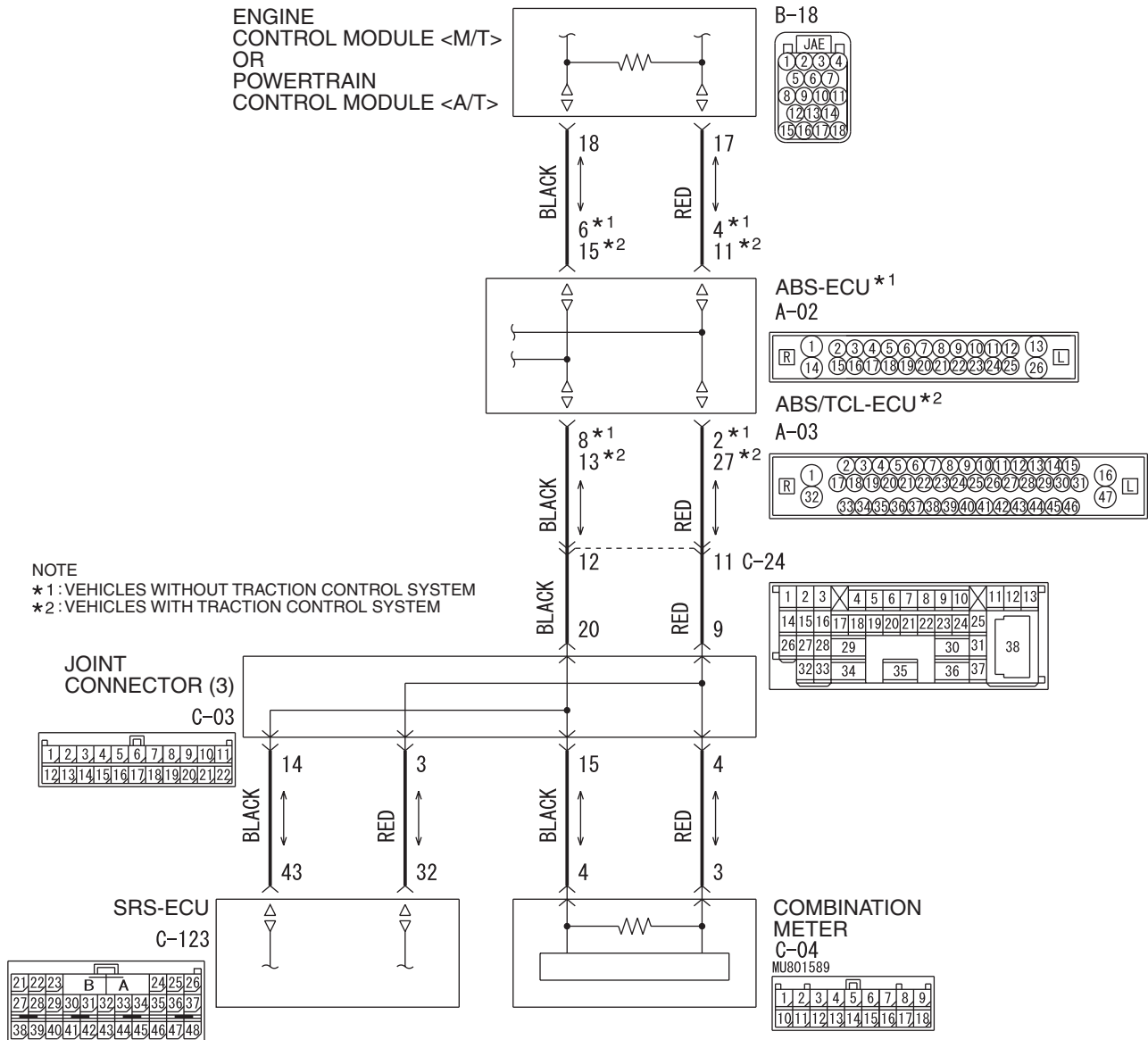
**NO :** Repair the wiring harness between joint connector (3) and the A/C-ECU connector.



DIAGNOSTIC ITEM 8: Diagnose when the scan tool cannot receive the data sent by SRS-ECU.

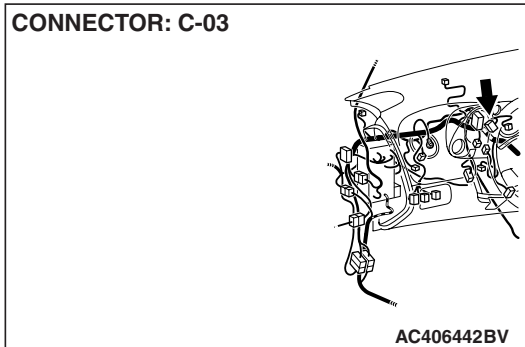
**CAUTION**

When servicing a CAN bus line, ground yourself by touching a metal object such as an unpainted water pipe. If you fail to do so, a component connected to the CAN bus line may be damaged.

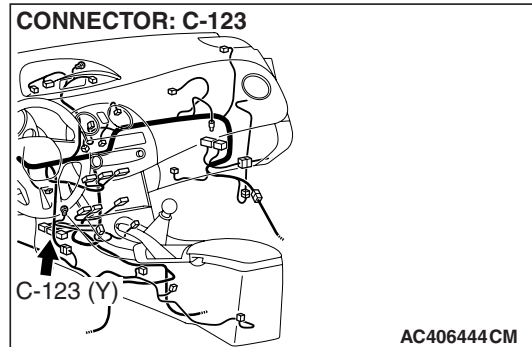


W6P54M005A

CONNECTOR: C-03



CONNECTOR: C-123



## FUNCTION

The diagnostic result demonstrates that "the scan tool cannot receive the sent data from the SRS-ECU" when the scan tool MB991958 checks the periodically sent data from each ECU and cannot receive the SRS-ECU data only.

## TRUBLE JUDGEMENT CONDITIONS

Scan tool MB991958 judges the trouble when the periodically sent data from SRS-ECU cannot be received and sent.

## TROUBLESHOOTING HINTS

- The wiring harness may be defective [open circuit between SRS-ECU and joint connector (3)]
- The connector may be defective [poor connection of joint connector (3) or SRS-ECU connector]
- Power supply circuit malfunction of the SRS-ECU
- The SRS-ECU may be defective

## DIAGNOSIS

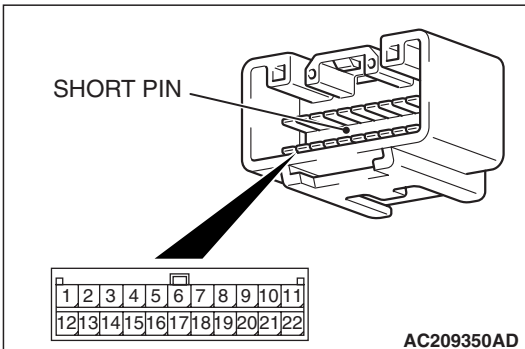
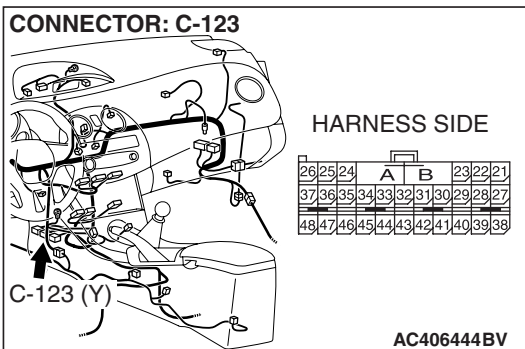
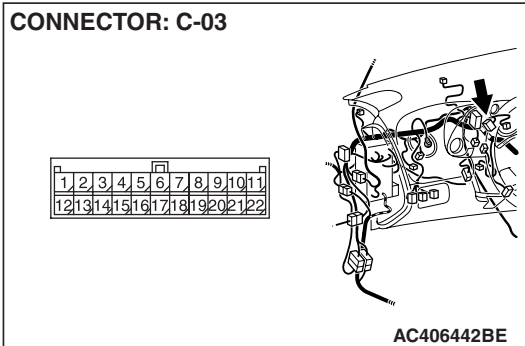
### Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra fine probe

**STEP 1. Check joint connector (3) C-03 and SRS-ECU connector C-123 for loose, corroded or damaged terminals, or terminals pushed back in the connector.**

**⚠ CAUTION**

The strand end of the twisted wire should be within 10 cm (4.0 inches) from the connector. For details refer to [P.54C-4](#).



Check the joint connector at the wiring harness side for loose, corroded or damaged terminals, or terminals pushed back in the connector, and also check the short pin behind the connector for corrosion, deformation and delamination.

**Q: Are joint connector (3) C-03 and SRS-ECU connector C-123 in good condition?**

**YES :** Go to Step 2.

**NO :** Repair the damaged parts. Replace the joint connector as necessary.

**STEP 2. Check the CAN bus lines joint connector (3) and the SRS-ECU. Measure the resistance between joint connector (3) C-03 and SRS-ECU connector C-123.**

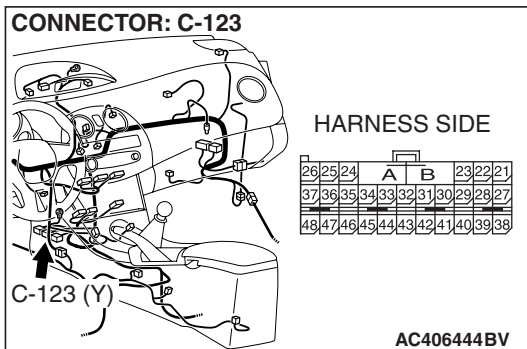
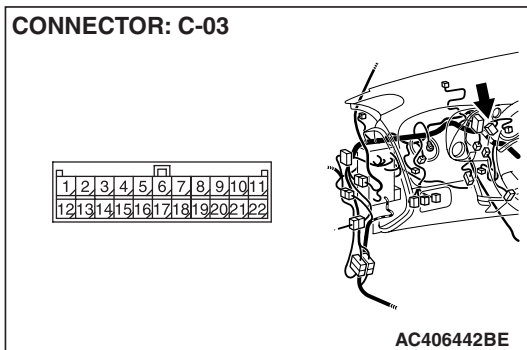
**⚠ CAUTION**

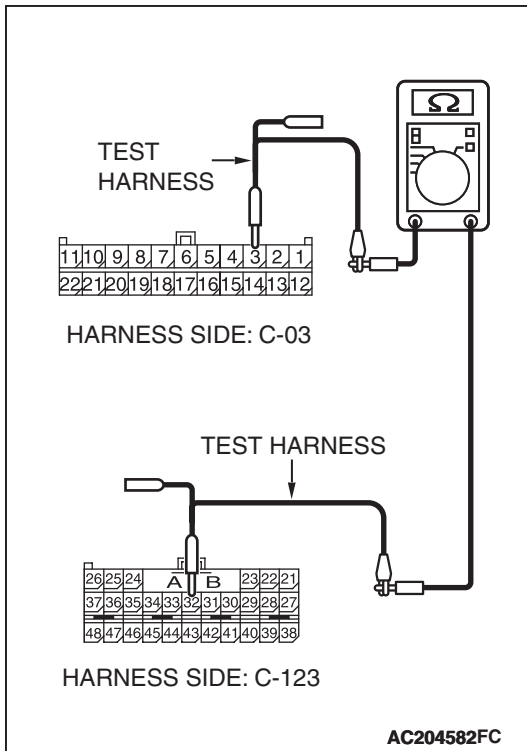
- A digital multimeter should be used. For details refer to [P.54C-4](#).
- The test wiring harness should be used. For details refer to [P.54C-4](#).

**⚠ CAUTION**

**Disconnect the negative battery terminal. For details refer to [P.54C-4](#).**

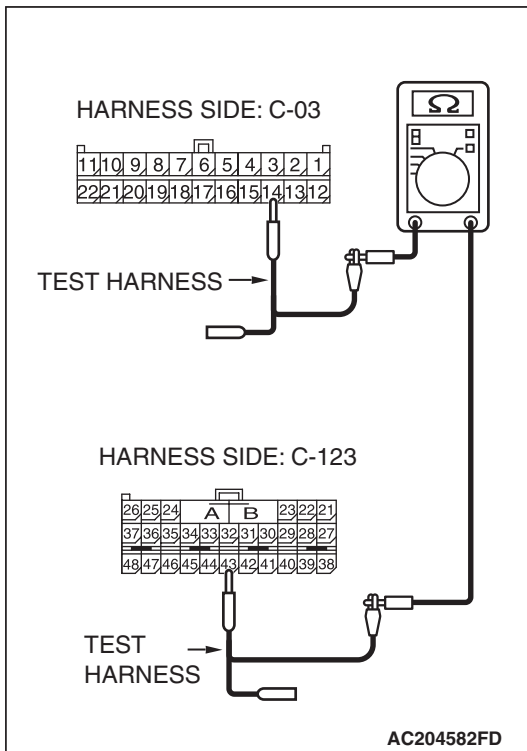
- (1) Disconnect the negative battery terminal.
- (2) Disconnect joint connector (3) C-03 and SRS-ECU connector C-123, and measure the resistance between the wiring harness side connector of SRS-ECU connector C-123 and joint connector (3) C-03.





- (3) Measure the resistance between joint connector (3) terminal 3 and SRS-ECU connector terminal 32.

**OK: 2 ohms or less**



- (4) Measure the resistance between joint connector (3) terminal 14 and SRS-ECU connector terminal 43.

**OK: 2 ohms or less**

**CAUTION**

Strictly observe the specified wiring harness repair procedure. For details refer to P.54C-5.

**Q: Do all the resistances measure 2 ohms or less?**

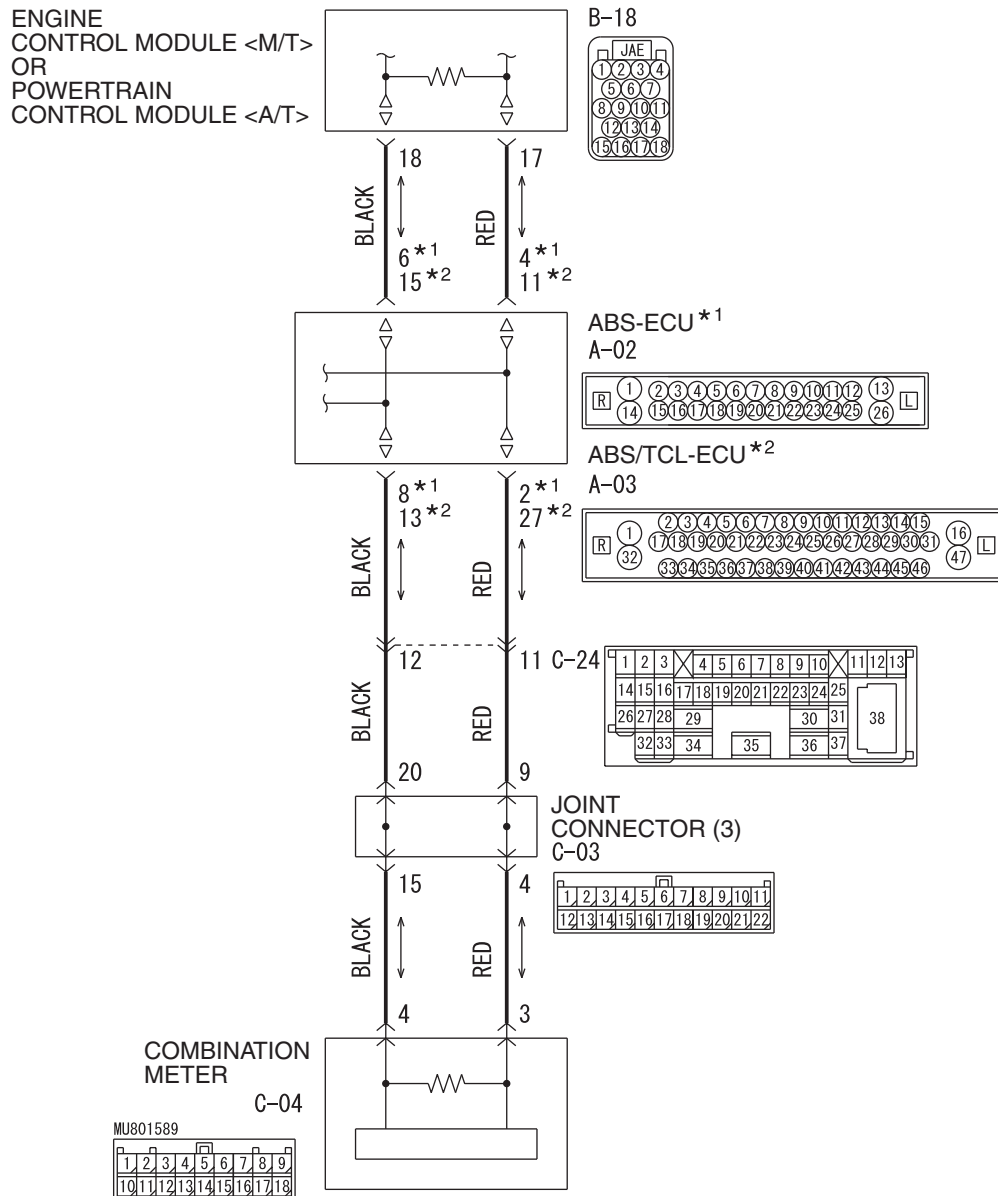
**YES :** Diagnose the supplemental restraint system. Refer to GROUP 52B, SRS air bag diagnosis P.52B-29.

**NO :** Repair the wiring harness between joint connector (3) and the SRS-ECU connector.

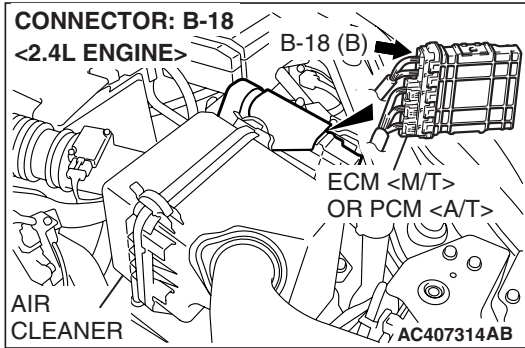
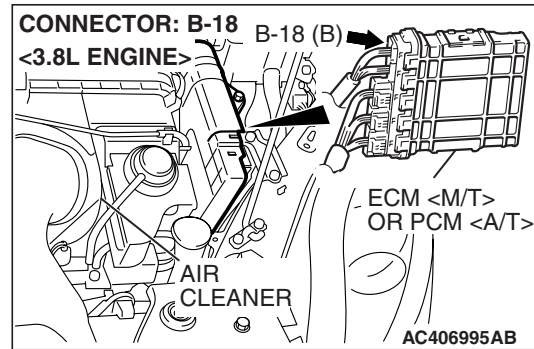
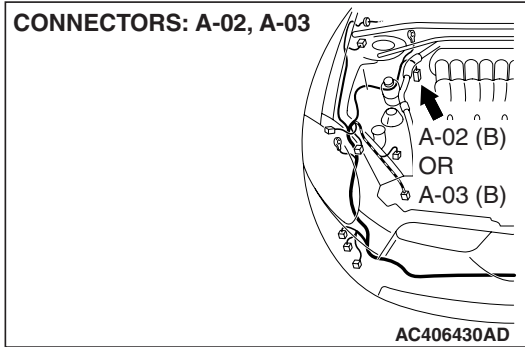
**DIAGNOSTIC ITEM 9: Diagnose when the scan tool cannot receive the data sent by the ECM <M/T> or the PCM <A/T>.**

**⚠ CAUTION**

**When servicing a CAN bus line, ground yourself by touching a metal object such as an unpainted water pipe. If you fail to do so, a component connected to the CAN bus line may be damaged.**



NOTE  
\*1 : VEHICLES WITHOUT TRACTION CONTROL SYSTEM  
\*2 : VEHICLES WITH TRACTION CONTROL SYSTEM



## FUNCTION

The diagnostic result demonstrates that "the scan tool cannot receive the sent data from the ECM <M/T> or PCM <A/T>" when the scan tool MB991958 checks the periodically sent data from each ECU and cannot receive the ECM <M/T> or PCM <A/T> data only.

## TROUBLE JUDGEMENT CONDITIONS

Scan tool MB991958 judges the trouble when the periodically sent data from the ECM <M/T> or PCM <A/T> cannot be received and sent.

## TROUBLESHOOTING HINTS

- The wiring harness may be defective (open circuit between ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> and ECM <M/T> or PCM <A/T>)
- The connector may be defective (poor connection of ECM <M/T> or PCM <A/T> connector and ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> connector)
- Power supply circuit malfunction of the ECM <M/T> or PCM <A/T>
- The ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> may be defective (internal open circuit)
- The ECM <M/T> or PCM <A/T> may be defective

## DIAGNOSIS

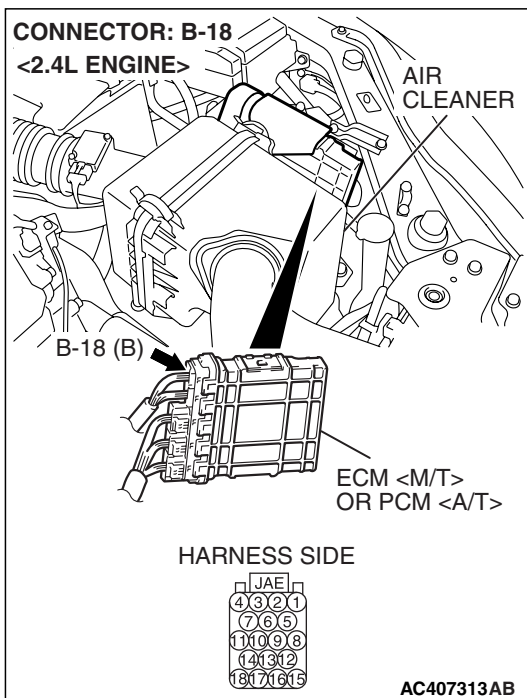
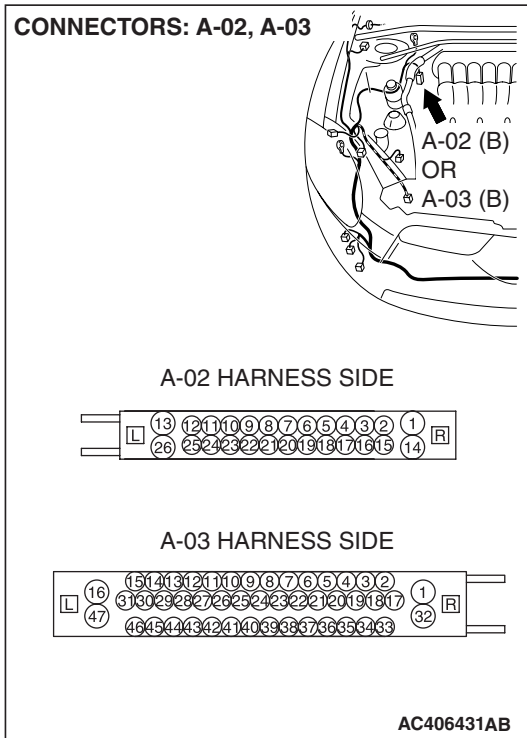
### Required Special Tools:

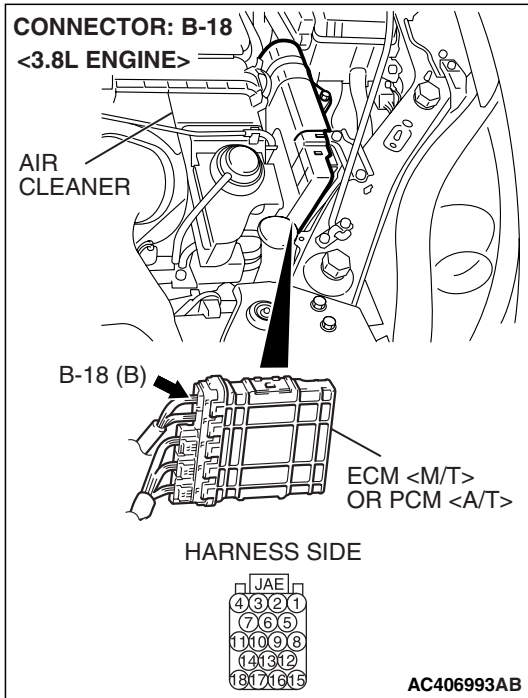
- MB991223: Harness Set
- MB992006: Extra fine probe
- MB991970: ABS Check Harness



**STEP 1.** Check ABS-ECU connector A-02 <vehicles without traction control system> or ABS/TCL-ECU connector A-03 <vehicles with traction control system> and ECM connector <M/T> or PCM connector <A/T> B-18 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

**CAUTION**





The strand end of the twisted wire should be within 10 cm (4.0 inches) from the connector. For details refer to [P.54C-4](#).

**Q:** Are ABS-ECU connector A-02 <vehicles without traction control system> or ABS/TCL-ECU connector A-03 <vehicles with traction control system> and ECM connector <M/T> or PCM connector <A/T> B-18 in good condition?

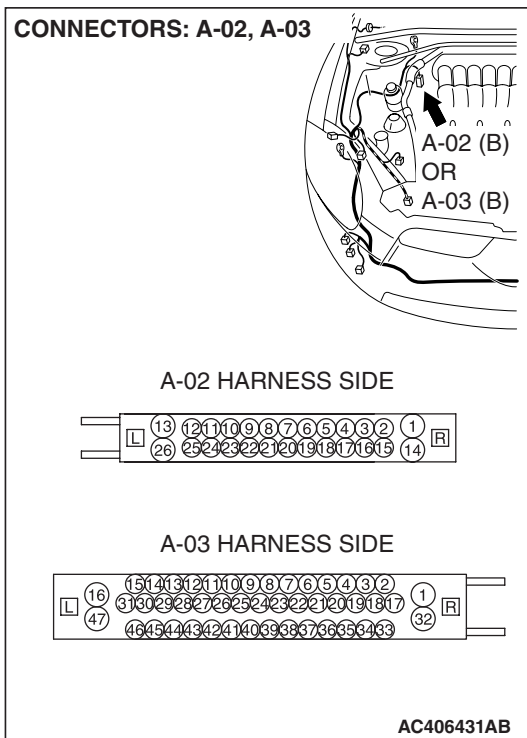
**YES :** Go to Step 2.

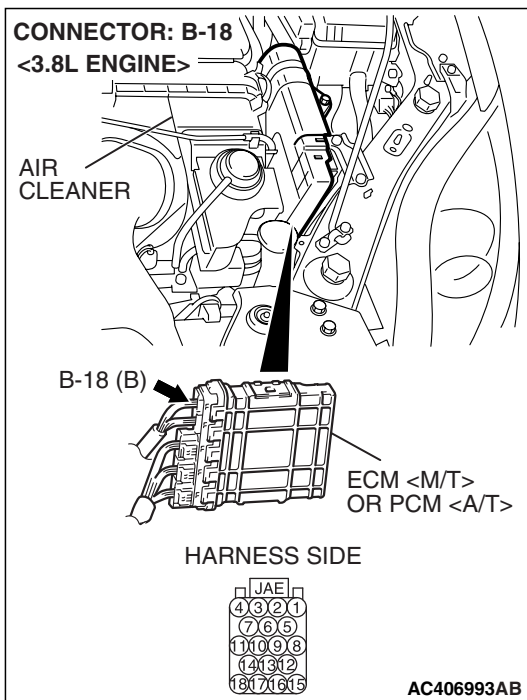
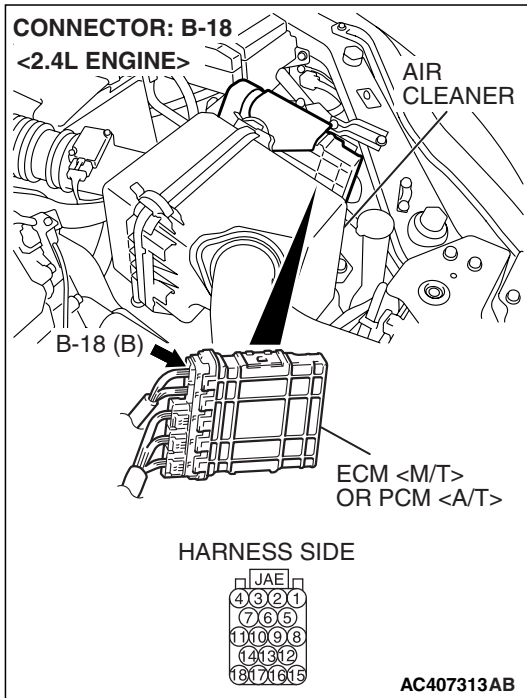
**NO :** Repair the damaged parts.

**STEP 2.** Check the CAN bus lines between the ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> and the ECM <M/T> or PCM <A/T>. Measure the resistance between ABS-ECU connector A-02 <vehicles with traction control system> or ABS/TCL-ECU connector <vehicles with traction control system> and ECM connector <M/T> or PCM connector <A/T> B-18.

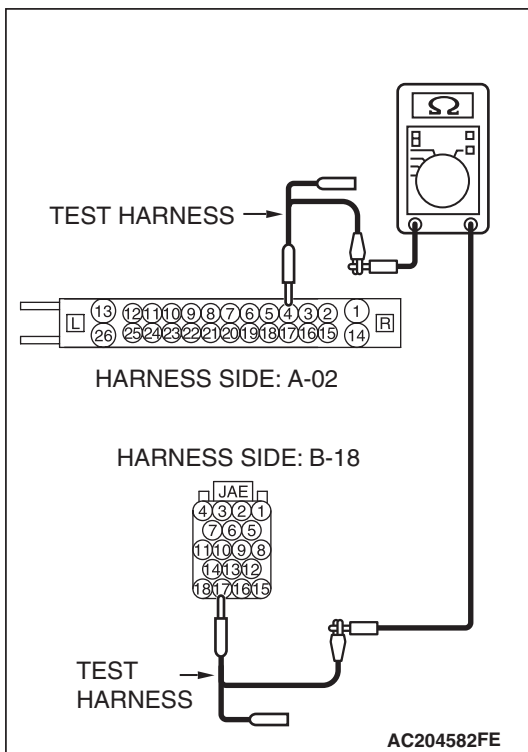
**⚠ CAUTION**

- A digital multimeter should be used. For details refer to [P.54C-4](#).
- The test wiring harness should be used. For details refer to [P.54C-4](#).



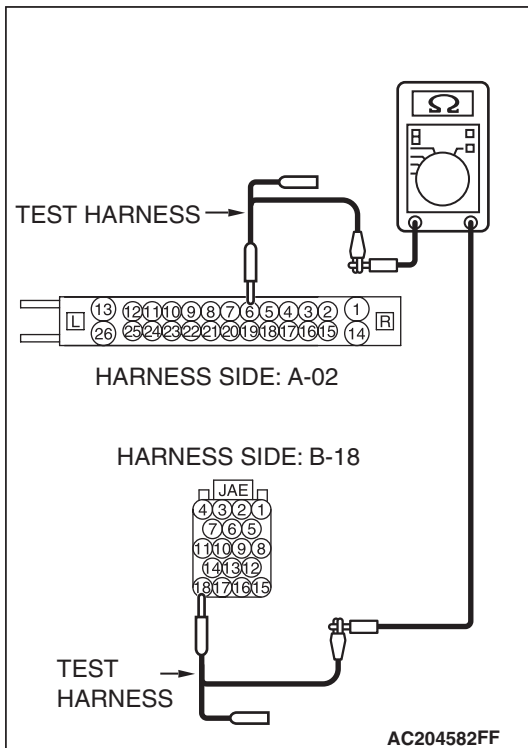


- (1) Disconnect ABS-ECU connector A-02 <vehicles without traction control system> or ABS/TCL-ECU connector A-03 <vehicles with traction control system> and ECM <M/T> or PCM connector <A/T> B-18, and measure the resistance between each wiring harness side connector.



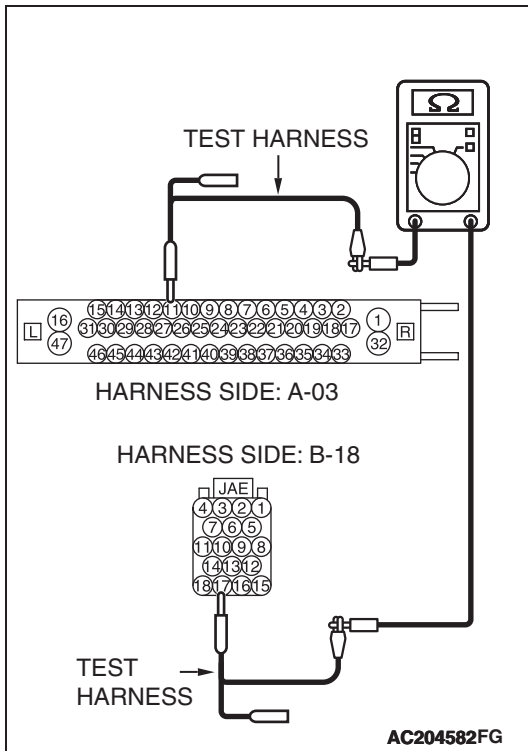
- (2) Measure the resistance between ABS-ECU connector <vehicles without traction control system> terminal 4 and ECM connector <M/T> or PCM connector <A/T> terminal 17.

**OK: 2 ohms or less**



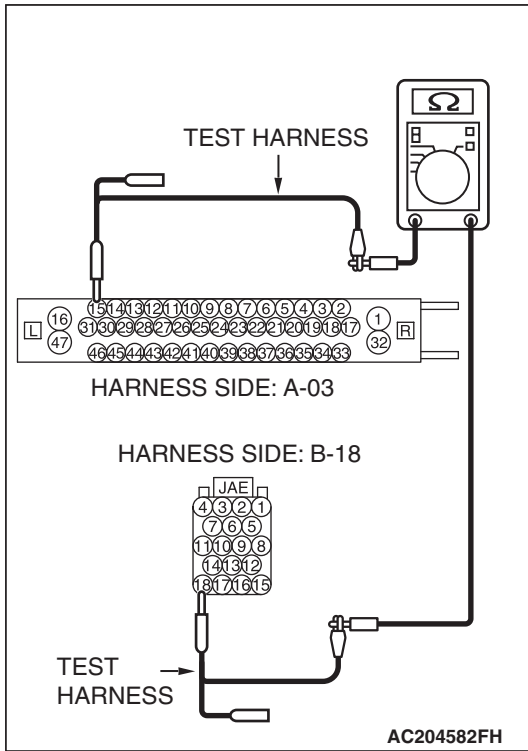
- (3) Measure the resistance between ABS-ECU connector <vehicles without traction control system> terminal 6 and ECM connector <M/T> or PCM connector <A/T> terminal 18.

**OK: 2 ohms or less**



- (4) Measure the resistance between ABS/TCL-ECU connector <vehicles with traction control system> terminal 11 and ECM connector <M/T> or PCM connector <A/T> terminal 17.

**OK: 2 ohms or less**



- (5) Measure the resistance between ABS/TCL-ECU connector <vehicles with traction control system> terminal 15 and ECM connector <M/T> or PCM connector <A/T> terminal 18.

**OK: 2 ohms or less**

**CAUTION**

Strictly observe the specified wiring harness repair procedure. For details refer to [P.54C-5](#).

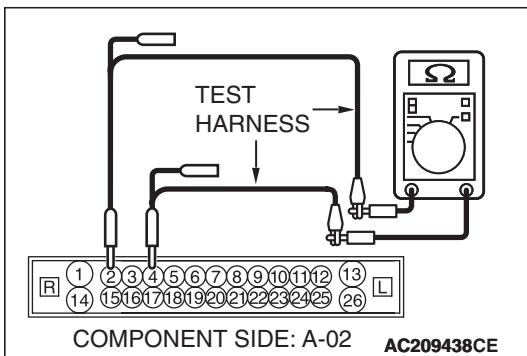
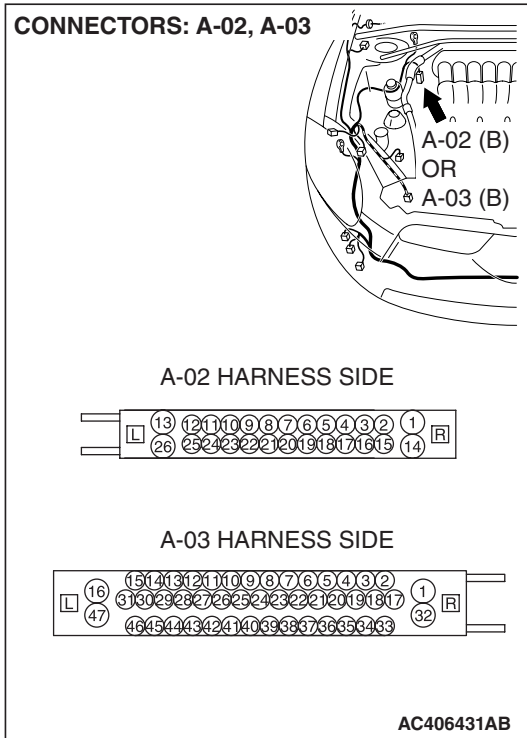
**Q: Do all the resistances measure 2 ohms or less?**

**YES :** Go to Step 3.

**NO :** Repair the wiring harness between the ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> connector and the ECM connector <M/T> or PCM connector <A/T>.

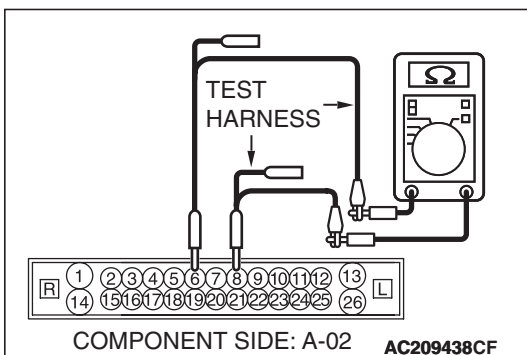
**STEP 3. Check the CAN bus lines inside the ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system>. Measure the resistance at ABS-ECU connector A-02 <vehicles without traction control system> or ABS/TCL-ECU connector A-03 <vehicles with traction control system>.**

- (1) Disconnect ABS-ECU connector A-02 <vehicles without traction control system> or ABS/TCL-ECU A-03 <vehicles with traction control system>, and measure the resistance at the component side of ABS-ECU connector A-02 <vehicles without traction control system> or ABS/TCL-ECU connector A-03 <vehicles with traction control system>.



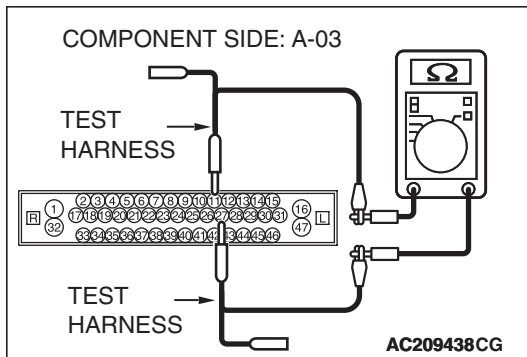
- (2) Measure the resistance between ABS-ECU connector <vehicles without traction control system> terminals 2 and 4.

**OK: 2 ohms or less**



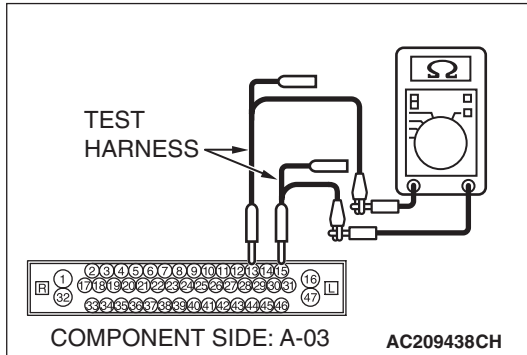
- (3) Measure the resistance between ABS-ECU connector <vehicles without traction control system> terminals 8 and 6.

**OK: 2 ohms or less**



- (4) Measure the resistance between ABS/TCL-ECU connector <vehicles with traction control system> terminals 11 and 27.

**OK: 2 ohms or less**



- (5) Measure the resistance between ABS/TCL-ECU connector <vehicles with traction control system> terminals 13 and 15.

**OK: 2 ohms or less**

**Q: Do all the resistances measure 2 ohms or less?**

**YES** : Diagnose the engine. Refer to GROUP 13A, MFI diagnosis [P.13A-1014](#) <2.4L engine> or GROUP 13B, MFI diagnosis [P.13B-1088](#) <3.8L engine>.

**NO** : Replace the ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system>.

**DIAGNOSTIC ITEM 10: Diagnose when the scan tool cannot receive the data sent by ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system>.**

### CAUTION

When servicing a CAN bus line, ground yourself by touching a metal object such as an unpainted water pipe. If you fail to do so, a component connected to the CAN bus line may be damaged.

### FUNCTION

The diagnostic result demonstrates that "the scan tool cannot receive the sent data from ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system>" when the scan tool MB991958 checks the periodically sent data from each ECU and cannot receive ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> data only.

### TRUBLE JUDGEMENT CONDITIONS

Scan tool MB991958 judges the trouble when the periodically sent data from ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> cannot be received and sent.

### TROUBLESHOOTING HINTS

- The wiring harness may be defective [open circuit between ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> and joint connector (3)]
- The connector may be defective [poor connection of joint connector (3) or ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> connector]
- Power supply circuit malfunction of ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system>
- The ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> may be defective (internal open circuit)
- The ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> may be defective

### DIAGNOSIS

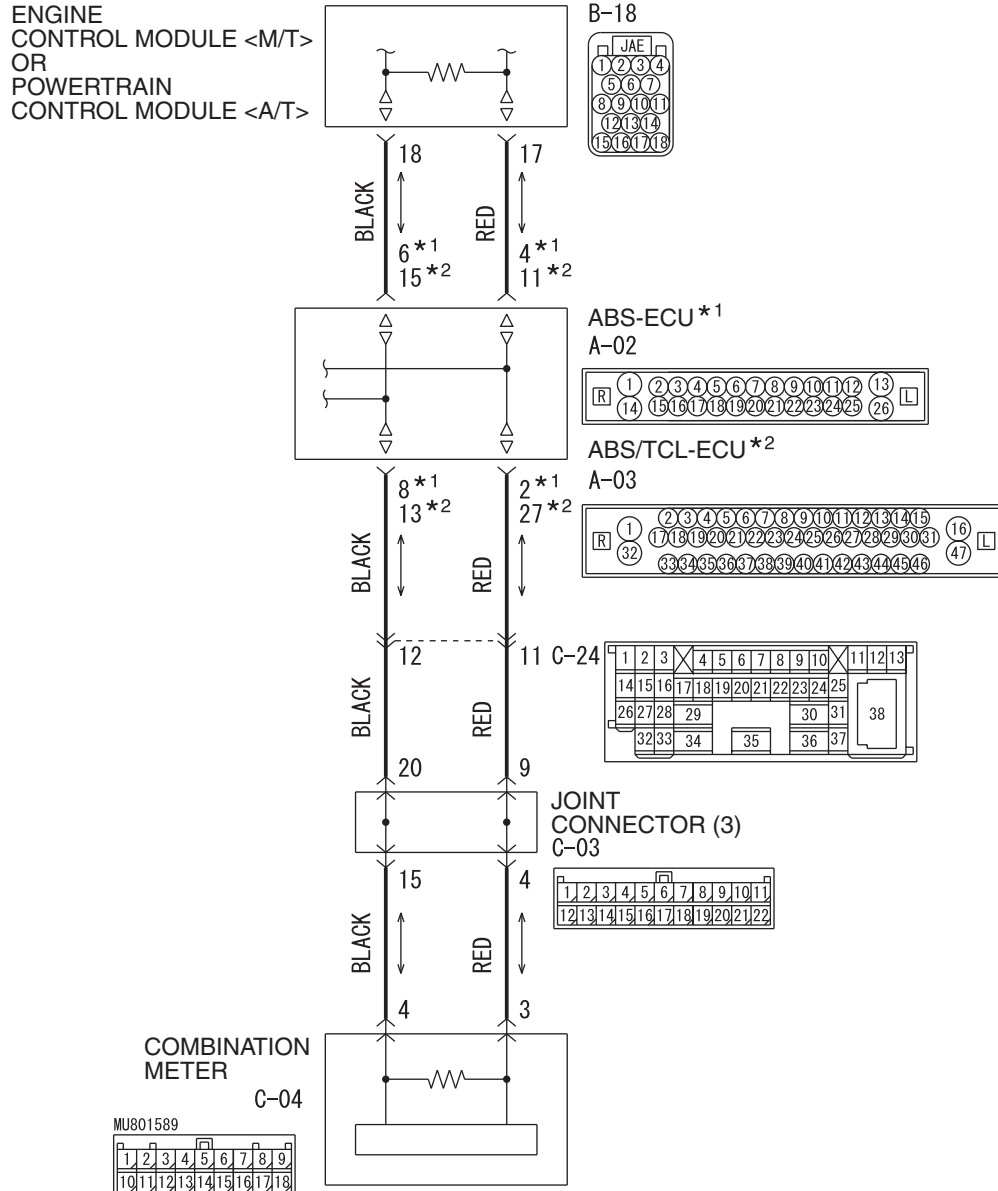
Diagnose the ABS system. Refer to GROUP 35B, ABS diagnosis [P.35B-119](#).



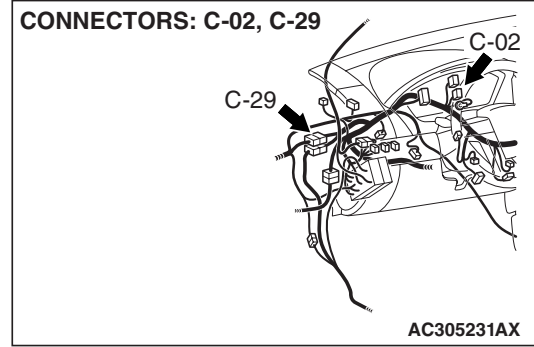
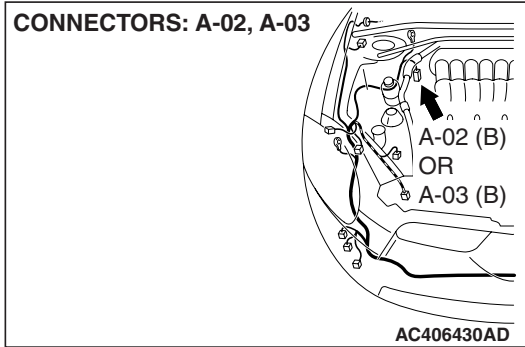
**DIAGNOSTIC ITEM 11: Diagnose when the scan tool cannot receive the data sent by the ECM <M/T> or the PCM <A/T> and ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system>.**

**CAUTION**

When servicing a CAN bus line, ground yourself by touching a metal object such as an unpainted water pipe. If you fail to do so, a component connected to the the CAN bus line may be damaged.



NOTE  
\*1 : VEHICLES WITHOUT TRACTION CONTROL SYSTEM  
\*2 : VEHICLES WITH TRACTION CONTROL SYSTEM



## FUNCTION

The diagnostic result demonstrates that "the scan tool cannot receive the sent data from the ECM <M/T> or PCM <A/T> and ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system>" when the scan tool MB991958 checks the periodically sent data from each ECU and cannot receive ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> and ECM <M/T> or powertrain control system <A/T> data only.

## TRUBLE JUDGEMENT CONDITIONS

Scan tool MB991958 judges the trouble when the periodically sent data from ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> and ECM <M/T> or PCM <A/T> cannot be received and sent.

## TROUBLESHOOTING HINTS

- The wiring harness may be defective [open circuit between ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> and joint connector (3)]
- The connector may be defective [poor connection of joint connector (3) or ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> connector]
- The ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> may be defective (internal open circuit)

## DIAGNOSIS

### Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra fine probe
- MB991970: ABS Check Harness

**STEP 1.** Check joint connector (3) C-03 and ABS-ECU connector A-02 <vehicles without traction control system> or ABS/TCL-ECU connector A-03 <vehicles with traction control system> for loose, corroded or damaged terminals, or terminals pushed back in the connector.

**CAUTION**

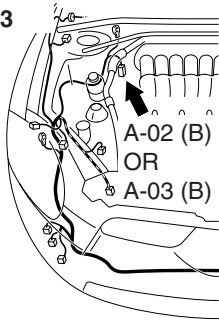
The strand end of the twisted wire should be within 10 cm (4.0 inches) from the connector. For details refer to [P.54C-4](#).

**Q:** Are joint connector (3) C-03 and ABS-ECU connector A-02 <vehicles without traction control system> or ABS/TCL-ECU connector A-03 <vehicles with traction control system> in good condition?

**YES :** Go to Step 2.

**NO :** Repair the damaged parts. Replace the joint connector as necessary.

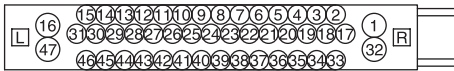
CONNECTORS: A-02, A-03



A-02 HARNESS SIDE

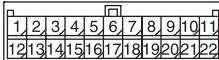
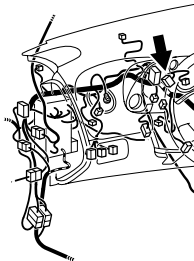


A-03 HARNESS SIDE



AC406431AB

CONNECTOR: C-03



AC406442BE

**STEP 2. Check the CAN bus lines between intermediate connector C-29 and joint connector (3). Measure the resistance between intermediate connector C-24 and joint connector (3) C-03.**

**⚠ CAUTION**

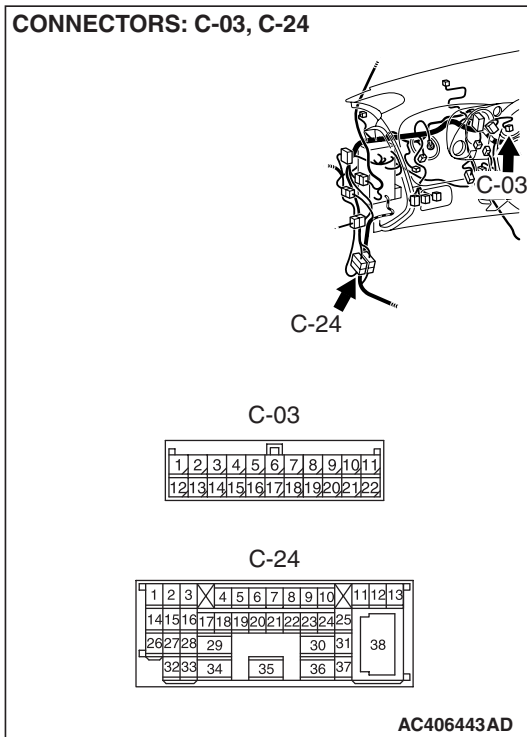
- A digital multimeter should be used. For details refer to [P.54C-4](#).
- The test wiring harness should be used. For details refer to [P.54C-4](#).

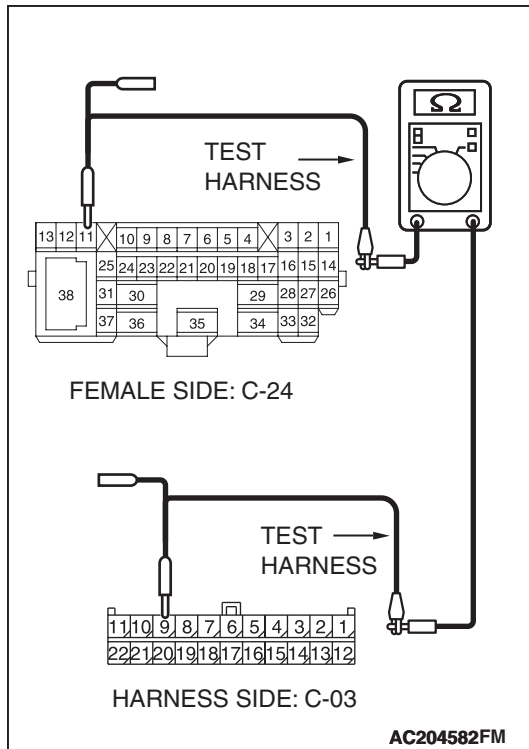
- (1) Disconnect intermediate connector C-24 and joint connector (3) C-03, and measure the resistance between the wiring harness side connector of joint connector (3) C-03 and the male side connector of intermediate connector C-24 (at front wiring harness side).
- (2) Turn the ignition switch to the "LOCK" (OFF) position.

**⚠ CAUTION**

**Disconnect the negative battery terminal. For details refer to [P.54C-4](#).**

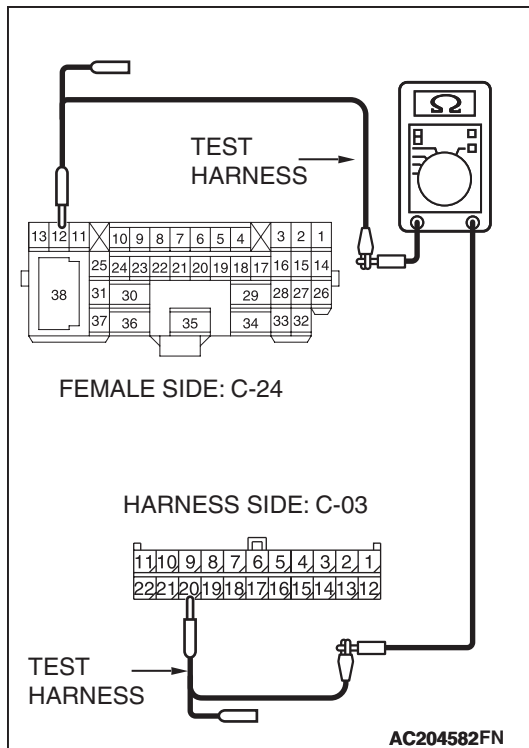
- (3) Disconnect the negative battery terminal.





- (4) Measure the resistance between intermediate connector terminal 11 and joint connector (3) terminal 9.

**OK: 2 ohms or less**



- (5) Measure the resistance between intermediate connector terminal 12 and joint connector (3) terminal 20

**OK: 2 ohms or less**

**CAUTION**

Strictly observe the specified wiring harness repair procedure. For details refer to [P.54C-5](#).

**Q: Do all the resistances measure 2 ohms or less?**

**YES :** If all the resistances measure 2 ohms or less, go to Step 3.

**NO :** If either of the resistances measures more than 2 ohms or all the resistances measure more than 2 ohms, repair the wiring harness between intermediate connector C-29 and the joint connector (3).

**STEP 3.** Check the CAN bus lines between intermediate connector C-29 and the ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system>. Measure the resistance between intermediate connector C-24 and ABS-ECU connector A-02 <vehicles without traction control system> or ABS/TCL-ECU connector A-03 <vehicles with traction control system>.

**⚠ CAUTION**

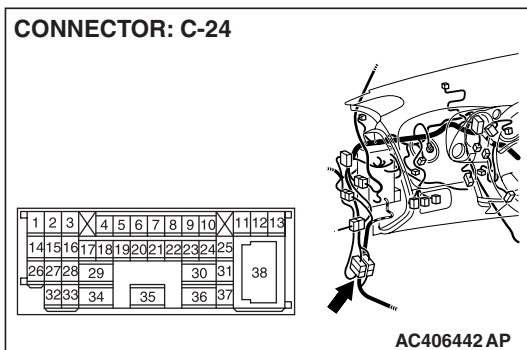
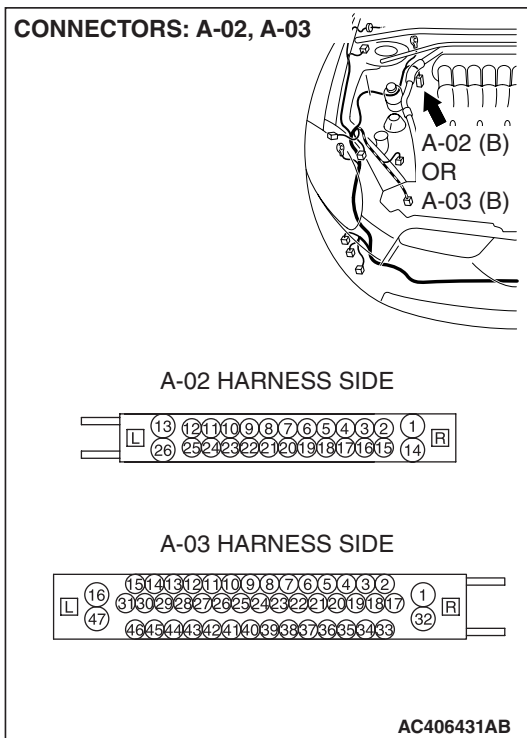
- A digital multimeter should be used. For details refer to [P.54C-4](#).
- The test wiring harness should be used. For details refer to [P.54C-4](#).

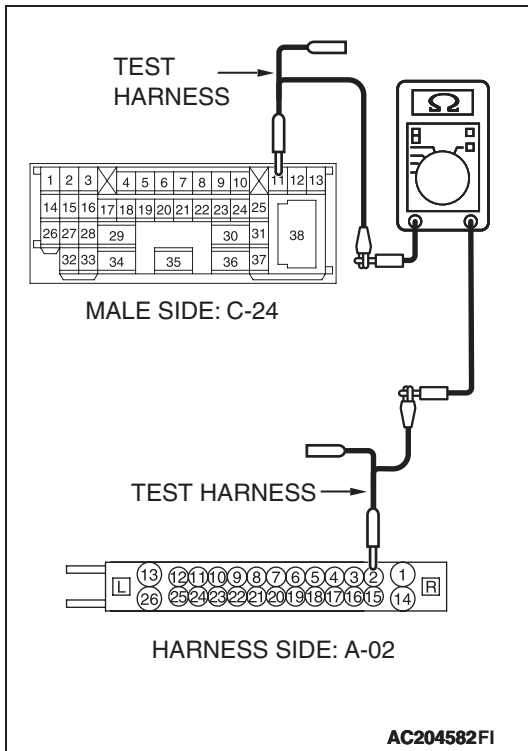
- (1) Disconnect intermediate connector C-24 and ABS-ECU connector A-02 <vehicles without traction control system> or ABS/TCL-ECU connector A-03 <vehicles with traction control system>, and measure the resistance between the wiring harness side connector of ABS-ECU connector A-02 <vehicles without traction control system> or ABS/TCL-ECU connector A-03 <vehicles with traction control system> and the male side connector of intermediate connector C-24 (at front wiring harness side).
- (2) Turn the ignition switch to the "LOCK" (OFF) position.

**⚠ CAUTION**

**Disconnect the negative battery terminal. For details refer to [P.54C-4](#).**

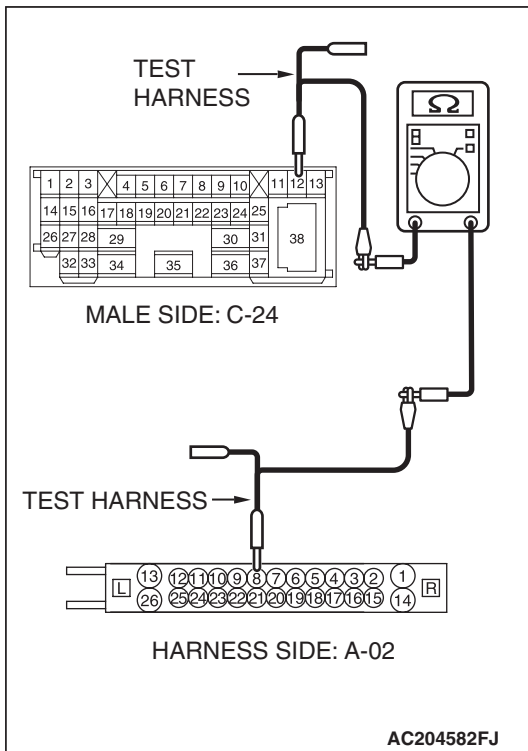
- (3) Disconnect the negative battery terminal.





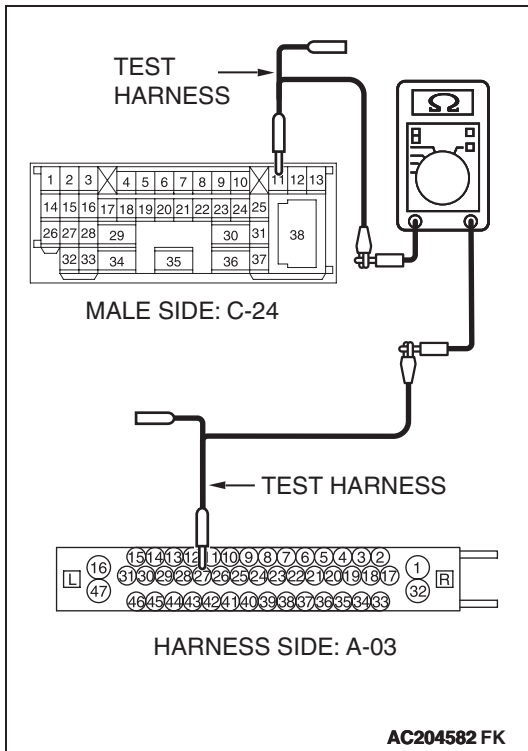
- (4) Measure the resistance between intermediate connector terminal 11 and ABS-ECU connector terminal 2. <vehicles without traction control system>

**OK: 2 ohms or less**



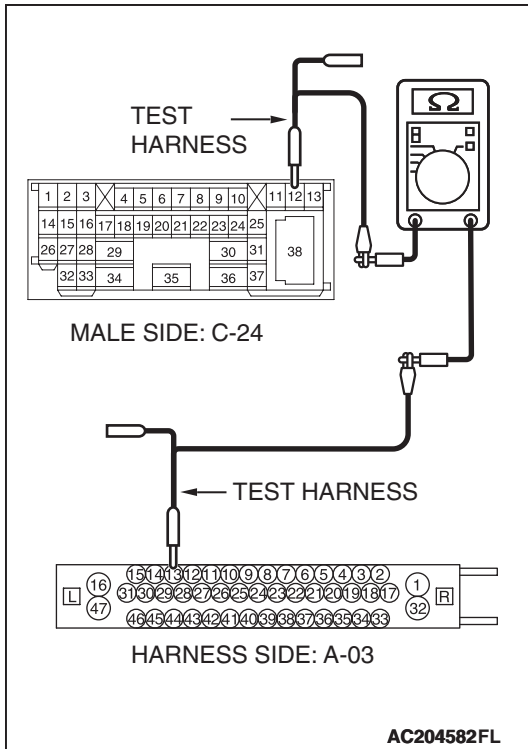
- (5) Measure the resistance between intermediate connector terminal 12 and ABS-ECU connector terminal 8. <vehicles without traction control system>

**OK: 2 ohms or less**



- (6) Measure the resistance between intermediate connector terminal 11 and ABS/TCL-ECU connector terminal 27.  
<vehicles with traction control system>

**OK: 2 ohms or less**



- (7) Measure the resistance between intermediate connector terminal 12 and ABS/TCL-ECU connector terminal 13.  
<vehicles with traction control system>

**OK: 2 ohms or less**

**CAUTION**

Strictly observe the specified wiring harness repair procedure. For details refer to [P.54C-5](#).

**Q: Do all the resistances measure 2 ohms or less?**

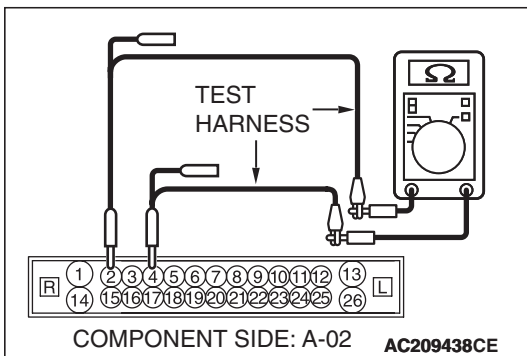
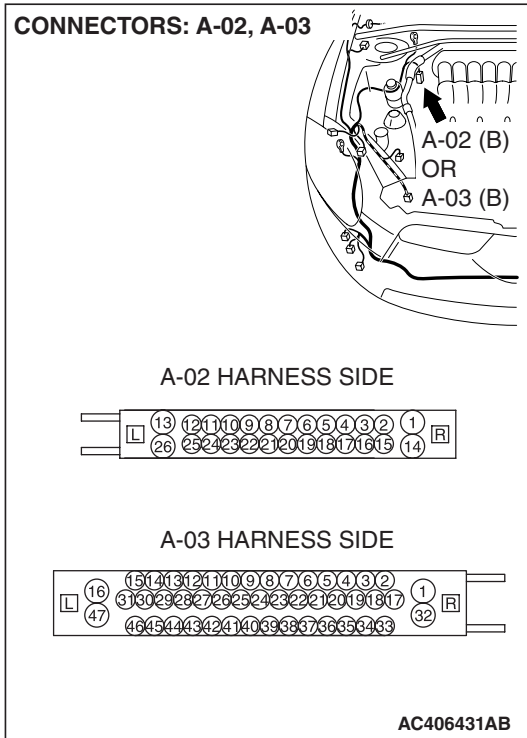
**YES :** If all the resistances measure 2 ohms or less, go to Step 4.

**NO :** If either of the resistances measures more than 2 ohms or all the resistances measure more than 2 ohms, repair the wiring harness between intermediate connector C-29 and the ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> connector.



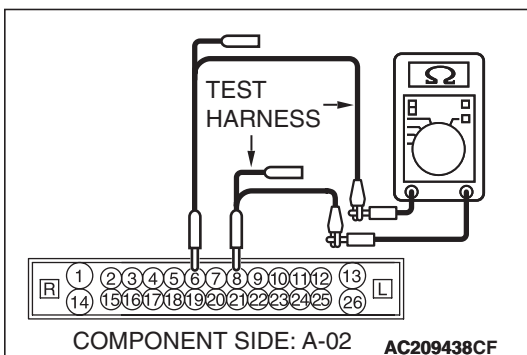
**STEP 4. Check the CAN bus lines inside the ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system>. Measure the resistance at ABS-ECU connector A-02 <vehicles without traction control system> or ABS/TCL-ECU connector A-03 <vehicles with traction control system>.**

- (1) Disconnect ABS-ECU connector A-02 <vehicles without traction control system> or ABS/TCL-ECU A-03 <vehicles with traction control system>, and measure the resistance at the component side of ABS-ECU connector A-02 <vehicles without traction control system> or ABS/TCL-ECU connector A-03 <vehicles with traction control system>.



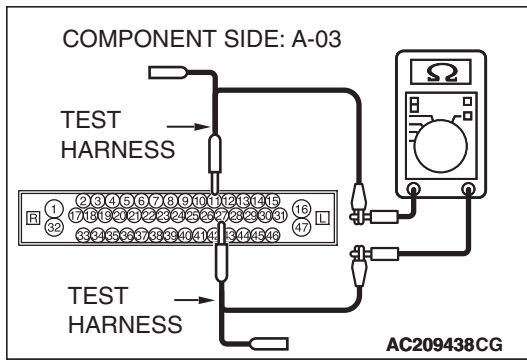
- (2) Measure the resistance between ABS-ECU connector <vehicles without traction control system> terminals 2 and 4.

**OK: 2 ohms or less**



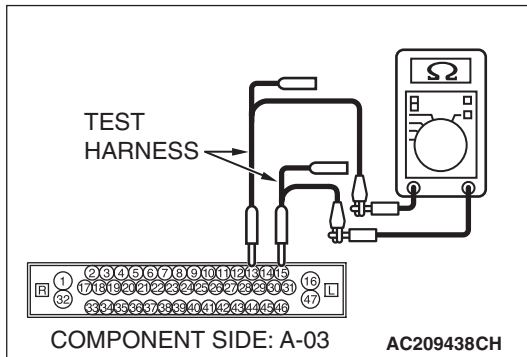
- (3) Measure the resistance between ABS-ECU connector <vehicles without traction control system> terminals 8 and 6.

**OK: 2 ohms or less**



- (4) Measure the resistance between ABS/TCL-ECU connector <vehicles with traction control system> terminals 11 and 27.

**OK: 2 ohms or less**



- (5) Measure the resistance between ABS/TCL-ECU connector <vehicles with traction control system> terminals 13 and 15.

**OK: 2 ohms or less**

**Q: Do all the resistances measure 2 ohms or less?**

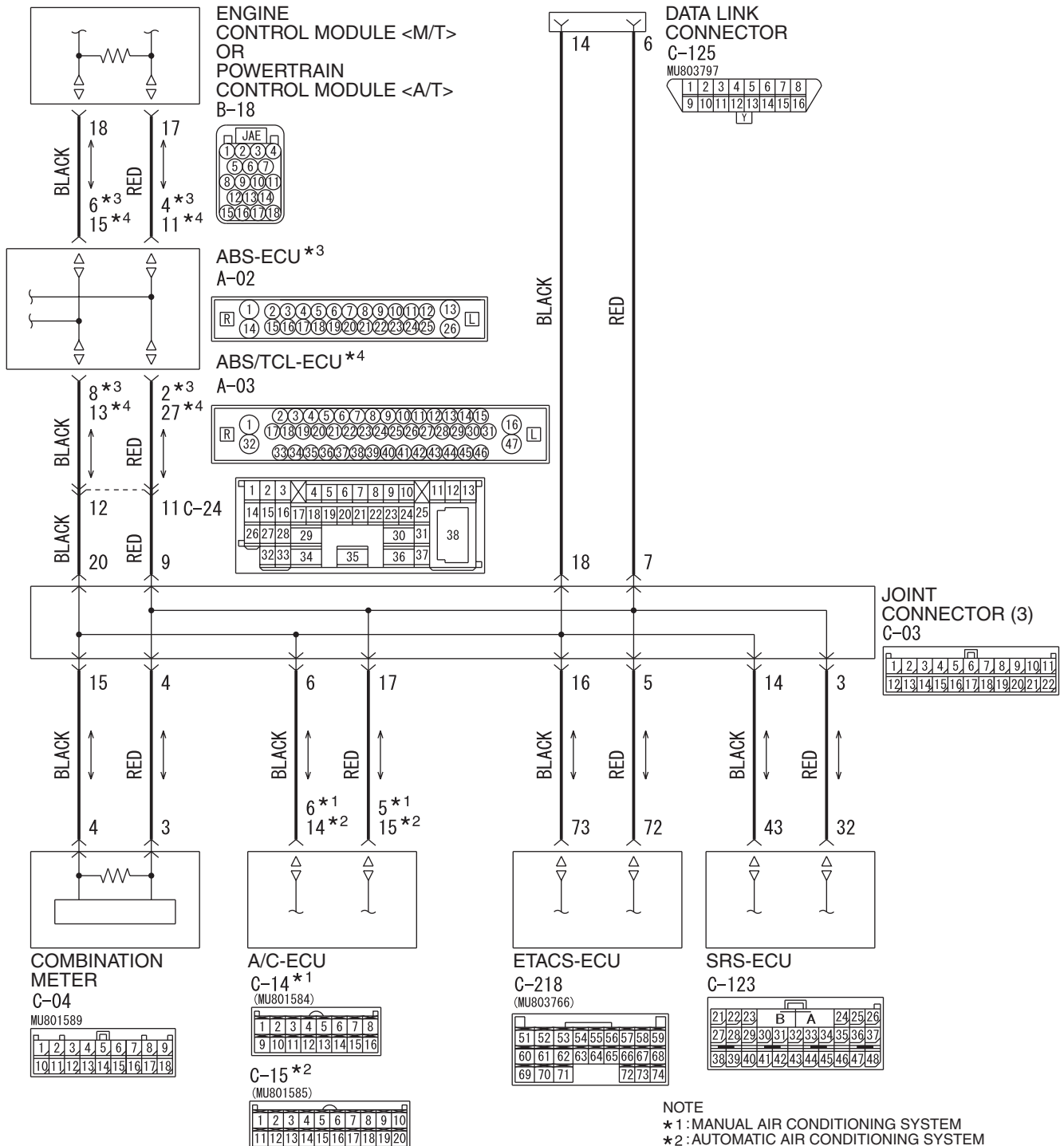
**YES** : Intermittent malfunction.

**NO** : Replace the ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system>.

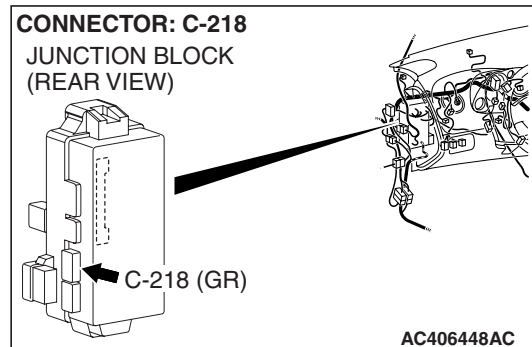
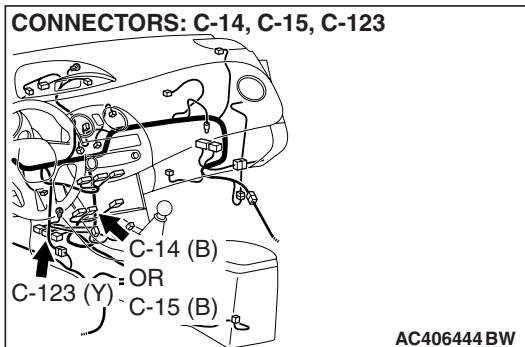
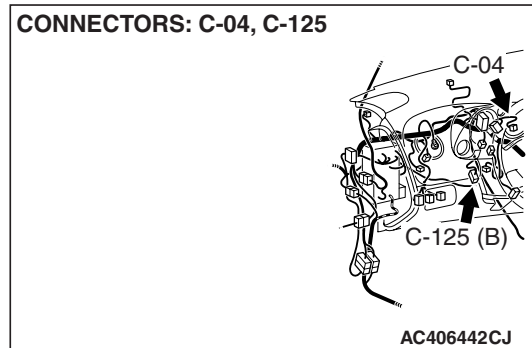
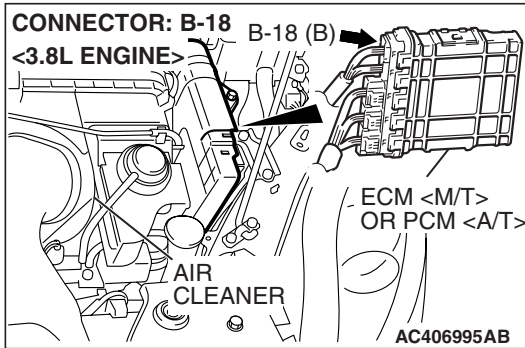
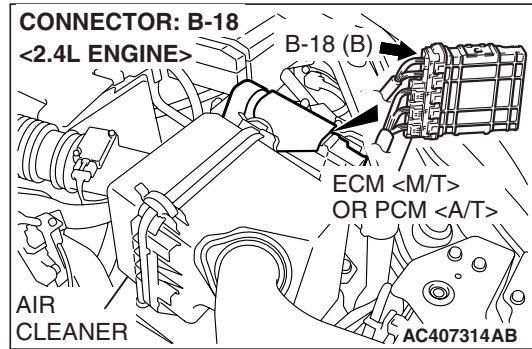
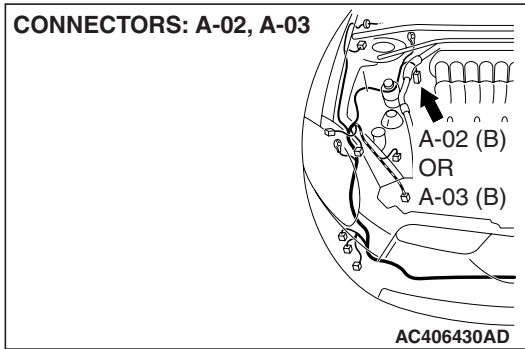
DIAGNOSTIC ITEM 12: Diagnose CAN bus lines thoroughly

**CAUTION**

When servicing a CAN bus line, ground yourself by touching a metal object such as an unpainted water pipe. If you fail to do so, a component connected to the CAN bus line may be damaged.



NOTE  
 \* 1 : MANUAL AIR CONDITIONING SYSTEM  
 \* 2 : AUTOMATIC AIR CONDITIONING SYSTEM  
 \* 3 : VEHICLES WITHOUT TRACTION CONTROL SYSTEM  
 \* 4 : VEHICLES WITH TRACTION CONTROL SYSTEM



**FUNCTION**

The diagnostic result demonstrates that "Diagnose CAN bus lines thoroughly" when the trouble spot cannot be localized by the CAN bus diagnostics.

**TRUBLE JUDGEMENT CONDITIONS**

Scan tool MB991958 judges "Diagnose CAN bus lines thoroughly" when any diagnostic item from 3 to 11 cannot be identified.

**TROUBLESHOOTING HINTS**

- Each ECU may be defective
- The wiring harness may be defective
- The connector may be defective

**DIAGNOSIS**

**Required Special Tools:**

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991910: MUT-III Main Harness A
- MB991970: ABS Check Harness

**STEP 1. Check the CAN bus lines at the data link connector. Measure the resistance at the data link connector C-125.**

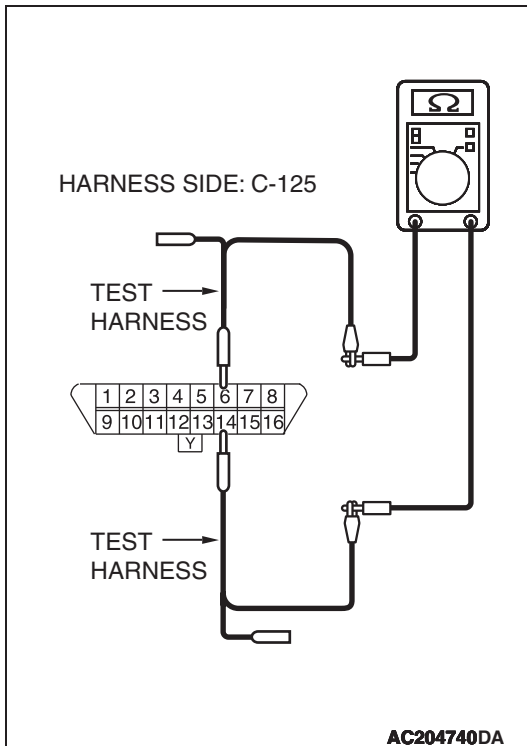
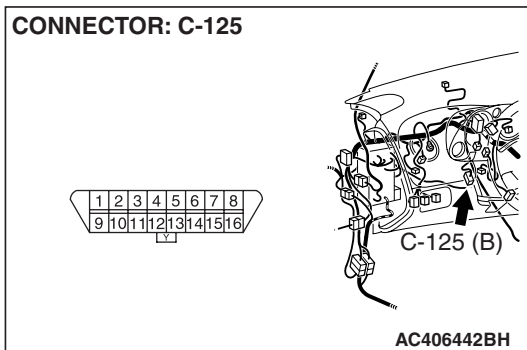
**⚠ CAUTION**

- A digital multimeter should be used. For details refer to [P.54C-4](#).
- The test wiring harness should be used. For details refer to [P.54C-4](#).

**⚠ CAUTION**

**Disconnect the negative battery terminal. For details refer to [P.54C-4](#).**

- (1) Disconnect the negative battery terminal.
- (2) Measure the resistance at the data link connector.



- (3) Measure the resistance between data link connector terminals 6 and 14.

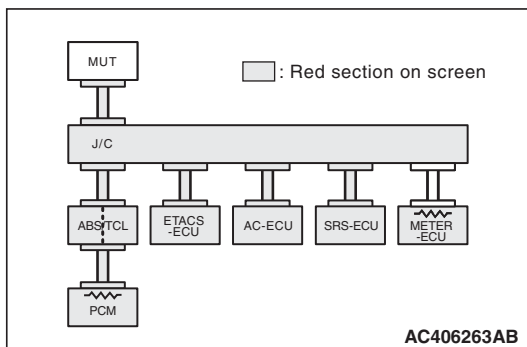
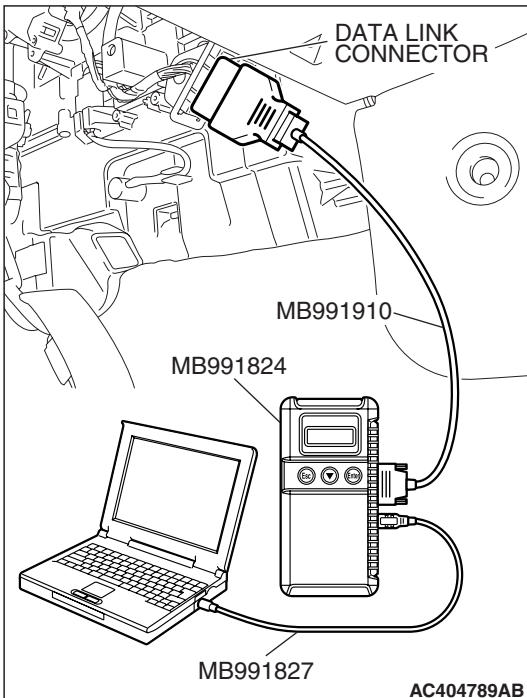
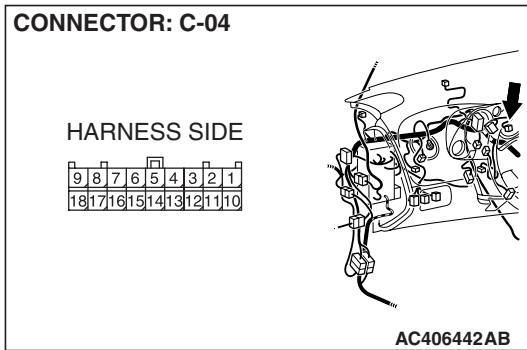
**OK:  $60 \pm 10$  ohms**

**Q: How much resistance is measured?**

**YES ( $60 \pm 10$  ohms) :** Go to Step 2.

**NO (2 ohms or less or 200 ohms or more) :** Diagnostic Item 3: Check the CAN\_H and L lines for a short circuit. Refer to [P.54C-66](#).

**NO (other than them resistance) :** Diagnostic Item 4: Diagnose terminator resistors at both ends. Refer to [P.54C-85](#).



**STEP 2.** Using scan tool MB991958, diagnose the CAN bus line (Disconnect combination meter connector C-04, and check the combination meter system).

(1) Disconnect combination meter connector C-04.

**CAUTION**

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

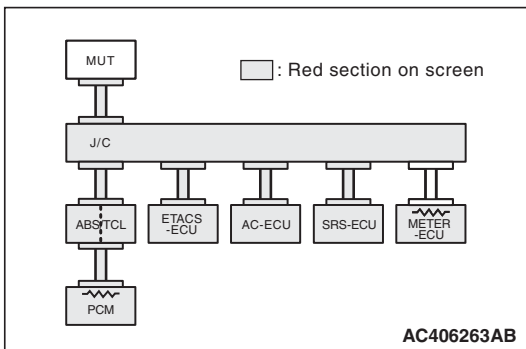
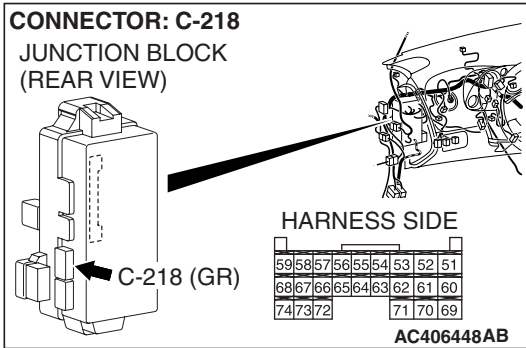
(2) Connect scan tool MB991958 to the data link connector.

(3) Diagnose CAN bus lines, and check if scan tool MB991958 screen is as shown in the illustration.

**Q: Does scan tool MB991958 screen correspond to the illustration?**

**YES :** Go to Step 3.

**NO :** Refer to diagnostics item 5: Diagnose when the scan tool cannot receive the data sent by combination meter [P.54C-90](#).



**STEP 3. Using scan tool MB991958, diagnose the CAN bus line (Disconnect ETACS-ECU connector C-218, and check the ETACS-ECU system).**

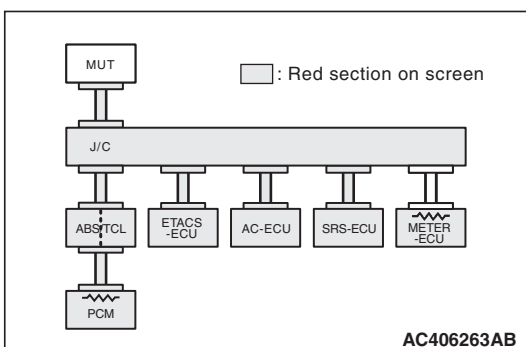
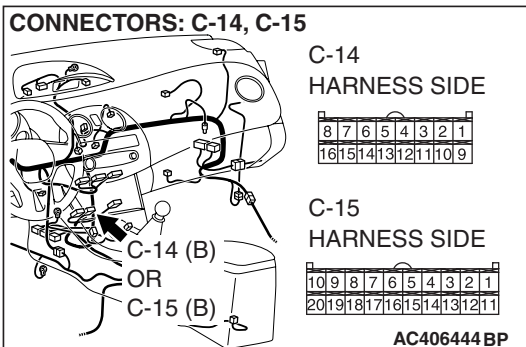
(1) Disconnect ETACS-ECU connector C-218.

(2) Diagnose CAN bus lines, and check if scan tool MB991958 screen is as shown in the illustration.

**Q: Does scan tool MB991958 screen correspond to the illustration?**

**YES :** Go to Step 4.

**NO :** Refer to diagnostics item 6: Diagnose when the scan tool cannot receive the data sent by ETACS-ECU  
[P.54C-95.](#)



**STEP 4. Using scan tool MB991958, diagnose the CAN bus line (Disconnect A/C-ECU connector C-14 <manual air conditioning system> or C-15 <automatic air conditioning system>, and check the A/C-ECU system).**

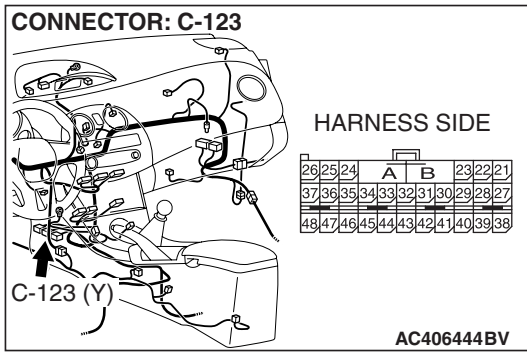
(1) Disconnect A/C-ECU connector C-14 <manual air conditioning system> or C-15 <automatic air conditioning system>.

(2) Diagnose CAN bus lines, and check if scan tool MB991958 screen is as shown in the illustration.

**Q: Does scan tool MB991958 screen correspond to the illustration?**

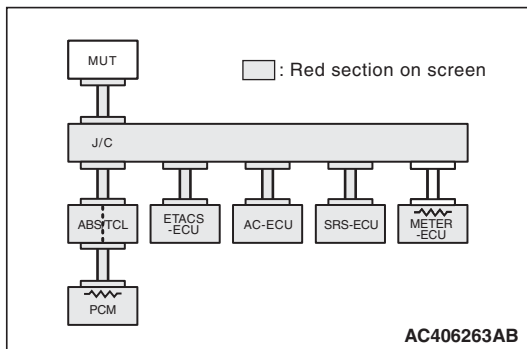
**YES :** Go to Step 5.

**NO :** Refer to diagnostics item 7: Diagnose when the scan tool cannot receive the data sent by A/C-ECU  
[P.54C-100.](#)



**STEP 5. Using scan tool MB991958, diagnose the CAN bus line (Disconnect SRS-ECU connector C-123, and check the supplemental restraint system).**

(1) Disconnect SRS-ECU connector C-123.



(2) Diagnose CAN bus lines, and check if scan tool MB991958 screen is as shown in the illustration.

**Q: Does scan tool MB991958 screen correspond to the illustration?**

**YES :** Go to Step 6.

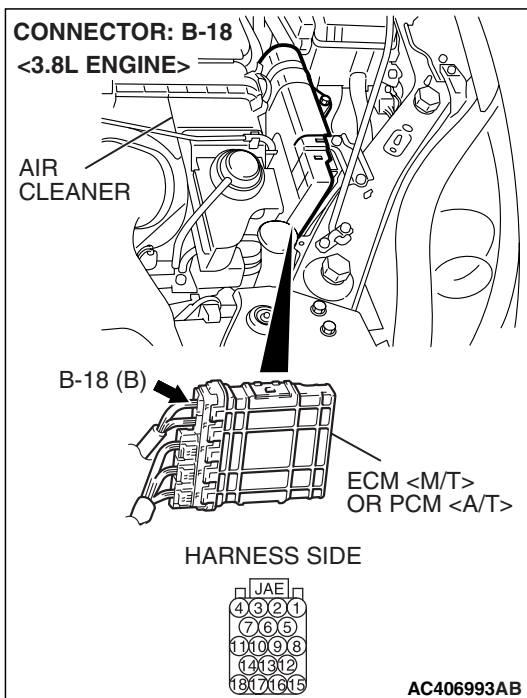
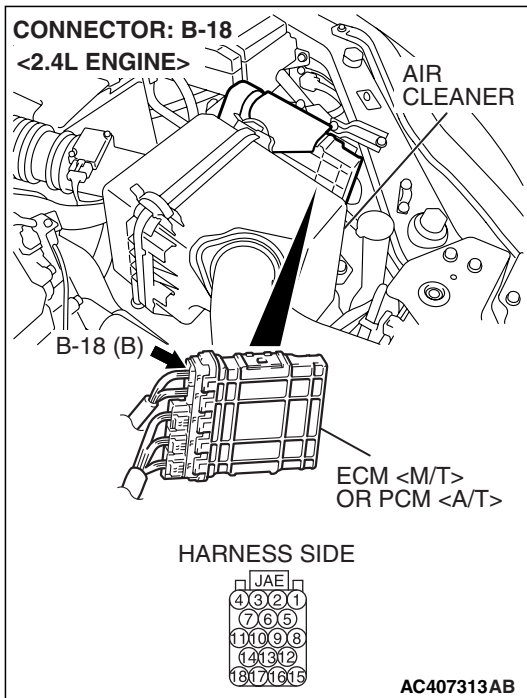
**NO :** Refer to diagnostics item 9: Diagnose when the scan tool cannot receive the data sent by SRS-ECU

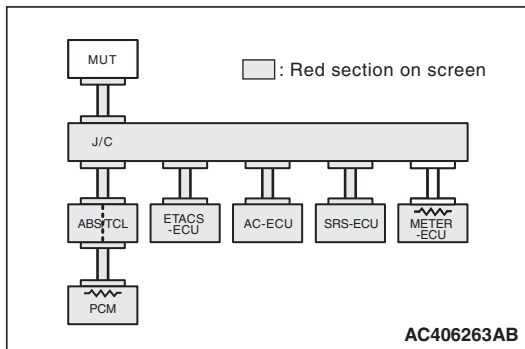
[P.54C-111.](#)



**STEP 6.** Using scan tool MB991958, diagnose the CAN bus line (Disconnect ECM connector <M/T> or PCM connector <A/T> B-18, and check the ECM system <M/T> or the PCM system <A/T>).

- (1) Disconnect ECM connector <M/T> or PCM connector <A/T> B-18.





(2) Diagnose CAN bus lines, and check if scan tool MB991958 screen is as shown in the illustration.

**Q: Does scan tool MB991958 screen correspond to the illustration?**

**YES :** Refer to diagnostics item 11: Diagnose when the scan tool cannot receive the data sent by the ECM <M/T> or the PCM <A/T> and ABS-ECU <vehicles without traction control system> or ABS/TCL-ECU <vehicles with traction control system> [P.54C-121](#) .

**NO :** Refer to diagnostics item 9: Diagnose when the scan tool cannot receive the data sent by the ECM <M/T> or the PCM <A/T> [P.54C-111](#) .

## CAN COMMUNICATION SIGNAL TABLE

M1548300400219

SIGNAL	TRANSMITTER ECU	RECEIVER ECU					
		ECM OR PCM	ABS-ECU OR ABS/TCL-ECU	COMBINATION METER	A/C-ECU	ETACS-ECU	SRS-ECU
Engine speed signal	Power train control module	—	•	•	•	•	—
A/C information signal		—	—	—	•	—	—
Vehicle speed signal		—	—	•	•	—	—
Vehicle stop signal		—	—	•	—	•	—
Malfunction indicator light request signal		—	—	•	—	—	—
Auto-cruise control indicator light signal		—	—	•	—	—	—
Engine coolant temperature signal		—	—	•	•	—	—
Selector position signal		—	•	•	—	•	—
ABS warning light request signal	ABS-ECU	—	—	•	—	—	—
SRS warning light request signal	SRS-ECU	—	—	•	—	—	—
Communication continuation request signal	Combination meter	—	—	—	—	•	—
Vehicle speed signal		—	—	—	—	•	•
Ignition switch (IG1) signal		—	—	—	—	•	—
Seat belt signal		—	—	—	—	•	—
Fuel information signal		•	—	—	—	—	—
Brake light signal		—	•	—	—	—	—
Communication continuation request signal	A/C-ECU	—	—	—	—	•	—

SIGNAL	TRANSMITTER ECU	RECEIVER ECU					
		ECM OR PCM	ABS-ECU OR ABS/TCL-ECU	COMBINATION METER	A/C-ECU	ETACS-ECU	SRS-ECU
Communication standby signal	ETACS-ECU	—	—	•	—	—	—
Ignition switch (ACC) signal		—	—	•	•	—	—
Ignition switch (IG1) signal		—	—	•	—	—	—
High-beam indicator request signal		—	—	•	—	—	—
Turn-signal indicator request signal		—	—	•	—	—	—
Fog light indicator request signal		—	—	•	—	—	—
Illumination signal		—	—	•	—	—	—
Door "open" signals		—	—	•	—	—	—
Interior light shut-off signal		—	—	•	—	—	—

NOTE: "•" indicates the applicable points.

## CAN COMMUNICATION-RELATED DTC CODE (U CODE) TABLE

M1548300300256

CODE NO.	DIAGNOSTIC ITEM	OUTPUT ECU	ACTION	
U1073	Bus Off	ECM <M/T> or PCM <A/T>, SRS-ECU, ABS-ECU <vehicles without traction control system>, ABS/TCL-ECU <vehicles with traction control system>, Combination meter, ETACS-ECU, A/C-ECU	CAN main bus line diagnostics	
U1100	ECM <M/T> or PCM <A/T> time-out (related to engine)	ABS/TCL-ECU <vehicles with traction control system>, Combination meter, ETACS-ECU, A/C-ECU		
U1101	ECM <M/T> or PCM <A/T> time-out (related to automatic transaxle)	ABS/TCL-ECU <vehicles with traction control system>, Combination meter, ETACS-ECU		
U1102	ABS-ECU time-out	ECM <M/T> or PCM <A/T>, Combination meter		
U1108	Combination meter time-out	ECM <M/T> or PCM <A/T>, ETACS-ECU		
U1109	ETACS-ECU time-out	ECM <M/T> or PCM <A/T>, Combination meter		
U1110	A/C-ECU time-out	ECM <M/T> or PCM <A/T>, ETACS-ECU		
U1111*	Multi-center display unit (middle-grade type) time-out	ETACS-ECU, A/C-ECU		
U1112	SRS-ECU time-out	Combination meter		
U1114*	TPMS-ECU time-out			
U1117	Immobilizer-ECU time-out	ECM <M/T> or PCM <A/T>		
U1120	Failure information on ECM <M/T> or PCM <A/T> (related to engine)	ABS/TCL-ECU <vehicles with traction control system>, Combination meter, A/C-ECU		Diagnose CAN main bus lines and confirm input signals.
U1128	Failure information on combination meter	ETACS-ECU		
U1434*	Failure information on TPMS-ECU	Combination meter		

NOTE: \*: This diagnostic trouble code will be set even if the system is normal.

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## NOTES