

GROUP 13D

TRACTION CONTROL SYSTEM (TCL)

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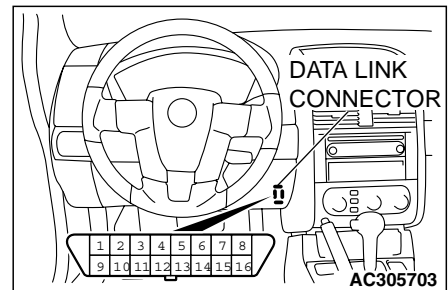
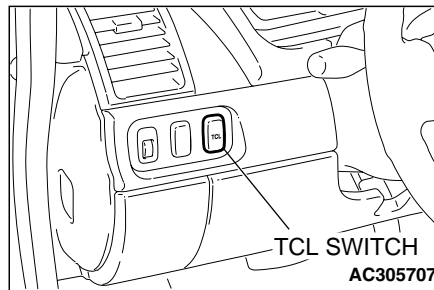
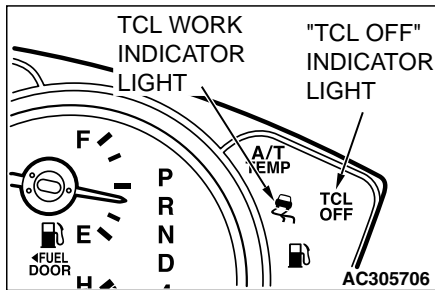
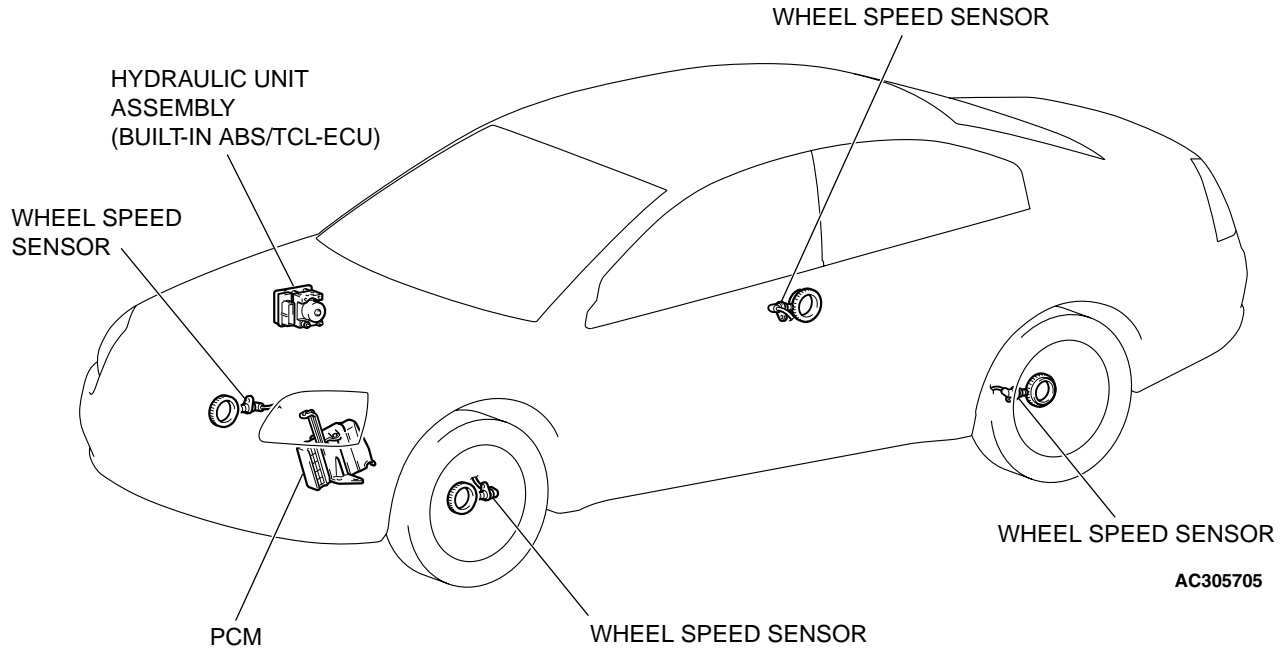
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GENERAL DESCRIPTION

M113600100029

The traction control system (TCL) controls engine output to prevent the wheelspin of the drive wheels (front wheels) for improved stability.

CONSTRUCTION DIAGRAM



AC305708 AB

TRACTION CONTROL SYSTEM (TCL) DIAGNOSIS

INTRODUCTION TO TRACTION CONTROL SYSTEM (TCL) DIAGNOSIS

M1136004600026

TCL Diagnostic Trouble Code Detection Conditions

TCL diagnostic trouble codes (TCL DTCs) are set under different conditions, depending on the malfunction detected. Most TCL DTCs will only be set during vehicle operation. Some TCL DTCs will also be set during the TCL self-check immediately after the engine is started. When you check if an TCL DTC

will be displayed again after the DTC has been erased, you should recreate the TCL DTC set conditions. Depending on the detection timing and set conditions for the specific TCL DTC, you must either drive the vehicle or turn the engine off and restart it. To set the proper conditions for that DTC again, refer to "TCL DTC SET CONDITIONS" for each TCL DTC that you are trying to reset.

TROUBLESHOOTING STRATEGY

M1136003100062

Use these steps to plan your diagnostic strategy. If you follow them carefully, you will check most of the possible causes of a TCL problem.

1. Gather information from the customer.
2. Verify that the condition described by the customer exists.
3. Check the vehicle for any TCL DTC. (Refer to P.13D-3, Diagnosis Function – How to Read and Erase Diagnostic Trouble Codes).
4. If you can verify the condition but no TCL DTCs are set, and the malfunction may be intermittent. (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points– How to Cope with Intermittent Malfunctions P.00-14).
5. If you can verify the condition but there is no TCL DTCs, or the system cannot communicate with scan tool MB991958 (MUT-III sub assembly), and find the fault. (Refer to P.13D-25, Symptom Chart).
6. If there is a TCL DTC, record the number of the code, then erase the code from vehicle memory using the scan tool MB991958 (MUT-III sub assembly). (Refer to P.13D-3, Diagnosis Function – How to Read and Erase Diagnostic Trouble Codes).
7. Re-create the TCL DTC set conditions to see if the same TCL DTC will set again. (Refer to P.13D-3, Diagnosis Function – How to Read and Erase Diagnostic Trouble Codes).
 - If the same TCL DTC sets again, perform the diagnostic procedures for the set code. (Refer to P.13D-7, Diagnostic Trouble Code Chart).

DIAGNOSIS FUNCTION

M1136003200025

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

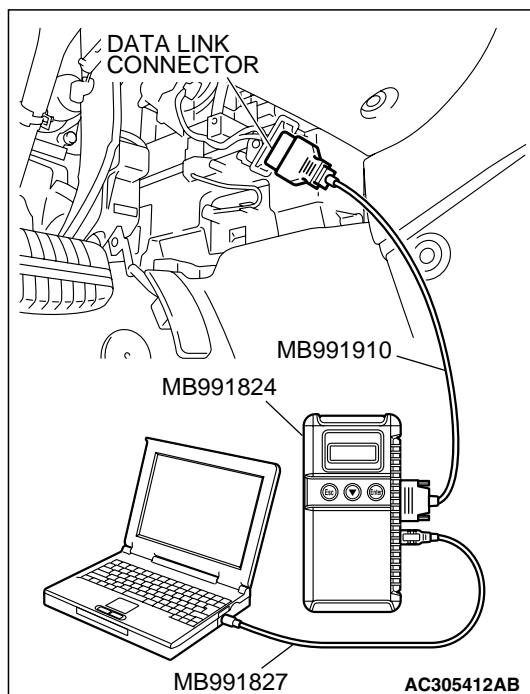
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

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



HOW TO READ AND ERASE DIAGNOSTIC TROUBLE CODES

Required Special Tools:

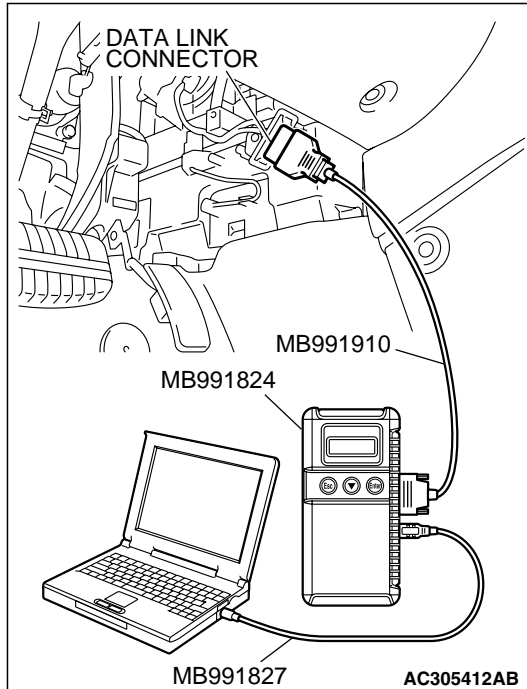
- MB991958: Scan Tool (MUT-III Sub Assembly)
 - MB991824: V.C.I.
 - MB991827: MUT-III USB Cable
 - MB991910: MUT-III Main Harness A

⚠ 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.

NOTE: If the battery voltage is low, diagnostic trouble codes will not be set. Check the battery if scan tool MB991958 does not display.

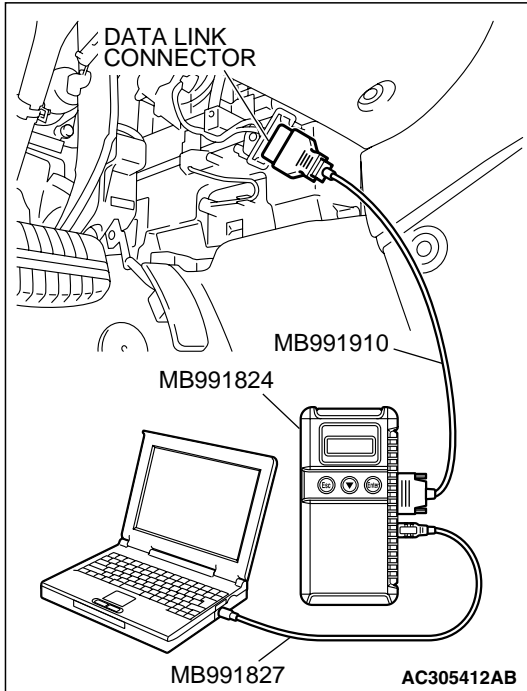
1. Connect scan tool MB991958 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select "Interactive Diagnosis" from the start-up screen.
4. Select "System Select".
5. Choose "TCL" from the "POWERTRAIN" tab.
6. Select "Diagnostic Trouble Code".
7. If a DTC is set, it is shown.
8. Choose "DTC erase" to erase the DTC.
9. Turn the ignition switch to the "LOCK" (OFF) position.
10. Disconnect scan tool MB991958.



HOW TO READ DATA LIST

Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
 - MB991824: 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 "Interactive Diagnosis" from the start-up screen.
4. Select "System Select."
5. Choose "TCL" from the "POWERTRAIN" tab.
6. Select "Data List."
7. Choose an appropriate item.
8. Turn the ignition switch to the "LOCK" (OFF) position.
9. Disconnect scan tool MB991958.

HOW TO PERFORM ACTUATOR TEST

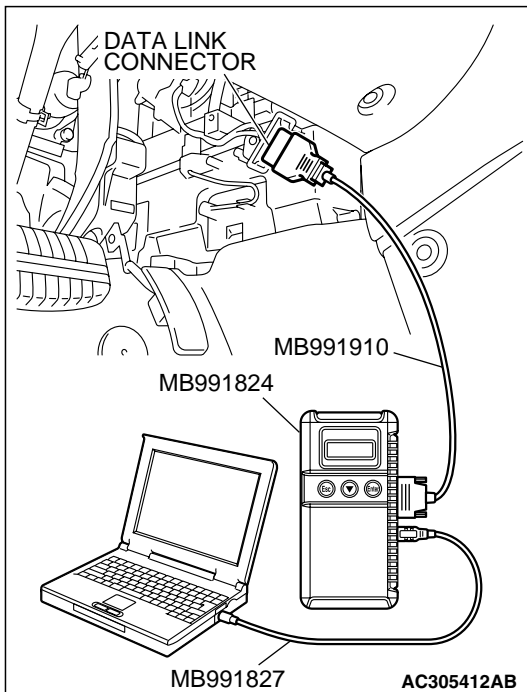
Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
 - MB991824: 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 "Interactive Diagnosis" from the start-up screen.
4. Select "System Select."
5. Choose "TCL" from the "POWERTRAIN" tab.
6. Choose "Actuator Test" from "TCL" screen.
7. Choose an appropriate item.
8. Turn the ignition switch to the "LOCK" (OFF) position.
9. Disconnect scan tool MB991958.



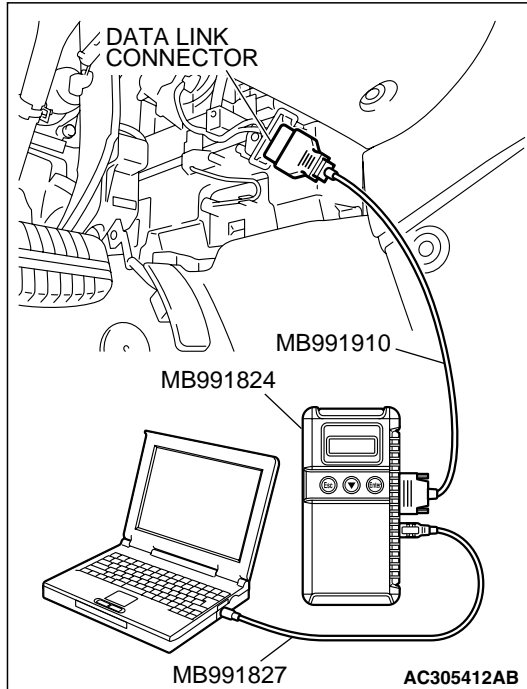
HOW TO DIAGNOSE THE CAN BUS LINE

Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
 - MB991824: 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 the "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 the information is correct, 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 which is diagnosed CAN bus line.
 - If they match, go to step 8.
 - If not, go to step 5.
8. Press 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.
10. Turn the ignition switch to the "LOCK" (OFF) position.
11. Disconnect scan tool MB991958.

DIAGNOSTIC TROUBLE CODE CHART

M1136003300022

⚠ CAUTION

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

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

DTC	INSPECTION ITEM	DIAGNOSTIC CONTENT	REFERENCE PAGE
C1200	Front right wheel speed sensor	Open circuit or short circuit	GROUP 35B, ABS Diagnosis – Diagnostic Trouble Code Procedures C1200 P. 35B-10
C1201	Front right wheel speed sensor	Abnormal output signal	GROUP 35B, ABS Diagnosis – Diagnostic Trouble Code Procedures C1201 P. 35B-26
C1205	Front left wheel speed sensor	Open circuit or short circuit	GROUP 35B, ABS Diagnosis – Diagnostic Trouble Code Procedures C1205 P. 35B-10
C1206	Front left wheel speed sensor	Abnormal output signal	GROUP 35B, ABS Diagnosis – Diagnostic Trouble Code Procedures C1206 P. 35B-26
C1210	Rear right wheel speed sensor	Open circuit or short circuit	GROUP 35B, ABS Diagnosis – Diagnostic Trouble Code Procedures C1210 P. 35B-10
C1211	Rear right wheel speed sensor	Abnormal output signal	GROUP 35B, ABS Diagnosis – Diagnostic Trouble Code Procedures C1211 P. 35B-26
C1215	Rear left wheel speed sensor	Open circuit or short circuit	GROUP 35B, ABS Diagnosis – Diagnostic Trouble Code Procedures C1215 P. 35B-10
C1216	Rear left wheel speed sensor	Abnormal output signal	GROUP 35B, ABS Diagnosis – Diagnostic Trouble Code Procedures C1216 P. 35B-26

DTC	INSPECTION ITEM	DIAGNOSTIC CONTENT	REFERENCE PAGE
C1226*	ABS front right solenoid inlet valve		-
C1231*	ABS front right solenoid outlet valve		-
C1236*	ABS front left solenoid valve inlet valve		-
C1241*	ABS front left solenoid valve outlet valve		-
C1246*	ABS rear right solenoid valve inlet valve		-
C1251*	ABS rear right solenoid valve outlet valve		-
C1256*	ABS rear left solenoid valve inlet valve		-
C1261*	ABS rear left solenoid valve outlet valve		-
C1266*	ABS hydraulic unit motor stuck		-
C1273*	ABS hydraulic unit motor drive circuit stuck off		-
C1274*	ABS hydraulic unit motor drive circuit stuck on		-
C1278*	ABS solenoid valve power circuit stuck off		-
C1279*	ABS solenoid valve power circuit stuck on		-
C1395*	Brake fluid filling incompleated		-
C1396	Engine torque intervention refusal		P.13D-9
C1397	Transmission range switch failure		P.13D-11
C1607	ABS/TCL-ECU failure		GROUP 35B, ABS Diagnosis – Diagnostic Trouble Code Procedures C1607 P.35B-71
C1860	ABS/TCL-ECU power supply	Abnormal rise in voltage	GROUP 35B, ABS Diagnosis – Diagnostic Trouble Code Procedures C1860 P.35B-73
C1861	ABS/TCL-ECU power supply	Abnormal drop in voltage	GROUP 35B, ABS Diagnosis – Diagnostic Trouble Code Procedures C1861 P.35B-73
U1073	CAN communications system bus off		GROUP 35B, ABS Diagnosis – Diagnostic Trouble Code Procedures U1073 P.35B-79
U1100	CAN communications system time out error engine related data		P.13D-13
U1101	CAN communications system time out error A/T related data		P.13D-17
U1120	CAN communications system TCL uncontrollable by engine malfunction		P.13D-21
U1400	Dynamic range error APS1		P.13D-25

*NOTE: Since the TCL is controlled with the same ABS/TCL-ECU used to control the ABS, the codes (with a *) used only for the ABS also appear.*

*The inspection contents for the codes (with a *) used only for the ABS do not described in this group.*

DIAGNOSTIC TROUBLE CODE PROCEDURES

C1396 Engine Torque Intervention Refusal

CAUTION

- If DTC C1396 is set in the ABS/TCL-ECU, always diagnose the CAN main bus line. If there is any fault in the CAN bus lines, an incorrect DTC may be set.
- Whenever the ABS/TCL-ECU is replaced, ensure that the communication circuit is normal.

DTC SET CONDITIONS

This DTC is set when the refusal of torque intervention request is sent from PCM.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the MFI system.
- Malfunction of the CAN bus line.
- Malfunction of the ABS/TCL-ECU.

DIAGNOSIS

Required Special Tools:

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

STEP 1. Using scan tool MB991958, read the diagnostic trouble code.

CAUTION

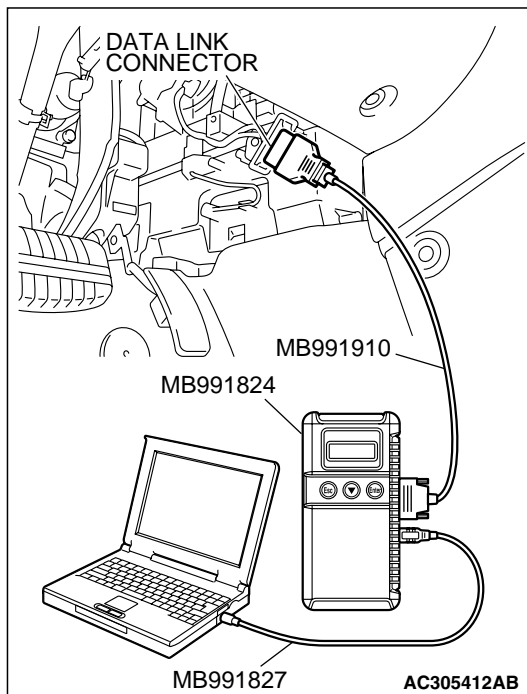
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

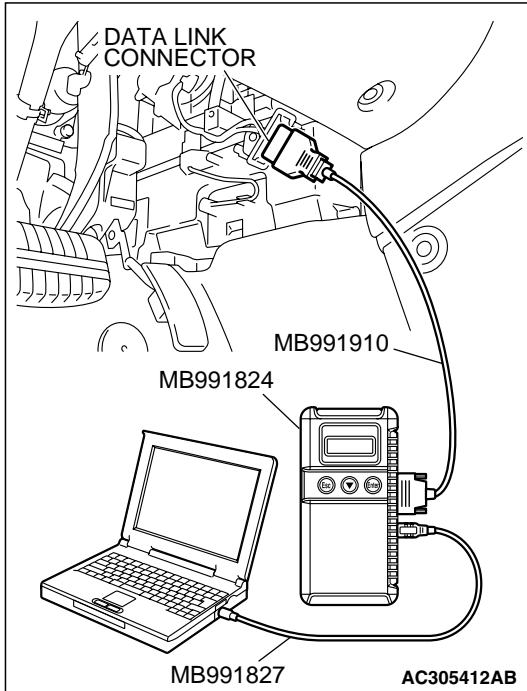
- (1) Connect scan tool MB991958 to the data link connector.
(Refer to P.13D-3).
- (2) Turn the ignition switch to the "ON" position.
- (3) Check for MFI system diagnostic trouble code. (Refer to GROUP 13B, MFI Diagnosis – Diagnostic Function – How to Read and Erase Diagnostic Trouble Code P.13B-6).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is any DTC set?

YES : Repair the MFI control system. (Refer to GROUP 13B, MFI Diagnosis – Diagnostic Trouble Code Chart P.13B-34). Then go to Step 4.

NO : Go to Step 2.





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

⚠ CAUTION

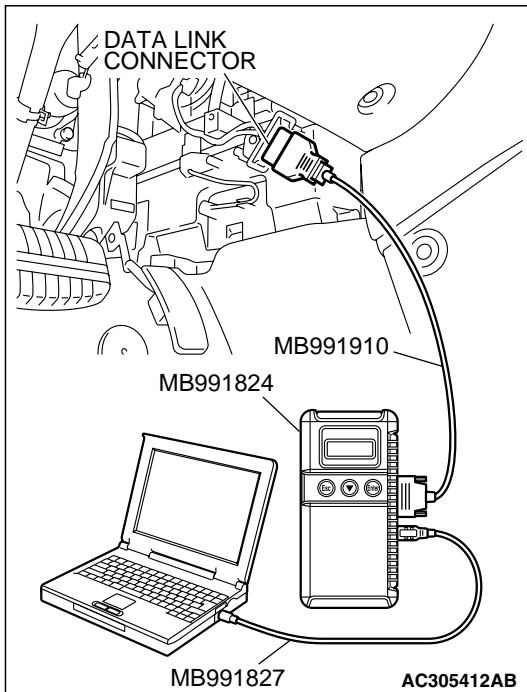
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector. (Refer to P.13D-3).
- (2) Turn the ignition switch to the "ON" position.
- (3) Diagnose the CAN bus line. (Refer to P.13D-3).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is any DTC set?

YES : Repair the CAN bus line. (Refer to GROUP 54C, Diagnosis – Can Bus Diagnostic Chart P.54C-14). Then go to Step 4.

NO : Go to Step 3.



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

⚠ CAUTION

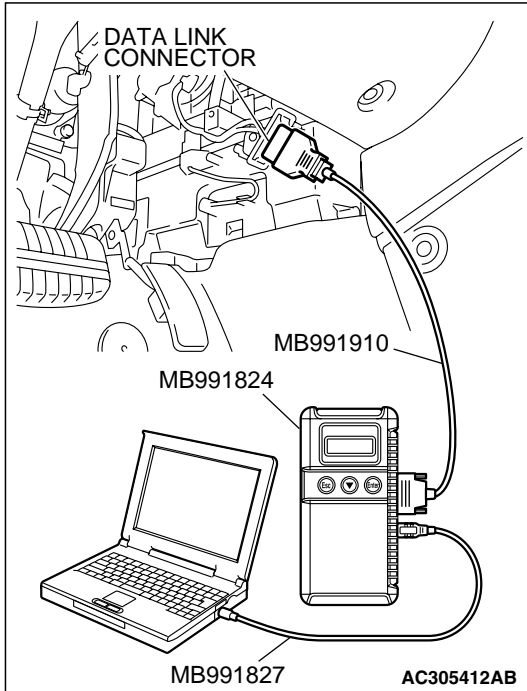
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector. (Refer to P.13D-3).
- (2) Turn the ignition switch to the "ON" position.
- (3) Use scan tool MB991958 to read the TCL diagnostic trouble codes. (Refer to P.13D-3).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is DTC C1396 set?

YES : Replace the hydraulic unit (integrated with ABS/TCL-ECU). (Refer to GROUP 35B – Hydraulic Unit P.35B-105). Then go to Step 4.

NO : It can be assumed that this malfunction is intermittent. (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-14).



STEP 4. Using scan tool MB991958, read the diagnostic trouble code.

⚠ CAUTION

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

- (1) Connect scan tool MB991958 to the data link connector. (Refer to P.13D-3).
- (2) Turn the ignition switch to the "ON" position.
- (3) Use scan tool MB991958 to read the TCL diagnostic trouble codes. (Refer to P.13D-3).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is DTC C1396 set?

YES : Return to Step 1.

NO : The procedure is complete.

C1397 Transmission Range Switch Failure

⚠ CAUTION

- If DTC C1397 is set in the ABS/TCL-ECU, always diagnose the CAN main bus line. If there is any fault in the CAN bus lines, an incorrect DTC may be set.
- Whenever the ABS/TCL-ECU is replaced, ensure that the communication circuit is normal.
- The A/T system-related DTC may be set when DTC C1397 is set. (For details refer to GROUP 00, Intersystem Affiliated DTC Reference Table P.00-17). Diagnose the A/T system first when the A/T system-related DTC is set.

DTC SET CONDITIONS

This DTC is set when the transmission range switch fail request is sent from PCM.

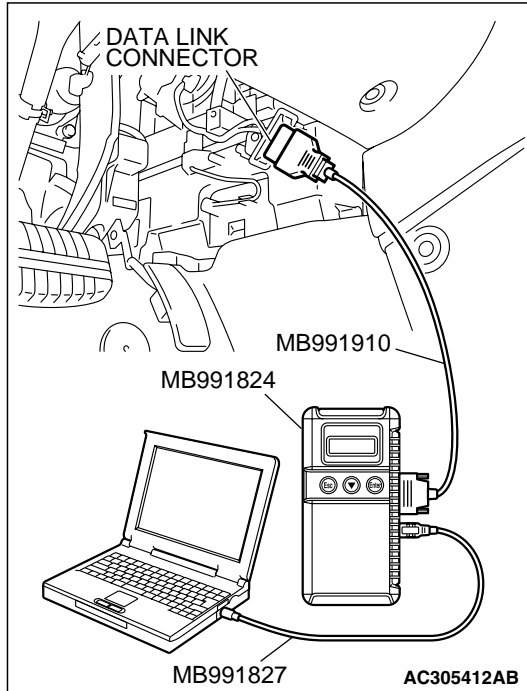
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the A/T system.
- Malfunction of the ABS/TCL-ECU.

DIAGNOSIS

Required Special Tools:

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



STEP 1. Using scan tool MB991958, read the diagnostic trouble code.

⚠ CAUTION

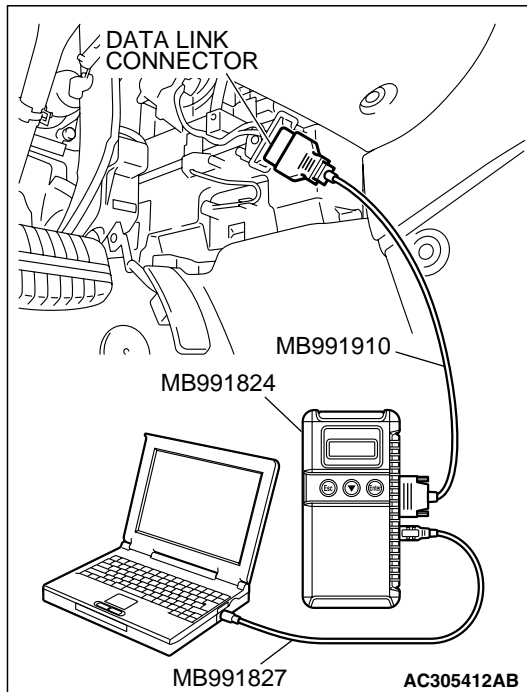
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector. (Refer to P.13D-3).
- (2) Turn the ignition switch to the "ON" position.
- (3) Check for A/T system diagnostic trouble code. (Refer to GROUP 23A, A/T Diagnosis – Diagnostic Function – How to Read and Erase Diagnostic Trouble Code P.23A-15).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is any DTC set?

YES : Repair the automatic transaxle control system. (Refer to GROUP 23A, A/T Diagnosis – Diagnostic Trouble Code Chart P.23A-42). Then go to Step 3.

NO : Go to Step 2.



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

⚠ CAUTION

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

- (1) Connect scan tool MB991958 to the data link connector. (Refer to P.13D-3).
- (2) Turn the ignition switch to the "ON" position.
- (3) Use scan tool MB991958 to read the TCL diagnostic trouble codes. (Refer to P.13D-3).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is DTC C1397 set?

YES : Replace the hydraulic unit (integrated with ABS/TCL-ECU). (Refer to GROUP 35B – Hydraulic Unit P.35B-105). Then go to Step 3.

NO : It can be assumed that this malfunction is intermittent. (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-14).

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

⚠ CAUTION

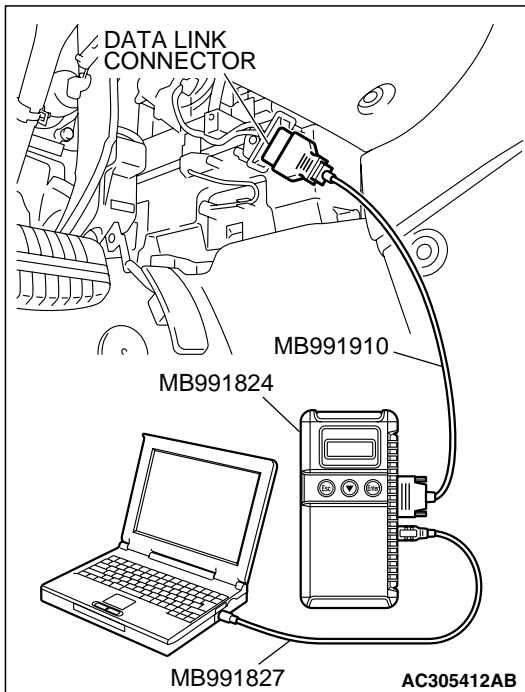
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector.
(Refer to P.13D-3).
- (2) Turn the ignition switch to the "ON" position.
- (3) Use scan tool MB991958 to read the TCL diagnostic trouble codes. (Refer to P.13D-3).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is DTC C1397 set?

YES : Return to Step 1.

NO : The procedure is complete.



U1100 CAN Communications System Time Out Error Engine Related Data

⚠ CAUTION

- If DTC U1100 is set in the ABS/TCL-ECU, always diagnose the CAN main bus line. If there is any fault in the CAN bus lines, an incorrect DTC may be set.
- Whenever the ABS/TCL-ECU is replaced, ensure that the communication circuit is normal.

DTC SET CONDITION

The ABS/TCL-ECU receives engine system-related signals from the PCM via CAN bus lines.

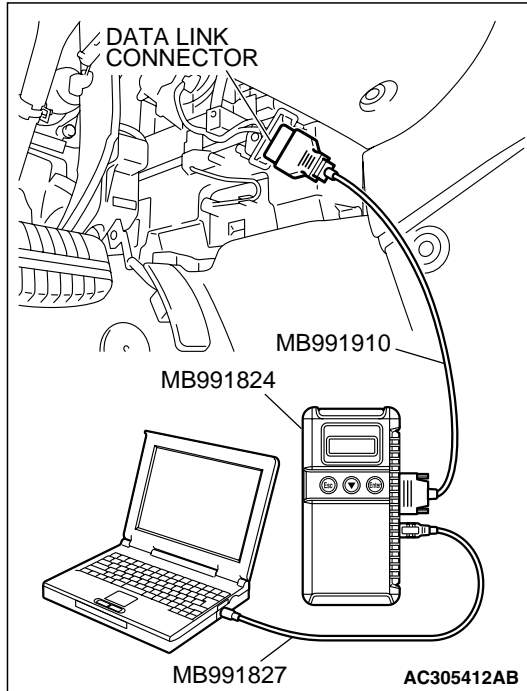
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THESE DTCS ARE TO SET ARE:)

- Damaged harness or connector.
- Malfunction of the PCM.
- Malfunction of the ABS/TCL-ECU.

DIAGNOSIS

Required Special Tools:

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



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

⚠ CAUTION

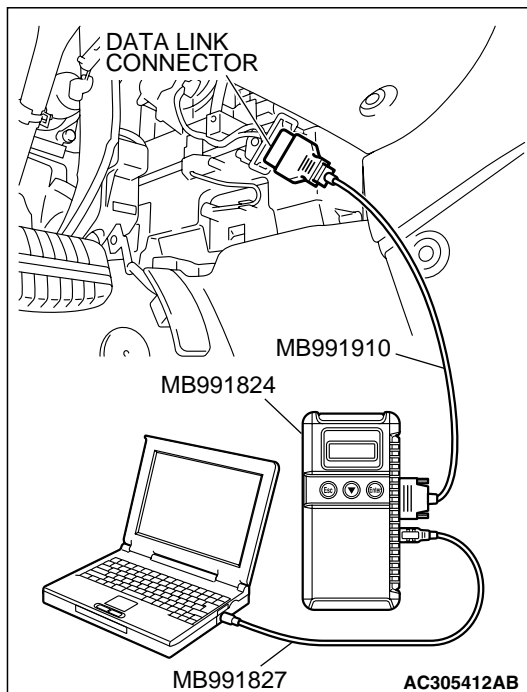
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector. (Refer to P.13D-3).
- (2) Turn the ignition switch to the "ON" position.
- (3) Diagnose the CAN bus line. (Refer to P.13D-3).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

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

YES : Go to Step 2.

NO : Repair the CAN bus line. (Refer to GROUP 54C, Diagnosis – Can Bus Diagnostic Chart P.54C-14). Then go to Step 6.



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

⚠ CAUTION

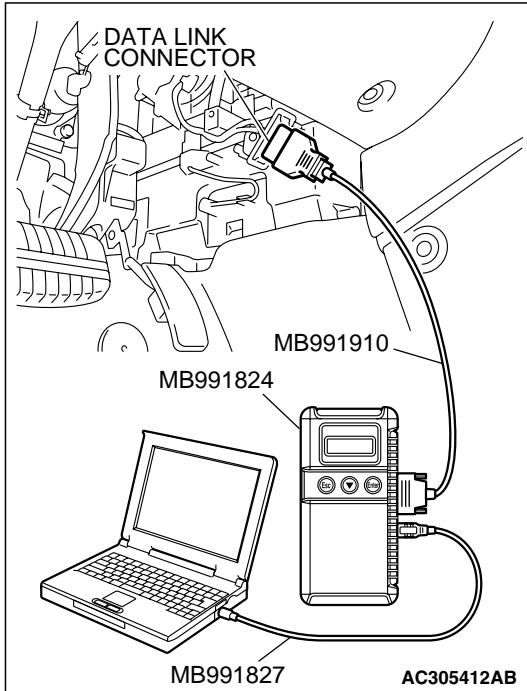
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector. (Refer to P.13D-3).
- (2) Turn the ignition switch to the "ON" position.
- (3) Check for MFI system diagnostic trouble code. (Refer to GROUP 13B, MFI Diagnosis – Diagnostic Function – How to Read and Erase Diagnostic Trouble Code P.13B-6).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is any DTC set?

YES : Repair the MFI control system. (Refer to GROUP 13B, MFI Diagnosis – Diagnostic Trouble Code Chart P.13B-34). Then go to Step 6.

NO : Go to Step 3.



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

CAUTION

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

(1) Connect scan tool MB991958 to the data link connector. (Refer to P.13D-3).

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

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

ETACS-ECU

- DTC 011: Power train control module time-out (related to engine). (Refer to GROUP 54B, SWS Diagnosis – General Description – Diagnostic Function – How to Read and Erase Diagnostic Trouble Code P.54B-10).

Combination meter

- DTC 011: Power train control module time-out (related to engine). (Refer to GROUP 54A, Combination Meter Assembly Diagnosis – Diagnostic Function – How to Read and Erase Diagnostic Trouble Code P.54A-50).

Multi-center display

- DTC 011: Power train control module time-out (related to engine). (Refer to GROUP 54A, Multi-center Display – Diagnostic Function – How to Read and Erase Diagnostic Trouble Code P.54A-222).

A/C-ECU

- DTC U1100: Power train control module time-out (related to engine). (Refer to GROUP 55A, Manual A/C Diagnosis – Diagnostic Function – How to Read and Erase Diagnostic Trouble Code P.55A-6) <Vehicle with manual A/C> or (Refer to GROUP 55B, Auto A/C Diagnosis – Diagnostic Function – How to Read and Erase Diagnostic Trouble Code P.55B-4) <Vehicle with auto A/C>.

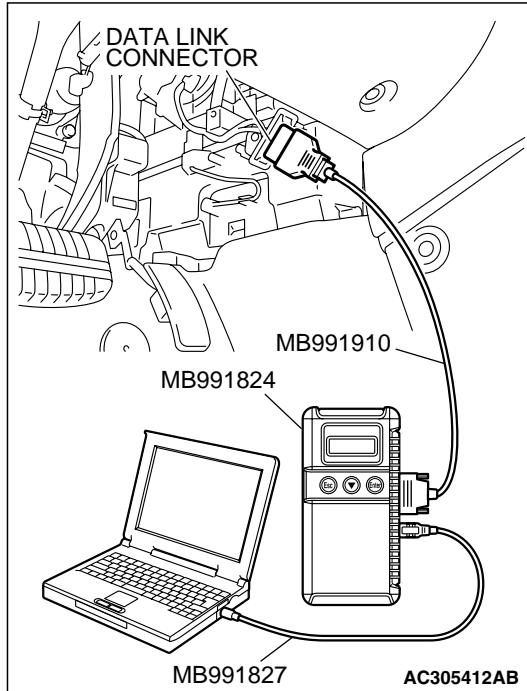
(4) Turn the ignition switch to the "LOCK" (OFF) position.

(5) Disconnect scan tool MB991958.

Q: Is DTC 011 or U1100 set?

YES : Go to Step 4.

NO : Go to Step 5.



STEP 4. Using scan tool MB991958, read the diagnostic trouble code.

⚠ CAUTION

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

- (1) Connect scan tool MB991958 to the data link connector. (Refer to P.13D-3).
- (2) Turn the ignition switch to the "ON" position.
- (3) Use scan tool MB991958 to read the TCL diagnostic trouble codes. (Refer to P.13D-3).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is DTC U1100 set?

YES : Replace the PCM. [Refer to GROUP 13B, Power Control Module (PCM) P.13B-1192]. Then go to Step 6.

NO : It can be assumed that this malfunction is intermittent. (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-14).

STEP 5. Using scan tool MB991958, read the diagnostic trouble code.

⚠ CAUTION

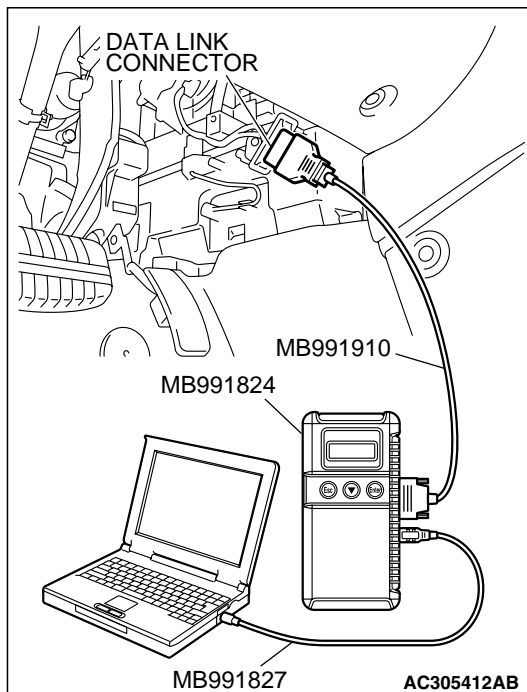
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector. (Refer to P.13D-3).
- (2) Turn the ignition switch to the "ON" position.
- (3) Use scan tool MB991958 to read the TCL diagnostic trouble codes. (Refer to P.13D-3).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is DTC U1100 set?

YES : Replace the hydraulic unit (integrated with ABS/TCL-ECU). (Refer to GROUP 35B – Hydraulic Unit P.35B-105). Then go to Step 6.

NO : It can be assumed that this malfunction is intermittent. (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-14).



STEP 6. Using scan tool MB991958, read the diagnostic trouble code.

⚠ CAUTION

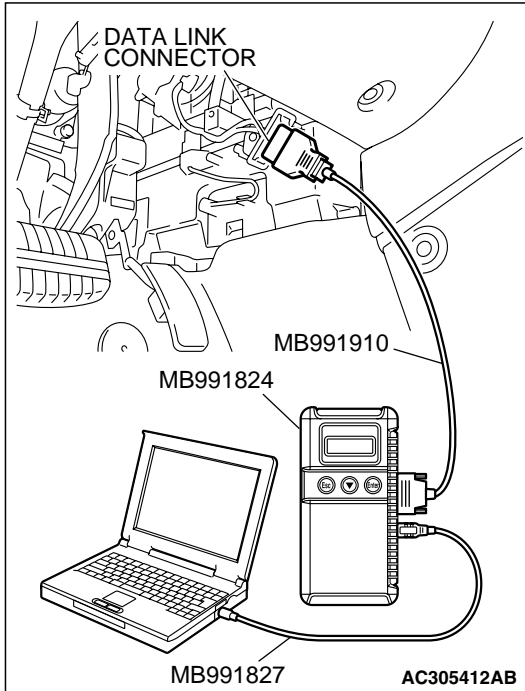
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector.
(Refer to P.13D-3).
- (2) Turn the ignition switch to the "ON" position.
- (3) Use scan tool MB991958 to read the TCL diagnostic trouble codes. (Refer to P.13D-3).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is DTC U1100 set?

YES : Return to Step 1.

NO : The procedure is complete.



U1101 CAN Communications System Time Out Error A/T Related Data

⚠ CAUTION

- If DTC U1101 is set in the ABS/TCL-ECU, always diagnose the CAN main bus line. If there is any fault in the CAN bus lines, an incorrect DTC may be set.
- Whenever the ABS/TCL-ECU is replaced, ensure that the communication circuit is normal.

DTC SET CONDITION

The ABS/TCL-ECU receives A/T system-related signals from the PCM via CAN bus lines.

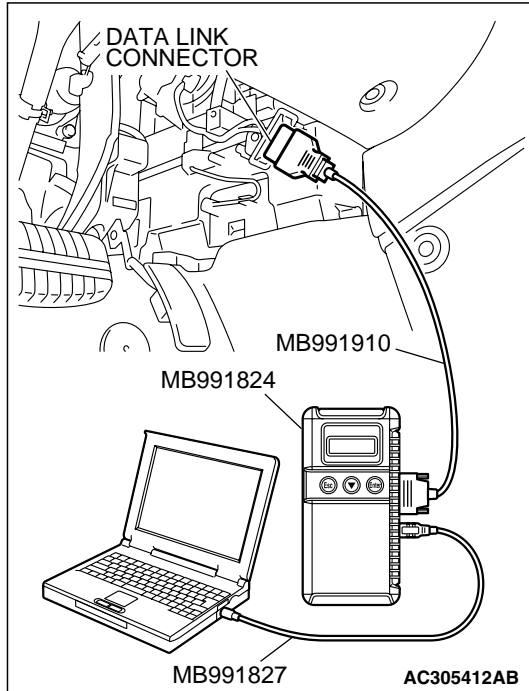
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THESE DTCS ARE TO SET ARE:)

- Damaged harness or connector.
- Malfunction of the PCM.
- Malfunction of the ABS/TCL-ECU.

DIAGNOSIS

Required Special Tools:

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



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

CAUTION

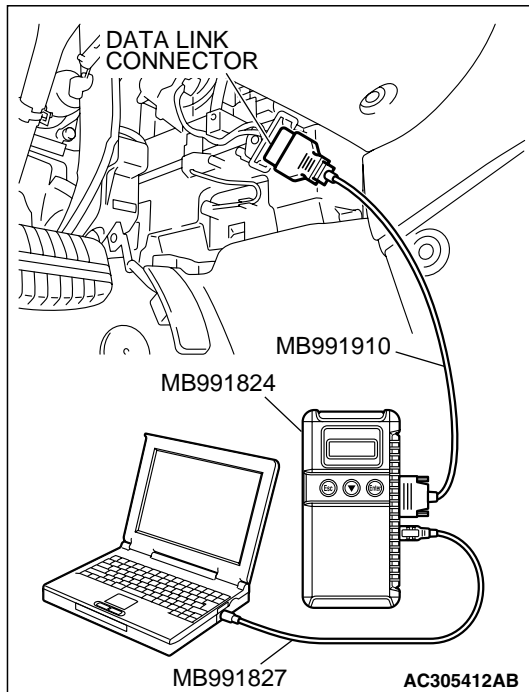
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector. (Refer to P.13D-3).
- (2) Turn the ignition switch to the "ON" position.
- (3) Diagnose the CAN bus line. (Refer to P.13D-3).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

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

YES : Go to Step 2.

NO : Repair the CAN bus lines. (Refer to GROUP 54C, Diagnosis – Can Bus Diagnostic Chart P.54C-14). Then go to Step 6.



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

CAUTION

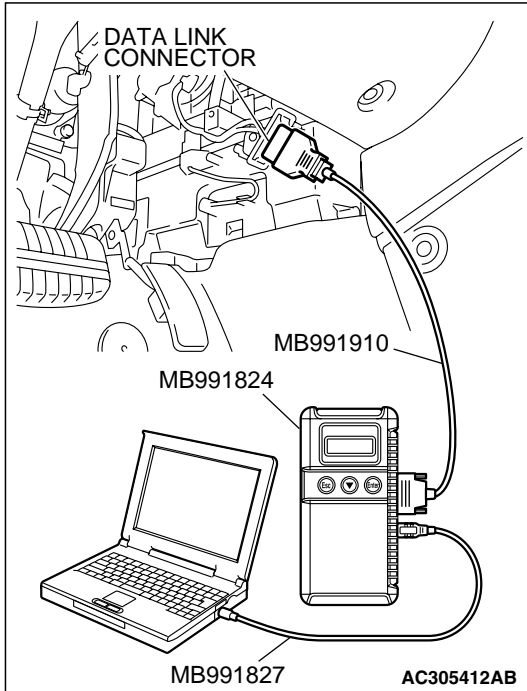
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector. (Refer to P.13D-3).
- (2) Turn the ignition switch to the "ON" position.
- (3) Check for A/T system diagnostic trouble code. (Refer to GROUP 23A, A/T Diagnosis – Diagnostic Function – How to Read and Erase Diagnostic Trouble Code P.23A-15).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is any DTC set?

YES : Repair the automatic transaxle control system. (Refer to GROUP 23A, A/T Diagnosis – Diagnostic Trouble Code Chart P.23A-42). Then go to Step 6.

NO : Go to Step 3.



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

⚠ CAUTION

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

(1) Connect scan tool MB991958 to the data link connector. (Refer to P.13D-3).

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

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

ETACS-ECU

- DTC 012: Power train control module time-out (related to A/T). (Refer to GROUP 54B, SWS Diagnosis – General Description – Diagnostic Function – How to Read and Erase Diagnostic Trouble Code P.54B-10).

Combination meter

- DTC 012: Power train control module time-out (related to A/T). (Refer to GROUP 54A, Combination Meter Assembly Diagnosis – Diagnostic Function – How to Read and Erase Diagnostic Trouble Code P.54A-50).

Multi-center display

- DTC 012: Power train control module time-out (related to A/T). (Refer to GROUP 54A, Multi-center Display – Diagnostic Function – How to Read and Erase Diagnostic Trouble Code P.54A-222).

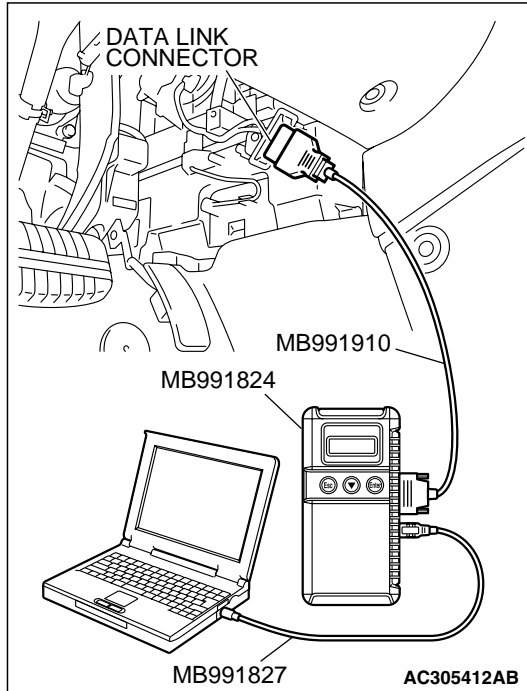
(4) Turn the ignition switch to the "LOCK" (OFF) position.

(5) Disconnect scan tool MB991958.

Q: Is DTC 012 set?

YES : Go to Step 4.

NO : Go to Step 5.



STEP 4. Using scan tool MB991958, read the diagnostic trouble code.

⚠ CAUTION

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

- (1) Connect scan tool MB991958 to the data link connector. (Refer to P.13D-3).
- (2) Turn the ignition switch to the "ON" position.
- (3) Use scan tool MB991958 to read the TCL diagnostic trouble codes. (Refer to P.13D-3).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is DTC U1101 set?

YES : Replace the PCM. [Refer to GROUP 13B, Power Control Module (PCM) P.13B-1192]. Then go to Step 6.

NO : It can be assumed that this malfunction is intermittent. (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-14).

STEP 5. Using scan tool MB991958, read the diagnostic trouble code.

⚠ CAUTION

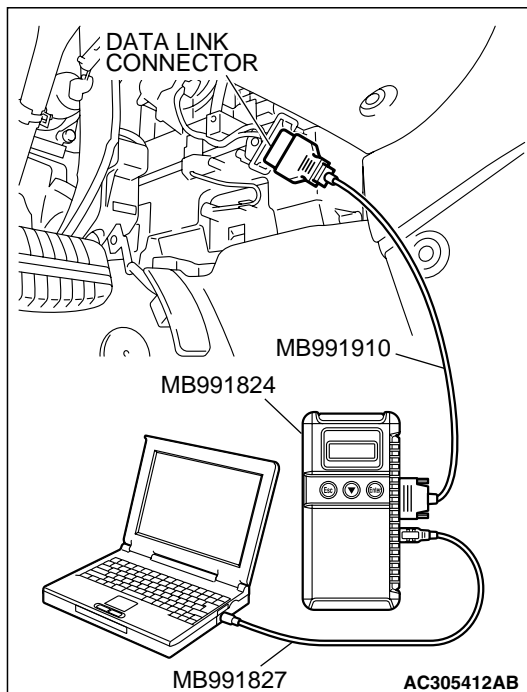
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector. (Refer to P.13D-3).
- (2) Turn the ignition switch to the "ON" position.
- (3) Use scan tool MB991958 to read the TCL diagnostic trouble codes. (Refer to P.13D-3).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is DTC U1101 set?

YES : Replace the hydraulic unit (integrated with ABS/TCL-ECU). (Refer to GROUP 35B – Hydraulic Unit P.35B-105). Then go to Step 6.

NO : It can be assumed that this malfunction is intermittent. (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-14).



STEP 6. Using scan tool MB991958, read the diagnostic trouble code.

⚠ CAUTION

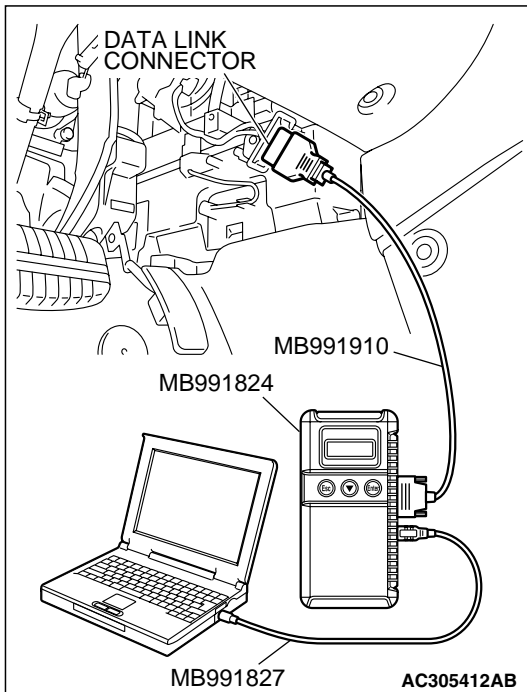
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector.
(Refer to P.13D-3).
- (2) Turn the ignition switch to the "ON" position.
- (3) Use scan tool MB991958 to read the TCL diagnostic trouble codes. (Refer to P.13D-3).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is DTC U1101 set?

YES : Return to Step 1.

NO : The procedure is complete.



U1120 CAN Communications System TCL Uncontrollable by Engine Malfunction

⚠ CAUTION

- If DTC U1120 is set in the ABS/TCL-ECU, always diagnose the CAN main bus line. If there is any fault in the CAN bus lines, an incorrect DTC may be set.
- Whenever the ABS/TCL-ECU is replaced, ensure that the communication circuit is normal.
- The engine control system-related DTC may be set when DTC U1120 is set. (For details refer to GROUP 00, Intersystem Affiliated DTC Reference Table P.00-17). Diagnose the engine control system first when the engine control system-related DTC is set.

DTC SET CONDITION

The ABS/TCL-ECU receives engine system-related signals from the PCM via CAN bus lines. If a fail-safe related data is contained in the signal from the PCM, DTC U1120 will be stored.

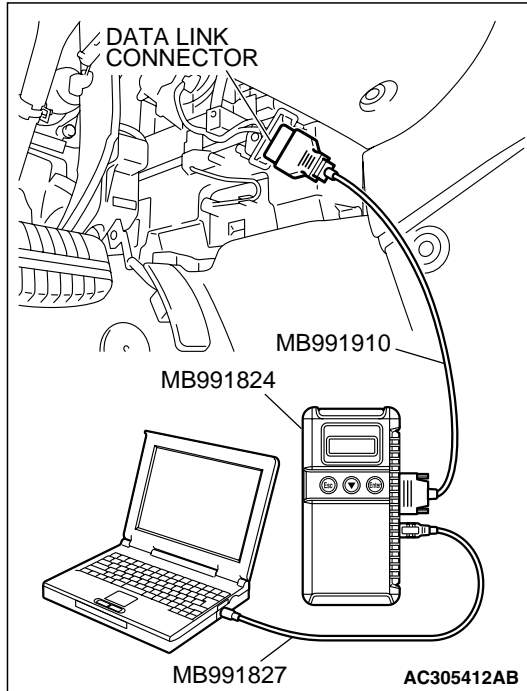
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THESE DTCS ARE TO SET ARE:)

- Damaged harness or connector.
- Malfunction of the PCM.
- Malfunction of the ABS/TCL-ECU.

DIAGNOSIS

Required Special Tools:

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



STEP 1. Using scan tool MB991958, read the diagnostic trouble code.

⚠ CAUTION

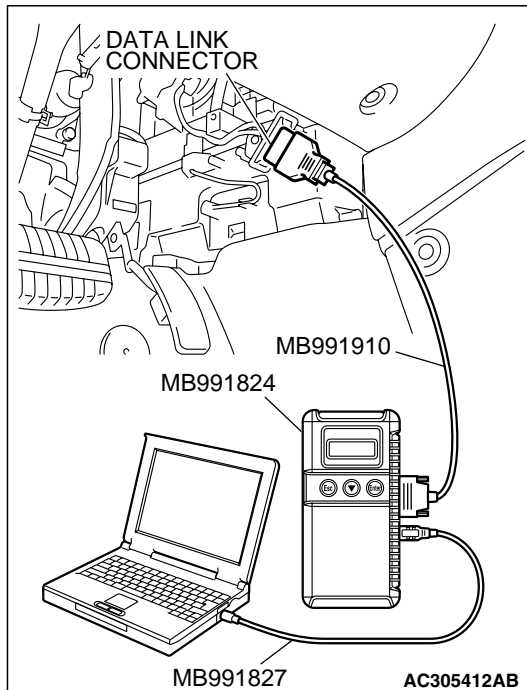
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector. (Refer to P.13D-3).
- (2) Turn the ignition switch to the "ON" position.
- (3) Check for MFI system diagnostic trouble code. (Refer to GROUP 13B, MFI Diagnosis – Diagnostic Function – How to Read and Erase Diagnostic Trouble Code P.13B-6).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is any DTC set?

YES : Repair the MFI control system. (Refer to GROUP 13B, MFI Diagnosis – Diagnostic Trouble Code Chart P.13B-34). Then go to Step 6.

NO : Go to Step 2.



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

⚠ CAUTION

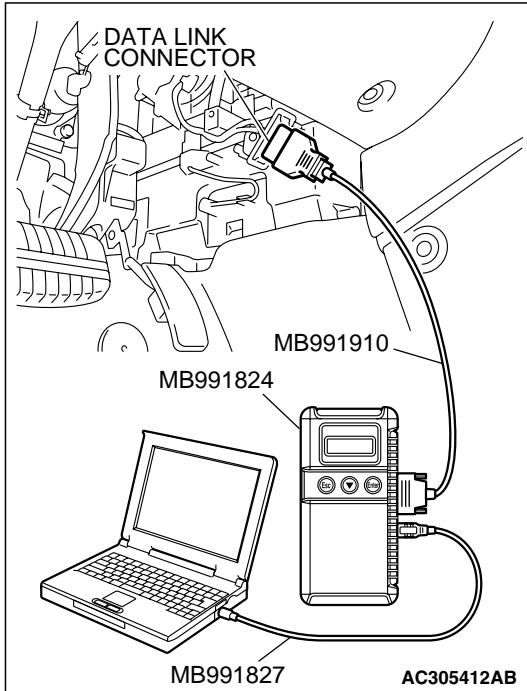
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector. (Refer to P.13D-3).
- (2) Turn the ignition switch to the "ON" position.
- (3) Diagnose the CAN bus line. (Refer to P.13D-3).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

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

YES : Go to Step 3.

NO : Repair the CAN bus lines. (Refer to GROUP 54C, Diagnosis – Can Bus Diagnostic Chart P.54C-14). Then go to Step 6.



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

CAUTION

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

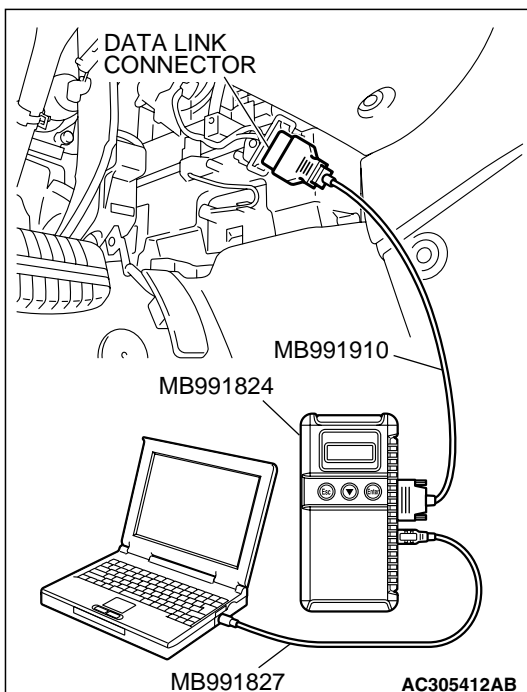
- (1) Connect scan tool MB991958 to the data link connector. (Refer to P.13D-3).
- (2) Turn the ignition switch to the "ON" position.
- (3) Check if a DTC, which relates to CAN communication-linked systems below, is set.
A/C-ECU

- DTC U1120: Failure Information on Power train control module (related to engine). (Refer to GROUP 55A, Manual A/C Diagnostic – Diagnostic Function – How to Read and Erase Diagnostic Trouble Code P.55A-6) <Vehicle with manual A/C> or (Refer to GROUP 55B, Auto A/C Diagnosis – Diagnostic Function – How to Read and Erase Diagnostic Trouble Code P.55B-4) <Vehicle with auto A/C>.

- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is DTC U1120 set?

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



STEP 4. Using scan tool MB991958, read the diagnostic trouble code.

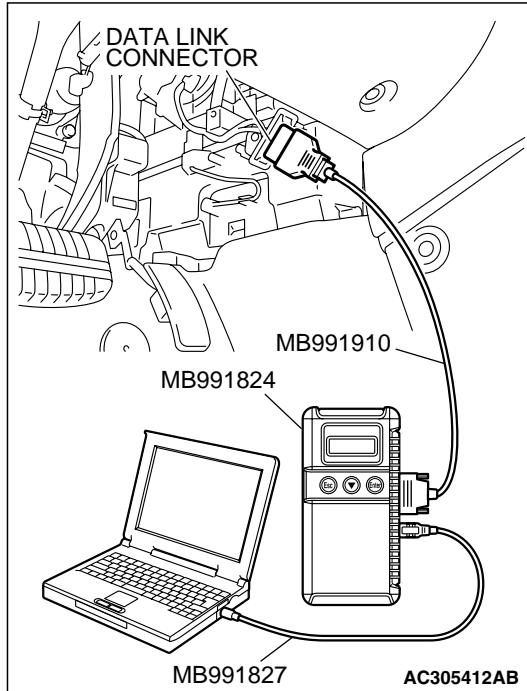
CAUTION

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

- (1) Connect scan tool MB991958 to the data link connector. (Refer to P.13D-3).
- (2) Turn the ignition switch to the "ON" position.
- (3) Use scan tool MB991958 to read the TCL diagnostic trouble codes. (Refer to P.13D-3).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is DTC U1120 set?

- YES** : Replace the PCM. [Refer to GROUP 13B, Power Control Module (PCM) P.13B-1192]. Then go to Step 6.
- NO** : It can be assumed that this malfunction is intermittent. (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-14).



STEP 5. Using scan tool MB991958, read the diagnostic trouble code.

⚠ CAUTION

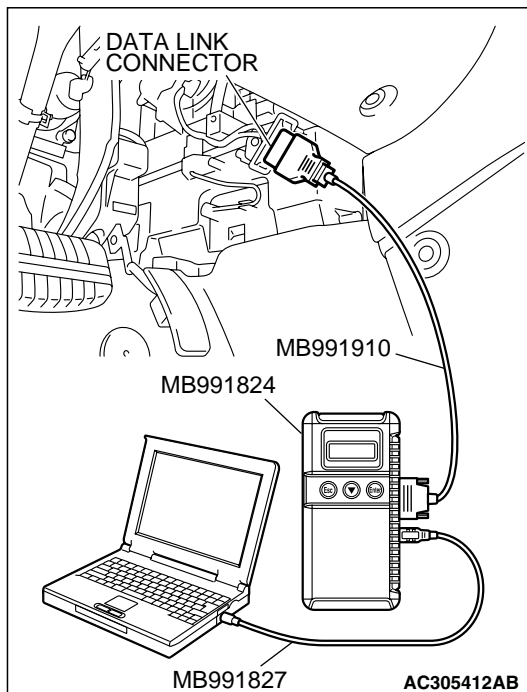
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector. (Refer to P.13D-3).
- (2) Turn the ignition switch to the "ON" position.
- (3) Use scan tool MB991958 to read the TCL diagnostic trouble codes. (Refer to P.13D-3).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is DTC U1120 set?

YES : Replace the hydraulic unit (integrated with ABS/TCL-ECU). (Refer to GROUP 35B – Hydraulic Unit P.35B-105). Then go to Step 6.

NO : It can be assumed that this malfunction is intermittent. (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-14).



STEP 6. Using scan tool MB991958, read the diagnostic trouble code.

⚠ CAUTION

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

- (1) Connect scan tool MB991958 to the data link connector. (Refer to P.13D-3).
- (2) Turn the ignition switch to the "ON" position.
- (3) Use scan tool MB991958 to read the TCL diagnostic trouble codes. (Refer to P.13D-3).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is DTC U1120 set?

YES : Return to Step 1.

NO : The procedure is complete.

U1400 Dynamic range error APS1

DTC SET CONDITION

This code is set when the MFI system sets either of DTCs P2138, P2122 or P2123.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THESE DTCS ARE TO SET ARE:)

- Malfunction of the MFI system

DIAGNOSIS

Check whether the MFI system sets either of diagnostic trouble codes P2138, P2122 or P2123, and repair if necessary. (Refer to GROUP 13B, MFI Diagnosis – Diagnostic Function – How to Read and Erase Diagnostic Trouble Code [P.13B-6](#)).

SYMPTOM CHART

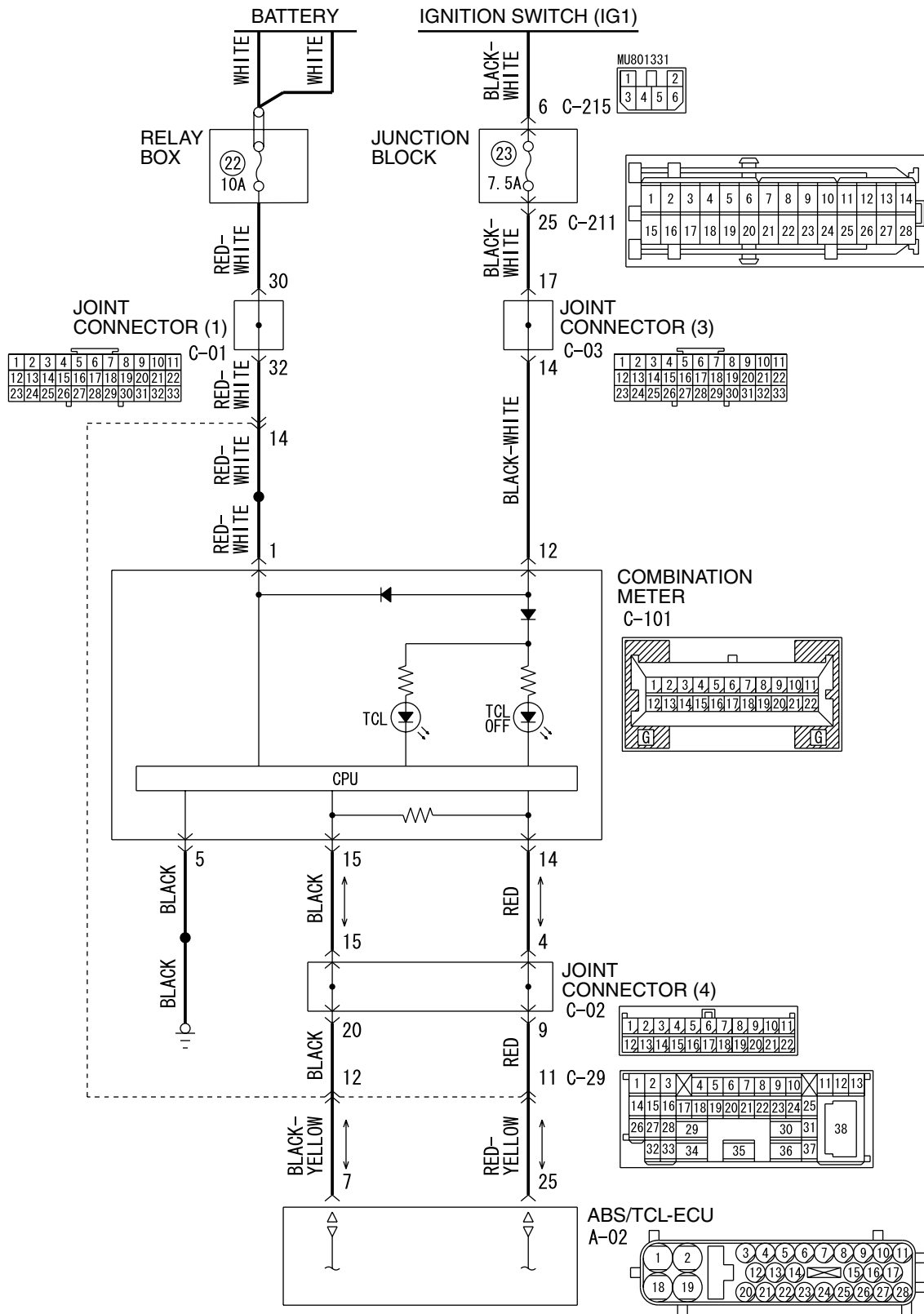
M1136003400029

SYMPTOM		INSPECTION PROCEDURE NO.	REFERENCE PAGE
Communication with scan tool is not possible	Communication with all systems is impossible	-	Group 13B, MFI Diagnosis – Symptom Procedures – Inspection Procedure 1 P.13B-1013 .
	Communication with the ABS/TCL-ECU only is impossible	-	Group 35B, ABS Diagnosis – Symptom Procedures – Inspection Procedure 1 P.35B-82 .
When the ignition switch is turned to the "ON" position (engine stopped), the "TCL OFF" indicator light dose not illuminate.		1	P.13D-26
When the ignition switch is turned to the "ON" position (engine stopped), the TCL work indicator light dose not illuminate.		2	
The "TCL OFF" indicator light remains illuminated after the engine is started.		3	
The TCL work indicator light remains illuminated after the engine is started.		4	
When the TCL switch is push on, TCL does not be cancelled.		5	P.13D-31
TCL dose not operate.		6	P.13D-38

SYMPTOM PROCEDURES

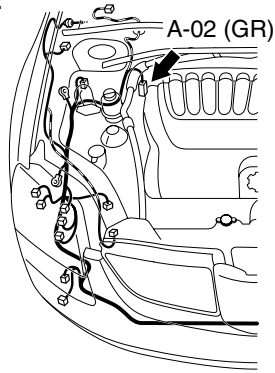
INSPECTION PROCEDURE 1: When the Ignition Switch is Turned to the "ON" Position (Engine Stopped), the "TCL OFF" Indicator Light dose not Illuminate. INSPECTION PROCEDURE 2: When the Ignition Switch is Turned to the "ON" Position (Engine Stopped), the TCL Work Indicator Light dose not Illuminate. INSPECTION PROCEDURE 3: The "TCL OFF" Indicator Light Remains Illuminated After the Engine is Started. INSPECTION PROCEDURE 4: The TCL Work Indicator Light Remains Illuminated After the Engine is Started.

"TCL OFF" Indicator Light and TCL Work Indicator Light Drive Circuit

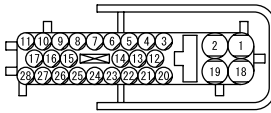


AC307013AB

CONNECTOR: A-02

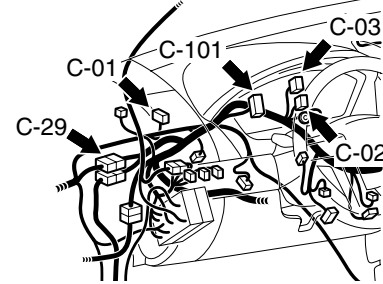


A-02 HARNESS CONNECTOR:
 COMPONENT SIDE

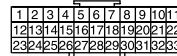


AC305209AB

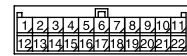
CONNECTORS: C-01, C-02, C-03, C-29, C-101



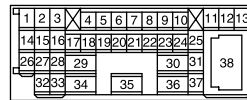
C-01 AND C-03
 HARNESS CONNECTOR:
 COMPONENT SIDE



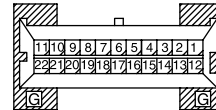
C-02 HARNESS
 CONNECTOR:
 COMPONENT SIDE



C-29 MALE SIDE
 CONNECTOR



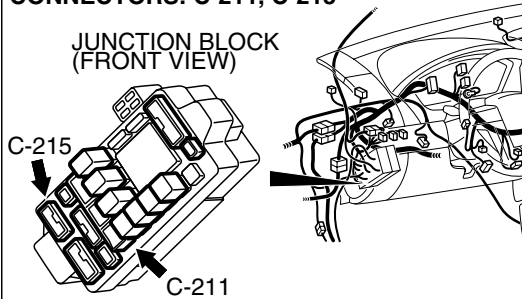
C-101 HARNESS
 CONNECTOR:
 COMPONENT SIDE



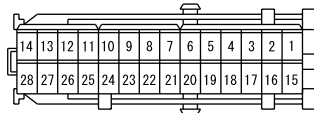
AC305232AO

CONNECTORS: C-211, C-215

JUNCTION BLOCK
 (FRONT VIEW)



C-211 HARNESS CONNECTOR:
 COMPONENT SIDE



C-215 HARNESS CONNECTOR:
 COMPONENT SIDE



AC305720AB

CIRCUIT OPERATION

- ABS/TCL-ECU send the illumination signal of "TCL OFF" indicator light and TCL work indicator light to the combination meter via the CAN communication.

- ABS/TCL-ECU operates the "TCL OFF" indicator light and the TCL work indicator light for three seconds after the ignition switch is turned "ON" position for bulb check.

COMMENT

This may be caused by faults in the CAN bus line, the combination meter or the ABS/TCL-ECU.

TROUBLESHOOTING HINTS

- Malfunction of the combination meter.
- Damaged harness or connector.
- Malfunction of the ABS/TCL-ECU.

DIAGNOSIS

Required Special Tools:

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

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

⚠ CAUTION

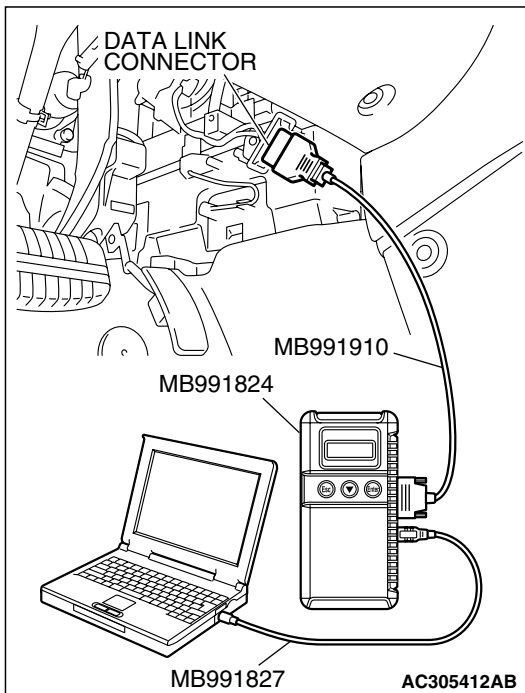
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

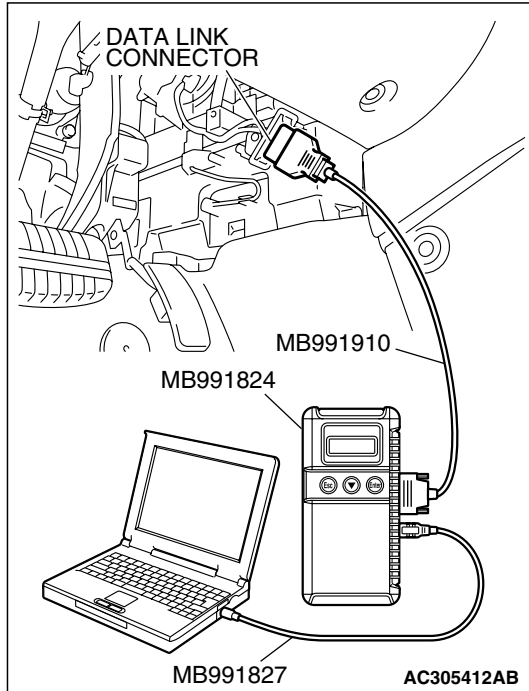
- (1) Connect scan tool MB991958 to the data link connector.
(Refer to [P.13D-3](#)).
- (2) Turn the ignition switch to the "ON" position.
- (3) Diagnose the CAN bus line. (Refer to [P.13D-3](#)).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is the check result satisfactory?

YES : Go to Step 2

NO : Repair the CAN bus lines. (Refer to GROUP 54C, Diagnosis – Can Bus Diagnostic Chart [P.54C-14](#)). Then go to Step 4.





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

⚠ CAUTION

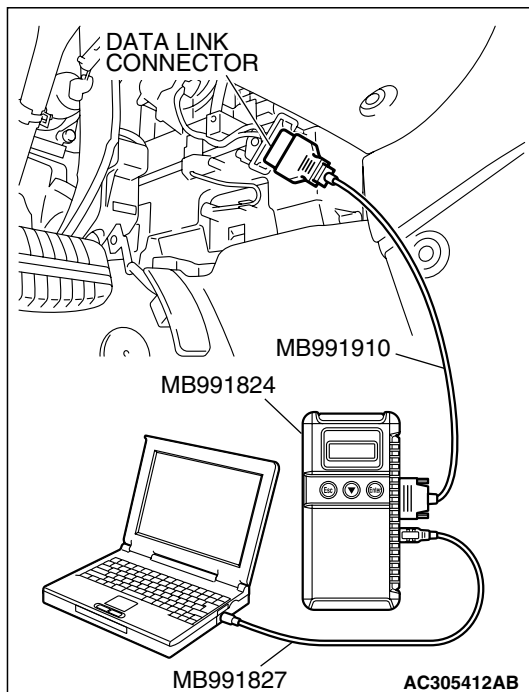
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector. (Refer to P.13D-3).
- (2) Turn the ignition switch to the "ON" position.
- (3) Use scan tool MB991958 to read the TCL diagnostic trouble codes. (Refer to P.13D-3).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is any DTC set?

YES : Refer to P.13D-7, Diagnostic Trouble Code Chart. Then go to Step 4.

NO : Go to Step 3.



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

⚠ CAUTION

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

- (1) Connect scan tool MB991958 to the data link connector. (Refer to P.17-11).
- (2) Turn the ignition switch to the "ON" position.
- (3) Check for Combination meter system diagnostic trouble code. (Refer to GROUP 54A, Combination Meter Assembly Diagnosis – Diagnosis Function – How to Read and Erase Diagnostic Trouble Code P.54A-50).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is DTC U1102 set?

YES : Replace the hydraulic unit (integrated with ABS/TCL-ECU). (Refer to GROUP 35B – Hydraulic Unit P.35B-105). Then go to Step 4.

NO : Replace the combination meter assembly. (Refer to GROUP 54A – Combination Meter Assembly P.54A-106). Then go to Step 4.

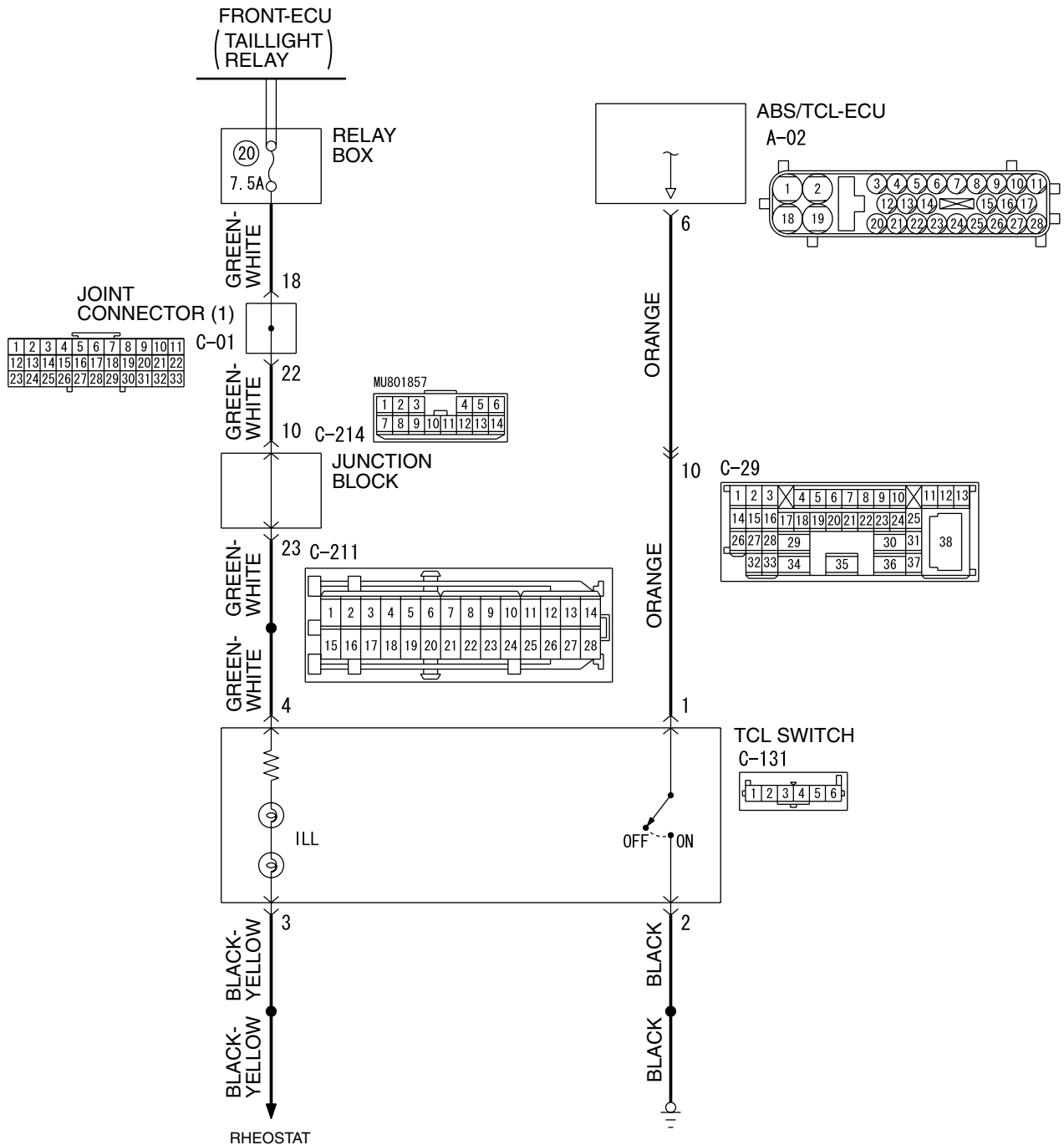
STEP 4. Retest the system

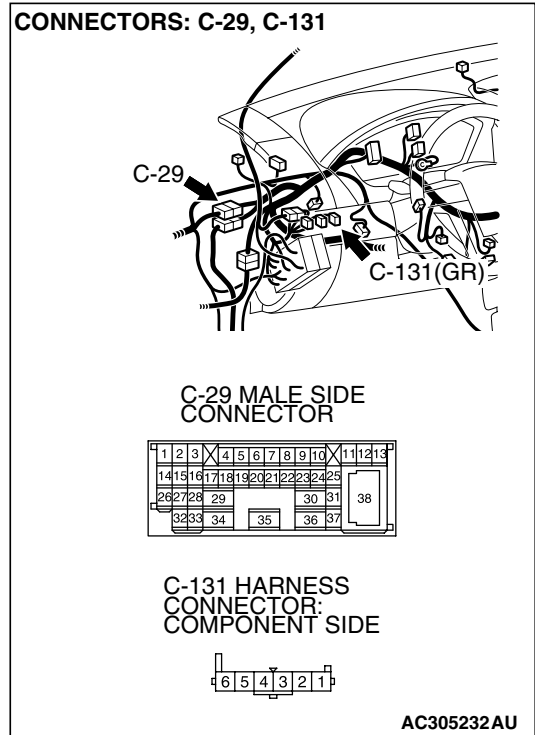
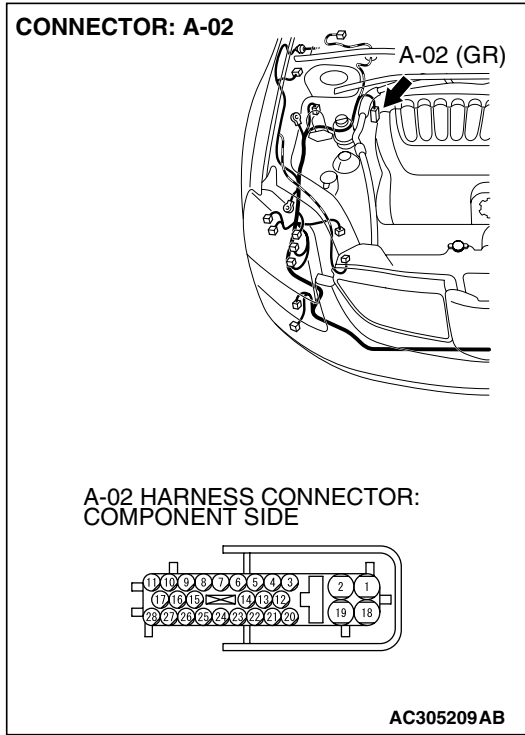
Q: Turn the ignition switch to the "ON" position. Do the "TCL OFF" indicator light and the TCL work indicator light illuminate for three seconds, and then go out after the engine starts?

- YES :** The procedure is complete.
- NO :** Return to Step 1.

INSPECTION PROCEDURE 5: When the TCL Switch is Push On, TCL dose not Cancelled.

TCL Switch System Circuit





CIRCUIT OPERATION

ABS/TCL-ECU terminal 6 is grounded every time the TCL switch is pressed. ABS/TCL-ECU monitors this operation state and turns the TCL ON or OFF.

COMMENT

The cause is probably an open-circuit in the TCL switch circuit.

TROUBLESHOOTING HINTS

- Malfunction of the TCL switch.
- Damaged harness or connector.
- Malfunction of the ABS/TCL-ECU.

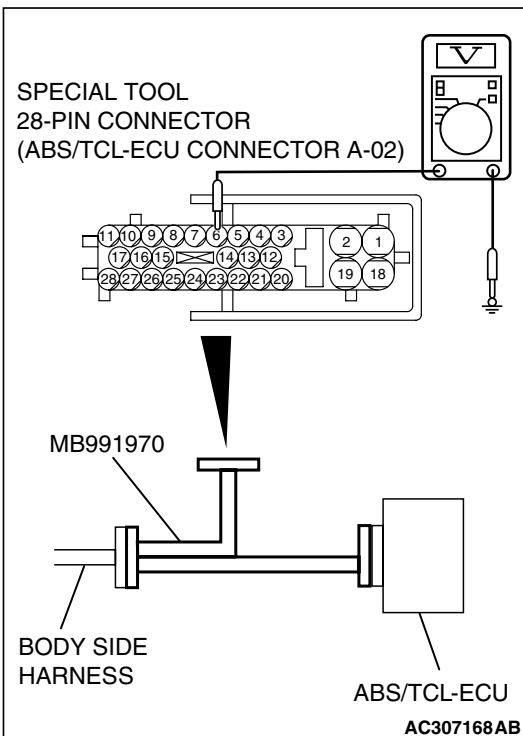
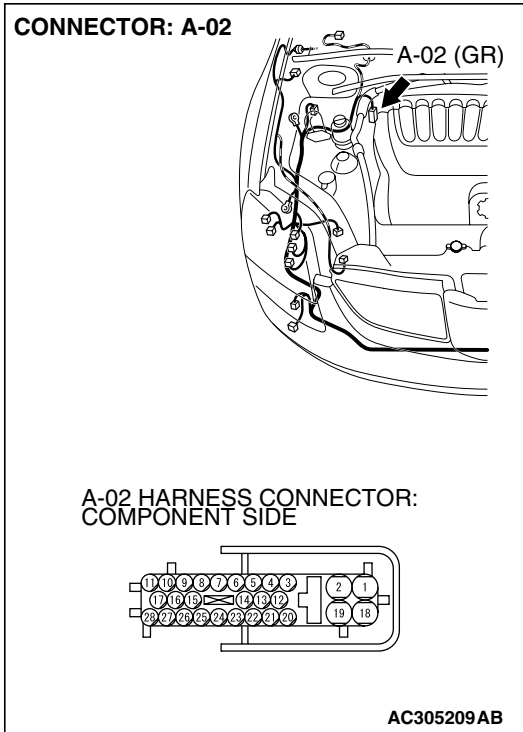
DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB991970: ABS Check Harness

STEP 1. Measure the terminal voltage at ABS/TCL-ECU connector A-02.

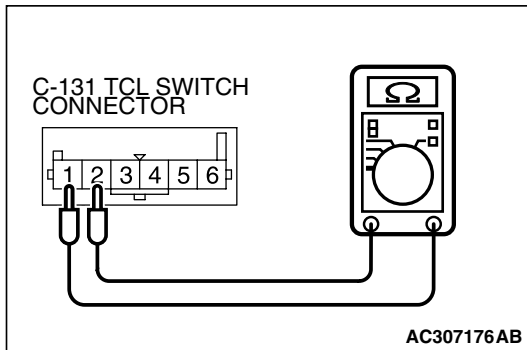
(1) Disconnect the ABS/TCL-ECU connector A-02.



- (2) Connect special tool MB991970 between the ABS/TCL-EUC and the body-side harness connector.
- (3) Turn the ignition switch to the "ON" position.
- (4) Measure the terminal voltage between special tool MB991970 connector terminal 6 (ABS/TCL-ECU connector A-02 terminal 6) and ground.
- When the TCL switch is not pressed, the voltage should measure battery positive voltage (approximately 12 volts).
 - When the TCL switch is pressed, the voltage should measure 1 volt or less.
- (5) Turn the ignition switch to the "LOCK" (OFF) position.
- (6) Disconnect special tool MB991970 between the ABS/TCL-ECU and the body-side harness connector.
- (7) Connect the ABS/TCL-ECU connector A-02.

Q: Is the terminal voltage battery terminal voltage when the TCL switch is not pressed, and is the terminal voltage 1 volt or less when the TCL switch is pressed?

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

**STEP 2. Check the TCL switch.**

- (1) Remove the TCL switch. (Refer to [P.13D-48](#)).
- (2) Connect an ohmmeter to the TCL switch between terminals 1 and 2.
- (3) Check for continuity between terminals 1 and 2 when the TCL switch is operated.
 - There is no continuity between terminals 1 and 2 when the TCL switch is not pressed.
 - There is continuity between terminals 1 and 2 when the TCL switch is pressed.

Q: Is there no continuity between terminals 1 and 2 when the TCL switch is not pressed, and is there continuity when the TCL switch is pressed?

YES : Install the TCL switch. (Refer to [P.13D-48](#)). Then go to Step 6.

NO : Replace the TCL switch. (Refer to [P.13D-48](#)). Then go to Step 7.

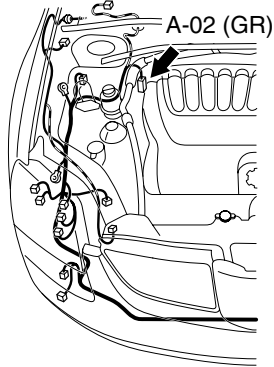
STEP 3. Check ABS/TCL-ECU connector A-02, intermediate connector C-29 and TCL switch connectors C-131 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are there connectors and terminals in good condition?

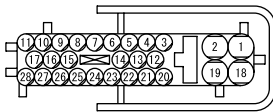
YES : Go to Step 4.

NO : Repair or replace the faulty connector. (Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#)). Then go to Step 7.

CONNECTOR: A-02

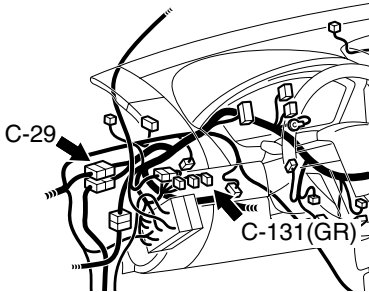


**A-02 HARNESS CONNECTOR:
COMPONENT SIDE**

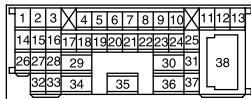


AC305209AB

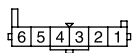
CONNECTORS: C-29, C-131



**C-29 MALE SIDE
CONNECTOR**



**C-131 HARNESS
CONNECTOR:
COMPONENT SIDE**



AC305232AU

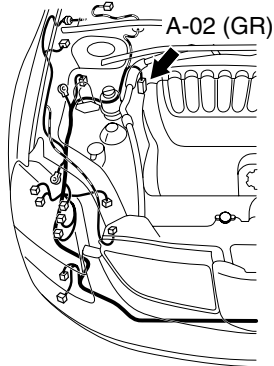
STEP 4. Check the harness wire between ABS/TCL-ECU connector A-02 terminal 6 and TCL switch connector C-131 terminal 1 for damage.

Q: Are there harness wires in good condition?

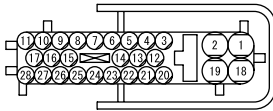
YES : Go to Step 5.

NO : Repair the damaged harness wire. Then go to Step 7.

CONNECTOR: A-02

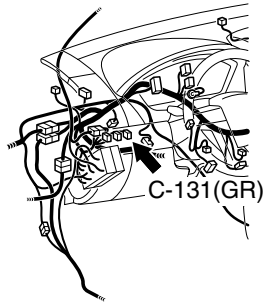


A-02 HARNESS CONNECTOR:
COMPONENT SIDE

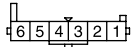


AC305209AB

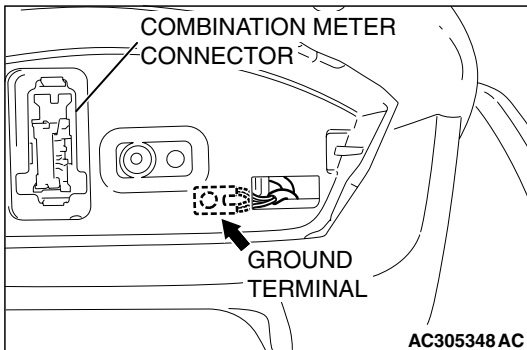
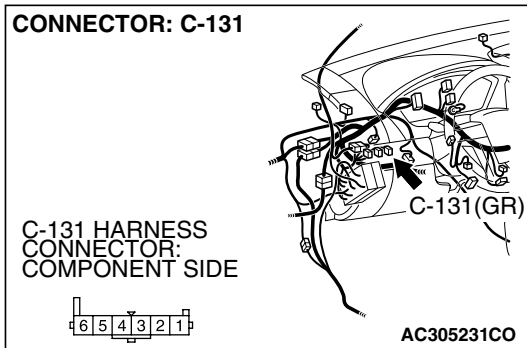
CONNECTOR: C-131



C-131 HARNESS
CONNECTOR:
COMPONENT SIDE



AC305231CO



STEP 5. Check the harness wire between TCL switch connector C-131 terminal 2 and ground for damage.

Q: Is the harness wire in good condition?

YES : Go to Step 6.

NO : Repair the damaged harness wire. Then go to Step 7.

STEP 6. Retest the system

Q: Dose TCL system cancelled, when the TCL switch is push on?

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

NO : Replace the hydraulic unit (integrated with ABS/TCL-ECU). (Refer to GROUP 35B – Hydraulic Unit [P.35B-105](#)). Then go to Step 7.

STEP 7. Retest the system

Q: Dose TCL system cancelled, when the TCL switch is push on?

YES : The procedure is complete.

NO : Return to Step 1.

INSPECTION PROCEDURE 6: TCL does not Operate.

COMMENT

The fail-safe function is probably canceling TCL. In this case, scan tool MB991958 can be used to retest each system by checking the diagnostic trouble codes.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

- Malfunction of the CAN bus line.
- Malfunction of the MFI system.
- Malfunction of the A/T system.
- Malfunction of the ABS/TCL-ECU.

DIAGNOSIS

Required Special Tools:

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

STEP 1. Using scan tool MB991958, read the diagnostic trouble code.

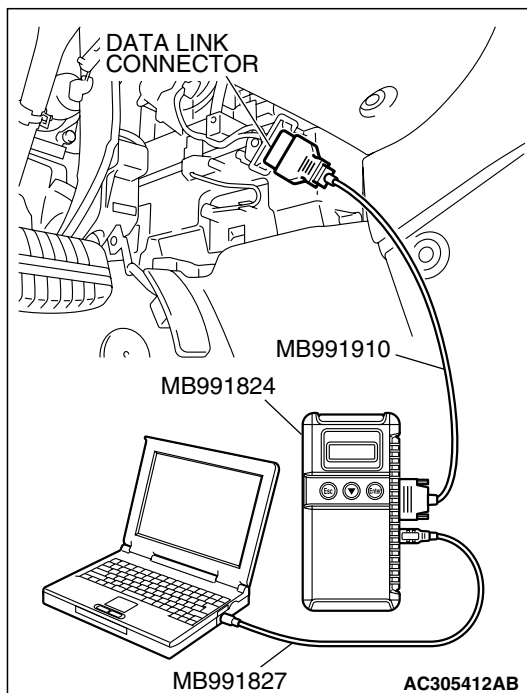
⚠ CAUTION

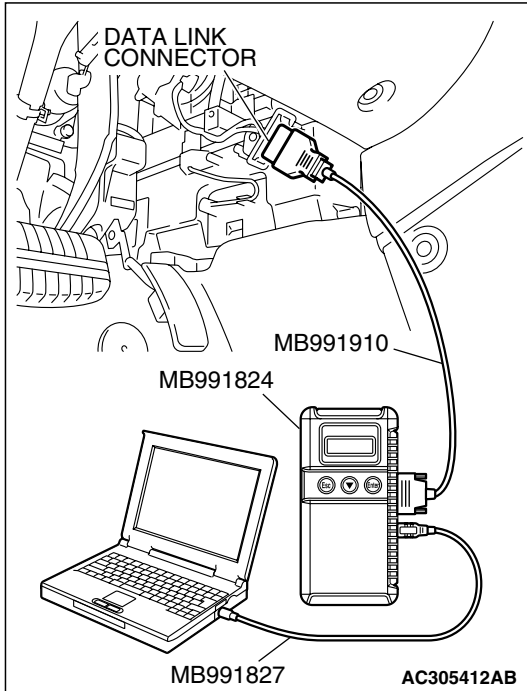
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector. (Refer to P.13D-3).
- (2) Turn the ignition switch to the "ON" position.
- (3) Use scan tool MB991958 to read the TCL diagnostic trouble codes. (Refer to P.13D-3).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is any DTC set?

- YES** : Repair the TCL. (Refer to P.13D-7, Diagnostic Trouble Code Chart). Then go to Step 4.
- NO** : Go to Step 2.





STEP 2. Using scan tool MB991958, check actuator test item09: Engine TCL Drive.

⚠ 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. (Refer to P.13D-3).
- (2) Turn the ignition switch to the "ON" position.

⚠ CAUTION

The engine speed increases after the actuator test because the actuator test continues for only three seconds. Therefore, release the accelerator pedal immediately.

- (3) Use scan tool MB991958 to check the actuator test. (Refer to P.13D-3).
 - Item 09: Engine TCL Drive.
 - When the accelerator pedal is depressed at the same time that the button for actuator test item 09 displayed on scan tool MB991958 is pressed, the system prevents the engine speed from rising for three seconds.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Are the check results for actuator test item 09 satisfactory?

YES : Go to Step 3.

NO : Replace the hydraulic unit (integrated with ABS/TCL-ECU). (Refer to GROUP 35B – Hydraulic Unit P.35B-105). Then go to Step 4.

STEP 3. Retest the system

Q: Does the TCL work normally?

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

NO : Replace the hydraulic unit (integrated with ABS/TCL-ECU). (Refer to GROUP 35B – Hydraulic Unit P.35B-105). Then go to Step 4.

STEP 4. Retest the system

Q: Does the TCL work normally?

YES : The procedure is complete.

NO : Return to Step 1.

DATA LIST REFERENCE TABLE

M1136003500071

The following items can be read by the scan tool from the ABS/TCL-ECU input data. (Refer to [P.13D-3](#)).

MUT-III SCAN TOOL DISPLAY	ITEM NO.	CHECK ITEM	CHECKING REQUIREMENTS	NORMAL VALUE
FR wheel speed sensor	01	Front right wheel speed sensor	Drive the vehicle	Vehicle speeds displayed on the speedometer and scan tool are identical.
FL wheel speed sensor	02	Front left wheel speed sensor		
RR wheel speed sensor	03	Rear right wheel speed sensor		
RL wheel speed sensor	04	Rear left wheel speed sensor		
Battery voltage	05	ABS/TCL-ECU power supply voltage	Ignition switch power supply voltage	Battery positive voltage
Stoplight switch*	06	Stoplight switch	Depress the brake pedal.	ON
			Release the brake pedal.	OFF
TCL mode	35	TCL operation	When the TCL outputs the operation permission signal during driving	ON
			When the TCL outputs the operation inhibition signal during driving	OFF

NOTE: Since the TCL is controlled with the same ABS/TCL-ECU used to control the ABS, the stoplight switch check item (No.6) used only for the ABS also appear.

ACTUATOR TEST REFERENCE TABLE

M1136003600067

The scan tool activates the following actuators for testing. (Refer to [P.13D-3](#)).

MUT-III SCAN TOOL DISPLAY	ITEM NO.	CHECK ITEM	PARTS TO BE ACTIVATED
FR wheel ABS Drive*	01	Solenoid valve for front right wheel	Solenoid valves and pump motors in the hydraulic unit (simple inspection mode)
FL wheel ABS Drive*	02	Solenoid valve for front left wheel	
RR wheel ABS Drive*	03	Solenoid valve for rear right wheel	
RL wheel ABS Drive*	04	Solenoid valve for rear left wheel	
Engine TCL Drive	09	TCL operation check	Outputs the engine torque control signal (engine torque = 0) to PCM for three seconds.

NOTE: Since the TCL is controlled with the same ABS/TCL-ECU used to control the ABS, the FR, FL, RR or RL Wheel ABS Drive testing items (No.01 to 04) used only for the ABS also appear.

CHECK AT ABS/TCL-ECU TERMINAL VOLTAGE
 M1136003800072
TERMINAL VOLTAGE CHECK CHART

Required Special Tools:

MB991970: ABS Check Harness

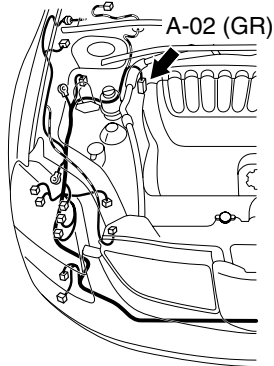
MB991223: Harness Set

1. Disconnect the ABS/TCL-ECU connector A-02 and connect special tool MB991970 between the ABS/TCL-ECU and the body-side harness connector. Then use special tool MB991970 to measure the voltages between terminal 2 and each terminal.

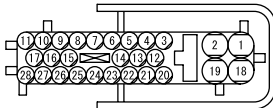
2. The terminal layouts are shown in the illustrations below.

NOTE: Do not measure terminal voltage for approximately three seconds after the ignition switch is turned "ON." The ABS/TCL-ECU performs the initial check during that period.

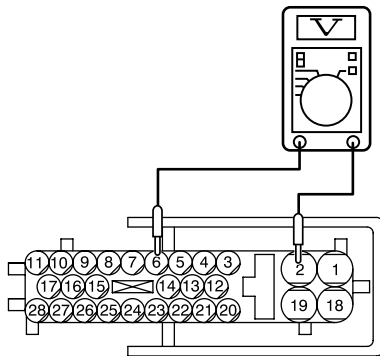
CONNECTOR: A-02



**A-02 HARNESS CONNECTOR:
 COMPONENT SIDE**



AC305209AB



**INSPECTION
 HARNESS
 CONNECTOR**

MB991970

ABS/TCL-ECU

**A-02 HARNESS
 CONNECTOR**

AC211156AC

CONNECTOR TERMINAL NO	SIGNAL	CHECKING REQUIREMENT		NORMAL CONDITION
6	TCL switch	Ignition switch: "ON"	When the TCL switch is not pressed.	Battery positive voltage
			When the TCL switch is pressed.	1 V or less
20	ABS/TCL-ECU power supply	Ignition switch: "ON"		Battery positive voltage
		Ignition switch: "START"		1 V or less

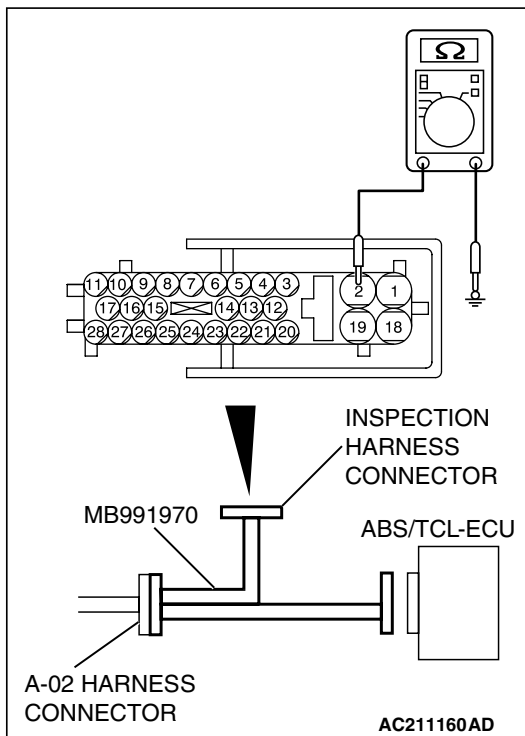
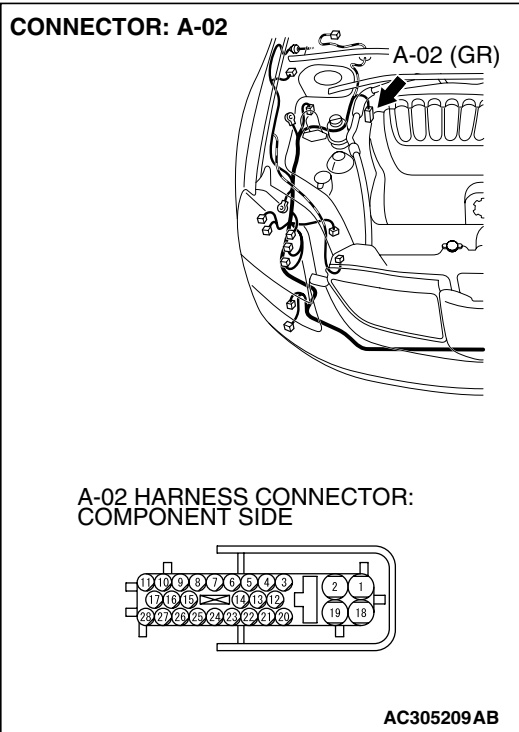
RESISTANCE AND CONTINUITY BETWEEN HARNESS-SIDE CONNECTOR TERMINALS

Required Special Tools:

MB991970: ABS Check Harness

MB991223: Harness Set

1. Disconnect the ABS/TCL-ECU connector A-02 and connect special tool MB991970 to the A-02 body-side harness connector. Then turn the ignition switch to the "LOCK" (OFF) position and checking resistance and continuity.
2. Check the resistance and continuity between the terminals indicated in the table below.
3. The terminal layout is shown in the illustration.



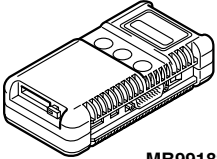
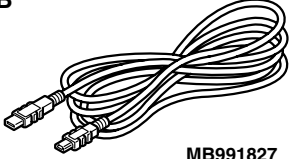
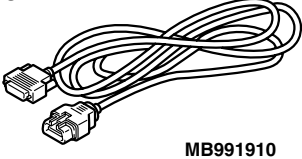
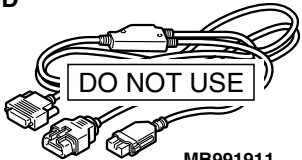
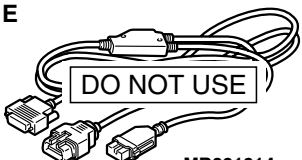
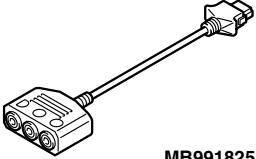
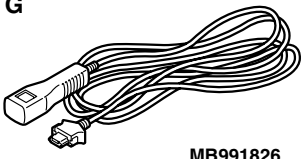
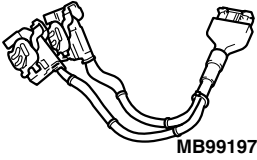
13D-44


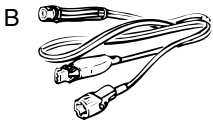
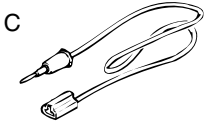

TRACTION CONTROL SYSTEM (TCL) TRACTION CONTROL SYSTEM (TCL) DIAGNOSIS

CONNECTOR TERMINAL NO.	SIGNAL	NORMAL CONDITION
2 – body ground	Ground	Less than 2 ohms
9 – 10	Front-right wheel speed sensor	1.24 – 1.64 k Ω
11 – 17	Rear-right wheel speed sensor	1.24 – 1.64 k Ω
16 – 26	Front-left wheel speed sensor	1.24 – 1.64 k Ω
18 – body ground	Ground	Less than 2 ohms
27 – 28	Rear-left wheel speed sensor	1.24 – 1.64 k Ω

SPECIAL TOOLS

M1136000600024

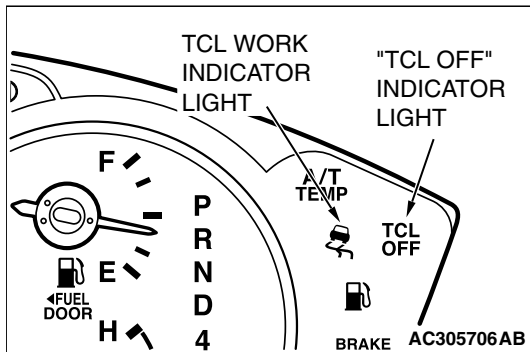
TOOL	TOOL NUMBER AND NAME	SUPERSESION	APPLICATION
<p>A</p>  <p>MB991824</p> <p>B</p>  <p>MB991827</p> <p>C</p>  <p>MB991910</p> <p>D</p>  <p>MB991911</p> <p>E</p>  <p>MB991914</p> <p>F</p>  <p>MB991825</p> <p>G</p>  <p>MB991826 MB991958</p>	<p>MB991958 A: MB991824 B: MB991827 C: MB991910 D: MB991911 E: MB991914 F: MB991825 G: MB991826</p> <p>MUT-III sub assembly 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 <i>NOTE: G: MB991826 MUT-III trigger harness is not necessary when pushing V.C.I. ENTER key.</i></p>	<p>Checking diagnostic trouble codes</p> <p>CAUTION 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>MB991970</p>	<p>MB991970 ABS check harness</p>		<p>ABS/TCL-ECU terminal voltage measurement</p>

TOOL	TOOL NUMBER AND NAME	SUPERSESION	APPLICATION
    <p>MB991223AD</p>	<p>MB991223</p> <p>A: MB991219</p> <p>B: MB991220</p> <p>C: MB991221</p> <p>D: MB991222</p> <p>Harness set</p> <p>A: Inspection harness</p> <p>B: LED harness</p> <p>C: LED harness adapter</p> <p>D: Probe</p>	<p>General service tools</p>	<p>Checking the continuity and measuring the voltage at the harness connector</p>

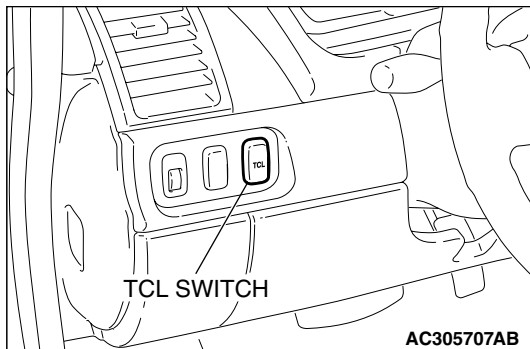
ON-VEHICLE SERVICE

TCL INDICATOR LIGHT CHECK

M1136000900058



1. Check that the "TCL OFF" indicator light and the TCL work indicator light illuminate for three seconds when the ignition switch is turned to the "ON" position.
2. Check that the "TCL OFF" indicator light illuminates and goes off in cycles each time the TCL switch is pushed after starting the engine.
3. Check that the "TCL OFF" indicator light and the TCL work indicator light do not illuminate, when driving at 30 km/h (37.5 mph) for more than 2 seconds.
4. If defective, repair it. (Refer to [P. 13D-26](#), TCL diagnosis – Symptom Procedures – Inspection Procedure 1, 2, 3 and 4).



TCL OPERATION CHECK

M1136001100055

Required Special Tools:

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

⚠ CAUTION

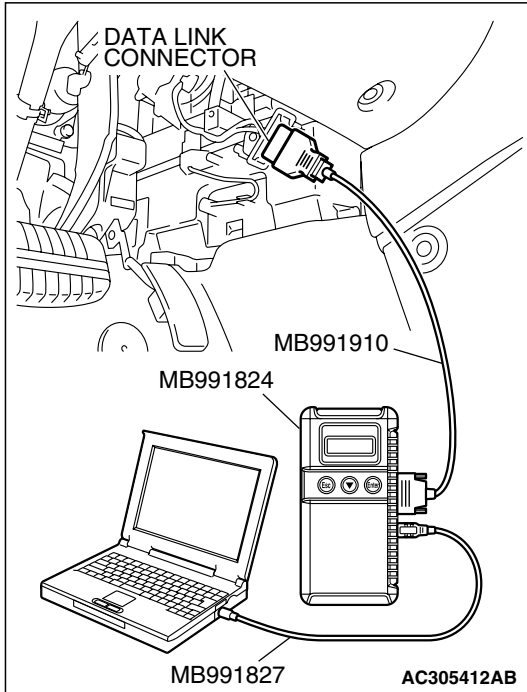
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

1. Connect scan tool MB991958 to the data link connector. (Refer to P.13D-3).
2. Turn the ignition switch to the "ON" position.

⚠ CAUTION

The engine speed increases after the actuator test because the actuator test continues for only three seconds. Therefore, release the accelerator pedal immediately.

3. Use scan tool MB991958 to check the actuator test. (Refer to P.13D-3).
 - Item 09: Engine TCL Drive.
 - When the accelerator pedal is depressed at the same time that the button for actuator test item 09 displayed on scan tool MB991958 is pressed, the system prevents the engine speed from rising for three seconds.
4. Turn the ignition switch to the "LOCK" (OFF) position.
5. Disconnect scan tool MB991958.
6. If defective, repair it. (Refer to P.13D-38, TCL diagnosis – Symptom Procedures – Inspection Procedure 6).

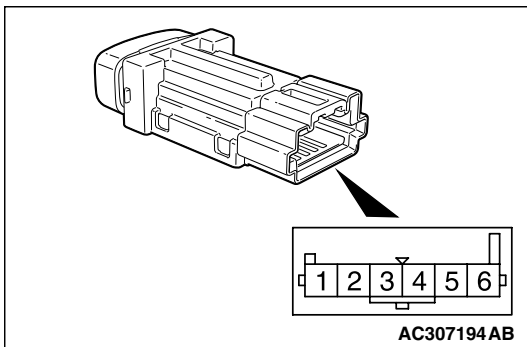


TCL SWITCH CHECK

M1136001700024

1. Remove the TCL switch. (Refer to P.13D-48).
2. Measure the resistance between terminal 1 and terminal 2 when the TCL switch is pressed or released. If the values measured at the time correspond to those in the table below, the resistance values are correct.

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



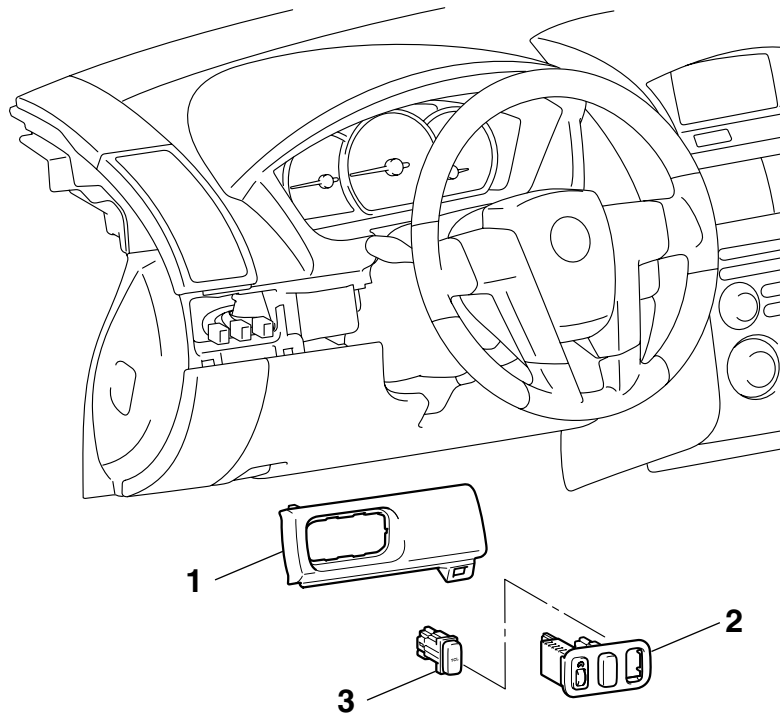
WHEEL SPEED SENSOR CHECK

M1136001300026

Refer to GROUP 35B, On-vehicle Service P.35B-100.

TCL SWITCH**REMOVAL AND INSTALLATION**

M1136001600027



AC307189AB

REMOVAL STEPS

- HOOD LOCK RELEASE HANDLE (REFER TO GROUP 42, HOOD [P.42-8.](#))
- INSTRUMENT LOWER PANEL (REFER TO GROUP 52A, INSTRUMENT PANEL ASSEMBLY [P.52A-3.](#))

REMOVAL STEPS (Continued)

- INSTRUMENT PANEL GARNISH (REFER TO GROUP 52A, INSTRUMENT PANEL ASSEMBLY [P.52A-3.](#))
1. SWITCH BEZEL ASSEMBLY
 2. SWITCH PANEL ASSEMBLY
 3. TCL SWITCH

WHEEL SPEED SENSOR**REMOVAL AND INSTALLATION**Refer to GROUP 35B, Wheel Speed Sensor [P.35B-107.](#)

M1136002500023

ABS/TCL-ECU**REMOVAL AND INSTALLATION**Replace the hydraulic unit (integrated with ABS/TCL-ECU). (Refer to GROUP 35B, Hydraulic Unit [P.35B-105.](#))

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