

GROUP 35C

TRACTION CONTROL SYSTEM (TCL)

CONTENTS

GENERAL DESCRIPTION	35C-2	SPECIAL TOOLS	35C-157
TRACTION CONTROL SYSTEM (TCL) DIAGNOSIS	35C-4	ON-VEHICLE SERVICE	35C-159
INTRODUCTION TO TRACTION CONTROL SYSTEM DIAGNOSIS	35C-4	WHEEL SPEED SENSOR OUTPUT VOLTAGE MEASUREMENT	35C-159
TCL DIAGNOSTIC TROUBLESHOOTING STRATEGY	35C-4	HYDRAULIC UNIT CHECK	35C-160
DIAGNOSTIC FUNCTION	35C-4	IN THE EVENT OF A DISCHARGED BATTERY	35C-163
DIAGNOSTIC TROUBLE CODE CHART ..	35C-9	HYDRAULIC UNIT	35C-164
DIAGNOSTIC TROUBLE CODE PROCEDURES	35C-10	REMOVAL AND INSTALLATION	35C-164
SYMPTOM CHART	35C-131	WHEEL SPEED SENSOR	35C-164
SYMPTOM PROCEDURES	35C-132	REMOVAL AND INSTALLATION	35C-164
DATA LIST REFERENCE TABLE	35C-153	TCL SWITCH	35C-164
ACTUATOR TEST REFERENCE TABLE ..	35C-153	REMOVAL AND INSTALLATION	35C-164
CHECK AT ABS/TCL-ECU	35C-155	INSPECTION	35C-164

GENERAL DESCRIPTION

M1354000100148

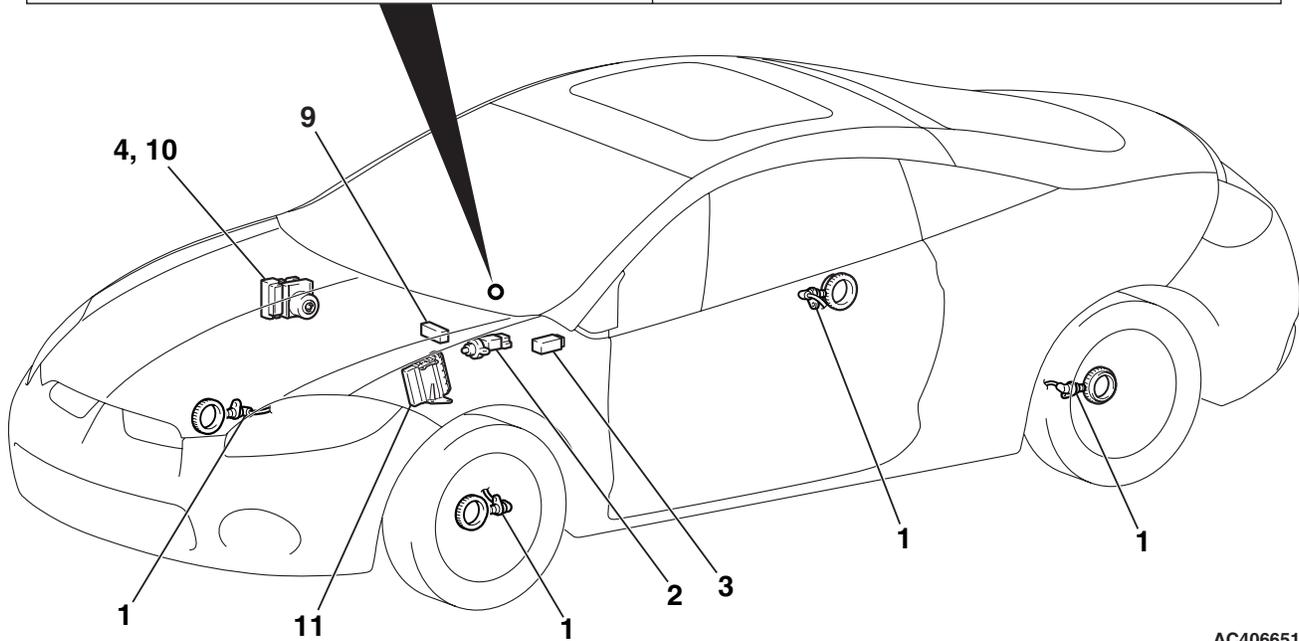
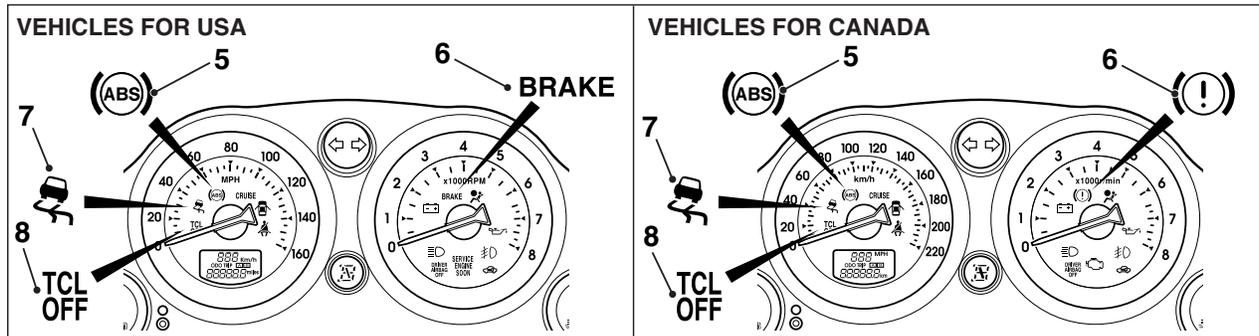
FEATURES

The traction control system (TCL) is adopted for vehicles with 3.8L engine.

- When a drive wheel is judged to be slipping by some reasons such as excessive accelerator pedal depression on a low friction road, the TCL applies brake force to the slipping drive wheel or lowers the engine output to suppress the drive wheel slippage.

- Fail-safe function ensures safety is maintained
- Diagnostic function provides improved serviceability
- To shorten the lines and enhance data transaxle reliability, communication with other ECU is performed over a CAN (Controller Area Network).

CONSTRUCTION DIAGRAM



AC406651AB

NAME OF PART		NUMBER	OUTLINE OF FUNCTION
Sensor	Wheel speed sensor	1	Sends alternating current signals at frequencies which are proportional to the rotation speeds of each wheel to the ABS/TCL-ECU.
	Stoplight switch	2	Sends a signal to the ABS/TCL-ECU to indicate whether the brake pedal is depressed or not.
	TCL OFF switch	3	Sends a signal to the ABS/TCL-ECU to indicate whether the TCL OFF switch is pushed or not.

NAME OF PART		NUMBER	OUTLINE OF FUNCTION
Actuator	Hydraulic unit	4	Drives the solenoid valves according to signals from the ABS/TCL-ECU in order to control the brake hydraulic pressure for each wheel.
	ABS warning light	5	Illuminates in response to signals from the ABS/TCL-ECU when a problem develops in the ABS/TCL system.
	Brake warning light	6	Illuminates in response to signals from the ABS/TCL-ECU when a problem develops in the EBD system.
	TCL indicator	7	Flashes when the TCL is activated. Illuminates when the ABS/TCL-ECU is defective.
	TCL OFF indicator	8	Illuminates when the TCL is OFF. Illuminates when the ABS/TCL-ECU is defective.
Data link connector		9	Outputs the diagnostic trouble codes and allows communication with the scan tool.
ABS/TCL-ECU		10	Controls actuators (described above) based on the signals coming from each sensor.
			Controls the self-diagnosis and fail-safe functions.
			Controls the diagnostic function (scan tool compatible).
Engine control module (ECM) <M/T>		11	Receives signals from ABS/TCL-ECU to control the engine output.
Powertrain control module (PCM) <A/T>			Controls the self-diagnosis and fail-safe functions.
			Controls the diagnostic function (scan tool compatible).

SYSTEM CHECK SOUND

When starting the engine, a thudding sound can sometimes be heard coming from the engine compartment. This is a normal sound during the ABS/TCL self-check.

ABS/TCL OPERATION SOUNDS AND SENSATIONS

During normal operation, the ABS/TCL makes several sounds that may seem unusual at first:

- A whining sound is caused by the ABS/TCL hydraulic unit motor.
- When pressure is applied to the brake pedal, the pulsation of the pedal causes a scraping sound.
- When the brakes are applied firmly, the ABS/TCL operates, rapidly applying and releasing the brakes many times per second. This repeated application and release of braking forces can cause the suspension to make a thumping sound and the tires to squeak.

TRACTION CONTROL SYSTEM (TCL) DIAGNOSIS

INTRODUCTION TO TRACTION CONTROL SYSTEM DIAGNOSIS

M1354004400011

The TCL is a system that has added the cut valve and suction valve to the conventional ABS system. These valves are used to control each of the road wheels independently. These differences include sounds, sensations, and vehicle performance that owners and service technicians who are not familiar with TCL may not be used to.

Some operational characteristics may seem to be malfunctions, but they are simply signs of normal TCL operation. When diagnosing the TCL system, keep these operational characteristics in mind. Inform the owner of the kind of performance characteristics to expect from a TCL-equipped vehicle.

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 a TCL DTC will be displayed again after the DTC has been erased, you should duplicate 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.

TCL DIAGNOSTIC TROUBLESHOOTING STRATEGY

M1354000400127

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

1. Gather information about the problem from the customer.
2. Verify that the condition described by the customer exists.
3. Check the vehicle for any TCL DTC.
4. If you cannot verify the condition and there are no TCL DTCs, the malfunction is 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 are no TCL DTCs, or the system cannot communicate with the scan tool, check that the basic brake system is operating properly.

- If the basic brake system is not operating properly, refer to the GROUP 35A, Basic Brake System Diagnosis [P.35A-4](#).
 - If the basic brake system is operating properly, refer to [P.35B-116](#).
6. If there is a TCL DTC, record the number of the DTC, then erase the DTC from the memory using the scan tool.

NOTE: Any DTCs stored in the ABS/TCL-ECU cannot be erased if there is a malfunction.

7. Duplicate the TCL DTC set conditions to see if the same TCL DTC will set again.
 - If the same TCL DTC sets again or the TCL DTC cannot be erased, perform the diagnostic procedures for the DTC. Refer to [P.35B-10](#).
 - If you cannot get the same TCL DTC to set again, the malfunction is intermittent. Refer to GROUP 00, How to use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunctions [P.00-14](#).

DIAGNOSTIC FUNCTION

ON-BOARD DIAGNOSTICS

If the ABS/TCL-ECU detects any problem in the CAN communication line or the ECUs, which the ABS/TCL-ECU is communicating with, it stores a diagnostic trouble code. The DTCs have 32 items. The DTCs can be confirmed by connecting scan tool

M1354004500018

MB991958 (MUT-III sub assembly). The stored DTCs are not erased even after the ignition switch has been turned to the "LOCK" (OFF) position, or the battery has been disconnected. The DTCs can be erased by operating scan tool MB991958 (MUT-III sub assembly).

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

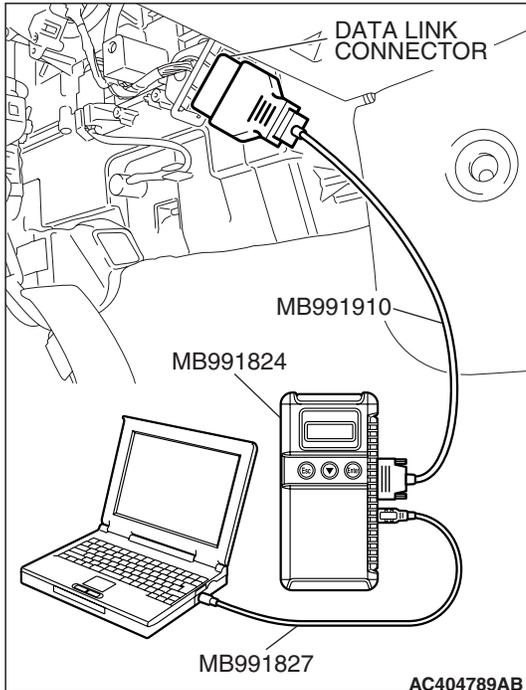
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

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.

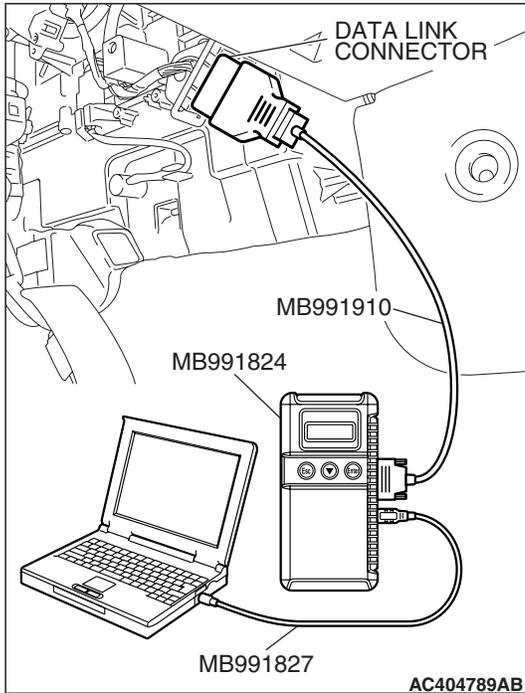
NOTE: Disconnecting scan tool MB991958 is the reverse of the connecting sequence, making sure that the ignition switch is at the "LOCK" (OFF) position.



HOW TO 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 "ABS/TCL" from the "CHASSIS" tab.
6. Select "Diagnostic Trouble Code."
7. If a DTC is set, it is shown.
8. Choose "Erase DTCs" to erase the DTC.

HOW TO READ DATA LIST

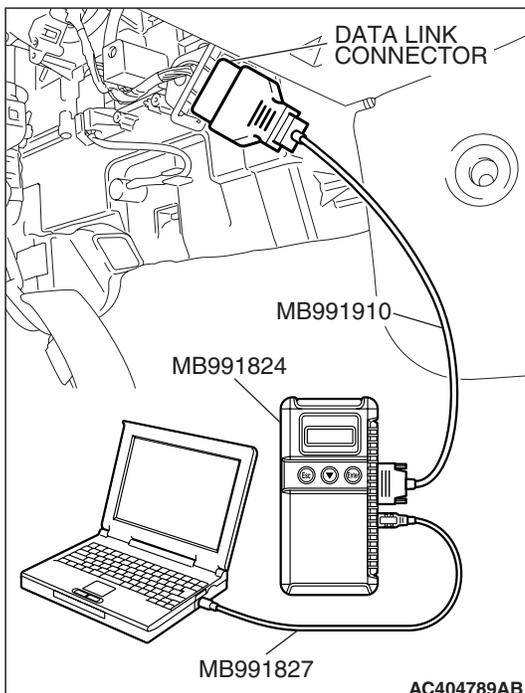
Required Special Tools:

- 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 "ABS/TCL" from the "CHASSIS" tab.
6. Select "Data List."
7. Choose an appropriate item and select the "OK" button.



HOW TO PERFORM ACTUATOR TEST

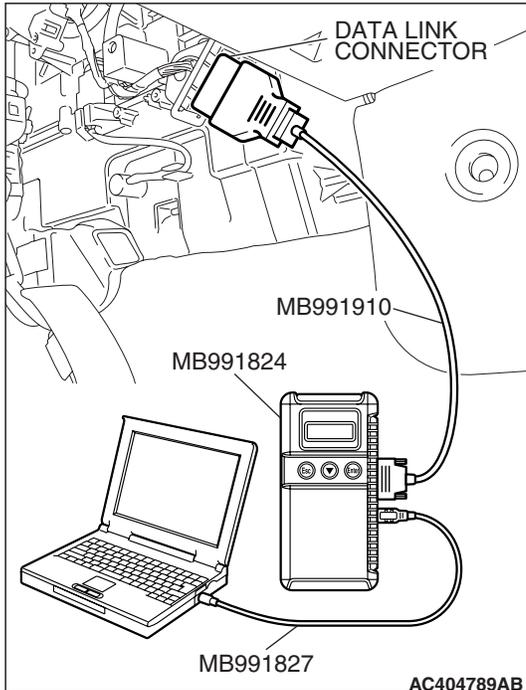
Required Special Tools:

- 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.

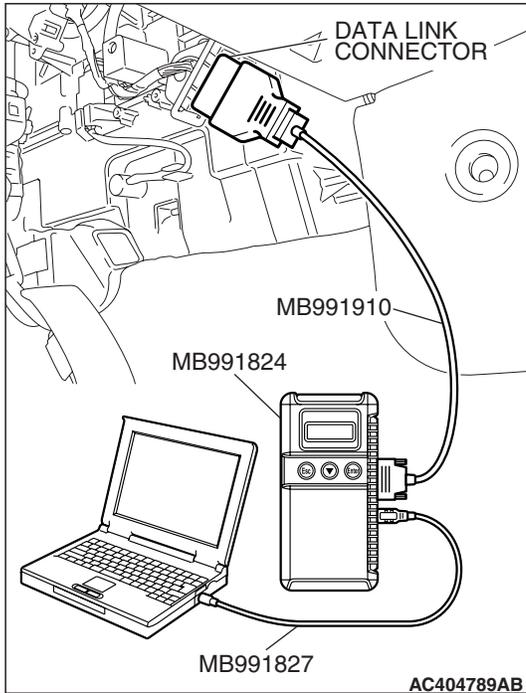
1. Connect scan tool MB991958 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select "Interactive Diagnosis" from the start-up screen.
4. Select "System Select."
5. Choose "ABS/TCL" from the "CHASSIS" tab.
6. Choose "Actuator Test" from "ABS/TCL" screen.
7. Choose an appropriate item and select the "OK" button.



HOW TO DIAGNOSE THE CAN BUS LINES

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 "CAN bus diagnosis" from the start-up screen.
4. When the vehicle information is displayed, confirm that it matches the vehicle being 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 being 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.

DIAGNOSTIC TROUBLE CODE CHART

M1354000600110

⚠ CAUTION

During diagnosis, a DTC code associated with another system may be set when the ignition switch is turned on with connector(s) disconnected. On completion, confirm all systems for DTCs. If DTC code(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	P.35C-10
C1201	Front right wheel speed sensor	Abnormal output signal	P.35C-20
C1205	Front left wheel speed sensor	Open circuit or short circuit	P.35C-30
C1206	Front left wheel speed sensor	Abnormal output signal	P.35C-39
C1210	Rear right wheel speed sensor	Open circuit or short circuit	P.35C-49
C1211	Rear right wheel speed sensor	Abnormal output signal	P.35C-59
C1215	Rear left wheel speed sensor	Open circuit or short circuit	P.35C-69
C1216	Rear left wheel speed sensor	Abnormal output signal	P.35C-79
C1226	ABS front right solenoid valve (pressure holding system)		P.35C-89
C1231	ABS front right solenoid valve (depressurizing system)		P.35C-89
C1236	ABS front left solenoid valve (pressure holding system)		P.35C-89
C1241	ABS front left solenoid valve (depressurizing system)		P.35C-89
C1246	ABS rear right solenoid valve (pressure holding system)		P.35C-89
C1251	ABS rear right solenoid valve (depressurizing system)		P.35C-89
C1256	ABS rear left solenoid valve (pressure holding system)		P.35C-89
C1261	ABS rear left solenoid valve (depressurizing system)		P.35C-89
C1271	Motor circuit failure		P.35C-97
C1276	Power supply circuit failure of valves		P.35C-105
C1300	Front right cut valve		P.35C-89
C1305	Front right suction valve		P.35C-89
C1310	Front left cut valve		P.35C-89
C1315	Front left suction valve		P.35C-89
C1607	ECU failure	Valve relay cannot activate	P.35C-107
		Valve relay can activate	
C1640	Variant Code un-writing/data abnormal		P.35C-109
C1860	Power supply high voltage		P.35C-111
C1861	Power supply low voltage		P.35C-111
U1073	Bus off		P.35C-118

DTC	INSPECTION ITEM	DIAGNOSTIC CONTENT	REFERENCE PAGE
U1100* ¹	ECM <M/T> or PCM <A/T> time-out (related to engine)		P.35C-120
U1101* ²	PCM time-out (related to transaxle)		P.35C-124
U1120* ¹	CAN communications system TCL uncontrollable by engine malfunction		P.35C-128

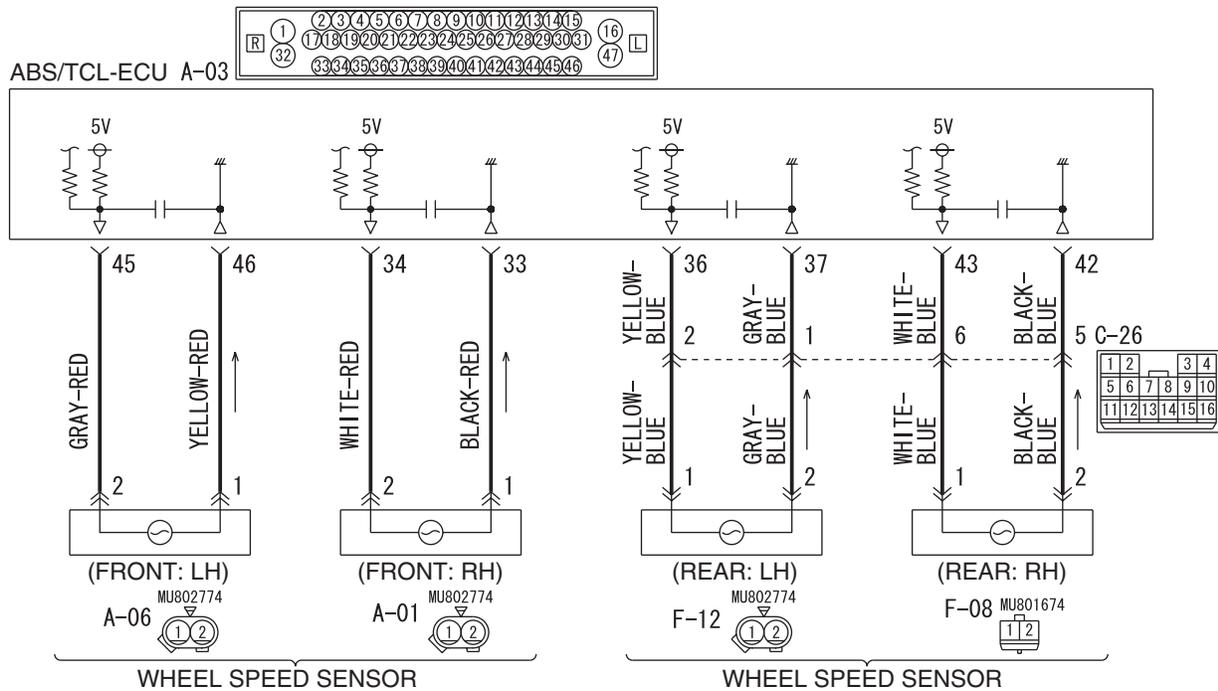
NOTE:

- Since the TCL system is controlled with the same ABS/TCL-ECU used to control the ABS system, the codes (with a *¹) used only for the TCL system also appear.
- *²: A/T model only

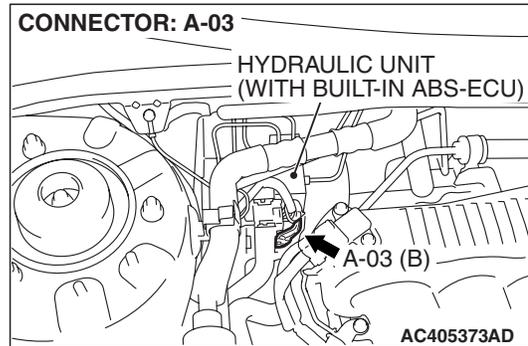
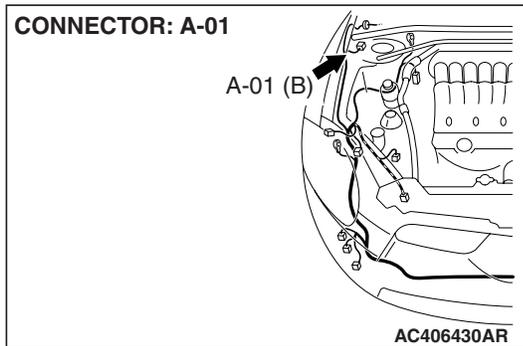
DIAGNOSTIC TROUBLE CODE PROCEDURES

DTC C1200: Front Right Wheel Speed Sensor (Open Circuit or Short Circuit)

Wheel Speed Sensor Circuit



W6P35M001A



CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54C, Trouble code diagnosis P.54C-12).

CIRCUIT OPERATION

- A toothed wheel speed rotor generates a voltage pulse as it moves across the pickup field of each wheel speed sensor.
- The amount of voltage generated at each wheel is determined by the clearance between the wheel speed rotor teeth and the wheel speed sensor, and by the speed of rotation.
- Sends alternating current signals at frequencies which are proportional to the rotation speeds of each wheel to the ABS electronic control unit (ABS/TCL-ECU).
- The ABS hydraulic unit modulates the amount of braking force individually applied to each wheel cylinder.

ABS/TCL DTC SET CONDITIONS

The ABS/TCL-ECU monitors voltage fluctuation in each wheel speed sensor circuit. If the ECU detects a short or open circuit in the circuit, it will set a diagnostic trouble code.

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

Current trouble

- Malfunction of the wheel speed sensor
- Damaged wiring harness or connector
- Malfunction of the hydraulic unit (integrated with ABS/TCL-ECU)

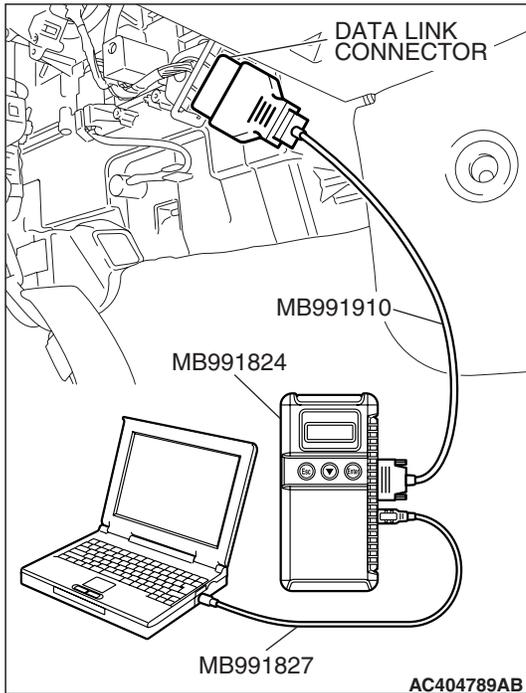
Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness in wheel speed sensor circuit. For diagnosis procedures, refer to "How to treat past trouble" (Refer to GROUP 00, How to treat past trouble P.00-16).

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
- MB991997: ASC Check Harness



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

⚠ CAUTION

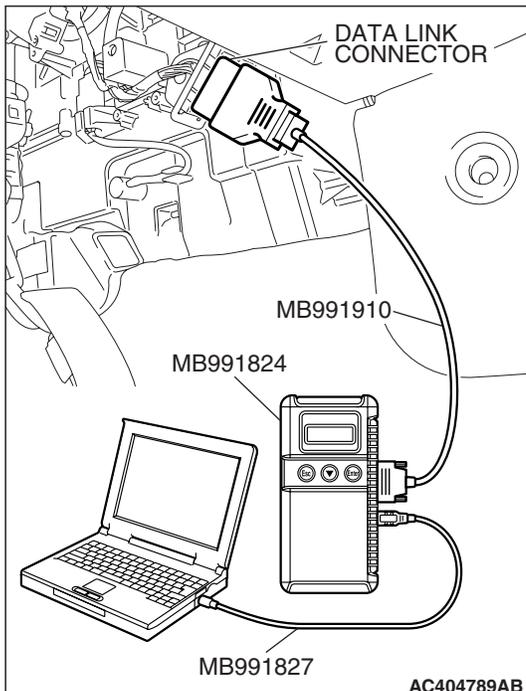
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

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

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

YES : Go to Step 3

NO : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis P.54C-14). Then go to Step 2.



STEP 2. Recheck for 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) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1200 set?

YES : Go to Step 3

NO : The procedure is complete.

STEP 3. Using scan tool MB991958, check data list.

⚠ 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) Start the engine.
- (3) Set scan tool MB991958 to the data reading mode, and check the data list items by driving the vehicle (Refer to [P.35C-153](#)).
 - Item 01: Front right wheel speed sensor
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

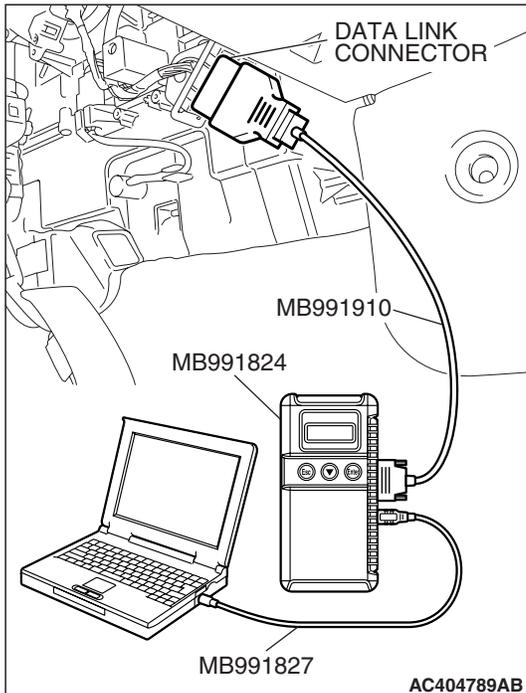
Q: Does the speedometer indication match the scan tool indication?

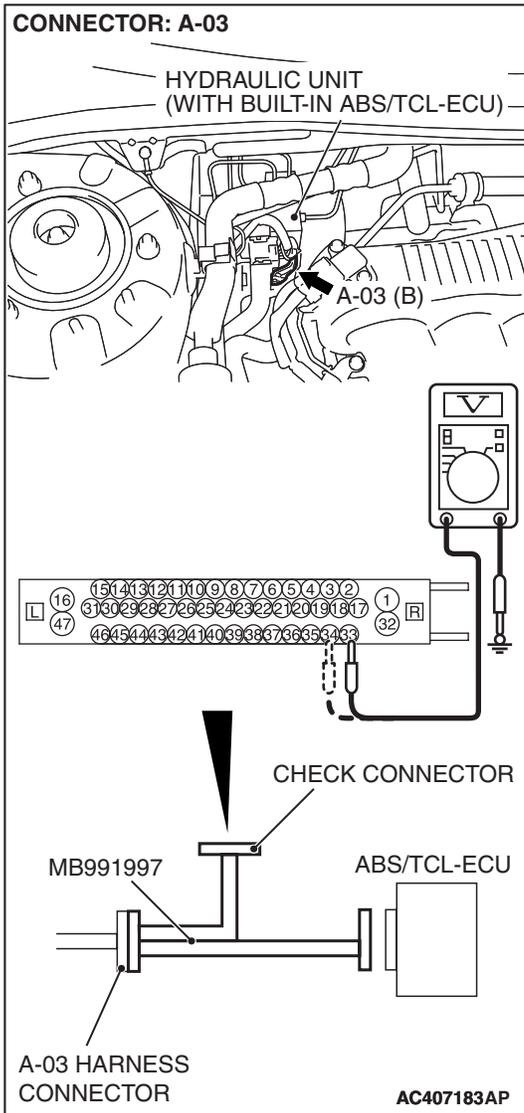
YES : It can be assumed that this malfunction is intermittent.

Refer to GROUP 00, How to Use

Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction [P.00-14](#).

NO : Go to Step 4.





STEP 4. Measure the voltage at ABS/TCL-ECU connector A-03.

(1) Disconnect the connector A-03, and connect special tool MB991997 to the wiring harness-side connector.

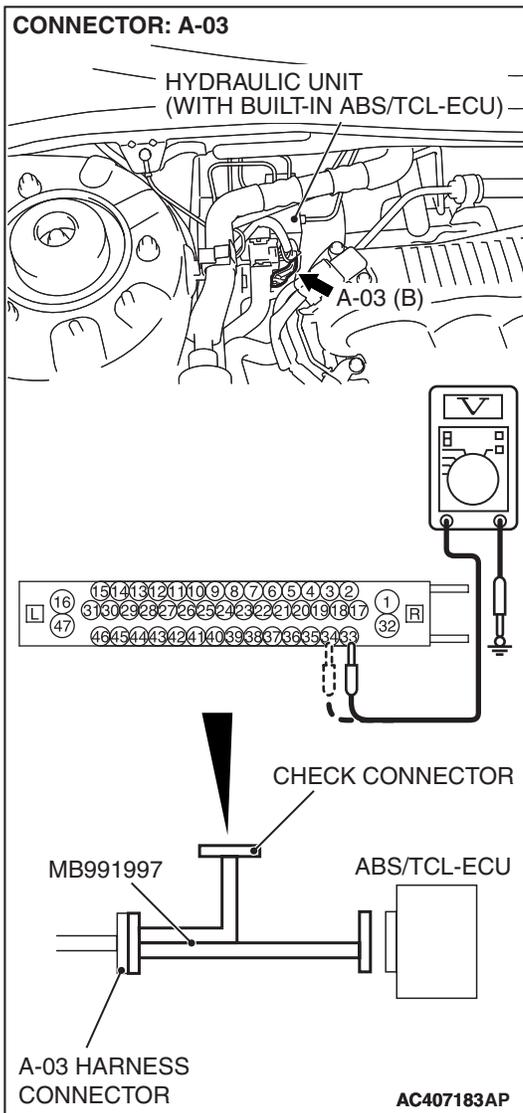
NOTE: Do not connect special tool MB991997 to the ABS/TCL-ECU.

- (2) Turn the ignition switch to the "ON" position.
- (3) Measure the voltage between terminal 33 and body ground, and between terminal 34 and body ground. It should be 1V or less.

Q: Does the voltage measure 1 V or less?

YES : Go to Step 5.

NO : Go to Step 7.



STEP 5. Measure the resistance at ABS/TCL-ECU connector A-03.

- (1) Disconnect the connector A-03, and connect special tool MB991997 to the wiring harness-side connector.

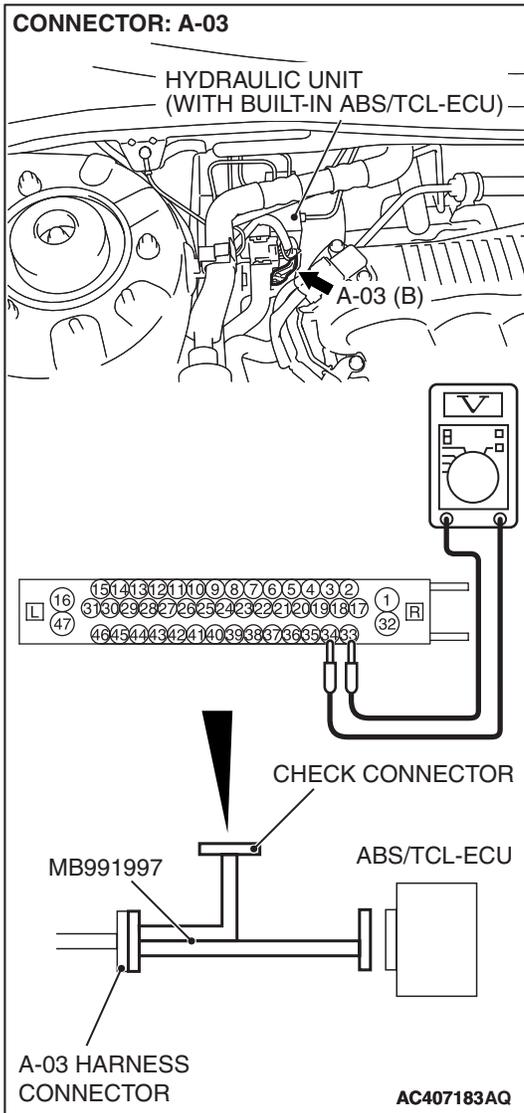
NOTE: Do not connect special tool MB991997 to the ABS/TCL-ECU.

- (2) Measure the resistance between terminal 33 and body ground, and between terminal 34 and body ground. There should be no continuity.

Q: Does continuity exist?

YES : Go to Step 7.

NO : Go to Step 6.



STEP 6. Measure the resistance at the ABS/TCL-ECU connector A-03.

- (1) Disconnect the connector A-03, and connect special tool MB991997 to the wiring harness-side connector.

NOTE: Do not connect special tool MB991997 to the ABS/TCL-ECU.

- (2) Measure the resistance between the ABS/TCL-ECU connector terminals 33 and 34.

Standard Value: 1.24 –1.64 kΩ

Q: Is the resistance between terminals 33 and 34 within the standard value?

YES : Go to Step 10.

NO : Go to Step 7.

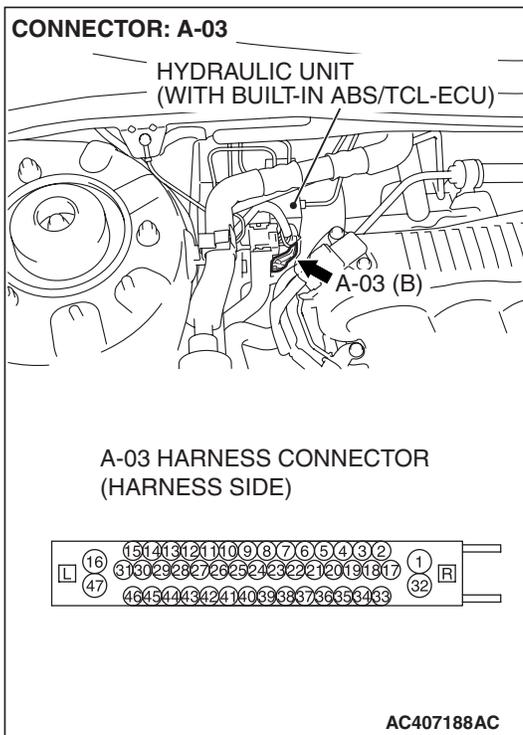
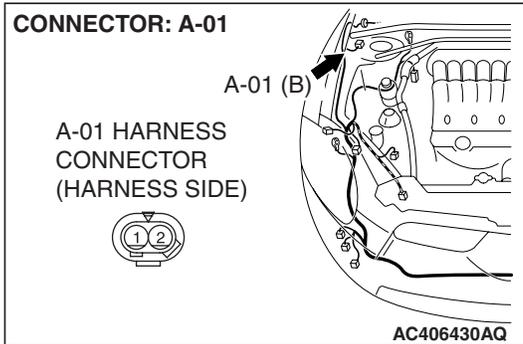
STEP 7. Check ABS/TCL-ECU connector A-03 and wheel speed sensor <front: RH> connector A-01 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

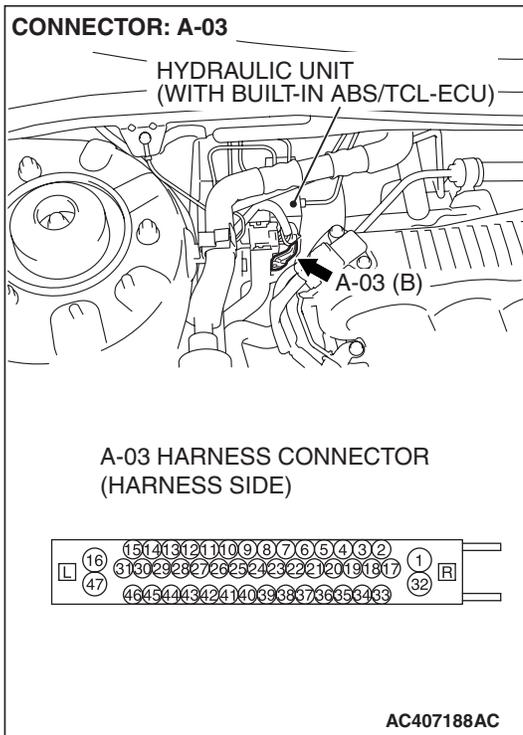
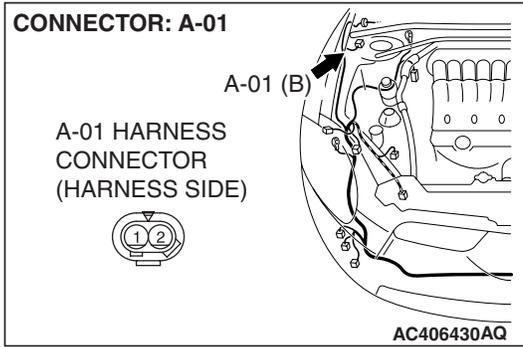
Q: Are ABS/TCL-ECU connector A-03 and wheel speed sensor <front: RH> connector A-01 damaged?

YES : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection

P.00E-2. Then go to Step 11.

NO : Go to Step 8.





STEP 8. Check the harness wires between ABS/TCL-ECU connector A-03 (terminal 33, 34) and wheel speed sensor connector A-01 (terminal 1, 2).

Q: Is the harness wire between ABS/TCL-ECU connector A-03 (terminal 33, 34) and wheel speed sensor connector A-01 (terminal 1, 2) damaged?

YES : Repair the wiring harness. Then go to Step 11.
NO : Go to Step 9.

STEP 9. Inspect the wheel speed sensor.

Check the front right wheel speed sensor relevant to the DTC code. For the applicable inspection procedure, refer to [P.35B-146](#).

Q: Is the wheel speed sensor damaged?

YES : Replace the wheel speed sensor. Then go to Step 11.
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 10. Recheck for 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.

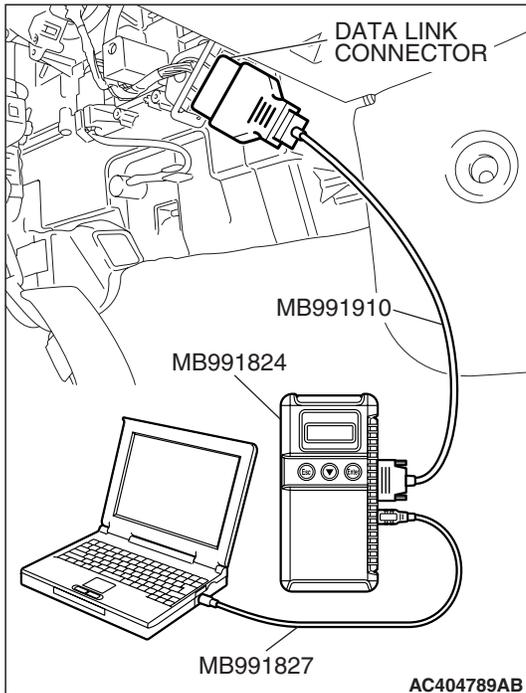
Check again if the DTC is set.

- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is reset.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1200 set?

YES : Replace the hydraulic unit (integrated with ABS/TCL-ECU). Then go to Step 11.

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 11. Recheck for diagnostic trouble code.

⚠ CAUTION

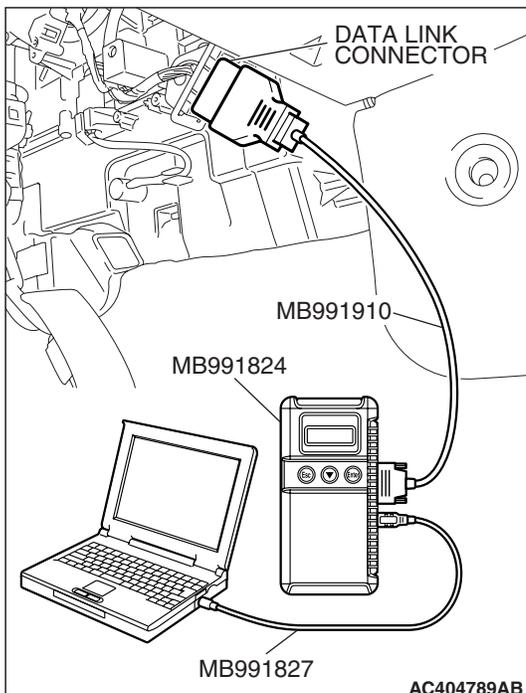
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1200 set?

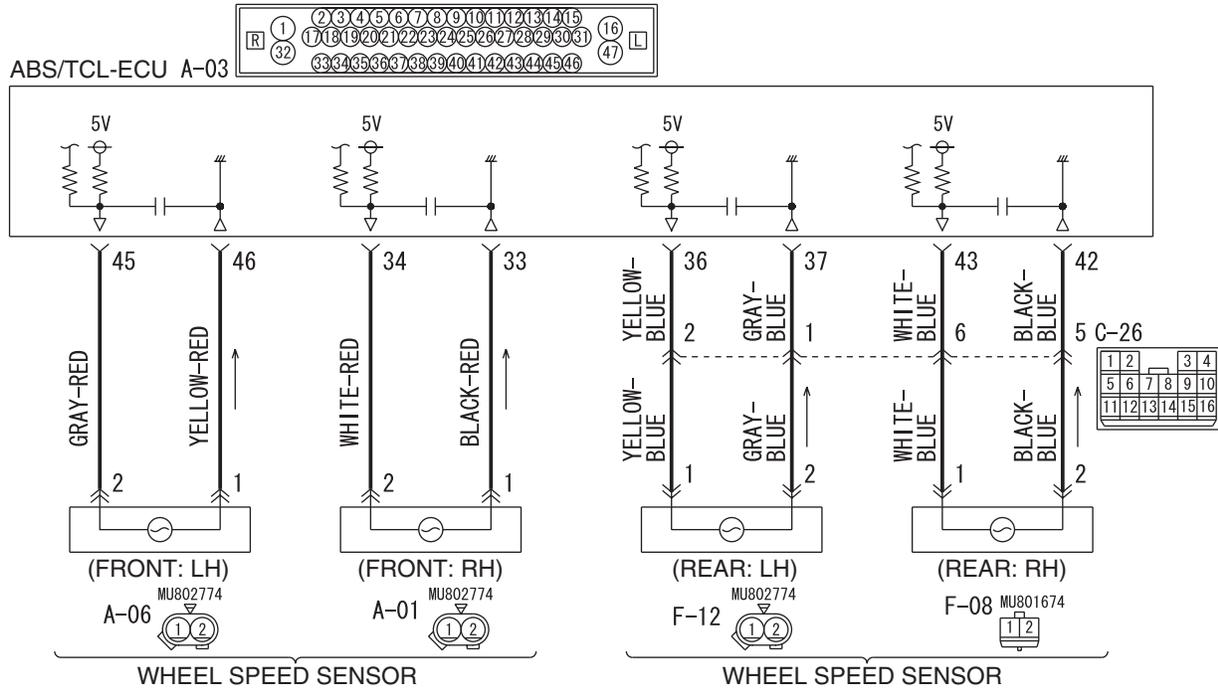
YES : Repeat the troubleshooting from Step 1.

NO : The procedure is complete.

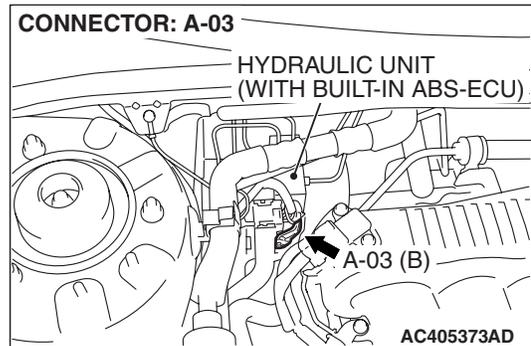
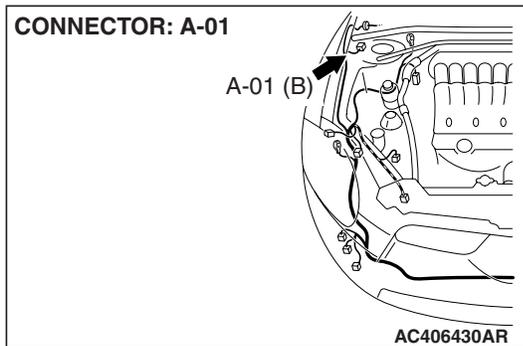


DTC C1201: Front Right Wheel Speed Sensor (Abnormal Output Signal)

Wheel Speed Sensor Circuit



W6P35M001A



CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54C, Trouble code diagnosis P.54C-12).

CIRCUIT OPERATION

- A toothed wheel speed rotor generates a voltage pulse as it moves across the pickup field of each wheel speed sensor.
- The amount of voltage generated at each wheel is determined by the clearance between the wheel speed rotor teeth and the wheel speed sensor, and by the speed of rotation.
- Sends alternating current signals at frequencies which are proportional to the rotation speeds of each wheel to the ABS/TCL electronic control unit (ABS/TCL-ECU).
- The ABS hydraulic unit modulates the amount of braking force to front wheel cylinders individually to activate the TCL system.

ABS/TCL DTC SET CONDITIONS

The ABS/TCL-ECU monitors the signals from each wheel speed sensor while the vehicle is being driven. If any fault below is found in these sensor signals, the ECU will set the relevant diagnostic trouble code.

- Missing sensor signal
- Sensor signal, which will not be created under normal operation

- Significant difference among the wheel speed sensor signals

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

Current trouble

- Malfunction of the wheel speed sensor or wheel speed rotor
- Damaged wiring harness or connector
- Malfunction of the hydraulic unit (integrated with ABS/TCL-ECU)

Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness in wheel speed sensor circuit. For diagnosis procedures, refer to "How to treat past trouble" (Refer to GROUP 00, How to treat past trouble [P.00-16](#)).

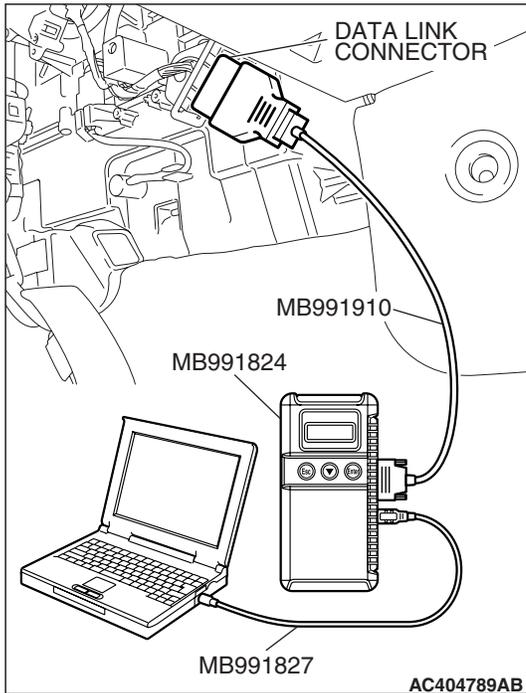
PAST TROUBLE

For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to Use Troubleshooting [P.00-16](#)).

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
- MB991997: ASC Check Harness



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

⚠ CAUTION

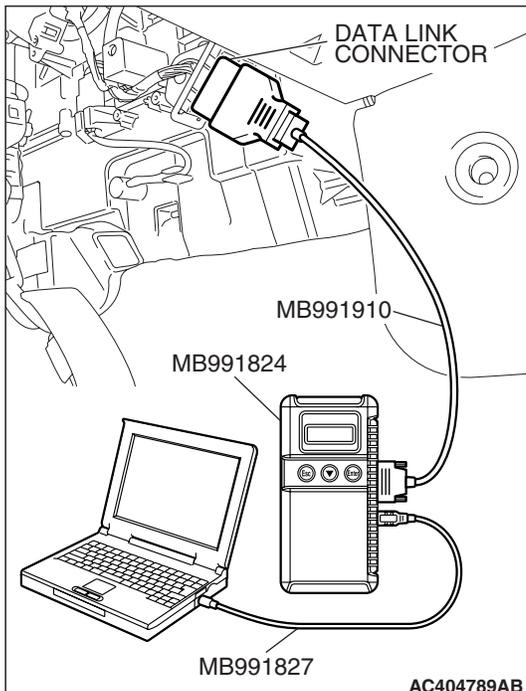
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

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

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

YES : Go to Step 3

NO : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis P.54C-14). Then go to Step 2.



STEP 2. Recheck for diagnostic trouble code.

⚠ CAUTION

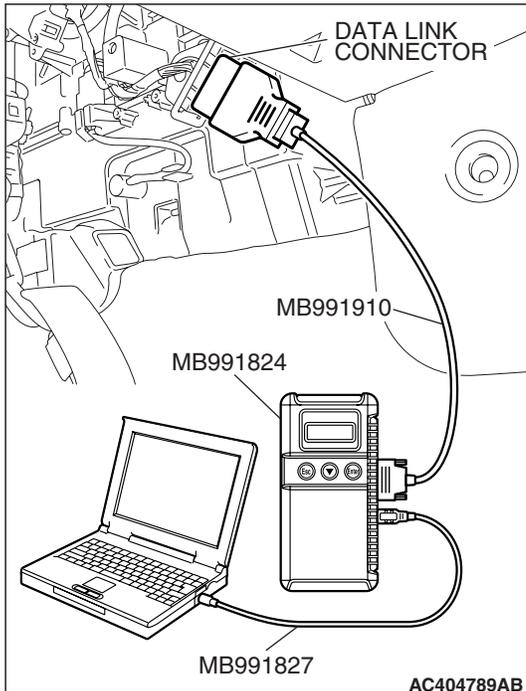
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1201 set?

YES : Go to Step 3

NO : The procedure is complete.



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.

Use scan tool MB991958 to check whether DTC code C1200 have been set simultaneously.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Check whether DTC C1200 have been set.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1200 set?

YES : Carry out diagnosis relevant to DTC C1200 (Refer to [P.35C-10](#)).

NO : Go to Step 4.

STEP 4. Check the installation condition of the wheel speed sensors.

For the wheel speed sensor, which the DTC code indicates, check whether the sensor or its mounting bolts are loosened.

- DTC C1201 is set: Front right wheel speed sensor

Q: Is the wheel speed sensor installed correctly?

YES : Go to Step 5.

NO : Reinstall the wheel speed sensor correctly. Then go to Step 13.

STEP 5. Check the wheel speed sensor after it is removed from the vehicle.

Check the wheel speed sensor which the DTC code indicates (Refer to [P.35B-146](#)).

- DTC C1201 is set: Front right wheel speed sensor

Q: Is the wheel speed sensor in good condition?

YES : Go to Step 6.

NO : Replace the wheel speed sensor (Refer to [P.35C-164](#)). Then go to Step 13.

STEP 6. Check the wheel bearing for looseness.

NOTE: If the wheel bearing is loose, the gap between the wheel speed sensor and rotor may become excessive. Check the wheel bearing, which DTC code indicates, for looseness.

- DTC C1201 is set: Check the front right wheel bearing (Refer to GROUP 26, On-vehicle service –Wheel bearing end play check [P.26-8](#)).

Q: Is the wheel bearing end play within the standard value?

YES : Go to Step 7.

NO : Replace the front hub assembly (Refer to GROUP 26, Front axle hub assembly [P.26-9](#)).

STEP 7. Check the wheel speed rotor.

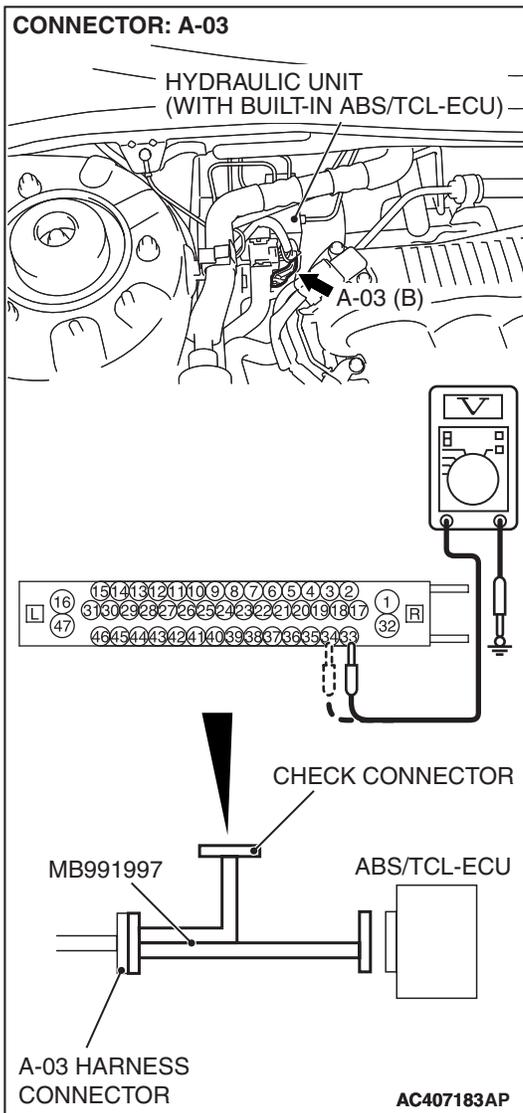
Check the wheel speed rotor, which DTC code indicates, for foreign material or deformation.

- DTC C1201 is set: Front right wheel speed sensor

Q: Is the wheel speed rotor in good condition?

YES : Go to Step 8.

NO : If the wheel speed rotor is contaminated with foreign material, clean it. If the driveshaft is deformed, replace it (Refer to GROUP 26, Drive shaft assembly [P.26-14](#)).



STEP 8. Measure the voltage at ABS/TCL-ECU connector A-03.

(1) Disconnect the connector A-03, and connect special tool MB991997 to the wiring harness-side connector.

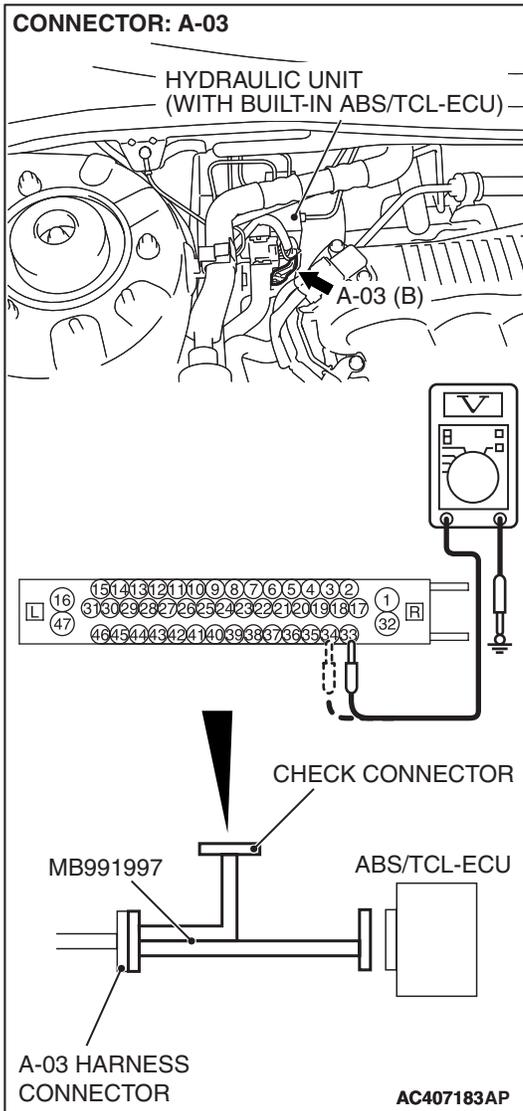
NOTE: Do not connect special tool MB991997 to the ABS/ASC-ECU.

- (2) Turn the ignition switch to the "ON" position.
- (3) Measure the voltage between terminal 33 and body ground, and between terminal 34 and body ground. It should be 1V or less.

Q: Does the voltage measure 1 V or less?

YES : Go to Step 9.

NO : Go to Step 11.



STEP 9. Measure the resistance at ABS/TCL-ECU connector A-03.

- (1) Disconnect the connector A-03, and connect special tool MB991997 to the wiring harness-side connector.

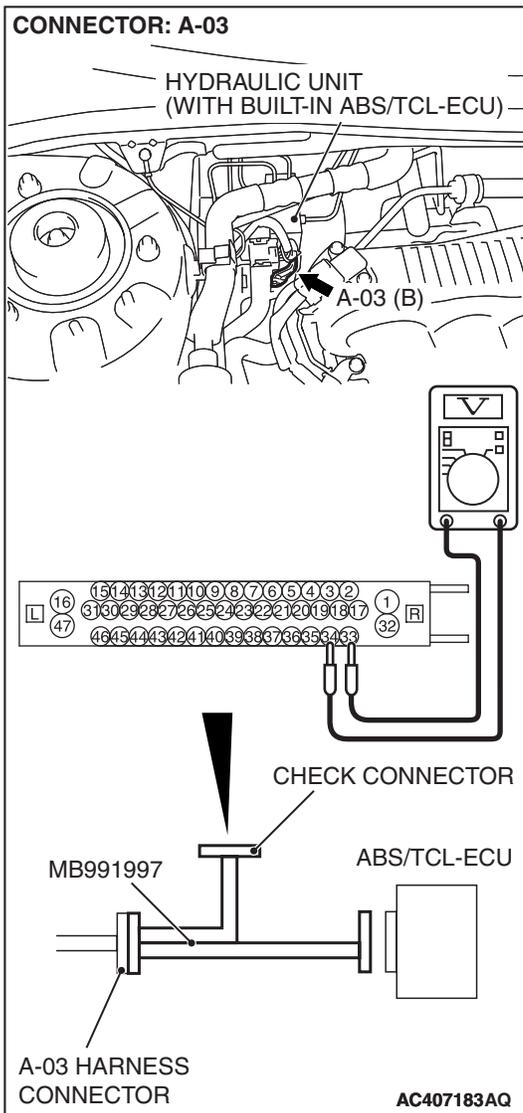
NOTE: Do not connect special tool MB991997 to the ABS/TCL-ECU.

- (2) Measure the resistance between terminal 33 and body ground, and between terminal 34 and body ground. There should be no continuity.

Q: Does continuity exist?

YES : Go to Step 11.

NO : Go to Step 10.



STEP 10. Measure the resistance at ABS/TCL-ECU connector A-03.

- (1) Disconnect the connector A-03, and connect special tool MB991997 to the wiring harness-side connector.

NOTE: Do not connect special tool MB991997 to the ABS/TCL-ECU.

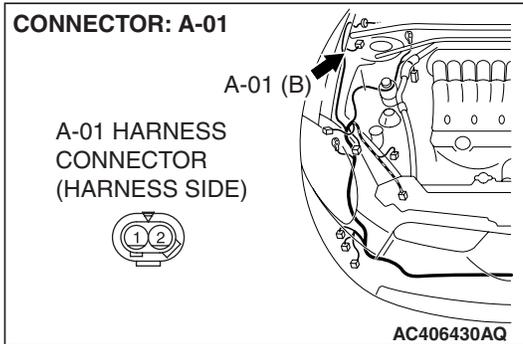
- (2) Measure the resistance between terminal 33 and terminal 34.

Standard Value: 1.24 – 1.64 kΩ

Q: Is the resistance between terminals 33 and 34 within the standard value?

YES : Go to Step 12.

NO : Go to Step 11.

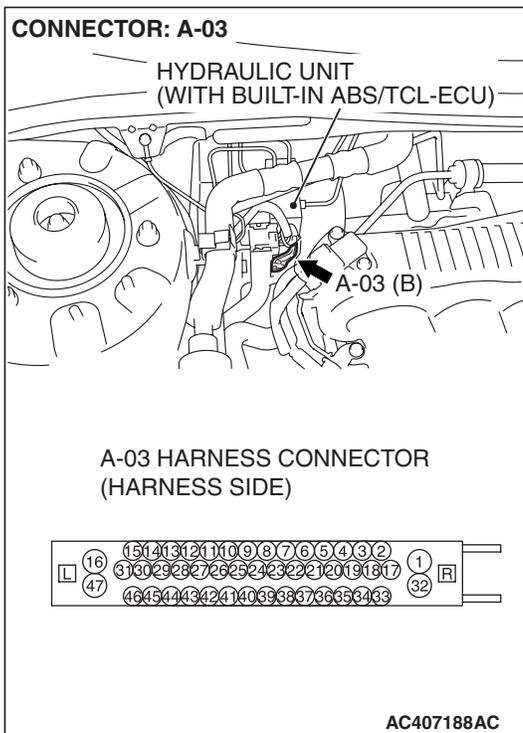


STEP 11. Check ABS/TCL-ECU connector A-03 and wheel speed sensor <front: RH> connector A-01 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are ABS/TCL-ECU connector A-03 and wheel speed sensor <front: RH> connector A-01 damaged?

YES : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 13.

NO : Open or short circuit may be present in the front right wheel speed sensor circuit. Repair the wiring harness between ABS/TCL-ECU connector A-03 (terminals 33 and 34) and front right wheel speed sensor A-01 (terminals 1 and 2). Then go to Step 13.



STEP 12. Recheck for 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.

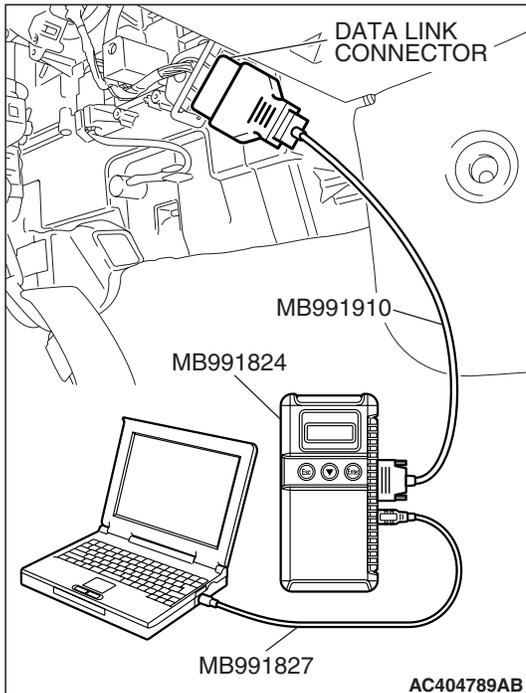
Check again if the DTC is set.

- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1201 set?

YES : Replace the hydraulic unit (integrated with ABS/TCL-ECU). Then go to Step 13.

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 13. Recheck for 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.

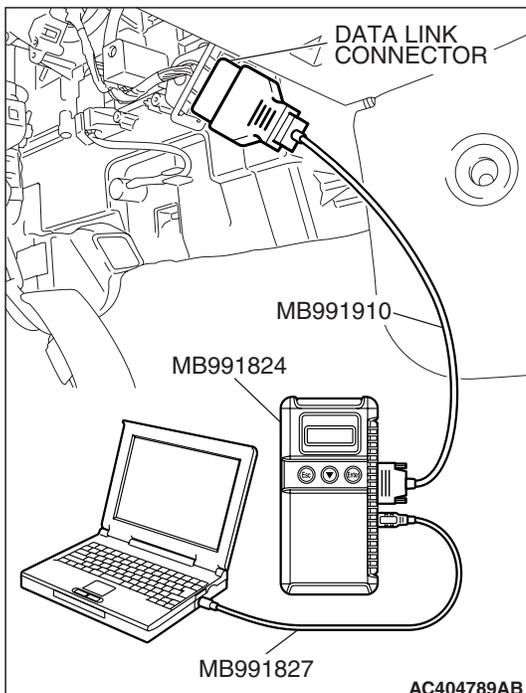
Check again if the DTC is set.

- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1201 set?

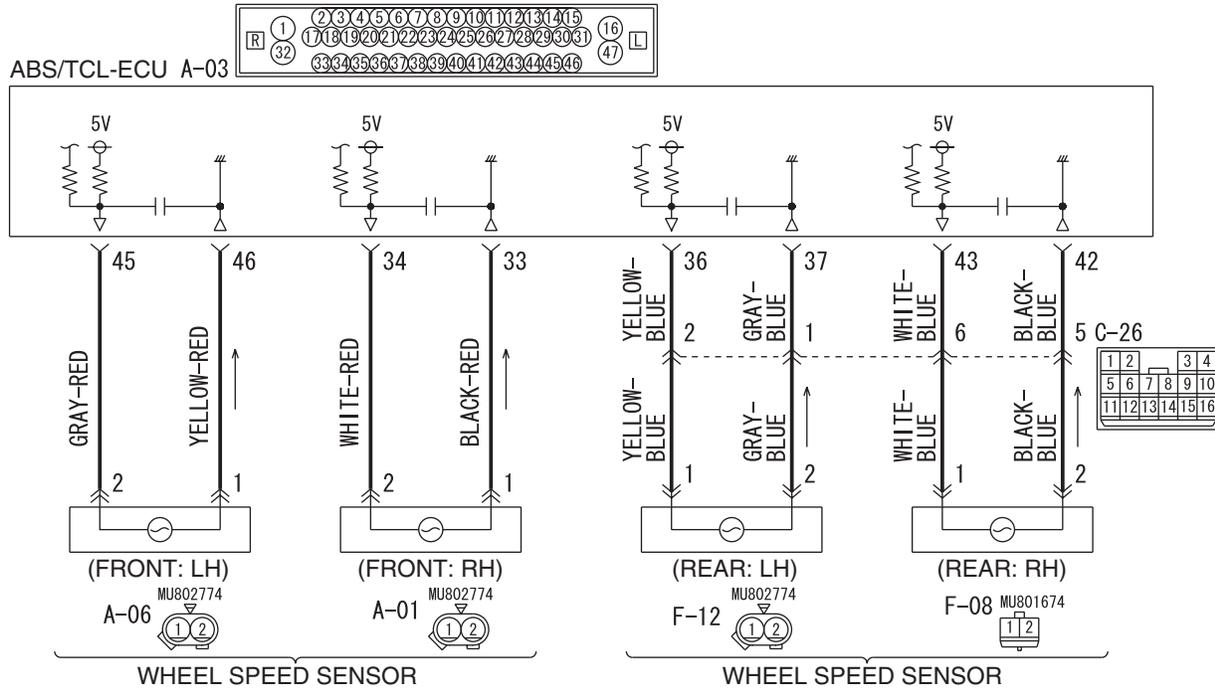
YES : Go to Step 1.

NO : The procedure is complete.

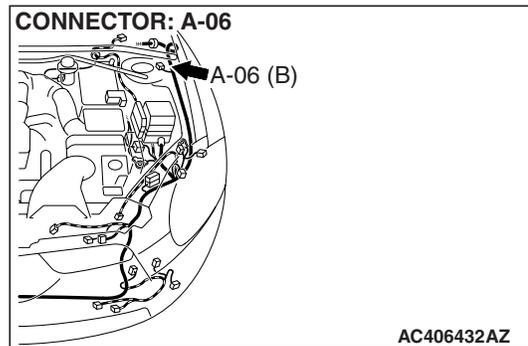
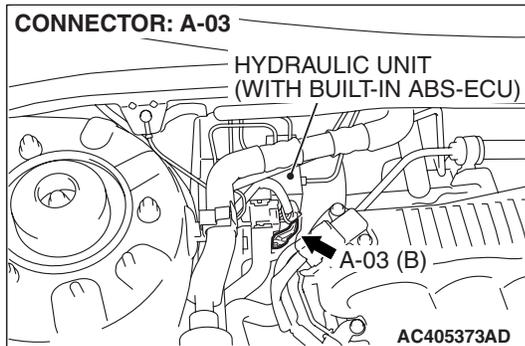


DTC C1205: Front Left Wheel Speed Sensor (Open Circuit or Short Circuit)

Wheel Speed Sensor Circuit



W6P35M001A



CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54C, Trouble code diagnosis P.54C-12).

CIRCUIT OPERATION

- A toothed wheel speed rotor generates a voltage pulse as it moves across the pickup field of each wheel speed sensor.
- The amount of voltage generated at each wheel is determined by the clearance between the wheel speed rotor teeth and the wheel speed sensor, and by the speed of rotation.

- Sends alternating current signals at frequencies which are proportional to the rotation speeds of each wheel to the ABS electronic control unit (ABS/TCL-ECU).
- The ABS hydraulic unit modulates the amount of braking force individually applied to each wheel cylinder.

ABS/TCL DTC SET CONDITIONS

The ABS/TCL-ECU monitors voltage fluctuation in each wheel speed sensor circuit. If the ECU detects a short or open circuit in the circuit, it will set a diagnostic trouble code.

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

Current trouble

- Malfunction of the wheel speed sensor
- Damaged wiring harness or connector

- Malfunction of the hydraulic unit (integrated with ABS/TCL-ECU)

Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness in wheel speed sensor circuit. For diagnosis procedures, refer to "How to treat past trouble" (Refer to GROUP 00, How to treat past trouble P.00-16).

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
- MB991997: ASC Check Harness

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

CAUTION

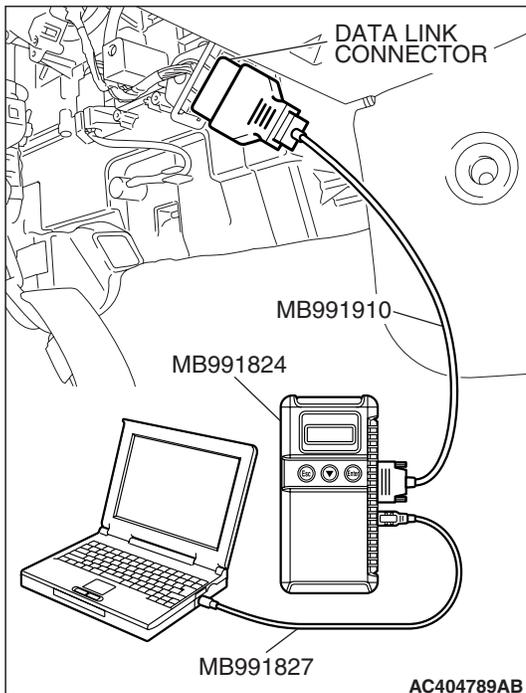
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

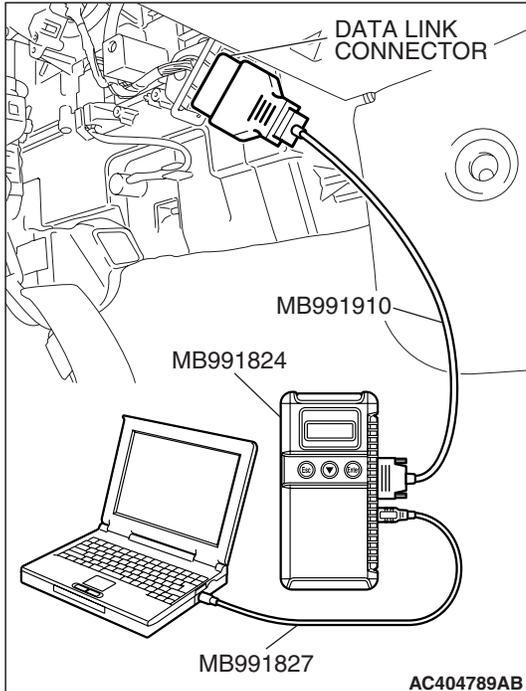
- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Diagnose the CAN bus line.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

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

YES : Go to Step 3

NO : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis P.54C-14). Then go to Step 2.



**STEP 2. Recheck for diagnostic trouble code.****⚠ CAUTION**

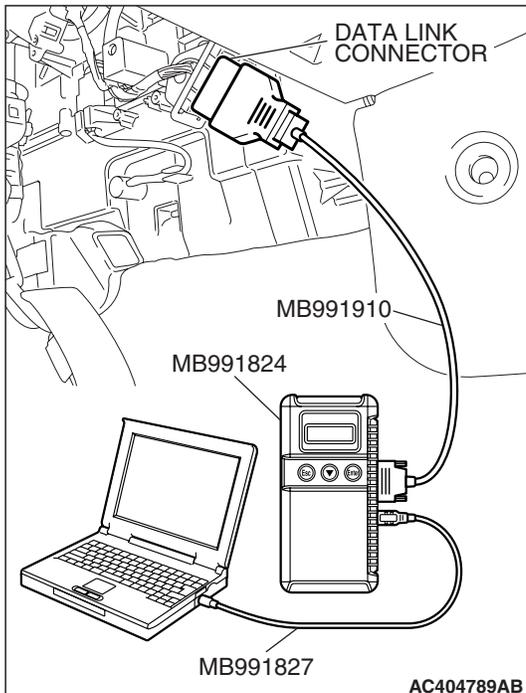
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1205 set?

YES : Go to Step 3

NO : The procedure is complete.

**STEP 3. Using scan tool MB991958, check data list.****⚠ 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) Start the engine.
- (3) Set scan tool MB991958 to the data reading mode, and check the data list items by driving the vehicle (Refer to [P.35C-153](#)).

- Item 02: Front left wheel speed sensor

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

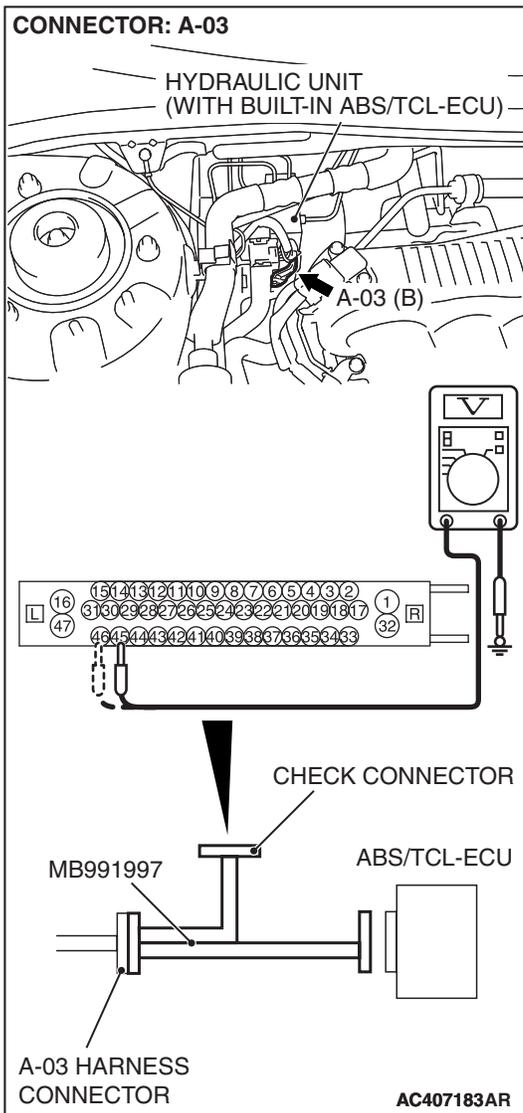
Q: Does the speedometer indication match the scan tool indication?

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 : Go to Step 4.



STEP 4. Measure the voltage at ABS/TCL-ECU connector A-03.

(1) Disconnect the connector A-03, and connect special tool MB991997 to the wiring harness-side connector.

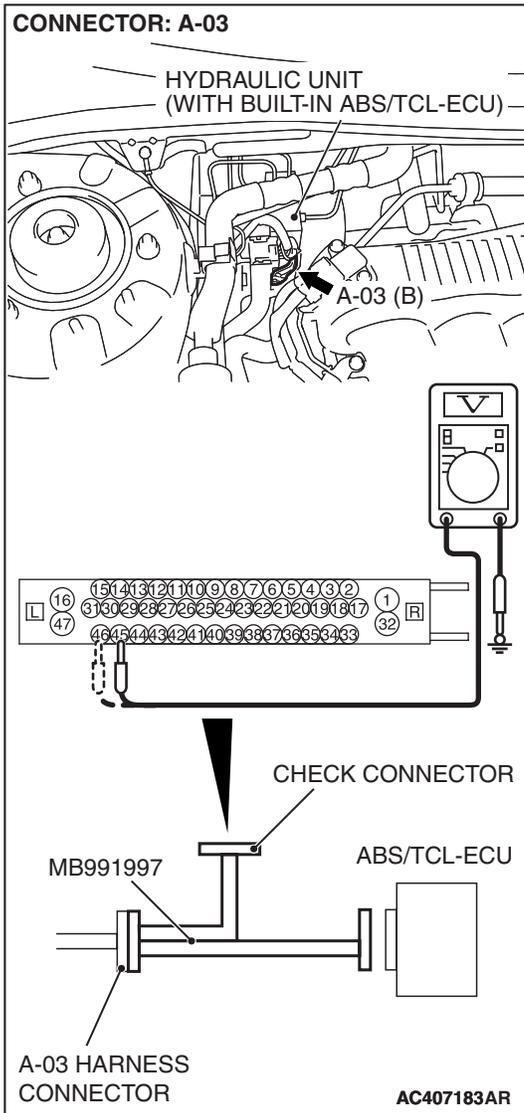
NOTE: Do not connect special tool MB991997 to the ABS/TCL-ECU.

- (2) Turn the ignition switch to the "ON" position.
 (3) Measure the voltage between terminal 45 and body ground, and between terminal 46 and body ground. It should be 1V or less.

Q: Does the voltage measure 1 V or less?

YES : Go to Step 5.

NO : Go to Step 7.



STEP 5. Measure the resistance at ABS/TCL-ECU connector A-03.

(1) Disconnect the connector A-03, and connect special tool MB991997 to the wiring harness-side connector.

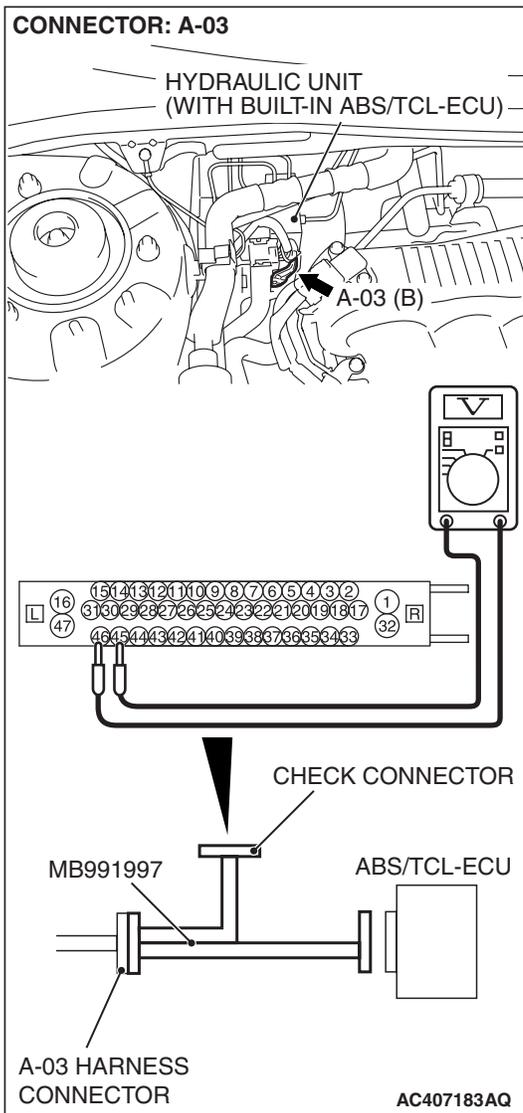
NOTE: Do not connect special tool MB991997 to the ABS/TCL-ECU.

(2) Measure the resistance between terminal 45 and body ground, and between terminal 46 and body ground. There should be no continuity.

Q: Does continuity exist?

YES : Go to Step 7.

NO : Go to Step 6.



STEP 6. Measure the resistance at the ABS/TCL-ECU connector A-03.

(1) Disconnect the connector A-03, and connect special tool MB991997 to the wiring harness-side connector.

NOTE: Do not connect special tool MB991997 to the ABS/TCL-ECU.

(2) Measure the resistance between the ABS/TCL-ECU connector terminals 45 and 46.

Standard Value: 1.24 –1.64 kΩ

Q: Is the resistance between terminals 45 and 46 within the standard value?

YES : Go to Step 10.

NO : Go to Step 7.

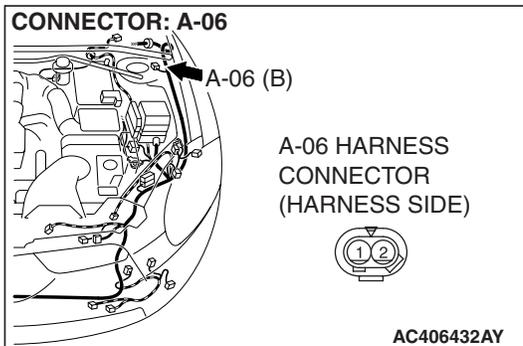
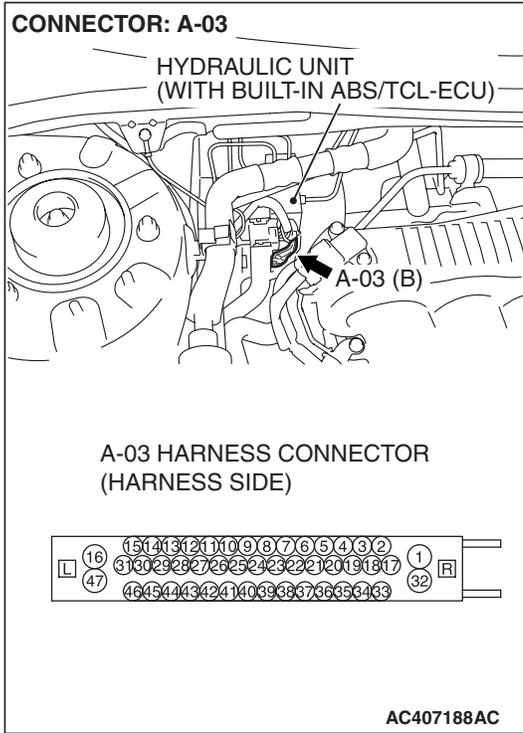
STEP 7. Check ABS/TCL-ECU connector A-03 and wheel speed sensor <front: LH> connector A-06 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

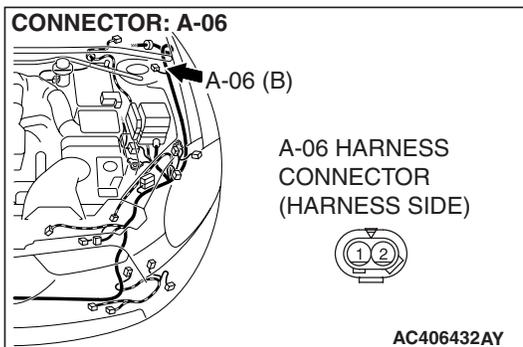
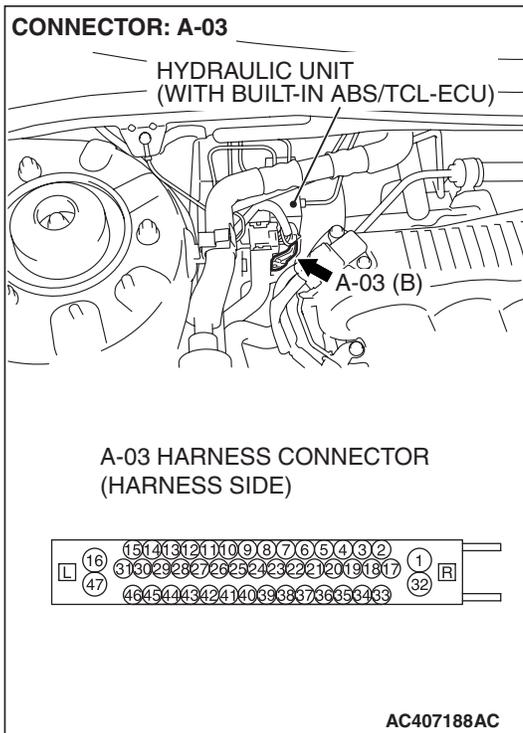
Q: Are ABS/TCL-ECU connector A-03 and wheel speed sensor <front: LH> connector A-06 damaged?

YES : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection

[P.00E-2](#). Then go to Step 11.

NO : Go to Step 8.





STEP 8. Check the harness wires between ABS/TCL-ECU connector A-03 (terminal 45, 46) and wheel speed sensor connector A-06 (terminal 2, 1).

Q: Is the harness wire between ABS/TCL-ECU connector A-03 (terminal 45, 46) and wheel speed sensor connector A-06 (terminal 2, 1) damaged?

YES : Repair the wiring harness. Then go to Step 11.
NO : Go to Step 9.

STEP 9. Inspect the wheel speed sensor.

Check the front left wheel speed sensor relevant to the DTC code. For the applicable inspection procedure, refer to [P.35B-146](#).

Q: Is the wheel speed sensor damaged?

YES : Replace the wheel speed sensor. Then go to Step 11.
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 10. Recheck for diagnostic trouble code.**⚠ CAUTION**

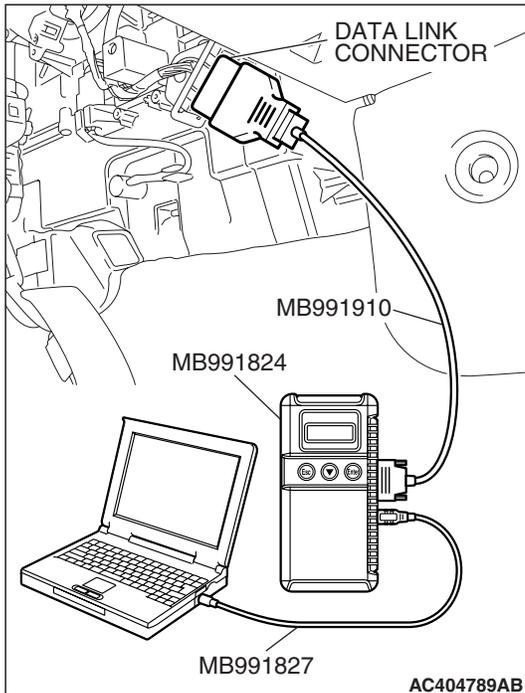
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

Check again if the DTC is set.

- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is reset.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1205 set?

- YES** : Replace the hydraulic unit (integrated with ABS/TCL-ECU). Then go to Step 11.
- 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](#).

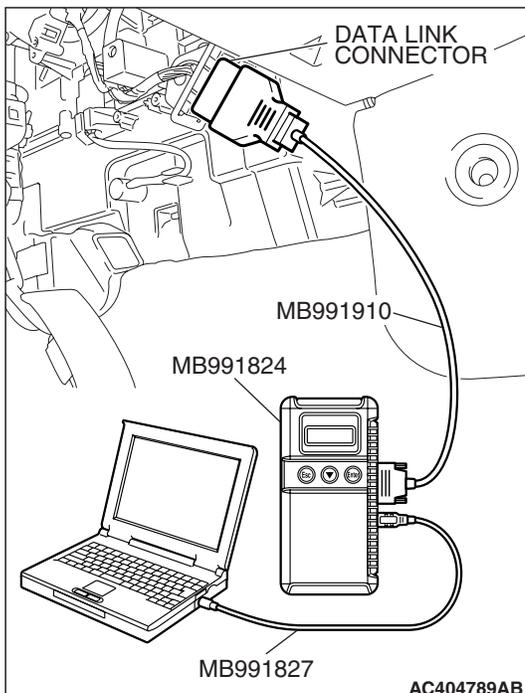
**STEP 11. Recheck for diagnostic trouble code.****⚠ CAUTION**

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) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

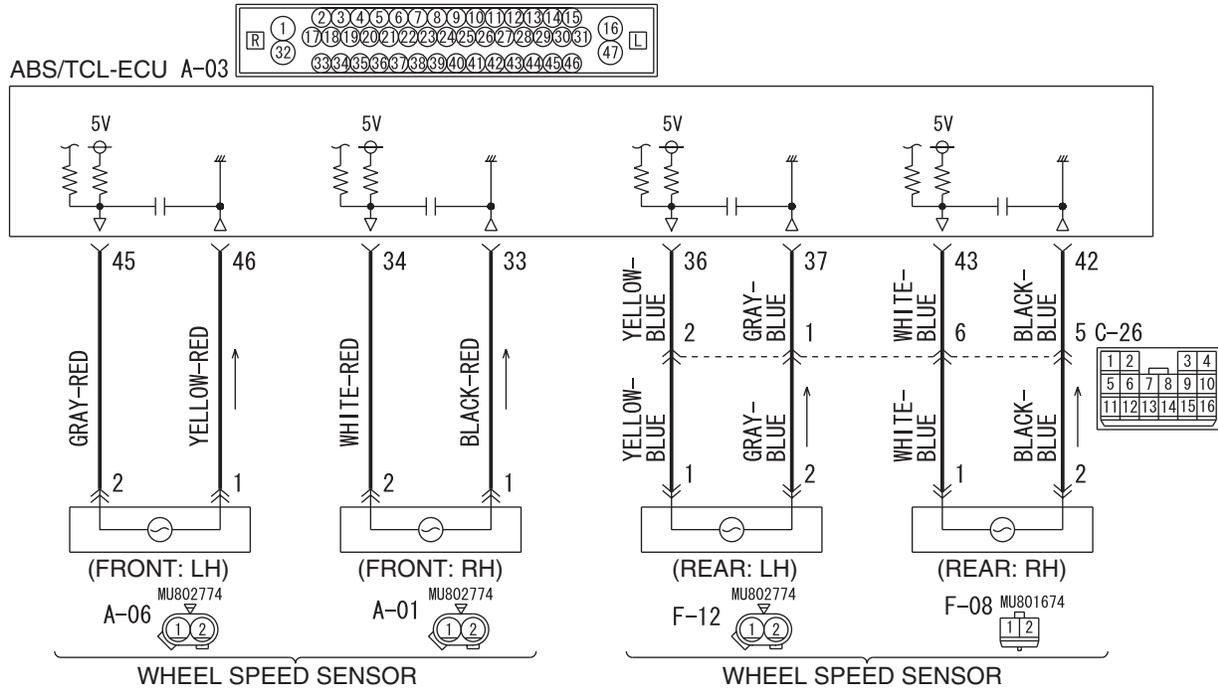
Q: Is DTC C1205 set?

- YES** : Repeat the troubleshooting from Step 1.
- NO** : The procedure is complete.

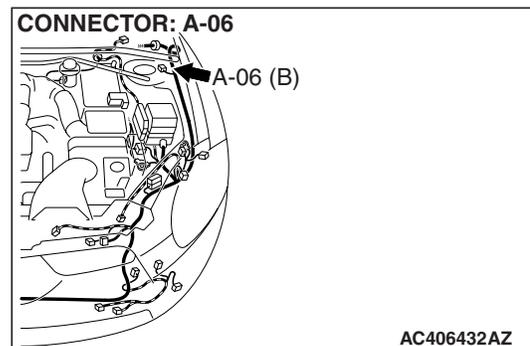
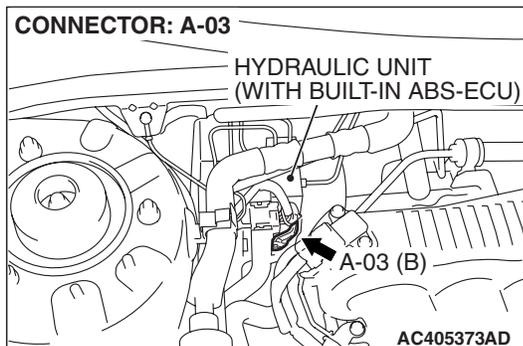


DTC C1206: Front Left Wheel Speed Sensor (Abnormal Output Signal)

Wheel Speed Sensor Circuit



W6P35M001A



CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54C, Trouble code diagnosis P.54C-12).

CIRCUIT OPERATION

- A toothed wheel speed rotor generates a voltage pulse as it moves across the pickup field of each wheel speed sensor.
- The amount of voltage generated at each wheel is determined by the clearance between the wheel speed rotor teeth and the wheel speed sensor, and by the speed of rotation.
- Sends alternating current signals at frequencies which are proportional to the rotation speeds of each wheel to the ABS/TCL electronic control unit (ABS/TCL-ECU).
- The ABS hydraulic unit modulates the amount of braking force to front wheel cylinders individually to activate the TCL system.

ABS/TCL DTC SET CONDITIONS

The ABS/TCL-ECU monitors the signals from each wheel speed sensor while the vehicle is being driven. If any fault below is found in these sensor signals, the ECU will set the relevant diagnostic trouble code.

- Missing sensor signal

- Sensor signal, which will not be created under normal operation
- Significant difference among the wheel speed sensor signals

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

- Malfunction of the wheel speed sensor or wheel speed rotor
- Damaged wiring harness or connector
- Malfunction of the hydraulic unit (integrated with ABS/TCL-ECU)

Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness in wheel speed sensor circuit. For diagnosis procedures, refer to "How to treat past trouble" (Refer to GROUP 00, How to treat past trouble [P.00-16](#)).

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
- MB991997: ASC Check Harness

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

⚠ CAUTION

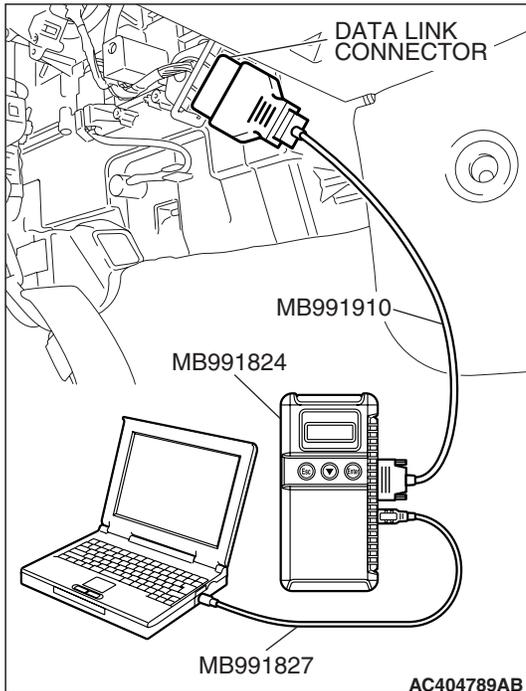
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

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

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

YES : Go to Step 3

NO : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis P.54C-14). Then go to Step 2.



STEP 2. Recheck for diagnostic trouble code.

⚠ CAUTION

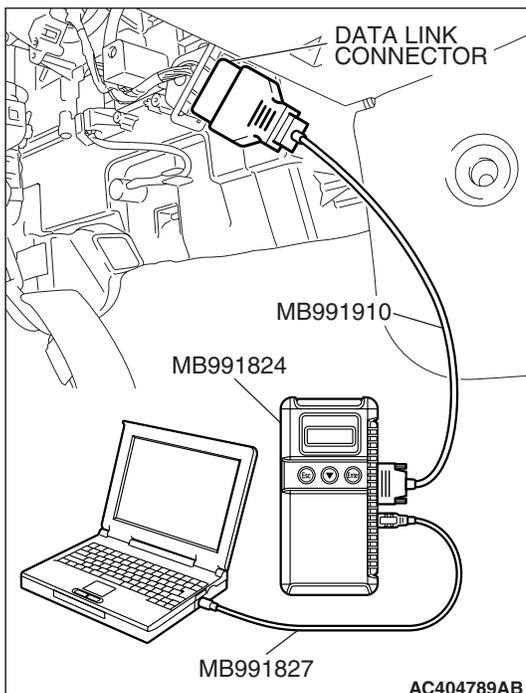
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

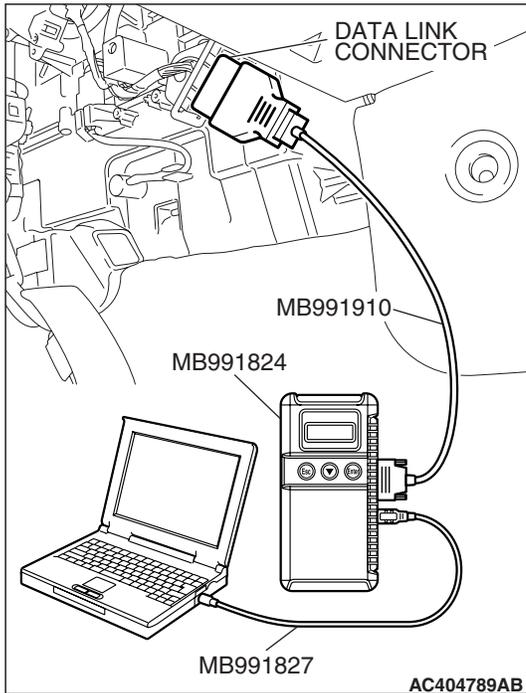
- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1206 set?

YES : Go to Step 3

NO : The procedure is complete.





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.

Use scan tool MB991958 to check whether DTC code C1205 have been set simultaneously.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Check whether DTC C1205 have been set.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1205 set?

YES : Carry out diagnosis relevant to DTC C1205 (Refer to [P.35C-30](#)).

NO : Go to Step 4.

STEP 4. Check the installation condition of the wheel speed sensors.

For the wheel speed sensor, which the DTC code indicates, check whether the sensor or its mounting bolts are loosened.

- DTC C1206 is set: Front left wheel speed sensor

Q: Is the wheel speed sensor installed correctly?

YES : Go to Step 5.

NO : Reinstall the wheel speed sensor correctly. Then go to Step 13.

STEP 5. Check the wheel speed sensor after it is removed from the vehicle.

Check the wheel speed sensor which the DTC code indicates (Refer to [P.35B-146](#)).

- DTC C1206 is set: Front left wheel speed sensor

Q: Is the wheel speed sensor in good condition?

YES : Go to Step 6.

NO : Replace the wheel speed sensor (Refer to [P.35C-164](#)). Then go to Step 13.

STEP 6. Check the wheel bearing for looseness.

NOTE: If the wheel bearing is loose, the gap between the wheel speed sensor and rotor may become excessive. Check the wheel bearing, which DTC code indicates, for looseness.

- DTC C1206 is set: Check the front right wheel bearing (Refer to GROUP 26, On-vehicle service –Wheel bearing end play check [P.26-8](#)).

Q: Is the wheel bearing end play within the standard value?

YES : Go to Step 7.

NO : Replace the front hub assembly (Refer to GROUP 26, Front axle hub assembly [P.26-9](#)).

STEP 7. Check the wheel speed rotor.

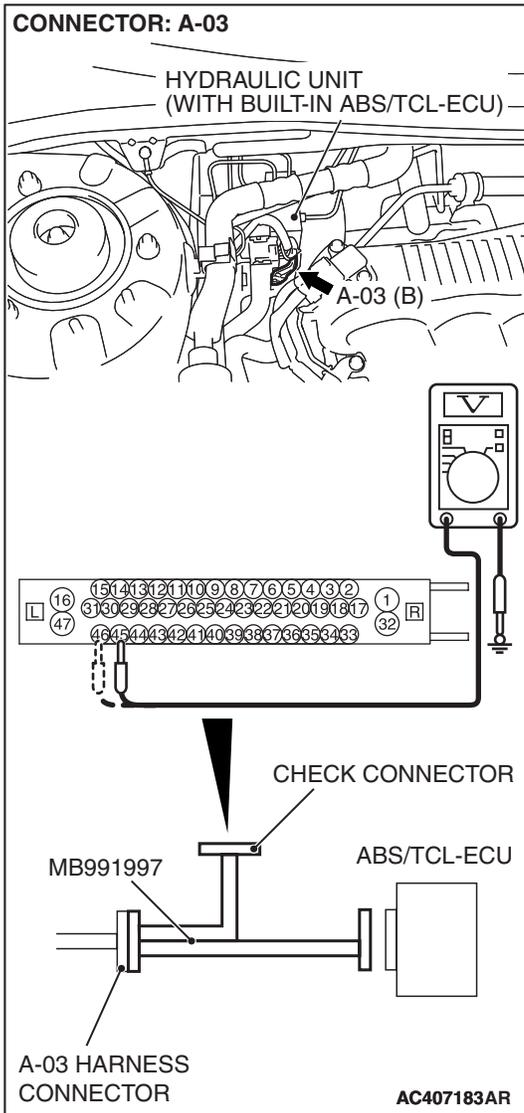
Check the wheel speed rotor, which DTC code indicates, for foreign material or deformation.

- DTC C1206 is set: Front left wheel speed sensor

Q: Is the wheel speed rotor in good condition?

YES : Go to Step 8.

NO : If the wheel speed rotor is contaminated with foreign material, clean it. If the driveshaft is deformed, replace it (Refer to GROUP 26, Drive shaft assembly [P.26-14](#)).



STEP 8. Measure the voltage at ABS/TCL-ECU connector A-03.

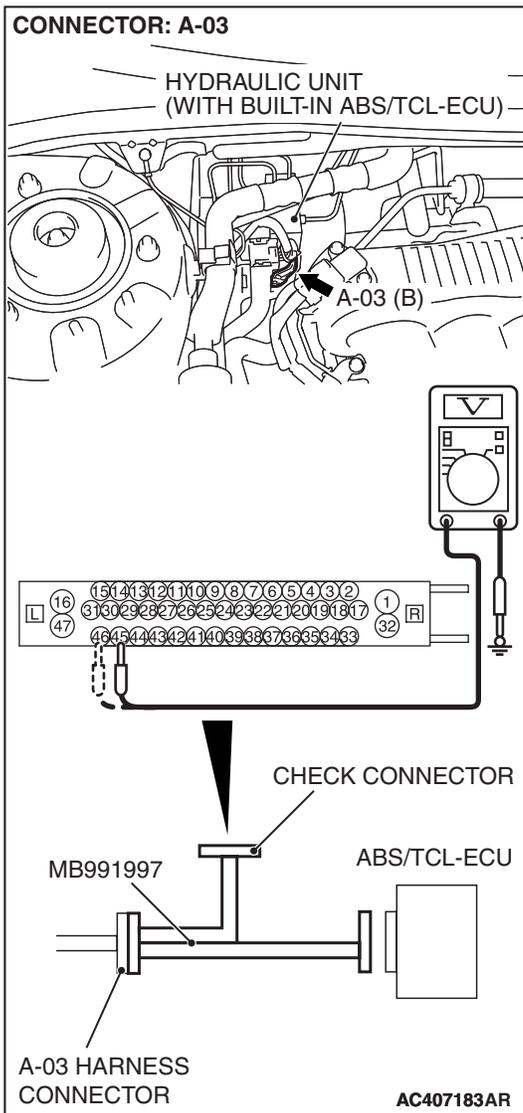
(1) Disconnect the connector A-03, and connect special tool MB991997 to the wiring harness-side connector.

NOTE: Do not connect special tool MB991997 to the ABS/ASC-ECU.

- (2) Turn the ignition switch to the "ON" position.
- (3) Measure the voltage between terminal 45 and body ground, and between terminal 46 and body ground. It should be 1V or less.

Q: Does the voltage measure 1 V or less?

- YES :** Go to Step 9.
- NO :** Go to Step 11.



STEP 9. Measure the resistance at ABS/TCL-ECU connector A-03.

- (1) Disconnect the connector A-03, and connect special tool MB991997 to the wiring harness-side connector.

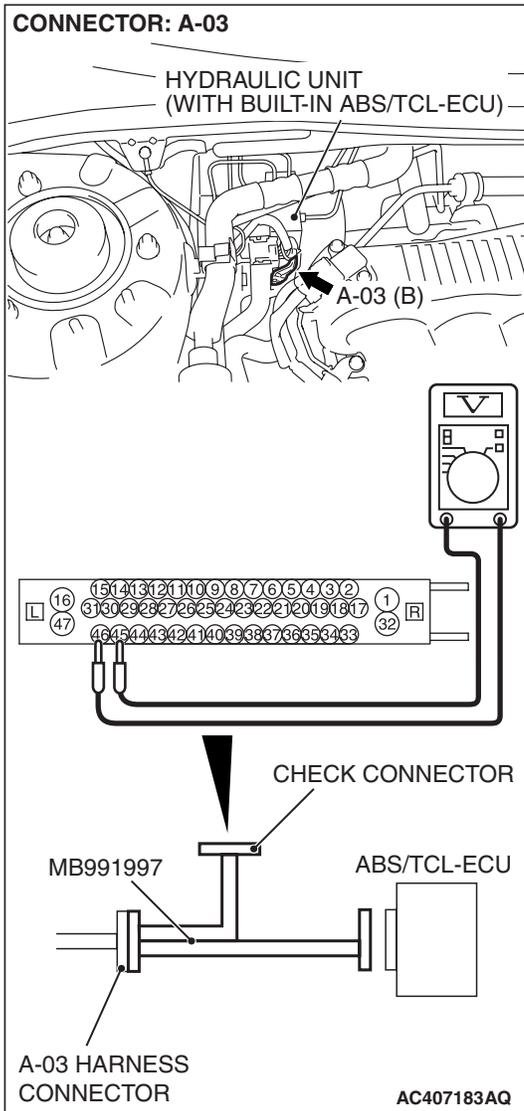
NOTE: Do not connect special tool MB991997 to the ABS/TCL-ECU.

- (2) Measure the resistance between terminal 45 and body ground, and between terminal 46 and body ground. There should be no continuity.

Q: Does continuity exist?

YES : Go to Step 11.

NO : Go to Step 10.



STEP 10. Measure the resistance at ABS/TCL-ECU connector A-03.

- (1) Disconnect the connector A-03, and connect special tool MB991997 to the wiring harness-side connector.

NOTE: Do not connect special tool MB991997 to the ABS/TCL-ECU.

- (2) Measure the resistance between terminal 45 and terminal 46.

Standard Value: 1.24 –1.64 kΩ

Q: Is the resistance between terminals 45 and 46 within the standard value?

YES : Go to Step 12.

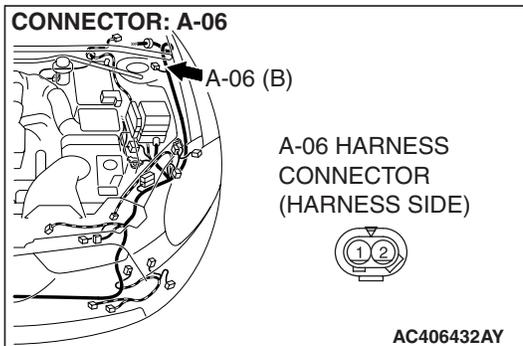
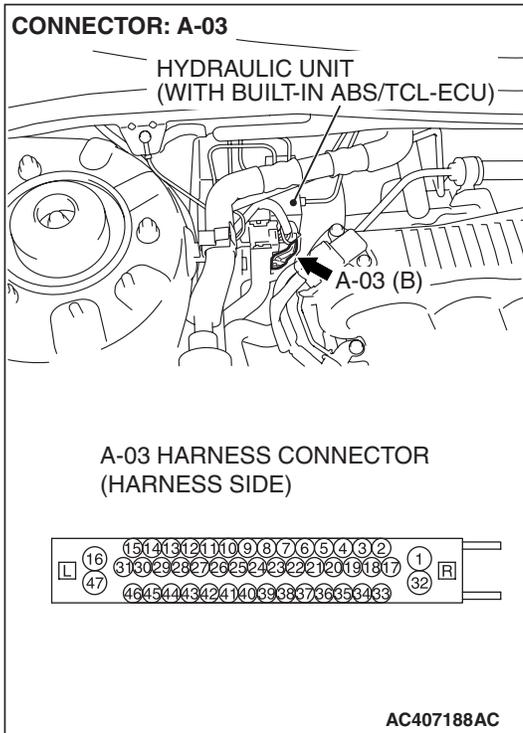
NO : Go to Step 11.

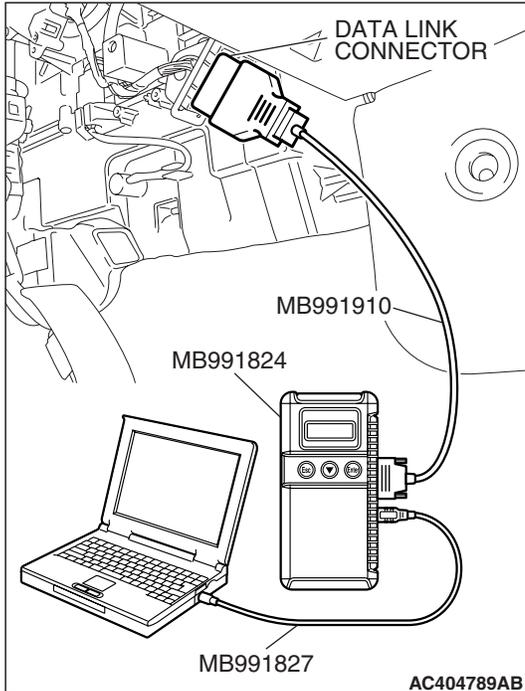
STEP 11. Check ABS/TCL-ECU connector A-03 and wheel speed sensor <front: LH> connector A-06 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are ABS/TCL-ECU connector A-03 and wheel speed sensor <front: LH> connector A-06 damaged?

YES : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 13.

NO : Open or short circuit may be present in the front right wheel speed sensor circuit. Repair the wiring harness between ABS/TCL-ECU connector A-03 (terminals 45 and 46) and front left wheel speed sensor A-06 (terminals 2 and 1). Then go to Step 13.



**STEP 12. Recheck for 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.

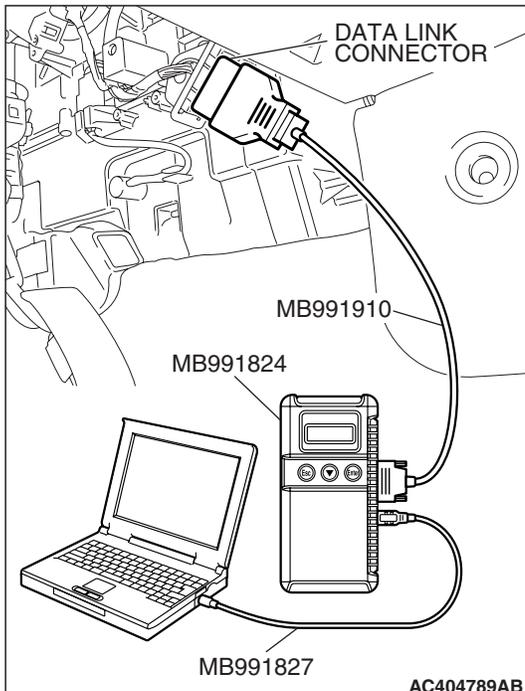
Check again if the DTC is set.

- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1206 set?

YES : Replace the hydraulic unit (integrated with ABS/TCL-ECU). Then go to Step 13.

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 13. Recheck for 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.

Check again if the DTC is set.

- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

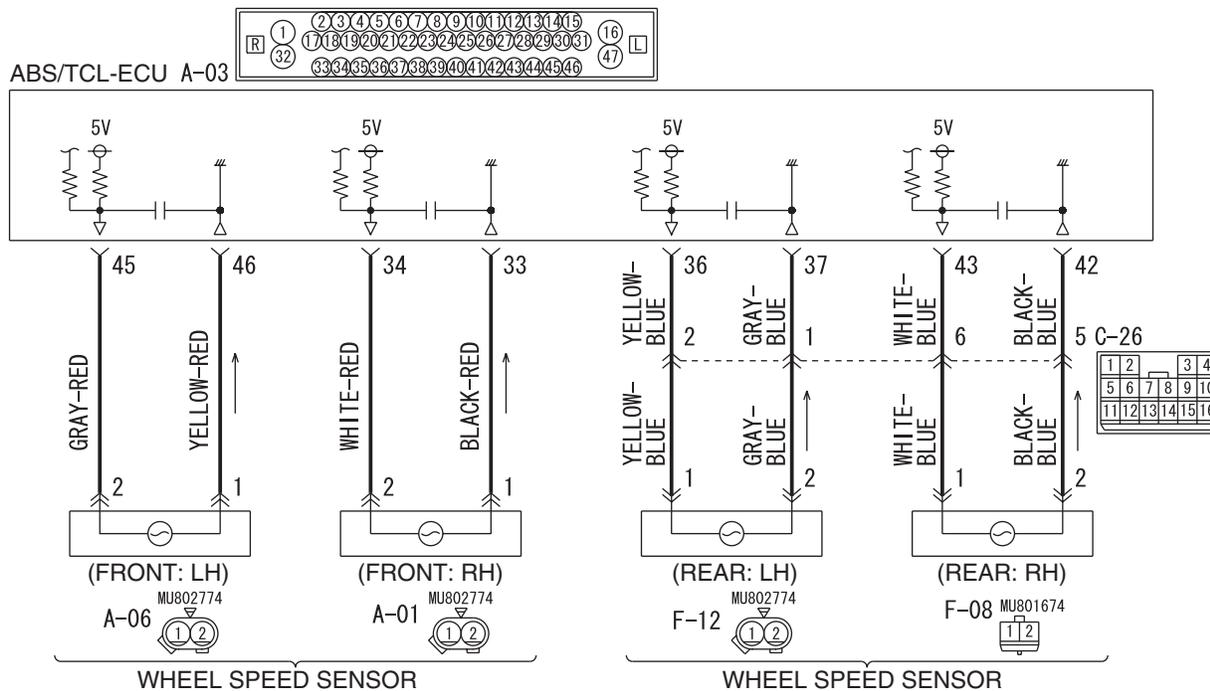
Q: Is DTC C1206 set?

YES : Go to Step 1.

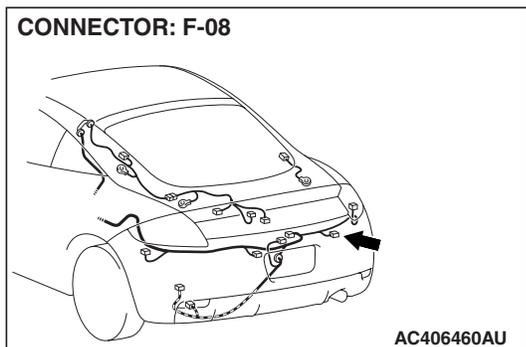
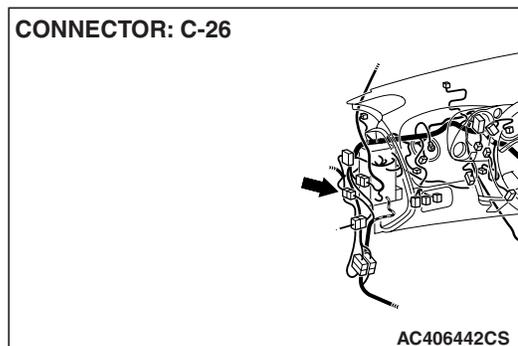
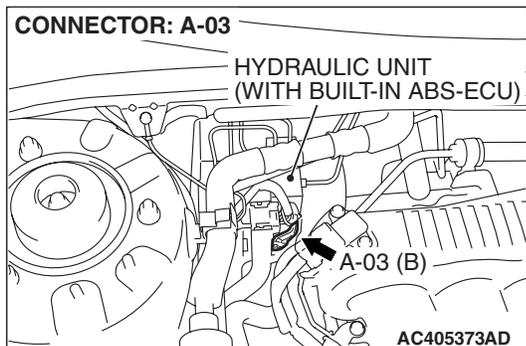
NO : The procedure is complete.

DTC C1210: Rear Right Wheel Speed Sensor (Open Circuit or Short Circuit)

Wheel Speed Sensor Circuit



W6P35M001A



⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54C, Trouble code diagnosis P.54C-12).

CIRCUIT OPERATION

- A toothed wheel speed rotor generates a voltage pulse as it moves across the pickup field of each wheel speed sensor.
- The amount of voltage generated at each wheel is determined by the clearance between the wheel speed rotor teeth and the wheel speed sensor, and by the speed of rotation.
- Sends alternating current signals at frequencies which are proportional to the rotation speeds of each wheel to the ABS electronic control unit (ABS/TCL-ECU).
- The ABS hydraulic unit modulates the amount of braking force individually applied to each wheel cylinder.

ABS/TCL DTC SET CONDITIONS

The ABS/TCL-ECU monitors voltage fluctuation in each wheel speed sensor circuit. If the ECU detects a short or open circuit in the circuit, it will set a diagnostic trouble code.

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

- Malfunction of the wheel speed sensor
- Damaged wiring harness or connector
- Malfunction of the hydraulic unit (integrated with ABS/TCL-ECU)

Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness in wheel speed sensor circuit. For diagnosis procedures, refer to "How to treat past trouble" (Refer to GROUP 00, How to treat past trouble P.00-16).

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
- MB991997: ASC Check Harness

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

⚠ CAUTION

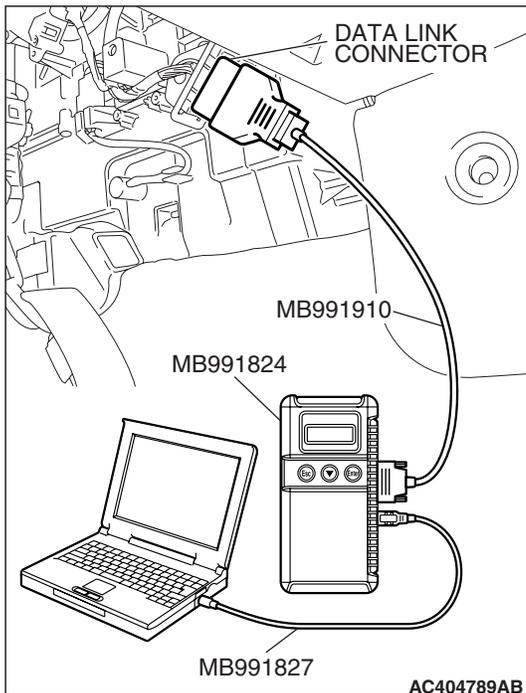
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

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

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

YES : Go to Step 3

NO : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis P.54C-14). Then go to Step 2.



STEP 2. Recheck for diagnostic trouble code.

⚠ CAUTION

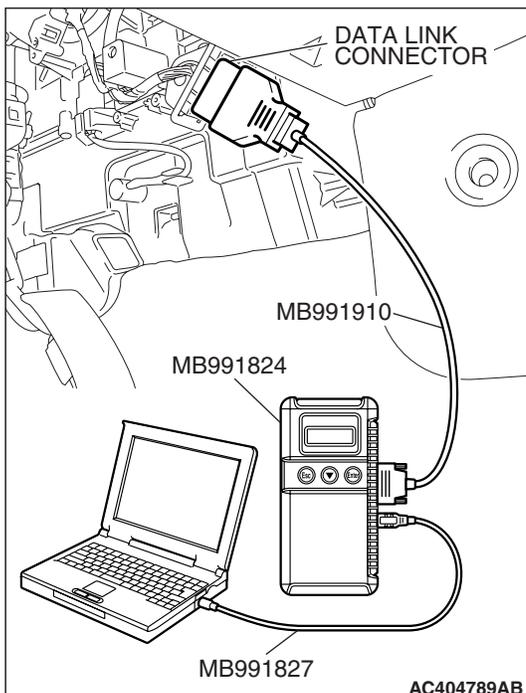
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1210 set?

YES : Go to Step 3

NO : The procedure is complete.



STEP 3. Using scan tool MB991958, check data list.**⚠ 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.

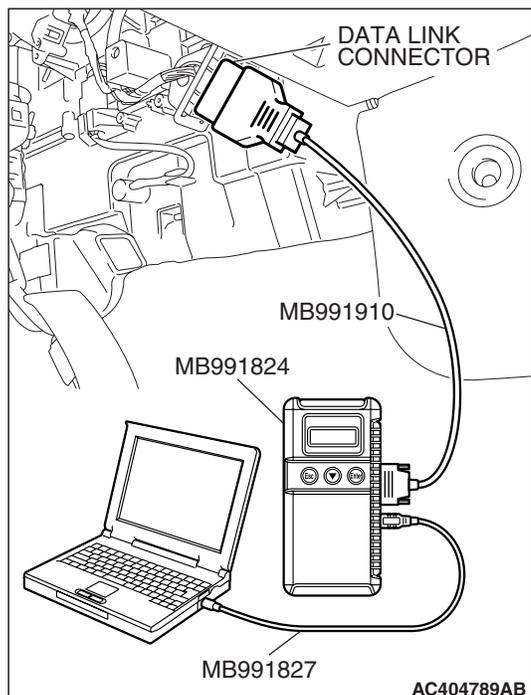
- (1) Connect scan tool MB991958 to the data link connector.
- (2) Start the engine.
- (3) Set scan tool MB991958 to the data reading mode, and check the data list items by driving the vehicle (Refer to [P.35C-153](#)).
 - Item 03: Rear right wheel speed sensor
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

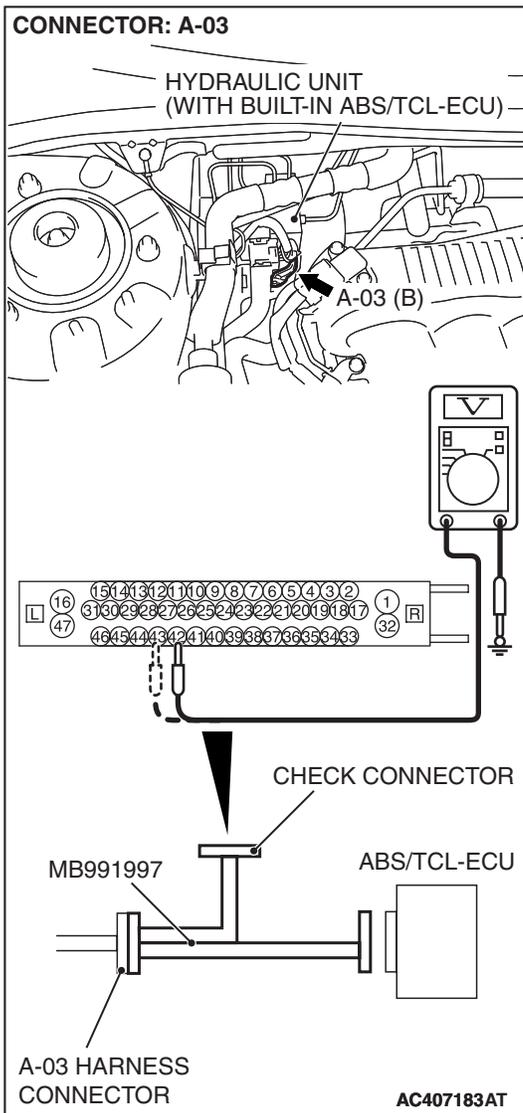
Q: Does the speedometer indication match the scan tool indication?

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 : Go to Step 4.





STEP 4. Measure the voltage at ABS/TCL-ECU connector A-03.

(1) Disconnect the connector A-03, and connect special tool MB991997 to the wiring harness-side connector.

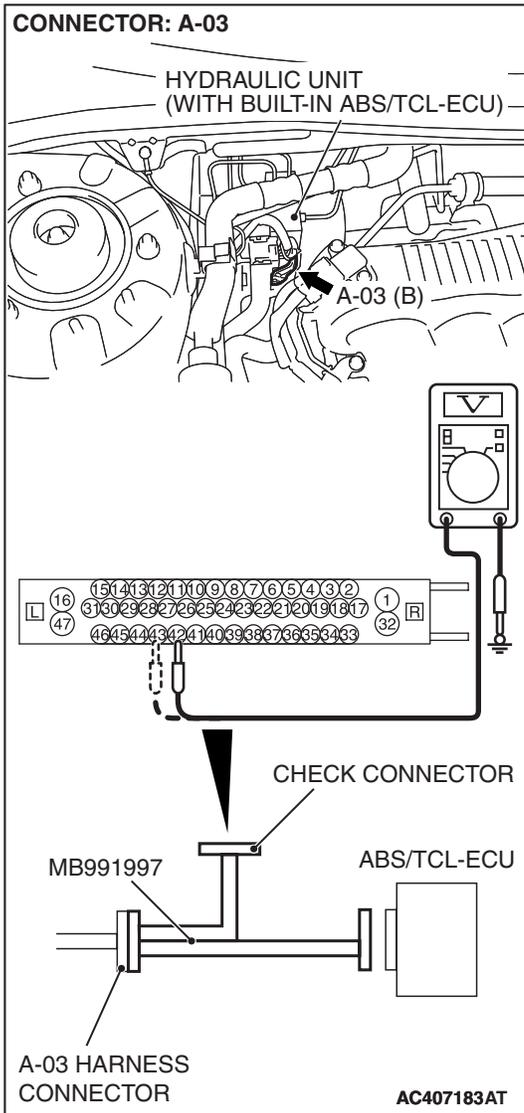
NOTE: Do not connect special tool MB991997 to the ABS/TCL-ECU.

- (2) Turn the ignition switch to the "ON" position.
- (3) Measure the voltage between terminal 42 and body ground, and between terminal 43 and body ground. It should be 1V or less.

Q: Does the voltage measure 1 V or less?

YES : Go to Step 5.

NO : Go to Step 7.



STEP 5. Measure the resistance at ABS/TCL-ECU connector A-03.

(1) Disconnect the connector A-03, and connect special tool MB991997 to the wiring harness-side connector.

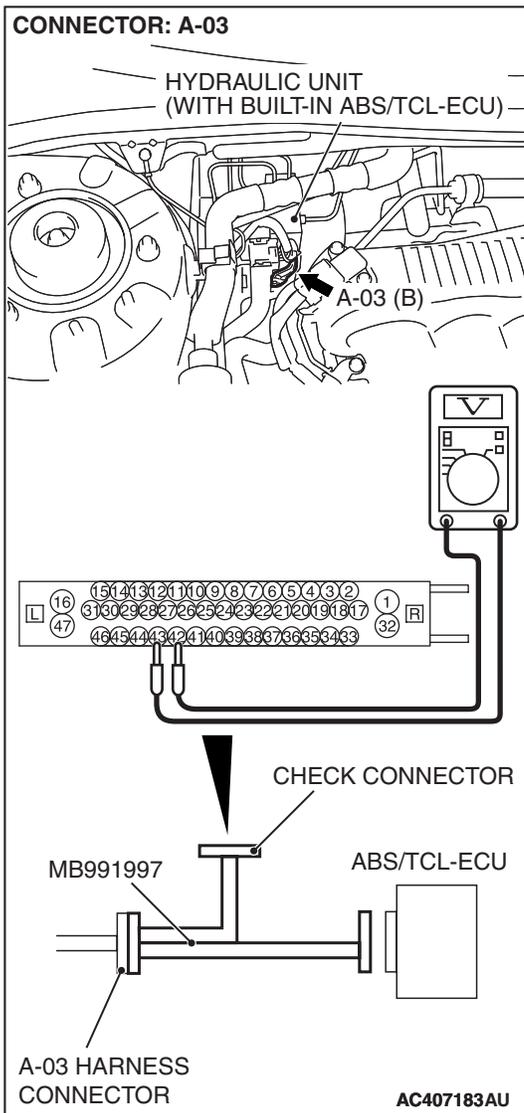
NOTE: Do not connect special tool MB991997 to the ABS/TCL-ECU.

(2) Measure the resistance between terminal 42 and body ground, and between terminal 43 and body ground. There should be no continuity.

Q: Does continuity exist?

YES : Go to Step 7.

NO : Go to Step 6.



STEP 6. Measure the resistance at the ABS/TCL-ECU connector A-03.

- (1) Disconnect the connector A-03, and connect special tool MB991997 to the wiring harness-side connector.

NOTE: Do not connect special tool MB991997 to the ABS/TCL-ECU.

- (2) Measure the resistance between the ABS/TCL-ECU connector terminals 42 and 43.

Standard Value: 1.24 –1.64 kΩ

Q: Is the resistance between terminals 42 and 43 within the standard value?

YES : Go to Step 10.

NO : Go to Step 7.

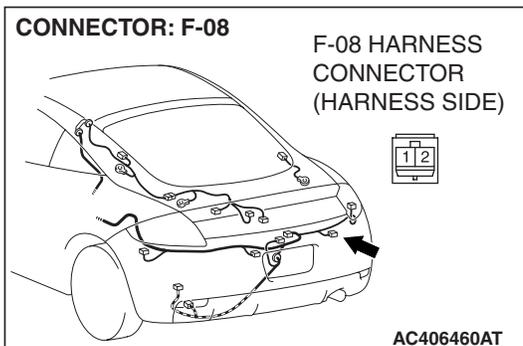
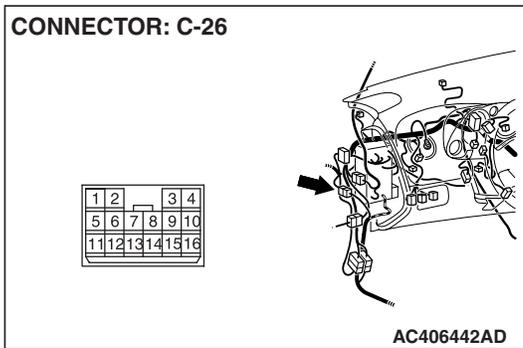
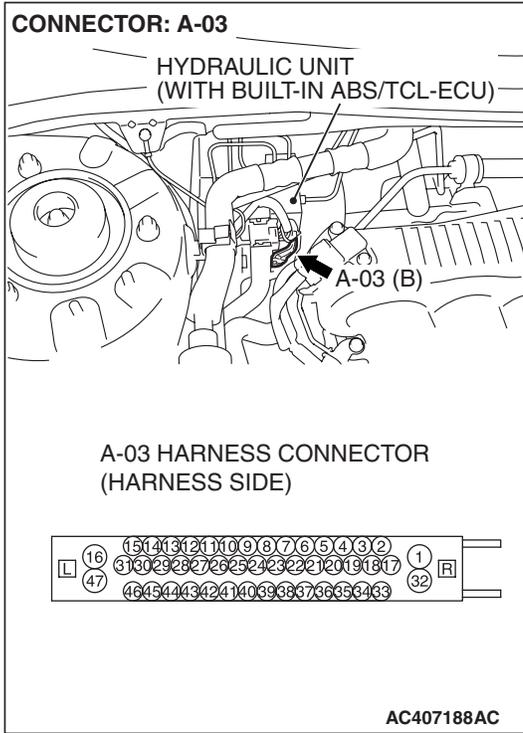
STEP 7. Check ABS/TCL-ECU connector A-03, intermediate connector C-26 and wheel speed sensor <rear: RH> connector F-08 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

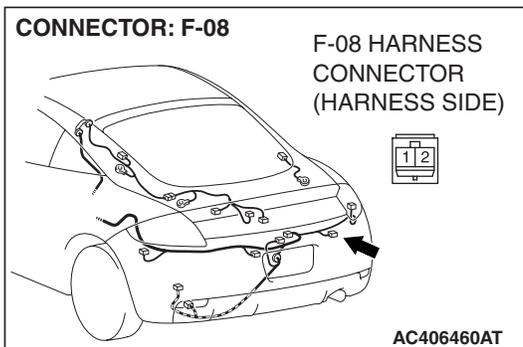
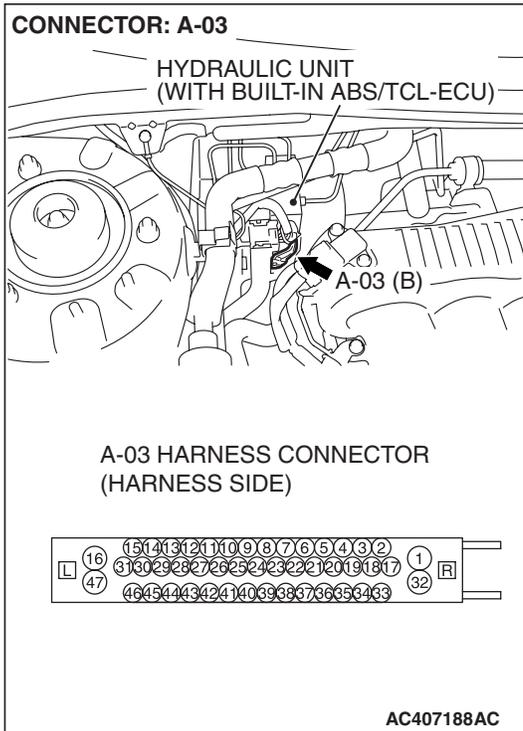
Q: Are ABS/TCL-ECU connector A-03, intermediate connector C-26 and wheel speed sensor <rear: RH> connector F-08 damaged?

YES : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection

P.00E-2. Then go to Step 11.

NO : Go to Step 8.





STEP 8. Check the harness wires between ABS/TCL-ECU connector A-03 (terminal 42, 43) and wheel speed sensor <rear: RH> connector F-08 (terminal 2, 1).

Q: Is the harness wire between ABS/TCL-ECU connector A-03 (terminal 42, 43) and wheel speed sensor <rear: RH> connector F-08 (terminal 2, 1) damaged?

- YES :** Repair the wiring harness. Then go to Step 11.
- NO :** Go to Step 9.

STEP 9. Inspect the wheel speed sensor.

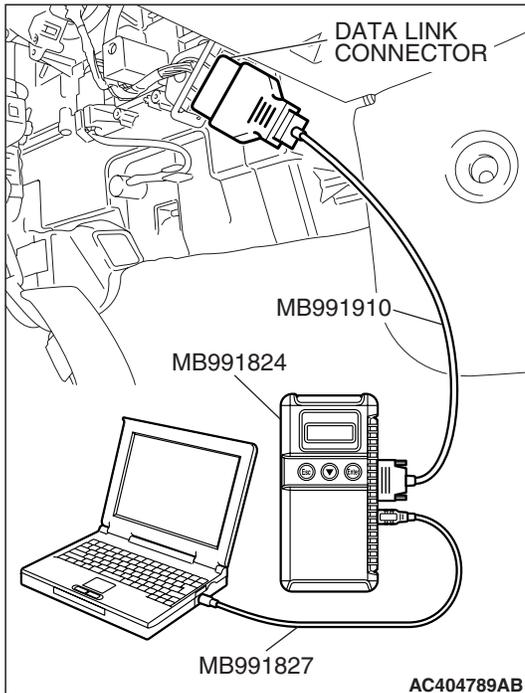
Check the wheel speed sensor relevant to the DTC code. For the applicable inspection procedure, refer to [P.35B-146](#).

- When DTC code C1210 is set: Rear right wheel speed sensor

Q: Is the wheel speed sensor damaged?

YES : Replace the wheel speed sensor. Then go to Step 11.

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 10. Recheck for 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.

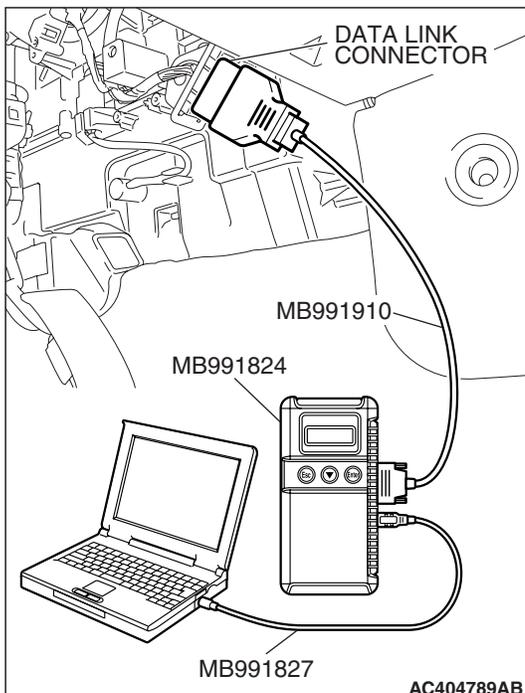
Check again if the DTC is set.

- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is reset.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1210 set?

YES : Replace the hydraulic unit (integrated with ABS/TCL-ECU). Then go to Step 11.

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 11. Recheck for 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) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

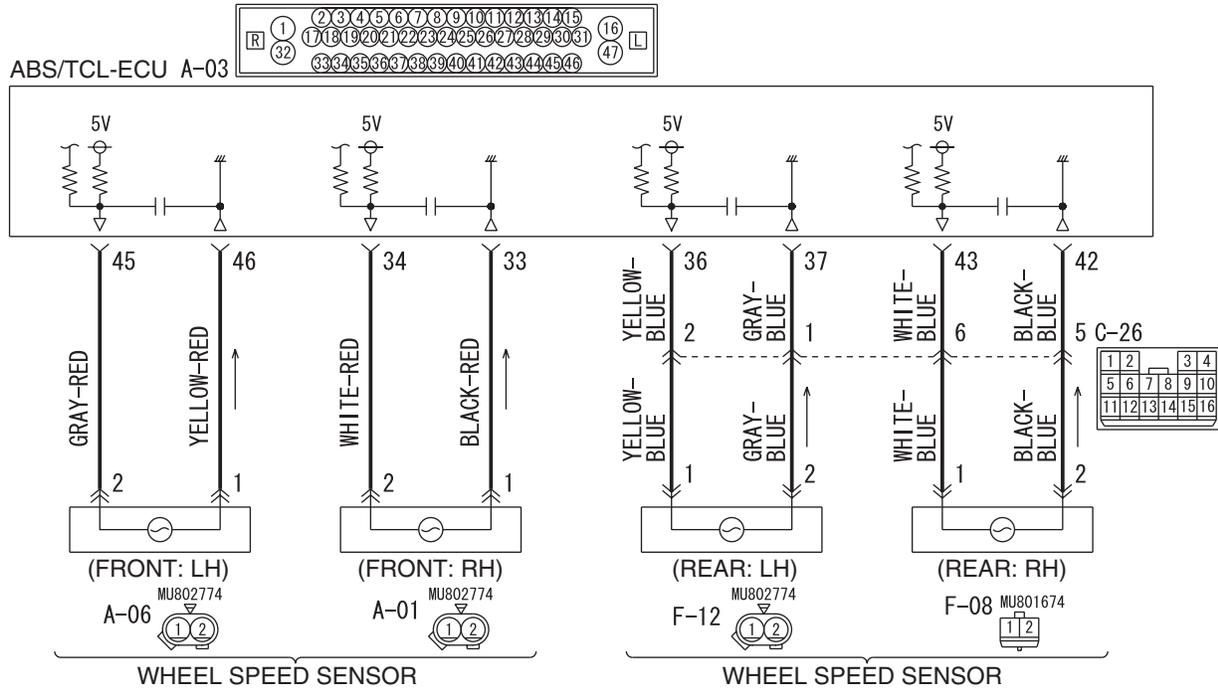
Q: Is DTC C1210 set?

YES : Repeat the troubleshooting from Step 1.

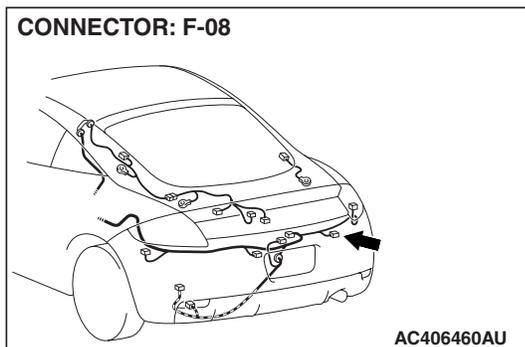
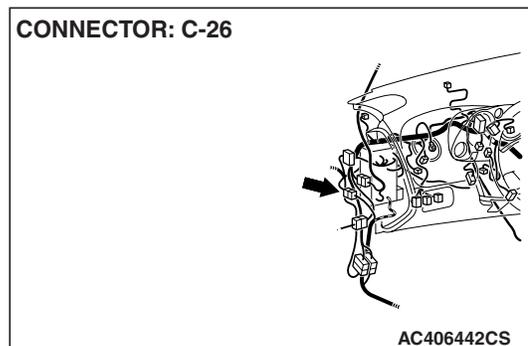
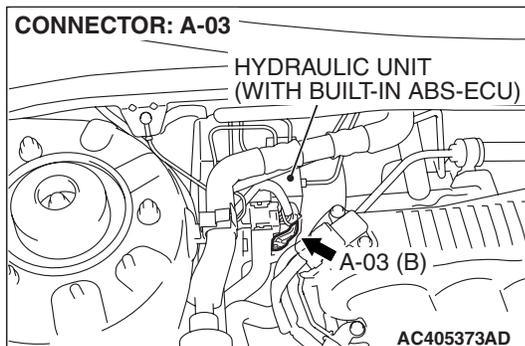
NO : The procedure is complete.

DTC C1211: Rear Right Wheel Speed Sensor (Abnormal Output Signal)

Wheel Speed Sensor Circuit



W6P35M001A



CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set.

Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54C, Trouble code diagnosis P.54C-12).

CIRCUIT OPERATION

- A toothed wheel speed rotor generates a voltage pulse as it moves across the pickup field of each wheel speed sensor.
- The amount of voltage generated at each wheel is determined by the clearance between the wheel speed rotor teeth and the wheel speed sensor, and by the speed of rotation.
- Sends alternating current signals at frequencies which are proportional to the rotation speeds of each wheel to the ABS electronic control unit (ABS/TCL-ECU).
- The ABS hydraulic unit modulates the amount of braking force to front wheel cylinders individually to activate the TCL system.

ABS/TCL DTC SET CONDITIONS

The ABS/TCL-ECU monitors the signals from each wheel speed sensor while the vehicle is being driven. If any fault below is found in these sensor signals, the ECU will set the relevant diagnostic trouble code.

- Missing sensor signal

- Sensor signal, which will not be created under normal operation
- Significant difference among the wheel speed sensor signals

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

- Malfunction of the wheel speed sensor or wheel speed rotor
- Damaged wiring harness or connector
- Malfunction of the hydraulic unit (integrated with ABS/TCL-ECU)

Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness in wheel speed sensor circuit. For diagnosis procedures, refer to "How to treat past trouble" (Refer to GROUP 00, How to treat past trouble [P.00-16](#)).

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
- MB991997: ASC Check Harness

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

⚠ CAUTION

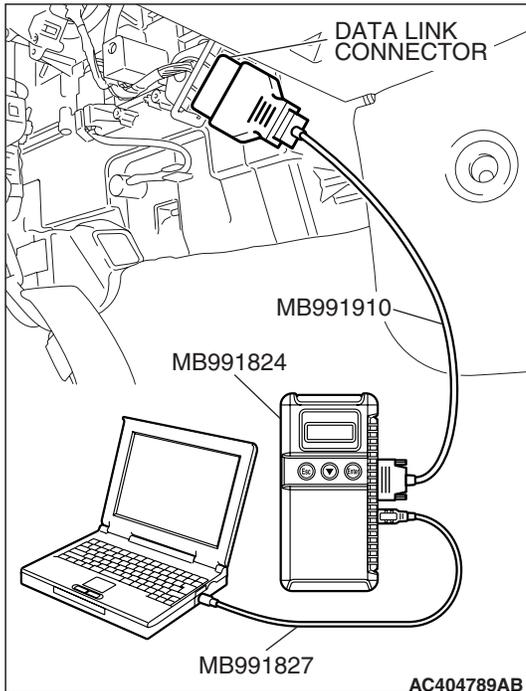
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

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

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

YES : Go to Step 3

NO : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis P.54C-14). Then go to Step 2.



STEP 2. Recheck for diagnostic trouble code.

⚠ CAUTION

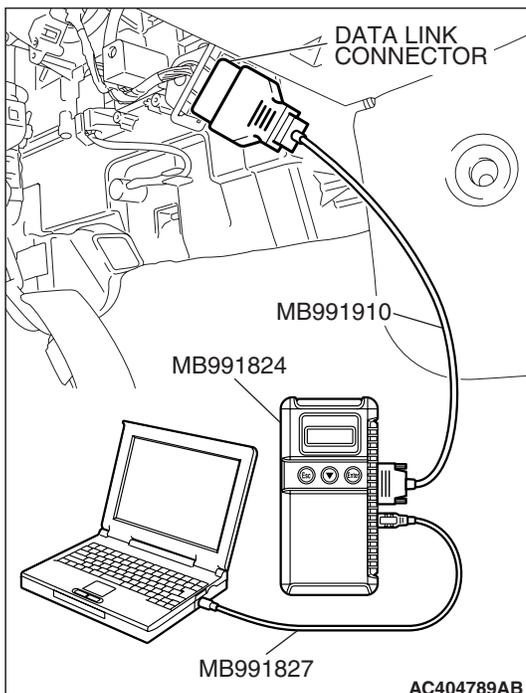
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

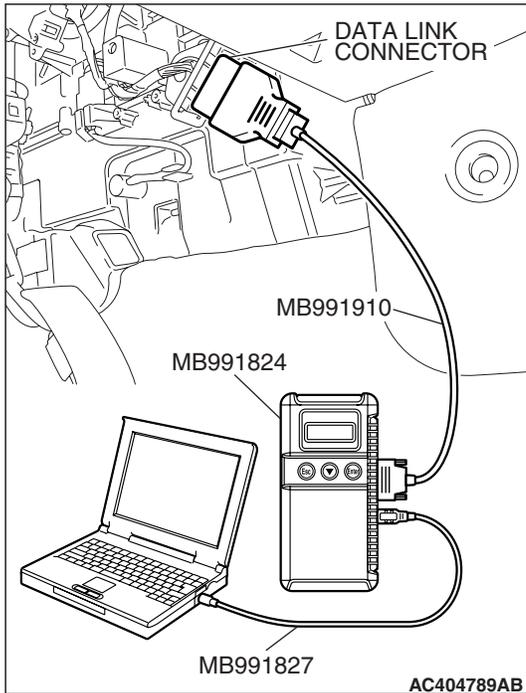
- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1211 set?

YES : Go to Step 3

NO : The procedure is complete.





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.

Use scan tool MB991958 to check whether DTC code C1210 have been set simultaneously.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Check whether DTC C1210 have been set.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1210 set?

YES : Carry out diagnosis relevant to DTC C1210 (Refer to [P.35C-49](#)).

NO : Go to Step 4.

STEP 4. Check the installation condition of the wheel speed sensors.

For the wheel speed sensor, which the DTC code indicates, check whether the sensor or its mounting bolts are loosened.

- DTC C1211 is set: Rear right wheel speed sensor

Q: Is the wheel speed sensor installed correctly?

YES : Go to Step 5.

NO : Reinstall the wheel speed sensor correctly. Then go to Step 13.

STEP 5. Check the wheel speed sensor after it is removed from the vehicle.

Check the wheel speed sensor which the DTC code indicates (Refer to [P.35B-146](#)).

- DTC C1211 is set: Rear right wheel speed sensor

Q: Is the wheel speed sensor in good condition?

YES : Go to Step 6.

NO : Replace the wheel speed sensor (Refer to [P.35B-145](#)). Then go to Step 13.

STEP 6. Check the wheel bearing for looseness.

NOTE: If the wheel bearing is loose, the gap between the wheel speed sensor and rotor may become excessive. Check the wheel bearing, which DTC code indicates, for looseness.

- DTC C1211 is set: Check the rear right wheel bearing (Refer to GROUP 27, On-vehicle service –Wheel bearing end play check [P.27-4](#)).

Q: Is the wheel bearing end play within the standard value?

YES : Go to Step 7.

NO : Replace the rear hub assembly (Refer to GROUP 27, Rear axle hub assembly [P.27-4](#)).

STEP 7. Check the wheel speed rotor.

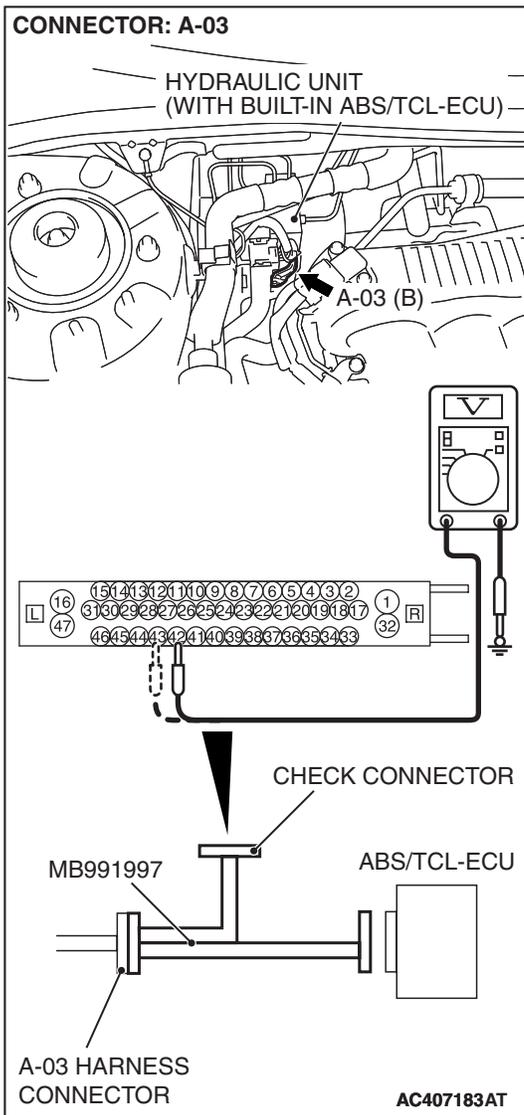
Check the wheel speed rotor, which DTC code indicates, for foreign material or deformation.

- DTC C1211 is set: Rear right wheel speed sensor

Q: Is the wheel speed rotor in good condition?

YES : Go to Step 8.

NO : If the wheel speed rotor is contaminated with foreign material, clean it. If the wheel speed rotor is deformed, replace it (Refer to GROUP 27, Rear axle hub assembly [P.27-6](#)).



STEP 8. Measure the voltage at ABS/TCL-ECU connector A-03.

(1) Disconnect the connector A-03, and connect special tool MB991997 to the wiring harness-side connector.

NOTE: Do not connect special tool MB991997 to the ABS/TCL-ECU.

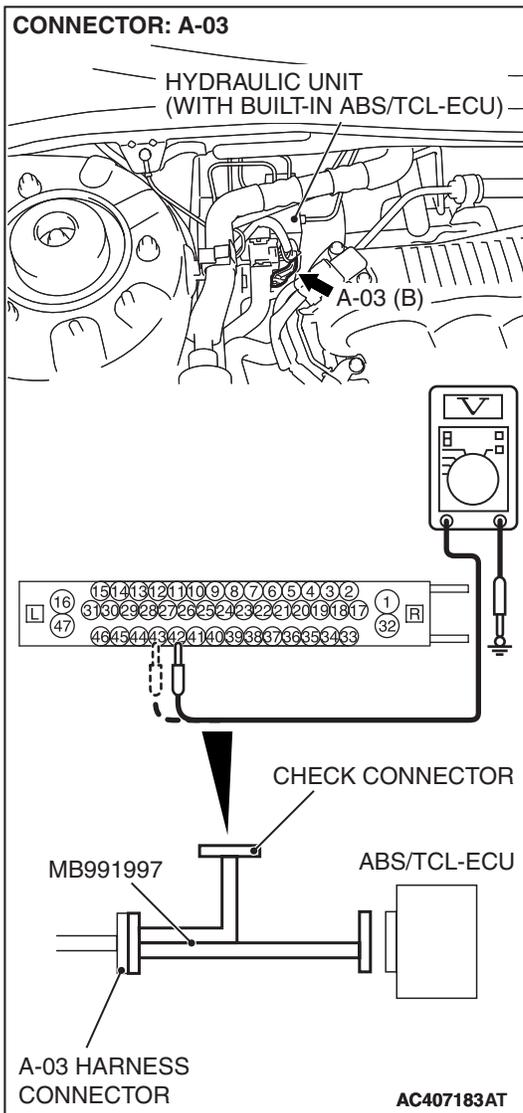
(2) Turn the ignition switch to the "ON" position.

(3) Measure the voltage between terminal 42 and body ground, and between terminal 43 and body ground. It should be 1V or less.

Q: Does the voltage measure 1 V or less?

YES : Go to Step 9.

NO : Go to Step 11.



STEP 9. Measure the resistance at ABS/TCL-ECU connector A-03.

- (1) Disconnect the connector A-03, and connect special tool MB991997 to the wiring harness-side connector.

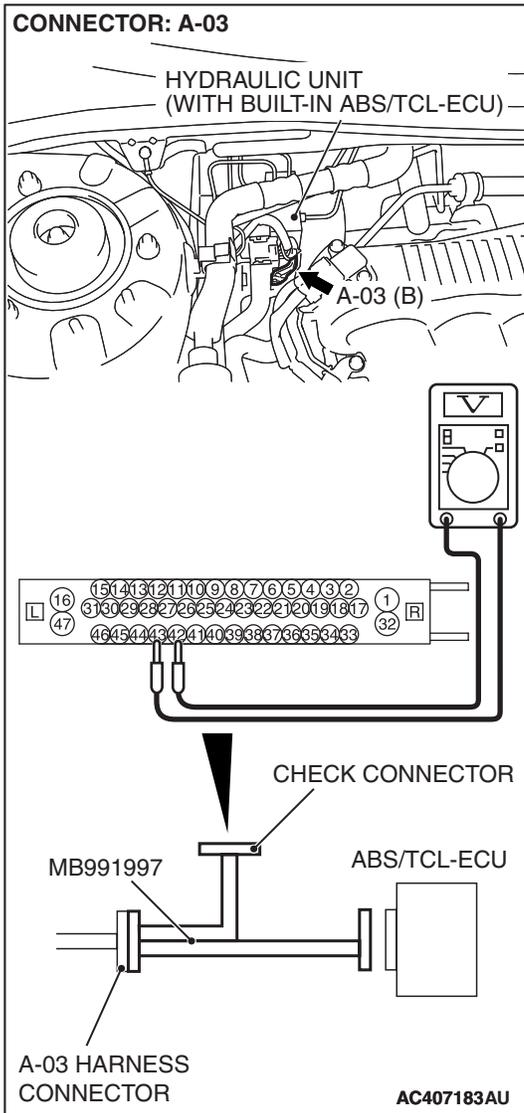
NOTE: Do not connect special tool MB991997 to the ABS/TCL-ECU.

- (2) Measure the resistance between terminal 42 and body ground, and between terminal 43 and body ground. There should be no continuity.

Q: Does continuity exist?

YES : Go to Step 11.

NO : Go to Step 10.



STEP 10. Measure the resistance at ABS/TCL-ECU connector A-03.

- (1) Disconnect the connector A-03, and connect special tool MB991997 to the wiring harness-side connector.

NOTE: Do not connect special tool MB991997 to the ABS/TCL-ECU.

- (2) Measure the resistance between the ABS/TCL-ECU connector terminals 42 and 43.

Standard Value: 1.24 –1.64 kΩ

Q: Is the resistance between terminals 42 and 43 within the standard value?

YES : Go to Step 12.

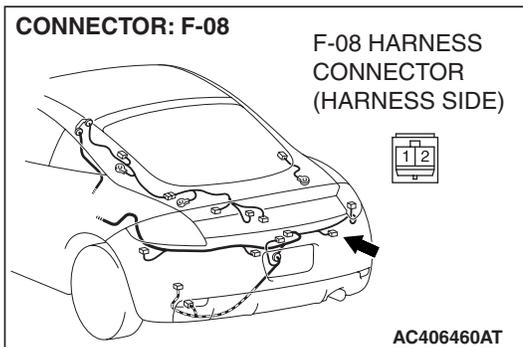
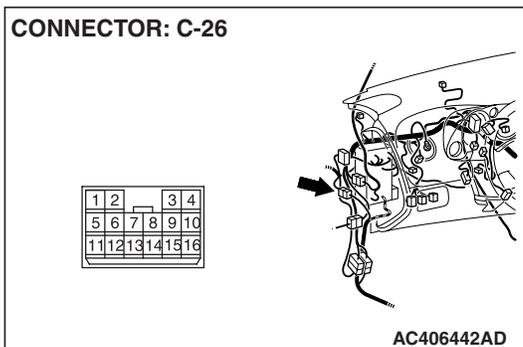
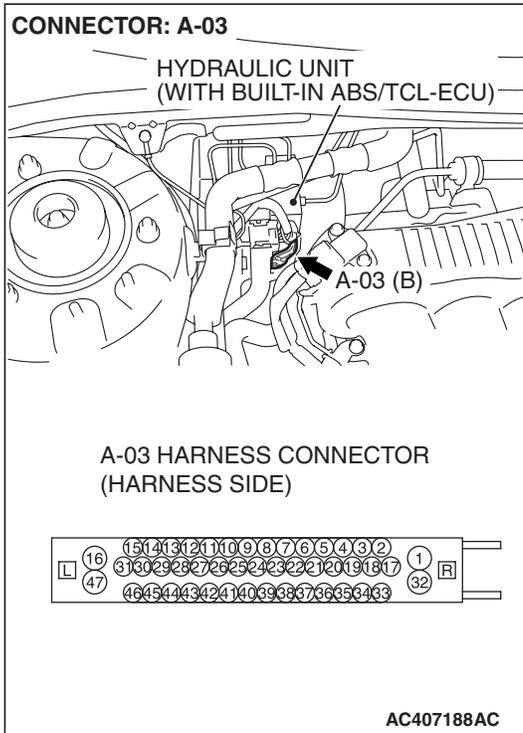
NO : Go to Step 11.

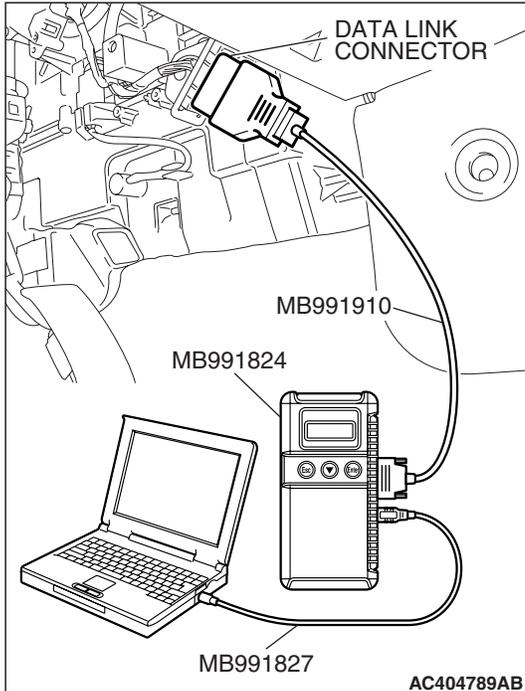
STEP 11. Check ABS/TCL-ECU connector A-03, intermediate connector C-26 and wheel speed sensor <Rear: RH> connector F-08 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are ABS/TCL-ECU connector A-03, intermediate connector C-26 and wheel speed sensor <Rear: RH> connector F-08 damaged?

YES : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 13.

NO : Open or short circuit may be present in the rear right wheel speed sensor circuit. Repair the wiring harness between ABS/TCL-ECU connector A-03 (terminals 42 and 43) and rear right wheel speed sensor F-08 (terminals 2 and 1). Then go to Step 13.



**STEP 12. Recheck for 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.

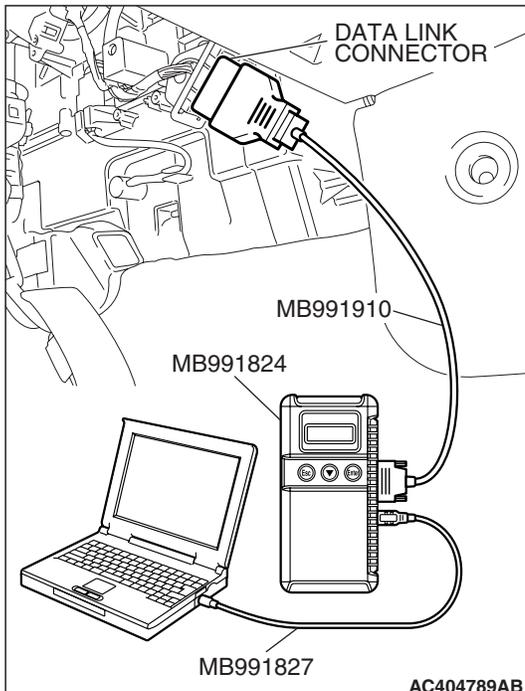
Check again if the DTC is set.

- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1211 set?

YES : Replace the hydraulic unit (integrated with ABS/TCL-ECU). Then go to Step 13.

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 13. Recheck for 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.

Check again if the DTC is set.

- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

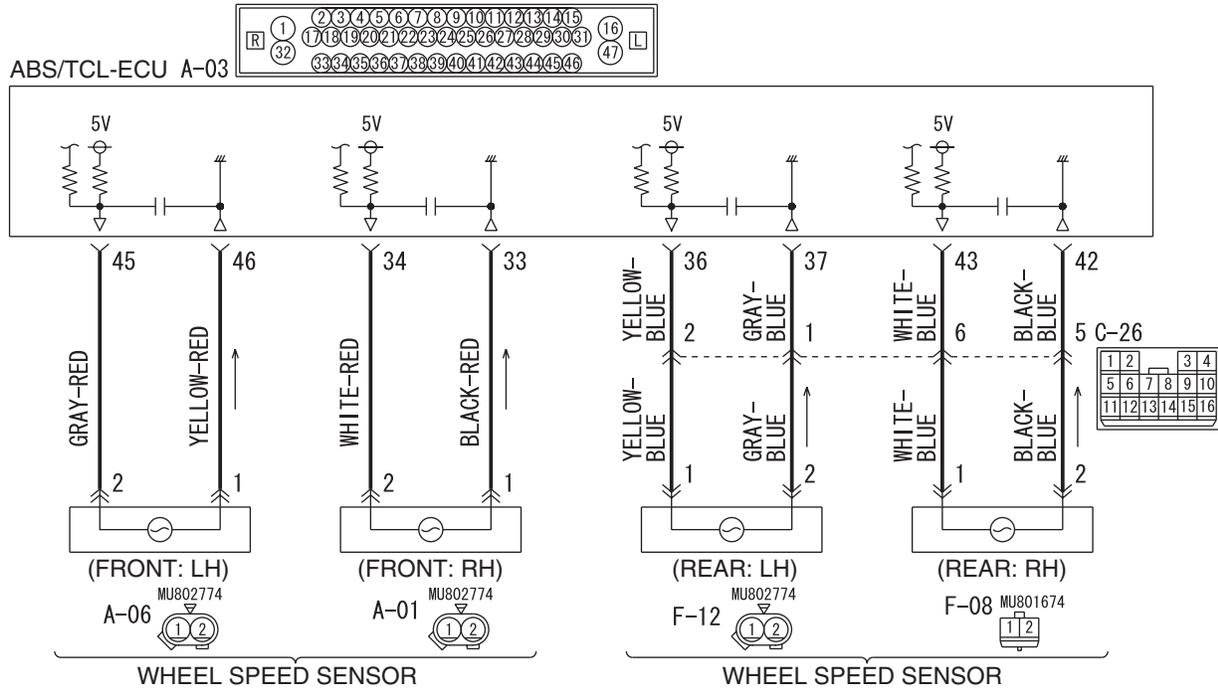
Q: Is DTC C1211 set?

YES : Go to Step 1.

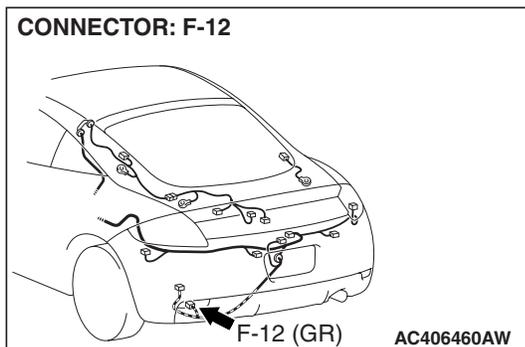
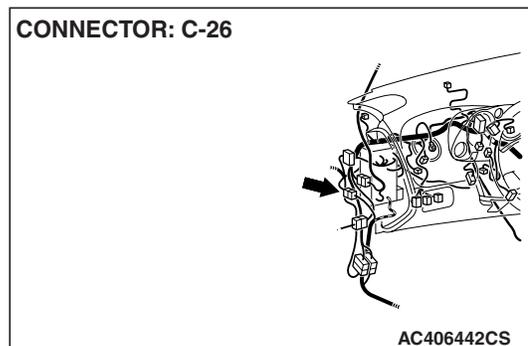
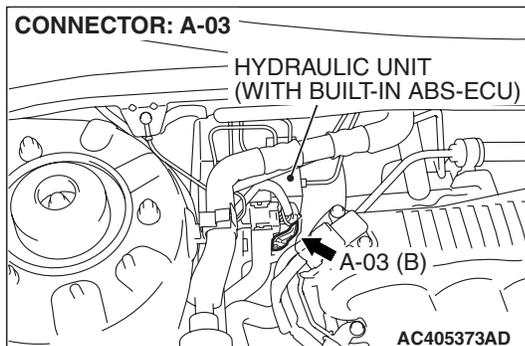
NO : The procedure is complete.

DTC C1215: Rear Left Wheel Speed Sensor (Open Circuit or Short Circuit)

Wheel Speed Sensor Circuit



W6P35M001A



CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set.

Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54C, Trouble code diagnosis P.54C-12).

CIRCUIT OPERATION

- A toothed wheel speed rotor generates a voltage pulse as it moves across the pickup field of each wheel speed sensor.
- The amount of voltage generated at each wheel is determined by the clearance between the wheel speed rotor teeth and the wheel speed sensor, and by the speed of rotation.
- Sends alternating current signals at frequencies which are proportional to the rotation speeds of each wheel to the ABS electronic control unit (ABS/TCL-ECU).
- The ABS hydraulic unit modulates the amount of braking force individually applied to each wheel cylinder.

ABS/TCL DTC SET CONDITIONS

The ABS/TCL-ECU monitors voltage fluctuation in each wheel speed sensor circuit. If the ECU detects a short or open circuit in the circuit, it will set a diagnostic trouble code.

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

- Malfunction of the wheel speed sensor
- Damaged wiring harness or connector
- Malfunction of the hydraulic unit (integrated with ABS/TCL-ECU)

Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness in wheel speed sensor circuit. For diagnosis procedures, refer to "How to treat past trouble" (Refer to GROUP 00, How to treat past trouble [P.00-16](#)).

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
- MB991997: ASC Check Harness

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

⚠ CAUTION

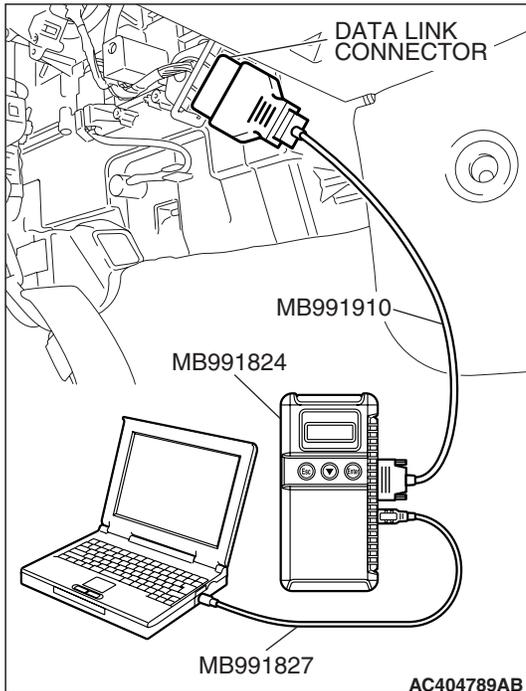
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

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

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

YES : Go to Step 3

NO : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis P.54C-14). Then go to Step 2.



STEP 2. Recheck for diagnostic trouble code.

⚠ CAUTION

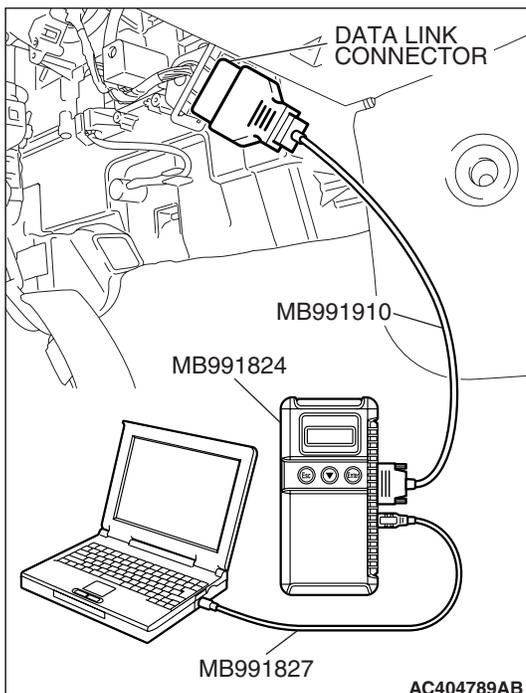
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

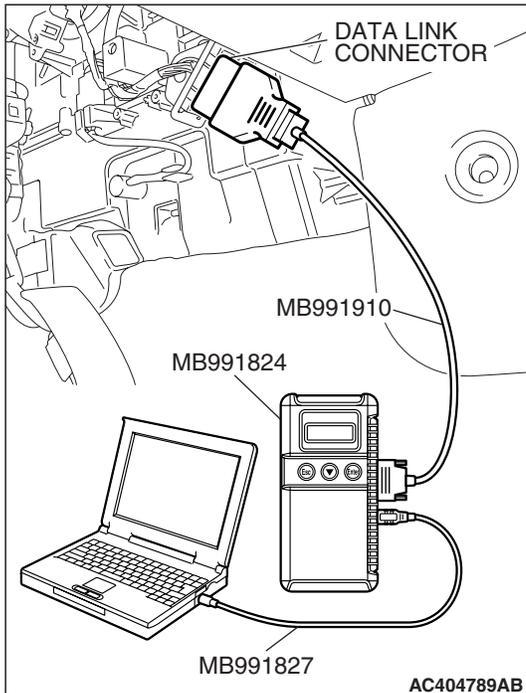
- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1215 set?

YES : Go to Step 3

NO : The procedure is complete.





STEP 3. Using scan tool MB991958, check data list.

⚠ 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) Start the engine.
- (3) Set scan tool MB991958 to the data reading mode, and check the data list items by driving the vehicle (Refer to [P.35C-153](#)).
 - Item 04: Rear left wheel speed sensor
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

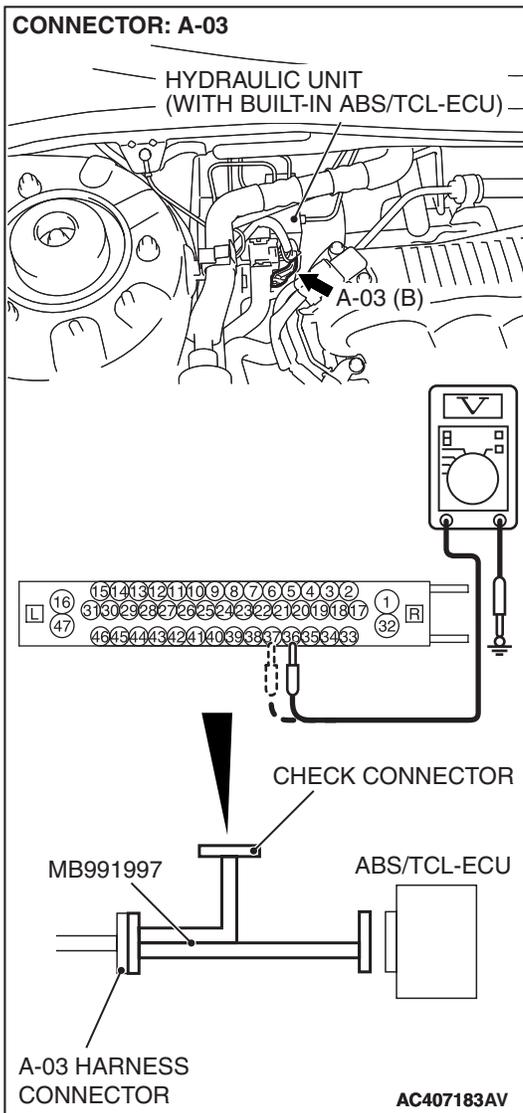
Q: Does the speedometer indication match the scan tool indication?

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 : Go to Step 4.



STEP 4. Measure the voltage at ABS/TCL-ECU connector A-03.

(1) Disconnect the connector A-03, and connect special tool MB991997 to the wiring harness-side connector.

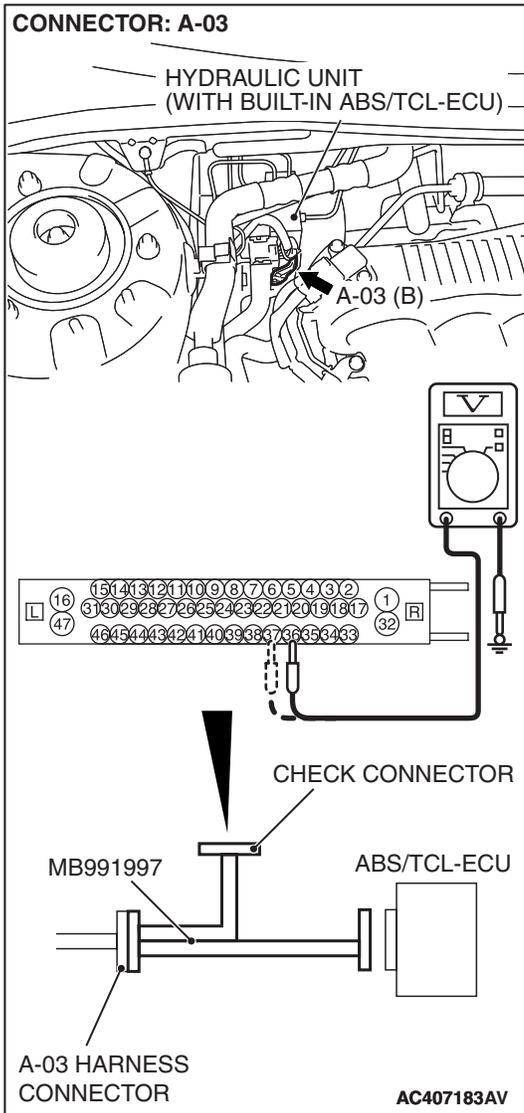
NOTE: Do not connect special tool MB991997 to the ABS/TCL-ECU.

- (2) Turn the ignition switch to the "ON" position.
- (3) Measure the voltage between terminal 36 and body ground, and between terminal 37 and body ground. It should be 1V or less.

Q: Does the voltage measure 1 V or less?

YES : Go to Step 5.

NO : Go to Step 7.



STEP 5. Measure the resistance at ABS/TCL-ECU connector A-03.

- (1) Disconnect the connector A-03, and connect special tool MB991997 to the wiring harness-side connector.

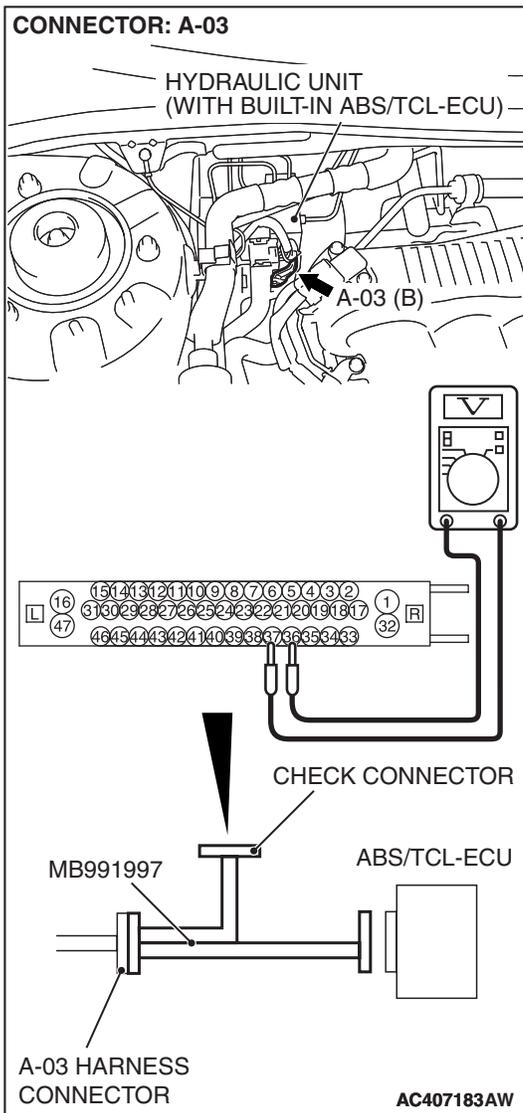
NOTE: Do not connect special tool MB991997 to the ABS/TCL-ECU.

- (2) Measure the resistance between terminal 36 and body ground, and between terminal 37 and body ground. There should be no continuity.

Q: Does continuity exist?

YES : Go to Step 7.

NO : Go to Step 6.



STEP 6. Measure the resistance at the ABS/TCL-ECU connector A-03.

- (1) Disconnect the connector A-03, and connect special tool MB991997 to the wiring harness-side connector.

NOTE: Do not connect special tool MB991997 to the ABS/TCL-ECU.

- (2) Measure the resistance between the ABS/TCL-ECU connector terminals 36 and 37.

Standard Value: 1.24 –1.64 kΩ

Q: Is the resistance between terminals 36 and 37 within the standard value?

YES : Go to Step 10.

NO : Go to Step 7.

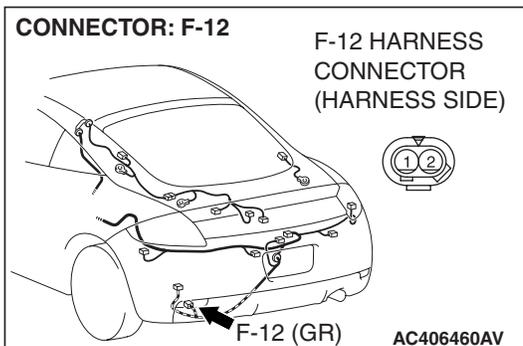
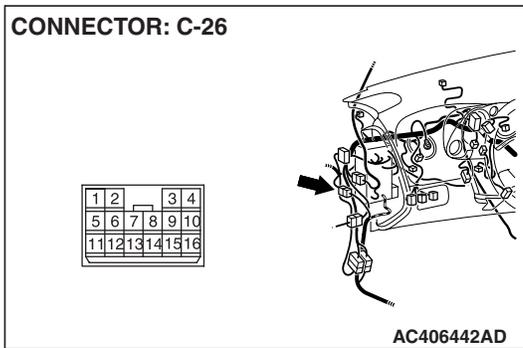
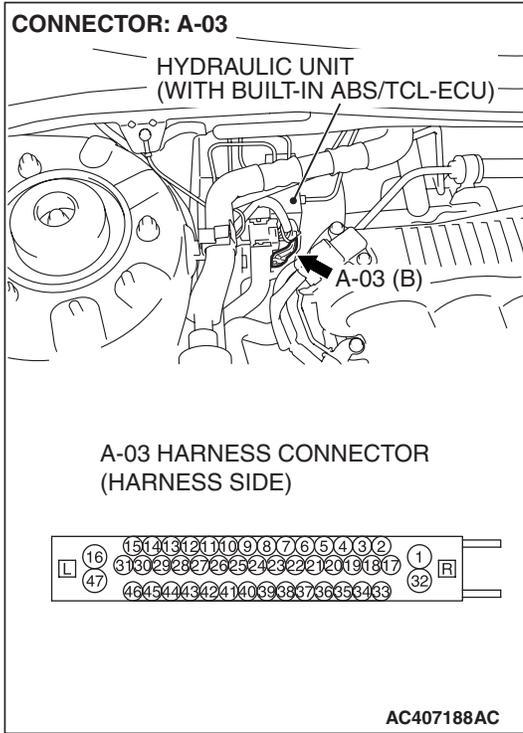
STEP 7. Check ABS/TCL-ECU connector A-03, intermediate connector C-26 and wheel speed sensor <rear: LH> connector F-12 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

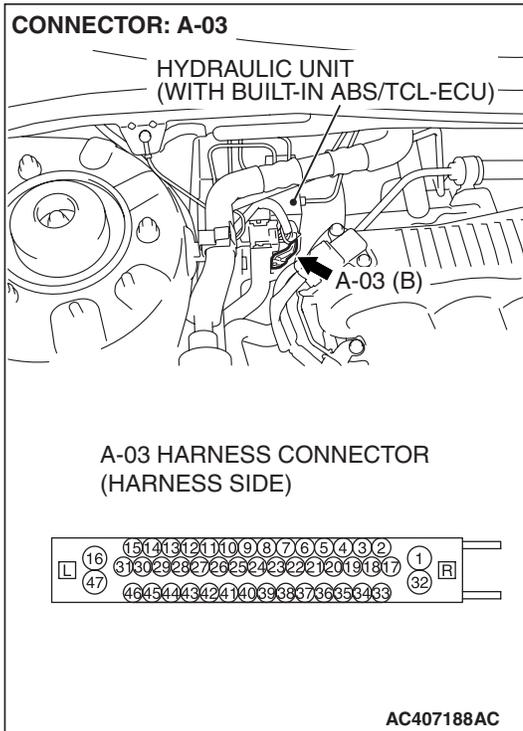
Q: Are ABS/TCL-ECU connector A-03, intermediate connector C-26 and wheel speed sensor <rear: LH> connector F-12 damaged?

YES : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection

P.00E-2. Then go to Step 11.

NO : Go to Step 8.



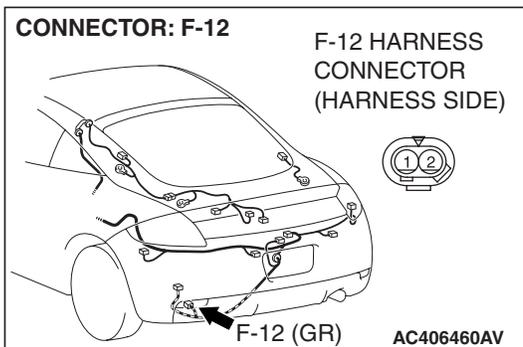


STEP 8. Check the harness wires between ABS/TCL-ECU connector A-03 (terminal 36, 37) and wheel speed sensor <rear: LH> connector F-12 (terminal 1, 2).

Q: Is the harness wire between ABS/TCL-ECU connector A-03 (terminal 36, 37) and wheel speed sensor <rear: LH> connector F-12 (terminal 1, 2) damaged?

YES : Repair the wiring harness. Then go to Step 11.

NO : Go to Step 9.



STEP 9. Inspect the wheel speed sensor.

Check the wheel speed sensor relevant to the DTC code. For the applicable inspection procedure, refer to [P.35B-146](#).

- When DTC code C1215 is set: Rear left wheel speed sensor

Q: Is the wheel speed sensor damaged?

YES : Replace the wheel speed sensor. Then go to Step 11.

NO : Go to Step 4.

STEP 10. Recheck for 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.

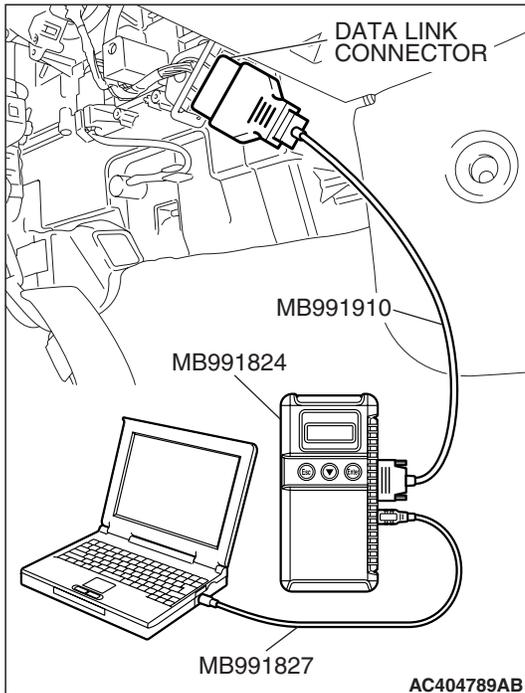
Check again if the DTC is set.

- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is reset.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1215 set?

YES : Replace the hydraulic unit (integrated with ABS/TCL-ECU). Then go to Step 11.

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 11. Recheck for diagnostic trouble code.****⚠ CAUTION**

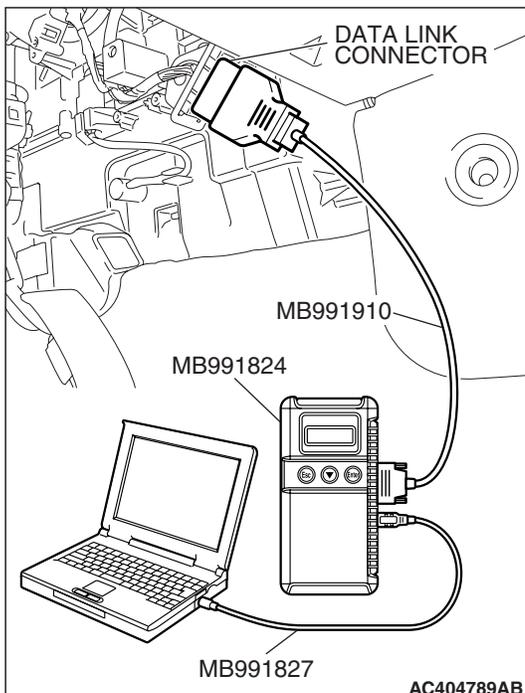
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1215 set?

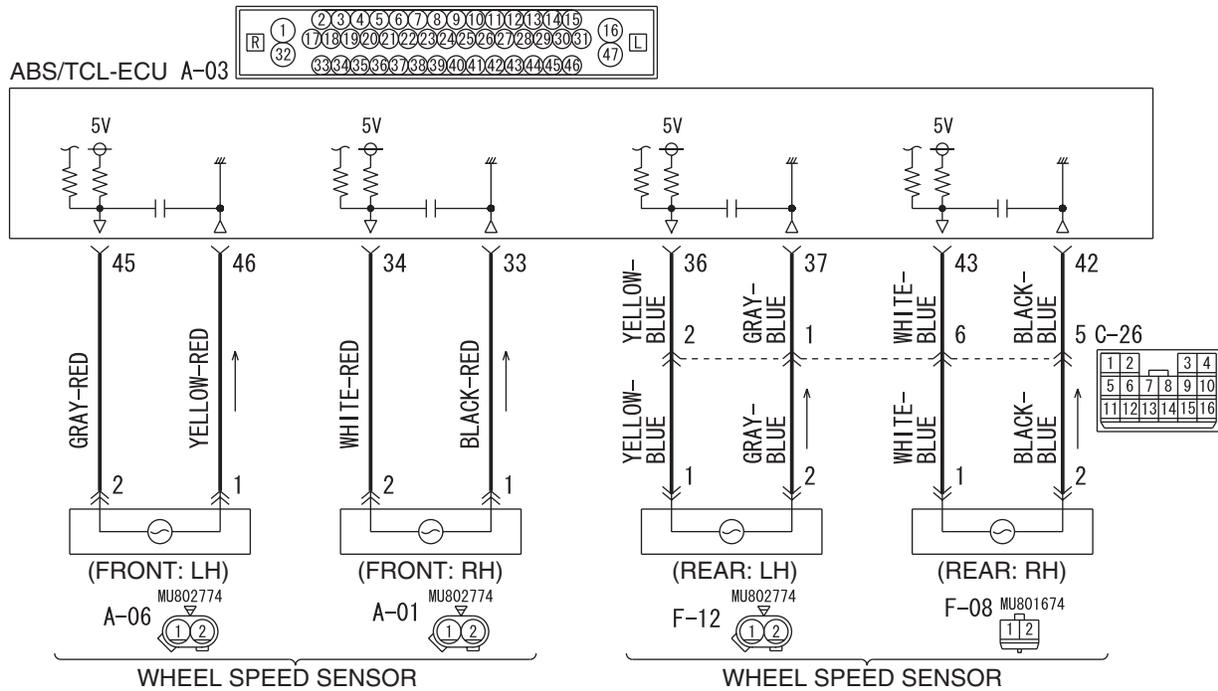
YES : Repeat the troubleshooting from Step 1.

NO : The procedure is complete.

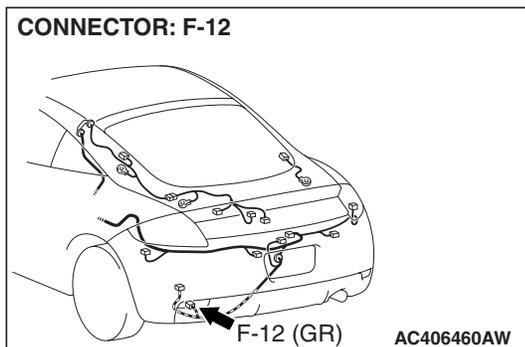
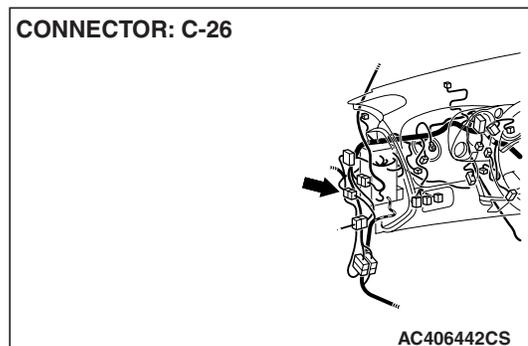
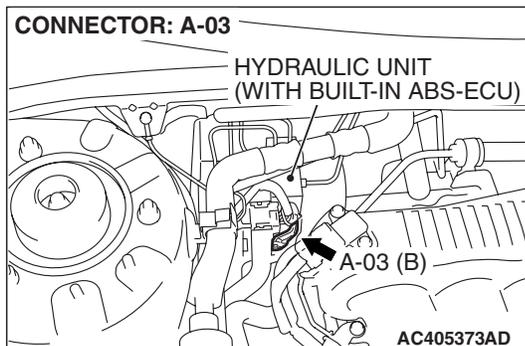


DTC C1216: Rear Left Wheel Speed Sensor (Abnormal Output Signal)

Wheel Speed Sensor Circuit



W6P35M001A



⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54C, Trouble code diagnosis P.54C-12).

CIRCUIT OPERATION

- A toothed wheel speed rotor generates a voltage pulse as it moves across the pickup field of each wheel speed sensor.
- The amount of voltage generated at each wheel is determined by the clearance between the wheel speed rotor teeth and the wheel speed sensor, and by the speed of rotation.
- Sends alternating current signals at frequencies which are proportional to the rotation speeds of each wheel to the ABS electronic control unit (ABS/TCL-ECU).
- The ABS hydraulic unit modulates the amount of braking force to front wheel cylinders individually to activate the TCL system.

ABS/TCL DTC SET CONDITIONS

The ABS/TCL-ECU monitors the signals from each wheel speed sensor while the vehicle is being driven. If any fault below is found in these sensor signals, the ECU will set the relevant diagnostic trouble code.

- Missing sensor signal
- Sensor signal, which will not be created under normal operation
- Significant difference among the wheel speed sensor signals

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

- Malfunction of the wheel speed sensor or wheel speed rotor
- Damaged wiring harness or connector
- Malfunction of the hydraulic unit (integrated with ABS/TCL-ECU)

Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness in wheel speed sensor circuit. For diagnosis procedures, refer to "How to treat past trouble" (Refer to GROUP 00, How to treat past trouble P.00-16).

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
- MB991997: ASC Check Harness

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

⚠ CAUTION

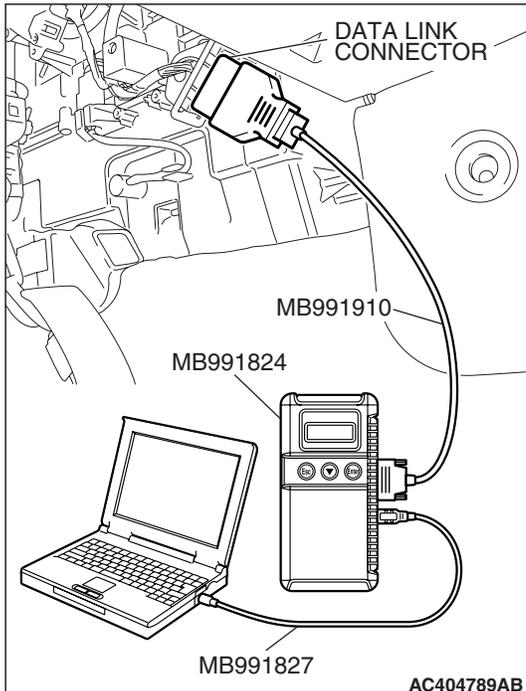
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

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

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

YES : Go to Step 3

NO : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis P.54C-14). Then go to Step 2.



STEP 2. Recheck for diagnostic trouble code.

⚠ CAUTION

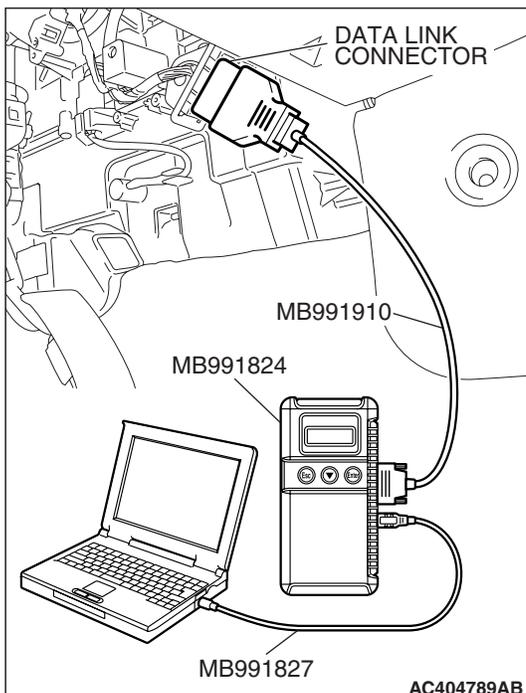
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

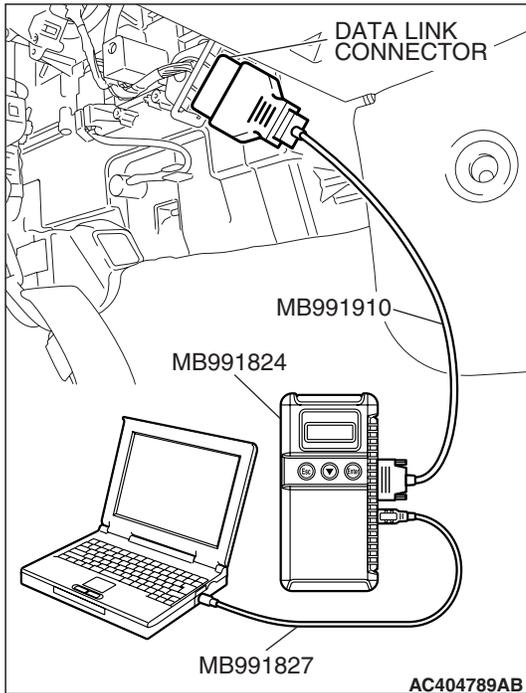
- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1216 set?

YES : Go to Step 3

NO : The procedure is complete.





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.

Use scan tool MB991958 to check whether DTC code C1215 have been set simultaneously.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Check whether DTC C1215 have been set.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1215 set?

YES : Carry out diagnosis relevant to DTC C1215 (Refer to [P.35C-69](#)).

NO : Go to Step 4.

STEP 4. Check the installation condition of the wheel speed sensors.

For the wheel speed sensor, which the DTC code indicates, check whether the sensor or its mounting bolts are loosened.

- DTC C1216 is set: Rear left wheel speed sensor

Q: Is the wheel speed sensor installed correctly?

YES : Go to Step 5.

NO : Reinstall the wheel speed sensor correctly. Then go to Step 13.

STEP 5. Check the wheel speed sensor after it is removed from the vehicle.

Check the wheel speed sensor which the DTC code indicates (Refer to [P.35B-146](#)).

- DTC C1216 is set: Rear left wheel speed sensor

Q: Is the wheel speed sensor in good condition?

YES : Go to Step 6.

NO : Replace the wheel speed sensor (Refer to [P.35B-145](#)). Then go to Step 13.

STEP 6. Check the wheel bearing for looseness.

NOTE: If the wheel bearing is loose, the gap between the wheel speed sensor and rotor may become excessive. Check the wheel bearing, which DTC code indicates, for looseness.

- DTC C1216 is set: Check the rear left wheel bearing (Refer to GROUP 27, On-vehicle service –Wheel bearing end play check [P.27-4](#)).

Q: Is the wheel bearing end play within the standard value?

YES : Go to Step 7.

NO : Replace the rear hub assembly (Refer to GROUP 27, Rear axle hub assembly [P.27-4](#)).

STEP 7. Check the wheel speed rotor.

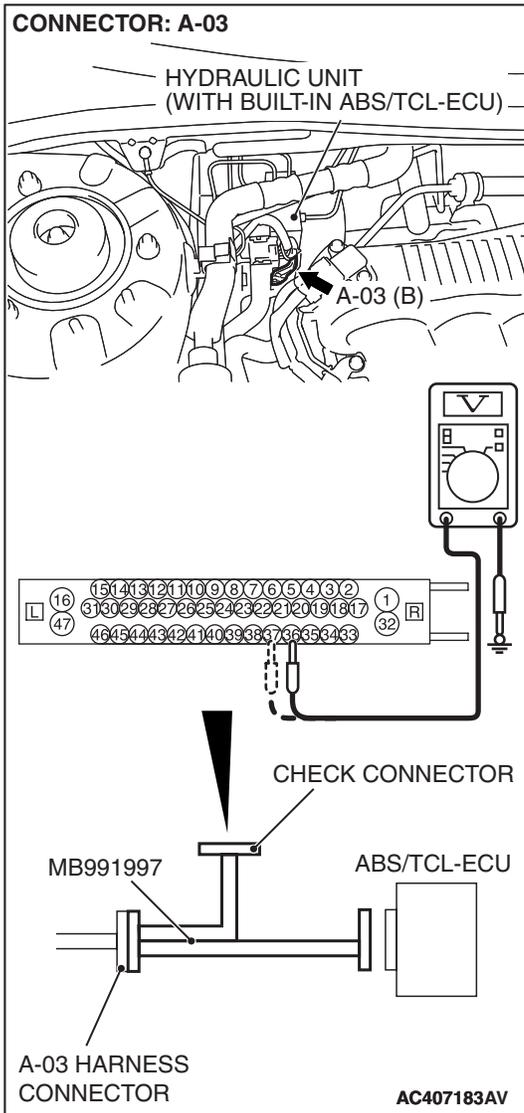
Check the wheel speed rotor, which DTC code indicates, for foreign material or deformation.

- DTC C1216 is set: Rear left wheel speed sensor

Q: Is the wheel speed rotor in good condition?

YES : Go to Step 8.

NO : If the wheel speed rotor is contaminated with foreign material, clean it. If the wheel speed rotor is deformed, replace it (Refer to GROUP 27, Rear axle hub assembly [P.27-6](#)).



STEP 8. Measure the voltage at ABS/TCL-ECU connector A-03.

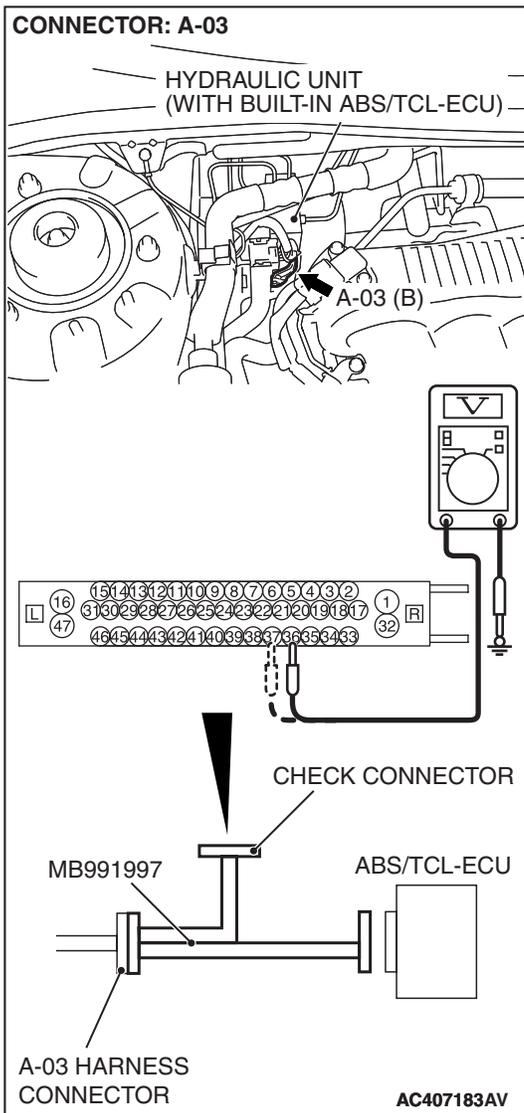
(1) Disconnect the connector A-03, and connect special tool MB991997 to the wiring harness-side connector.

NOTE: Do not connect special tool MB991997 to the ABS/TCL-ECU.

- (2) Turn the ignition switch to the "ON" position.
- (3) Measure the voltage between terminal 36 and body ground, and between terminal 37 and body ground. It should be 1V or less.

Q: Does the voltage measure 1 V or less?

- YES :** Go to Step 9.
- NO :** Go to Step 11.



STEP 9. Measure the resistance at ABS/TCL-ECU connector A-03.

- (1) Disconnect the connector A-03, and connect special tool MB991997 to the wiring harness-side connector.

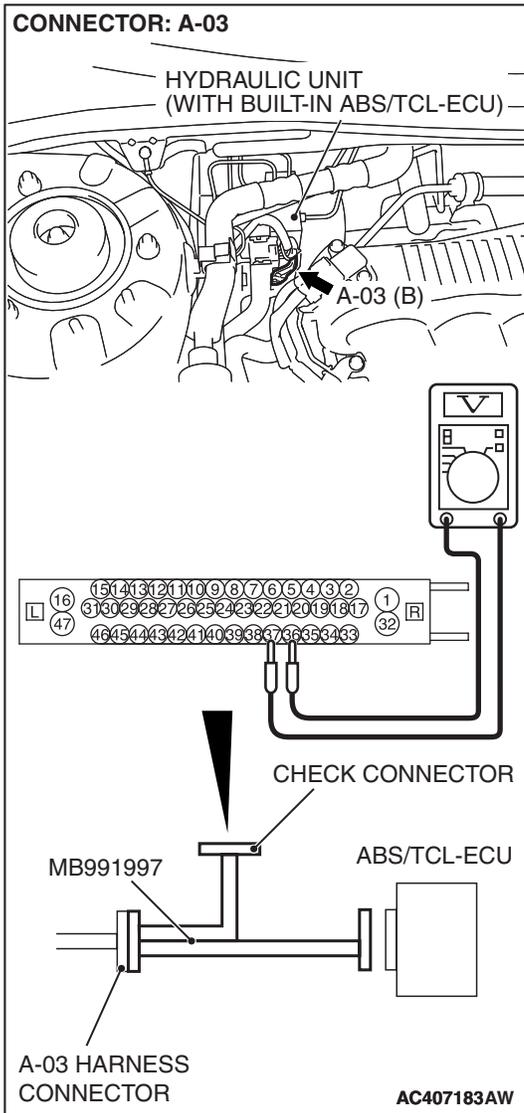
NOTE: Do not connect special tool MB991997 to the ABS/TCL-ECU.

- (2) Measure the resistance between terminal 36 and body ground, and between terminal 37 and body ground. There should be no continuity.

Q: Does continuity exist?

YES : Go to Step 11.

NO : Go to Step 10.



STEP 10. Measure the resistance at ABS/TCL-ECU connector A-03.

- (1) Disconnect the connector A-03, and connect special tool MB991997 to the wiring harness-side connector.

NOTE: Do not connect special tool MB991997 to the ABS/TCL-ECU.

- (2) Measure the resistance between signal terminal 36 and ground terminal 37.

Standard Value: 1.24 –1.64 kΩ

Q: Is the resistance between terminals 36 and 37 within the standard value?

YES : Go to Step 12.

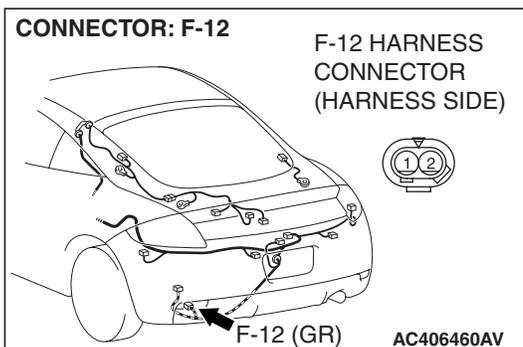
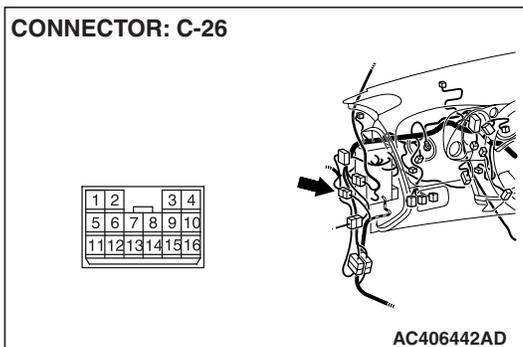
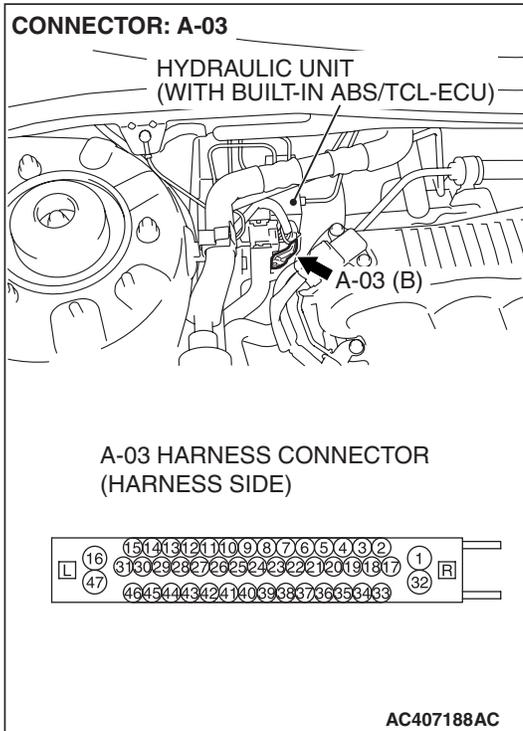
NO : Go to Step 11.

STEP 11. Check ABS/TCL-ECU connector A-03, intermediate connector C-26 and wheel speed sensor <Rear: LH> connector F-12 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are ABS/TCL-ECU connector A-03, intermediate connector C-26 and wheel speed sensor <Rear: LH> connector F-12 damaged?

YES : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 13.

NO : Open or short circuit may be present in the rear left wheel speed sensor circuit. Repair the wiring harness between ABS/TCL-ECU connector A-03 (terminals 36 and 37) and rear left wheel speed sensor F-12 (terminals 1 and 2). Then go to Step 13.



STEP 12. Recheck for diagnostic trouble code.**⚠ CAUTION**

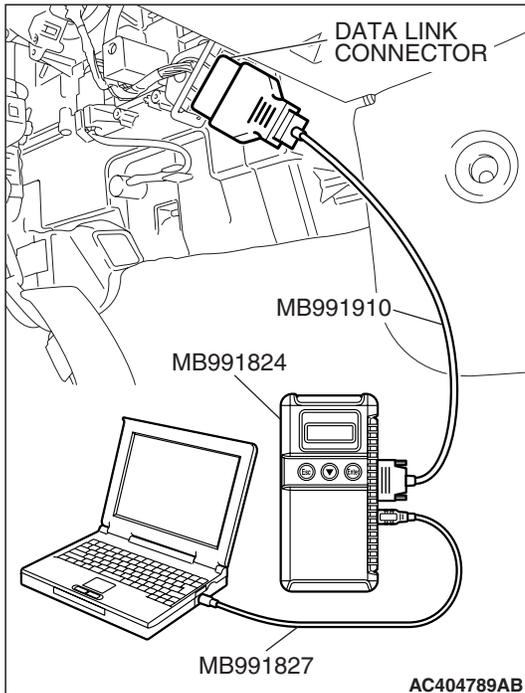
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

Check again if the DTC is set.

- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1216 set?

- YES** : Replace the hydraulic unit (integrated with ABS/TCL-ECU). Then go to Step 13.
- 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 13. Recheck for diagnostic trouble code.****⚠ CAUTION**

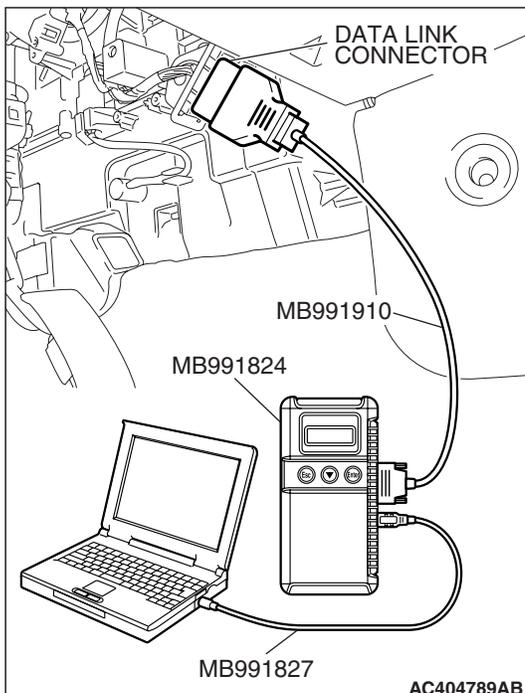
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

Check again if the DTC is set.

- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

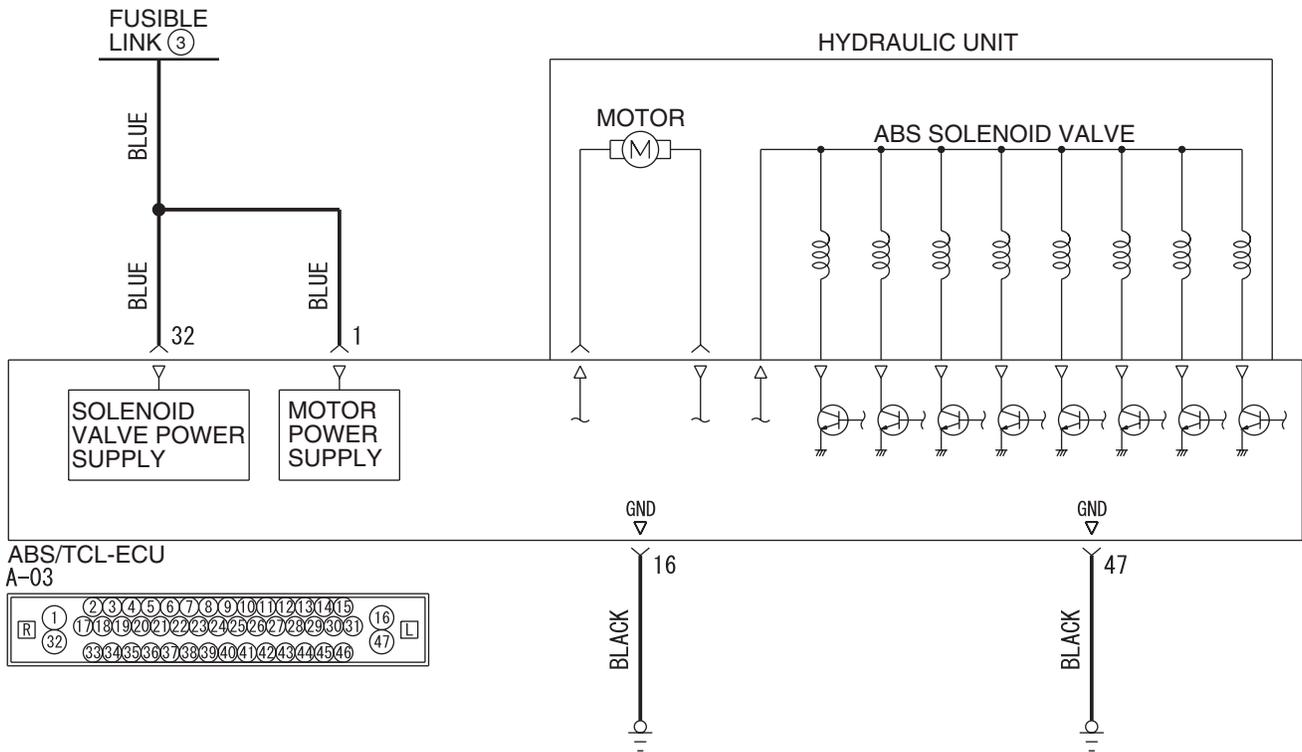
Q: Is DTC C1216 set?

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

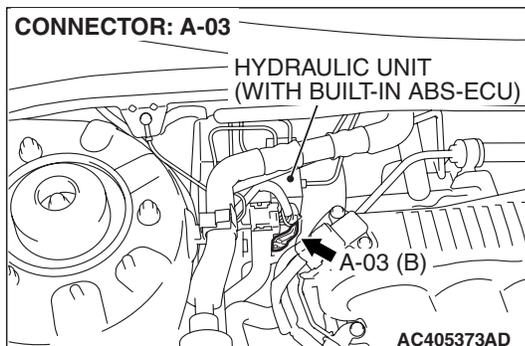


- DTC C1226: ABS Front Right Solenoid Valve (Pressure Holding System)
- DTC C1231: ABS Front Right Solenoid Valve (Depressurizing System)
- DTC C1236: ABS Front Left Solenoid Valve (Pressure Holding System)
- DTC C1241: ABS Front Left Solenoid Valve (Depressurizing System)
- DTC C1246: ABS Rear Right Solenoid Valve (Pressure Holding System)
- DTC C1251: ABS Rear Right Solenoid Valve (Depressurizing System)
- DTC C1256: ABS Rear Left Solenoid Valve (Pressure Holding System)
- DTC C1261: ABS Rear Left Solenoid Valve (Depressurizing System)
- DTC C1300: Front Right Cut Valve
- DTC C1305: Front Right Suction Valve
- DTC C1310: Front Left Cut Valve
- DTC C1315: Front Left Suction Valve

Solenoid Valve and Motor Power Supply Circuit



W6P35M003A



⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54C, Trouble code diagnosis P.54C-12).

CIRCUIT OPERATION

- The ABS/TCL-ECU contains the power supply circuit (terminal 32) for the solenoid valve. The solenoid valve is energized by the valve relay, which is integrated in the ABS/TCL-ECU.
- The valve relay, which is integrated in the ABS/TCL-ECU, is always energizing the solenoid valve unless the initial check is in progress when the ignition switch is turned on.
- The ABS/TCL-ECU activates the solenoid valve by turning on its driving transistor.

ABS/TCL DTC SET CONDITIONS

These diagnostic trouble codes will be set under the cases below.

DTC C1226, C1231, C1236, C1241, C1246, C1251, C1256 and C1261

- The solenoid valve is not energized even after the ABS/TCL-ECU has turned on the driving transistor (Open circuit is present in the power supply circuit to the ABS/TCL-ECU solenoid valve, or the valve relay has failed).
- The solenoid valve is not energized even after the ABS/TCL-ECU has turned on the driving transistor (Open circuit is present in the solenoid valve circuit inside the ABS/TCL-ECU, or the valve relay has failed).
- After the ABS/TCL-ECU has turned off the driving transistor, the solenoid valve still remains energized (short in the solenoid valve circuit).
- When a solenoid valve failure is detected

DTC C1300, C1305, C1310 and C1315

- The cut valve and suction valve are not energized even after the ABS/TCL-ECU has turned on the driving transistor (Open circuit is present in the power supply circuit to the ABS/TCL-ECU cut valve and suction valve, or the valve relay has failed).
- The cut valve and suction valve are not energized even after the ABS/TCL-ECU has turned on the driving transistor (Open circuit is present in the cut valve and suction valve circuit inside the ABS/TCL-ECU, or the valve relay has failed).
- After the ABS/TCL-ECU has turned off the driving transistor, the cut valve and suction valve still remains energized (short in the cut valve and suction valve circuit).
- When a cut valve or suction valve failure is detected

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

- Damaged wiring harness or connector
- Malfunction of the hydraulic unit (integrated with ABS/TCL-ECU)

PAST TROUBLE

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness between the power supply circuit (terminal 32) to the ABS/TCL-ECU solenoid valve or cut valve or suction valve ground circuit (terminal 16). For diagnosis procedures, refer to "How to treat past trouble" (Refer to GROUP 00, How to treat past trouble P.00-16).

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
- MB991997: ASC Check Harness

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

⚠ CAUTION

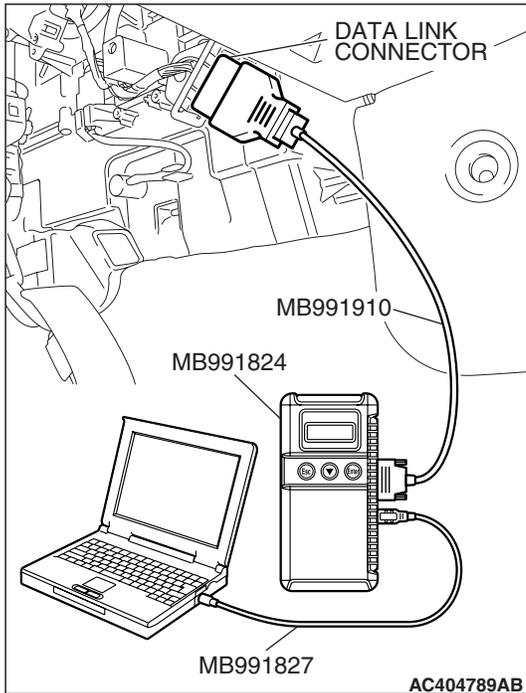
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

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

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

YES : Go to Step 3.

NO : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis P.54C-14). Then go to Step 2.



STEP 2. Recheck for diagnostic trouble code.

⚠ CAUTION

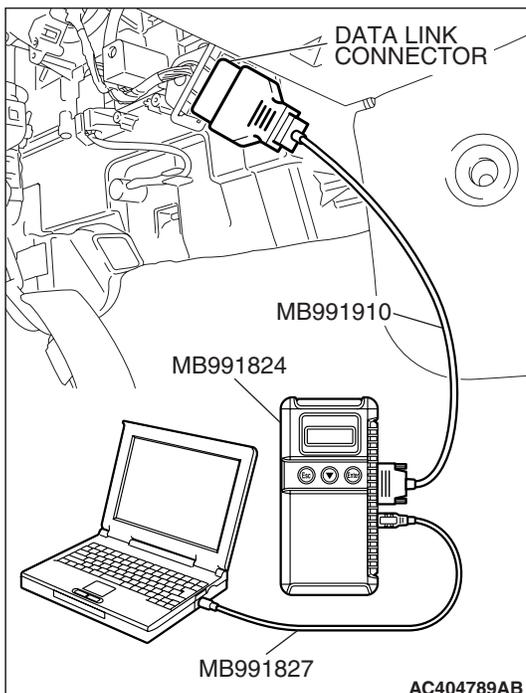
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

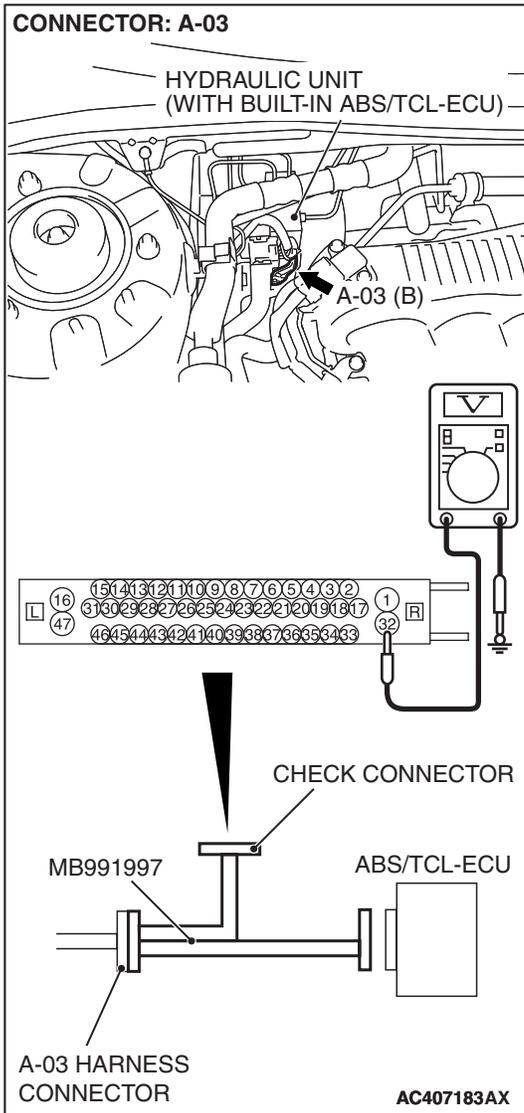
- (1) Erase the DTC.
- (2) Turn the ignition switch to the "ON" position.
- (3) Check if the DTC is set.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1226, C1231, C1236, C1241, C1246, C1251, C1256, C1261, C1300, C1305, C1310 or C1315 set?

YES : Go to Step 3.

NO : The procedure is complete.





STEP 3. Measure the voltage at ABS/TCL-ECU connector A-03.

(1) Disconnect the connector A-03, and connect special tool MB991997 to the wiring harness-side connector.

NOTE: Do not connect special tool MB991997 to the ABS/TCL-ECU.

- (2) Turn the ignition switch to the "ON" position.
- (3) Measure the voltage between terminal 32 and ground. It should be approximately 12 volts (battery positive voltage).

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

YES : Go to Step 5.

NO : Go to Step 4.

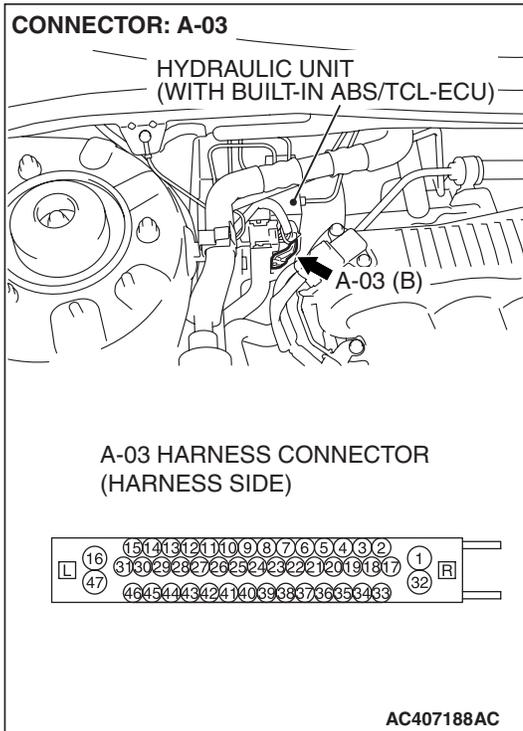
STEP 4. Check ABS/TCL-ECU connector A-03 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

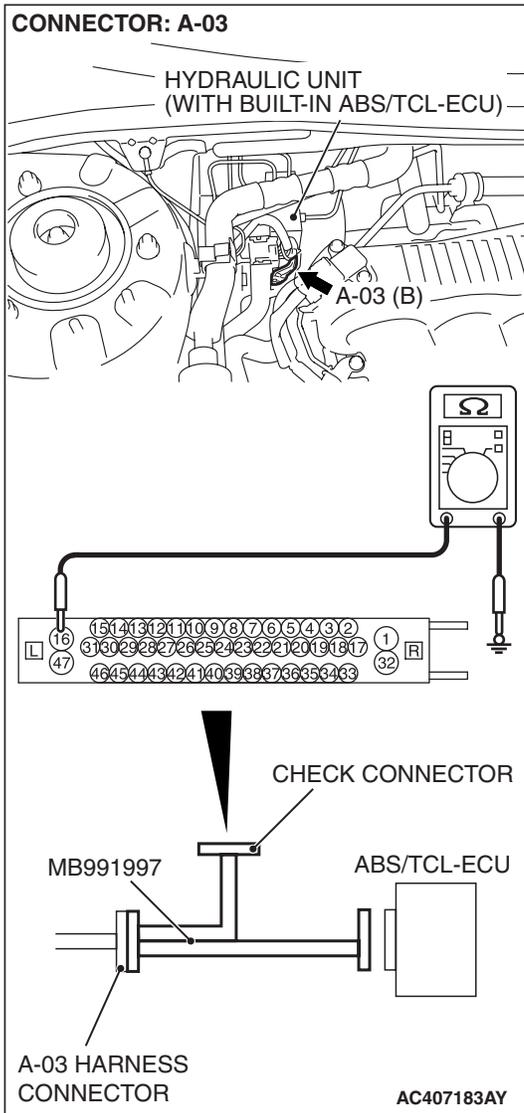
Q: Is ABS/TCL-ECU connector A-03 damaged?

YES : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection

[P.00E-2](#). Then go to Step 8.

NO : An open or short circuit may be present in the solenoid valve power supply circuit. Repair the wiring harness between ABS/TCL-ECU connector A-03 terminal 26 and fusible link No.3. Then go to Step 8.





STEP 5. Measure the resistance at ABS/TCL-ECU connector A-03.

(1) Disconnect the connector A-03, and connect special tool MB991997 to the wiring harness-side connector.

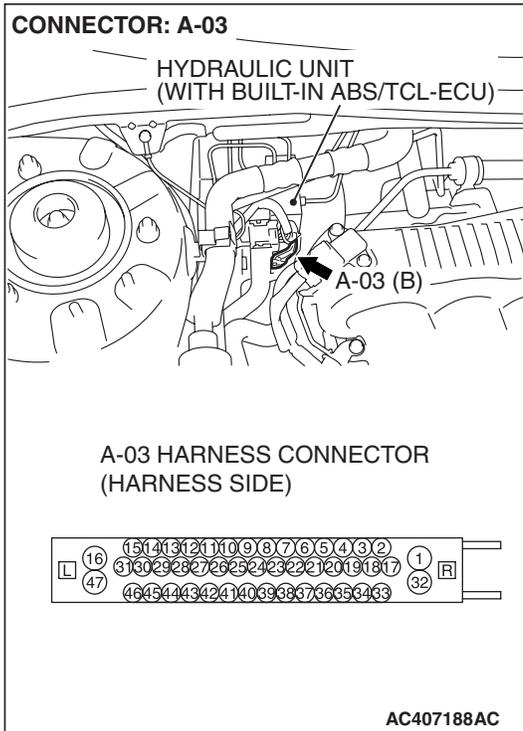
NOTE: Do not connect special tool MB991997 to the ABS/TCL-ECU.

(2) Measure the resistance between terminal 16 and ground. It should be 2 ohms or less.

Q: Is the measured resistance 2 ohms or less?

YES : Go to Step 7.

NO : Go to Step 6.

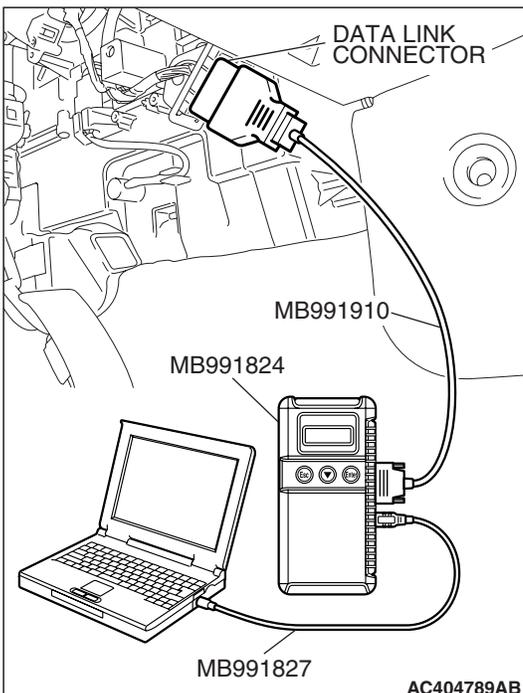


STEP 6. Check ABS/TCL-ECU connector A-03 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is ABS/TCL-ECU connector A-03 damaged?

YES : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 8.

NO : An open circuit may be present in the ground circuit. Repair the wiring harness between ABS/TCL-ECU connector A-03 terminal 32 and the body ground. Then go to Step 8.



STEP 7. Recheck for 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.

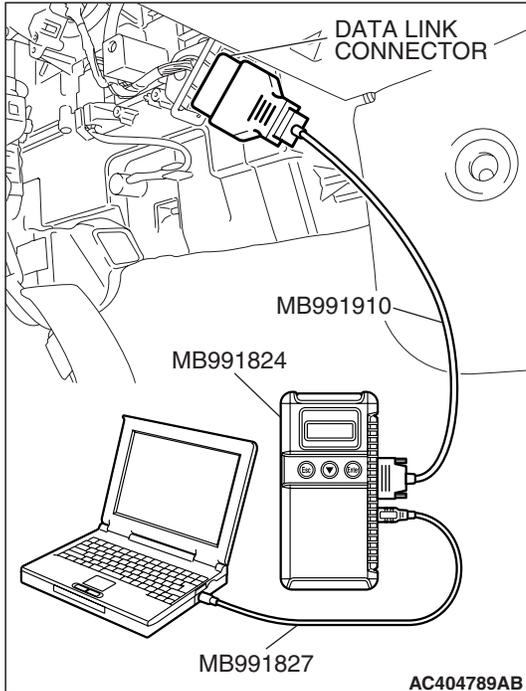
Check again if the DTC is set.

- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1226, C1231, C1236, C1241, C1246, C1251, C1256, C1261, C1300, C1305, C1310 or C1315 set?

YES : Replace the hydraulic unit (integrated with ABS/TCL-ECU). Then go to Step 8.

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 8. Recheck for 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.

Check again if the DTC is set.

- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

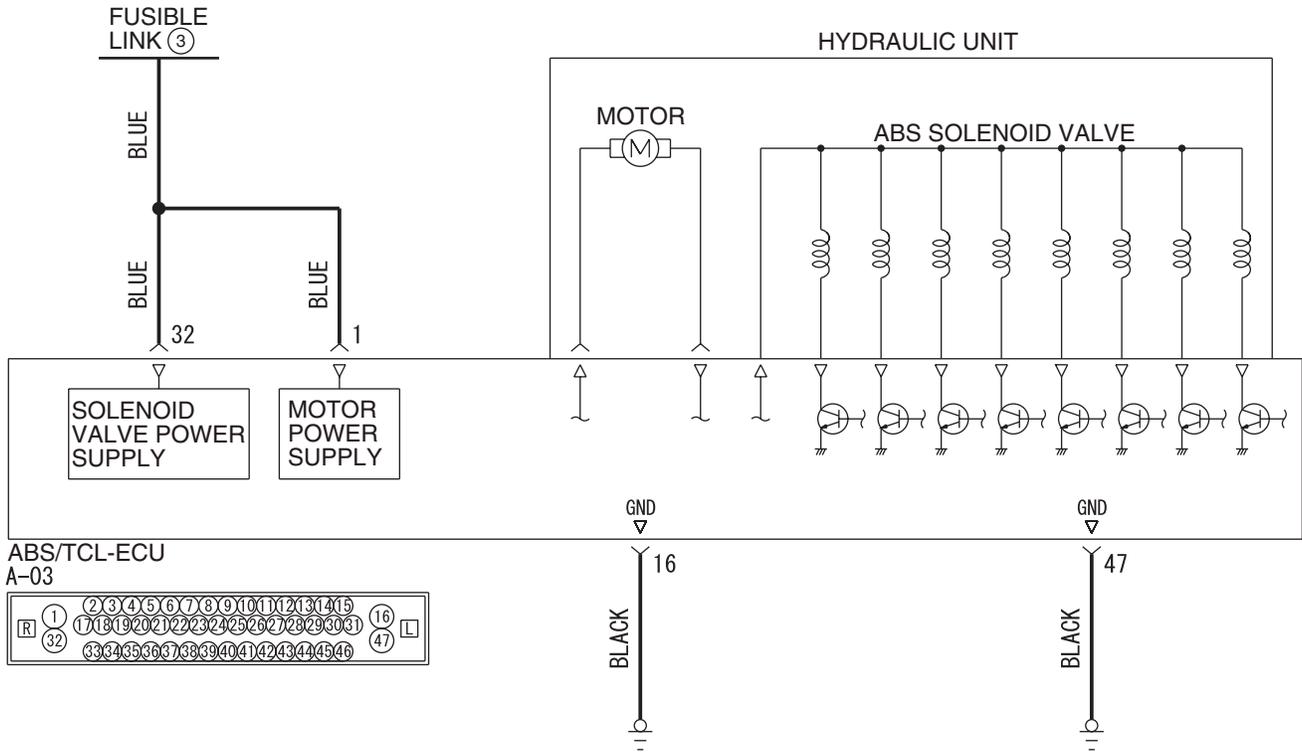
Q: Is DTC C1226, C1231, C1236, C1241, C1246, C1251, C1256, C1261, C1300, C1305, C1310 or C1315 set?

YES : Go to Step 1.

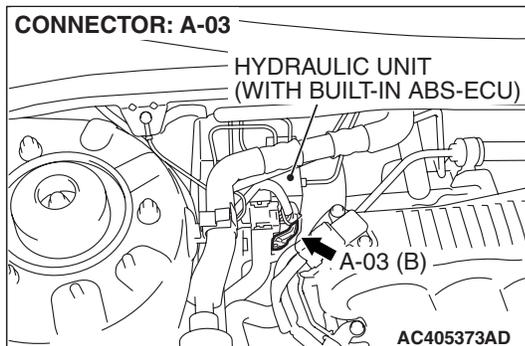
NO : The procedure is complete.

DTC C1271: Motor Circuit Failure

Solenoid Valve and Motor Power Supply Circuit



W6P35M003A



CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54C, Trouble code diagnosis P.54C-12).

CIRCUIT OPERATION

- The ABS/TCL-ECU contains the power supply circuit (terminal 1) for the pump motor. The pump motor is energized by the motor relay, which is integrated in the ABS/TCL-ECU.
- The motor relay, which is integrated in the ABS/TCL-ECU, is always off unless the motor solenoid valve check is activated when the vehicle is started.
- The ABS/TCL-ECU activates the pump motor by turning on the ECU built-in motor relay when the ABS is working.

ABS/TCL DTC SET CONDITIONS

This diagnostic trouble code will be set under the cases below.

- When the voltage supplied to the pump motor is too low.
- When the voltage supplied to the pump motor is too high.

- When the ABS/TCL-ECU judges that the voltage is supplied to the pump motor while the pump motor is stopped.

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

- Damaged wiring harness or connector
- Malfunction of the hydraulic unit (integrated with ABS/TCL-ECU)

PAST TROUBLE

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness between the power supply circuit (terminal 1) to the ABS/TCL-ECU motor or ground circuit (terminal 47). For diagnosis procedures, refer to "How to treat past trouble" (Refer to GROUP 00, How to treat past trouble [P.00-16](#)).

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
- MB991997: ASC Check Harness

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

⚠ CAUTION

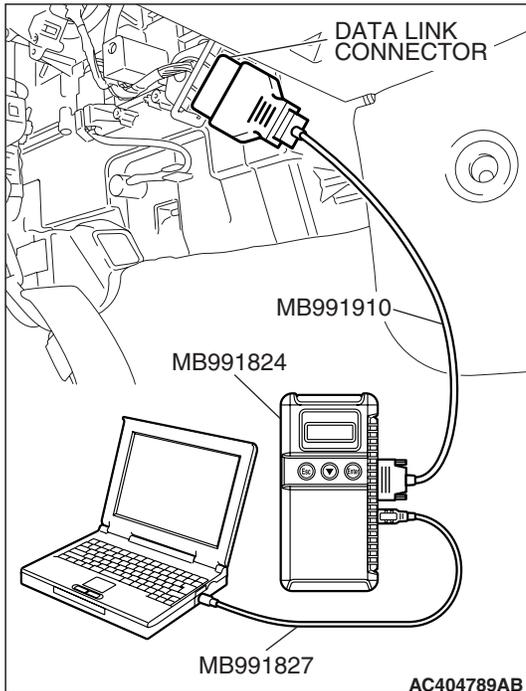
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

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

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

YES : Go to Step 3.

NO : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis P.54C-14). Then go to Step 2.



STEP 2. Recheck for diagnostic trouble code.

⚠ CAUTION

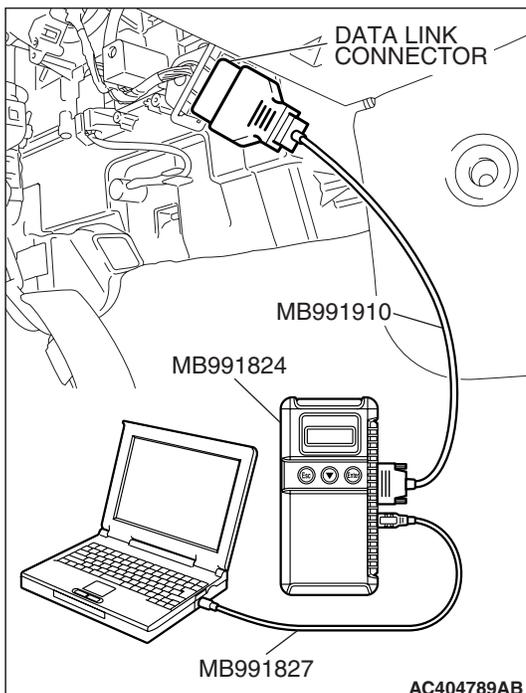
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

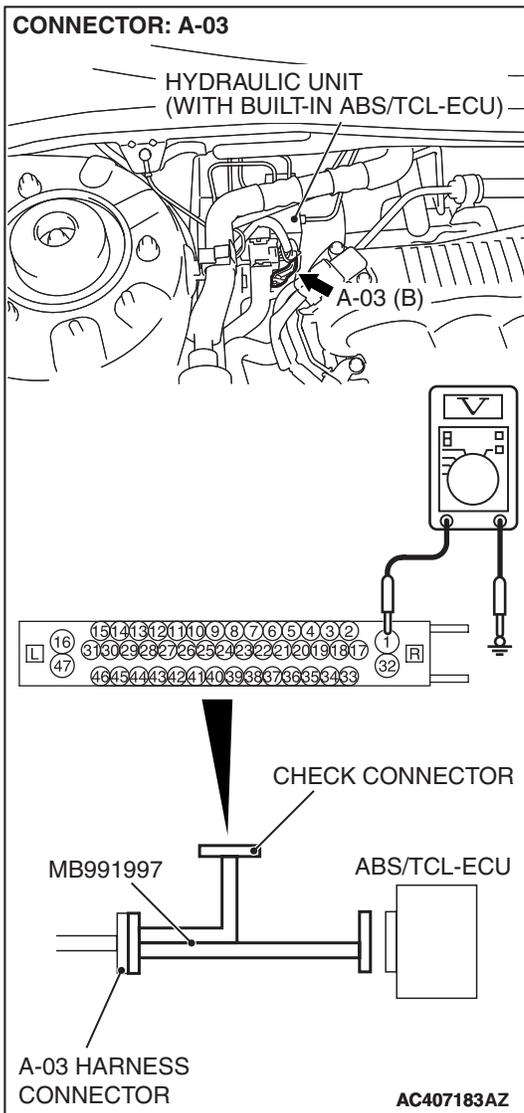
- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1271 set?

YES : Go to Step 3.

NO : The procedure is complete.





STEP 3. Measure the voltage at ABS/TCL-ECU connector A-03.

(1) Disconnect the connector A-03, and connect special tool MB991997 to the wiring harness-side connector.

NOTE: Do not connect special tool MB991997 to the ABS/TCL-ECU.

- (2) Turn the ignition switch to the "ON" position.
- (3) Measure the voltage between terminal 1 and ground. It should be approximately 12 volts (battery positive voltage).

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

YES : Go to Step 5.

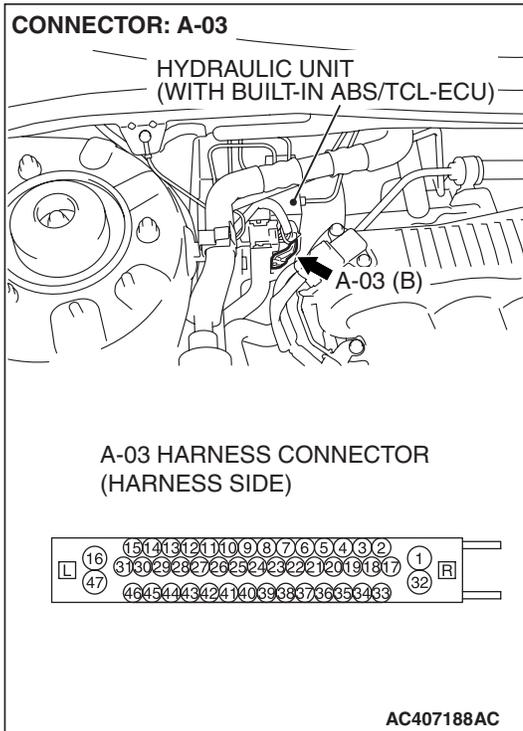
NO : Go to Step 4.

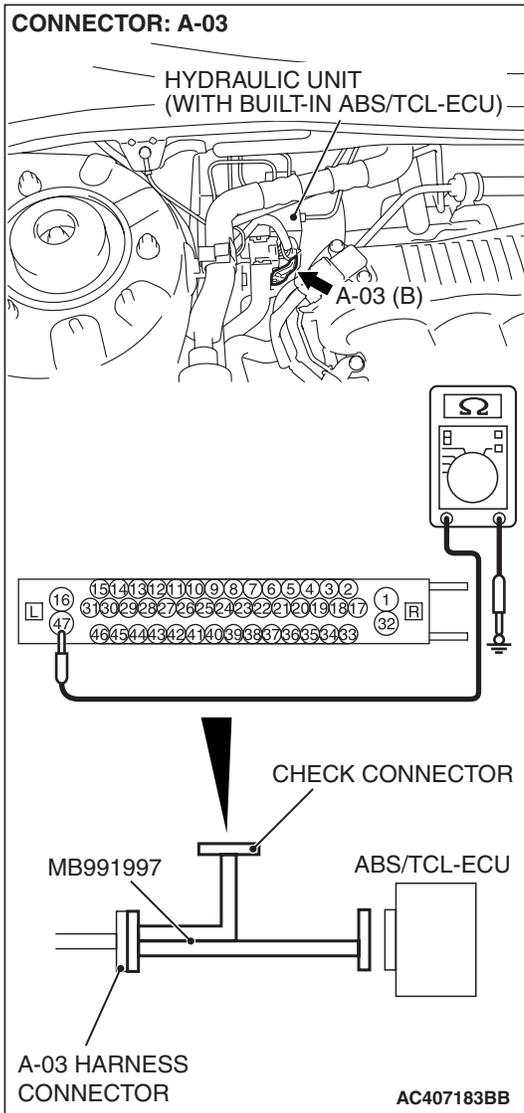
STEP 4. Check ABS/TCL-ECU connector A-03 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is ABS/TCL-ECU connector A-03 damaged?

YES : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then go to Step 8.

NO : An open or short circuit may be present in the solenoid valve power supply circuit. Repair the wiring harness between ABS/TCL-ECU connector A-03 terminal 1 and fusible link No.3. Then go to Step 8.





STEP 5. Measure the resistance at ABS/TCL-ECU connector A-03.

(1) Disconnect the connector A-03, and connect special tool MB991997 to the wiring harness-side connector.

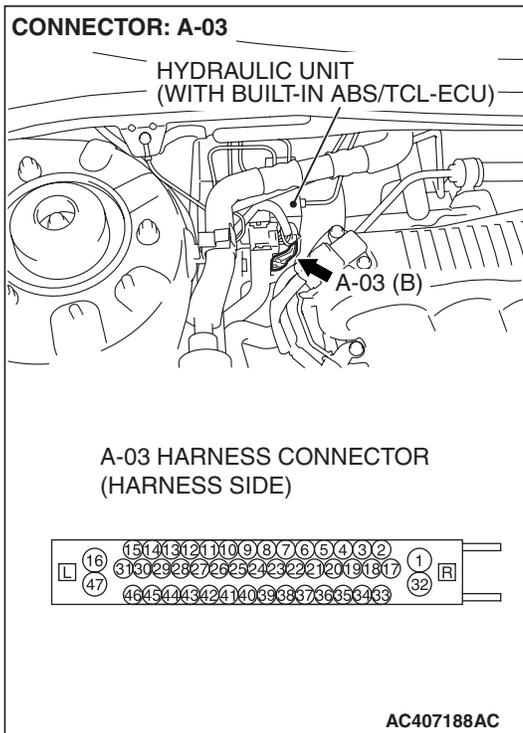
NOTE: Do not connect special tool MB991997 to the ABS/TCL-ECU.

(2) Measure the resistance between terminal 47 and ground. It should be 2 ohms or less.

Q: Is the measured resistance 2 ohms or less?

YES : Go to Step 7.

NO : Go to Step 6.

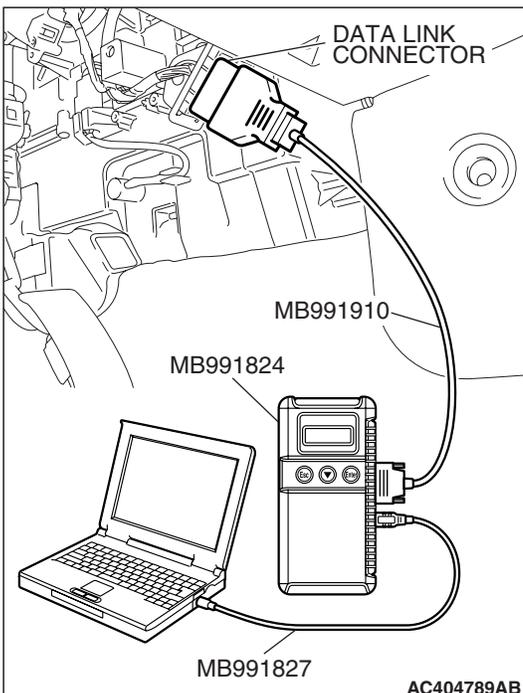


STEP 6. Check ABS/TCL-ECU connector A-03 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is ABS/TCL-ECU connector A-03 damaged?

YES : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 8.

NO : An open circuit may be present in the ground circuit. Repair the wiring harness between ABS/TCL-ECU connector A-03 terminal 1 and the body ground. Then go to Step 8.



STEP 7. Recheck for 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.

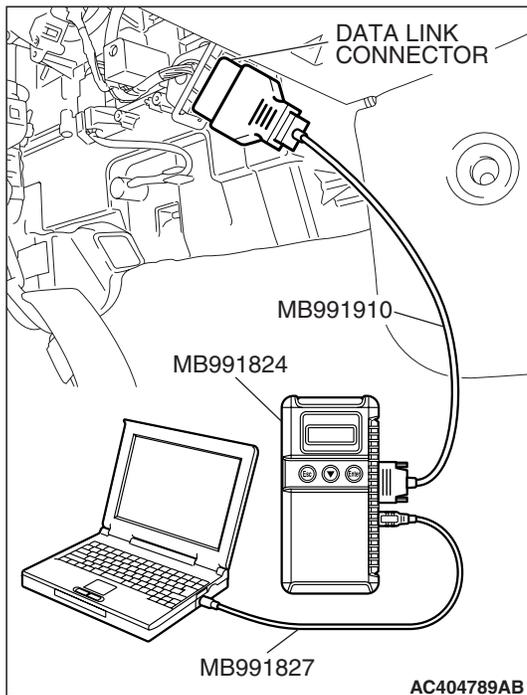
Check again if the DTC is set.

- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1271 set?

YES : Replace the hydraulic unit (integrated with ABS/TCL-ECU). Then go to Step 8.

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 8. Recheck for 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.

Check again if the DTC is set.

- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

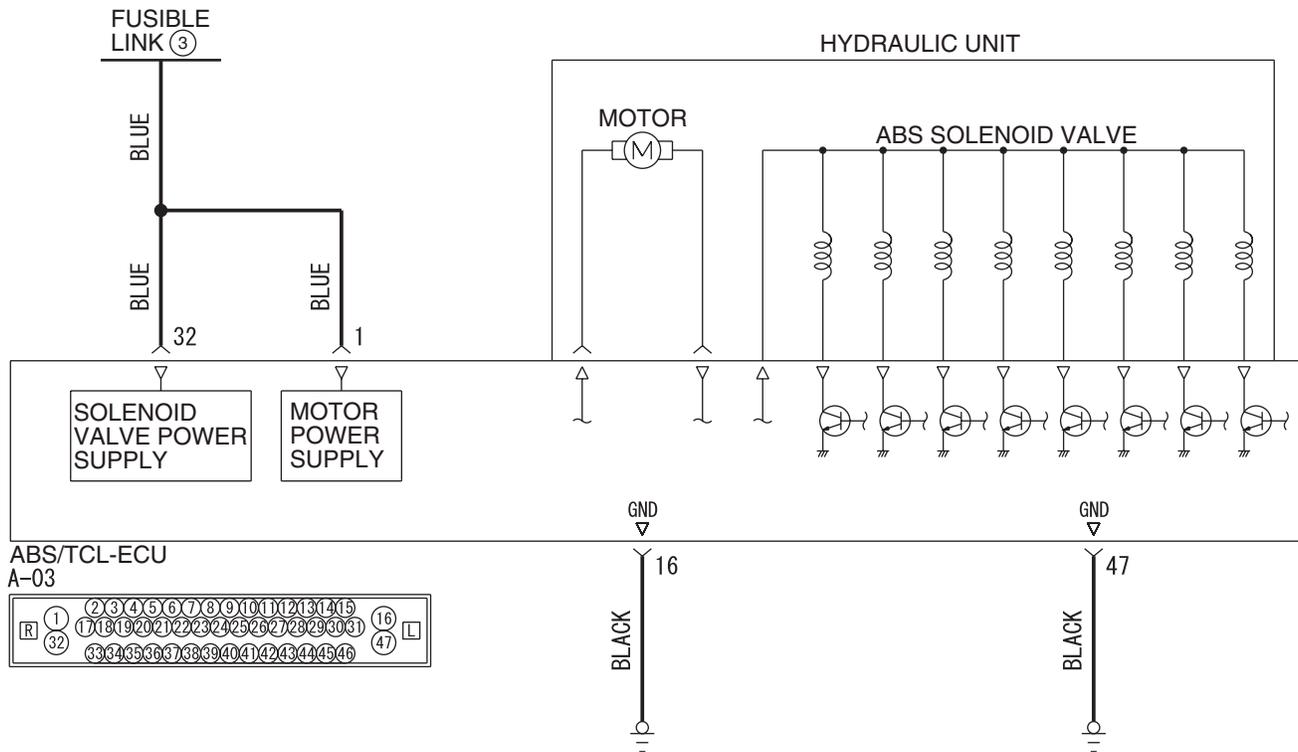
Q: Is DTC C1271 set?

YES : Go to Step 1.

NO : The procedure is complete.

DTC C1276: Power Supply Circuit Failure of Valves

Solenoid Valve and Motor Power Supply Circuit



W6P35M003A

CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54C, Trouble code diagnosis P.54C-12).

CIRCUIT OPERATION

- The ABS/TCL-ECU contains the power supply circuit (terminal 32) for the solenoid valve. The solenoid valve is energized by the valve relay, which is integrated in the ABS/TCL-ECU.
- The valve relay, which is integrated in the ABS/TCL-ECU, is always energizing the solenoid valve unless the initial check is in progress when the ignition switch is turned on.

ABS/TCL DTC SET CONDITIONS

This diagnostic trouble code will be set under the cases below.

- After the ABS/TCL-ECU turned on the valve relay, the solenoid valve is not energized (valve relay OFF failure).

- After the ABS/TCL-ECU turned off the valve relay, the solenoid valve still remains energized (valve relay ON failure).

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

Current trouble

- Damaged wiring harness or connector
- Malfunction of the hydraulic unit (integrated with ABS/TCL-ECU)

PAST TROUBLE

Carry out diagnosis with particular emphasis on connector(s) or wiring harness between the power supply circuit (terminal 32) to the ABS/TCL-ECU solenoid valve or ground circuit (terminal 16). For diagnosis procedures, refer to "How to treat past trouble" (Refer to GROUP 00, How to treat past trouble P.00-16).

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

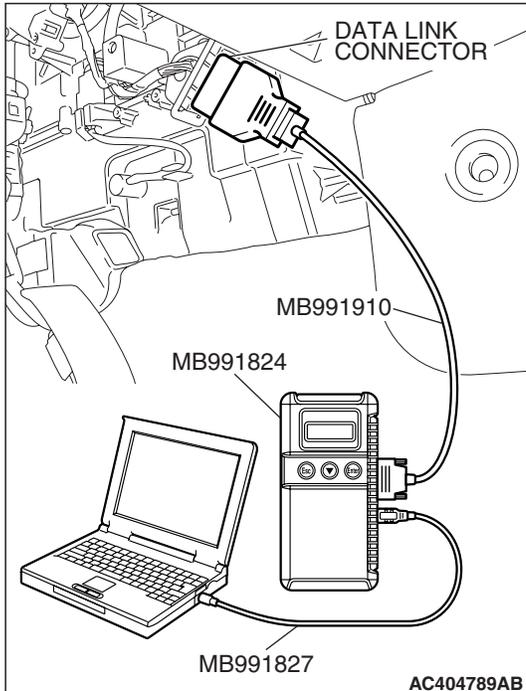
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

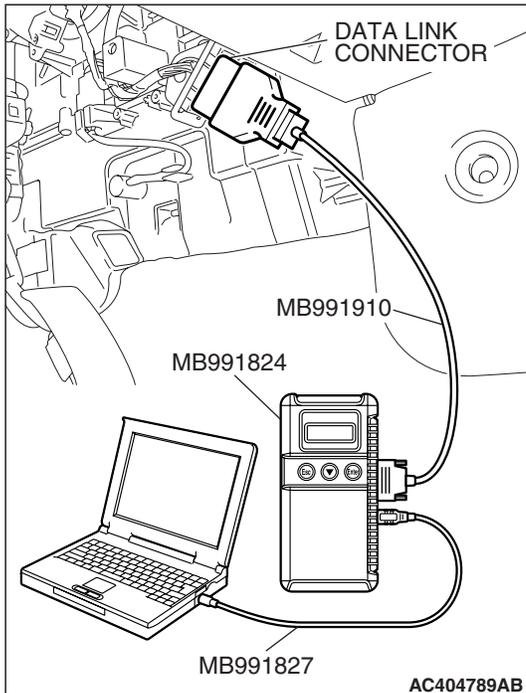
- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Diagnose the CAN bus line.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

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 [P.54C-14](#)). Then go to Step 2.





STEP 2. Recheck for 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) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1276 set?

YES : Replace the hydraulic unit (integrated with ABS/TCL-ECU).

NO : The procedure is complete.

DTC C1607: ECU failure

⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54C, Trouble code diagnosis P.54C-12).

⚠ CAUTION

Whenever the ECU is replaced, ensure that the CAN bus lines are normal.

ABS/TCL DTC SET CONDITIONS

The ABS/TCL-ECU always monitors itself while the system is working. If the ECU detects any faults, it will set this DTC.

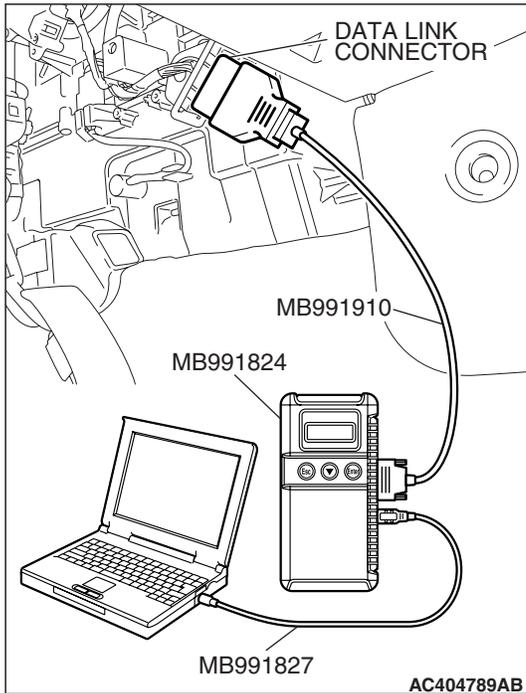
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THESE DTCS ARE TO SET ARE:)

- Malfunction of the hydraulic unit (integrated with 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

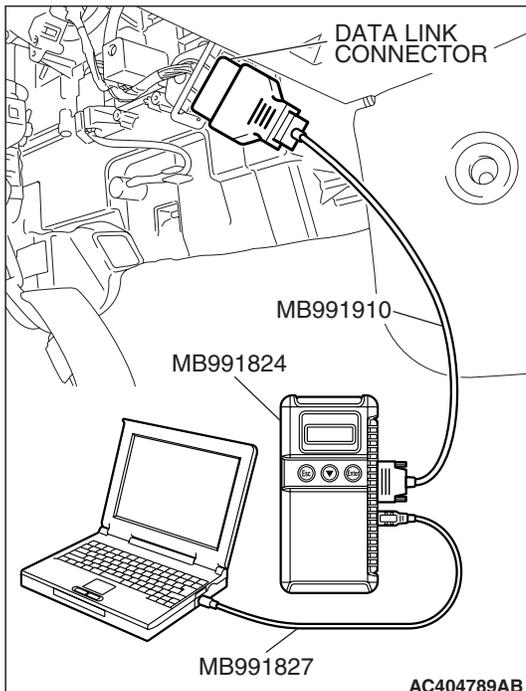
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

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

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 P.54C-14). Then go to Step 2.



STEP 2. Recheck for 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) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1607 set?

YES : Replace the hydraulic unit (integrated with ABS/TCL-ECU).

NO : The procedure is complete.

DTC C1640: Variant Code un-writing/data Abnormal

⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54C, Trouble code diagnosis P.54C-12).

⚠ CAUTION

Whenever the ECU is replaced, ensure that the CAN bus lines are normal.

CIRCUIT OPERATION

The ECM <M/T> or PCM <A/T> communicates with the ABS/TCL-ECU via CAN bus lines, and sends the data from each ECU.

ABS/TCL DTC SET CONDITIONS

The ABS/TCL-ECU always monitors itself while the system is working. If the ECU detects any faults, it will set this diagnosis code.

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

A different hydraulic unit is used. (integrated with 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

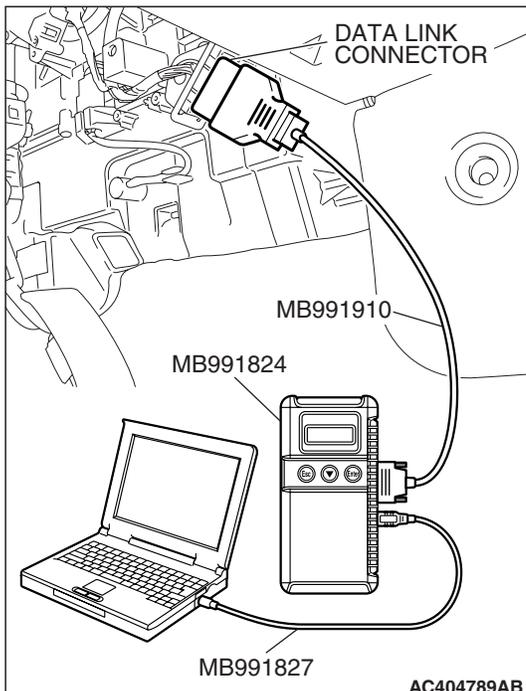
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

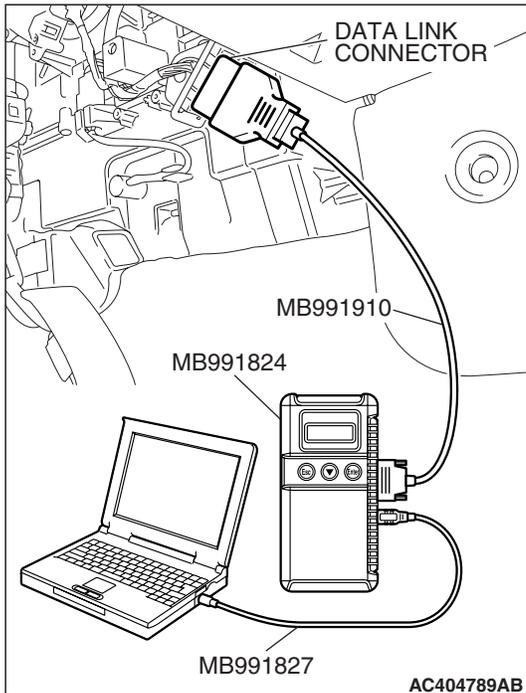
- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Diagnose the CAN bus line.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

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 P.54C-14). Then go to Step 2.



**STEP 2. Recheck for 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) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

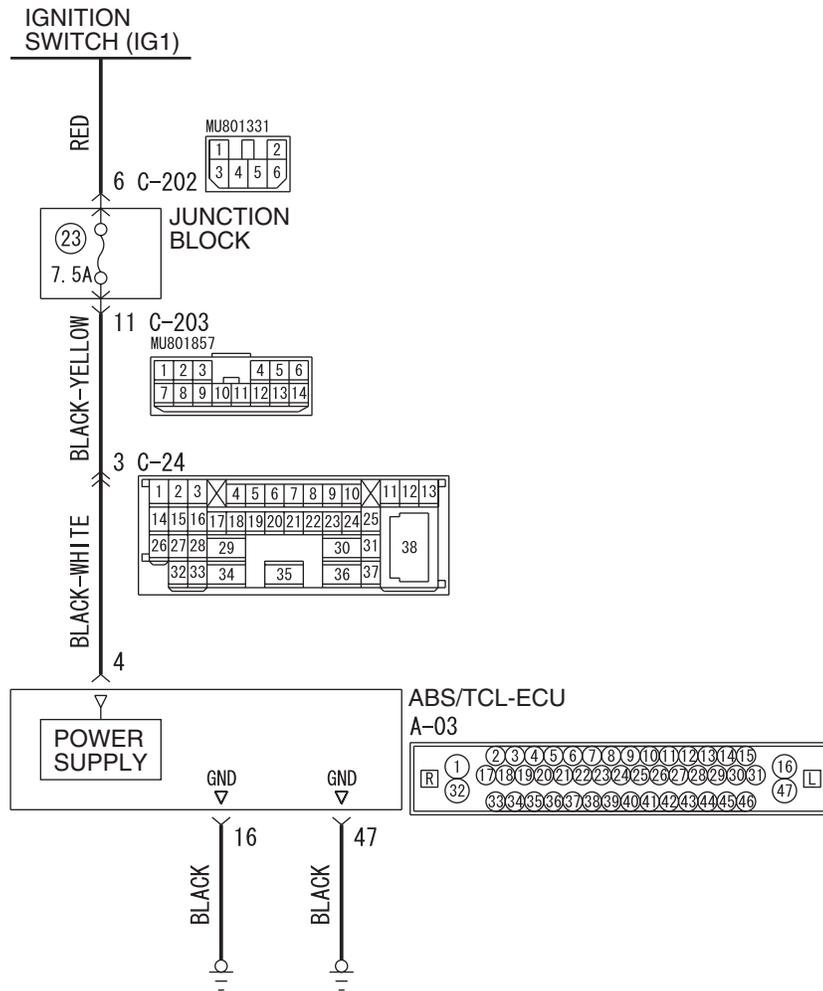
Q: Is DTC C1640 set?

YES : Replace the hydraulic unit (integrated with ABS/TCL-ECU).

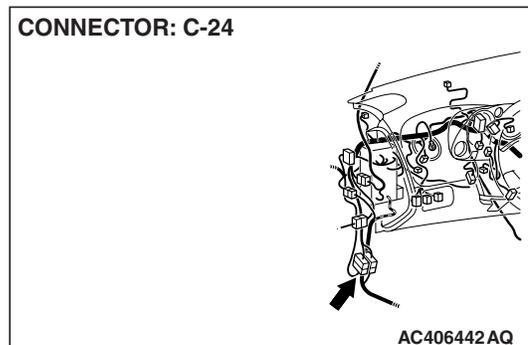
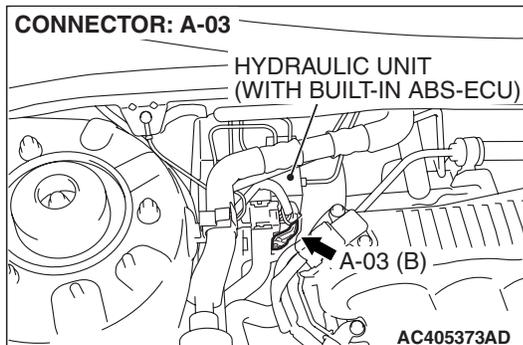
NO : The procedure is complete.

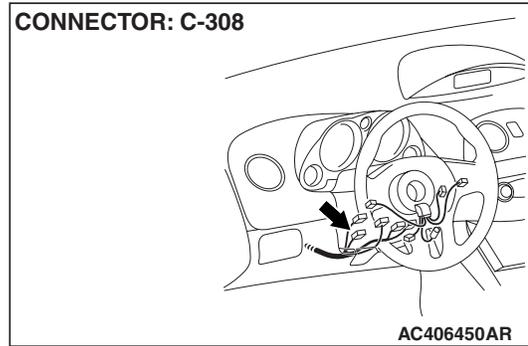
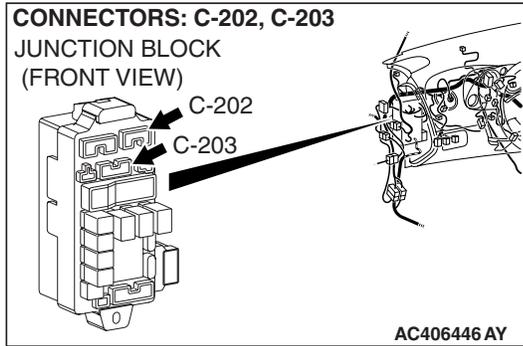
DTC C1860/C1861: Power Supply High Voltage/Power Supply Low Voltage

ABS/TCL-ECU Power Supply and Ground Circuit



W6P35M007A





⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54C, Trouble code diagnosis [P.54C-12](#)).

CIRCUIT OPERATION

The ABS/TCL-ECU is energized by the ignition switch (IG1) through multi-purpose fuse 23 and the ABS/TCL-ECU terminal 4.

ABS/TCL DTC SET CONDITIONS

- C1860 will be set when the power supply voltage to the ABS/TCL-ECU has increased to a predetermined value or higher.
- C1861 will be set when the power supply voltage to the ABS/TCL-ECU has decreased to a predetermined value or lower.

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

Current trouble

- Excessive electrical load
- Defective battery
- Damaged wiring harness or connector
- Malfunction of the hydraulic unit (integrated with ABS/TCL-ECU)
- Charging system failed

PAST TROUBLE

Carry out diagnosis with particular emphasis on connector(s) or wiring harness in the power supply circuit (terminal 4) to the ABS/TCL-ECU. For diagnosis procedures, refer to "How to treat past trouble" (Refer to GROUP 00, How to treat past trouble [P.00-16](#)).

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
- MB991997: ASC Check Harness

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

⚠ CAUTION

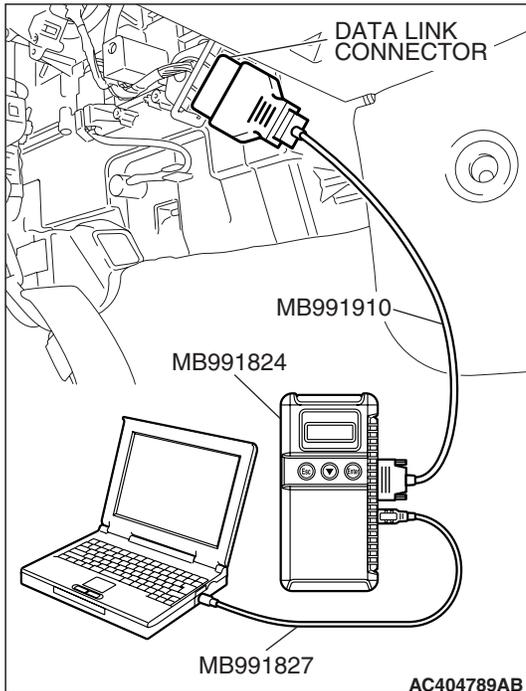
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

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

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

YES : Go to Step 3.

NO : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis P.54C-14). Then go to Step 2.



STEP 2. Recheck for diagnostic trouble code.

⚠ CAUTION

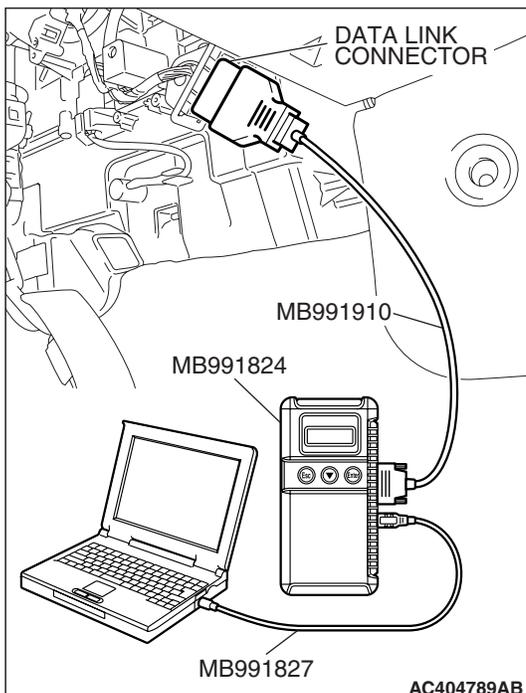
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1860 or C1861 set?

YES : Go to Step 3.

NO : The procedure is complete.



STEP 3. Check the battery.

Check the battery (Refer to GROUP 54A, Battery test P.54A-6).

Q: Is the battery in good condition?

YES : Go to Step 4.

NO : Charge or replace the battery. Then go to Step 8.

STEP 4. Check the charging system.

Check the charging system (Refer to GROUP 16, Charging system diagnosis P.16-4).

Q: Is the charging system in good condition?

YES : Go to Step 5.

NO : Repair or replace the charging system component(s). Then go to Step 8.

STEP 5. Measure the voltage at ABS/TCL-ECU connector A-03.

(1) Disconnect the connector A-03, and connect special tool MB991997 to the wiring harness-side connector.

NOTE: Do not connect special tool MB991997 to the ABS/TCL-ECU.

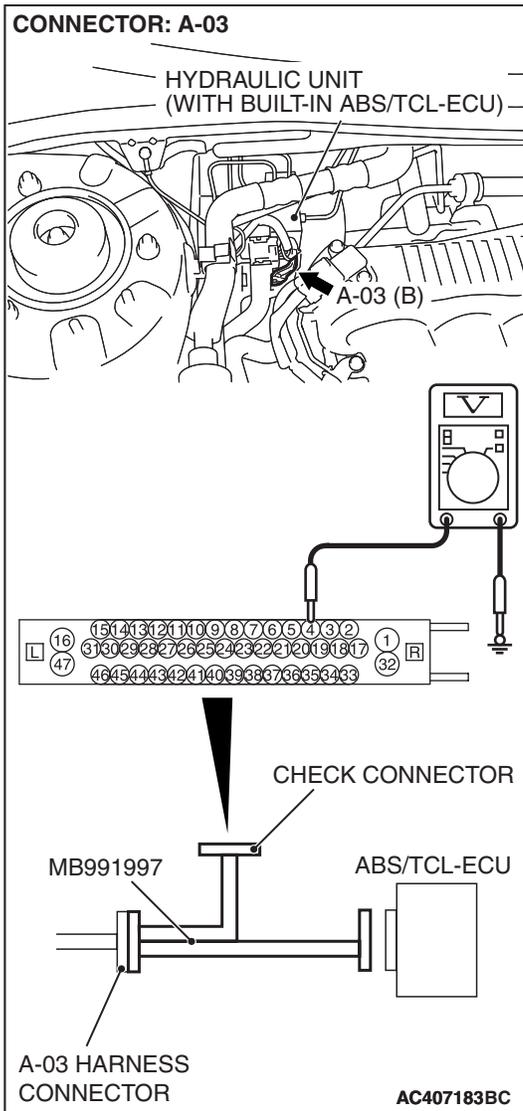
(2) Turn the ignition switch to the "ON" position.

(3) Measure the voltage between terminal 4 and ground. It should be approximately 12 volts (battery positive voltage).

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

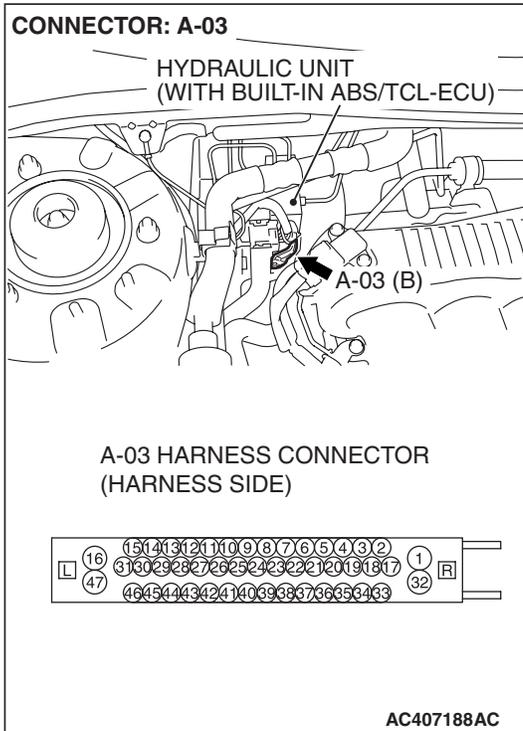
YES : Go to Step 7.

NO : Go to Step 6.

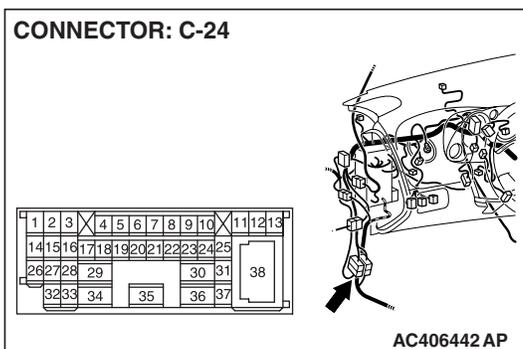


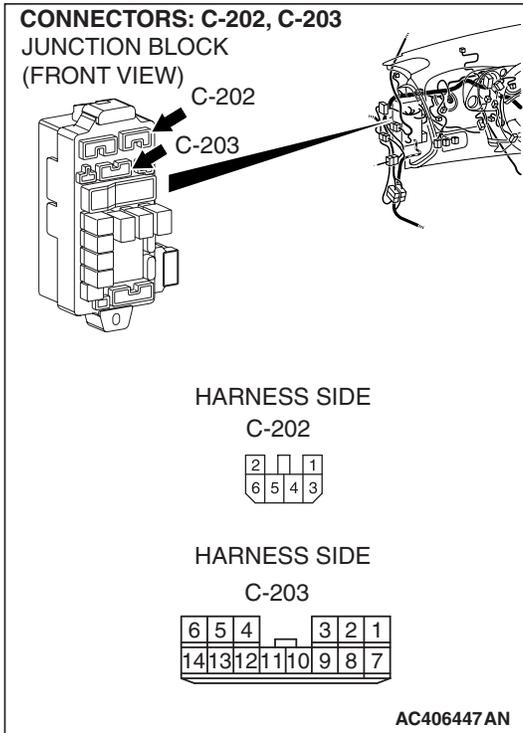
STEP 6. Check ABS/TCL-ECU connector A-03, intermediate connector C-24, junction block connectors C-202, C-203 and ignition switch connector C-308 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

- ABS/TCL-ECU connector A-03

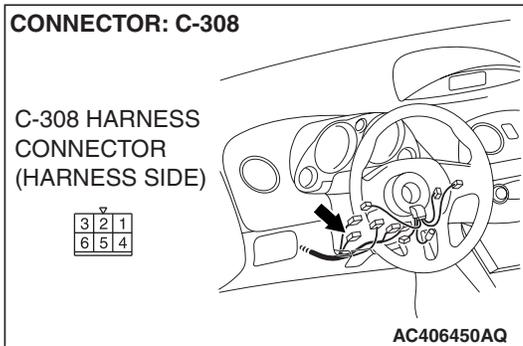


- Intermediate connector C-24





- Junction block connectors C-202 and C-203



- Ignition switch connector C-308

Q: Are the connectors and terminals in good condition?

YES : An open or short circuit may be present in the power supply line to the ABS/TCL-ECU. Repair the wiring harness between ABS/TCL-ECU connector A-03 terminal 4 and ignition switch connector C-308 terminal 4. Go to Step 8.

NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 8.

STEP 7. Recheck for 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.

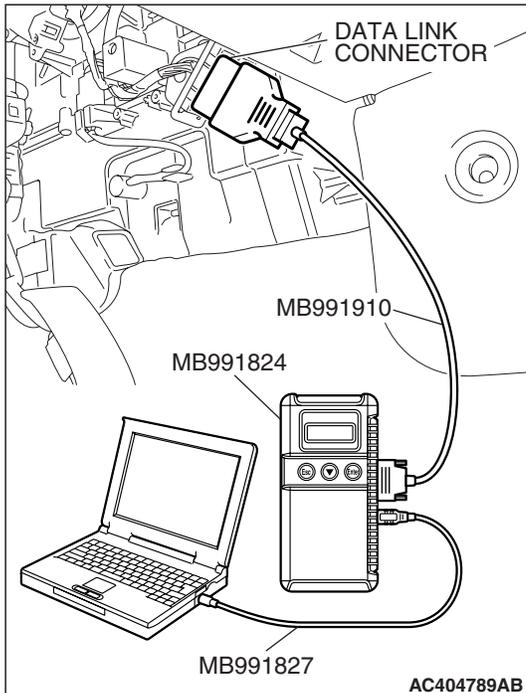
Check again if the DTC is set.

- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1860 or C1861 set?

YES : Replace the hydraulic unit (integrated with ABS/TCL-ECU). Then go to Step 8.

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 8. Recheck for 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.

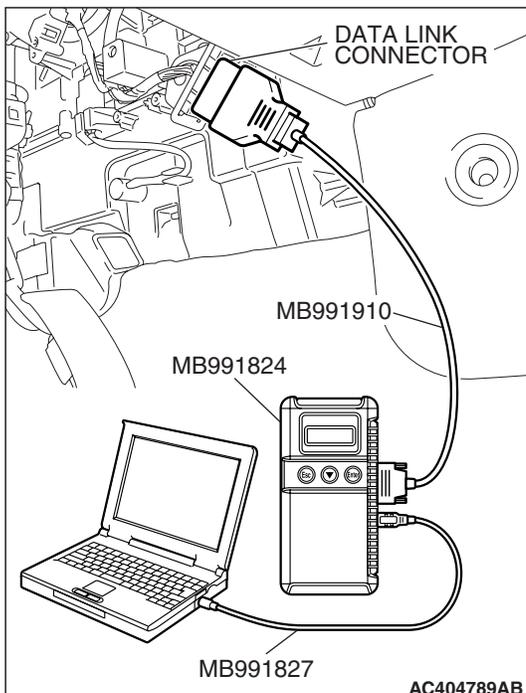
Check again if the DTC is set.

- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1860 or C1861 set?

YES : Go to Step 1.

NO : The procedure is complete.



DTC U1073: Bus off

CAUTION

- If DTC U1073 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 ECU is replaced, ensure that the communication circuit is normal.

TROUBLE JUDGMENT

This code is stored when the ABS/TCL-ECU has ceased the CAN communication (bus off). Then, if a penalty mode is entered after approximately five minutes, the regular data transaxle from the ABS/TCL-ECU will be cancelled.

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

- Damaged wiring harness or connector
- Malfunction of the hydraulic unit (integrated with 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**

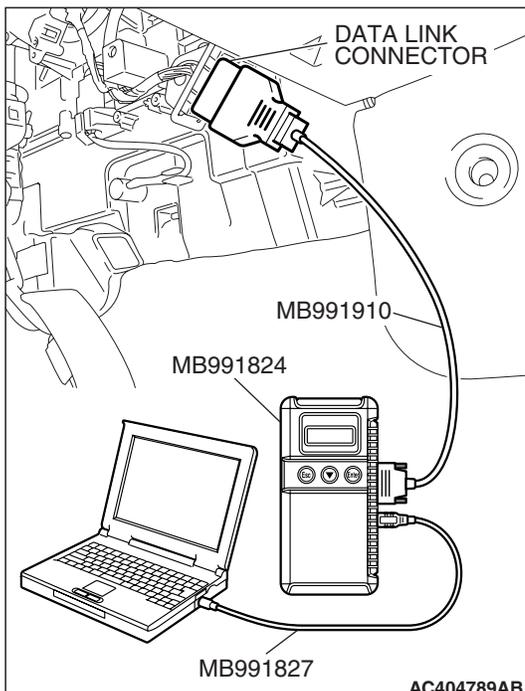
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

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

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 P.54C-14). Then go to Step 2.



STEP 2. Recheck for 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.

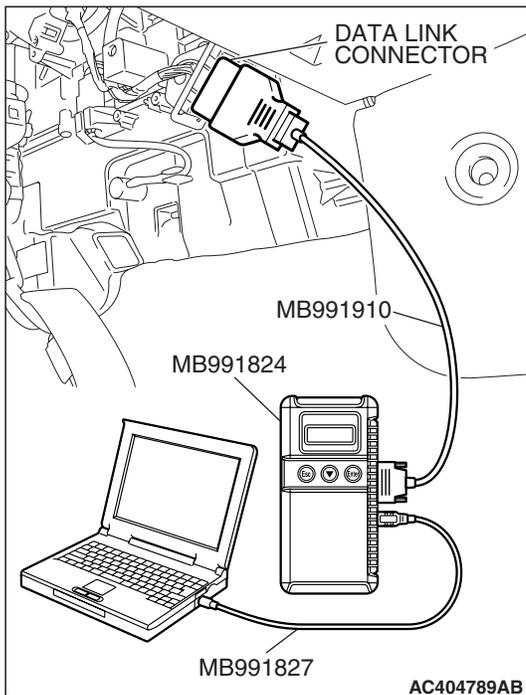
Check again if the DTC is set.

- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC U1073 set?

YES : Replace the ABS/TCL-ECU. 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. Recheck for 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.

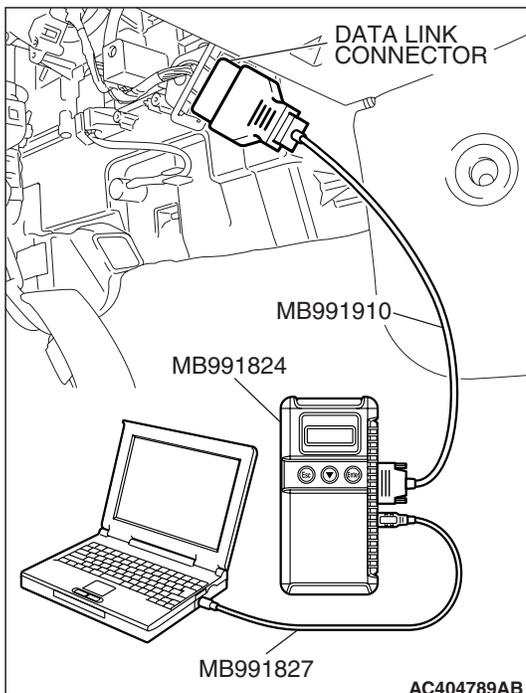
Check again if the DTC is set.

- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC U1073 set?

YES : Go to Step 1.

NO : The procedure is complete.



DTC U1100: ECM <M/T> or PCM <A/T> time-out (related to engine)

⚠ 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 ECM<M/T> or PCM<A/T> via CAN bus lines.

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

- Damaged harness or connector.
- Malfunction of the ECM<M/T>.
- Malfunction of the PCM<A/T>.
- 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

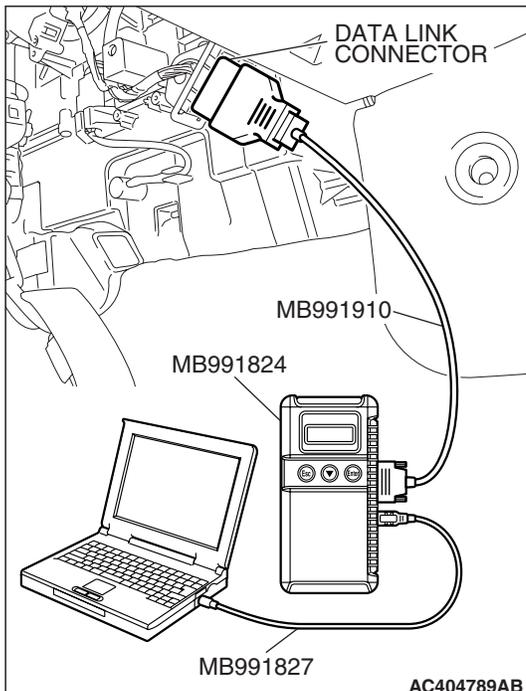
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

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

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 P.54C-14). Then go to Step 6.



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

⚠ CAUTION

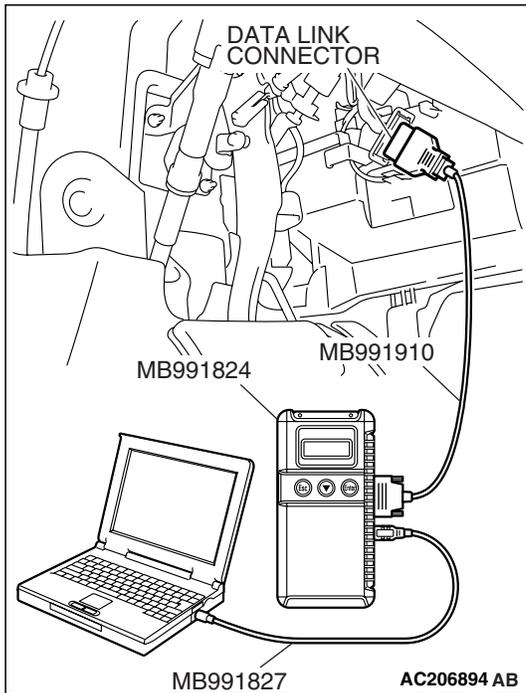
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

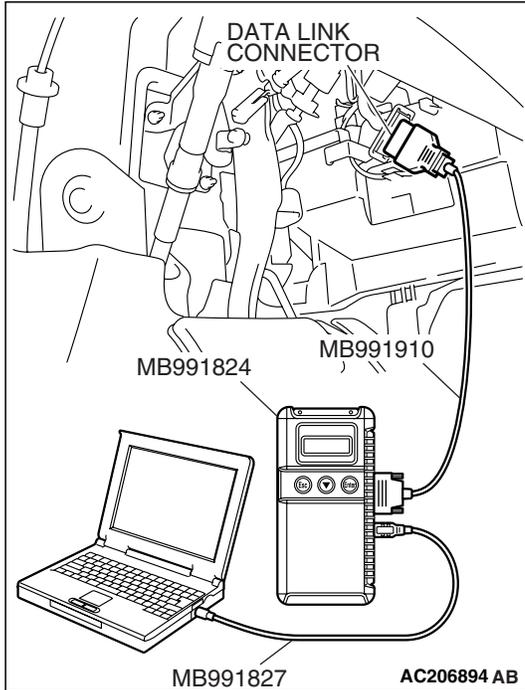
- (1) Erase the DTC.
- (2) Turn the ignition switch to the "ON" position.
- (3) Check for MFI system diagnostic trouble code. (Refer to GROUP 13B, MFI Diagnosis –Diagnostic Function –How to Read and Erase Diagnostic Trouble Code [P.13B-6](#)).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is any DTC set?

YES : Repair the MFI control system. (Refer to GROUP 13B, MFI Diagnosis –Diagnostic Trouble Code Chart [P.13B-43](#)). 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.
- (2) Turn the ignition switch to the "ON" position.
- (3) Check if a DTC, which relates to CAN communication-linked systems below, is set.

ECM or PCM

- DTC U1100: ECM or PCM time-out (related to engine). (Refer to GROUP 13B, Multiport Fuel Injection (MFI) Diagnosis –Diagnostic Function –How to Read and Erase Diagnostic Trouble Code [P.13B-6](#)).

ETACS-ECU

- DTC 011: ECM or PCM 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: ECM or PCM 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-52](#)).

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

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

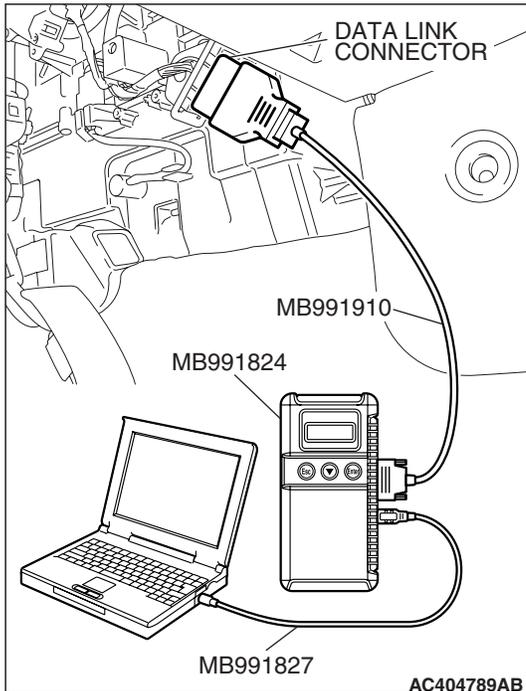
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Check if the DTC is set.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC U1100 set?

YES : Replace the ECM<M/T> or PCM<A/T>. [Refer to GROUP 13B, Engine Control Module (PCM) or Power Control Module (PCM) [P.13B-1295](#)]. 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.

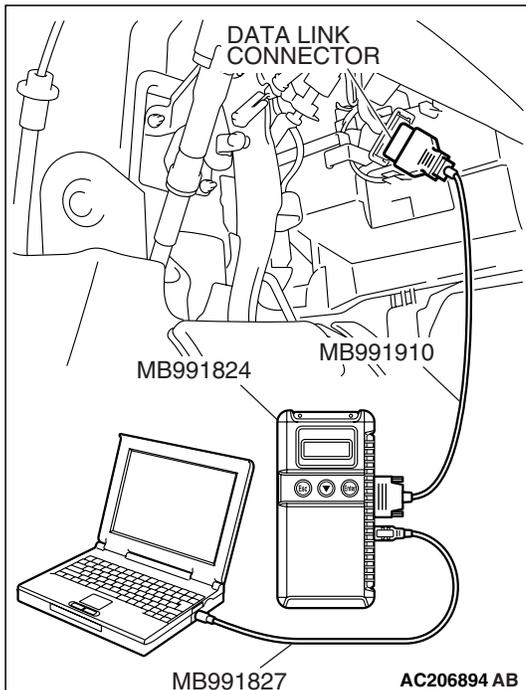
Check again if the DTC is set.

- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC U1100 set?

YES : Replace the hydraulic unit (integrated with ABS/TCL-ECU). 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.

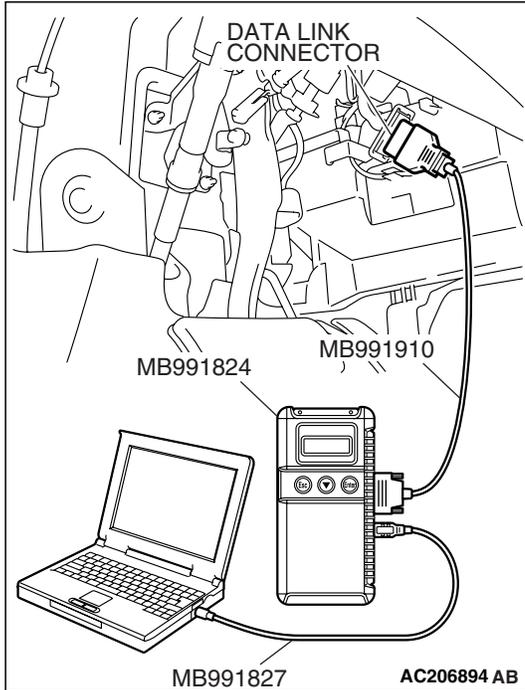
Check again if the DTC is set.

- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC U1100 set?

YES : Return to Step 1.

NO : The procedure is complete.



DTC U1101: PCM time-out (related to transaxle)

⚠ 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

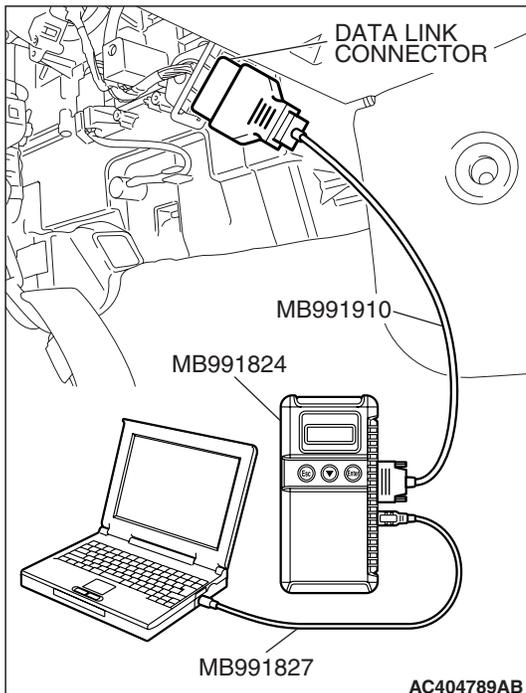
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

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

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 P.54C-14). Then go to Step 6.



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

⚠ CAUTION

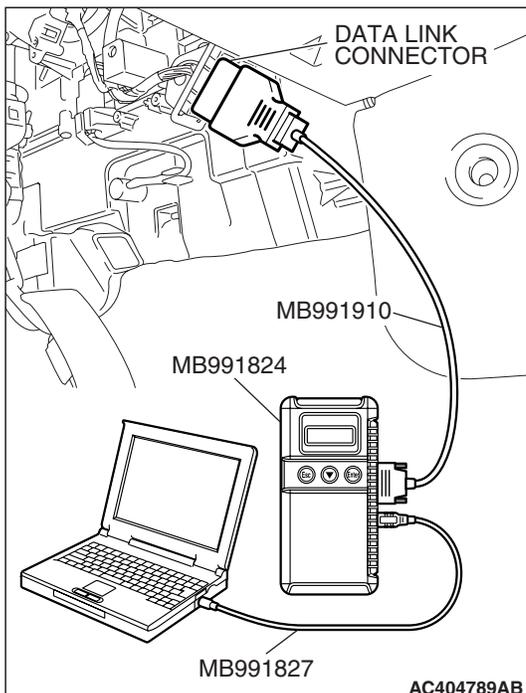
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

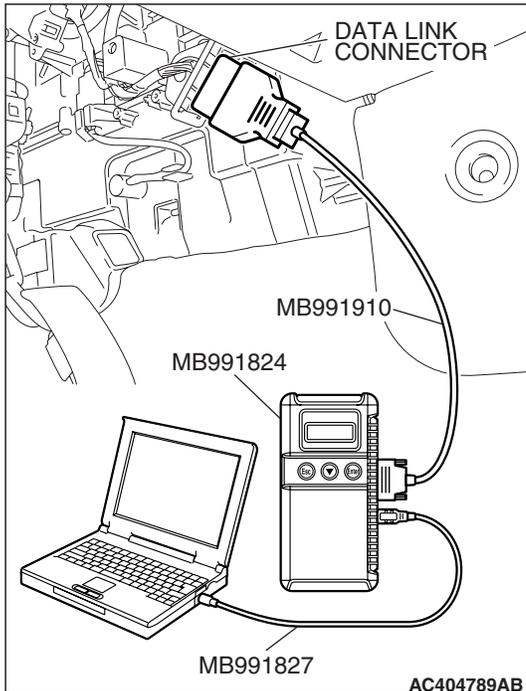
- (1) Erase the DTC.
- (2) Turn the ignition switch to the "ON" position.
- (3) Check for A/T system diagnostic trouble code. (Refer to GROUP 23A, A/T Diagnosis –Diagnostic Function –How to Read and Erase Diagnostic Trouble Code P.23A-16).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

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-64). 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.
- (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 U1100: ECM <M/T> or PCM <A/T> 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

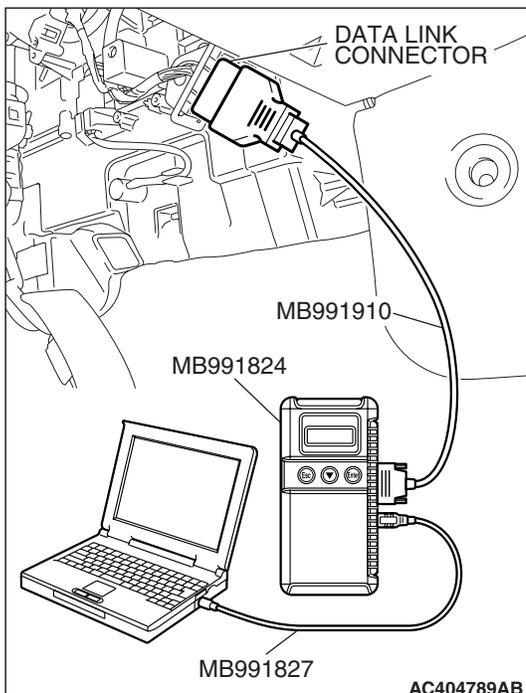
- DTC U1100: ECM <M/T> or PCM <A/T> time-out (related to engine). (Refer to GROUP 54A, Combination Meter Assembly Diagnosis –Diagnostic Function –How to Read and Erase Diagnostic Trouble Code [P.54A-52](#)).

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

Q: Is DTC 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.
- (2) Turn the ignition switch to the "ON" position.
- (3) Check if the DTC is set.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC U1101 set?

YES : Replace the PCM. [Refer to GROUP 13A, Powertrain Control Module (PCM) [P.13A-1214](#)]. 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

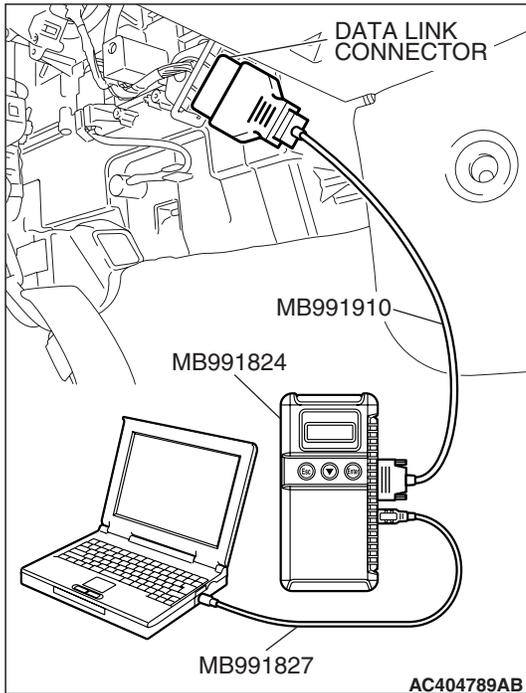
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Check if the DTC is set.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC U1101 set?

YES : Replace the hydraulic unit (integrated with ABS/TCL-ECU). 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

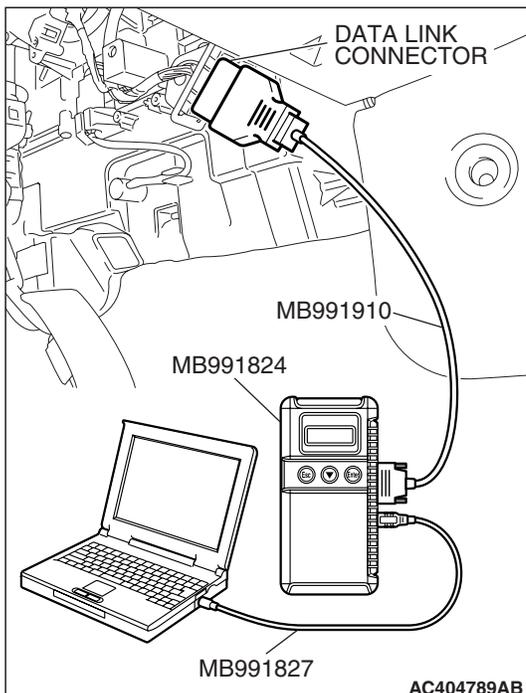
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Check if the DTC is set.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC U1101 set?

YES : Return to Step 1.

NO : The procedure is complete.



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

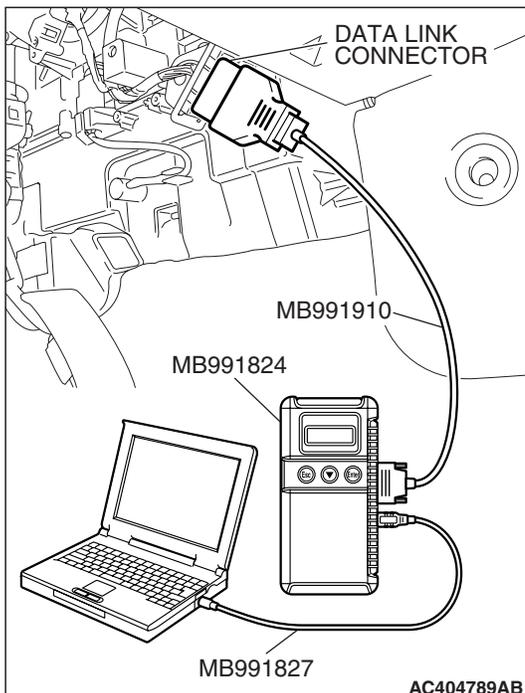
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

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

Q: Is any DTC set?

YES : Repair the MFI control system. (Refer to GROUP 13B, MFI Diagnosis –Diagnostic Trouble Code Chart P.13B-43). Then go to Step 6.

NO : Go to Step2.



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

CAUTION

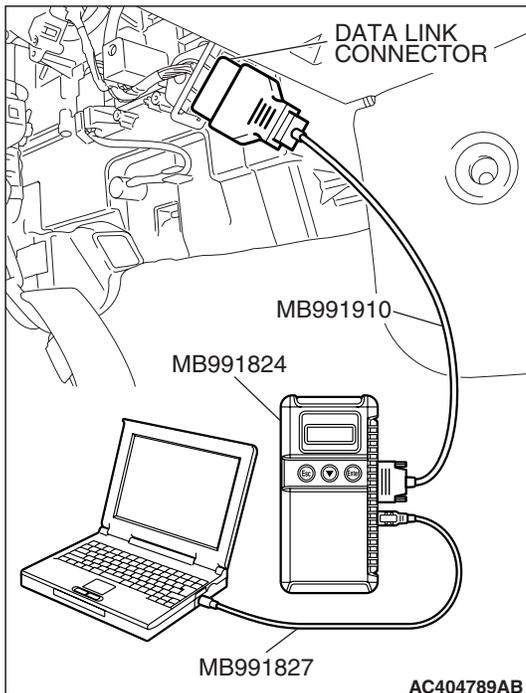
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

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

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

YES : Go to Step 3.

NO : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis 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.
- (2) Check if a DTC, which relates to CAN communication-linked systems below, is set.

A/C-ECU

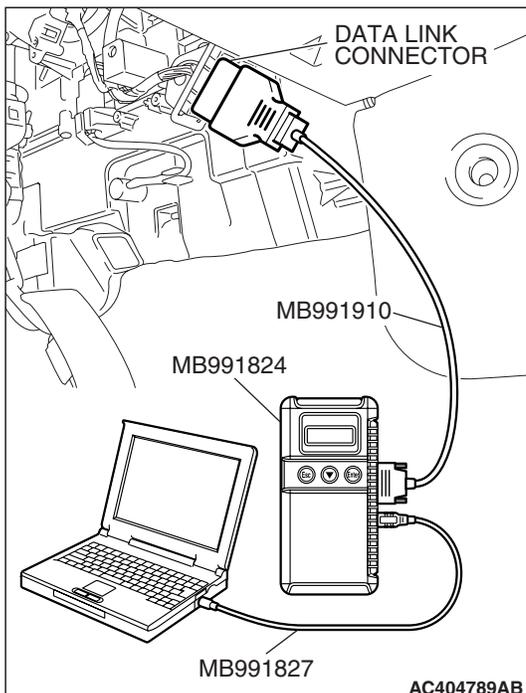
- DTC U1120: Failure Information on ECM <M/T> or PCM <A/T> (Related to Engine). (Refer to GROUP 55B, Automatic A/C Diagnosis –Diagnostic Function –How to Read and Erase Diagnostic Trouble Code P.55B-5).

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

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

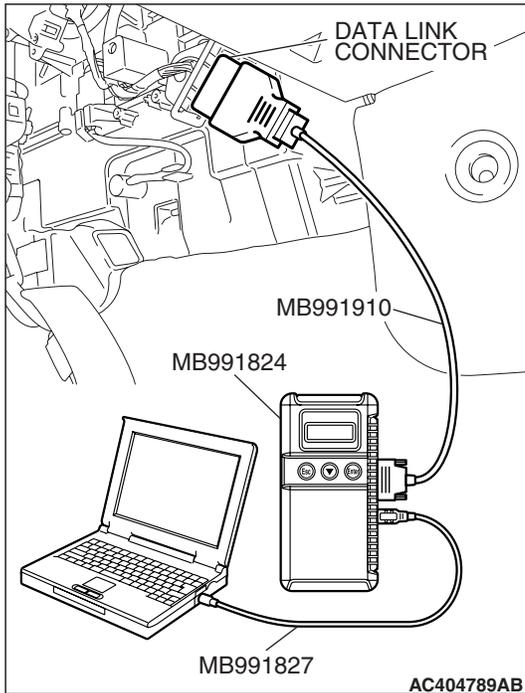
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Check if the DTC is set.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.
- (5) Disconnect scan tool MB991958.

Q: Is DTC U1120 set?

YES : Replace the ECM<M/T> or PCM<A/T>. [Refer to GROUP 13B, Engine Control Module (ECM) <M/T> or Powertrain Control Module (PCM) <A/T> P.13B-1295]. 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

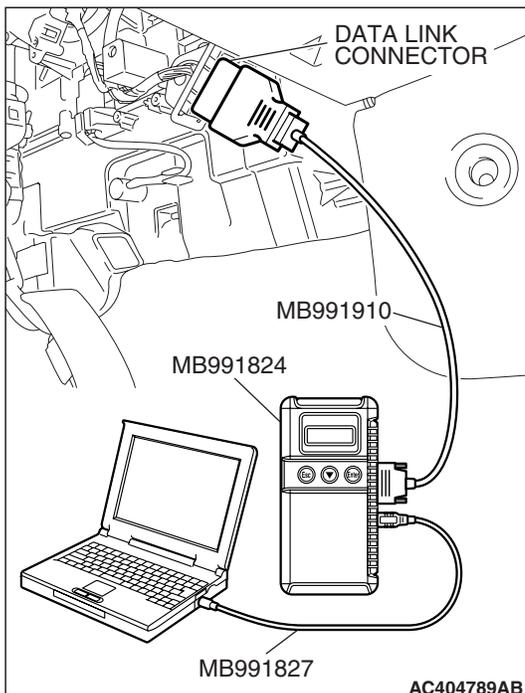
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Check if the DTC is set.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC U1120 set?

YES : Replace the hydraulic unit (integrated with ABS/TCL-ECU). 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

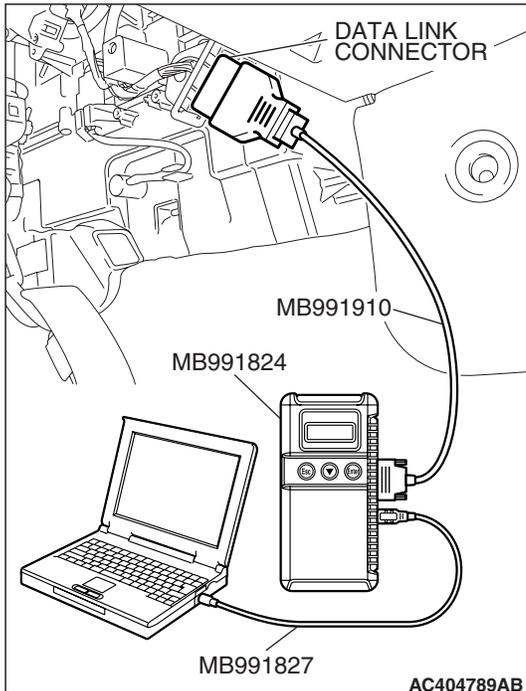
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Check if the DTC is set.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC U1120 set?

YES : Return to Step 1.

NO : The procedure is complete.



SYMPTOM CHART

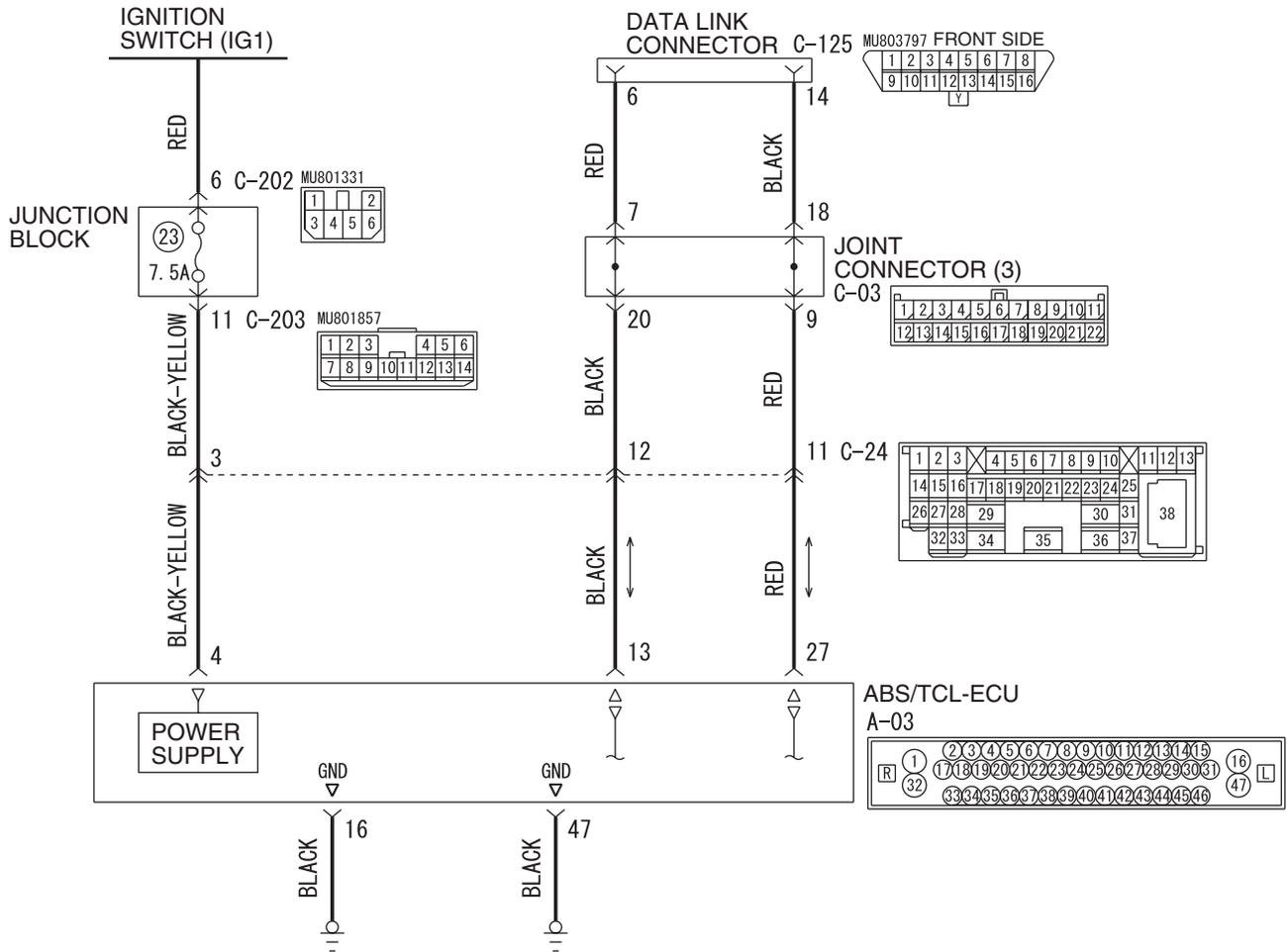
M1354000700140

SYMPTOM	INSPECTION PROCEDURE NO.	REFERENCE PAGE
Communication between the scan tool and the ABS/TCL-ECU is not possible.	1	P.35C-132
ABS/TCL-ECU power supply circuit system	2	P.35C-134
When the ignition switch is turned to the "ON" position (engine stopped), the TCL OFF indicator does not illuminate.	3	P.35C-142
When the ignition switch is turned to the "ON" position (engine stopped), the TCL indicator does not illuminate.	4	P.35C-142
The TCL OFF indicator remains illuminated after the engine is started.	5	P.35C-142
The ABS/TCL indicator remains illuminated after the engine is started.	6	P.35C-142
When the TCL switch is pushed on, TCL system is not cancelled.	7	P.35C-145
TCL system does not operate.	8	P.35C-150

SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: Communication between the Scan Tool and the ABS/TCL-ECU is not Possible.

Data Link Connector Circuit



W6P35M014A

TECHNICAL DESCRIPTION (COMMENT)

If the scan tool (MUT-III Sub Assembly) cannot communicate with the ABS system, the CAN bus lines may be defective. If the ABS system does not work, the ABS/TCL-ECU or its power supply circuit may be defective.

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

- Damaged wiring harness or connector
- Malfunction of the hydraulic unit (Integrated with 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

Using scan tool MB991958, diagnose the CAN bus line.

⚠ CAUTION

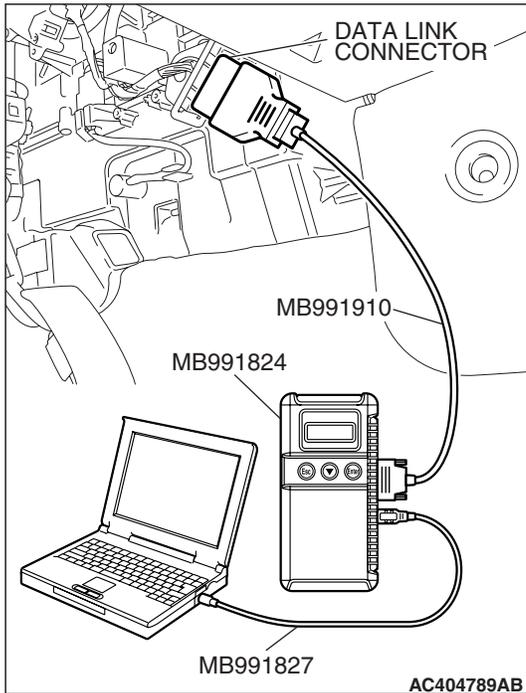
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

Use scan tool MB991958 to diagnose the CAN bus lines.

- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Diagnose the CAN bus line.

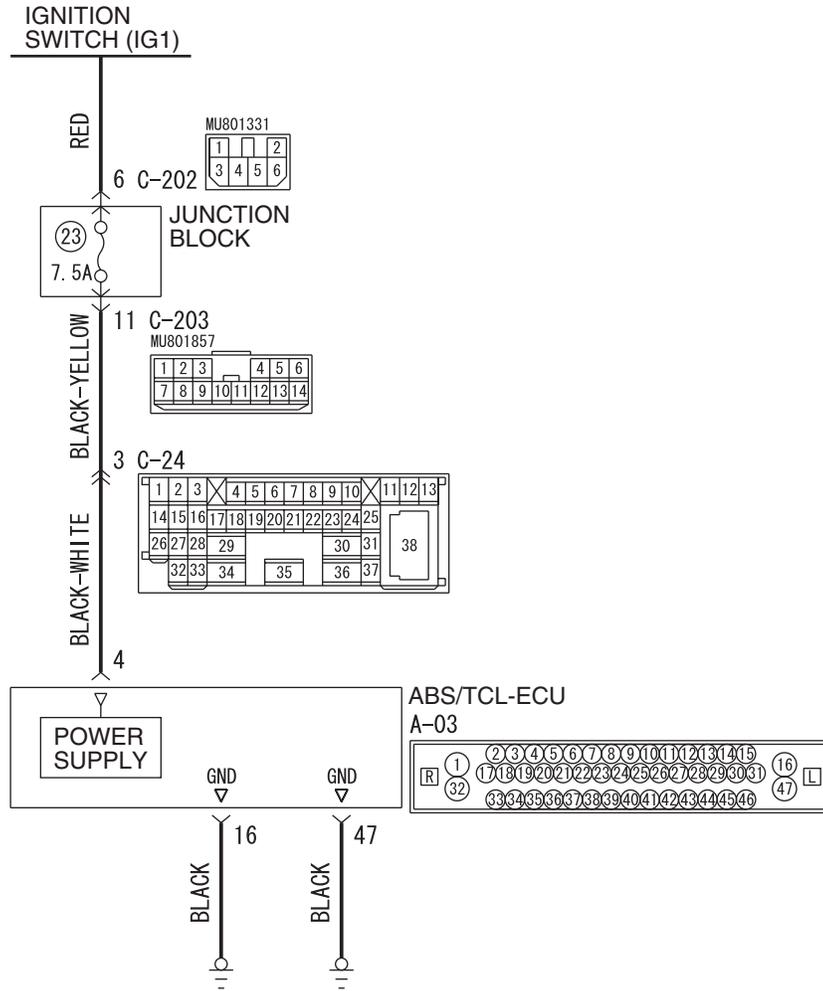
Q: Is the check result satisfactory?

- YES** : Check and repair the power supply circuit system (Refer to [P.35B-119](#)).
- NO** : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis [P.54C-14](#)).

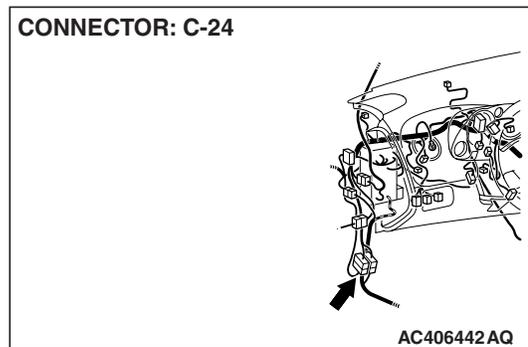
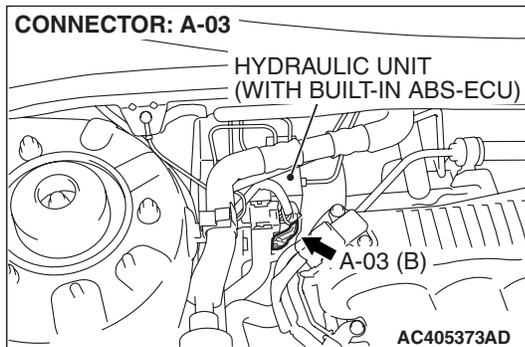


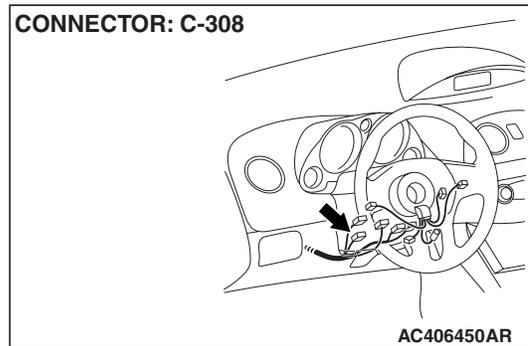
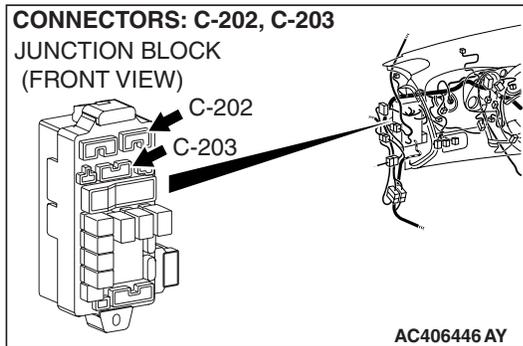
INSPECTION PROCEDURE 2: ABS/TCL-ECU Power Supply Circuit System

ABS/TCL-ECU Power Supply and Ground Circuit



W6P35M007A





CIRCUIT OPERATION

- The ABS/TCL-ECU is energized by the ignition switch (IG1) through multi-purpose fuse 23 and the ABS/TCL-ECU terminal 4.
- If the power supply to the ABS/TCL-ECU has failed, scan tool (MUT-III Sub Assembly) will not be able to communicate with it.

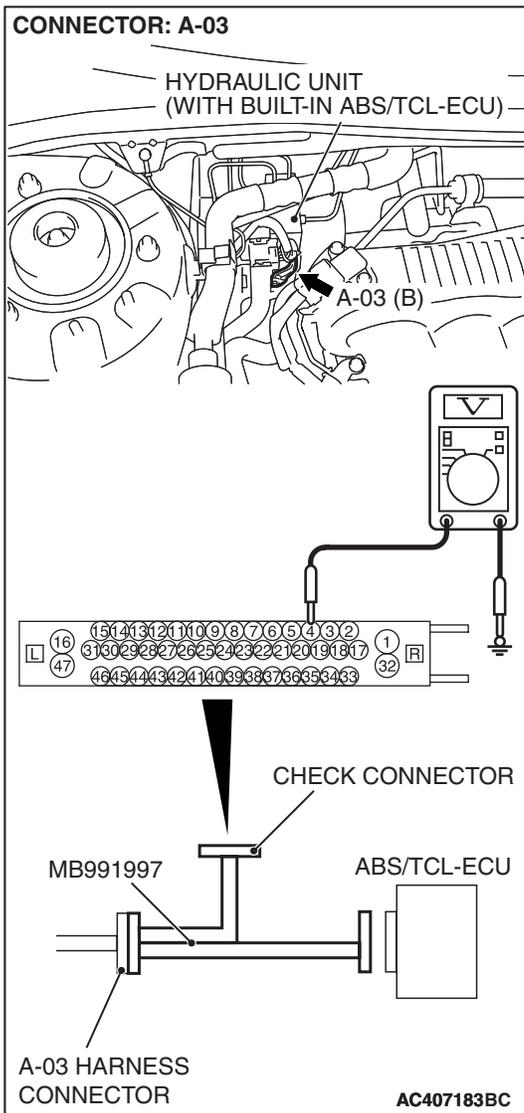
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

- Damaged wiring harness or connector
- Defective battery
- Charging system failed
- Malfunction of the hydraulic unit (integrated with 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
- MB991997: ASC Check Harness



STEP 1. Measure the voltage at ABS/TCL-ECU connector A-03.

(1) Disconnect the connector A-03, and connect special tool MB991997 to the wiring harness-side connector.

NOTE: Do not connect special tool MB991997 to the ABS/TCL-ECU.

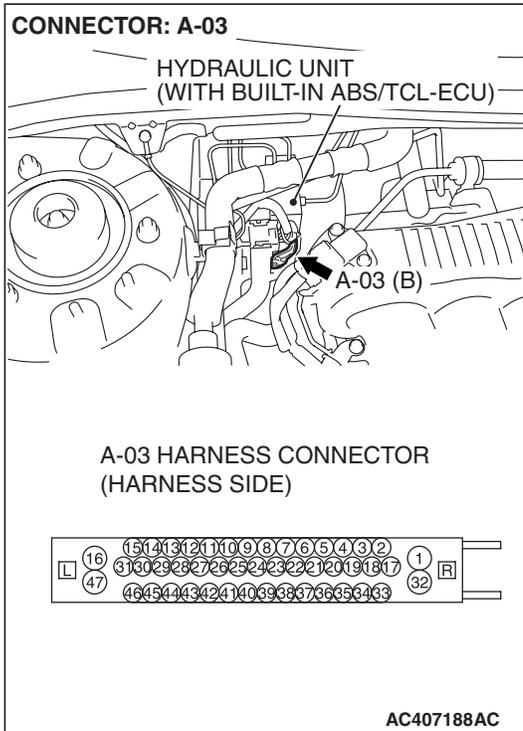
- (2) Turn the ignition switch to the "ON" position.
- (3) Measure the voltage between terminal 4 and ground. It should measure approximately 12 volts (battery positive voltage).

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

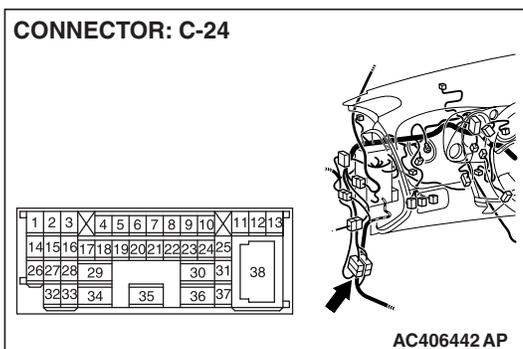
- YES :** Go to Step 3.
- NO :** Go to Step 2.

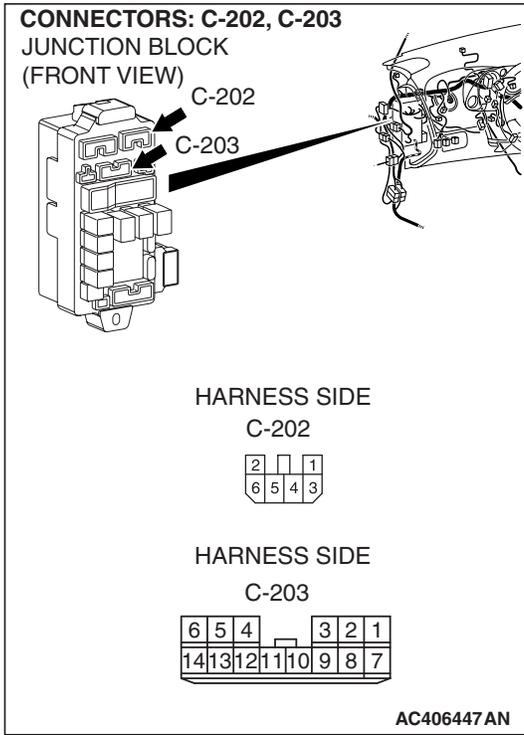
STEP 2. Check ABS/TCL-ECU connector A-03, intermediate connector C-24, junction block connectors C-202, C-203 and ignition switch connector C-308 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

- ABS/TCL-ECU connector A-03

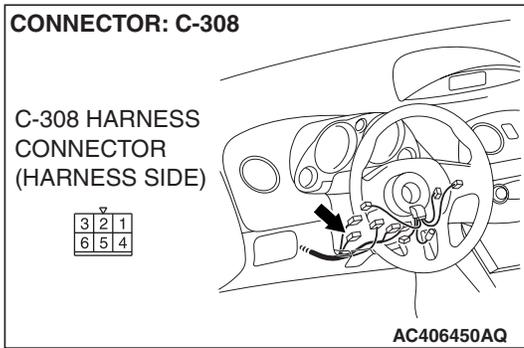


- Intermediate connector C-24





- Junction block connectors C-202 and C-203

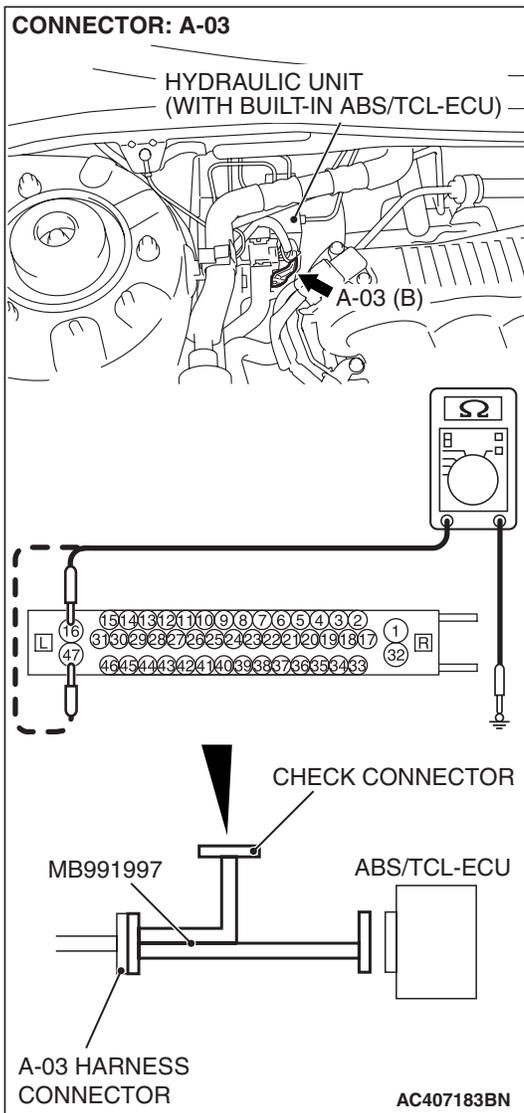


- Ignition switch connector C-308

Q: Are the connectors and terminals in good condition?

YES : An open or short circuit may be present in the power supply line to the ABS/TCL-ECU. Repair the wiring harness between ABS/TCL-ECU connector A-03 terminal 4 and ignition switch connector C-308 terminal 4. Then go to Step 8.

NO : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection [P.00E-2](#). Then go to Step 8.



STEP 3. Measure the resistance at ABS/TCL-ECU connector A-03.

(1) Disconnect the connector A-03, and connect special tool MB991997 to the wiring harness-side connector.

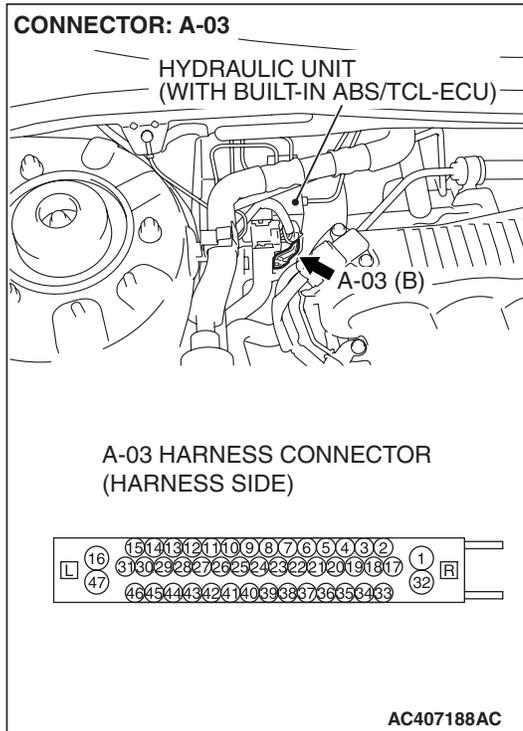
NOTE: Do not connect special tool MB991997 to the ABS/TCL-ECU.

(2) Measure the resistance between terminal 16, 47 and ground. It should be 2 ohms or less.

Q: Is the measured resistance 2 ohms or less?

YES : Go to Step 5.

NO : Go to Step 4.



STEP 4. Check ABS/TCL-ECU connector A-03 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is ABS/TCL-ECU connector A-03 damaged?

YES : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection

[P.00E-2](#). Then go to Step 8.

NO : An open circuit may be present in the ground circuit. Repair the wiring harness between ABS/TCL-ECU connector A-03 terminals 16, 47 and the body ground. Then go to Step 8.

STEP 5. Check the battery.

Check the battery (Refer to GROUP 54A, Battery test [P.54A-6](#)).

Q: Is the battery in good condition?

YES : Go to Step 6.

NO : Charge or replace the battery. Then go to Step 8.

STEP 6. Check the charging system.

Check the charging system (Refer to GROUP 16, Charging system diagnosis [P.16-4](#)).

Q: Is the charging system in good condition?

YES : Go to Step 7.

NO : Repair or replace the charging system component(s). Then go to Step 8.

STEP 7. Retest the system.

Q: Can the ABS/TCL-ECU communicate with the scan tool (MUT-III Sub Assembly)?

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 ABS/TCL-ECU. Then go to Step 8.

STEP 8. Retest the system.

Q: Can the ABS/TCL-ECU communicate with the scan tool (MUT-III Sub Assembly)?

YES : The procedure is complete.

NO : Go to Step 1.

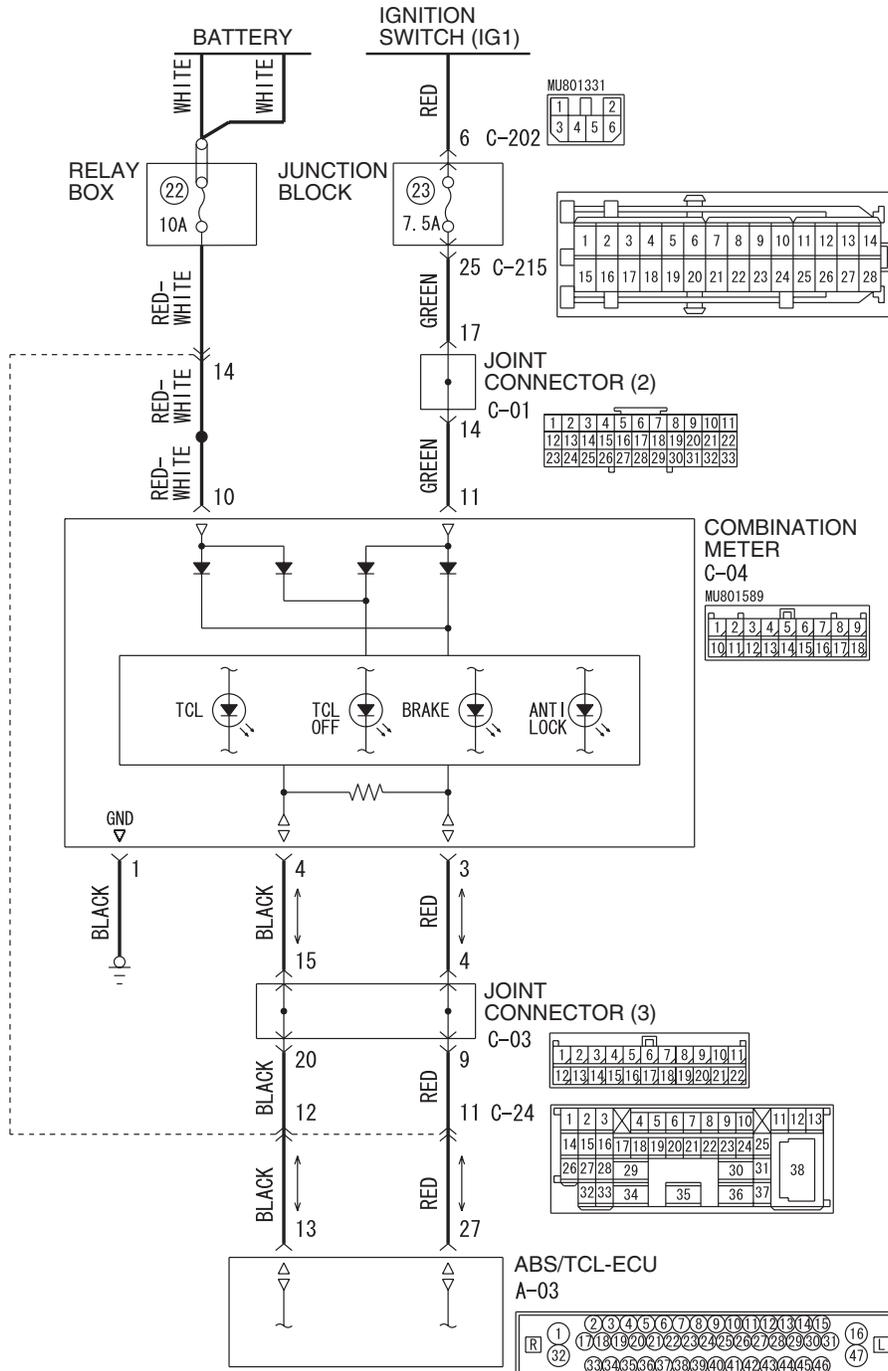
INSPECTION PROCEDURE 3: When the Ignition Switch is Turned to the "ON" Position (Engine Stopped), the TCL OFF Indicator does not Illuminate.

INSPECTION PROCEDURE 4: When the Ignition Switch is Turned to the "ON" Position (Engine Stopped), the TCL Indicator does not Illuminate.

INSPECTION PROCEDURE 5: The TCL OFF Indicator Remains Illuminated After the Engine is Started.

INSPECTION PROCEDURE 6: The TCL Indicator Remains Illuminated After the Engine is Started.

TCL OFF Indicator and TCL Indicator Drive Circuit



TECHNICAL DESCRIPTION (COMMENT)

- The ABS/TCL-ECU sends the TCL OFF indicator and TCL indicator signals to the combination meter via the CAN communication.
- This may be caused by faults in the CAN bus line, the combination meter, or the ABS/TCL-ECU.

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, connector
- Malfunction of the hydraulic unit (integrated with 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

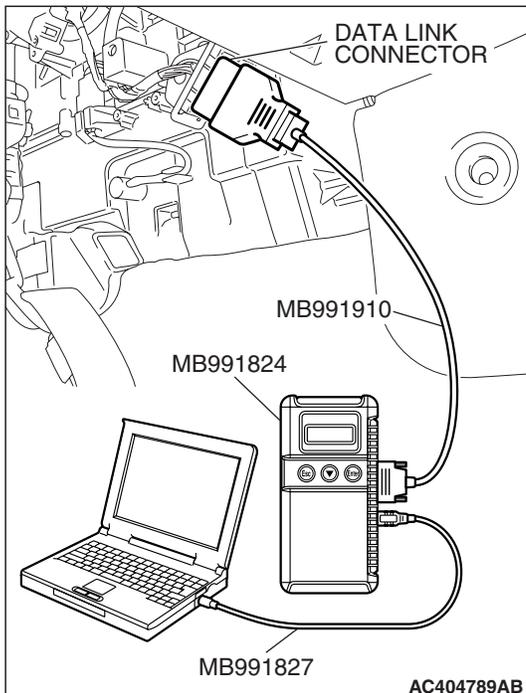
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

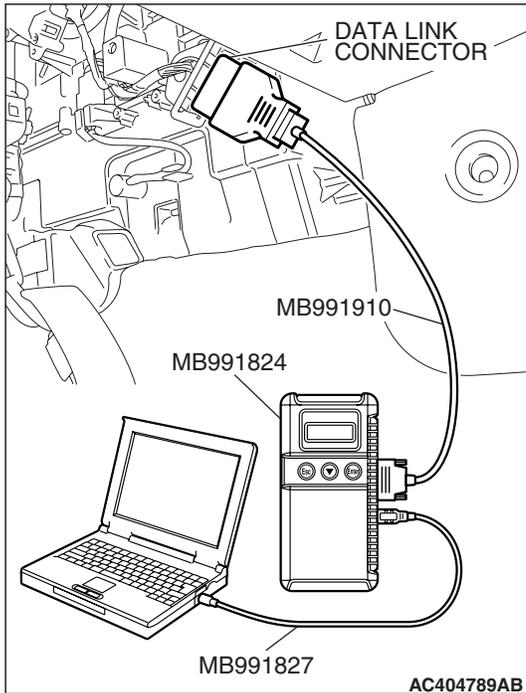
- (1) Connect scan tool MB991958 to the data link connector.
- (2) Turn the ignition switch to the "ON" position.
- (3) Diagnose the CAN bus line.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

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 P.54C-14). Then go to Step 4.





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

⚠ CAUTION

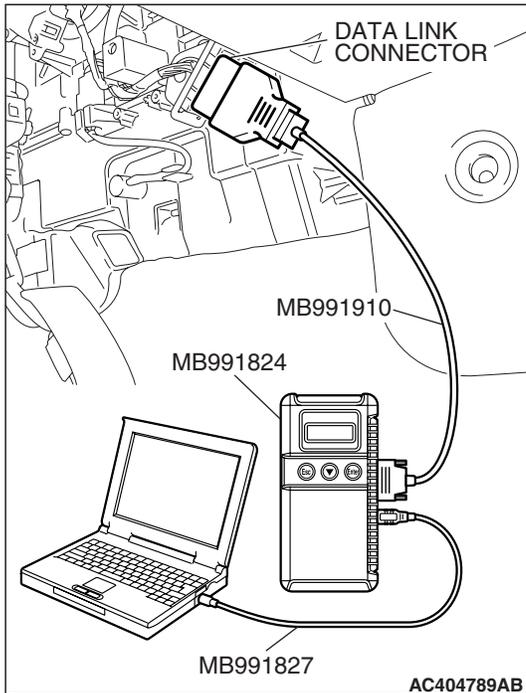
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is any DTC set?

YES : Refer to P.35C-9, 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.
- (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-52).
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC U1102 set?

YES : Replace the hydraulic unit (integrated with ABS/TCL-ECU). Then go to Step 4.

NO : Replace the combination meter assembly. (Refer to GROUP 54A –Combination Meter Assembly P.54A-131). Then go to Step 4.

STEP 4. Retest the system

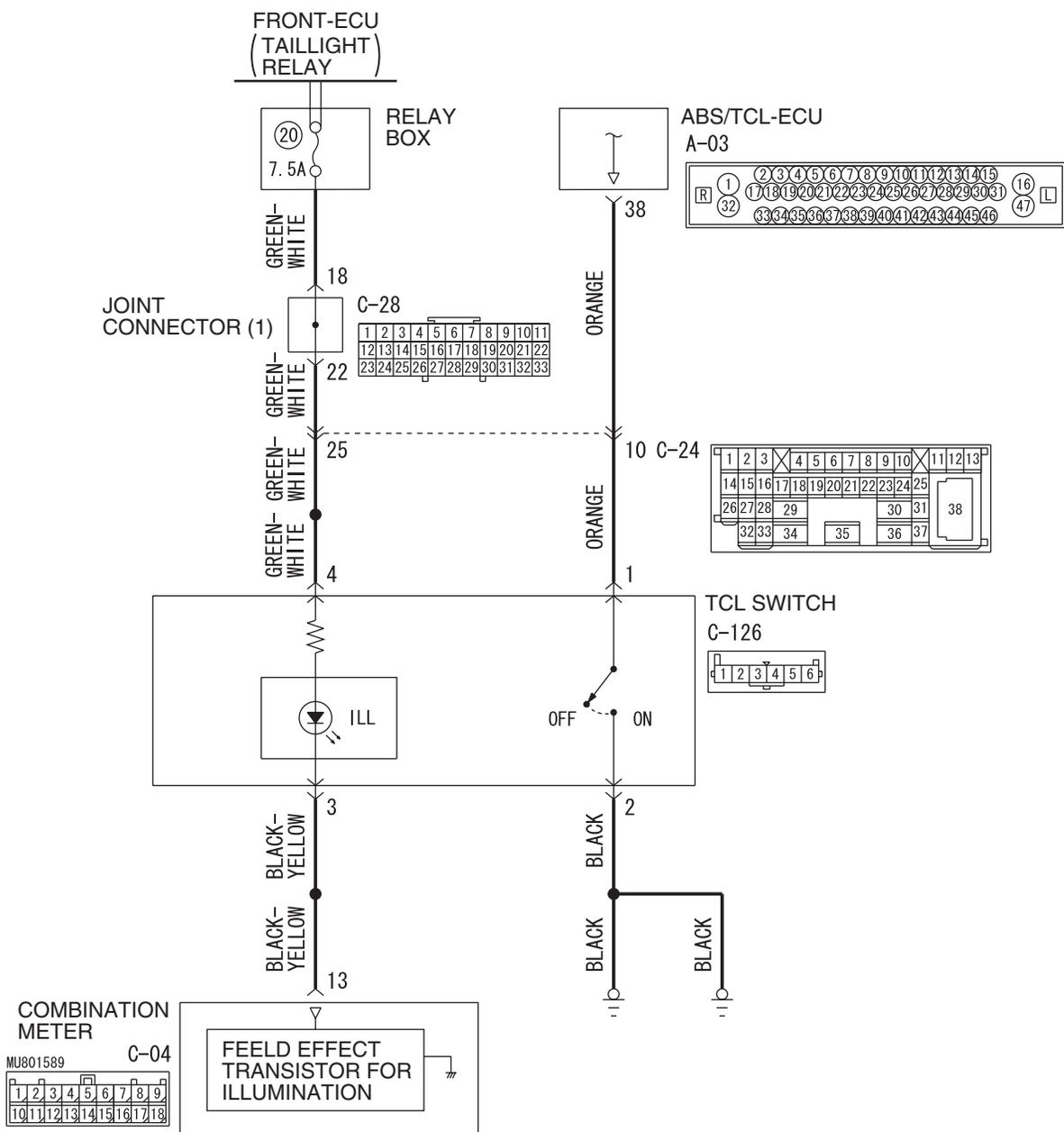
Q: Turn the ignition switch to the "ON" position. Do the TCL OFF indicator and the TCL indicator illuminate for three seconds, and then go out after the engine starts?

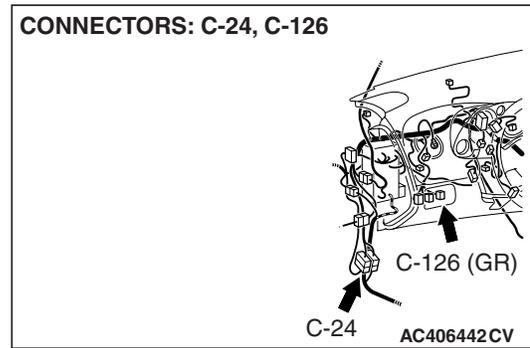
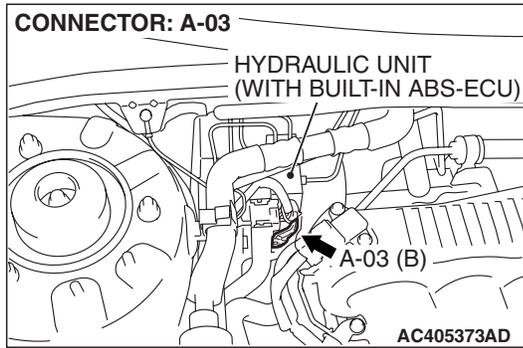
YES : The procedure is complete.

NO : Return to Step 1.

INSPECTION PROCEDURE 7: When the TCL Switch is Pushed On, TCL System is not Cancelled.

TCL Switch System Circuit





CIRCUIT OPERATION

ABS/TCL-ECU terminal 38 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.

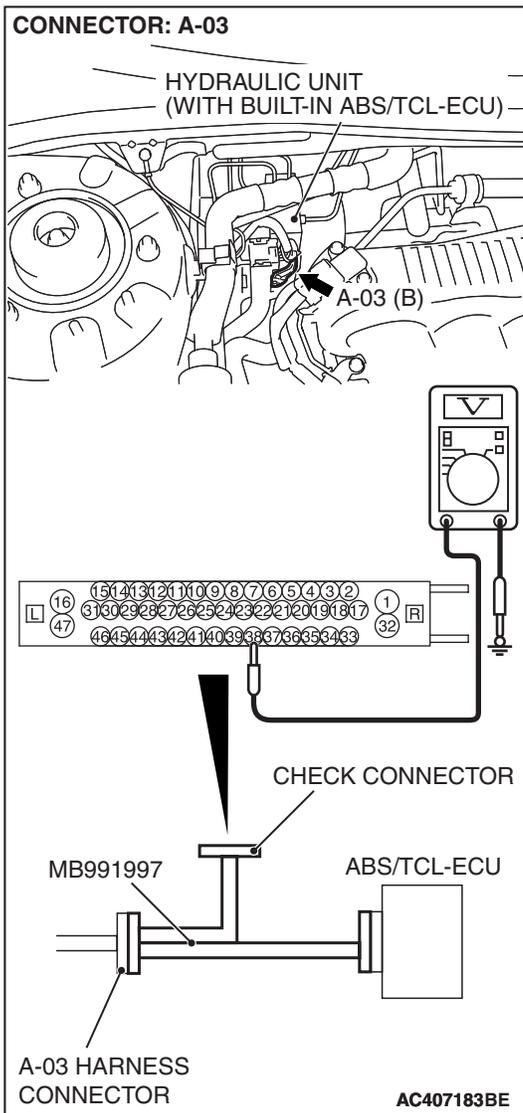
TROUBLESHOOTING HINTS

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

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB991997: ASC Check Harness

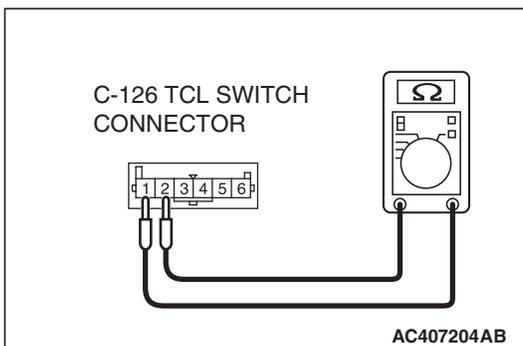


STEP 1. Measure the terminal voltage at ABS/TCL-ECU connector A-03.

- (1) Connect special tool MB991997 between the ABS/TCL-ECU and the body-side harness connector A-03.
- (2) Turn the ignition switch to the "ON" position.
- (3) Measure the terminal voltage between special tool MB991997 connector terminal 38 (ABS/TCL-ECU connector A-03 terminal 38) 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.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the terminal voltage battery positive 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.35C-164).
- (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?

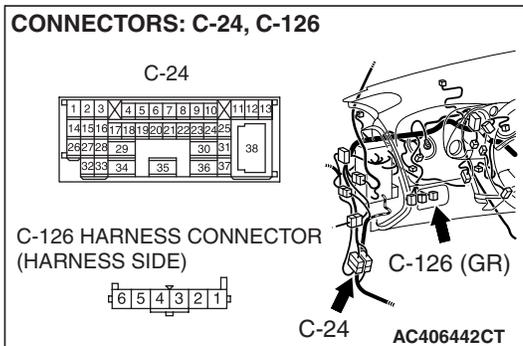
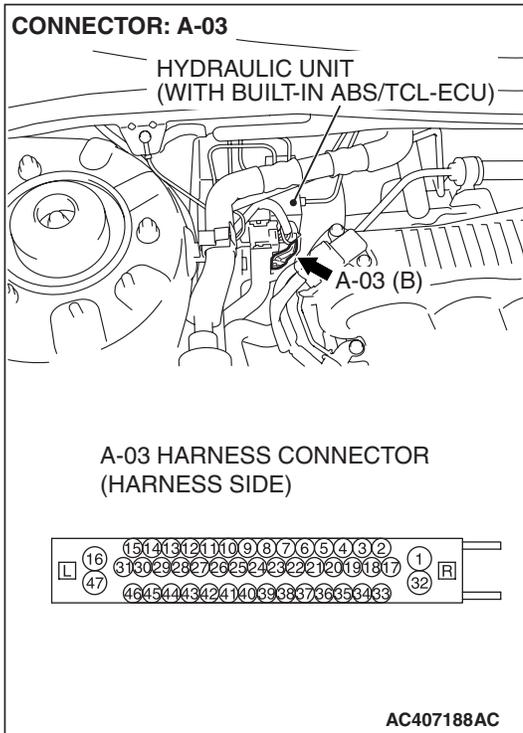
- YES :** Install the TCL switch. (Refer to P.35C-164). Then go to Step 6.
NO : Replace the TCL switch. (Refer to P.35C-164). Then go to Step 7.

STEP 3. Check ABS/TCL-ECU connector A-03, intermediate connector C-24 and TCL switch connector C-126 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.

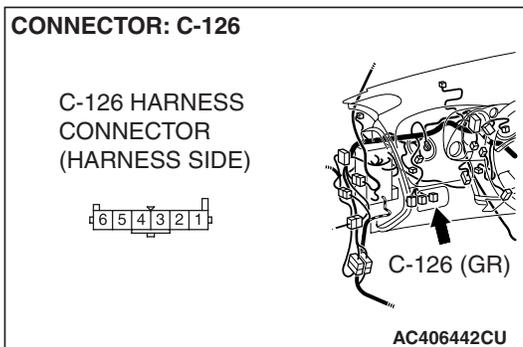
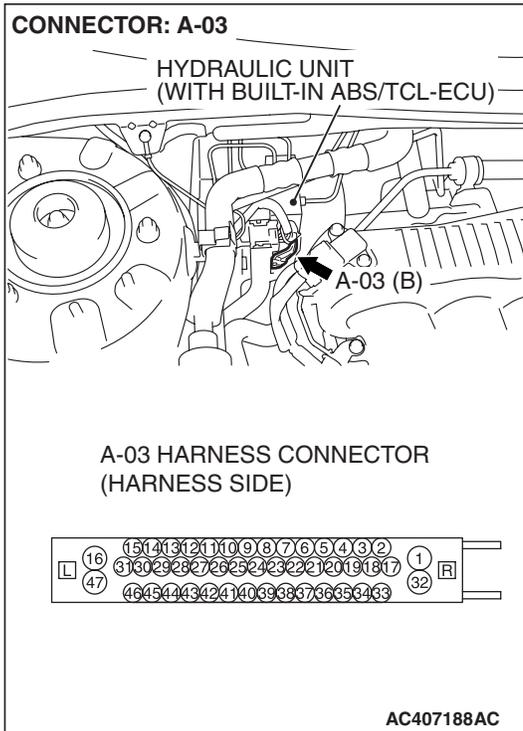


STEP 4. Check the harness wire between ABS/TCL-ECU connector A-03 terminal 38 and TCL switch connector C-126 terminal 1 for damage.

Q: Are there harness wires in good condition?

YES : Go to Step 5.

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

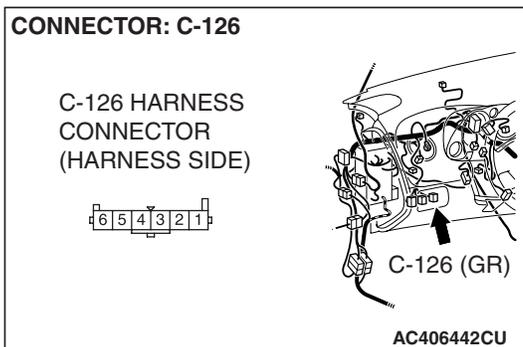


STEP 5. Check the harness wire between TCL switch connector C-126 terminal 2 and ground for damage.

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: Is TCL cancelled when the TCL switch is pushed 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). Then go to Step 7.

STEP 7. Retest the system**Q: Is TCL cancelled when the TCL switch is pushed on?****YES :** The procedure is complete.**NO :** Return to Step 1.

INSPECTION PROCEDURE 8: TCL System 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, diagnose the CAN bus line.

⚠ CAUTION

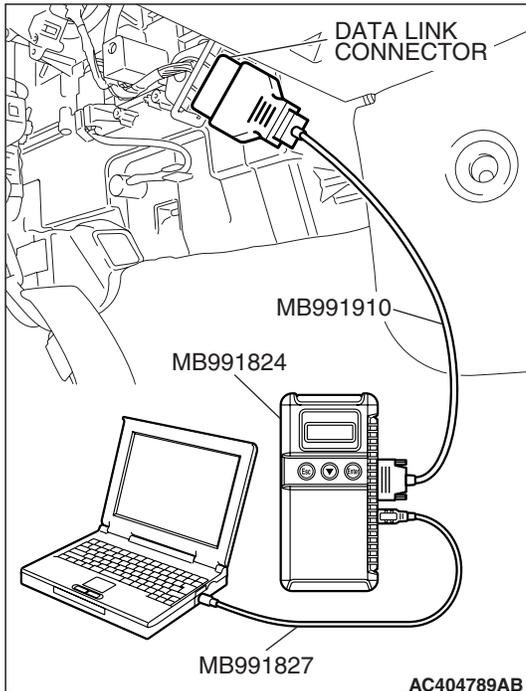
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

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

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 P.54C-14). Then go to Step 2.



STEP 2. Recheck for 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.

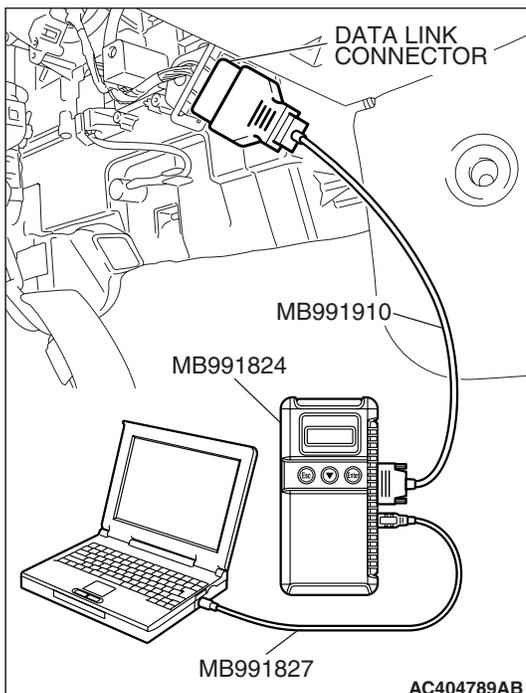
Check again if the DTC is set.

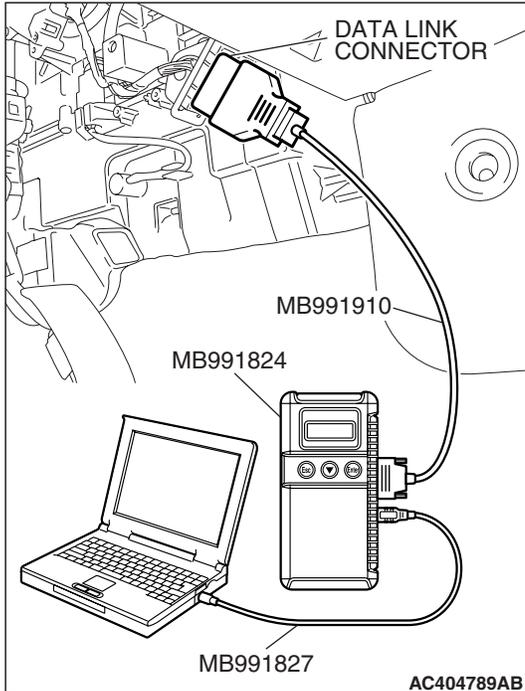
- (1) Turn the ignition switch to the "ON" position.
- (2) Erase the DTC.
- (3) Turn the ignition switch to the "LOCK" (OFF) position.
- (4) Turn the ignition switch to the "ON" position.
- (5) Check if the DTC is set.
- (6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is any DTC set?

YES : Diagnose the output DTC (Refer to P.35C-9). 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, check actuator test.
⚠ 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 "ABS/TCL" from the "CHASSIS" tab.
- (6) Choose "Actuator Test" from "ABS/TCL" screen.

⚠ CAUTION

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

- (7) Choose an appropriate item and select the "OK" button.
 - 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.
- (8) Turn the ignition switch to the "LOCK" (OFF) position.

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

YES : Go to Step 4.

NO : Replace the hydraulic unit (integrated with ABS/TCL-ECU). Then go to Step 5.

STEP 4. 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). Then go to Step 5.

STEP 5. Retest the system

Q: Does the TCL work normally?

YES : The procedure is complete.

NO : Return to Step 1.

DATA LIST REFERENCE TABLE

M1354003000117

The following items can be read by the scan tool from the ABS/TCL-ECU input data.

MUT-III SCAN TOOL DISPLAY	ITEM NO.	CHECK ITEM	CHECKING REQUIREMENTS	NORMAL VALUE
FL wheel speed sensor	01	Front-left wheel speed sensor	Drive the vehicle	Vehicle speeds displayed on the speedometer and scan tool are identical.
FR wheel speed sensor	02	Front-right wheel speed sensor		
RL wheel speed sensor	03	Rear-left wheel speed sensor		
RR wheel speed sensor	04	Rear-right wheel speed sensor		
Power supply voltage	05	ABS/TCL-ECU power supply voltage	Ignition switch power supply voltage and valve monitor voltage	Battery positive voltage
Stoplight switch (input)	06	Stoplight switch	Depress the brake pedal.	ON
			Release the brake pedal.	OFF
TCL OFF switch	28	TCL switch	TCL switch: ON	ON
			TCL switch: OFF	OFF

ACTUATOR TEST REFERENCE TABLE

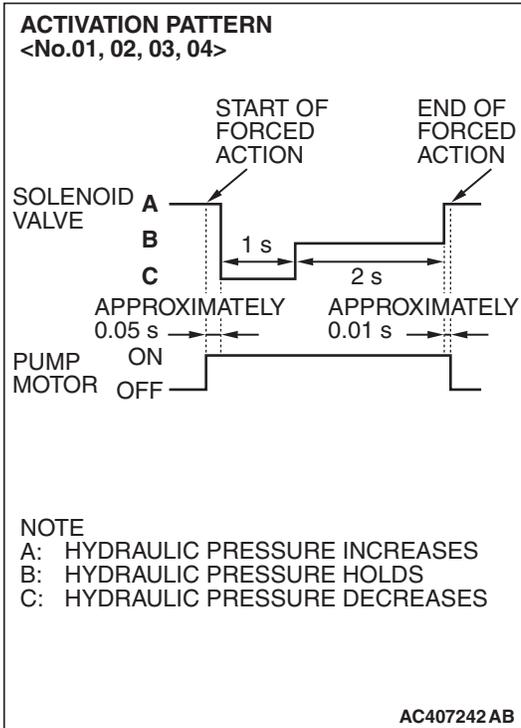
M1354003100147

The scan tool activates the following actuators for testing.

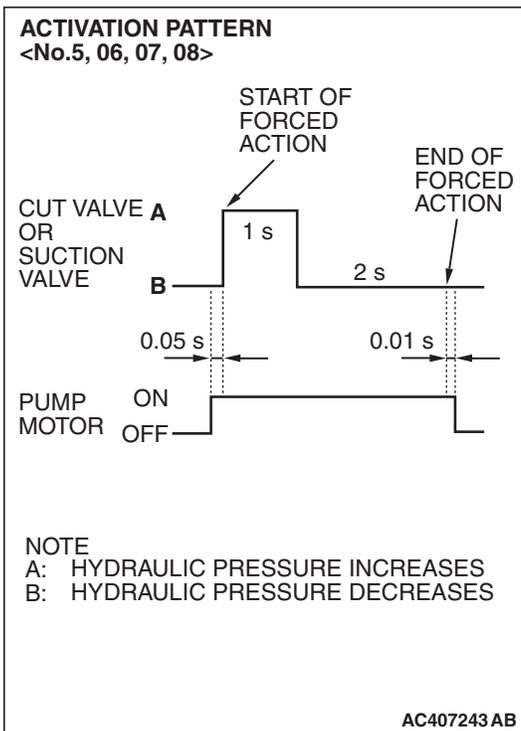
NOTE: Actuator testing is only possible when the vehicle is stationary.

NOTE: If the ABS/TCL-ECU runs down, actuator testing cannot be carried out.

ACTUATOR TEST SPECIFICATIONS



NO.	ITEM	PARTS TO BE ACTIVATED
01	FL wheel speed sensor	Solenoid valves and pump motors in the hydraulic unit (simple inspection mode)
02	FR wheel speed sensor	
03	RL wheel speed sensor	
04	RR wheel speed sensor	
05	FR wheel TCL Drive	Solenoid valves and pump motors in the hydraulic unit (simple inspection mode)
06	FL wheel TCL Drive	
07	RR wheel TCL Drive	
08	RL wheel TCL Drive	



CHECK AT ABS/TCL-ECU

M1354003200122

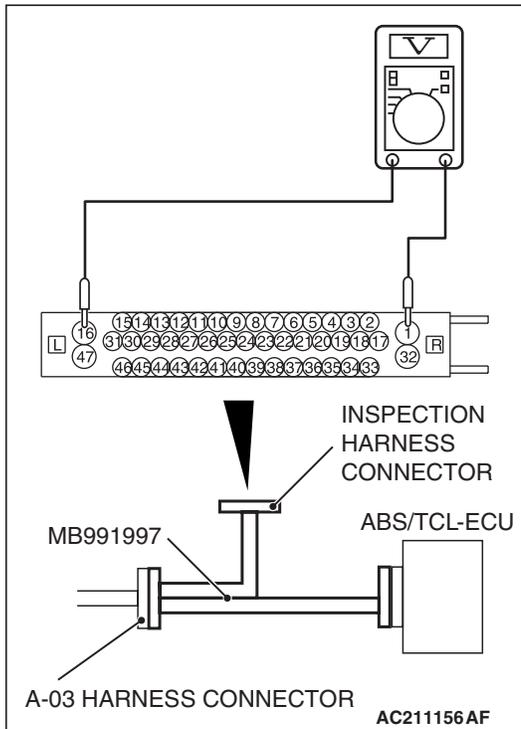
TERMINAL VOLTAGE CHECK CHART

Required Special Tool:

MB991997: ASC Check Harness

1. Disconnect the ABS/TCL-ECU connector A-03, and then use special tool MB991970 to measure the voltages between terminals (16) and each terminal other than terminal (47). Also measure voltages between terminal (47) and each terminal other than terminal (16).

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.

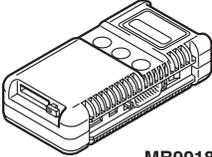
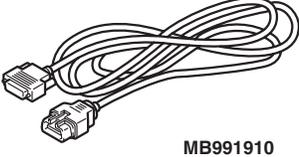
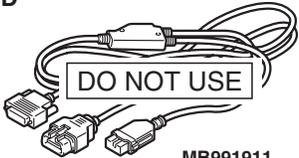
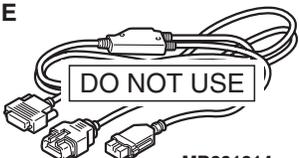
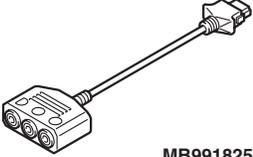
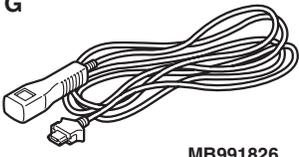


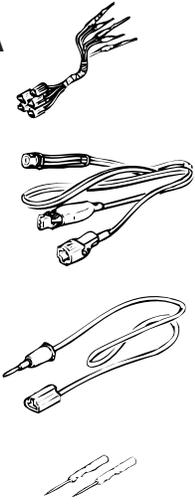
2. The terminal layouts are shown in the illustrations below.

CONNECTOR TERMINAL NO	SIGNAL	CHECKING REQUIREMENT		NORMAL CONDITION
1	Motor power supply	Always		Battery positive voltage
4	ABS/TCL-ECU power supply	Ignition switch: "ON"		Battery positive voltage
		Ignition switch: "START"		Approximately 0 V
32	Solenoid valve power supply	Always		Battery positive voltage
38	TCL switch input	Ignition switch: "ON"	TCL switch: "ON"	Battery positive voltage
			TCL switch: "OFF"	Approximately 0 V
41	Stoplight switch input	Ignition switch: "ON"	Stoplight switch: "ON"	Battery positive voltage
			Stoplight switch: "OFF"	Approximately 0 V

SPECIAL TOOLS

M1354000200145

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	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</p> <p>A: MB991824 B: MB991827 C: MB991910 D: MB991911 E: MB991914 F: MB991825 G: MB991826</p> <p>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 Adapter Harness G: MUT-III Trigger Harness</p>	<p>MB991824-KIT</p> <p><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</p> <p>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>MB991997</p>	<p>MB991997 ASC check harness</p>		<p>ABS/TCL-ECU terminal voltage measurement</p>

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
<p data-bbox="170 254 191 279">A</p>  <p data-bbox="337 726 454 747">MB991223AH</p>	<p data-bbox="467 201 724 331">MB991223 Harness set A: MB991219 Inspection harness</p>	<p data-bbox="865 201 1143 226">General service tools</p>	<p data-bbox="1175 201 1446 296">Wheel speed sensor output voltage measurement</p>

ON-VEHICLE SERVICE

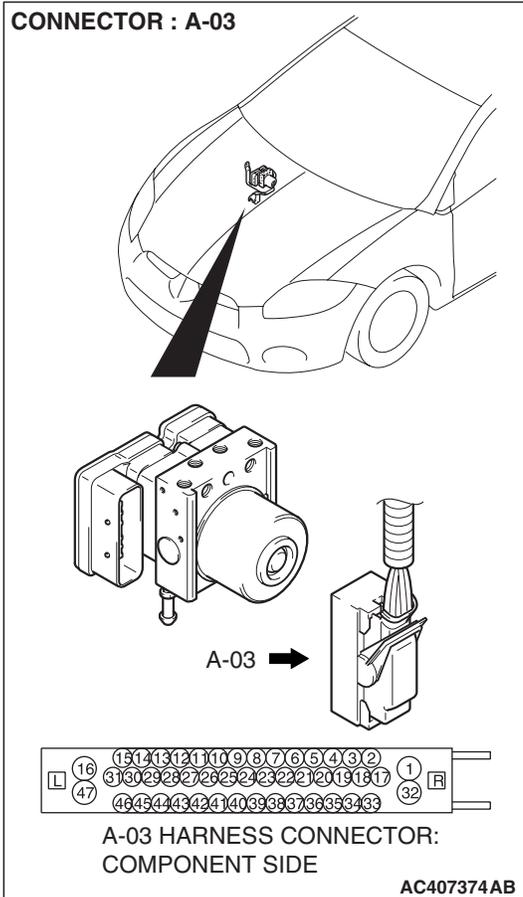
WHEEL SPEED SENSOR OUTPUT VOLTAGE MEASUREMENT

M1354005500011

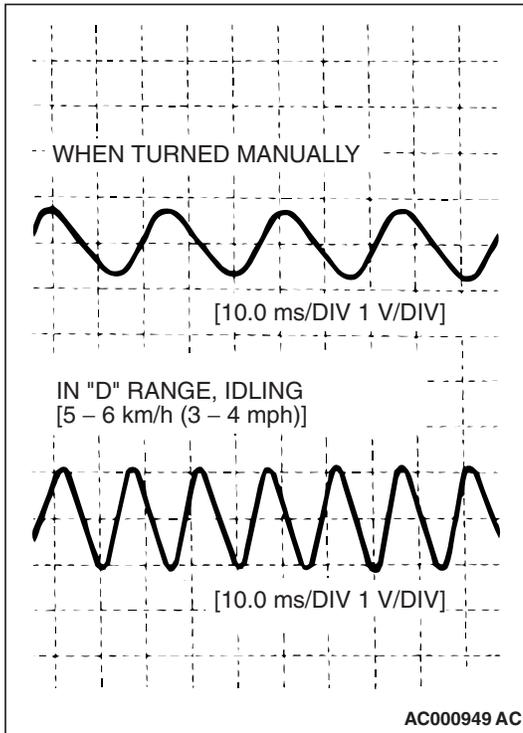
Required Special Tool:

MB991219: Inspection Harness

1. Release the parking brake and lift up the vehicle.
2. Disconnect the ABS/TCL-ECU connector A-03, and then use special tool MB991219 to measure the output voltage at the harness side connector.



TERMINAL NO.			
Front left	Front right	Rear left	Rear right
45	33	36	42
46	34	37	43



3. Manually turn the wheel to be measured 1/2 to 1 turn/second. Measure the output voltage with a voltmeter or oscilloscope.
NOTE: Check the connection of the sensor harness and connector before using the oscilloscope.

Output voltage:

- Minimal voltmeter reading: 42 mV
- Maximum voltmeter reading: 300 mV
- Minimal oscilloscope reading: 120 mV
- Maximum oscilloscope reading: 600 mV

Probable causes of low output voltage

- Wheel speed sensor pole piece-to-Wheel speed rotor clearance too large
 - Faulty wheel speed sensor
4. To observe the waveform with an oscilloscope:
 - Front wheels: Shift into 1st gear <M/T> or "D" range <A/T> and drive the wheels.
 - Rear wheels: Turn the wheels manually at a constant speed
- NOTE: The output waveform is low when the wheel speed is low. Similarly, it will be higher as the wheel speed increases. Waveform may also be observed by driving the vehicle.*

POINTS IN WAVEFORM MEASUREMENT

SYMPTOM	PROBABLE CAUSE	REMEDY
Too small or zero waveform amplitude	Faulty wheel speed sensor or excessive gap between it and the wheel speed rotor	Replace wheel speed sensor
Waveform amplitude fluctuates excessively (This is no problem if the minimum amplitude is 100 mV or more)	Axle hub eccentric or with large runout	Replace hub assembly
	Faulty ABS/TCL-ECU ground	Repair harness wires
Noisy or disturbed waveform	Open circuit in wheel speed sensor	Replace wheel speed sensor
	Open circuit in harness	Repair harness wire
	Incorrectly mounted wheel speed sensor	Mount wheel speed sensor correctly
	wheel speed rotor with missing or damaged teeth	Replace wheel speed rotor

NOTE: The Wheel speed sensor cable moves in relation to motion of the front or rear suspension. Therefore, it is likely that it has an open circuit only when driving on rough roads but it functions normally when driving on smooth roads. It is recommended to observe sensor output voltage waveform also under special conditions, such as driving on a rough road.

HYDRAULIC UNIT CHECK

M1354003400137

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

- The roller of the braking force tester and the tire should be dry during testing.
 - When testing the front brakes, apply the parking brake. When testing the rear brakes, stop the front wheels with chocks.
1. Jack up the vehicle. Then support the vehicle with rigid racks at the specified jack-up points or place the front or rear wheels on the rollers of the braking force tester.
 2. Release the parking brake, and feel the drag force (drag torque) on each road wheel. When using the braking force tester, take a reading of the brake drag force.

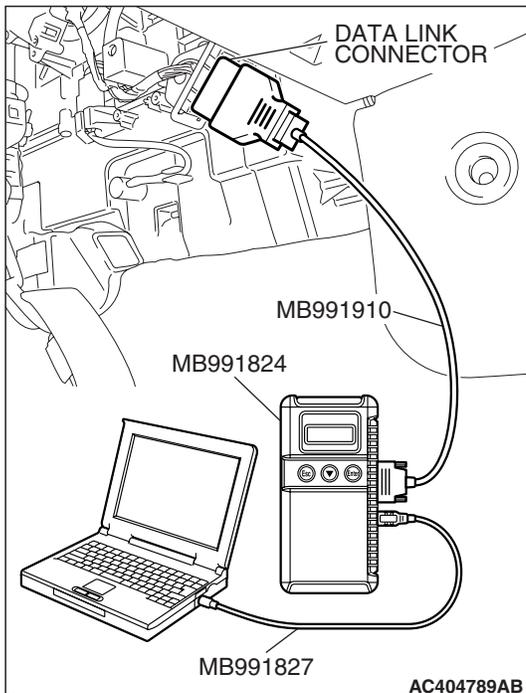
⚠ CAUTION

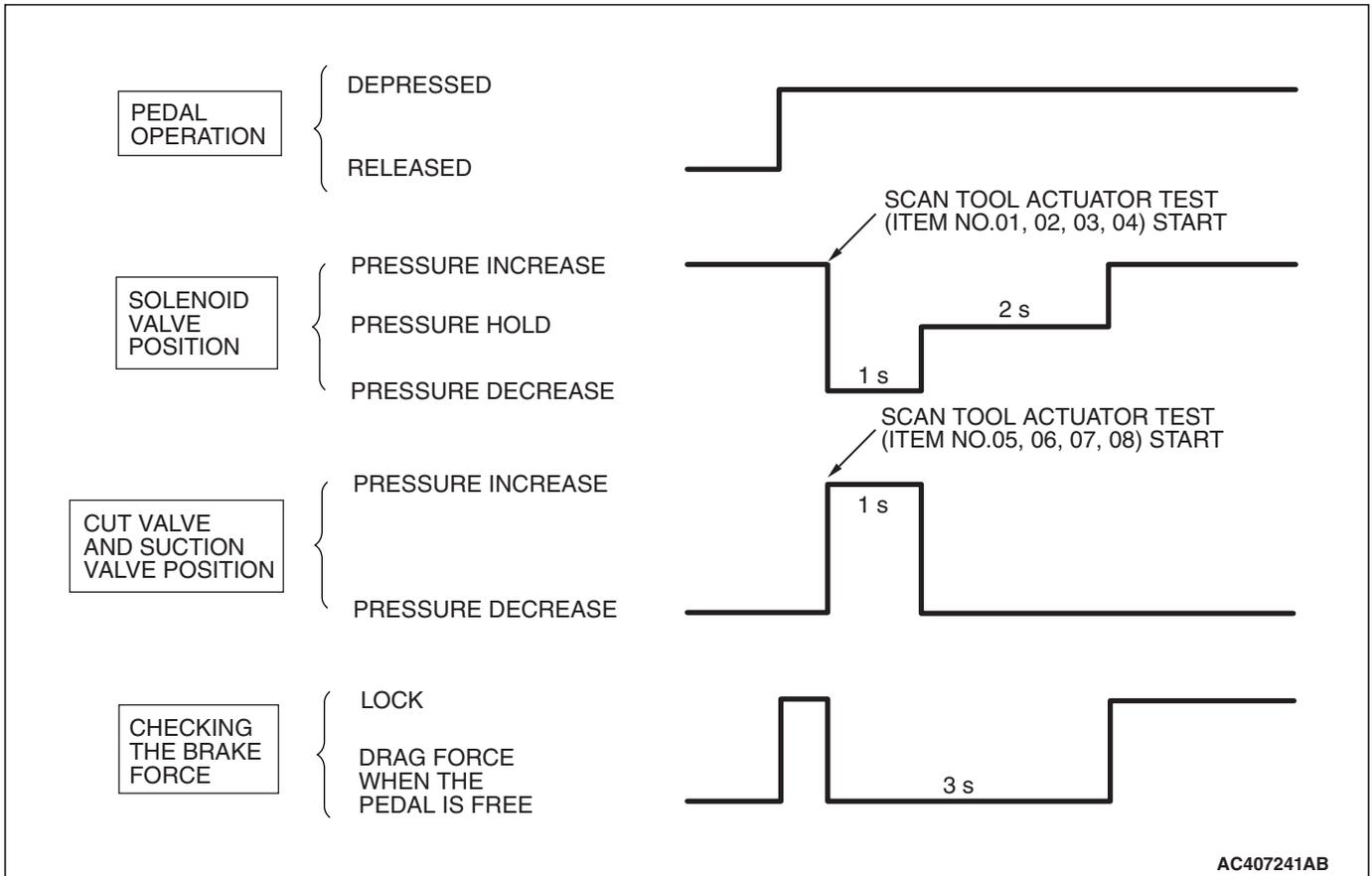
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

3. Connect scan tool MB991958 to the data link connector.
4. After checking that the neutral position <M/T> or the selector lever is in "P" range, start the engine.
5. Select "Interactive Diagnosis" from the start-up screen.
6. Select "System Select."
7. Choose "ABS/TCL" from the "CHASSIS" tab.
8. Select "Actuator Test" from "ABS/TCL" screen
9. Choose an appropriate item for hydraulic unit check.

NOTE: The ABS/TCL system will switch to the scan tool mode and the ABS warning light, TCL indicator and TCL OFF indicator will illuminate.

NOTE: When the ABS and TCL has been interrupted by the fail-safe function, scan tool MB991958 actuator testing cannot be used.





10. Turn the wheel by hand and check the change in braking force when the brake pedal is depressed. When using the braking force tester, depress the brake pedal until the braking force is at the following values, and check that the braking force changes to the brake drag force reading taken in step 2 when the actuator is force-driven. The result should be as shown in the diagram above.

Front wheel	785 –981 N (176 –220 lb)
Rear wheel	588 –784 N (132 –176 lb)

11. If the result of inspection is abnormal, repair according to the Diagnosis Table below.

DIAGNOSIS TABLE					
MUT-III SCAN TOOL DISPLAY	OPERATION	INSPECTION RESULT	JUDGMENT	PROBABLE CAUSE	REMEDY
01 FR VALVE 02 FL VALVE 03 RR VALVE 04 RL VALVE	<ul style="list-style-type: none"> Depress brake pedal to lock wheel. Using scan tool MB991958, select the wheel to be checked and force the actuator to operate. Turn the selected wheel manually to check the change of brake force. 	Brake force is released for three seconds after wheels have been locked.	Normal	–	–
		Wheel does not lock when brake pedal is depressed.	Abnormal	Clogged brake line other than hydraulic unit	Check and clean brake line
		Brake force is not released		Clogged hydraulic circuit in hydraulic unit	Replace hydraulic unit assembly
				Incorrect hydraulic unit brake tube connection	Connect correctly
				Hydraulic unit solenoid valve not functioning correctly	Replace hydraulic unit assembly

12. After inspection, disconnect scan tool MB991958 immediately after turning the ignition switch to the "LOCK" (OFF) position.

IN THE EVENT OF A DISCHARGED BATTERY

M1354005700015

⚠ WARNING

If the ABS is not operating, the vehicle will be unstable during braking, Do not drive the vehicle with the ABS/TCL-ECU connector disconnected or with the ABS/TCL not operating for any other reason.

If the engine is started using a booster cable when the battery is completely flat, and the vehicle is then driven without waiting for the battery to be recharged, the engine may misfire and it may not be possible to drive the vehicle. This is because the ABS consumes a large amount of current when carrying out its initial checks. If this happens, recharge the battery fully.

HYDRAULIC UNIT

REMOVAL AND INSTALLATION

Refer to GROUP 35B, Hydraulic Unit [P.35B-141](#).

M1354005900019

WHEEL SPEED SENSOR

REMOVAL AND INSTALLATION

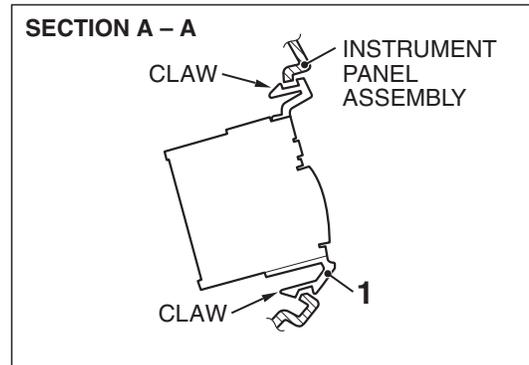
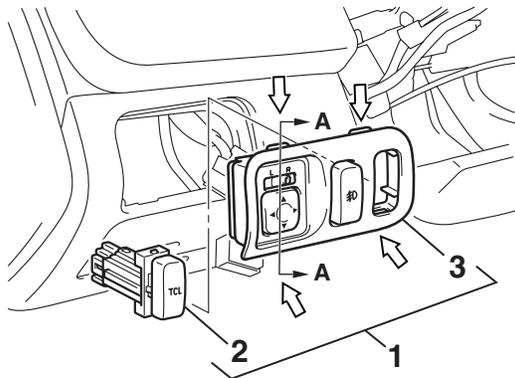
Refer to GROUP 35B, Wheel Speed Sensor [P.35B-145](#).

M1354006100016

TCL SWITCH

REMOVAL AND INSTALLATION

M1354006400017



NOTE
← : CLAW POSITION

- REMOVAL STEPS**
1. SWITCH PANEL ASSEMBLY

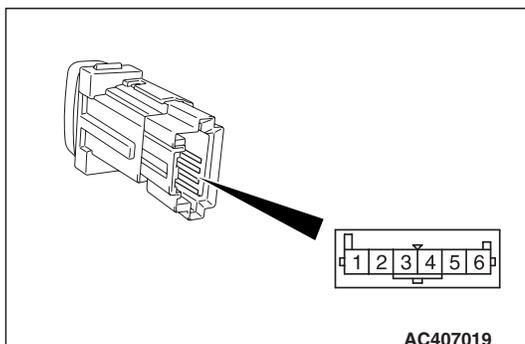
- REMOVAL STEPS (Continued)**
2. TCL SWITCH
 3. SWITCH PANEL

AC406895 AB

INSPECTION

TCL SWITCH CONTINUITY CHECK

M1354006600011



AC407019

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