GROUP 35C

TRACTION CONTROL/ACTIVE STABILITY CONTROL SYSTEM

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

⚠ WARNING

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

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

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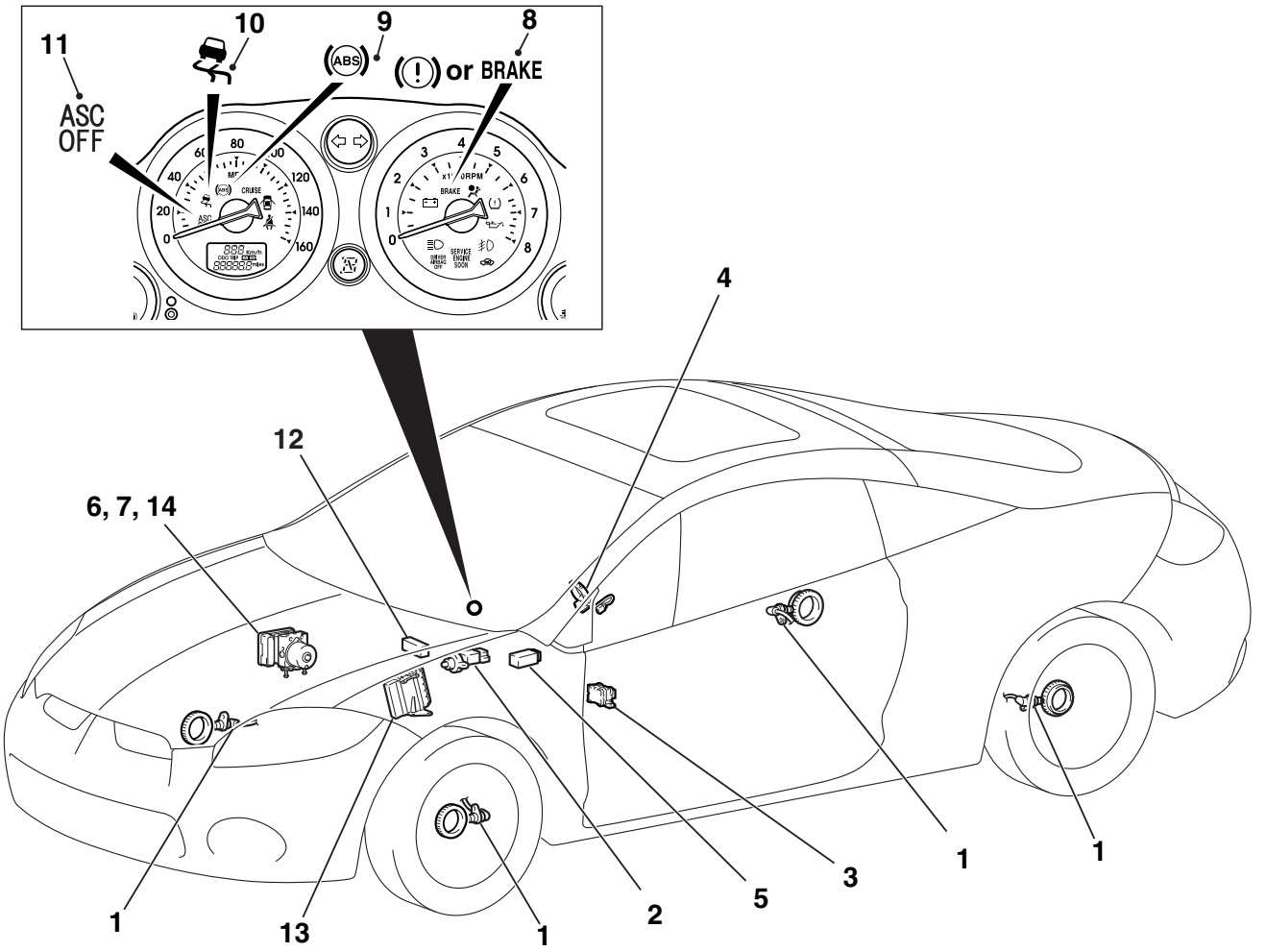
GENERAL DESCRIPTION

M1355000200223

Traction Control/Active Stability Control System (TCL/ASC) is available for all model as standard equipment.

- The TCL/ASC is a combination system of active stability control system (ASC) and traction control system (TCL). The ASC avoids a dangerous vehicle attitude by limiting the engine output and braking a set of wheels (front-left and right-rear, or front-right and rear-left) according to driving conditions. The TCL prevents wheel spinning at vehicle start.
- Fail-safe function ensures safety is maintained
- Diagnostic function provides improved service-ability
- To shorten the lines and enhance data transmis-sion reliability, communication with other ECU is performed over a CAN (Controller Area Network).

CONSTRUCTION DIAGRAM



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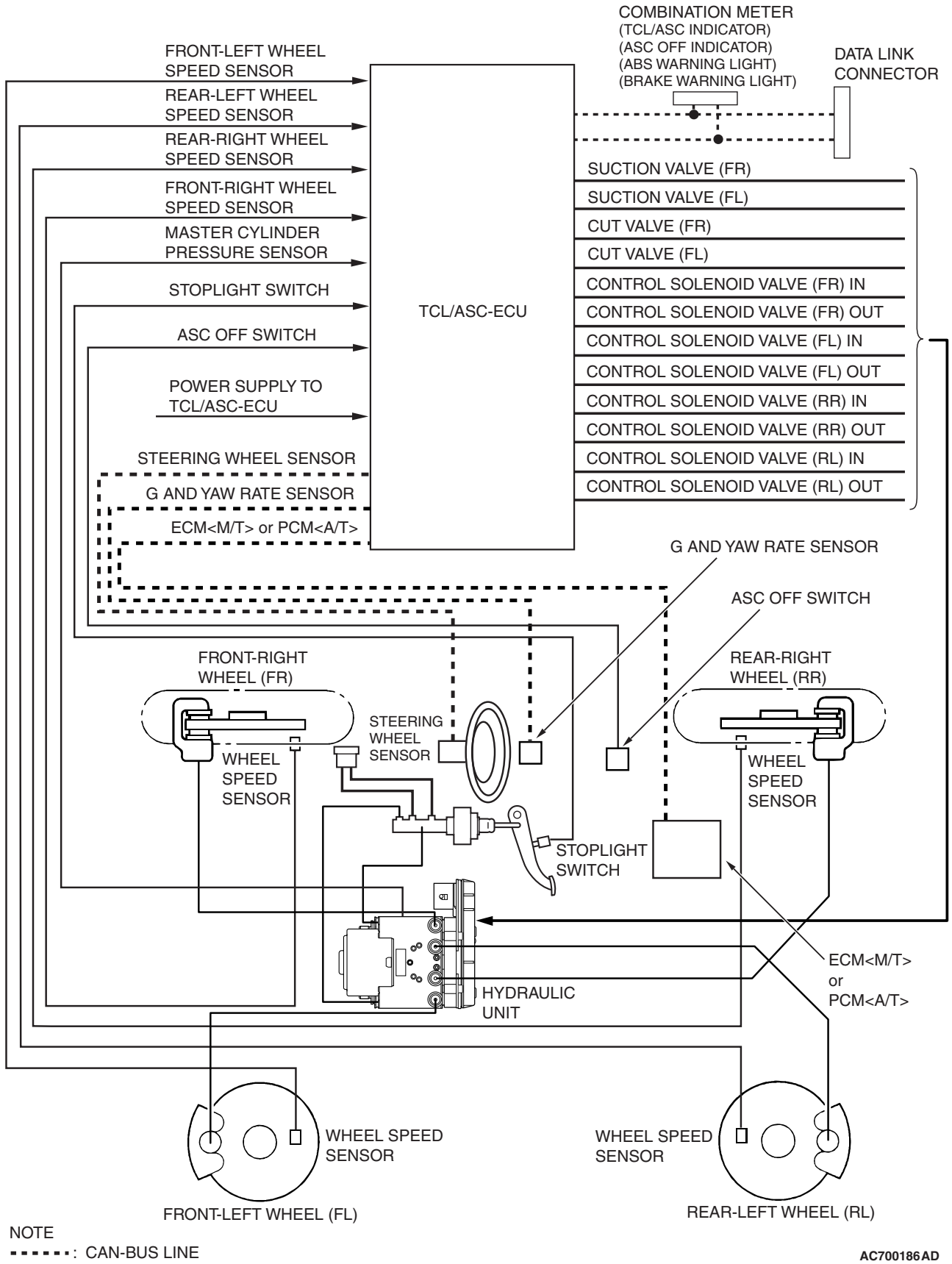
NAME OF PART		NUMBER	OUTLINE OF FUNCTIONS
Sensor	Wheel speed sensor	1	Sends alternating current signals at frequencies which are proportional to the rotation speeds of each wheel to the TCL/ASC-ECU.
	Stoplight switch	2	Sends a signal to the TCL/ASC-ECU to indicate whether the brake pedal is depressed or not.
	G and yaw rate sensor	3	It detects the lateral acceleration, the yaw angular velocity of the vehicle. Then it sends a signal through the CAN bus line to the TCL/ASC-ECU.
	Steering wheel sensor	4	Detects the steering wheel angle, and sends a signal to the TCL/ASC-ECU through the CAN bus line.
	ASC OFF switch	5	Sends a signal to the TCL/ASC-ECU to turn on and off the active stability control and traction control.
	Master cylinder pressure sensor	6	Is incorporated in the hydraulic unit, and informs the TCL/ASC-ECU of the brake fluid pressure in the master cylinder.
Actuator	Hydraulic unit	7	Drives the solenoid valves according to signals from the TCL/ASC-ECU in order to control the brake hydraulic pressure for each wheel.
	Brake warning light	8	Used as the warning light for the parking brake, brake fluid level, and EBD control. Informs the driver of the system status by illuminating or turning off the warning light according to the signal from TCL/ASC-ECU.
	ABS warning light	9	Informs the driver of the system status by illuminating or turning off the warning light according to the signal from TCL/ASC-ECU.
	TCL/ASC indicator	10	Receives a signal from the TCL/ASC-ECU, and flashes (4Hz) to inform the driver that the system is operating.
	ASC OFF indicator	11	Receives a signal from the TCL/ASC-ECU, and illuminates to inform the driver that the system is not operating, and flashes (2Hz) to inform the driver of system overheat.
Data link connector		12	Sets the diagnostic trouble codes and allows communication with the scan tool.
Engine control module (ECM) <M/T>		13	Receives signals from the TCL/ASC-ECU to control the engine output.
Powertrain control module (PCM) <A/T>			
Traction Control/Active Stability Control System control unit (TCL/ASC-ECU)		14	Controls actuators (described above) based on the signals coming from each sensor.
			Controls the self-diagnostics and fail-safe functions.
			Controls the diagnostic function (scan tool compatible).

SYSTEM CONFIGURATION DIAGRAM



NOTE
- - - - - - : CAN-BUS LINE

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TSB Revision

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 TCL/ASC self-check.

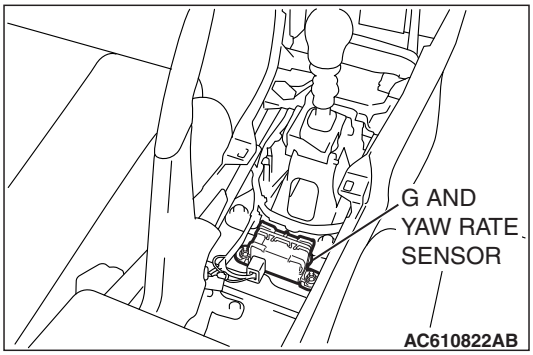
TCL/ASC OPERATION SOUNDS AND SENSATIONS

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

- A whining sound is caused by the TCL/ASC 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 TCL/ASC 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.

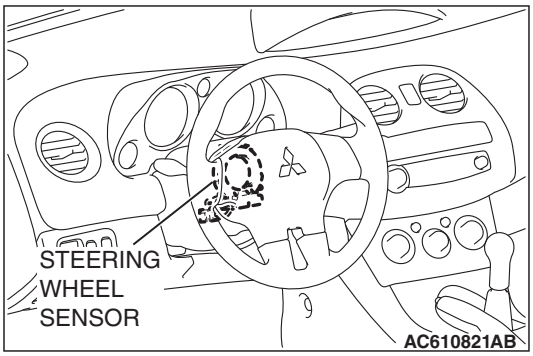
SENSOR

G AND YAW RATE SENSOR



This sensor is mounted under the floor console, and detects lateral acceleration, longitudinal acceleration and yaw angular velocity of the vehicle.

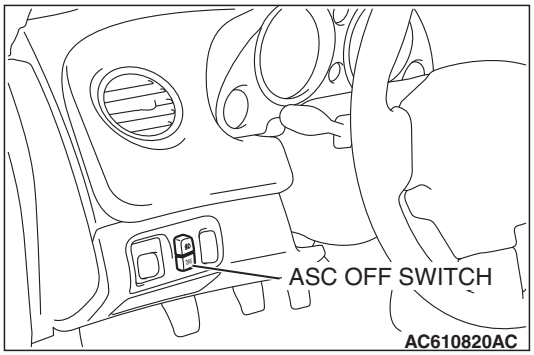
STEERING WHEEL SENSOR



- This sensor is mounted behind the column switch, and detects the steering wheel angle.
- The steering wheel sensor has a self-diagnosis function and a memory function. If the diagnosis function finds a trouble, it sends a DTC code to the TCL/ASC-ECU. Then the ECU will illuminate the TCL/ASC indicator.

  NOTE: For the details of the DTC codes, refer to P.35C-14.

ASC OFF SWITCH



This switch is mounted on the left side of the instrument panel, and turns on and off the system.

ASC OFF SWITCH OPERATION AND THEIR RESPECTIVE CONTROLS

ASC OFF SWITCH OPERATION	ACTIVE STABILITY CONTROL	TRACTION CONTROL	
		BRAKE CONTROL	ENGINE CONTROL
Not operated	Active	Active	Active
Operated (Press and hold for 3 seconds)	Inactive	Inactive	Inactive

NOTE:
The ASC returns to the active state automatically when the ignition switch is turned to the ON position.

ACTUATOR

HYDRAULIC UNIT

The hydraulic unit includes a cut valve, suction valve and pressure switch for the ASC control additionally, compared with the conventional hydraulic unit for the ABS control.

TCL/ASC INDICATOR AND ASC OFF INDICATOR

The TCL/ASC indicator and ASC OFF indicator illuminate or flash under the conditions below to inform the driver.

TCL/ASC INDICATOR

- When the ASC is active, the indicator flashes. (4Hz)
- When the TCL is active, the indicator flashes. (4Hz)
- When sensors related to TCL/ASC are not initialized, the indicator flashes (2Hz).
- When there is a failure in the TCL/ASC, the indicator illuminates.

ASC OFF INDICATOR

- When the TCL is inactive, the indicator illuminates.
- When the TCL/ASC is defective, the indicator illuminates.
- When the brake pad temperature is high, the ASC OFF indicator flashes at a rate of 2 Hz.

TCL/ASC INDICATOR, ASC OFF INDICATOR AND THEIR OPERATION PATTERN

STATE	CONDITION	TCL/ASC INDICATOR	ASC OFF INDICATOR
Normal	Bulb check	Illuminates for three seconds after the ignition is on.	Illuminates for three seconds after the ignition is on
	ASC OFF switch: ON	OFF	ON
	ASC OFF switch: OFF	OFF	OFF
	ASC is active	Flashes (4Hz).	OFF
	TCL is active	Flashes (4Hz).	OFF
	Brake TCL is prohibited by the pad high temperature.	OFF	Flashes (2Hz)
Defective	ASC is defective.	Illuminates	Illuminates
	TCL is defective.	Illuminates	Illuminates
Scan tool is connected	Actuator test not executed	–	–
	Actuator test executed	Illuminates	Illuminates
Battery is removed and then reconnected.	Steering wheel sensor not initialized	Flashes (2Hz)	Flashes (2Hz)

TCL/ASC-ECU

The ECU incorporates the ABS-ECU, ASC-ECU, and TCL-ECU. The integral design allows joint operation of the TCL/ASC-ECU with the ABS and coordinated control of the driving force and braking force.

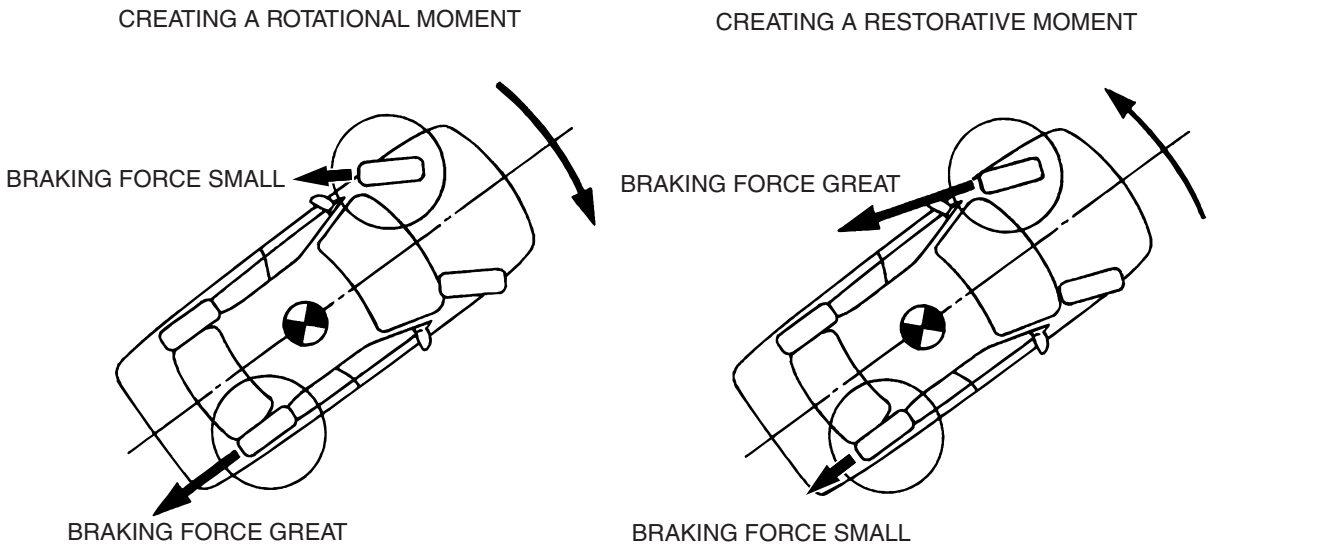
SYSTEM CONFIGURATION

The TCL/ASC is a system that adds a yaw rate sensor, a lateral G sensor, a steering wheel sensor and master cylinder pressure sensor (incorporated in hydraulic unit) to the ABS system.

OVERVIEW OF CONTROL

The TCL/ASC-ECU detects vehicle movement based on information from various sensors and calculates a model of ideal vehicle movement. After comparing actual and ideal movements, it acts to bring the actual vehicle movement closer to the ideal model by controlling specific wheel brake force and governing engine output. It restrains under-steering and over-steering through a corrective yaw moment, as explained on the following pages.

EXAMPLE OF ASC OPERATION

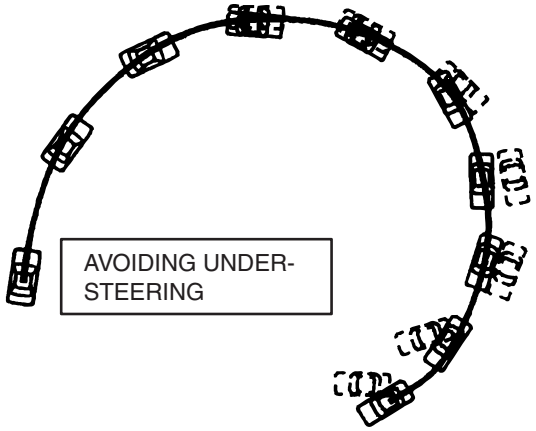


The ASC manages the vehicle attitude by creating a yaw moment from altering the balance between the cornering force and each wheel's braking mechanism.

For example, on a slippery surface, if the vehicle tends to be under-steered contrary to the driver's intention, a yaw moment (a rotational moment) is created to restrain the under-steering by increasing the rear-inside braking force. On the other hand, when the vehicle tends to be over-steered, a yaw moment (a restorative moment) is created to restrain the over-steering by increasing the front-outside braking force. Furthermore, when it is determined that the vehicle is over-speeding, safe and stable cornering is enabled by deceleration from restricting engine output.

EXAMPLE OF THE EFFECT OF CONTROL

RESTRAINING UNDER-STEERING



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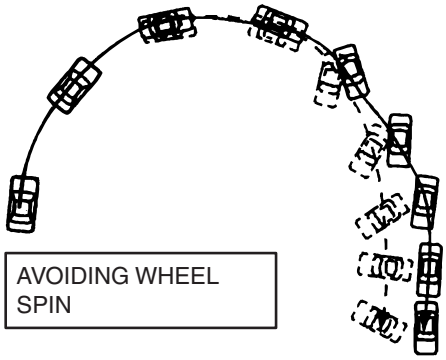
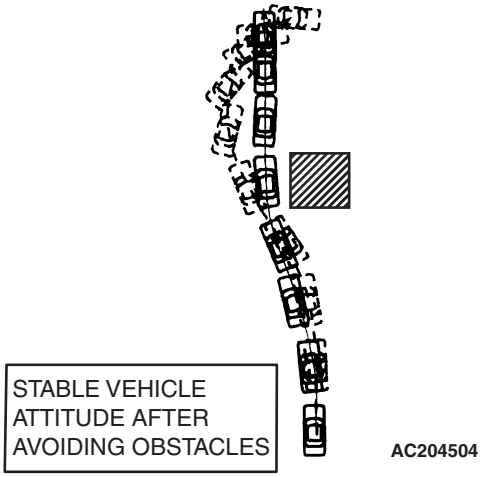
RESTRAINING OVER-STEERING



AC204506

IMPROVING ABS PERFORMANCE



AC204504

AC204507AB

INTEGRATED CONTROL

The ASC transmits data necessary for control of the ABS and the TCL, performing integrated control.

CONTROL SYSTEM	CONTROL CONTENT
ABS	Even during ABS operation, ABS performance is improved from the integrated operation of the ABS control.
TCL	During acceleration, engine output is governed through integrated operation with the TCL.

EXAMPLE OF OPERATION OF TCL

The TCL prevents drive force loss during slipping of the drive wheels by automatically applying the brakes and sending engine torque reduction signal to the ECM <M/T> or PCM <A/T> when the drive wheels slip or when driving on partly low-friction surfaces.

FAIL-SAFE AND DIAGNOSTIC FUNCTIONS

The TCL/ASC-ECU regularly monitors input and output signals. If an error is detected in the system, the ECU sends a fail signal and the TCL/ASC indicator is illuminated or blinks. Various controls are processed depending on the cause of malfunction as shown

below. When the ABS system fails, the TCL/ASC system is also suspended. However, when the TCL/ASC system fails, no other system is suspended. The appropriate indicator lights are illuminated/flashed.
The TCL/ASC-ECU includes the following functions to make system inspection easier.

- Diagnostic trouble code
- Displays Data list
- Actuator test

All of the above operations can be carried out using scan tool MB991958.

TCL/ASC DIAGNOSIS

INTRODUCTION TO TCL/ASC DIAGNOSIS

The TCL/ASC 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/ASC may not be used to. Some operational characteristics may seem to be malfunctions, but they are simply signs of normal TCL/ASC operation. When diagnosing the TCL/ASC system, keep these operational characteristics in mind. Inform the owner of the kind of performance characteristics to expect from an TCL/ASC-equipped vehicle.

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TCL/ASC DIAGNOSTIC TROUBLE CODE DETECTION CONDITIONS

TCL/ASC diagnostic trouble codes (TCL/ASC DTCs) are set under different conditions, depending on the malfunction detected. Most TCL/ASC DTCs will only be set during vehicle operation. Some TCL/ASC DTCs will also be set during the TCL/ASC self-check immediately after the engine is started.
When you check if an TCL/ASC DTC will be displayed again after the DTC has been erased, you should duplicate the TCL/ASC DTC set conditions. Depending on the detection timing and set conditions for the specific TCL/ASC 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/ASC DTC SET CONDITIONS" for each TCL/ASC DTC that you are trying to reset.

TCL/ASC DIAGNOSTIC TROUBLESHOOTING STRATEGY

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

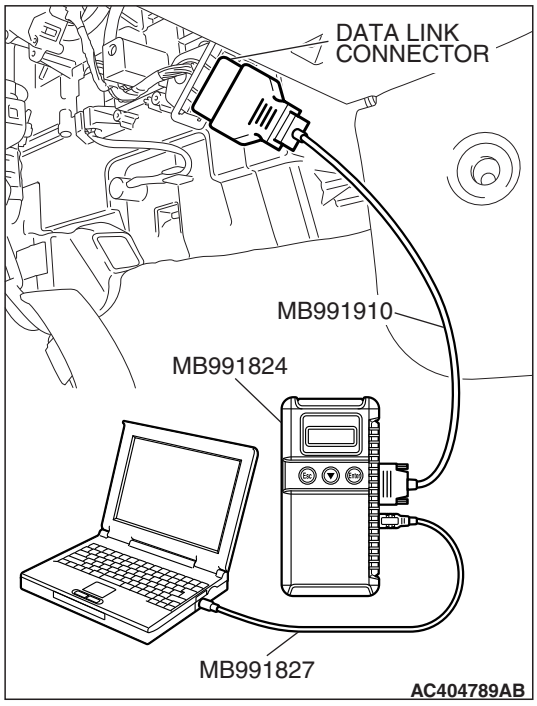
1. Gather information about the problem from the customer.
2. Verify that the condition described by the customer exists.
3. Check the vehicle for any TCL/ASC DTC.
4. If you cannot verify the condition and there are no TCL/ASC DTCs, the malfunction is intermittent. Refer to GROUP 00, How to use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-14.
5. If you can verify the condition but there is no TCL/ASC DTC, 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-3.
   - If the basic brake system is operating properly, refer to P.35C-179.
6. If there is an TCL/ASC DTC, record the number of the DTC, then erase the DTC from the memory using the scan tool.
7. Duplicate the TCL/ASC DTC set conditions to see if the same TCL/ASC DTC will set again.
   - If the same TCL/ASC DTC sets again or the TCL/ASC DTC cannot be erased, perform the diagnostic procedures for the DTC. Refer to P.35C-14.
   - If you cannot get the same TCL/ASC 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

M1355001000125

ON-BOARD DIAGNOSTICS

If the TCL/ASC-ECU detects any problem in the CAN communication line or the ECUs, which the TCL/ASC-ECU is communicating with, it stores a diagnostic trouble code. The DTCs can be confirmed by connecting scan tool MB991958 (M.U.T.-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 (M.U.T.-III sub assembly).



HOW TO CONNECT THE SCAN TOOL (M.U.T.-III)

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-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 to the data link connector.
6. Turn the power switch of special tool MB991824 to the "ON" position.

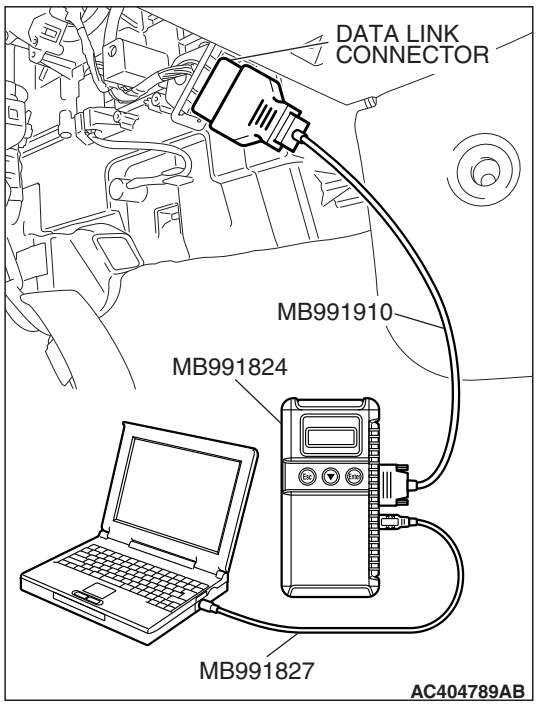
   NOTE: When special tool MB991958 is energized, special tool MB991824 indicator light will be illuminated in a green color.
7. Start the M.U.T.-III system on the personal computer.

NOTE: Disconnect the scan tool MB991958 is the reverse order 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 (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-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.

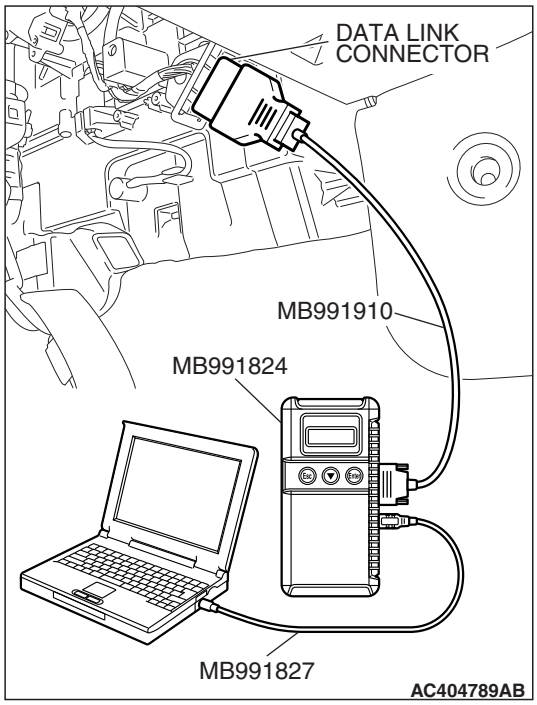
NOTE: If the battery voltage is low, diagnostic trouble codes will not be set. Check the battery if scan tool MB991958 does not display.

1. Connect scan tool MB991958 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select "System Select."
4. Choose "ABS/ASC/ASTC" and "STEERING ANGLE SENSOR."
5. Select "Diagnostic Trouble Code." to read the DTC.
6. If a DTC is set, it is shown.
7. Choose "DTC erase" to erase the DTC.

HOW TO READ DATA LIST

Required Special Tools:

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



⚠ CAUTION

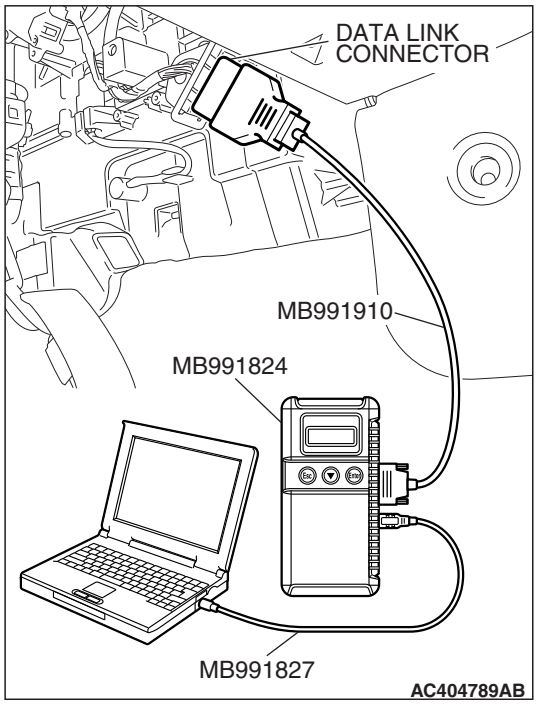
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

1. Connect scan tool MB991958 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select "System Select."
4. Choose "ABS/ASC/ASTC."
5. Select "Data List."
6. Choose an appropriate item and select the "OK" button.

HOW TO PERFORM ACTUATOR TEST

Required Special Tools:

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



⚠ CAUTION

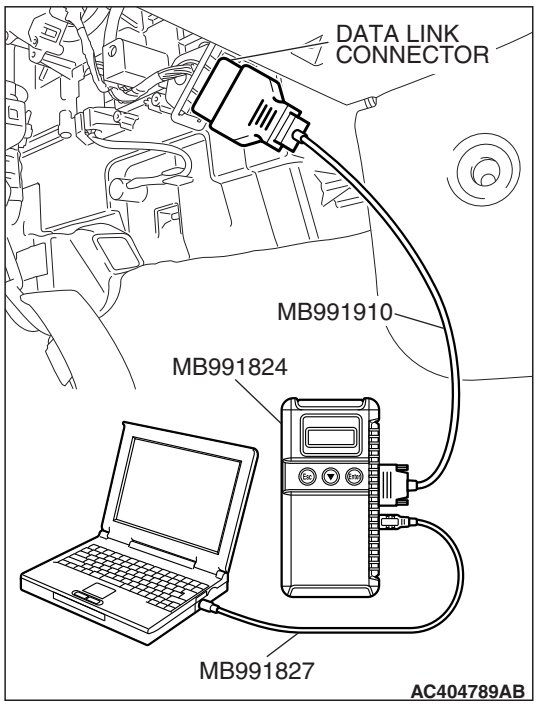
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

1. Connect scan tool MB991958 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select "System Select."
4. Choose "ABS/ASC/ASTC."
5. Choose "Actuator Test" from "ABS/ASC/ASTC" screen.
6. Choose an appropriate item and select the "OK" button.

HOW TO DIAGNOSE THE CAN BUS LINE

Required Special Tools:

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



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

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

DIAGNOSTIC TROUBLE CODE CHART

M1355001100779

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

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

<ABS/TCL/ASC DTC>

DTC	INSPECTION ITEM (M.U.T.-III SCAN TOOL DISPLAY)	DIAGNOSTIC CONTENT	REFERENCE PAGE
C1200	FR wheel SPD. SNSR. malfunction	Open circuit or short circuit	P.35C-16
C1201	FR wheel SPD. SNSR. invalid signal	Abnormal output signal	P.35C-26
C1205	FL wheel SPD. SNSR. malfunction	Open circuit or short circuit	P.35C-16
C1206	FL wheel SPD. SNSR. invalid signal	Abnormal output signal	P.35C-26
C1210	RR wheel SPD. SNSR. malfunction	Open circuit or short circuit	P.35C-16
C1211	RR wheel SPD. SNSR. invalid signal	Abnormal output signal	P.35C-26
C1215	RL wheel SPD. SNSR. malfunction	Open circuit or short circuit	P.35C-16
C1216	RL wheel SPD. SNSR. invalid signal	Abnormal output signal	P.35C-26

TSB Revision

DTC	INSPECTION ITEM (M.U.T.-III SCAN TOOL DISPLAY)	DIAGNOSTIC CONTENT	REFERENCE PAGE
C1226	FR inlet valve		P.35C-95
C1231	FR outlet valve		P.35C-95
C1236	FL inlet valve		P.35C-95
C1241	FL outlet valve		P.35C-95
C1246	RR inlet valve		P.35C-95
C1251	RR outlet valve		P.35C-95
C1256	RL inlet valve		P.35C-95
C1261	RL outlet valve		P.35C-95
C1271	Motor drive circuit		P.35C-99
C1276	Valve power supply circuit		P.35C-107
C1300	FR cut valve		P.35C-95
C1305	FR suction valve		P.35C-95
C1310	FL cut valve		P.35C-95
C1315	FL suction valve		P.35C-95
C1340	Stoplight switch		P.35C-115
C1361	M/C pressure SNSR. stuck/low gain		P.35C-122
C1364	M/C pressure SNSR. malfunction		P.35C-122
C1366	Lateral G SNSR. stuck/low gain		P.35C-124
C1371	Yaw rate SNSR. stuck/low gain		P.35C-124
C1377	Communication error G and yaw rate SNSR.		P.35C-124
C1394	INCOMP. learn neutral (SAS)		P.35C-136
C1395	INCOMP. Brake fluid filling		P.35C-139
C1505	Steering angle sensor (detected by ASC side)		P.35C-142
C1506	Steering angle sensor error (detected by itself)		P.35C-142
C1607	ECU failure (valve relay cannot activate)		P.35C-149
	ECU failure (valve relay cannot deactivate)		
C1640	Coding not completed		P.35C-150
C1860	Abnormality in battery voltage (high voltage)		P.35C-154
C1861	Abnormality in battery voltage (low voltage)		P.35C-154
C1864	G and yaw rate SNSR. power supply voltage		P.35C-124
U1073	Bus-off		P.35C-160
U1100	CAN communications system time out error engine related data		P.35C-162
U1101	CAN communications system time out error A/T related data		P.35C-166
U1104	SAS CAN Timeout/Not equipped		P.35C-169
U1120	CAN communications system TCL uncontrollable by engine malfunction		P.35C-172

TSB Revision

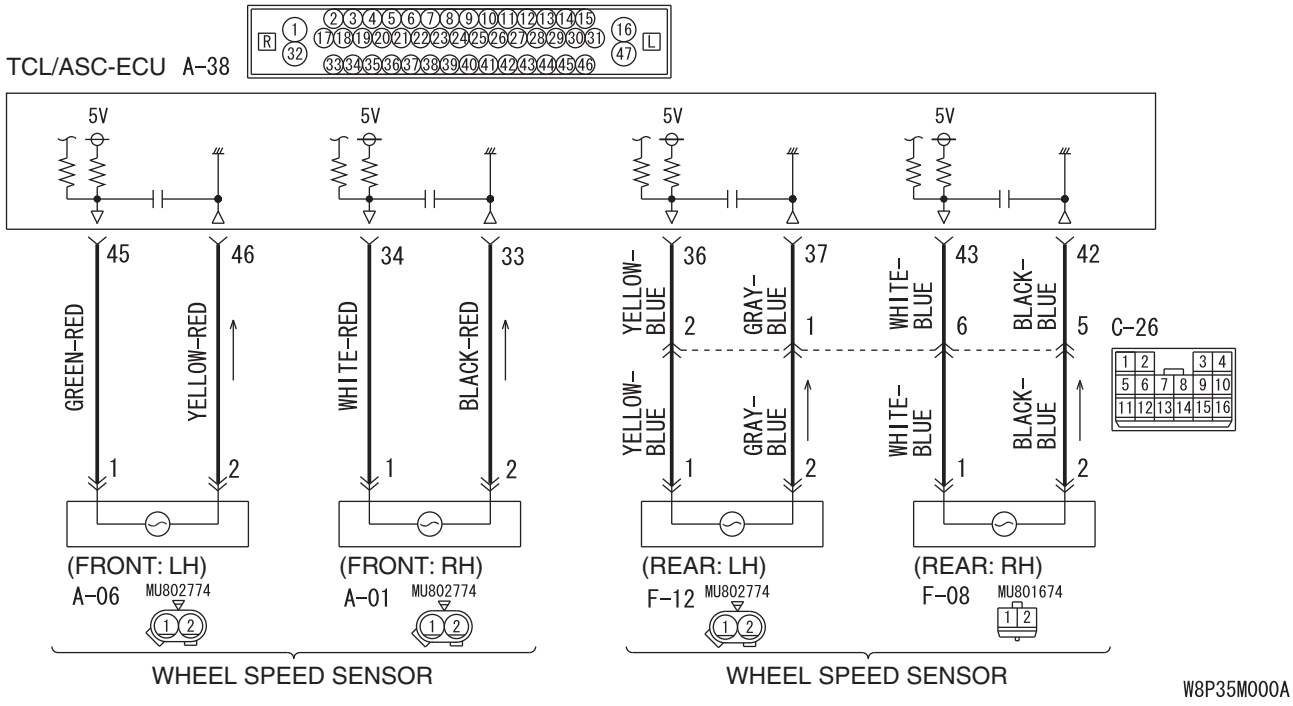
<STEERING WHEEL SENSOR DTC>

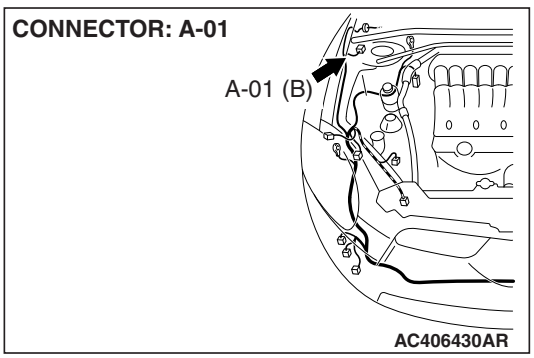
DTC	INSPECTION ITEM (M.U.T.-III SCAN TOOL DISPLAY)	REFERENCE PAGE
C1551	Hall-IC output voltage	P.35C-142
C1552	Hall-IC output pattern	P.35C-142
C1553	Optical sensor	P.35C-142
C1554	Speed sensor is out of range	P.35C-142
C1555	Steering angle SNS. out of range	P.35C-142
C1608	EEPROM failure	P.35C-142
U1073	Bus-off	P.35C-177

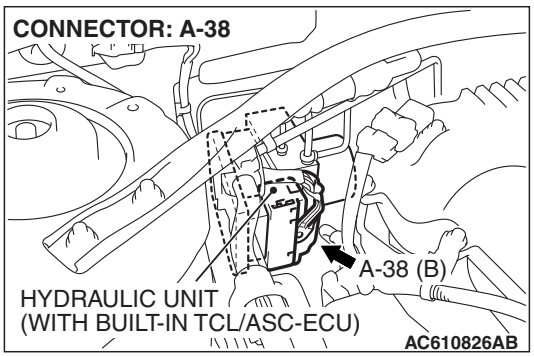
DIAGNOSTIC TROUBLE CODE PROCEDURES <TCL/ASC-ECU>

wheel speed DTC C1200: FR wheel SPD. SNSR. malfunction

TCL/ASC Sensor Circuit







TSB Revision

⚠ CAUTION
If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Diagnose the CAN bus lines before the DTC (Refer to GROUP 54C, Trouble code diagnosis P.54C-15).

CIRCUIT OPERATION

- A toothed ABS 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 ABS 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 TCL/ASC electronic control unit (TCL/ASC-ECU).
- The hydraulic unit modulates the amount of braking force individually applied to each wheel cylinder.

TCL/ASC DTC SET CONDITIONS

The TCL/ASC-ECU monitors voltage fluctuation in each wheel speed sensor circuit. If the ECU detects 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 TCL/ASC-ECU)

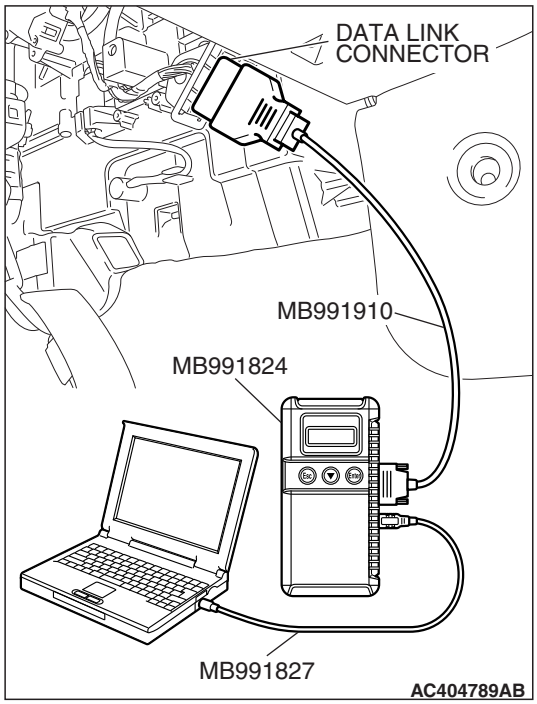
Past trouble

- Carry out diagnosis with particular emphasis o connector(s) or wiring harness in wheel speed sensor circuit. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to use Troubleshooting/Inspection Service Points P.00-16).

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A
- MB991997: ASC Check Harness



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

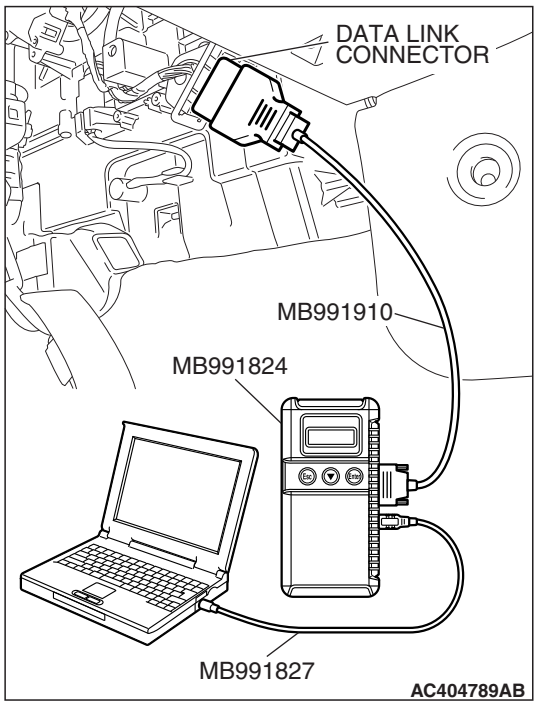
⚠ CAUTION

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-17orP.54C-17). Then go to Step 2.



STEP 2. Recheck for diagnostic trouble code.

⚠ CAUTION

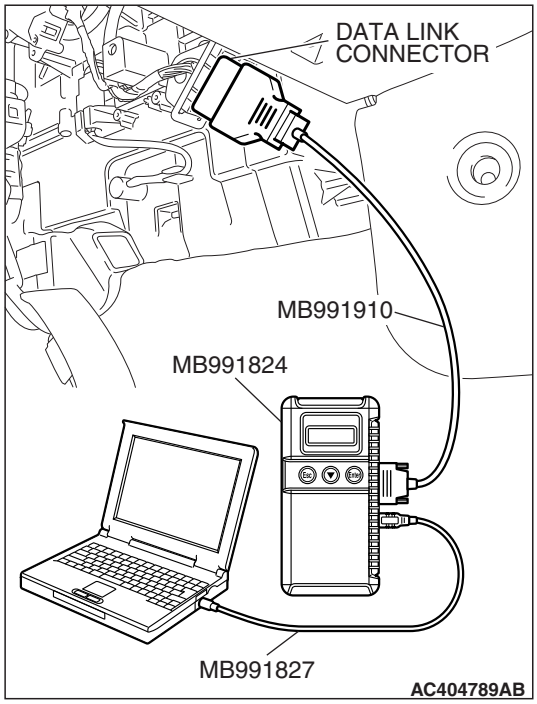
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(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) Drive the vehicle at 9 mph (15 km/h) or more.
(6) Check if the DTC is set.
(7) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1200 set?

YES : Go to Step 3.
NO : The procedure is complete.

TSB Revision



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

⚠ CAUTION

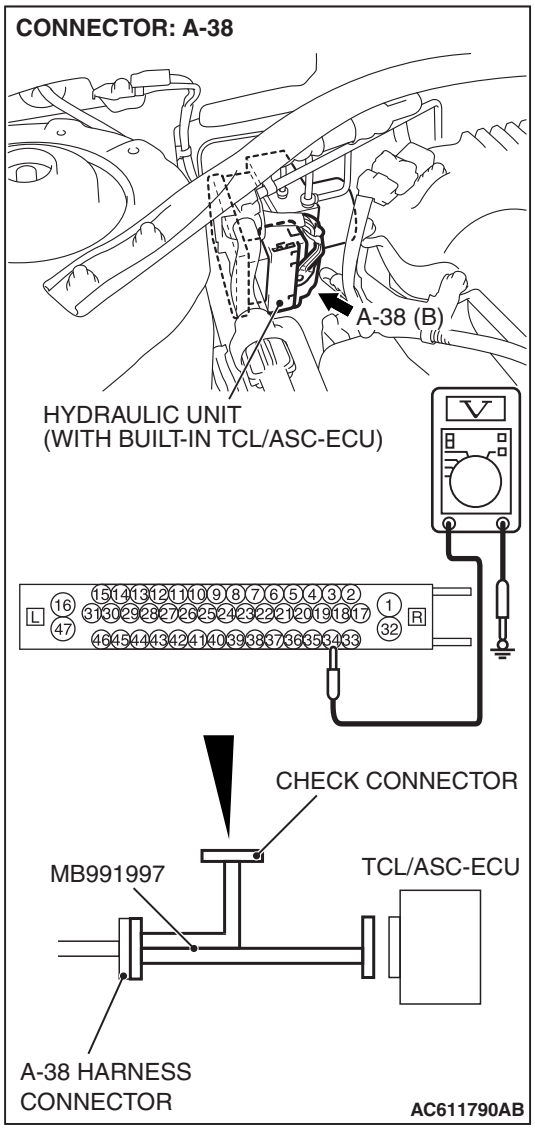
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(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.
- Item 02 (DTC C1200 is set): 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 : Go to Step 10.
NO : Go to Step 4.



STEP 4. Measure the voltage at TCL/ASC-ECU connector A-38.

(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

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

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

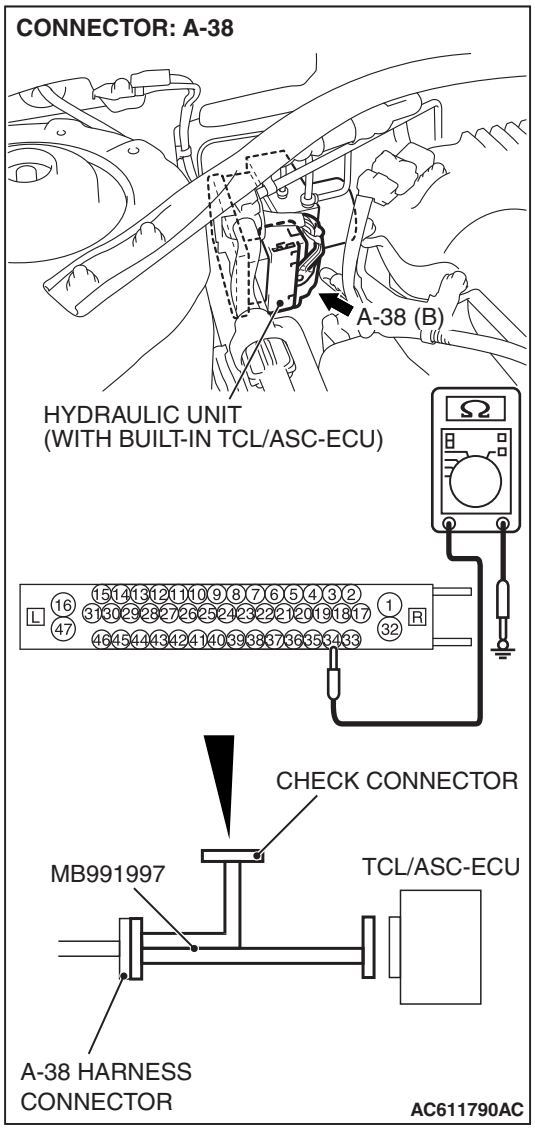
(3) Measure the voltage between the relevant signal and ground terminals in the wheel speed sensor circuit and body ground. It should be less than 1V.

- DTC C1200 is set: Between signal terminal 34 and body ground, and between ground terminal 33 and body ground

Q: Does the voltage measure 1 V or less?

YES : Go to Step 5.

NO (When the voltage between terminal 34 or 33 – and body ground measures more than 1 V) : Go to Step 7.



STEP 5. Measure the resistance at TCL/ASC-ECU connector A-38.

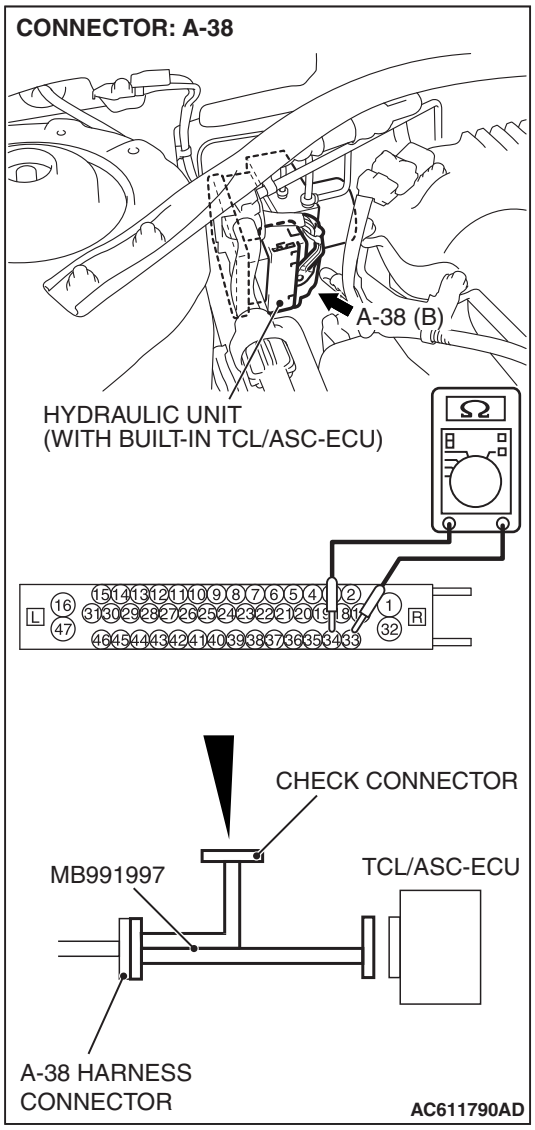
(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

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

(2) Measure the resistance between the relevant signal and ground terminals in the wheel speed sensor circuit and body ground. There should be no continuity.
- DTC C1200 is set: Between signal terminal 34 and body ground, and between ground terminal 33 and body ground

Q: Does continuity exist?

YES (Continuity exists between terminal 34 or terminal 33 and body ground) : Go to Step 7.
NO : Go to Step 6.



STEP 6. Measure the resistance at the TCL/ASC-ECU connector A-38.

(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

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

(2) Measure the resistance between the TCL/ASC-ECU connector terminals.

- DTC C1200 is set: Between terminal 34 and terminal 33

Standard Value: 1.24 – 1.64 kΩ

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

YES (When resistances between all terminals are within the standard value) : Go to Step 10.

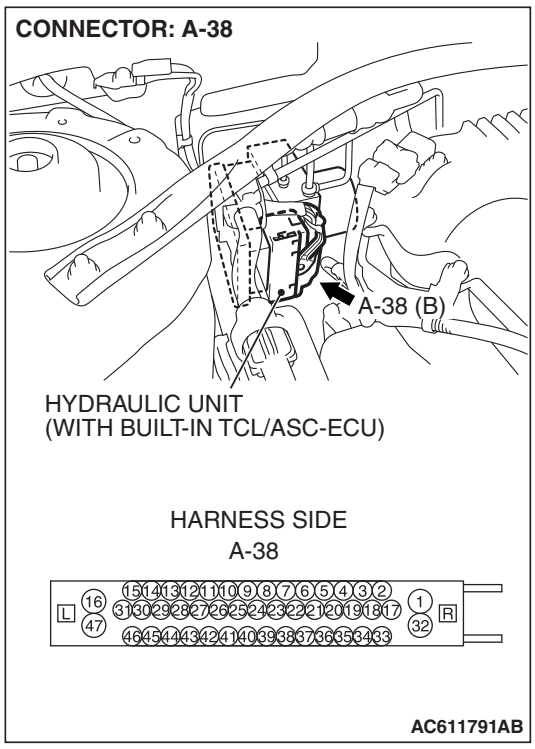
NO (When resistance between terminals 34 and 33 is not within the standard value) : Go to Step 7.

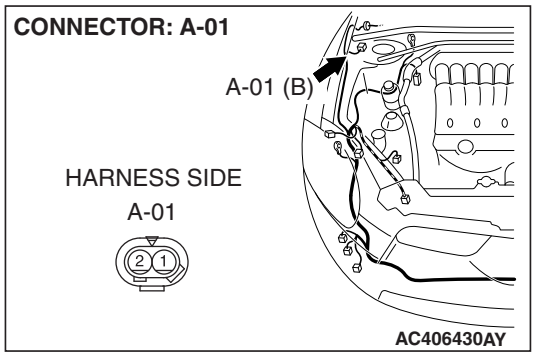
STEP 7. Check TCL/ASC-ECU connector A-38 and wheel speed sensor <front: RH> connector A-01 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

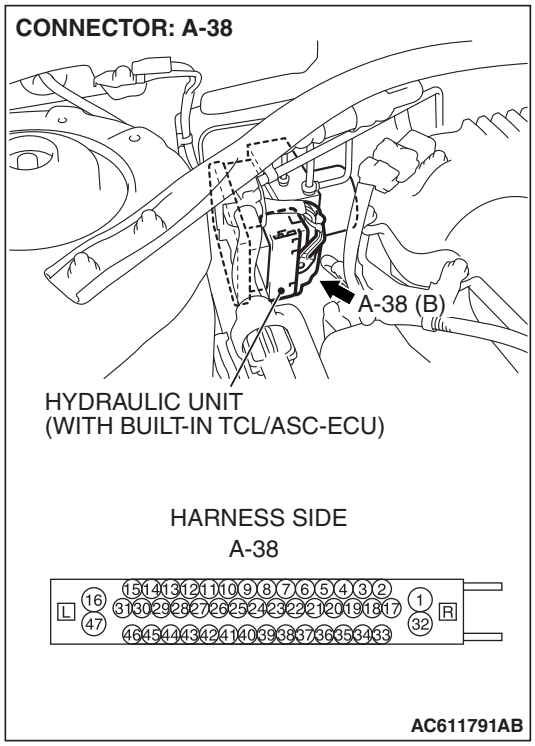
Q: Are TCL/ASC-ECU connector A-38 and wheel speed sensor <front: RH> connector A-01 damaged?

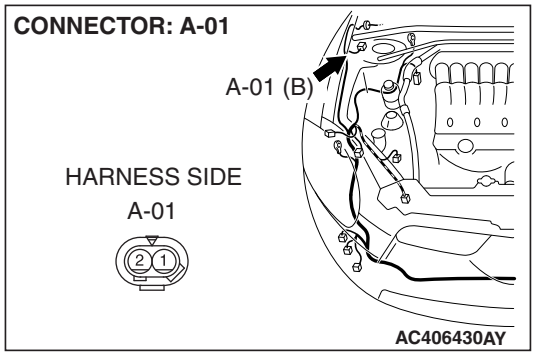
YES : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then go to Step 11.

NO : Go to Step 8.









STEP 8. Check the harness wires between TCL/ASC-ECU connector A-38 (terminal 34, 33) and wheel speed sensor <front: RH> connector A-01 (terminal 1, 2).

Q: Is the harness wire between TCL/ASC-ECU connector A-38 (terminal 34, 33) and wheel speed sensor <front: RH> 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.

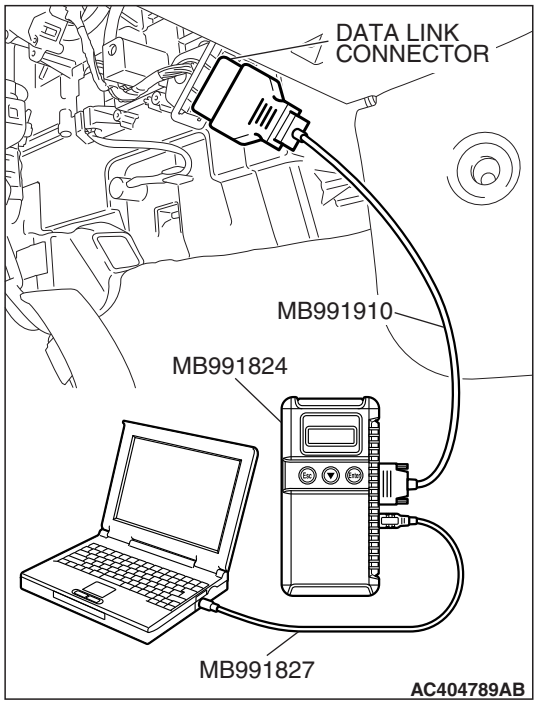
Check the wheel speed sensor relevant to the DTC code. For the applicable inspection procedure, refer to P.35C-228.

- When DTC code C1200 is set: Front 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.

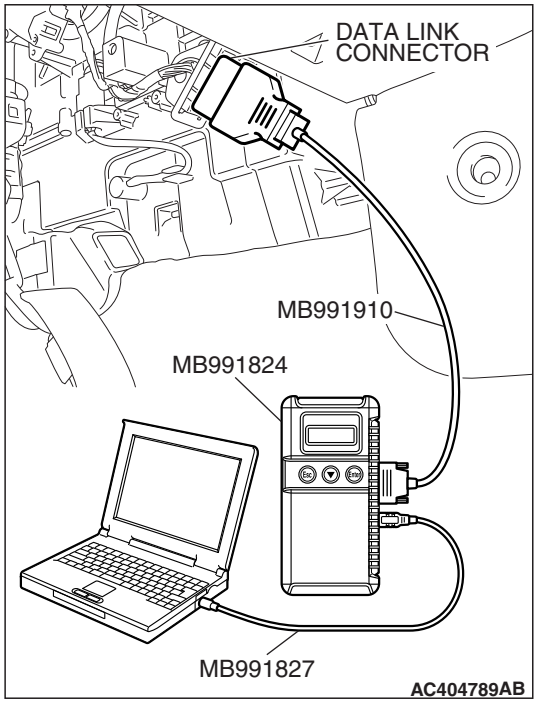


STEP 10. Recheck for diagnostic trouble code.

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) Drive the vehicle at 9 mph (15 km/h) or more.
(6) Check if the DTC is reset.
(7) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1200 set?

YES : Replace the hydraulic unit (integrated with TCL/ASC-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.

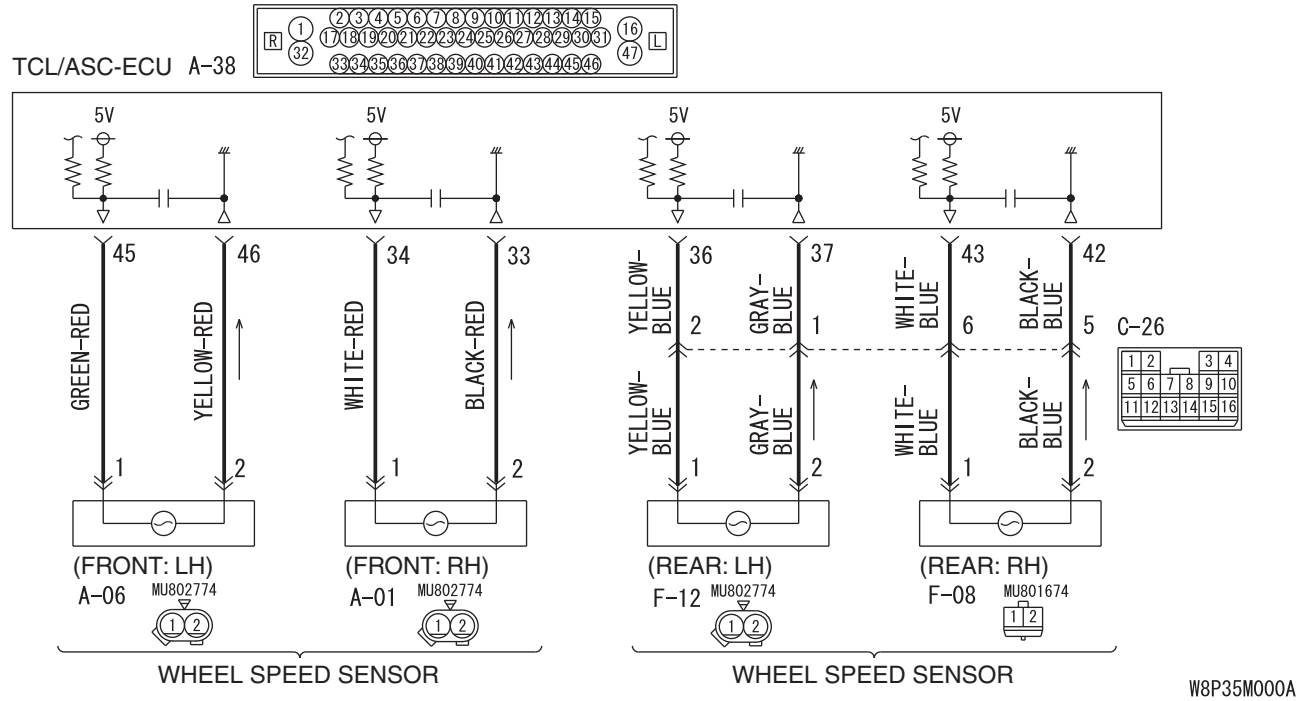
(1) Turn the ignition switch to the "ON" position.
(2) Erase the DTC.
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to the "ON" position.
(5) Drive the vehicle at 9 mph (15 km/h) or more.
(6) Check if the DTC is set.
(7) Turn the ignition switch to the "LOCK" (OFF) position.

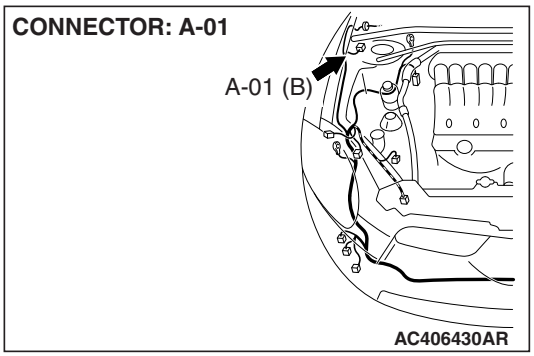
Q: Is DTC C1200 set?

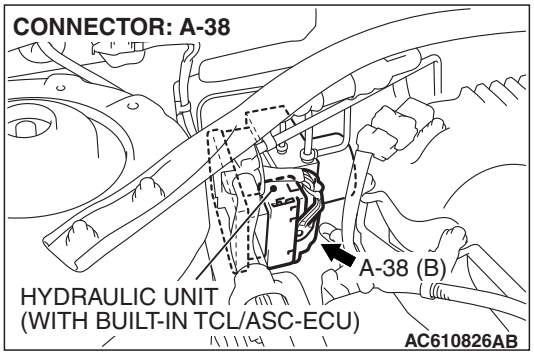
YES : Repeat the troubleshooting from Step 1.
NO : The procedure is complete.

DTC C1201: FR wheel SPD. SNSR. invalid signal

TCL/ASC Sensor Circuit







⚠ 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.

CIRCUIT OPERATION

- A toothed 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 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 TCL/ASC electronic control unit (TCL/ASC-ECU).
- The hydraulic unit modulates the amount of braking force individually applied to each wheel cylinder.

DTC SET CONDITIONS

The TCL/ASC-ECU monitors the signals from each wheel speed sensor while the vehicle is being driven. If any faults below are 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

TSB Revision

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

Current trouble

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

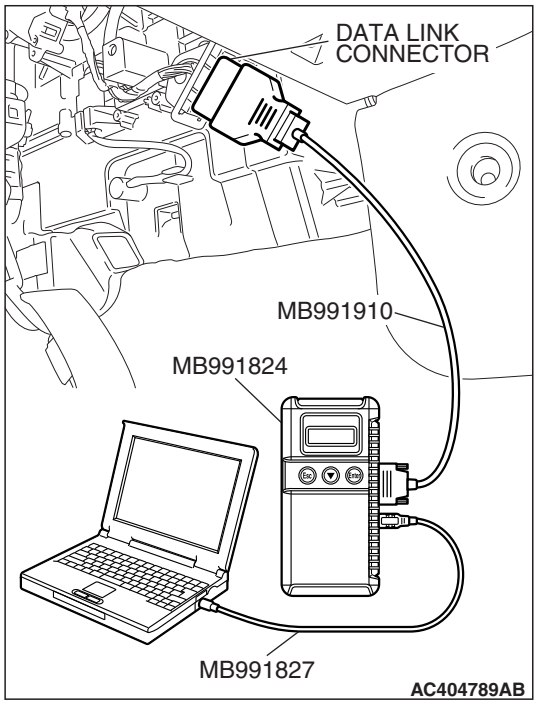
Past trouble

- Carry out diagnosis with particular emphasis o connector(s) or wiring harness in wheel speed sensor circuit. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to use Troubleshooting/Inspection Service Points P.00-16).

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A
- MB991997: ASC Check Harness



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

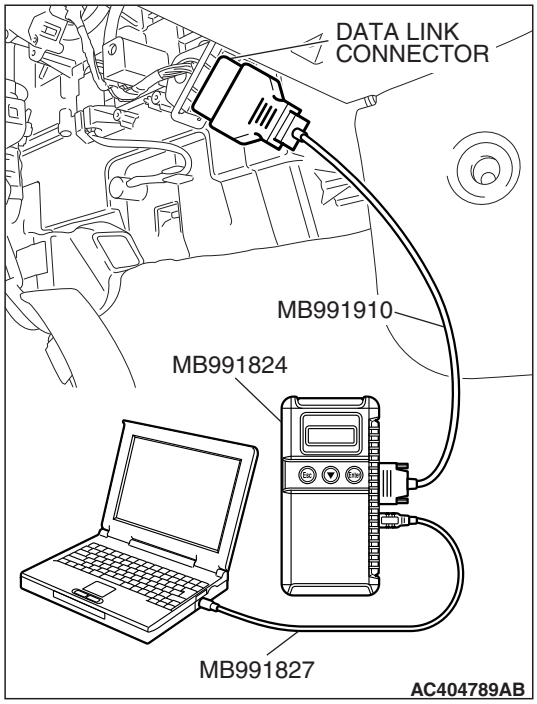
⚠ CAUTION

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-17orP.54C-17). Then go to Step 2.



STEP 2. Recheck for diagnostic trouble code.

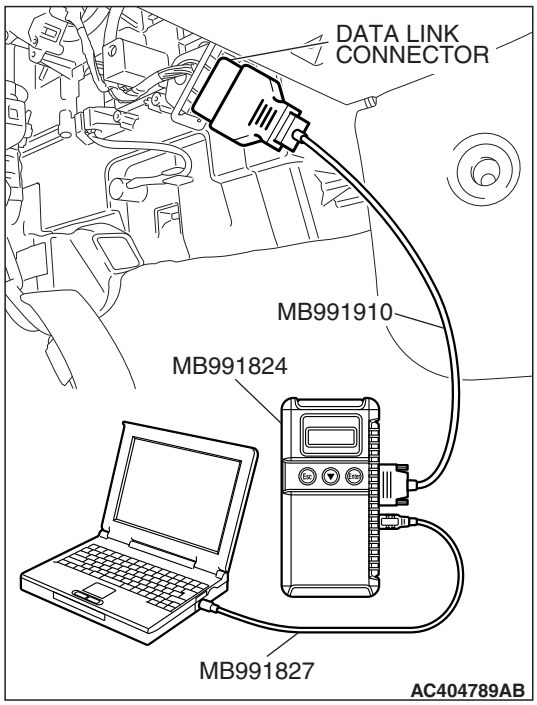
⚠ CAUTION

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) Drive the vehicle at 9 mph (15 km/h) or more.
(6) Check if the DTC is set.
(7) 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 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) Drive the vehicle at 9 mph (15 km/h) or more.
(4) Check whether DTC C1200 have been set.
(5) 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-16).
NO : Go to Step 4.

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

For the wheel speed sensor, which the DTC 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 14.

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

Check the wheel speed sensor, which the DTC indicates (Refer to P.35C-228).

- 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. Then go to Step 14.

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 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 (front bearing end play is not within the standard value) : Replace the front hub assembly (Refer to GROUP 26, Front axle hub assembly P.26-10). Then go to Step 14.

STEP 7. Check the rotor.

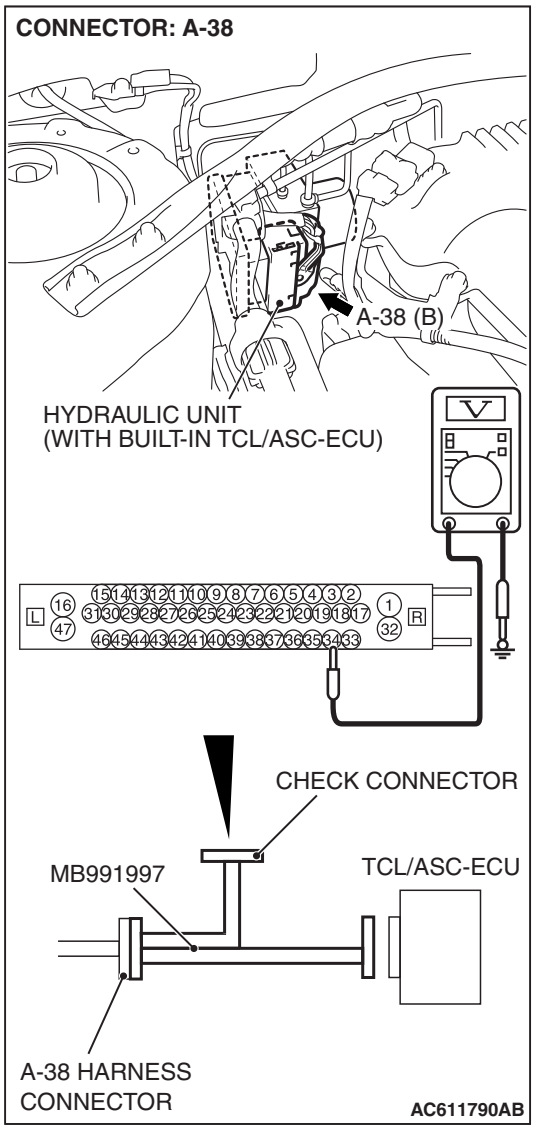
Check the rotor, which DTC indicates, for foreign material or deformation.

- DTC C1201 is set: Front right wheel speed sensor

Q: Is the rotor in good condition?

YES : Go to Step 8.

NO (front bearing end play is not within the standard value) : If the 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). Then go to Step 14.



STEP 8. Measure the voltage at TCL/ASC-ECU connector A-38.

(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

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

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

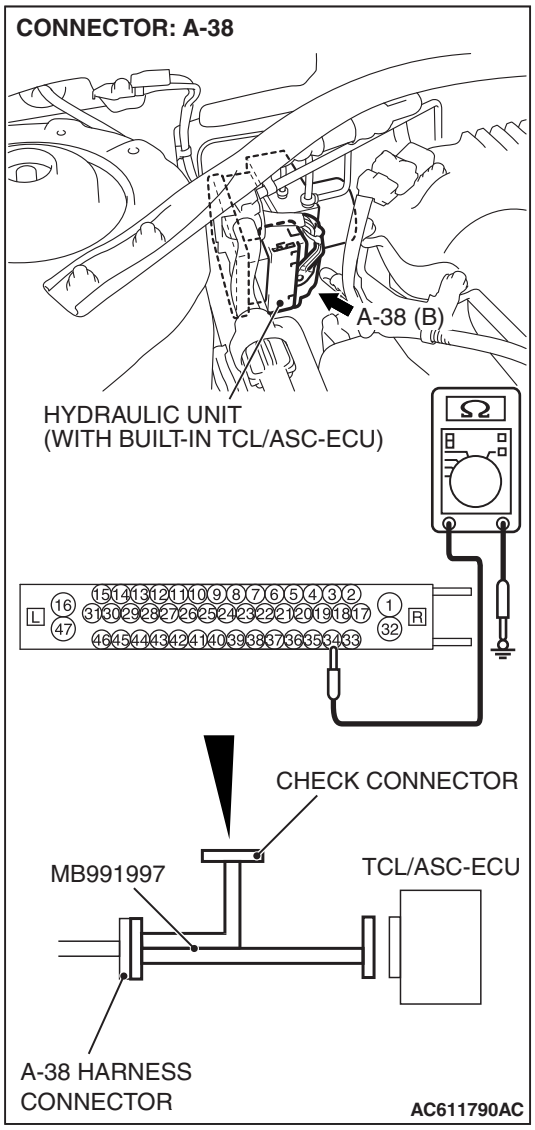
(3) Measure the voltage between the relevant signal and ground terminals in the wheel speed sensor circuit and body ground. It should be less than 1V.

- DTC C1201 is set: Between signal terminal 34 and body ground, and between ground terminal 33 and body ground

Q: Does the voltage measure 1 V or less?

YES : Go to Step 9.

NO (When the voltage between terminal 34 or 33 – and body ground measures more than 1 V) : Go to Step 12.



STEP 9. Measure the resistance at TCL/ASC-ECU connector A-38.

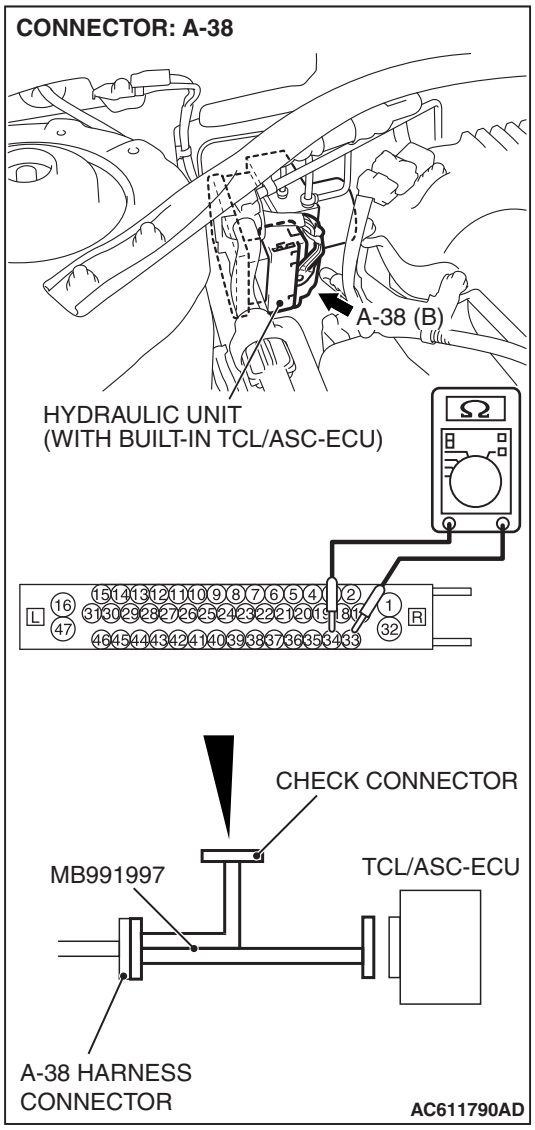
(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

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

(2) Measure the resistance between the relevant signal and ground terminals in the wheel speed sensor circuit and body ground. OK if there is no continuity.
- DTC C1201 is set: Between signal terminal 34 and body ground, and between ground terminal 33 and body ground

Q: Does continuity exist?

YES (Continuity exists between terminal 34 or terminal 33 and body ground) : Go to Step 12.
NO : Go to Step 10.



STEP 10. Measure the resistance at TCL/ASC-ECU connector A-38.

(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

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

(2) Measure the resistance between the relevant signal and ground terminals in the wheel speed sensor circuit.
- DTC C1201 is set: Between signal terminal 34 and ground terminal 33

Standard Value: 1.24 – 1.64 kΩ

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

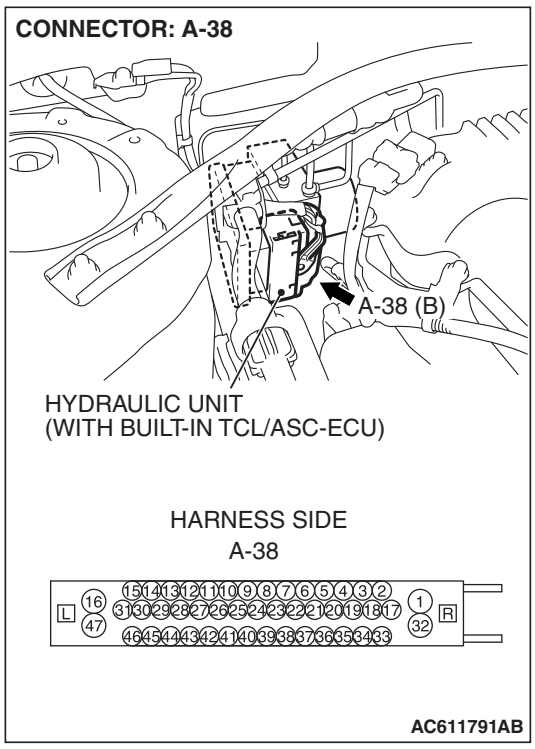
YES (When resistances between all terminals are within the standard value) : Go to Step 13.
NO (When resistance between terminals 34 and 33 is not within the standard value) : Go to Step 11.

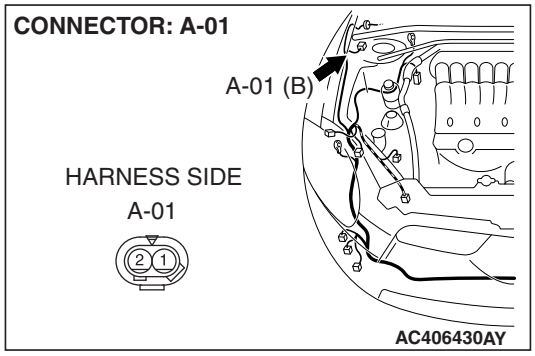
STEP 11. Inspect the wheel speed sensor.

Check the front right wheel speed sensor relevant to the DTC. For the applicable inspection procedure, refer to P.35C-228.

Q: Is the wheel speed sensor damaged?

YES : Replace the wheel speed sensor (Refer to P.35C-227).
NO : Go to Step 12.



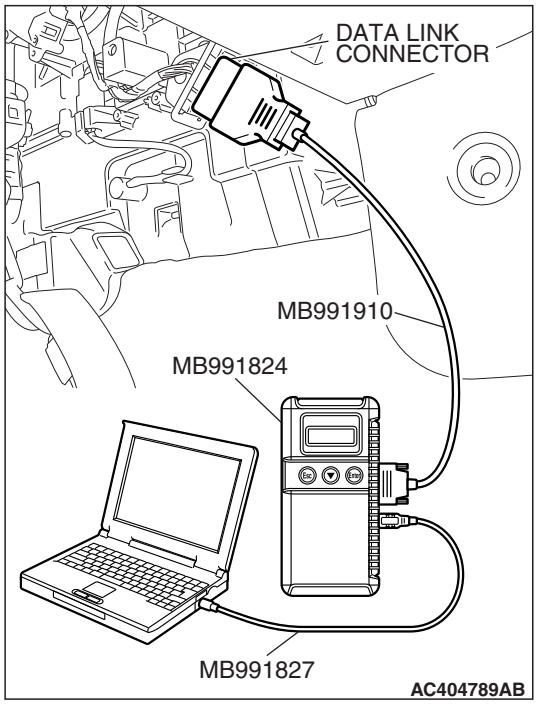


STEP 12. Check TCL/ASC-ECU connector A-38 and wheel speed sensor <front: RH> connector A-01 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are TCL/ASC-ECU connector A-38 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 14.

NO : Open or short circuit may be present in the front right wheel speed sensor circuit. Repair the wiring harness between TCL/ASC-ECU connector A-38 (terminals 34 and 33) and front right wheel speed sensor A-01 (terminals 1 and 2). Then go to Step 14.

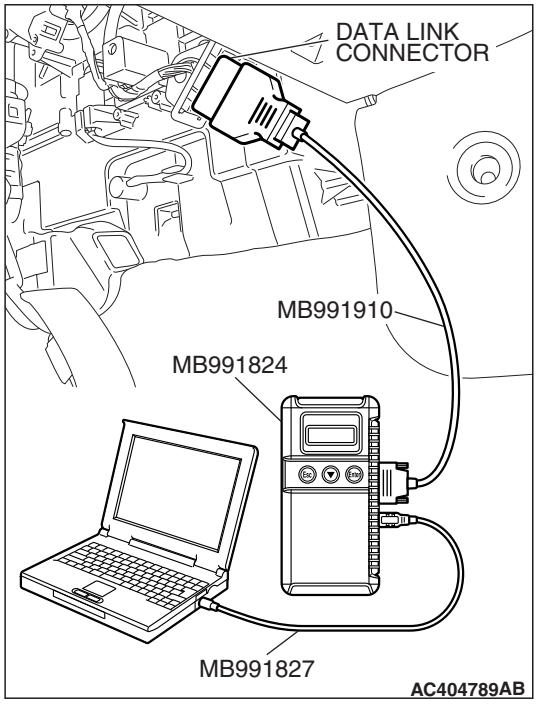


STEP 13. Recheck for diagnostic trouble code.

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) Drive the vehicle at 9 mph (15 km/h) or more.
(6) Check if the DTC is set.
(7) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1201 set?

YES : Replace the hydraulic unit (integrated with TCL/ASC-ECU). Then go to Step 14.
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 14. Recheck for diagnostic trouble code.

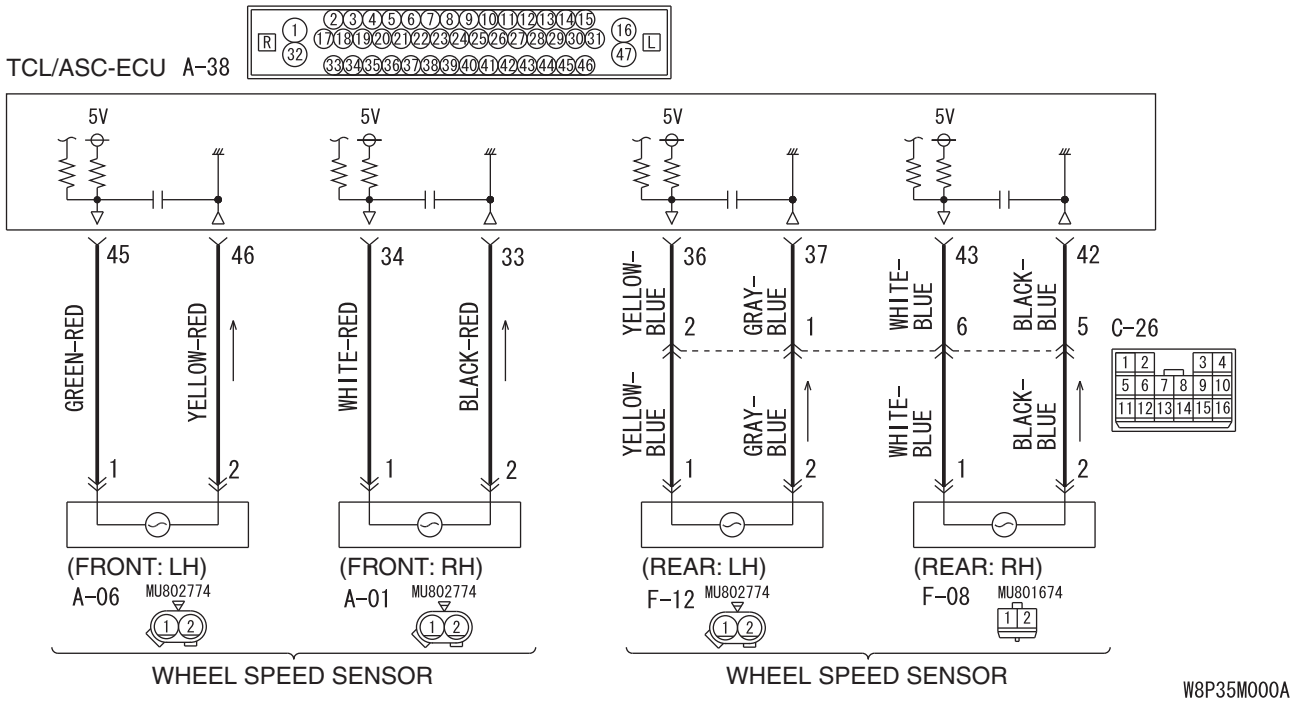
Check again if the DTC is set.
(1) Turn the ignition switch to the "ON" position.
(2) Erase the DTC.
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to the "ON" position.
(5) Drive the vehicle at 9 mph (15 km/h) or more.
(6) Check if the DTC is set.
(7) Turn the ignition switch to the "LOCK" (OFF) position.

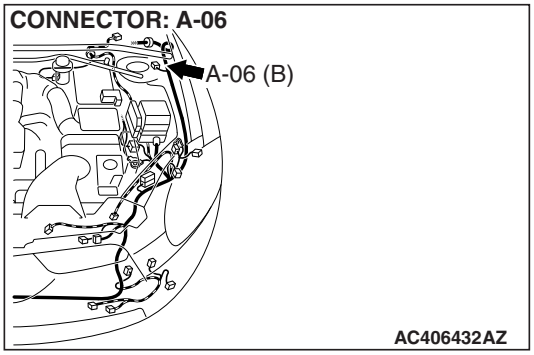
Q: Is DTC C1201 set?

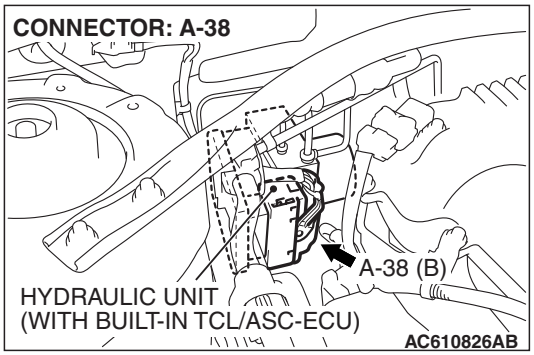
YES : Go to Step 1.
NO : The procedure is complete.

DTC C1205: FL wheel SPD. SNSR. malfunction

TCL/ASC Sensor Circuit







⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Diagnose the CAN bus lines before the DTC (Refer to GROUP 54C, Trouble code diagnosis P.54C-15).

CIRCUIT OPERATION

- A toothed ABS 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 ABS 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 TCL/ASC electronic control unit (TCL/ASC-ECU).
- The hydraulic unit modulates the amount of braking force individually applied to each wheel cylinder.

TCL/ASC DTC SET CONDITIONS

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

TSB Revision

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 TCL/ASC-ECU)

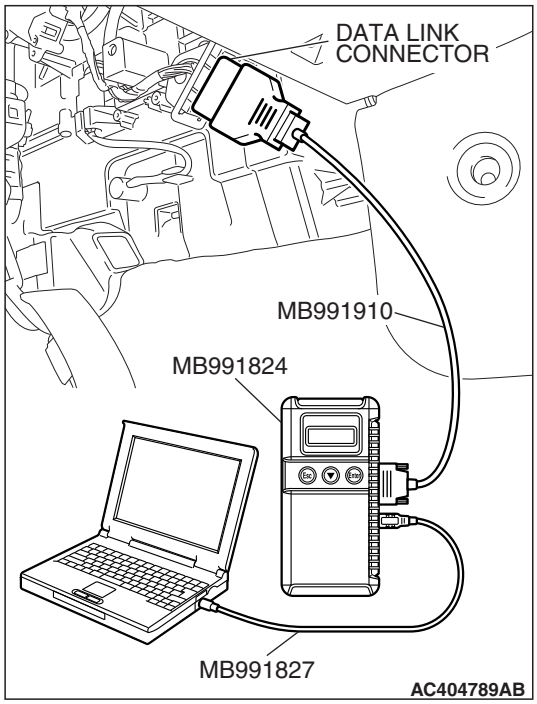
Past trouble

- Carry out diagnosis with particular emphasis o connector(s) or wiring harness in wheel speed sensor circuit. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to use Troubleshooting/Inspection Service Points P.00-16).

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A
- MB991997: ASC Check Harness



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

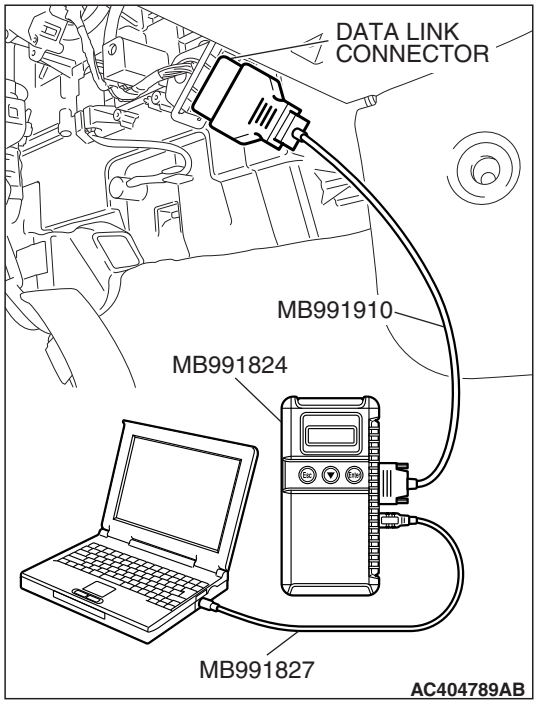
⚠ CAUTION

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-17orP.54C-17). Then go to Step 2.



STEP 2. Recheck for diagnostic trouble code.

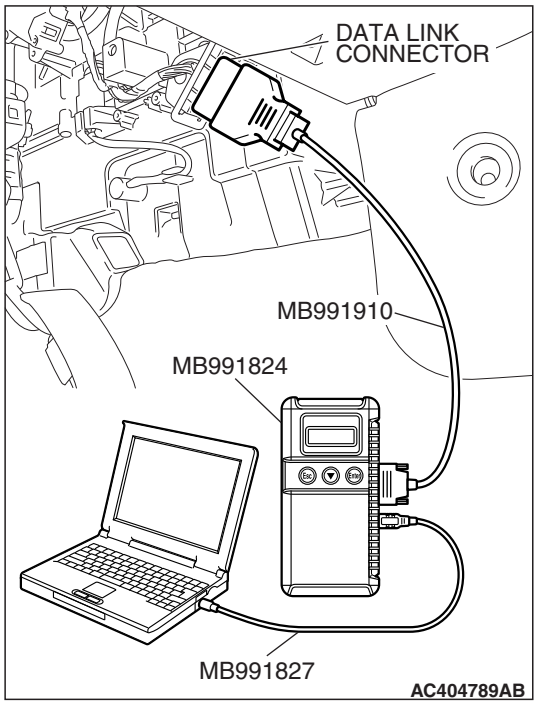
⚠ CAUTION

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) Drive the vehicle at 9 mph (15 km/h) or more.
(6) Check if the DTC is set.
(7) 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.

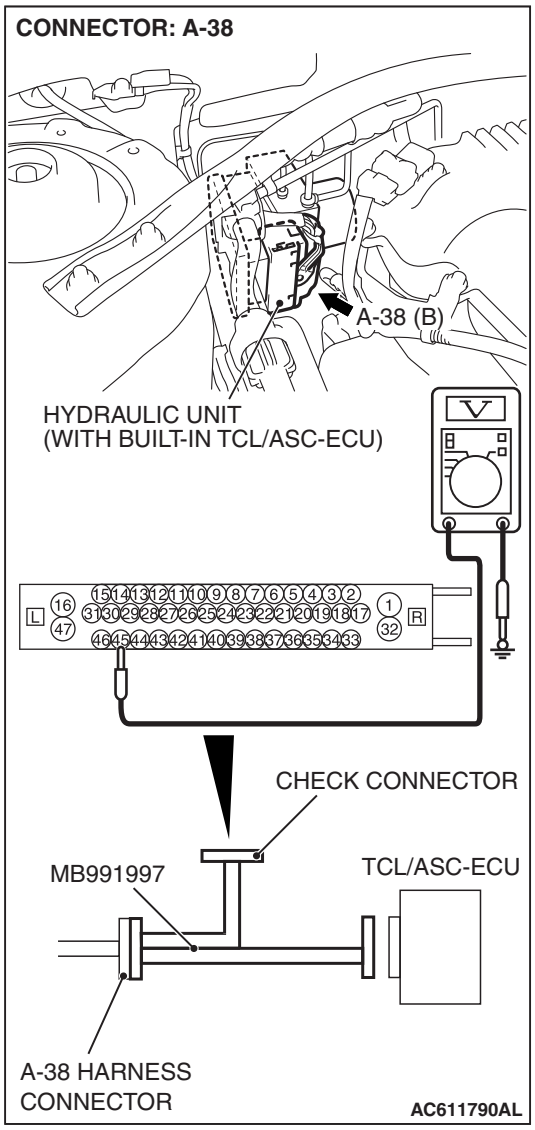
⚠ CAUTION

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.
  • Item 01 (DTC C1205 is set): 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 : Go to Step 10.
NO : Go to Step 4.



STEP 4. Measure the voltage at TCL/ASC-ECU connector A-38.

(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

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

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

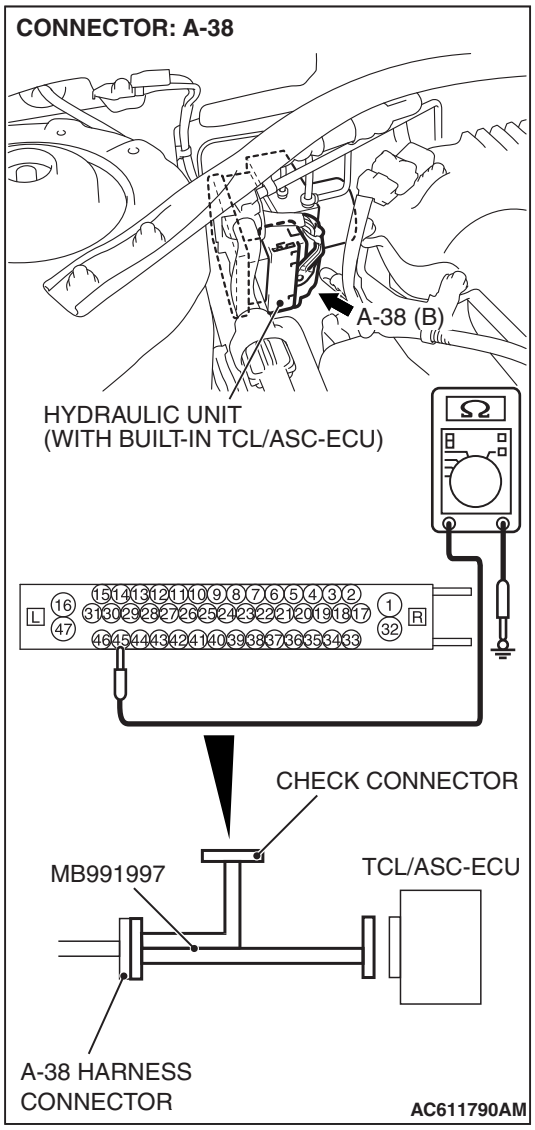
(3) Measure the voltage between the relevant signal and ground terminals in the wheel speed sensor circuit and body ground. It should be less than 1V.

- DTC C1205 is set: Between signal terminal 45 and body ground, and between ground terminal 46 and body ground

Q: Does the voltage measure 1 V or less?

YES : Go to Step 5.

NO (When the voltage between terminal 45 or 46 – and body ground measures more than 1 V) : Go to Step 7.



STEP 5. Measure the resistance at TCL/ASC-ECU connector A-38.

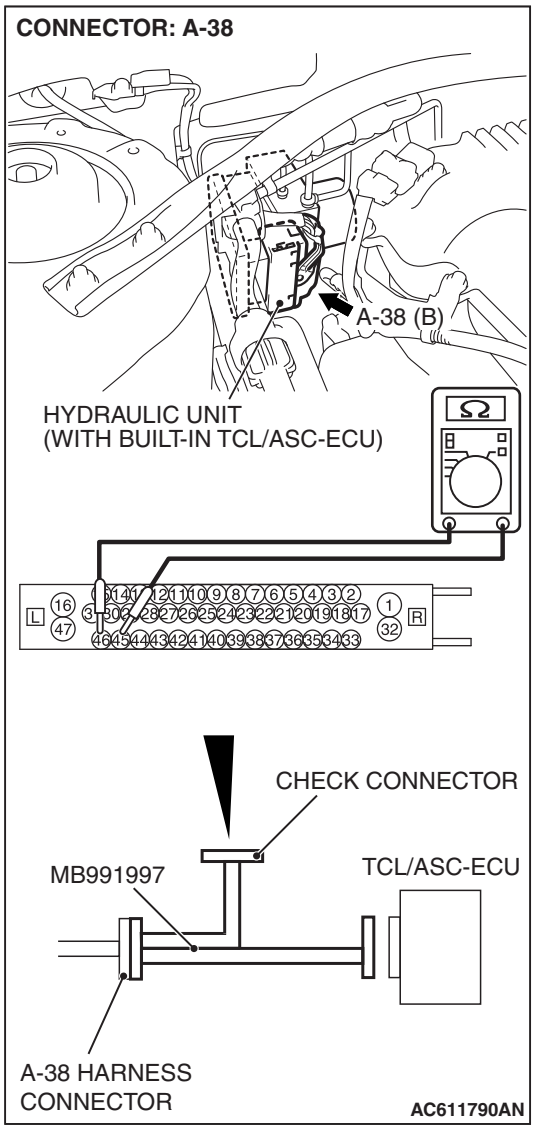
(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

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

(2) Measure the resistance between the relevant signal and ground terminals in the wheel speed sensor circuit and body ground. There should be no continuity.
- DTC C1205 is set: Between signal terminal 45 and body ground, and between ground terminal 46 and body ground

Q: Does continuity exist?

YES (Continuity exists between terminal 45 or terminal 46 and body ground) : Go to Step 7.
NO : Go to Step 6.



STEP 6. Measure the resistance at the TCL/ASC-ECU connector A-38.

(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

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

(2) Measure the resistance between the TCL/ASC-ECU connector terminals.

- DTC C1205 is set: 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 (When resistances between all terminals are within the standard value) : Go to Step 10.

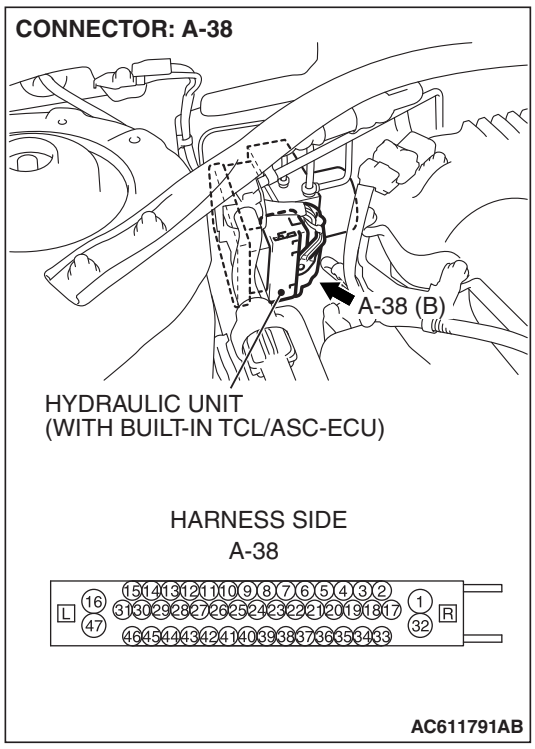
NO (When resistance between terminals 45 and 46 is not within the standard value) : Go to Step 7.

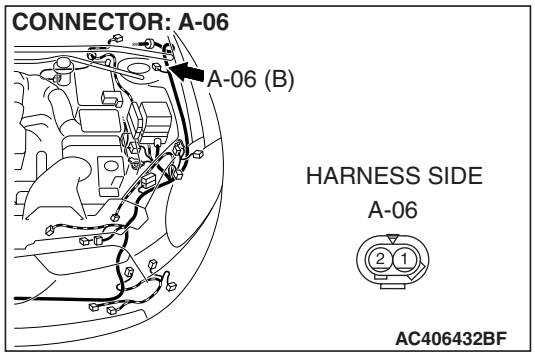
STEP 7. Check TCL/ASC-ECU connector A-38 and wheel speed sensor <front: LH> connector A-06 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

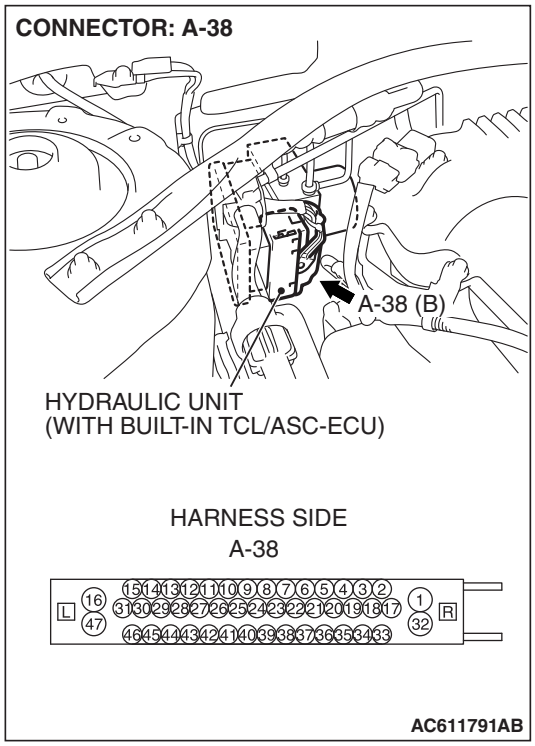
Q: Are TCL/ASC-ECU connector A-38 and wheel speed sensor <front: LH> connector A-06 damaged?

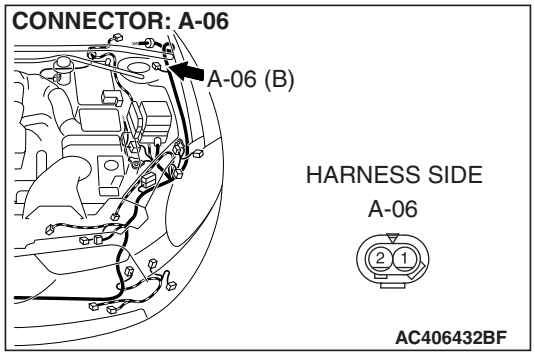
YES : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then go to Step 11.

NO : Go to Step 8.









STEP 8. Check the harness wires between TCL/ASC-ECU connector A-38 (terminal 45, 46) and wheel speed sensor <front: LH> connector A-06 (terminal 1, 2).

Q: Is the harness wire between TCL/ASC-ECU connector A-38 (terminal 45, 46) and wheel speed sensor <front: LH> connector A-06 (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.

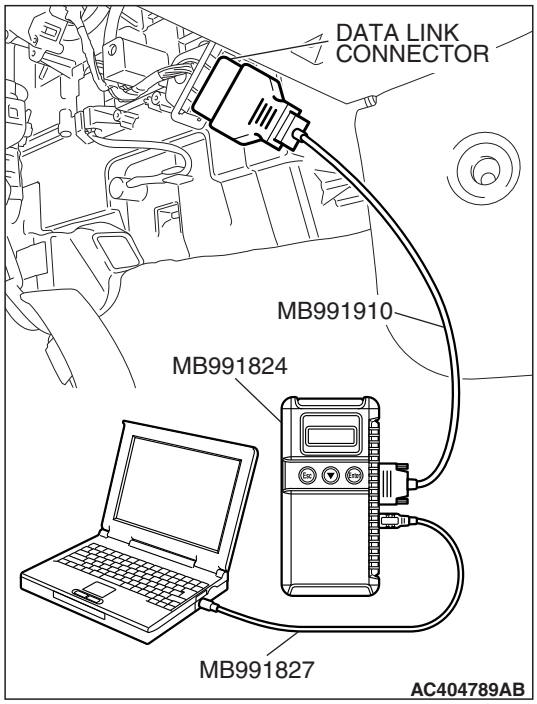
Check the wheel speed sensor relevant to the DTC code. For the applicable inspection procedure, refer to P.35C-228.

- When DTC code C1205 is set: Front left 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.

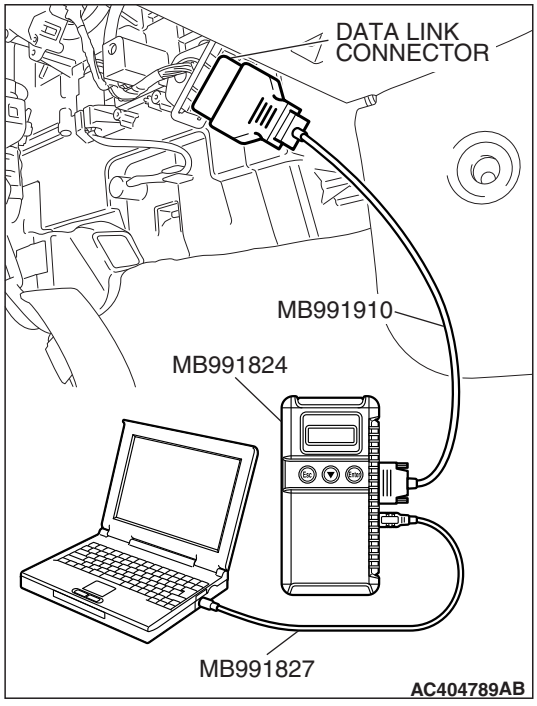


STEP 10. Recheck for diagnostic trouble code.

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) Drive the vehicle at 9 mph (15 km/h) or more.
(6) Check if the DTC is reset.
(7) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1205 set?

YES : Replace the hydraulic unit (integrated with TCL/ASC-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.

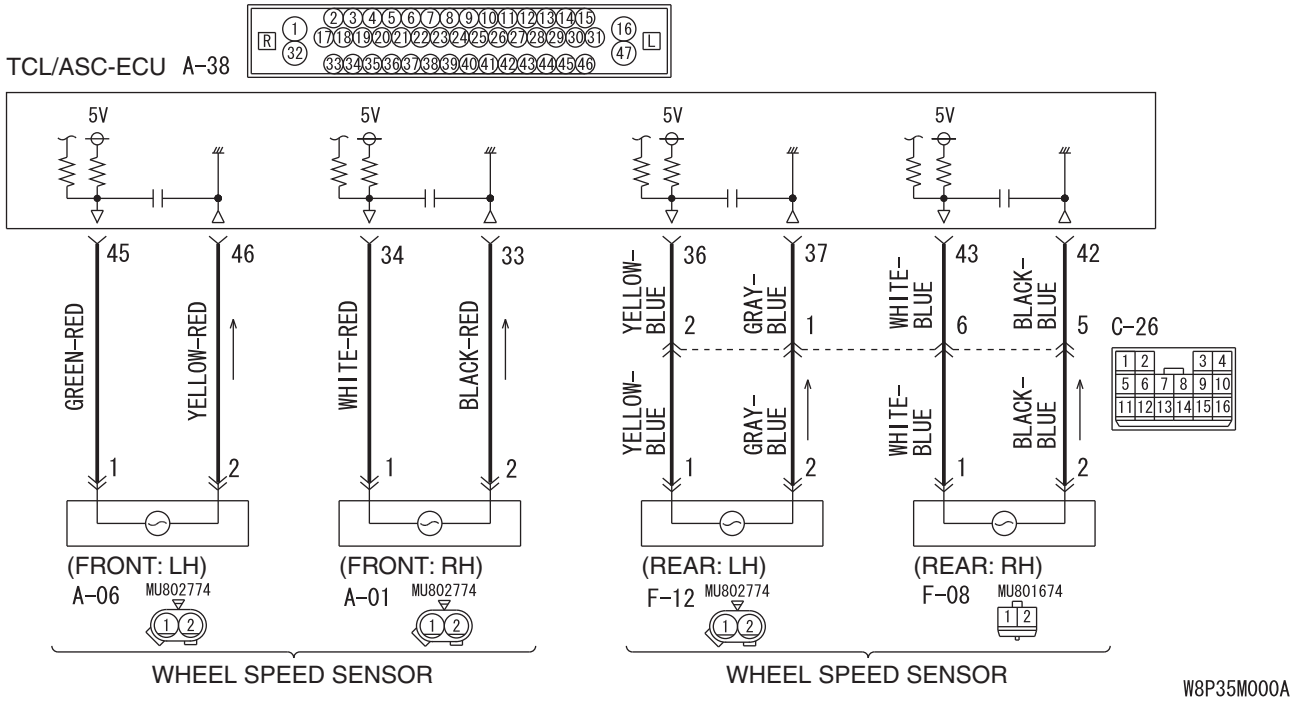
(1) Turn the ignition switch to the "ON" position.
(2) Erase the DTC.
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to the "ON" position.
(5) Drive the vehicle at 9 mph (15 km/h) or more.
(6) Check if the DTC is set.
(7) Turn the ignition switch to the "LOCK" (OFF) position.

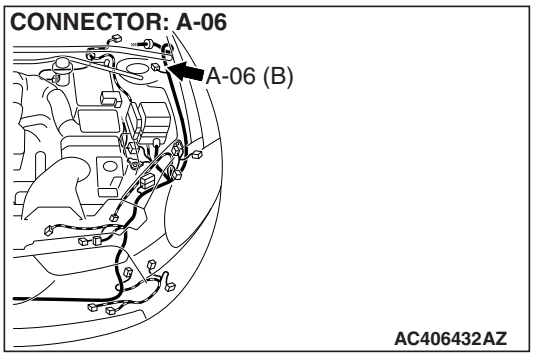
Q: Is DTC C1205 set?

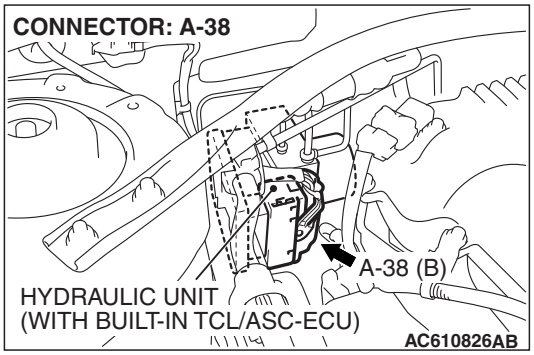
YES : Repeat the troubleshooting from Step 1.
NO : The procedure is complete.

DTC C1206: FL wheel SPD. SNSR. invalid signal

TCL/ASC Sensor Circuit







⚠ 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.

CIRCUIT OPERATION

- A toothed 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 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 TCL/ASC electronic control unit (TCL/ASC-ECU).
- The hydraulic unit modulates the amount of braking force individually applied to each wheel cylinder.

DTC SET CONDITIONS

The TCL/ASC-ECU monitors the signals from each wheel speed sensor while the vehicle is being driven. If any faults below are 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

TSB Revision

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

Current trouble

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

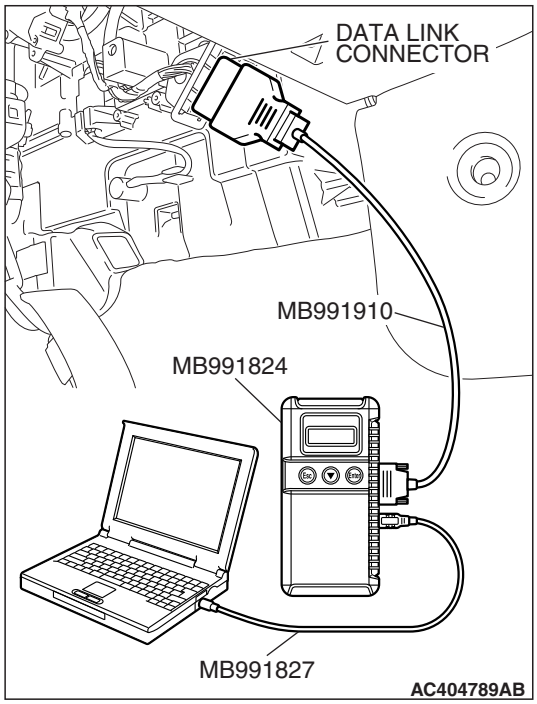
Past trouble

- Carry out diagnosis with particular emphasis o connector(s) or wiring harness in wheel speed sensor circuit. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to use Troubleshooting/Inspection Service Points P.00-16).

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A
- MB991997: ASC Check Harness



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

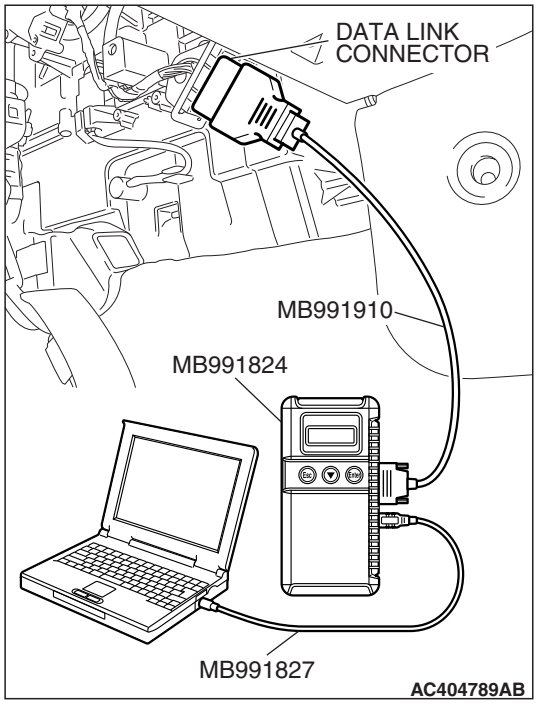
⚠ CAUTION

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-17orP.54C-17). Then go to Step 2.



STEP 2. Recheck for diagnostic trouble code.

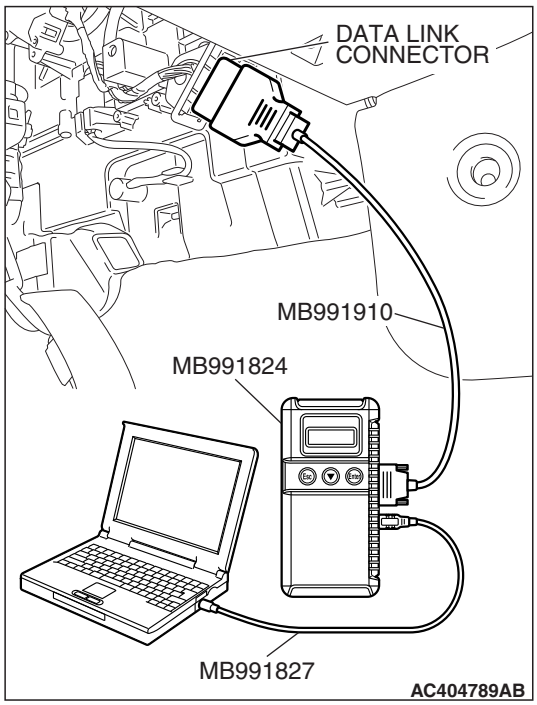
⚠ CAUTION

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) Drive the vehicle at 9 mph (15 km/h) or more.
(6) Check if the DTC is set.
(7) 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 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) Drive the vehicle at 9 mph (15 km/h) or more.
(4) Check whether DTC C1205 have been set.
(5) 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-35).
NO : Go to Step 4.

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

For the wheel speed sensor, which the DTC 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 14.

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

Check the wheel speed sensor, which the DTC indicates (Refer to P.35C-228).

- 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. Then go to Step 14.

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 indicates, for looseness.

- DTC C1206 is set: Check the front left 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 (front bearing end play is not within the standard value) : Replace the front hub assembly (Refer to GROUP 26, Front axle hub assembly P.26-10). Then go to Step 14.

STEP 7. Check the rotor.

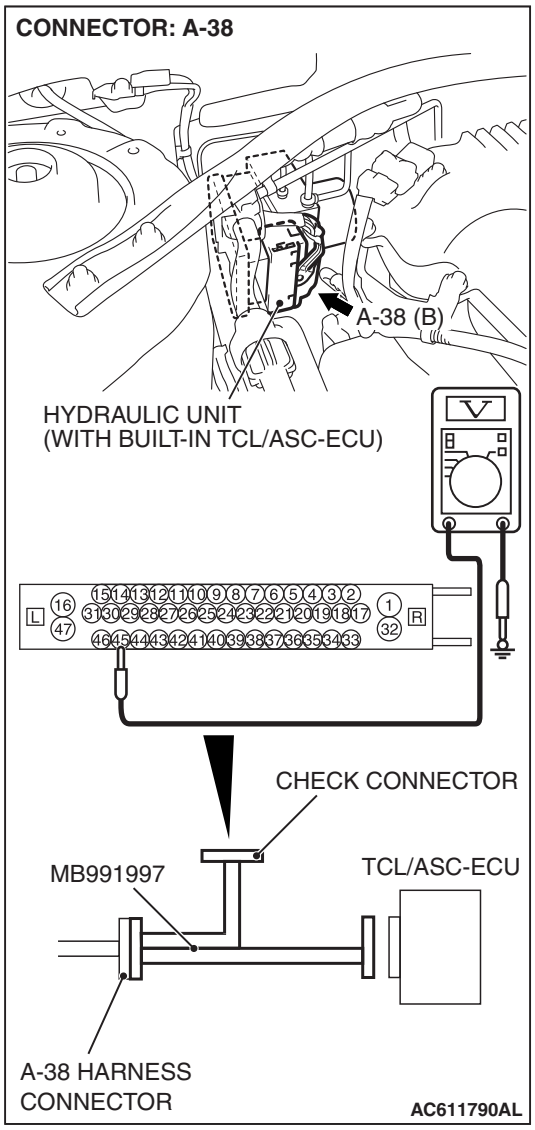
Check the rotor, which DTC indicates, for foreign material or deformation.

- DTC C1206 is set: Front left wheel speed sensor

Q: Is the rotor in good condition?

YES : Go to Step 8.

NO (front bearing end play is not within the standard value) : If the 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). Then go to Step 14.



STEP 8. Measure the voltage at TCL/ASC-ECU connector A-38.

(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

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

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

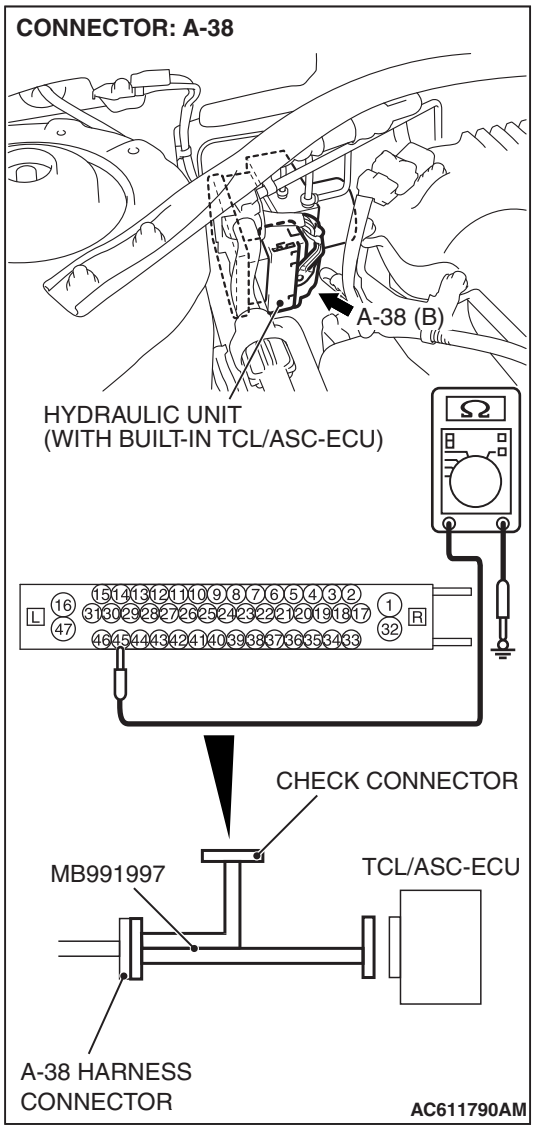
(3) Measure the voltage between the relevant signal and ground terminals in the wheel speed sensor circuit and body ground. It should be less than 1V.

- DTC C1206 is set: Between signal terminal 45 and body ground, and between ground terminal 46 and body ground

Q: Does the voltage measure 1 V or less?

YES : Go to Step 9.

NO (When the voltage between terminal 45 or 46 – and body ground measures more than 1 V) : Go to Step 12.



STEP 9. Measure the resistance at TCL/ASC-ECU connector A-38.

(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

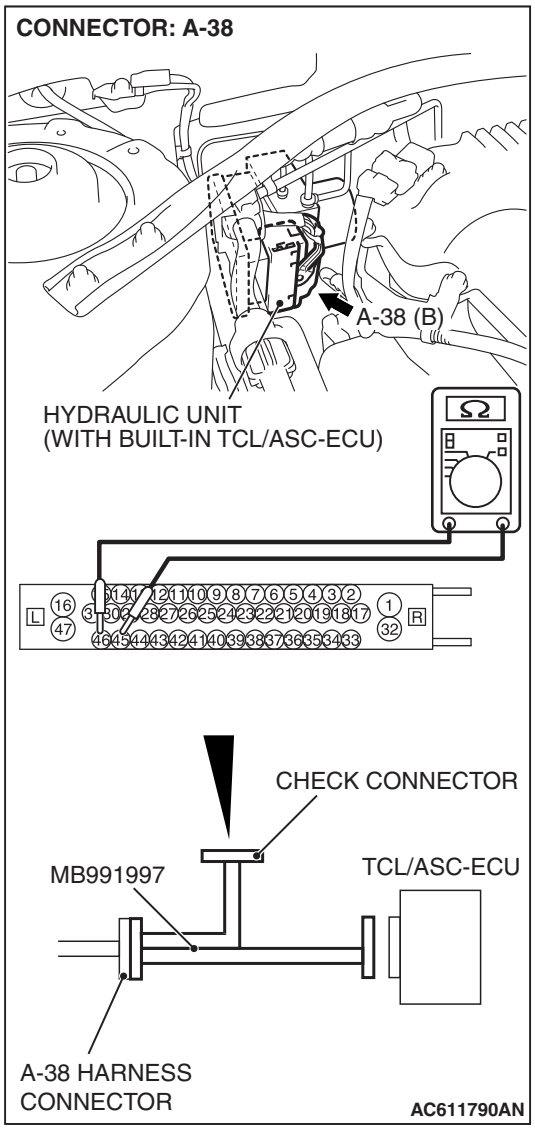
NOTE: Do not connect special tool MB991997 to the TCL/ASC-ECU.

(2) Measure the resistance between the relevant signal and ground terminals in the wheel speed sensor circuit and body ground. OK if there is no continuity.
- DTC C1206 is set: Between signal terminal 45 and body ground, and between ground terminal 46 and body ground

Q: Does continuity exist?

YES (Continuity exists between terminal 45 or terminal 46 and body ground) : Go to Step 12.

NO : Go to Step 10.



STEP 10. Measure the resistance at TCL/ASC-ECU connector A-38.

(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

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

(2) Measure the resistance between the relevant signal and ground terminals in the wheel speed sensor circuit.
- DTC C1206 is set: Between signal terminal 45 and ground terminal 46

Standard Value: 1.24 – 1.64 kΩ

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

YES (When resistances between all terminals are within the standard value) : Go to Step 13.
NO (When resistance between terminals 45 and 46 is not within the standard value) : Go to Step 11.

STEP 11. Inspect the wheel speed sensor.

Check the front left wheel speed sensor relevant to the DTC. For the applicable inspection procedure, refer to P.35C-228.

Q: Is the wheel speed sensor damaged?

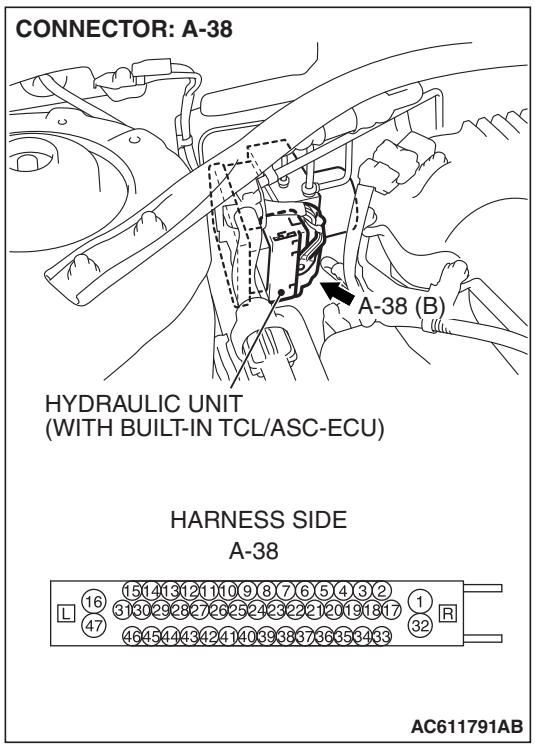
YES : Replace the wheel speed sensor (Refer to P.35C-227).
NO : Go to Step 12.

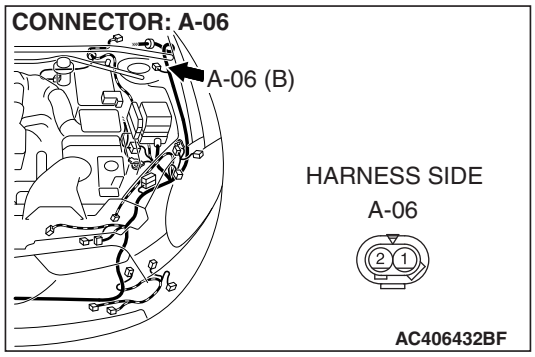
STEP 12. Check TCL/ASC-ECU connector A-38 and wheel speed sensor <front: LH> connector A-06 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

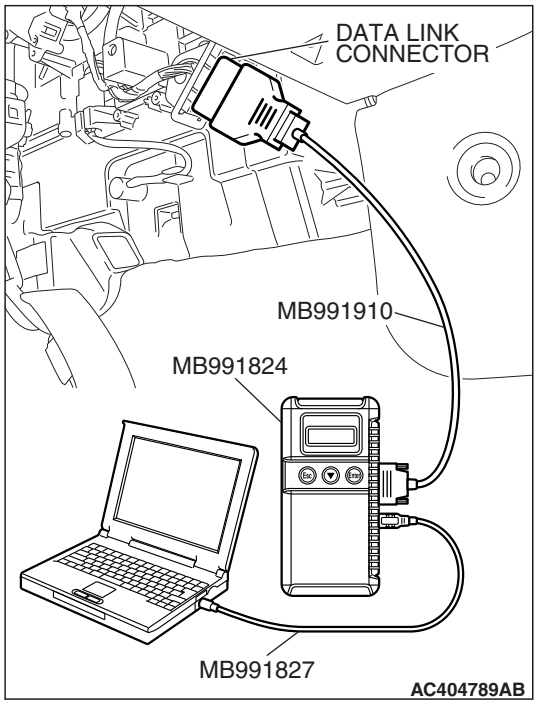
Q: Are TCL/ASC-ECU connector A-38 and wheel speed sensor <front: LH> connector A-06 damaged?

YES : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then go to Step 14.

NO : Open or short circuit may be present in the front right wheel speed sensor circuit. Repair the wiring harness between TCL/ASC-ECU connector A-38 (terminals 45 and 46) and front left wheel speed sensor A-06 (terminals 1 and 2). Then go to Step 14.





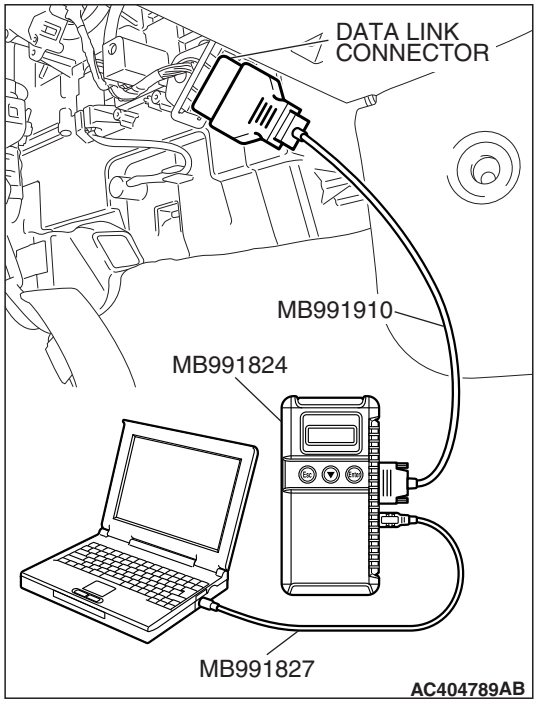


STEP 13. Recheck for diagnostic trouble code.

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) Drive the vehicle at 9 mph (15 km/h) or more.
(6) Check if the DTC is set.
(7) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1206 set?

YES : Replace the hydraulic unit (integrated with TCL/ASC-ECU). Then go to Step 14.
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 14. Recheck for diagnostic trouble code.

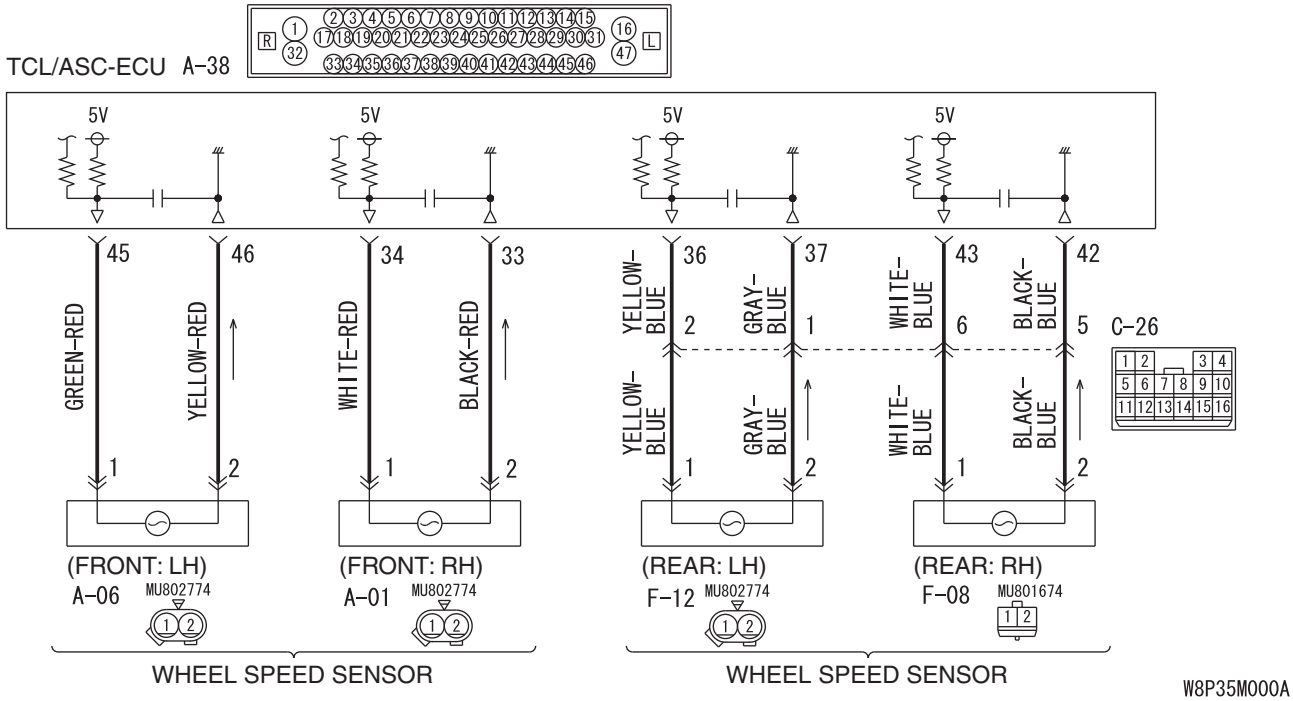
Check again if the DTC is set.
(1) Turn the ignition switch to the "ON" position.
(2) Erase the DTC.
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to the "ON" position.
(5) Drive the vehicle at 9 mph (15 km/h) or more.
(6) Check if the DTC is set.
(7) Turn the ignition switch to the "LOCK" (OFF) position.

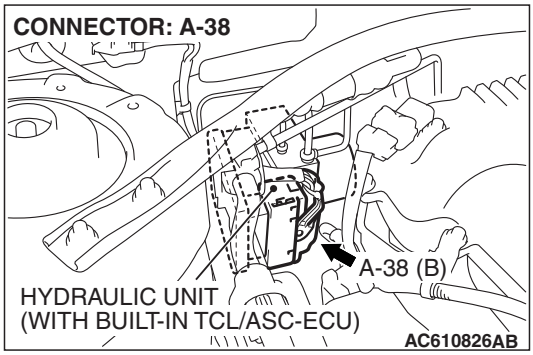
Q: Is DTC C1206 set?

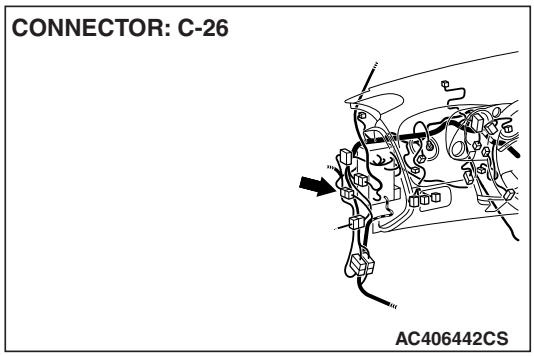
YES : Go to Step 1.
NO : The procedure is complete.

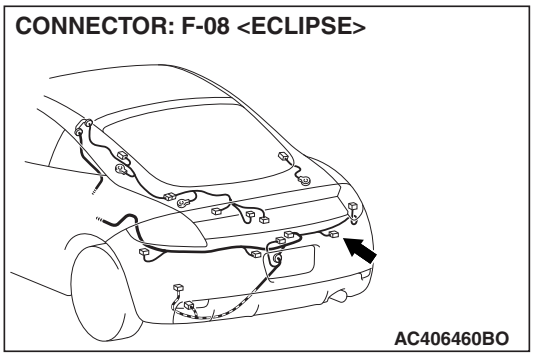
DTC C1210: RR wheel SPD. SNSR. malfunction

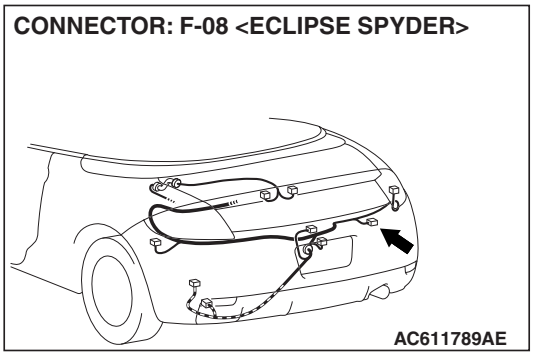
TCL/ASC Sensor Circuit











⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Diagnose the CAN bus lines before the DTC (Refer to GROUP 54C, Trouble code diagnosis P.54C-15).

CIRCUIT OPERATION

- A toothed ABS rotor generates a voltage pulse as it moves across the pickup field of each wheel speed sensor.

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- The amount of voltage generated at each wheel is determined by the clearance between the ABS 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 TCL/ASC electronic control unit (TCL/ASC-ECU).
- The hydraulic unit modulates the amount of braking force individually applied to each wheel cylinder.

TCL/ASC DTC SET CONDITIONS

The TCL/ASC-ECU monitors voltage fluctuation in each wheel speed sensor circuit. If the ECU detects 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 TCL/ASC-ECU)

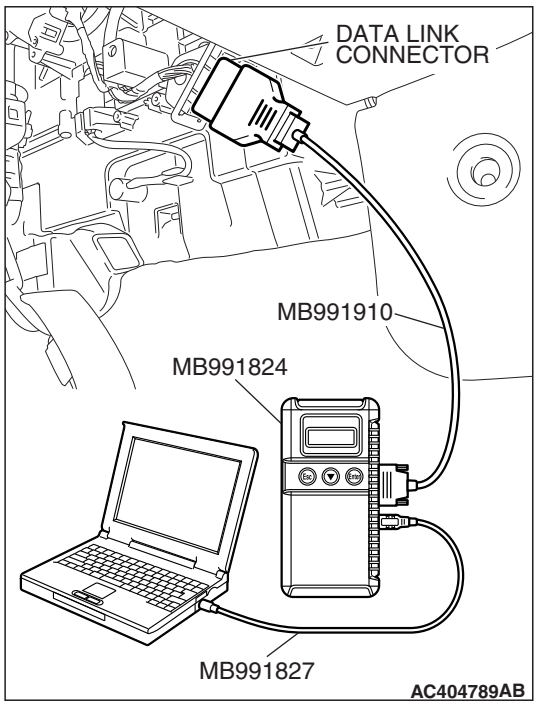
Past trouble

- Carry out diagnosis with particular emphasis o connector(s) or wiring harness in wheel speed sensor circuit. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to use Troubleshooting/Inspection Service Points P.00-16).

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-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-17orP.54C-17). Then go to Step 2.

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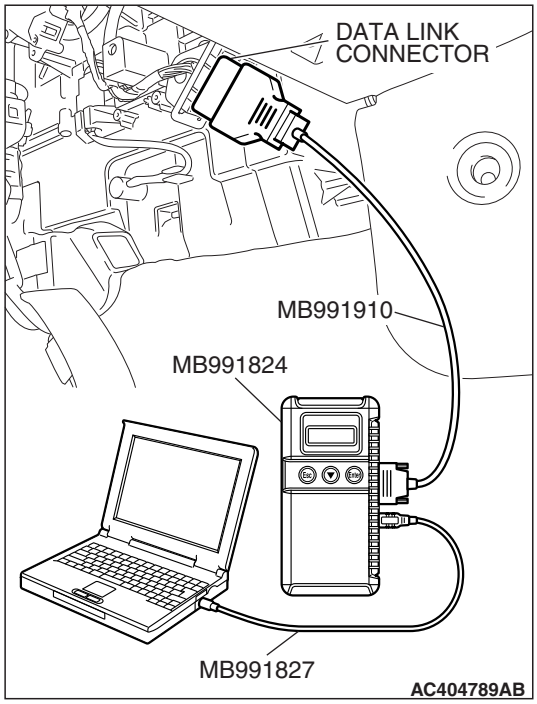
STEP 2. Recheck for diagnostic trouble code.



⚠ CAUTION

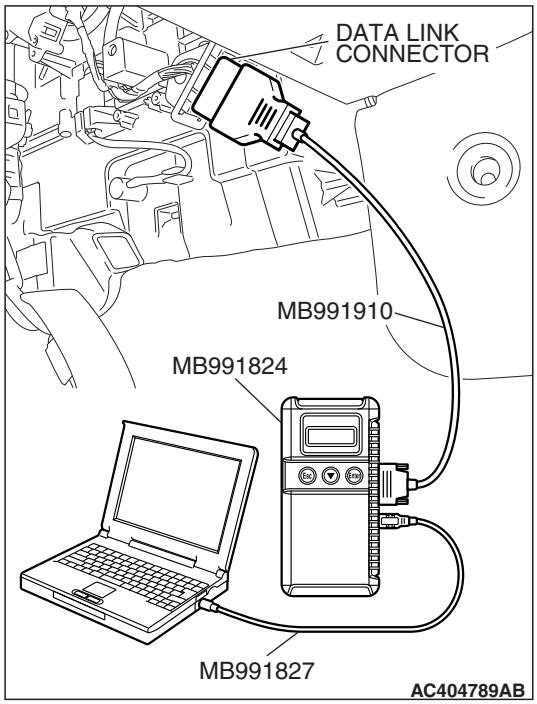
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(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) Drive the vehicle at 9 mph (15 km/h) or more.
(6) Check if the DTC is set.
(7) 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.



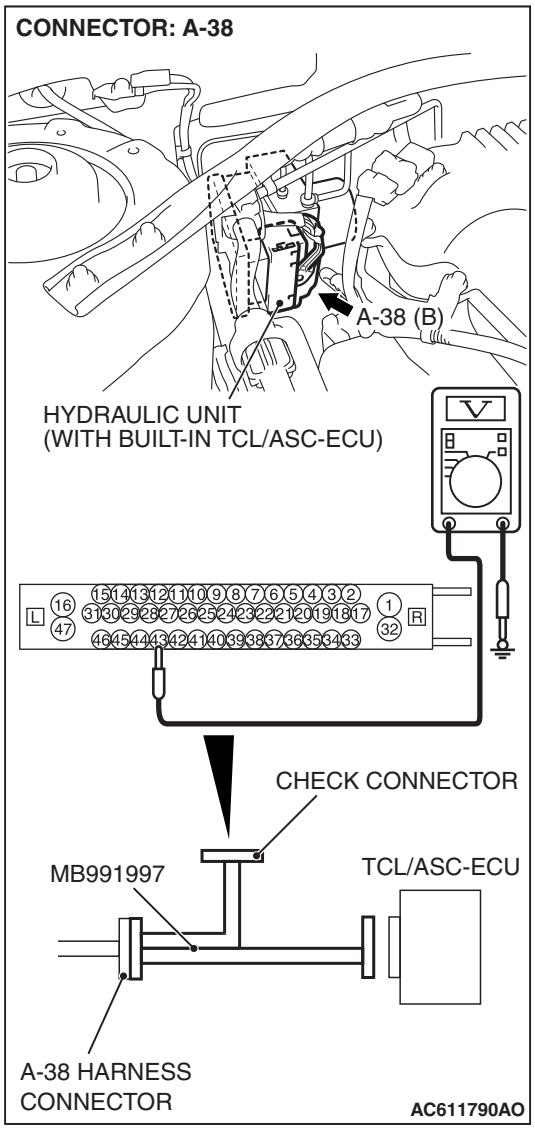
⚠ CAUTION

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.
  • Item 04 (DTC C1210 is set): 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 : Go to Step 10.
NO : Go to Step 4.



STEP 4. Measure the voltage at TCL/ASC-ECU connector A-38.

(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

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

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

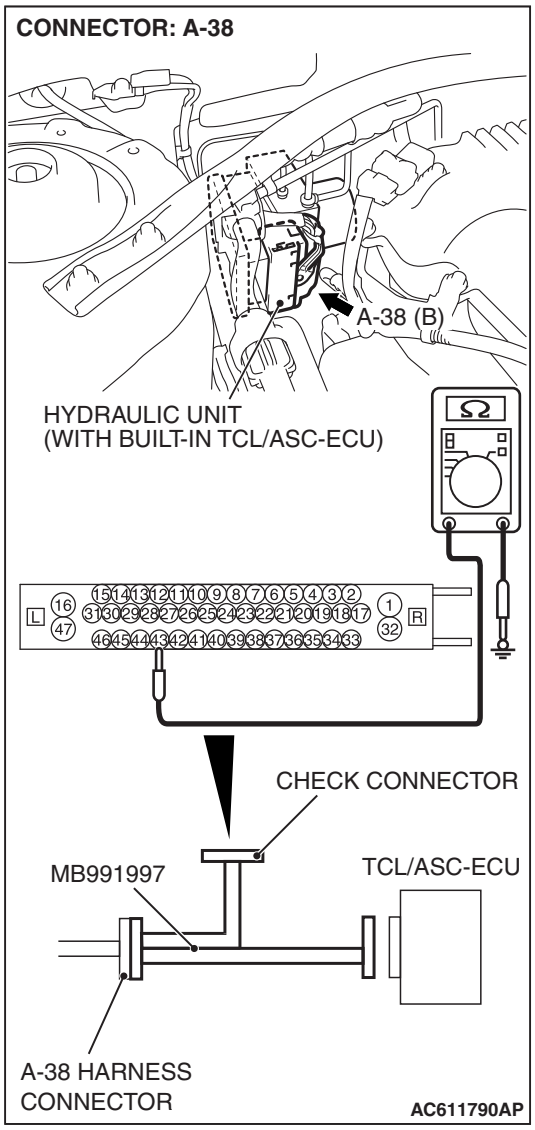
(3) Measure the voltage between the relevant signal and ground terminals in the wheel speed sensor circuit and body ground. It should be less than 1V.

- DTC C1210 is set: Between signal terminal 43 and body ground, and between ground terminal 42 and body ground

Q: Does the voltage measure 1 V or less?

YES : Go to Step 5.

NO (When the voltage between terminal 43 or 42 – and body ground measures more than 1 V) : Go to Step 7.



STEP 5. Measure the resistance at TCL/ASC-ECU connector A-38.

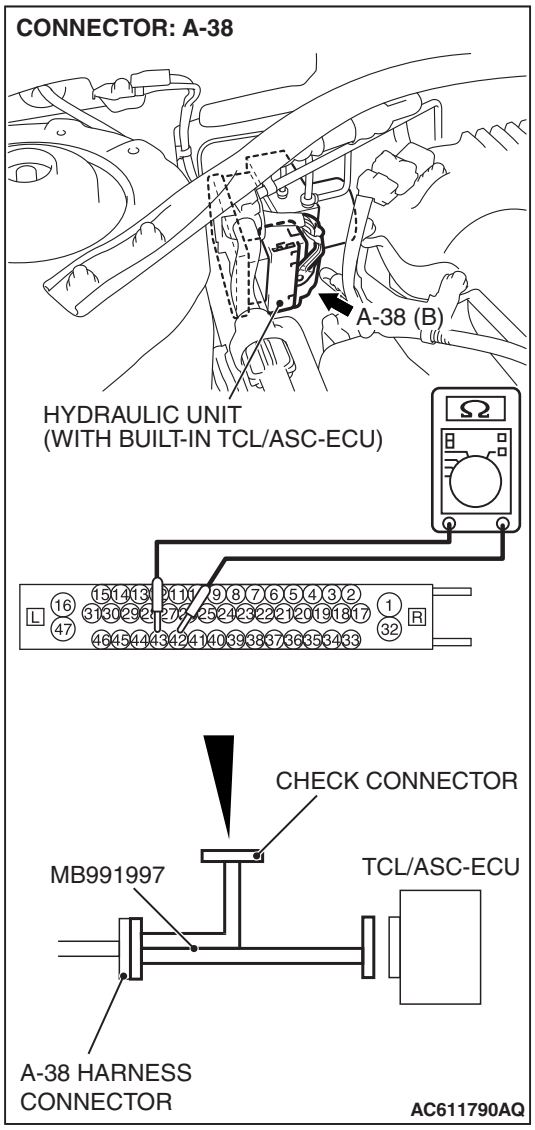
(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

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

(2) Measure the resistance between the relevant signal and ground terminals in the wheel speed sensor circuit and body ground. There should be no continuity.
- DTC C1210 is set: Between signal terminal 43 and body ground, and between ground terminal 42 and body ground

Q: Does continuity exist?

YES (Continuity exists between terminal 43 or terminal 42 and body ground) : Go to Step 7.
NO : Go to Step 6.



STEP 6. Measure the resistance at the TCL/ASC-ECU connector A-38.

(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

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

(2) Measure the resistance between the TCL/ASC-ECU connector terminals.

- DTC C1210 is set: Between terminal 43 and terminal 42

Standard Value: 1.24 – 1.64 kΩ

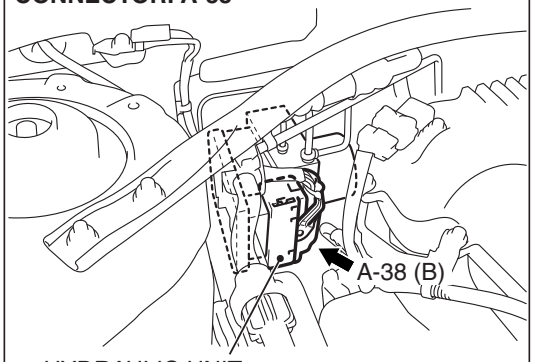
Q: Is the resistance between terminals 43 and 42 within the standard value?

YES (When resistances between all terminals are within the standard value) : Go to Step 10.

NO (When resistance between terminals 43 and 42 is not within the standard value) : Go to Step 7.

STEP 7. Check TCL/ASC-ECU connector A-38, 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.

CONNECTOR: A-38



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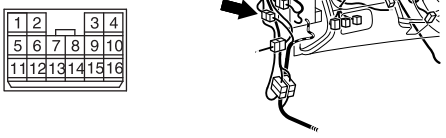
CONNECTOR: C-26



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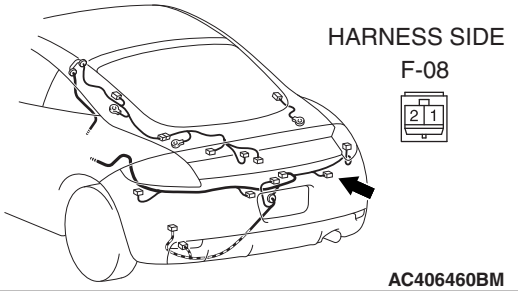
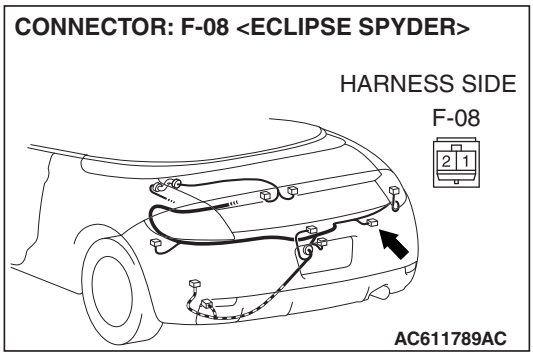
CONNECTOR: F-08 <ECLIPSE>



AC406460BM



Q: Are TCL/ASC-ECU connector A-38, 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.

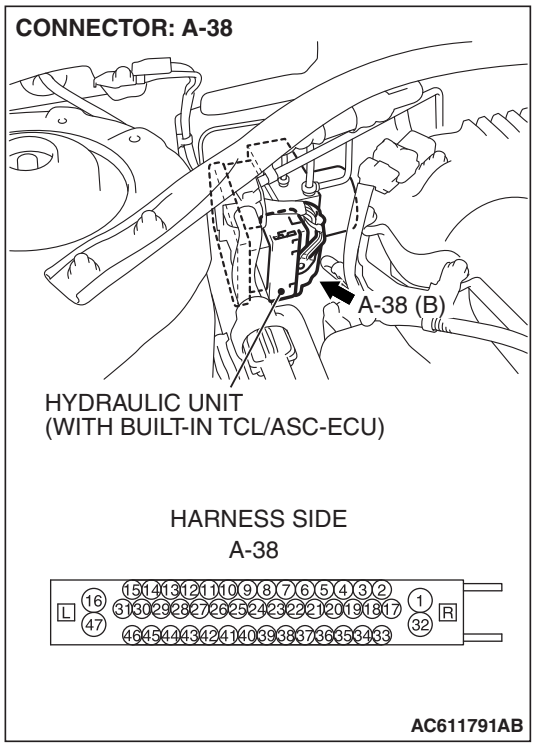
NO : Go to Step 8.

STEP 8. Check the harness wires between TCL/ASC-ECU connector A-38 (terminal 43, 42) and wheel speed sensor <rear: RH> connector F-08 (terminal 1, 2).

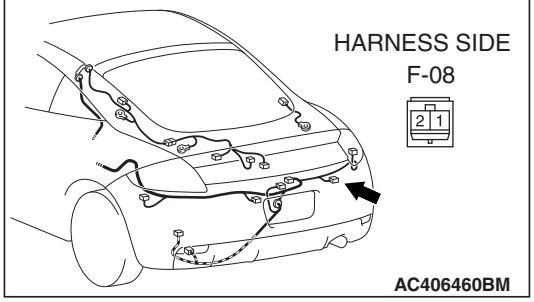
Q: Is the harness wire between TCL/ASC-ECU connector A-38 (terminal 43, 42) and wheel speed sensor <rear: RH> connector F-08 (terminal 1, 2) damaged?

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

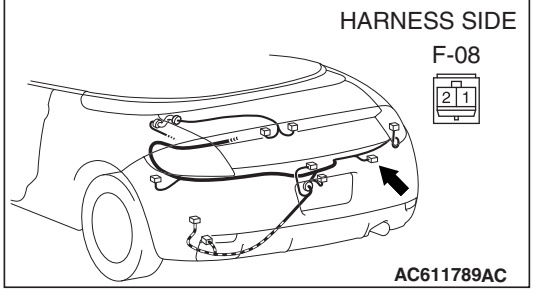
NO : Go to Step 9.



CONNECTOR: F-08 <ECLIPSE>



CONNECTOR: F-08 <ECLIPSE SPYDER>



STEP 9. Inspect the wheel speed sensor.

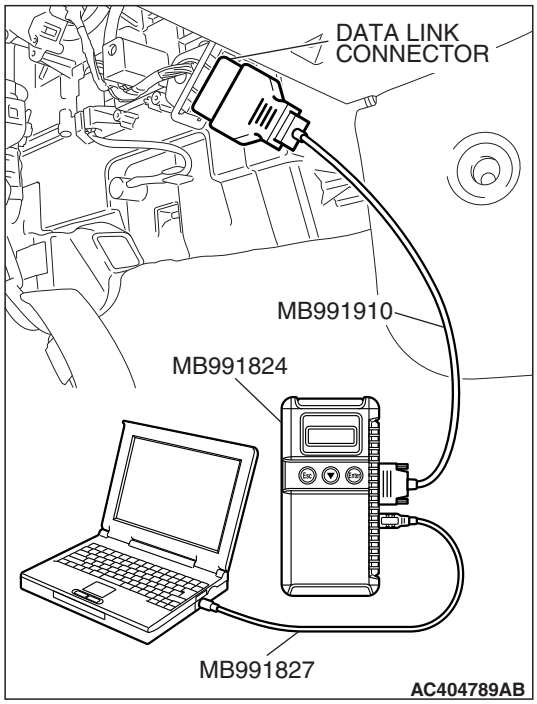
Check the wheel speed sensor relevant to the DTC code. For the applicable inspection procedure, refer to P.35C-228.

- 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.

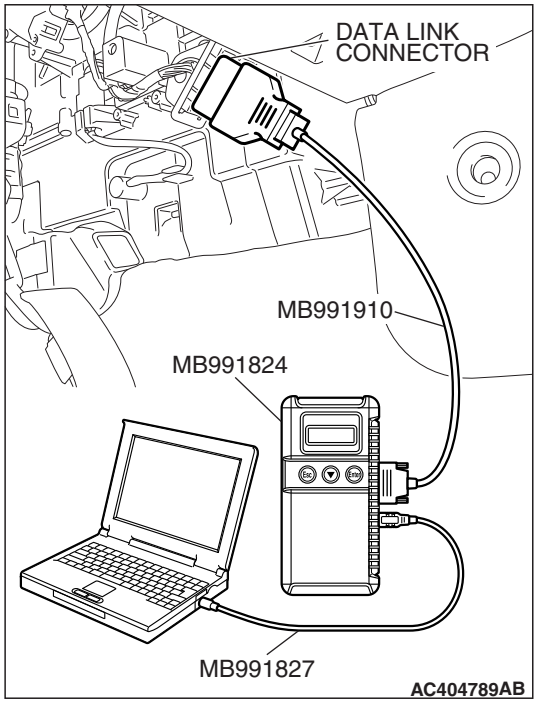


STEP 10. Recheck for diagnostic trouble code.

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) Drive the vehicle at 9 mph (15 km/h) or more.
(6) Check if the DTC is reset.
(7) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1210 set?

YES : Replace the hydraulic unit (integrated with TCL/ASC-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.

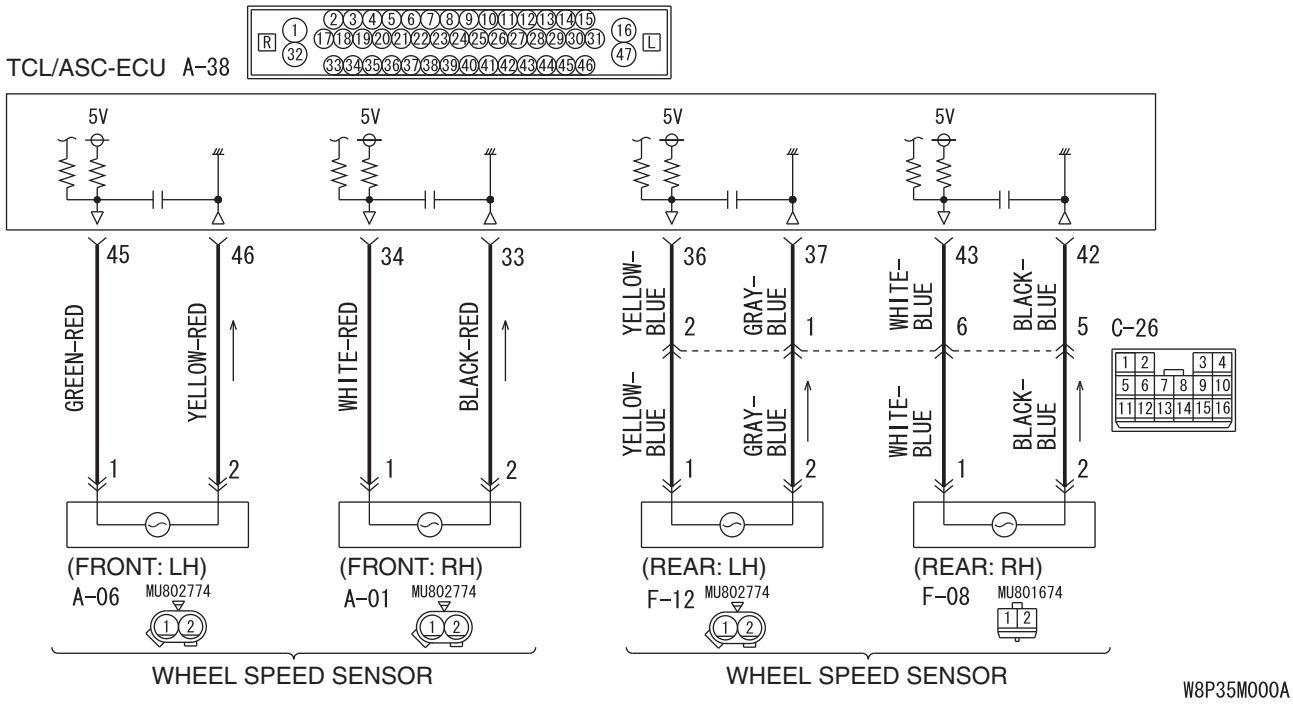
(1) Turn the ignition switch to the "ON" position.
(2) Erase the DTC.
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to the "ON" position.
(5) Drive the vehicle at 9 mph (15 km/h) or more.
(6) Check if the DTC is set.
(7) Turn the ignition switch to the "LOCK" (OFF) position.

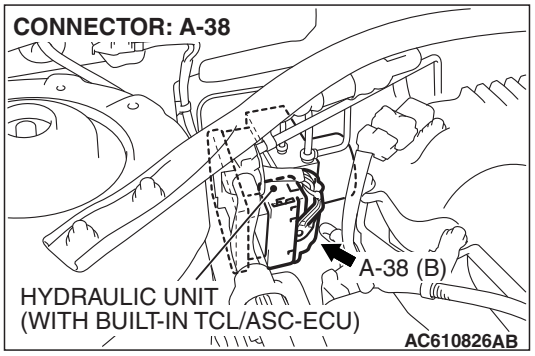
Q: Is DTC C1210 set?

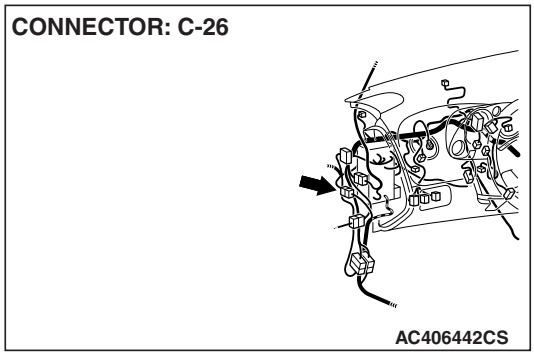
YES : Repeat the troubleshooting from Step 1.
NO : The procedure is complete.

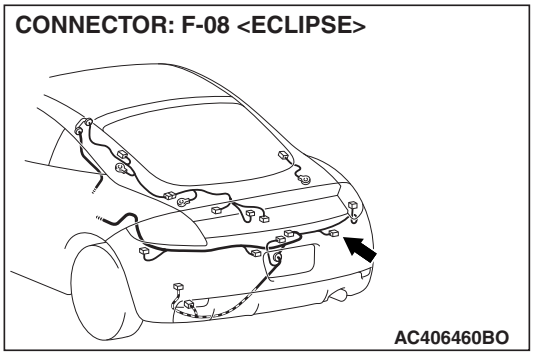
DTC C1211: RR wheel SPD. SNSR. invalid signal

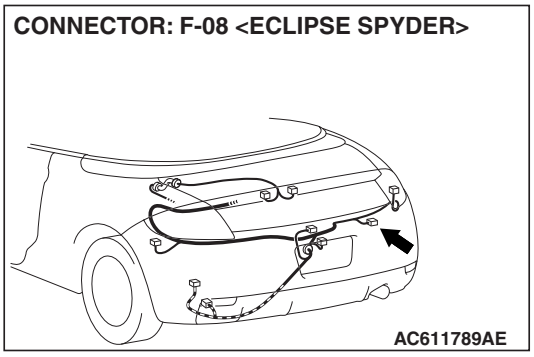
TCL/ASC Sensor Circuit











⚠ 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.

CIRCUIT OPERATION

- A toothed rotor generates a voltage pulse as it moves across the pickup field of each wheel speed sensor.

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- The amount of voltage generated at each wheel is determined by the clearance between the 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 TCL/ASC electronic control unit (TCL/ASC-ECU).
- The hydraulic unit modulates the amount of braking force individually applied to each wheel cylinder.

DTC SET CONDITIONS

The TCL/ASC-ECU monitors the signals from each wheel speed sensor while the vehicle is being driven. If any faults below are 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 rotor
- Damaged wiring harness or connector
- Malfunction of the hydraulic unit (integrated with TCL/ASC-ECU)

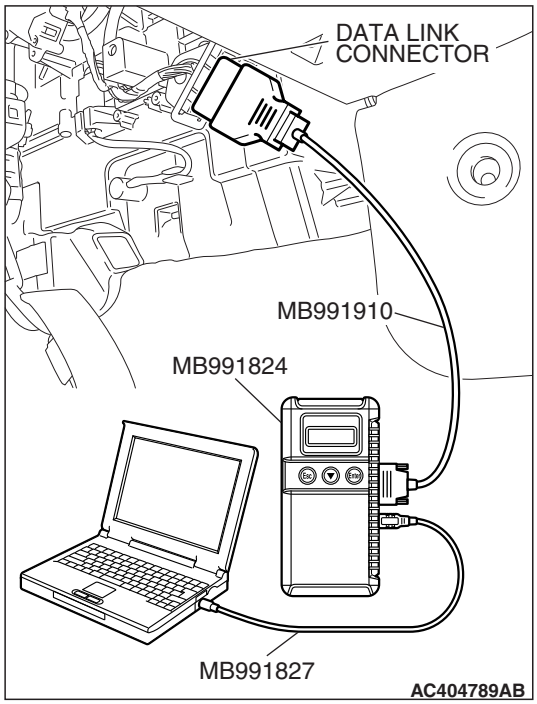
Past trouble

- Carry out diagnosis with particular emphasis o connector(s) or wiring harness in wheel speed sensor circuit. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to use Troubleshooting/Inspection Service Points P.00-16).

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A
- MB991997: ASC Check Harness



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

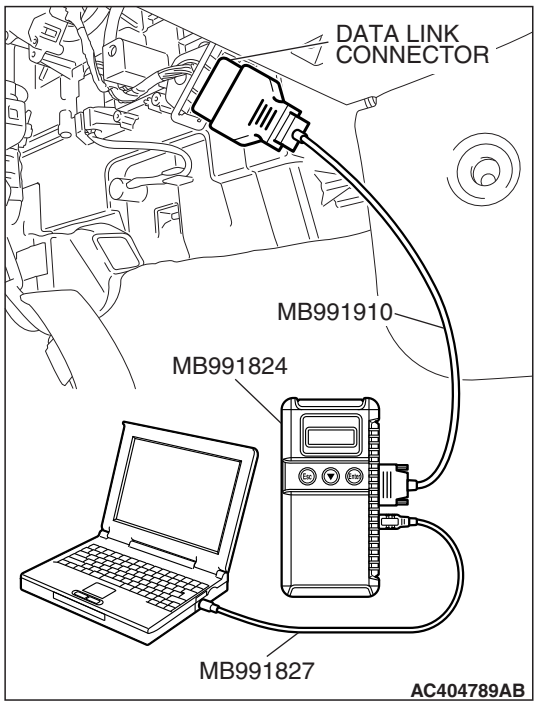
⚠ CAUTION

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-17orP.54C-17). Then go to Step 2.



STEP 2. Recheck for diagnostic trouble code.

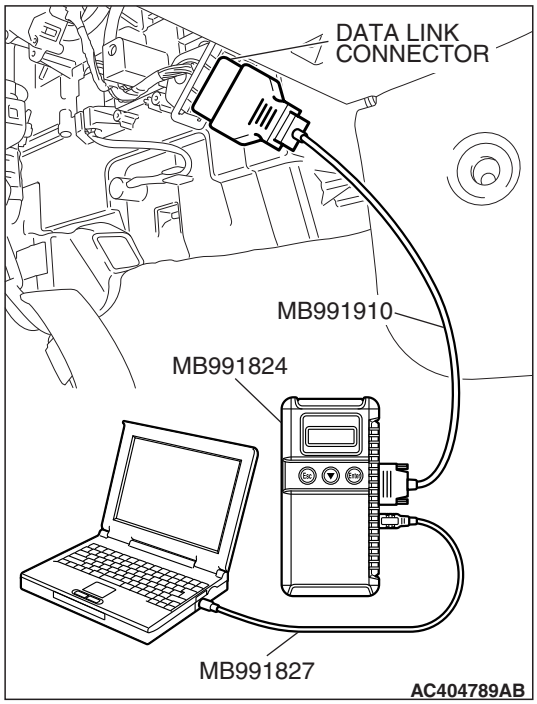
⚠ CAUTION

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) Drive the vehicle at 9 mph (15 km/h) or more.
(6) Check if the DTC is set.
(7) 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 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) Drive the vehicle at 9 mph (15 km/h) or more.
(4) Check whether DTC C1210 have been set.
(5) 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-53).
NO : Go to Step 4.

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

For the wheel speed sensor, which the DTC 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 14.

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

Check the wheel speed sensor, which the DTC indicates (Refer to P.35C-228).

- 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. Then go to Step 14.

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 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.27-5).

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.27-5). Then go to Step 14.

STEP 7. Check the rotor.

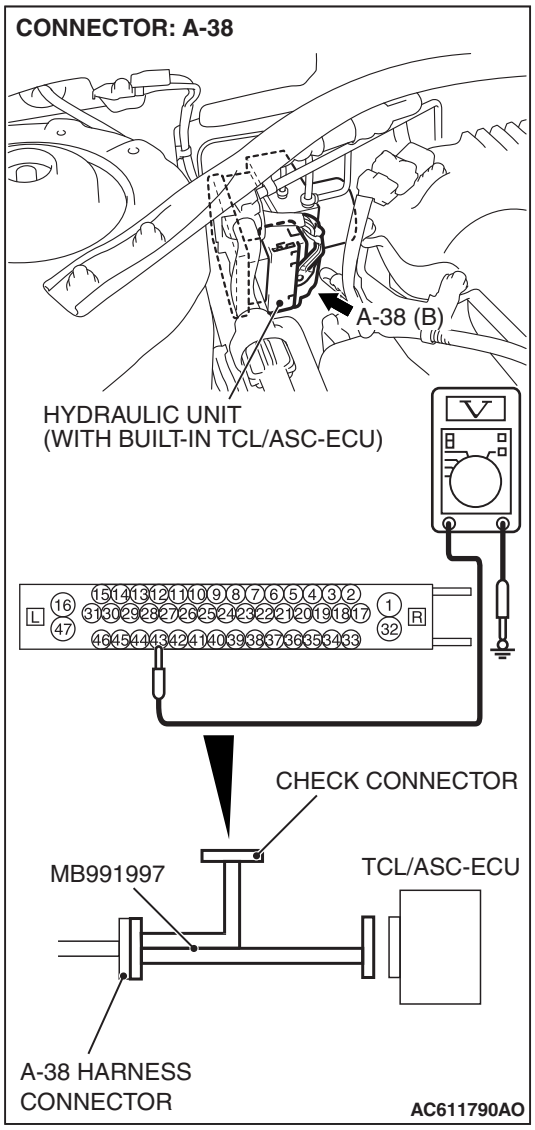
Check the rotor, which DTC indicates, for foreign material or deformation.

- DTC C1211 is set: Rear right wheel speed sensor

Q: Is the rotor in good condition?

YES : Go to Step 8.

NO (front bearing end play is not within the standard value) : If the 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). Then go to Step 14.



STEP 8. Measure the voltage at TCL/ASC-ECU connector A-38.

(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

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

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

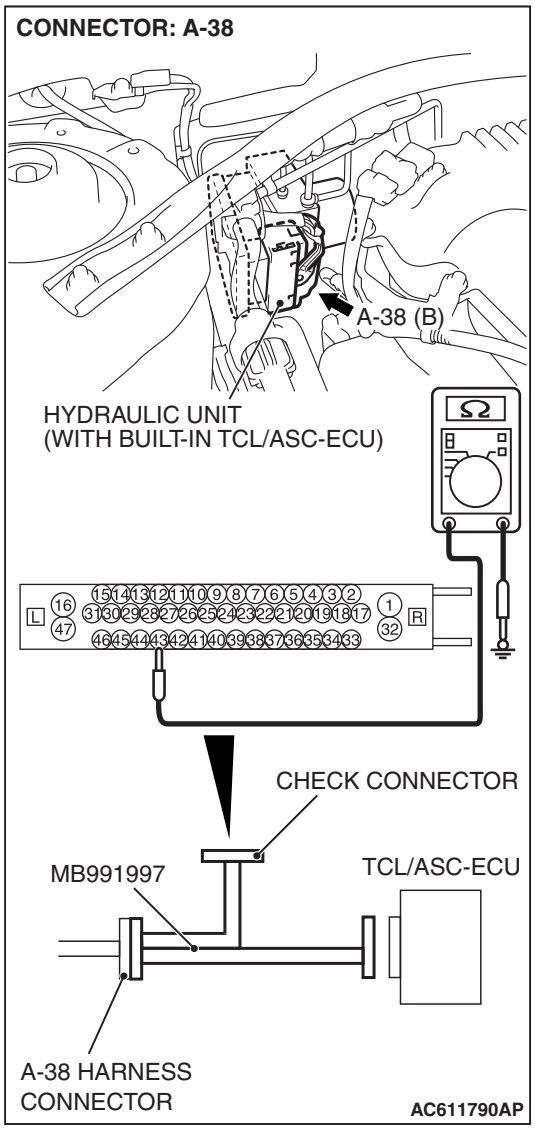
(3) Measure the voltage between the relevant signal and ground terminals in the wheel speed sensor circuit and body ground. It should be less than 1V.

- DTC C1211 is set: Between signal terminal 43 and body ground, and between ground terminal 42 and body ground

Q: Does the voltage measure 1 V or less?

YES : Go to Step 9.

NO (When the voltage between terminal 43 or 42 – and body ground measures more than 1 V) : Go to Step 12.



STEP 9. Measure the resistance at TCL/ASC-ECU connector A-38.

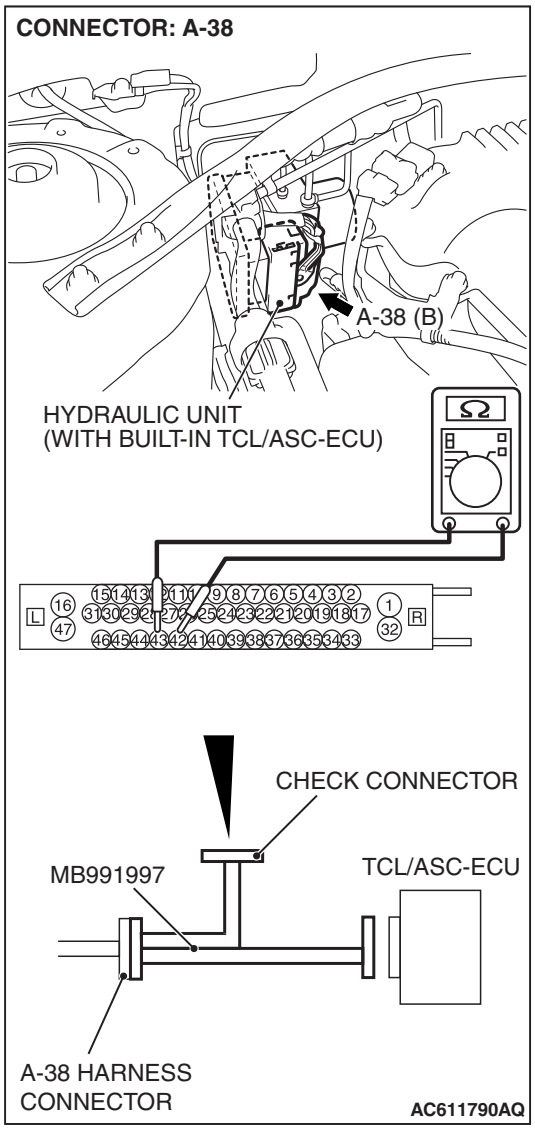
(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

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

(2) Measure the resistance between the relevant signal and ground terminals in the wheel speed sensor circuit and body ground. OK if there is no continuity.
- DTC C1211 is set: Between signal terminal 43 and body ground, and between ground terminal 42 and body ground

Q: Does continuity exist?

YES (Continuity exists between terminal 43 or terminal 42 and body ground) : Go to Step 12.
NO : Go to Step 10.



STEP 10. Measure the resistance at TCL/ASC-ECU connector A-38.

(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

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

(2) Measure the resistance between the relevant signal and ground terminals in the wheel speed sensor circuit.
- DTC C1211 is set: Between signal terminal 43 and ground terminal 42

Standard Value: 1.24 – 1.64 kΩ

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

YES (When resistances between all terminals are within the standard value) : Go to Step 13.
NO (When resistance between terminals 43 and 42 is not within the standard value) : Go to Step 11.

STEP 11. Inspect the wheel speed sensor.

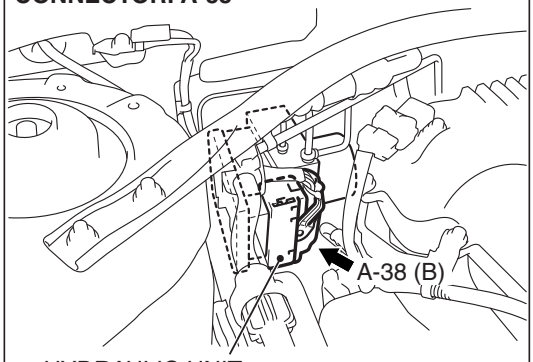
Check the rear right wheel speed sensor relevant to the DTC. For the applicable inspection procedure, refer to P.35C-228.

Q: Is the wheel speed sensor damaged?

YES : Replace the wheel speed sensor (Refer to P.35C-227).
NO : Go to Step 12.

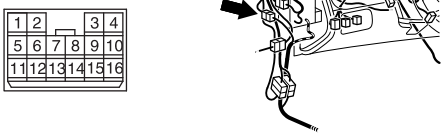
STEP 12. Check TCL/ASC-ECU connector A-38, intermediate connector C-26 and wheel speed sensor <rear: RH> connector F-08 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

CONNECTOR: A-38



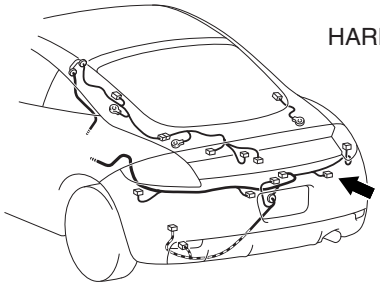
AC611791AB

CONNECTOR: C-26

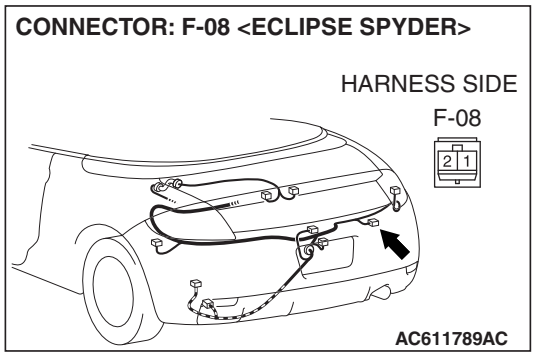


AC406442AD

CONNECTOR: F-08 <ECLIPSE>



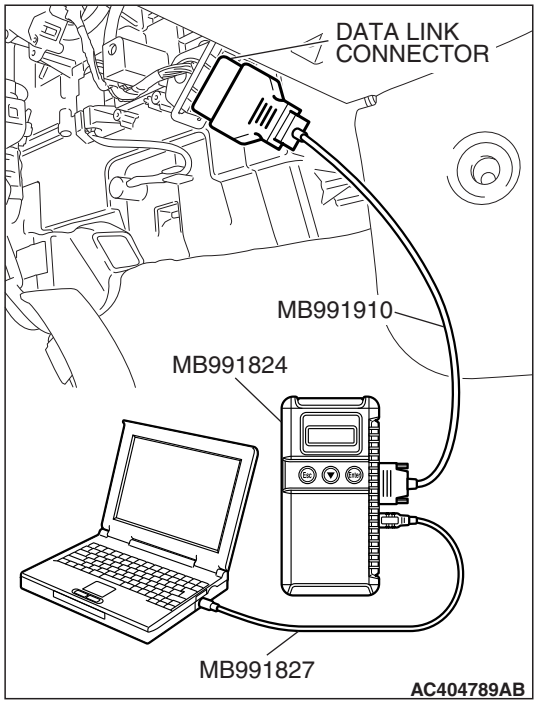
AC406460BM



Q: Are TCL/ASC-ECU connector A-38, 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 14.

NO : Open or short circuit may be present in the rear right wheel speed sensor circuit. Repair the wiring harness between TCL/ASC-ECU connector A-38 (terminals 43 and 42) and rear right wheel speed sensor F-08 (terminals 1 and 2). Then go to Step 14.



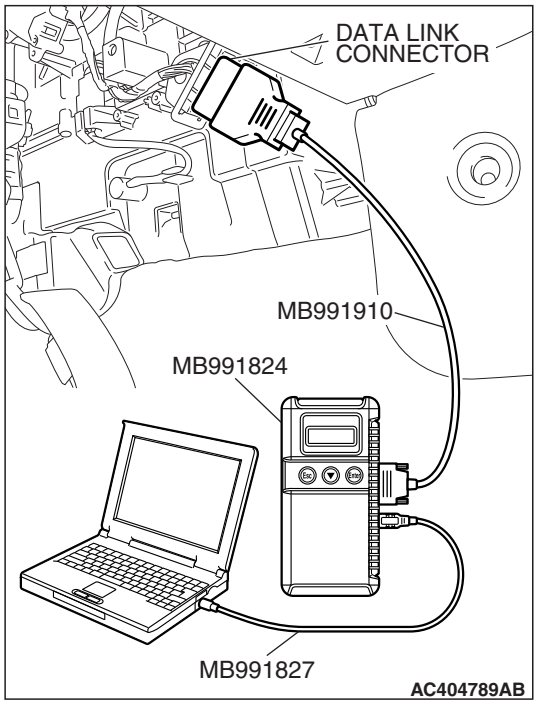
STEP 13. Recheck for diagnostic trouble code.

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) Drive the vehicle at 9 mph (15 km/h) or more.
(6) Check if the DTC is set.
(7) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1211 set?

YES : Replace the hydraulic unit (integrated with TCL/ASC-ECU). Then go to Step 14.

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 14. Recheck for diagnostic trouble code.

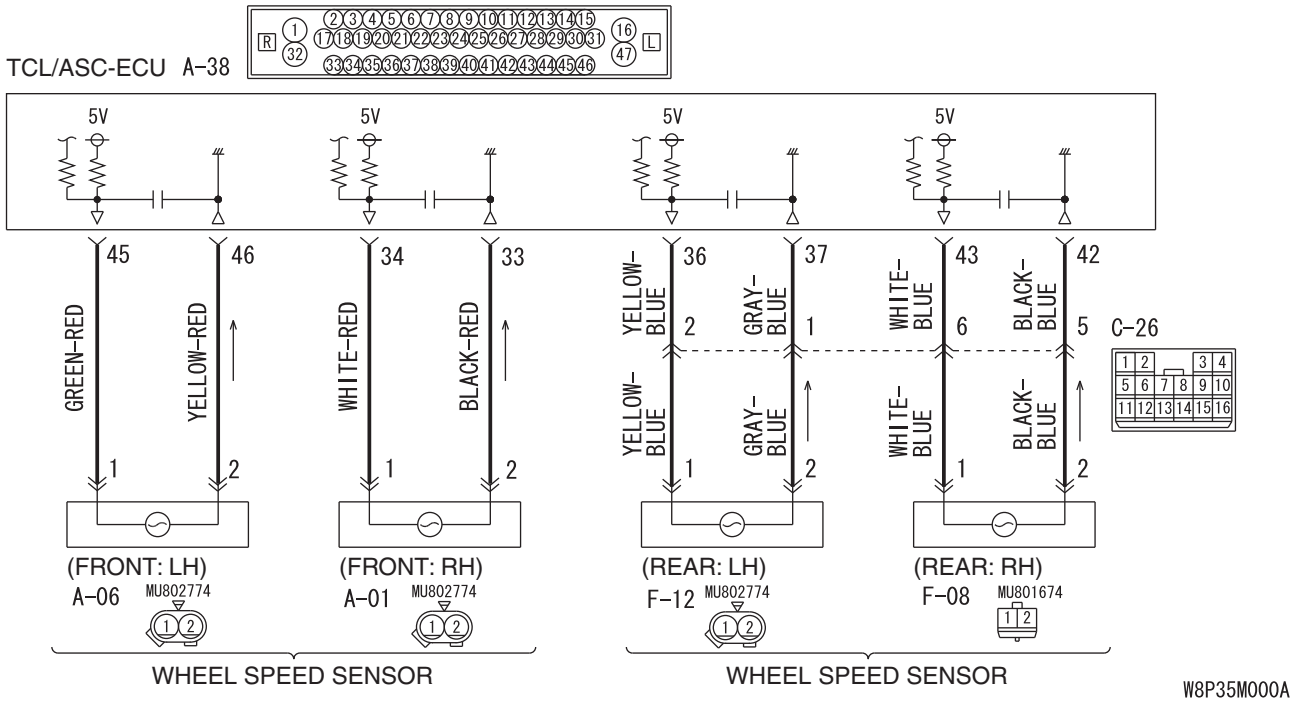
Check again if the DTC is set.
(1) Turn the ignition switch to the "ON" position.
(2) Erase the DTC.
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to the "ON" position.
(5) Drive the vehicle at 9 mph (15 km/h) or more.
(6) Check if the DTC is set.
(7) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1211 set?

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

DTC C1215: RL wheel SPD. SNSR. malfunction

TCL/ASC Sensor Circuit



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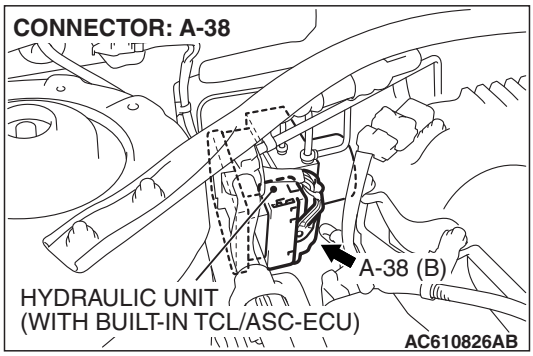
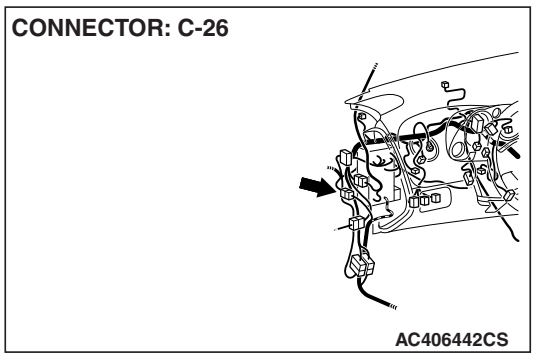
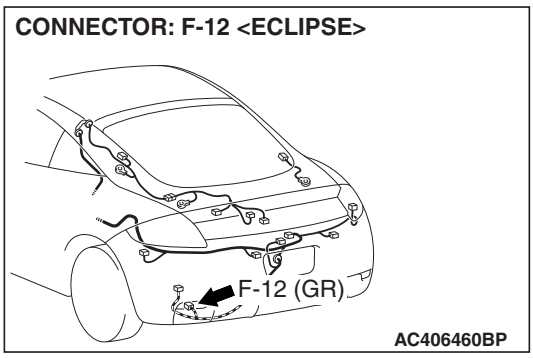
CONNECTOR: A-38



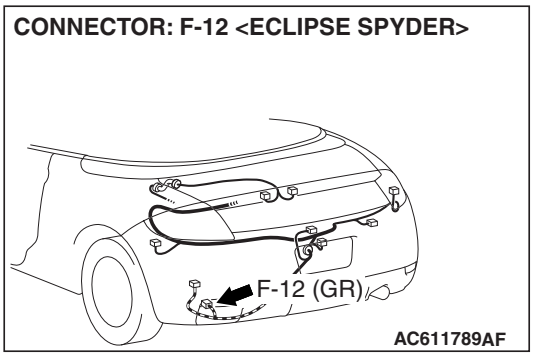
CONNECTOR: C-26



CONNECTOR: F-12 <ECLIPSE>



CONNECTOR: F-12 <ECLIPSE SPYDER>



⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Diagnose the CAN bus lines before the DTC (Refer to GROUP 54C, Trouble code diagnosis P.54C-15).

CIRCUIT OPERATION

- A toothed ABS 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 ABS 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 TCL/ASC electronic control unit (TCL/ASC-ECU).
- The hydraulic unit modulates the amount of braking force individually applied to each wheel cylinder.

TCL/ASC DTC SET CONDITIONS

The TCL/ASC-ECU monitors voltage fluctuation in each wheel speed sensor circuit. If the ECU detects 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 TCL/ASC-ECU)

Past trouble

- Carry out diagnosis with particular emphasis o connector(s) or wiring harness in wheel speed sensor circuit. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to use Troubleshooting/Inspection Service Points P.00-16).

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A
- MB991997: ASC Check Harness

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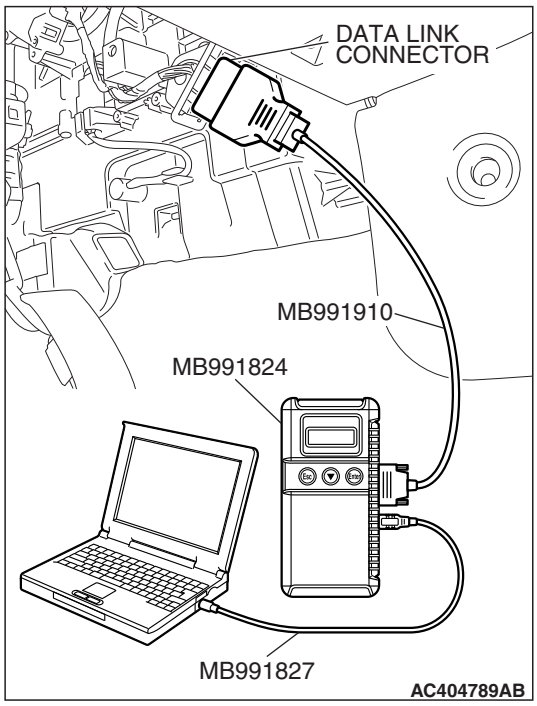


STEP 1. Using scan tool MB991958, diagnose the CAN bus line.

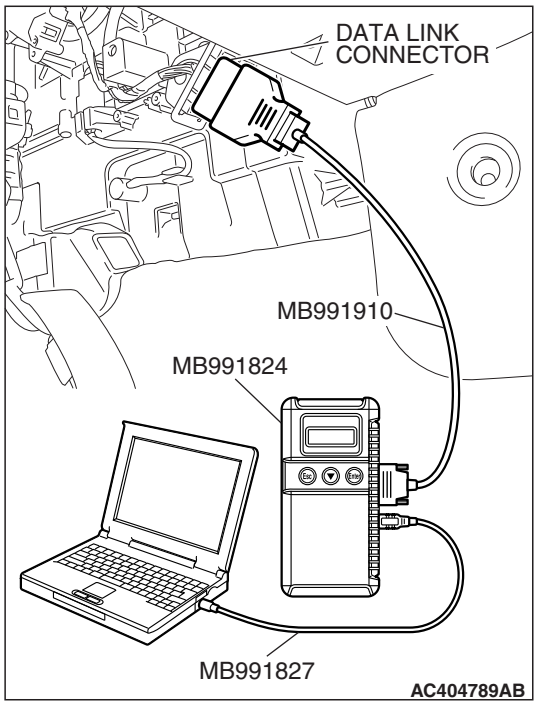
⚠ CAUTION

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-17orP.54C-17). Then go to Step 2.



STEP 2. Recheck for diagnostic trouble code.

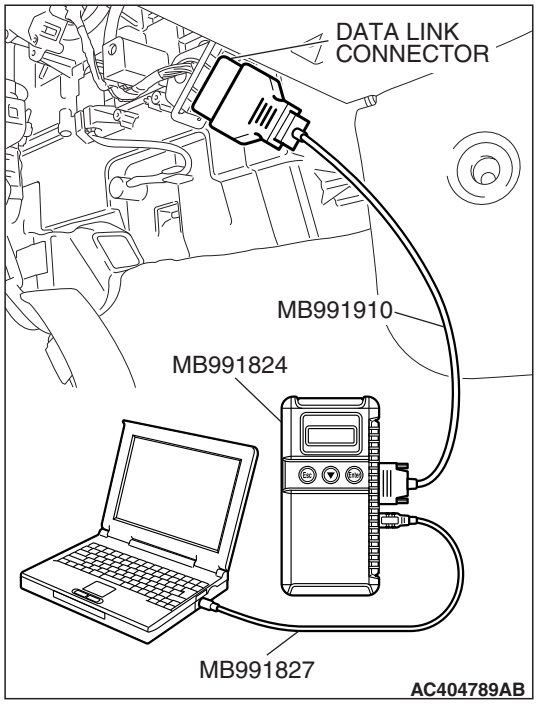
⚠ CAUTION

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) Drive the vehicle at 9 mph (15 km/h) or more.
(6) Check if the DTC is set.
(7) 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

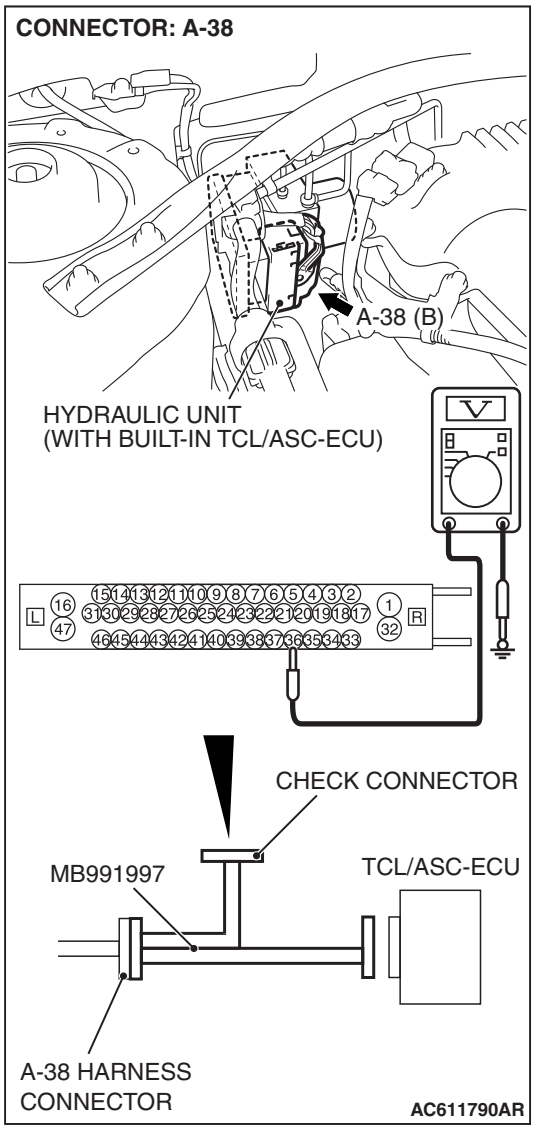
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(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.
- Item 03 (DTC C1215 is set): 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 : Go to Step 10.
NO : Go to Step 4.



STEP 4. Measure the voltage at TCL/ASC-ECU connector A-38.

(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

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

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

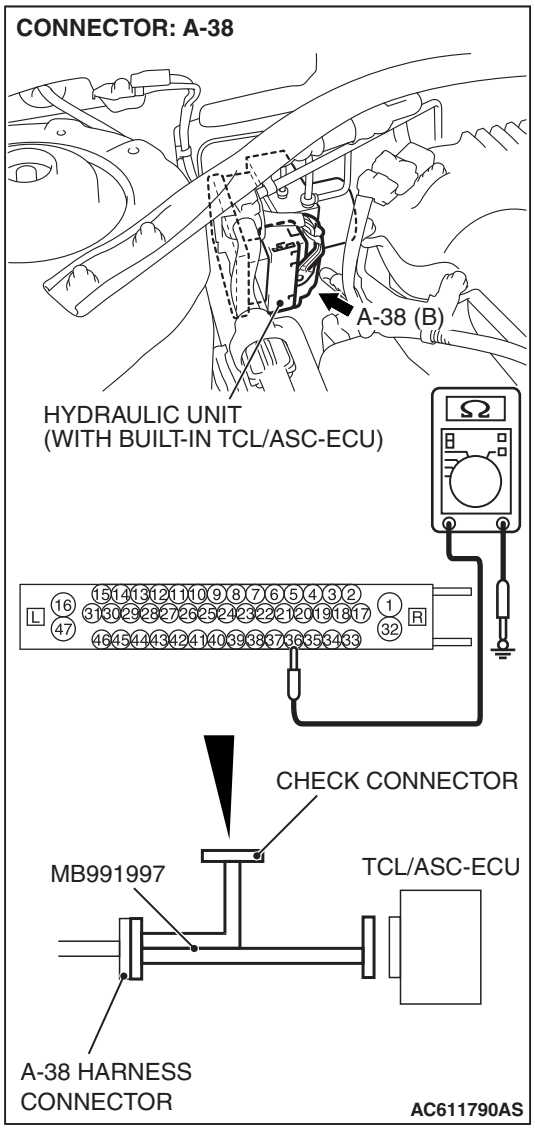
(3) Measure the voltage between the relevant signal and ground terminals in the wheel speed sensor circuit and body ground. It should be less than 1V.

- DTC C1215 is set: Between signal terminal 36 and body ground, and between ground terminal 37 and body ground

Q: Does the voltage measure 1 V or less?

YES : Go to Step 5.

NO (When the voltage between terminal 36 or 37 – and body ground measures more than 1 V) : Go to Step 7.



STEP 5. Measure the resistance at TCL/ASC-ECU connector A-38.

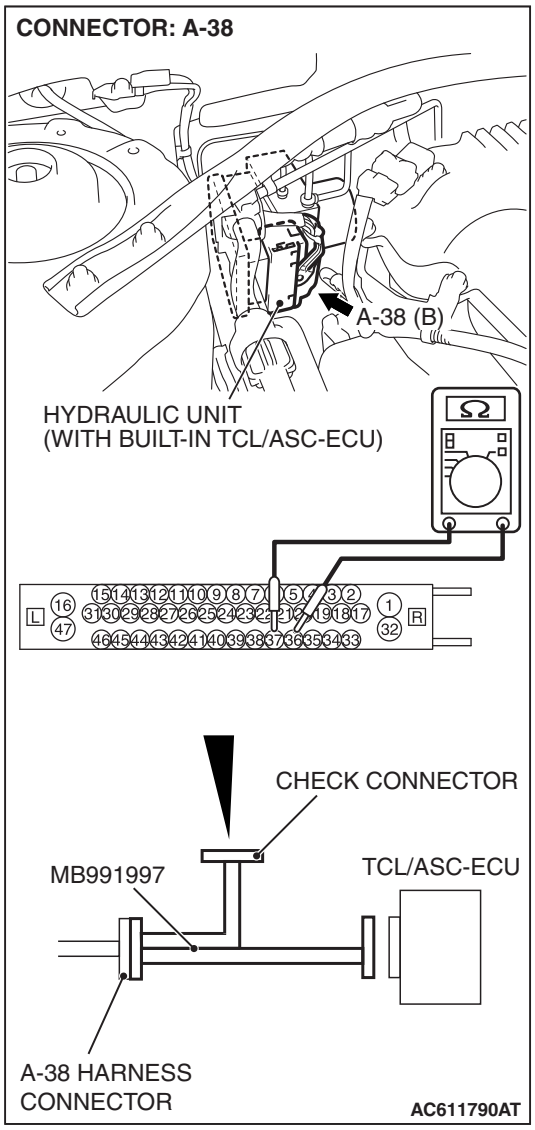
(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

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

(2) Measure the resistance between the relevant signal and ground terminals in the wheel speed sensor circuit and body ground. There should be no continuity.
- DTC C1215 is set: Between signal terminal 36 and body ground, and between ground terminal 37 and body ground

Q: Does continuity exist?

YES (Continuity exists between terminal 36 or terminal 37 and body ground) : Go to Step 7.
NO : Go to Step 6.



STEP 6. Measure the resistance at the TCL/ASC-ECU connector A-38.

(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

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

(2) Measure the resistance between the TCL/ASC-ECU connector terminals.

- DTC C1215 is set: Between terminal 36 and terminal 37

Standard Value: 1.24 – 1.64 kΩ

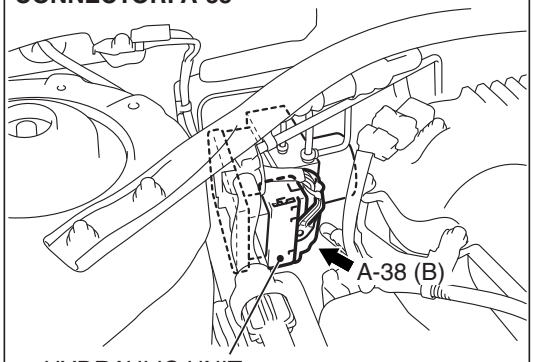
Q: Is the resistance between terminals 36 and 37 within the standard value?

YES (When resistances between all terminals are within the standard value) : Go to Step 10.

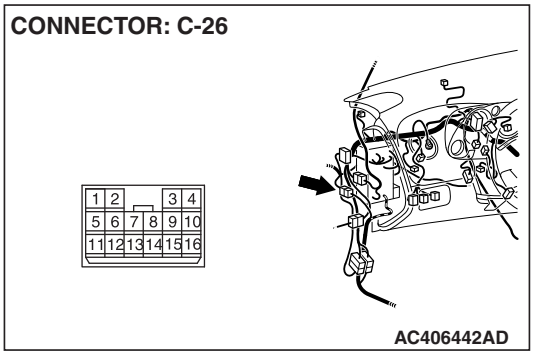
NO (When resistance between terminals 36 and 37 is not within the standard value) : Go to Step 7.

STEP 7. Check TCL/ASC-ECU connector A-38, 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.

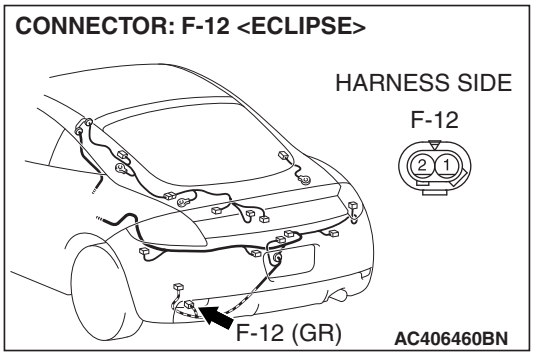
CONNECTOR: A-38

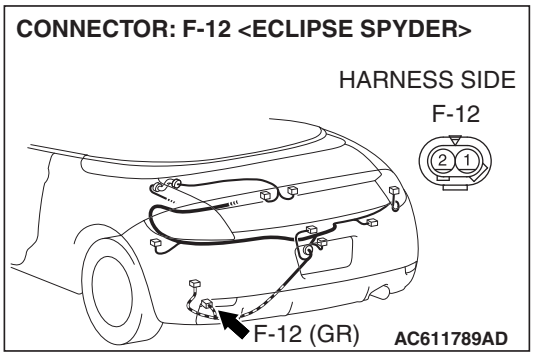


CONNECTOR: C-26



CONNECTOR: F-12 <ECLIPSE>



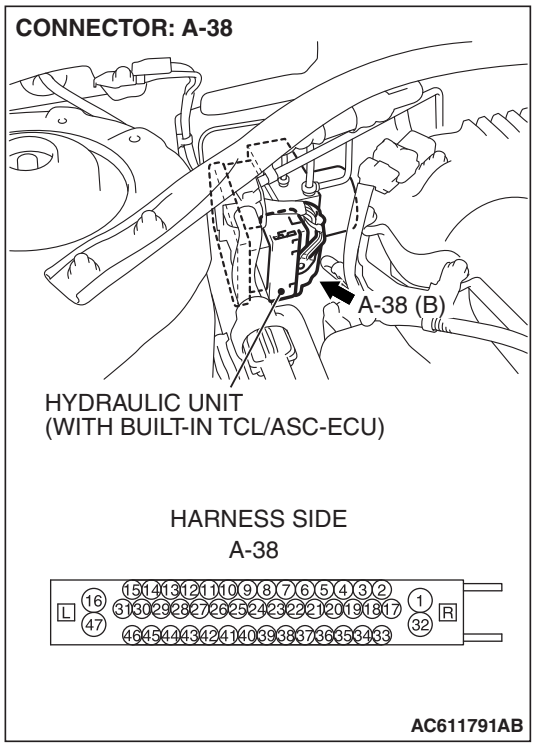


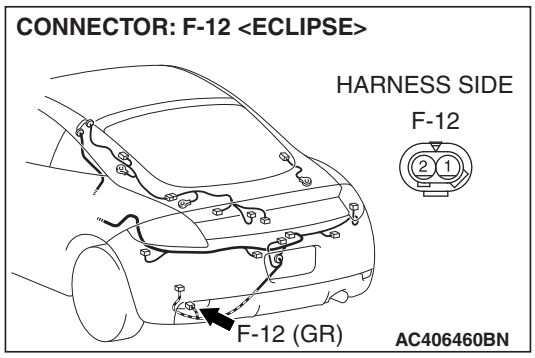
Q: Are TCL/ASC-ECU connector A-38, intermediate connector C-26 and wheel speed sensor <rear: LH> connector F-12 damaged?

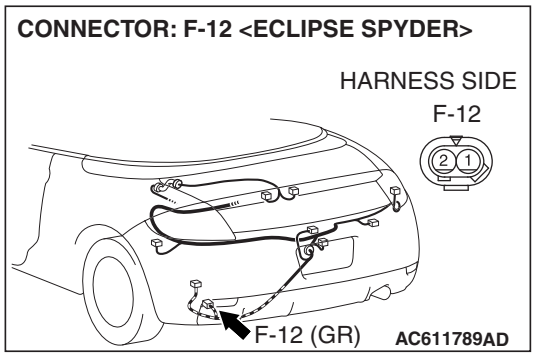
YES : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then go to Step 11.

NO : Go to Step 8.

STEP 8. Check the harness wires between TCL/ASC-ECU connector A-38 (terminal 36, 37) and wheel speed sensor <rear: LH> connector F-12 (terminal 1, 2).







Q: Is the harness wire between TCL/ASC-ECU connector A-38 (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.

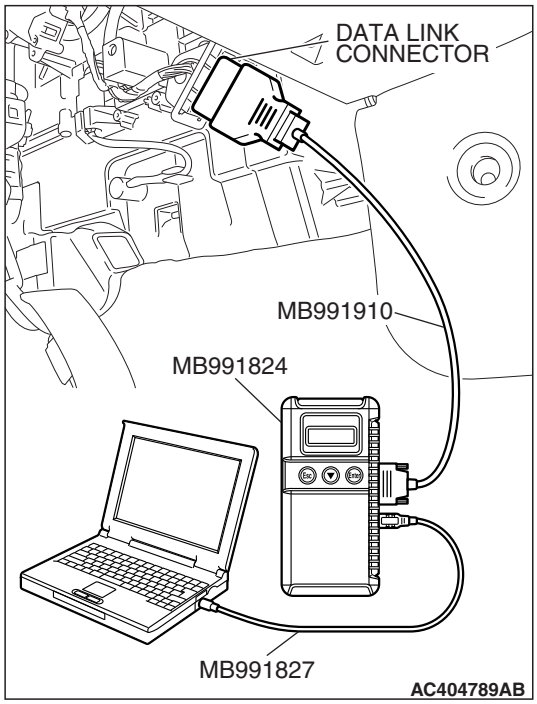
STEP 9. Inspect the wheel speed sensor.

Check the wheel speed sensor relevant to the DTC code. For the applicable inspection procedure, refer to P.35C-228.

- 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 : 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.

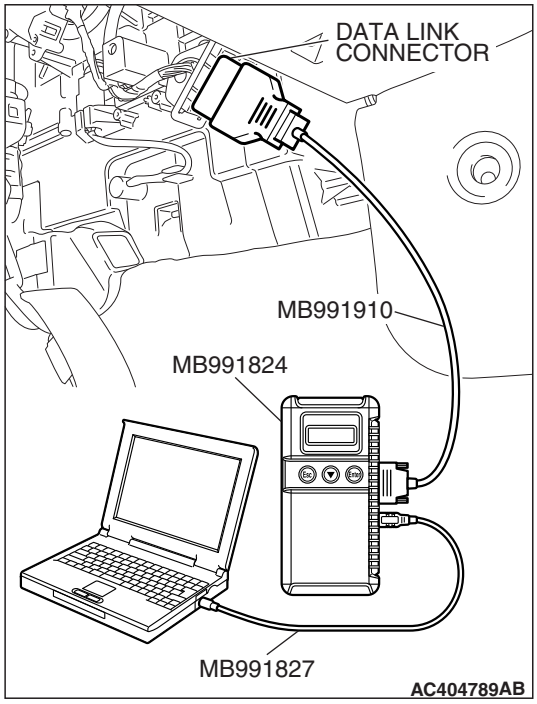


STEP 10. Recheck for diagnostic trouble code.

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) Drive the vehicle at 9 mph (15 km/h) or more.
(6) Check if the DTC is reset.
(7) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1215 set?

YES : Replace the hydraulic unit (integrated with TCL/ASC-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.

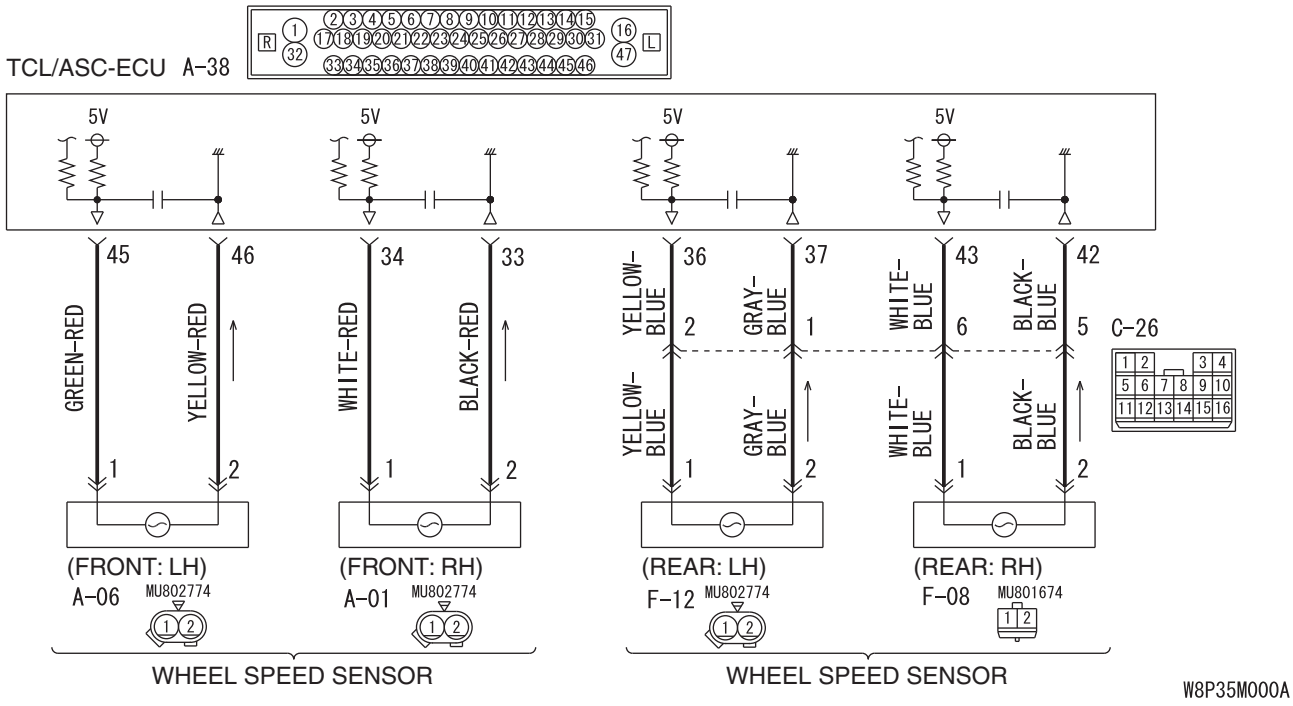
(1) Turn the ignition switch to the "ON" position.
(2) Erase the DTC.
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to the "ON" position.
(5) Check if the DTC is set.
(6) Turn the ignition switch to the "LOCK" (OFF) position.

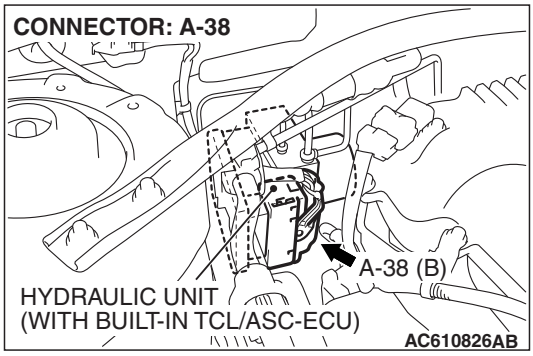
Q: Is DTC C1215 set?

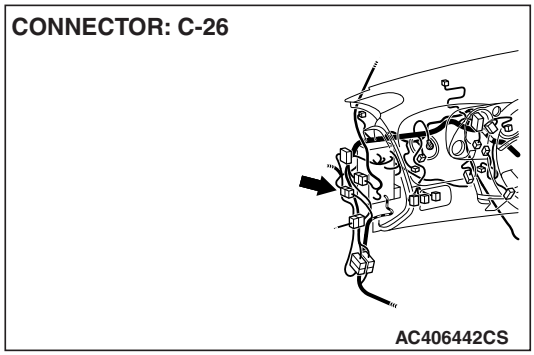
YES : Repeat the troubleshooting from Step 1.
NO : The procedure is complete.

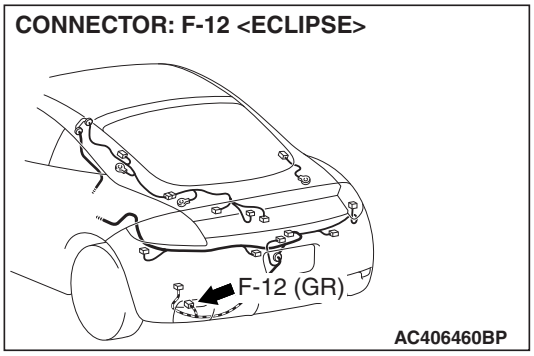
DTC C1216: RL wheel SPD. SNSR. invalid signal

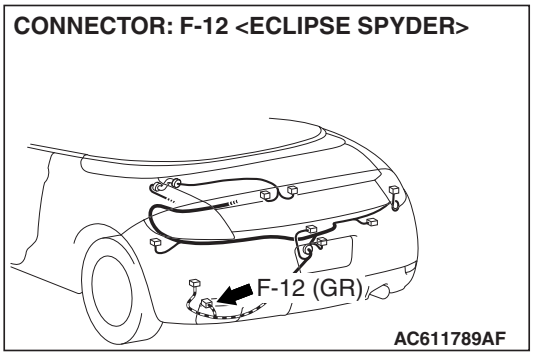
TCL/ASC Sensor Circuit











⚠ 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.

CIRCUIT OPERATION

- A toothed rotor generates a voltage pulse as it moves across the pickup field of each wheel speed sensor.

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- The amount of voltage generated at each wheel is determined by the clearance between the 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 TCL/ASC electronic control unit (TCL/ASC-ECU).
- The hydraulic unit modulates the amount of braking force individually applied to each wheel cylinder.

DTC SET CONDITIONS

The TCL/ASC-ECU monitors the signals from each wheel speed sensor while the vehicle is being driven. If any faults below are 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 rotor
- Damaged wiring harness or connector
- Malfunction of the hydraulic unit (integrated with TCL/ASC-ECU)

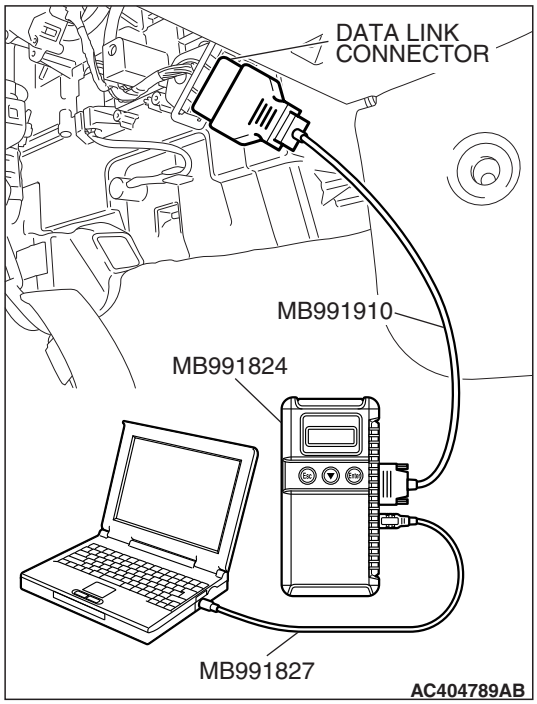
Past trouble

- Carry out diagnosis with particular emphasis o connector(s) or wiring harness in wheel speed sensor circuit. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to use Troubleshooting/Inspection Service Points P.00-16).

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A
- MB991997: ASC Check Harness



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

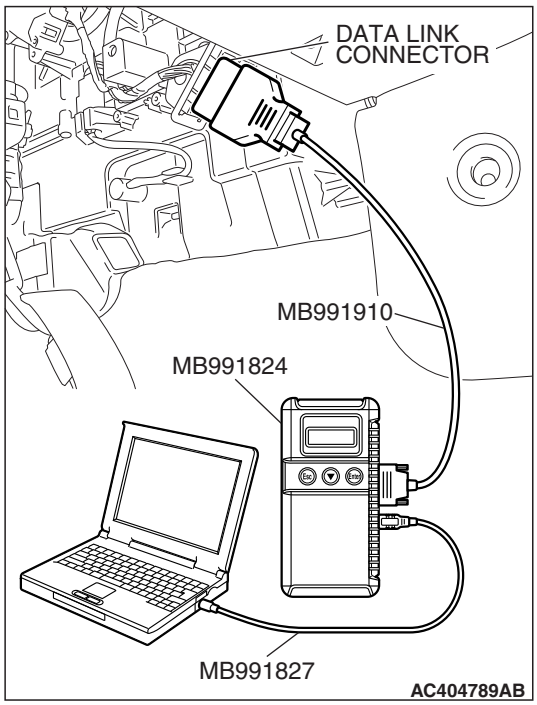
⚠ CAUTION

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-17orP.54C-17). 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) Drive the vehicle at 9 mph (15 km/h) or more.
(6) Check if the DTC is set.
(7) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1216 set?

YES : Go to Step 3.
NO : The procedure is complete.

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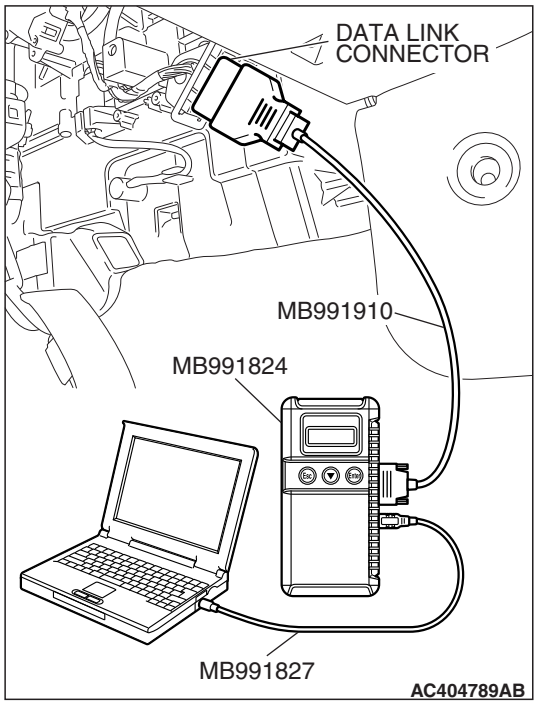


STEP 3. Using scan tool MB991958, read the diagnostic trouble code.

⚠ 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 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) Drive the vehicle at 9 mph (15 km/h) or more.
(4) Check whether DTC C1215 have been set.
(5) 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-73).
NO : Go to Step 4.

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

For the wheel speed sensor, which the DTC 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 14.

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

Check the wheel speed sensor, which the DTC indicates (Refer to P.35C-228).

- 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. Then go to Step 14.

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 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.27-5).

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.27-5). Then go to Step 14.

STEP 7. Check the rotor.

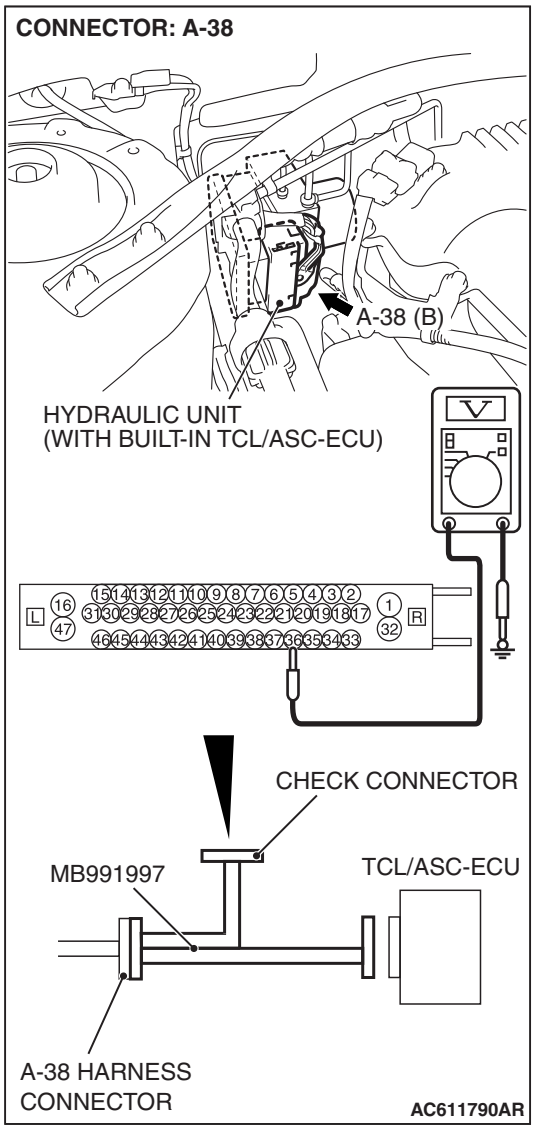
Check the rotor, which DTC indicates, for foreign material or deformation.

- DTC C1216 is set: Rear left wheel speed sensor

Q: Is the rotor in good condition?

YES : Go to Step 8.

NO (front bearing end play is not within the standard value) : If the 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). Then go to Step 14.



STEP 8. Measure the voltage at TCL/ASC-ECU connector A-38.

(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

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

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

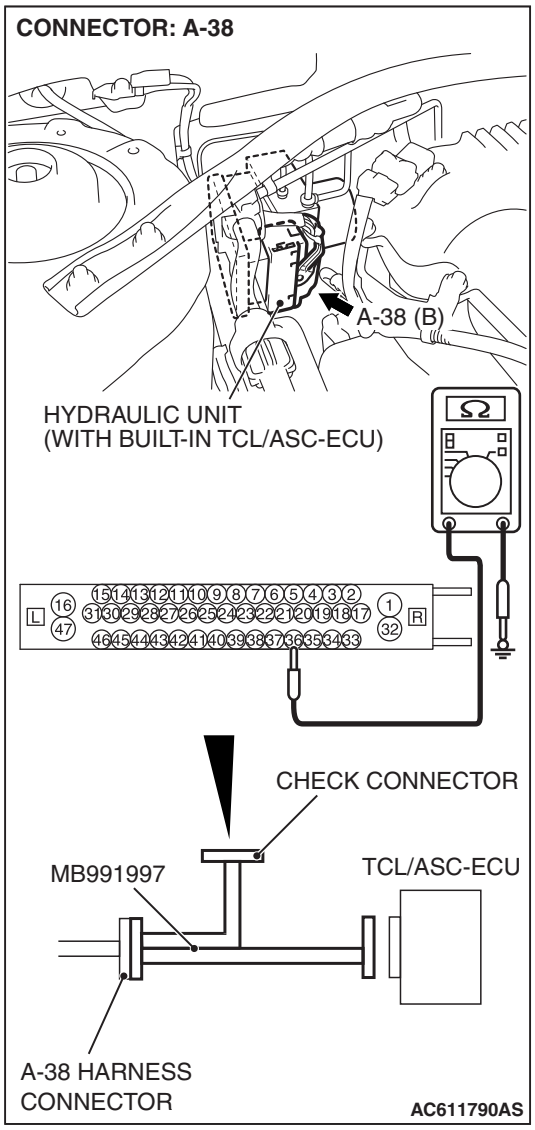
(3) Measure the voltage between the relevant signal and ground terminals in the wheel speed sensor circuit and body ground. It should be less than 1V.

- DTC C1216 is set: Between signal terminal 36 and body ground, and between ground terminal 37 and body ground

Q: Does the voltage measure 1 V or less?

YES : Go to Step 9.

NO (When the voltage between terminal 36 or 37 – and body ground measures more than 1 V) : Go to Step 12.



STEP 9. Measure the resistance at TCL/ASC-ECU connector A-38.

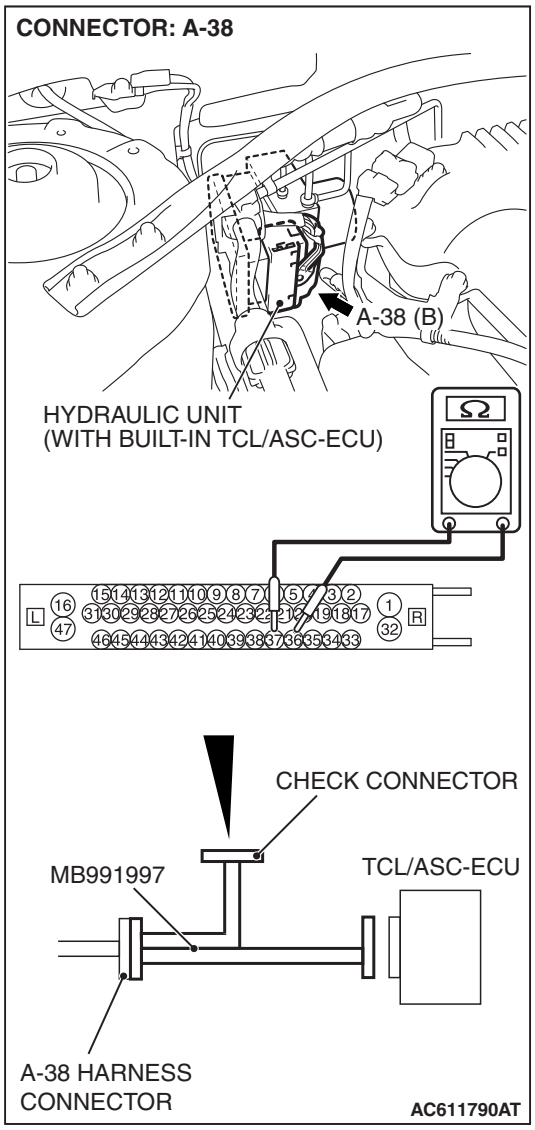
(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

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

(2) Measure the resistance between the relevant signal and ground terminals in the wheel speed sensor circuit and body ground. OK if there is no continuity.
- DTC C1216 is set: Between signal terminal 36 and body ground, and between ground terminal 37 and body ground

Q: Does continuity exist?

YES (Continuity exists between terminal 36 or terminal 37 and body ground) : Go to Step 12.
NO : Go to Step 10.



STEP 10. Measure the resistance at TCL/ASC-ECU connector A-38.

(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

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

(2) Measure the resistance between the relevant signal and ground terminals in the wheel speed sensor circuit.
- DTC C1216 is set: 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 (When resistances between all terminals are within the standard value) : Go to Step 13.
NO (When resistance between terminals 36 and 37 is not within the standard value) : Go to Step 11.

STEP 11. Inspect the wheel speed sensor.

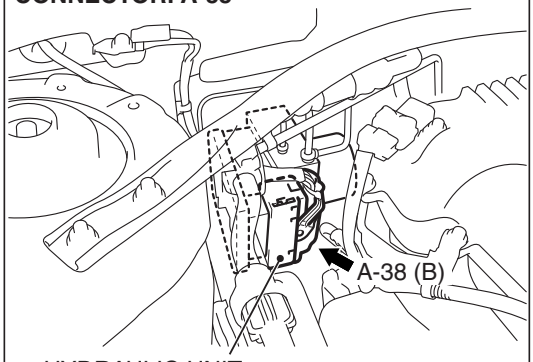
Check the rear left wheel speed sensor relevant to the DTC. For the applicable inspection procedure, refer to P.35C-228.

Q: Is the wheel speed sensor damaged?

YES : Replace the wheel speed sensor (Refer to P.35C-227).
NO : Go to Step 12.

STEP 12. Check TCL/ASC-ECU connector A-38, 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.

CONNECTOR: A-38



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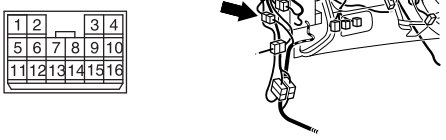
CONNECTOR: C-26



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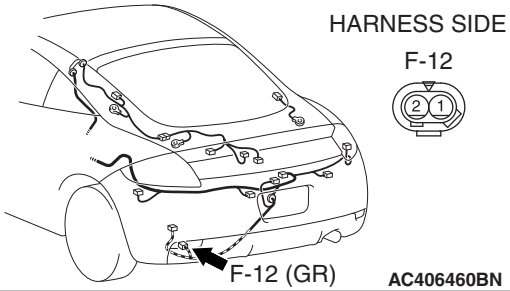
CONNECTOR: F-12 <ECLIPSE>



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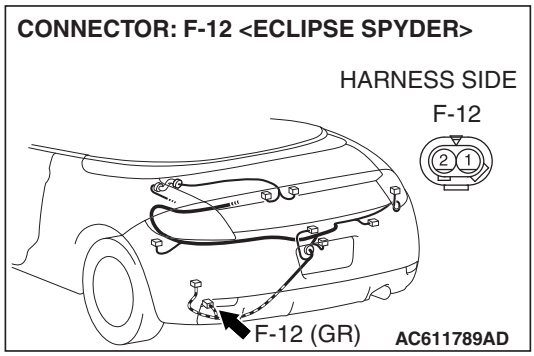
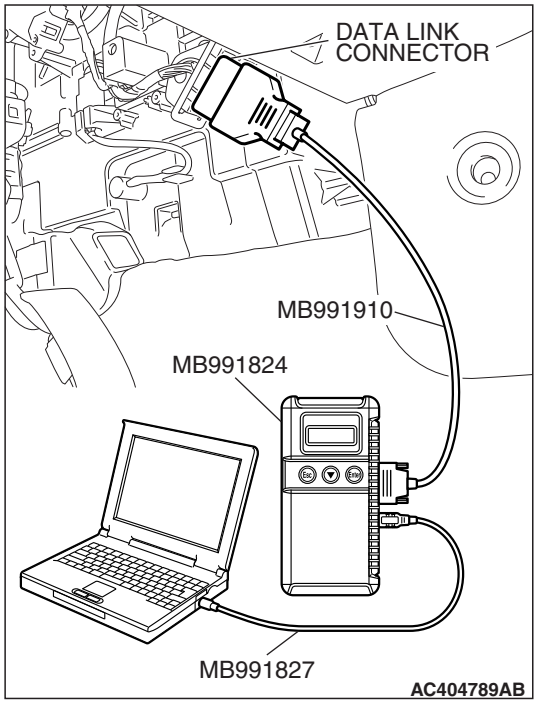


Q: Are TCL/ASC-ECU connector A-38, intermediate connector C-26 and wheel speed sensor <rear: LH> connector F-12 damaged?

YES : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then go to Step 14.

NO : Open or short circuit may be present in the rear left wheel speed sensor circuit. Repair the wiring harness between TCL/ASC-ECU connector A-38 (terminals 36 and 37) and rear left wheel speed sensor F-12 (terminals 1 and 2). Then go to Step 14.

STEP 13. Recheck for diagnostic trouble code.

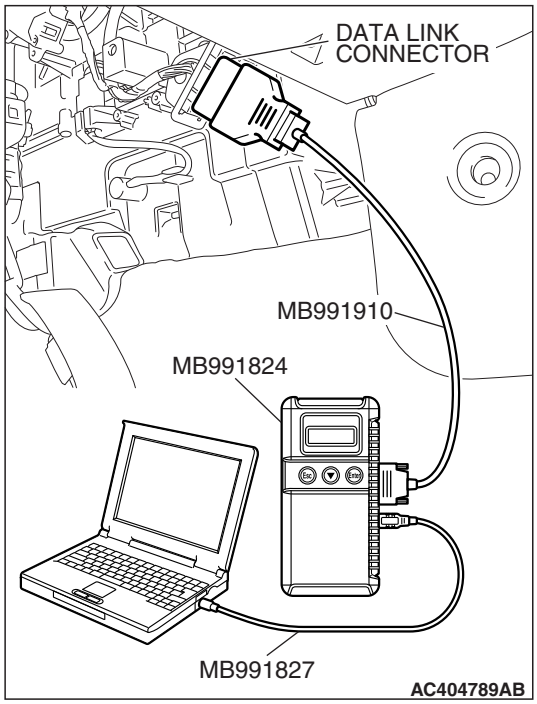


Check again if the DTC is set.
(1) Turn the ignition switch to the "ON" position.
(2) Erase the DTC.
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to the "ON" position.
(5) Drive the vehicle at 9 mph (15 km/h) or more.
(6) Check if the DTC is set.
(7) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1216 set?

YES : Replace the hydraulic unit (integrated with TCL/ASC-ECU). Then go to Step 14.

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 14. Recheck for diagnostic trouble code.

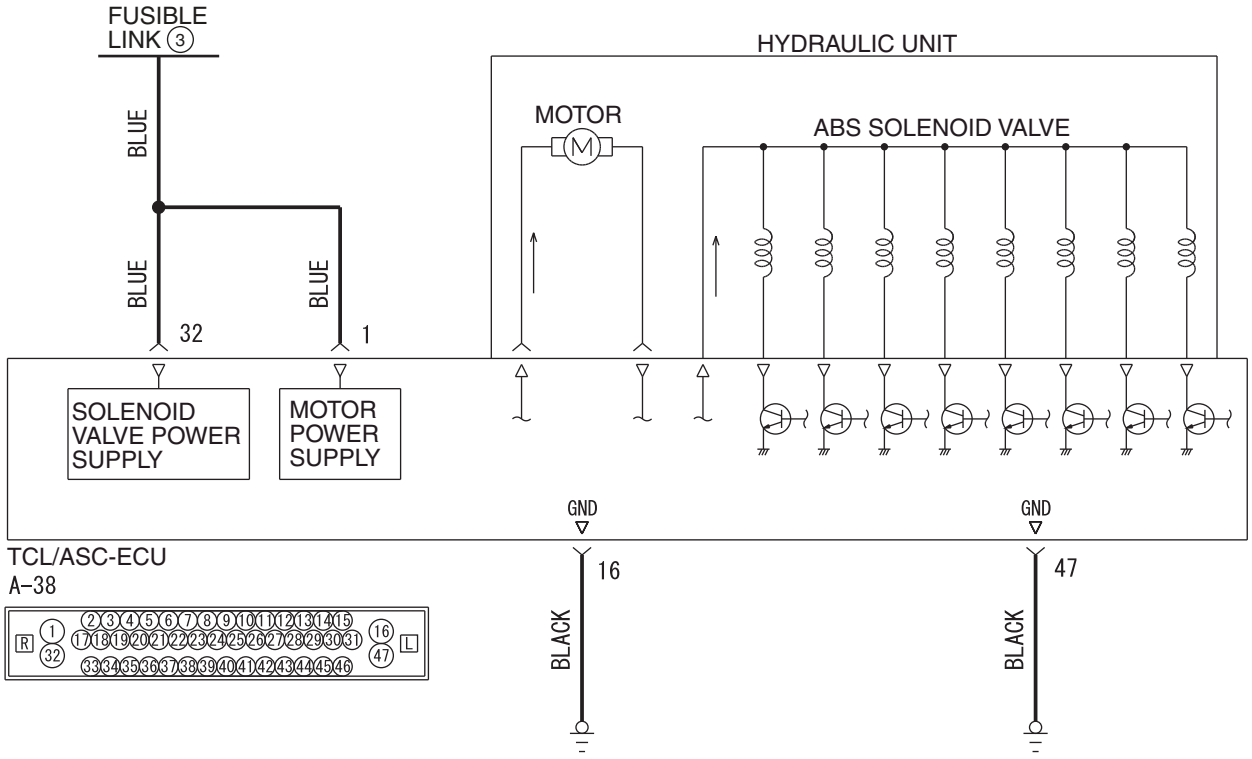
Check again if the DTC is set.
(1) Turn the ignition switch to the "ON" position.
(2) Erase the DTC.
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to the "ON" position.
(5) Drive the vehicle at 9 mph (15 km/h) or more.
(6) Check if the DTC is set.
(7) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1216 set?

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

DTC C1226: FR inlet valve
DTC C1231: FR outlet valve
DTC C1236: FL inlet valve
DTC C1241: FL outlet valve
DTC C1246: RR inlet valve
DTC C1251: RR outlet valve
DTC C1256: RL inlet valve
DTC C1261: RL outlet valve
DTC C1300: FR cut valve
DTC C1305: FR suction valve
DTC C1310: FL cut valve
DTC C1315: FL suction valve

Solenoid Valve and Motor Power Supply Circuit



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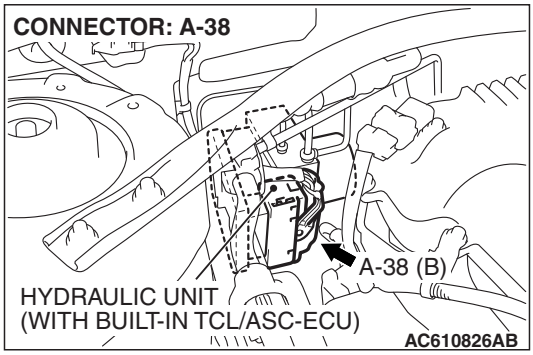


TSB Revision

⚠ 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.

CIRCUIT OPERATION

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

DTC SET CONDITIONS

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

- The solenoid valve is not energized even after the TCL/ASC-ECU has turned on the driving transistor (Open circuit is present in the power supply circuit to the TCL/ASC-ECU solenoid valve, or the valve relay has failed).
- The solenoid valve is not energized even after the TCL/ASC-ECU has turned on the driving transistor (Open circuit is present in the solenoid valve circuit inside the TCL/ASC-ECU, or the valve relay has failed).
- After the TCL/ASC-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

TROUBLESHOOTING HINTS (The most likely causes for these DTCs are to set are:)

Current trouble

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

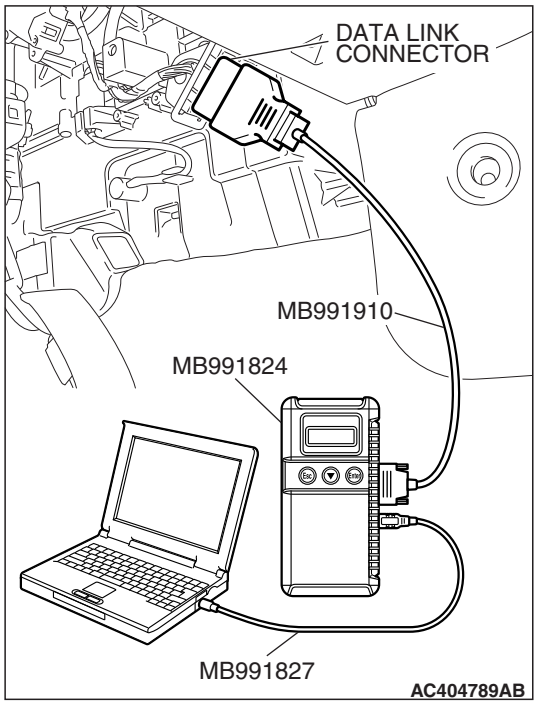
Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness in the power supply circuit (terminal 32) to the TCL/ASC-ECU solenoid valve or ground circuit (terminal 16, 47). For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-16).

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A
- MB991997: ASC Check Harness



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

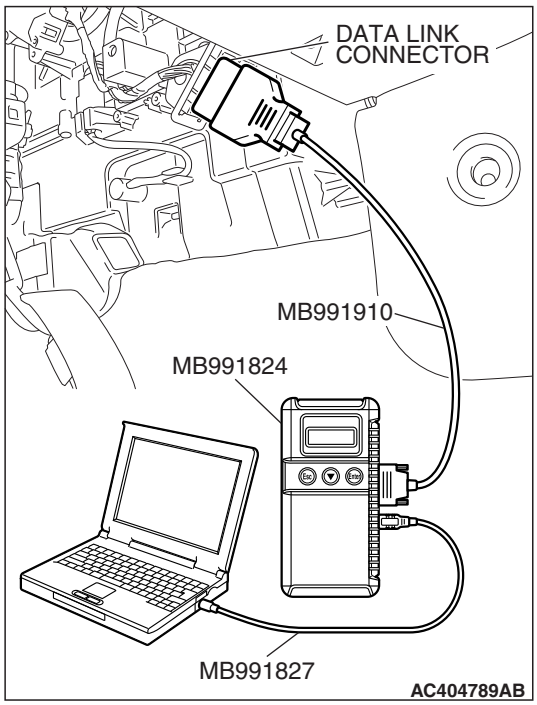
⚠ CAUTION

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-17). Then go to Step 2.



STEP 2. Recheck for diagnostic trouble code.

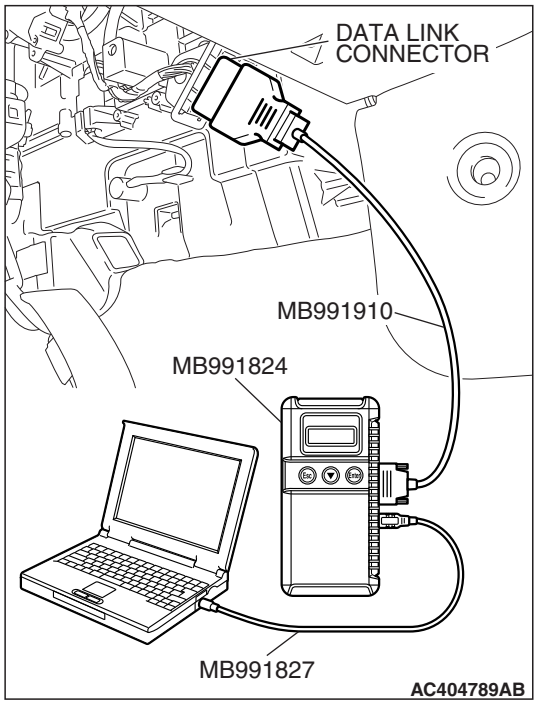
⚠ CAUTION

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.



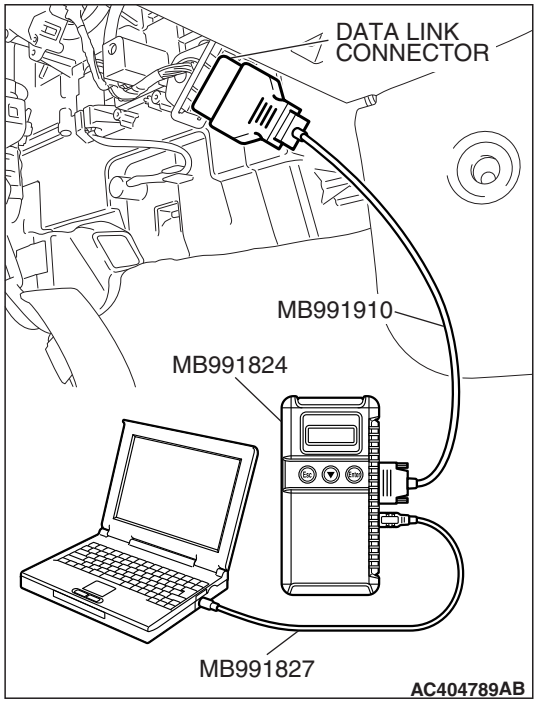
STEP 3. Recheck for diagnostic trouble code.

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 TCL/ASC-ECU). Then go to Step 4.

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



STEP 4. Recheck for diagnostic trouble code.

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.

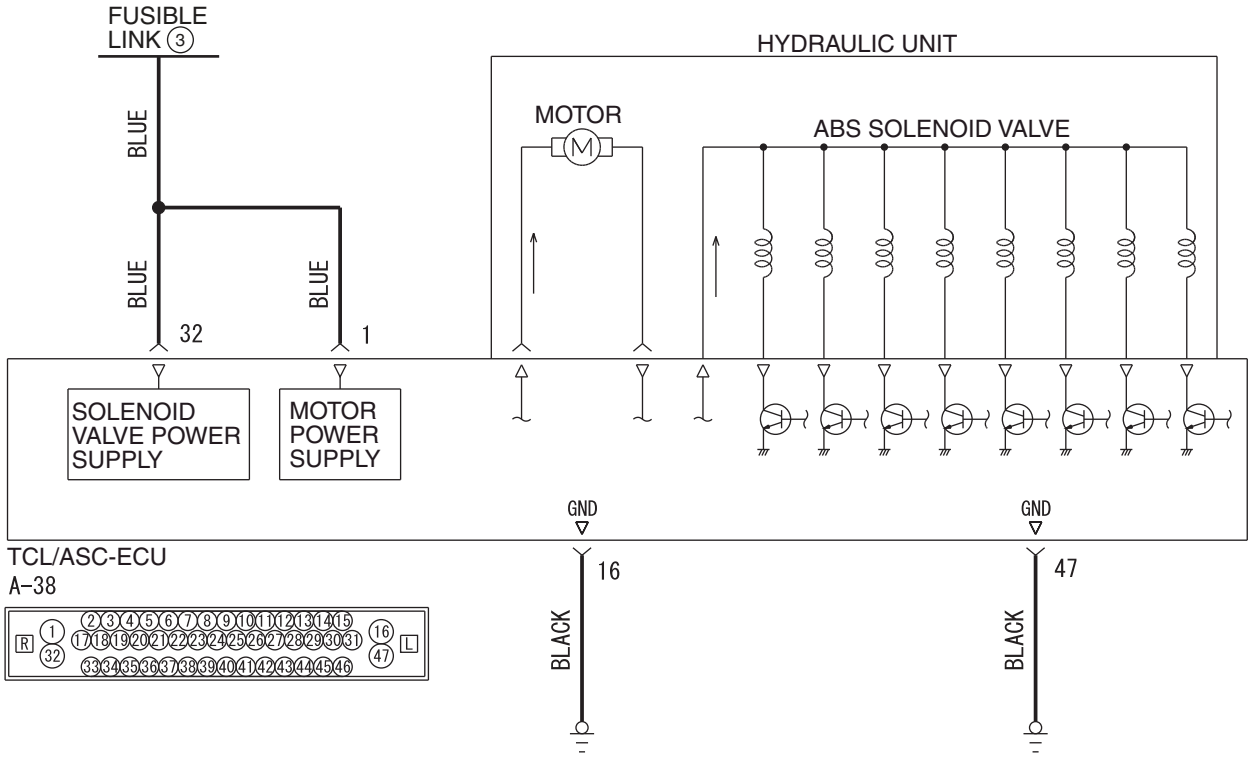
Q: Is C1226, C1231, C1236, C1241, C1246, C1251, C1256, C1261, C1300, C1305, C1310 or C1315 set?

YES : Go to Step 1.

NO : The procedure is complete.

DTC C1271: Motor drive circuit

Solenoid Valve and Motor Power Supply Circuit



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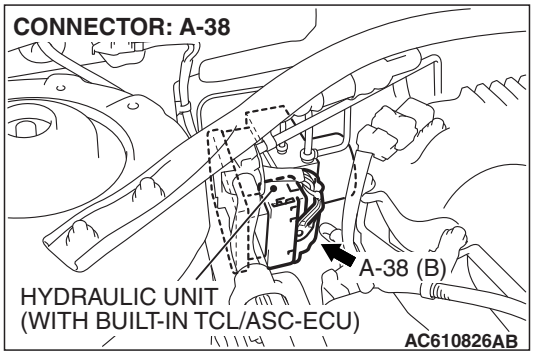


⚠ CAUTION

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.

⚠ CAUTION

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

⚠ CAUTION

When I replace hydraulic unit (integrated with TCL/ASC-ECU), Always perform the calibration of steering wheel sensor and yaw rate sensor.

CIRCUIT OPERATION

- The TCL/ASC-ECU contains the power supply circuit (terminal 1) for the pump motor. The pump motor is energized by the motor relay, which is incorporated in the TCL/ASC-ECU.

TSB Revision

- The motor relay, which is incorporated in the TCL/ASC-ECU, is always off unless the motor solenoid valve check is activated when the vehicle is started.
- The TCL/ASC-ECU activates the pump motor by turning on the ECU built-in motor relay when the TCL/ASC system is working.

TCL/ASC DTC SET CONDITIONS

- When pump motor drive time or a voltage descent of a pump motor switch after drive showed a high value, The TCL/ASC-ECU stop pump motor drive, and this DTC is output.

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

Current trouble

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

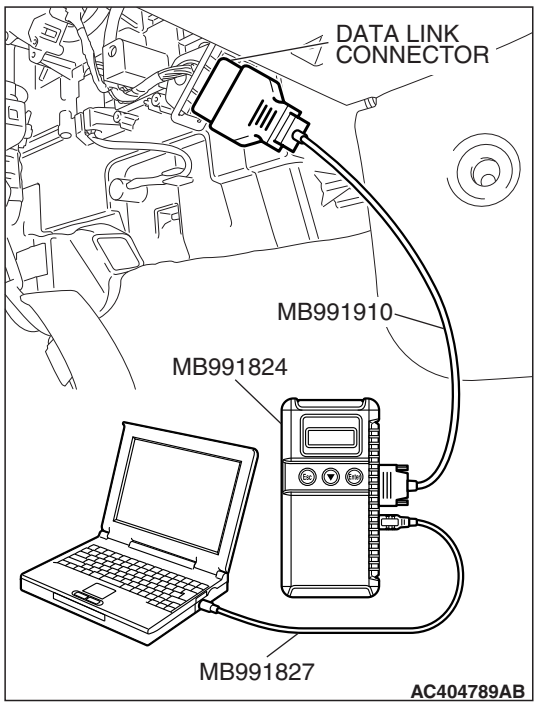
PAST TROUBLE

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness in the power supply circuit (terminal 1) to the TCL/ASC-ECU motor or ground circuit (terminal 16, 47). For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-16).

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A
- MB991997: ASC Check Harness



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

⚠ CAUTION

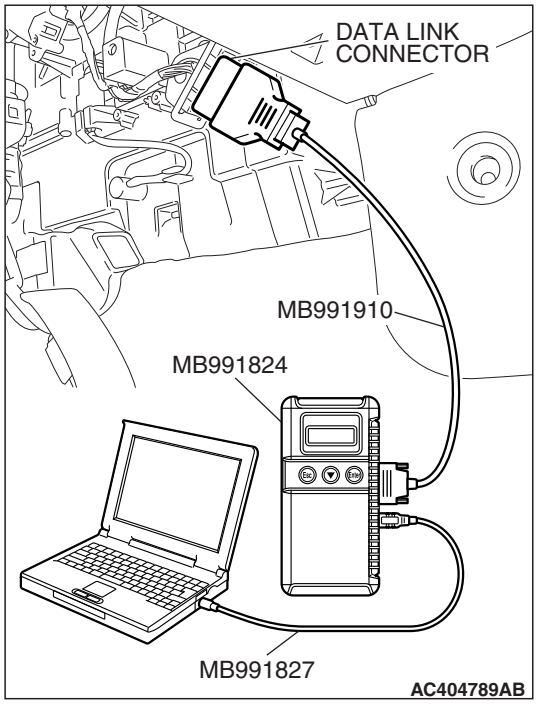
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(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-17). Then go to Step 2.

TSB Revision



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. Battery check

Refer to GROUP 54A – Battery Test P.54A-7.

Q: Is the battery in good condition?

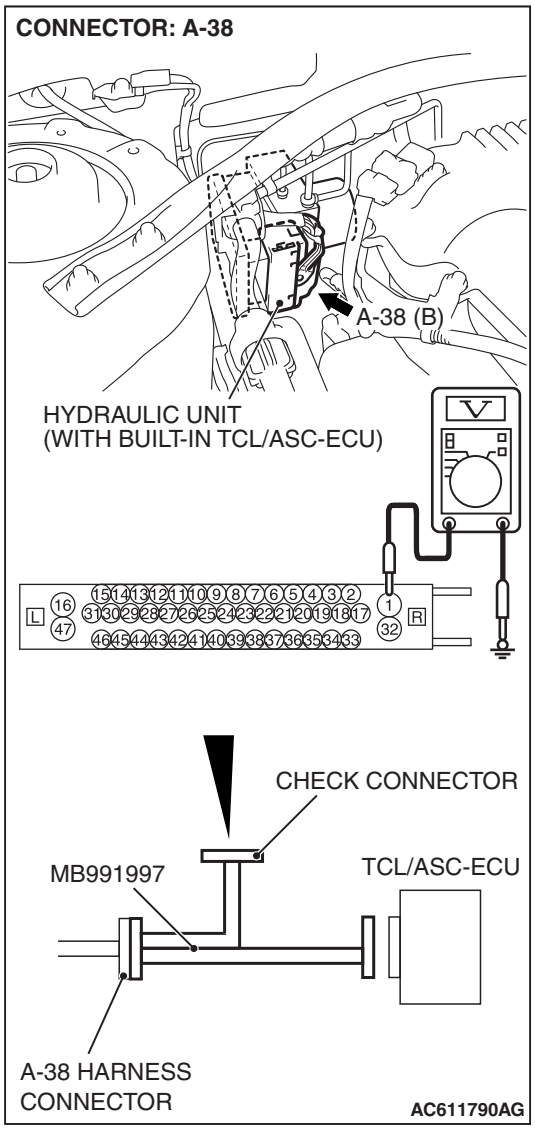
YES : Go to Step 5.
NO : Replace the battery. Then go to Step 4.

STEP 4. Charging system check

Refer to GROUP 16 – Charging System P.16-3.

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 10.



STEP 5. Measure the voltage at TCL/ASC-ECU connector A-38.

(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

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

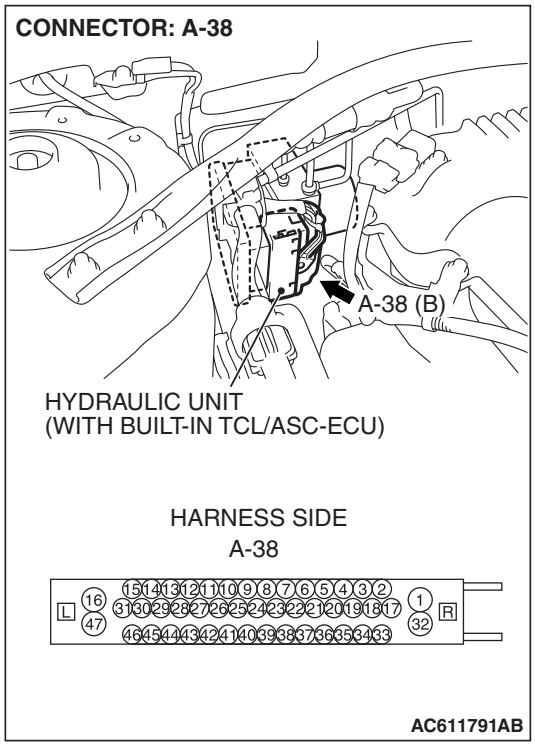
(2) Turn the ignition switch to the "ON" position.

(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 7.

NO : Go to Step 6.

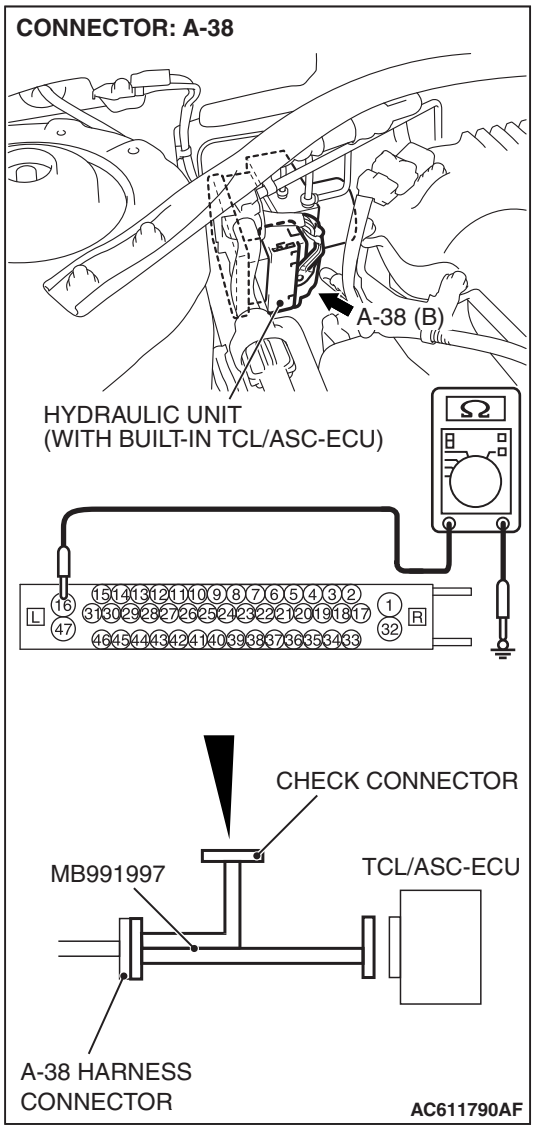


STEP 6. Check TCL/ASC-ECU connector A-38 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is TCL/ASC-ECU connector A-38 damaged?

YES : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then go to Step 10.

NO : An open or short circuit may be present in the solenoid valve power supply circuit. Repair the wiring harness between TCL/ASC-ECU connector A-38 terminal 1 and fusible link No.3. Then go to Step 10.



STEP 7. Measure the resistance at TCL/ASC-ECU connector A-38.

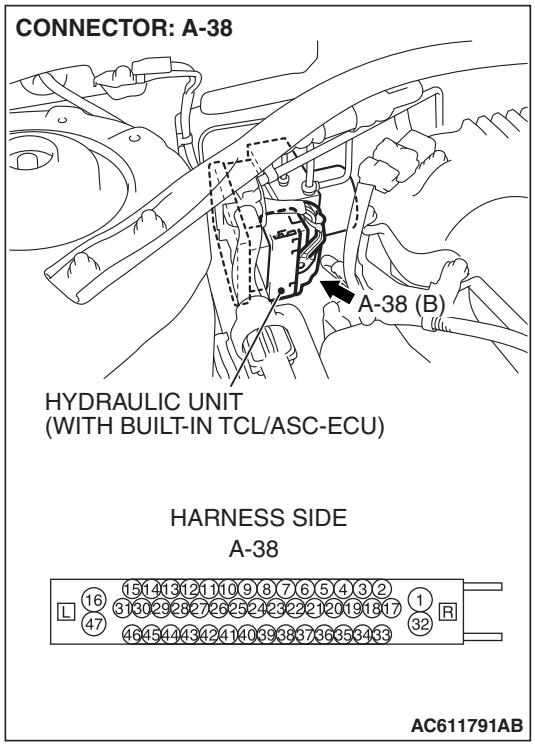
(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

NOTE: Do not connect special tool MB991997 to the TCL/ASC-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 9.
NO : Go to Step 8.

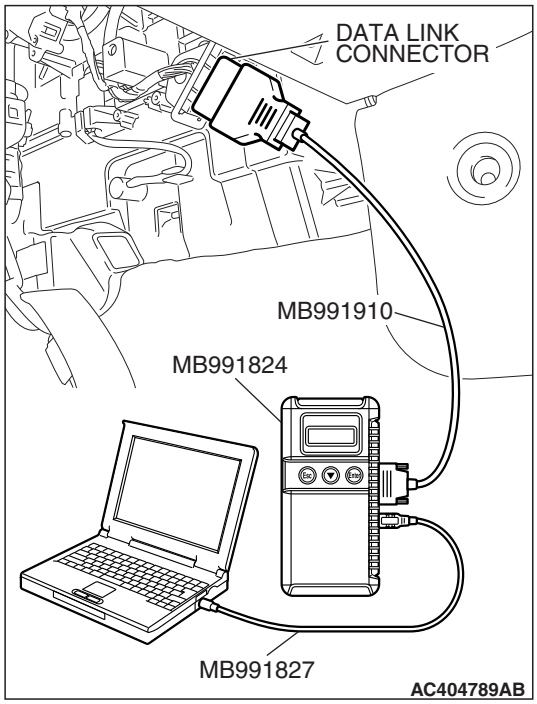


STEP 8. Check TCL/ASC-ECU connector A-38 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is TCL/ASC-ECU connector A-38 damaged?

YES : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then go to Step 10.

NO : An open circuit may be present in the ground circuit. Repair the wiring harness between TCL/ASC-ECU connector A-38 terminal 16, 47 and the body ground. Then go to Step 10 .



STEP 9. Recheck for diagnostic trouble code.

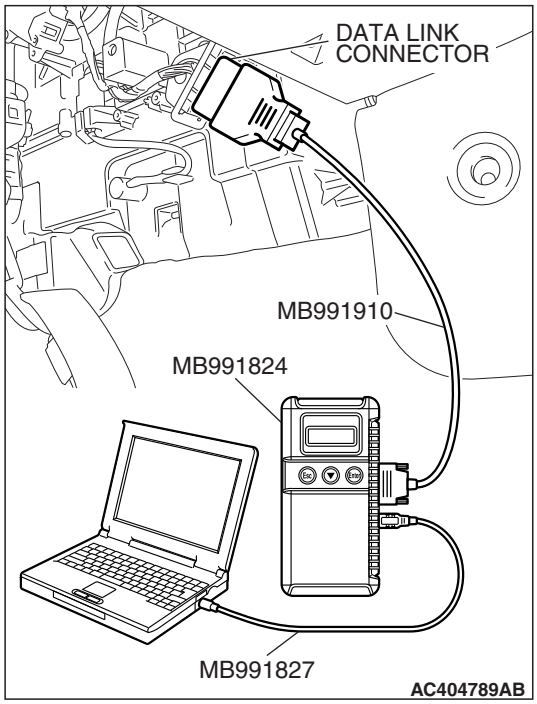
Check again if the DTC is set.

(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 TCL/ASC-ECU). Then go to Step 10.

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.

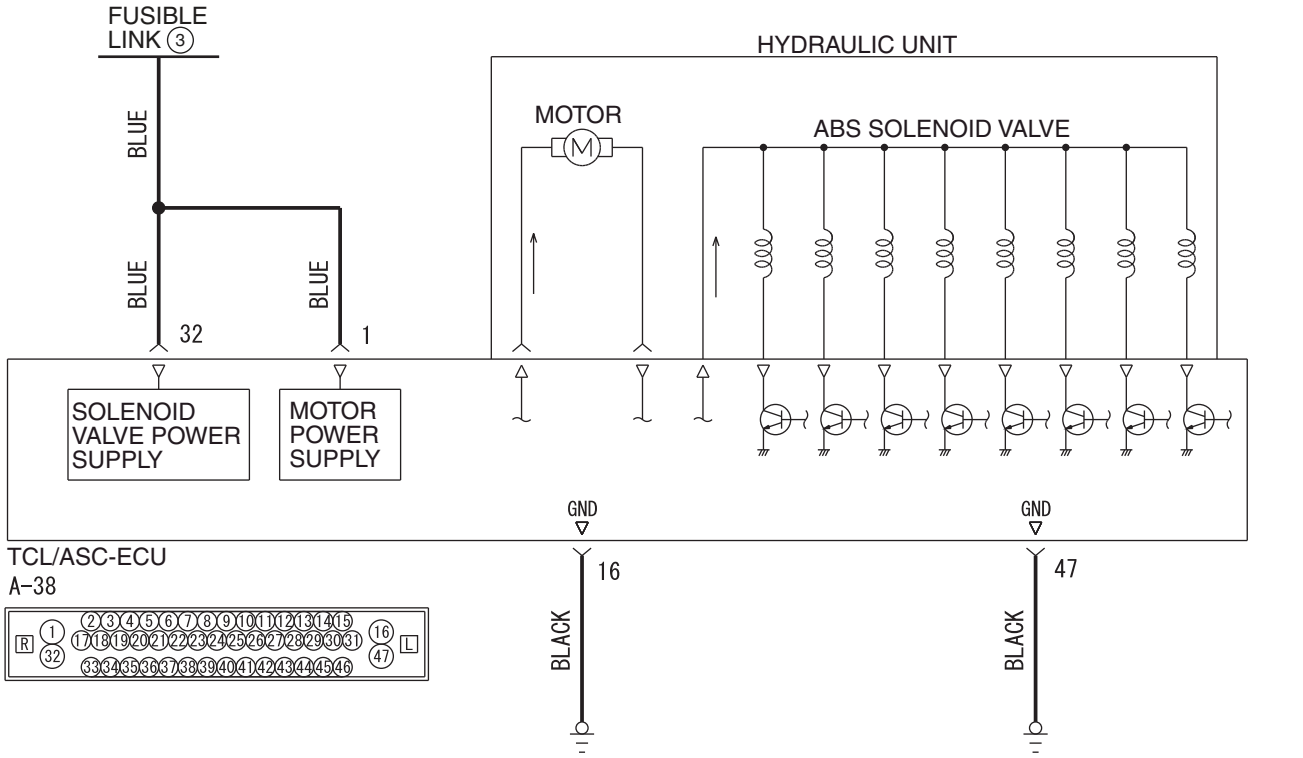
Check again if the DTC is set.
(1) Turn the ignition switch to the "ON" position.
(2) Erase the DTC.
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to the "ON" position.
(5) Check if the DTC is set.
(6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1271 set ?

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

DTC C1276: Valve Power Supply Circuit

Solenoid Valve and Motor Power Supply Circuit



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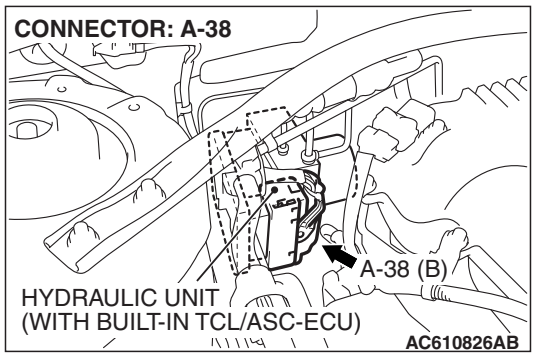


⚠ CAUTION

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.

⚠ CAUTION

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

⚠ CAUTION

When I replace hydraulic unit (integrated with TCL/ASC-ECU), Always perform the calibration of steering wheel sensor and yaw rate sensor.

CIRCUIT OPERATION

- The TCL/ASC-ECU contains the power supply circuit (terminal 32) for the solenoid valve. The solenoid valve is energized by the valve relay, which is incorporated in the TCL/ASC-ECU.

TSB Revision

- The valve relay, which is incorporated in the TCL/ASC-ECU, is always energizing the solenoid valve unless the initial check is in progress when the ignition switch is turned on.

TCL/ASC DTC SET CONDITIONS

- When the solenoid valve power supply voltage is off the normal range, this DTC is output.

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

Current trouble

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

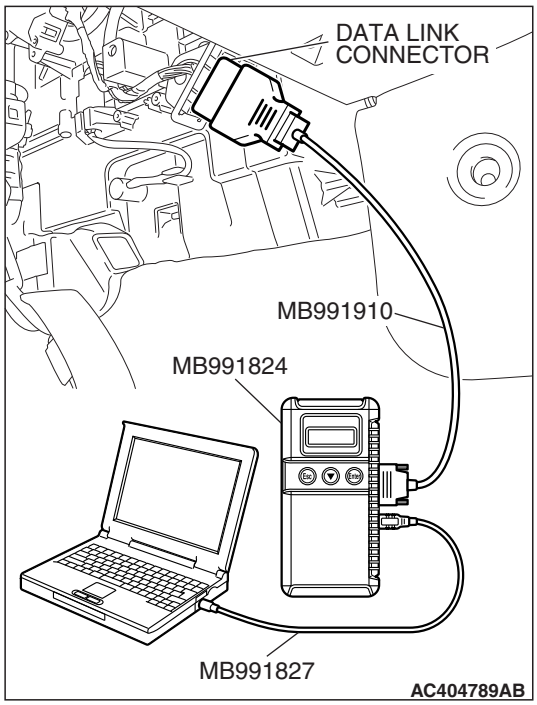
PAST TROUBLE

Carry out diagnosis with particular emphasis on connector(s) or wiring harness in the power supply circuit (terminal 32) to the TCL/ASC-ECU solenoid valve or ground circuit (terminal 16, 47). For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-16).

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A
- MB991997: ASC Check Harness



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

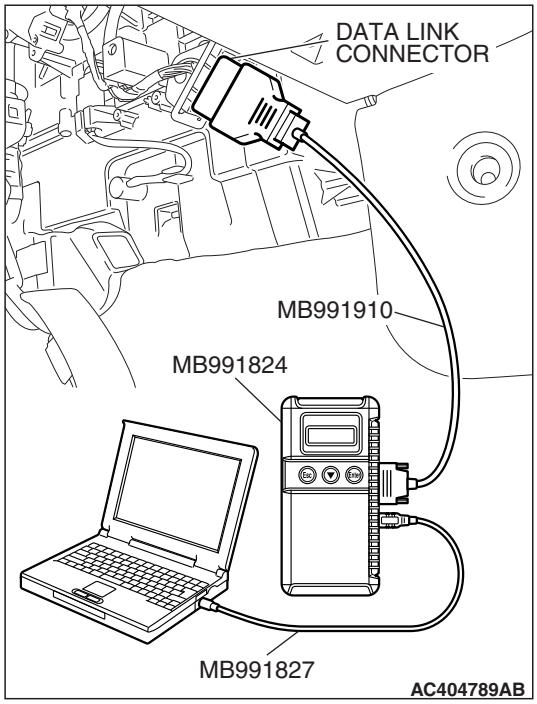
⚠ CAUTION

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 2.
NO : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis P.54C-17). 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 : Go to Step 3.
NO : The procedure is complete.

STEP 3. Battery check

Refer to GROUP 54A – Battery Test P.54A-7.

Q: Is the battery in good condition?

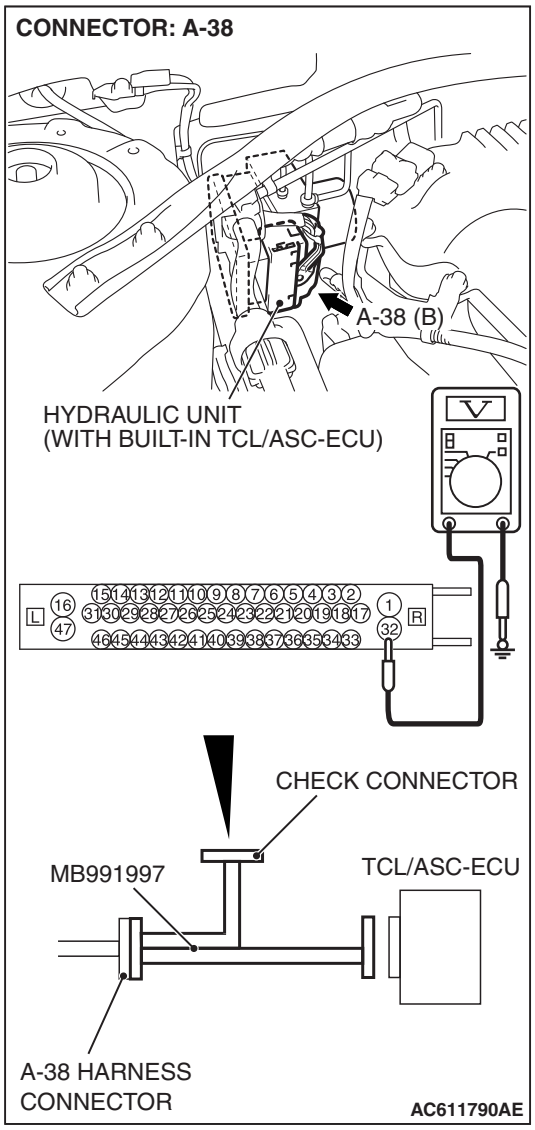
YES : Go to Step 5.
NO : Replace the battery. Then go to Step 4.

STEP 4. Charging system check

Refer to GROUP 16 – Charging System P.16-3.

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 10.



STEP 5. Measure the voltage at TCL/ASC-ECU connector A-38.

(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

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

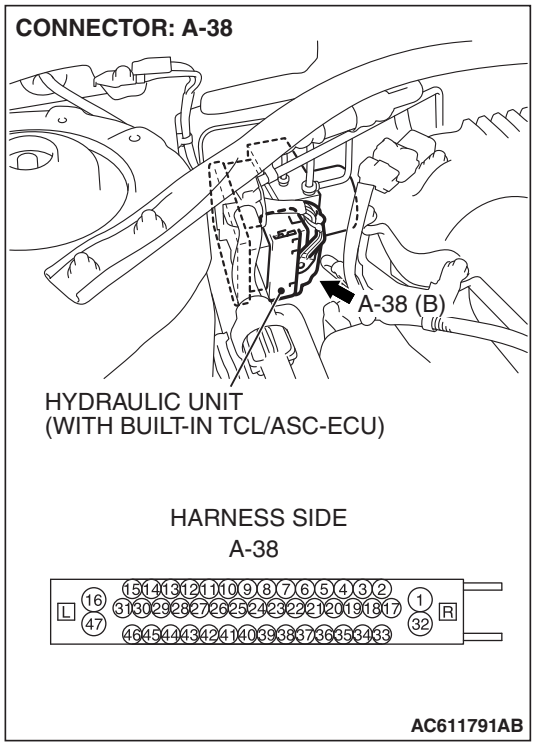
(2) Turn the ignition switch to the "ON" position.

(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 7.

NO : Go to Step 6.

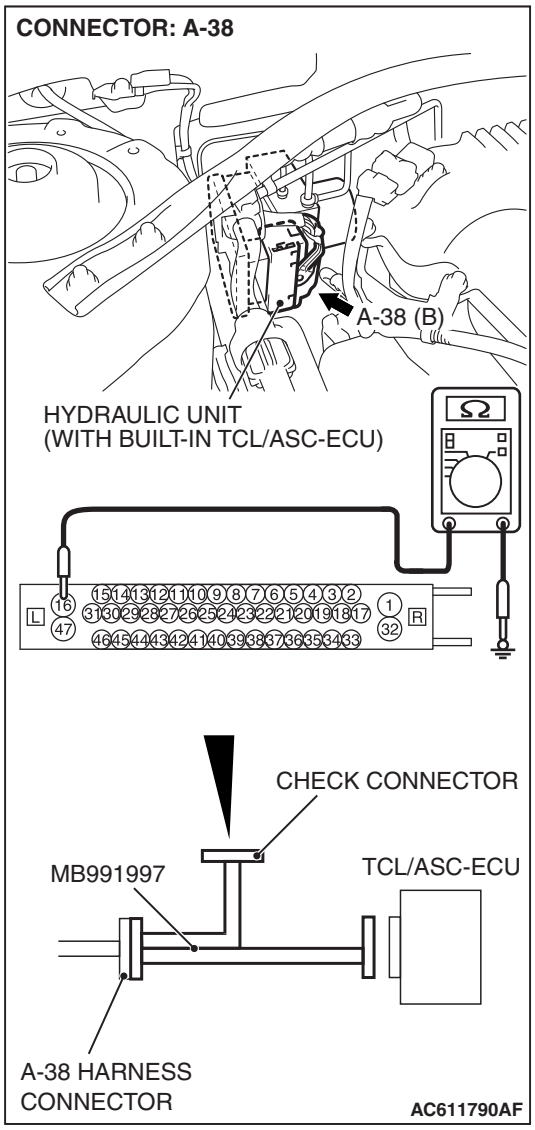


STEP 6. Check TCL/ASC-ECU connector A-38 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is TCL/ASC-ECU connector A-38 damaged?

YES : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then go to Step 10.

NO : An open or short circuit may be present in the solenoid valve power supply circuit. Repair the wiring harness between TCL/ASC-ECU connector A-38 terminal 32 and fusible link No.3. Then go to Step 10.



STEP 7. Measure the resistance at TCL/ASC-ECU connector A-38.

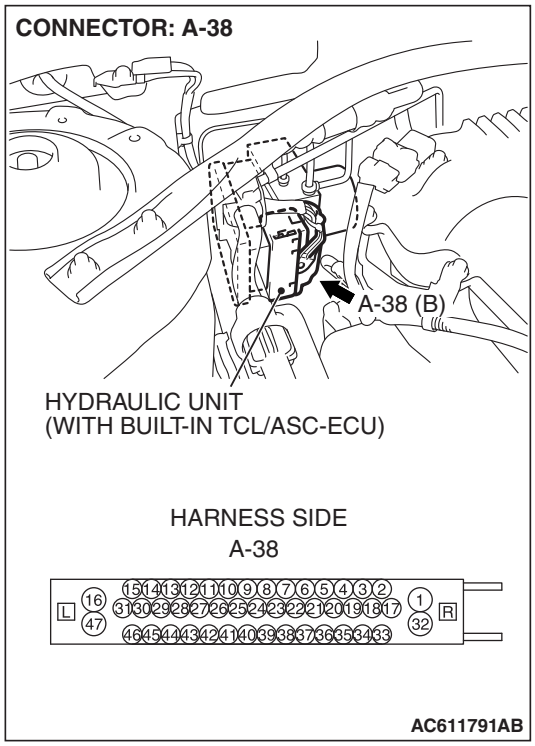
(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

NOTE: Do not connect special tool MB991997 to the TCL/ASC-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 9.
NO : Go to Step 8.

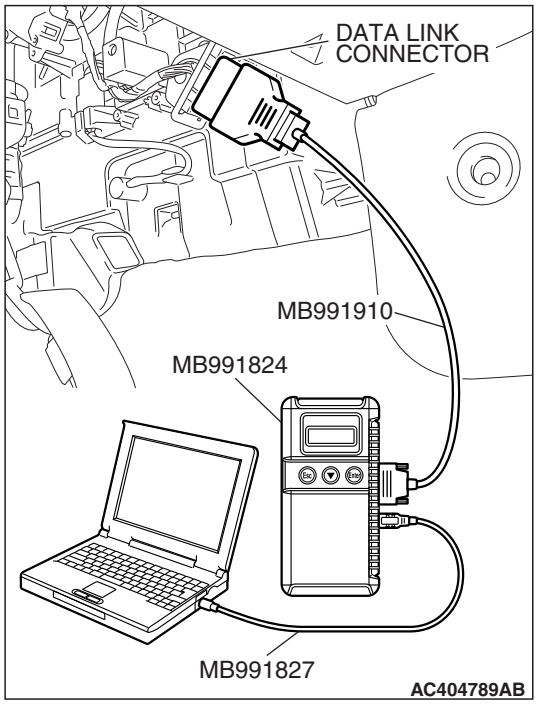


STEP 8. Check TCL/ASC-ECU connector A-38 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is TCL/ASC-ECU connector A-38 damaged?

YES : Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then go to Step 10.

NO : An open circuit may be present in the ground circuit. Repair the wiring harness between TCL/ASC-ECU connector A-38 terminal 16, 47 and the body ground. Then go to Step 10 .



STEP 9. Recheck for diagnostic trouble code.

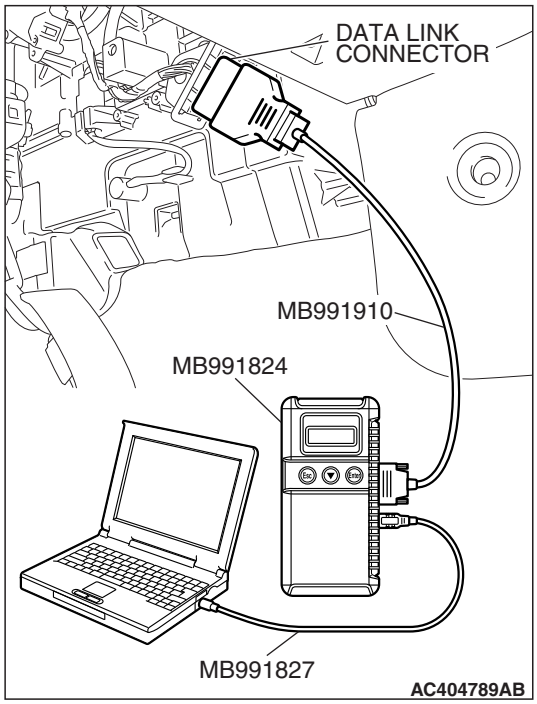
Check again if the DTC is set.

(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 C1276 set?

YES : Replace the hydraulic unit (integrated with TCL/ASC-ECU). Then go to Step 10.

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.

Check again if the DTC is set.

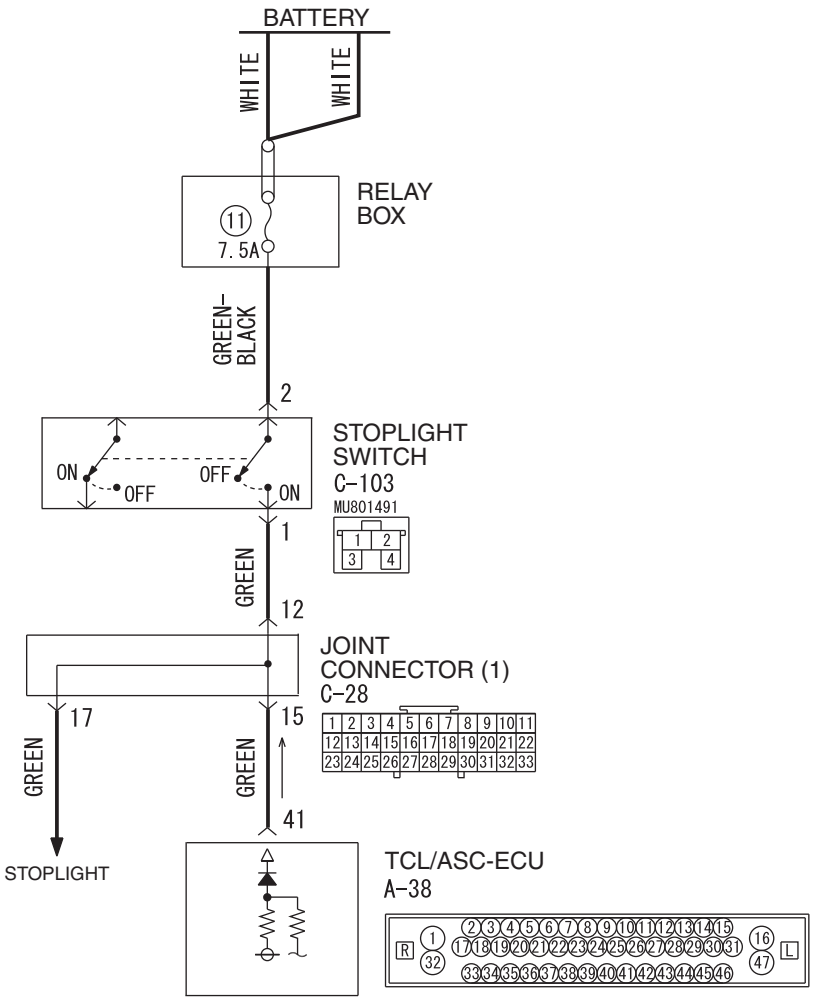
(1) Turn the ignition switch to the "ON" position.
(2) Erase the DTC.
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to the "ON" position.
(5) Check if the DTC is set.
(6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1276 set?

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

DTC C1340: Stoplight switch

Stoplight Switch Circuit



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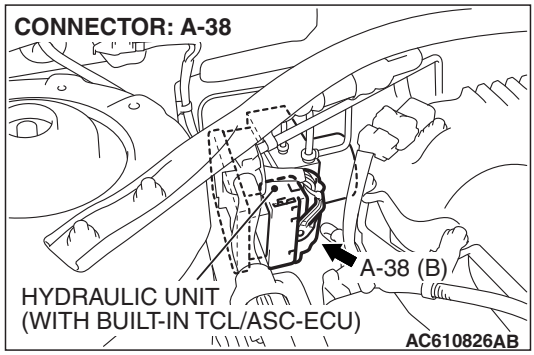

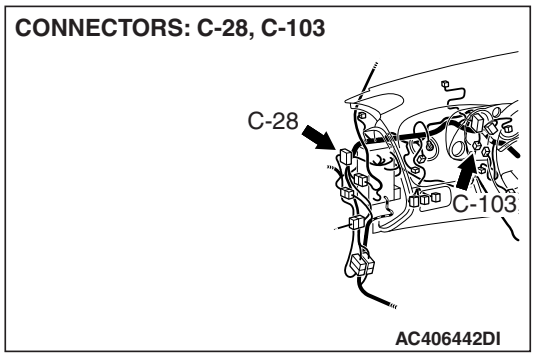

⚠ CAUTION

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.

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CIRCUIT OPERATION

- The "ON" signal when the brake pedal is pressed or the "OFF" signal when the brake pedal is released is input to the TCL/ASC-ECU (terminal 41).

DTC SET CONDITIONS

Diagnosis code No.1340 is set in the following cases:

- Stoplight switch is not operating properly and remains ON state and vehicle speed exceeds 12mph (20km/h) for more than 6 minutes.
- Stoplight switch system harness is damaged and no signal is input to TCL/ASC-ECU.

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

Current trouble

- Malfunction of the stoplight switch
- Incorrect positioning of stoplight switch
- Damaged wiring harness or connector
- Malfunction of the hydraulic unit (integrated with TCL/ASC-ECU)

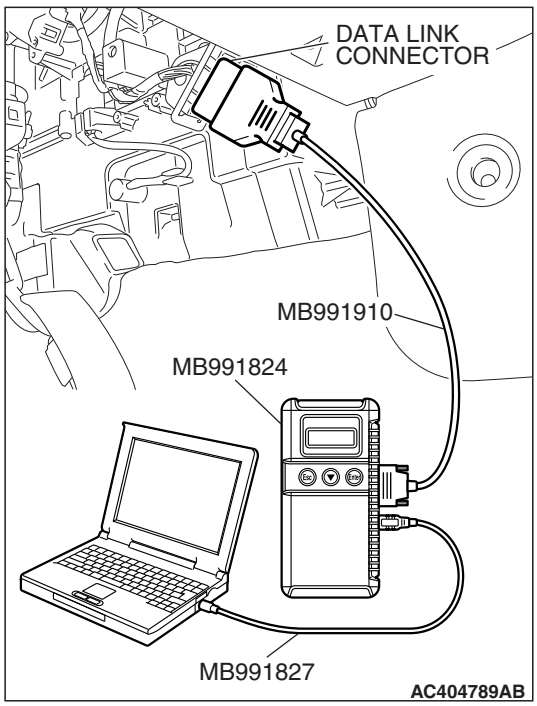
PAST TROUBLE

Carry out diagnosis with particular emphasis on connector(s) or wiring harness between the TCL/ASC-ECU and the stoplight switch. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-16).

DIAGNOSIS

Required Special Tools:

- MB991958 Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827 M.U.T.-III USB Cable
  - MB991910 M.U.T.-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-17). Then go to Step 2.

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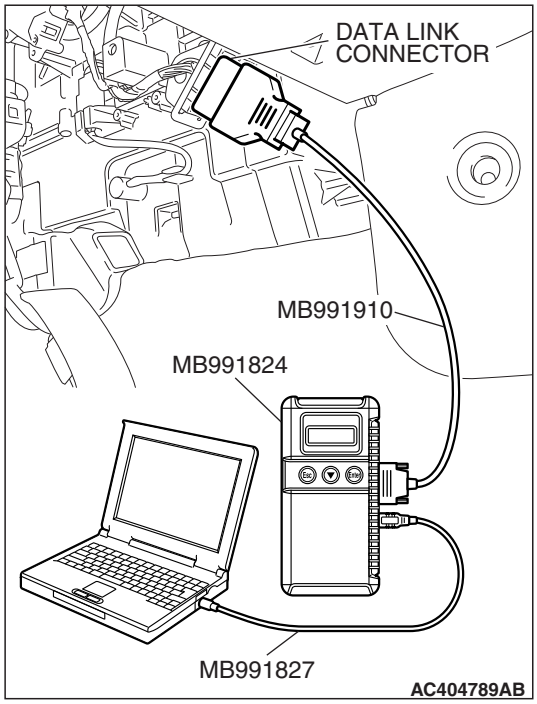


STEP 2. Recheck for diagnostic trouble code.

⚠ 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 C1340 set?

YES : Go to Step 3.
NO : The procedure is complete.

STEP 3. Check the stoplight operation.

(1) Turn the ignition switch to the "ON" position.
(2) Check the operation of the stoplight when the brake pedal is operated.

OK:
Brake pedal depressed: ON
Brake pedal released: OFF

Q: Is the check result normal?

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

STEP 4. Connector check: A-38 TCL/ASC-ECU connector, C-28 joint connector (1).

Q: Is the check result normal?

YES : Go to Step 5.
NO : Repair or replace the damaged component(s). Then go to Step 16.

STEP 5. Measure the resistance at the C-28 joint connector (1).

(1) Disconnect the connector C-28 joint connector (1) and A-38 TCL/ASC-ECU connector, and measure the wiring harness-side connector.
(2) Measure the resistance between the C-28 joint connector (1) terminal 15 and A-38 TCL/ASC-ECU connector terminal 41.

OK: Continuity exists (2 ohms or less)

Q: Is the check result normal?

YES : Go to Step 15.
NO : Repair the harness wire. Then go to Step 16.

STEP 6. Connector check: A-38 TCL/ASC-ECU connector, C-28 joint connector (1), C-103 stoplight switch connector, C-26 intermediate connector, F-02 intermediate connector (ECLIPSE), F-05 (standard type rear spoiler) or F-30 (large type rear spoiler) high-mounted stoplight, F-07 rear combination light (RH), F-14 rear combination light (LH)

Q: Is the check result normal?

YES : Go to Step 7.
NO : Repair or replace the damaged component(s). Then go to Step 16.

STEP 7. Check for stoplight switch installation

Refer to GROUP 35A – On-vehicle Service P.35A-13.

Q: Is the check result normal?

YES : Go to Step 8.
NO : Install the stoplight switch correctly (Refer to GROUP 35A – On-vehicle Service P.35A-13). Then go to Step 16.

STEP 8. Check for stoplight switch

Refer to GROUP 35A – Brake Pedal Inspection P.35A-25.

Q: Is the check result normal?

YES : Go to Step 9.
NO : Replace the stoplight switch (Refer to GROUP 35A – Brake Pedal P.35A-24). Then go to Step 16.

STEP 9. Check the fuse No. 11.

Visually check for melted fuse.

Q: Is the check result normal?

YES : Go to Step 13.
NO : Go to Step 10.

STEP 10. Measure the resistance at the C-103 stoplight switch connector.

(1) Disconnect the connector C-103, and measure at the wiring harness-side connector.
(2) Remove fuse No. 11.
(3) Measure the resistance between the C-103 stoplight switch connector terminal 2 and body ground.

OK: No continuity

Q: Is the check result normal?

YES : Go to Step 11.

NO : The wiring harness between fuse No. 11 and C-103 stoplight switch connector terminal 2 is shorted to ground. Repair the wiring harness. Then, replace fuse No. 11.Then go to Step 16 .

STEP 11. Measure the resistance at the C-103 stoplight switch connector.

(1) Disconnect the connector C-103, and measure at the wiring harness-side connector.
(2) Disconnect the connector C-28 joint connector (1).
(3) Measure the resistance between the C-103 stoplight switch connector terminal 1 and body ground.

OK: No continuity

Q: Is the check result normal?

YES : Go to Step 12.

NO : The wiring harness between C-28 joint connector (1) terminal 12 and C-103 stoplight switch connector terminal 1 is shorted to ground. Repair the wiring harness. Then, replace fuse No. 11.Then go to Step 16.

STEP 12. Measure the resistance at the C-28 joint connector (1).

(1) Disconnect the connector C-28, and measure at the wiring harness-side connector.
(2) Disconnect the connector A-38 TCL/ASC-ECU connector.
(3) Measure the resistance between the C-28 joint connector (1) terminal 15 and body ground.

OK: No continuity

Q: Is the check result normal?

YES : The wiring harness between C-28 joint connector (1) terminal 17 and F-05 (standard type rear spoiler) or F-30 (large type rear spoiler) high-mounted stoplight connector terminal 2 or the wiring harness F-07 rear combinatonlight (RH) connector terminal 2 and F-11 rear combination light (LH) connector terminal 2 is shorted to ground. Repair the wiring harness. Then, replace fuse No. 11.Then go to Step 15.

NO : The wiring harness between C-28 joint connector (1) terminal 15 and A-38 TCL/ASC-ECU connector terminal 41 is shorted to ground. Repair the wiring harness. Then, replace fuse No. 11.Then go to Step 16.

STEP 13. Measure the resistance at the C-103 stoplight switch connector.

(1) Disconnect the connector C-103, and measure at the wiring harness-side connector.
(2) Remove fuse No. 11.
(3) Measure the resistance between the C-103 stoplight switch connector terminal 2 and Fuse No.11.

OK: Continuity exists (2 ohms or less)

Q: Is the check result normal?

YES : Go to Step 14.

NO : An open circuit is present in the wiring harness between fuse No. 11 and C-103 stoplight switch connector terminal 2. Repair the wiring harness.Then go to Step 16.

STEP 14. Measure the resistance at the C-103 stoplight switch connector.

(1) Disconnect the connector C-103, and measure at the wiring harness-side connector.
(2) Disconnect the connector C-28 joint connector (1).
(3) Measure the resistance between the C-103 stoplight switch connector terminal 1 and C-28 joint connector (1) terminal 12.

OK: Continuity exists (2 ohms or less)

Q: Is the check result normal?

YES : Go to Step 15.

NO : An open circuit is present in the wiring harness between C-28 joint connector (1) terminal 12 and C-103 stoplight switch connector terminal 1. Repair the wiring harness.Then go to Step 16.

STEP 15. Recheck for diagnostic trouble code.

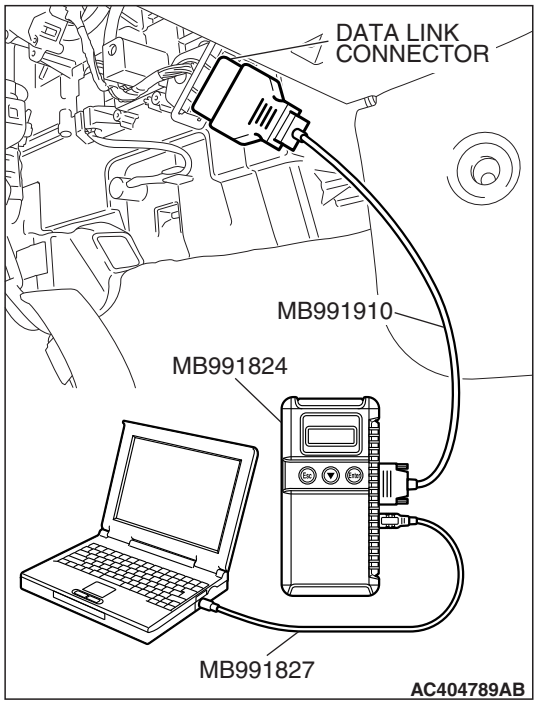
Check again if the DTC is set.

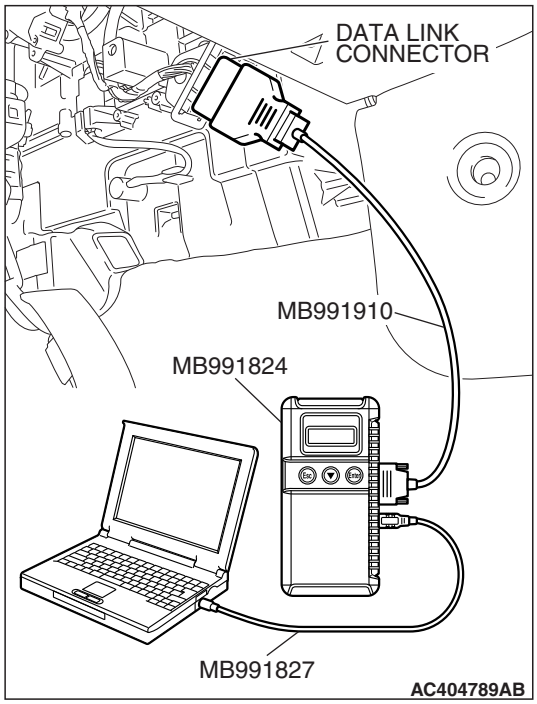
(1) Turn the ignition switch to the "ON" position.
(2) Erase the DTC.
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to the "ON" position.
(5) Check if the DTC is set.
(6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1340 set?

YES : Replace the hydraulic unit (integrated with TCL/ASC-ECU). Then go to Step 16.

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 16. Recheck for diagnostic trouble code.

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) Drive the vehicle at 12 mph (20km/h) or more for 6 minutes or more. (there is no need to drive continuously).
(6) Stop the vehicle with braking at 25 mph (40km/h) or more.
(7) Check if the DTC is set.
(8) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1340 set?

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

DTC C1361: M/C pressure SNSR. stuck/low gain
DTC C1364: M/C pressure SNSR. malfunction

⚠ 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.

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

CIRCUIT OPERATION

The master cylinder pressure sensor is incorporated in the hydraulic unit. When the brake pedal is depressed, the sensor detects the fluid pressure in the master cylinder, and converts it to voltage signal.

TCL/ASC DTC SET CONDITIONS

This DTC is set if the master cylinder pressure sensor is defective.

TROUBLESHOOTING HINTS (The most likely causes for these DTCs are to set are:)

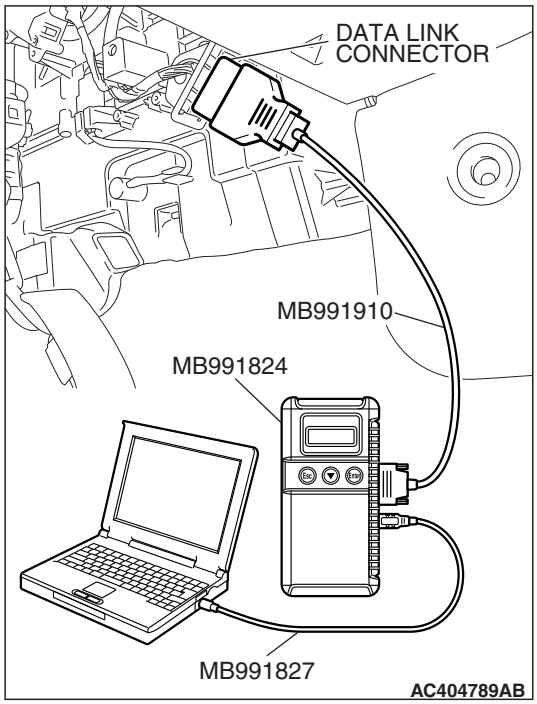
- The CAN bus line is defective.
- Malfunction of the hydraulic unit (integrated with TCL/ASC-ECU)

DIAGNOSIS

Required Special Tools:

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

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



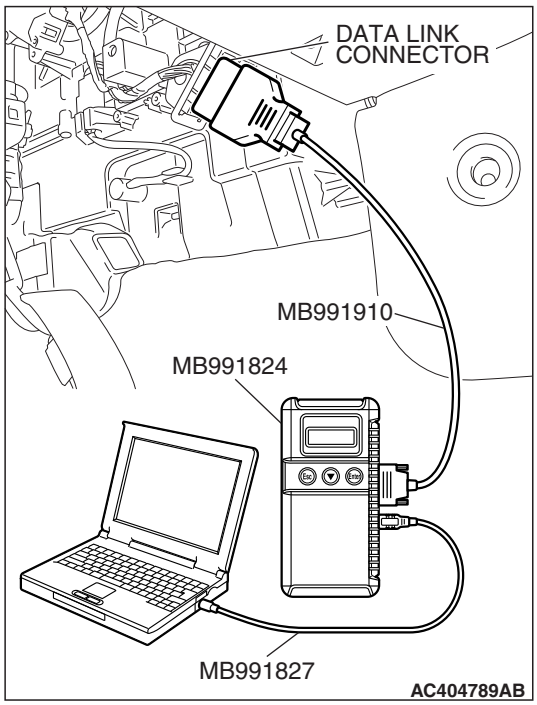
⚠ CAUTION
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(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-17). 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.

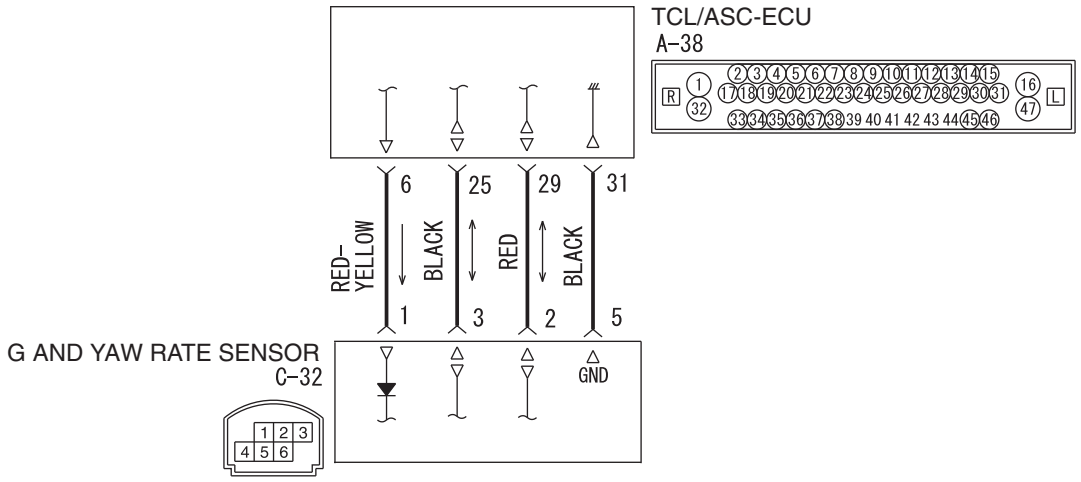
(1) Turn the ignition switch to the "ON" position.
(2) Erase the DTC.
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to the "ON" position.
(5) Check if the DTC is set.
(6) Turn the ignition switch to the "LOCK" (OFF) position.

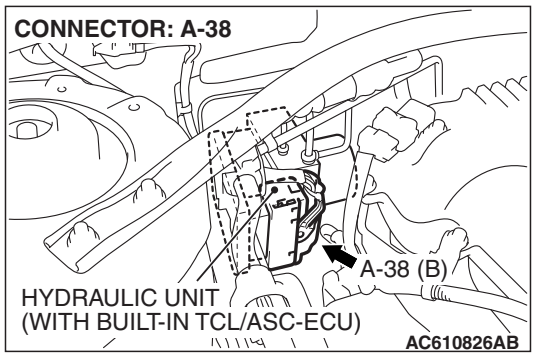
Q: Is DTC C1361 or C1364 set ?

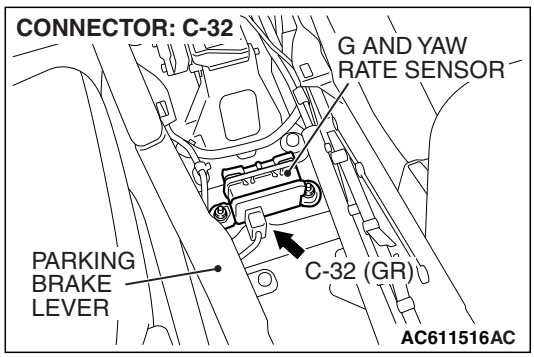
YES : Replace the hydraulic unit (integrated with TCL/ASC-ECU).
NO : The procedure is complete.

DTC C1366: Lateral G SNSR. stuck/low gain
DTC C1371: Yaw rate SNSR. stuck/low gain
DTC C1377: Communication error G and yaw rate SNSR.
DTC C1864: G and yaw rate SNSR. power supply voltage

G and Yaw Rate Sensor Circuit







⚠ 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.

CIRCUIT OPERATION

- The G and yaw rate sensor is power-supplied from TCL/ASC-ECU, and communicates with TCL/ASC-ECU via the special CAN bus lines.

TCL/ASC DTC SET CONDITIONS

These codes are set at the following cases:

DTC C1366: Lateral G SNSR. stuck/low gain (seizure or abnormal output signal)

- Lateral acceleration value from the sensor is abnormal, or the value does not fluctuate during driving.

DTC C1371: Yaw rate SNSR. stuck/low gain (seizure, abnormal output signal or oscillation)

- Yaw rate value from the sensor is abnormal, or the value does not fluctuate during driving.

DTC C1377: Communication error G and yaw rate SNSR. (seizure or abnormal output signal)

- When communication error of the G and yaw rate sensor occurs

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DTC C1864: G and yaw rate SNSR. power supply voltage (abnormal output or poor performance)

- When the G and yaw rate sensor power supply voltage is abnormal

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

Current trouble

- Malfunction of the G and yaw late sensor
- Damaged wiring harness or connector
- Malfunction of the hydraulic unit (integrated with TCL/ASC-ECU)

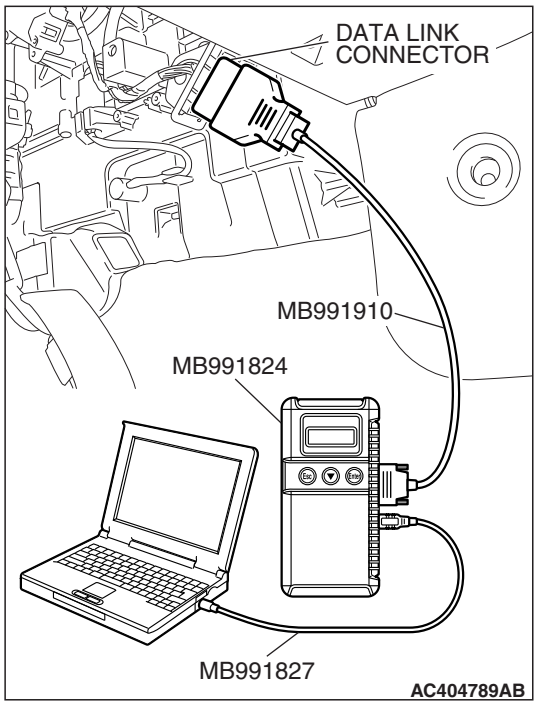
PAST TROUBLE

Carry out diagnosis with particular emphasis on connector(s) or wiring harness between the TCL/ASC-ECU and the G and yaw late sensor. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-16).

DIAGNOSIS

Required Special Tools:

- MB991958 Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827 M.U.T.-III USB Cable
  - MB991910 M.U.T.-III Main Harness A
- MB991997: ASC Check Harness



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

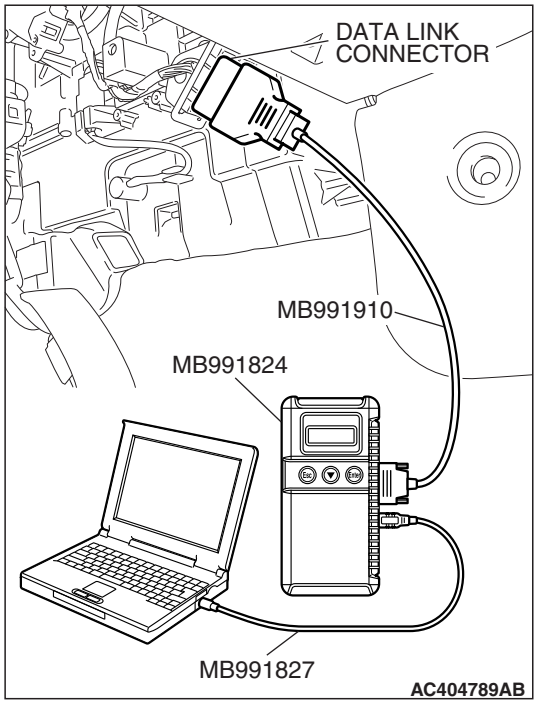
⚠ CAUTION

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-17). Then go to Step 2.



STEP 2. Recheck for diagnostic trouble code.

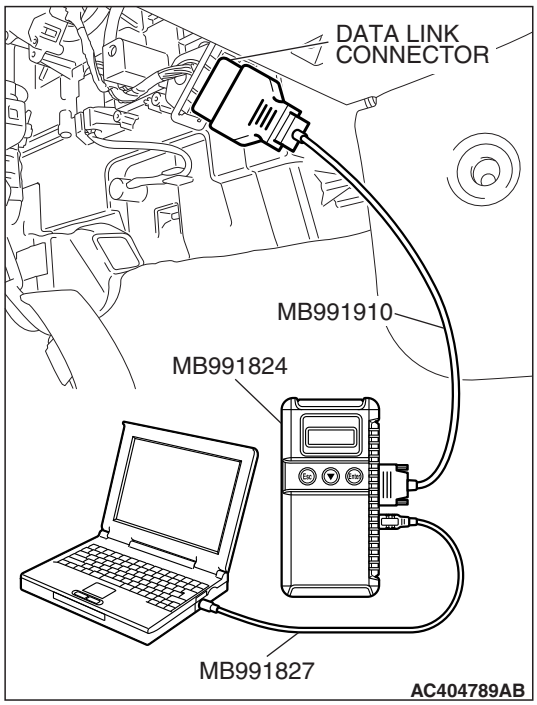
⚠ CAUTION

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 C1366, C1371, C1377 or C1864 set?

YES : Go to Step 3.
NO : The procedure is complete.



STEP 3. Using scan tool MB991958, check data list item 8: Lateral G sensor and item 12: Yaw rate sensor.

⚠ 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.

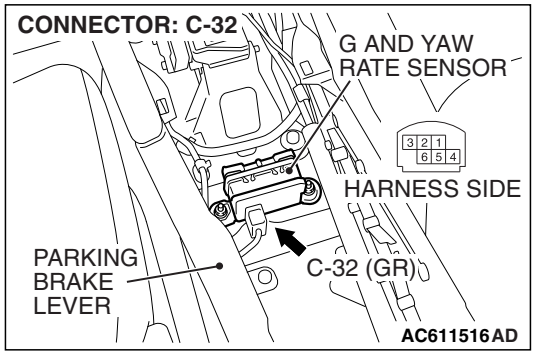
(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Use scan tool MB991958 to read the following data list (Refer to P.35C-211).
- Item 8: Lateral G sensor
- Item 12: Yaw rate sensor

Q: Is the G and yaw rate sensor output normal?

YES : Then go to Step 13.
NO : Go to Step 4.

STEP 4. Check the following connectors.

- G and yaw rate sensor connector C-32



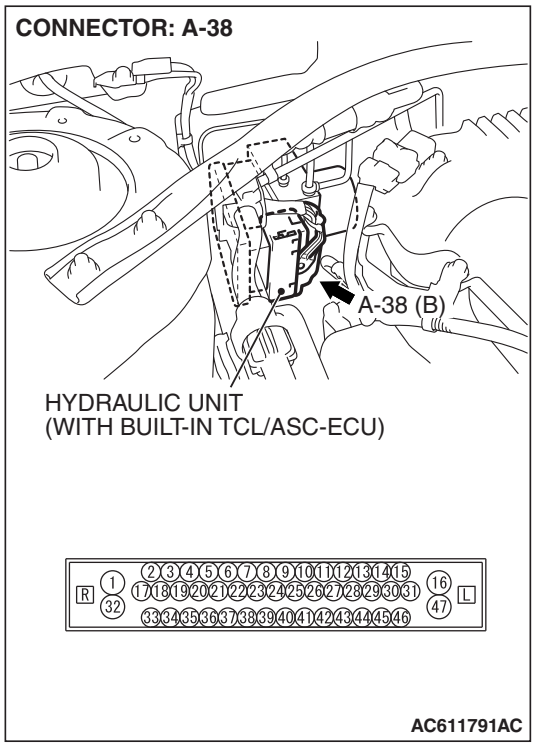
- TCL/ASC-ECU connector A-38

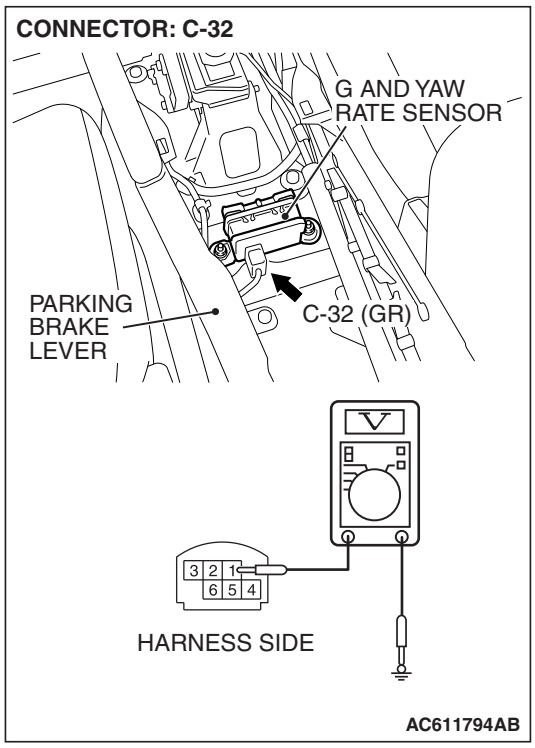
Check the connectors, for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 5.

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



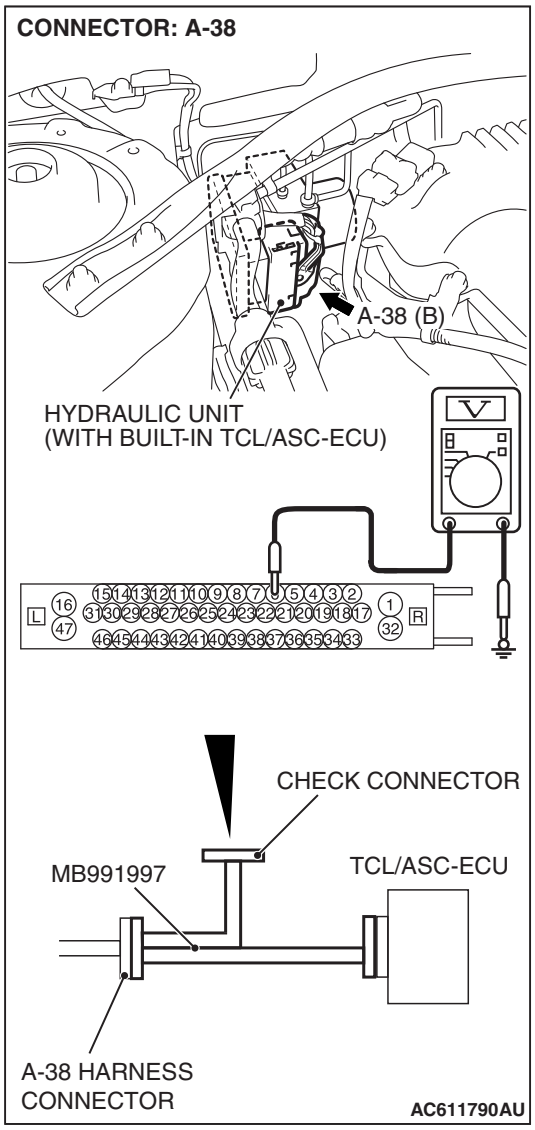


STEP 5. Measure the voltage at G and yaw rate sensor connector C-32.

(1) Disconnect the G and yaw rate sensor connector C-32, and measure at the harness side connector.
(2) Turn the ignition switch to the "ON" position.
(3) Measure the voltage between terminal 1 and body ground.
- Voltage should measure battery positive voltage (approximately 12 volts).

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

YES : Go to Step 8.
NO : Go to Step 6.



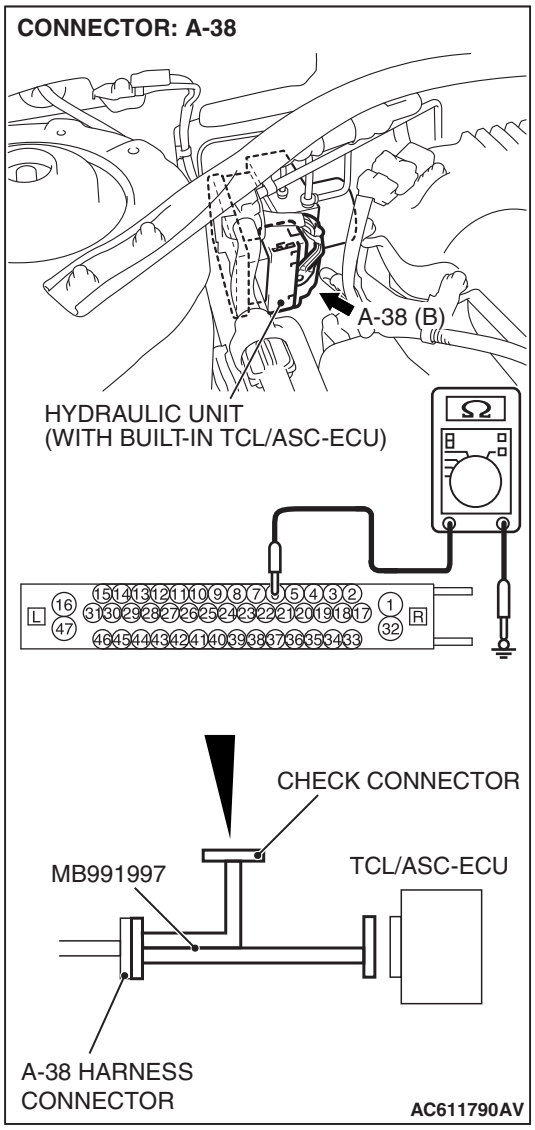
STEP 6. Measure the voltage at the TCL-ASC-ECU connector A-38.

(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector and TCL/ASC-ECU side.
(2) Turn the ignition switch to the "ON" position.
(3) Measure the voltage between terminal 6 and body ground.
- Voltage should measure battery positive voltage (approximately 12 volts).

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

YES : Open circuit may be present in the G and yaw rate sensor power supply lines. Repair the wiring harness between TCL/ASC-ECU connector A-38 (terminal 6) and G and yaw rate sensor connector C-32 (terminal 1). Then go to Step 14.

NO : Go to Step 7.



STEP 7. Measure the resistance at the TCL-ASC-ECU connector A-38.

(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

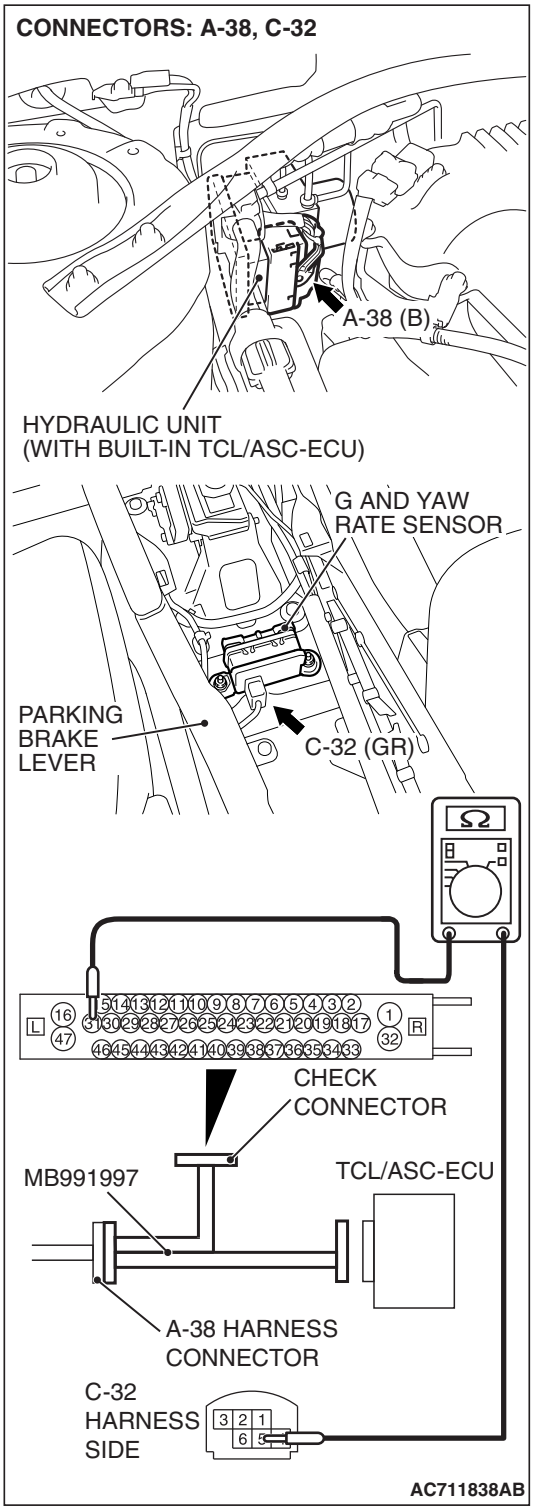
NOTE: Do not connect special tool MB991997 to the TCL/ASC-ECU.

(2) Measure the resistance between terminal 6 and body ground.
- Resistance should measure no continuity.

Q: Is the measured resistance no continuity?

YES : Replace the hydraulic unit (integrated with TCL/ASC-ECU). Then go to Step 14.

NO : Short circuit may be present in the G and yaw rate sensor power supply lines. Repair the wiring harness between TCL/ASC-ECU connector A-38 (terminal 6) and G and yaw rate sensor connector C-32 (terminal 1). Then go to Step 14.



STEP 8. Check for continuity of the wiring harness between A-38 TCL/ASC-ECU connector and C-32 G and yaw rate sensor connector.

(1) Disconnect the TCL/ASC-ECU connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

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

(2) Disconnect the G and yaw rate sensor connector C-32.

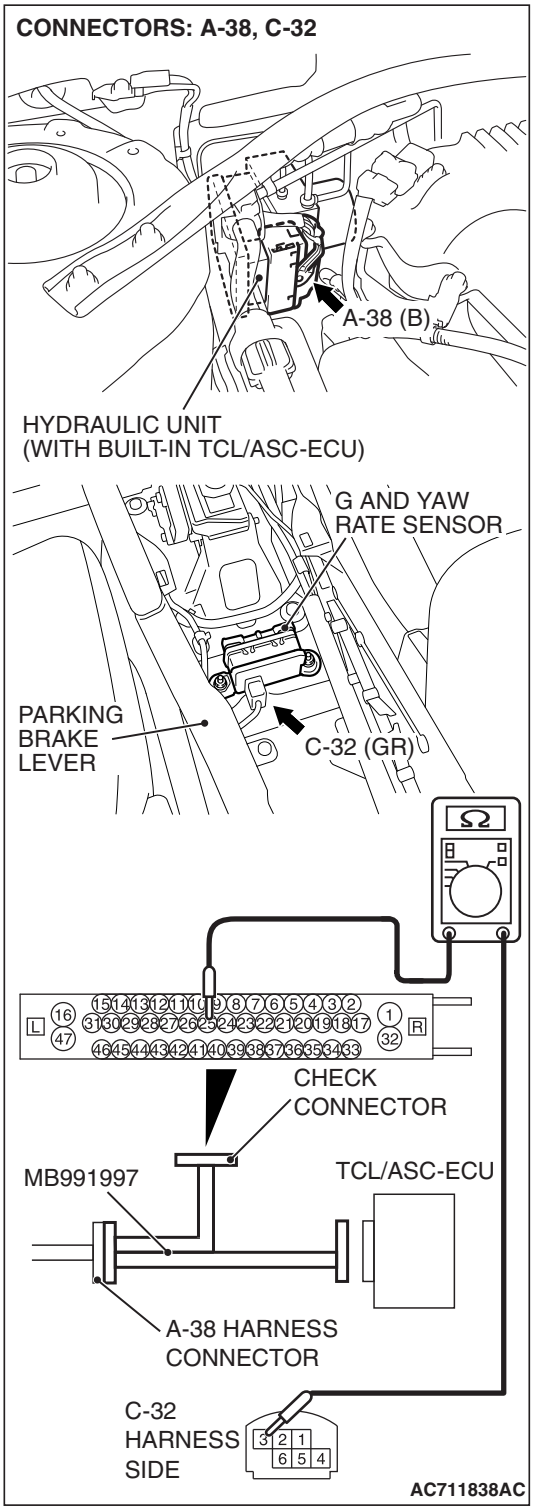
(3) Measure the resistance between A-38 TCL/ASC-ECU connector terminal 31 and C-32 G and yaw rate sensor connector terminal 5.

- Resistance should measure 2 ohms or less.

Q: Is the measured resistance 2 ohms or less?

YES : Go to Step 9.

NO : Open may be present in the G and yaw rate sensor ground lines. Repair the wiring harness. Then go to Step 14.



STEP 9. Check for continuity of the wiring harness between A-38 TCL/ASC-ECU connector and C-32 G and yaw rate sensor connector.

(1) Disconnect the TCL/ASC-ECU connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

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

(2) Disconnect the G and yaw rate sensor connector C-32.

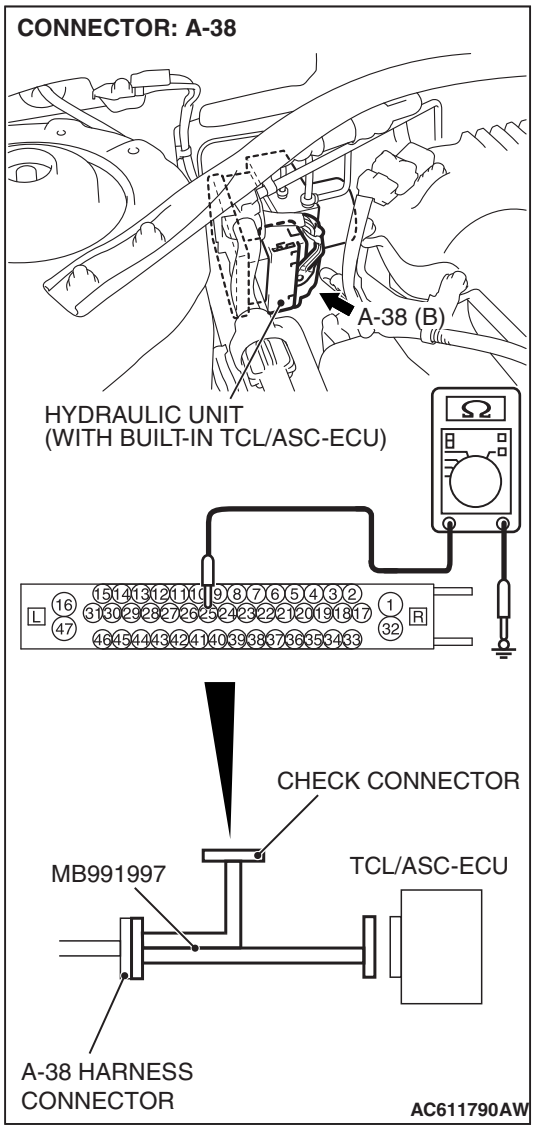
(3) Measure the resistance between TCL/ASC-ECU connector A-38 (terminal 25) and G and yaw rate sensor connector C-32 (terminal 3), and between TCL/ASC-ECU connector A-38 (terminal 29) and G and yaw rate sensor connector C-32 (terminal 2).

- Resistance should measure 2 ohms or less.

Q: Is the measured resistance 2 ohms or less?

YES : Go to Step 10.

NO : Open circuit may be present in the special CAN bus line of the G and yaw rate sensor. Repair the wiring harness. Then go to Step 14.



STEP 10. Measure the resistance at the TCL-ASC-ECU connector A-38.

(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

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

(2) Disconnect the G and yaw rate sensor connector C-32.

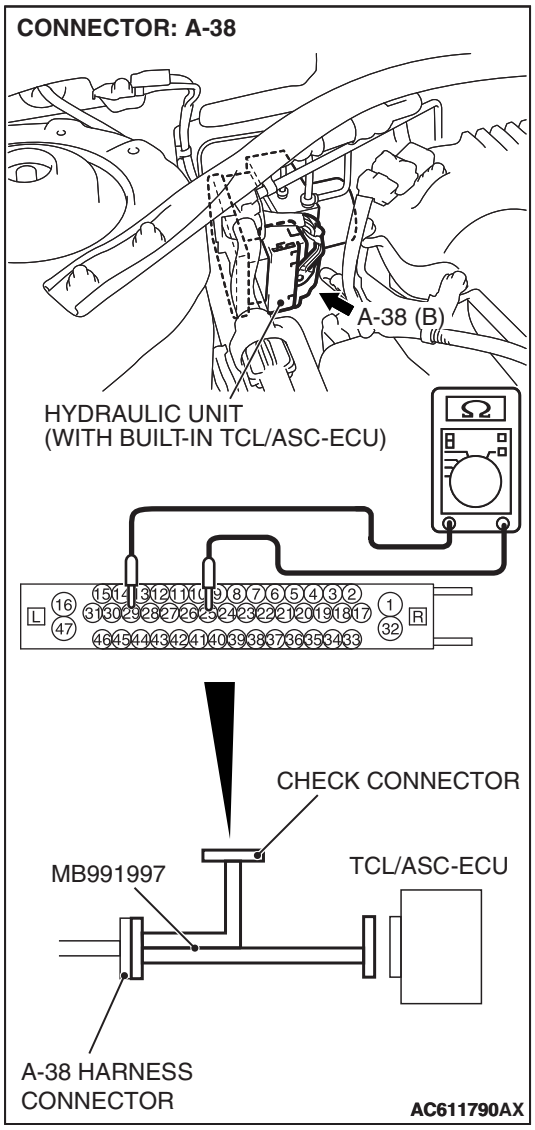
(3) Measure the resistance between TCL/ASC-ECU connector A-38 (terminal 25) and body ground, and between TCL/ASC-ECU connector A-38 (terminal 29) and body ground.

- Resistance should measure no continuity.

Q: Is the measured resistance no continuity?

YES : Go to Step 11.

NO : Short circuit may be present in the special CAN bus line of the G and yaw rate sensor. Repair the wiring harness. Then go to Step 14.



STEP 11. Measure the resistance at the TCL-ASC-ECU connector A-38.

(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

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

(2) Disconnect the G and yaw rate sensor connector C-32.

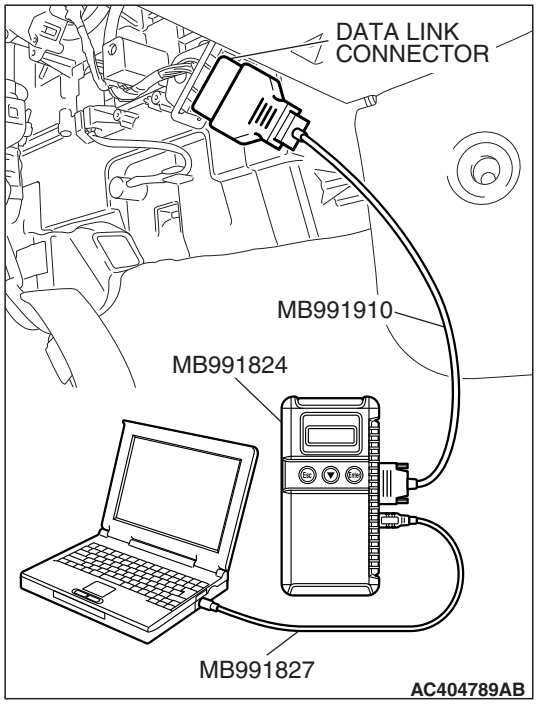
(3) Measure the resistance between TCL/ASC-ECU connector A-38 (terminal 25) and TCL/ASC-ECU connector A-38 (terminal 29).

- Resistance should measure no continuity.

Q: Is the measured resistance no continuity?

YES : Go to Step 12.

NO : Short circuit may be present in the special CAN bus line of the G and yaw rate sensor. Repair the wiring harness. Then go to Step 14.



STEP 12. Recheck for diagnostic trouble code.

⚠ CAUTION

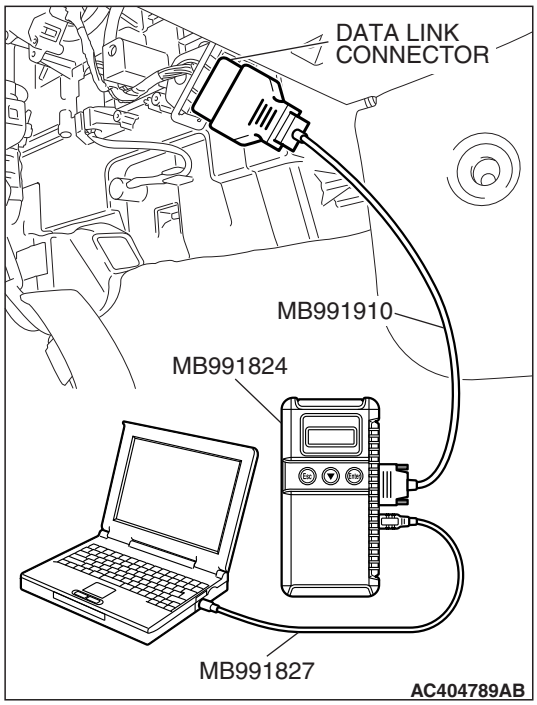
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

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

Q: Is DTC C1366, C1371, C1377 or C1864 set?

YES : Replace the G and yaw rate sensor (Refer to P.35C-230). 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.



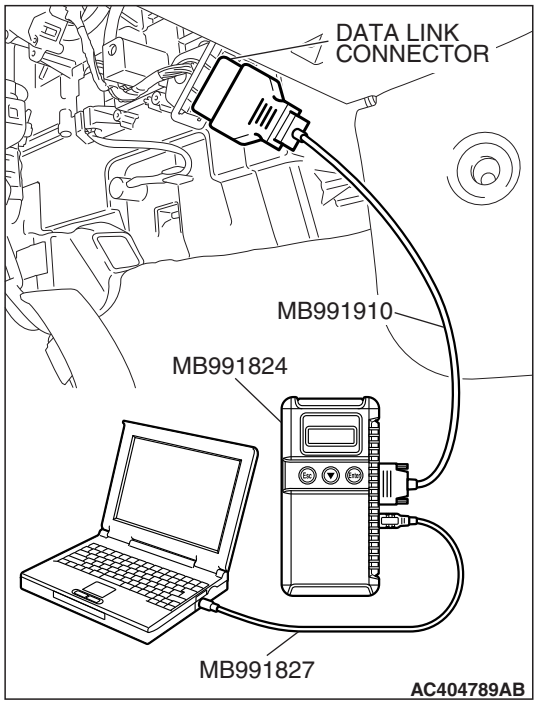
STEP 13. Recheck for diagnostic trouble code.

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 C1366, C1371, C1377 or C1864 set?

YES : Replace the hydraulic unit (integrated with TCL/ASC-ECU). Then go to Step 14.

NO : The procedure is complete.



STEP 14. Recheck for diagnostic trouble code.

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 C1366, C1371, C1377 or C1864 set?

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

DTC C1394: INCOMP. learn neutral (SAS)

⚠ 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.

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

DTC SET CONDITIONS

This DTC is set if the steering wheel sensor has not been initialized.

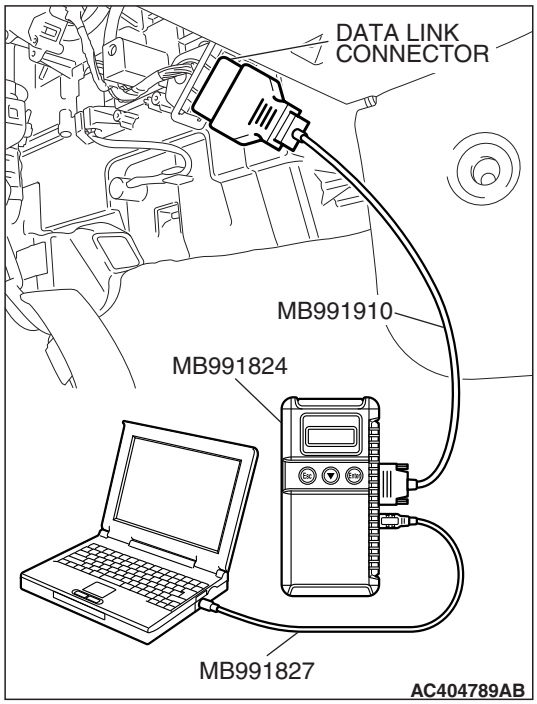
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THESE DTCS ARE TO SET ARE:)

- The CAN bus line is defective.
- Malfunction of the hydraulic unit (integrated with TCL/ASC-ECU)

DIAGNOSIS

Required Special Tools:

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



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

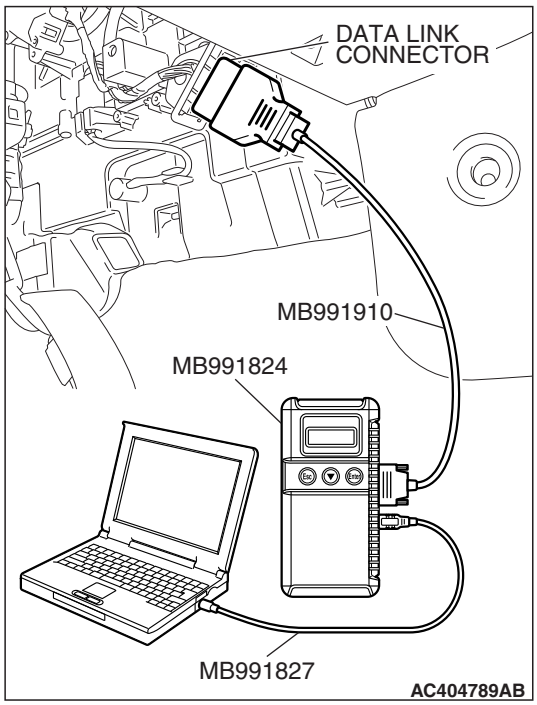
⚠ CAUTION

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-17). Then go to Step 2.



STEP 2. Recheck for diagnostic trouble code.

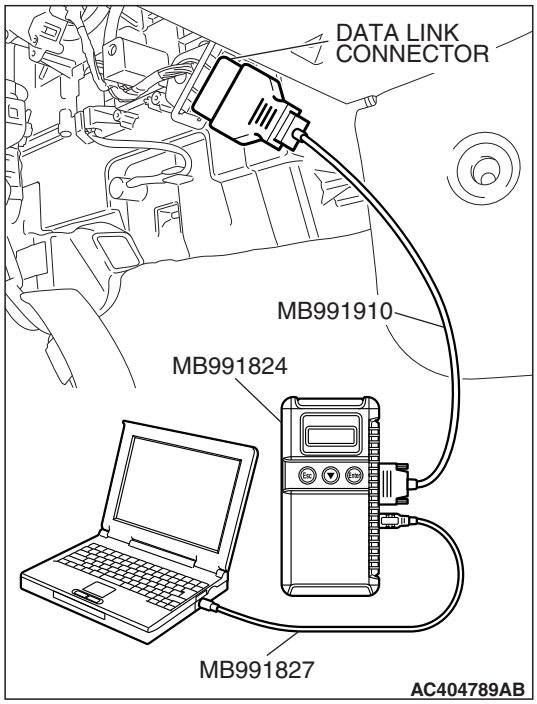
⚠ CAUTION

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 C1394 set?

YES : Initialize the steering wheel sensor (Refer to P.35C-231). Then go to Step 3.
NO : The procedure is complete.

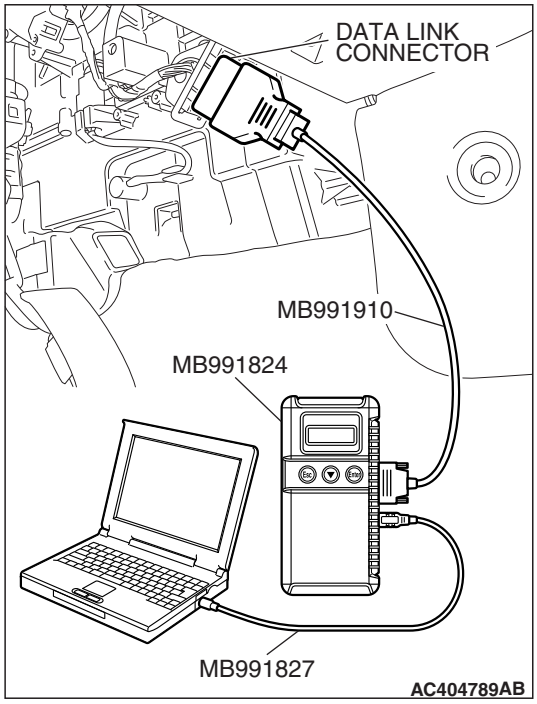


STEP 3. Recheck for diagnostic trouble code.

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 C1394 set?

YES : Replace the hydraulic unit (integrated with TCL/ASC-ECU). Then go to Step 4.
NO : The procedure is complete.



STEP 4. Recheck for diagnostic trouble code.

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 C1394 set?

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

DTC C1395: INCOMP. Brake fluid filling

⚠ 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.

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

TCL/ASC DTC SET CONDITIONS

This DTC is set if air-bleeding has not been performed.

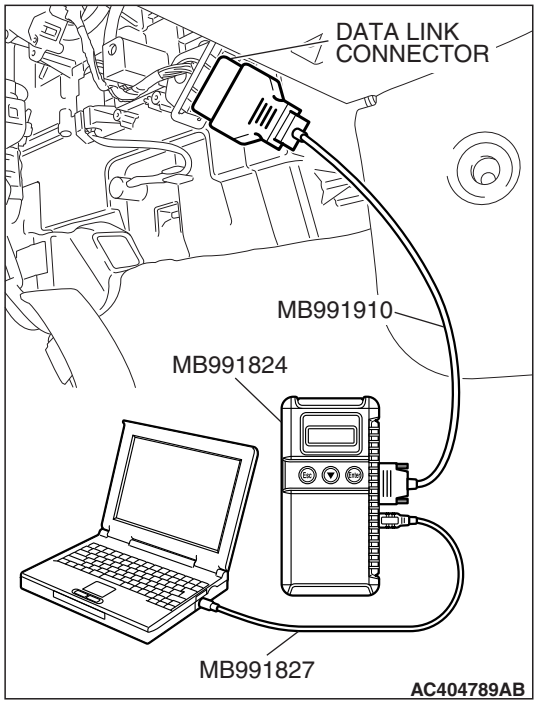
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THESE DTCS ARE TO SET ARE:)

- The CAN bus line is defective.
- Malfunction of the hydraulic unit (integrated with TCL/ASC-ECU)

DIAGNOSIS

Required Special Tools:

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



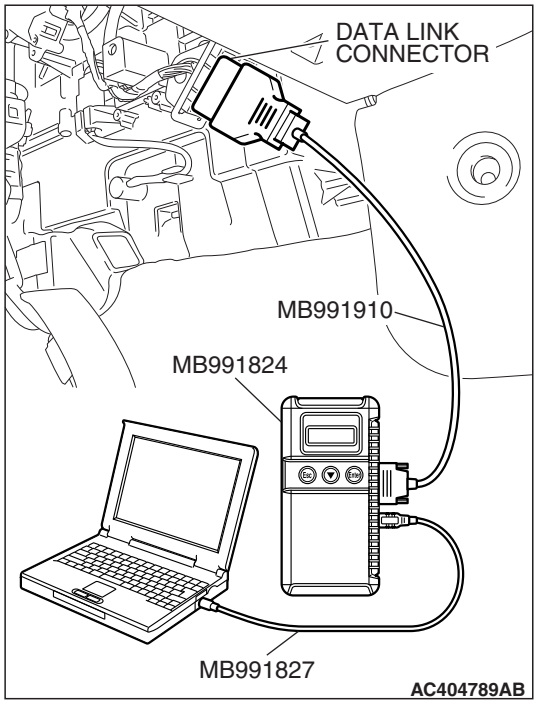
STEP 1. Using scan tool MB991958, diagnose the CAN bus line.

⚠ 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-17). Then go to Step 2.



STEP 2. Recheck for diagnostic trouble code.

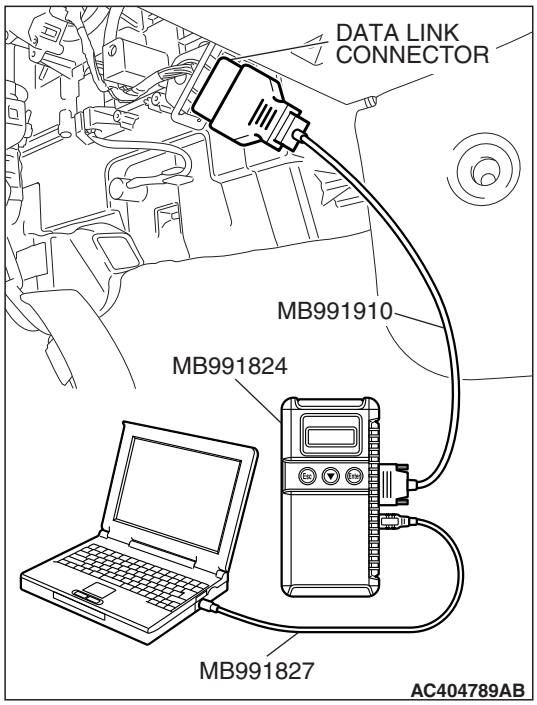
⚠ CAUTION

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 C1395 set?

YES : Perform air-bleeding (Refer to P.35C-225). Then go to Step 3.
NO : The procedure is complete.

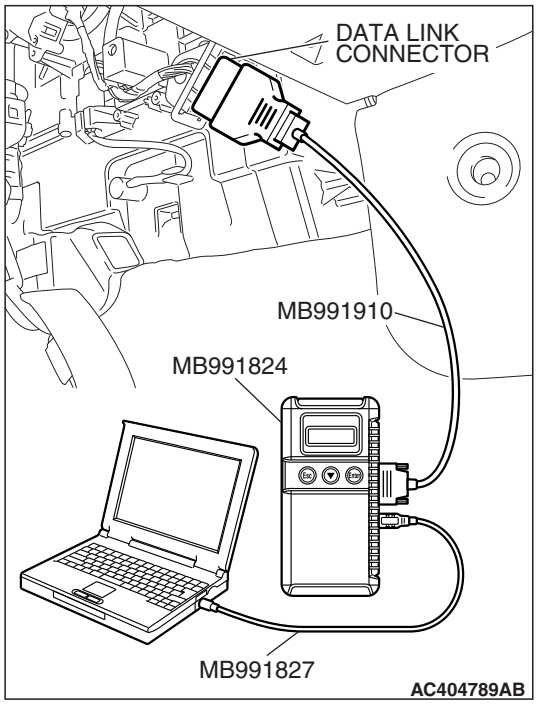


STEP 3. Recheck for diagnostic trouble code.

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 C1395 set?

YES : Replace the hydraulic unit (integrated with TCL/ASC-ECU). Then go to Step 4.
NO : The procedure is complete.



STEP 4. Recheck for diagnostic trouble code.

Check again if the DTC is set.

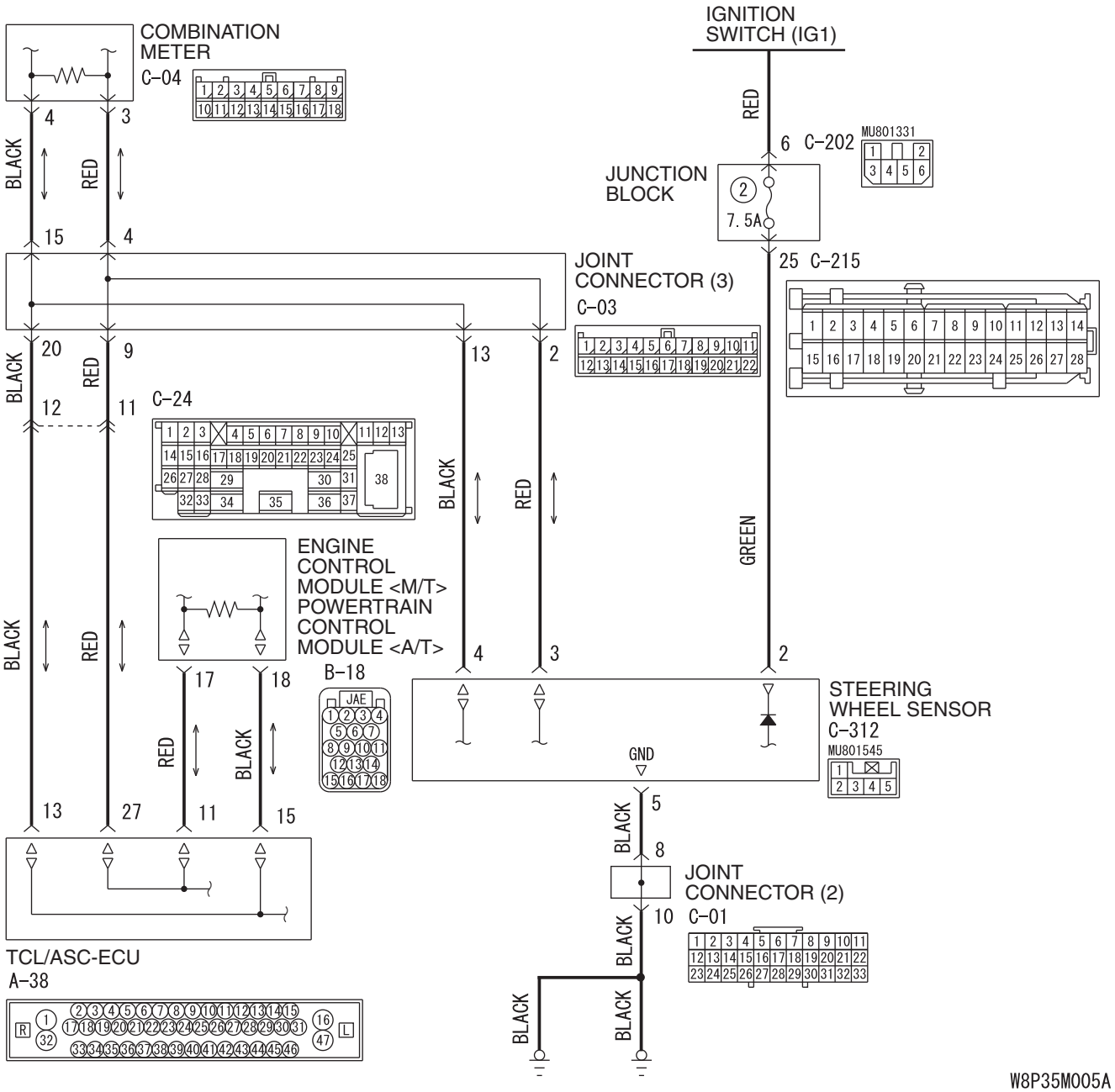
(1) Turn the ignition switch to the "ON" position.
(2) Erase the DTC.
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to the "ON" position.
(5) Check if the DTC is set.
(6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1395 set?

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

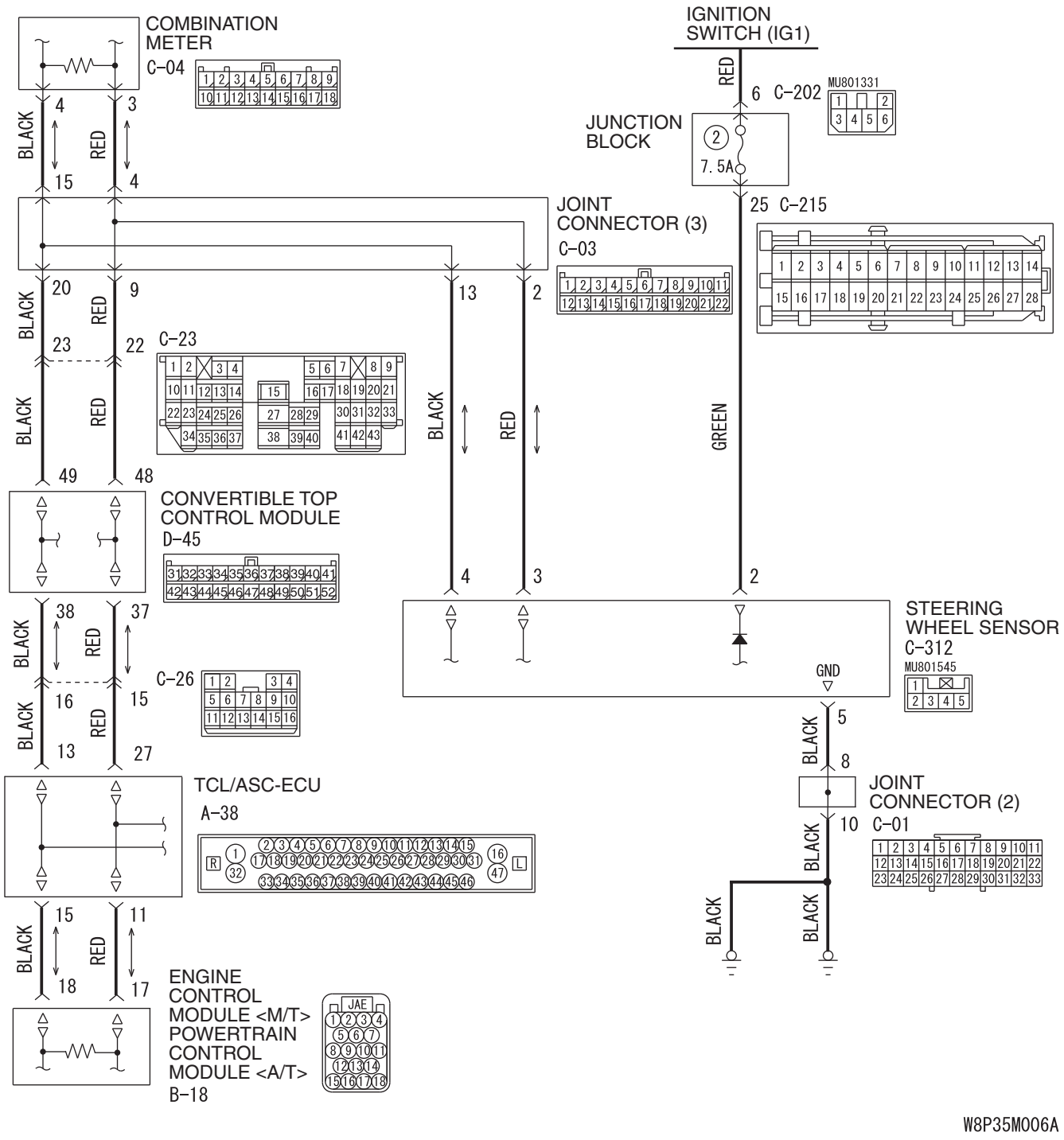
DTC C1505: Steering angle sensor (detected by ASC side)
DTC C1506: Steering angle sensor error (detected by itself)

Steering Wheel Sensor Communication Circuit <ECLIPSE>

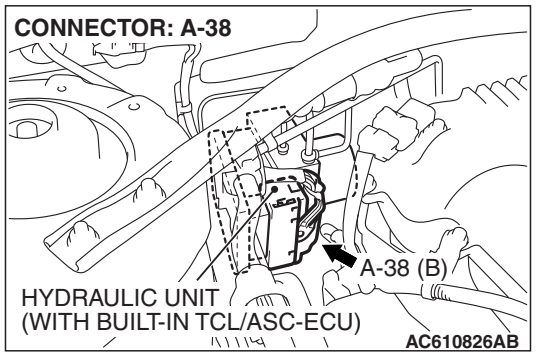


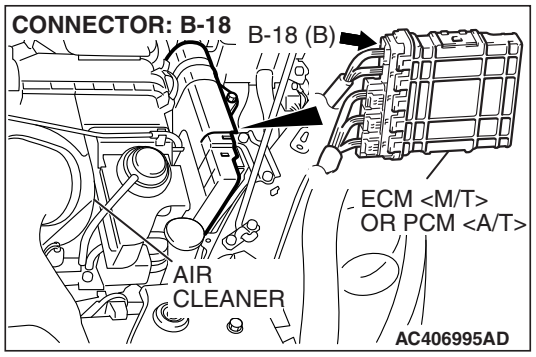
TSB Revision

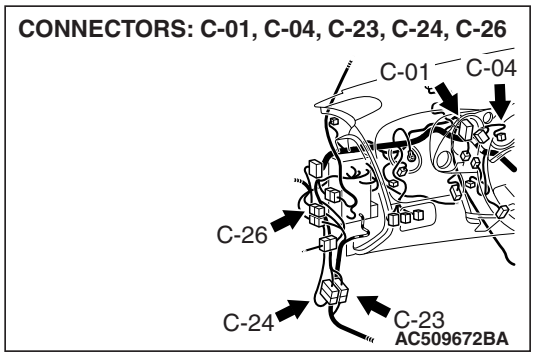
Steering Wheel Sensor Communication Circuit <ECLIPSE SPYDER>

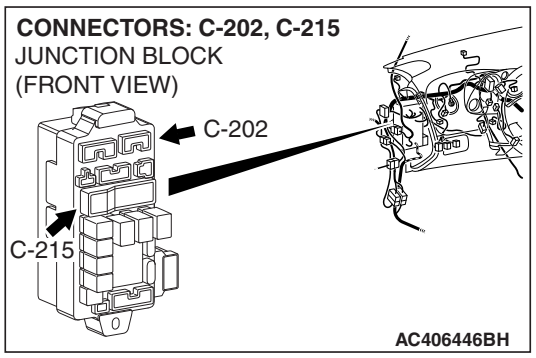


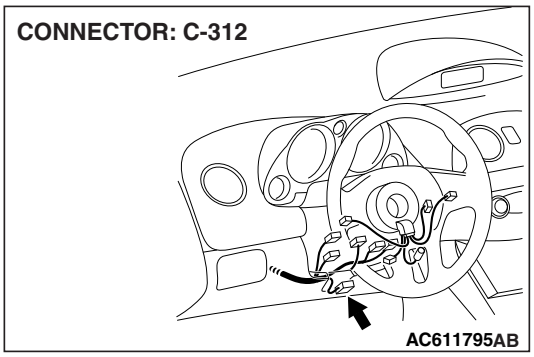
TSB Revision

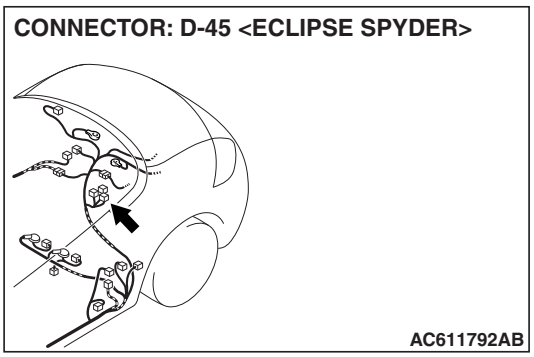












⚠ CAUTION

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.

⚠ CAUTION

The steering wheel sensor-related DTC may be set when DTC C1506 is set. Diagnose the steering wheel sensor first when the steering wheel sensor-related DTC is set.

CIRCUIT OPERATION

- The TCL/ASC-ECU and the steering wheel sensor are connected each other via a CAN bus line, and the sensor sends the steering wheel angle and angular velocity information to the ECU.

TCL/ASC DTC SET CONDITIONS

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

DTC C1505: Steering Angle Sensor (signal seizure or abnormal neutral point)

- The steering wheel sensor output value does not fluctuate for more than 20 seconds although the vehicle speed is 15 km/h or more and the G and yaw rate sensor output value is fluctuating.
- The neutral point has been ±180 deg or more and the vehicle speed remains 10 km/h or more for at least one second.

DTC C1506: Steering Angle Sensor (abnormal steering angle)

- When the steering wheel sensor sets a DTC, the TCL/ASC-ECU receives the information and sets this code.

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

Current trouble

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

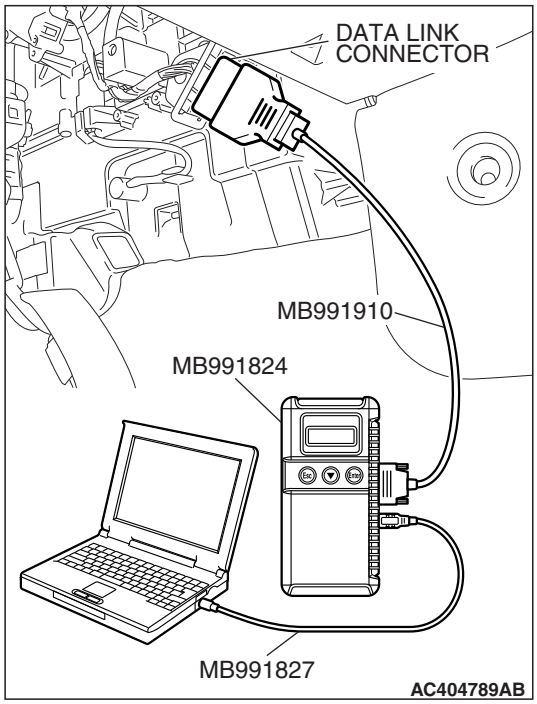
PAST TROUBLE

Carry out diagnosis with particular emphasis on connector(s) or wiring harness between the TCL/ASC-ECU and the steering sensor. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-16).

DIAGNOSIS

Required Special Tools:

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



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

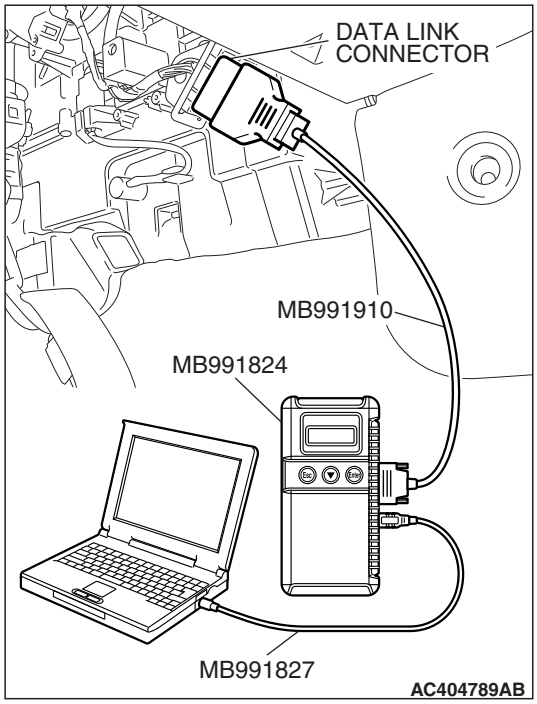
⚠ CAUTION

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 3.
NO : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis P.54C-17). Then go to Step 2.



STEP 2. Recheck for diagnostic trouble code.

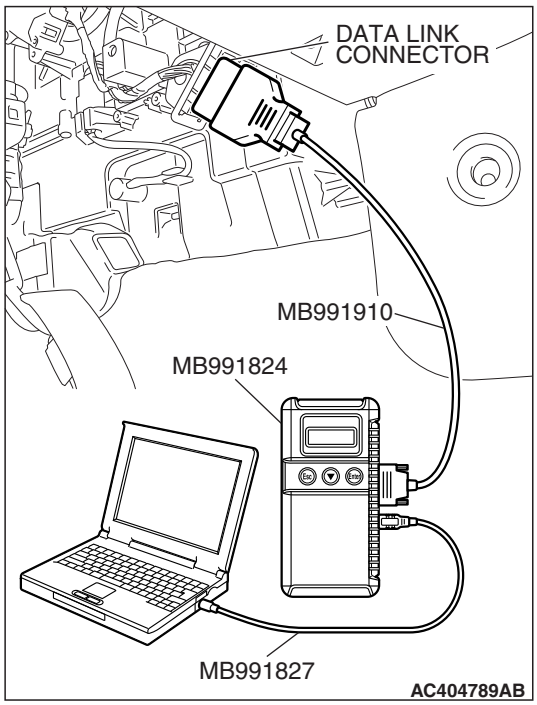
⚠ CAUTION

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 C1505 or C1506 set?

YES <C1505 is set> : Go to Step 3.
YES <C1506 is set> : Check the steering wheel sensor DTC, and diagnose the DTC (Refer to P.35C-175).
NO : The procedure is complete.



STEP 3. Using scan tool MB991958, check data list item 11: Steering angle.

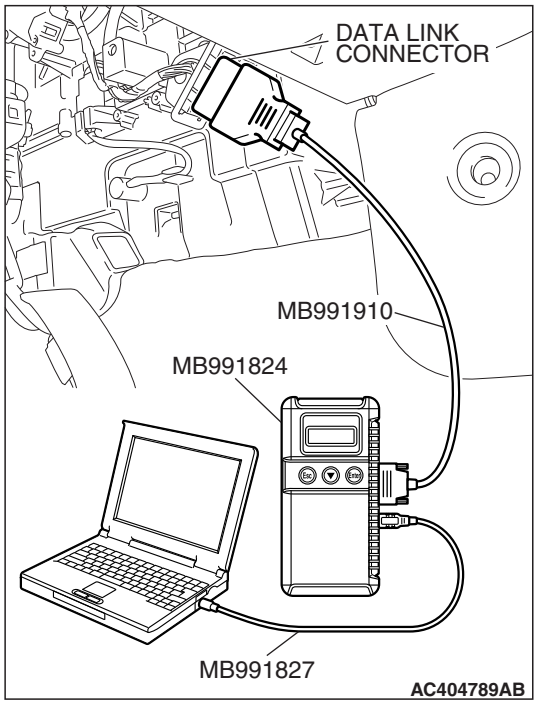
⚠ CAUTION

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) Set scan tool MB991958 to data reading mode for item 11, Steering angle.
- Correct angle is displayed as the steering wheel is turned.

Q: Does the steering wheel sensor send correct steering angle?

YES : Go to step 6.
NO : Align the steering wheel sensor neutral point and carry out calibration (Refer to P.35C-231). Then go to Step 4.

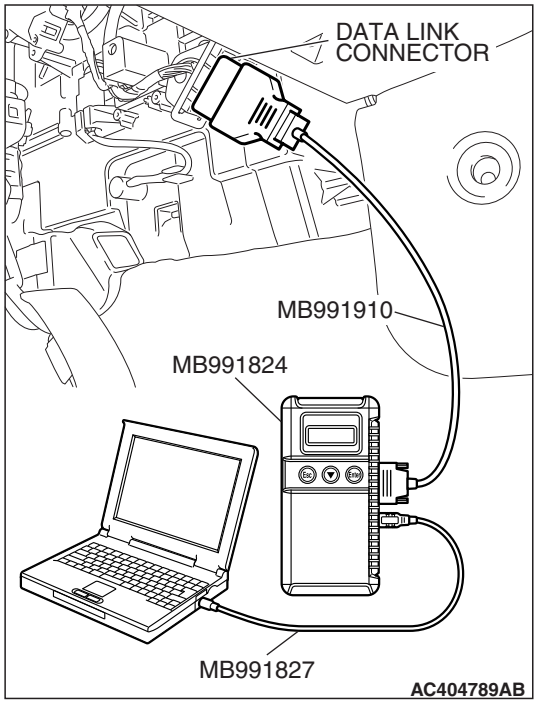


STEP 4. Recheck for diagnostic trouble code.

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 C1505 set?

YES : Go to Step 5.
NO : The procedure is complete.



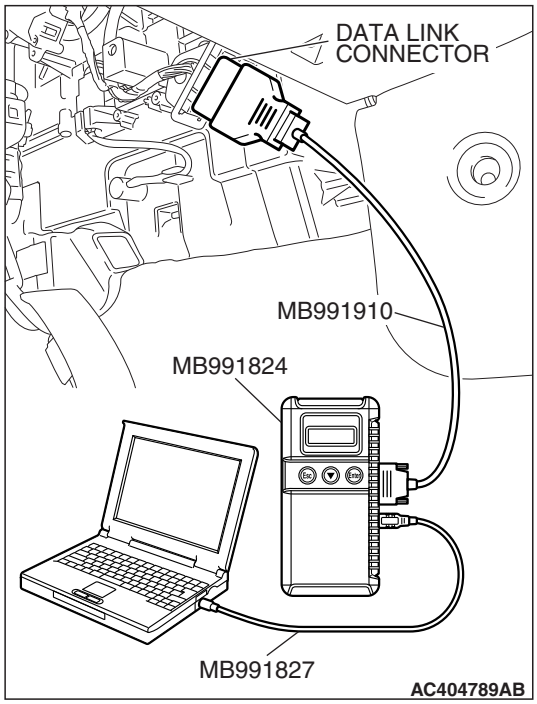
STEP 5. Recheck for diagnostic trouble code after the steering wheel sensor is replaced.

⚠ 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.

Replace the steering wheel sensor (Refer to P.35C-231), and check whether DTC C1505 is reset.
(1) Replace the steering wheel sensor.
(2) Connect scan tool MB991958 to the data link connector.
(3) Turn the ignition switch to the "ON" position.
(4) Erase the DTC.
(5) Turn the ignition switch to the "LOCK" (OFF) position.
(6) Turn the ignition switch to the "ON" position.
(7) Check if the DTC is set.
(8) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1505 set?

YES : Replace the hydraulic unit (integrated with TCL/ASC-ECU). Then go to Step 7.
NO : The procedure is complete.

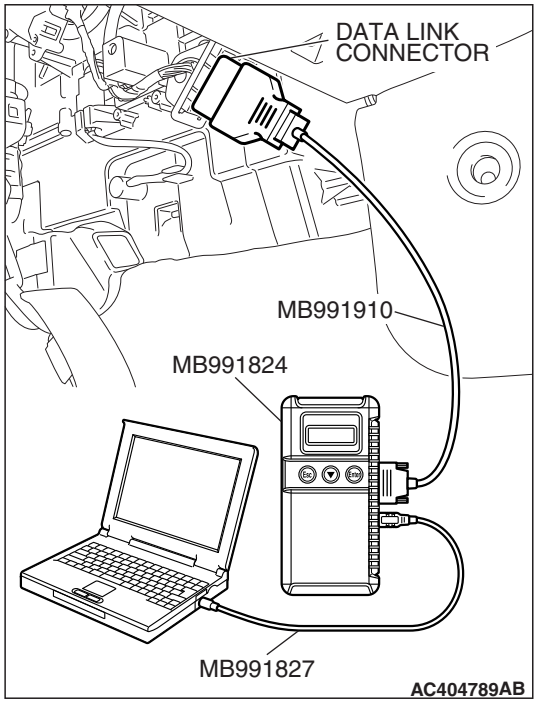


STEP 6. Recheck for diagnostic trouble code.

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 C1505 set?

YES : Replace the hydraulic unit (integrated with TCL/ASC-ECU). Then go to Step 7.
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 7. Recheck for diagnostic trouble code.

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 C1505 set?

YES : Go to Step 1.
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.

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

TCL/ASC DTC SET CONDITIONS

The TCL/ASC-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 TCL/ASC-ECU)

DIAGNOSIS

Required Special Tools:

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

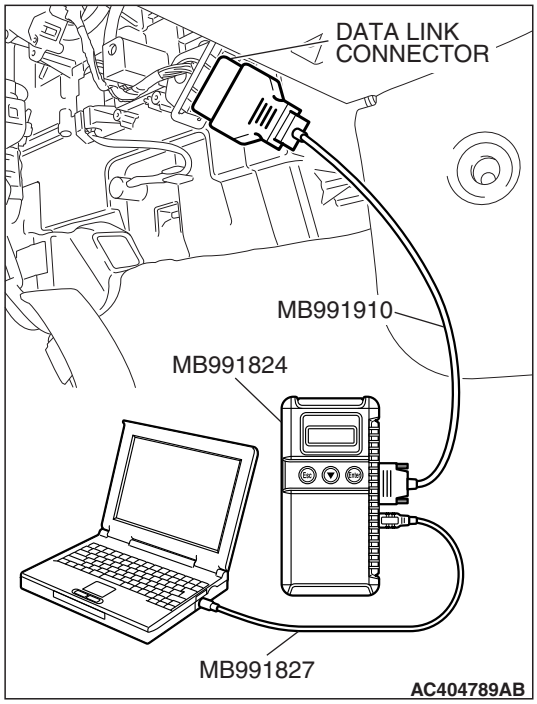
STEP 1. Using scan tool MB991958, diagnose the CAN bus line.

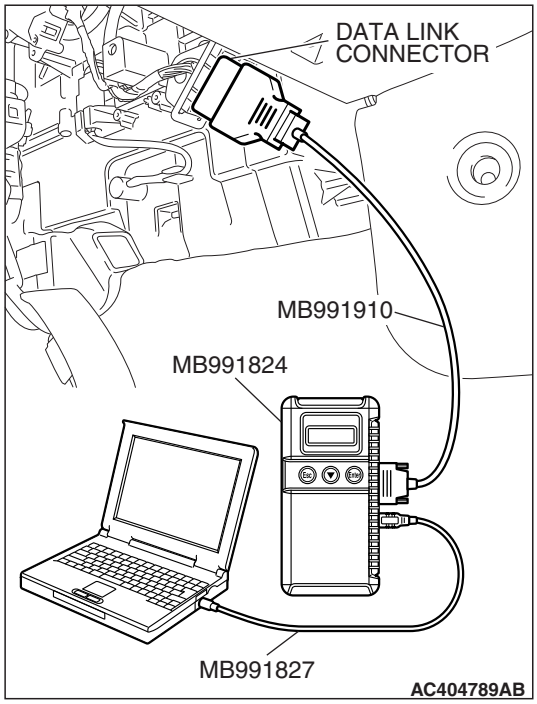
⚠ CAUTION
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(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-17). 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 TCL/ASC-ECU).
NO : The procedure is complete.

DTC C1640: Coding not completed

⚠ 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.

⚠ CAUTION

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

TCL/ASC DTC SET CONDITIONS

The TCL/ASC-ECU always monitors itself while the system is working. If the variant coding has not been implemented.

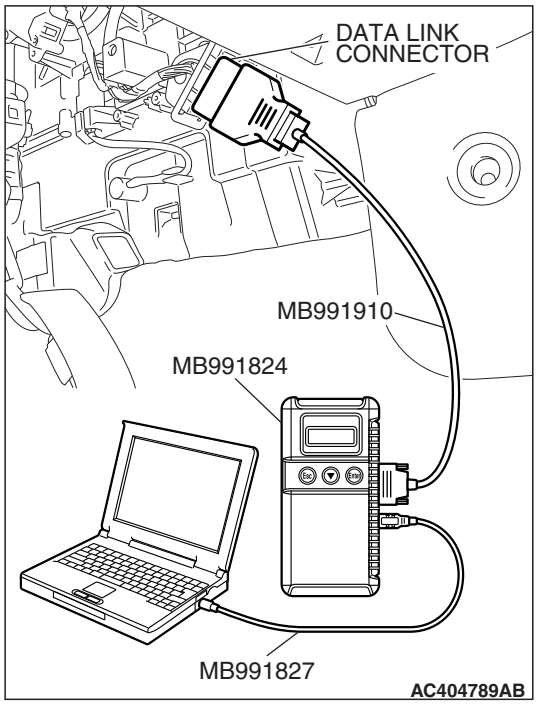
TROUBLESHOOTING HINTS (The most likely causes for these DTCs are to set are:)

- A different hydraulic unit is used. (integrated with TCL/ASC-ECU)
- Malfunction of the hydraulic unit (integrated with TCL/ASC-ECU)

DIAGNOSIS

Required Special Tools:

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



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

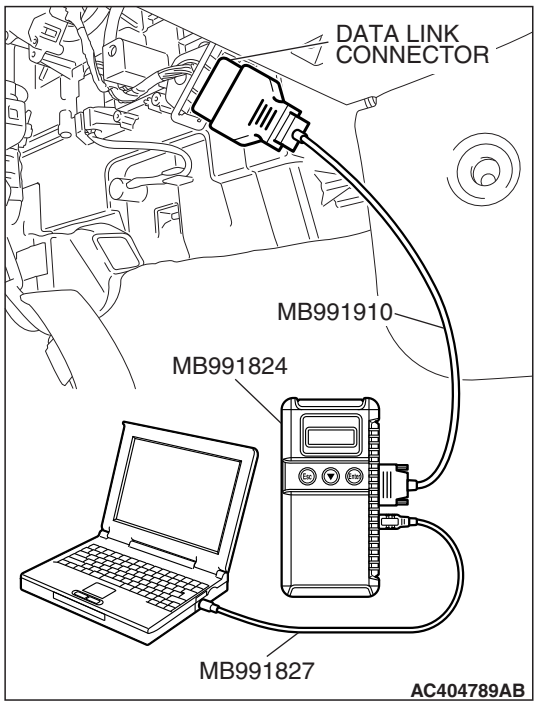
⚠ CAUTION

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-17). 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 TCL/ASC-ECU).
NO : The procedure is complete.

DTC C1641: Coding not completed

⚠ 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.

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

TCL/ASC DTC SET CONDITIONS

The TCL/ASC-ECU always monitors itself while the system is working. If the variant coding has not been implemented.

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

- A different hydraulic unit is used. (integrated with TCL/ASC-ECU)
- Malfunction of the hydraulic unit (integrated with TCL/ASC-ECU)

DIAGNOSIS

Required Special Tools:

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

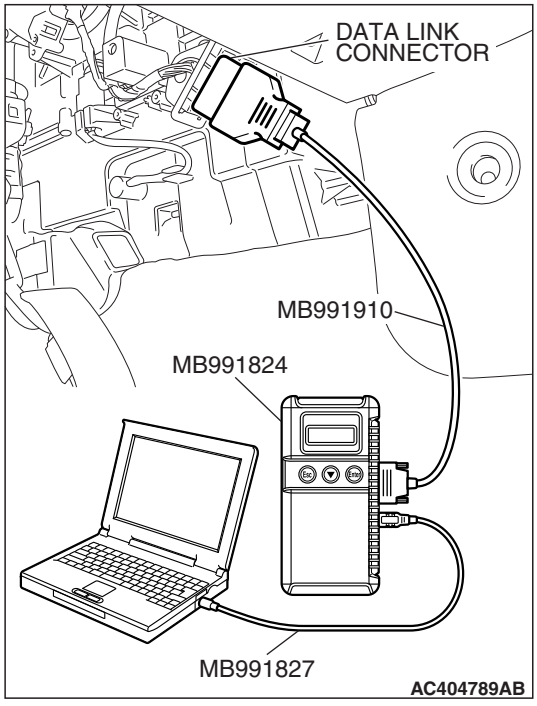
STEP 1. Using scan tool MB991958, diagnose the CAN bus line.

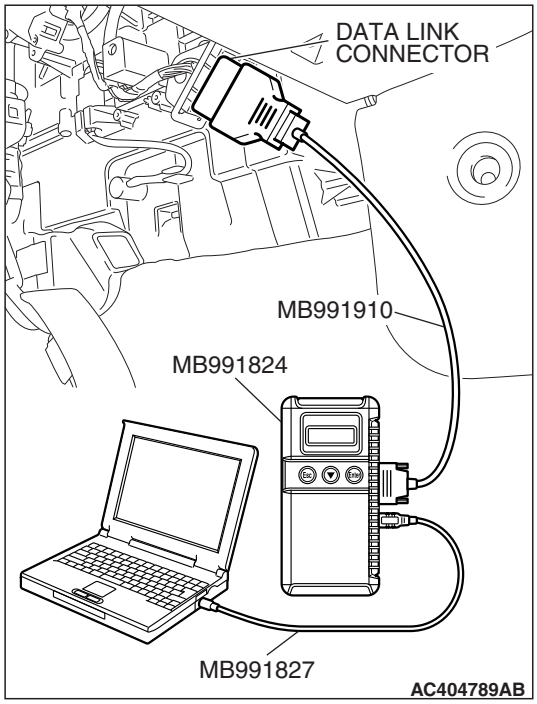
⚠ CAUTION
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(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-17). 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.

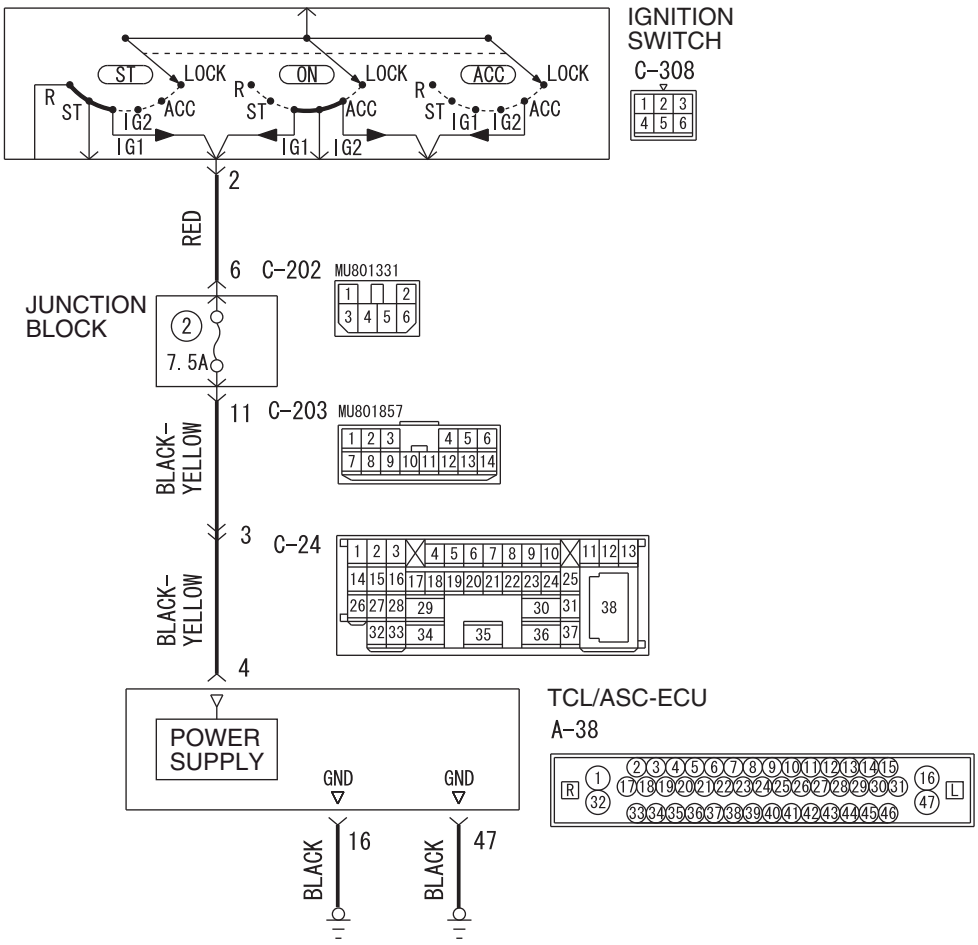
(1) Turn the ignition switch to the "ON" position.
(2) Erase the DTC.
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to the "ON" position.
(5) Check if the DTC is set.
(6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC C1641 set?

YES : Replace the hydraulic unit (integrated with TCL/ASC-ECU).
NO : The procedure is complete.

DTC C1860: Abnormality in battery voltage (high voltage)
DTC C1861: Abnormality in battery voltage (low voltage)

TCL/ASC-ECU Power Supply and Ground Circuit



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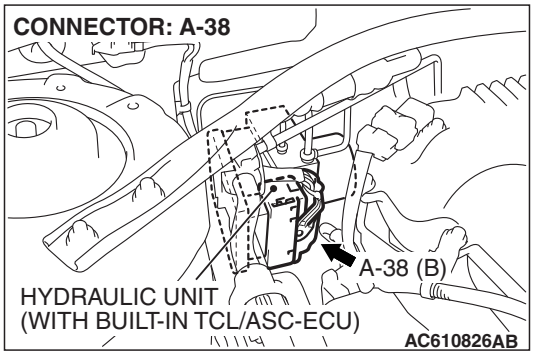
CONNECTOR: A-38



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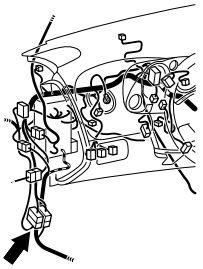
CONNECTOR: C-24



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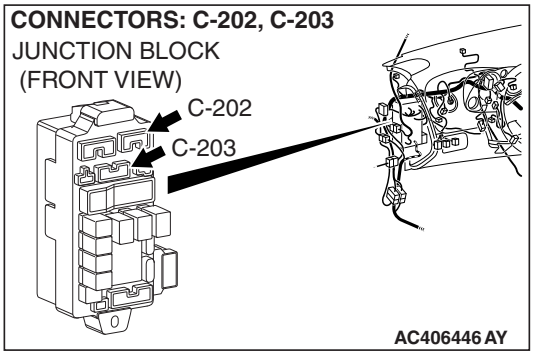
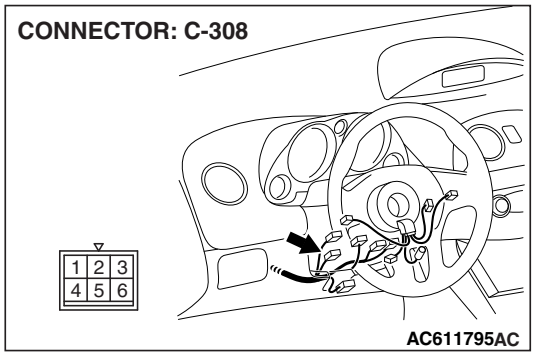
TSB Revision





⚠ 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.

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

⚠ CAUTION
When I replace hydraulic unit (integrated with TCL/ASC-ECU), Always perform the calibration of steering wheel sensor and yaw rate sensor.

CIRCUIT OPERATION

The TCL/ASC-ECU is energized by the ignition switch (IG1) through multi-purpose fuse No.2 and the TCL/ASC-ECU terminal 4.

TCL/ASC DTC SET CONDITIONS

C1860 will be set when the power supply voltage to the TCL/ASC-ECU became more than 18.0 ± 1.0 volts during a run in more than 12mph (20 km/h).
C1861 will be set when the power supply voltage to the TCL/ASC-ECU became less than 9.7 ± 0.3 volts during a run in more than 12mph (20 km/h).

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 TCL/ASC-ECU)
- Charging system failed

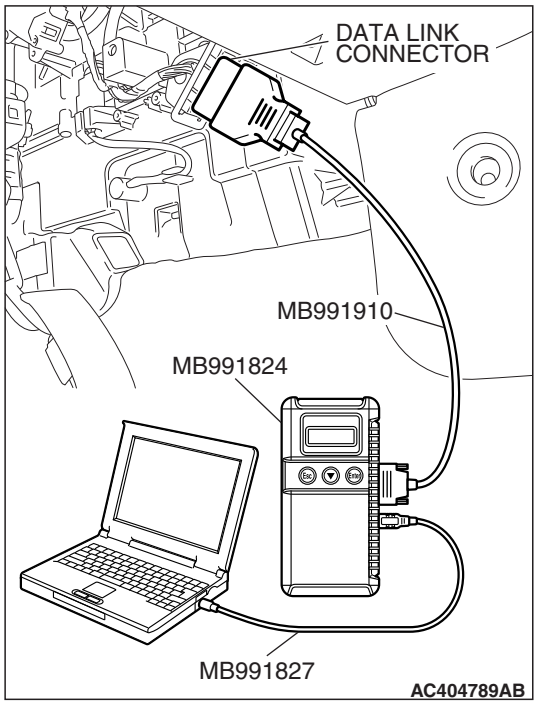
PAST TROUBLE

Carry out diagnosis with particular emphasis on connector(s) or wiring harness in the power supply circuit (terminal 4) to the TCL/ASC-ECU. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-16).

DIAGNOSIS

Required Special Tools:
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A
- MB991997: ASC Check Harness

TSB Revision



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

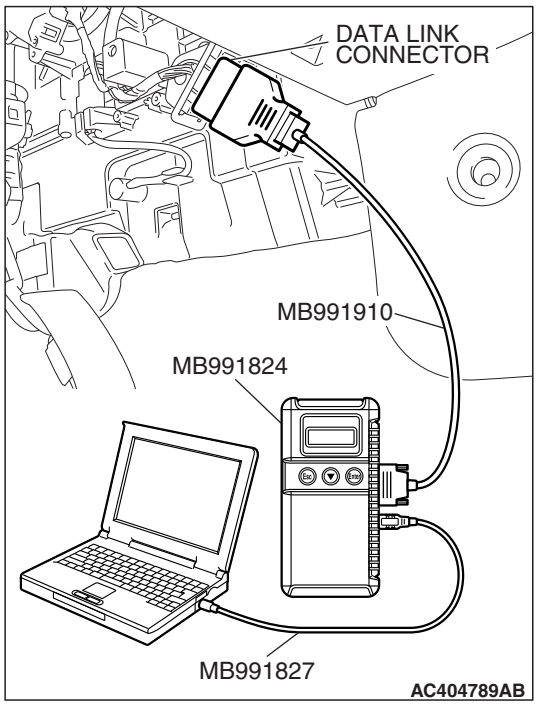
⚠ CAUTION

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-17). 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-7).

Q: Is the battery in good condition?

YES : Go to Step 4.
NO : Charge or replace the battery.

STEP 4. Check the charging system.

Check the charging system (Refer to GROUP 16, Charging system diagnosis P.16-3).

Q: Is the charging system in good condition?

YES : Go to Step 5.
NO : Repair or replace the charging system component(s).

STEP 5. Measure the voltage at TCL/ASC-ECU connector A-38.

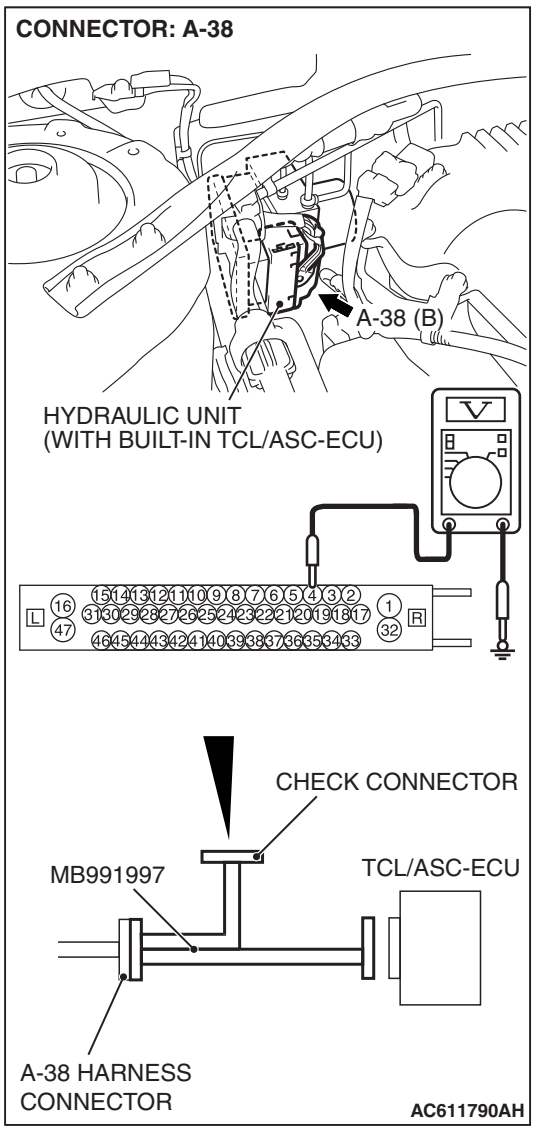
(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

NOTE: Do not connect special tool MB991997 to the TCL/ASC-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).

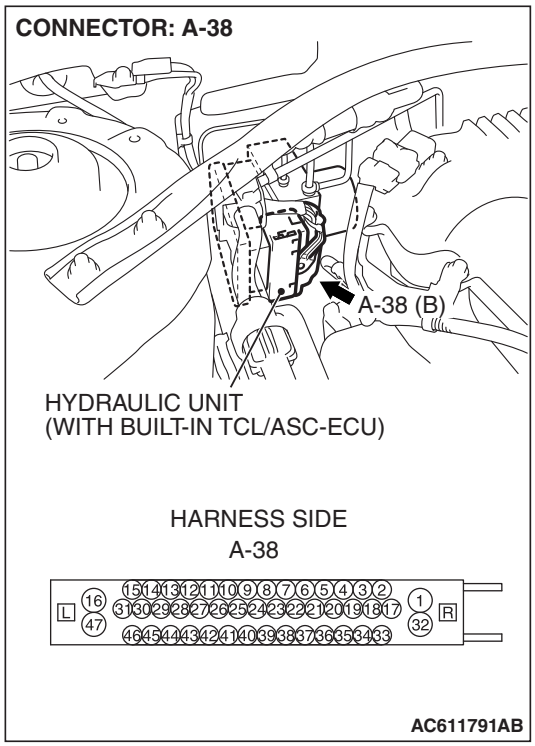
Q: Is the voltage approximately 12 volts (battery positive voltage)?

YES : Go to Step 7.
NO : Go to Step 6.

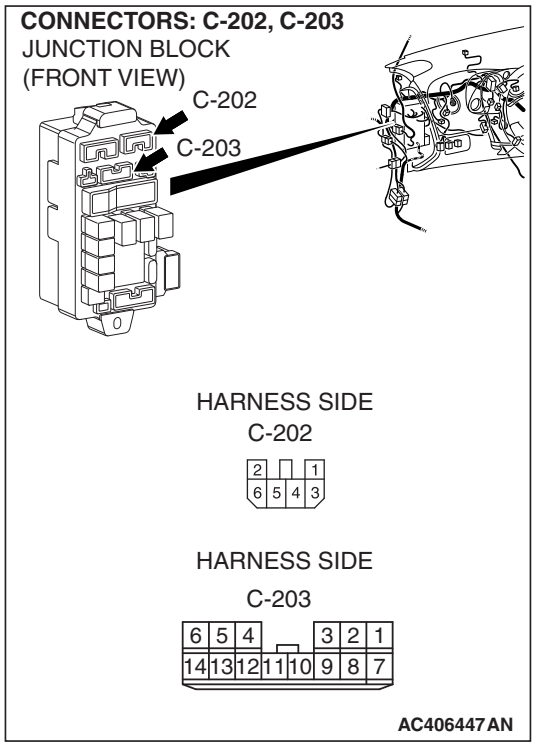


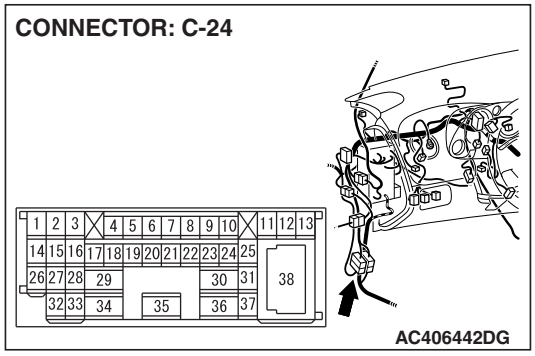
STEP 6. Check the following connectors.

- TCL/ASC-ECU connector A-38

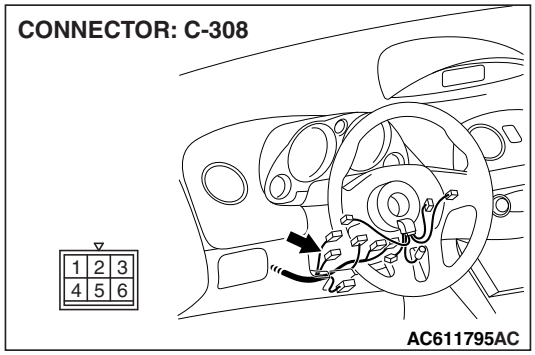


- Junction block connectors C-202 and C-203





- Intermediate connector C-24



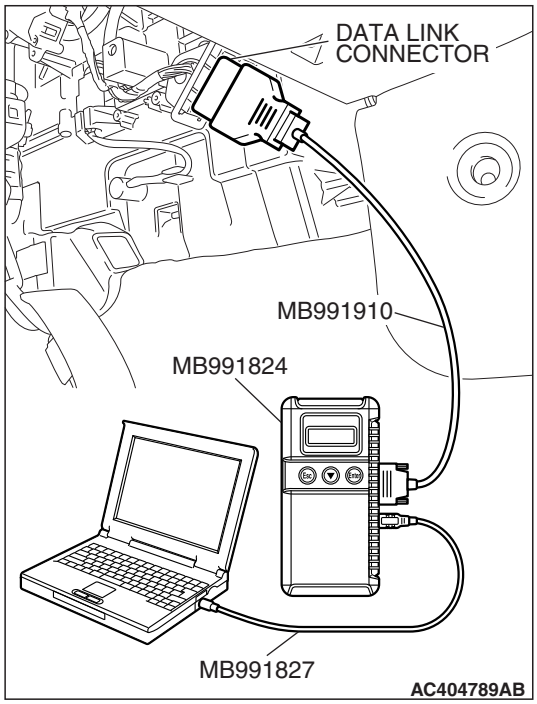
- Ignition switch connector C-308

Check the connectors, for loose, corroded or damaged terminals, or terminals pushed back in the connector.

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 TCL/ASC-ECU. Repair the wiring harness between TCL/ASC-ECU connector A-38 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.



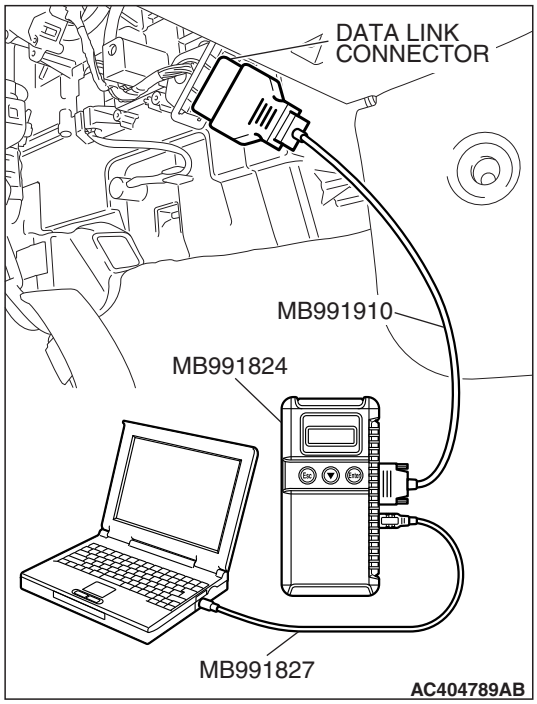
STEP 7. Recheck for diagnostic trouble code.

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 TCL/ASC-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.

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 TCL/ASC-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 TCL/ASC-ECU has ceased the CAN communication error (bus off). Then, if a penalty mode is entered after approximately five minutes, regular data transmission will be cancelled.

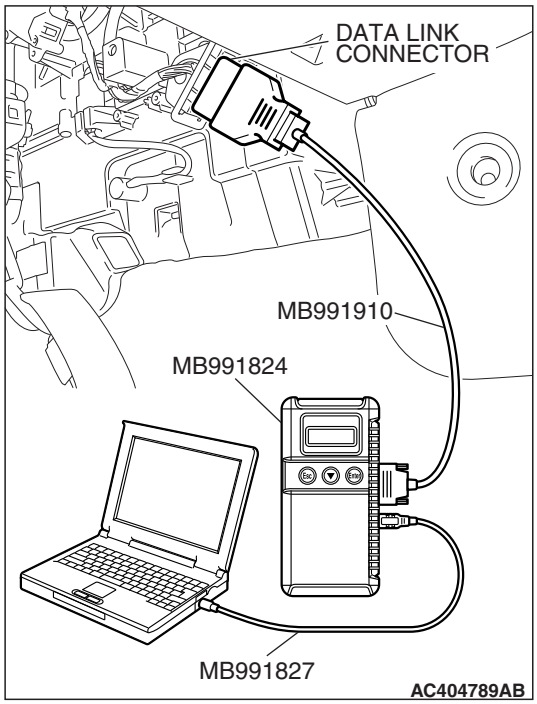
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THESE DTCS ARE TO SET ARE:)

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

DIAGNOSIS

Required Special Tools:

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



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

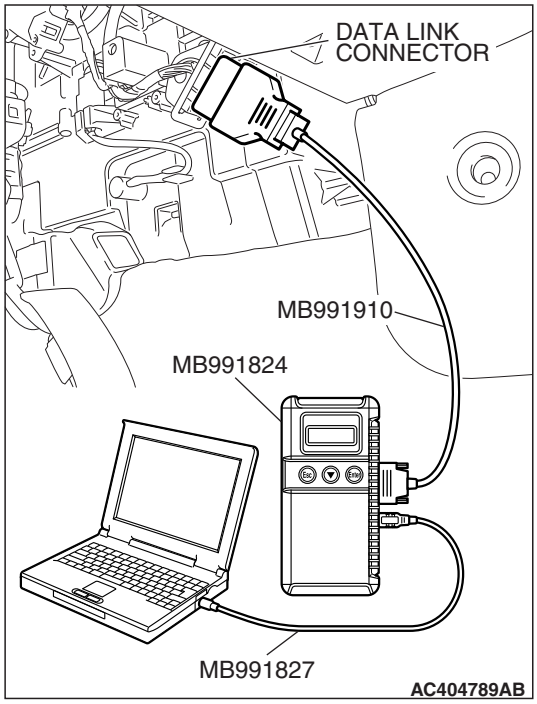
⚠ CAUTION

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-17). Then go to Step 3.

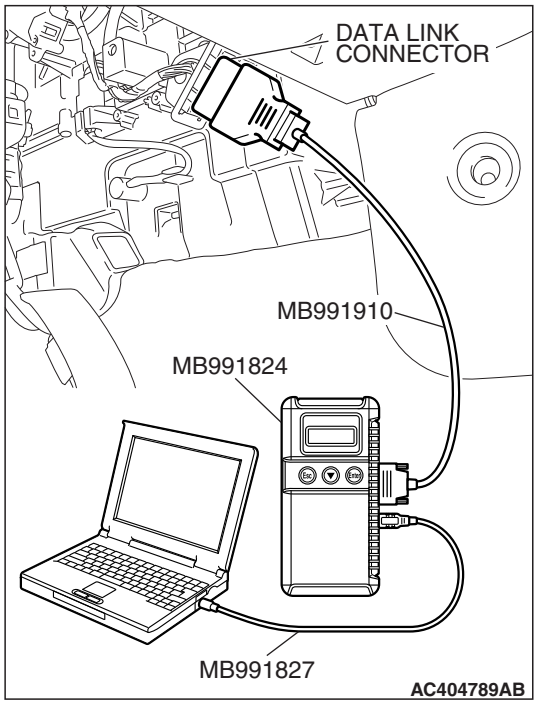


STEP 2. Recheck for diagnostic trouble code.

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 hydraulic unit (integrated with TCL/ASC - 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.

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: CAN Communications System Time Out Error Engine Related Data

⚠ CAUTION

- **If DTC U1100 is set in the TCL/ASC-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 TCL/ASC-ECU is replaced, ensure that the communication circuit is normal.**

DTC SET CONDITION

The TCL/ASC-ECU receives engine system-related signals from the ECM <M/T> or PCM <A/T> via CAN bus lines.

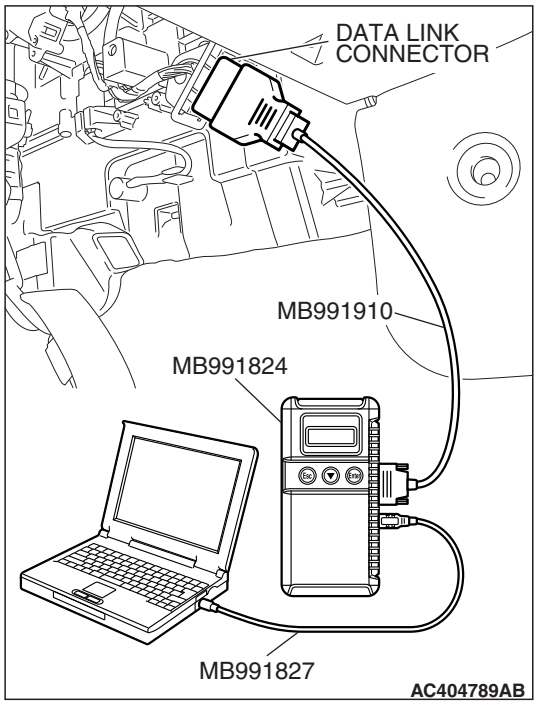
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THESE DTCS ARE TO SET ARE:)

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

DIAGNOSIS

Required Special Tools:

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



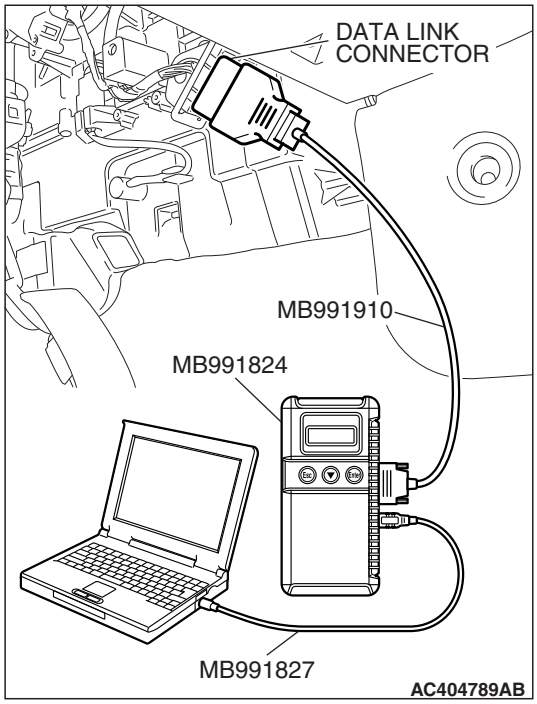
STEP 1. Using scan tool MB991958, diagnose the CAN bus line.

⚠ 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.
(5) Disconnect scan tool MB991958.

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

YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C, Diagnosis – Can Bus Diagnostic Chart P.54C-17). Then go to Step 6.



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

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

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for MFI system diagnostic trouble code. (Refer to GROUP 13A, MFI Diagnosis – Diagnostic Function – How to Read and Erase Diagnostic Trouble Code P.13A-5 <2.4L ENGINE> or GROUP 13B, MFI Diagnosis – Diagnostic Function – How to Read and Erase Diagnostic Trouble Code P.13B-6 <3.8L ENGINE>).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is any DTC set?

YES : Diagnose the MFI control system. (Refer to GROUP 13A, MFI Diagnosis – Diagnostic Trouble Code Chart P.13A-41<2.4L ENGINE> or GROUP 13B, MFI Diagnosis – Diagnostic Trouble Code Chart P.13B-43 <3.8L ENGINE>). Then go to Step 6.
NO : Go to Step 3.

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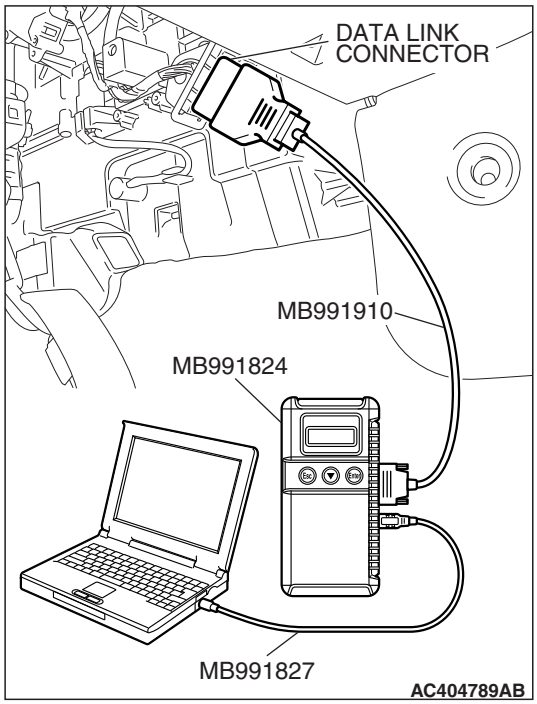


STEP 3. Using scan tool MB991958, read the diagnostic trouble code.

⚠ 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.

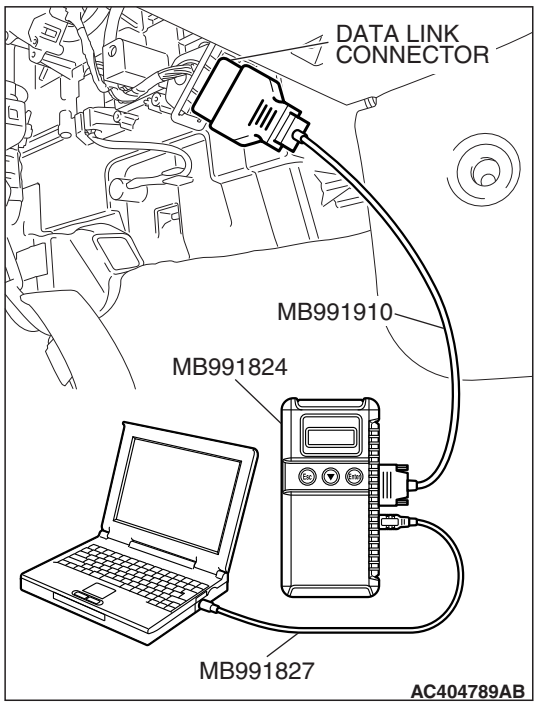
(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check if a DTC, which relates to CAN communication-linked systems below, is set.
ETACS-ECU
- DTC U1100: ECM <M/T> or PCM <A/T> time-out (related to engine). (Refer to GROUP 54B, SWS Diagnosis – 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 – Diagnosis Function – How to Read and Erase Diagnostic Trouble Code P.54A-57).

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

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) Use scan tool MB991958 to read the TCL/ASC diagnostic trouble codes. (Refer to P.35C-11).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is DTC U1100 set?

YES : Replace the ECM <M/T> or PCM <A/T>. [Refer to GROUP 13A, Engine Control Module (ECM) and Power Control Module (PCM) P.13A-1247 <2.4L ENGINE> or GROUP 13B, Engine Control Module (ECM) and Power Control Module (PCM) P.13B-1291 <3.8L ENGINE>]. 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).

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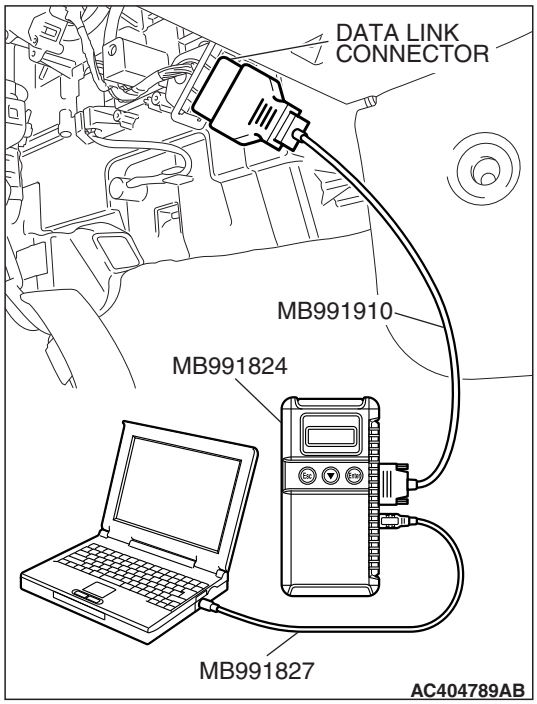


STEP 5. Using scan tool MB991958, read the diagnostic trouble code.

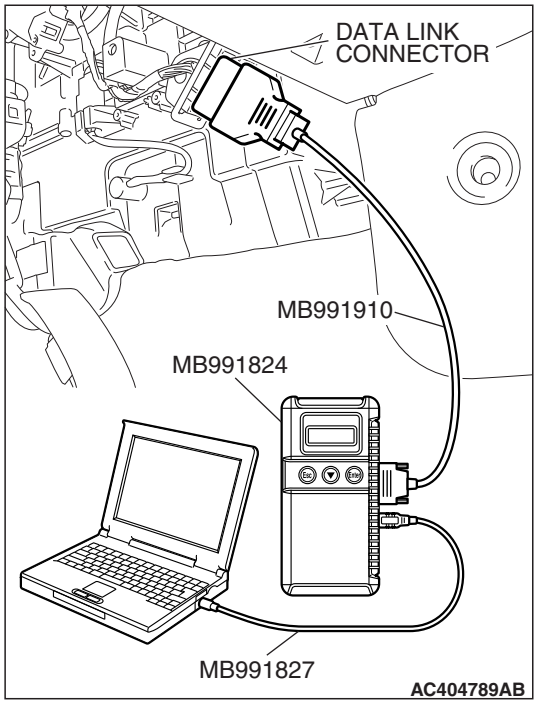
⚠ CAUTION

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) Use scan tool MB991958 to read the TCL/ASC diagnostic trouble codes. (Refer to P.35C-11).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is DTC U1100 set?

YES : Replace the hydraulic unit (integrated with TCL/ASC-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) Use scan tool MB991958 to read the TCL/ASC diagnostic trouble codes. (Refer to P.35C-11).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is DTC U1100 set?

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

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

⚠ CAUTION

- **If DTC U1101 is set in the TCL/ASC-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 TCL/ASC-ECU is replaced, ensure that the communication circuit is normal.**

DTC SET CONDITION

The TCL/ASC-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 TCL/ASC-ECU.

DIAGNOSIS

Required Special Tools:

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

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

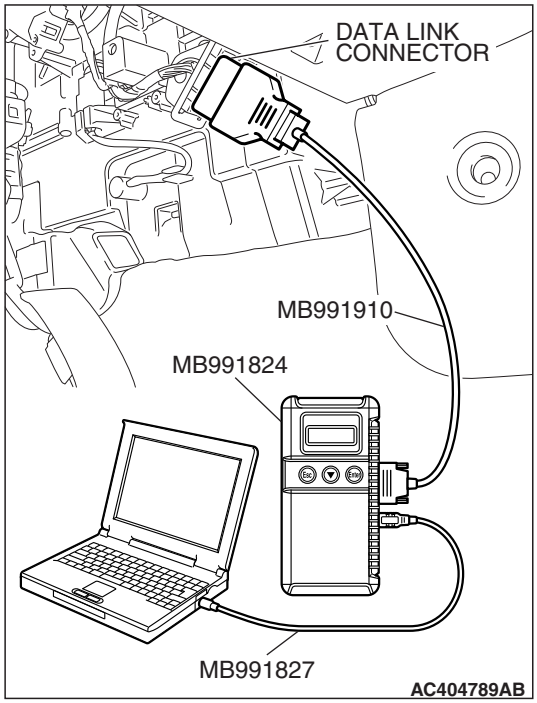
⚠ CAUTION

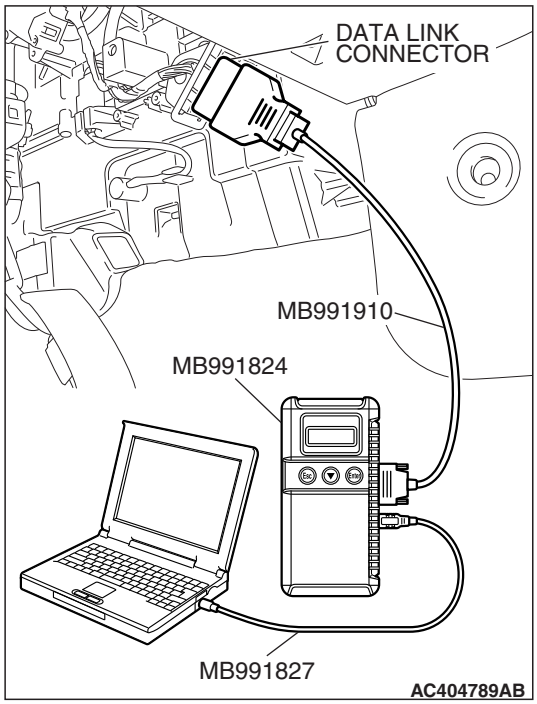
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(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.
(5) Disconnect scan tool MB991958.

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

YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C, Diagnosis – Can Bus Diagnostic Chart P.54C-17). Then go to Step 6.





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

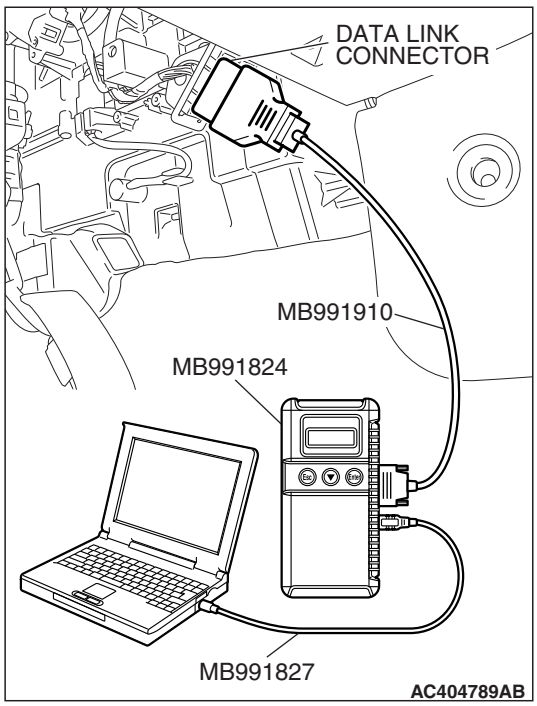
⚠ CAUTION

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

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

Q: Is any DTC set?

YES : Diagnose the automatic transaxle control system. (Refer to GROUP 23A, A/T Diagnosis – Diagnostic Trouble Code Chart P.23A-65). 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 U1101: Power train control module time-out (related to A/T). (Refer to GROUP 54B, SWS Diagnosis – General Description – Diagnostic Function – How to Read and Erase Diagnostic Trouble Code P.54B-10).

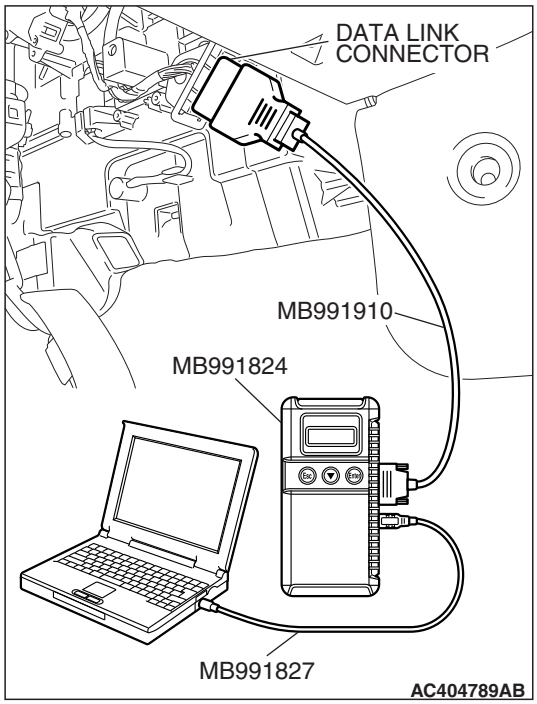
Combination meter
- DTC U1101: Power train control module time-out (related to A/T). (Refer to GROUP 54A, Combination Meter Assembly Diagnosis – Diagnosis Function – How to Read and Erase Diagnostic Trouble Code P.54A-57).

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

Q: Is DTC U1101 set?

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

TSB Revision



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

⚠ CAUTION

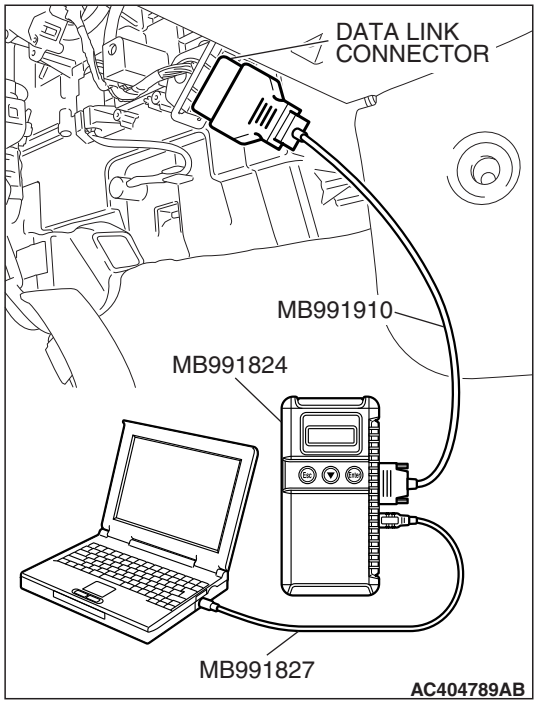
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Use scan tool MB991958 to read the TCL/ASC diagnostic trouble codes. (Refer to P.35C-11).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is DTC U1101 set?

YES : Replace the PCM. [Refer to GROUP 13A, Engine Control Module (ECM) and Power Control Module (PCM) P.13A-1247 <2.4L ENGINE> or GROUP 13B, Engine Control Module (ECM) and Power Control Module (PCM) P.13B-1291 <3.8L ENGINE>]. 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

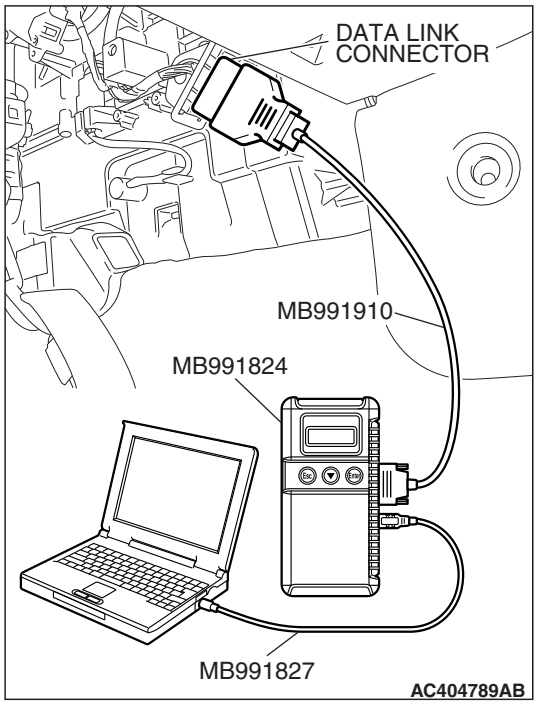
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Use scan tool MB991958 to read the TCL/ASC diagnostic trouble codes. (Refer to P.35C-11).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is DTC U1101 set?

YES : Replace the hydraulic unit (integrated with TCL/ASC-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) Use scan tool MB991958 to read the TCL/ASC diagnostic trouble codes. (Refer to P.35C-11).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is DTC U1101 set?

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

DTC U1104: SAS CAN Timeout/Not equipped

⚠ CAUTION
If DTC U1104 is set in the TCL/ASC-ECU, always diagnose the CAN bus lines.

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

CIRCUIT OPERATION

The TCL/ASC-ECU and the steering wheel sensor are connected each other via a CAN bus line, and the sensor sends the steering wheel angle information to the ECU.

TCL/ASC DTC SET CONDITIONS

Current trouble

- Connector(s) or wiring harness in the CAN bus lines between the TCL/ASC-ECU and the steering wheel sensor, the power supply system to the steering wheel sensor, the steering wheel sensor itself, or the TCL/ASC-ECU may be defective.

Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness in the CAN bus lines between the steering wheel sensor and the TCL/ASC-ECU, and the power supply system to the steering wheel sensor. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-16).

  NOTE: For a past trouble, you may not find it by the M.U.T.-III CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-14. and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the DTC, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54C, CAN bus line Diagnostics Flow P.54C-10).

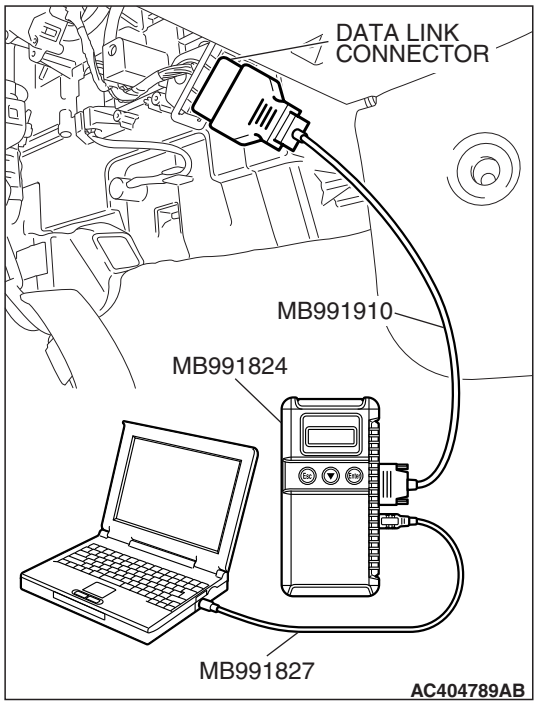
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THESE DTCS ARE TO SET ARE:)

- The CAN bus line is defective.
- Malfunction of the hydraulic unit (integrated with TCL/ASC-ECU)
- Malfunction of the steering wheel sensor

DIAGNOSIS

Required Special Tools:

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



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

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 "ON" position.
(3) Diagnose the CAN bus line.

Q: Is the check result satisfactory?

YES : Go to Step 2.
NO : Repair the CAN bus lines (Refer to GROUP 54C, Diagnosis-Can Bus Diagnostic Chart P.54C-17orP.54C-17). On completion, go to Step 6.

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

Check if a steering wheel sensor DTC is set.

Q: Is the DTC set?

YES : Diagnose the steering wheel sensor by referring to P.35C-14. Then go to Step 6.
NO : Go to Step 3.

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

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

Engine control module (ECM) <M/T> or power train control module (PCM) <A/T>

- DTC U1102: TCL/ASC-ECU time-out

Combination meter

- DTC U1102: TCL/ASC-ECU time-out

Q: Is the DTC set?

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

STEP 4. Recheck for diagnostic trouble code.

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

Q: Is the check result satisfactory?

YES : A poor connection, open circuit or other intermittent malfunction is present in the CAN bus lines between the steering wheel sensor and the TCL/ASC-ECU (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-14).
NO : Replace hydraulic unit (integrated with TCL/ASC-ECU) and then go to Step 6 .

STEP 5. Recheck for diagnostic trouble code.

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

Q: Is the check result satisfactory?

YES : A poor connection, open circuit or other intermittent malfunction is present in the CAN bus lines between the steering wheel sensor and the TCL/ASC-ECU (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-14).
NO : Replace steering wheel sensor and then go to Step 6.

STEP 6. Recheck for diagnostic trouble code.

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

Q: Is the check result satisfactory?

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

DTC U1120: CAN Communications System TCL Uncontrollable by Engine Malfunction

⚠ CAUTION

- **If DTC U1120 is set in the TCL/ASC-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 TCL/ASC-ECU is replaced, ensure that the communication circuit is normal.**
- **The engine control system-related DTC may be set when DTC U1120 is set. Diagnose the engine control system first when the engine control system-related DTC is set.**

DTC SET CONDITION

The TCL/ASC-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 ECM <M/T> or PCM <A/T>, DTC U1120 will be stored.

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

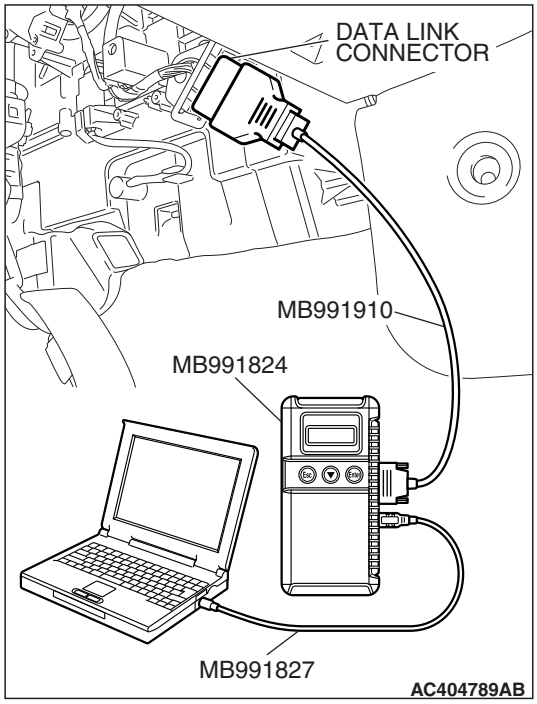
- Damaged harness or connector.
- Malfunction of the ECM <M/T> or PCM <A/T>.
- Malfunction of the TCL/ASC-ECU.

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-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.

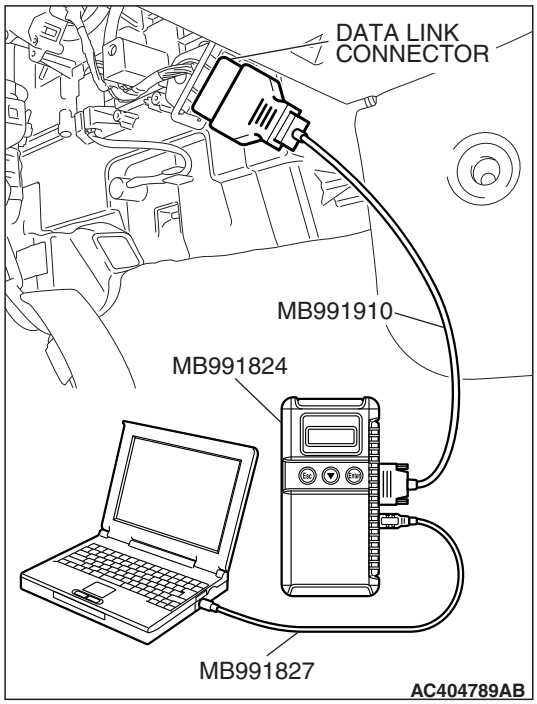
(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for MFI system diagnostic trouble code. (Refer to GROUP 13A, MFI Diagnosis – Diagnostic Function – How to Read and Erase Diagnostic Trouble Code P.13A-5<2.4L ENGINE> or GROUP 13B, MFI Diagnosis – Diagnostic Function – How to Read and Erase Diagnostic Trouble Code P.13B-6<3.8L ENGINE>).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is any DTC set?

YES : Diagnose the MFI control system. (Refer to GROUP 13A, MFI Diagnosis – Diagnostic Trouble Code Chart P.13A-41<2.4L ENGINE> or GROUP 13B, MFI Diagnosis – Diagnostic Trouble Code Chart P.13B-43 <3.8L ENGINE>). Then go to Step 6.

NO : Go to Step2.

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



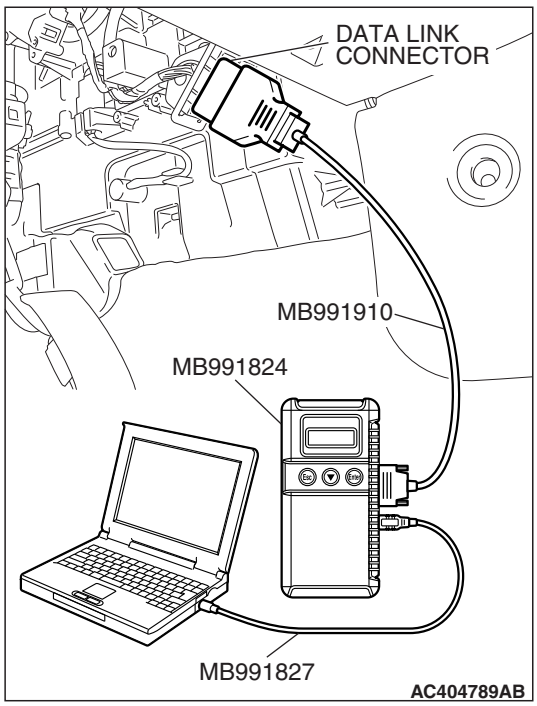
⚠ CAUTION
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(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.
(5) Disconnect scan tool MB991958.

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

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54C, Diagnosis – Can Bus Diagnostic Chart P.54C-17). Then go to Step 6.

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



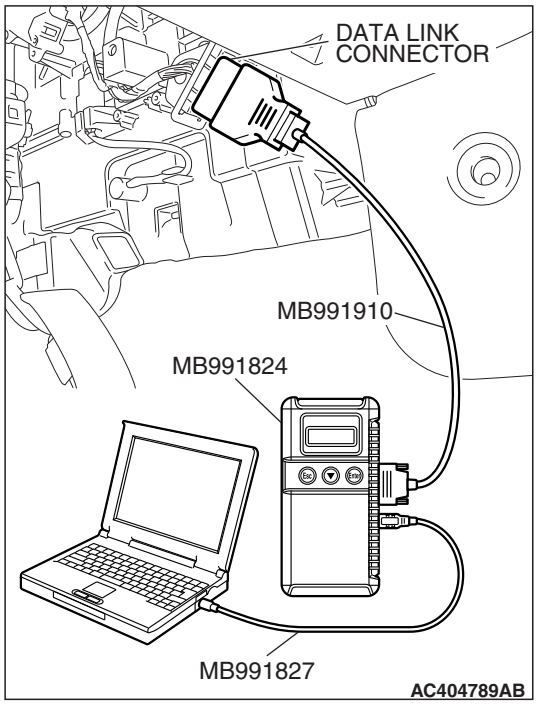
⚠ CAUTION
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check if a DTC, which relates to CAN communication-linked systems below, is set.
A/C-ECU
- DTC U1120: Failure Information on ECM <M/T> or PCM <A/T> (Related to engine). (Refer to GROUP 55A, Manual A/C Diagnostic – Diagnosis Function – How to Read and Erase Diagnostic Trouble Code P.55A-6) <Vehicle with manual A/C> or (Refer to GROUP 55B, Auto A/C Diagnosis – Diagnostic Function – How to Read and Erase Diagnostic Trouble Code P.55B-4) <Vehicle with auto A/C>.

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

Q: Is DTC U1120 set?

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



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

⚠ CAUTION

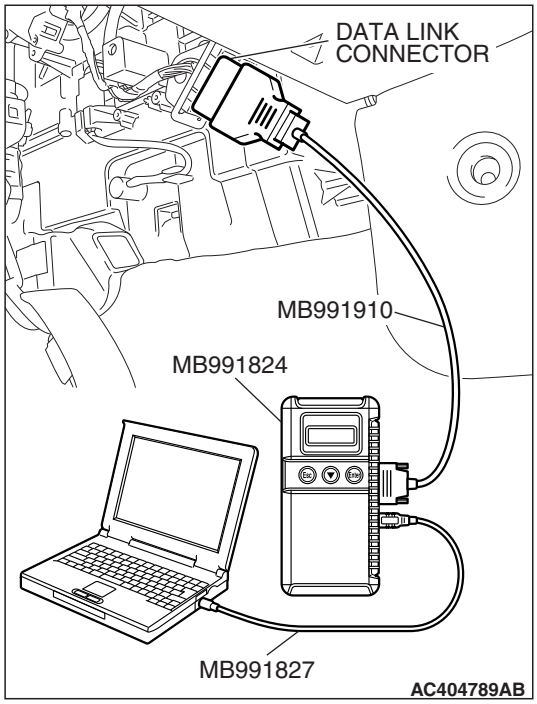
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Use scan tool MB991958 to read the TCL/ASC diagnostic trouble codes. (Refer to P.35C-11).
(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 13A, Engine Control Module (ECM) and Power Control Module (PCM) P.13A-1247 <2.4L ENGINE> or GROUP 13B, Engine Control Module (ECM) and Power Control Module (PCM) P.13B-1291 <3.8L ENGINE>]. 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

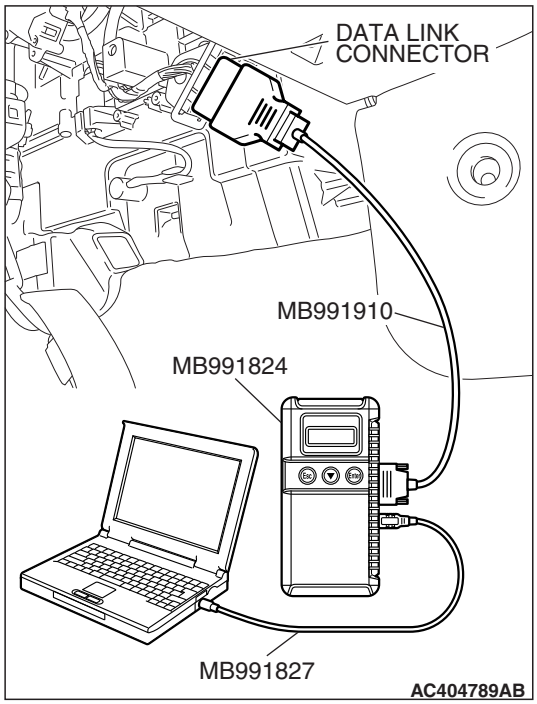
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Use scan tool MB991958 to read the TCL/ASC diagnostic trouble codes. (Refer to P.35C-11).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is DTC U1120 set?

YES : Replace the hydraulic unit (integrated with TCL/ASC-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) Use scan tool MB991958 to read the TCL/ASC diagnostic trouble codes. (Refer to P.35C-11).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is DTC U1120 set?

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

DIAGNOSTIC TROUBLE CODE PROCEDURES <STEERING WHEEL SENSOR>

DTC C1551: Hall-IC output voltage
DTC C1552: Hall-IC output pattern
DTC C1553: Optical sensor
DTC C1554: Speed sensor is out of range
DTC C1555: Steering angle SNS. out of range
DTC C1608: EEPROM 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.

⚠ CAUTION
If these DTCs has been set, TCL/ASC-ECU related DTC C1506 is also set. After these DTCs has been diagnosed, don't forget to erase DTC C1506.

CIRCUIT OPERATION

- The steering wheel sensor is energized via the ignition switch, and communicates the TCL/ASC-ECU via a CAN bus-line.
- The steering wheel sensor has a self-diagnosis function and a memory function. If the diagnosis function finds a trouble, it sends these DTC codes to the TCL/ASC-ECU. Then the ECU will illuminate the TCL/ASC indicator light. At this time, the TCL/ASC-ECU sets DTC No. C1506 (Steering angle sensor error).

TCL/ASC DTC SET CONDITIONS

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

DTC C1551: Hall-IC output voltage
- The Hall cell sends incorrect voltage signal for at least one second.

DTC C1552: Hall-IC output pattern
- Invalid Hall cell pattern fluctuates at least once.

DTC C1553: Optical sensor
- The optical sensor output is invalid.

DTC C1554: Speed sensor is out of range
- The sensor speed is 25°/10 ms or more.

DTC C1555: Steering angle SNS. out of range
- The sensor is out of a predetermined operation range.

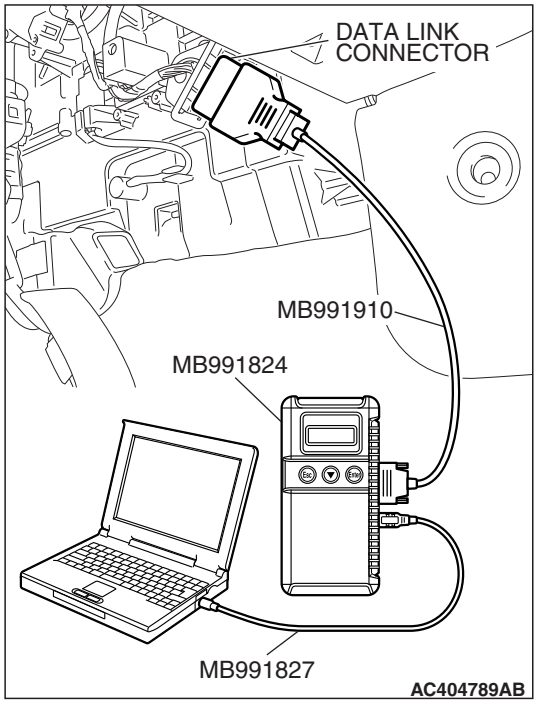
DTC C1608: EEPROM failure
- The sensor detects an EEPROM error.

TROUBLESHOOTING HINTS (The most likely causes for these DTCs are to set are:)

Malfunction of the steering wheel sensor

DIAGNOSIS

Required Special Tools:
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A



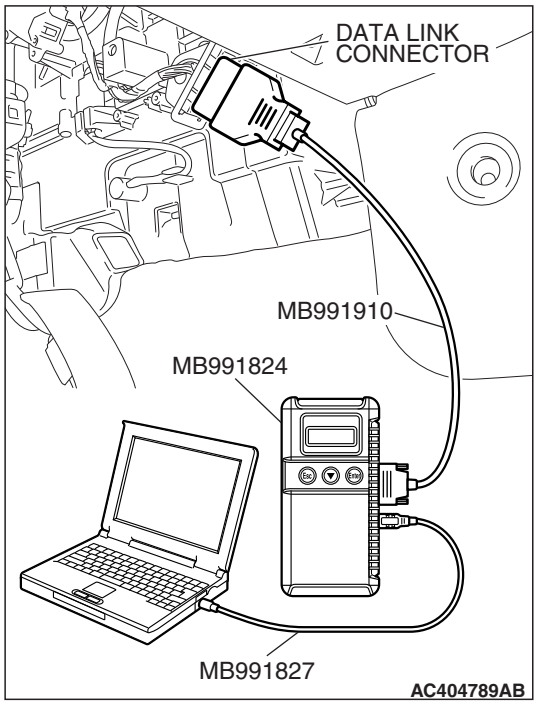
STEP 1. Using scan tool MB991958, diagnose the CAN bus line.

⚠ 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-17). Then go to Step 2.



STEP 2. Recheck for steering wheel sensor 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 C1551, C1552, C1553, C1554, C1555 or C1608 set?

YES : Replace steering wheel sensor.
NO : The procedure is complete.

DTC U1073: Bus off

⚠ CAUTION

- **If DTC U1073 is set in the steering wheel sensor, 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.**

⚠ CAUTION

If DTC U1073 has been set, TCL/ASC-ECU related DTC C1506 is also set. After DTC U1073 has been diagnosed, don't forget to erase DTC C1506.

TROUBLE JUDGMENT

This code is stored when the steering wheel sensor has ceased the CAN communication error (bus off). Then, if a penalty mode is entered after approximately five minutes, regular data transmission 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 TCL/ASC-ECU)

DIAGNOSIS

Required Special Tools:

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

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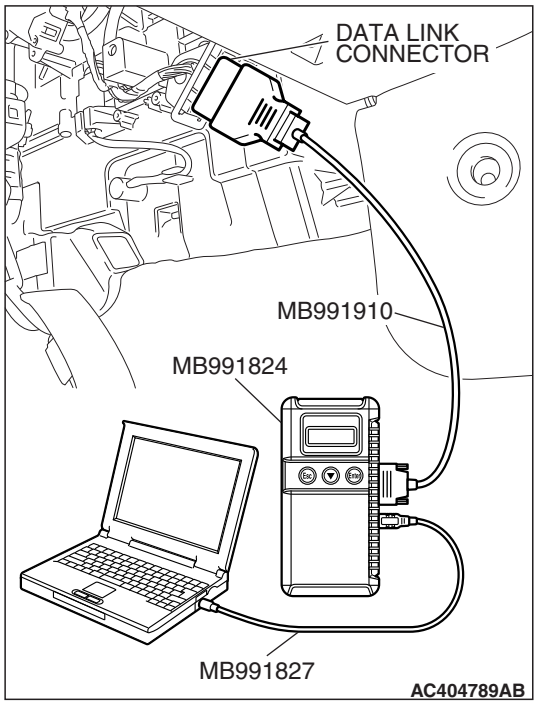


STEP 1. Using scan tool MB991958, diagnose the CAN bus line.

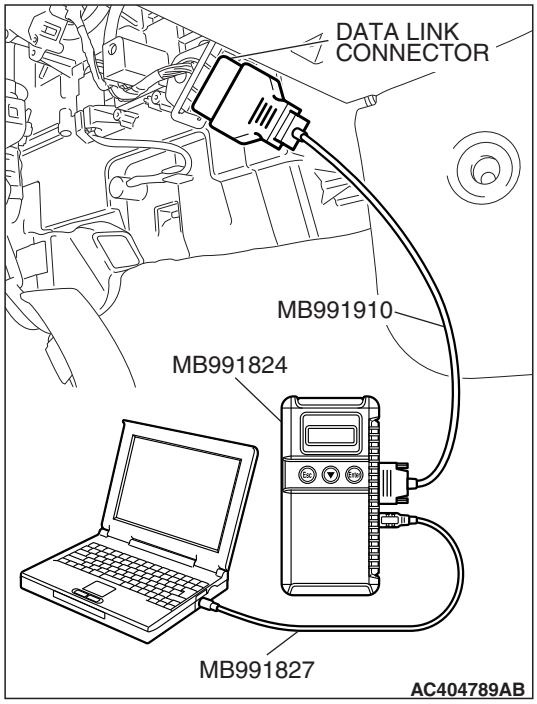
⚠ CAUTION

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-17). Then go to Step 3.

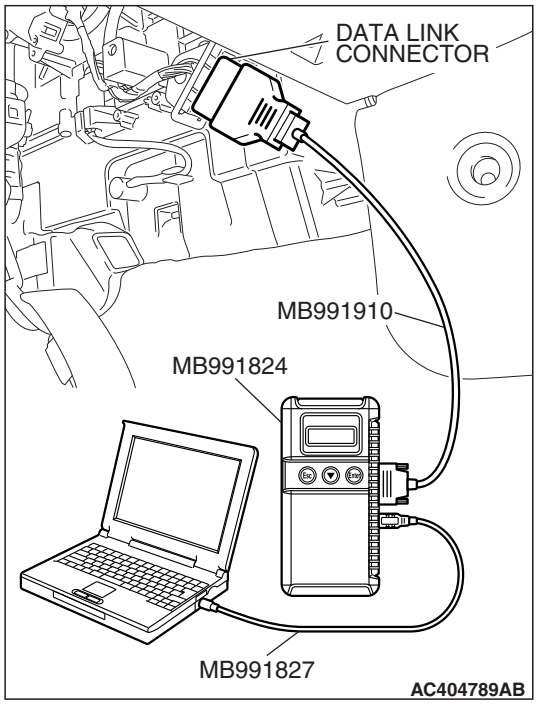


STEP 2. Recheck for diagnostic trouble code.

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 steering wheel sensor. 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.

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.

SYMPTOM CHART

M1355006900350

SYMPTOM		INSPECTION PROCEDURE NO.	REFERENCE PAGE
Communication with scan tool is not possible	Communication with all systems is impossible	-	Refer to GROUP 54C – Troubleshooting P.54C-17.
	Communication with the TCL/ASC-ECU only is impossible	1	P.35C-180
	Communication with the steering wheel sensor only is impossible	2	P.35C-183
TCL/ASC-ECU power supply circuit system		3	P.35C-187
Steering wheel sensor power supply circuit system		4	P.35C-194
When the ignition switch is turned to the "ON" position (engine stopped), the ASC OFF indicator dose not illuminate.		5	P.35C-200
When the ignition switch is turned to the "ON" position (engine stopped), the TCL/ASC work indicator dose not illuminate.		6	
The ASC OFF indicator remains illuminated after the engine is started.		7	
The TCL/ASC work indicator remains illuminated after the engine is started.		8	
When the ASC OFF switch is push on, ASC system does not be cancelled.		9	P.35C-205
TCL/ASC system dose not operate.		10	P.35C-211

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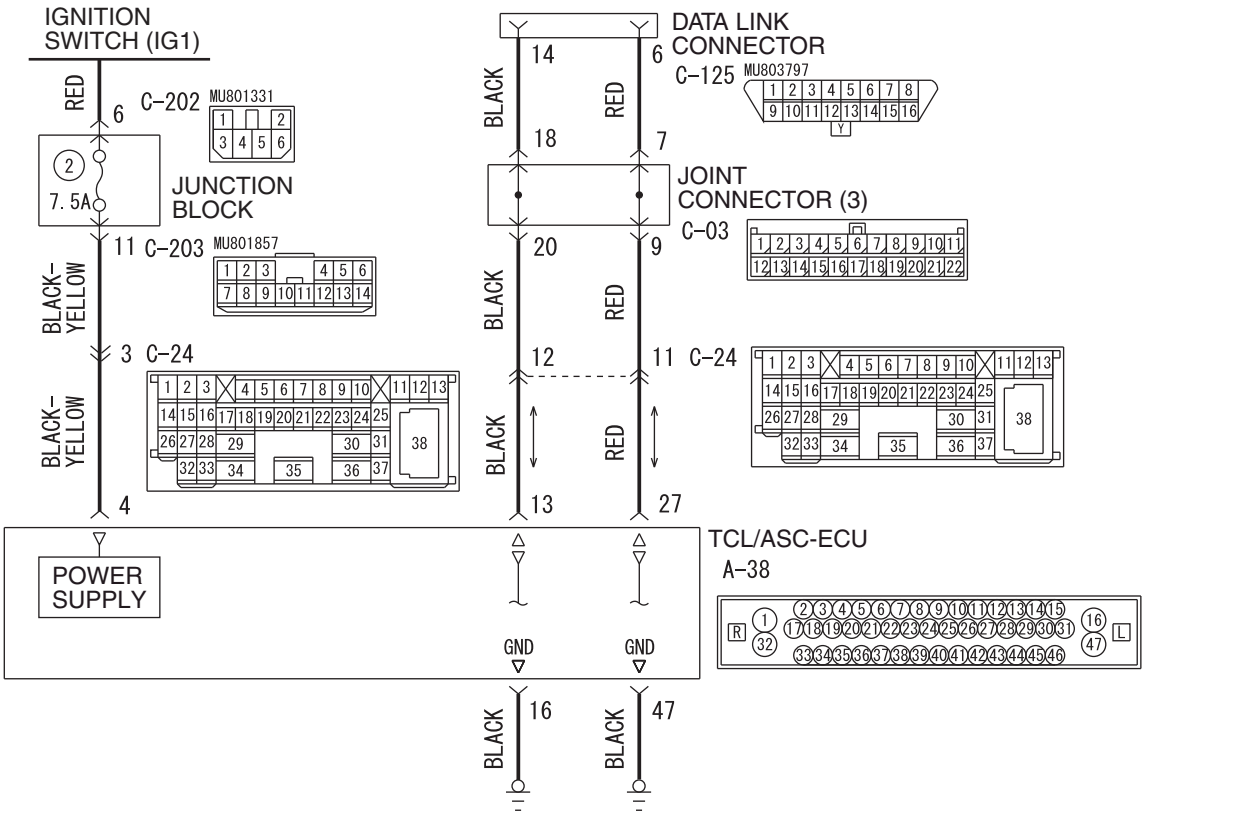
SYMPTOM PROCEDURES

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

Data Link Connector Circuit <ECLIPSE>



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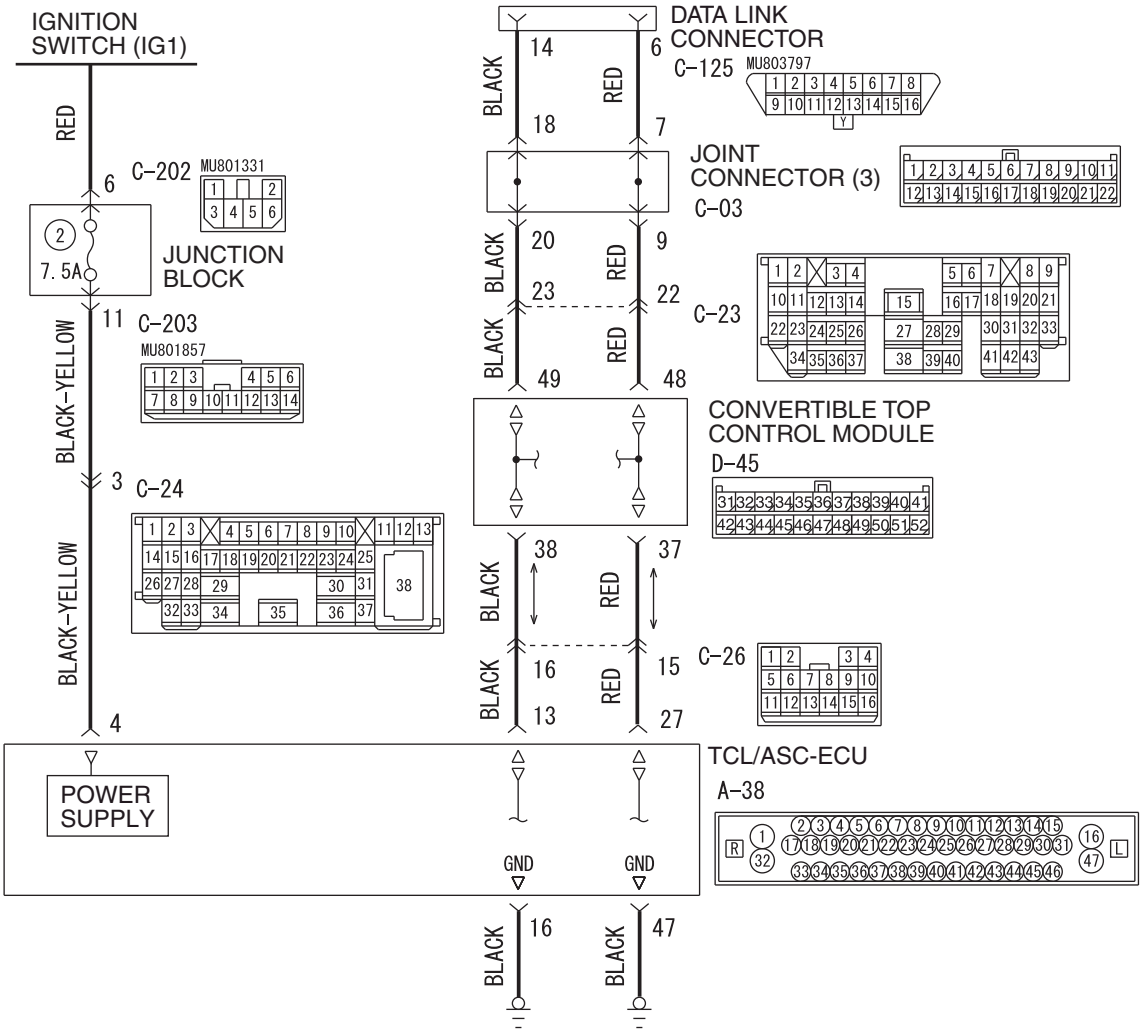
Data Link Connector Circuit <ECLIPSE SPYDER>



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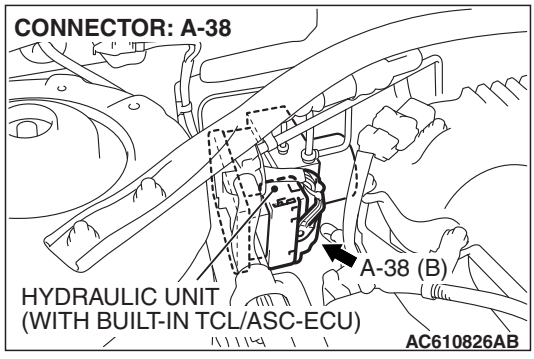

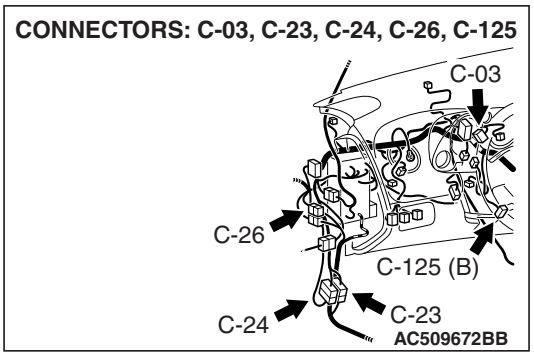

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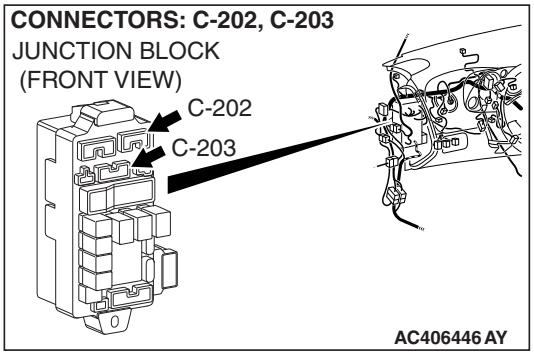
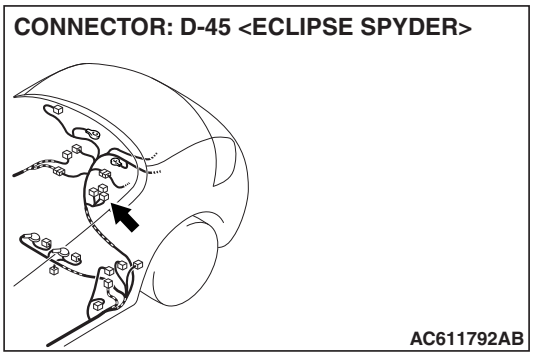




TECHNICAL DESCRIPTION (COMMENT)

If the scan tool (M.U.T.-III Sub Assembly) can not communicate with the ABS system, the CAN bus lines may be defective. If the ABS system does not work, the TCL/ASC-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 TCL/ASC-ECU)

DIAGNOSIS

Required Special Tools:

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

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

⚠ CAUTION

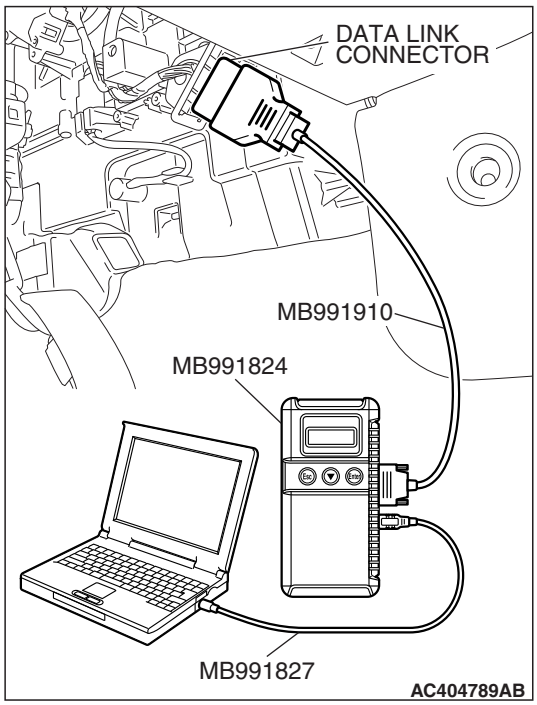
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

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?

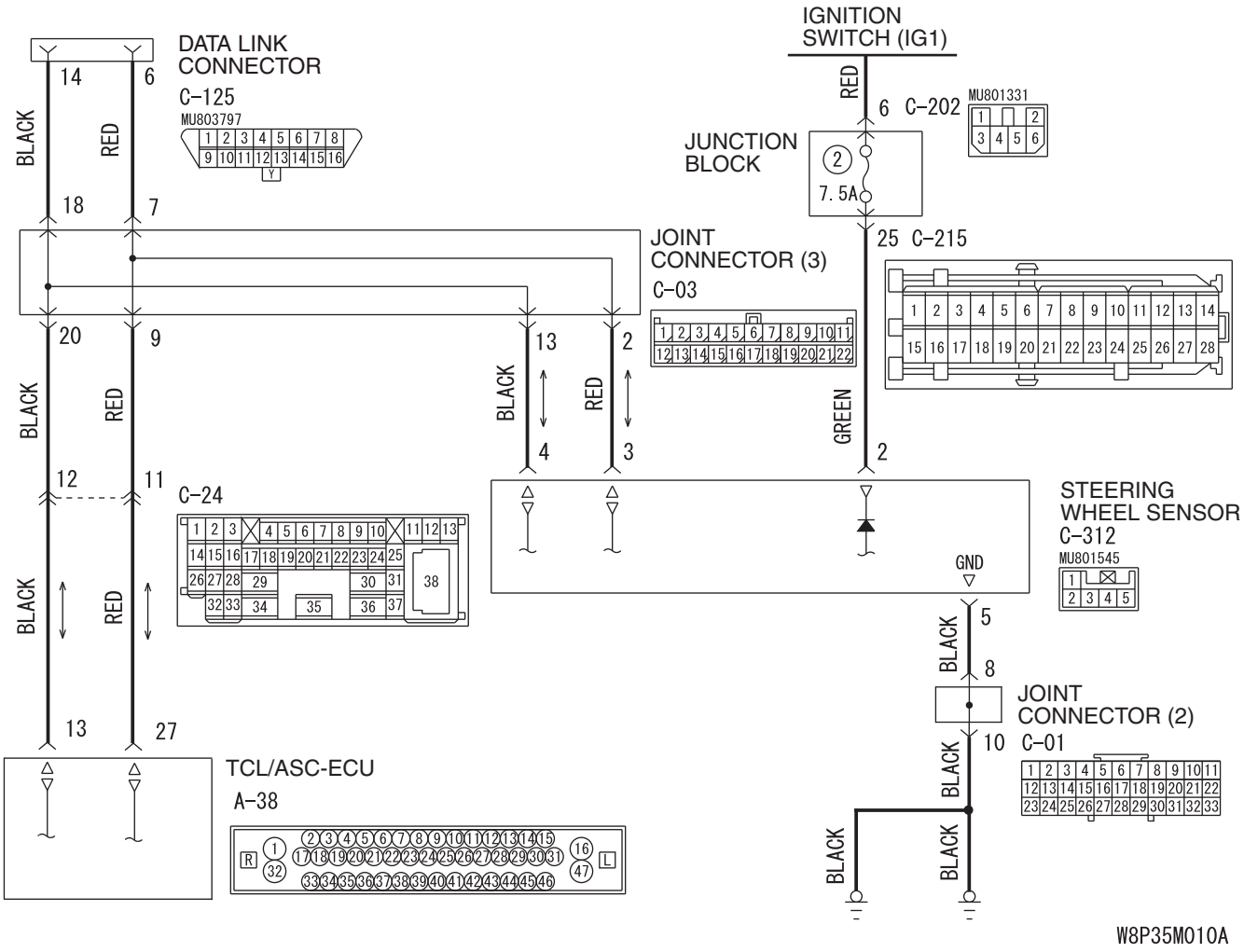
YES : Check and repair the power supply circuit system.
NO : Repair the CAN bus lines (Refer to GROUP 54C, Diagnosis-Can Bus Diagnostic Chart P.54C-17).



TSB Revision

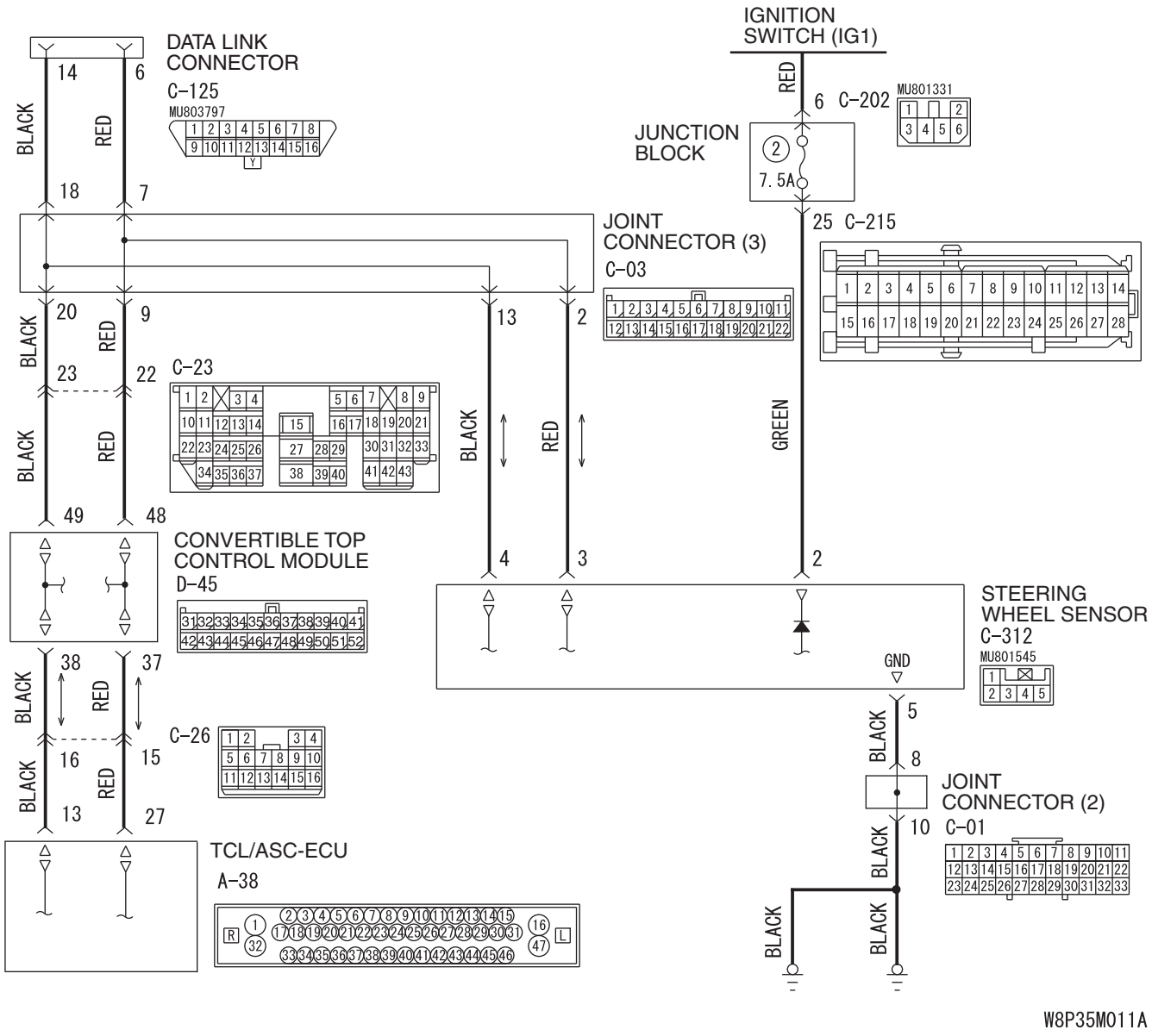
INSPECTION PROCEDURE 2: Communication between Scan Tool and the steering wheel sensor is not possible.

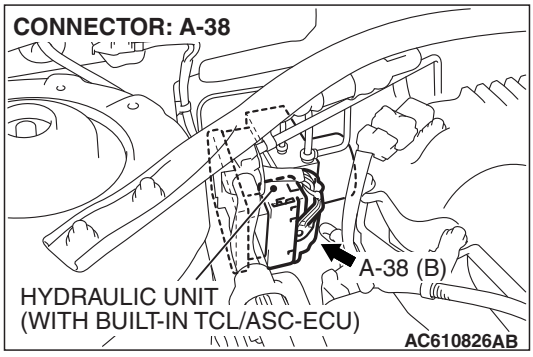
Data Link Connector Circuit <ECLIPSE>

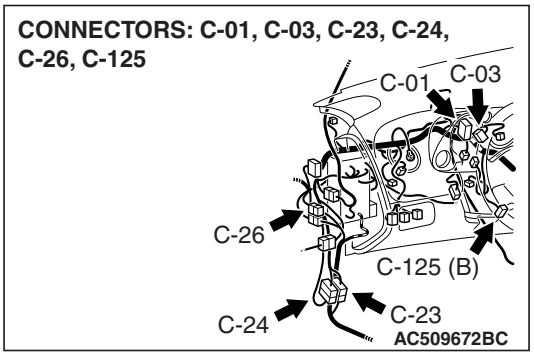


TSB Revision

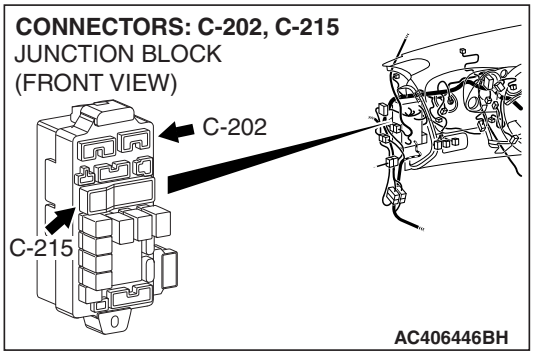
Data Link Connector Circuit <ECLIPSE SPYDER>

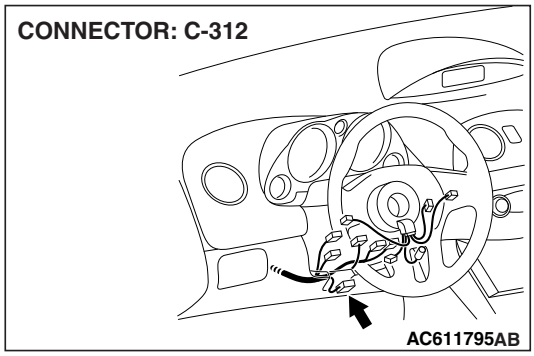


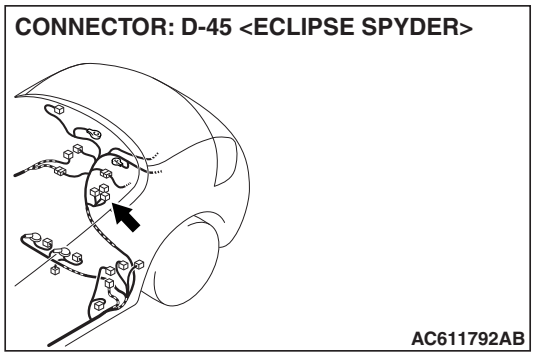




TSB Revision







TECHNICAL DESCRIPTION (COMMENT)

If the scan tool (M.U.T.-III Sub Assembly) can not communicate with the steering wheel sensor, the CAN bus lines may be defective. If the ASC system does not work, the steering wheel sensor or its power supply circuit may be defective.

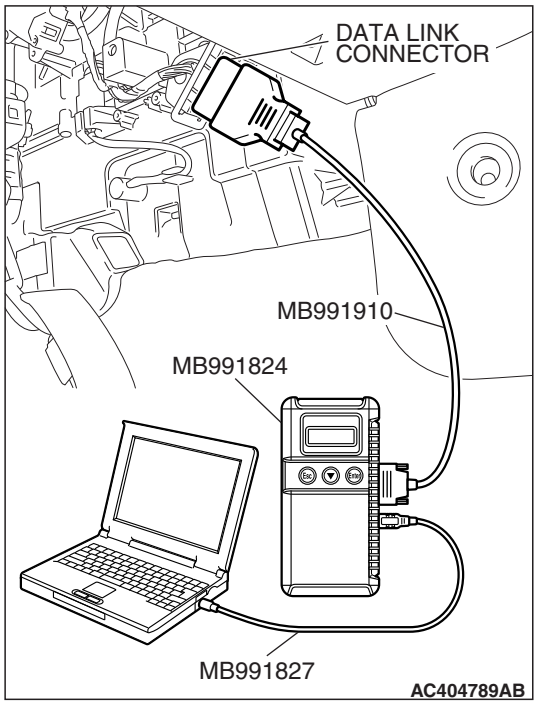
TROUBLESHOOTING HINTS (The most likely causes for this case:)

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

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-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.

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.

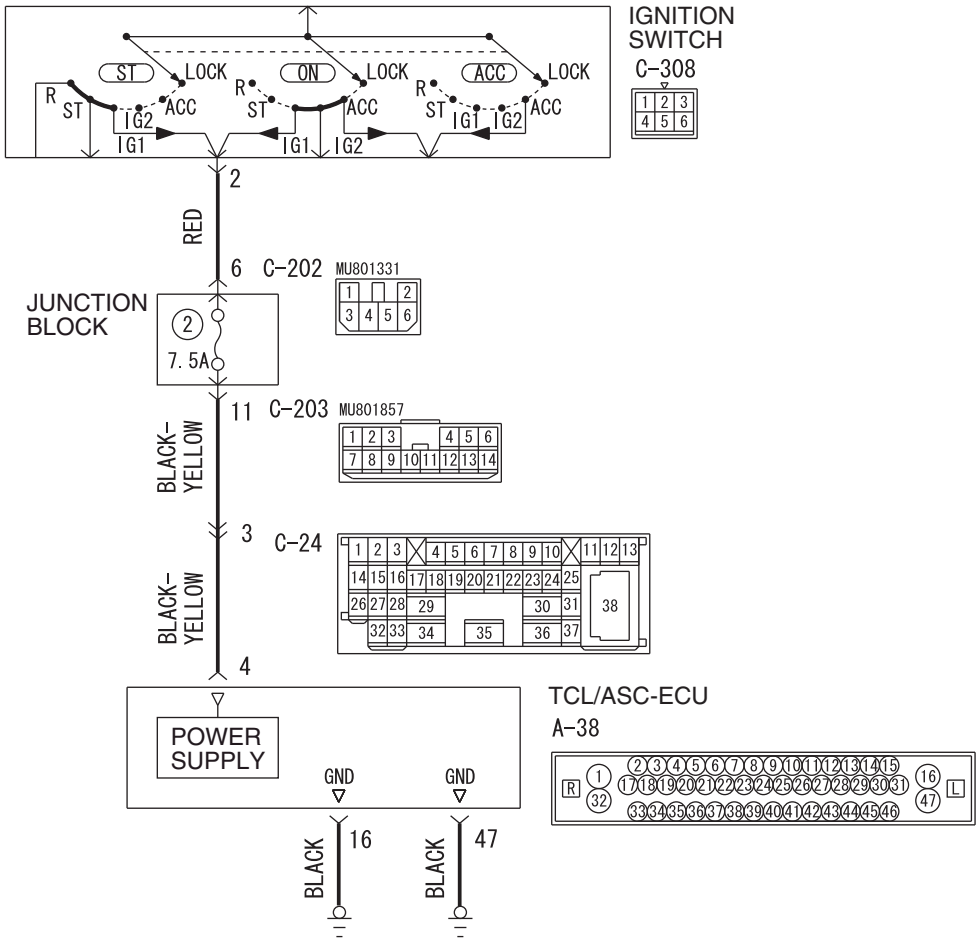
Q: Is the check result satisfactory?

YES : Check and repair the power supply circuit system (Refer to P.35C-194).

NO : Repair the CAN bus lines (Refer to GROUP 54C, Diagnosis-Can Bus Diagnostic Chart P.54C-17).

INSPECTION PROCEDURE 3: TCL/ASC-ECU power supply circuit system

TCL/ASC-ECU Power Supply and Ground Circuit



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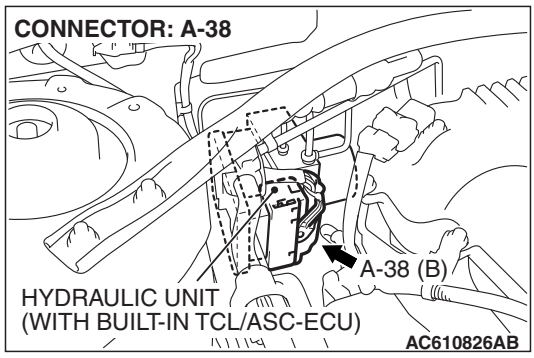

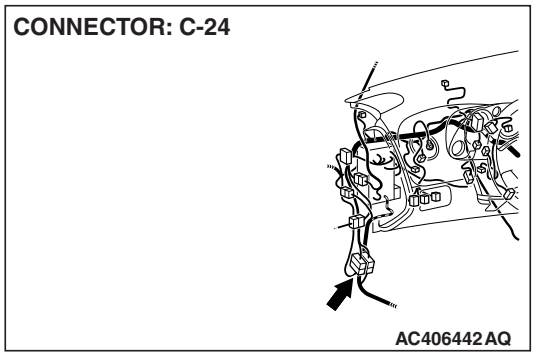

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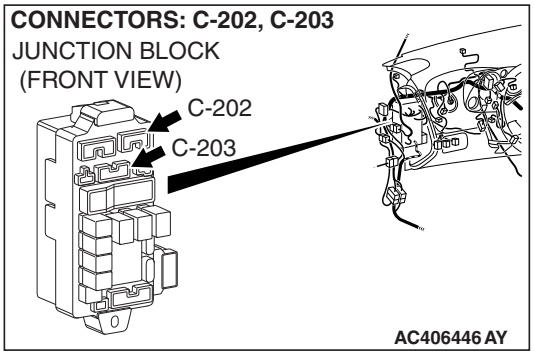
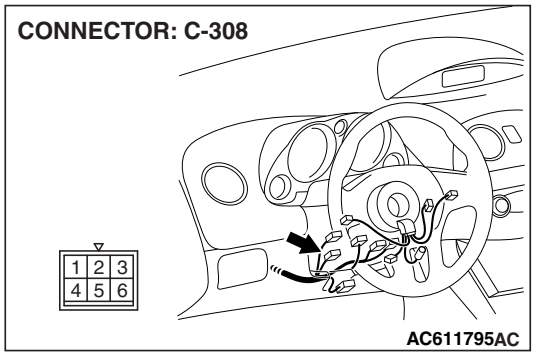




CIRCUIT OPERATION

- The TCL/ASC-ECU is energized by the ignition switch (IG1) through multi-purpose fuse No.2 and the TCL/ASC-ECU terminal 4.
- If the power supply to the TCL/ASC-ECU has failed, scan tool MB991958 will not be able to communicate with it.

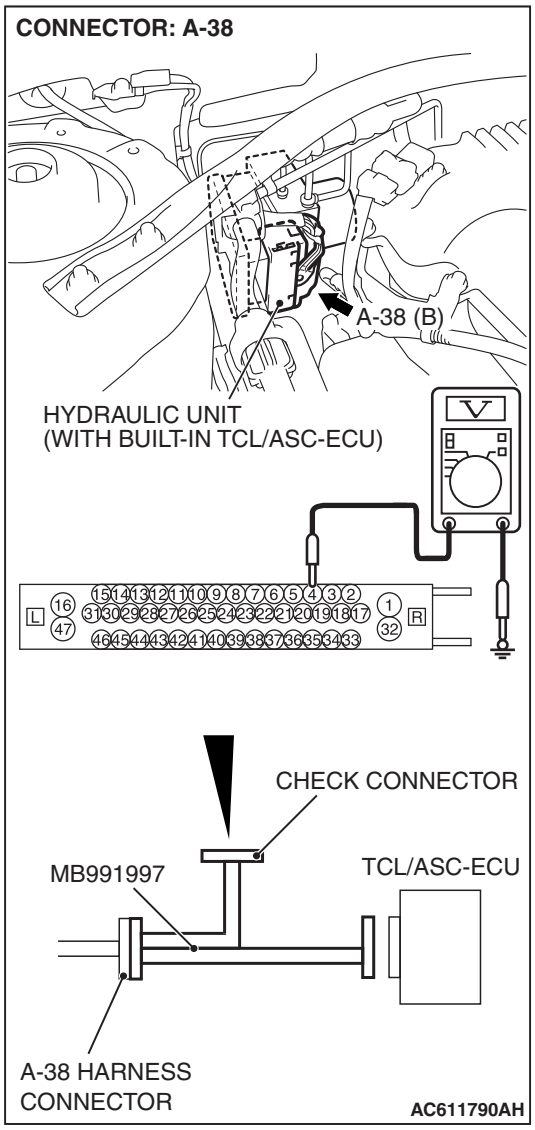
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

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

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A
- MB991997: ASC Check Harness



STEP 1. Measure the voltage at TCL/ASC-ECU connector A-38.

(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

NOTE: Do not connect special tool MB991997 to the TCL/ASC-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).

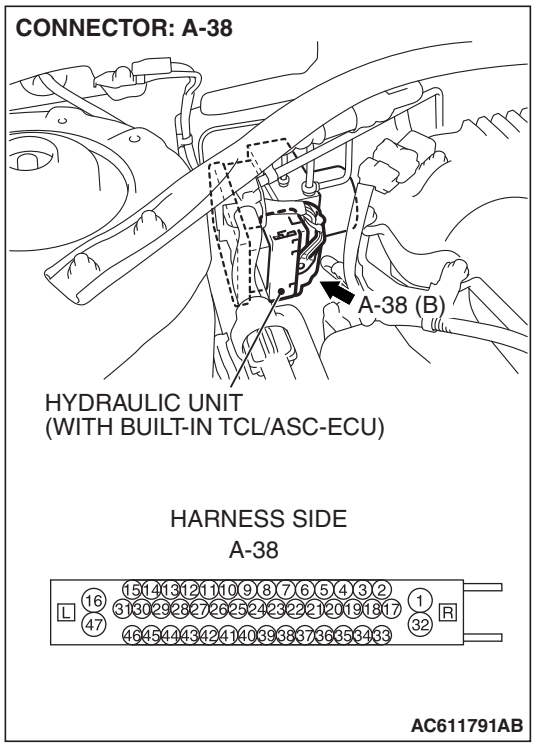
Q: Is battery positive voltage (approximately 12 volts) present?

YES : Go to Step 3.

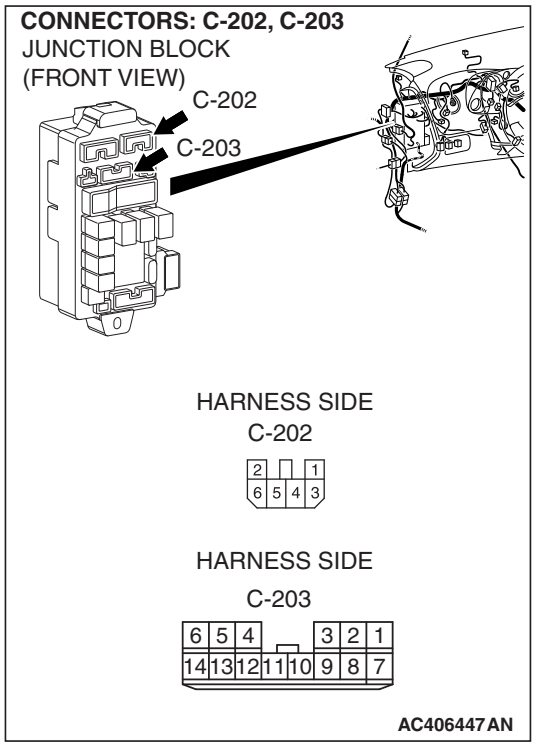
NO : Go to Step 2.

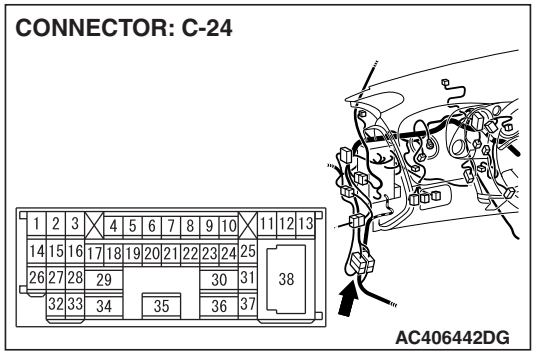
STEP 2. Check the following connectors.

- TCL/ASC-ECU connector A-38

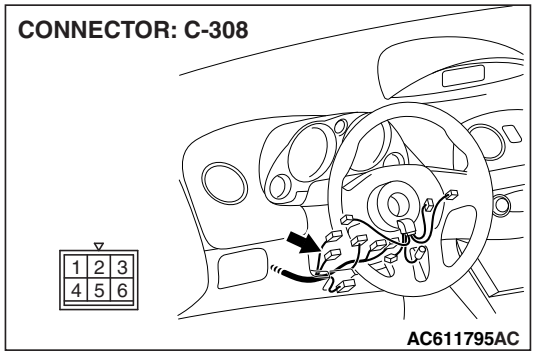


- Junction block connectors C-202 and C-203





- Intermediate connector C-24



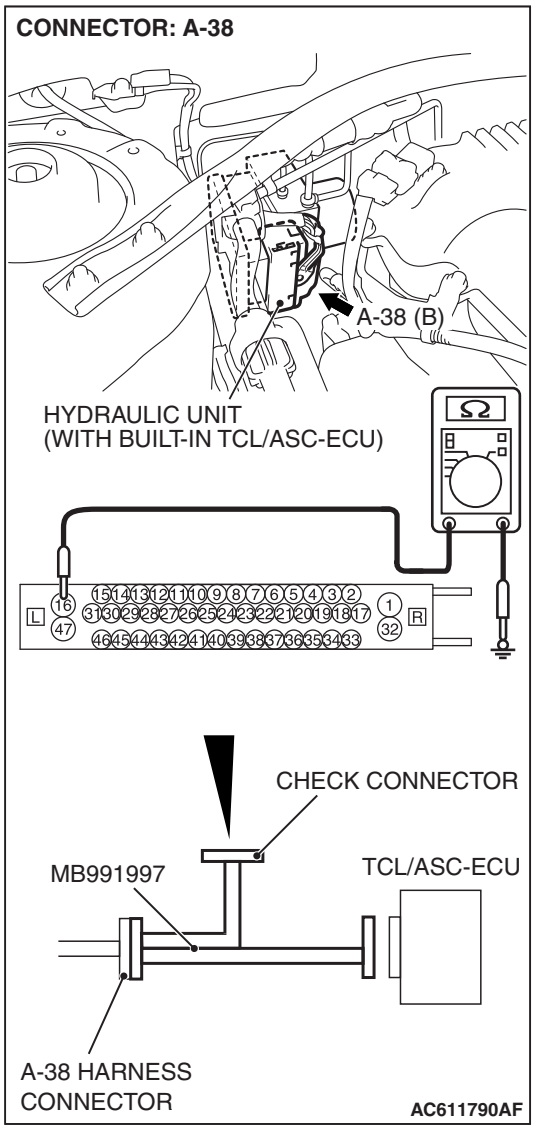
- Ignition switch connector C-308

Check the connectors, for loose, corroded or damaged terminals, or terminals pushed back in the connector.

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 TCL/ASC-ECU. Repair the wiring harness between TCL/ASC-ECU connector A-38 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 3. Measure the resistance at TCL/ASC-ECU connector A-38.

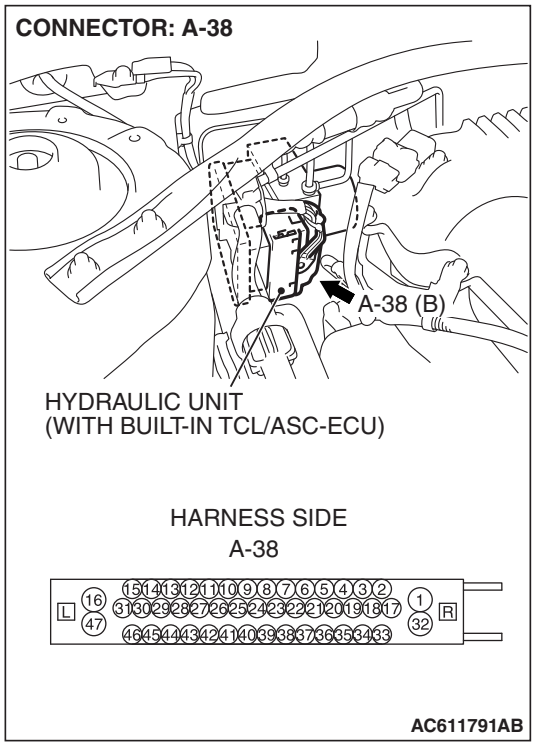
(1) Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

NOTE: Do not connect special tool MB991997 to the TCL/ASC-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 TCL/ASC-ECU connector A-38 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : An open circuit may be present in the ground circuit. Repair the wiring harness between TCL/ASC-ECU connector A-38 terminals 16, 47 and the body ground. 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 5. Check the battery.

Check the battery (Refer to GROUP 54A, Battery test P.54A-7).

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.16-3).

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 TCL/ASC-ECU communicate with the scan tool (M.U.T.-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 TCL/ASC-ECU. Then go to Step 8.

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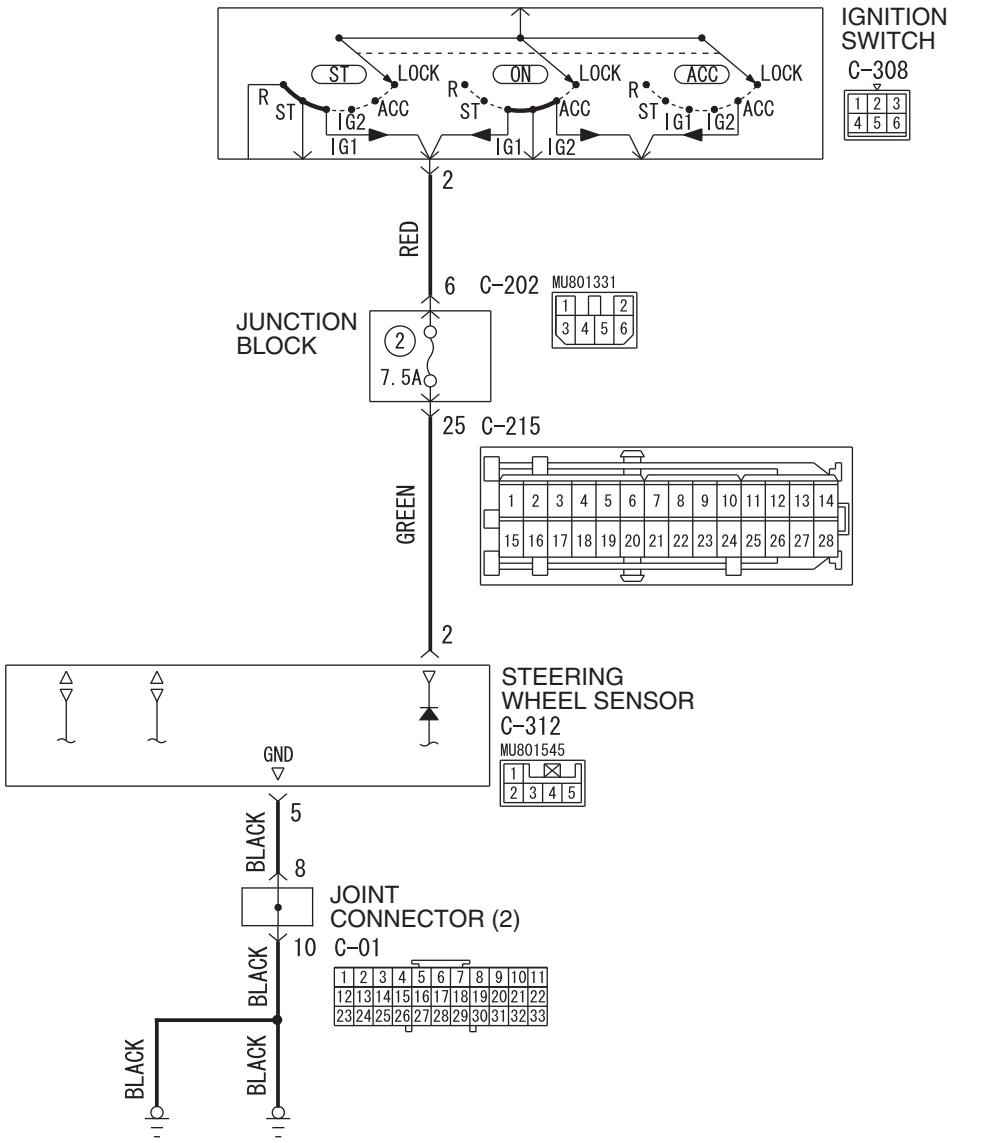
STEP 8. Retest the system.

Q: Can the TCL/ASC-ECU communicate with the scan tool (M.U.T.-III Sub Assembly)?

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

INSPECTION PROCEDURE 4: Steering wheel sensor power supply circuit system

Steering Wheel Sensor Power Supply Circuit



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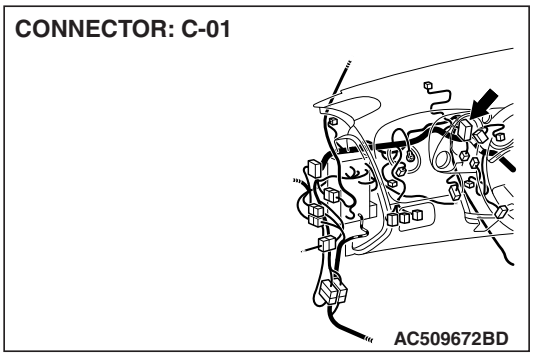
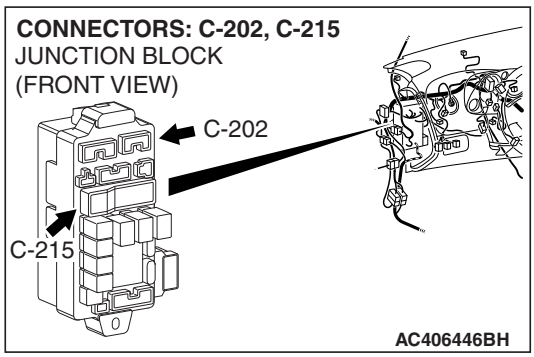
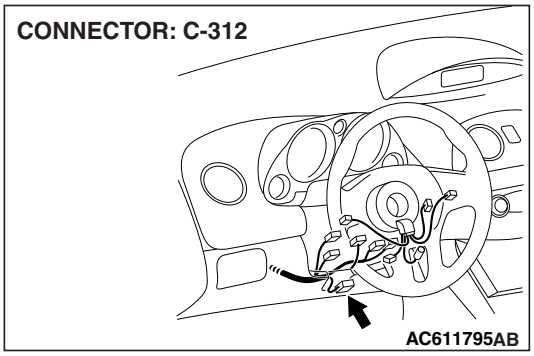
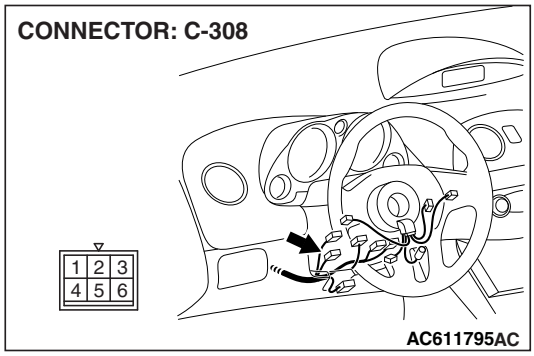








CIRCUIT OPERATION

- The steering wheel sensor is energized by the ignition switch (IG1) through multi-purpose fuse No.2 and the steering wheel sensor terminal 2.
- If the power supply to the steering wheel sensor has failed, scan tool (M.U.T.-III Sub Assembly) will not be able to communicate with it.

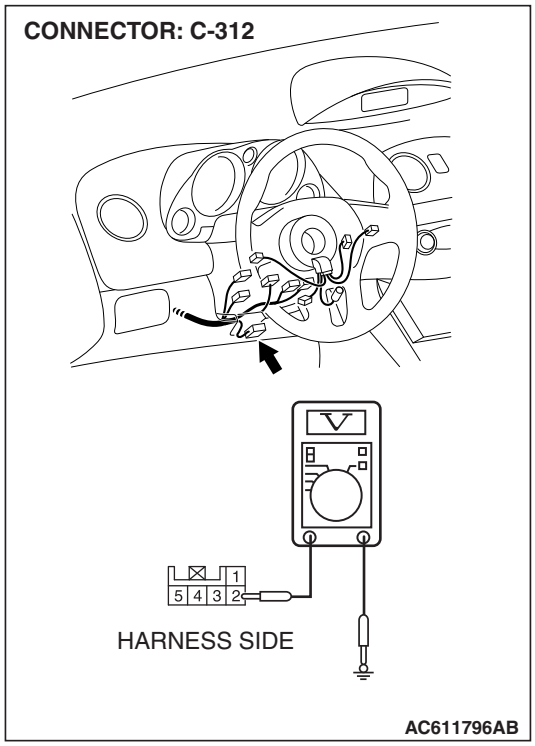
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

- Damaged wiring harness or connector
- Defective battery
- Charging system failed
- Malfunction of the steering wheel sensor

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A
- MB991997: ASC Check Harness

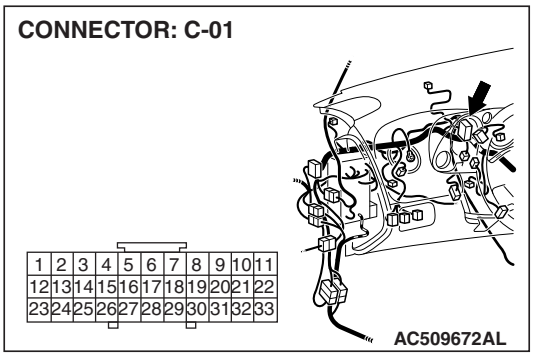


STEP 1. Measure the voltage at steering wheel sensor connector C-312.

(1) Disconnect the connector C-312.
(2) Turn the ignition switch to the "ON" position.
(3) Measure the voltage between terminal 2 and ground. It should measure approximately 12 volts (battery positive voltage).

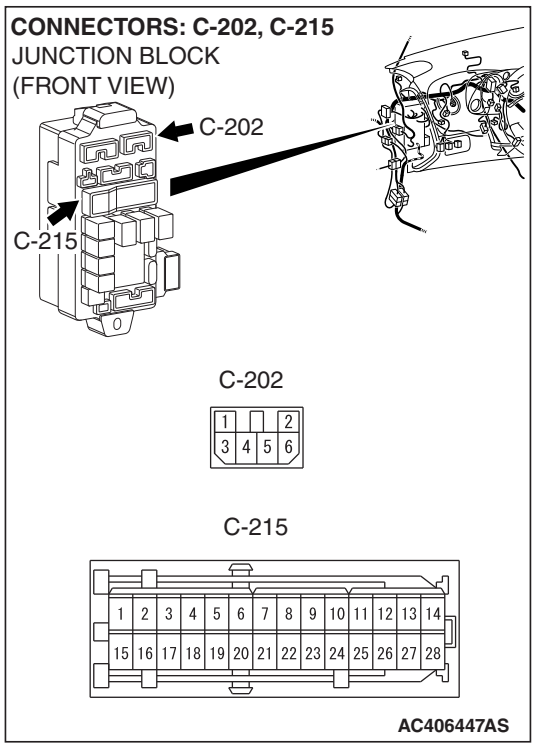
Q: Is battery positive voltage (approximately 12 volts) present?

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

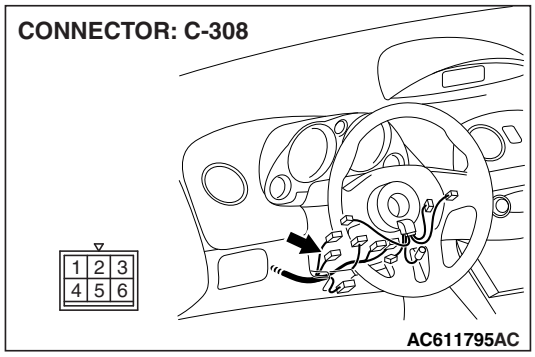


STEP 2. Check the following connectors.

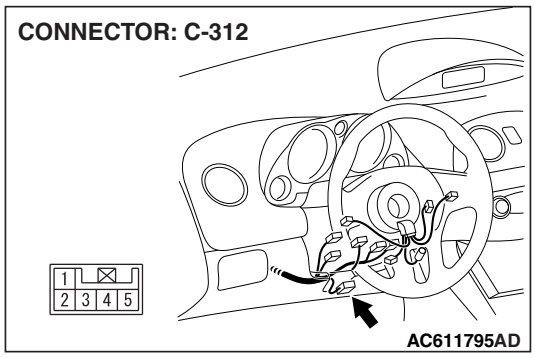
- Joint connectors (2) C-01



- Junction block connectors C-202 and C-215



- Ignition switch connector C-308



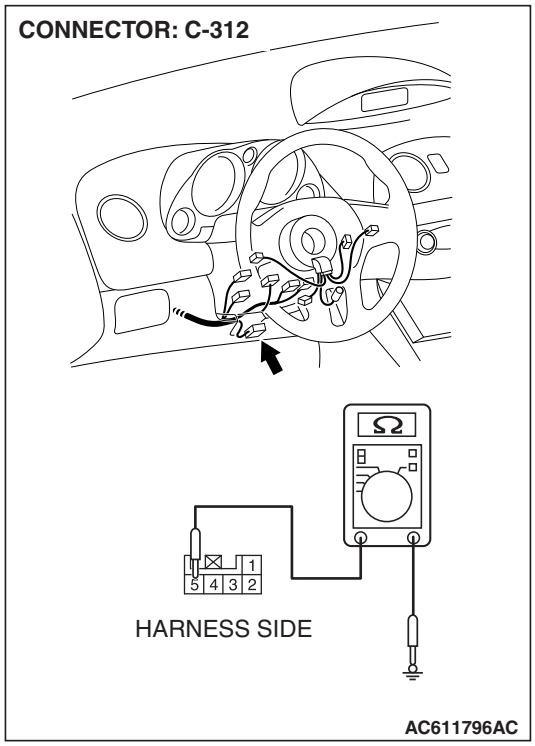
- Steering wheel sensor connector C-312

Check the connectors, for loose, corroded or damaged terminals, or terminals pushed back in the connector.

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 steering wheel sensor. Repair the wiring harness between steering wheel sensor connector C-312 terminal 2 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.

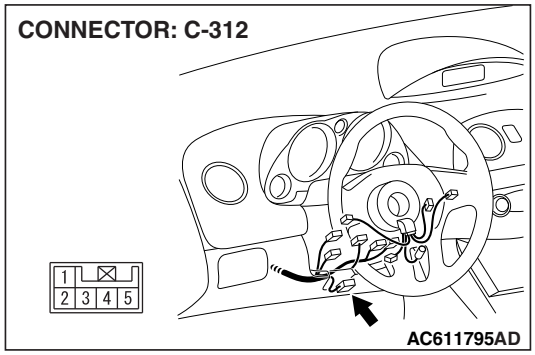


STEP 3. Measure the resistance at steering wheel sensor connector C-312.

(1) Disconnect the steering sensor connector C-312, and measure at the harness side connector.
(2) Measure the resistance between terminal 5 and body ground.

Q: Is the measured resistance 2 ohms or less?

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



STEP 4. Check steering wheel sensor connector C-312 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : An open circuit may be present in the ground circuit. Repair the wiring harness between steering wheel sensor connector C-312 terminals 5 and the body ground. 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 5. Check the battery.

Check the battery (Refer to GROUP 54A, Battery test P.54A-7).

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.16-3).

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 steering wheel sensor communicate with the scan tool (M.U.T.-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 steering wheel sensor. Then go to Step 8.

STEP 8. Retest the system.

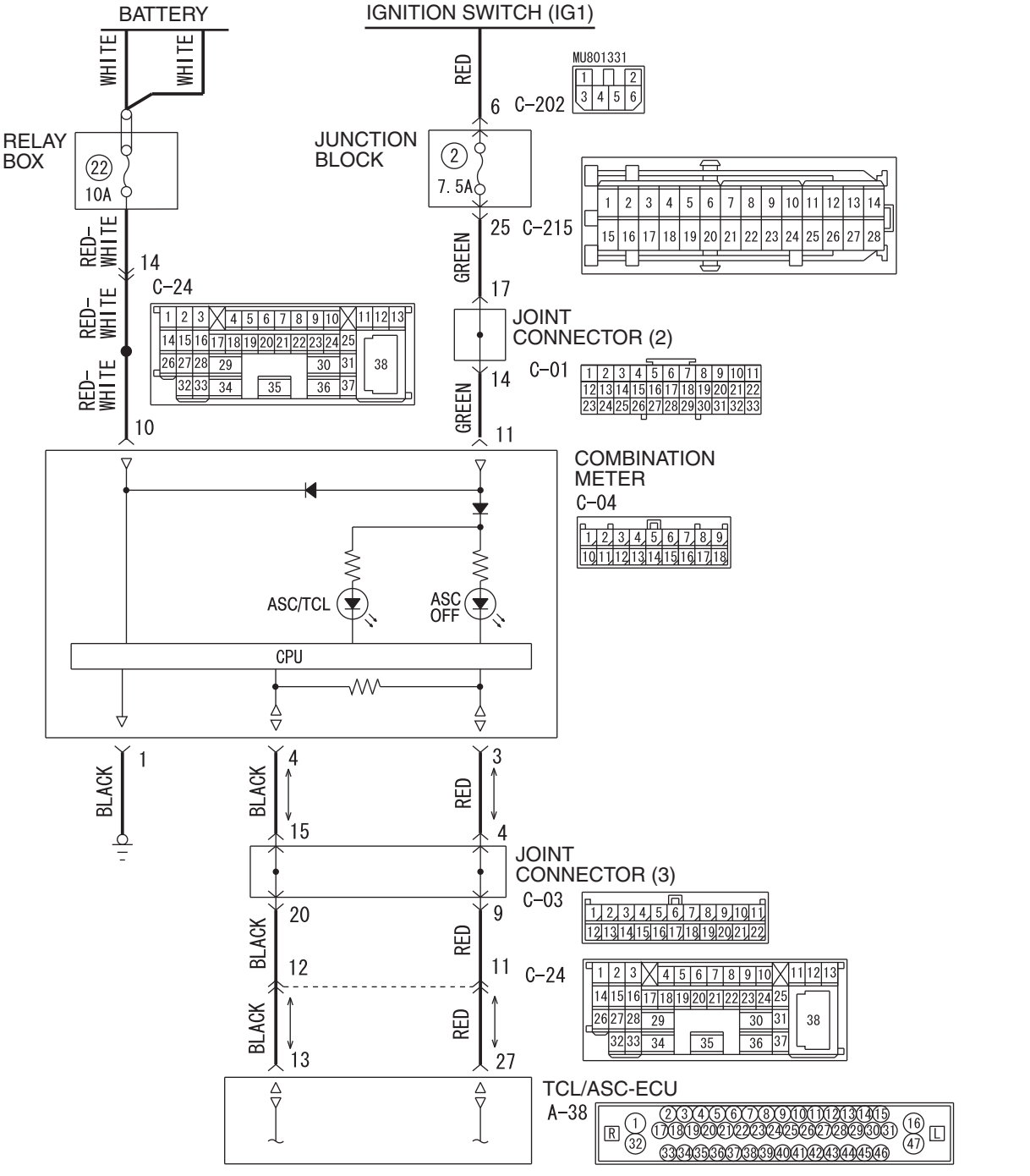
Q: Can the steering wheel sensor communicate with the scan tool (M.U.T.-III Sub Assembly)?

YES : The procedure is complete.

NO : Go to Step 1.

INSPECTION PROCEDURE 5: When the Ignition Switch is Turned to the "ON" Position (Engine Stopped), the "ASC OFF" Indicator does not Illuminate.
INSPECTION PROCEDURE 6: When the Ignition Switch is Turned to the "ON" Position (Engine Stopped), the TCL/ASC Work Indicator does not Illuminate.
INSPECTION PROCEDURE 7: The "ASC OFF" Indicator Remains Illuminated After the Engine is Started.
INSPECTION PROCEDURE 8: The TCL/ASC Work Indicator Remains Illuminated After the Engine is Started.

"ASC OFF" Indicator and ASC Work Indicator Drive Circuit <ECLIPSE>



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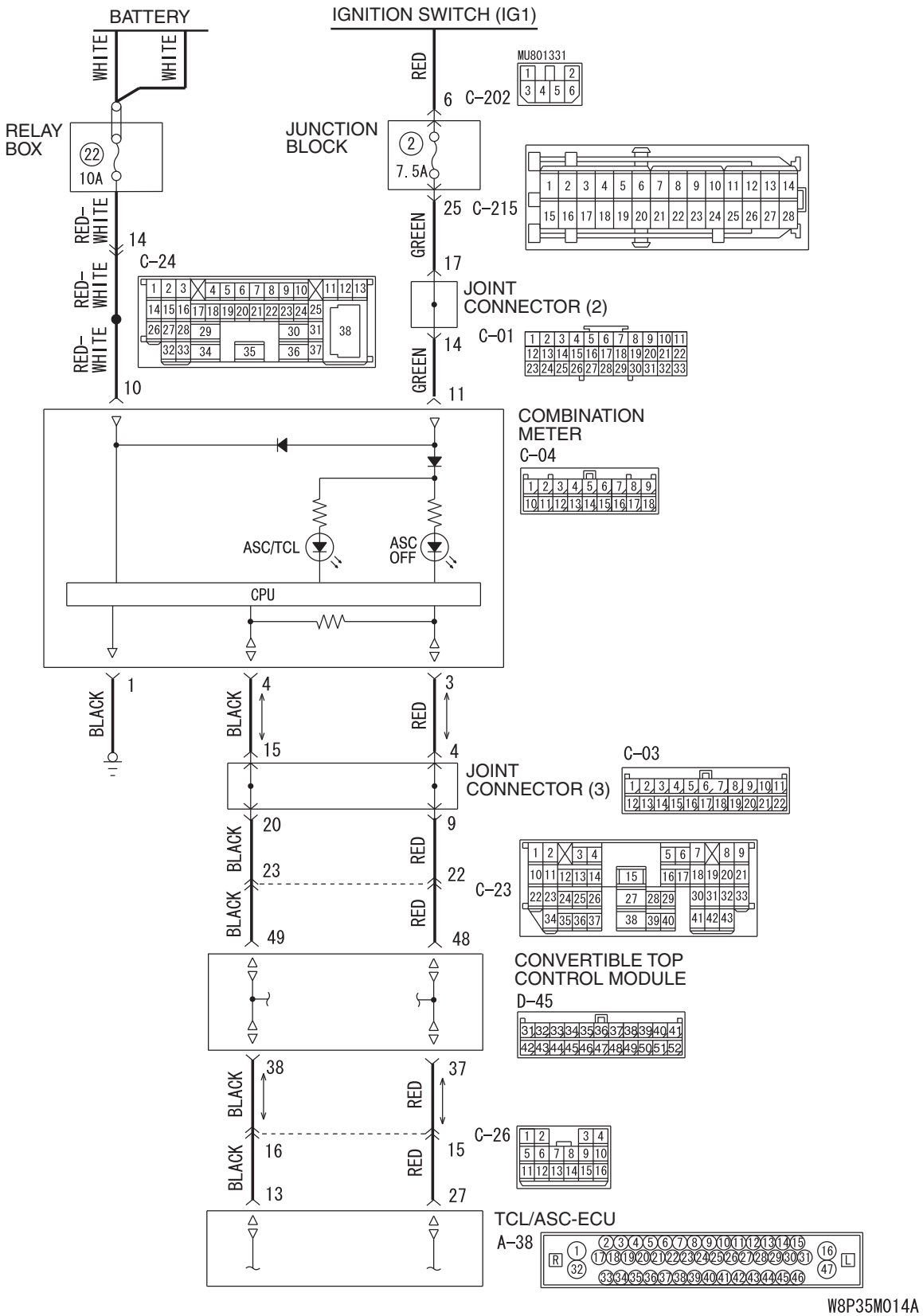
"ASC OFF" Indicator and ASC Work Indicator Drive Circuit <ECLIPSE SPYDER>



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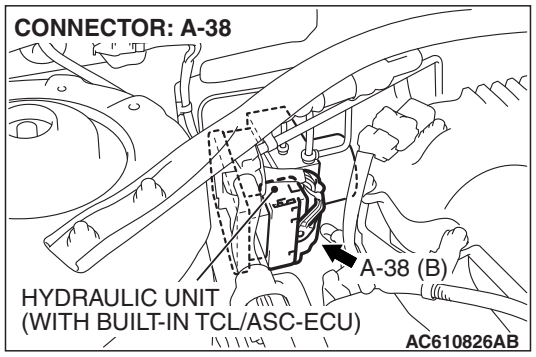

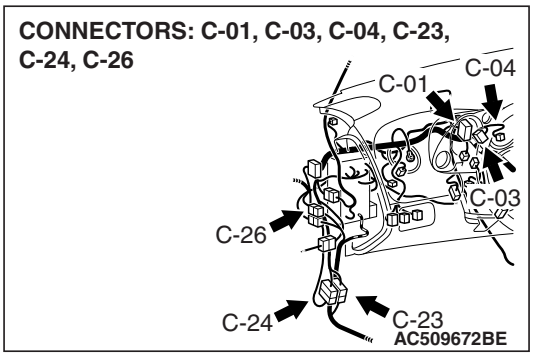

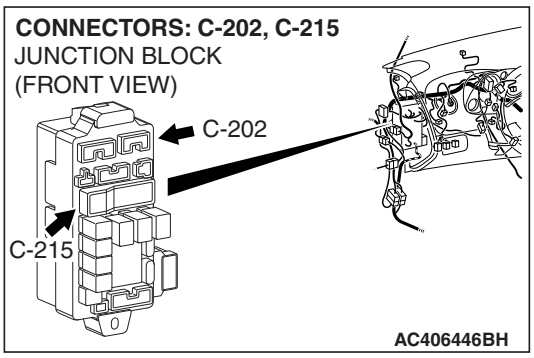

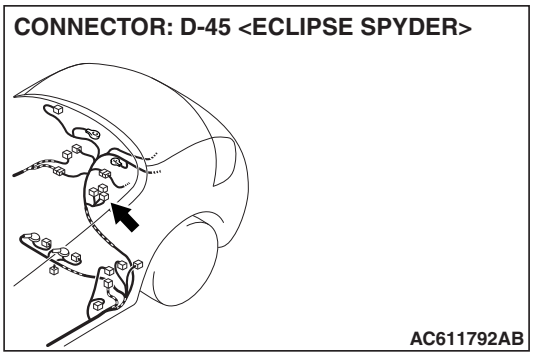

CIRCUIT OPERATION

- TCL/ASC-ECU send the illumination signal of "ASC OFF" indicator and TCL/ASC work indicator to the combination meter via the CAN communication.
- TCL/ASC-ECU operates the "ASC OFF" indicator and the TCL/ASC work indicator for three seconds after the ignition switch is turned "ON" position for bulb check.

COMMENT

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

TROUBLESHOOTING HINTS

- Malfunction of the combination meter
- Damaged harness, connector
- Malfunction of the TCL/ASC-ECU

DIAGNOSIS

Required Special Tools:

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

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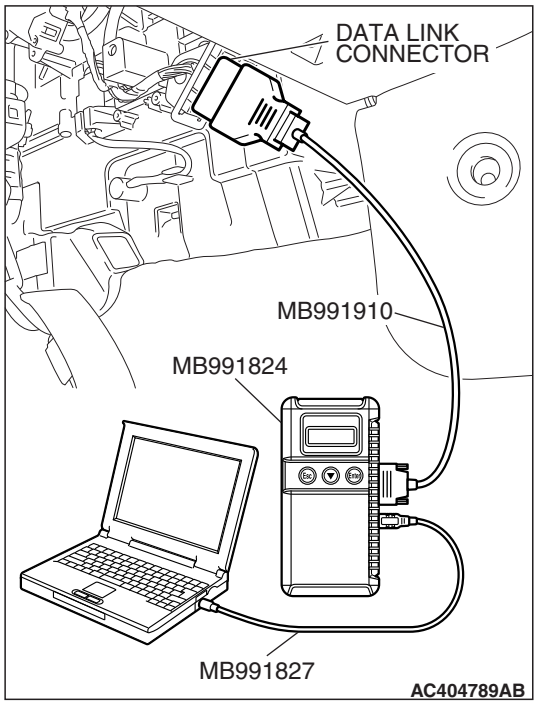
STEP 1. Using scan tool MB991958, diagnose the CAN bus line.



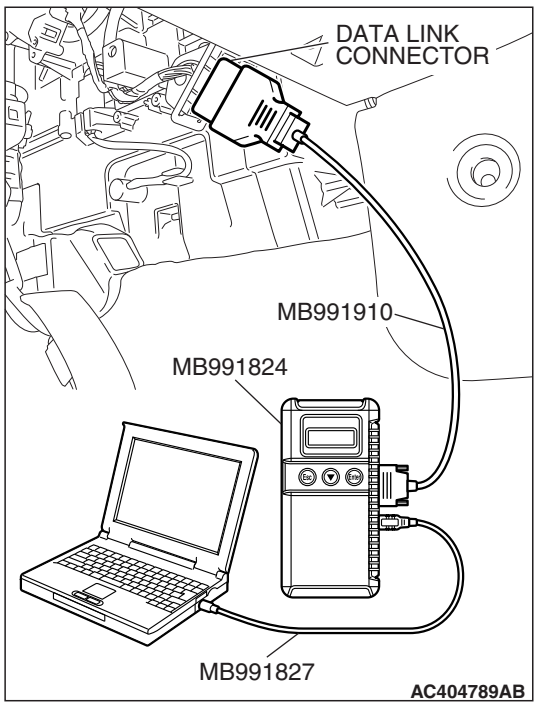
⚠ CAUTION
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(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.
(5) Disconnect scan tool MB991958.

Q: Is the check result satisfactory?

YES : Go to Step 2
NO : Repair the CAN bus lines. (Refer to GROUP 54C, Diagnosis – Can Bus Diagnostic Chart P.54C-17). Then go to Step 4.

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



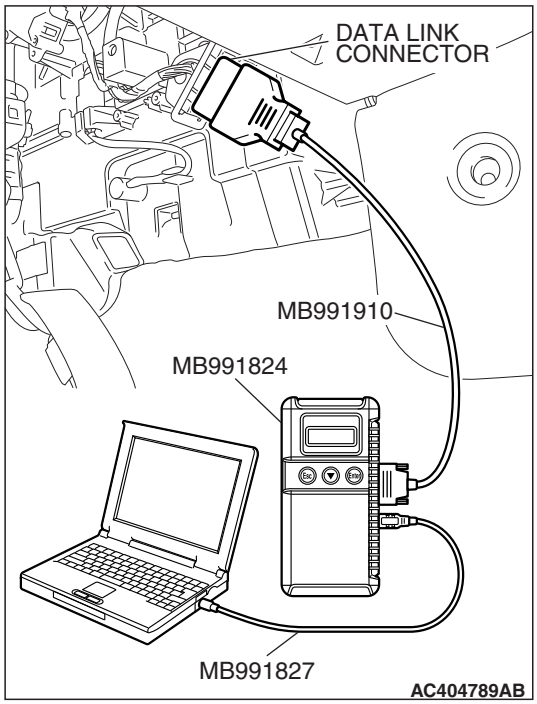
⚠ CAUTION
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Use scan tool MB991958 to read the TCL/ASC diagnostic trouble codes. (Refer to P.35C-11).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is any DTC set?

YES : Refer to P.35C-14, Diagnostic Trouble Code Chart. Then go to Step 4.
NO : Go to Step 3.

TSB Revision



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-57).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect scan tool MB991958.

Q: Is DTC U1102 set?

YES : Replace the hydraulic unit (integrated with TCL/ASC-ECU). Then go to Step 4.
NO : Replace the combination meter assembly. (Refer to GROUP 54A – Combination Meter Assembly P.54A-135). Then go to Step 4.

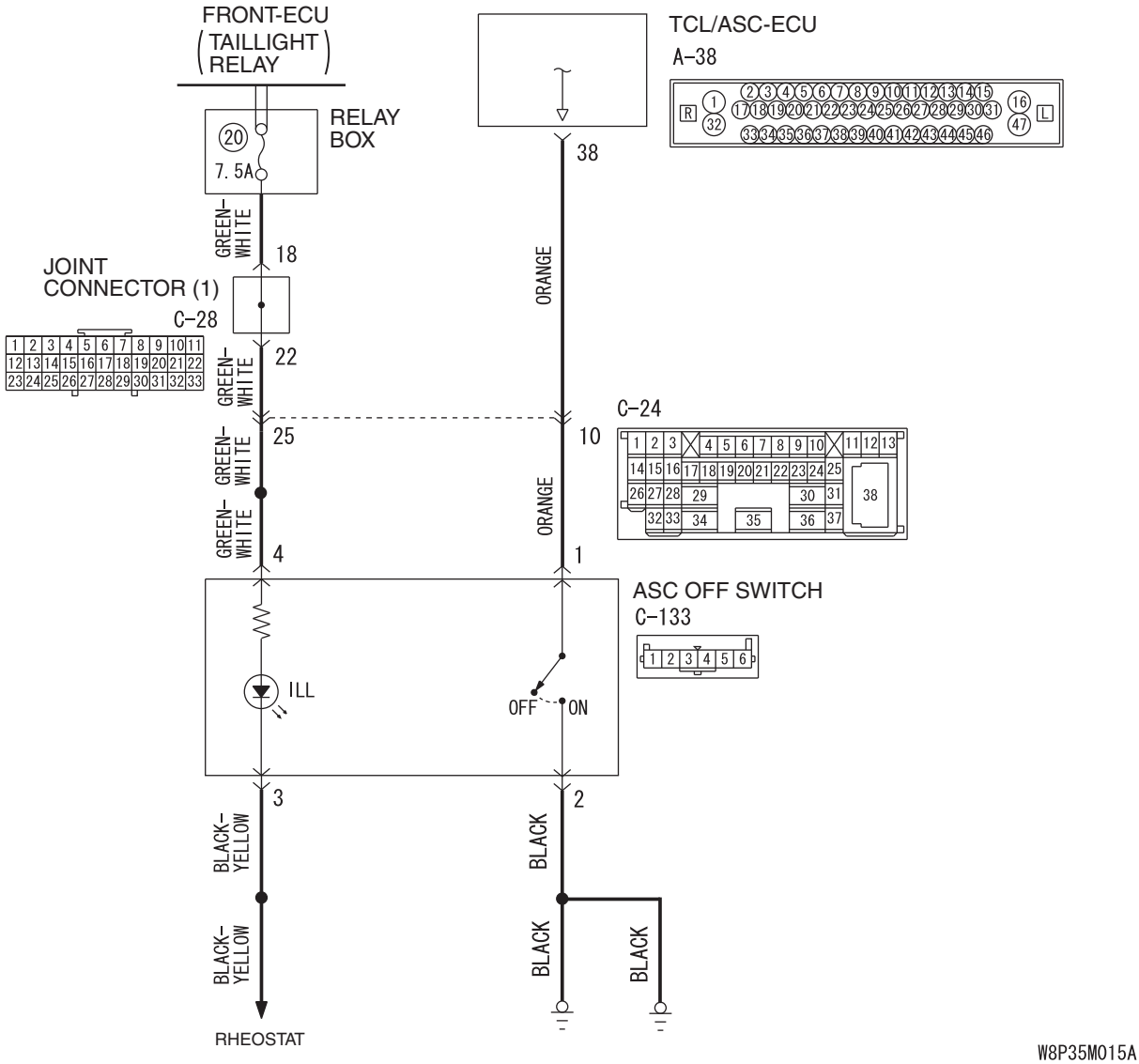
STEP 4. Retest the system

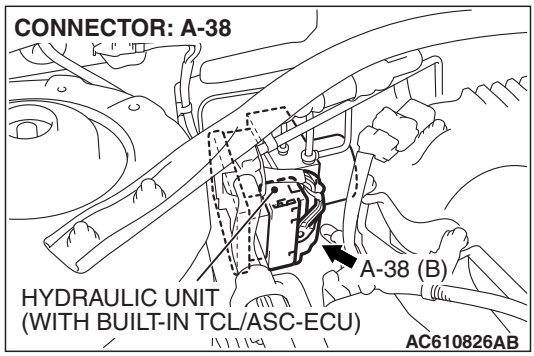
Q: Turn the ignition switch to the "ON" position. Do the "ASC OFF" indicator and the TCL/ASC work indicator illuminate for three seconds, and then go out after the engine starts?

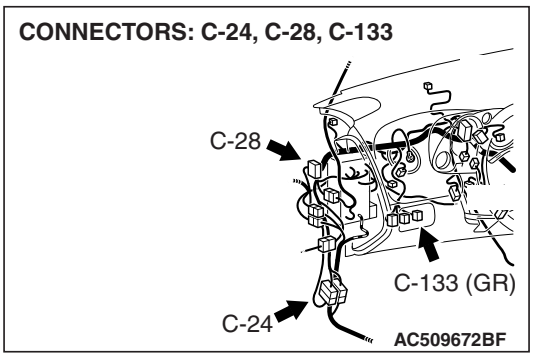
YES : The procedure is complete.
NO : Return to Step 1.

INSPECTION PROCEDURE 9: When the ASC OFF Switch is Push On, ASC does not be Cancelled.

ASC OFF Switch System Circuit







TSB Revision

CIRCUIT OPERATION

TCL/ASC-ECU terminal 38 is grounded every time the ASC OFF switch is pressed. TCL/ASC-ECU monitors this operation state and turns the ASC ON or OFF.

COMMENT

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

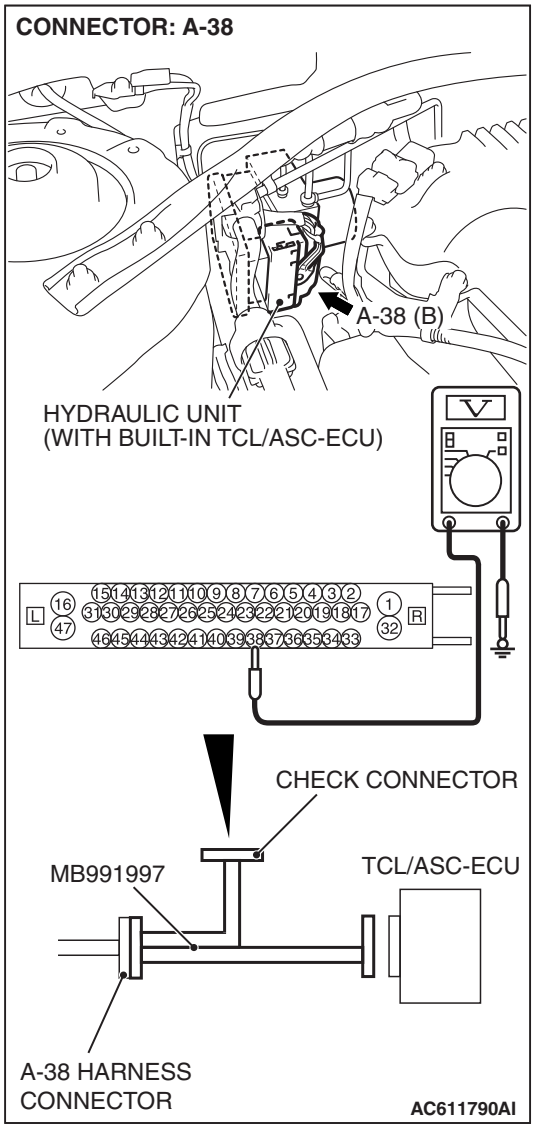
TROUBLESHOOTING HINTS

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

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB991997: ASC Check Harness
- MB992006: Extra Fine Probe



STEP 1. Measure the voltage at TCL/ASC-ECU connector A-38.

(1) Disconnect the the TCL/ASC-ECU connector A-38.
(2) Connect special tool MB991997 between the TCL/ASC-ECU and the body-side harness connector A-38.
(3) Turn the ignition switch to the "ON" position.
(4) Measure the voltage between special tool MB991997 connector terminal 38 (TCL/ASC-ECU connector A-38 terminal 38) and ground.
  - When the ASC OFF switch is not pressed, the voltage should measure battery positive voltage (approximately 12 volts).
  - When the ASC OFF switch is pressed, the voltage should measure 1 volt or less.
(5) Turn the ignition switch to the "LOCK" (OFF) position.
(6) Disconnect special tool MB991997 between the TCL/ASC-ECU and the body-side harness connector A-38.
(7) Connect the TCL/ASC-ECU connector A-38.

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

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

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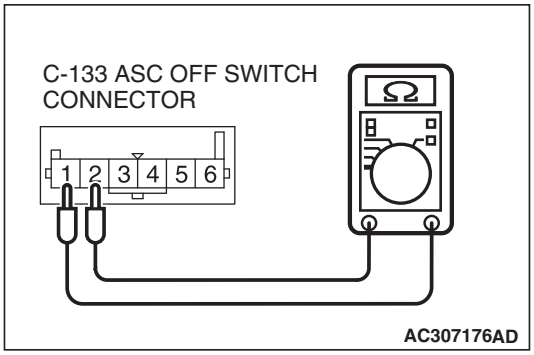


STEP 2. Check the ASC OFF switch.

(1) Remove the ASC OFF switch. (Refer to P.35C-229).
(2) Connect an ohmmeter to the ASC OFF switch between terminals 1 and 2.
(3) Check for continuity between terminals 1 and 2 when the ASC OFF switch is operated.
- There is no continuity between terminals 1 and 2 when the ASC OFF switch is not pressed.
- There is continuity between terminals 1 and 2 when the ASC OFF switch is pressed.

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

YES : Install the ASC OFF switch. (Refer to P.35C-229). Then go to Step 3.

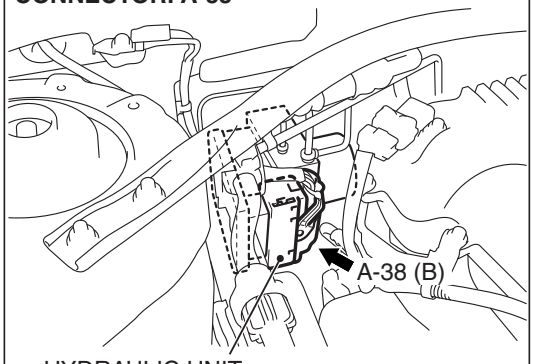
NO : Replace the ASC OFF switch. (Refer to P.35C-229). Then go to Step 7.

STEP 3. Check TCL/ASC-ECU connector A-38, intermediate connector C-24 and ASC OFF switch connectors C-133 for loose, corroded or damaged terminals, or terminals pushed back in the connector.
Q: Are there connectors and terminals in good condition?

YES : Go to Step 4.

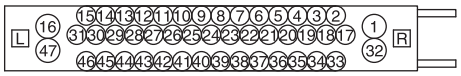
NO : Repair or replace the faulty connector. (Refer to GROUP 00E, Harness Connector Inspection P.00E-2). Then go to Step 7.

CONNECTOR: A-38



HYDRAULIC UNIT
(WITH BUILT-IN TCL/ASC-ECU)

HARNESS SIDE
A-38



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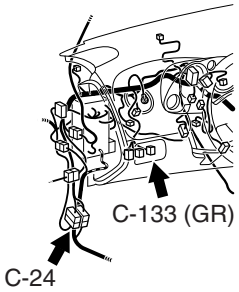
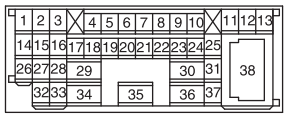
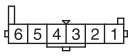
CONNECTORS: C-24, C-133



C-24



HARNESS SIDE
C-133



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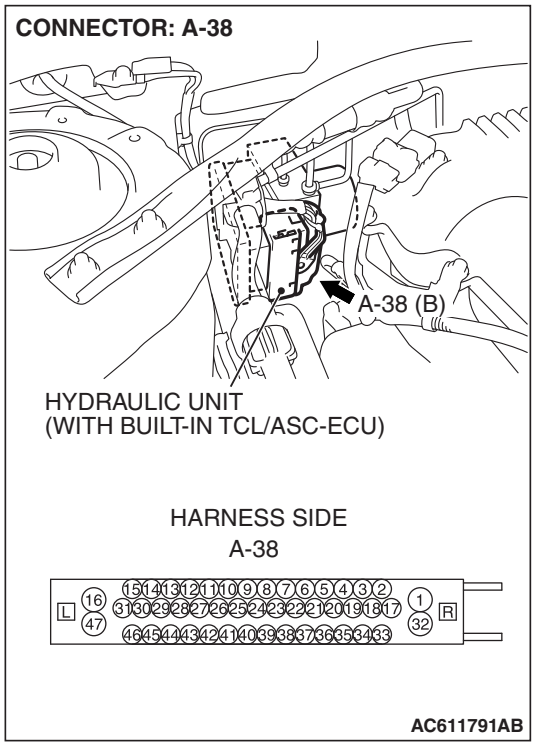
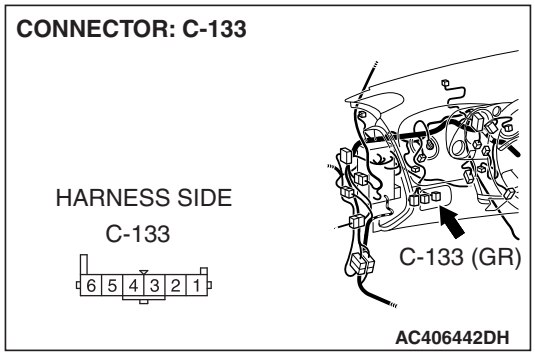
STEP 4. Check the harness wire between TCL/ASC-ECU connector A-38 terminal 38 and ASC OFF switch connector C-133 terminal 1 for open circuit.

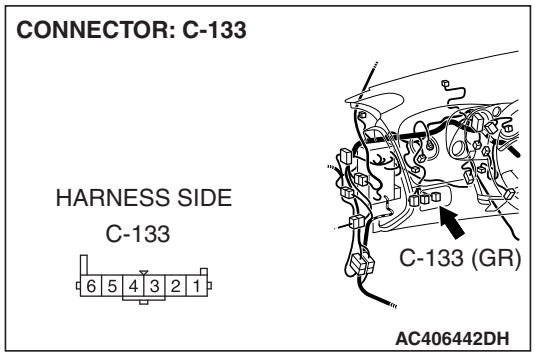
Q: Are there harness wires in good condition?

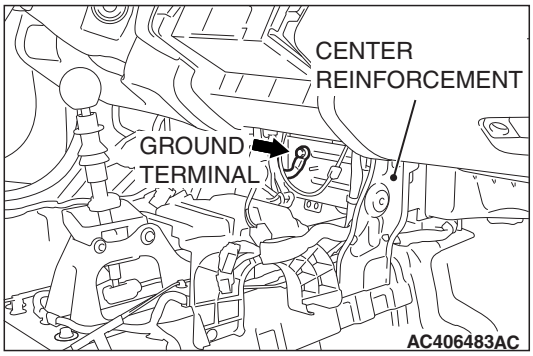
YES : Go to Step 5.

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









STEP 5. Check the harness wire between ASC OFF switch connector C-133 terminal 2 and ground for open circuit.

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 ASC cancelled when the ASC OFF switch is push on?

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

NO : Replace the hydraulic unit (integrated with TCL/ASC-ECU). Then go to Step 7.

STEP 7. Retest the system

Q: Is ASC cancelled when the ASC OFF switch is push on for 3 seconds or longer?

YES : The procedure is complete.

NO : Return to Step 1.

INSPECTION PROCEDURE 10: TCL/ASC System dose not Operate.

COMMENT

The fail-safe function is probably canceling TCL/ASC system. 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 TCL/ASC-ECU.

DIAGNOSIS

Required Special Tools:

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

STEP 1. Hydraulic unit check

Refer to P.35C-220.

Q: Is the hydraulic unit normal?

YES : Go to Step 2.

NO : Connect the brake pipes correctly, repair the external brake lines, or replace the hydraulic unit.

STEP 2. Verify that the condition described by the customer exists.

Q: Can any faults be found with the brake operation?

YES : Check the brake system related components except the ASC system.

NO : The procedure is complete.

DATA LIST REFERENCE TABLE

M1355001500142

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

M.U.T.-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	TCL/ASC-ECU power supply voltage	Ignition switch power supply voltage and valve monitor voltage	Battery positive voltage

M.U.T.-III SCAN TOOL DISPLAY	ITEM NO.	CHECK ITEM	CHECKING REQUIREMENTS	NORMAL VALUE
Stoplight switch (input)	06	Stoplight switch	Depress the brake pedal.	ON
			Release the brake pedal.	OFF
Lateral G sensor	08	Lateral G	Vehicle stopped (level)	-0.11 to 0.11 G
			Running	-1 to 1 G
Master cylinder pressure	10	Master cylinder pressure	Depress the brake pedal.	Rises depending on the brake pedal depression value
			Release the brake pedal.	-3 to 3 bar
Steering angle	11	Steering angle	Vehicle stopped (Steering wheel in straight position)	-6 to 6 deg
			Running	-480 to 480 deg
Yaw rate sensor	12	Yaw rate	Vehicle stopped (level)	-3.5 to 3.5 deg/s
			Running	-80 to 80 deg/s
ASC off switch	28	ASC mode	ASC OFF switch: ON	OFF
			ASC OFF switch: OFF	ON
Master cylinder pressure offset	47	Master cylinder pressure offset	The difference between the neutral position that was input to the TCL/ASC-ECU before the master cylinder pressure sensor calibration and the neutral position after the calibration.	-8 to 8 bar
Lateral G sensor offset	49	Lateral G sensor offset	The difference between the neutral position that was input to the TCL/ASC-ECU before the G sensor calibration and the neutral position after the calibration.	-0.17 to 0.17 G
Steering angle offset	50	Steering angle offset	The difference between the neutral position that was input to the TCL/ASC-ECU before the steering wheel sensor calibration and the neutral position after the calibration.	-15 to 15 deg

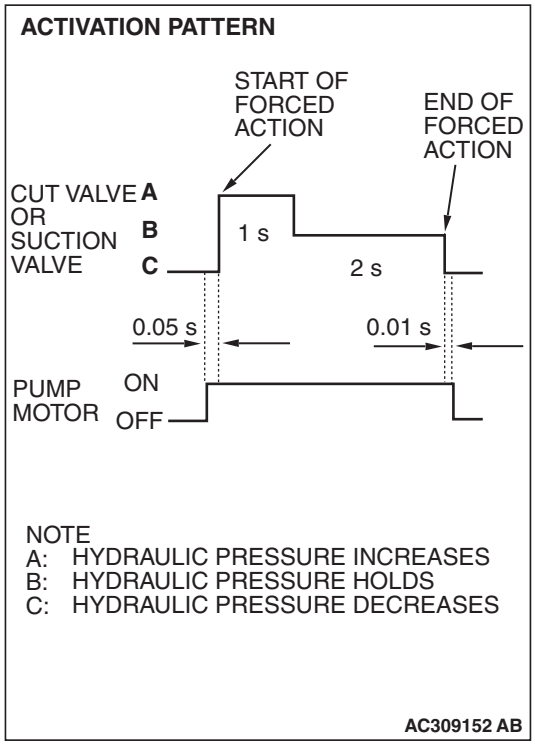
ACTUATOR TEST REFERENCE TABLE

M1355001600149

The scan tool activates the following actuators for testing.

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

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



ACTUATOR TEST SPECIFICATIONS

NO.	ITEM	PARTS TO BE ACTIVATED
01	FL wheel ABS drive	Solenoid valves and pump motors in the hydraulic unit (simple inspection mode)
02	FR wheel ABS drive	
03	RL wheel ABS drive	
04	RR wheel ABS drive	
05	FL wheel TCL drive	Control solenoid valves and pump motors in the hydraulic unit (simple inspection mode)
06	FR wheel TCL drive	
07	RL wheel TCL drive	
08	RR wheel TCL drive	
09	Engine TCL drive	Outputs the engine torque control signal (engine torque = 0) to ECM<M/T> or PCM<A/T> for three seconds

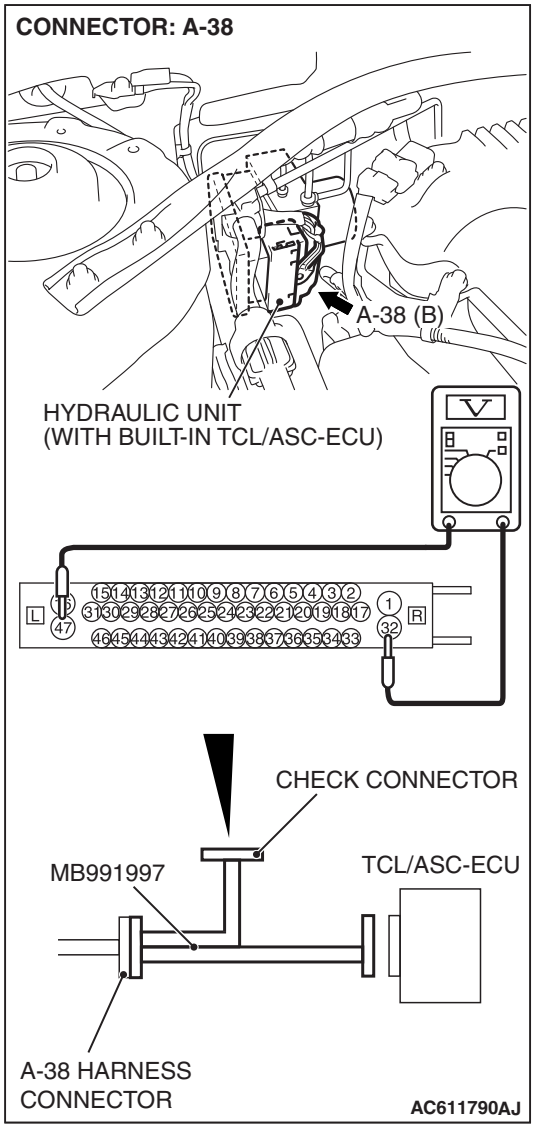
CHECK AT TCL/ASC-ECU

M1355001700135

TERMINAL VOLTAGE CHECK CHART

Required Special Tool:
MB991997: ASC Check Harness

1. Disconnect the TCL/ASC-ECU connector A-38, and then use special tool MB991997 to measure the voltages between terminals (47) and each terminal other than terminal (16) as well as between terminal (16) and each terminal other than terminal (47).

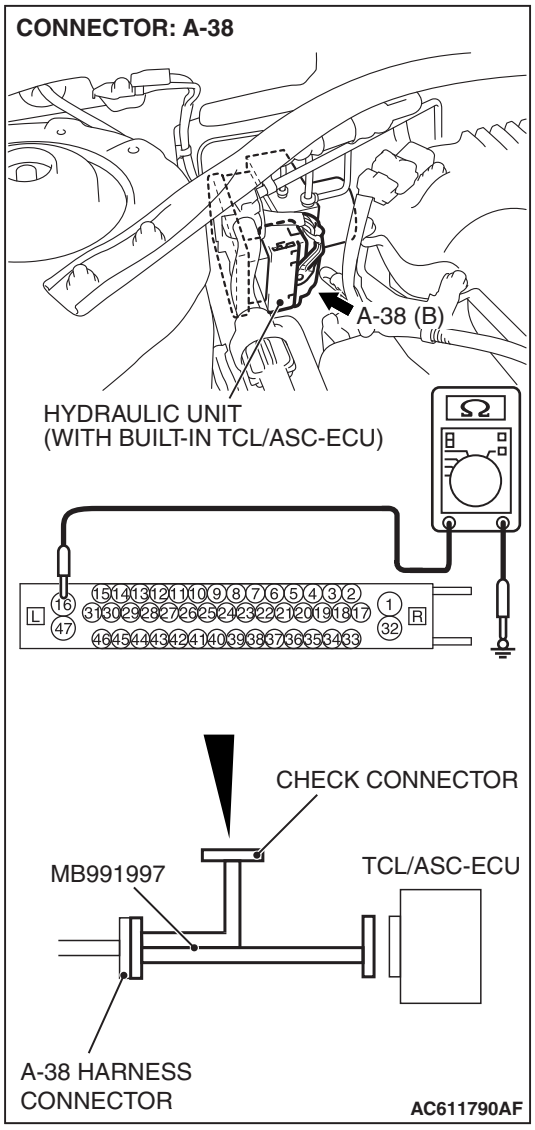


2. The terminal layouts are shown in the illustrations below.

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

CONNECTOR TERMINAL NO	SIGNAL	CHECKING REQUIREMENT	NORMAL CONDITION
1	Motor power supply	Always	Battery positive voltage
4	TCL/ASC-ECU power supply	Ignition switch: "ON"	Battery positive voltage
32	Solenoid valve power supply	Always	Battery positive voltage

CONNECTOR TERMINAL NO	SIGNAL	CHECKING REQUIREMENT		NORMAL CONDITION
38	ASC OFF switch output	Ignition switch: "ON"	ASC OFF switch: "ON"	1V or less
			ASC OFF switch: "OFF"	Battery positive voltage
41	Stop light switch input	Ignition switch: "ON"	Stop light switch: "ON"	Battery positive voltage
			Stop light switch: "OFF"	1V or less



RESISTANCE AND CONTINUITY BETWEEN HARNESS-SIDE CONNECTOR TERMINALS

1. Disconnect the connector A-38, and connect special tool MB991997 to the wiring harness-side connector.

   NOTE: Do not connect special tool MB991997 to the TCL/ASC-ECU.
2. Measure the resistance and continuity between the terminals indicated in the table below.

CONNECTOR TERMINAL NO.	SIGNAL	NORMAL CONDITION
45 – 46	Front-left wheel speed sensor	1.24 – 1.64 kΩ
33 – 34	Front-right wheel speed sensor	1.24 – 1.64 kΩ
36 – 37	Rear-left wheel speed sensor	1.24 – 1.64 kΩ

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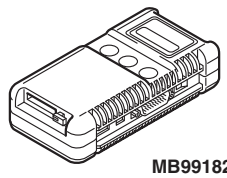
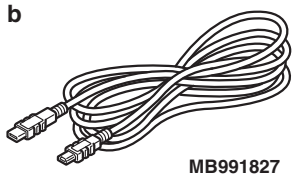
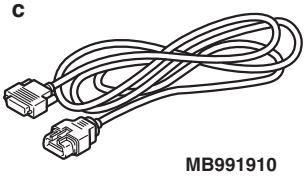
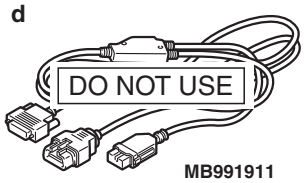
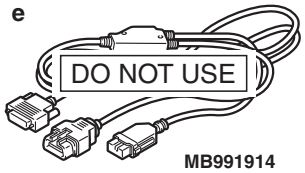
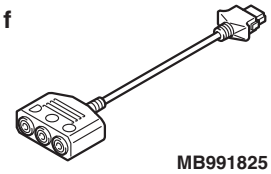
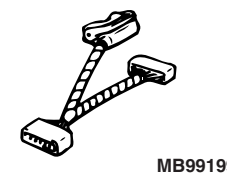
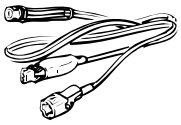
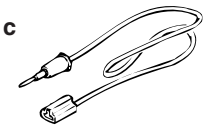
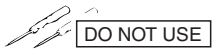
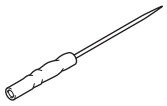
CONNECTOR TERMINAL NO.	SIGNAL	NORMAL CONDITION
42 – 43	Rear-right wheel speed sensor	1.24 – 1.64 kΩ
16 – body ground	Ground	Continuity exists (2 Ω or less)
47 – body ground	Ground	Continuity exists (2 Ω or less)

SPECIAL TOOLS

M1355005800156

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
a  MB991824 b  MB991827 c  MB991910 d  MB991911 e  MB991914 f  MB991825 AC700745AB	MB991958 a. MB991824 b. MB991827 c. MB991910 d. MB991911 e. MB991914 f. MB991825 g. MB991826 M.U.T.-III sub assembly a. Vehicle communication interface (V.C.I.) b. M.U.T.-III USB cable c. M.U.T.-III main harness A (Vehicles with CAN communication system) d. M.U.T.-III main harness B (Vehicles without CAN communication system) e. M.U.T.-III main harness C (for Chrysler models only) f. M.U.T.-III measurement adapter	MB991824-KIT *NOTE: G: MB991826 M.U.T.-III trigger harness is not necessary when pushing V.C.I. ENTER key.*	SWS communication line check (ECU check and service data) **⚠ CAUTION** **For vehicles with CAN communication, use M.U.T.-III main harness A to send simulated vehicle speed. If you connect M.U.T.-III main harness B instead, the CAN communication does not function correctly.**
 MB991997	MB991997 ASC check harness	–	TCL/ASC-ECU terminal voltage measurement

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
a b  c  d  MB991223	MB991223 a. MB991219 b. MB991220 c. MB991221 d. MB991222 Harness set a. Test harness b. LED harness c. LED harness adaptor d. Probe	General service tool (jumper)	Making voltage and resistance measurements during troubleshooting A: Connect pin contact pressure inspection B: Power circuit inspection C: Power circuit inspection D: Commercial tester connection
 MB992006	MB992006 Extra fine probe	–	Making voltage and resistance measurement during troubleshooting
 MB991348	MB991348 The harness set	–	For checking of G and yaw rate sensor input voltage measurement

ON-VEHICLE SERVICE

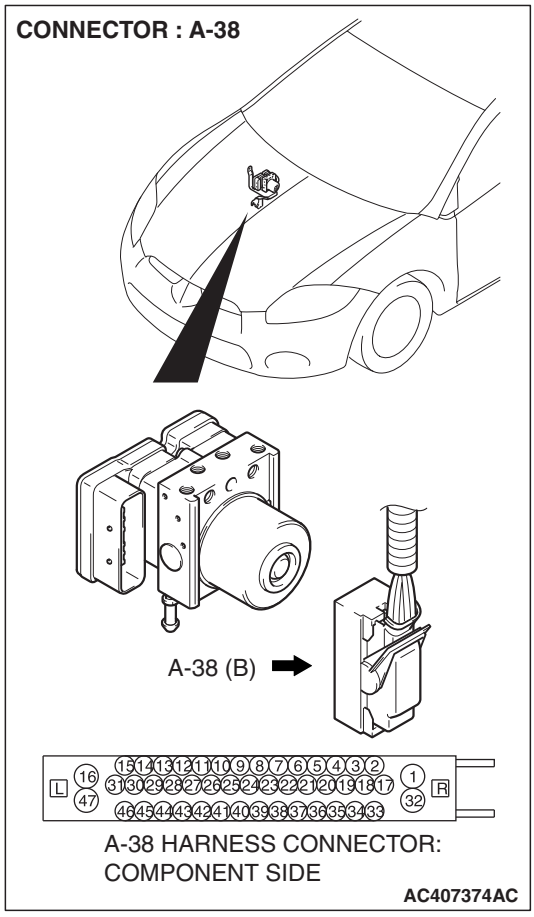
WHEEL SPEED SENSOR OUTPUT VOLTAGE MEASUREMENT

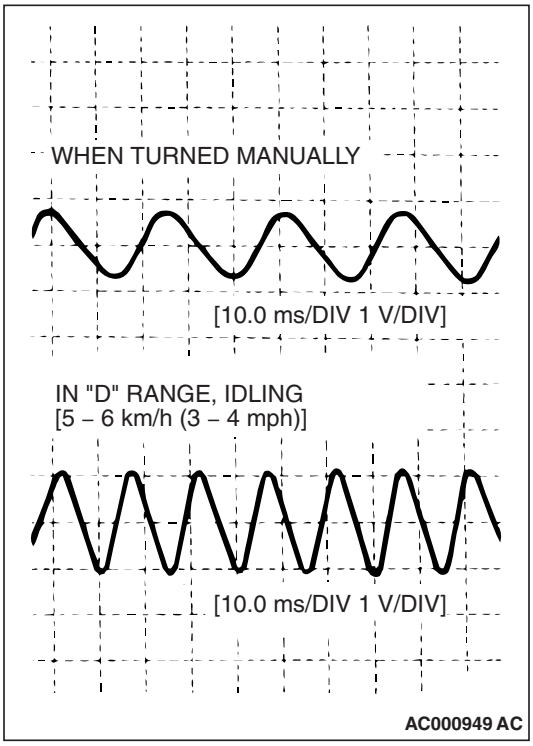
M1355006000045

Required Special Tool:
MB991997: ASC Check Harness

1. Release the parking brake and lift up the vehicle.
2. Disconnect the TCL/ASC-ECU connector A-38, and then use special tool MB991997 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 TCL/ASC-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

M1355006100116

Required Special Tools:

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

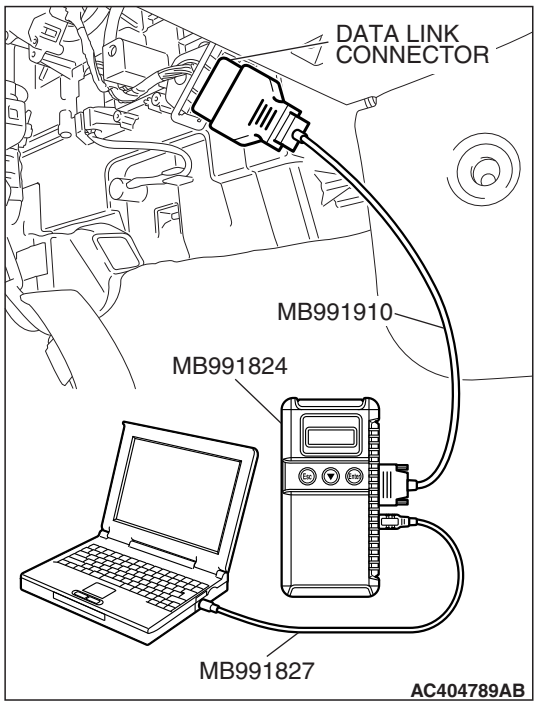
⚠ CAUTION

- **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

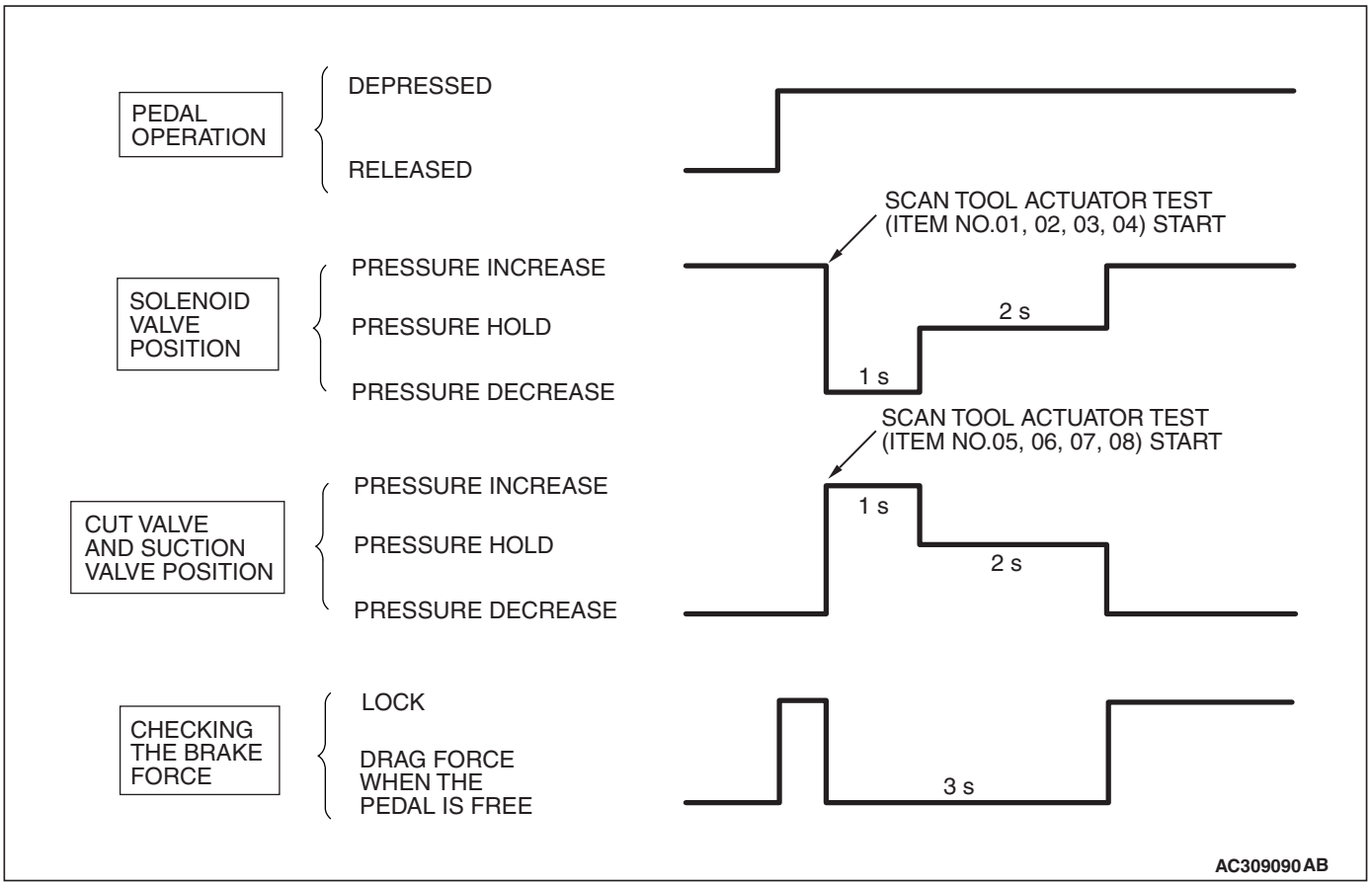
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.



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

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

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



9. 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)

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

DIAGNOSIS TABLE

SCAN TOOL M.U.T.-III DISPLAY	OPERATION	INSPECTION RESULT	JUDGMENT	PROBABLE CAUSE	REMEDY
01 FL wheel ABS drive 02 FR wheel ABS drive 03 RL wheel ABS drive 04 RR wheel ABS drive 05 FL wheel TCL drive 06 FR wheel TCL drive 07 RL wheel TCL drive 08 RR wheel TCL drive	• 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
				Clogged hydraulic circuit in hydraulic unit	Replace hydraulic unit assembly
		Brake force is not released		Incorrect hydraulic unit brake tube connection	Connect correctly
				Hydraulic unit solenoid valve not functioning correctly	Replace hydraulic unit assembly

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

IN THE EVENT OF A DISCHARGED BATTERY

M1355006200016

⚠ ***WARNING***

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

G AND YAW RATE SENSOR CALIBRATION

M1355009300119

⚠ CAUTION

If the work below is done, finally calibrate the G and yaw rate sensor.This is necessary because the TCL/ASC-ECU should update the G and yaw rate sensor neutral point.

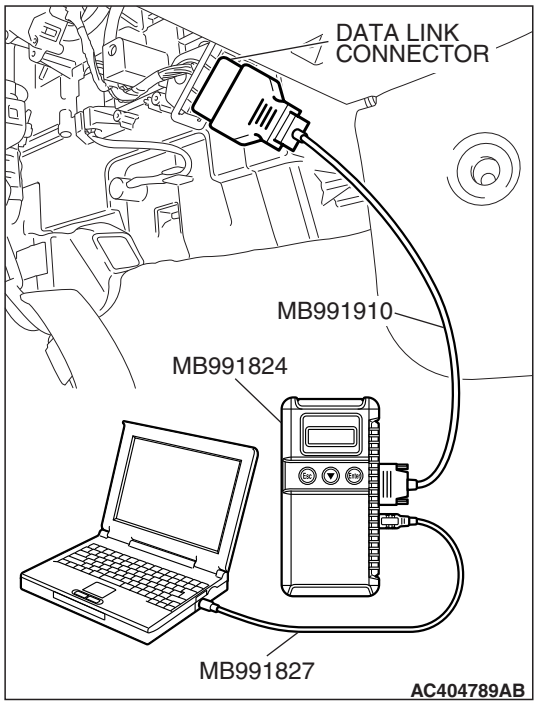
- **G and yaw rate sensor replacement**
- **TCL/ASC-ECU replacement**

Required Special Tools:

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

1. Park the vehicle on a level surface.

⚠ CAUTION



2. **To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.**
   Connect scan tool MB991958 to the data link connector.
3. Turn the ignition switch to the "ON" position.
4. Select "ABS/ASC/ASTC".
5. Select "Special function".
6. Select "Sensor calibration".
7. Select "Lateral G sensor calibration".
8. Select "G sensor calibration".
9. Turn the ignition switch to the "LOCK" (OFF) position.
10. Disconnect scan tool MB991958.

STEERING WHEEL SENSOR CALIBRATION

M1355009200112

⚠ CAUTION

After the next operation has been completed, carry out the following two operations:

1. **Update the neutral point that the steering wheel sensor stores.**
2. **Reset the steering wheel angle correction value that the TCL/ASC-ECU stores.**

- **Front alignment adjustment**
- **Steering wheel sensor removal and installation**
- **TCL/ASC-ECU replacement**

⚠ CAUTION

Before carrying out the calibration, check if the steering wheel sensor-related diagnostic trouble code is set in the TCL/ASC-ECU.

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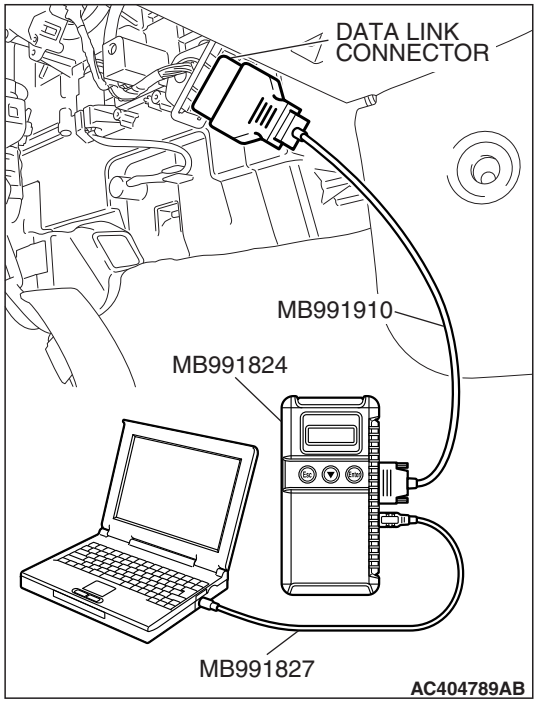


Required Special Tools:

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

1. Park the vehicle on a level surface.

⚠ CAUTION

2. **To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.**
   Connect scan tool MB991958 to the data link connector.
3. Turn the ignition switch to the "ON" position.
4. Select "Steering Angle Sensor".
5. Select "Special Function".
6. Select "Steering Angle Sensor Calibration".
7. Run "SAS Initialization". (Reusable parts only)
8. Select and run "Calibration".
9. Exit "Steering Angle Sensor" menu, and then select "ABS/ASC/ASTC".
10. Select "Special Function".
11. Select "Sensor calibration".
12. Select "SAS calibration".
13. Turn the ignition switch to the "LOCK" (OFF) position.
14. Disconnect scan tool MB991958.

BRAKE FLUID PRESSURE SENSOR CALIBRATION

M1355024100071

⚠ CAUTION

Before performing calibration, check that the brake fluid pressure sensor-related diagnosis code is not set.

⚠ CAUTION

After the next operation has been completed, carry out the calibration to make TCL/ASC-ECU learn the neutral position of the brake fluid pressure sensor.

- **Brake fluid pressure sensor replacement**
- **TCL/ASC-ECU replacement**

⚠ CAUTION

Always perform the calibration with the brake pedal released (stop lamp switch is turned off).

1. Park the vehicle on a level surface.

⚠ CAUTION

Before connecting or disconnecting M.U.T.-III, always turn the ignition switch to the LOCK (OFF) position.

2. Before setting M.U.T.-III, turn the ignition key to the LOCK (OFF) position.
3. Turn the ignition switch to the ON position.
4. Select "ABS/ASC/ASTC."
5. Select "Special function."
6. Select "Sensor calibration."
7. Select "M/C pressure sensor calibration."
8. Before removing M.U.T.-III from the vehicle, turn the ignition key to the LOCK (OFF) position.

HYDRAULIC UNIT

REMOVAL AND INSTALLATION

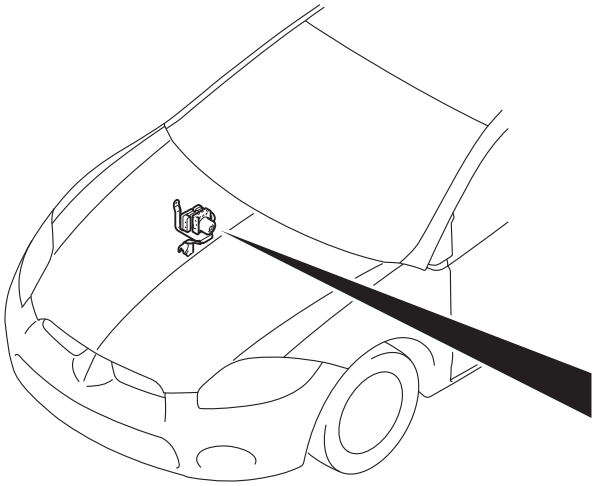
M1355005600497

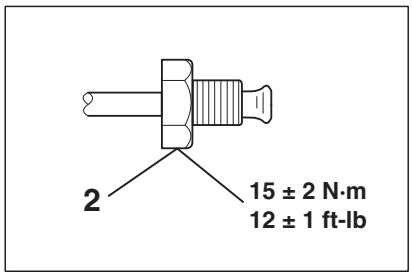
NOTE: The TCL/ASC-ECU is integrated in the hydraulic unit.

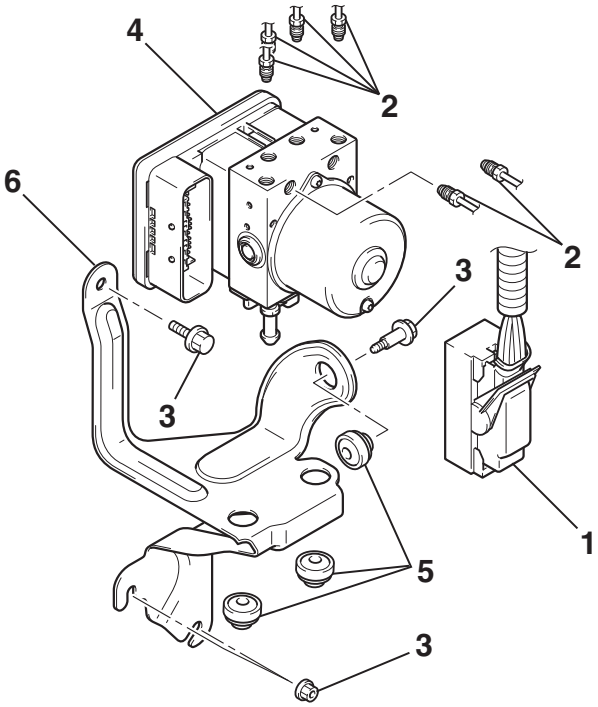
⚠ CAUTION

Always calibrate the steering wheel sensor and the G and yaw rate sensor if the hydraulic unit (integrated in the TCL/ASC-ECU) is replaced.(Refer to P.35C-223 and P.35C-223)

Pre-removal Operation	Post-installation Operation
• Strut Tower Bar Removal (Refer to GROUP 42, Strut Tower Bar P.42-14 <Except ECLIPSE 2.4L Engine>). • Air Cleaner To Throttle Body Duct Removal (Refer to GROUP 15, Air Cleaner P.15-4 <2.4L Engine>, P.15-5 <3.8L Engine>). • Intake Manifold Plenum Removal (Refer to GROUP 15, Intake Manifold Plenum P.15-7 <3.8L Engine>). • Brake Fluid Draining	• Brake Fluid Filling • Brake Line Bleeding (Refer to GROUP 35A, On-vehicle Service – Bleeding P.35A-15). • Hydraulic Unit Check (Refer to P.35C-220). • Intake Manifold Plenum Installation (Refer to GROUP 15, Intake Manifold Plenum P.15-7 <3.8L Engine>). • Air Cleaner To Throttle Body Duct Installation (Refer to GROUP 15, Air Cleaner P.15-4 <2.4L Engine>, P.15-5 <3.8L Engine>). • Strut Tower Bar Installation (Refer to GROUP 42, Strut Tower Bar P.42-14 <Except ECLIPSE 2.4L Engine>). • G and Yaw Rate Sensor Calibration (Refer to P.35C-223.) • Steering Wheel Sensor Calibration (Refer to P.35C-223.)







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REMOVAL STEPS

- ENGINE COVER
- HARNESS CONNECTORS AROUND THE TCL/ASC-ECU
- HARNESS CLAMPS AROUND THE TCL/ASC-ECU
- CONNECTOR BRACKETS AROUND THE TCL/ASC-ECU

<<A>> 1. TCL/ASC-ECU HARNESS CONNECTOR

REMOVAL STEPS (Continued)

>>A<< 2. BRAKE TUBE CONNECTION
- EGR PIPE (REFER TO GROUP 15, INTAKE AND EXHAUST P.15-7).

3. BOLTS AND NUTS

<<B>> 4. HYDRAULIC UNIT (INTEGRATED WITH TCL/ASC-ECU)

5. INSULATOR
6. HYDRAULIC UNIT BRACKET

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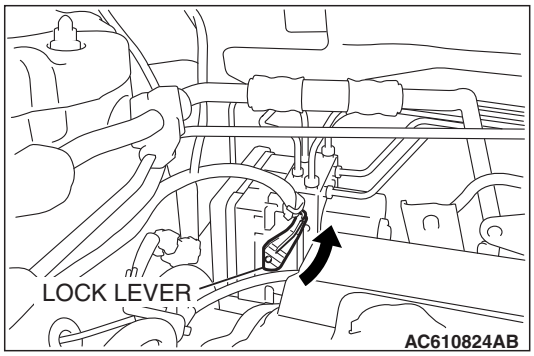
REMOVAL SERVICE POINTS

<<A>> TCL/ASC-ECU HARNESS CONNECTOR DISCONNECTION



Move the lock lever of the TCL/ASC-ECU connector as shown in the illustration, and then disconnect the harness connector.

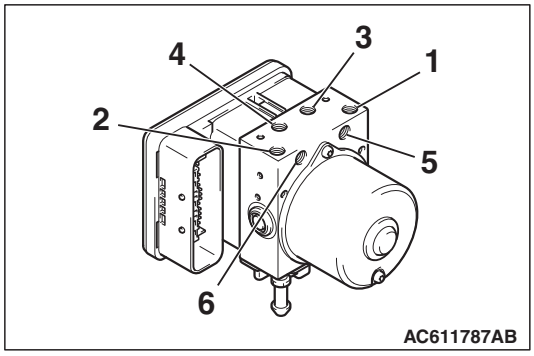
<<B>> HYDRAULIC UNIT (INTEGRATED WITH TCL/ASC-ECU) REMOVAL

⚠ ***WARNING***
The hydraulic unit is heavy. Use care when removing it.

⚠ **CAUTION**
- **The hydraulic unit cannot be disassembled. Never loosen its nuts or bolts.**
- **Do not drop or shock the hydraulic unit.**
- **Do not turn the hydraulic unit upside down or lay it on its side.**

INSTALLATION SERVICE POINT

>>A<< BRAKE TUBE CONNECTION



Connect the tubes to the hydraulic unit assembly as shown in the illustration.

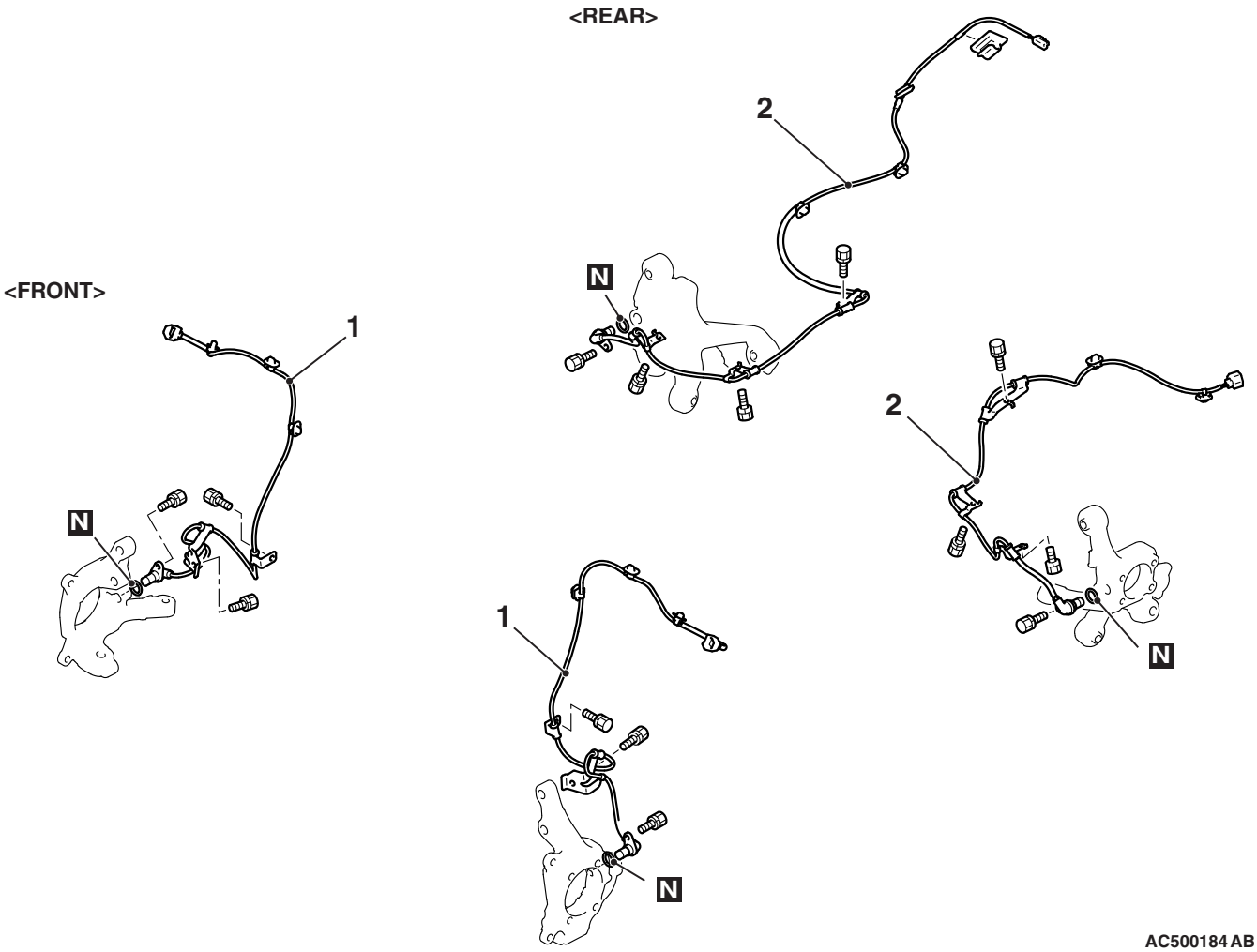
1. From the master cylinder (secondary)
2. From the master cylinder (primary)
3. To the front brake (RH)
4. To the front brake (LH)
5. To the rear brake (LH)
6. To the rear brake (RH)

WHEEL SPEED SENSOR

REMOVAL AND INSTALLATION

M1355005300355

Post-installation Operation
- Wheel Speed Sensor Output Voltage Measurement (Refer to P.35C-218).



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FRONT WHEEL SPEED SENSOR REMOVAL STEPS

- SPLASH SHIELD (REFER TO GROUP 42, FENDER P.42-12).

<<A>> 1. FRONT WHEEL SPEED SENSOR
- FRONT WHEEL SPEED ROTOR (REFER TO GROUP 26, DRIVESHAFT ASSEMBLY P.26-14).

REAR WHEEL SPEED SENSOR REMOVAL STEPS

<<A>> 2. REAR WHEEL SPEED SENSOR
- REAR WHEEL SPEED ROTOR (REFER TO GROUP 27, REAR AXLE HUB ASSEMBLY P.27-7).

NOTE: Front wheel speed rotors are integrated with the BJ assembly of the drive shaft and cannot be disassembled.

NOTE: Rear wheel speed rotors are integrated with the rear hub assembly and cannot be disassembled.

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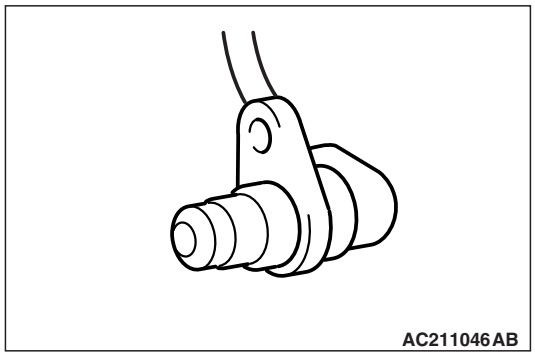
REMOVAL SERVICE POINT

<<A>> FRONT WHEEL SPEED SENSOR/REAR WHEEL SPEED SENSOR REMOVAL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⚠ CAUTION
Be careful when handling the projection at the tip of the wheel speed sensor and the toothed edge of the wheel speed rotor so as not to damage them by contacting other parts.

INSPECTION

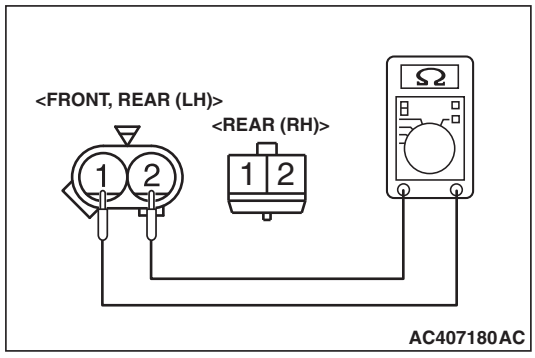
M1355005400040

WHEEL SPEED SENSOR CHECK

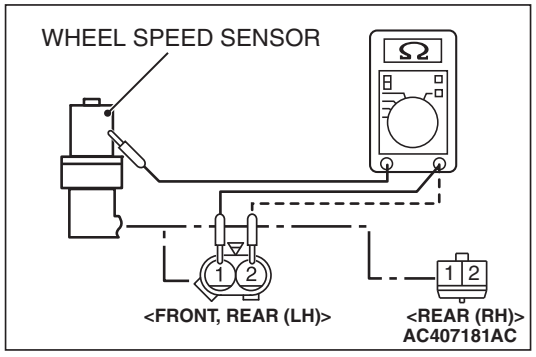
1. Check whether any metallic foreign material has adhered to the projection at the speed sensor tip. Remove any foreign material. Also check whether the pole piece is damaged. Replace it with a new one if it is damaged.

   NOTE: The projection can become magnetized due to the magnet inside the wheel speed sensor, causing foreign material to easily adhere to it. The projection may not be able to correctly sense the wheel rotation speed if foreign matter is on it or if it is damaged.
2. Measure the resistance between the wheel speed sensor terminals.

   Standard value: 1.24 – 1.64 kΩ
3. If the internal resistance of the wheel speed sensor is not within the standard value, replace it with a new wheel speed sensor.



AC407180AC

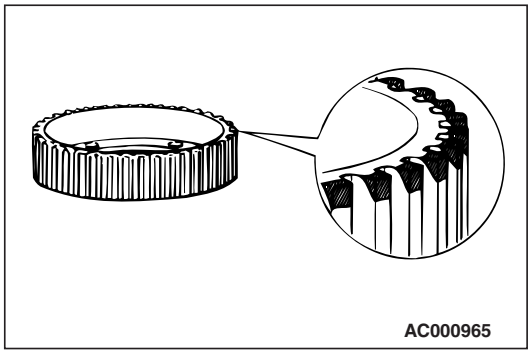


AC407181AC

4. Remove all connections from the wheel speed sensor. The circuit should be open between terminals (1) and (2) and the body of the wheel speed sensor. If the circuit is not open, replace with a new wheel speed sensor.
5. Check the wheel speed sensor cable for breakage, damage or disconnection. Replace with a new one if a problem is found.

   NOTE: When checking for cable damage, remove the cable clamp part from the body and then gently bend and pull the cable near the clamp.

TOOTHED WHEEL SPEED ROTOR CHECK

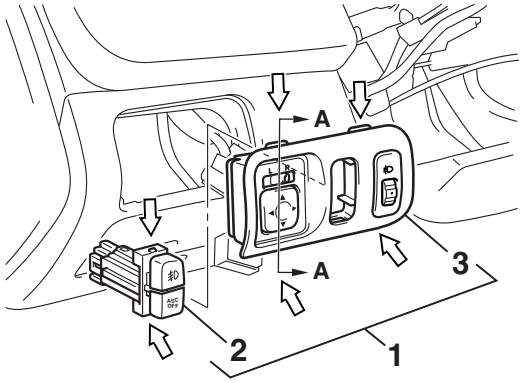

AC000965

Check whether the wheel speed rotor teeth are broken or deformed. Replace the BJ assembly of the drive shaft, or the rear hub assembly, respectively, if the teeth are damaged or deformed.

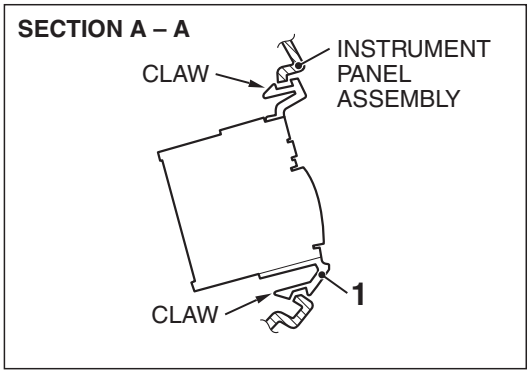
ASC OFF SWITCH

REMOVAL AND INSTALLATION

M1355020100165



NOTE
⇦ : CLAW POSITION



AC711994AB

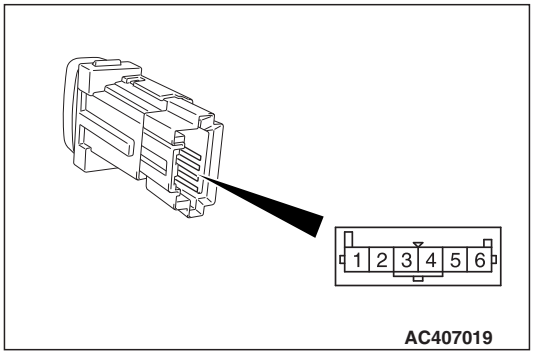
REMOVAL STEPS
1. SWITCH PANEL ASSEMBLY

REMOVAL STEPS (Continued)
2. ASC OFF SWITCH
3. SWITCH PANEL

INSPECTION

M1357003400028

ASC OFF SWITCH CONTINUITY CHECK



AC407019

SWITCH POSITION	TESTER CONNECTION	SPECIFIED CONDITION
Pressed	5 – 6	Continuity exists (2 Ω or less)
Released	5 – 6	Open circuit

TSB Revision

G AND YAW RATE SENSOR

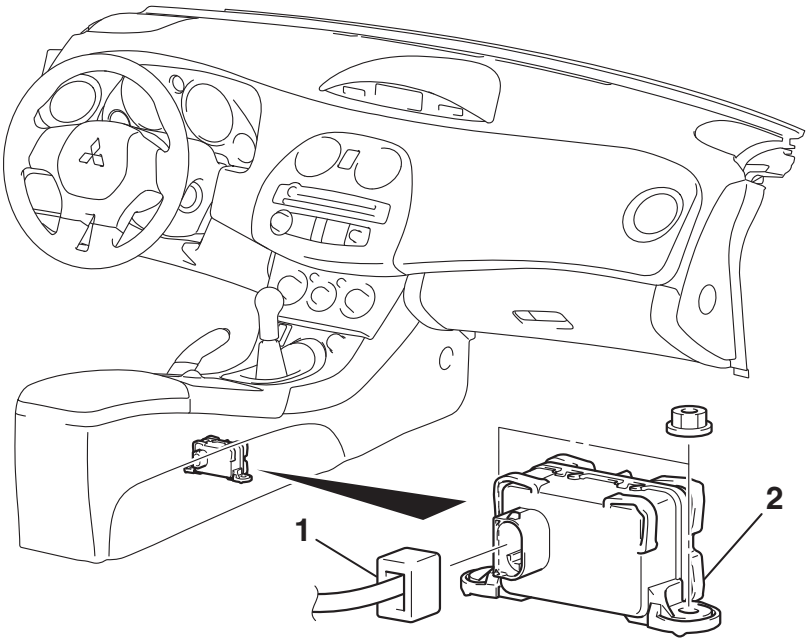
REMOVAL AND INSTALLATION

M1355004500130

⚠ CAUTION
Do not drop or shock the G and yaw rate sensor.

⚠ CAUTION
Always carry out calibration if steering angle is adjusted (Refer to P.35C-223). This is necessary because the TCL/ASC-ECU should update the G and yaw rate sensor neutral point.

Pre-removal and Post-installation Operation
- Floor Console Center Panel Assembly Removal and Installation (Refer to GROUP 52A, Floor Console Assembly P.52A-28.)
- G and Yaw Rate Sensor Calibration (Refer to P.35C-223.)



AC610819AB

REMOVAL STEPS
1. HARNESS CONNECTOR
2. G AND YAW RATE SENSOR

TSB Revision

STEERING WHEEL SENSOR

REMOVAL AND INSTALLATION

M1355005100168

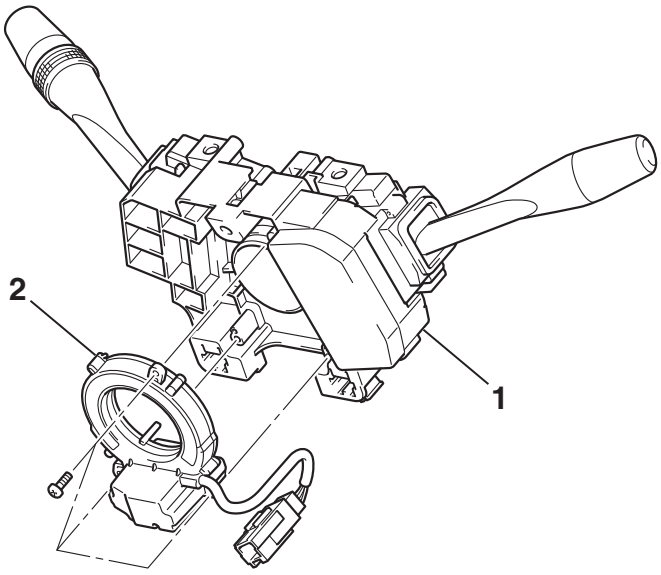
⚠ *WARNING*

Before removing the steering wheel and air bag module assembly, refer to GROUP 52B, Service Precautions P.52B-28 and Air Bag Module and Clock Spring P.52B-423orP.52B-423.

⚠ CAUTION

- **When centering the clock spring, always remove the clock spring from the column switch in advance. Otherwise, the sensor may be damaged.**
- **If the clock spring is not correctly aligned, the steering wheel may not be turned or the cable inside the clock spring may be broken, causing the SRS to be inoperative.**
- **Always carry out steering wheel sensor calibration after the steering wheel sensor has been installed (Refer to P.35C-223). This is necessary because the TCL/ASC-ECU should update the steering neutral point.**

Pre-removal Operation	Post-installation Operation
• Steering Wheel and Air Bag Module Assembly Removal (Refer to GROUP 37, Steering Wheel P.37-27.)	• Steering Wheel and Air Bag Module Assembly Installation (Refer to GROUP 37, Steering Wheel P.37-27.) • Steering Wheel Sensor Calibration (Refer to P.35C-223.)



AC308440AB

REMOVAL STEPS

- TURN THE FRONT WHEELS TO THE STRAIGHT-AHEAD POSITION.

REMOVAL STEPS (Continued)

>>**A**<< 1. CLOCK SPRING AND COLUMN SWITCH ASSEMBLY (REFER TO GROUP 52B, AIR BAG MODULE AND CLOCK SPRING P.52B-423orP.52B-423.)

>>**A**<< 2. STEERING WHEEL SENSOR

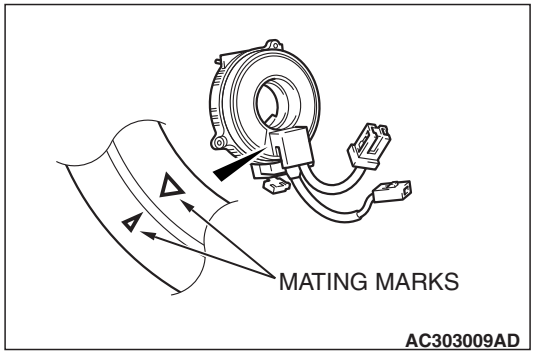
TSB Revision

INSTALLATION SERVICE POINT

>>A<< STEERING WHEEL SENSOR NEUTRAL POINT ALIGNMENT

⚠ *WARNING*

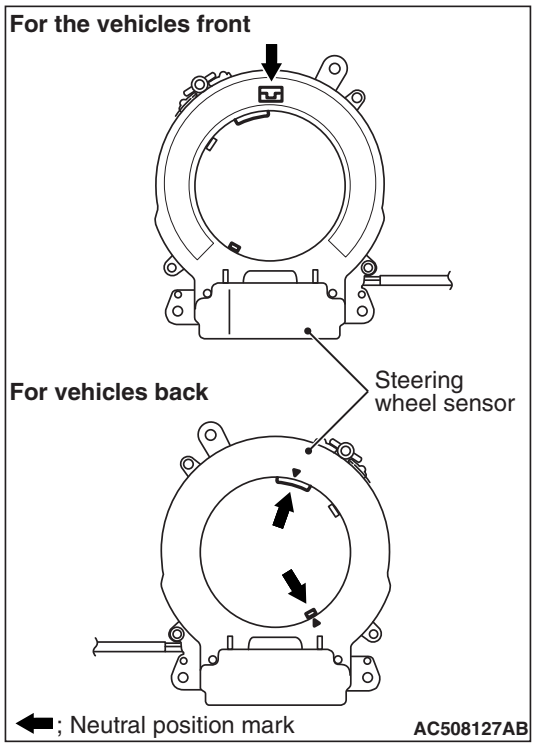
Ensure that the clock spring's mating marks are properly aligned. If not, the steering wheel may not rotate completely during a turn, or the flat cable in the clock spring could be damaged, This would prevent normal SRS operation and possibly cause serious injury to the driver.



1. Align the mating marks of the clock spring.
   <Mating Mark Alignment>
   (1) Turn the clock spring clockwise fully. Then turn it back approximately 3-3/4 turns counterclockwise to align the mating marks.
   (2) Then install the clock spring to the column switch.

⚠ CAUTION

Be sure to align the three neutral point marks of the steering wheel sensor at the same time as shown in the figure. If these mating marks are not aligned correctly, the steering wheel sensor may be damaged.



2. Align the three neutral point marks of the steering wheel sensor at the same time as shown in the figure.
   <Mating Mark Alignment>
   (1) If the neutral point mark is not seen when the window for checking the neutral point of the steering wheel sensor is checked, turn it to align the neutral point marks as shown in the figure.
   (2) With paying attention not to misalign the neutral position, install the steering wheel sensor to the clock spring and and column switch assembly.

   NOTE: A new steering wheel sensor has a pin for preventing the rotation of (fixing) the steering wheel sensor. After installing the sensor to the clock spring and column switch assembly, remove this pin.
   (3) Install the clock spring and column switch assembly to the vehicle, maintaining the neutral position correctly.

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATION

M1355008000030

ITEM	SPECIFICATION
Brake tube flare nut	15 ± 2 N·m (12 ± 1 ft-lb)

SERVICE SPECIFICATIONS

M1355008200012

ITEM	STANDARD VALUE
Wheel speed sensor internal resistance kΩ	1.24 – 1.64

NOTES