

## GROUP 35C

# ACTIVE SKID CONTROL SYSTEM (ASC)

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**GENERAL INFORMATION**

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ASC (Active Skid Control System) has been installed.

- The ASC system integrates the traction control function and skid control function.
- When Traction control function detects the slip of the driving wheel (ex. during startup on slippery surfaces), it automatically applies the brakes to control the wheel slip ratios. At the same time, Traction control function reduces the engine output and prevents the wheel spin.
- Skid control function responds to driving conditions and reduces the engine output and applies brake force to four wheels independently to control the vehicle behavior.

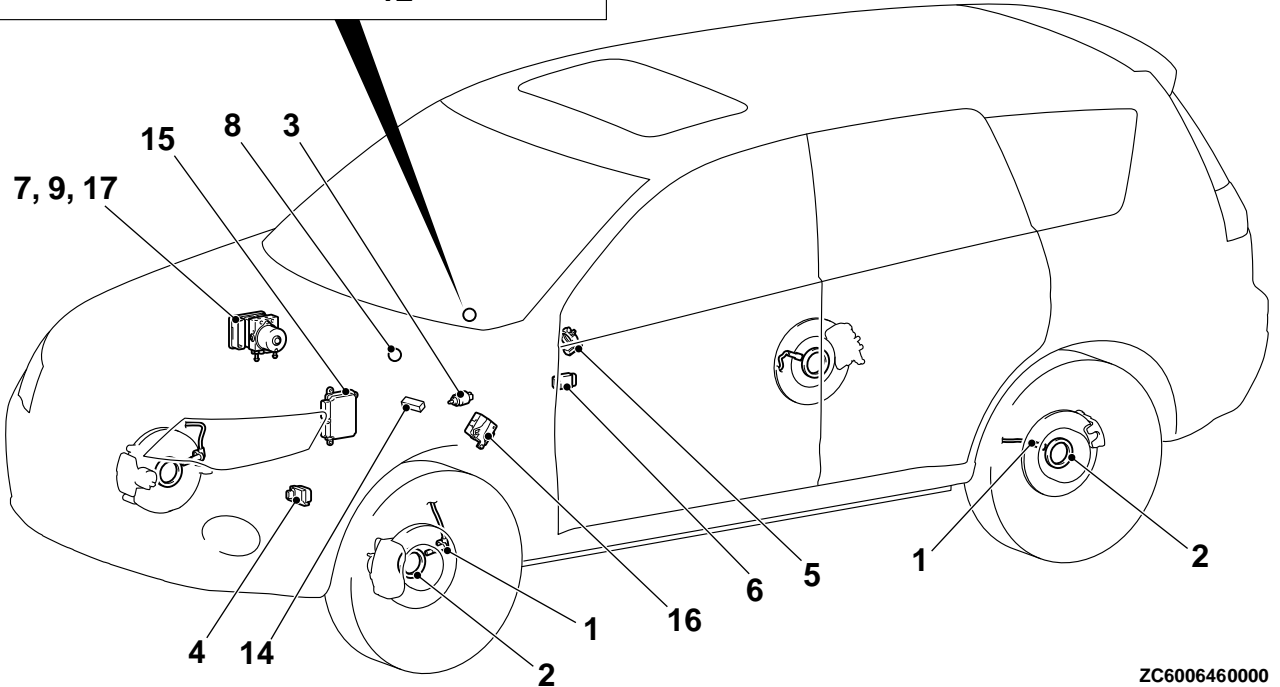
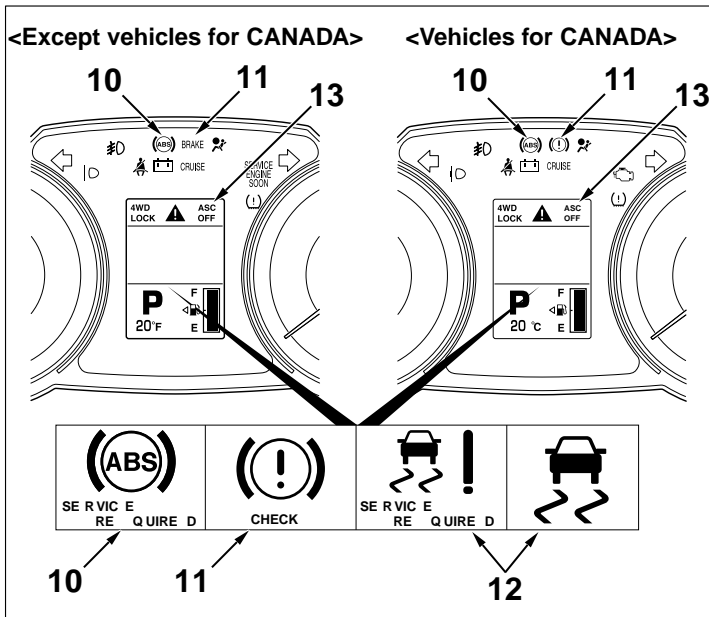
- Fail-safe function assures the safety.
- Serviceability improvement
- For reduced wiring harnesses and secure data communication, the CAN\* communication has been adopted as a tool of communication with another ECU.

**NOTE:**

\*\*For more information about CAN (Controller Area Network), refer to GROUP 54D P.54D-3.

\*ABS and ASC are controlled by ASC-ECU.

**CONSTRUCTION DIAGRAM**



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NAME OF PART		NUMBER	OUTLINE OF FUNCTION
Sensor	Wheel speed sensor	1	Outputs the frequency signal in proportion to the rotation speed of each wheel to ASC-ECU.
	Magnetic encoder for wheel speed detection	2	The wheel speed sensor is a pulse generator. When the magnetic encoder for wheel speed detection (a plate on which north and south pole sides of the magnets are arranged alternately) rotates, it outputs frequency pulse signal in proportion to each wheel speed.
	Stoplight switch	3	Outputs the signal indicating whether the brake pedal is depressed or not through ETACS to ASC-ECU via CAN-bus line.

**ACTIVE SKID CONTROL SYSTEM (ASC)  
SERVICE SPECIFICATIONS**

NAME OF PART		NUM BER	OUTLINE OF FUNCTION
	G&yaw rate sensor	4	Detects yaw rate longitudinal (AWD only) and lateral acceleration of a vehicle, and outputs signal to ASC-ECU via the CAN line.
	Steering wheel sensor	5	Detects the steering angle of the steering wheel, and outputs signal to ASC-ECU via the CAN bus line.
	ASC OFF switch	6	Outputs the ON/OFF signal through ETACS to ASC-ECU via CAN-bus line to turn on and off skid control function and traction control function.
	Pressure sensor	7	Integrated into the hydraulic unit, and outputs the signal for the brake fluid pressure in the master cylinder to ASC-ECU.
	Brake fluid level switch	8	Outputs a drop in the brake fluid level in the brake fluid reservoir tank through ETACS to ASC-ECU via CAN-bus line.
ACTUA TOR	Hydraulic unit	9	Drives the solenoid valve using the signal from ASC-ECU, and controls the brake fluid pressure for each wheel.
	ABS warning light	10	Informs the driver of the system status by illuminating, flashing, or turning off the warning light according to the signal from ASC-ECU.
	Brake warning light	11	Used as the warning light for the parking brake, brake fluid level, and EBD control. Informs the driver of the system status by illuminating, flashing, or turning off the warning light according to the signal from ASC-ECU.
	ASC operation indicator light	12	Traction control function and skid control function use the same display. Depending on the signal from ASC-ECU, the indicator light informs the driver of the system status by flashing when the system operates and by illuminating when skid control function or traction control function has a malfunction.
	ASC OFF indicator light	13	Informs the driver of skid control function and traction control function shutdown by the signal from ASC-ECU. Informs the driver that the brake system overheats and the brake traction control stops by flashing the indicator light in approximately 2 Hz.
Data link connector	14	Sets the diagnostic trouble code and establishes the communication with scan tool.	
Engine ECU	15	Controls the engine output based on the signal from ASC-ECU.	
AWD-ECU	16	Outputs the drive status to ASC-ECU.	
ASC-ECU		17	Controls actuators (described above) based on the signals coming from each sensor.
			Controls the self-diagnosis and fail-safe functions.
			Controls the diagnostic function (scan tool compatible).

**SERVICE SPECIFICATIONS**

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Item	Standard value
Wheel speed sensor current mA	5.9 - 8.4 or 11.8 - 16.8
Wheel speed sensor insulation resistance MΩ	5 or more

## DIAGNOSIS

### INTRODUCTION TO ASC DIAGNOSIS

The active skid control system (ASC) operates differently from conventional brake systems. These differences include sounds, sensations, and vehicle performance that owners and service technicians who are not familiar with ASC may not be used to. Some operational characteristics may seem to be malfunctions, but they are simply signs of normal ASC

operation. When diagnosing the ASC system, keep these operational characteristics in mind. Inform the owner of the kind of performance characteristics to expect from an ASC-equipped vehicle.

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### ASC DIAGNOSTIC TROUBLE CODE DETECTION CONDITIONS

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

When you check if an ASC DTC will be displayed again after the DTC has been erased, you should

duplicate the ASC DTC set conditions. Depending on the detection timing and set conditions for the specific 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 "ASC DTC SET CONDITIONS" for each ASC DTC that you are trying to reset.

### ASC DIAGNOSTIC TROUBLESHOOTING STRATEGY

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 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 ASC DTC.
4. If you cannot verify the condition and there are no ASC DTCs, the malfunction is intermittent. Refer to GROUP 00, How to use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunctions P.00-15.
5. If you can verify the condition but there are no ASC DTCs, or the system cannot communicate with the scan tool, check that the basic brake system is operating properly.
  - \*If the basic brake system is not operating properly, refer to the GROUP 35A, Basic Brake

System Diagnostic troubleshooting strategy P. 35A-5.

- \*If the basic brake system is operating properly, refer to P.35C-160.
6. If there is an ASC DTC, record the number of the DTC, then erase the DTC from the memory using the scan tool.
7. Recreate the ASC DTC set conditions to see if the same ASC DTC will set again.
  - \*If the same ASC DTC sets again, perform the diagnostic procedures for the DTC. Refer to P. 35C-11.
  - \*If you cannot get the same 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.00-15.

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**DIAGNOSTIC FUNCTION****ON-BOARD DIAGNOSTICS**

If the ASC-ECU detects any problem in the CAN communication line or the ECUs, which the ASC-ECU is communicating with, it stores a diagnostic trouble code. The DTCs have 73 items. The DTCs can be confirmed by connecting scan tool MB991958

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(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 the special tool MB991824.
5. Connect special tool MB991910 to the data link connector.
6. Turn the power switch special tool MB991824 to the "ON" position.

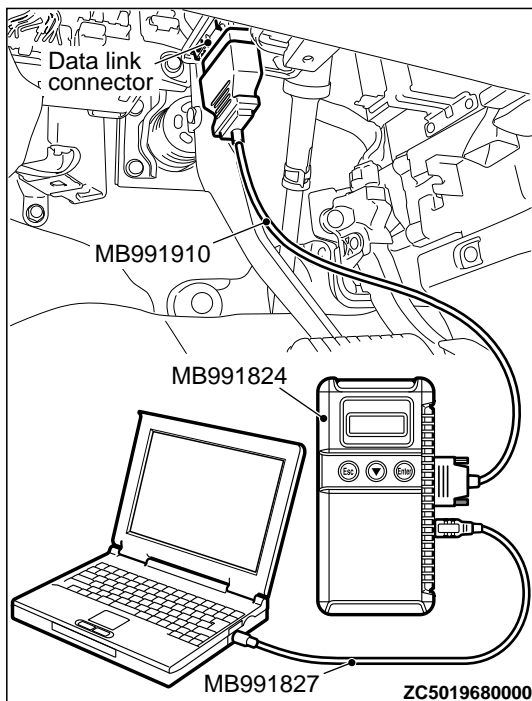
*NOTE: When the special tool MB991824 is energized, the special tool MB991824 indicator light will be illuminated in a green color.*

7. Start the M.U.T.-III system on the personal computer.

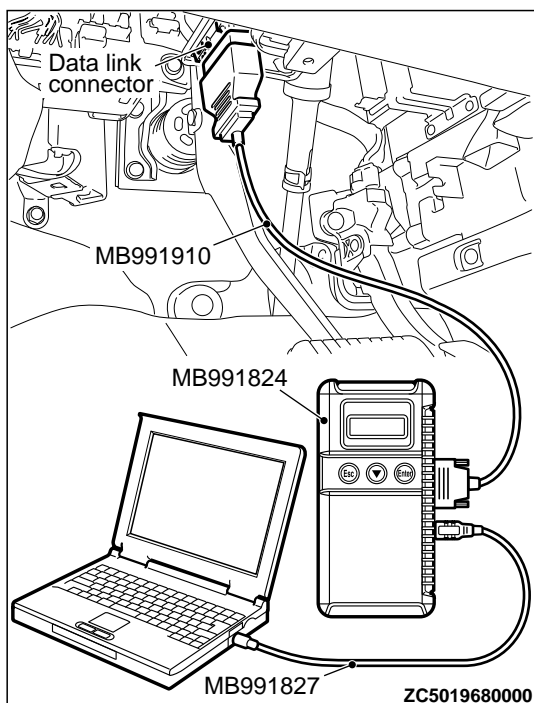
*NOTE: Disconnect the scan tool MB991958 in the reverse order of the connecting sequence, making sure that the ignition switch is at the "LOCK" (OFF) position.*

**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. Select "ABS/ASC/ASTC" from the system list, and select the "OK" button.
5. Select "Diagnostic Trouble Code."
6. If a DTC is set, it is shown.
7. Choose "DTC erase" to erase the DTC.

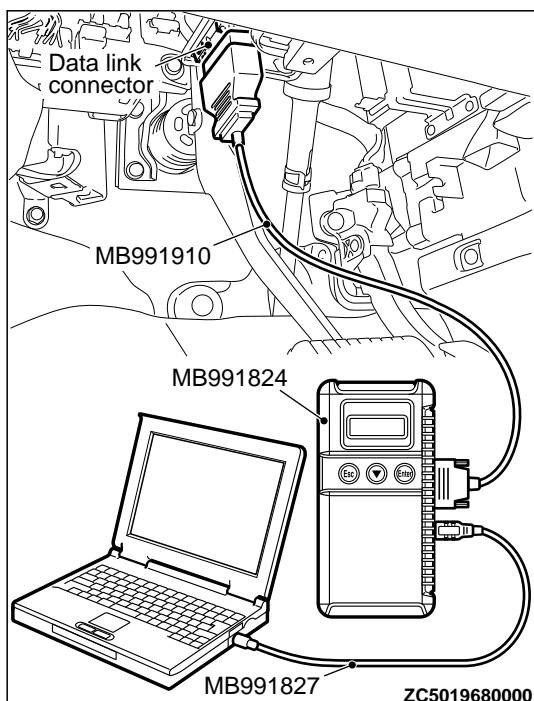
**HOW TO READ DATA LIST****Required Special Tools:**

- 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. Select "ABS/ASC/ASTC" from the system list, and select the "OK" button.
5. Select "Data List."



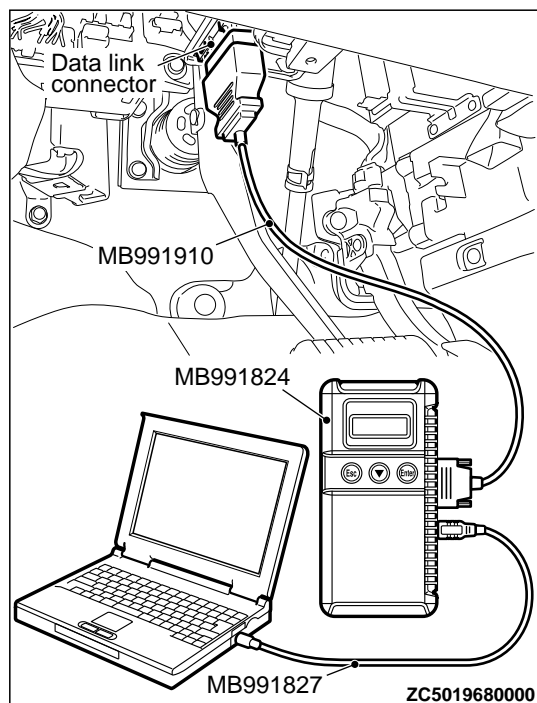
**HOW TO PERFORM ACTUATOR TEST****Required Special Tools:**

- 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

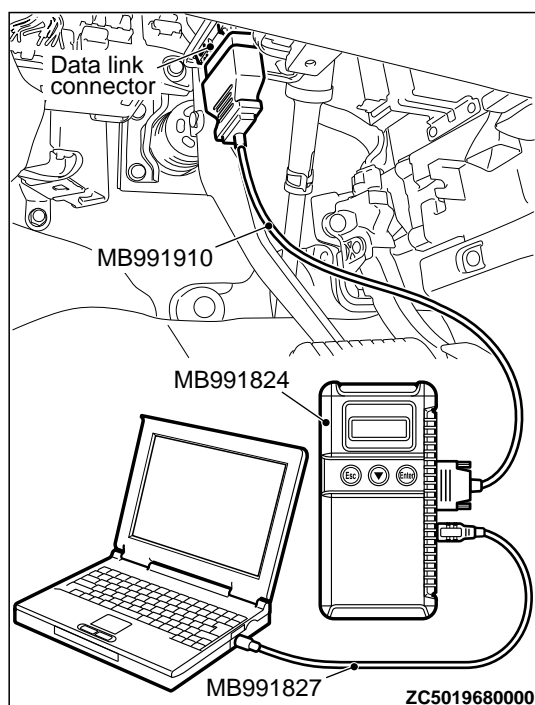
**⚠ CAUTION**

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. Select "ABS/ASC/ASTC" from the system list, and select the "OK" button.
5. Choose "Actuator Test" from "ABS" 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**

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**⚠ CAUTION**

During diagnosis, a DTC code associated with another system may be set when the ignition switch is turned on with connector(s)

disconnected. On completion, confirm all systems for DTCs. If DTC code(s) are set, erase them all.

DTC	Inspection item	Reference page
C100A	Abnormality in FL wheel speed sensor circuit	P.35C-14
C1015	Abnormality in FR wheel speed sensor circuit	P.35C-18
C1020	Abnormality in RL wheel speed sensor circuit	P.35C-23
C102B	Abnormality in RR wheel speed sensor circuit	P.35C-28
C1011	Abnormality in FL wheel speed sensor signal	P.35C-33
C101C	Abnormality in FR wheel speed sensor signal	P.35C-38
C1027	Abnormality in RL wheel speed sensor signal	P.35C-43
C1032	Abnormality in RR wheel speed sensor signal	P.35C-49
C1014	Mutual monitoring of FL wheel speed sensor	P.35C-55
C101F	Mutual monitoring of FR wheel speed sensor	P.35C-58
C102A	Mutual monitoring of RL wheel speed sensor	P.35C-61
C1035	Mutual monitoring of RR wheel speed sensor	P.35C-65
C1041	Abnormality in periodical signal for FL wheel speed sensor	P.35C-69
C1042	Abnormality in periodical signal for FR wheel speed sensor	P.35C-71
C1043	Abnormality in periodical signal for RL wheel speed sensor	P.35C-74
C1044	Abnormality in periodical signal for RR wheel speed sensor	P.35C-77
C1046	FL wheel speed sensor control phase time exceeded	P.35C-80

**ACTIVE SKID CONTROL SYSTEM (ASC)  
DIAGNOSIS**

<b>DTC</b>	<b>Inspection item</b>		<b>Reference page</b>	
C1047	FR wheel speed sensor control phase time exceeded		P.35C-84	
C1048	RL wheel speed sensor control phase time exceeded		P.35C-87	
C1049	RR wheel speed sensor control phase time exceeded		P.35C-89	
C104B	Abnormality in FL wheel inlet valve system		P.35C-91	
C104F	Abnormality in FR wheel inlet valve system			
C1053	Abnormality in RL wheel inlet valve system			
C1057	Abnormality in RR wheel inlet valve system			
C105F	Abnormality in FL wheel outlet valve system			
C1063	Abnormality in FR wheel outlet valve system			
C1067	Abnormality in RL wheel outlet valve system			
C105B	Abnormality in RR wheel outlet valve system			
C1200	Abnormality in FL/RR wheel cut valve system			
C1204	Abnormality in FR/RL wheel cut valve system			
C1208	Abnormality in FL/RR wheel suction valve system			
C120C	Abnormality in FR/RL wheel suction valve system			
C2104	Malfunction of valve power supply circuit			P.35C-94
C1073	Malfunction of motor drive circuit			P.35C-98
C2116	Abnormality in power supply voltage in pump motor		P.35C-102	
C121D	Abnormality in brake fluid pressure sensor circuit		P.35C-106	
C121E	Abnormality in brake fluid pressure sensor output signal		P.35C-107	
C1000	Abnormality in stoplight switch circuit		P.35C-110	
C1009	Low brake fluid level		P.35C-113	
C123B	Prolonged operation of ASC		P.35C-115	
C2200	Abnormality in ASC-ECU		P.35C-117	
C2100	Abnormality in battery voltage (low voltage)	Below $9.7 \pm 0.3$ V, below $8.0 \pm 0.5$ V	P.35C-118	
		Lower than $8.0 \pm 0.5$ V Vehicle stopped		
C2101	Abnormality in battery voltage (high voltage)	$18.0 \pm 1.0$ V or more	P.35C-122	
C1395	Brake fluid filling not complete		P.35C-125	
C121C	Torque request signal rejection		P.35C-126	
C1290	CAN time-out error		P.35C-128	
C2203	VIN not recorded		P.35C-129	
C2206	Re-execution of variant coding		P.35C-131	
C1210	Abnormality in G and yaw rate sensor	Longitudinal G sensor	P.35C-132	
C1242	Abnormality in G and yaw rate sensor	Longitudinal G sensor	P.35C-134	

**ACTIVE SKID CONTROL SYSTEM (ASC)  
DIAGNOSIS**

**35C-13**

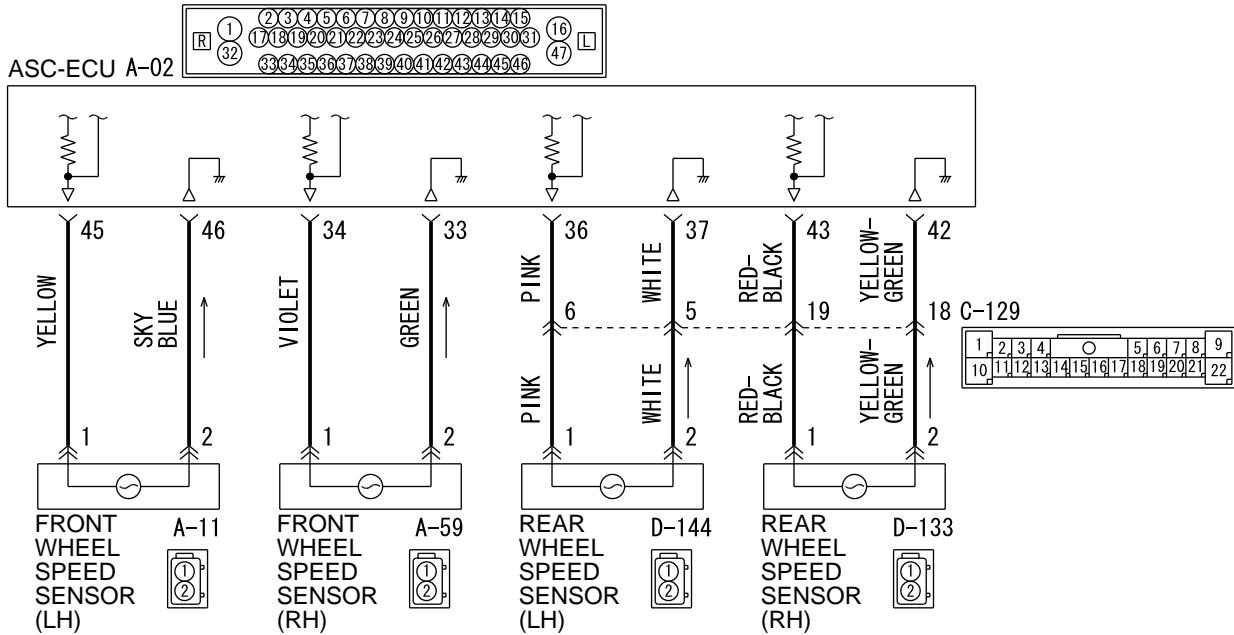
<b>DTC</b>	<b>Inspection item</b>		<b>Reference page</b>
C123C	Abnormality in G and yaw rate sensor	Lateral G and yaw rate sensor	P.35C-135
C2204	Internal abnormality in G and yaw rate sensor	Abnormality in Internal circuit	P.35C-137
		Abnormality in lateral G-sensor output voltage	
		Abnormality in yaw rate sensor output voltage	
		Abnormality in G and yaw rate sensor supply voltage	
C2111	Sensor power supply circuit	Low input	P.35C-139
C2112	Sensor power supply circuit	High input	
C2114	Abnormality in G and yaw rate sensor operation voltage	Low voltage (below $6.5 \pm 0.5$ V)	P.35C-140
C2115	Abnormality in G and yaw rate sensor operation voltage	High voltage ( $18.0 \pm 1.0$ V or more)	
C123A	Abnormality in sensor calibration		P.35C-143
C1219	Abnormality in steering wheel sensor signal		P.35C-144
C121A	Abnormality in steering wheel sensor initialization	Steering wheel sensor neutral point not learned	P.35C-146
C2205	Internal abnormality in steering wheel sensor		P.35C-147
C1608	Implausible diagnosis data		P.35C-149
U0001	Bus-off		P.35C-149
U0100	Engine time-out error		P.35C-150
U0101	A/T time-out error		
U0114	AWD-ECU time-out error		
U0126	Steering wheel sensor time-out error		
U0141	ETACS time-out error		
U0125	G and yaw rate sensor message time-out error/message error		
U0401	Engine malfunction detected		P.35C-153
U0428	Communication error in steering wheel sensor		P.35C-154
U1003	G and yaw rate sensor bus-off		P.35C-155
U1415	Variant coding not completed		P.35C-157
U1417	Variant coding value invalid (includes faulty installation)		P.35C-158

DIAGNOSTIC TROUBLE CODE PROCEDURES

DTC C100A: Abnormality in FL wheel speed sensor circuit

M13506100010USA0000010000

Wheel Speed Sensor Circuit



D7G35M016A00

**CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

- The wheel speed sensor is a kind of a pulse generator. It consists of encoders (a plate on which north and south pole sides of the magnets are arranged alternately) for detecting the wheel speed which rotates at the same speed of the wheels and wheel speed sensors. This sensor outputs frequency pulse signals in proportion to the wheel speed.
- The pulse signals, which the wheel speed sensor creates, are sent to ASC-ECU. ASC-ECU uses the frequency of the pulse signals to determine the wheel speed.

---

### DTC SET CONDITIONS

ASC-ECU monitors the voltage fluctuation in each wheel speed sensor circuit. If ASC-ECU detects the open or short circuit in the circuit, it will set a DTC.

### PROBABLE CAUSES

#### Current trouble

- Damaged wiring harness and connectors
- Noise interference
- Malfunction of wheel speed sensor
- ASC-ECU malfunction

#### Past trouble

- Carry out diagnosis with particular emphasis on wiring harness and connector failures between ASC-ECU and the wheel speed sensor. For diagnosis procedures, refer to How to treat past trouble (GROUP 00 - How to Cope with Intermittent Malfunction P.00-15).

### 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. M.U.T.-III CAN bus diagnostics

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

---

#### STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines

#### Q:Is the diagnostic trouble code C100A set?

**YES:** Go to Step 3.

**NO:** The procedure is complete.

---

#### STEP 3. M.U.T.-III data list

Check the following service data.

- Item No.01: FL wheel speed sensor

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

**YES:** Intermittent malfunction. (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15.)

**NO:** Go to Step 4.

**STEP 4. Voltage measurement at the A-02 ASC-ECU connector**

- (1) Disconnect the ASC-ECU connector, connect special tool MB991997 to the harness-side connector, and then measure the resistance at the special tool connector side.

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

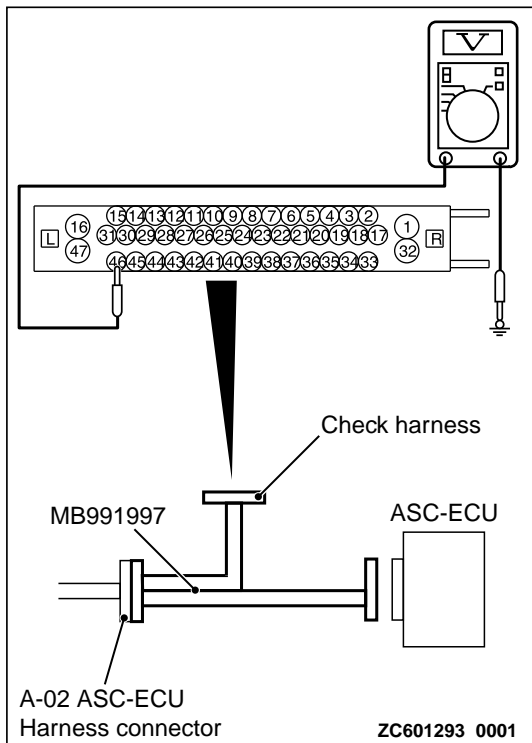
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between the wheel speed sensor power supply terminal (signal terminal) No. 45/the ground terminal No. 46 and the body ground.

**OK: 0 volt**

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

**YES:** Go to Step 5.

**NO (Not normal at the terminal No. 45 or 46):** Go to Step 6.

**STEP 5. Resistance measurement at A-02 ASC-ECU connector**

- (1) Disconnect the ASC-ECU connector, connect special tool MB991997 to the harness-side connector, and then measure the resistance at the special tool connector side.

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

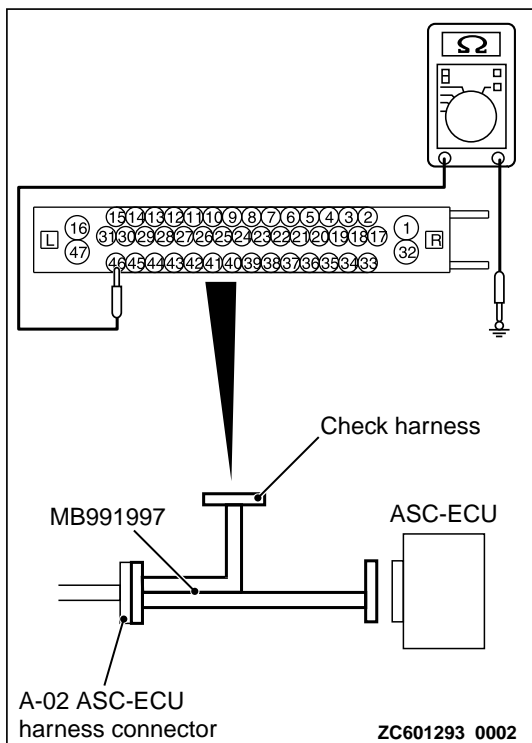
- (2) Resistance between the wheel speed sensor power supply terminal (signal terminal) No. 45/the ground terminal No. 46 and the body ground

**OK: No continuity**

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

**YES:** Go to Step 8.

**NO (Not normal at the terminal No. 45 or 46):** Go to Step 6.

**STEP 6. Connector check: A-02 ASC-ECU connector, A-11 wheel speed sensor <FL> connector****Q: Is the check result normal?**



**YES:** Go to Step 7.

**NO:** Repair the defective connector.

**STEP 7. Wiring harness check between A-02 ASC-ECU connector terminal No. 45/46 and A-11 wheel speed sensor <FL> connector terminal No. 1/2**

\*Check for short circuit in wheel speed sensor <FL> circuit

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

**YES:** Replace the wheel speed sensor <FL>.

**NO:** Repair the wiring harness.

**STEP 8. Voltage measurement at the A-02 ASC-ECU connector**

(1) Disconnect the ASC-ECU connector, connect special tool MB991997 to the ASC-ECU-side connector and harness-side connector, and then measure the voltage at the special tool connector side.

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

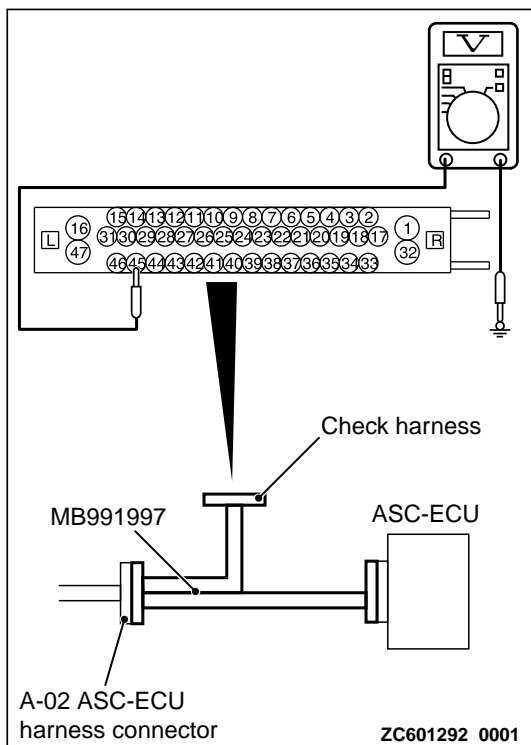
(3) Measure the voltage between the wheel speed sensor circuit power supply terminal (signal terminal) No. 45 and the body ground.

**OK: Approximately battery voltage**

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

**YES:** Go to Step 11.

**NO:** Go to Step 9.



**STEP 9. Connector check: A-02 ASC-ECU connector, A-11 wheel speed sensor <FL> connector**

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

**YES:** Go to Step 10.

**NO:** Repair the defective connector.

**STEP 10. Wiring harness check between A-02 ASC-ECU connector terminal No. 45/46 and A-11 wheel speed sensor <FL> connector terminal No. 1/2**

\*Check for open circuit in wheel speed sensor <FL> circuit.

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

**YES:** Replace the wheel speed sensor.

**NO:** Repair the wiring harness.

**STEP 11. Check for wheel speed sensor as a single unit**

Refer to P.35C-197.

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

**YES:** Go to Step 12.

**NO:** Replace the wheel speed sensor.

**STEP 12. Check whether the diagnostic trouble code is reset.**

- (1) Erase the diagnostic trouble code.
- (2) Drive the vehicle at 12mph (20 km/h) or more.

*NOTE: The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12mph (20 km/h) or higher.*

**Q: Is DTC C100A set?**

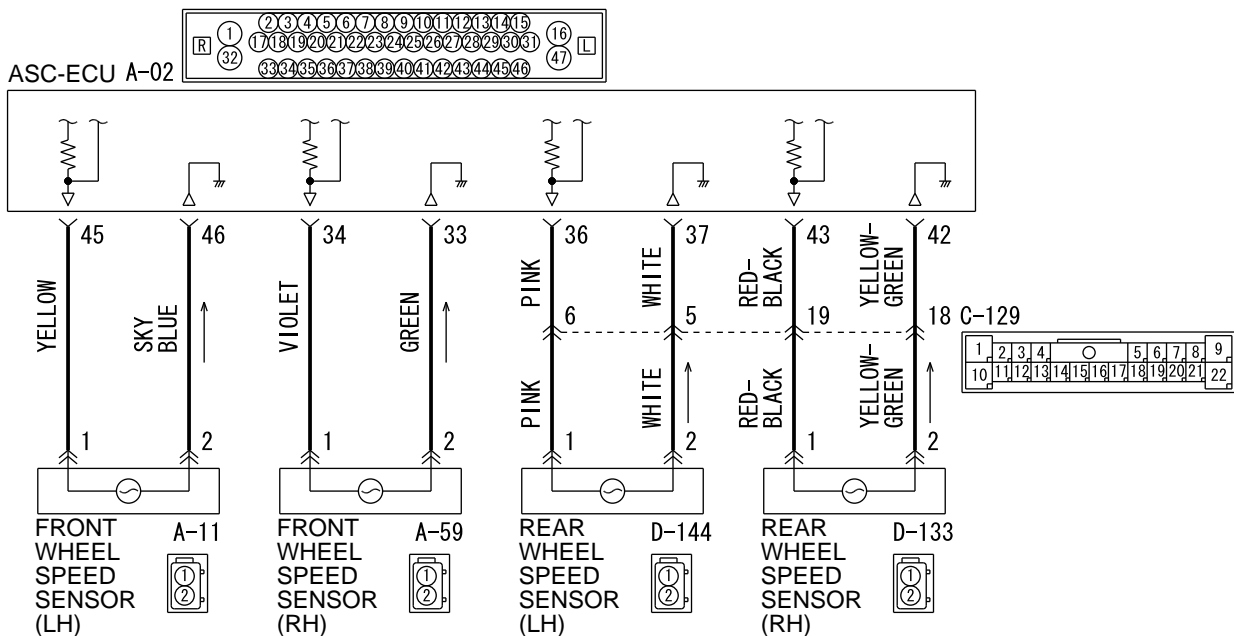
**YES:** Replace the ASC-ECU.

**NO:** Intermittent malfunction. (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15.)

**DTC C1015: Abnormality in FR wheel speed sensor circuit**

M13506100011USA0000010000

Wheel Speed Sensor Circuit



D7G35M016A00

**CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

### **CIRCUIT OPERATION**

- The wheel speed sensor is a kind of a pulse generator. It consists of encoders (a plate on which north and south pole sides of the magnets are arranged alternately) for detecting the wheel speed which rotates at the same speed of the wheels and wheel speed sensors. This sensor outputs frequency pulse signals in proportion to the wheel speed.
- The pulse signals, which the wheel speed sensor creates, are sent to ASC-ECU. ASC-ECU uses the frequency of the pulse signals to determine the wheel speed.

### **DTC SET CONDITIONS**

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

### **PROBABLE CAUSES**

#### **Current trouble**

- Damaged wiring harness and connectors
- Noise interference
- Malfunction of wheel speed sensor
- ASC-ECU malfunction

#### **Past trouble**

- Carry out diagnosis with particular emphasis on wiring harness and connector failures between ASC-ECU and the wheel speed sensor. For diagnosis procedures, refer to How to treat past trouble (GROUP 00 - How to Cope with Intermittent Malfunction P.00-15).

### **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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

---

#### **STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines**

#### **Q:Is the diagnostic trouble code No. C1015 set?**

**YES:** Go to Step 3.

**NO:** The procedure is complete.

### STEP 3. M.U.T.-III data list

Check the following service data.

- Item No.02: FR wheel speed sensor

### Q:Is the check result normal?

**YES:** Intermittent malfunction (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15).

**NO:** Go to Step 4.

### STEP 4. Voltage measurement at the A-02 ASC-ECU connector

- (1) Disconnect the ASC-ECU connector, connect special tool MB991997 to the harness-side connector, and then measure the resistance at the special tool connector side.

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

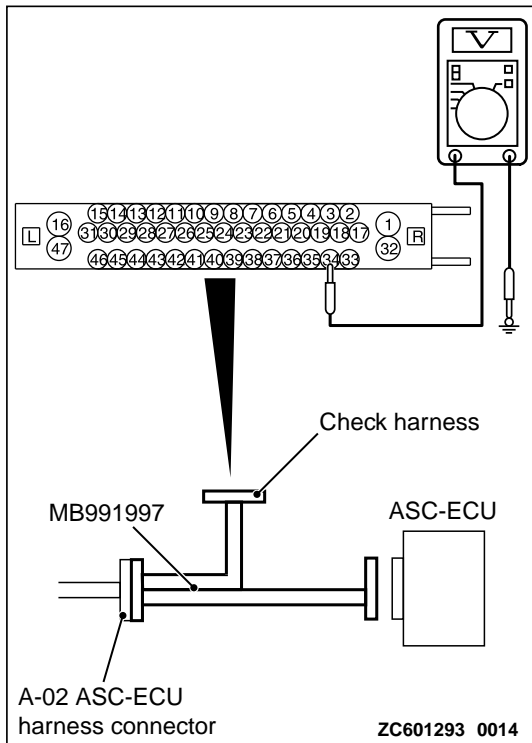
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between the wheel speed sensor power supply terminal (signal terminal) No. 34/the ground terminal No. 33 and the body ground.

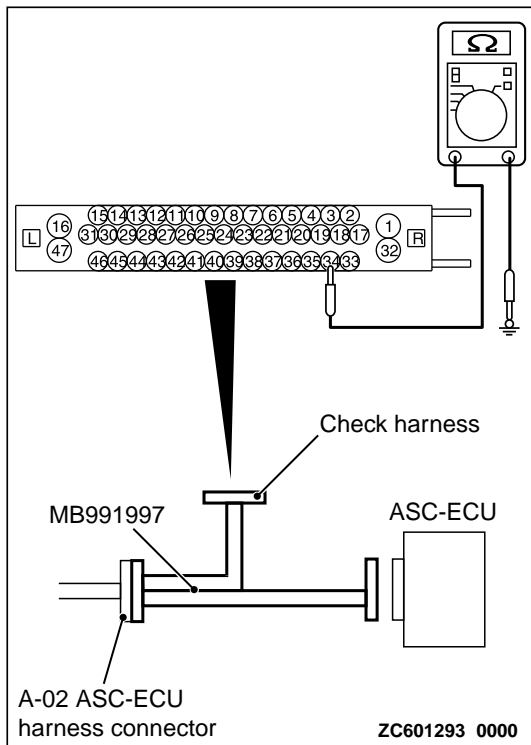
**OK: 0 volt**

### Q:Is the check result normal?

**YES:** Go to Step 5.

**NO (Not normal at the terminal No. 34 or 33):** Go to Step 6.





### STEP 5. Resistance measurement at A-02 ASC-ECU connector

- (1) Disconnect the ASC-ECU connector, connect special tool MB991997 to the harness-side connector, and then measure the resistance at the special tool connector side.

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

- (2) Resistance between the wheel speed sensor power supply terminal (signal terminal) No. 34/the ground terminal No. 33 and the body ground

**OK: No continuity**

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

**YES:** Go to Step 8.

**NO (Not normal at the terminal No. 34 or 33):** Go to Step 6.

### STEP 6. Connector check: A-02 ASC-ECU connector, A-59 wheel speed sensor <FR> connector

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

**YES:** Go to Step 7.

**NO:** Repair the defective connector.

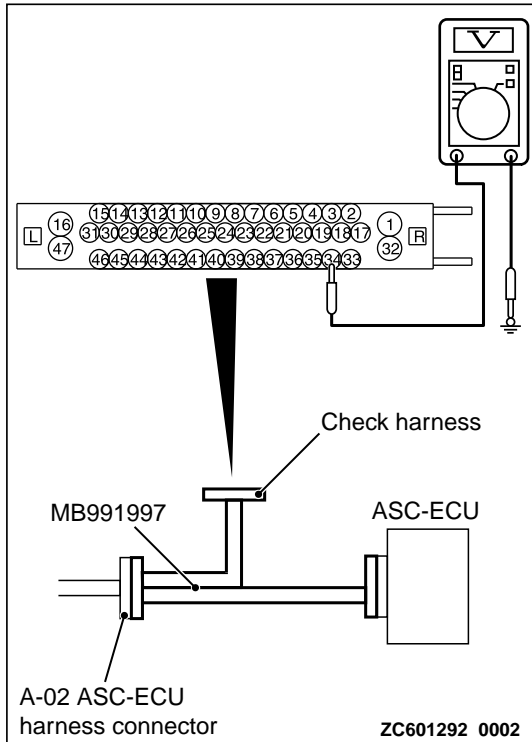
### STEP 7. Wiring harness check between A-02 ASC-ECU connector terminal No. 34/33 and A-59 wheel speed sensor <FR> connector terminal No. 1/2

\*Check for short circuit in wheel speed sensor <FR> circuit

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

**YES:** Replace the wheel speed sensor <FR>.

**NO:** Repair the wiring harness.

**STEP 8. Voltage measurement at the A-02 ASC-ECU connector**

- (1) Disconnect the ASC-ECU connector, connect special tool MB991997 to the ASC-ECU-side connector and harness-side connector, and then measure the voltage at the special tool connector side.
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between the wheel speed sensor circuit power supply terminal (signal terminal) No. 34 and the body ground.

**OK:** Approximately battery voltage

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

**YES:** Go to Step 11.

**NO:** Go to Step 9.

**STEP 9. Connector check: A-02 ASC-ECU connector, A-59 wheel speed sensor <FR> connector**

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

**YES:** Go to Step 10.

**NO:** Repair the defective connector.

**STEP 10. Wiring harness check between A-02 ASC-ECU connector terminal No. 34/33 and A-59 wheel speed sensor <FR> connector terminal No. 1/2**

\*Check for the open circuit in the wheel speed sensor <FR> circuit.

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

**YES:** Replace the wheel speed sensor.

**NO:** Repair the wiring harness.

**STEP 11. Check for wheel speed sensor as a single unit**  
Refer to P.35C-197.

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

**YES:** Go to Step 12.

**NO:** Replace the wheel speed sensor.

**STEP 12. Check whether the diagnostic trouble code is reset.**

- (1) Erase the diagnostic trouble code.
- (2) Drive the vehicle at 12mph (20 km/h) or more.

*NOTE:* The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12mph (20 km/h) or higher.

**Q: Is DTC C1015 set?**

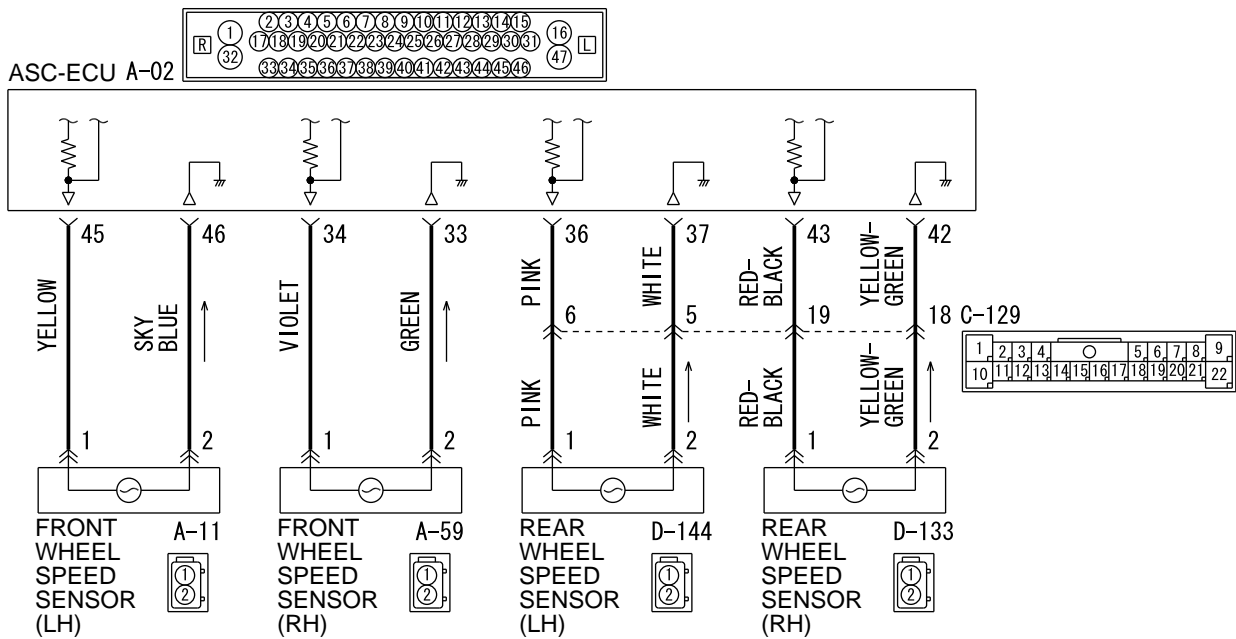
**YES:** Replace the ASC-ECU.

**NO:** Intermittent malfunction (GROUP 00 – How to Cope with Intermittent Malfunction P. 00-15).

**DTC C1020: Abnormality in RL wheel speed sensor circuit**

M13506100012USA0000010000

**Wheel Speed Sensor Circuit**



D7G35M016A00

**CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

- The wheel speed sensor is a kind of a pulse generator. It consists of encoders (a plate on which north and south pole sides of the magnets are arranged alternately) for detecting the wheel speed which rotates at the same speed of the wheels and wheel speed sensors. This sensor outputs frequency pulse signals in proportion to the wheel speed.
- The pulse signals, which the wheel speed sensor creates, are sent to ASC-ECU. ASC-ECU uses the frequency of the pulse signals to determine the wheel speed.

**DTC SET CONDITIONS**

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

**PROBABLE CAUSES****Current trouble**

- Damaged wiring harness and connectors
- Noise interference
- Malfunction of wheel speed sensor
- ASC-ECU malfunction

**Past trouble**

- Carry out diagnosis with particular emphasis on wiring harness and connector failures between ASC-ECU and the wheel speed sensor. For diagnosis procedures, refer to How to treat past trouble (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15).

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

**STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines****Q:Is the diagnostic trouble code No. C1020 set?**

**YES:** Go to Step 3.

**NO:** The procedure is complete.

**STEP 3. M.U.T.-III data list**

Check the following service data.

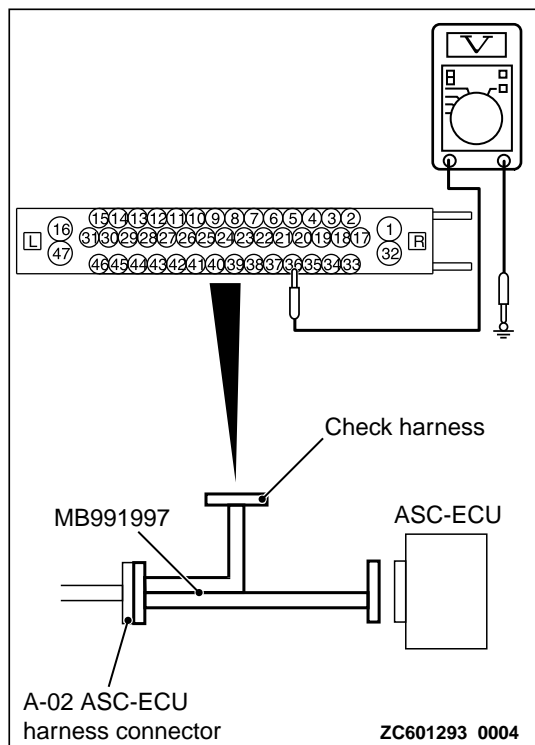
- Item No.03: RL wheel speed sensor

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

**YES:** Intermittent malfunction (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15).

**NO:** Go to Step 4.





#### STEP 4. Voltage measurement at the A-02 ASC-ECU connector

- (1) Disconnect the ASC-ECU connector, connect special tool MB991997 to the harness-side connector, and then measure the resistance at the special tool connector side.

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

- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between the wheel speed sensor power supply terminal (signal terminal) No. 36/the ground terminal No. 37 and the body ground.

**OK: 0 volt**

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

**YES:** Go to Step 5.

**NO (Not normal at the terminal No. 36 or 37):** Go to Step 7.

#### STEP 5. Connector check: A-02 ASC-ECU connector, C-125 intermediate connector, D-114 wheel speed sensor <RL> connector

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

**YES:** Go to Step 6.

**NO:** Repair the defective connector.

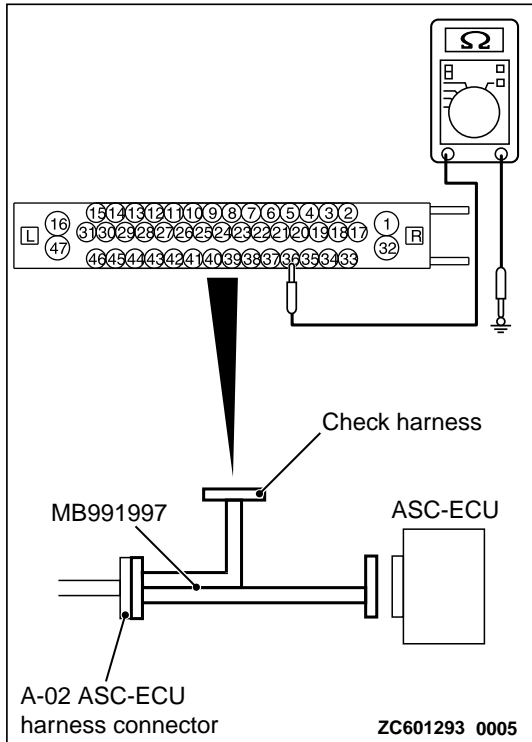
#### STEP 6. Wiring harness check between A-02 ASC-ECU connector terminal No. 36/37 and D-114 wheel speed sensor <RL> connector terminal No. 1/2

- \* Check for short circuit in wheel speed sensor <RL> circuit

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

**YES:** Replace the wheel speed sensor <RL>.

**NO:** Repair the wiring harness.

**STEP 7. Resistance measurement at A-02 ASC-ECU connector**

- (1) Disconnect the ASC-ECU connector, connect special tool MB991997 to the harness-side connector, and then measure the resistance at the special tool connector side.

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

- (2) Resistance between the wheel speed sensor power supply terminal (signal terminal) No. 36/the ground terminal No. 37 and the body ground

**OK: No continuity**

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

**YES:** Go to Step 10.

**NO (Not normal at the terminal No. 36 or 37):** Go to Step 8.

**STEP 8. Connector check: A-02 ASC-ECU connector, D-114 wheel speed sensor <RL> connector****Q: Is the check result normal?**

**YES:** Go to Step 9.

**NO:** Repair the defective connector.

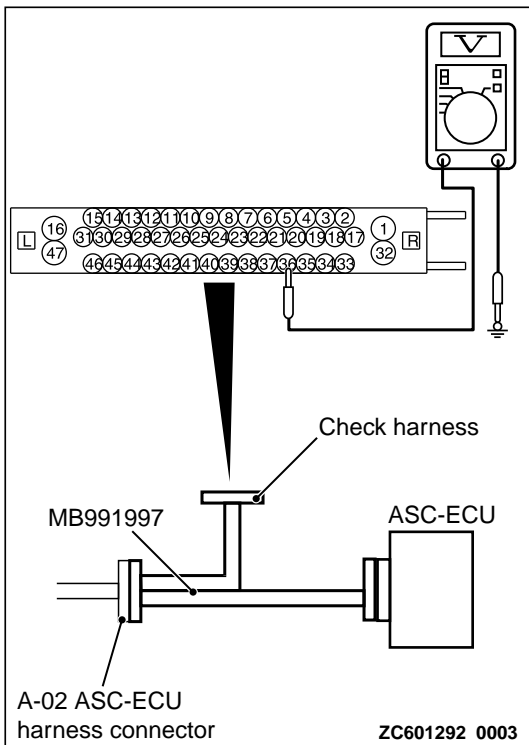
**STEP 9. Wiring harness check between A-02 ASC-ECU connector terminal No. 36/37 and D-114 wheel speed sensor <RL> connector terminal No. 1/2**

\* Check for short circuit in wheel speed sensor <RL> circuit

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

**YES:** Replace the wheel speed sensor <RL>.

**NO:** Repair the wiring harness.



**STEP 10. Voltage measurement at the A-02 ASC-ECU connector**

- (1) Disconnect the ASC-ECU connector, connect special tool MB991997 to the ASC-ECU-side connector and harness-side connector, and then measure the voltage at the special tool connector side.
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between the wheel speed sensor circuit power supply terminal (signal terminal) No. 36 and the body ground.

**OK: Approximately battery voltage**

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

**YES:** Go to Step 13.

**NO:** Go to Step 11.

**STEP 11. Connector check: A-02 ASC-ECU connector, D-114 wheel speed sensor <RL> connector**

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

**YES:** Go to Step 12.

**NO:** Repair the defective connector.

**STEP 12. Wiring harness check between A-02 ASC-ECU connector terminal No. 36/37 and D-114 wheel speed sensor <RL> connector terminal No. 1/2**

\*Check for open circuit in wheel speed sensor <RL> circuit

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

**YES:** Replace the wheel speed sensor.

**NO:** Repair the wiring harness.

**STEP 13. Check for wheel speed sensor as a single unit**  
Refer to P.35C-197.

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

**YES:** Go to Step 14.

**NO:** Replace the wheel speed sensor.

**STEP 14. Check whether the diagnostic trouble code is reset.**

- (1) Erase the diagnostic trouble code.
- (2) Drive the vehicle at 12mph (20 km/h) or more.

*NOTE: The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12mph (20 km/h) or higher.*

**Q: Is DTC C1020 set?**

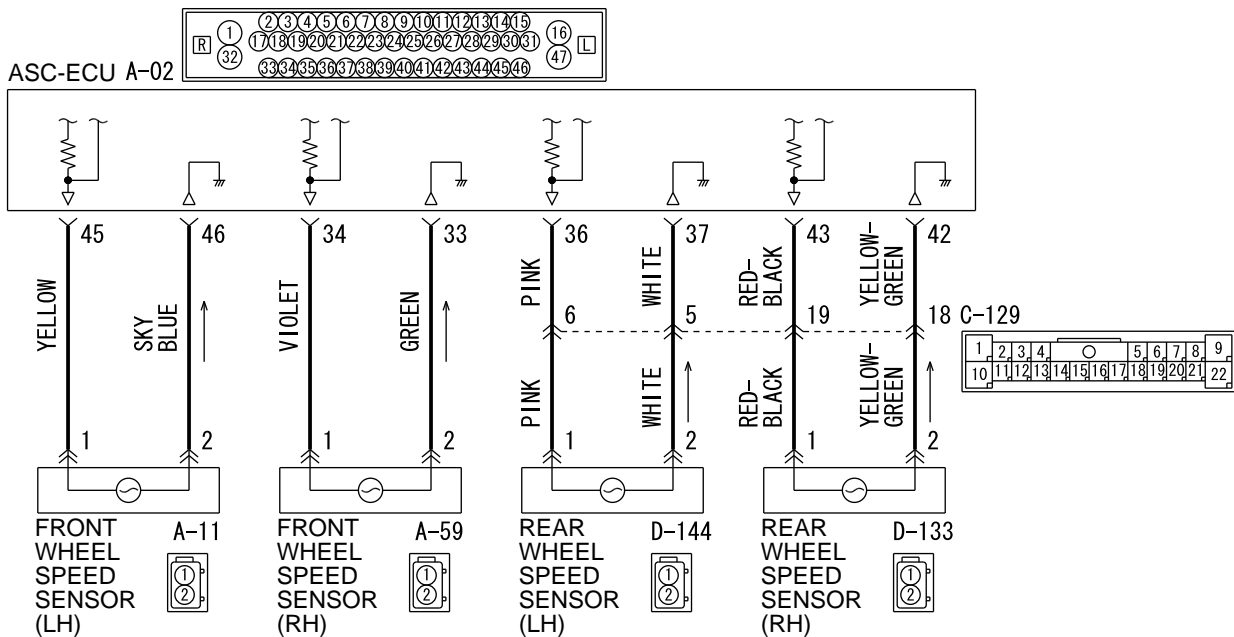
**YES:** Replace the ASC-ECU.

**NO:** Intermittent malfunction. (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15.)

**DTC C102B: Abnormality in RR wheel speed sensor circuit**

M13506100013USA0000010000

**Wheel Speed Sensor Circuit**



D7G35M016A00

**CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

- The wheel speed sensor is a kind of a pulse generator. It consists of encoders (a plate on which north and south pole sides of the magnets are arranged alternately) for detecting the wheel speed which rotates at the same speed of the wheels and wheel speed sensors. This sensor outputs frequency pulse signals in proportion to the wheel speed.
- The pulse signals, which the wheel speed sensor creates, are sent to ASC-ECU. ASC-ECU uses the frequency of the pulse signals to determine the wheel speed.

---

### DTC SET CONDITIONS

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

### PROBABLE CAUSES

#### Current trouble

- Damaged wiring harness and connectors
- Noise interference
- Malfunction of wheel speed sensor
- ASC-ECU malfunction

#### Past trouble

- Carry out diagnosis with particular emphasis on wiring harness and connector failures between ASC-ECU and the wheel speed sensor. For diagnosis procedures, refer to How to treat past trouble (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15).

### 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. M.U.T.-III CAN bus diagnostics

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

---

#### STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines

#### Q:Is the diagnostic trouble code C102B set?

**YES:** Go to Step 3.

**NO:** The procedure is complete.

---

#### STEP 3. M.U.T.-III data list

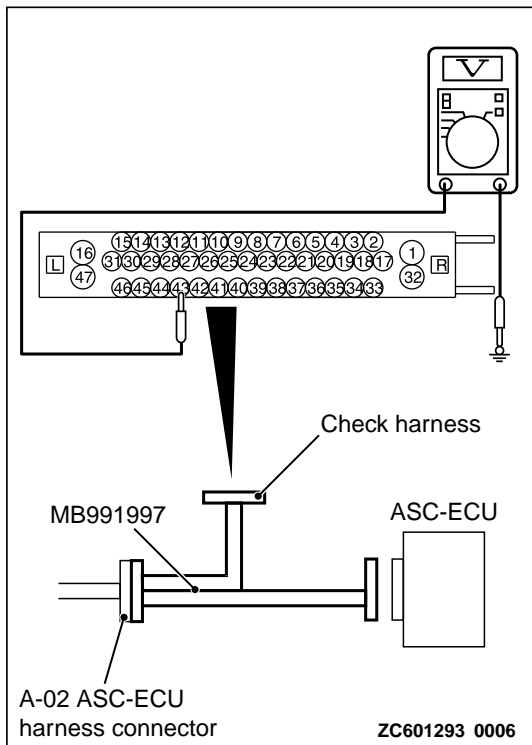
Check the following service data.

- Item No.04: RR wheel speed sensor

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

**YES:** Intermittent malfunction (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15).

**NO:** Go to Step 4.

**STEP 4. Voltage measurement at the A-02 ASC-ECU connector**

- (1) Disconnect the ASC-ECU connector, connect special tool MB991997 to the harness-side connector, and then measure the resistance at the special tool connector side.

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

- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between the wheel speed sensor power supply terminal (signal terminal) No. 43/the ground terminal No. 42 and the body ground.

**OK: 0 volt**

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

**YES:** Go to Step 5.

**NO (Not normal at the terminal No. 43 or 42):** Go to Step 7.

**STEP 5. Connector check: A-02 ASC-ECU connector, C-125 intermediate connector, D-133 wheel speed sensor <RR> connector****Q:Is the check result normal?**

**YES:** Go to Step 6.

**NO:** Repair the defective connector.

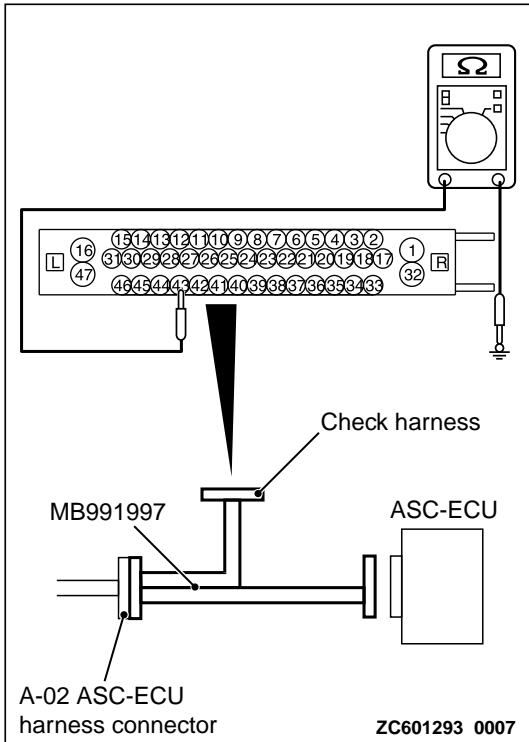
**STEP 6. Wiring harness check between A-02 ASC-ECU connector terminal No. 43/42 and D-133 wheel speed sensor <RR> connector terminal No. 1/2**

- \* Check for short circuit in wheel speed sensor <RR> circuit

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

**YES:** Replace the wheel speed sensor <RR>.

**NO:** Repair the wiring harness.



**STEP 7. Resistance measurement at A-02 ASC-ECU connector**

- (1) Disconnect the ASC-ECU connector, connect special tool MB991997 to the harness-side connector, and then measure the resistance at the special tool connector side.

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

- (2) Resistance between the wheel speed sensor power supply terminal (signal terminal) No. 43/the ground terminal No. 42 and the body ground

**OK: No continuity**

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

**YES:** Go to Step 10.

**NO (Not normal at the terminal No. 43 or 42):** Go to Step 8.

**STEP 8. Connector check: A-02 ASC-ECU connector, D-133 wheel speed sensor <RR> connector**

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

**YES:** Go to Step 9.

**NO:** Repair the defective connector.

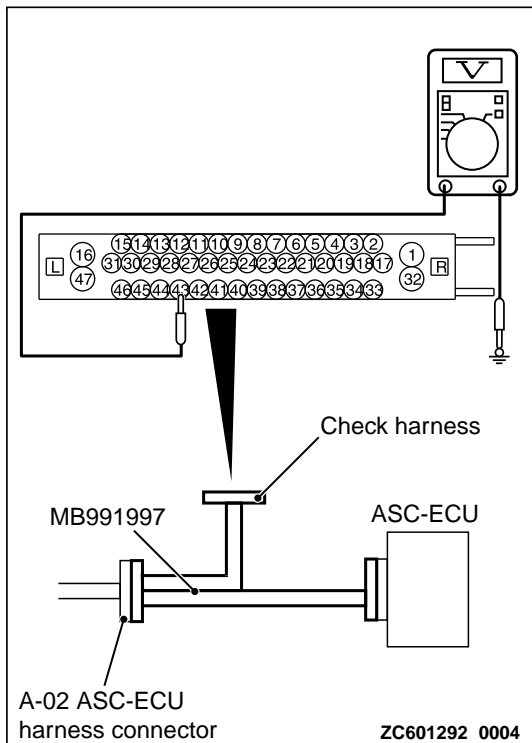
**STEP 9. Wiring harness check between A-02 ASC-ECU connector terminal No. 43/42 and D-133 wheel speed sensor <RR> connector terminal No. 1/2**

\*Check for short circuit in wheel speed sensor <RR> circuit

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

**YES:** Replace the wheel speed sensor <RR>.

**NO:** Repair the wiring harness.

**STEP 10. Voltage measurement at the A-02 ASC-ECU connector**

- (1) Disconnect the ASC-ECU connector, connect special tool MB991997 to the ASC-ECU-side connector and harness-side connector, and then measure the voltage at the special tool connector side.
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between the wheel speed sensor circuit power supply terminal (signal terminal) No. 43 and the body ground.

**OK:** Approximately battery voltage

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

**YES:** Go to Step 13.

**NO:** Go to Step 11.

**STEP 11. Connector check: A-02 ASC-ECU connector, D-133 wheel speed sensor <RR> connector**

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

**YES:** Go to Step 12.

**NO:** Repair the defective connector.

**STEP 12. Wiring harness check between A-02 ASC-ECU connector terminal No. 43/42 and D-133 wheel speed sensor <RR> connector terminal No. 1/2**

\* Check for open circuit in wheel speed sensor <RR> circuit

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

**YES:** Replace the wheel speed sensor.

**NO:** Repair the wiring harness.

**STEP 13. Check for wheel speed sensor as a single unit**

Refer to P.35C-197.

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

**YES:** Go to Step 14.

**NO:** Replace the wheel speed sensor.

**STEP 14. Check whether the diagnostic trouble code is reset.**

- (1) Erase the diagnostic trouble code.
- (2) Drive the vehicle at 12mph (20 km/h) or more.

*NOTE: The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12mph (20 km/h) or higher.*



**Q: Is DTC C102B set?**

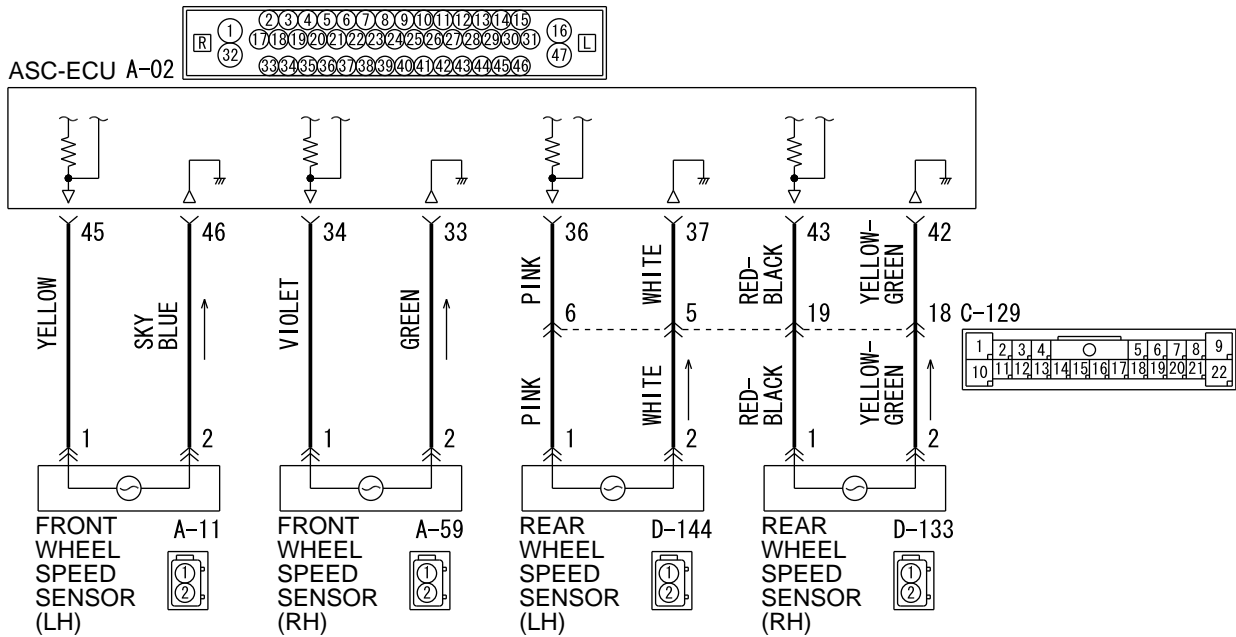
**YES:** Replace the ASC-ECU.

**NO:** Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-15).

**DTC C1011: Abnormality in FL wheel speed sensor signal**

M13506100014USA0000010000

**Wheel Speed Sensor Circuit**



D7G35M016A00

**CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

- The wheel speed sensor is a kind of a pulse generator. It consists of encoders (a plate on which north and south pole sides of the magnets are arranged alternately) for detecting the wheel speed which rotates at the same speed of the wheels and wheel speed sensors. This sensor outputs frequency pulse signals in proportion to the wheel speed.
- The pulse signals, which the wheel speed sensor creates, are sent to ASC-ECU. ASC-ECU uses the frequency of the pulse signals to determine the wheel speed.

**DTC SET CONDITIONS**

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

- Irregular change in the wheel speed sensor signal
- Wheel speed sensor signal continuously indicates high value.

**PROBABLE CAUSES****Current trouble**

- Excessive gap between the wheel speed sensor and the wheel speed detection encoder
- Adhesion of foreign materials on the wheel speed sensor
- Adhesion of foreign materials on the wheel speed detection encoder
- Wheel bearing malfunction
- Malfunction of wheel speed sensor
- Damaged wiring harness and connectors
- External noise interference
- Improper installation of the wheel speed sensor
- Deformation of the wheel speed detection encoder
- ASC-ECU malfunction
- Disturbance of magnetization pattern for wheel speed detection encoder

**Past trouble**

- When the diagnostic trouble code No. C100A is also set, carry out diagnosis with particular emphasis on wiring harness and connector failures between ASC-ECU and the wheel speed sensor. For diagnosis procedures, refer to How to treat past trouble (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15).
- When the diagnostic trouble code No. C100A is not set, the following conditions may be present:
  - Right or/and left wheels are rotated.
  - Unstable vehicle attitude
  - External noise interference
  - Vehicle ran with the parking brake applied.

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

---

**STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines**

**Q: Is DTC C1011 set?**

**YES:** Go to Step 3.

**NO:** The procedure is complete.

---

**STEP 3. M.U.T.-III diagnostic trouble code**

Check that the diagnostic trouble code No. C100A is also set.

**Q: Is DTC C100A also set?**

**YES:** Perform the diagnosis for the diagnostic trouble code No. C100A. (Refer to P.35C-14.)

**NO:** Go to Step 4.

---

**STEP 4. Check for wheel speed sensor installation**

Check how the wheel speed sensor <FL> is installed (Disconnection of wheel speed sensor, loose mounting bolt, etc.).

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

**YES:** Go to Step 5.

**NO:** Reinstall the wheel speed sensor correctly.

---

**STEP 5. Check for wheel speed sensor as a single unit**

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

**YES:** Go to Step 6.

**NO:** Replace the wheel speed sensor.

---

**STEP 6. Check for wheel bearing looseness**

*NOTE: Loose wheel bearing may increase the gap between the wheel speed sensor and the wheel speed detection magnet encoder. Check the wheel bearing <FL> for looseness. (Refer to GROUP 26 - On-vehicle Service P.26-8.)*

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

**YES:** Go to Step 7.

**NO:** Replace the wheel bearing.

---

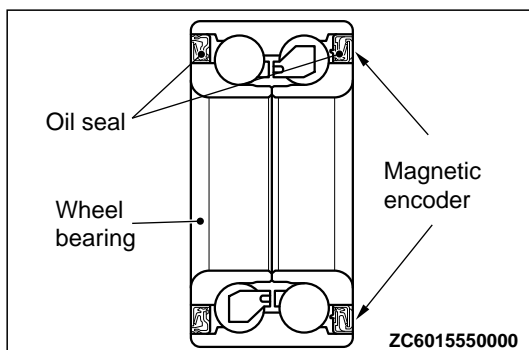
**STEP 7. Check of wheel speed detection encoder**

Check the encoder for adhesion of foreign materials or deformation.

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

**YES:** Go to Step 8.

**NO:** Remove the foreign materials and clean the encoder so as not to disturb the magnetization pattern on it while taking care of the magnet, magnetic substance, and magnetic attraction. When the encoder is deformed, replace the wheel bearing.



**STEP 8. Voltage measurement at the A-02 ASC-ECU connector**

- (1) Disconnect the ASC-ECU connector, connect special tool MB991997 to the harness-side connector, and then measure the resistance at special tool connector side.

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

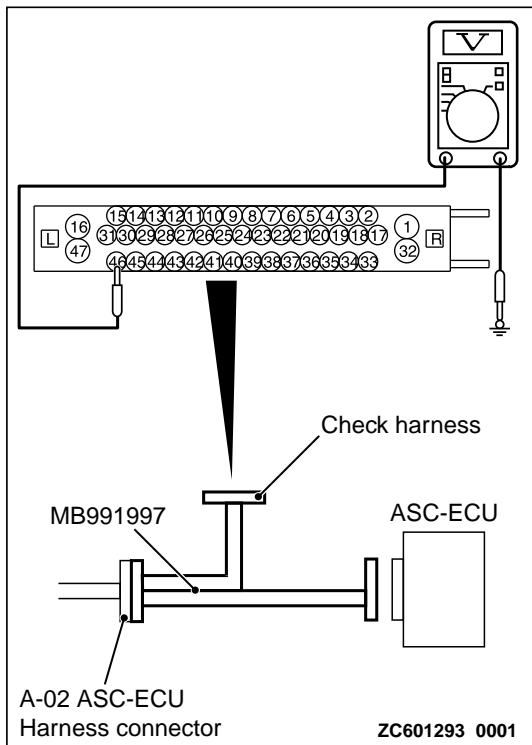
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between the wheel speed sensor power supply terminal (signal terminal) No. 45/the ground terminal No. 46 and the body ground.

**OK: 0 volt**

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

**YES:** Go to Step 9.

**NO (Not normal at the terminal No. 45 or 46):** Go to Step 10.

**STEP 9. Resistance measurement at A-02 ASC-ECU connector**

- (1) Disconnect the ASC-ECU connector, connect special tool MB991997 to the harness-side connector, and then measure the resistance at special tool connector side.

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

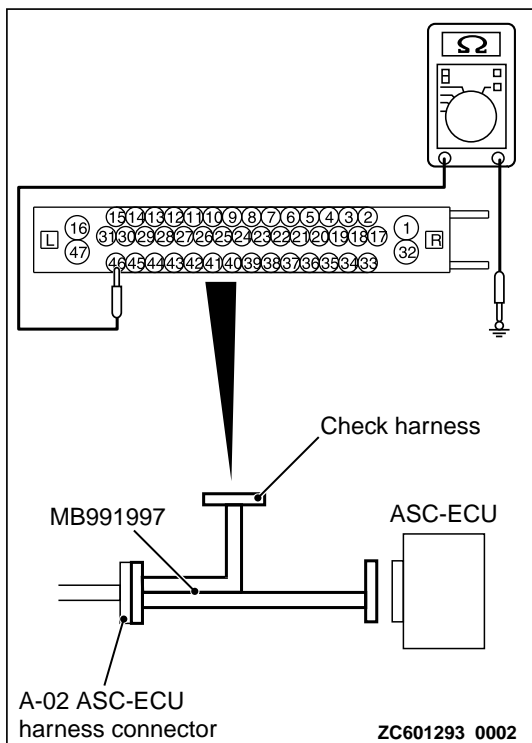
- (2) Resistance between the wheel speed sensor power supply terminal (signal terminal) No. 45/the ground terminal No. 46 and the body ground

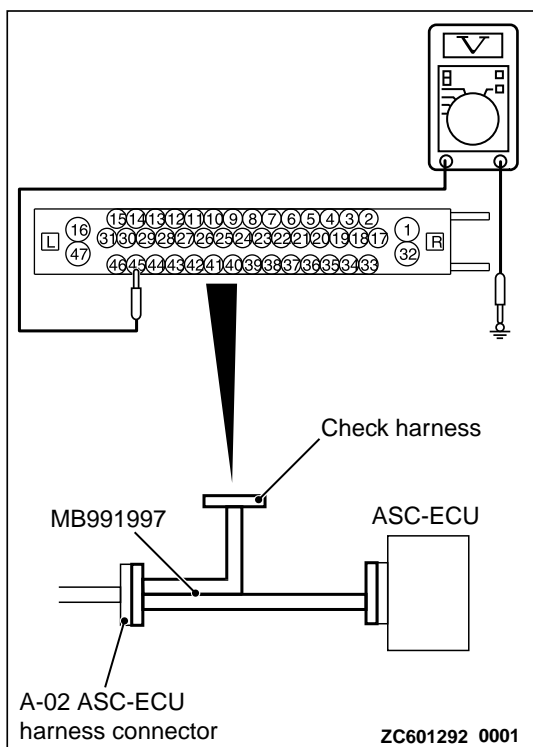
**OK: No continuity**

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

**YES:** Go to Step 11.

**NO (Not normal at the terminal No. 45 or 46):** Go to Step 10.

**STEP 10. Connector check: A-02 ASC-ECU connector, A-11 wheel speed sensor <FL> connector****Q: Is the check result normal?**



**YES:** The short circuit in the wheel speed sensor <FL> circuit may be present. Repair the wiring harness between the A-02 ASC-ECU connector terminal No. 45/46 and the A-11 wheel speed sensor <FL> connector terminal No. 1/2.

**NO:** Repair the defective connector.

#### STEP 11. Voltage measurement at the A-02 ASC-ECU connector

- (1) Disconnect the ASC-ECU connector, connect special tool MB991997 to the ASC-ECU-side connector and harness-side connector, and then measure the voltage at the special tool connector side.
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between the wheel speed sensor circuit power supply terminal (signal terminal) No. 45 and the body ground.

**OK:** Approximately battery voltage

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

**YES:** Go to Step 14.

**NO:** Go to Step 12.

#### STEP 12. Connector check: A-02 ASC-ECU connector, A-11 wheel speed sensor <FL> connector

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

**YES:** Go to Step 13.

**NO:** Repair the defective connector.

#### STEP 13. Wiring harness check between A-02 ASC-ECU connector terminal No. 45/46 and A-11 wheel speed sensor <FL> connector terminal No. 1/2

\*Check for open circuit in wheel speed sensor <FL> circuit.

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

**YES:** Replace the wheel speed sensor.

**NO:** Repair the wiring harness.

#### STEP 14. Check whether the diagnostic trouble code is reset.

- (1) Erase the diagnostic trouble code.
- (2) Drive the vehicle at 12mph (20 km/h) or more.

*NOTE:* The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12mph (20 km/h) or higher.

**Q:** Is DTC C1011 set?

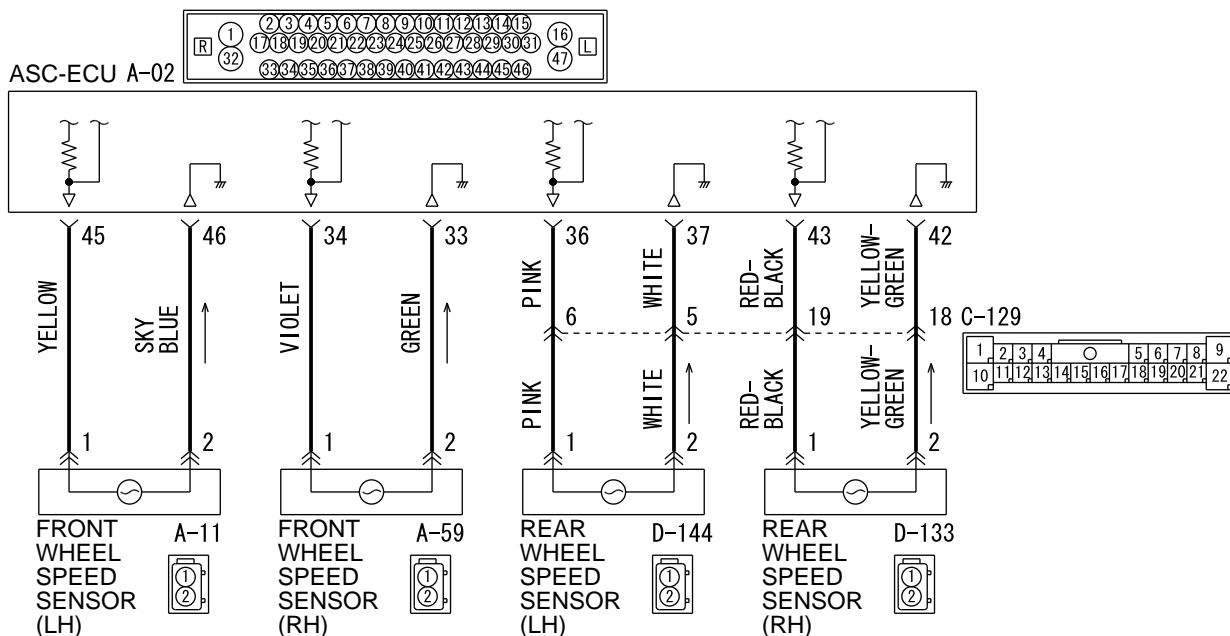
**YES:** Replace the ASC-ECU.

**NO:** Intermittent malfunction. (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15.)

**DTC C101C Abnormality in FR wheel speed sensor signal**

M13506100015USA0000010000

**Wheel Speed Sensor Circuit**



D7G35M016A00

**CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

- The wheel speed sensor is a kind of a pulse generator. It consists of encoders (a plate on which north and south pole sides of the magnets are arranged alternately) for detecting the wheel speed which rotates at the same speed of the wheels and wheel speed sensors. This sensor outputs frequency pulse signals in proportion to the wheel speed.
- The pulse signals, which the wheel speed sensor creates, are sent to ASC-ECU. ASC-ECU uses the frequency of the pulse signals to determine the wheel speed.

## DIAGNOSIS

**DTC SET CONDITIONS**

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

- Irregular change in the wheel speed sensor signal
- Wheel speed sensor signal continuously indicates high value.

**PROBABLE CAUSES****Current trouble**

- Excessive gap between the wheel speed sensor and the wheel speed detection encoder
- Adhesion of foreign materials on the wheel speed sensor
- Adhesion of foreign materials on the wheel speed detection encoder
- Wheel bearing malfunction
- Malfunction of wheel speed sensor
- Damaged wiring harness and connectors
- External noise interference
- Improper installation of the wheel speed sensor
- Deformation of the wheel speed detection encoder
- ASC-ECU malfunction
- Disturbance of magnetization pattern for wheel speed detection encoder

**Past trouble**

- When the diagnostic trouble code No. C1015 is also set, carry out diagnosis with particular emphasis on wiring harness and connector failures between ASC-ECU and the wheel speed sensor. For diagnosis procedures, refer to How to treat past trouble (GROUP 00 - How to Cope with Intermittent Malfunction P.00-15).
- When diagnostic trouble code No. C1015 is not set, the following conditions may be present:
  - Right or/and left wheels are rotated.
  - Unstable vehicle attitude
  - External noise interference
  - Vehicle ran with the parking brake applied.

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

---

**STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines**

**Q: Is DTC C101C set?**

**YES:** Go to Step 3.

**NO:** The procedure is complete.

---

**STEP 3. M.U.T.-III diagnostic trouble code**

Check that the diagnostic trouble code No. C1015 is also set.

**Q: Is DTC C1015 also set?**

**YES:** Perform the diagnosis for the diagnostic trouble code No. C1015. (Refer to P.35C-18.)

**NO:** Go to Step 4.

---

**STEP 4. Check for wheel speed sensor installation**

Check how the wheel speed sensor <FR> is installed (Disconnection of wheel speed sensor, loose mounting bolt, etc.).

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

**YES:** Go to Step 5.

**NO:** Reinstall the wheel speed sensor correctly.

---

**STEP 5. Check for wheel speed sensor as a single unit**

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

**YES:** Go to Step 6.

**NO:** Replace the wheel speed sensor.

---

**STEP 6. Check for wheel bearing looseness**

*NOTE: Loose wheel bearing may increase the gap between the wheel speed sensor and the wheel speed detection magnet encoder. Check the wheel bearing <FR> for looseness. (Refer to GROUP 26 - On-vehicle Service P.26-8.)*

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

**YES:** Go to Step 7.

**NO:** Replace the wheel bearing.

---

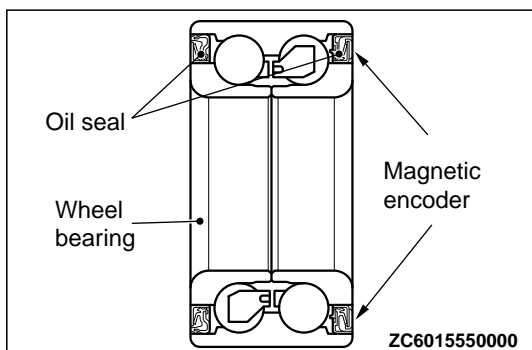
**STEP 7. Check of wheel speed detection encoder**

Check the encoder for adhesion of foreign materials or deformation.

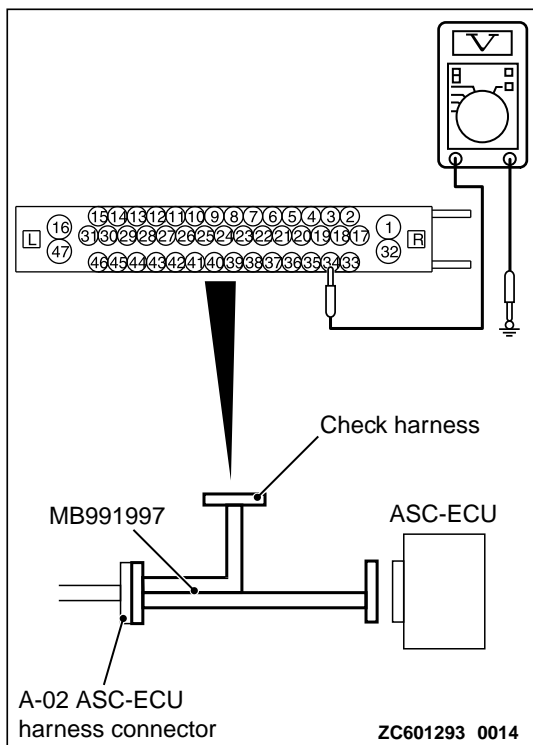
**Q: Is the check result normal?**

**YES:** Go to Step 8.

**NO:** Remove the foreign materials and clean the encoder so as not to disturb the magnetization pattern on it while taking care of the magnet, magnetic substance, and magnetic attraction. When the encoder is deformed, replace the wheel bearing.







**STEP 8. Voltage measurement at the A-02 ASC-ECU connector**

- (1) Disconnect the connector, connect special tool MB991997 to the harness-side connector, and measure the voltage at the special tool connector side.

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

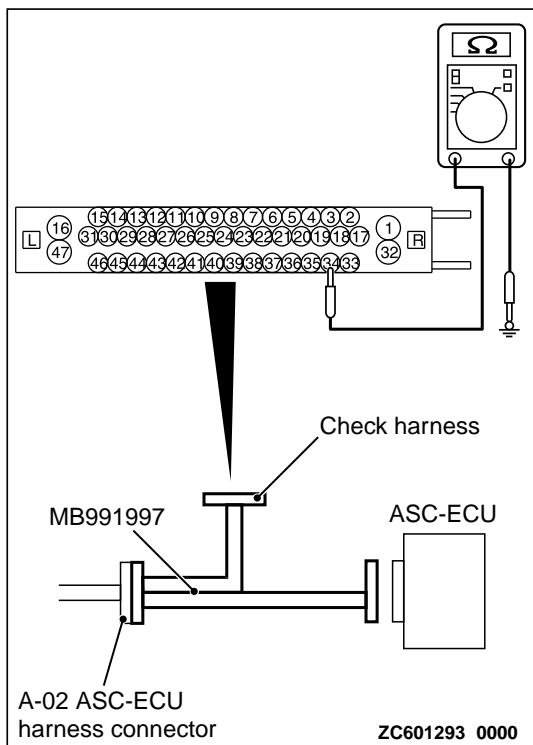
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between the wheel speed sensor power supply terminal (signal terminal) No.34/the ground terminal No. 33 and the body ground.

**OK: 0 volt**

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

**YES:** Go to Step 9.

**NO (Not normal at the terminal No. 34 or 33):** Go to Step 10.



**STEP 9. Resistance measurement at A-02 ASC-ECU connector**

- (1) Disconnect the connector, connect special tool MB991997 to the harness-side connector, and measure the voltage at the special tool connector side.

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

- (2) Resistance between the wheel speed sensor power supply terminal (signal terminal) No. 34/the ground terminal No. 33 and the body ground

**OK: No continuity**

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

**YES:** Go to Step 11.

**NO (Not normal at the terminal No. 34 or 33):** Go to Step 10.

**STEP 10. Connector check: A-02 ASC-ECU connector, A-59 wheel speed sensor <FR> connector**

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

**YES:** The short circuit in the wheel speed sensor <FR> circuit may be present. Repair the wiring harness between the A-02 ASC-ECU connector terminal No. 34/33 and the A-59 wheel speed sensor <FR> connector terminal No. 1/2.

**NO:** Repair the defective connector.

### STEP 11. Voltage measurement at the A-02 ASC-ECU connector

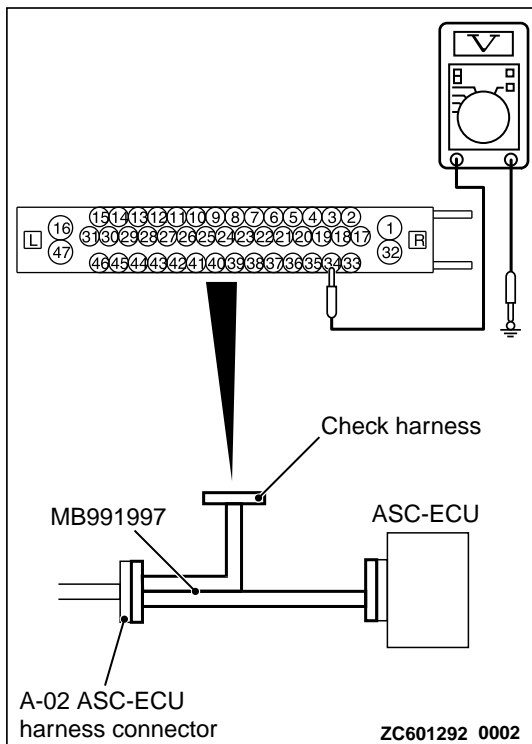
- (1) Disconnect the ASC-ECU connector, connect special tool MB991997 to the ASC-ECU-side connector and harness-side connector, and then measure the voltage at the special tool connector side.
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between the wheel speed sensor circuit power supply terminal (signal terminal) No. 34 and the body ground.

**OK:** Approximately battery voltage

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

**YES:** Go to Step 14.

**NO:** Go to Step 12.



### STEP 12. Connector check: A-02 ASC-ECU connector, A-59 wheel speed sensor <FR> connector

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

**YES:** Go to Step 13.

**NO:** Repair the defective connector.

### STEP 13. Wiring harness check between A-02 ASC-ECU connector terminal No. 34/33 and A-59 wheel speed sensor <FR> connector terminal No. 1/2

\* Check for the open circuit in the wheel speed sensor <FR> circuit.

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

**YES:** Replace the wheel speed sensor.

**NO:** Repair the wiring harness.

### STEP 14. Check whether the diagnostic trouble code is reset.

- (1) Erase the diagnostic trouble code.
- (2) Drive the vehicle at 12mph (20 km/h) or more.

*NOTE: The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12mph (20 km/h) or higher.*

**Q: Is DTC C101C set?**

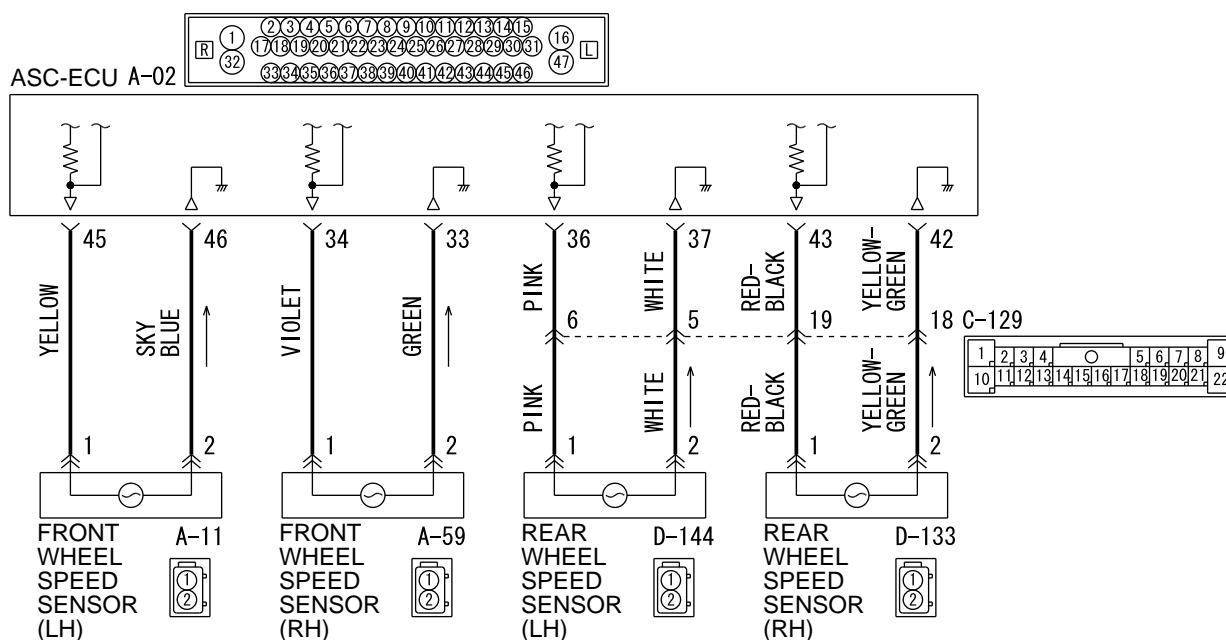
**YES:** Replace the ASC-ECU.

**NO:** Intermittent malfunction (GROUP 00 – How to Cope with Intermittent Malfunction P. 00-15).

**DTC C1027: Abnormality in RL wheel speed sensor signal**

M13506100016USA0000010000

**Wheel Speed Sensor Circuit**



D7G35M016A00

**CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

- The wheel speed sensor is a kind of a pulse generator. It consists of encoders (a plate on which north and south pole sides of the magnets are arranged alternately) for detecting the wheel speed which rotates at the same speed of the wheels and wheel speed sensors. This sensor outputs frequency pulse signals in proportion to the wheel speed.
- The pulse signals, which the wheel speed sensor creates, are sent to ASC-ECU. ASC-ECU uses the frequency of the pulse signals to determine the wheel speed.

**DTC SET CONDITIONS**

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

- Irregular change in the wheel speed sensor signal
- Wheel speed sensor signal continuously indicates high value.

**PROBABLE CAUSES****Current trouble**

- Excessive gap between the wheel speed sensor and the wheel speed detection encoder
- Adhesion of foreign materials on the wheel speed sensor
- Adhesion of foreign materials on the wheel speed detection encoder
- Wheel bearing malfunction
- Malfunction of wheel speed sensor
- Damaged wiring harness and connectors
- External noise interference
- Improper installation of the wheel speed sensor
- Deformation of the wheel speed detection encoder
- ASC-ECU malfunction
- Disturbance of magnetization pattern for wheel speed detection encoder

**Past trouble**

- When the diagnostic trouble code No. C1020 is also set, carry out diagnosis with particular emphasis on wiring harness and connector failures between ASC-ECU and the wheel speed sensor. For diagnosis procedures, refer to How to treat past trouble (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15).
- When the diagnostic trouble code No. C1020 is not set, the following conditions may be present:
  - Right or/and left wheels are rotated.
  - Unstable vehicle attitude
  - External noise interference
  - Vehicle ran with the parking brake applied.

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

## DIAGNOSIS

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

---

**STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines**

**Q: Is DTC C1027 set?**

**YES:** Go to Step 3.

**NO:** The procedure is complete.

---

**STEP 3. M.U.T.-III diagnostic trouble code**

Check that the diagnostic trouble code C1020 is also set.

**Q: Is DTC C1020 also set?**

**YES:** Perform the diagnosis for the diagnostic trouble code C1020. (Refer to P.35C-23.)

**NO:** Go to Step 4.

---

**STEP 4. Check for wheel speed sensor installation**

Check how the wheel speed sensor <RL> is installed (Disconnection of wheel speed sensor, loose mounting bolt, etc.).

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

**YES:** Go to Step 5.

**NO:** Reinstall the wheel speed sensor <RL> correctly.

---

**STEP 5. Check for wheel speed sensor as a single unit**

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

**YES:** Go to Step 6.

**NO:** Replace the wheel speed sensor.

---

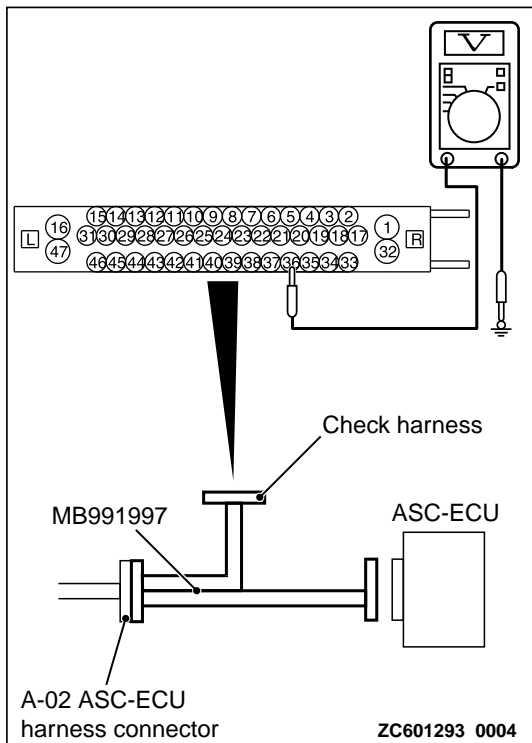
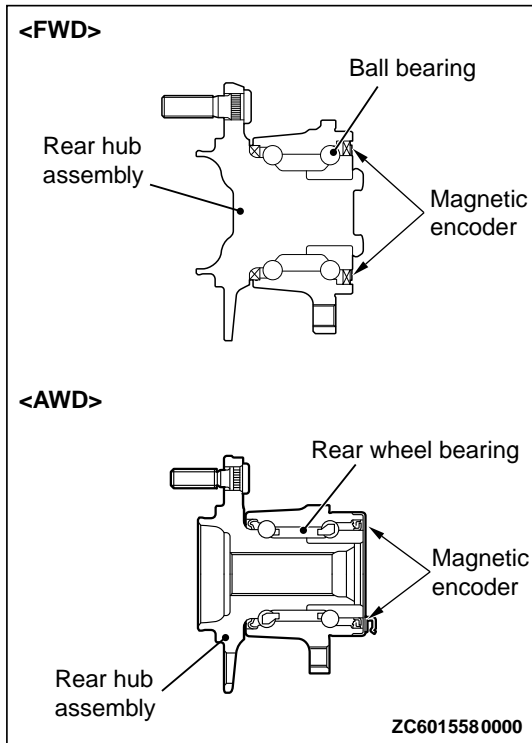
**STEP 6. Check for wheel bearing looseness**

*NOTE: Loose wheel bearing may increase the gap between the wheel speed sensor and the wheel speed detection magnet encoder. Check the wheel bearing <RL> for looseness. <Refer to GROUP 27A - On-vehicle Service P. 27A-4. (FWD) or GROUP 27B - On-vehicle Service P. 27B-15. (AWD)>*

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

**YES:** Go to Step 7.

**NO:** Replace the rear wheel hub assembly.

**STEP 7. Check of wheel speed detection encoder**

Check the encoder for adhesion of foreign materials or deformation.

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

**YES:** Go to Step 8.

**NO (Adhesion of foreign materials):** Remove the foreign materials and clean the encoder so as not to disturb the magnetization pattern on it while taking care of the magnet, magnetic substance, and magnetic attraction.

**NO (Deformation):** Replace the rear wheel hub assembly.

**STEP 8. Voltage measurement at the A-02 ASC-ECU connector**

- (1) Disconnect the ASC-ECU connector, connect special tool MB991997 to the harness-side connector, and then measure the resistance at special tool connector side.

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

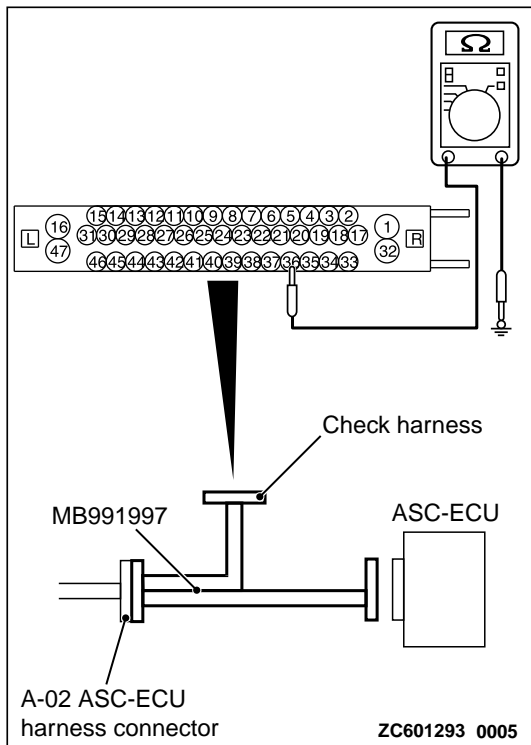
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between the wheel speed sensor power supply terminal (signal terminal) No. 36/the ground terminal No. 37 and the body ground.

**OK: 0 volt**

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

**YES:** Go to Step 9.

**NO (Not normal at the terminal No. 36 or 37):** Go to Step 10.



**STEP 9. Resistance measurement at A-02 ASC-ECU connector**

- (1) Disconnect the ASC-ECU connector, connect special tool MB991997 to the harness-side connector, and then measure the resistance at special tool connector side.

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

- (2) Resistance between the wheel speed sensor power supply terminal (signal terminal) No. 36/the ground terminal No. 37 and the body ground

**OK: No continuity**

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

**YES:** Go to Step 11.

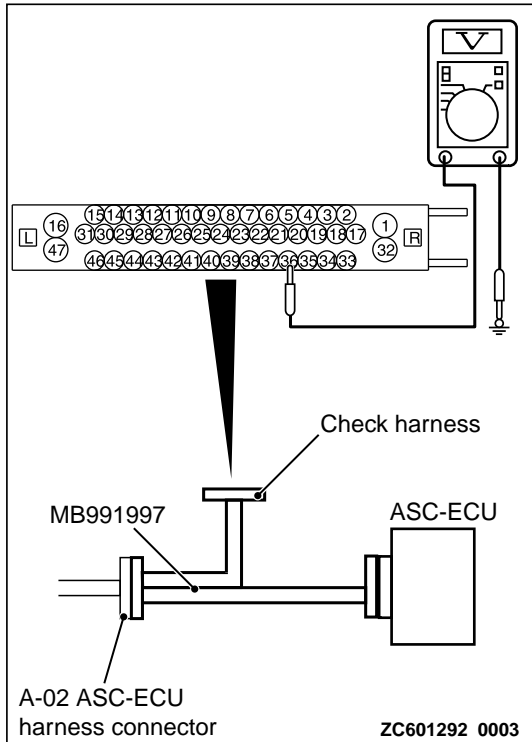
**NO (Not normal at the terminal No. 36 or 37):** Go to Step 10.

**STEP 10. Connector check: A-02 ASC-ECU connector, C-125 intermediate connector, D-114 wheel speed sensor <RL> connector**

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

**YES:** The short circuit in the wheel speed sensor <RL> circuit may be present. Repair the wiring harness between the A-02 ASC-ECU connector terminal No. 36/37 and the D-114 wheel speed sensor <RL> connector terminal No. 1/2.

**NO:** Repair the defective connector.

**STEP 11. Voltage measurement at the A-02 ASC-ECU connector**

- (1) Disconnect the ASC-ECU connector, connect special tool MB991997 to the ASC-ECU-side connector and harness-side connector, and then measure the voltage at the special tool connector side.
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between the wheel speed sensor circuit power supply terminal (signal terminal) No. 36 and the body ground.

**OK: Approximately battery voltage**

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

**YES:** Go to Step 14.

**NO:** Go to Step 12.

**STEP 12. Connector check: A-02 ASC-ECU connector, C-125 intermediate connector, D-114 wheel speed sensor <RL> connector****Q: Is the check result normal?**

**YES:** Go to Step 13.

**NO:** Repair the defective connector.

**STEP 13. Wiring harness check between A-02 ASC-ECU connector terminal No. 36/37 and D-114 wheel speed sensor <RL> connector terminal No. 1/2**

- \* Check for open circuit in wheel speed sensor <RL> circuit

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

**YES:** Replace the wheel speed sensor.

**NO:** Repair the wiring harness.

**STEP 14. Check whether the diagnostic trouble code is reset.**

- (1) Erase the diagnostic trouble code.
- (2) Drive the vehicle at 12mph (20 km/h) or more.

*NOTE: The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12mph (20 km/h) or higher.*

**Q: Is DTC C1027 set?**

**YES:** Replace the ASC-ECU.

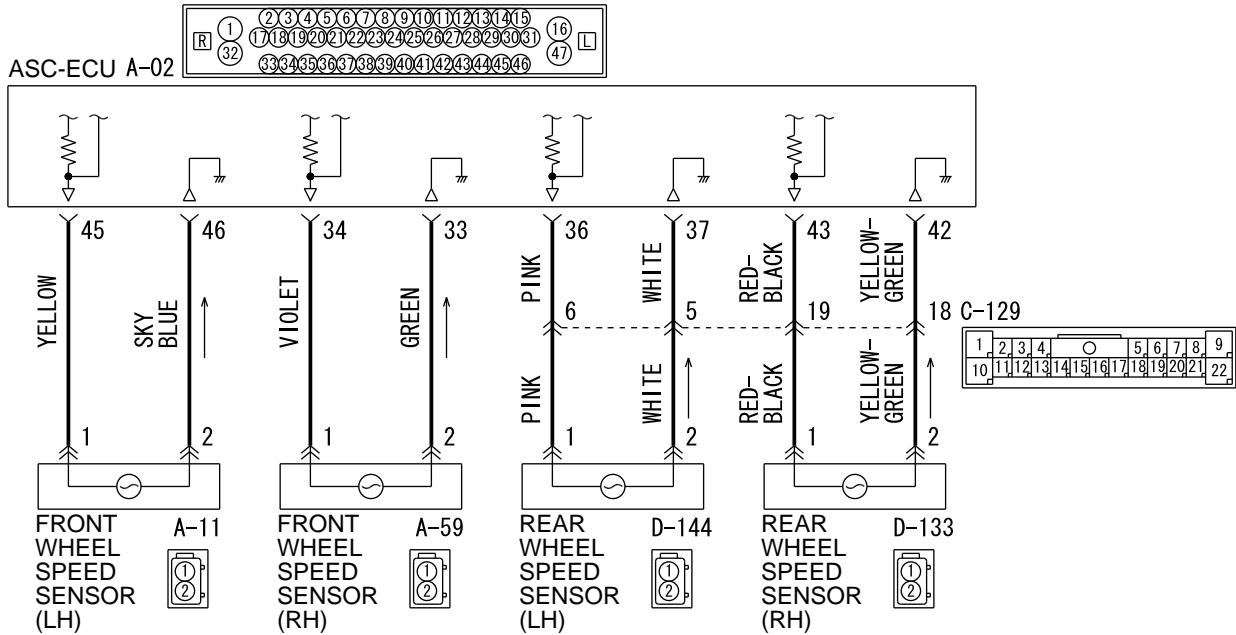
**NO:** Intermittent malfunction. (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15.)



**DTC C1032: Abnormality in RR wheel speed sensor signal**

M13506100017USA0000010000

**Wheel Speed Sensor Circuit**



D7G35M016A00

**CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

- The wheel speed sensor is a kind of a pulse generator. It consists of encoders (a plate on which north and south pole sides of the magnets are arranged alternately) for detecting the wheel speed which rotates at the same speed of the wheels and wheel speed sensors. This sensor outputs frequency pulse signals in proportion to the wheel speed.
- The pulse signals, which the wheel speed sensor creates, are sent to ASC-ECU. ASC-ECU uses the frequency of the pulse signals to determine the wheel speed.

**DTC SET CONDITIONS**

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

- Irregular change in the wheel speed sensor signal

- Wheel speed sensor signal continuously indicates high value.

## PROBABLE CAUSES

### Current trouble

- Excessive gap between the wheel speed sensor and the wheel speed detection encoder
- Adhesion of foreign materials on the wheel speed sensor
- Adhesion of foreign materials on the wheel speed detection encoder
- Wheel bearing malfunction
- Malfunction of wheel speed sensor
- Damaged wiring harness and connectors
- External noise interference
- Improper installation of the wheel speed sensor
- Deformation of the wheel speed detection encoder
- ASC-ECU malfunction
- Disturbance of magnetization pattern for wheel speed detection encoder

### Past trouble

- When the diagnostic trouble code No. C102B is also set, carry out diagnosis with particular emphasis on wiring harness and connector failures between ASC-ECU and the wheel speed sensor. For diagnosis procedures, refer to How to treat past trouble (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15).
- When the diagnostic trouble code No. C102B is not set, the following conditions may be present:
  - Right or/and left wheels are rotated.
  - Unstable vehicle attitude
  - External noise interference
  - Vehicle ran with the parking brake applied.

## 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. M.U.T.-III CAN bus diagnostics

Use scan tool to diagnose the CAN bus lines.

### Q:Is the check result normal?

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

## DIAGNOSIS

---

**STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines****Q: Is DTC C1032 set?****YES:** Go to Step 3.**NO:** The procedure is complete.

---

**STEP 3. M.U.T.-III diagnostic trouble code**

Check that the diagnostic trouble code C102B is also set.

**Q: Is DTC C102B also set?****YES:** Perform the diagnosis for the diagnostic trouble code No. C102B. (Refer to P. 35C-28.)**NO:** Go to Step 4.

---

**STEP 4. Check for wheel speed sensor installation**

Check how the wheel speed sensor &lt;RR&gt; is installed (Disconnection of wheel speed sensor, loose mounting bolt, etc.).

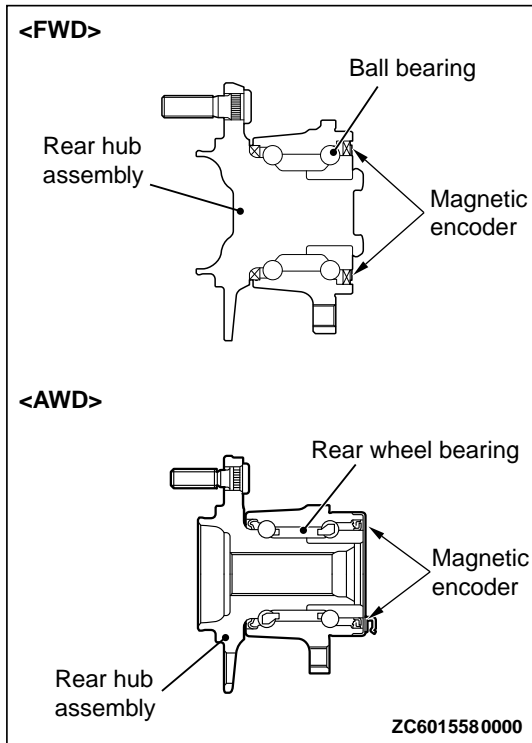
**Q: Is the check result normal?****YES:** Go to Step 5.**NO:** Reinstall the wheel speed sensor correctly.

---

**STEP 5. Check for wheel speed sensor as a single unit****Q: Is the check result normal?****YES:** Go to Step 6.**NO:** Replace the wheel speed sensor.

---

**STEP 6. Check for wheel bearing looseness***NOTE: Loose wheel bearing may increase the gap between the wheel speed sensor and the wheel speed detection magnet encoder. Check the wheel bearing <RR> for looseness. <Refer to GROUP 27A - On-vehicle Service P. 27A-4. (FWD) or GROUP 27B - On-vehicle Service P. 27B-15. (AWD)>***Q: Is the check result normal?****YES:** Go to Step 7.**NO:** Replace the rear wheel hub assembly.

**STEP 7. Check of wheel speed detection encoder**

Check the encoder for adhesion of foreign materials or deformation.

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

**YES:** Go to Step 8.

**NO:** Remove the foreign materials and clean the encoder so as not to disturb the magnetization pattern on it while taking care of the magnet, magnetic substance, and magnetic attraction. When the encoder is deformed, replace the rear hub assembly.

**STEP 8. Voltage measurement at the A-02 ASC-ECU connector**

- (1) Disconnect the ASC-ECU connector, connect special tool MB991997 to the harness-side connector, and then measure the resistance at special tool connector side.

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

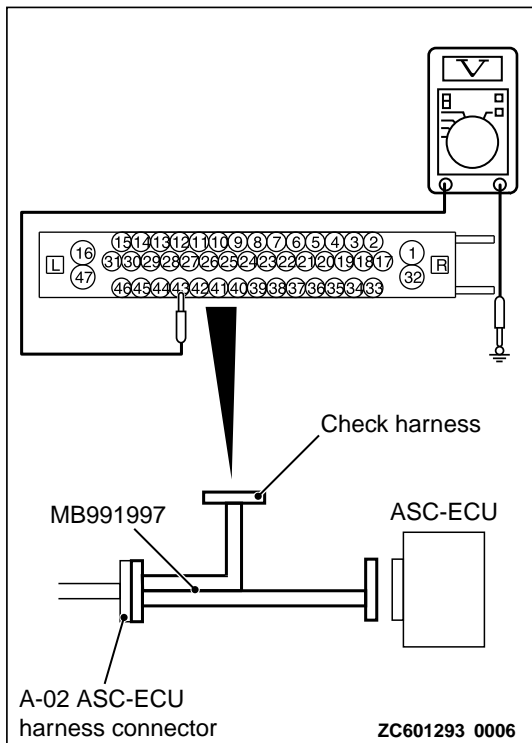
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between the wheel speed sensor power supply terminal (signal terminal) No. 43/the ground terminal No. 42 and the body ground.

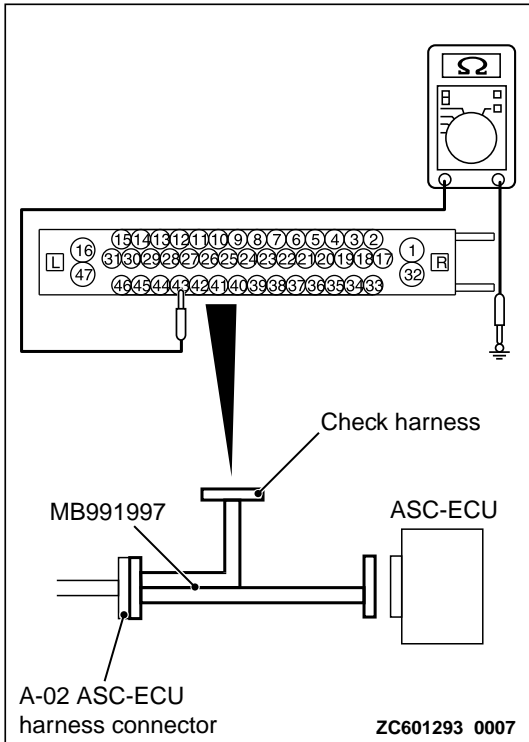
**OK: 0 volt**

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

**YES:** Go to Step 9.

**NO (Not normal at terminal No. 43 or 42):** Go to Step 10.





**STEP 9. Resistance measurement at A-02 ASC-ECU connector**

- (1) Disconnect the ASC-ECU connector, connect special tool MB991997 to the harness-side connector, and then measure the resistance at special tool connector side.

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

- (2) Resistance between the wheel speed sensor power supply terminal (signal terminal) No. 43/the ground terminal No. 42 and the body ground

**OK: No continuity**

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

**YES:** Go to Step 11.

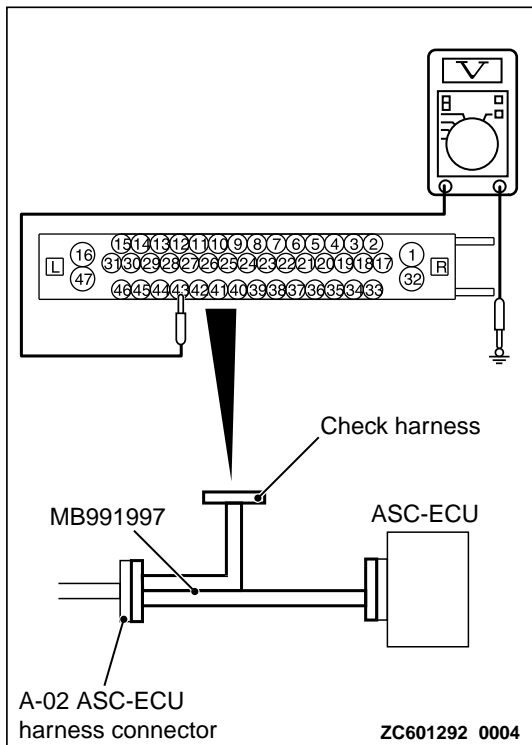
**NO (Not normal at terminal No. 43 or 42):** Go to Step 10.

**STEP 10. Connector check: A-02 ASC-ECU connector, C-125 intermediate connector, D-133 wheel speed sensor <RR> connector**

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

**YES:** The short circuit in the wheel speed sensor <RR> circuit may be present. Repair the wiring harness between the A-02 ASC-ECU connector terminal No. 43/42 and the D-133 wheel speed sensor <RR> connector terminal No. 1/2.

**NO:** Repair the defective connector.

**STEP 11. Voltage measurement at the A-02 ASC-ECU connector**

- (1) Disconnect the ASC-ECU connector, connect special tool MB991997 to the ASC-ECU-side connector and harness-side connector, and then measure the voltage at the special tool connector side.
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between the wheel speed sensor circuit power supply terminal (signal terminal) No. 43 and the body ground.

**OK: Approximately battery voltage**

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

**YES:** Go to Step 14.

**NO:** Go to Step 12.

**STEP 12. Connector check: A-02 ASC-ECU connector, C-125 intermediate connector, D-133 wheel speed sensor <RR> connector**

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

**YES:** Go to Step 13.

**NO:** Repair the defective connector.

**STEP 13. Wiring harness check between A-02 ASC-ECU connector terminal No. 43/42 and D-133 wheel speed sensor <RR> connector terminal No. 1/2**

- \* Check for open circuit in wheel speed sensor <RR> circuit

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

**YES:** Replace the wheel speed sensor.

**NO:** Repair the wiring harness.

**STEP 14. Check whether the diagnostic trouble code is reset.**

- (1) Erase the diagnostic trouble code.
- (2) Drive the vehicle at 12mph (20 km/h) or more.

*NOTE: The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12mph (20 km/h) or higher.*

**Q: Is DTC C1032 set?**

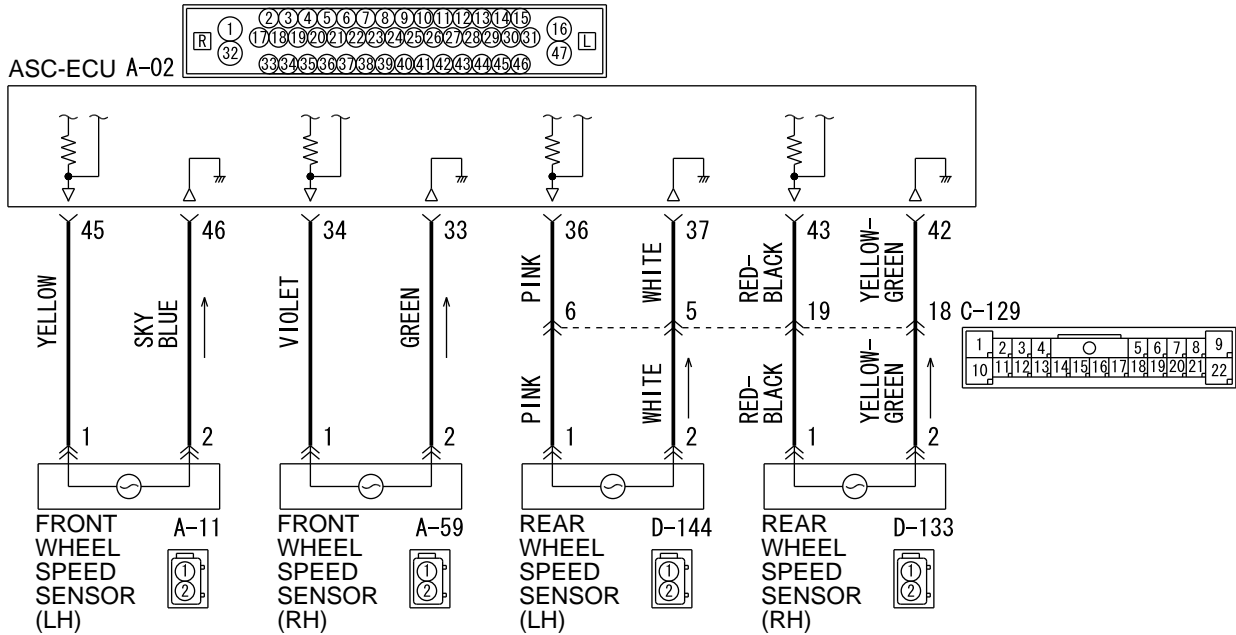
**YES:** Replace the ASC-ECU.

**NO:** Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P. 00-15).

**DTC C1014: Mutual monitoring of FL wheel speed sensor**

M13506100018USA0000010000

Wheel Speed Sensor Circuit



D7G35M016A00

**CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

- The wheel speed sensor is a kind of a pulse generator. It consists of encoders (a plate on which north and south pole sides of the magnets are arranged alternately) for detecting the wheel speed which rotates at the same speed of the wheels and wheel speed sensors. This sensor outputs frequency pulse signals in proportion to the wheel speed.
- The pulse signals, which the wheel speed sensor creates, are sent to ASC-ECU. ASC-ECU uses the frequency of the pulse signals to determine the wheel speed.

**DTC SET CONDITIONS**

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

- Missing wheel speed sensor signal

- Wheel speed sensor signal continuously indicates low value.

### PROBABLE CAUSES

#### Current trouble

- Excessive gap between the wheel speed sensor and the wheel speed detection encoder
- Wheel bearing malfunction
- Deformation of the wheel speed detection encoder
- Adhesion of foreign materials on the wheel speed sensor
- Adhesion of foreign materials on the wheel speed detection encoder
- Malfunction of wheel speed sensor
- Improper installation of the wheel speed sensor
- ASC-ECU malfunction

#### Past trouble

- When the diagnostic trouble code C100A is also set, carry out diagnosis with particular emphasis on wiring harness and connector failures between ASC-ECU and the wheel speed sensor. For diagnosis procedures, refer to How to treat past trouble (GROUP 00 - How to Cope with Intermittent Malfunction P.00-15).
- When the diagnostic trouble code C100A is not set, the following conditions may be present:
  - Right or left wheels are rotated.
  - Unstable vehicle attitude
  - External noise interference
  - Vehicle ran with the parking brake applied.

### 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. M.U.T.-III CAN bus diagnostics

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

---

#### STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines

#### Q:Is DTC C1014 set?

**YES:** Go to Step 3.

**NO:** The procedure is complete.



---

**STEP 3. M.U.T.-III diagnostic trouble code**

Check that the diagnostic trouble code C100A is also set.

**Q:Is DTC C100A also set?**

**YES:** Perform the diagnosis for the diagnostic trouble code C100A. (Refer to P.35C-14.)

**NO:** Go to Step 4.

---

**STEP 4. Check for wheel speed sensor installation**

Check how the wheel speed sensor <FL> is installed (Disconnection of wheel speed sensor, loose mounting bolt, etc.).

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

**YES:** Go to Step 5.

**NO:** Reinstall the wheel speed sensor correctly.

---

**STEP 5. Check for wheel speed sensor as a single unit**

Refer to P.35C-197.

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

**YES:** Go to Step 6.

**NO:** Replace the wheel speed sensor.

---

**STEP 6. Check for wheel bearing looseness**

*NOTE: Loose wheel bearing may increase the gap between the wheel speed sensor and the wheel speed detection magnet encoder. Check the wheel bearing <FL> for looseness. (Refer to GROUP 26 - On-vehicle Service P.26-8.)*

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

**YES:** Go to Step 7.

**NO:** Replace the wheel bearing.

---

**STEP 7. Check of wheel speed detection encoder**

Check the encoder for adhesion of foreign materials or deformation.

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

**YES:** Go to Step 8.

**NO (Adhesion of foreign materials):** Remove the foreign materials and clean the encoder so as not to disturb the magnetization pattern on it while taking care of the magnet, magnetic substance, and magnetic attraction.

**NO (Deformation):** Replace the wheel bearing.

---

**STEP 8. Check whether the diagnostic trouble code is reset.**

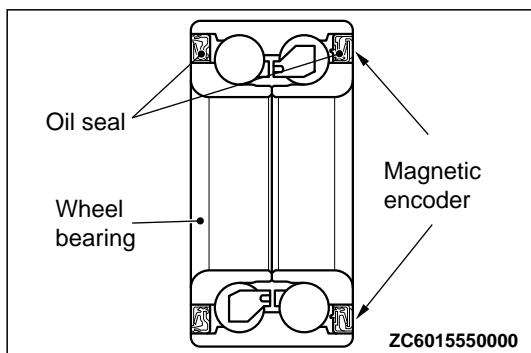
- (1) Erase the diagnostic trouble code.
- (2) Drive the vehicle at 12mph (20 km/h) or more.

*NOTE: The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12mph (20 km/h) or higher.*

**Q:Is DTC C1014 set?**

**YES:** Replace the ASC-ECU.

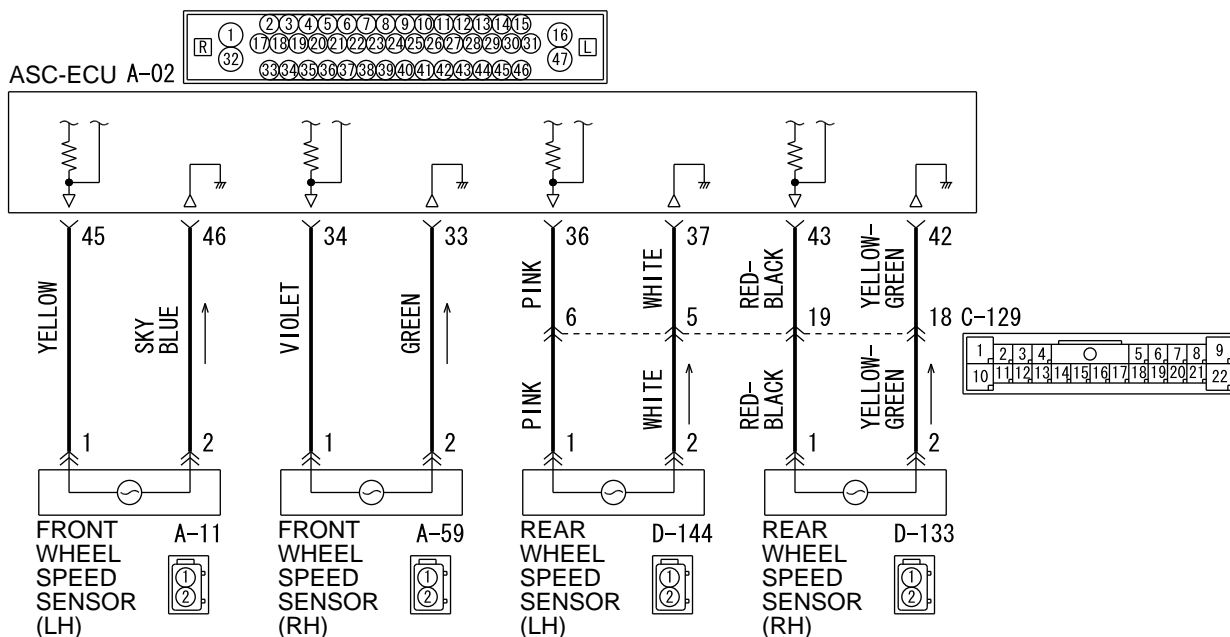
**NO:** Intermittent malfunction. (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15.)



DTC C101F Mutual monitoring of FR wheel speed sensor

M13506100019USA0000010000

Wheel Speed Sensor Circuit



D7G35M016A00

**CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

- The wheel speed sensor is a kind of a pulse generator. It consists of encoders (a plate on which north and south pole sides of the magnets are arranged alternately) for detecting the wheel speed which rotates at the same speed of the wheels and wheel speed sensors. This sensor outputs frequency pulse signals in proportion to the wheel speed.
- The pulse signals, which the wheel speed sensor creates, are sent to ASC-ECU. ASC-ECU uses the frequency of the pulse signals to determine the wheel speed.

**DTC SET CONDITIONS**

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

- Missing wheel speed sensor signal

- Wheel speed sensor signal continuously indicates low value.

### PROBABLE CAUSES

#### Current trouble

- Excessive gap between the wheel speed sensor and the wheel speed detection encoder
- Wheel bearing malfunction
- Deformation of the wheel speed detection encoder
- Adhesion of foreign materials on the wheel speed sensor
- Adhesion of foreign materials on the wheel speed detection encoder
- Malfunction of wheel speed sensor
- Improper installation of the wheel speed sensor
- ASC-ECU malfunction

#### Past trouble

- When the diagnostic trouble code C1015 is also set, carry out diagnosis with particular emphasis on wiring harness and connector failures between ASC-ECU and the wheel speed sensor. For diagnosis procedures, refer to How to treat past trouble (GROUP 00 - How to Cope with Intermittent Malfunction P.00-15).
- When diagnostic trouble code C1015 is not set, the following conditions may be present:
  - Right or/and left wheels are rotated.
  - Unstable vehicle attitude
  - External noise interference
  - Vehicle ran with the parking brake applied.

### 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. M.U.T.-III CAN bus diagnostics

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

---

#### STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines

#### Q:Is DTC C101F set?

**YES:** Go to Step 3.

**NO:** The procedure is complete.

**STEP 3. M.U.T.-III diagnostic trouble code**

Check that the diagnostic trouble code C1015 is also set.

**Q:Is DTC C1015 also set?**

**YES:** Perform the diagnosis for the diagnostic trouble code No. C1015. (Refer to P. 35C-18.)

**NO:** Go to Step 4.

**STEP 4. Check for wheel speed sensor installation**

Check how the wheel speed sensor <FR> is installed (Disconnection of wheel speed sensor, loose mounting bolt, etc.).

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

**YES:** Go to Step 5.

**NO:** Reinstall the wheel speed sensor correctly.

**STEP 5. Check for wheel speed sensor as a single unit****Q:Is the check result normal?**

**YES:** Go to Step 6.

**NO:** Replace the wheel speed sensor.

**STEP 6. Check for wheel bearing looseness**

*NOTE: Loose wheel bearing may increase the gap between the wheel speed sensor and the wheel speed detection magnet encoder. Check the wheel bearing <FR> for looseness. (Refer to GROUP 26 - On-vehicle Service P. 26-8.)*

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

**YES:** Go to Step 7.

**NO:** Replace the wheel bearing.

**STEP 7. Check of wheel speed detection encoder**

Check the encoder for adhesion of foreign materials or deformation.

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

**YES:** Go to Step 8.

**NO (Adhesion of foreign materials):** Remove the foreign materials and clean the encoder so as not to disturb the magnetization pattern on it while taking care of the magnet, magnetic substance, and magnetic attraction.

**NO (Deformation):** Replace the wheel bearing.

**STEP 8. Check whether the diagnostic trouble code is reset.**

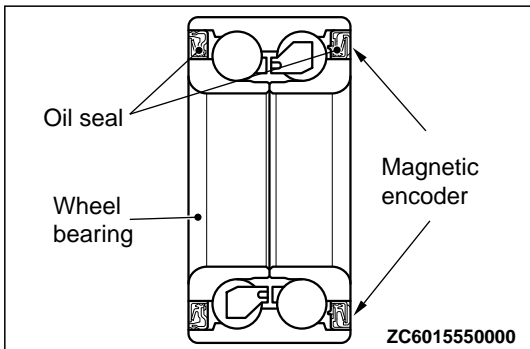
- (1) Erase the diagnostic trouble code.
- (2) Drive the vehicle at 12mph (20 km/h) or more.

*NOTE: The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12mph (20 km/h) or higher.*

**Q:Is DTC C101F set?**

**YES:** Replace the ASC-ECU.

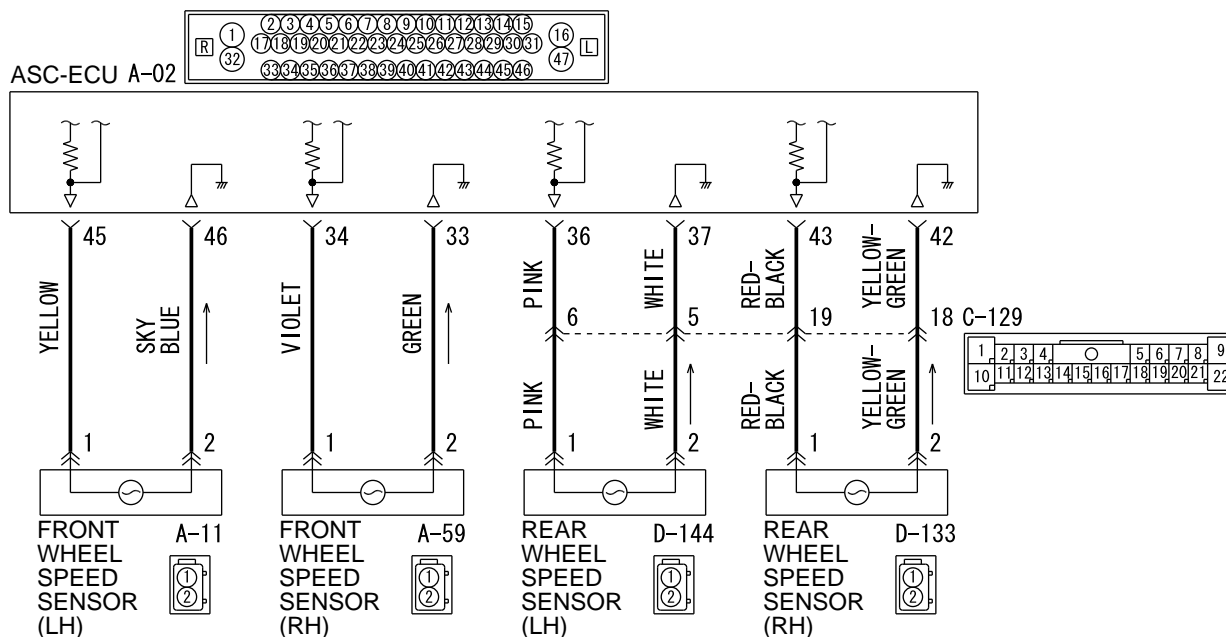
**NO:** Intermittent malfunction. (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P. 00-15.)



**DTC No. C102A: Mutual monitoring of RL wheel speed sensor**

M13506100020USA0000010000

Wheel Speed Sensor Circuit



D7G35M016A00

**CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

- The wheel speed sensor is a kind of a pulse generator. It consists of encoders (a plate on which north and south pole sides of the magnets are arranged alternately) for detecting the wheel speed which rotates at the same speed of the wheels and wheel speed sensors. This sensor outputs frequency pulse signals in proportion to the wheel speed.
- The pulse signals, which the wheel speed sensor creates, are sent to ASC-ECU. ASC-ECU uses the frequency of the pulse signals to determine the wheel speed.

**DTC SET CONDITIONS**

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

- Missing wheel speed sensor signal

- Wheel speed sensor signal continuously indicates low value.

### PROBABLE CAUSES

#### Current trouble

- Excessive gap between the wheel speed sensor and the wheel speed detection encoder
- Adhesion of foreign materials on the wheel speed sensor
- Wheel bearing malfunction
- Deformation of the wheel speed detection encoder
- Adhesion of foreign materials on the wheel speed detection encoder
- Malfunction of wheel speed sensor
- Improper installation of the wheel speed sensor
- ASC-ECU malfunction

#### Past trouble

- When the diagnostic trouble code C1020 is also set, carry out diagnosis with particular emphasis on wiring harness and connector failures between ASC-ECU and the wheel speed sensor. For diagnosis procedures, refer to How to treat past trouble (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15).
- When the diagnostic trouble code C1020 is not set, the following conditions may be present:
  - Right or left wheels are rotated.
  - Unstable vehicle attitude
  - External noise interference
  - Vehicle ran with the parking brake applied.

### 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. M.U.T.-III CAN bus diagnostics

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

---

#### STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines

#### Q:Is DTC C102A set?

**YES:** Go to Step 3.

**NO:** The procedure is complete.

## DIAGNOSIS

---

**STEP 3. M.U.T.-III diagnostic trouble code**

Check that the diagnostic trouble code C1020 is also set.

**Q: Is DTC C1020 also set?**

**YES:** Perform the diagnosis for the diagnostic trouble code C1020. (Refer to P.35C-23.)

**NO:** Go to Step 4.

---

**STEP 4. Check for wheel speed sensor installation**

Check how the wheel speed sensor <RL> is installed (Disconnection of wheel speed sensor, loose mounting bolt, etc.).

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

**YES:** Go to Step 5.

**NO:** Reinstall the wheel speed sensor correctly.

---

**STEP 5. Check for wheel speed sensor as a single unit**

Refer to P.35C-197.

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

**YES:** Go to Step 6.

**NO:** Replace the wheel speed sensor.

---

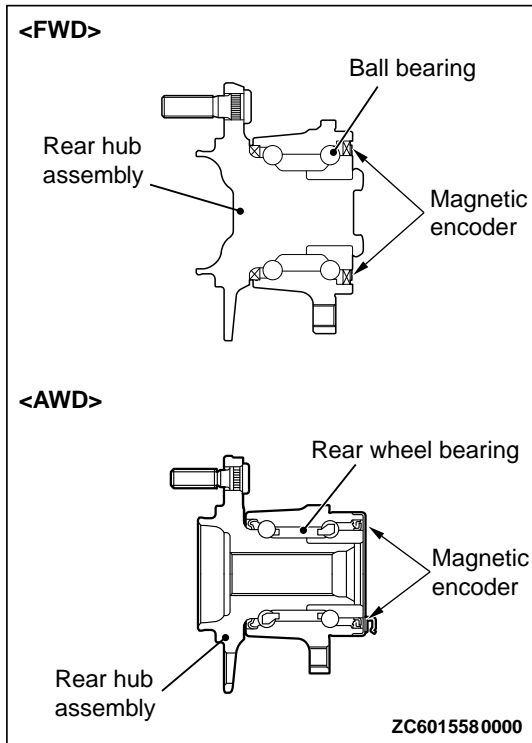
**STEP 6. Check for wheel bearing looseness**

*NOTE: Loose wheel bearing may increase the gap between the wheel speed sensor and the wheel speed detection magnet encoder. Check the wheel bearing <RL> for looseness. <Refer to GROUP 27A - On-vehicle Service P. 27A-4. (FWD) or GROUP 27B - On-vehicle Service P. 27B-15. (AWD)>*

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

**YES:** Go to Step 7.

**NO:** Replace the rear wheel hub assembly.

**STEP 7. Check of wheel speed detection encoder**

Check the encoder for adhesion of foreign materials or deformation.

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

**YES:** Go to Step 8.

**NO (Adhesion of foreign materials):** Remove the foreign materials and clean the encoder so as not to disturb the magnetization pattern on it while taking care of the magnet, magnetic substance, and magnetic attraction.

**NO (Deformation):** Replace the rear wheel hub assembly.

**STEP 8. Check whether the diagnostic trouble code is reset.**

- (1) Erase the diagnostic trouble code.
- (2) Drive the vehicle at 12mph (20 km/h) or more.

*NOTE: The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12mph (20 km/h) or higher.*

**Q: Is DTC C102A set?**

**YES:** Replace the ASC-ECU.

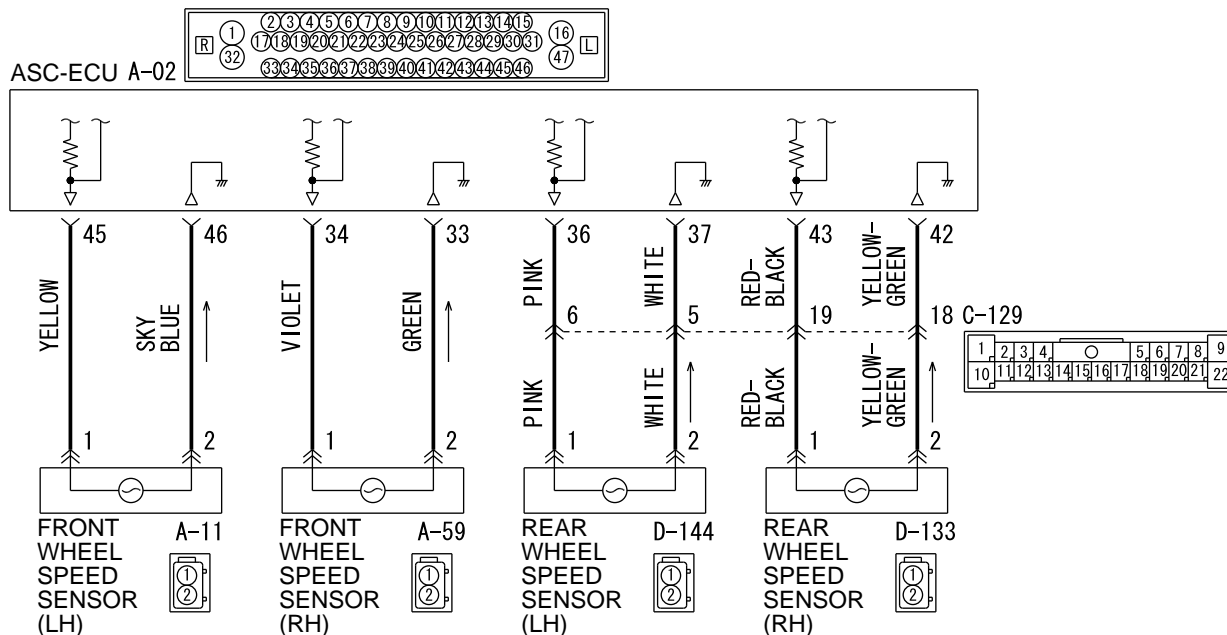
**NO:** Intermittent malfunction. (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15.)



**DTC C1035: Mutual monitoring of RR wheel speed sensor**

M13506100021USA0000010000

Wheel Speed Sensor Circuit



D7G35M016A00

**CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

- \*The wheel speed sensor is a kind of a pulse generator. It consists of encoders (a plate on which north and south pole sides of the magnets are arranged alternately) for detecting the wheel speed which rotates at the same speed of the wheels and wheel speed sensors. This sensor outputs frequency pulse signals in proportion to the wheel speed.
- \*The pulse signals, which the wheel speed sensor creates, are sent to ASC-ECU. ASC-ECU uses the frequency of the pulse signals to determine the wheel speed.

**DTC SET CONDITIONS**

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

- \*Missing wheel speed sensor signal

- Wheel speed sensor signal continuously indicates low value.

### PROBABLE CAUSES

#### Current trouble

- Excessive gap between the wheel speed sensor and the wheel speed detection encoder
- Adhesion of foreign materials on the wheel speed sensor
- Wheel bearing malfunction
- Deformation of the wheel speed detection encoder
- Adhesion of foreign materials on the wheel speed detection encoder
- Malfunction of wheel speed sensor
- Improper installation of the wheel speed sensor
- ASC-ECU malfunction

#### Past trouble

- When the diagnostic trouble code C102B is also set, carry out diagnosis with particular emphasis on wiring harness and connector failures between ASC-ECU and the wheel speed sensor. For diagnosis procedures, refer to How to treat past trouble (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15).
- When the diagnostic trouble code C102B is not set, the following conditions may be present:
  - Right or left wheels are rotated.
  - Unstable vehicle attitude
  - External noise interference
  - Vehicle ran with the parking brake applied.

### 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. M.U.T.-III CAN bus diagnostics

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

---

#### STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines

#### Q:Is DTC C1035 set?

**YES:** Go to Step 3.

**NO:** The procedure is complete.

## DIAGNOSIS

---

**STEP 3. M.U.T.-III diagnostic trouble code**

Check that the diagnostic trouble code C102B is also set.

**Q: Is DTC C102B also set?**

**YES:** Perform the diagnosis for the diagnostic trouble code C102B. (Refer to P.35C-28.)

**NO:** Go to Step 4.

---

**STEP 4. Check for wheel speed sensor installation**

Check how the wheel speed sensor <RR> is installed (Disconnection of wheel speed sensor, loose mounting bolt, etc.).

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

**YES:** Go to Step 5.

**NO:** Reinstall the wheel speed sensor correctly.

---

**STEP 5. Check for wheel speed sensor as a single unit**

Refer to P.35C-197.

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

**YES:** Go to Step 6.

**NO:** Replace the wheel speed sensor.

---

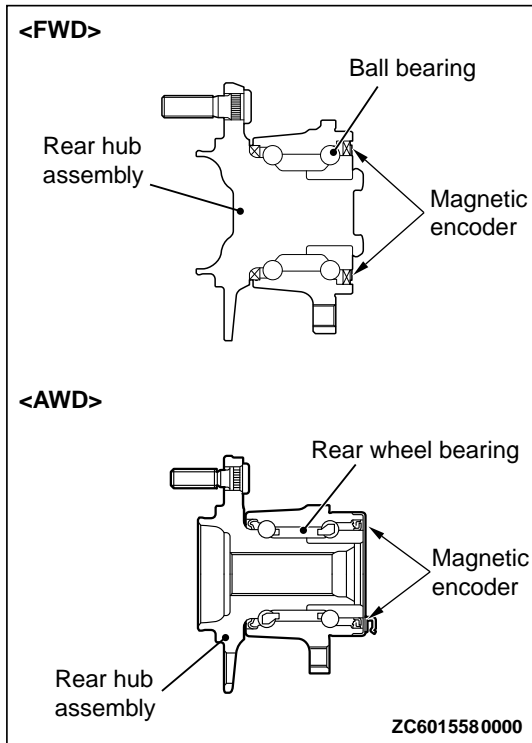
**STEP 6. Check for wheel bearing looseness**

*NOTE: Loose wheel bearing may increase the gap between the wheel speed sensor and the wheel speed detection magnet encoder. Check the wheel bearing <RL> for looseness. (Refer to GROUP 27A - On-vehicle Service P.27A-4 (FWD) or GROUP 27B - On-vehicle Service P.27B-15 (AWD).)*

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

**YES:** Go to Step 7.

**NO:** Replace the rear wheel hub assembly.

**STEP 7. Check of wheel speed detection encoder**

Check the encoder for adhesion of foreign materials or deformation.

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

**YES:** Go to Step 8.

**NO (Adhesion of foreign materials):** Remove the foreign materials and clean the encoder so as not to disturb the magnetization pattern on it while taking care of the magnet, magnetic substance, and magnetic attraction.

**NO (Deformation):** Replace the rear wheel hub assembly.

**STEP 8. Check whether the diagnostic trouble code is reset.**

- (1) Erase the diagnostic trouble code.
- (2) Drive the vehicle at 12mph (20 km/h) or more.

*NOTE: The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12mph (20 km/h) or higher.*

**Q: Is DTC C1035 set?**

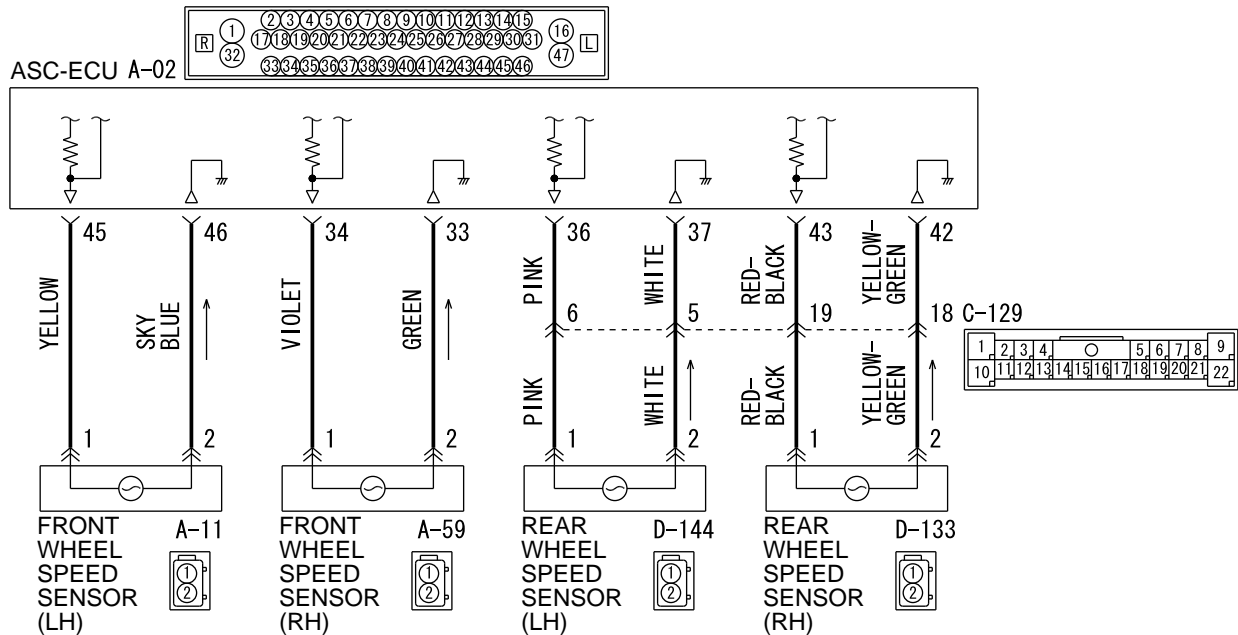
**YES:** Replace the ASC-ECU.

**NO:** Intermittent malfunction. (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15.)

**DTC C1041: Abnormality in periodical signal for FL wheel speed sensor**

M1350610002USA0000010000

**Wheel Speed Sensor Circuit**



D7G35M016A00

**CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

- The wheel speed sensor is a kind of a pulse generator. It consists of encoders (a plate on which north and south pole sides of the magnets are arranged alternately) for detecting the wheel speed which rotates at the same speed of the wheels and wheel speed sensors. This sensor outputs frequency pulse signals in proportion to the wheel speed.
- The pulse signals, which the wheel speed sensor creates, are sent to ASC-ECU. ASC-ECU uses the frequency of the pulse signals to determine the wheel speed.

**DTC SET CONDITIONS**

ASC-ECU monitors the signals from each wheel speed sensor while the vehicle is being driven. If any periodical drop is found in these sensor signals, ASC-ECU will set the relevant diagnostic trouble code.

**PROBABLE CAUSES**

- Wheel bearing malfunction
- Deformation of the wheel speed detection encoder
- Missing teeth of the wheel speed detection encoder
- Adhesion of foreign materials on the wheel speed detection encoder
- ASC-ECU malfunction

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D – CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

**STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines****Q:Is DTC C1041 set?**

**YES:** Go to Step 3.

**NO:** The procedure is complete.

**STEP 3. Check for wheel bearing looseness**

*NOTE: Loose wheel bearing may increase the gap between the wheel speed sensor and the wheel speed detection magnet encoder. Check the wheel bearing <FL> for looseness. (Refer to GROUP 26 – On-vehicle Service P.26-8.)*

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

**YES:** Go to Step 4.

**NO:** Replace the wheel bearing.

**STEP 4. Check of wheel speed detection encoder**

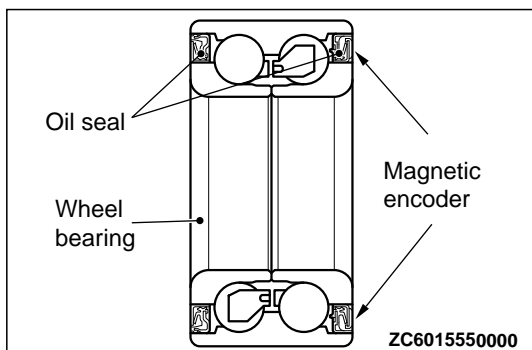
Check the encoder for adhesion of foreign materials or deformation.

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

**YES:** Go to Step 5.

**NO (Adhesion of foreign materials):** Remove the foreign materials and clean the encoder so as not to disturb the magnetization pattern on it while taking care of the magnet, magnetic substance, and magnetic attraction. When the encoder is deformed, replace the wheel bearing.

**NO (Deformation):** Replace the wheel bearing.



**STEP 5. Check whether the diagnostic trouble code is reset.**

- (1) Erase the diagnostic trouble code.
- (2) Drive the vehicle at 12mph (20 km/h) or more.

*NOTE: The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12mph (20 km/h) or higher.*

**Q: Is DTC C1041 set?**

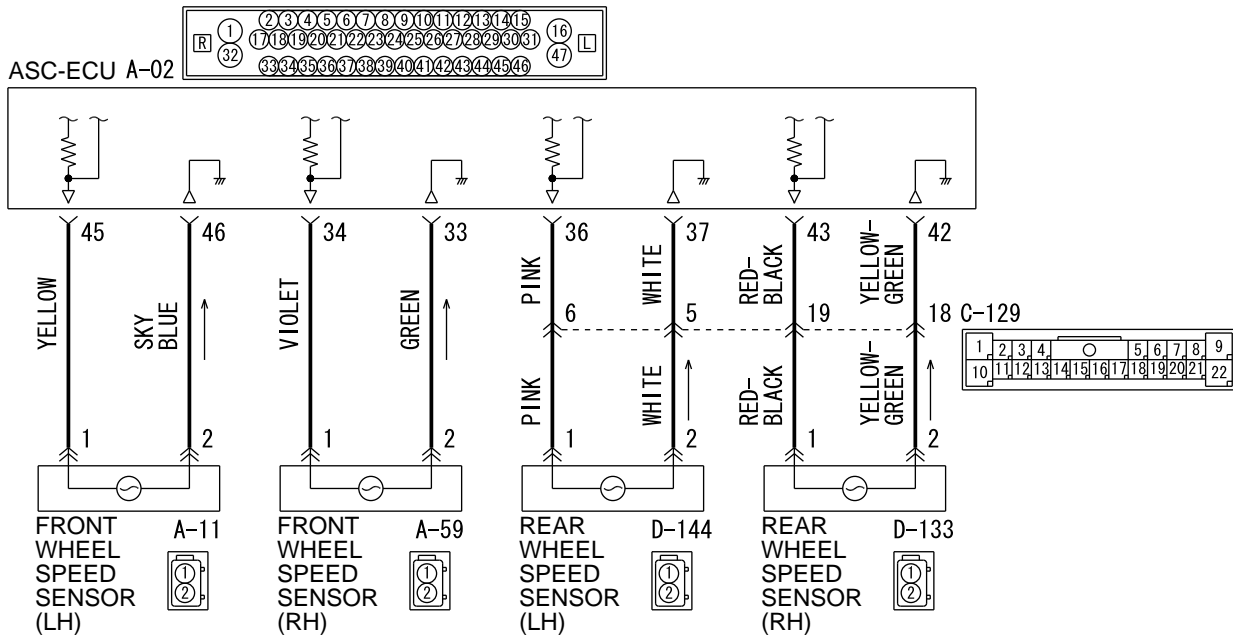
**YES:** Replace the ASC-ECU.

**NO:** Intermittent malfunction. (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15.)

**DTC C1042: Abnormality in periodical signal for FR wheel speed sensor**

M13506100023USA0000010000

Wheel Speed Sensor Circuit



D7G35M016A00

**CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

- The wheel speed sensor is a kind of a pulse generator. It consists of encoders (a plate on which north and south pole sides of the magnets are arranged alternately) for detecting the wheel speed which rotates at the same speed of the wheels and wheel speed sensors. This sensor outputs frequency pulse signals in proportion to the wheel speed.
- The pulse signals, which the wheel speed sensor creates, are sent to ASC-ECU. ASC-ECU uses the frequency of the pulse signals to determine the wheel speed.

**DTC SET CONDITIONS**

ASC-ECU monitors the signals from each wheel speed sensor while the vehicle is being driven. If any periodical drop is found in these sensor signals, ASC-ECU will set the relevant diagnostic trouble code.

**PROBABLE CAUSES**

- Wheel bearing malfunction
- Deformation of the wheel speed detection encoder
- Missing teeth of the wheel speed detection encoder
- Adhesion of foreign materials on the wheel speed detection encoder
- ASC-ECU malfunction

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

---

**STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines****Q:Is DTC C1042 set?**

**YES:** Go to Step 3.

**NO:** The procedure is complete.



**STEP 3. Check for wheel bearing looseness**

*NOTE: Loose wheel bearing may increase the gap between the wheel speed sensor and the wheel speed detection magnet encoder. Check the wheel bearing <FR> for looseness. (Refer to GROUP 26 - On-vehicle Service P. 26-8.)*

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

**YES:** Go to Step 4.

**NO:** Replace the wheel bearing.

**STEP 4. Check of wheel speed detection encoder**

Check the encoder for adhesion of foreign materials or deformation.

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

**YES:** Go to Step 5.

**NO (Adhesion of foreign materials):** Remove the foreign materials and clean the encoder so as not to disturb the magnetization pattern on it while taking care of the magnet, magnetic substance, and magnetic attraction. When the encoder is deformed, replace the wheel bearing.

**NO (Deformation):** Replace the wheel bearing.

**STEP 5. Check whether the diagnostic trouble code is reset.**

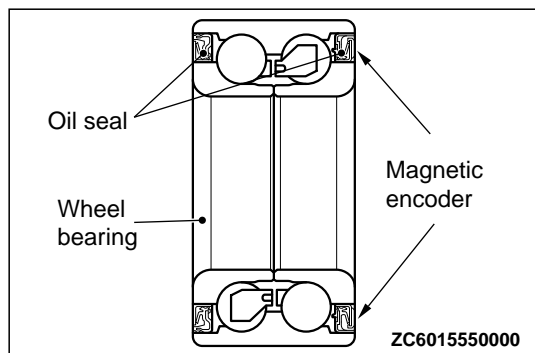
- (1) Erase the diagnostic trouble code.
- (2) Drive the vehicle at 12mph (20 km/h) or more.

*NOTE: The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12mph (20 km/h) or higher.*

**Q: Is DTC C1042 set?**

**YES:** Replace the ASC-ECU.

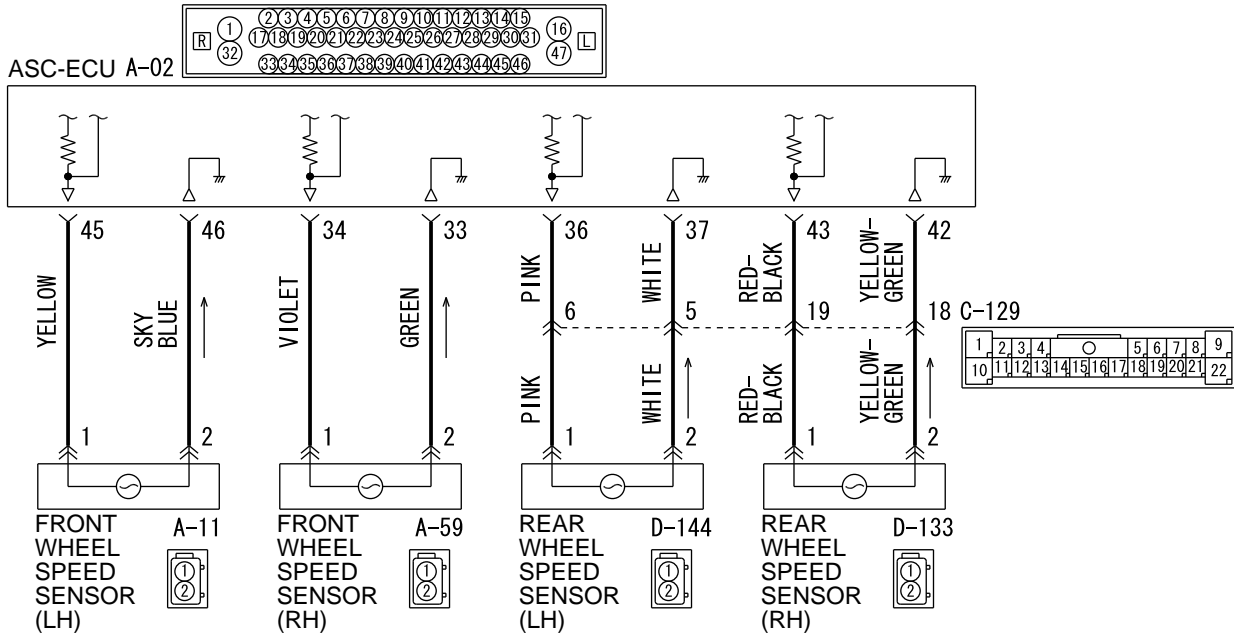
**NO:** Intermittent malfunction. (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P. 00-15.)



DTC C1043: Abnormality in periodical signal for RL wheel speed sensor

M1350610002USA0000010000

Wheel Speed Sensor Circuit



D7G35M016A00

**CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

- The wheel speed sensor is a kind of a pulse generator. It consists of encoders (a plate on which north and south pole sides of the magnets are arranged alternately) for detecting the wheel speed which rotates at the same speed of the wheels and wheel speed sensors. This sensor outputs frequency pulse signals in proportion to the wheel speed.
- The pulse signals, which the wheel speed sensor creates, are sent to ASC-ECU. ASC-ECU uses the frequency of the pulse signals to determine the wheel speed.

**DTC SET CONDITIONS**

ASC-ECU monitors the signals from each wheel speed sensor while the vehicle is being driven. If any periodical drop is found in these sensor signals, ASC-ECU will set the relevant diagnostic trouble code.

## DIAGNOSIS

**PROBABLE CAUSES**

- Wheel bearing malfunction
- Deformation of the wheel speed detection encoder
- Missing teeth of the wheel speed detection encoder
- Adhesion of foreign materials on the wheel speed detection encoder
- ASC-ECU malfunction

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

**STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines****Q: Is DTC C1043 set?**

**YES:** Go to Step 3.

**NO:** The procedure is complete.

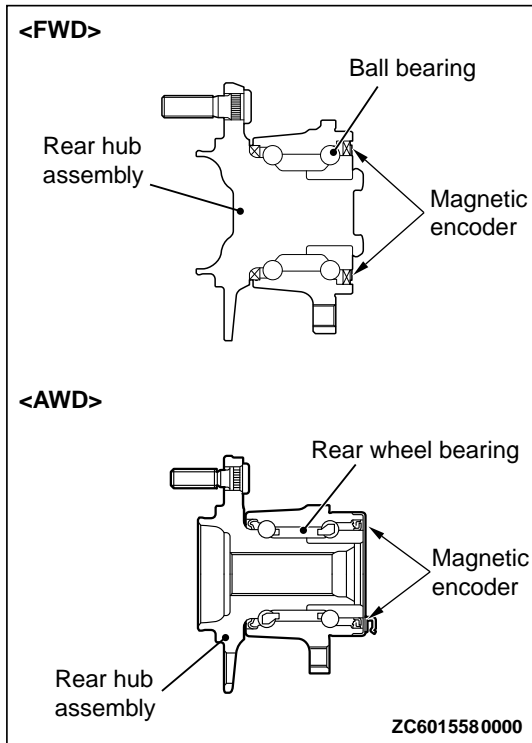
**STEP 3. Check for wheel bearing looseness**

*NOTE: Loose wheel bearing may increase the gap between the wheel speed sensor and the wheel speed detection magnet encoder. Check the wheel bearing <RL> for looseness. <Refer to GROUP 27A - On-vehicle Service P.27A-4 (FWD) or GROUP 27B - On-vehicle Service P.27B-15 (AWD).>*

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

**YES:** Go to Step 4.

**NO:** Replace the rear wheel hub assembly.

**STEP 4. Check of wheel speed detection encoder**

Check the encoder for adhesion of foreign materials or deformation.

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

**YES:** Go to Step 5.

**NO (Presence of foreign materials):** Remove the foreign materials and clean the encoder so as not to disturb the magnetization pattern on it while taking care of the magnet, magnetic substance, and magnetic attraction. When the encoder is deformed, replace the rear hub assembly.

**NO (Deformation):** Replace the rear wheel hub assembly.

**STEP 5. Check whether the diagnostic trouble code is reset.**

- (1) Erase the diagnostic trouble code.
- (2) Drive the vehicle at 12mph (20 km/h) or more.

*NOTE: The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12mph (20 km/h) or higher.*

**Q: Is DTC C1043 set?**

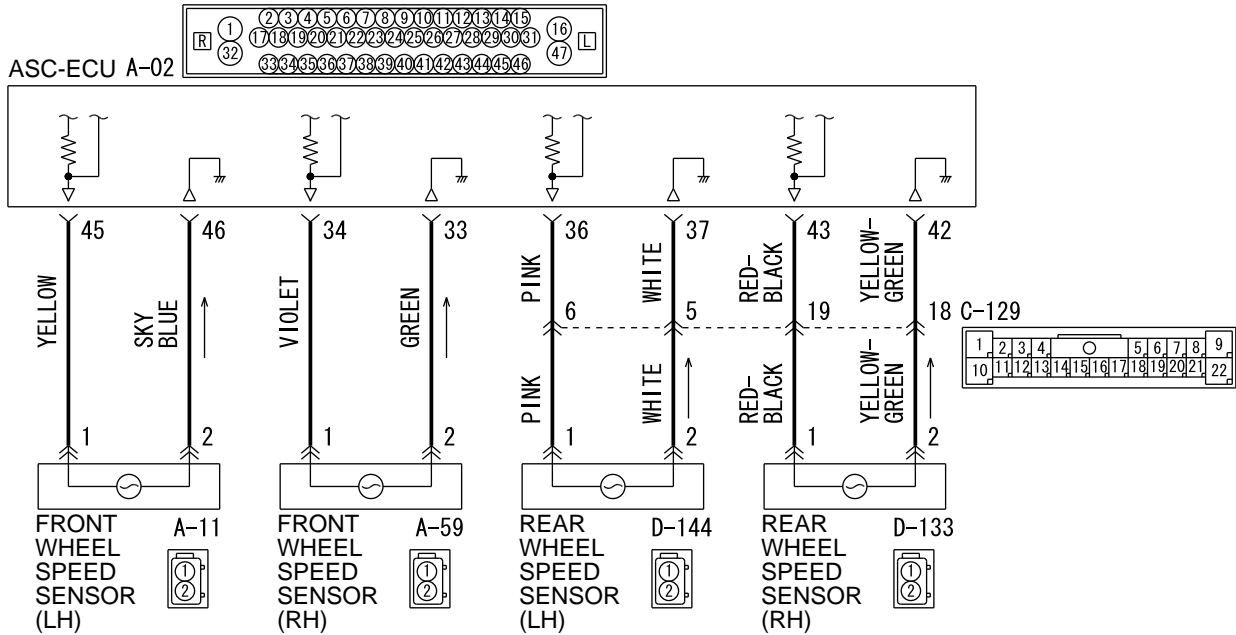
**YES:** Replace the ASC-ECU.

**NO:** Intermittent malfunction. (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15.)

**DTC C1044: Abnormality in periodical signal for RR wheel speed sensor**

M13506100025USA0000010000

**Wheel Speed Sensor Circuit**



D7G35M016A00

**CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

- The wheel speed sensor is a kind of a pulse generator. It consists of encoders (a plate on which north and south pole sides of the magnets are arranged alternately) for detecting the wheel speed which rotates at the same speed of the wheels and wheel speed sensors. This sensor outputs frequency pulse signals in proportion to the wheel speed.
- The pulse signals, which the wheel speed sensor creates, are sent to ASC-ECU. ASC-ECU uses the frequency of the pulse signals to determine the wheel speed.

**DTC SET CONDITIONS**

ASC-ECU monitors the signals from each wheel speed sensor while the vehicle is being driven. If any periodical drop is found in these sensor signals, ASC-ECU will set the relevant diagnostic trouble code.

**PROBABLE CAUSES**

- Wheel bearing malfunction
- Deformation of the wheel speed detection encoder
- Missing teeth of the wheel speed detection encoder
- Adhesion of foreign materials on the wheel speed detection encoder
- ASC-ECU malfunction

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

---

**STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines****Q:Is DTC C1044 set?**

**YES:** Go to Step 3.

**NO:** The procedure is complete.

---

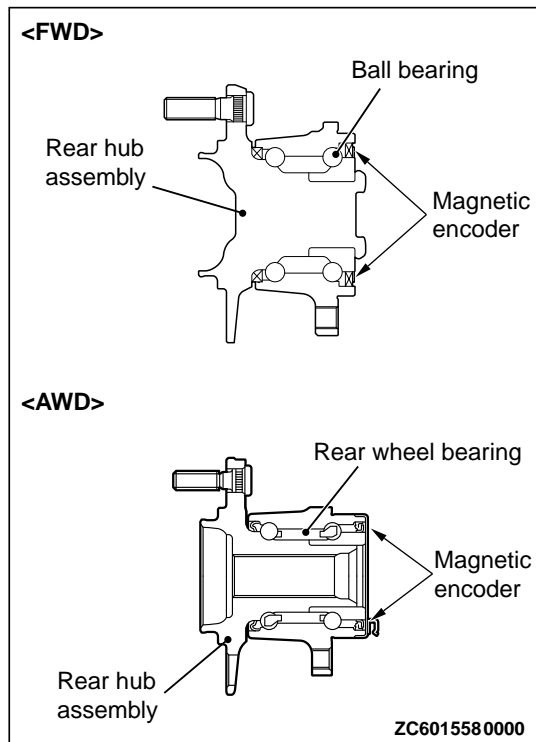
**STEP 3. Check for wheel bearing looseness**

*NOTE: Loose wheel bearing may increase the gap between the wheel speed sensor and the wheel speed detection magnet encoder. Check the wheel bearing <RR> for looseness. <Refer to GROUP 27A - On-vehicle Service P. 27A-4 (FWD) or GROUP 27B - On-vehicle Service P. 27B-15 (AWD).>*

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

**YES:** Go to Step 4.

**NO:** Replace the rear wheel hub assembly.

**STEP 4. Check of wheel speed detection encoder**

Check the encoder for adhesion of foreign materials or deformation.

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

**YES:** Go to Step 5.

**NO (Presence of foreign materials):** Remove the foreign materials and clean the encoder so as not to disturb the magnetization pattern on it while taking care of the magnet, magnetic substance, and magnetic attraction. When the encoder is deformed, replace the rear hub assembly.

**NO (Deformation):** Replace the rear wheel hub assembly.

**STEP 5. Check whether the diagnostic trouble code is reset.**

- (1) Erase the diagnostic trouble code.
- (2) Drive the vehicle at 12mph (20 km/h) or more.

*NOTE: The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12mph (20 km/h) or higher.*

**Q: Is DTC C1044 set?**

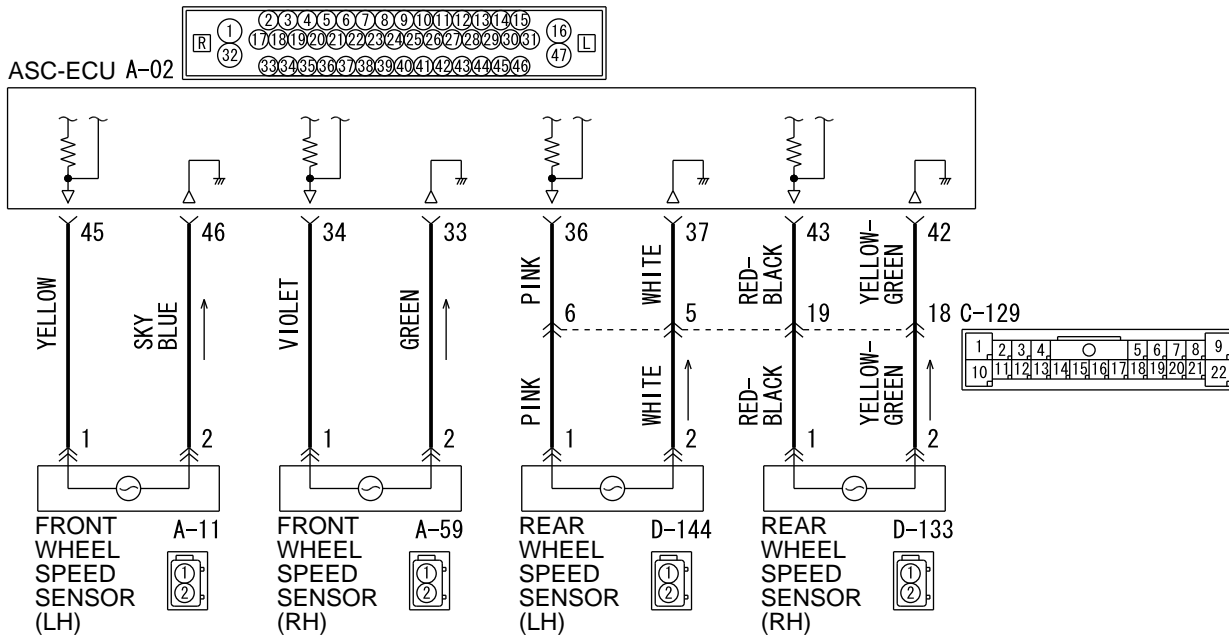
**YES:** Replace the ASC-ECU.

**NO:** Intermittent malfunction. (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15.)

DTC C1046: FL wheel speed sensor control phase time exceeded

M13506100026USA0000010000

Wheel Speed Sensor Circuit



D7G35M016A00

**CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

- The wheel speed sensor is a kind of a pulse generator. It consists of encoders (a plate on which north and south pole sides of the magnets are arranged alternately) for detecting the wheel speed which rotates at the same speed of the wheels and wheel speed sensors. This sensor outputs frequency pulse signals in proportion to the wheel speed.
- The pulse signals, which the wheel speed sensor creates, are sent to ASC-ECU. ASC-ECU uses the frequency of the pulse signals to determine the wheel speed.

**DTC SET CONDITIONS**

This diagnostic trouble code is set if any malfunction below is found:

- When the brake fluid pressure is decreased for a long time.
- When the brake fluid pressure is held for a long time.



## DIAGNOSIS

**PROBABLE CAUSES**

- Damaged wiring harness and connectors
- External noise interference
- Malfunction of wheel speed sensor
- ASC-ECU malfunction
- Excessive gap between the wheel speed sensor and the wheel speed detection encoder
- Adhesion of foreign materials on the wheel speed sensor
- Adhesion of foreign materials on the wheel speed detection encoder
- Wheel bearing malfunction
- Improper installation of the wheel speed sensor
- Deformation of the wheel speed detection encoder
- Disturbance of magnetization pattern for wheel speed detection encoder
- Missing teeth of the wheel speed detection encoder

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D – CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

**STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines****Q:Is DTC C1046 set?**

**YES:** Go to Step 3.

**NO:** The procedure is complete.

**STEP 3. M.U.T.-III diagnostic trouble code**

Check that the diagnostic trouble codes C100A, C1011, C1014, and C1041 are also set.

**Q:Are DTC C100A, C1011, C1014, and C1041 also set?**

**YES:** Carry out the diagnosis for the relevant diagnostic trouble codes, and then go to Step 12.

**NO:** Go to Step 4.

**STEP 4. M.U.T.-III data list**

Check the following service data.

- Item No.01: FL wheel speed sensor

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

**YES:** Intermittent malfunction. (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15.)

**NO:** Go to Step 5.

### STEP 5. Voltage measurement at the A-02 ASC-ECU connector

- (1) Disconnect the ASC-ECU connector, connect special tool MB991997 to the harness-side connector, and then measure the resistance at the special tool connector side.

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

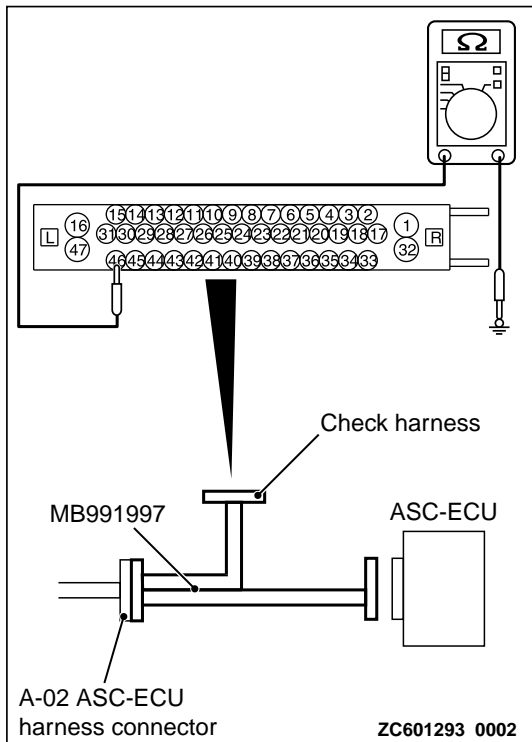
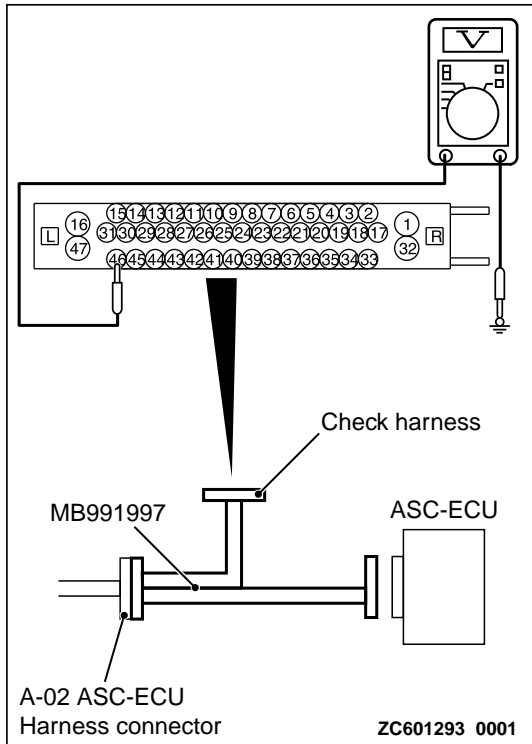
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between the wheel speed sensor power supply terminal (signal terminal) No. 45/the ground terminal No. 46 and the body ground.

**OK: 0 volt**

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

**YES:** Go to Step 6.

**NO (Not normal at the terminal No. 45 or 46):** Go to Step 7.



### STEP 6. Resistance measurement at A-02 ASC-ECU connector

- (1) Disconnect the ASC-ECU connector, connect special tool MB991997 to the harness-side connector, and then measure the resistance at the special tool connector side.

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

- (2) Resistance between the wheel speed sensor power supply terminal (signal terminal) No. 45/the ground terminal No. 46 and the body ground

**OK: No continuity**

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

**YES:** Go to Step 9.

**NO (Not normal at the terminal No. 45 or 46):** Go to Step 7.

**STEP 7. Connector check: A-02 ASC-ECU connector, A-11 wheel speed sensor <FL> connector**

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

**YES:** Go to Step 8.

**NO:** Repair the defective connector.

**STEP 8. Wiring harness check between A-02 ASC-ECU connector terminal No. 45/46 and A-11 wheel speed sensor <FL> connector terminal No. 1/2**

\*Check for short circuit in wheel speed sensor <FL> circuit

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

**YES:** Replace the wheel speed sensor <FL>.

**NO:** Repair the wiring harness.

**STEP 9. Voltage measurement at the A-02 ASC-ECU connector**

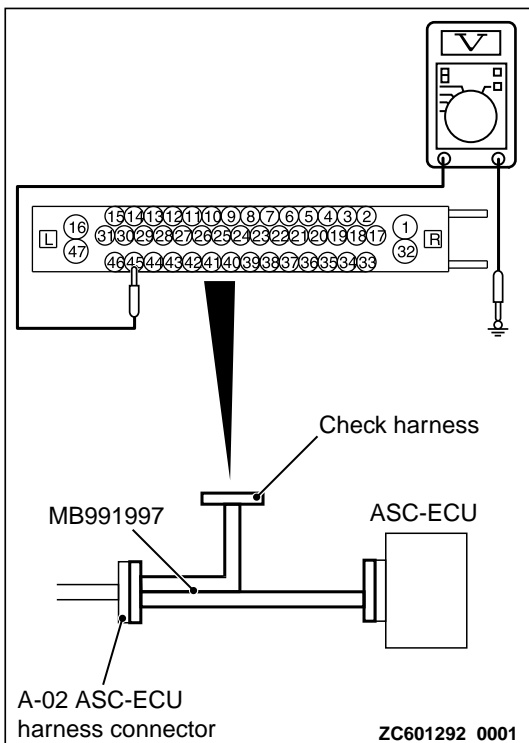
- (1) Disconnect the ASC-ECU connector, connect special tool MB991997 to the ASC-ECU-side connector and harness-side connector, and then measure the voltage at the special tool connector side.
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between the wheel speed sensor circuit power supply terminal (signal terminal) No. 45 and the body ground.

**OK: Approximately battery voltage**

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

**YES:** Go to Step 12.

**NO:** Go to Step 10.



**STEP 10. Connector check: A-02 ASC-ECU connector, A-11 wheel speed sensor <FL> connector**

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

**YES:** Go to Step 11.

**NO:** Repair the defective connector.

**STEP 11. Wiring harness check between A-02 ASC-ECU connector terminal No. 45/46 and A-11 wheel speed sensor <FL> connector terminal No. 1/2**

\*Check for open circuit in wheel speed sensor <FL> circuit.

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

**YES:** Replace the wheel speed sensor.

**NO:** Repair the wiring harness.

**STEP 12. Check whether the diagnostic trouble code is reset.**

- (1) Erase the diagnostic trouble code.
- (2) Drive the vehicle at 12mph (20 km/h) or more.

*NOTE: The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12mph (20 km/h) or higher.*

**Q:Is DTC C1046 set?**

**YES:** Replace the ASC-ECU, and then go to Step 13.

**NO:** The procedure is complete.

**STEP 13. Check whether the diagnostic trouble code is reset.**

- (1) Erase the diagnostic trouble code.
- (2) Drive the vehicle at 12mph (20 km/h) or more.

*NOTE: The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12mph (20 km/h) or higher.*

**Q:Is DTC C1046 set?**

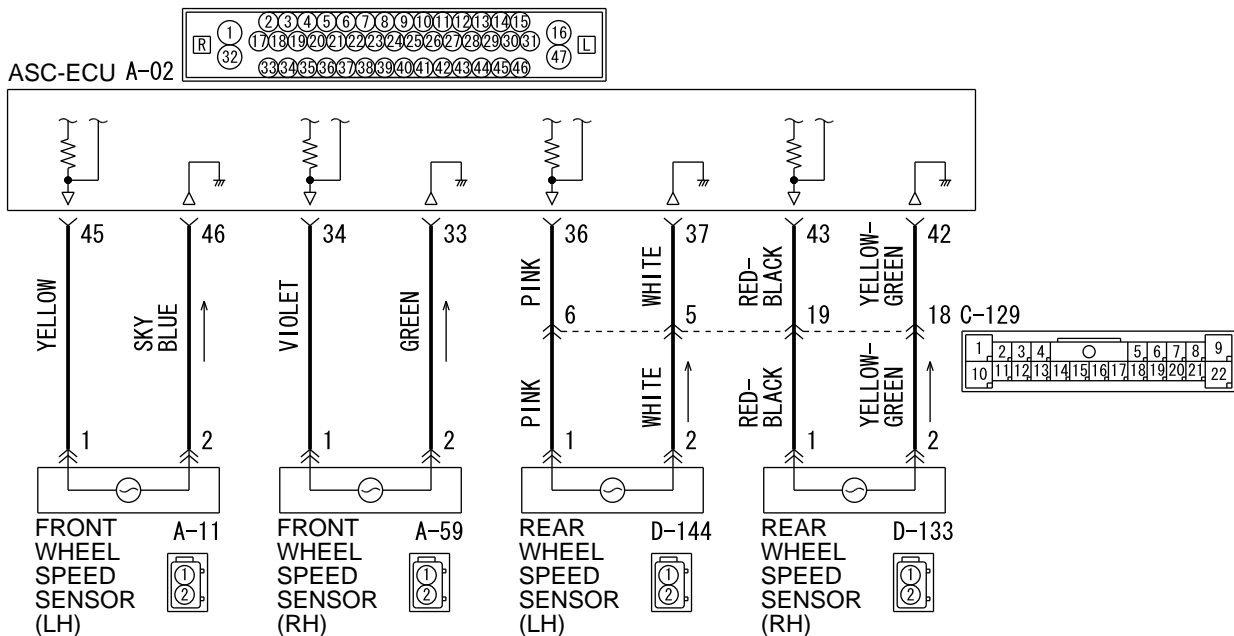
**YES:** Intermittent malfunction. (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15.)

**NO:** The procedure is complete.

**DTC C1047: FR wheel speed sensor control phase time exceeded**

M13506100027USA0000010000

Wheel Speed 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. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

- The wheel speed sensor is a kind of a pulse generator. It consists of encoders (a plate on which north and south pole sides of the magnets are arranged alternately) for detecting the wheel speed which rotates at the same speed of the wheels and wheel speed sensors. This sensor outputs frequency pulse signals in proportion to the wheel speed.
- The pulse signals, which the wheel speed sensor creates, are sent to ASC-ECU. ASC-ECU uses the frequency of the pulse signals to determine the wheel speed.

**DTC SET CONDITIONS**

This diagnostic trouble code is set if any malfunction below is found:

- When the brake fluid pressure is decreased for a long time.
- When the brake fluid pressure is held for a long time.

**PROBABLE CAUSES**

- Damaged wiring harness and connectors
- External noise interference
- Malfunction of wheel speed sensor
- ASC-ECU malfunction
- Excessive gap between the wheel speed sensor and the wheel speed detection encoder
- Adhesion of foreign materials on the wheel speed sensor
- Adhesion of foreign materials on the wheel speed detection encoder
- Wheel bearing malfunction
- Improper installation of the wheel speed sensor
- Deformation of the wheel speed detection encoder
- Disturbance of magnetization pattern for wheel speed detection encoder
- Missing teeth of the wheel speed detection encoder

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

**Q: Is the check result normal?****YES:** Go to Step 3.**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

---

**STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines****Q: Is DTC C1047 set?****YES:** Go to Step 3.**NO:** The procedure is complete.

---

**STEP 3. M.U.T.-III diagnostic trouble code**

Check that the diagnostic trouble codes C1015, C101C, C101F, and C1042 are also set.

**Q: Are DTC C1015, C101C, C101F, and C1042 also set?****YES:** Carry out the diagnosis for the relevant diagnostic trouble codes, and then go to Step 5.**NO:** Go to Step 4.

---

**STEP 4. Check whether the diagnostic trouble code is reset.**

- (1) Erase the diagnostic trouble code.
- (2) Drive the vehicle at 12mph (20 km/h) or more.

*NOTE: The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12mph (20 km/h) or higher.*

**Q: Is DTC C1047 set?****YES:** Replace the ASC-ECU, and then go to Step 5.**NO:** The procedure is complete.

---

**STEP 5. Check whether the diagnostic trouble code is reset.**

- (1) Erase the diagnostic trouble code.
- (2) Drive the vehicle at 12mph (20 km/h) or more.

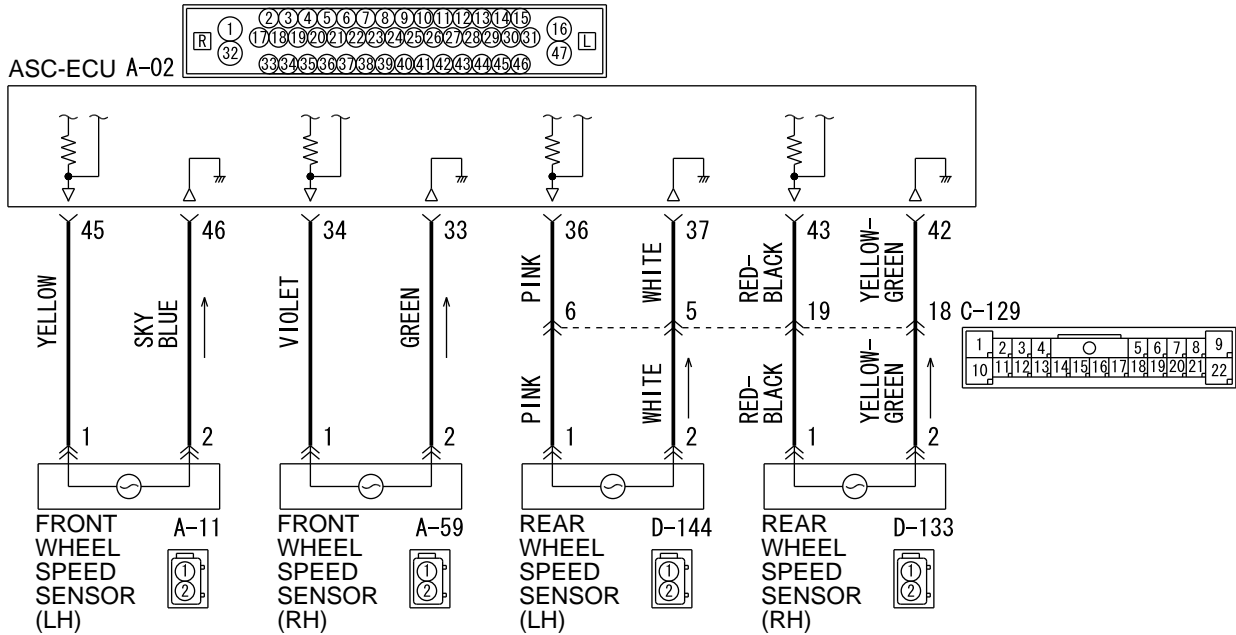
*NOTE: The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12mph (20 km/h) or higher.*

**Q: Is DTC C1047 set?****YES:** Intermittent malfunction. (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15.)**NO:** The procedure is complete.

**DTC C1048: RL wheel speed sensor control phase time exceeded**

M13506100028USA0000010000

**Wheel Speed Sensor Circuit**



D7G35M016A00

**CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

- The wheel speed sensor is a kind of a pulse generator. It consists of encoders (a plate on which north and south pole sides of the magnets are arranged alternately) for detecting the wheel speed which rotates at the same speed of the wheels and wheel speed sensors. This sensor outputs frequency pulse signals in proportion to the wheel speed.
- The pulse signals, which the wheel speed sensor creates, are sent to ASC-ECU. ASC-ECU uses the frequency of the pulse signals to determine the wheel speed.

**DTC SET CONDITIONS**

This diagnostic trouble code is set if any malfunction below is found:

- When the brake fluid pressure is decreased for a long time.
- When the brake fluid pressure is held for a long time.

---

**PROBABLE CAUSES**

- Damaged wiring harness and connectors
- External noise interference
- Malfunction of wheel speed sensor
- ASC-ECU malfunction
- Excessive gap between the wheel speed sensor and the wheel speed detection encoder
- Adhesion of foreign materials on the wheel speed sensor
- Adhesion of foreign materials on the wheel speed detection encoder
- Wheel bearing malfunction
- Improper installation of the wheel speed sensor
- Deformation of the wheel speed detection encoder
- Disturbance of magnetization pattern for wheel speed detection encoder
- Missing teeth of the wheel speed detection encoder

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D – CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

---

**STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines****Q:Is DTC C1048 set?**

**YES:** Go to Step 3.

**NO:** The procedure is complete.

---

**STEP 3. M.U.T.-III diagnostic trouble code**

Check that the diagnostic trouble codes C1020, C1027, C102A, and C1043 are also set.

**Q:Are DTC C1020, C1027, C102A, and C1043 also set?**

**YES:** Carry out the diagnosis for the relevant diagnostic trouble codes, and then go to Step 5.

**NO:** Go to Step 4.

---

**STEP 4. Check whether the diagnostic trouble code is reset.**

(1) Erase the diagnostic trouble code.



(2) Drive the vehicle at 12mph (20 km/h) or more.

*NOTE: The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12mph (20 km/h) or higher.*

**Q: Is DTC C1048 set?**

**YES:** Replace the ASC-ECU, and then go to Step 5.

**NO:** The procedure is complete.

**STEP 5. Check whether the diagnostic trouble code is reset.**

(1) Erase the diagnostic trouble code.

(2) Drive the vehicle at 12mph (20 km/h) or more.

*NOTE: The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12mph (20 km/h) or higher.*

**Q: Is DTC C1048 set?**

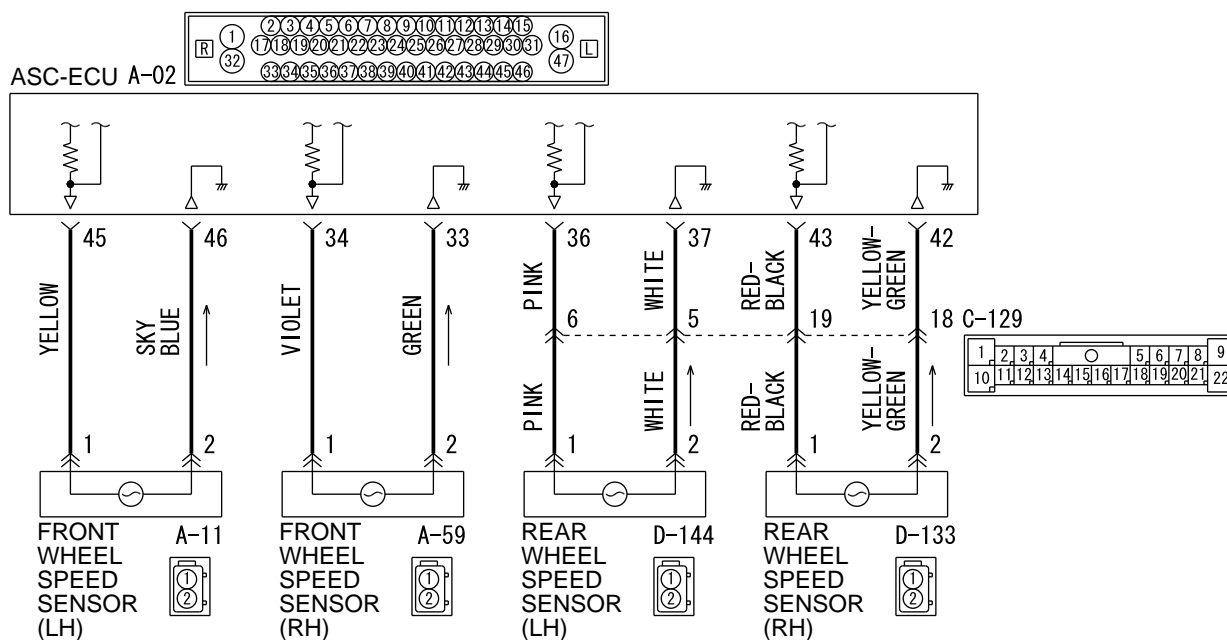
**YES:** Intermittent malfunction. (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P. 00-15.)

**NO:** The procedure is complete.

**DTC C1049: RR wheel speed sensor control phase time exceeded**

M13506100029USA0000010000

Wheel Speed 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. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

- The wheel speed sensor is a kind of a pulse generator. It consists of encoders (a plate on which north and south pole sides of the magnets are arranged alternately) for detecting the wheel speed which rotates at the same speed of the wheels and wheel speed sensors. This sensor outputs frequency pulse signals in proportion to the wheel speed.
- The pulse signals, which the wheel speed sensor creates, are sent to ASC-ECU. ASC-ECU uses the frequency of the pulse signals to determine the wheel speed.

**DTC SET CONDITIONS**

This diagnostic trouble code is set if any malfunction below is found:

- When the brake fluid pressure is decreased for a long time.
- When the brake fluid pressure is held for a long time.

**PROBABLE CAUSES**

- Damaged wiring harness and connectors
- External noise interference
- Malfunction of wheel speed sensor
- ASC-ECU malfunction
- Excessive gap between the wheel speed sensor and the wheel speed detection encoder
- Adhesion of foreign materials on the wheel speed sensor
- Adhesion of foreign materials on the wheel speed detection encoder
- Wheel bearing malfunction
- Improper installation of the wheel speed sensor
- Deformation of the wheel speed detection encoder
- Disturbance of magnetization pattern for wheel speed detection encoder
- Missing teeth of the wheel speed detection encoder

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

---

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

---

**STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines**

**Q: Is DTC C1049 set?**

**YES:** Go to Step 3.

**NO:** The procedure is complete.

---

**STEP 3. M.U.T.-III diagnostic trouble code**

Check that the diagnostic trouble codes C102B, C1032, C1035, and C1044 are also set.

**Q: Are DTC C102B, C1032, C1035, and C1044 also set?**

**YES:** Carry out the diagnosis for the relevant diagnostic trouble codes, and then go to Step 5.

**NO:** Go to Step 4.

---

**STEP 4. Check whether the diagnostic trouble code is reset.**

- (1) Erase the diagnostic trouble code.
- (2) Drive the vehicle at 12mph (20 km/h) or more.

*NOTE: The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12mph (20 km/h) or higher.*

**Q: Is DTC C1049 set?**

**YES:** Replace the ASC-ECU, and then go to Step 5.

**NO:** The procedure is complete.

---

**STEP 5. Check whether the diagnostic trouble code is reset.**

- (1) Erase the diagnostic trouble code.
- (2) Drive the vehicle at 12mph (20 km/h) or more.

*NOTE: The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12mph (20 km/h) or higher.*

**Q: Is DTC C1049 set?**

**YES:** Intermittent malfunction. (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15.)

**NO:** The procedure is complete.

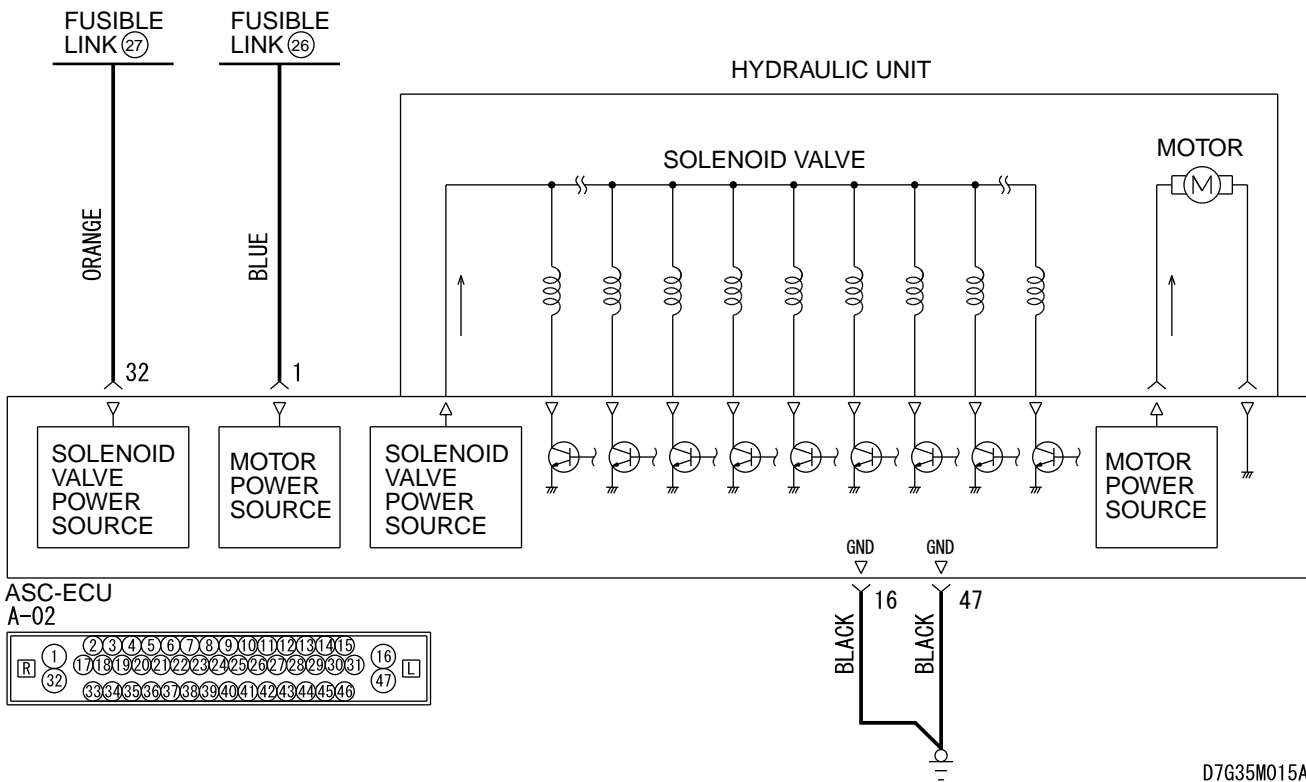
---

**DTC C104B,C104F,C1053,C1057/C105F,C1063,C1067,C105B: Abnormality in inlet/outlet valve (FL,RL,RR,RL)**

**DTC C1200,C1204/C1208,C120C: Abnormality in cut/suction valve(FL/RR,FR/RL)**

M13506100030USA0000010000

Solenoid Valve and Motor Power Supply Circuit



D7G35M015A00

**CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

- ASC-ECU contains the power supply circuit (terminal No. 32) for the solenoid valve. The solenoid valve is energized by the valve relay, which is incorporated in ASC-ECU.
- The valve relay, which is incorporated in ASC-ECU, is always energizing the solenoid valve unless the initial check is in progress when the ignition switch is turned on, or the recurrent system check is in progress.
- 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:

## DIAGNOSIS

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

**PROBABLE CAUSES**

- ASC-ECU malfunction

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D – CAN Bus Diagnostics table P.54D-10.) On completion, go to Step 2.

**STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines**

**Q: Are DTC C104B, C104F, C1053, C1057, C105F, C1063, C1067, C105B, C1200, C1204, C1208 or C120C set?**

**YES:** Go to Step 3.

**NO:** The procedure is complete.

**STEP 3. Check whether the diagnostic trouble code is reset.**

**Q: Are DTC C104B, C104F, C1053, C1057, C105F, C1063, C1067, C105B, C1200, C1204, C1208 or C120C set?**

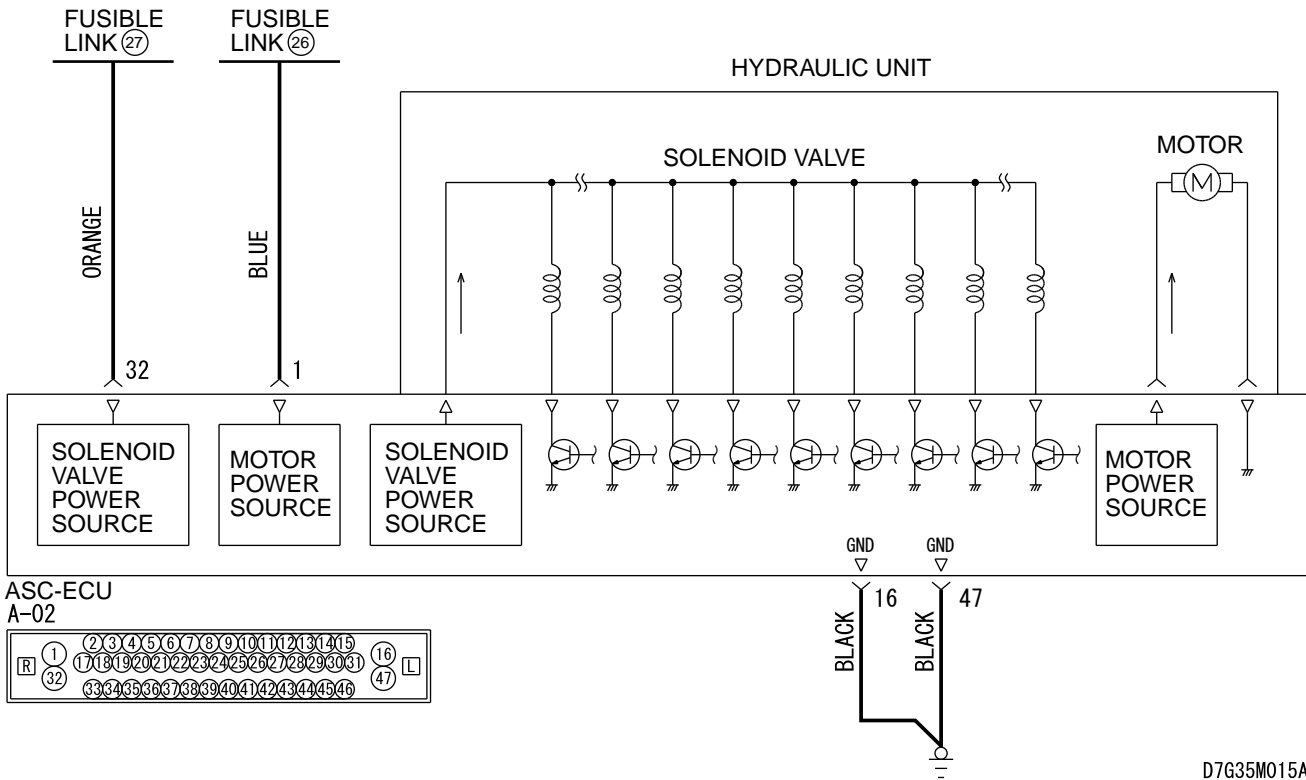
**YES:** Replace the ASC-ECU.

**NO:** Intermittent malfunction. (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-15.)

DTC C2104: Faulty valve power supply circuit

M13506100042USA0000010000

Solenoid Valve and Motor Power Supply Circuit



D7G35M015A00

**CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

- ASC-ECU contains the power supply circuit (terminal No. 32) for the solenoid valve. The solenoid valve is energized by the valve relay, which is incorporated in ASC-ECU.
- The valve relay, which is incorporated in ASC-ECU, is always energizing the solenoid valve unless the initial check is in progress when the ignition switch is turned on, or the recurrent system check is in progress.

**DTC SET CONDITIONS**

This diagnostic trouble codes will be set under the cases below:

- When the solenoid valve supply voltage is not within the standard value.

---

## PROBABLE CAUSES

### Current trouble

- Fusible link malfunction
- Damaged wiring harness and connectors
- Abnormality in battery or generator
- ASC-ECU malfunction

### Past trouble

- Carry out diagnosis with particular emphasis on wiring harness and connector failures between the power supply circuit (terminal No. 32) to ASC-ECU solenoid valve or ground circuit (terminal No. 16). For diagnosis procedures, refer to How to treat past trouble (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15).

## 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. M.U.T.-III CAN bus diagnostics

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

---

### STEP 2. Diagnostic Trouble code recheck after resetting CAN bus lines

#### Q:Is DTC C2104 set?

**YES:** Go to Step 3.

**NO:** The procedure is complete.

---

### STEP 3. Fusible link check: Check the fusible link No. 27.

Visually check for open circuit in the fusible link No. 27.

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

**YES:** Go to Step 4.

**NO:** Replace the fusible link No. 27.

---

### STEP 4. Battery check

Refer to GROUP 54Aa - Battery Test P.54Aa-3.

#### Q:Is the battery in good condition?

**YES:** Go to Step 5.

**NO:** Charge or replace the battery.

---

### STEP 5. Charging system check

Refer to GROUP 16a - Output Current Test P.16a-8.

**Q: Is the charging system in good condition?**

**YES:** Go to Step 6.

**NO:** Repair or replace the charging system component(s).

**STEP 6. Voltage measurement at the A-02 ASC-ECU connector**

- (1) Disconnect the connector, connect special tool MB991997 to the harness-side connector, and measure the voltage at the special tool connector side.

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

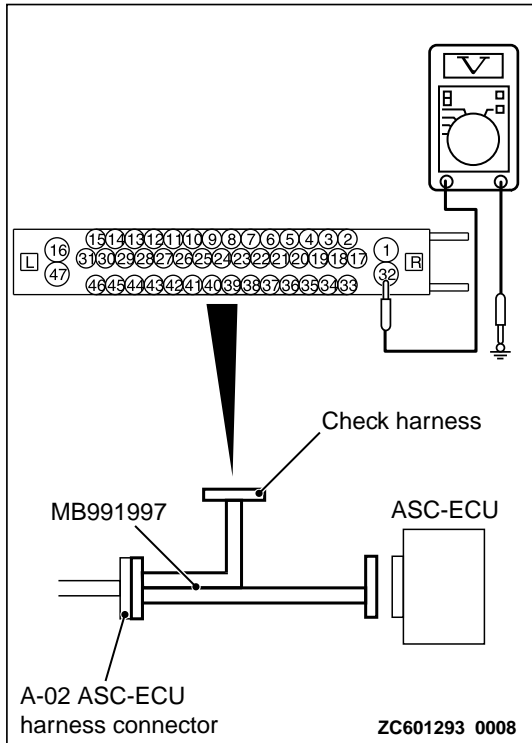
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between the terminal No. 32 and the body ground.

**OK: 12 volts (Battery voltage)**

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

**YES:** Go to Step 8.

**NO:** Go to Step 7.



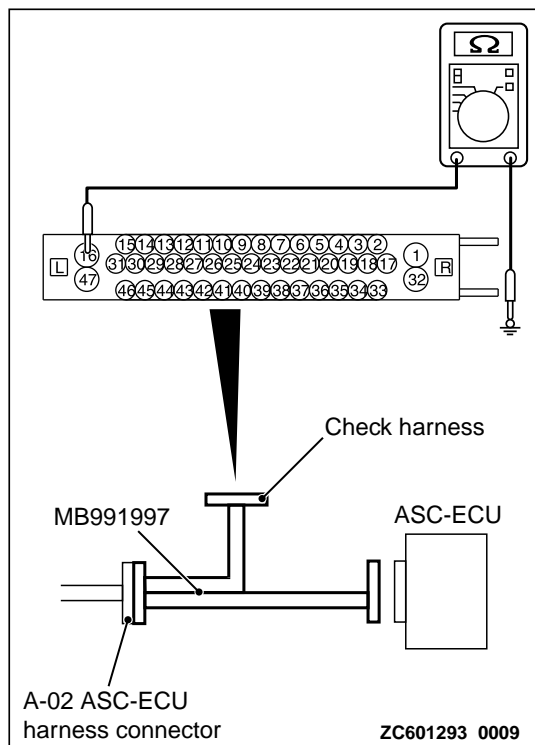
**STEP 7. Connector check: A-02 ASC-ECU connector**

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

**YES:** The open or short circuit may be present in the power supply circuit. Repair the wiring harness between the A-02 ASC-ECU connector terminal No. 32 and the fusible link No. 27.

**NO:** Repair the defective connector.





### STEP 8. Resistance measurement at A-02 ASC-ECU connector

- (1) Disconnect the connector, connect special tool MB991997 to the harness-side connector, and measure the voltage at the special tool connector side.

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

- (2) Resistance between the terminal No. 16 and the body ground

**OK: Continuity exists (2 ohms or less)**

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

**YES:** Go to Step 10.

**NO:** Go to Step 9.

### STEP 9. Connector check: A-02 ASC-ECU connector

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

**YES:** An open circuit may be present in the ground circuit. Repair the wiring harness between the A-02 ASC-ECU connector terminal No. 16 and the body ground.

**NO:** Repair the defective connector.

### STEP 10. Check whether the diagnostic Trouble code is reset.

#### Q:Is DTC C2104 set?

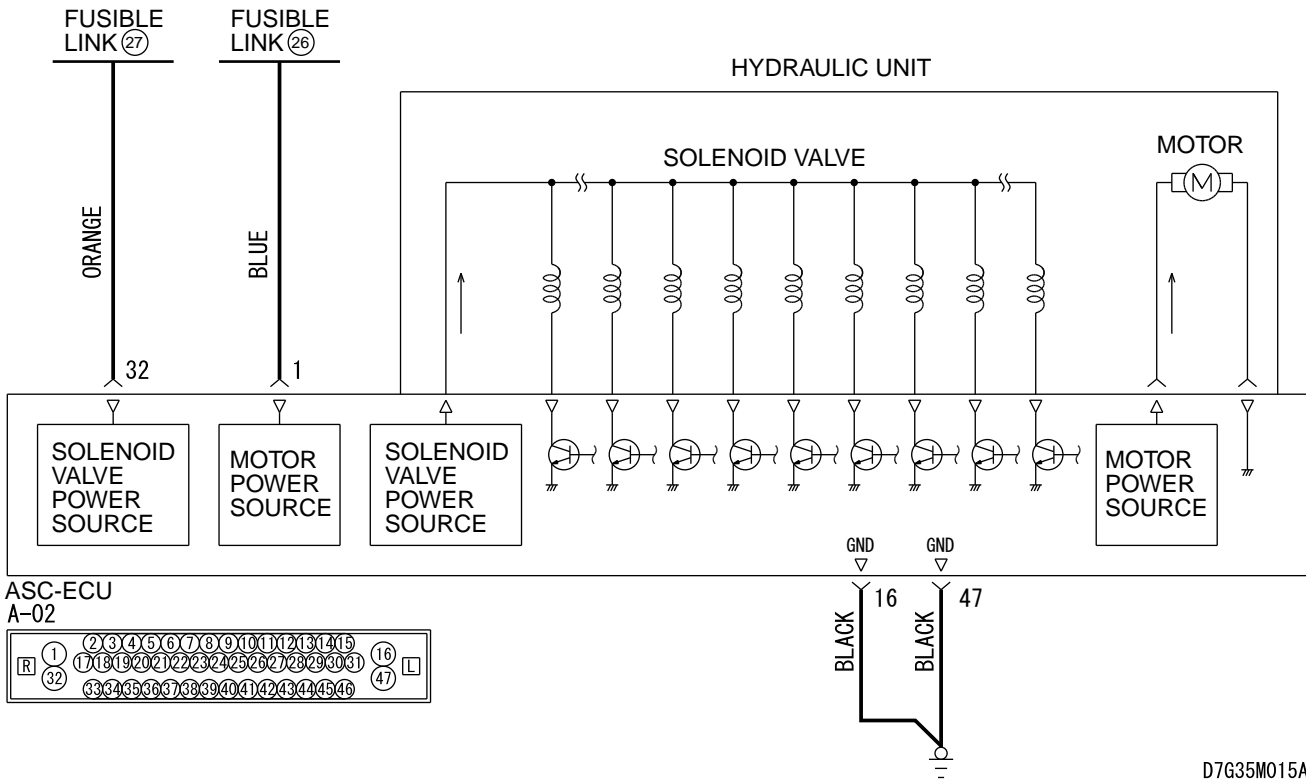
**YES:** Replace the ASC-ECU.

**NO:** Intermittent malfunction. (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15.)

DTC C1073: Faulty motor drive circuit

M13506100043USA0000010000

Solenoid Valve and Motor Power Supply Circuit



D7G35M015A00

**CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

- ASC-ECU contains the power supply circuit (terminal No. 1) for the pump motor. The pump motor is energized by the motor switch, which is incorporated in ASC-ECU.
- The pump motor switch, which is incorporated in ASC-ECU, is always off unless the motor and solenoid valve check is activated when the vehicle is started.
- ASC-ECU activates the pump motor by turning on the ECU built-in pump motor switch.

**DTC SET CONDITIONS**

If the pump motor switch voltage drop indicates high value when the pump motor operates or after the operation, the pump motor operation is stopped and this diagnostic trouble code is set.

---

## PROBABLE CAUSES

### Current trouble

- Fusible link malfunction
- Damaged wiring harness and connectors
- Abnormality in battery or generator
- ASC-ECU malfunction

### Past trouble

- Carry out diagnosis with particular emphasis on wiring harness and connector failures between the power supply circuit (A-02 ASC-ECU connector terminal No. 1) to the ASC-ECU motor and the ground circuit (A-02 ASC-ECU connector terminal No. 47). For diagnosis procedures, refer to How to treat past trouble (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15).

## 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. M.U.T.-III CAN bus diagnostics

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

---

### STEP 2. Check whether the diagnostic trouble code is reset.

#### Q:Is DTC C1073 set?

**YES:** Go to Step 3.

**NO:** The procedure is complete.

---

### STEP 3. Fusible link check: Check the fusible link No. 26.

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

**YES:** Go to Step 4.

**NO:** Replace the fusible link No. 26.

---

### STEP 4. Battery check

Refer to GROUP 54Aa - Battery Test P.54Aa-3.

#### Q:Is the battery in good condition?

**YES:** Go to Step 5.

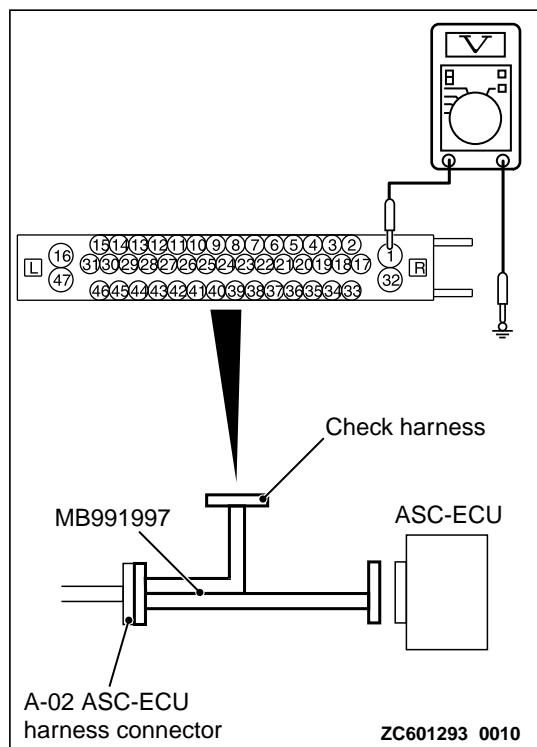
**NO:** Charge or replace the battery.

---

### STEP 5. Charging system check

Refer to GROUP 16a - Output Current Test P.16a-8.

#### Q:Is the charging system in good condition?



**YES:** Go to Step 6.

**NO:** Repair or replace the charging system component(s).

### STEP 6. Voltage measurement at the A-02 ASC-ECU connector

- (1) Disconnect the connector, connect special tool MB991997 to the harness-side connector, and measure the voltage at the special tool connector side.

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

- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between the terminal No. 1 and the body ground.

**OK: 12 volts (Battery voltage)**

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

**YES:** Go to Step 8.

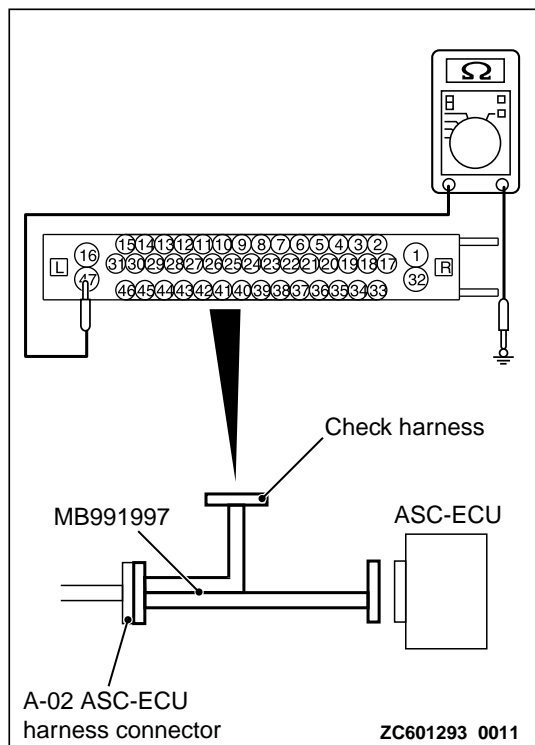
**NO:** Go to Step 7.

### STEP 7. Connector check: A-02 ASC-ECU connector

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

**YES:** The open or short circuit may be present in the solenoid valve power supply circuit. Repair the wiring harness between the A-02 ASC-ECU connector terminal No. 1 and the fusible link No. 26.

**NO:** Repair the defective connector.



### STEP 8. Resistance measurement at A-02 ASC-ECU connector

- (1) Disconnect the connector, connect special tool MB991997 to the harness-side connector, and measure the voltage at the special tool connector side.

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

- (2) Resistance between terminal No. 47 and body ground  
**OK: Continuity exists (2 ohms or less)**

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

**YES:** Go to Step 10.

**NO:** Go to Step 9.

### STEP 9. Connector check: A-02 ASC-ECU connector

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

**YES:** An open circuit may be present in the ground circuit. Repair the wiring harness between the A-02 ASC-ECU terminal No. 47 and the body ground.

**NO:** Repair the defective connector.

### STEP 10. Check whether the diagnostic trouble code is reset.

- (1) Erase the diagnostic trouble code.
- (2) Drive the vehicle at 12mph (20 km/h) or more.

*NOTE:* The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12mph (20 km/h) or higher.

#### Q:Is DTC C1073 set?

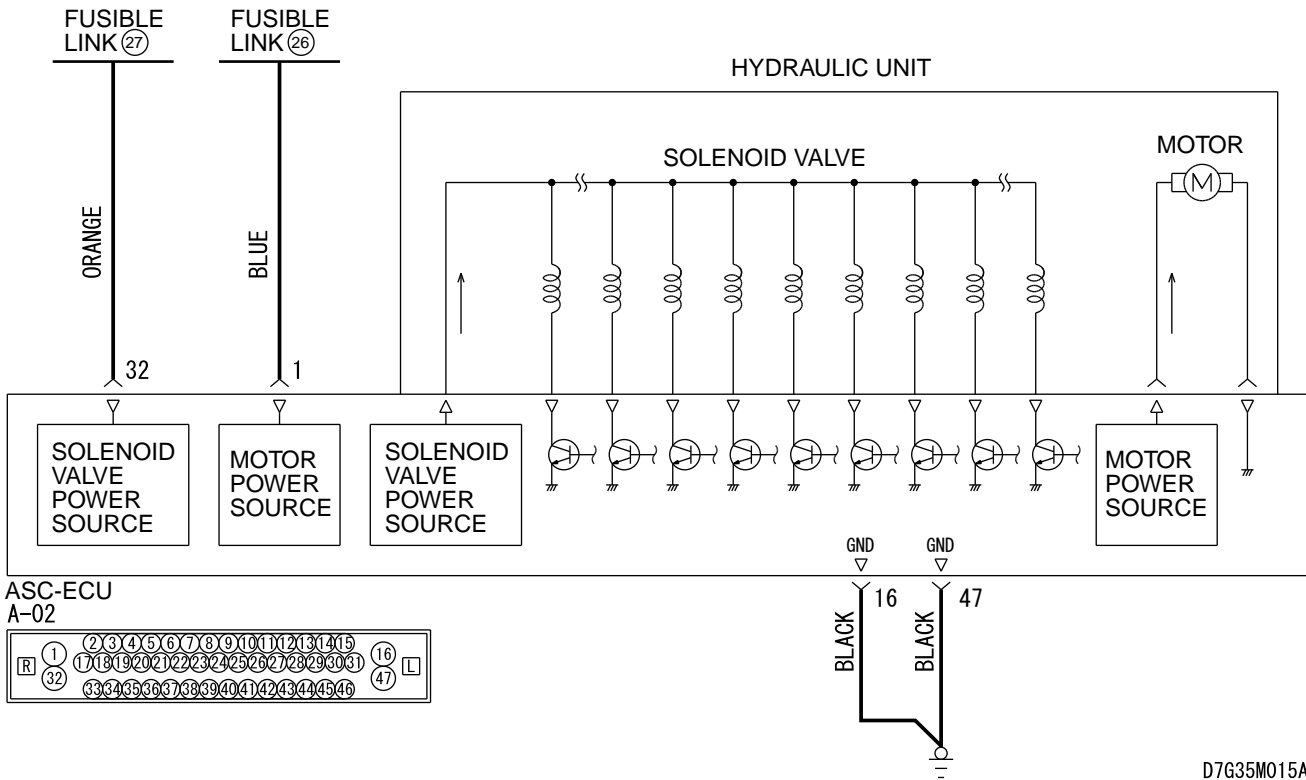
**YES:** Replace the ASC-ECU.

**NO:** Intermittent malfunction. (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15.)

**DTC C2116: Abnormality in power supply voltage in pump motor**

M13506100044USA0000010001

Solenoid Valve and Motor Power Supply Circuit



D7G35M015A00

**CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

- ASC-ECU contains the power supply circuit (terminal No. 1) for the pump motor. The pump motor is energized by the motor switch, which is incorporated in ASC-ECU.
- The pump motor switch, which is incorporated in ASC-ECU, is always off unless the motor and solenoid valve check is activated when the vehicle is started.
- ASC-ECU activates the pump motor by turning on the ECU built-in pump motor switch.

**DTC SET CONDITIONS**

This diagnostic trouble codes will be set under the cases below:

- When the power supply voltage of the pump motor, which is not in operation, is abnormally low for a prolonged period

- 
- When the power supply voltage of the pump motor, which is not in operation, is abnormally high for a prolonged period

### PROBABLE CAUSES

#### Current trouble

- Fusible link malfunction
- Damaged wiring harness and connectors
- Abnormality in battery or generator
- ASC-ECU malfunction

#### Past trouble

- Carry out diagnosis with particular emphasis on wiring harness and connector failures between the power supply circuit (A-02 ASC-ECU connector terminal No. 1) to the ASC-ECU motor and the ground circuit (A-02 ASC-ECU connector terminal No. 47). For diagnosis procedures, refer to How to treat past trouble (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15).

### 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. M.U.T.-III CAN bus diagnostics

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

---

#### STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines

#### Q:Is DTC C2116 set?

**YES:** Go to Step 3.

**NO:** The procedure is complete.

---

#### STEP 3. Fusible link check: Check the fusible link No. 26.

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

**YES:** Go to Step 4.

**NO:** Replace the fusible link No. 26.

---

#### STEP 4. Battery check

Refer to GROUP 54Aa - Battery Test P.54Aa-3.

#### Q:Is the battery in good condition?

**YES:** Go to Step 5.

**NO:** Charge or replace the battery.

### STEP 5. Charging system check

Refer to GROUP 16a - Output Current Test P.16a-8.

**Q: Is the charging system in good condition?**

**YES:** Go to Step 6.

**NO:** Repair or replace the charging system component(s).

### STEP 6. Voltage measurement at the A-02 ASC-ECU connector

(1) Disconnect the connector, connect special tool MB991997 to the harness-side connector, and measure the voltage at the special tool connector side.

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

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

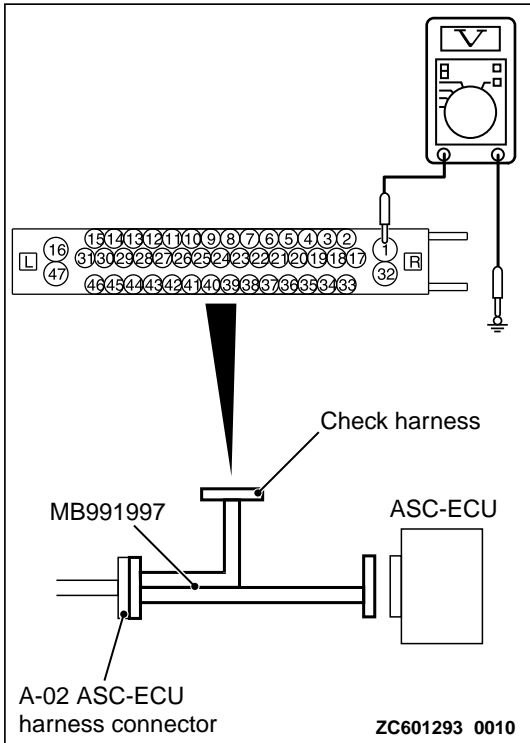
(3) Measure the voltage between the terminal No. 1 and the body ground.

**OK: 12 volts (Battery voltage)**

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

**YES:** Go to Step 8.

**NO:** Go to Step 7.



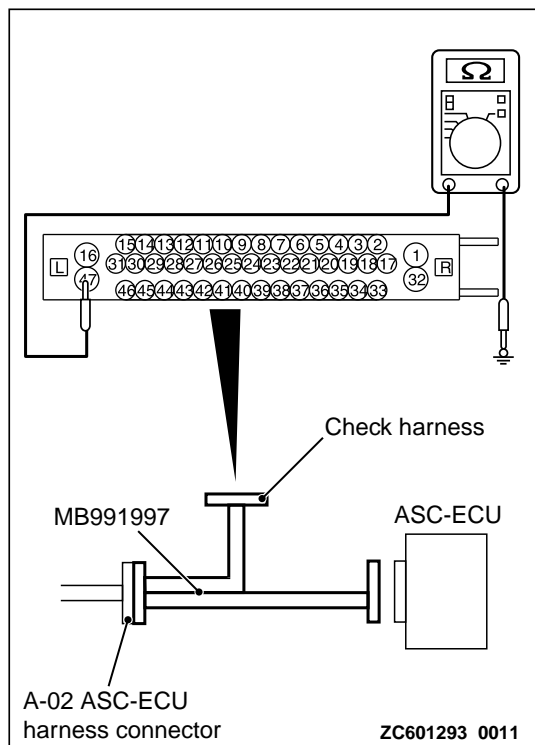
### STEP 7. Connector check: A-02 ASC-ECU connector

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

**YES:** The open or short circuit may be present in the solenoid valve power supply circuit. Repair the wiring harness between the A-02 ASC-ECU connector terminal No. 1 and the fusible link No. 26.

**NO:** Repair the defective connector.





### STEP 8. Resistance measurement at A-02 ASC-ECU connector

- (1) Disconnect the connector, connect special tool MB991997 to the harness-side connector, and measure the voltage at the special tool connector side.

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

- (2) Resistance between terminal No. 47 and body ground  
**OK: Continuity exists (2 ohms or less)**

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

**YES:** Go to Step 10.

**NO:** Go to Step 9.

### STEP 9. Connector check: A-02 ASC-ECU connector

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

**YES:** An open circuit may be present in the ground circuit. Repair the wiring harness between the A-02 ASC-ECU terminal No. 47 and the body ground.

**NO:** Repair the defective connector.

### STEP 10. Check whether the diagnostic trouble code is reset.

- (1) Erase the diagnostic trouble code.
- (2) Drive the vehicle at 12mph (20 km/h) or more.

*NOTE:* The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12mph (20 km/h) or higher.

#### Q:Is DTC C2116 set?

**YES:** Replace the ASC-ECU.

**NO:** Intermittent malfunction. (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15.)

---

**DTC C121D: Abnormality in brake fluid pressure sensor circuit**

---

M13506100045USA0000010000

**⚠ CAUTION**

- If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).
- Whenever ECU is replaced, ensure that the CAN bus lines are normal.

**CIRCUIT OPERATION**

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

**DTC SET CONDITIONS**

When the pressure sensor output signal is not within the standard value range, ASC-ECU outputs this diagnostic trouble code.

**PROBABLE CAUSES**

- Incorrect adjustment of brake pedal height
- Master cylinder malfunction
- Brake booster malfunction
- ASC-ECU malfunction

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 2.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

---

**STEP 2. Brake pedal check**

Refer to GROUP 35A - On-vehicle Service P.35A-14.

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

**YES:** Go to Step 3.

**NO:** Adjust the brake pedal, and then go to Step 3.

**STEP 3. Brake booster check**

Refer to GROUP 35A - On-vehicle Service P.35A-16.

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

**YES:** Go to Step 4.

**NO:** Replace the brake booster.

**STEP 4. Check whether the diagnostic trouble code is reset.**

**Q: Is DTC C121D set?**

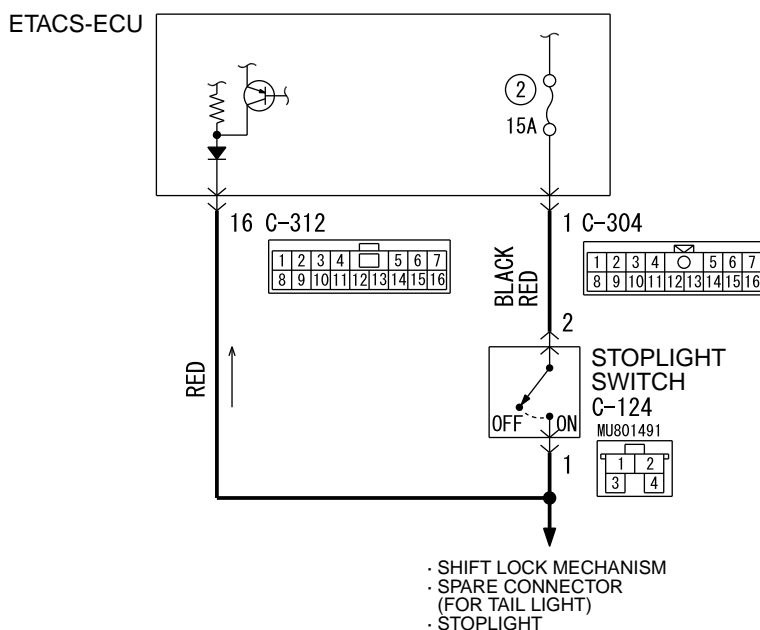
**YES:** Replace the ASC-ECU.

**NO:** The procedure is complete.

**DTC C121E: Abnormality in brake fluid pressure sensor output signal**

M13506100046USA0000010000

Stoplight Switch Circuit



D7G35M014A00

**CAUTION**

- If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).
- Whenever ECU is replaced, ensure that the CAN bus lines are normal.

**CIRCUIT OPERATION**

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

**DTC SET CONDITIONS**

This diagnostic trouble codes will be set under the cases below:

- When the pressure sensor offset is not within the standard value range
- When the estimated pressure sensor temperature is not normal

**PROBABLE CAUSES**

- Incorrect adjustment of brake pedal height
- Master cylinder malfunction
- Brake booster malfunction
- Incorrect installation position of stop light switch
- Malfunction of the stop light switch
- Brake drag
- Malfunction of the ASC-ECU
- Malfunction of the stop light

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

---

**STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines****Q:Is DTC C121E set?**

**YES:** Go to Step 3.

**NO:** The procedure is complete.

---

**STEP 3. Check whether the diagnostic trouble code is set.**

Refer to GROUP 54Ac - Diagnosis Function <Rear combination light> P.54Ac-99.

**Q:Is any DTC set?**

**YES:** Repair or replace the rear combination light or rear combination light circuit.

**NO:** Go to Step 4.

#### STEP 4. Stop light check

Check if the stop light illuminates or goes out normally when the brake pedal is operated.

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

**YES:** Go to Step 9.

**NO:** Go to Step 5.

#### STEP 5. Brake pedal check

Refer to GROUP 35A - On-vehicle Service P.35A-14.

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

**YES:** Go to Step 6.

**NO:** Adjust the brake pedal, and then go to Step 7.

#### STEP 6. Check for stop light switch installation

Refer to GROUP 35A - On-vehicle Service P.35A-24.

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

**YES:** Go to Step 7.

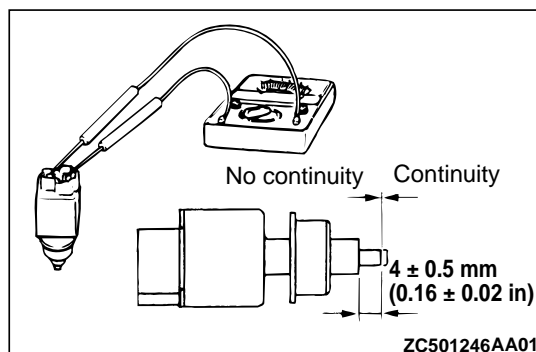
**NO:** Install the stop light switch correctly, and then go to Step 8.

#### STEP 7. Stop light switch continuity check

\*Remove the stop light switch. (Refer to GROUP 35A -Brake Pedal P.35A-22.)

\*Connect the circuit tester ( $\Omega$  range) to the stop light switch connector terminals No. 1 and 2.

\*When no continuity is detected with the plunger pressed from the edge of the outer case by the dimension shown in the figure and when continuity is detected with the plunger released, the stop light switch is in good condition.



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

**YES:** Go to Step 8.

**NO:** Replace the stop light switch, and then go to Step 10.

#### STEP 8. Brake drag check

Check the brake system for drag.

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

**YES:** Go to Step 9.

**NO:** Repair the brake drag.

#### STEP 9. Brake booster check

Refer to GROUP 35A - On-vehicle Service P.35A-16.

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

**YES:** Go to Step 10.

**NO:** Replace the brake booster.

**STEP 10. Check whether the diagnostic trouble code is reset.**

**Q: Is DTC C121E set?**

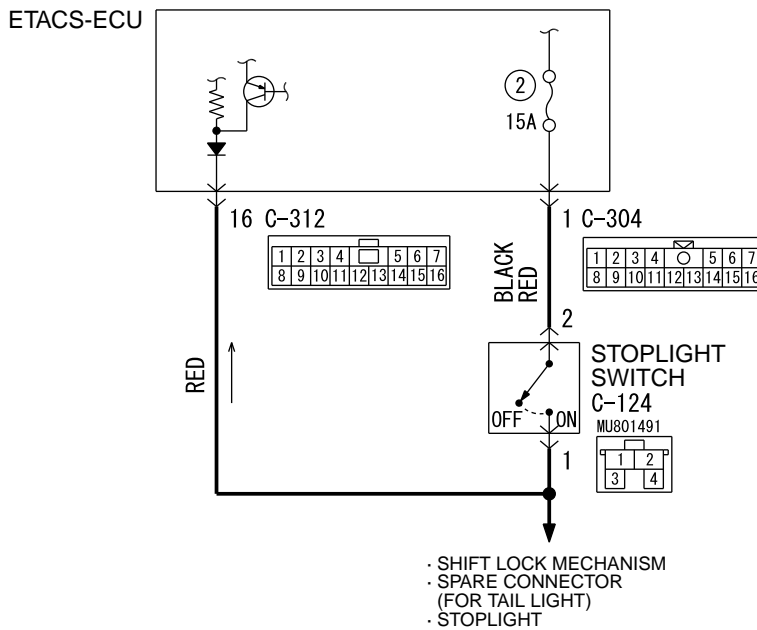
**YES:** Replace the ASC-ECU.

**NO:** The procedure is complete.

**DTC C1000: Abnormality in stop light switch circuit**

M13506100047USA0000010000

**Stoplight Switch Circuit**



D7G35M014A00

**CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

ETACS-ECU sends the ON signal generated when the brake pedal is depressed and OFF signal generated when it is released to ASC-ECU via the CAN bus lines.

**DTC SET CONDITIONS**

This diagnostic trouble code is set in the following case.

- When the vehicle has run for a long time with the stop light switch turned ON.
- When there is difference between the stop light state and the vehicle's behavior

**PROBABLE CAUSES**

- Improper adjustment of stop light switch installation position

## DIAGNOSIS

- Malfunction of the stop light switch
- Damaged wiring harness and connectors
- Malfunction of ETACS-ECU
- Malfunction of the ASC-ECU
- Malfunction of the stop light

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

**STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines****Q: Is DTC C1000 set?**

**YES:** Go to Step 3.

**NO:** The procedure is complete.

**STEP 3. Stop light operation check**

(1) Turn the ignition switch to the ON position.

(2) Check the stop light operation when the brake pedal is depressed. Check that the stop light illuminates when the brake pedal is depressed and that it goes out when the brake pedal is released.

**OK:**

**When the brake pedal is released: OFF**

**When the brake pedal is depressed: ON**

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

**YES:** Go to Step 10.

**NO:** Go to Step 4.

**STEP 4. Check for stop light switch installation**

Refer to GROUP 35A - On-vehicle Service P.35A-24.

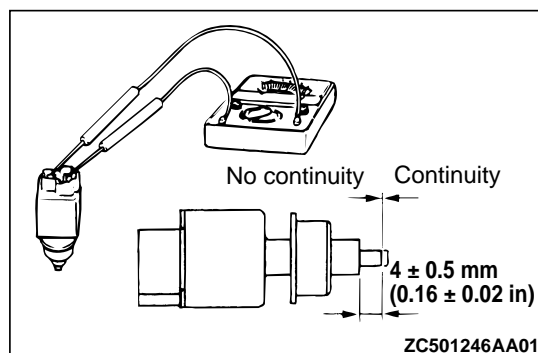
**Q: Is the check result normal?**

**YES:** Go to Step 5.

**NO:** Install the stop light switch correctly.

**STEP 5. Stop light switch continuity check**

(1) Remove the stop light switch. (Refer to GROUP 35A - Brake Pedal P.35A-22.)



(2) Connect the circuit tester ( $\Omega$  range) to the stop light switch connector terminals No. 1 and 2.

(3) When no continuity is detected with the plunger pressed from the edge of the outer case by the dimension shown in the figure and when continuity is detected with the plunger released, the stop light switch is in good condition.

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

**YES:** Go to Step 6.

**NO:** Replace the stop light switch.

**STEP 6. Check whether the diagnostic trouble code is set.**

Refer to GROUP 54Ac - Diagnosis Function <Rear combination light> P.54Ac-99.

**Q: Is any DTC set?**

**YES:** Repair or replace the rear combination light or rear combination light circuit.

**NO:** Go to Step 7.

**STEP 7. Voltage measurement at C-304 ETACS-ECU connector**

(1) Turn the ignition switch to the ON position.

(2) Measure the voltage between the terminal No. 1 and the body ground.

**OK: 12 volts (Battery voltage)**

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

**YES:** Go to Step 9.

**NO:** Go to Step 8.

**STEP 8. Connector check: C-304 ETACS-ECU connector, C-124 stop light switch connector**

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

**YES:** The short circuit between the C-304 ETACS-ECU connector terminal No. 1 and the C-124 stop light switch connector terminal No. 2 may be present. Repair the wiring harness between the C-304 ETACS-ECU connector terminal No. 1 and the C-124 stop light switch connector terminal No. 2.

**NO:** Repair the defective connector.

**STEP 9. ETACS-ECU fuse No.2 check**

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

**YES:** Replace the ETACS-ECU, and then go to Step 12.

**NO:** Go to Step 10.

**STEP 10. Voltage measurement at C-312 ETACS-ECU connector**

(1) Turn the ignition switch to the ON position.

(2) Measure the voltage between the terminal No. 16 and the body ground.

**OK: Approx. 5 volts**

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



**YES:** Go to Step 11.

**NO:** Replace the ETACS-ECU, and then go to Step 12.

**STEP 11. Connector check: C-312 ETACS-ECU connector, C-124 stop light switch connector**

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

**YES:** The short circuit between the C-312 ETACS-ECU connector terminal No. 16 and the C-124 stop light switch connector terminal No. 1 may be present. Repair the wiring harness between the C-312 ETACS-ECU connector terminal No. 16 and the C-124 stop light switch connector terminal No. 1.

**NO:** Repair the defective connector.

**STEP 12. Check whether the diagnostic trouble code is reset.**

**Q: Is DTC 1000 set?**

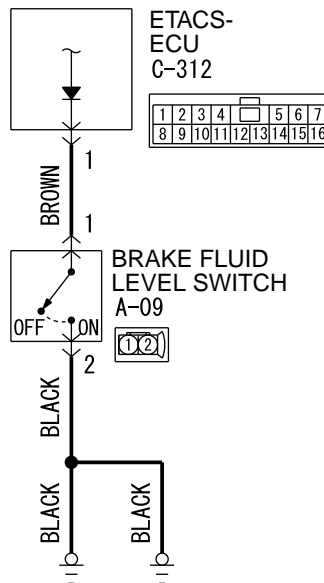
**YES:** Replace the ASC-ECU.

**NO:** The procedure is complete.

**DTC C1009: Low brake fluid level**

M13506100048USA0000010000

Brake Fluid Level Switch Circuit



D7G35M010A00

**CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

ASC-ECU receives the low level signal of the brake fluid level switch in ETACS-ECU via the CAN bus lines. When the brake fluid level is lower than the specified.

**DTC SET CONDITIONS**

This diagnostic trouble code is set when the brake fluid level is lower than the specified.

**PROBABLE CAUSES**

- Low brake fluid level
- Brake fluid level switch malfunction
- Brake pad wear
- Damaged wiring harness and connectors
- Malfunction of ETACS-ECU
- ASC-ECU malfunction

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

---

**STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines****Q:Is DTC C1009 set?**

**YES:** Go to Step 3.

**NO:** The procedure is complete.

---

**STEP 3. Brake fluid level check**

Check that the brake fluid level is higher than the lower limit.

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

**YES:** Go to Step 4.

**NO:** Add brake fluid as necessary.

---

**STEP 4. Brake pad check**

Check that the brake pad is thicker than the limit. (Refer to GROUP 35A - On-vehicle Service P.35A-20.)

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

**YES:** Go to Step 5.

---

**NO:** Replace the brake pad. (Refer to GROUP 35A - On-vehicle Service P. 35A-20.)

---

**STEP 5. Voltage measurement at C-312 ETACS-ECU connector**

- (1) Turn the ignition switch to the ON position.
- (2) Measure the voltage between the terminal No. 1 and the body ground.

**OK: 12 volts (Battery voltage)**

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

**YES:** Go to Step 7.

**NO:** Go to Step 6.

---

**STEP 6. Connector check: C-312 ETACS-ECU connector, A-09 brake fluid level switch connector**

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

**YES:** The short circuit between the C-312 ETACS-ECU connector terminal No. 1 and the A-09 brake fluid level switch connector terminal No. 1 may be present. Repair the wiring harness between the C-312 ETACS-ECU connector terminal No. 1 and the A-09 brake fluid level switch connector terminal No. 1.

**NO:** Repair the defective connector.

---

**STEP 7. Brake fluid level switch check**

Refer to GROUP 35A - On-vehicle Service P.35A-19.

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

**YES:** Go to Step 8.

**NO:** Replace the brake fluid level switch.

---

**STEP 8. Check whether the diagnostic trouble code is reset.**

**Q: Is DTC 1009 set?**

**YES:** Replace the ASC-ECU.

**NO:** The procedure is complete.

---

**DTC C123B: Prolonged operation of ASC**

M13506100049USA0000010000

**⚠ CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

ASC-ECU controls ASC by calculating the data sent from the wheel speed sensor, the steering wheel sensor, and the G and yaw rate sensor.

**DTC SET CONDITIONS**

This diagnostic trouble code is set when ASC operates for a prolonged period.

*NOTE: When the vehicle runs on a slippery or rough road, or when the vehicle makes the steady turn, this diagnostic trouble code may be set.*

**PROBABLE CAUSES**

- Malfunction of wheel speed sensor
- Steering wheel sensor malfunction
- G and yaw rate sensor malfunction
- Improper installation of wheel speed sensor, steering wheel sensor, or G and yaw rate sensor
- ASC-ECU malfunction

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D – CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

**STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines****Q:Is DTC C123B set?**

**YES:** Go to Step 3.

**NO:** The procedure is complete.

**STEP 3. M.U.T.-III diagnostic trouble code**

Check that DTCs C100A, C1015, C1020, C102B, C1011, C101C, C1027, C1032, C1014, C101F, C102A, C1035, C1041, C1042, C1043, C1044, C1219, C2205, C123C, and C2204 are also set.

**Q:Are DTCs C100A, C1015, C1020, C102B, C1011, C101C, C1027, C1032, C1014, C101F, C102A, C1035, C1041, C1042, C1043, C1044, C1219, C2205, C123C, and C2204 also set?**

**YES:** Carry out the diagnosis for the relevant diagnostic trouble codes, and then go to Step 4.

**NO:** Go to Step 4.

---

**STEP 4. Check whether the diagnostic trouble code is reset.**

**Q: Is DTC C123B set?**

**YES:** Replace the ASC-ECU.

**NO:** Intermittent malfunction. (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15.)

---

**DTC C2200: Abnormality in ASC-ECU**

---

M13506100050USA0000010000

**⚠ CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

- The ASC-ECU always monitors itself while the system is in operation. If the ASC-ECU detects any faults it will set this DTC
- ASC-ECU controls ASC by calculating the data sent from the wheel speed sensor, the steering wheel sensor, and the G and yaw rate sensor.

**DTC SET CONDITIONS**

This diagnostic trouble code is set when ASC-ECU has malfunction.

**PROBABLE CAUSES**

ASC-ECU malfunction

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 2.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

---

**STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines**

**Q: Is DTC C2200 set?**

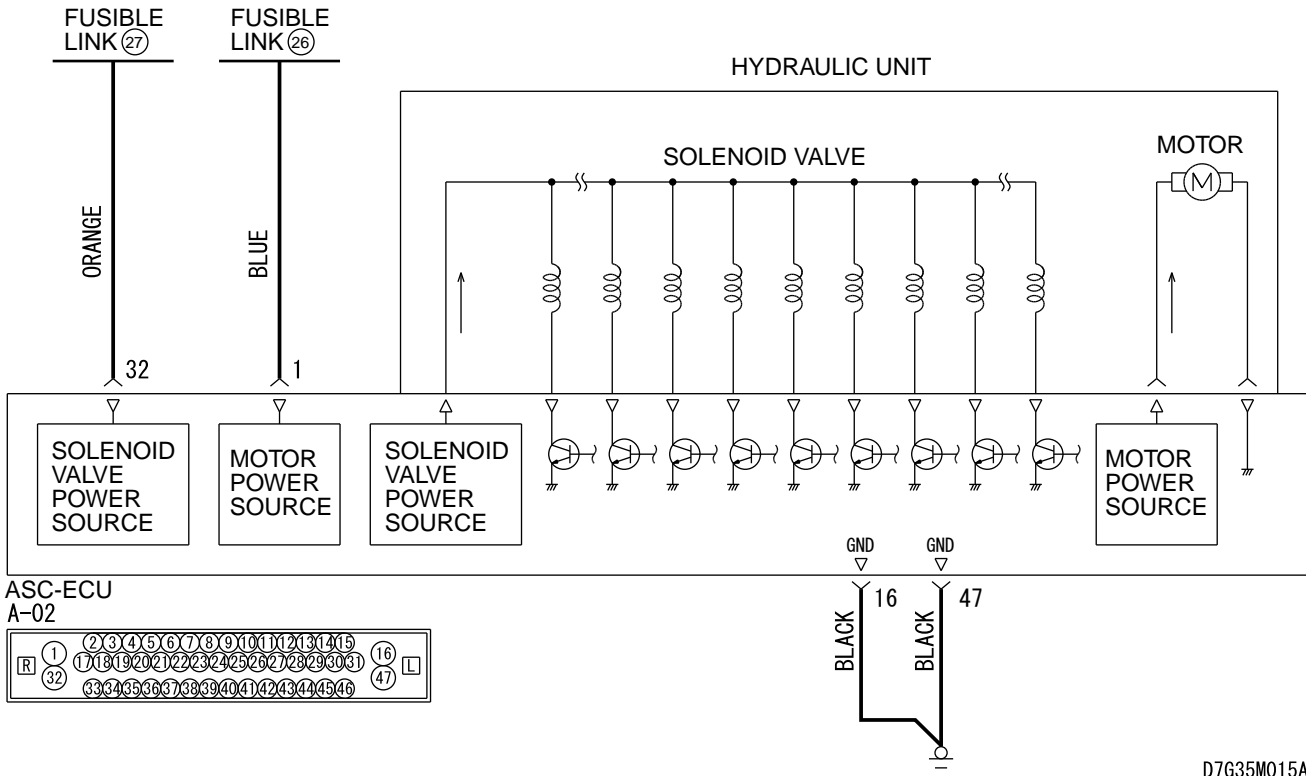
**YES:** Replace the ASC-ECU.

**NO:** Intermittent malfunction. (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15.)

**DTC C2100: Abnormality in battery voltage (low voltage)**

M13506100051USA0000010000

Solenoid Valve and Motor Power Supply Circuit



D7G35M015A00

**CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

- The ASC-ECU is energized by the valve power supply circuit (terminal No. 26).
- When the power is supplied from the ignition switch (IG1) to the IG1 relay in ETACS-ECU, IG1 relay is turned on. At this time, the valve power supply circuit (terminal No. 26) energizes the ASC-ECU.

**DTC SET CONDITIONS**

This diagnostic trouble code is set in the following case.

## DIAGNOSIS

- When the ASC-ECU power supply voltage drops below 9.7 ± 0.3 volts during driving
- When the ASC-ECU power supply voltage drops below 8.0 ± 0.5 volts during driving

**PROBABLE CAUSES**

- Battery failure
- Battery terminal looseness
- Charging system failed
- Damaged wiring harness and connectors
- ASC-ECU malfunction
- Fusible link malfunction

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D – CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

**STEP 2. Diagnostic Trouble code recheck after resetting CAN bus lines****Q:Is DTC C2100 set?**

**YES:** Go to Step 3.

**NO:** The procedure is complete.

**STEP 3. Fusible link check: Check the fusible link No. 27.**

Visually check for open circuit in the fusible link No. 27.

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

**YES:** Go to Step 4.

**NO:** Replace the fusible link No.27.

**STEP 4. Battery check**

Refer to GROUP 54Aa - Battery Test P.54Aa-3.

**Q:Is the battery in good condition?**

**YES:** Go to Step 5.

**NO:** Charge or replace the battery.

**STEP 5. Charging system check**

Refer to GROUP 16a - Output Current Test P.16a-8.

**Q:Is the charging system in good condition?**

**YES:** Go to Step 6.

**NO:** Repair or replace the charging system component(s).

### STEP 6. Voltage measurement at the A-02 ASC-ECU connector

- (1) Disconnect the connector, connect special tool MB991997 to the harness-side connector, and measure the voltage at the special tool connector side.

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

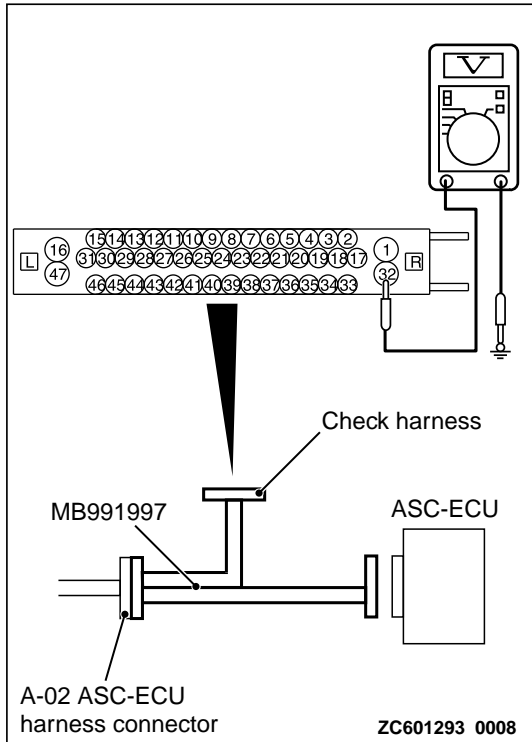
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between the terminal No. 32 and the body ground.

**OK: 12 volts (Battery voltage)**

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

**YES:** Go to Step 8.

**NO:** Go to Step 7.



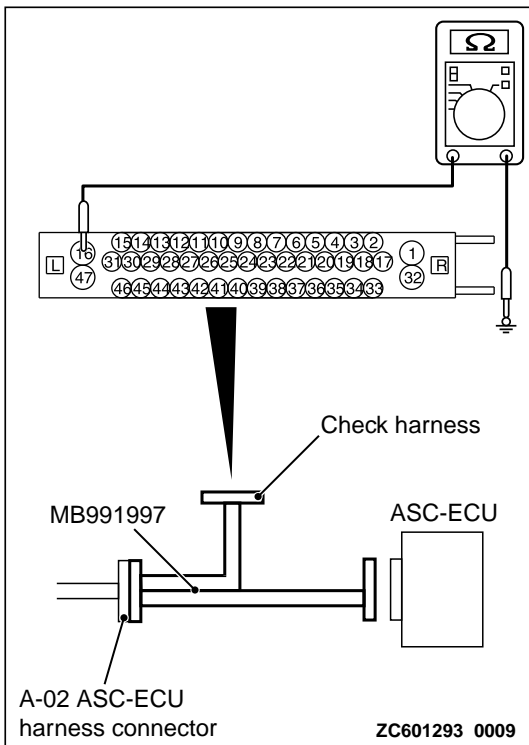
### STEP 7. Connector check: A-02 ASC-ECU connector

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

**YES:** The open or short circuit may be present in the power supply circuit. Repair the wiring harness between the A-02 ASC-ECU connector terminal No. 32 and the fusible link No. 27.

**NO:** Repair the defective connector.





### STEP 8. Resistance measurement at A-02 ASC-ECU connector

- (1) Disconnect the connector, connect special tool MB991997 to the harness-side connector, and measure the voltage at the special tool connector side.

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

- (2) Resistance between the terminal No. 16 and the body ground  
**OK: Continuity exists (2 ohms or less)**

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

**YES:** Go to Step 10.

**NO:** Go to Step 9.

### STEP 9. Connector check: A-02 ASC-ECU connector

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

**YES:** An open circuit may be present in the ground circuit. Repair the wiring harness between the A-02 ASC-ECU connector terminal No. 16 and the body ground.

**NO:** Repair the defective connector.

### STEP 10. Check whether the diagnostic Trouble code is reset.

#### Q:Is DTC C2100 set?

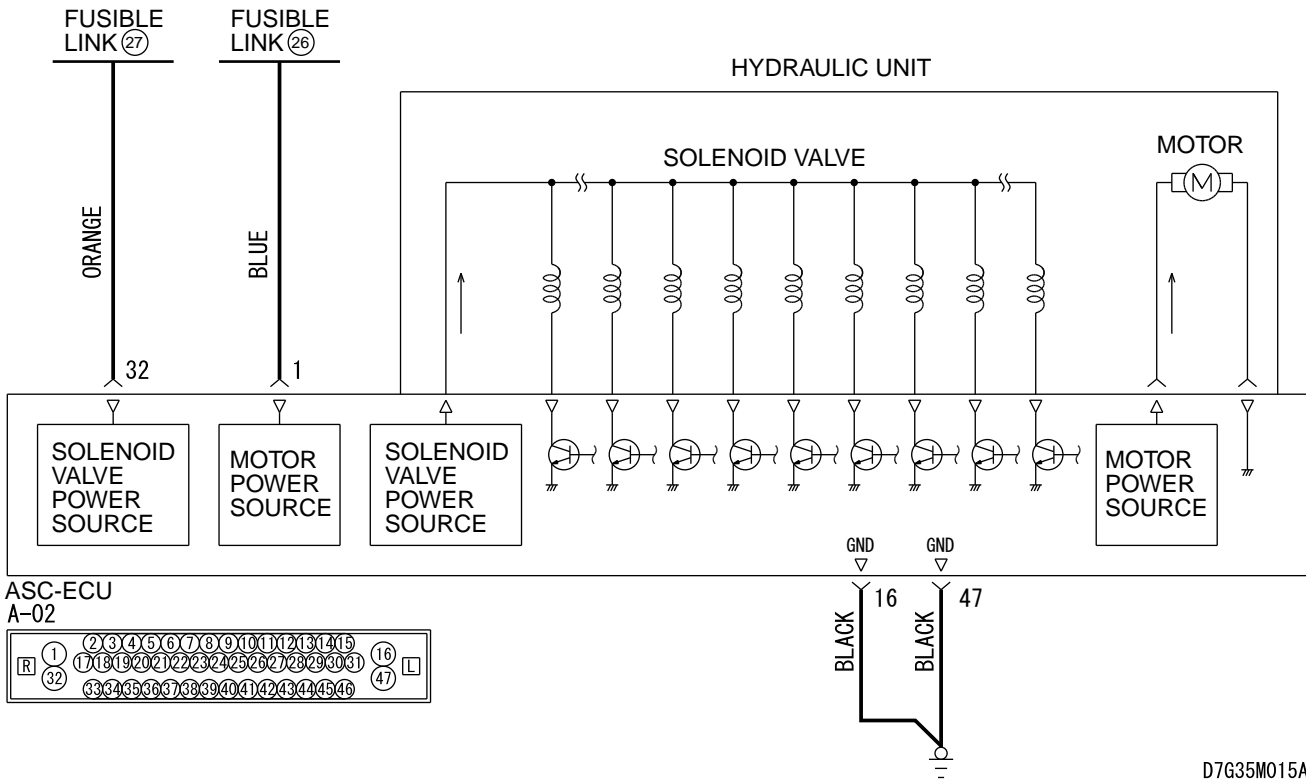
**YES:** Replace the ASC-ECU.

**NO:** Intermittent malfunction. (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15.)

**DTC C2101: Abnormality in battery voltage (high voltage)**

M13506100052USA0000010000

**Solenoid Valve and Motor Power Supply Circuit**



D7G35M015A00

**CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

- The ASC-ECU is energized by the valve power supply circuit (terminal No. 26).
- When the power is supplied from the ignition switch (IG1) to the IG1 relay in ETACS-ECU, IG1 relay is turned on. At this time, the valve power supply circuit (terminal No. 26) energizes the ASC-ECU.

**DTC SET CONDITIONS**

This diagnostic trouble code is set when the ASC-ECU power supply voltage is more than 18.0 ± 1.0 volts.

## DIAGNOSIS

**PROBABLE CAUSES**

- Battery failure
- Battery terminal looseness
- Charging system failed
- Damaged wiring harness and connectors
- ASC-ECU malfunction
- Fusible link malfunction

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D – CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

**STEP 2. Diagnostic Trouble code recheck after resetting CAN bus lines****Q: Is DTC C2101 set?**

**YES:** Go to Step 3.

**NO:** The procedure is complete.

**STEP 3. Fusible link check: Check the fusible link No. 27.**

Visually check for open circuit in the fusible link No. 27.

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

**YES:** Go to Step 4.

**NO:** Replace the fusible link No.27.

**STEP 4. Battery check**

Refer to GROUP 54Aa - Battery Test P.54Aa-3.

**Q: Is the battery in good condition?**

**YES:** Go to Step 5.

**NO:** Charge or replace the battery.

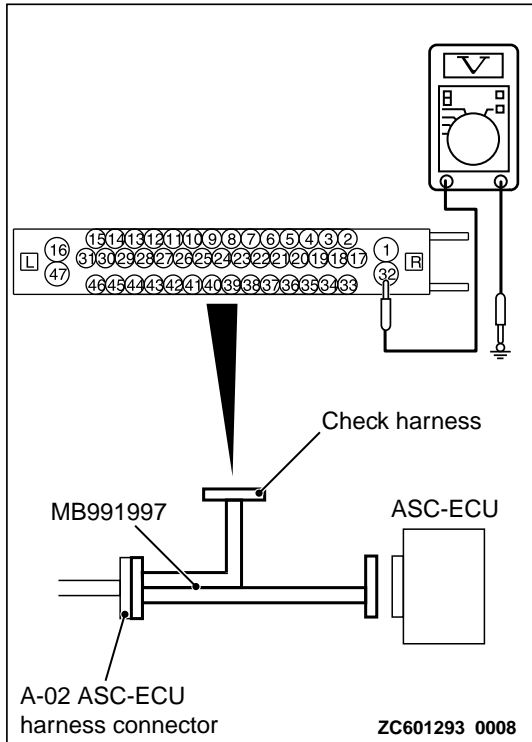
**STEP 5. Charging system check**

Refer to GROUP 16a - Output Current Test P.16a-8.

**Q: Is the charging system in good condition?**

**YES:** Go to Step 6.

**NO:** Repair or replace the charging system component(s).

**STEP 6. Voltage measurement at the A-02 ASC-ECU connector**

- (1) Disconnect the connector, connect special tool MB991997 to the harness-side connector, and measure the voltage at the special tool connector side.

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

- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between the terminal No. 32 and the body ground.

**OK: 12 volts (Battery voltage)**

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

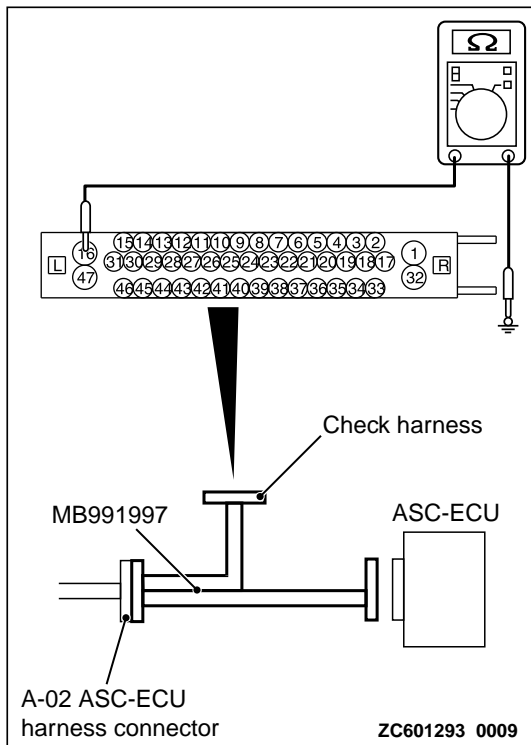
**YES:** Go to Step 8.

**NO:** Go to Step 7.

**STEP 7. Connector check: A-02 ASC-ECU connector****Q:Is the check result normal?**

**YES:** The open or short circuit may be present in the power supply circuit. Repair the wiring harness between the A-02 ASC-ECU connector terminal No. 32 and the fusible link No. 27.

**NO:** Repair the defective connector.



### STEP 8. Resistance measurement at A-02 ASC-ECU connector

- (1) Disconnect the connector, connect special tool MB991997 to the harness-side connector, and measure the voltage at the special tool connector side.

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

- (2) Resistance between the terminal No. 16 and the body ground  
**OK: Continuity exists (2 ohms or less)**

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

**YES:** Go to Step 10.

**NO:** Go to Step 9.

### STEP 9. Connector check: A-02 ASC-ECU connector

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

**YES:** An open circuit may be present in the ground circuit. Repair the wiring harness between the A-02 ASC-ECU connector terminal No. 16 and the body ground.

**NO:** Repair the defective connector.

### STEP 10. Check whether the diagnostic Trouble code is reset.

#### Q:Is DTC C2101 set?

**YES:** Replace the ASC-ECU.

**NO:** Intermittent malfunction. (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15.)

## DTC C1395: Brake fluid filling not completed

M13506100053USA0000010000

### **CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

#### DTC SET CONDITIONS

This diagnostic trouble code is set when the brake fluid is not filled in the hydraulic unit.

**PROBABLE CAUSES**

- Different hydraulic unit (For delivery to factory)
- ASC-ECU malfunction

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

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

**STEP 1. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 2.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

**STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines****Q: Is DTC C1395 set?**

**YES:** Replace the ASC-ECU.

**NO:** The procedure is complete.

**DTC C121C: Torque request signal rejection**

M13506100054USA0000010000

**CAUTION**

- If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).
- Whenever ECU is replaced, ensure that the CAN bus lines are normal.

**CIRCUIT OPERATION**

ASC-ECU sends the signal to the engine ECU as necessary to decrease the engine output for the ASC system operation.

**DTC SET CONDITIONS**

This diagnostic trouble code is set when the request for the decrease of output is rejected by the engine ECU.

**PROBABLE CAUSES**

- Wrong coding
- Engine ECU malfunction
- ASC-ECU malfunction

---

\*External noise interference

## 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. M.U.T.-III CAN bus diagnostics

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

---

### STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines

#### Q:Is DTC C121C set?

**YES:** Go to Step 3.

**NO:** The procedure is complete.

---

### STEP 3. M.U.T.-III other system diagnostic trouble code

Use scan tool to check that the diagnostic trouble code is set in the engine ECU.

#### Q:Is any DTC set?

**YES:** Troubleshoot the engine ECU diagnostic trouble code. (Refer to GROUP 13Ab - Diagnostic trouble code chart P.13Ab-44.)

**NO:** Go to Step 4.

---

### STEP 4. Check whether the diagnostic trouble code is reset.

#### Q:Is DTC C121C set?

**YES:** Replace the ASC-ECU. Then go to Step 5.

**NO:** If the trouble symptom is resolved, an intermittent malfunction such as poorly engaged connector(s) or wiring harness is suspected. (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15.)

---

### STEP 5. M.U.T.-III diagnostic trouble code

Check that the diagnostic trouble code U1417 is set in ASC-ECU.

#### Q:Is DTC U1417 set?

**YES:** Troubleshoot for the diagnostic trouble code U1417. Refer to P.35C-158.

**NO:** The procedure is complete.

---

**DTC C1290: CAN time-out error**

---

M13506100055USA0000010000

**⚠ CAUTION**

- If the diagnostic trouble code C1290 is set in ASC-ECU, always diagnose the CAN bus line. If there is any fault in the CAN bus lines, an incorrect diagnostic trouble code may be set. In this case, the set diagnostic trouble code is not highly reliable.
- Before replacing the ECU, ensure that the communication circuit is normal.
- When the diagnostic trouble code C1290 is set in ASC-ECU, the diagnostic trouble code for another system may also be set. When the diagnostic trouble code for another system is set, carry out diagnosis for that system first.

**CIRCUIT OPERATION**

ASC-ECU receives signals necessary for the operations of ABS, ASC, and TCL from the engine ECU, A/T-ECU, AWD-ECU, ETACS-ECU, and the steering wheel sensor via the CAN bus lines.

**DTC SET CONDITIONS**

ASC-ECU receives signals necessary for the operations of ABS, ASC, and TCL from the engine ECU, A/T-ECU, AWD-ECU, ETACS-ECU, and steering wheel sensor via CAN bus lines. This diagnostic trouble code is stored when ASC-ECU cannot receive the signals necessary for the operations of ABS, ASC, and TCL from the engine ECU, A/T-ECU, AWD-ECU, ETACS-ECU, and steering wheel sensor.

**PROBABLE CAUSES**

- Engine ECU malfunction
- Malfunction of A/T-ECU
- AWD-ECU malfunction
- Steering wheel sensor malfunction
- Malfunction of the CAN bus
- ASC-ECU malfunction
- Malfunction of ETACS-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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 2.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D – CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 5.

---

**STEP 2. M.U.T.-III diagnostic trouble code**

Check that the diagnostic trouble codes U0100, U0101, U0114, U0126, and U0141 are set in ASC-ECU.

**Q:Is any DTC set?**

**YES:** Troubleshoot for the relevant diagnostic trouble code. (Refer to P.35C-11.)

**NO:** Go to Step 3.

---

**STEP 3. M.U.T.-III other system diagnostic trouble code**

Using scan tool, check if the diagnostic trouble codes are set from the engine ECU, A/T-ECU, AWD-ECU and ETACS-ECU or not.

**Q:Is any DTC set?**

**YES:** Troubleshoot the relevant diagnostic trouble code, and then go to Step 4.

**NO:** Go to Step 5.

---

**STEP 4. Check whether the diagnostic trouble code is reset.****Q:Is DTC C1290 set?**

**YES:** Replace the ASC-ECU. Go to Step 5.

**NO:** If the trouble symptom is resolved, an intermittent malfunction such as poorly engaged connector(s) or wiring harness is suspected. (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-15.)

---

**STEP 5. Check whether the diagnostic trouble code is reset.****Q:Is DTC C1290 set?**

**YES:** Return to Step 1.

**NO:** The procedure is complete.

---

**DTC C2203: VIN not recorded**

M13506100056USA0000010000

**⚠ CAUTION**

- If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).
- When other diagnostic trouble code for ASC-ECU is set, troubleshoot that diagnostic trouble code first.

**CIRCUIT OPERATION**

ASC-ECU receives vehicle information from the engine ECU and stores it.

**DTC SET CONDITIONS**

This diagnostic trouble code is set when ASC-ECU cannot receive the vehicle information from the engine ECU.

**PROBABLE CAUSES**

- Malfunction of the CAN bus
- Engine ECU malfunction
- ASC-ECU malfunction

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

---

**STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines****Q:Is DTC C2203 set?**

**YES:** Go to Step 3.

**NO:** The procedure is complete.

---

**STEP 3. M.U.T.-III diagnostic trouble code**

Check that the engine ECU sets a diagnostic trouble code.

**Q:Is any DTC set?**

**YES:** Troubleshoot the engine ECU diagnostic trouble code. (Refer to GROUP 13Ab - Diagnostic trouble code chart P.13Ab-44.)

**NO:** Go to Step 4.

---

**STEP 4. Check whether the diagnostic trouble code is reset.****Q:Is DTC C2203 set?**

**YES:** Replace the ASC-ECU.

**NO:** The procedure is complete.

---

## DTC C2206: Re-execution of variant coding

---

M13506100057USA0000010000

### CAUTION

- If the diagnostic trouble code C2206 is set in ASC-ECU, always diagnose the CAN bus line. If there is any fault in the CAN bus lines, an incorrect diagnostic trouble code may be set. In this case, the set diagnostic trouble code is not highly reliable.
- Before replacing the ECU, ensure that the communication circuit is normal.
- When the diagnostic trouble code C2206 is set in ASC-ECU, the diagnostic trouble code may also be set in ETACS-ECU. When the diagnostic trouble code is set in ETACS-ECU, carry out the diagnosis of the diagnostic trouble code for ETACS-ECU first.

### CIRCUIT OPERATION

ASC-ECU receives the vehicle information stored in the ETACS-ECU via CAN bus lines.

### DTC SET CONDITIONS

ASC-ECU communicates with ETACS-ECU via CAN bus lines. This diagnostic trouble code is set if the vehicle information stored in ETACS-ECU varies from the one stored when the ignition switch was last turned on.

### PROBABLE CAUSES

- ETACS-ECU or ASC-ECU which was equipped with other vehicle is used.
- Malfunction of ETACS-ECU
- ASC-ECU malfunction
- External noise interference

### 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. M.U.T.-III CAN bus diagnostics

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 2.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D – CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 6.

---

**STEP 2. M.U.T.-III diagnostic trouble code**

Check that the diagnostic trouble code U1415 or U1417 is set in ASC-ECU.

**Q:Is any DTC set?**

**YES:** Troubleshoot for the relevant diagnostic trouble code. (Refer to P.35C-11.)

**NO:** Go to Step 3.

---

**STEP 3. M.U.T.-III Diagnostic trouble code of other systems**

Use scan tool to check that the ETACS-ECU-related diagnostic trouble code is set.

**Q:Is any DTC set?**

**YES:** Troubleshoot the relevant diagnostic trouble code, and then go to Step 4.

**NO:** Go to Step 4.

---

**STEP 4. Check whether the diagnostic trouble code is reset.**

**Q:Is DTC C2206 set?**

**YES:** Replace the ASC-ECU. Go to Step 5.

**NO:** The procedure is complete.

---

**STEP 5. Check whether the diagnostic trouble code is reset.**

**Q:Is DTC C2206 set?**

**YES:** Replace ETACS-ECU. Go to Step 6.

**NO:** The procedure is complete.

---

**STEP 6. Check whether the diagnostic trouble code is reset.**

**Q:Is DTC C2206 set?**

**YES:** Return to Step 1.

**NO:** The procedure is complete.

---

**DTC C1210: Abnormality in G and yaw rate sensor (longitudinal G sensor)**

M13506100058USA0000010000

**CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

- ASC-ECU supplies power to the G and yaw rate sensor at the terminal No. 1.
- The G and yaw rate sensor outputs the signal to ASC-ECU via the CAN bus lines.

## DIAGNOSIS

**DTC SET CONDITIONS**

This diagnostic trouble code is set if any malfunction below is found:

- When the output value of the longitudinal G-sensor is abnormal
- When abnormality in longitudinal G-sensor is detected by the self-diagnosis of the G and yaw rate sensor

**PROBABLE CAUSES**

- G and yaw rate sensor malfunction
- ASC-ECU malfunction
- External noise interference
- The G and yaw rate sensor for FWD is installed.

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

**STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines****Q:Is DTC C1210 set?**

**YES:** Go to Step 3.

**NO:** The procedure is complete.

**STEP 3. G and yaw rate sensor parts number check**

**OK: 4670A282**

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

**YES:** Go to Step 4.

**NO:** Replace the G and yaw rate sensor.

**STEP 4. M.U.T.-III data list**

Check the following service data.

- Item 09: G sensor

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

**YES:** Go to Step 5.

**NO:** Replace the G and yaw rate sensor, and then go to Step 6.

**STEP 5. Check whether the diagnostic trouble code is reset.****Q:Is DTC C1210 set?**

**YES:** Replace the G and yaw rate sensor, and then go to Step 6.

**NO:** The procedure is complete.

**STEP 6. Check whether the diagnostic trouble code is reset.****Q:Is DTC C1210 set?**

**YES:** Replace the ASC-ECU.

**NO:** Intermittent malfunction. (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15.)

**DTC C1242: Abnormality in G and yaw rate sensor (longitudinal G sensor)**

M13506100059USA0000010000

**⚠ CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

- ASC-ECU supplies power to the G and yaw rate sensor at the terminal No. 1.
- The G and yaw rate sensor outputs the signal to ASC-ECU via the special CAN bus lines.

**DTC SET CONDITIONS**

This diagnostic trouble code is set when the abnormality is detected by comparing the longitudinal G-sensor value output from the G and yaw rate sensor with the value output from the wheel speed sensor.

**PROBABLE CAUSES**

- Improper installation of the G and yaw rate sensor
- G and yaw rate sensor malfunction
- Malfunction of wheel speed sensor
- ASC-ECU malfunction
- External noise interference

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

---

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

---

**STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines**

**Q: Is DTC C1242 set?**

**YES:** Go to Step 3.

**NO:** The procedure is complete.

---

**STEP 3. Check the wheel speed sensor-related diagnostic trouble code.**

Use scan tool to check whether the wheel speed sensor-related diagnostic trouble code is set or not.

**Q: Is any DTC set?**

**YES:** Troubleshoot for the relevant diagnostic trouble code. (Refer to P.35C-11.)

**NO:** Go to Step 4.

---

**STEP 4. G and yaw rate sensor check**

Check that the G and yaw rate sensor is installed correctly.

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

**YES:** Go to Step 5.

**NO:** Reinstall the G and yaw rate sensor correctly.

---

**STEP 5. M.U.T.-III data list**

Check the following service data.

•Item 09: G sensor

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

**YES:** Go to Step 6.

**NO:** Replace the G and yaw rate sensor, and then go to Step 6.

---

**STEP 6. Check whether the diagnostic trouble code is reset.**

**Q: Is DTC C1242 set?**

**YES:** Replace the ASC-ECU.

**NO:** The procedure is complete.

---

## DTC C123C: Abnormality in G and yaw rate sensor (lateral G and yaw rate sensor)

---

M13506100060USA0000010000

**⚠ CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

- ASC-ECU supplies power to the G and yaw rate sensor at the terminal No. 1.
- The G and yaw rate sensor outputs the signal to ASC-ECU via the CAN bus lines.

**DTC SET CONDITIONS**

This diagnostic trouble code is set if any malfunction below is found:

- The output value of lateral G and yaw rate sensor is abnormal.
- When abnormality is detected by comparing the value output from the lateral G and yaw rate sensor with the one from the steering wheel sensor and wheel speed sensor

**PROBABLE CAUSES**

- Improper installation of the G and yaw rate sensor
- G and yaw rate sensor malfunction
- Steering wheel sensor malfunction
- Malfunction of wheel speed sensor
- ASC-ECU malfunction
- External noise interference

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

---

**STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines****Q:Is DTC C123C set?**

**YES:** Go to Step 3.

**NO:** The procedure is complete.

---

**STEP 3. Check the wheel speed sensor-related diagnostic trouble code.**

Use scan tool to check whether the wheel speed sensor-related or steering wheel sensor-related diagnostic trouble code is set or not.

**Q:Is any DTC set?**



## DIAGNOSIS

**YES:** Troubleshoot for the relevant diagnostic trouble code. (Refer to P. 35C-11.)

**NO:** Go to Step 4.

**STEP 4. G and yaw rate sensor installation check**

Check that the G and yaw rate sensor is installed correctly.

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

**YES:** Go to Step 5.

**NO:** Reinstall the G and yaw rate sensor correctly.

**STEP 5. M.U.T.-III data list**

Check the following service data.

- Item 08: Lateral G-sensor
- Item 12: Yaw rate sensor

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

**YES:** Go to Step 6.

**NO:** Replace the G and yaw rate sensor, and then go to Step 7.

**STEP 6. M.U.T.-III data list**

Check the following service data.

- Item 11: Steering angle sensor

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

**YES:** Go to Step 7.

**NO:** Replace the steering wheel sensor, and then go to Step 7.

**STEP 7. Check whether the diagnostic trouble code is reset.**

**Q: Is DTC C123C set?**

**YES:** Replace the ASC-ECU.

**NO:** The procedure is complete.

**DTC C2204: Internal abnormality in G and yaw rate sensor (lateral G and yaw rate sensor)**

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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. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

- ASC-ECU supplies power to the G and yaw rate sensor at the terminal No. 1.
- The G and yaw rate sensor outputs the signal to ASC-ECU via the CAN bus lines.

**DTC SET CONDITIONS**

This diagnostic trouble code is set if any malfunction below is found:

- When abnormality in lateral G sensor and yaw rate sensor is detected by the self-diagnosis of the G and yaw rate sensor
- When the output value of the G and yaw rate sensor is not within the standard value range

*NOTE: This diagnostic trouble code may be set when G and yaw rate sensor is put on the turntable turning at high speed.*

### PROBABLE CAUSES

- Improper installation of the G and yaw rate sensor
- Damaged wiring harness and connectors
- G and yaw rate sensor malfunction
- ASC-ECU malfunction

### 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. M.U.T.-III CAN bus diagnostics

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

---

#### STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines

#### Q:Is DTC C2204 set?

**YES:** Go to Step 3.

**NO:** The procedure is complete.

---

#### STEP 3. G and yaw rate sensor installation check

Check that the G and yaw rate sensor is installed correctly.

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

**YES:** Go to Step 4.

**NO:** Reinstall the G and yaw rate sensor correctly.

---

#### STEP 4. M.U.T.-III data list

Check the following service data.

- Item 08: Lateral G-sensor
- Item 12: Yaw rate sensor

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

**YES:** Go to Step 5.

**NO:** Replace the G and yaw rate sensor, and then go to Step 5.

---

**STEP 5. Check whether the diagnostic trouble code is reset.**

**Q: Is DTC C2204 set?**

**YES:** Replace the ASC-ECU.

**NO:** The procedure is complete.

---

**DTC C2111: Sensor Power Supply Circuit**

**DTC C2112: Sensor Power Supply Circuit (Brake Fluid Pressure Sensor)**

---

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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. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

When the brake pedal is depressed, the brake fluid pressure sensor integrated in the hydraulic unit detects the brake fluid pressure applied from the master cylinder, converts the pressure value into voltage signal, and outputs it.

**DTC SET CONDITIONS**

This diagnostic trouble code is set when the voltage applied to the pressure sensor is not within the standard value range.

**PROBABLE CAUSES**

ASC-ECU malfunction

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D – CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

---

**STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines**

**Q: Are DTCs C2111 and C2112 set?**

**YES:** Go to Step 3.

**NO:** The procedure is complete.

**STEP 3. Battery check**

Refer to GROUP 54Aa - Battery Test P.54Aa-3.

**Q: Is the battery in good condition?**

**YES:** Go to Step 4.

**NO:** Charge or replace the battery.

**STEP 4. Charging system check**

Refer to GROUP 16a - Output Current Test P.16a-8.

**Q: Is the charging system in good condition?**

**YES:** Go to Step 5.

**NO:** Repair or replace the charging system component(s).

**STEP 5. Check whether the diagnostic trouble code is reset.**

**Q: Are DTCs C2111 and C2112 set?**

**YES:** Replace the ASC-ECU.

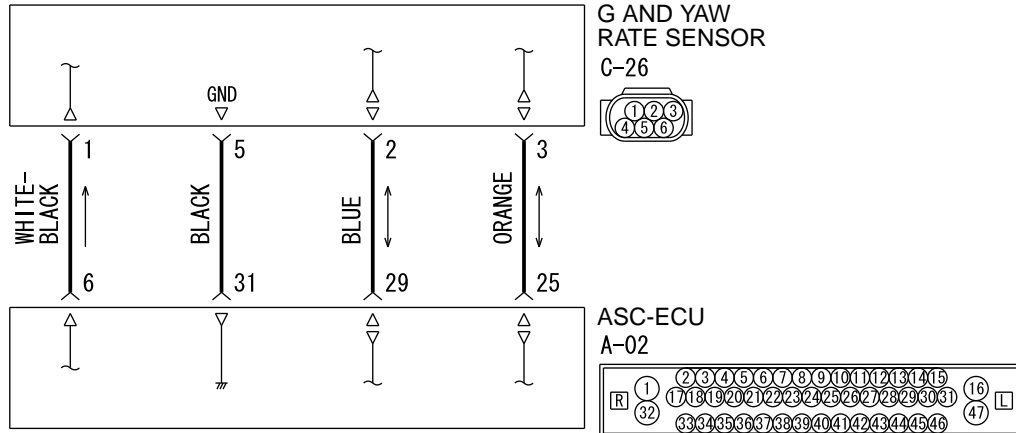
**NO:** The procedure is complete.

**DTC C2114: Abnormality in G and yaw rate sensor operation voltage**

**DTC C2115: Abnormality in G and yaw rate sensor operation voltage**

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G and Yaw Rate Sensor Circuit



D7G35M013A00

**CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

- ASC-ECU supplies power to the G and yaw rate sensor at the terminal No. 1.

- The G and yaw rate sensor outputs the signal to ASC-ECU via the special CAN bus lines.

### DTC SET CONDITIONS

This diagnostic trouble code is set if any malfunction below is found:

#### DTC C2114

- When the power supply voltage applied from ASC-ECU to the G and yaw rate sensor is not within the standard value range (low)

#### DTC C2115

- When the power supply voltage applied from ASC-ECU to the G and yaw rate sensor is not within the standard value range (high)

### PROBABLE CAUSES

- Damaged wiring harness and connectors
- G and yaw rate sensor malfunction
- ASC-ECU malfunction

### 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. M.U.T.-III CAN bus diagnostics

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D – CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

---

#### STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines

#### Q:Are DTCs C2114 and C2115 set?

**YES:** Go to Step 3.

**NO:** The procedure is complete.

---

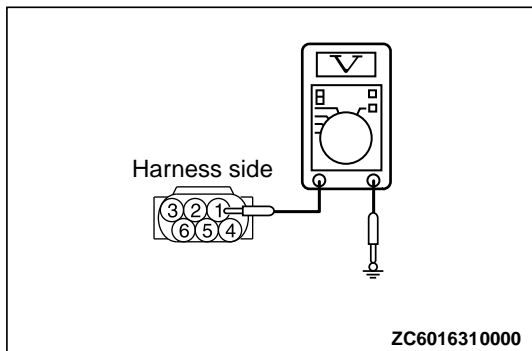
#### STEP 3. G and yaw rate sensor installation check

Check that the G and yaw rate sensor is installed correctly.

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

**YES:** Go to Step 4.

**NO:** Reinstall the G and yaw rate sensor correctly.

**STEP 4. Voltage measurement at C-26 G and yaw rate sensor connector**

- (1) Disconnect the connector, and measure at the wiring harness-side connector.
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between the terminal No. 1 and the body ground.

**OK: 12 volts (Battery voltage)**

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

**YES:** Go to Step 7.

**NO:** Go to Step 5.

**STEP 5. Connector check: A-02 ASC-ECU connector, C-26 G and yaw rate sensor connector**

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

**YES:** Go to Step 6.

**NO:** Repair the defective connector.

**STEP 6. Wiring harness check between A-02 ASC-ECU connector terminal No. 6 and C-26 G and yaw rate sensor connector terminal No. 1.**

- \* Check the open circuit in power supply circuit.

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

**YES:** Go to Step 7.

**NO:** Repair the wiring harness.

**STEP 7. Resistance measurement between C-26 G and yaw rate sensor connector and A-02 ASC-ECU connector**

- (1) Disconnect the connector, and measure at the wiring harness-side connector.
- (2) Resistance between the C-26 G and yaw rate sensor connector terminal No. 5 and the A-02 ASC-ECU connector terminal No. 6.

**OK: Continuity exists (2 ohms or less)**

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

**YES:** Go to Step 10.

**NO:** Go to Step 8.

**STEP 8. Connector check: A-02 ASC-ECU connector, C-26 G and yaw rate sensor connector**

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

**YES:** Go to Step 9.

**NO:** Repair the defective connector.

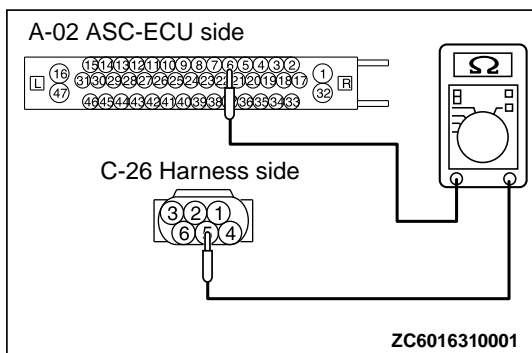
**STEP 9. Wiring harness check between A-02 ASC-ECU connector terminal No. 31 and C-26 G and yaw rate sensor connector terminal No. 5**

- \* Check the ground wires for open circuit.

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

**YES:** Go to Step 10.

**NO:** Repair the wiring harness.



## DIAGNOSIS

**STEP 10. M.U.T.-III data list**

Check the following service data.

- Item 08: Lateral G-sensor
- Item 09: G sensor
- Item 12: Yaw rate sensor

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

**YES:** Go to Step 11.

**NO:** Replace the G and yaw rate sensor, and then go to Step 11.

**STEP 11. Check whether the diagnostic trouble code is reset.****Q:Are DTCs C2114 and C2115 set?**

**YES:** Replace the ASC-ECU.

**NO:** The procedure is complete.

**DTC C123A: Abnormality in sensor calibration**

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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. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

ASC-ECU stores the calibrated value of the G and yaw rate sensor, steering wheel sensor, and brake fluid pressure sensor.

**DTC SET CONDITIONS**

This diagnostic trouble code is set when the calibrated value for each sensor stored in ASC-ECU is not within the predetermined range.

- Abnormality in neutral position of the G and yaw rate sensor
- Abnormality in neutral position of the steering wheel sensor

**PROBABLE CAUSES**

- ASC-ECU malfunction
- External noise interference
- Accidental shutdown of power supply during the storing operation of calibrated value

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D – CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

---

**STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines****Q:Is DTC C123A set?**

**YES:** Go to Step 3.

**NO:** The procedure is complete.

---

**STEP 3. G and yaw rate sensor calibration**

Perform calibration of G and yaw rate sensor. (Refer to P. 35C-191.)

**Q:Has the calibration succeeded?**

**YES:** Go to Step 4.

**NO:** Replace the ASC-ECU.

---

**STEP 4. Steering wheel sensor calibration**

Perform calibration of steering wheel sensor. (Refer to P. 35C-192.)

**Q:Has the calibration succeeded?**

**YES:** Go to Step 5.

**NO:** Replace the ASC-ECU.

---

**STEP 5. Check whether the diagnostic trouble code is reset.****Q:Is DTC C123A set?**

**YES:** Replace the ASC-ECU.

**NO:** The procedure is complete.

---

**DTC C1219: Abnormality in steering wheel sensor signal**

---

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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. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

Steering wheel sensor outputs the signal to ASC-ECU via the CAN bus lines.

**DTC SET CONDITIONS**

This diagnostic trouble code is set if any malfunction below is found:



## DIAGNOSIS

- The tolerance of the neutral position of steering wheel sensor exceeds the specified range.
- Abnormality in steering wheel sensor output value
- When abnormality is detected by comparing the value output from the steering wheel sensor with the one from the wheel speed sensor and the G and yaw rate sensor.

**PROBABLE CAUSES**

- Improper installation of steering wheel sensor
- Wheel alignment not performed
- Steering wheel sensor malfunction
- Different steering wheel
- G and yaw rate sensor malfunction
- Malfunction of wheel speed sensor
- ASC-ECU malfunction
- External noise interference

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

**STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines****Q: Is DTC C1219 set?**

**YES:** Go to Step 3.

**NO:** The procedure is complete.

**STEP 3. M.U.T.-III diagnostic trouble code**

Check that the wheel speed sensor-related, G and yaw rate sensor-related, or steering wheel sensor-related diagnostic trouble code is set.

**Q: Is any DTC set?**

**YES:** Troubleshoot the relevant diagnostic trouble code, and then go to Step 4.

**NO:** Go to Step 4.

**STEP 4. Check how steering wheel sensor is installed.**

Check that the steering wheel sensor is installed correctly. (Refer to P.35C-198.)

**Q:Is the check result normal?****YES:** Go to Step 5.**NO:** Install the steering wheel sensor correctly, and then go to Step 5.**STEP 5. M.U.T.-III data list**

Check the following service data.

- \*Item 11: Steering angle sensor

**Q:Is the check result normal?****YES:** Go to Step 6.**NO:** Replace the steering wheel sensor.**STEP 6. Wheel alignment check****Q:Is the check result normal?****YES:** Go to Step 7.**NO:** Adjust the wheel alignment, and then go to Step 7.**STEP 7. Check whether the diagnostic trouble code is reset.****Q:Is DTC C1219 set?****YES:** Replace the steering wheel sensor, and then go to Step 8.**NO:** The procedure is complete.**STEP 8. Check whether the diagnostic trouble code is reset.****Q:Is DTC C1219 set?****YES:** Replace ASC-ECU.**NO:** The procedure is complete.**DTC C121A: Abnormality in steering wheel sensor initialization**

M13506100068USA0000010000

**⚠ CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

Steering wheel sensor stores the neutral position learned by the scan tool. When the neutral position has not been stored in the steering wheel sensor yet, the steering wheel sensor outputs the signal indicating that it does not have neutral position.

**DTC SET CONDITIONS**

This diagnostic trouble code is set when ASC-ECU detects that the steering wheel sensor has not learned the neutral position yet.

**PROBABLE CAUSES**

- \*Steering wheel sensor malfunction

- \*ASC-ECU malfunction
- \*Neutral position of steering wheel sensor not learned

## 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. M.U.T.-III CAN bus diagnostics

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D – CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

### STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines

#### Q:Is DTC C121A set?

**YES:** Go to Step 3.

**NO:** The procedure is complete.

### STEP 3. Steering wheel sensor calibration

Perform calibration of steering wheel sensor. (Refer to P. 35C-192.)

#### Q:Has the calibration succeeded?

**YES:** Go to Step 4.

**NO:** Replace the steering wheel sensor, and then go to Step 4.

### STEP 4. Check whether the diagnostic trouble code is reset.

#### Q:Is DTC C121A set?

**YES:** Replace the ASC-ECU.

**NO:** The procedure is complete.

## DTC C2205: Internal malfunction of steering wheel sensor

M13506100081USA0000010000

### CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

### CIRCUIT OPERATION

- \*Steering wheel sensor sends its status signal to ASC-ECU.

**DTC SET CONDITIONS**

This diagnostic trouble code is set when ASC-ECU detects that the steering wheel sensor has malfunction.

**PROBABLE CAUSES**

- Steering wheel sensor malfunction
- ASC-ECU malfunction
- External noise interference

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 2.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 4.

---

**STEP 2. Check whether the diagnostic trouble code is reset.****Q:Is DTC C2205 set?**

**YES:** Replace the steering wheel sensor, and then go to Step 3.

**NO:** The procedure is complete.

---

**STEP 3. Check whether the diagnostic trouble code is reset.****Q:Is DTC C2205 set?**

**YES:** Replace the ASC-ECU, and then go to Step 4.

**NO:** The procedure is complete.

---

**STEP 4. Check whether the diagnostic trouble code is reset.****Q:Is DTC C2205 set?**

**YES:** Go to Step 1.

**NO:** The procedure is complete.

---

## DTC U0001: Bus-off

---

### **⚠ CAUTION**

- If diagnostic trouble code U0001 is set in ASC-ECU, always diagnose the CAN bus line. If there is any fault in the CAN bus lines, an incorrect diagnostic trouble code may be set. In this case, the set diagnostic trouble code is not highly reliable.
- Before replacing the ECU, ensure that the communication circuit is normal.

### DTC SET CONDITIONS

This diagnostic trouble code is set when ASC-ECU has ceased the CAN communication (bus off).

### COMMENTS ON TROUBLE SYMPTOM

Malfunction of wiring harness, connector (s), or ASC-ECU may be present.

### PROBABLE CAUSES

- Wiring harness or connector failure of CAN bus line
- ASC-ECU malfunction

## 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. M.U.T.-III CAN bus diagnostics

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 2.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D – CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 3.

---

### STEP 2. Check whether the diagnostic trouble code is reset.

#### Q: Is DTC U0001 set?

**YES:** Replace the ASC-ECU.

**NO:** If the trouble symptom is resolved, an intermittent malfunction such as poorly engaged connector(s) or wiring harness is suspected. (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-15.)

---

**STEP 3. Check whether the diagnostic trouble code is reset.****Q: Is DTC U0001 set?****YES:** Return to Step 1.**NO:** The procedure is complete.

---

**DTC U0100: Engine time-out error****DTC U0101: A/T time-out error****DTC U0114: AWD time-out error****DTC U0126: Steering wheel sensor time-out error****DTC U0141: ETACS time-out error**

---

M13506100070USA0000010000

**CAUTION**

- If the diagnostic trouble codes U0100, U0101, U0114, U0126, and U0141 are set in ASC-ECU, always diagnose the CAN bus line. If there is any fault in the CAN bus lines, an incorrect diagnostic trouble code may be set. In this case, the set diagnostic trouble code is not highly reliable.
- Before replacing the ECU, ensure that the communication circuit is normal.

**CIRCUIT OPERATION**

ASC-ECU communicates with the engine ECU, A/T-ECU, AWD-ECU, the steering wheel sensor, and ETACS-ECU via the CAN bus lines.

**DTC SET CONDITIONS**

This diagnostic trouble code is set if ASC-ECU cannot receive the signal sent from other ECU for a certain period.

**PROBABLE CAUSES****DTC U0100**

- Wiring harness or connector failure of CAN bus line
- Engine ECU malfunction
- ASC-ECU malfunction

**DTC U0101**

- Wiring harness or connector failure of CAN bus line
- Malfunction of A/T-ECU
- ASC-ECU malfunction

**DTC U0114**

- Wiring harness or connector failure of CAN bus line
- AWD-ECU malfunction
- ASC-ECU malfunction

**DTC U0126**

- Wiring harness or connector failure of CAN bus line
- Steering wheel sensor malfunction
- ASC-ECU malfunction

**DTC U0141**

- Wiring harness or connector failure of CAN bus line
- Malfunction of ETACS-ECU
- ASC-ECU malfunction

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 2.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D – CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 4.

**STEP 2. M.U.T.-III other system diagnostic trouble code**

Use scan tool to check that other diagnostic trouble code is set in the ECU corresponding to the relevant diagnosis.

**Q:Is other DTC set?**

**YES:** Troubleshoot for the relevant diagnostic trouble code.

**NO:** Go to Step 3.

**STEP 3. M.U.T.-III diagnostic trouble code**

Use scan tool to check that the diagnostic trouble code is set in ASC-ECU.

**Q:Is any DTC set?**

**YES (DTC U0100 is set):** Replace the engine ECU, and then go to Step 4.

**YES (DTC U0101 is set):** Replace the A/T-ECU, and then go to Step 4.

**YES (DTC U0114 is set):** Replace AWD-ECU, and then go to Step 4.

**YES (DTC U0123 is set):** Replace the steering wheel sensor, and then go to Step 4.

**YES (DTC U0141 is set):** Replace the ETACS-ECU, and then go to Step 4.

**NO (No DTC is set.):** The procedure is complete.

**STEP 4. Check whether the diagnostic trouble code is reset.****Q:Is DTC U0100, U0101, U0114, U0126, or U0141 set?**

**YES:** Replace the ASC-ECU.

**NO:** The procedure is complete.

---

**DTC U0125: G and yaw rate sensor message time-out error/message error**

---

M13506100075USA0000010000

**⚠ CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

The G and yaw rate sensor outputs the signal to ASC-ECU via the special CAN bus lines.

**DTC SET CONDITIONS**

This diagnostic trouble code is set when the G and yaw rate sensor signal is not sent to ASC-ECU.

**PROBABLE CAUSES**

- Wiring harness or connector failure of CAN bus line
- G and yaw rate sensor malfunction
- ASC-ECU malfunction
- External noise interference

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 2.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D – CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 4.

---

**STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines****Q:Is DTC U0125 set?**

**YES:** Replace the G and yaw rate sensor, and then go to Step 3.

**NO:** The procedure is complete.



---

**STEP 3. Check whether the diagnostic trouble code is reset.**

**Q: Is DTC U0125 set?**

**YES:** Replace the ASC-ECU, and then go to Step 4.

**NO:** The procedure is complete.

---

**STEP 4. Check whether the diagnostic trouble code is reset.**

**Q: Is DTC U0125 set?**

**YES:** Go to Step 1.

**NO:** The procedure is complete.

---

**DTC U0401: Engine malfunction detected**

M13506100076USA0000010000

**⚠ CAUTION**

•If diagnostic trouble code U0401 is set in ASC-ECU, always diagnose the CAN bus line. If there is any fault in the CAN bus lines, an incorrect diagnostic trouble code may be set. In this case, the set diagnostic trouble code is not highly reliable.

•Before replacing the ECU, ensure that the communication circuit is normal.

**CIRCUIT OPERATION**

Engine-related signals are sent or received to and from between ASC-ECU and engine ECU via CAN bus lines.

**DTC SET CONDITIONS**

This diagnostic trouble code is set when the engine ECU malfunction has been detected.

**PROBABLE CAUSES**

- Engine ECU malfunction
- ASC-ECU malfunction
- External noise interference

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 2.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 5.

---

**STEP 2. M.U.T.-III diagnostic trouble code**

Use scan tool to check that any diagnostic trouble code other than the code U0401 is set in ASC-ECU.

**Q:Is any DTC set?**

**YES:** Troubleshoot the relevant diagnostic trouble code, and then go to Step 5.

**NO:** Go to Step 3.

---

**STEP 3. M.U.T.-III other system diagnostic trouble code**

Use scan tool to check that the diagnostic trouble code is set by the engine ECU.

**Q:Is any DTC set?**

**YES:** Troubleshoot the relevant diagnostic trouble code, and then go to Step 5.

**NO:** Go to Step 4.

---

**STEP 4. Check whether the diagnostic trouble code is reset.**

**Q:Is DTC U0401 set?**

**YES:** Replace the ASC-ECU.

**NO:** If the trouble symptom is resolved, an intermittent malfunction such as poorly engaged connector(s) or wiring harness is suspected. (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15.)

---

**STEP 5. Check whether the diagnostic trouble code is reset.**

**Q:Is DTC U0401 set?**

**YES:** Return to Step 1.

**NO:** The procedure is complete.

---

**DTC U0428: Communication error in steering wheel sensor**

M13506100077USA0000010000

**CAUTION**

- If the diagnostic trouble code U0428 is set in ASC-ECU, always diagnose the CAN bus line. If there is any fault in the CAN bus lines, an incorrect diagnostic trouble code may be set. In this case, the set diagnostic trouble code is not highly reliable.
- Before replacing the ECU, ensure that the communication circuit is normal.

**CIRCUIT OPERATION**

The steering wheel sensor outputs the steering wheel status to ASC-ECU via the CAN bus lines.

**DTC SET CONDITIONS**

This diagnostic trouble code is set when ASC-ECU has detected the communication error in the steering wheel sensor.

**PROBABLE CAUSES**

- Steering wheel sensor malfunction
- ASC-ECU malfunction
- External noise interference

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 2.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 3.

**STEP 2. Check whether the diagnostic trouble code is reset.****Q:Is DTC U0428 set?**

**YES:** Replace the steering wheel sensor, and then go to Step 3.

**NO:** The procedure is complete.

**STEP 3. Check whether the diagnostic trouble code is reset.****Q:Is DTC U0428 set?**

**YES:** Replace the ASC-ECU, and then go to Step 4.

**NO:** The procedure is complete.

**STEP 4. Check whether the diagnostic trouble code is reset.****Q:Is DTC U0428 set?**

**YES:** Return to Step 1.

**NO:** The procedure is complete.

**DTC U1003: G and yaw rate sensor bus-off**

M13506100078USA0000010000

**CAUTION**

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

**CIRCUIT OPERATION**

The G and yaw rate sensor outputs the signal to ASC-ECU via the special CAN bus lines.

**DTC SET CONDITIONS**

This diagnostic trouble code is set when ASC-ECU cannot receive the signal sent from the G and yaw rate sensor.

**PROBABLE CAUSES**

- Wiring harness or connector failure for the special CAN bus lines between ASC-ECU and the G and yaw rate sensor
- ASC-ECU malfunction

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

---

**STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines****Q:Is DTC U0125 set?**

**YES:** Go to Step 3.

**NO:** The procedure is complete.

---

**STEP 3. Connector check: A-08 ASC-ECU connector, C-20 G and yaw rate sensor connector****Q:Is the check result normal?**

**YES:** Go to Step 4.

**NO:** Repair the connector, and then go to Step 5.

---

**STEP 4. Wiring harness check between A-08 ASC-ECU connector terminals No. 29/25 and C-20 G and yaw rate sensor connector terminals No. 2/3**

Check for open circuit in communication circuit

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

**YES:** Go to Step 5.

**NO:** Repair the wiring harness, and then go to Step 5.

---

**STEP 5. Check whether the diagnostic trouble code is reset.**

**Q: Is DTC U0125 set?**

**YES:** Replace the G and yaw rate sensor, and then go to Step 6.

**NO:** The procedure is complete.

---

**STEP 6. Check whether the diagnostic trouble code is reset.**

**Q: Is DTC U0125 set?**

**YES:** Replace the ASC-ECU.

**NO:** The procedure is complete.

---

**DTC U1415: Variant coding not completed**

M13506100079USA0000010000

**⚠ CAUTION**

When the diagnostic trouble code U1415 is set in ASC-ECU, the diagnostic trouble code may also be set in ETACS-ECU. When the diagnostic Trouble code is set in ETACS-ECU, carry out the diagnosis of the diagnostic Trouble code for ETACS-ECU first.

**CIRCUIT OPERATION**

ASC-ECU receives the vehicle information stored in the ETACS-ECU via CAN bus lines.

**DTC SET CONDITIONS**

This diagnostic Trouble code is set when the variant coding for ETACS-ECU has not been completed.

**PROBABLE CAUSES**

- Variant coding for ETACS-ECU has not been implemented.
- ASC-ECU malfunction

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 2.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 4.

---

**STEP 2. M.U.T.-III other system diagnostic Trouble code**

Use scan tool to check that the diagnostic trouble code B222C is set in the ETACS-ECU.

**Q:Is any DTC set?**

**YES:** Troubleshoot the relevant diagnostic Trouble code, and then go to Step 4.

**NO:** Go to Step 3.

---

**STEP 3. Check whether the diagnostic Trouble code is reset.****Q:Is DTC U1415 set?**

**YES:** Replace the ASC-ECU. Go to Step 4.

**NO:** If the trouble symptom is resolved, an intermittent malfunction such as poorly engaged connector(s) or wiring harness is suspected. (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15.)

---

**STEP 4. Check whether the diagnostic Trouble code is reset.****Q:Is DTC U1415 set?**

**YES:** Return to Step 1.

**NO:** The procedure is complete.

---

**DTC U1417: Variant coding value invalid (includes faulty installation)**

---

M13506100080USA0000010000

**⚠ CAUTION**

- If diagnostic trouble code U1417 is set in ASC-ECU, always diagnose the CAN bus lines. If there is any fault in the CAN bus lines, an incorrect diagnostic trouble code may be set. In this case, the set diagnostic trouble code is not highly reliable.
- Before replacing the ECU, ensure that the communication circuit is normal.
- When the diagnostic trouble code U1417 is set in ASC-ECU, the diagnostic trouble code may also be set in ETACS-ECU. When the diagnostic trouble code is set in ETACS-ECU, carry out the diagnosis of the diagnostic trouble code for ETACS-ECU first.

**CIRCUIT OPERATION**

ASC-ECU receives the vehicle information stored in the ETACS-ECU via CAN bus lines.

**DTC SET CONDITIONS**

ASC-ECU communicates with ETACS-ECU via CAN bus lines. This diagnostic trouble code is set when the vehicle information received from the ETACS-ECU is invalid.

## DIAGNOSIS

**PROBABLE CAUSES**

- Malfunction of ETACS-ECU
- Engine ECU malfunction
- ETACS-ECUs have been interchanged between two vehicles.
- ASC-ECU malfunction
- ASC-ECUs have been interchanged between two vehicles.

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 3.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

**STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines****Q:Is DTC U1417 set?**

**YES:** Go to Step 3.

**NO:** The procedure is complete.

**STEP 3. M.U.T.-III diagnostic trouble code**

Use scan tool to check diagnostic trouble code C121C is set or not.

**Q:Is DTC C121C set?**

**YES:** Troubleshoot for the relevant diagnostic trouble code.

**NO:** Go to Step 4.

**STEP 4. M.U.T.-III other system diagnostic trouble code**

Use scan tool to check whether the ETACS-ECU-related or engine ECU-related diagnostic trouble code is set or not.

**Q:Is any DTC set?**

**YES:** Troubleshoot for the relevant diagnostic trouble code.

**NO:** Go to Step 5.

**STEP 5. Check part number of ETACS-ECU**

Check the part number of ETACS-ECU.

**OK: 8637A213**

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

**YES:** Go to Step 6.

**NO:** Replace ETACS-ECU.

**STEP 6. Check part number of ASC-ECU**

Check the part number of ASC-ECU.

**OK: 4670A251****Q: Is the check result normal?****YES:** Go to Step 7.**NO:** Replace the ASC-ECU.**STEP 7. Check whether the diagnostic trouble code is reset.****Q: Is DTC U1417 set?****YES:** Replace the ASC-ECU.**NO:** The procedure is complete.**SYMPTOM CHART**

M13506100082USA0000010000

**⚠ CAUTION**

- ABS may operate in the following conditions without hard braking: Slippery road surface, high-speed turn, and bumpy road surface. When asking the customers, confirm that they have/have not encountered ABS operation in corresponding conditions.
- During ABS operation, the brake pedal is pulled forward gradually, and the noise occurs at the same time. This is because the brake line

pressure varies intermittently to prevent the wheel lock, and not a system malfunction.

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

Symptoms	Inspection procedure No.	Reference page
M.U.T.-III cannot communicate only with ASC-ECU.	1	P.35C-161
ASC OFF indicator light flashes at a rate of 2Hz.	2	P.35C-162
Brake warning light stays ON with the parking brake lever released.	3	P.35C-162
ABS warning light does not illuminate when ignition switch is turned to the ON position (Engine stopped).	4	P.35C-166
Brake warning light does not illuminate when the ignition switch is turned to ON position (Engine stopped).	5	P.35C-167
ABS warning light stays ON	6	P.35C-168
ASC indicator light stays ON	7	P.35C-169
ASC-OFF indicator light stays ON after the engine is started.	8	P.35C-170
After ASC switch is turned OFF, TCL/ASC system cannot be disabled.	9	P.35C-172
Abnormality in brake operation	10	P.35C-174
Traction control function or skid control function inoperative	11	P.35C-174
ASC-ECU power supply circuit system	12	P.35C-176



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## SYMPTOM PROCEDURES

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### Inspection Procedure 1: Scan tool cannot communication only with ASC-ECU.

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M13506100084USA0000010000

#### TECHNICAL DESCRIPTION (COMMENT)

When scan tool cannot communicate with the ABS/TCL/ASC system, the CAN bus line, ASC-ECU power supply circuit system, or ASC-ECU may be faulty.

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

- Damaged wiring harness and connectors
- ASC-ECU malfunction
- Wrong routing of M.U.T.-III harness
- Abnormality in battery or generator
- Abnormality in power supply voltage to ASC-ECU
- ECU malfunction of other system

#### 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. M.U.T.-III CAN bus diagnostics

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Check and repair the power supply circuit system. (Refer to P.35C-176.) Then go to Step 2.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) Then go to Step 2.

---

##### STEP 2. Retest the system

Check the communication with the scan tool.

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

**YES:** This diagnosis is complete.

**NO:** Replace the ASC-ECU.

---

**Inspection Procedure 2: ASC OFF Indicator Light Flashes at a Rate of 2Hz.**

---

M13506100085USA0000010000

**SYSTEM OPERATION**

When ASC OFF indicator light flashes at a rate of 2 Hz, traction control by brake force is prohibited.

**TECHNICAL DESCRIPTION (COMMENT)**

This operation is performed for the following reasons and is not a malfunction.

- ASC-ECU calculates the estimated temperature of the brake pad. In general, as the brake pad temperature increases, the coefficient of friction for the brake pad becomes smaller, resulting in the reduced braking force. When the estimated temperature of the brake pad exceeds the specification, ASC-ECU flashes the ASC OFF indicator light at a rate of 2 Hz to warn the driver that the controllability of TCL is decreased by the reduced braking force. Consequently, ASC-ECU prohibits the traction control by brake force until it determines that the estimated temperature of the brake pad is at normal value.

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

- Overheat of brake pad

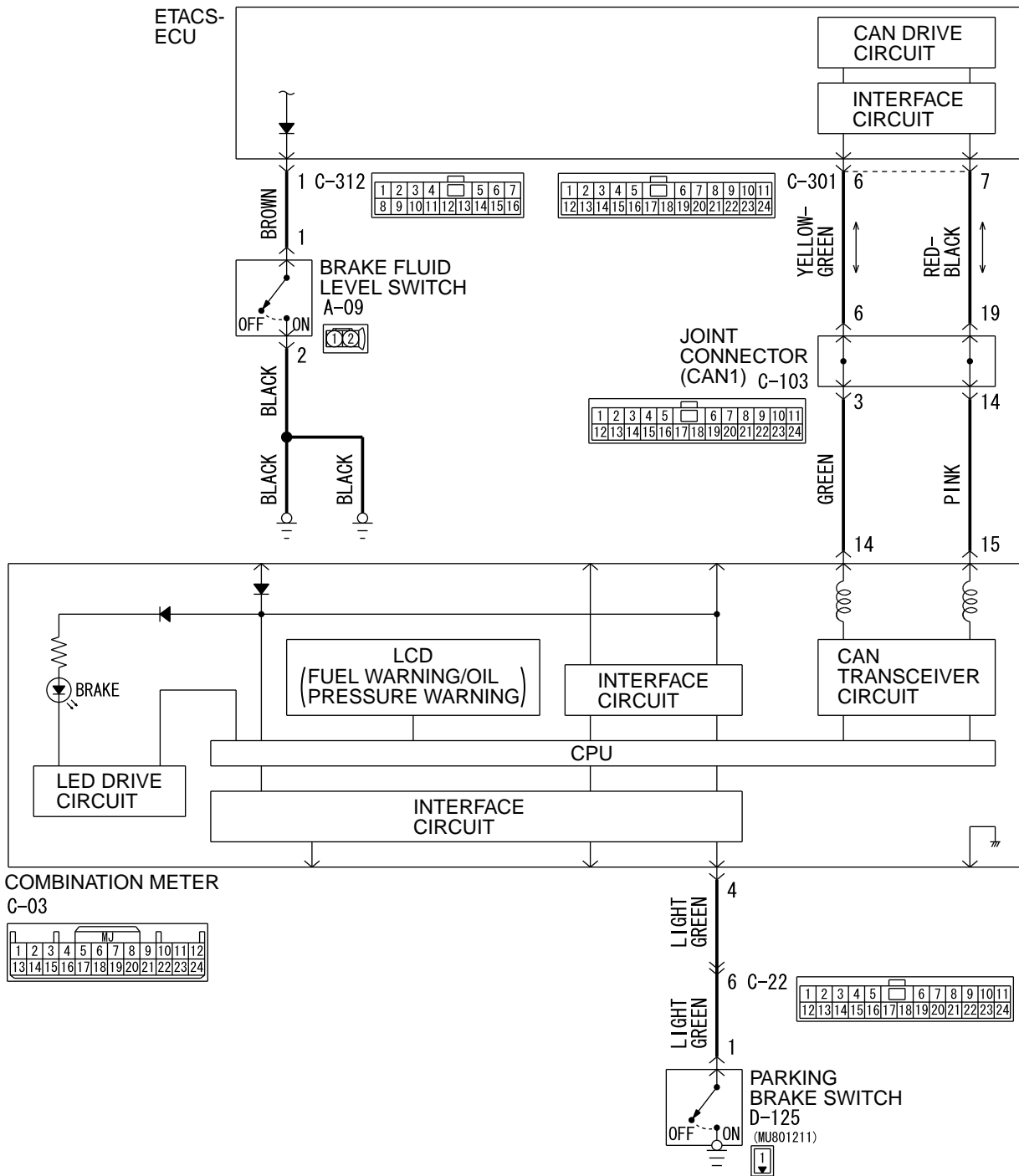
---

**Inspection Procedure 3: Brake Warning Light Stays ON with the Parking Brake Lever Released.**

---

M13506100086USA0000010000

**Brake Warnnig Light Circuit**



D7G35M017A00

**CIRCUIT OPERATION**

When the parking brake switch is turned ON, the combination meter terminal No. 4 is earthed, and the brake warning light illuminates.

**TECHNICAL DESCRIPTION (COMMENT)**

The following cases may have occurred.

- Ground fault in the parking brake switch circuit.
- The EBD is defective.
- The brake fluid level in the brake fluid reservoir is the specified value or lower.

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

- Low brake fluid level
- Damaged wiring harness and connectors
- Parking brake switch malfunction
- Combination meter malfunction
- Malfunction of ETACS-ECU
- Malfunction of EBD

**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. Brake fluid level check****Q: Is the check result normal?**

**YES:** Go to Step 2.

**NO:** Add brake fluid to the specified level.

**STEP 2. Brake fluid level switch check**

Refer to GROUP 35A - On-vehicle Service P.35A-19.

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

**YES:** Go to Step 3.

**NO:** Replace the reservoir assembly and master cylinder assembly.

**STEP 3. Voltage measurement at C-312 ETACS-ECU connector**

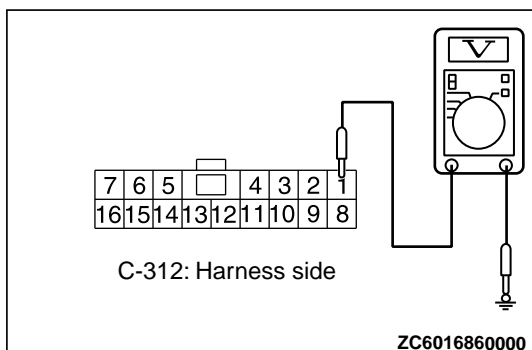
- Measure the voltage between the terminal No. 1 and the body ground.

**OK: Approx. 5 volts**

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

**YES:** Go to Step 4.

**NO:** Replace ETACS-ECU.

**STEP 4. Connector check: C-312 ETACS-ECU connector, A-09 brake fluid level switch connector****Q: Is the check result normal?**

**YES:** Go to Step 5.

**NO:** Repair the defective connector.

---

**STEP 5. Check the wiring harness between the C-312 ETACS-ECU connector terminal No. 1 and the A-09 brake fluid level switch connector terminal No. 1.**

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

**YES:** Go to Step 6.

**NO:** Check the wiring harness between the C-312 ETACS-ECU connector terminal No. 1 and the A-09 brake fluid level switch connector terminal No. 1.

---

**STEP 6. Parking brake lever stroke check**

Refer to GROUP 36 - On-vehicle Service P.36-11.

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

**YES:** Go to Step 7.

**NO:** Adjust the parking brake lever stroke, and then go to Step 10.

---

**STEP 7. Parking brake switch check**

Refer to GROUP 36 - On-vehicle Service P.36-12.

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

**YES:** Go to Step 8.

**NO:** Replace the parking brake switch.

---

**STEP 8. Voltage measurement at the C-03 combination meter connector**

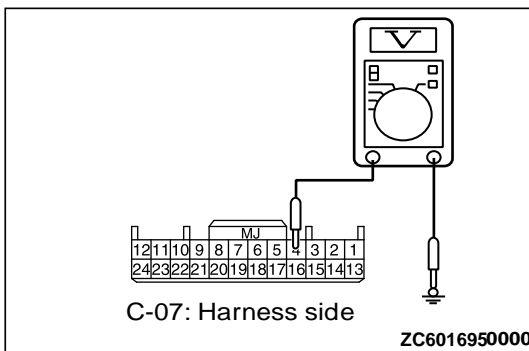
\*Measure the voltage between terminal No. 4 and body ground.

**OK: Approx. 5 volts**

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

**YES:** Go to Step 9.

**NO:** Replace the combination meter assembly, and then go to Step 10.



---

**STEP 9. Connector check: C-03 Combination meter connector, C-22 intermediate connector, D-125 parking brake switch connector**

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

**YES:** Repair the wiring harness between the C-03 combination meter connector terminal No. 4 and the D-125 parking brake switch connector.

**NO:** Repair the defective connector.

---

**STEP 10. Retest the system.**

**Q: Does the brake warning light turn ON and OFF normally according to the parking brake lever operation?**

**YES:** The procedure is complete.

**NO:** Return to Step 1.

---

**Inspection Procedure 4: ABS Warning Light does not Illuminate when Ignition Switch is Turned to the ON Position (Engine Stopped).**

---

M13506100087USA0000010000

**SYSTEM OPERATION**

- ASC-ECU sends the illumination request signal of the ABS warning light to the combination meter through ETACS-ECU via CAN communication.
- ASC-ECU illuminates the ABS warning light via ETACS-ECU for approximately 3 seconds for valve check with the ignition switch turned to the ON position.

**TECHNICAL DESCRIPTION (COMMENT)**

This may be caused by faults in the CAN bus line, ETACS-ECU, combination meter or ASC-ECU.

**PROBABLE CAUSES**

- Damaged wiring harness and connectors
- Malfunction of ETACS-ECU
- Combination meter malfunction
- ASC-ECU malfunction

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 2.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.)

---

**STEP 2. M.U.T.-III diagnostic trouble code**

Use scan tool to check the diagnostic trouble code for the ASC system.

**Q:Is the diagnostic trouble code set?**

**YES:** Carry out the diagnosis for the diagnostic trouble code. (Refer to P.35C-11.)

**NO:** Go to Step 3.

---

**STEP 3. M.U.T.-III actuator test**

Perform the actuator test No. 07 of the combination meter system, and check if the ABS warning light illuminates.

---

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

**YES:** Troubleshoot the combination meter, and then go to Step 4.

**NO:** Go to Step 4.

---

**STEP 4. Retest the system.**

**Q: Does the ABS warning light turn ON and OFF normally?**

**YES:** The procedure is complete.

**NO:** Return to Step 1.

---

**Inspection Procedure 5: Brake Warning Light does not Illuminate when the Ignition Switch is Turned to ON Position (Engine Stopped).**

---

M13506100088USA0000010000

**CIRCUIT OPERATION**

ASC-ECU sends the illumination request signal of the brake warning light to the combination meter through ETACS-ECU via the CAN communication.

**TECHNICAL DESCRIPTION (COMMENT)**

This may be caused by faults in the CAN bus line, ETACS-ECU, combination meter or ASC-ECU.

**PROBABLE CAUSES**

- Damaged wiring harness and connectors
- Malfunction of ETACS-ECU
- Combination meter malfunction
- ASC-ECU malfunction

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 2.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.)

---

**STEP 2. M.U.T.-III diagnostic trouble code**

Use scan tool to check the diagnostic trouble code for the ASC system.

**Q: Is the diagnostic trouble code set?**

---

**YES:** Carry out the diagnosis for the diagnostic trouble code. (Refer to P. 35C-11.)

**NO:** Go to Step 3.

---

**STEP 3. Retest the system.**

**Q: Does the brake warning light turn ON and OFF normally?**

**YES:** The procedure is complete.

**NO:** Return to Step 1.

---

**Inspection Procedure 6: ABS Warning Light Stays ON.**

---

M13506100089USA0000010000

**SYSTEM OPERATION**

- ASC-ECU sends the illumination request signal of the ABS warning light to the combination meter through ETACS-ECU via CAN communication.
- ASC-ECU illuminates the ABS warning light via ETACS-ECU for approximately 3 seconds for valve check with the ignition switch turned to the ON position.
- The ASC-ECU turns off the ABS warning light if an ABS error is not detected after illuminating the ABS warning light for approximately 3 seconds.

**TECHNICAL DESCRIPTION (COMMENT)**

This may be caused by faults in the CAN bus line, ETACS-ECU, combination meter or ASC-ECU.

**PROBABLE CAUSES**

- Damaged wiring harness and connectors
- Malfunction of ETACS-ECU
- Combination meter malfunction
- ASC-ECU malfunction

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 2.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P. 54D-17.)



## DIAGNOSIS

**STEP 2. M.U.T.-III diagnostic trouble code**

Use scan tool to check the diagnostic trouble code for the ASC system.

**Q:Is the diagnostic trouble code set?**

**YES:** Carry out the diagnosis for the diagnostic trouble code. (Refer to P.35C-11.)

**NO:** Go to Step 3.

**STEP 3. M.U.T.-III other system diagnostic trouble code**

Using scan tool, check that the diagnostic trouble code U0141 is not set by the combination meter system.

**Q:Is any DTC set?**

**YES:** Troubleshoot the combination meter, and then go to Step 5.

**NO:** Go to Step 4.

**STEP 4. M.U.T.-III other system diagnostic trouble code**

Using scan tool, check that the diagnostic trouble code U0121 is not set by the ETACS system.

**Q:Is any DTC set?**

**YES:** Troubleshoot the ETACS, and then go to Step 5.

**NO:** Replace the ASC-ECU, and then go to Step 5.

**STEP 5. Retest the system.****Q:Does the ABS warning light turn ON and OFF normally?**

**YES:** The procedure is complete.

**NO:** Return to Step 1.

---

**Inspection Procedure 7: ASC Indicator Light Stays ON.**

---

M13506100090USA0000010000

**SYSTEM OPERATION**

ASC-ECU sends the illumination request signal of the ASC indicator light to the combination meter through ETACS-ECU via the CAN communication.

**TECHNICAL DESCRIPTION (COMMENT)**

This may be caused by faults in the CAN bus line, ETACS-ECU, combination meter or ASC-ECU.

**PROBABLE CAUSES**

- Damaged wiring harness and connectors
- Malfunction of ETACS-ECU
- Combination meter malfunction
- ASC-ECU malfunction

---

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 2.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.)

---

**STEP 2. M.U.T.-III diagnostic trouble code**

Use scan tool to check the diagnostic trouble code for the ASC system.

**Q:Is any DTC set?**

**YES:** Carry out the diagnosis for the diagnostic trouble code. (Refer to P.35C-11.)

**NO:** Go to Step 3.

---

**STEP 3. M.U.T.-III other system diagnostic trouble code**

Using scan tool, check that the diagnostic trouble code U0141 is not set by the combination meter system.

**Q:Is any DTC set?**

**YES:** Troubleshoot the combination meter, and then go to Step 5.

**NO:** Go to Step 4.

---

**STEP 4. M.U.T.-III other system diagnostic trouble code**

Using scan tool, check that the diagnostic trouble code U0121 is not set by the ETACS system.

**Q:Is any DTC set?**

**YES:** Troubleshoot the ETACS, and then go to Step 5.

**NO:** Replace the ASC-ECU, and then go to Step 5.

---

**STEP 5. Retest the system.****Q:Does the ASC indicator light turn ON and OFF normally?**

**YES:** The procedure is complete.

**NO:** Return to Step 1.

---

**Inspection Procedure 8: ASC-OFF Indicator Light Stays ON.**

---

M13506100091USA0000010000

**SYSTEM OPERATION**

ASC-ECU sends the illumination request signal of the ASC OFF indicator light to the combination meter through ETACS-ECU via CAN communication.

---

**TECHNICAL DESCRIPTION (COMMENT)**

This may be caused by faults in the CAN bus line, ETACS-ECU, combination meter or ASC-ECU.

**PROBABLE CAUSES**

- Damaged wiring harness and connectors
- Malfunction of ETACS-ECU
- Combination meter malfunction
- ASC-ECU malfunction

**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. M.U.T.-III CAN bus diagnostics**

Use scan tool to diagnose the CAN bus lines.

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

**YES:** Go to Step 2.

**NO:** Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.)

---

**STEP 2. M.U.T.-III diagnostic trouble code**

Use scan tool to check the diagnostic trouble code for the ASC system.

**Q: Is any DTC set?**

**YES:** Carry out the diagnosis for the diagnostic trouble code. (Refer to P.35C-11.)

**NO:** Go to Step 3.

---

**STEP 3. ASC switch check**

Refer to P.35C-195.

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

**YES:** Go to Step 4.

**NO:** Replace the ASC switch.

---

**STEP 4. M.U.T.-III other system diagnostic trouble code**

Using scan tool, check that the diagnostic trouble code U0141 is not set by the combination meter system.

**Q: Is any DTC set?**

**YES:** Troubleshoot the combination meter, and then go to Step 6.

**NO:** Go to Step 5.

---

**STEP 5. M.U.T.-III other system diagnostic trouble code**

Using scan tool, check that the diagnostic trouble code U0121 is not set by the ETACS system.

**Q: Is any DTC set?**

**YES:** Troubleshoot the ETACS, and then go to Step 6.

**NO:** Replace the ASC-ECU, and then go to Step 6.

**STEP 6. Retest the system.**

**Q: Does the ASC indicator light turn ON and OFF normally?**

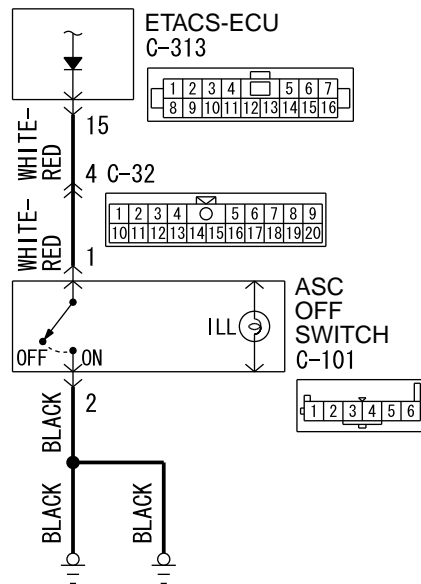
**YES:** The procedure is complete.

**NO:** Return to Step 1.

**Inspection Procedure 9: After ASC Switch is Turned OFF, TCL/ASC System cannot be Disabled.**

M13506100093USA000001000

**ASC OFF Switch Circuit**



D7G35M012A00

**SYSTEM OPERATION**

The ETACS-ECU terminal No. 15 is earthed by pressing the ASC switch. The active or not active state of the ASC switch is transferred from ETACS-ECU to ASC-ECU via the CAN bus line.

**TECHNICAL DESCRIPTION (COMMENT)**

This may be caused by the open circuit in the ASC switch circuit.

**PROBABLE CAUSES**

- Damaged wiring harness and connectors
- ASC switch malfunction
- Malfunction of ETACS-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. Voltage measurement at C-313 ETACS-ECU connector

\*Measure the voltage between the terminal No. 15 and the body ground.

**OK: Approx. 5 volts**

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

**YES:** Go to Step 4.

**NO:** Go to Step 2.

---

### STEP 2. Connector check: C-313 ETACS-ECU connector, C-26 intermediate connector, C-10 ASC switch connector

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

**YES:** Go to Step 3.

**NO:** Repair the defective connector.

---

### STEP 3. ASC switch check

Refer to P.35C-195.

**Q: Does the check result vary?**

**YES:** Repair the wiring harness between the C-313 ETACS-ECU connector terminal No. 15 and the ground.

**NO:** Go to Step 4.

---

### STEP 4. Retest the system.

**Q: Does ASC turn ON and OFF normally using the ASC switch?**

**YES:** An intermittent malfunction may be present. (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-15).

**NO:** Replace the ETACS-ECU, and then go to Step 5.

---

### STEP 5. Retest the system.

**Q: Does ASC turn ON and OFF normally using the ASC switch?**

**YES:** The procedure is complete.

**NO:** Return to Step 1.

---

**Inspection Procedure 10: Abnormality in Brake Operation**

---

M13506100094USA0000010000

**TECHNICAL DESCRIPTION (COMMENT)**

•Although the cause of the trouble cannot be clearly resolved since it depends on the running status and road surface condition, the malfunction of the hydraulic circuit may occur if any diagnostic trouble code is not detected.

**PROBABLE CAUSES**

•Hydraulic unit (HU) malfunction

**DIAGNOSIS****STEP 1. Hydraulic unit (HU) check**

Refer to P.35C-188.

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

**YES:** Go to Step 2.

**NO:** Connect the brake tubes correctly, repair the external brake lines, or replace the hydraulic unit.

**STEP 2. Retest the system.****Q:Can any fault be found with the brake operation?**

**YES:** Check the brake system related components except ABS.

**NO:** The procedure is complete.

---

**Inspection Procedure 11: Traction Control Function or Skid Control Function Inoperative.**

---

M13506100095USA0000010000

**TECHNICAL DESCRIPTION (COMMENT)**

In case of this trouble symptom, traction control function or skid control function operation may be disabled. Diagnostic trouble code may be set by the traction control function or skid control function.

**PROBABLE CAUSES**

- Low battery output
- Wiring harness or connector failure of CAN bus line
- ASC-ECU malfunction

## 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. M.U.T.-III diagnostic trouble code

#### Q:Is any DTC set?

**YES:** Troubleshoot for the relevant diagnostic trouble code.

**NO:** Go to Step 2.

---

### STEP 2. Hydraulic unit (HU) check

Refer to P.35C-188.

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

**YES:** Go to Step 3.

**NO:** Repair the brake pipe or replace ASC-ECU.

---

### STEP 3. Operation check

#### Q:Does traction control function or skid control function operate normally?

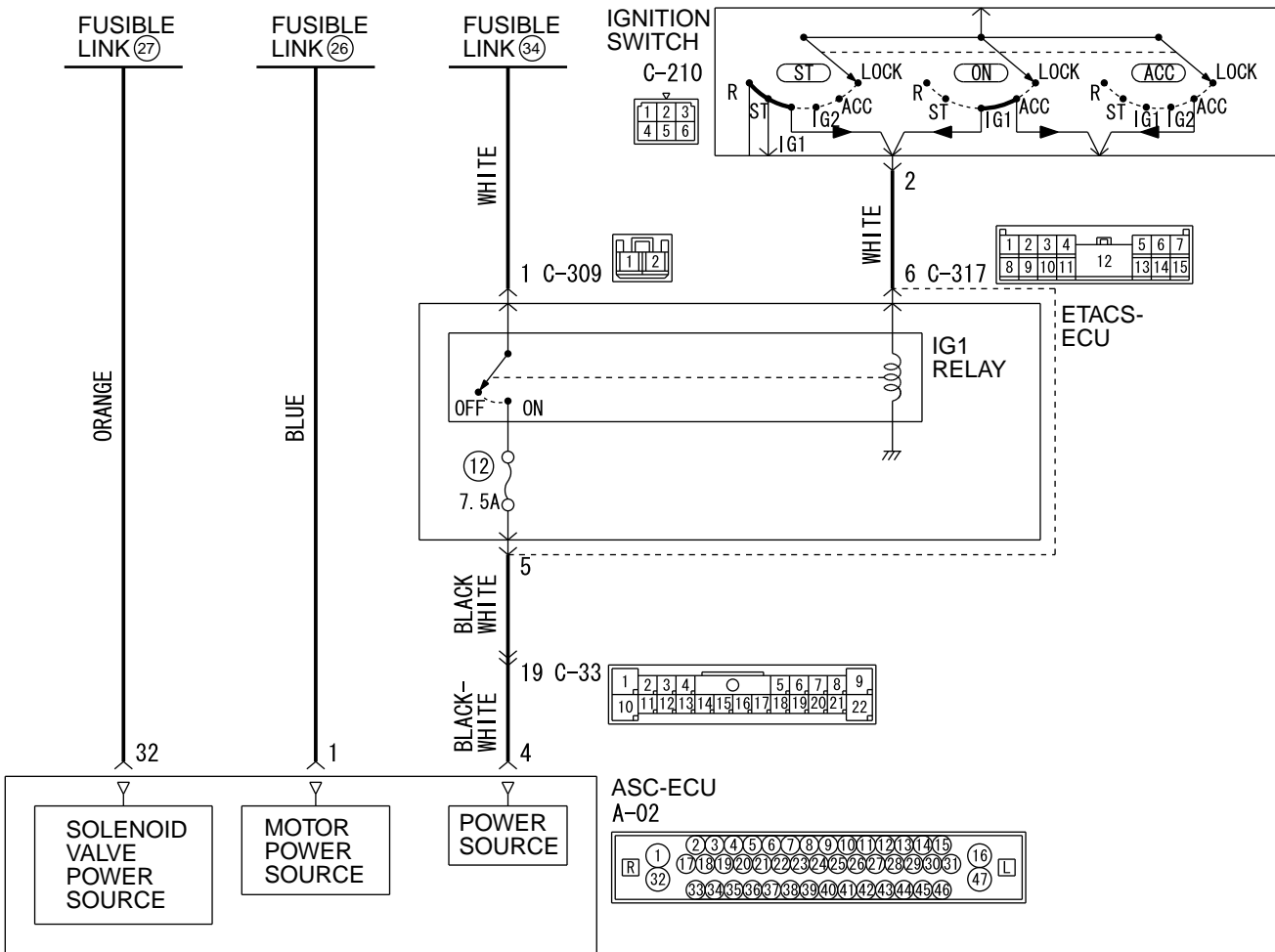
**YES:** The procedure is complete.

**NO:** Check the brake system related components except the ASC.

Inspection Procedure 12: ASC-ECU Power Supply Circuit System

M13506100096USA0000010000

Solenoid Valve, Motor and ASC-ECU Power Supply Circuit



D7G35M009A00

**SYSTEM OPERATION**

- The ASC-ECU power supply signal energized by the ignition switch (IG1) is transmitted to ASC-ECU (terminal No. 4) via the multi-purpose fuse No.12.
- The ASC-ECU power supply and the valve power supply are transmitted to ASC-ECU (terminal No. 32) via the fusible link No. 27.
- When malfunction occurs in ASC-ECU power supply, the communication with scan tool becomes unavailable.

**PROBABLE CAUSES**

- Damaged wiring harness and connectors



- Battery failure
- Charging system failed
- ASC-ECU malfunction

## 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. Voltage measurement at the A-02 ASC-ECU connector

- (1) Disconnect the connector, connect special tool MB991997 to the harness-side connector, and measure the voltage at the special tool connector side.

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

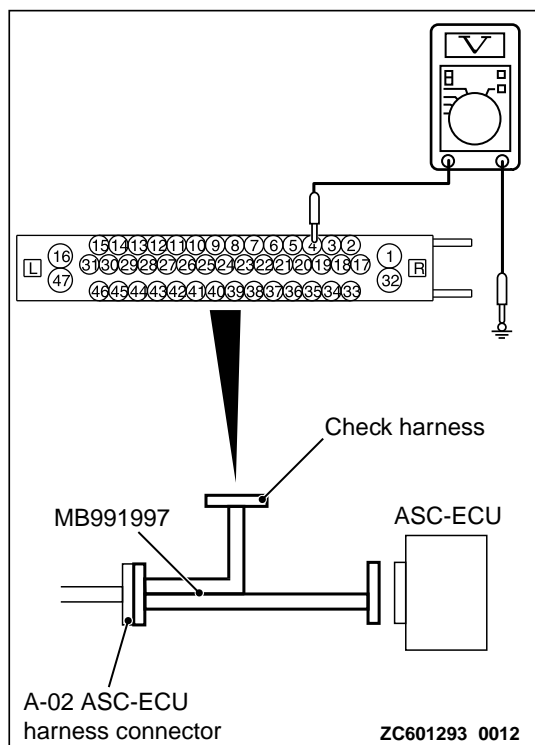
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between terminal No. 4 and body ground.

**OK: 12 volts (Battery voltage)**

### Q:Is the check result normal?

**YES:** Go to Step 2.

**NO:** Go to Step 6.



**STEP 2. Voltage measurement at the A-02 ASC-ECU connector**

- (1) Disconnect the connector, connect special tool MB991997 to the harness-side connector, and measure the voltage at the special tool connector side.

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

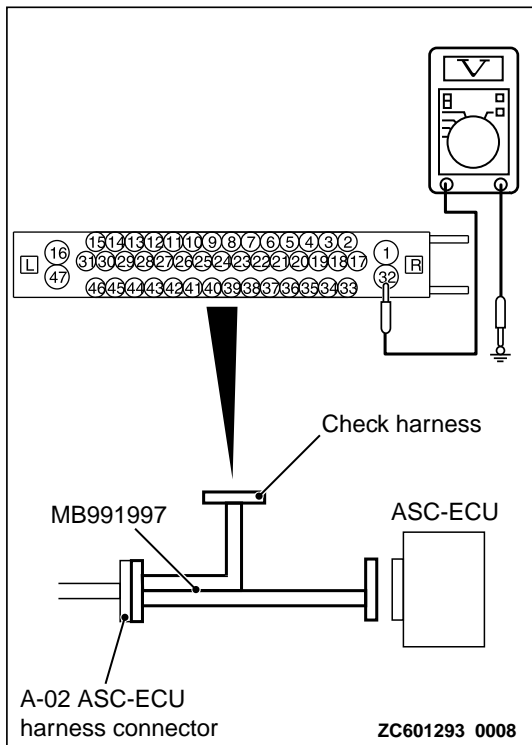
- (2) Turn the ignition switch to the ON position.
- (3) Measure the voltage between the terminal No. 32 and the body ground.

**OK: 12 volts (Battery voltage)**

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

**YES:** Go to Step 4.

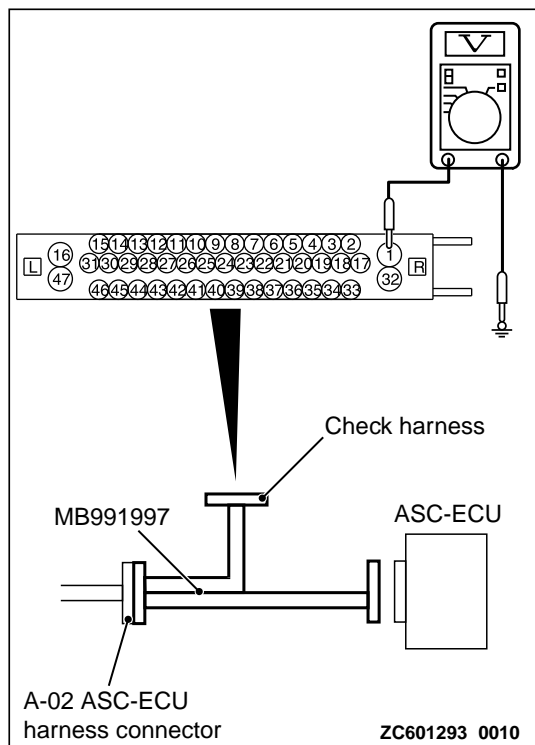
**NO:** Go to Step 3.

**STEP 3. Connector check: A-02 ASC-ECU connector**

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

**YES:** Repair the wiring harness between the fusible link No. 27 and the A-02 ASC-ECU connector terminal No. 32.

**NO:** Repair the defective connector.



#### STEP 4. Voltage measurement at the A-02 ASC-ECU connector

- (1) Disconnect the connector, connect special tool MB991997 to the harness-side connector, and measure the voltage at the special tool connector side.

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

- (2) Turn the ignition switch to the ON position.
- (3) Voltage between the terminal No. 1 and the body ground

**OK: 12 volts (Battery voltage)**

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

**YES:** Go to Step 7.

**NO:** Go to Step 5.

#### STEP 5. Connector check: A-02 ASC-ECU connector

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

**YES:** Repair the wiring harness between the fusible link No. 26 and the A-02 ASC-ECU connector terminal No. 1.

**NO:** Repair the defective connector.

#### STEP 6. Connector check: A-02 ASC-ECU connector, C-33 intermediate connector, C-317 junction block connector, C-210 ignition switch connector

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

**YES:** The open or short circuit may be present in the power supply circuit. Repair the wiring harness between the A-02 ASC-ECU connector terminal No. 4 and the C-210 ignition switch connector.

**NO:** Repair the defective connector.

#### STEP 7. Wiring harness check between the A-02 ASC-ECU connector terminal No. 16/47 and the body ground

\*Check the ground wires for open circuit.

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

**YES:** Go to Step 8.

**NO:** Repair the wiring harness.

#### STEP 8. Battery check

Refer to GROUP 54Aa - Battery Test P.54Aa-2.

#### Q:Is the battery in good condition?

**YES:** Go to Step 9.

**NO:** Charge or replace the battery.

**STEP 9. Charging system check**

Refer to GROUP 16a - Charging System P.16a-8.

**Q:Is the charging system in good condition?****YES:** Go to Step 10.**NO:** Repair or replace the charging system component(s).**STEP 10. Retest the system.****Q:Is the communication with scan tool possible?****YES:** An intermittent malfunction may be present. (Refer to GROUP 00 - How to Cope with Intermittent Malfunction P.00-15.)**NO:** Make sure that the M.U.T.-III cable is properly connected and the V.C.I. switch is ON, and then replace ASC-ECU.**DATA LIST REFERENCE TABLE**

M13506100097USA0000010000

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

The following items of ECU input data can be read using scan tool.

## 1. The system is normal.

Item No.	Check item	Check conditions	Normal conditions
01	FL wheel speed sensor	Perform a test run of the vehicle.	The speedometer display and the scan tool display almost agree with each other.
02	FR wheel speed sensor		
03	RL wheel speed sensor		
04	RR wheel speed sensor		
05	Power supply voltage		10 to 18 V
07	Brake switch (input)		OFF
			ON
			Undefined
			-
08	Lateral G sensor (+: left turn, -: right turn)	Vehicle stopped (level)	-0.11 to 0.11 G
		Running	-1 to 1 G
09	G sensor (+: deceleration, -: acceleration)	Vehicle stopped (level)	-0.11 to 0.11 G
		Running	-1 to 1 G
10	Master cylinder pressure (+: pressure increase, -: pressure decrease)	The brake pedal is depressed.	Increases by the amount of the brake pedal depression.
		The brake pedal is released.	-3 to 3 bar
11	Steering angle (+: left turn, -: right turn)	Vehicle stopped (level)	-6 to 6 deg
		Running	-720 to 720 deg. (ASC-ECU normal detection value)
			-850 to 850 deg. (Sensor normal value as a single unit)
12	Yaw rate sensor (+: left turn, -: right turn)	Vehicle stopped (level)	-3.6 to 3.6 deg/s

**ACTIVE SKID CONTROL SYSTEM (ASC)  
DIAGNOSIS**

**35C-181**

Item No.	Check item	Check conditions	Normal conditions
		Running	-100 to 100 deg/s
14	Brake switch (Stop light switch)	The brake pedal is depressed.	ON
		The brake pedal is released.	OFF
15	Emission test mode		OFF
			ON
26	Brake fluid pressure switch	Brake fluid level is lower than the "LOWER" marking.	Low
		Brake fluid level is higher than the "LOWER" marking.	Normal
		Brake fluid level switch connector is not connected.	Not connected
28	ASC/TCL OFF switch (ASC OFF switch)	ASC is turned ON by the ASC OFF switch.	ON
		ASC is turned OFF by the ASC OFF switch.	OFF
45	SAS OK flag (Steering wheel sensor neutral point learned)	The neutral point learning of the steering wheel sensor is completed.	Comp
		The neutral point learning of the steering wheel sensor (ASC-ECU side) is not completed.	Not Comp (ASC)
		The neutral point learning of the steering wheel sensor (steering wheel sensor side) is not completed.	Not Comp (SAS)
		The neutral point learning of the steering wheel sensor (ASC-ECU side and steering wheel sensor side) is not completed.	Not Comp
65	Engine speed	When the accelerator pedal is depressed (engine started)	The tachometer display and the scan tool display almost agree with each other.
66	Engine torque		Increases by the amount of the brake pedal depression.
67	TP sensor (TPS)		
68	Allow ESP torque request		Not allowed
			Allow
69	Allow ESP torque request (engine)		Not allowed
			Allow
70	Target gear	Shift position; "N" range	N
		Shift position; "D" range	D
		Shift position; "R" range	R
		Shift position; "P" range	P
		Shift position; "-" range	-

**ACTIVE SKID CONTROL SYSTEM (ASC)  
DIAGNOSIS**

Item No.	Check item	Check conditions	Normal conditions
71	Actual gear	Shift position; "N" range	N
		Shift position; "D" range	D
		Shift position; "R" range	R
		Shift position; "P" range	P
		Shift position; "-" range	-
72	Master cylinder pressure offset		
73	Lateral G sensor offset		
86	Ignition switch	Ignition switch is "ON" position	ON
		Ignition switch is "LOCK (OFF)" position	OFF
87	Ignition switch (input)	Ignition switch is "LOCK (OFF)" position	Lock
		Ignition switch is "LOCK (OFF)" position	OFF
		Ignition switch is "ACC" position	ACC2
		Ignition switch is "ACC" position	ACC
		Ignition switch is "ON" position	ON
		Ignition switch is "START" position	Start
		Ignition switch is "-" position	-
88	Vehicle speed	Perform a test run of the vehicle.	The speedometer display and the scan tool display almost agree with each other.
91	Brake pressure sensor	The brake pedal is depressed.	ON
		The brake pedal is released.	OFF
97	Yaw rate sensor offset		
96	G sensor offset		
105	Power supply voltage (input)		10 to 18 V
120	Parking brake switch (Input)	When the parking brake lever is pulled up:	ON
		When the parking brake lever is released:	OFF
128	A.S.C./TCL off switch (input)	When the ASC OFF switch is pressed.	ON
		When the ASC OFF switch is not pressed.	OFF

## 2. System shutdown by ECU

While ASC-ECU is disabled by the diagnostic function, the scan tool displayed data is different from the actual measurement.

## ACTUATOR TEST REFERENCE TABLE

M13506100098USA0000010000

Using scan tool, the following actuators can be forcibly operated:

**NOTE:**

- \*ABS, TCL, and ASC are operated by ASC-ECU.
- \*When ASC-ECU is disabled due to the fail-safe function, the actuator test cannot be performed.
- \*The actuator test can be performed only when the vehicle is stationary.

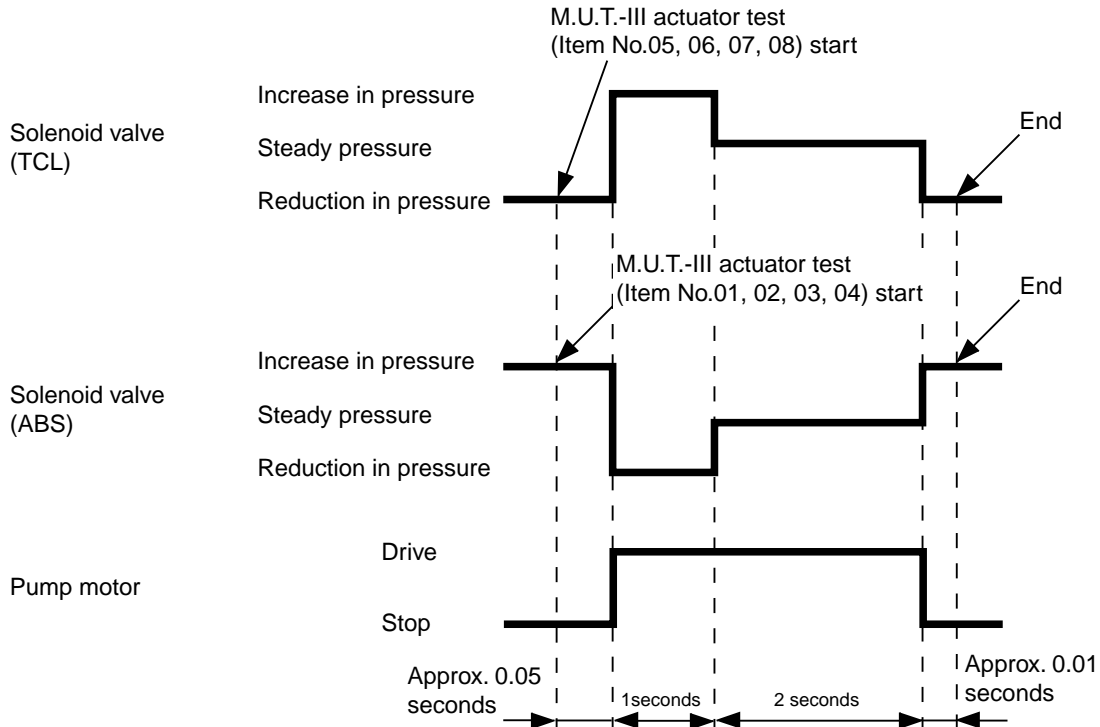
*\*While the actuator test is performed, the ABS warning light flashes at a rate of 2 Hz.*

*\*After the actuator test has been performed, the brake warning light, ABS warning light, ASC ON indicator light, and ASC OFF indicator light illuminate until the ignition switch is turned to ON again or the communication between scan tool and ASC-ECU is terminated.*

### Actuator test specifications

Item No.	Check item	Driven component
01	FL wheel ABS drive	Solenoid valve for the corresponding channel of the hydraulic unit and pump motor (simplified inspection mode)
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	
09	Engine TCL drive	Outputs the engine torque control signal (engine torque = 0 N·m) to the engine ECU for three seconds.

Operation pattern of items 01 to 08



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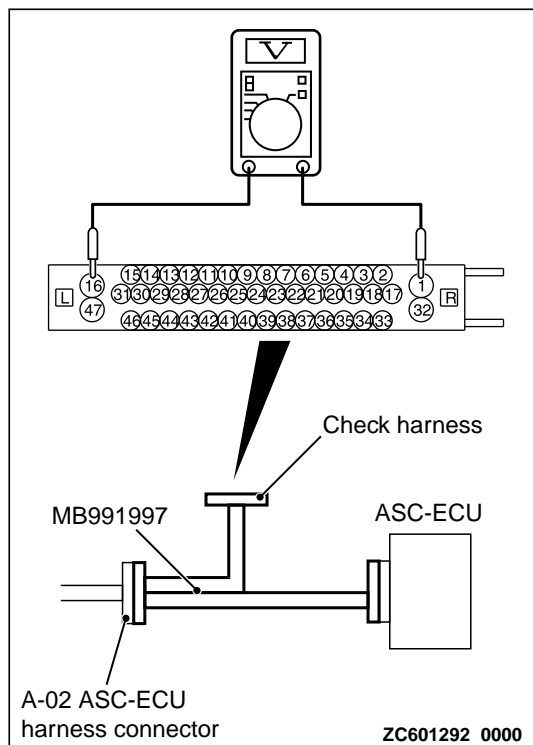
**CHECK AT ECU TERMINALS**

M13506100099USA0000010000

**TERMINAL VOLTAGE CHECK**

Required Special Tool:  
MB991997: ASC Check Harness





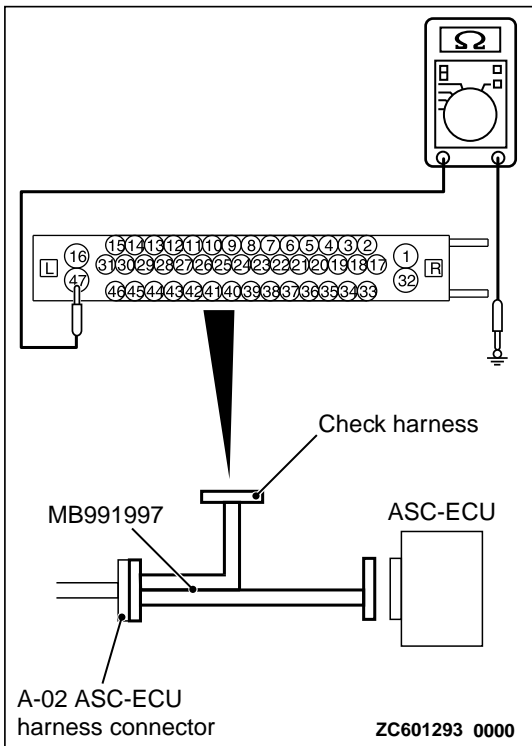
Connect special tool MB991997 to measure the voltage between each check connector terminal and the ground terminal (No. 16 or 47).

Terminal No.	Check item	Check conditions	Normal conditions
1	Motor power supply	Ignition switch: ON (OFF)	Approximately battery voltage
4	ASC-ECU power supply	Ignition switch: ON	Approximately battery voltage
		Ignition switch: OFF	0V
6	G and yaw rate sensor power supply	Ignition switch: ON	Approximately battery voltage
32	Solenoid valve and ASC-ECU power supply	Ignition switch: ON (OFF)	Approximately battery voltage
34	Wheel speed sensor (FR) power supply	Ignition switch: ON	Approximately battery voltage
36	Wheel speed sensor (RL) power supply	Ignition switch: ON	Approximately battery voltage
43	Wheel speed sensor (RR) power supply	Ignition switch: ON	Approximately battery voltage
45	Wheel speed sensor (FL) power supply	Ignition switch: ON	Approximately battery voltage

**RESISTANCE AND CONTINUITY BETWEEN HARNESS-SIDE CONNECTOR TERMINALS**

Required Special Tool:  
MB991997: ASC Check Harness

ACTIVE SKID CONTROL SYSTEM (ASC)  
DIAGNOSIS

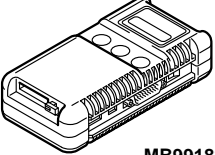
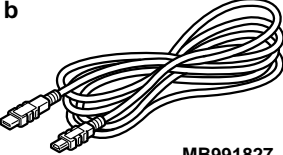
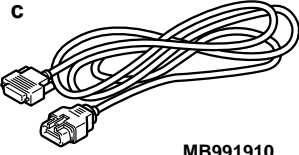
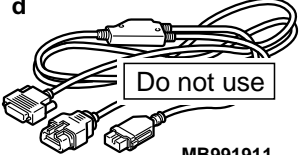
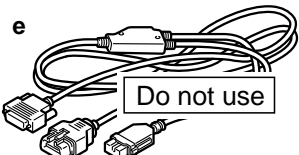
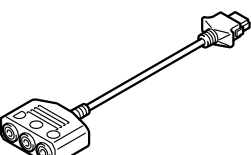
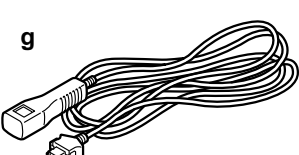



1. When performing the continuity check, turn the ignition switch to LOCK (OFF) position, connect special tool MB991997 as shown in the figure, and disconnect the ASC-ECU connector.
2. Check for continuity between terminals shown in the chart below.
3. Terminal layout is shown in the figure.


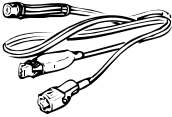
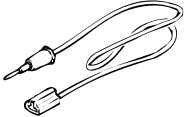
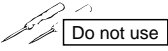
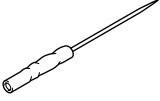
Terminal No.	Signal	Normal conditions
16 - body ground	Ground	2 ohms or less
47 - body ground	Ground	2 ohms or less

SPECIAL TOOL

M13506100002USA0000010000

Tool	Tool number and name	Supersession	Application
<p>a</p>  <p>MB991824</p> <p>b</p>  <p>MB991827</p> <p>c</p>  <p>MB991910</p> <p>d</p>  <p>MB991911</p> <p>e</p>  <p>MB991914</p> <p>f</p>  <p>MB991825</p> <p>g</p>  <p>MB991826 YB9919580000</p>	<p>MB991958</p> <p>a. MB991824</p> <p>b. MB991827</p> <p>c. MB991910</p> <p>d. MB991911</p> <p>e. MB991914</p> <p>f. MB991825</p> <p>g. MB991826</p> <p>M.U.T.-III sub assembly</p> <p>a. Vehicle communication interface (V.C.I.)</p> <p>b. M.U.T.-III USB cable</p> <p>c. M.U.T.-III main harness A (Vehicles with CAN communication system)</p> <p>d. M.U.T.-III main harness B (Vehicles without CAN communication system)</p> <p>e. M.U.T.-III main harness C (for Daimler Chrysler models only)</p> <p>f. M.U.T.-III measurement adapter</p> <p>g. M.U.T.-III trigger harness</p>	<p>MB991824-KIT</p> <p><i>NOTE: G: MB991826 M. U. T. -III Trigger Harness is not necessary when pushing V. C. I. ENTER key.</i></p>	<p><b>CAUTION</b></p> <p><b>M.U.T.-III main harness A (MB991910) should be used. M.U.T.-III main harness B and C should not be used for this vehicle.</b></p> <p>ASC check (Diagnostic trouble code display, service data display and calibration by scan tool )</p>
 <p>MB991997</p>	<p>MB991997</p>	<p>ASC check harness</p>	<p>Voltage inspection at ASC-ECU terminals</p>

ACTIVE SKID CONTROL SYSTEM (ASC)  
ON-VEHICLE SERVICE

Tool	Tool number and name	Supersession	Application
<p>a</p>  <p>b</p>  <p>c</p>  <p>d</p>  <p>YB9912230000</p>	<p>MB991223 a. MB991219 b. MB991220 c. MB991221 d. MB991222</p> <p>Harness set a. Test harness b. LED harness c. LED harness adaptor d. Probe</p>	<p>General service tools</p>	<p>Continuity check and voltage measurement at harness wire or connector for loose, corroded or damaged terminals, or terminals pushed back in the connector.</p> <p>a. Connector pin contact pressure inspection b. Power circuit inspection c. Power circuit inspection d. Commercial tester connection</p>
 <p>MB992006</p>	<p>MB992006 Extra fine probe</p>	<p>-</p>	<p>Continuity check and voltage measurement at harness wire or connector for loose, corroded or damaged terminals, or terminals pushed back in the connector.</p>

ON-VEHICLE SERVICE

HYDRAULIC UNIT CHECK

M13506100101USA0000010000

Required Special Tools:

- MB991958: 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 (Vehicles with CAN communication system)

1. Raise the vehicle using a jack and support the specified points with a rigid rack.

**CAUTION**

**Before connecting or disconnecting scan tool, always turn the ignition switch to the LOCK (OFF) position.**

2. Before setting scan tool, turn the ignition key to the LOCK (OFF) position.
3. Confirm that the selector lever is in the "N" position, and then start the engine.

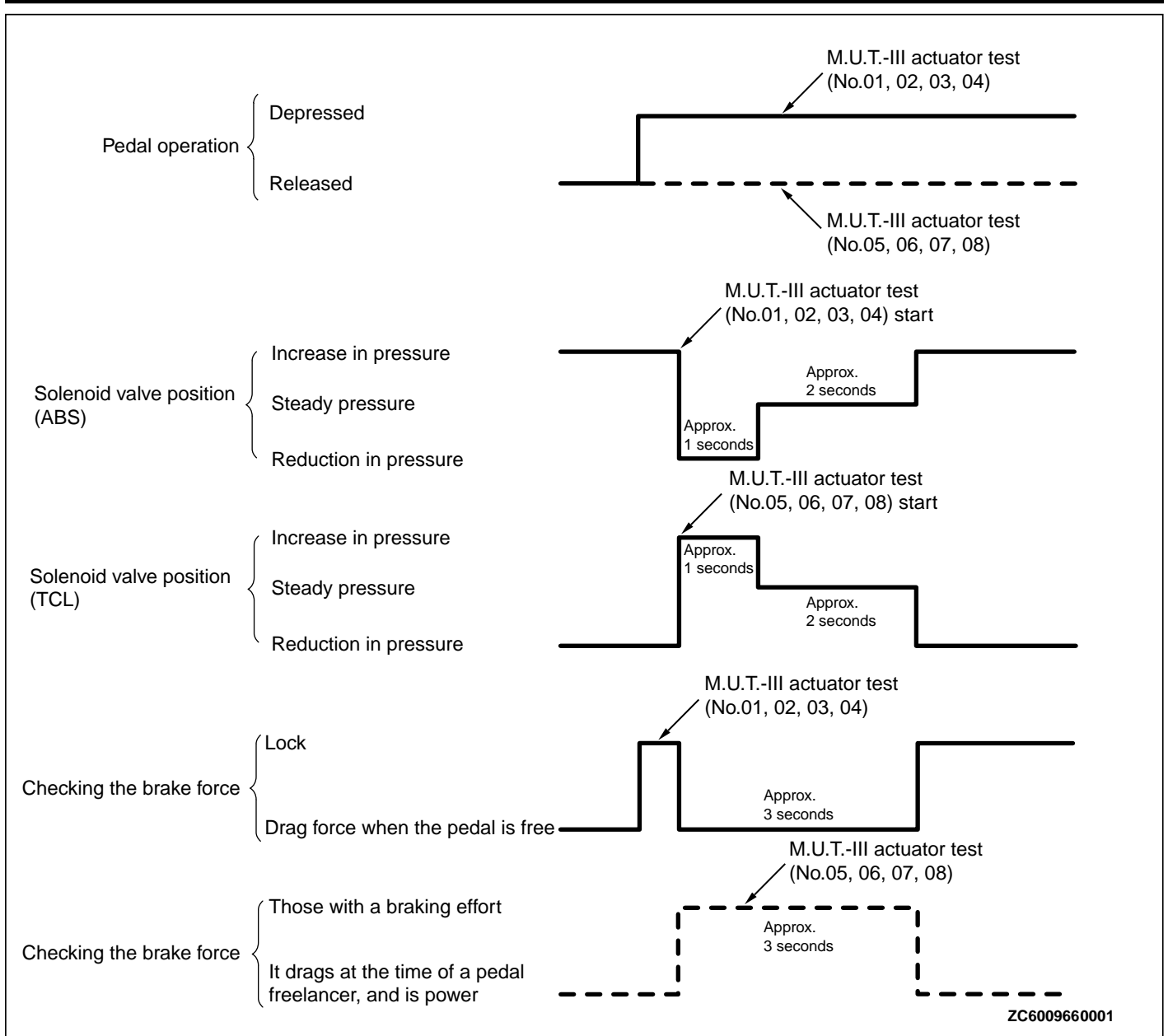
4. When carrying out the actuator tests No. 01 to 04, perform the actuator tests using scan tool while depressing the brake pedal. When carrying out the actuator tests No.05 to 08, perform the actuator tests using scan tool without depressing the brake pedal. When carrying out the actuator tests, rotate the wheel by hands to confirm that the braking force changes.

*NOTE:*

*\*While performing the actuator test, the ABS warning light flashes at a rate of 2 Hz.*

*\*When ASC-ECU is disabled due to the fail-safe function, the M.U.T.-III actuator test cannot be performed.*

*\*After the actuator test has been performed, the ABS warning light, brake warning light, ASC ON indicator light, and ASC OFF indicator light illuminate until the ignition switch is turned to ON again or the communication between scan tool and ASC-ECU is terminated.*



5. This is indicated as shown in the above.

6. When any malfunction has been found, take a necessary action according to the "Judgment Table."

**Judgment Table**

Display on scan tool	Operation	Inspection result	Judgment	Probable cause	Remedy	
01 FL wheel ABS drive	<ul style="list-style-type: none"> <li>Depress the brake pedal to lock the vehicle.</li> <li>Select the vehicle to be inspected using scan tool, perform the actuator test.</li> </ul>	Braking force decreases for 3 seconds from the lock status.	Normal	-	-	
02 FR wheel ABS drive		The wheel does not lock even if the brake pedal is depressed.	Error	Clogged brake line other than hydraulic unit	Check and clean the brake line.	
03 RL wheel ABS drive						
04 RR wheel ABS drive						

Display on scan tool	Operation	Inspection result	Judgment	Probable cause	Remedy
	*Rotate the selected wheel by hands to confirm the braking force.			Clogged hydraulic circuit in the hydraulic unit	Replace the hydraulic unit assembly.
		Braking force does not decrease.		Faulty routing of hydraulic unit brake tube	Route the brake tube correctly.
				Malfunction of hydraulic unit solenoid valve operation	Replace the hydraulic unit assembly.
05 FL wheel TCL drive 06 FR wheel TCL drive 07 RL wheel TCL drive 08 RR wheel TCL drive	*Select the vehicle to be inspected using scan tool, perform the actuator test. *Rotate the selected wheel by hands to confirm the braking force.	Lock condition occurs for 3 seconds from the status without braking force.	Normal	-	-
		The wheel does not lock.	Error	*Faulty routing of hydraulic unit brake tube *Clogged brake line other than hydraulic unit	Check and clean the brake line.
				Clogged hydraulic circuit in the hydraulic unit	Replace the hydraulic unit assembly.

7. After the inspection, turn the ignition switch to the LOCK (OFF) position, and then disconnect scan tool.

## IN THE EVENT OF A DISCHARGED BATTERY

M13506100102USA0000010000

### **WARNING**

***If the ASC is not operating, the vehicle will be unstable during braking, Do not drive the vehicle with the ASC-ECU connector disconnected or with the ASC not operating.***

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 ASC 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

M13506100103USA0000010000

### **CAUTION**

**Prior to calibration, check that no G and yaw rate sensor-related diagnosis codes are set.**

**⚠ CAUTION**

After the following procedure is complete, carry out calibration to let the ASC-ECU learn the neutral position of the G and yaw rate sensor.

- G and yaw rate sensor replacement
- ASC-ECU replacement

1. Park the vehicle on a level surface.

**⚠ CAUTION**

Before connecting or disconnecting the scan tool, turn the ignition switch to the "LOCK" (OFF) position.

2. Set the scan tool with the ignition "LOCK" (OFF).
3. Turn the ignition switch to the ON position.
4. Select the relevant system from the menu.
5. Select "ABS/ASC/ASTC" from the system lists in "System select", and press "OK" button.
6. Select "Special function" in "ABS/ASC/ASTC".
7. Select "Sensor calibration" in "Special function".
8. Select "G sensor calibration" from the selected item, and press "OK" button.
9. The screen displays "G sensor calibration: The selected command will be executed. Are you sure? Caution: Please check the execution conditions." Then press "OK" button.
10. "Execute: The command was executed." will be shown. Then press "OK" button.
11. Select "Lateral/G sensor calibration" from the selected item, and press "OK" button.
12. The screen displays "Lateral/G sensor calibration: The selected command will be executed. Are you sure? Caution: Please check execution conditions." Then press "OK" button.
13. "Executed: The command was executed." will be shown. Then press "OK" button.
14. Learning neutral point complete
15. Turn the ignition switch to "LOCK" (OFF) position and then disconnect the scan tool.

**STEERING WHEEL SENSOR CALIBRATION**

M13506100104USA0000010000

**⚠ CAUTION**

After the following procedures are complete, perform the operations below.

1. Revise the neutral point which the steering wheel sensor stores.
2. Reset the steering angle compensation value which the ASC-ECU stores.
  - Front alignment
  - Steering wheel sensor (column switch assembly) replacement, removal and installation
  - ASC-ECU replacement



**⚠ CAUTION**

- Prior to calibration, check that no steering wheel sensor-related diagnosis codes are set.
- If diagnosis codes other than C121A have set, proceed to the relevant troubleshootings.

1. Place the vehicle on a level surface with its road wheels in the straight ahead position.

**⚠ CAUTION**

**Before connecting or disconnecting the scan tool, turn the ignition switch to the "LOCK" (OFF) position.**

2. Set the scan tool with the ignition at "LOCK" (OFF).
3. Ignition switch: ON
4. Select the relevant system from the menu.
5. Select "Steering angle sensor" from the system list in "System select", and press "OK" button.
6. Select "Special function" under "Steering angle sensor".
7. Select "SAS Calibration" under "Special function".

*NOTE: If the steering angle sensor neutral point has been learned, the display will show "If SAS needs re-calibration, execute SAS calibration after executing SAS initialization". If yes, press "OK" button.*

8. As "SAS initialization" is selected under "SAS Calibration", press "OK" button.

*NOTE: At this time, if the steering angle sensor neutral point has been learned, the display will show "Do you want to start? Note This operation will clear DTCs". Then, press "OK" button.*

9. The display should show "Completed." Press "OK" button.
10. Press the OK button.
11. The display should show "SAS Calibration: Do you want to start?". Then press the OK button.

*NOTE: Please execute after making a tire and a steering wheel straight.*

12. The display should show "Completed." Press "OK" button.
13. Turn the ignition switch to "LOCK" (off) position, and then turn the ignition switch ON again.
14. Select the relevant system from the menu.
15. Select "ABS/ASC/ASTC" from the system list under "System select", and press "OK" button.
16. Select "Special function" under "ABS/ASC/ASTC".
17. Select "Sensor calibration" under "Special function".
18. Select "SAS calibration" under "Sensor calibration", and press "OK" button.
19. The screen displays "SAS calibration: The selected command will be executed. Are you sure? Caution: Confirm the execution conditions." Then press "OK" button.
20. "Executed: The command was executed." will be shown. Then press "OK" button.

21. Select "Diagnostic trouble code" under "ABS/ASC/ASTC". If the diagnostic trouble code "C2205 SAS internal failure (past trouble)" is set, clear it.
22. Learning neutral point complete
23. Turn the ignition switch to "LOCK" (OFF) position and then disconnect the scan tool.

## BRAKE FLUID PRESSURE SENSOR CALIBRATION

M13506100105USA0000010000

### CAUTION

Prior to calibration, check that no brake fluid pressure sensor-related diagnosis codes are set.

### CAUTION

After the following procedure is complete, carry out calibration to let the ASC-ECU learn the neutral position of the brake fluid pressure sensor.

- During diagnosis according to diagnostic trouble code No. C123A
- ASC-ECU replacement

### CAUTION

During the calibration, the brake pedal should be released (the stoplight switch should be off).

1. Park the vehicle on a level surface.

### CAUTION

Before connecting or disconnecting the scan tool, turn the ignition switch to the "LOCK" (OFF) position.

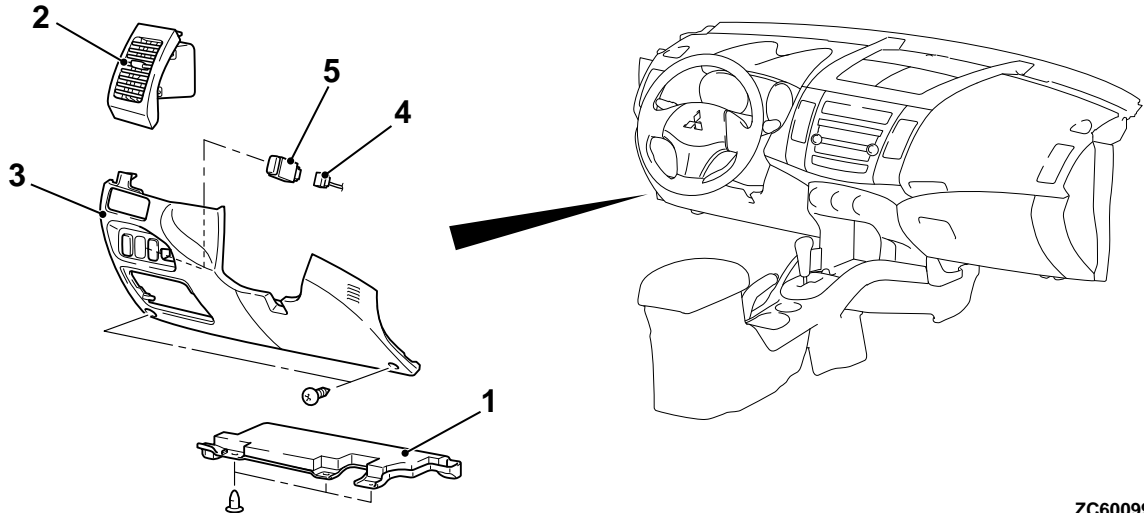
2. Set the scan tool with the ignition at "LOCK" (OFF).
3. Turn the ignition switch to the ON position.
4. Select the relevant system from the menu.
5. Select "ABS/ASC/ASTC" from the system list under "System select", and press "OK" button.
6. Select "Special function" under "ABS/ASC/ASTC".
7. Select "Sensor calibration" under "Special function".
8. Select "M/C pressure sensor calibration" from the selected item, and press "OK" button.
9. The screen displays "M/C pressure sensor calibration: The selected command will be executed. Are you sure? Caution: Please check execution conditions." Then press "OK" button.
10. "Executed: The command was executed." will be shown. Then press "OK" button.
11. Learning neutral point complete
12. Turn the ignition switch to "LOCK" (OFF) position and then disconnect the scan tool.

## ASC OFF SWITCH

### REMOVAL AND INSTALLATION

M13506100107USA0000010000

*NOTE: Refer to GROUP 52A - Instrument Panel Assembly for the clip location P. 52A-7.*



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#### Removal steps

1. Bottom cover assembly (driver side)
2. Side air outlet
3. Lower panel assembly

#### Removal steps

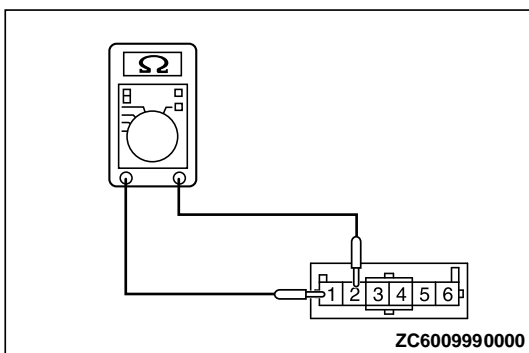
4. ASC OFF switch connector
5. ASC OFF switch

### INSPECTION

M13506100108USA0000010000

#### ASC OFF SWITCH CONTINUITY CHECK

1. As shown in the figure, connect the circuit tester to the ASC OFF switch terminals No. 1 and No. 2 as a single unit.
2. If continuity is detected when the ASC OFF switch is pressed and if not detected when the switch is released, the ASC OFF switch is in good condition.



HYDRAULIC UNIT

REMOVAL AND INSTALLATION

M13506100110USA0000010000

NOTE: ASC-ECU is located in the hydraulic unit.

of the steering wheel sensor and the G and yaw rate sensor. (Refer to P.35C-191 and P.35C-192.)

**CAUTION**

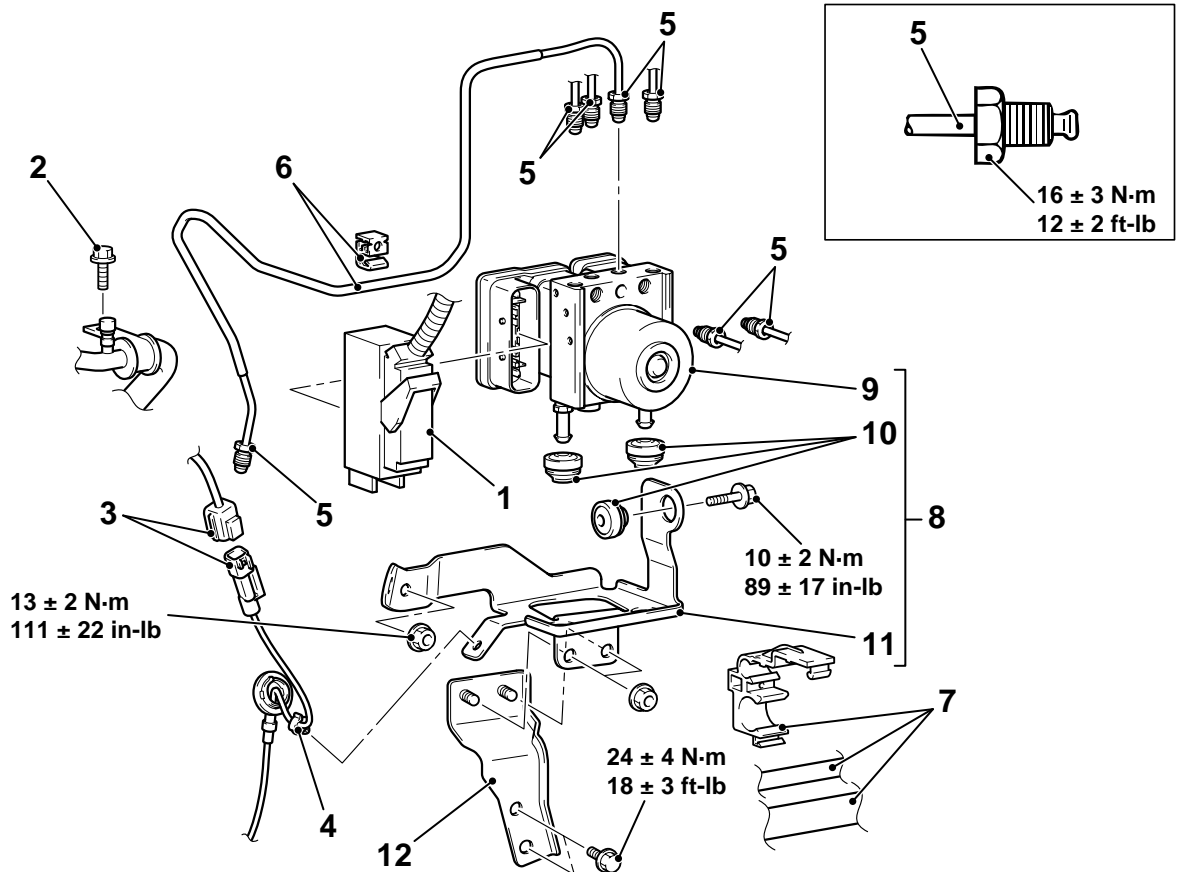
When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration

**Pre-removal operation**

- Strut tower bar removal (Refer to GROUP 42Aa - Strut Tower Bar P.42Aa-11.)
- Brake fluid draining
- Intake manifold plenum removal (Refer to GROUP 15 - Intake Manifold Plenum P.15-7.)

**Post-installation operation**

- Intake manifold plenum installation (Refer to GROUP 15 - Intake Manifold Plenum P.15-7.)
- Brake fluid refilling and air bleeding (Refer to GROUP 35A - On-vehicle Service, Brake Fluid Level Inspection and Bleeding P.35A-18.)
- Strut tower bar installation (Refer to GROUP 42Aa - Strut Tower Bar P.42Aa-11.)
- Hydraulic unit check (Refer to P.35C-188.)



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**Removal steps**

1. ASC-ECU harness connector
2. Suction pipe installation bolt
3. Wheel speed sensor harness connector connection
4. Wheel speed sensor harness clip connection

>>A<<

**Removal steps**

5. Brake tube connection
6. Brake tube and clip connection
7. Suction pipe, liquid pipe and clip connection
8. Hydraulic unit (ASC-ECU) and hydraulic unit bracket

	Removal steps	Removal steps
<<A>>	9. Hydraulic unit (ASC-ECU)	12. Hydraulic unit bracket A
	10. Hydraulic unit bracket insulator	
	11. Hydraulic unit bracket B	

## REMOVAL SERVICE POINTS

### <<A>> HYDRAULIC UNIT (ASC-ECU) REMOVAL

#### **CAUTION**

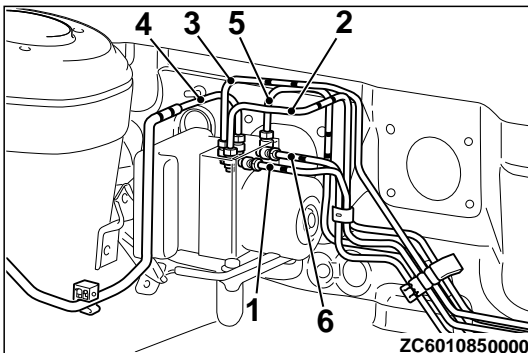
- Be careful when removing the hydraulic unit because it is heavy.
- Never loosen the nuts and the bolts because the hydraulic unit cannot be disassembled.
- Do not drop or shock the hydraulic unit.
- Do not turn the hydraulic unit upside down or lay down the unit because the inner air becomes difficult to be bled.

## INSTALLATION SERVICE POINTS

### >>A<< BRAKE TUBE CONNECTION

Install the brake pipe to the hydraulic unit as shown in the figure.

1. To rear brake (RH) <Marking color: White>
2. From master cylinder (secondary) <Marking color: Yellow and white>
3. To front brake (LH) <Marking color: Red and white>
4. To front brake (RH) <Marking color: Orange and white>
5. From master cylinder (primary) <Marking color: Blue and white>
6. To rear brake (LH) <Marking color: Pink>



## WHEEL SPEED SENSOR

### REMOVAL AND INSTALLATION

Refer to GROUP 35B, Wheel Speed Sensor P.  
35B-152.

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### WHEEL AND TIRE INSPECTION

Refer to GROUP 35B, Wheel and Tire Inspection P.  
35B-155.

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## G AND YAW RATE SENSOR

## REMOVAL AND INSTALLATION

**CAUTION**

- Do not drop or shock the G and yaw rate sensor.

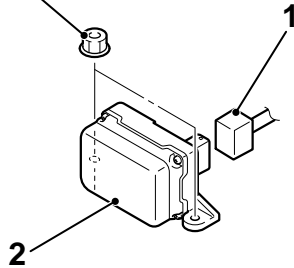
## Pre-removal and post-installation steps

- SRS control unit (SRS-ECU) removal and installation Refer to GROUP 52B - SRS Control Unit (SRS-ECU) P.52B-326.

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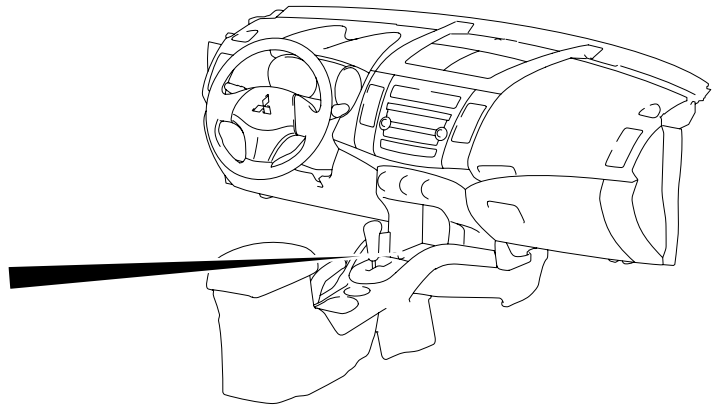
When the G and yaw rate sensor is replaced, always carry out calibration to make ASC-ECU learn the neutral point. (Refer to P.35C-191.)

5.0 ± 1.0 N·m  
44 ± 9 in·lb



## Removal steps

- Harness connector



## Removal steps

- G and yaw rate sensor

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## STEERING WHEEL SENSOR

## REMOVAL AND INSTALLATION

**CAUTION**

- Always align the center of the clock spring before installing the steering wheel sensor. Otherwise, the sensor can be damaged.
- If the center of the clock spring is not correctly aligned, the steering wheel may not be turned fully or the cable inside the clock spring may be broken, causing the SRS air bag to be inoperative or operated incorrectly.

## Pre-removal operation

- Air bag module assembly and steering wheel assembly removal (Refer to GROUP 37 - Steering Wheel P.37-20.)

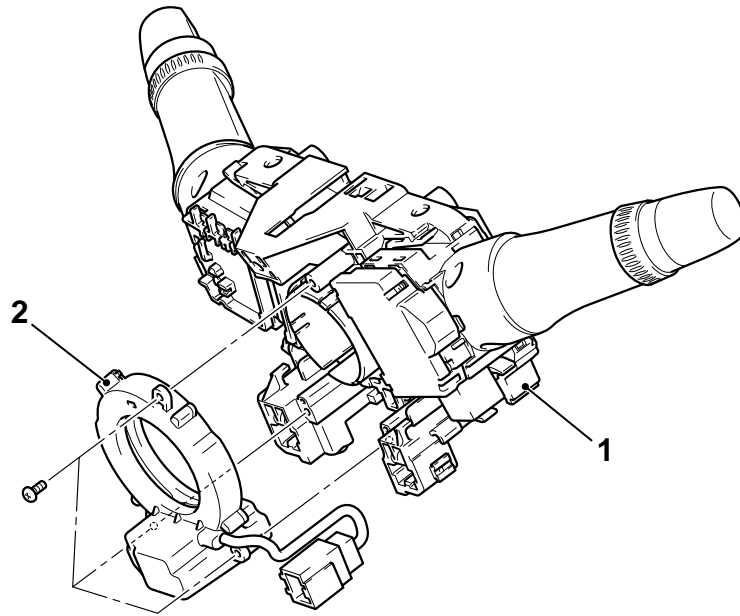
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- Before removing the steering wheel/air bag module assembly, refer to GROUP 52B - Service Precautions P.52B-28 and Air Bag Module Clock Spring P.52B-329.

- When the steering wheel sensor is replaced, always carry out calibration to make ASC-ECU learn the neutral point. (Refer to P.35C-192.)

## Post-installation operation

- Airbag module assembly and steering wheel assembly installation (Refer to GROUP 37 - Steering Wheel P.37-20.)
- Perform steering wheel calibration. (Refer to P.35C-192.)



ZC6011230000

**Removal steps**

- Position the front wheels in a straight ahead direction.
1. Clock spring/column switch assembly (Refer to GROUP 52B - SRS Control Unit P.52B-326.)

>>A<<

**Removal steps**

2. Steering wheel sensor

>>A<<

## INSTALLATION SERVICE POINTS

### A NEUTRAL POSITIONING OF STEERING WHEEL SENSOR

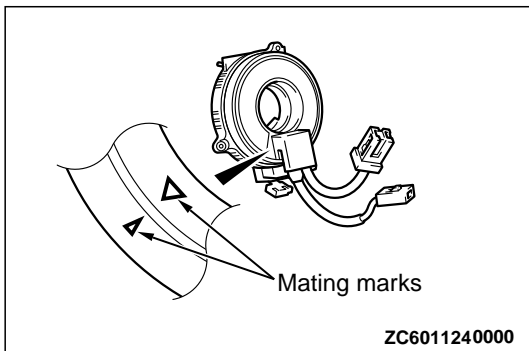
**⚠ CAUTION**

- Always align the center of the clock spring before installing the steering wheel sensor. Otherwise, the sensor can be damaged.
- If the center of the clock spring is not correctly aligned, the steering wheel may not be turned fully or the cable inside the clock spring may be broken, causing the SRS air bag to be inoperative or operated incorrectly.

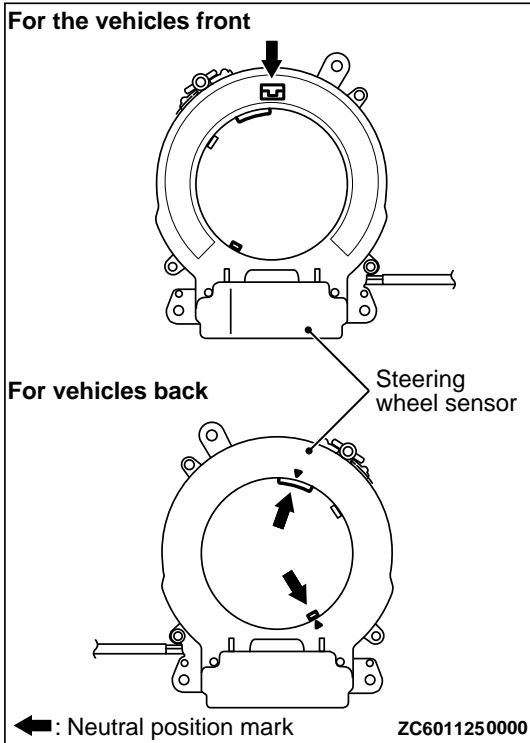
1. Align the mating marks of the clock spring.

Alignment of mating marks

- (1) Turn the clock spring clockwise fully.
- (2) Turn the clock spring counterclockwise approximately three and 3/4 turns to align the mating marks.
- (3) Install the clock spring to the column switch.



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**CAUTION**

Always align three mating marks of the steering wheel sensor simultaneously as shown in the figure. If these mating marks are not aligned correctly, the steering wheel sensor may be damaged.

2. Align three mating marks of the steering wheel sensor simultaneously as shown in the figure.

Alignment of mating marks

- (1) Check the window for inspecting the neutral position of the steering wheel sensor. If the mating marks cannot be seen from the window, align the mating marks as shown in the figure.
- (2) Install the steering wheel sensor to the column switch assembly, maintaining the neutral position correctly.

*NOTE: A new steering wheel sensor has a pin for preventing the rotation of (fixing) the steering wheel sensor. After installing the column switch assembly, remove this pin.*

- (3) Install the column switch assembly to the vehicle, maintaining the neutral position correctly.