GROUP 35C

ACTIVE STABILITY CONTROL SYSTEM (ASC)

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GENERAL INFORMATION

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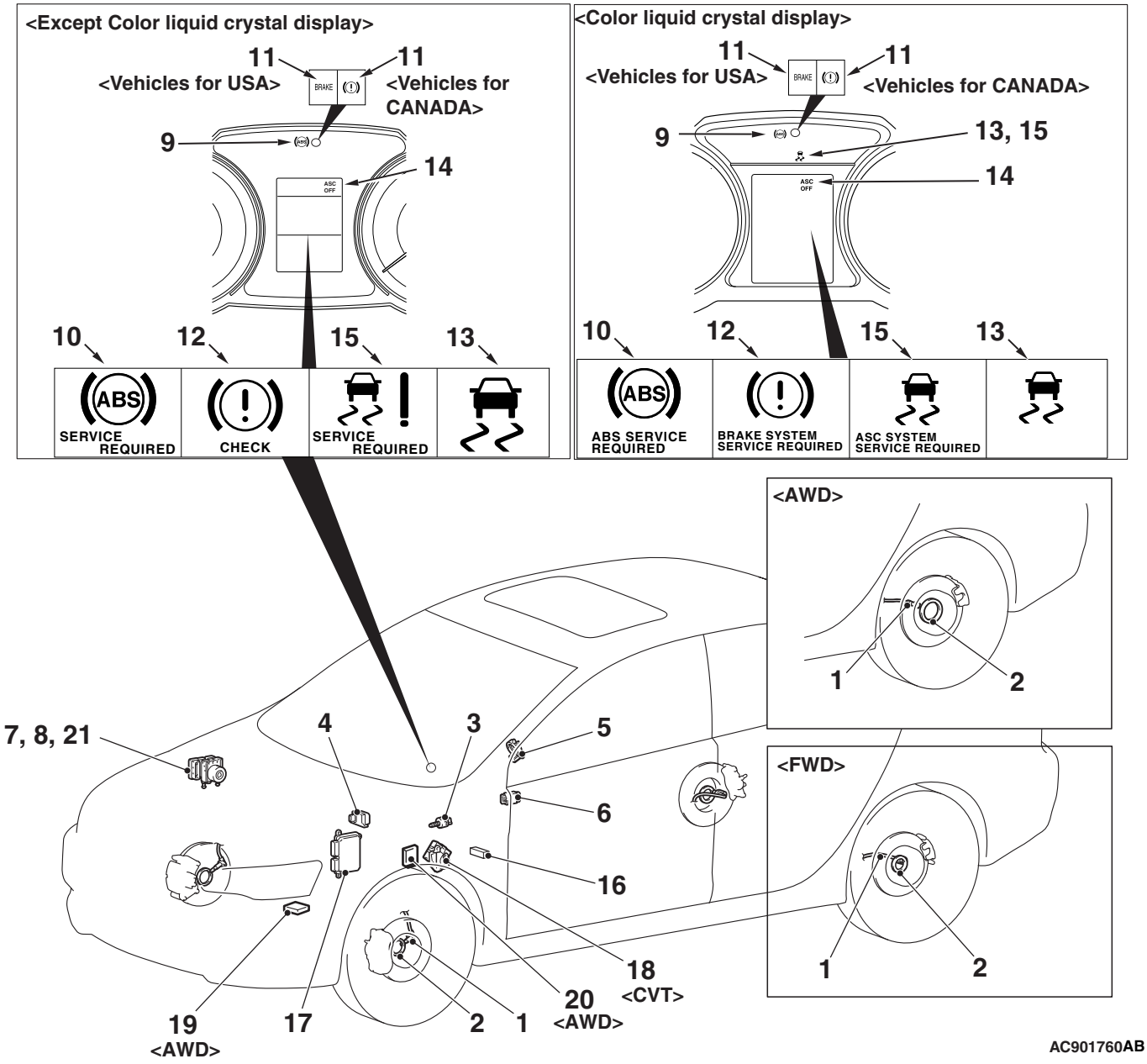
Active Stability Control System (ASC) has been installed.

- ASC is the system which has the function to ensure the stability at the limit of steering with TCL function as well as ABS (Anti-skid Brake System) and EBD (Electronic Brake-force Distribution). To realize that, the suction valve, cut valve and the pressure sensor have been added.
- When TCL detects the slip of the driving wheel (ex. during startup on low μ road), it automatically applies the brakes to the slipping driving wheel. At the same time, TCL reduces the engine output and prevents the wheel spin when it determines that the engine torque is too high for the road surface μ.
- When the ASC-ECU determines that the vehicle is in a dangerous condition, it reduces the engine output and applies brake force to four wheels independently to control the vehicle behavior, avoiding the critical state.
- ASC has been added to the transmission <twin clutch sport shift transmission (TC-SST)[*1]> and active center differential (ACD)[*2] control, and the controls are integrated to improve the vehicle stability <Vehicles with AWD>.
- Hill Start Assist (HSA) function has been adopted to hold and prevent the roll back of the vehicle when the vehicle is on a slope and the foot is transferred from the brake pedal to the accelerator pedal <Vehicles with HSA>.
- By the integrated control with the anti-skid brake system (ABS), the system stabilizes the vehicle attitude and at the same time secures the driving force.

NOTE:

- *[*1]: For the details on twin clutch sport shift transmission (TC-SST), refer to GROUP 22C – Twin Clutch Sport Shift Transmission (TC-SST) P.22C-3.*
- *[*2]: For the details on active center differential (ACD), refer to GROUP 22C – Active Center Differential (ACD) P.22C-3.*

CONSTRUCTION DIAGRAM



MAIN COMPONENTS AND FUNCTIONS

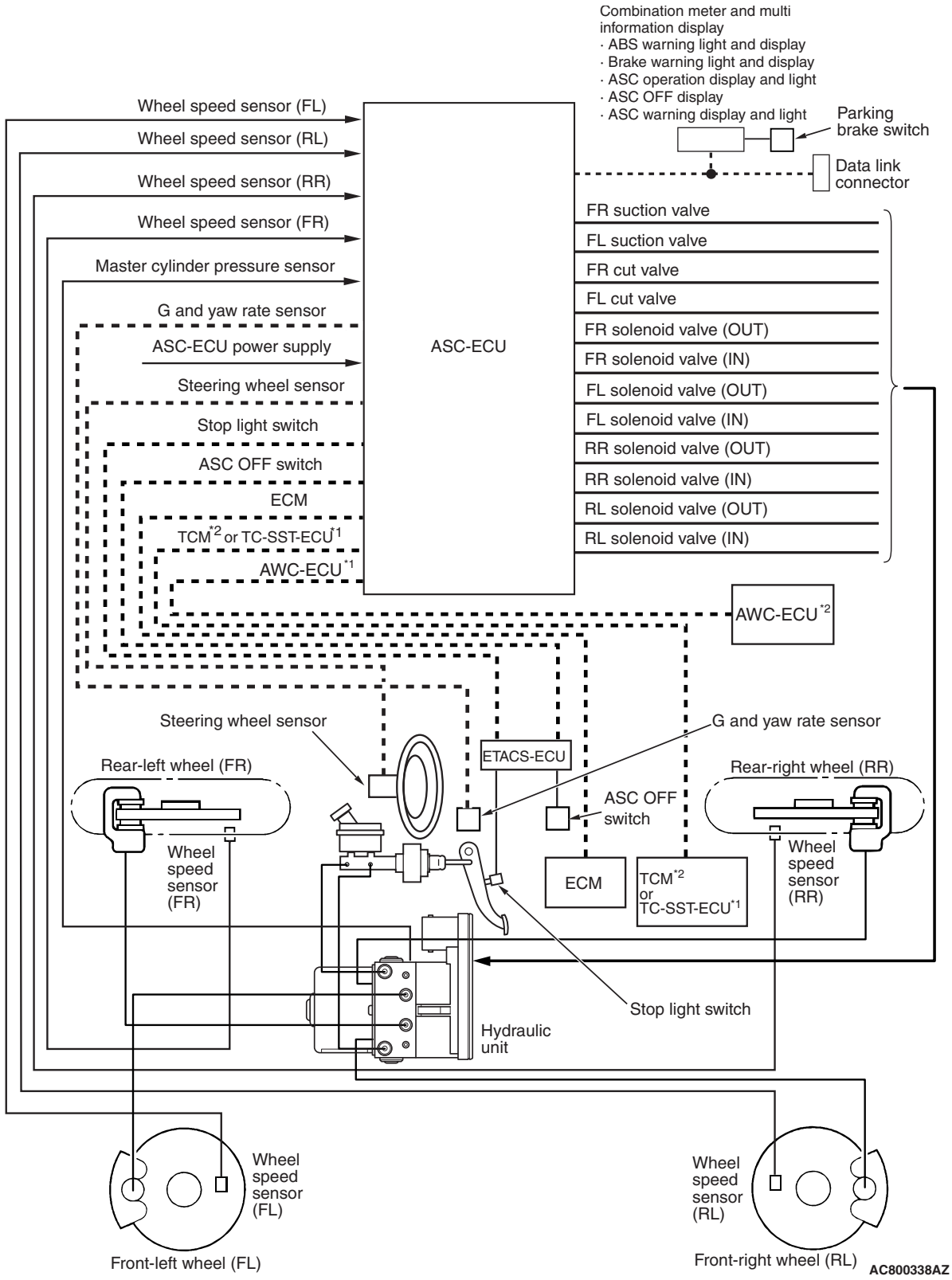
Name of part		Number	Functional description
Sensor	Wheel speed sensor	1	Outputs the frequency signal in proportion to the rotation speed of each wheel to ASC-ECU.
	Magnetic encoder for wheel speed detection	2	The wheel speed sensor is a pulse generator. When the magnetic encoder for wheel speed detection (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.
	Stop light switch	3	Outputs the signal indicating whether the brake pedal is depressed or not to ASC-ECU.
	G & yaw rate sensor	4	Detects longitudinal 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 for ASC to ASC-ECU.
	Brake fluid pressure sensor	7	Integrated into the hydraulic unit, and outputs the signal for the brake fluid pressure in the master cylinder to ASC-ECU.
Actuator	Hydraulic unit	8	Drives the solenoid valve using the signal from ASC-ECU, and controls the brake fluid pressure for each wheel.
	ABS warning light	9	Informs the driver of the system status by illuminating, flashing, or turning off the ABS warning light according to the signal from ASC-ECU.
	ABS warning display	10	Informs the driver of the system status by illuminating or turning off the ABS warning display according to the signal from ASC-ECU.
	Brake warning light	11	Used as the brake warning light for the parking brake, brake fluid level, and EBD control. Informs the driver of the system status by illuminating or turning off the brake warning light according to the signal from ASC-ECU.
	Brake warning display	12	Used as the brake warning display for the brake fluid level, and EBD control. Informs the driver of the system status by illuminating or turning off the brake warning display according to the signal from ASC-ECU.
	ASC operation display and light[*3]	13	Informs the driver of the system status by flashing when the system operates according to the signal from ASC-ECU.
	ASC OFF display	14	Informs the driver of the system shutdown by illuminating by the signal from ASC-ECU. Informs the driver that the brake system overheats and the brake TCL stops by flashing the ASC OFF display for the duration of approximately 2 Hz.
	ASC warning display and light[*3]	15	TCL function and skid control function use the same display and light[*3]. Depending on the signal from ASC-ECU, the ASC warning display and light[*3] informs the driver of the system status by illuminating when the system has malfunction.
Data link connector		16	Sets the diagnostic trouble code and establishes the communication with scan tool.

Name of part	Number	Functional description
Engine control module (ECM)	17	Controls the engine output based on the signal from ASC-ECU.
TCM*2	18*2	TCM performs integrated control with ASC-ECU. Output the gear position to ASC-ECU.
TC-SST ECU*1	19*1	TC-SST-ECU performs integrated control with ASC-ECU. Outputs the gear position to ASC-ECU.
AWC ECU*1	20*1	Outputs the drive status to ASC-ECU. AWC-ECU performs integrated control with ASC-ECU.
ASC control unit (ASC-ECU)	21	Controls the actuators (hydraulic unit) based on the signals sent from sensors.
		Controls the self-diagnostic function and fail-safe function.
		Controls diagnostic function (Compatible with scan tool).

NOTE:

- **1: AWD*
- **2: CVT*
- **3: Color liquid crystal display*

SCHEMATIC DIAGRAM



NOTE:

- *Dashed lines indicate the CAN bus line.*
- **1: AWD*
- **2: CVT*

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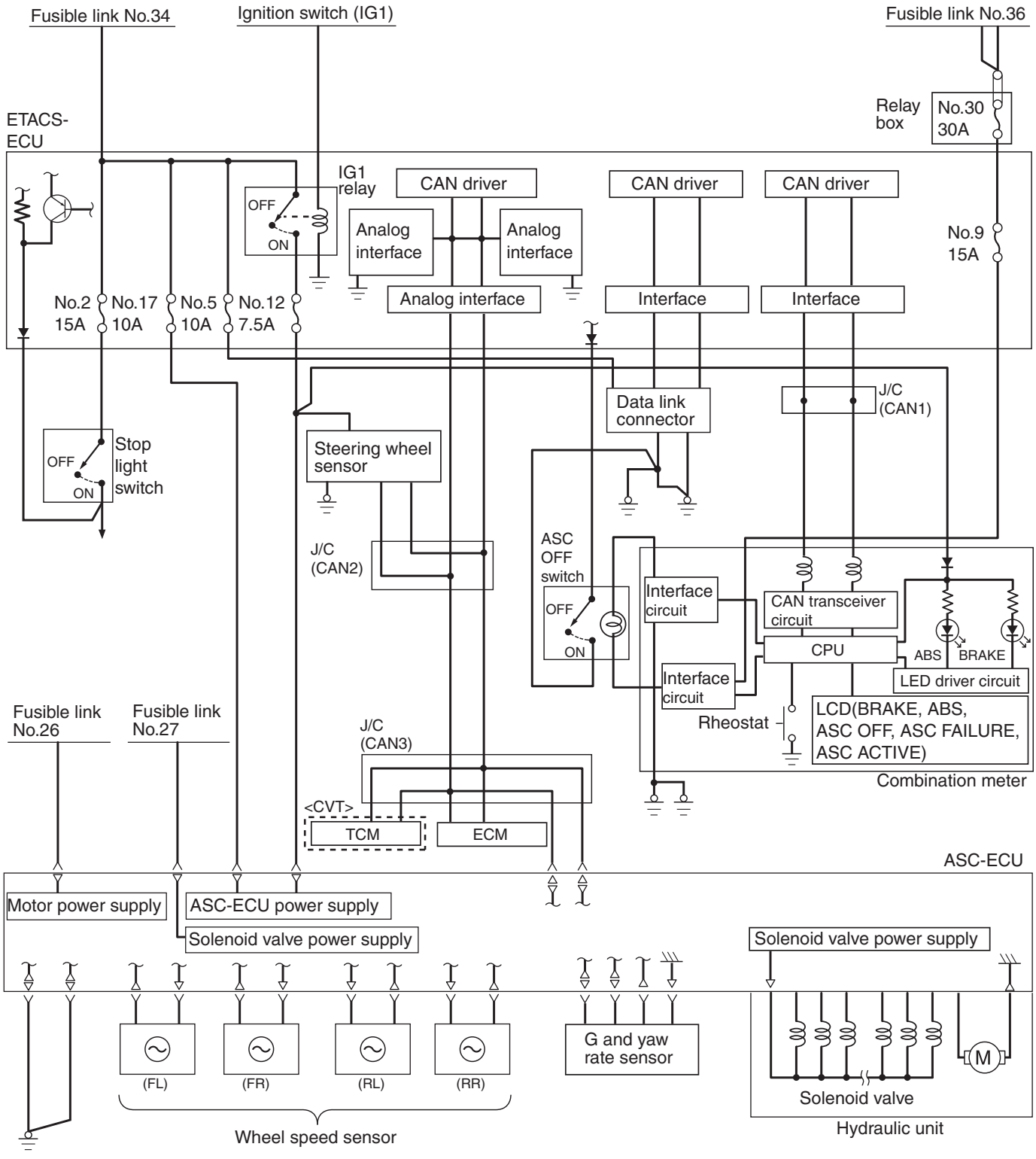
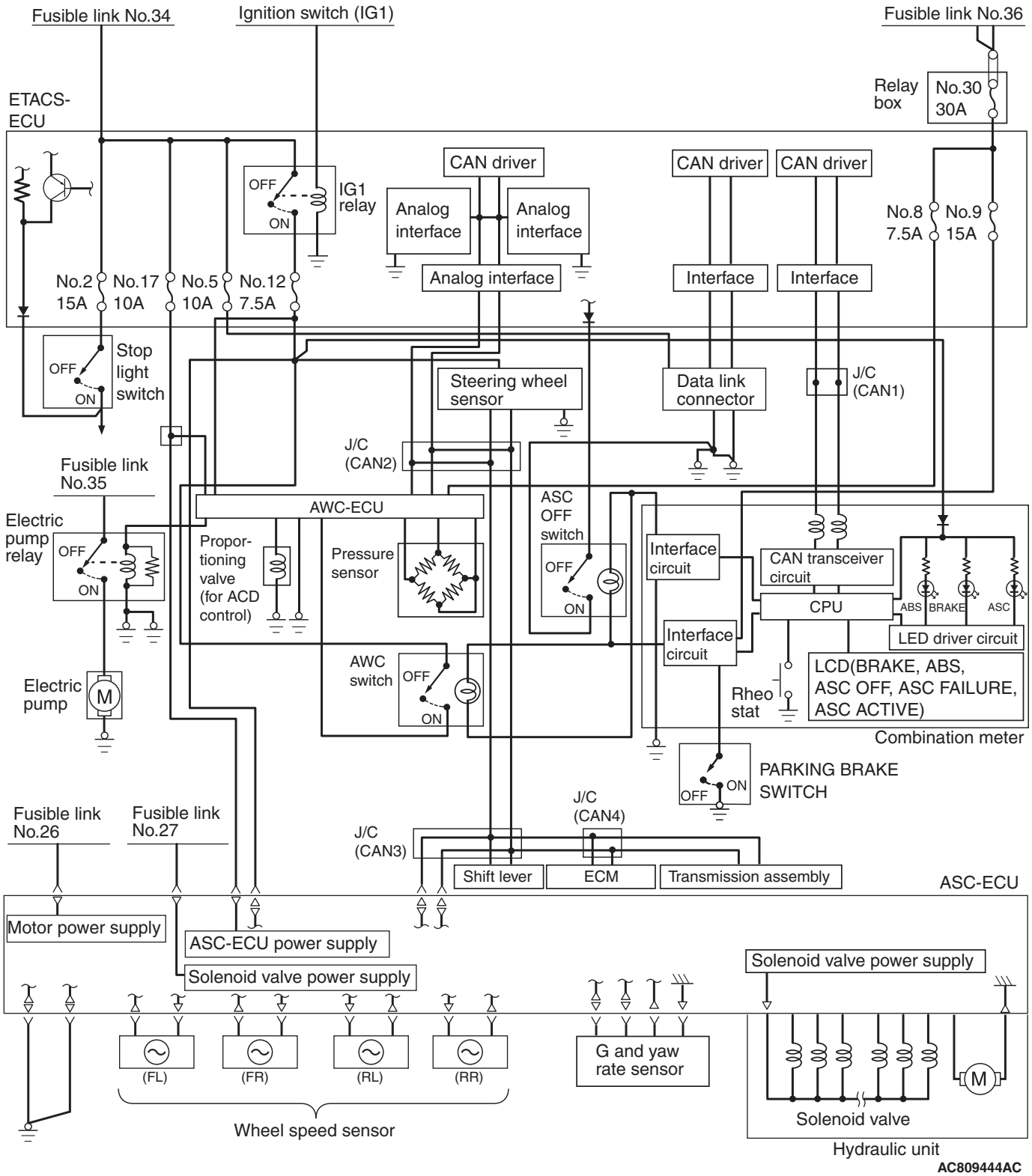
ASC ELECTRICAL DIAGRAM

FWD



AWD



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

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DIAGNOSIS

INTRODUCTION TO ASC DIAGNOSIS

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The 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.

ASC DIAGNOSTIC TROUBLE CODE DETECTION CONDITIONS

ASC diagnostic trouble codes (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

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Use these steps to plan your diagnostic strategy. If you follow them carefully, you will be sure that you have exhausted most of the possible ways to find an 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.00-14.
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-230.
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-25.
   - 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.00-14.

ABS WARNING LIGHT, ASC WARNING/OPERATION LIGHT AND BRAKE WARNING LIGHT CHECK

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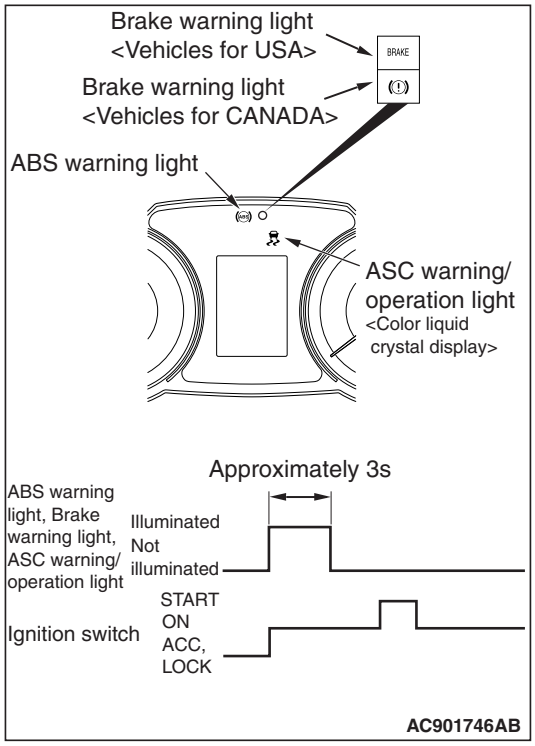
Check that ABS and brake warning light, ASC warning/operation light illuminate as follows.

NOTE: The brake warning light is used as a warning light for parking brake, brake fluid level, and EBD control.



1. When the ignition switch is turned to the ON position, ABS and brake warning light, ASC warning/operation light illuminate.
2. The ABS and brake warning light, ASC warning/operation light illuminate for three seconds*1 and then turn OFF*2.
3. Otherwise, check the diagnostic trouble code.

NOTE:

- **1: The ABS warning light may stay ON until the vehicle speed reaches 10 km/h. As far as ABS-ECU stores any diagnostic trouble code related to the wheel speed sensor malfunction or the motor malfunction as past trouble, ABS-ECU continues illuminating the ABS warning light until it verifies that the malfunction for that code is resolved (start-tup check).*
- **2: The brake warning light does not turn OFF when the parking brake is applied or the brake fluid level is lowered.*

DIAGNOSTIC FUNCTION

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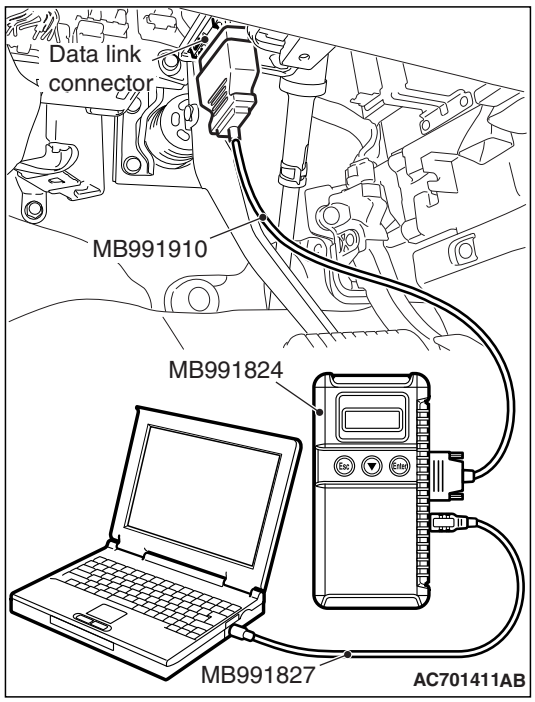
ON-BOARD DIAGNOSTICS

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

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

Required Special Tools:

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



⚠ CAUTION

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

1. Ensure that the ignition switch is at the "LOCK" (OFF) position.
2. Start up the personal computer.
3. Connect special tool MB991827 to special tool MB991824 and the personal computer.
4. Connect special tool MB991910 to 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.

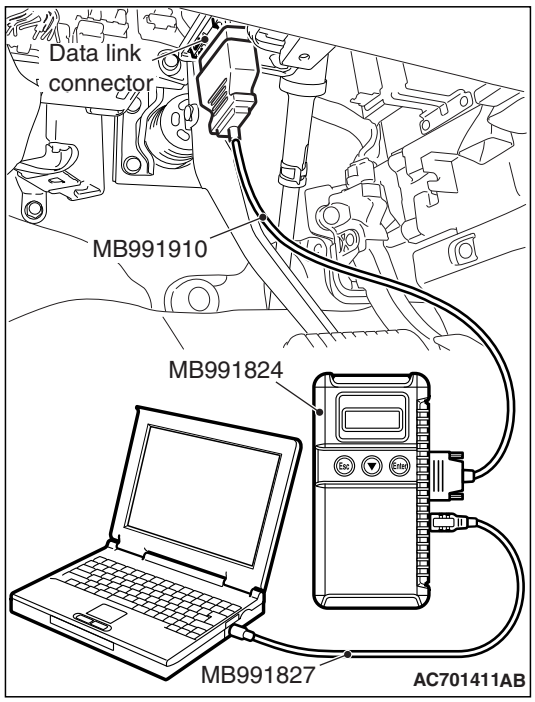
   NOTE: When the special tool MB991824 is energized, the special tool MB991824 indicator light will be illuminated in a green color.
7. Start the M.U.T.-III system on the personal computer.

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.

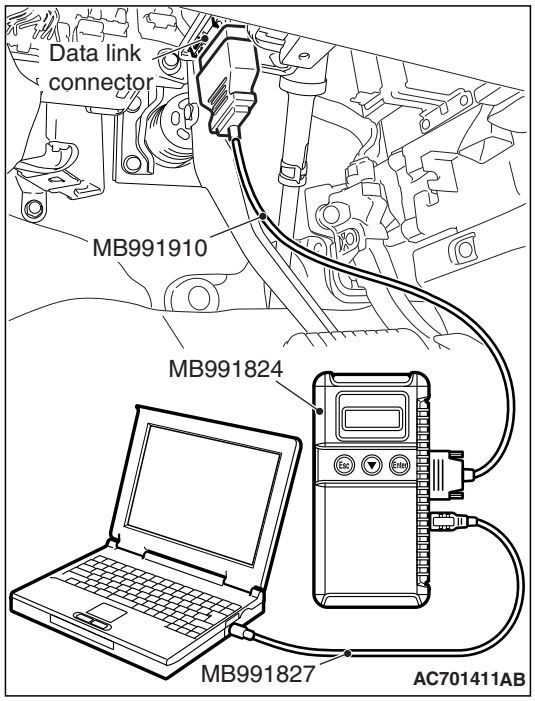
NOTE: If the battery voltage is low, diagnostic trouble codes will not be set. Check the battery if scan tool MB991958 does not display.

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." to read the DTC.
6. If a DTC is set, it is shown.
7. Choose "DTC erase" to erase the DTC.

HOW TO READ DATA LIST

Required Special Tools:

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



⚠ CAUTION

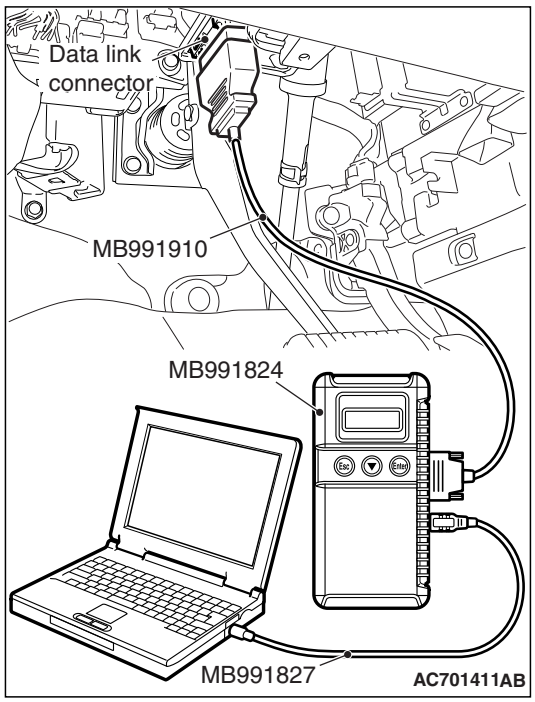
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

1. Connect scan tool MB991958 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select "System Select."
4. 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

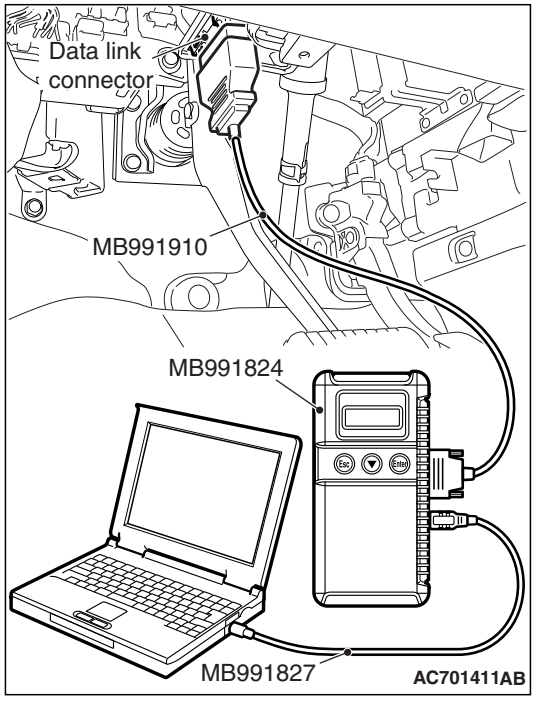
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

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 FUNCTION

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ASC-ECU has the following functions for easier system checks.

- DTC set (Refer to P.35C-25).
- Service data output (Refer to P.35C-282).
- Actuator test (Refer to P.35C-285).
- Freeze frame data output (Refer to P.35C-14).

All the above items can be diagnosed using scan tool.

CHECK OF FREEZE FRAME DATA

The freeze frame data can be checked by using the scan tool.

When detecting fault and storing the DTC, the ECU connected to CAN bus line obtains the data before the determination of the DTC and the data when the DTC is determined, and then stores the ECU status of that time. By analyzing each data from scan tool, the troubleshooting can be performed more efficiently. The displayed items are as the table below.

Display item list

Item No.	Item name	Content	Unit
1	Odometer	Total driving distance after the DTC is generated	mile
2	Ignition cycle	Number of times the ignition switch is turned "ON" or "LOCK (OFF)" after the past failure transition	Number of counts is displayed.
4	Accumulated minute	Cumulative time for current malfunction of DTC	min
5	Power supply voltage	Voltage of power supply when the DTC is generated	V
8	Lateral G sensor	Lateral G of G and yaw rate sensor when the DTC is generated	G
9	G sensor	Longitudinal G of G and yaw rate sensor when the DTC is generated	G
10	Master cylinder pressure	Master cylinder pressure of Master cylinder pressure sensor when the DTC is generated	bar
11	Steering angle	Steering angle of steering wheel sensor when the DTC is generated	deg
12	Yaw rate sensor	Yaw rate of G and yaw rate sensor when the DTC is generated	deg/s
13	Stop light switch	Stop light switch condition when the DTC is generated :OFF/ON	–
21	Pump motor	Pump motor condition when the DTC is generated :OFF/ON	–
28	ASC/TCL off switch	ASC OFF switch condition when the DTC is generated :OFF/ON	–
301	ABS control	ABS control when the DTC is generated :OFF/ON	–
302	Brake TCL control	Traction control (brake control) when the DTC is generated :OFF/ON	–
303	Engine TCL control	Traction control (engine control) when the DTC is generated :OFF/ON	–
304	ASC control	ASC control when the DTC is generated :OFF/ON	–
305	Brake TCL operation	Traction control (brake control) operation when the DTC is generated: Permission/Prohibition	–

Item No.	Item name	Content	Unit
401	FL wheel speed sensor	Wheel speed (FL) when the DTC is generated	mph
402	FR wheel speed sensor	Wheel speed (FR) when the DTC is generated	mph
403	RL wheel speed sensor	Wheel speed (RL) when the DTC is generated	mph
404	RR wheel speed sensor	Wheel speed (RR) when the DTC is generated	mph

FAIL-SAFE FUNCTIONS

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

Illumination condition of warning light and display in case of failure

DTC	Item	Brake warning light, brake warning display	ABS warning light, ABS warning display	ASC warning display and light	ASC OFF display
C100A	Abnormality in FL wheel speed sensor circuit	OFF*1	ON *2	ON	ON
C1015	Abnormality in FR wheel speed sensor circuit				
C1020	Abnormality in RL wheel speed sensor circuit				
C102B	Abnormality in RR wheel speed sensor circuit				
C1011	Abnormality in FL wheel speed sensor signal	OFF*1	ON *2	ON	ON
C101C	Abnormality in FR wheel speed sensor signal				
C1027	Abnormality in RL wheel speed sensor signal				
C1032	Abnormality in RR wheel speed sensor signal				

DTC	Item	Brake warning light, brake warning display	ABS warning light, ABS warning display	ASC warning display and light	ASC OFF display
C1014	Mutual monitoring of FL wheel speed sensor	OFF*1	ON *2	ON	ON
C101F	Mutual monitoring of FR wheel speed sensor				
C102A	Mutual monitoring of RL wheel speed sensor				
C1035	Mutual monitoring of RR wheel speed sensor				
C1041	Abnormality in periodical signal for FL wheel speed sensor	OFF*1	ON *2	ON	ON
C1042	Abnormality in periodical signal for FR wheel speed sensor				
C1043	Abnormality in periodical signal for RL wheel speed sensor				
C1044	Abnormality in periodical signal for RR wheel speed sensor				
C1046	FL wheel speed sensor control phase time exceeded	OFF*1	ON *2	ON	ON
C1047	FR wheel speed sensor control phase time exceeded				
C1048	RL wheel speed sensor control phase time exceeded				
C1049	RR wheel speed sensor control phase time exceeded				
C104B	Abnormality in FL wheel inlet valve system	ON	ON	ON	ON
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	ON	ON	ON	ON
C1063	Abnormality in FR wheel outlet valve system				
C1067	Abnormality in RL wheel outlet valve system				
C105B	Abnormality in RR wheel outlet valve system				

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DTC	Item		Brake warning light, brake warning display	ABS warning light, ABS warning display	ASC warning display and light	ASC OFF display
C1200	Abnormality in FL/RR wheel cut valve system		ON	ON	ON	ON
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	Faulty valve power supply circuit		ON	ON	ON	ON
C1073	Faulty motor drive circuit		OFF	ON *2	ON	ON
C2116	Low or high power supply voltage in pump motor		OFF	ON *2	ON	ON
C121D	Abnormality in brake fluid pressure sensor circuit		OFF	ON	ON	ON
C121E	Abnormality in brake fluid pressure sensor output signal		OFF	ON	ON	ON
C1000	Abnormality in stop light switch circuit		OFF	OFF	ON	ON
C123B	Prolonged operation of ASC		OFF	OFF	ON	ON
C2200	Abnormality in ASC-ECU		ON*4	ON*5	ON	ON
C2101	Abnormality in battery voltage (high voltage)	18.0 ± 1.0 V or more	ON	ON	ON	ON
C1395	Brake fluid filling not completed		OFF	ABS warning light: Flashing (1 Hz) ABS warning display: ON	OFF	OFF
C121C	Torque request signal rejection		OFF	OFF	ON	ON
C1290	CAN time-out error		OFF	OFF	ON	ON
C2203	VIN not recorded		OFF	ON	OFF	OFF
C1210*7	Abnormality in G & yaw rate sensor	Abnormality in longitudinal G-sensor output voltage	OFF	ON	ON	ON

DTC	Item		Brake warning light, brake warning display	ABS warning light, ABS warning display	ASC warning display and light	ASC OFF display
C1242*7	Abnormality in G & yaw rate sensor	Abnormality in longitudinal G-sensor output signal	OFF	ON	ON	ON
C123C	Abnormality in G & yaw rate sensor		OFF	OFF	ON	ON
C2204	Internal abnormality in G & yaw rate sensor		OFF	OFF*6 ON*5, 7	ON	ON
C2111	Brake fluid pressure sensor power supply circuit	Low input	OFF	ON	ON	ON
C2112	Brake fluid pressure sensor power supply circuit	High input	OFF	ON	ON	ON
C2114*3	Abnormality in G & yaw rate sensor operation voltage	Low voltage	OFF	OFF*6 ON*7	ON	ON
C2115	Abnormality in G & yaw rate sensor operation voltage	High voltage	OFF	OFF*6 ON*7	ON	ON
C123A	Abnormality in sensor calibration		OFF	OFF*6 ON*5, 7	ON	ON
C1219	Abnormality in steering wheel sensor signal		OFF	OFF	ON	ON
C121A	Abnormality in steering wheel sensor calibration	Steering wheel sensor neutral point not learned	OFF	ABS warning light: Flashing (2 Hz) ABS warning display: ON	ON	ON
C2205	Internal abnormality in steering wheel sensor		OFF	OFF	ON	ON
C2002	Valve calibration error		ON	ON	ON	ON
C2003	Control parameter not implement		OFF	OFF	OFF	ON

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DTC	Item	Brake warning light, brake warning display	ABS warning light, ABS warning display	ASC warning display and light	ASC OFF display
C1608	Implausible diagnosis data	OFF	OFF	OFF	OFF
U0001	Bus-off	OFF	OFF	OFF	OFF
U0100	Engine time-out error	OFF	OFF	OFF	OFF
U0101	CVT time-out error*8	OFF	OFF	OFF	OFF
	TC-SST time-out error*7	OFF	OFF	OFF	OFF
U0126	Steering wheel sensor time-out error	OFF	OFF	OFF	OFF
U0141	ETACS time-out error	OFF	OFF	OFF	OFF
U0114*7	AWC time-out error	OFF	OFF	OFF	OFF
U0125	G & yaw rate sensor message time-out error/message error	OFF	OFF*6 ON*7	ON	ON
U1003	G & yaw rate sensor bus-off	OFF	OFF*6 ON*7	ON	ON
U0401	Engine signal malfunction detected	OFF	OFF	ON	ON
U0428	Steering wheel sensor CRC, message error	OFF	OFF	ON	ON
U1415	Variant coding not implemented	OFF	ON	ON	ON
U1417	Variant coding value invalid (includes faulty installation)	OFF	ON*5	ON	ON

NOTE:

- **1: Turns on when two or more wheels are faulty.*
- **2: Stays on until the vehicle speed reaches 6 mph (10 km/h) when the ignition switch is turned to ON next time.*
- **3: This DTC is not set with the vehicle speed of 12 mph (20 km/h) or less.*
- **4: Does not illuminate when there is no effect to the EBD function.*
- **5: Does not illuminate when there is no effect to the ABS function.*
- **6: FWD*
- **7: AWD*
- **8: CVT*

Under EBD, ABS, skid control, TCL control and HSA function in case of failure

DTC	Item	EBD	ABS	Skid control	TCL	HSA
C100A	Abnormality in FL wheel speed sensor circuit	Enabled*1	Prohibited	Prohibited	Prohibited	Prohibited
C1015	Abnormality in FR wheel speed sensor circuit					
C1020	Abnormality in RL wheel speed sensor circuit					
C102B	Abnormality in RR wheel speed sensor circuit					
C1011	Abnormality in FL wheel speed sensor signal	Enabled*1	Prohibited	Prohibited	Prohibited	Prohibited
C101C	Abnormality in FR wheel speed sensor signal					
C1027	Abnormality in RL wheel speed sensor signal					
C1032	Abnormality in RR wheel speed sensor signal					
C1014	Mutual monitoring of FL wheel speed sensor	Enabled*1	Prohibited	Prohibited	Prohibited	Prohibited
C101F	Mutual monitoring of FR wheel speed sensor					
C102A	Mutual monitoring of RL wheel speed sensor					
C1035	Mutual monitoring of RR wheel speed sensor					
C1041	Abnormality in periodical signal for FL wheel speed sensor	Enabled*1	Prohibited	Prohibited	Prohibited	Prohibited
C1042	Abnormality in periodical signal for FR wheel speed sensor					
C1043	Abnormality in periodical signal for RL wheel speed sensor					
C1044	Abnormality in periodical signal for RR wheel speed sensor					

DTC	Item	EBD	ABS	Skid control	TCL	HSA
C1046	FL wheel speed sensor control phase time exceeded	Enabled*1	Prohibited	Prohibited	Prohibited	Prohibited
C1047	FR wheel speed sensor control phase time exceeded					
C1048	RL wheel speed sensor control phase time exceeded					
C1049	RR wheel speed sensor control phase time exceeded					
C104B	Abnormality in FL wheel inlet valve system	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
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	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
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	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
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	Faulty valve power supply circuit	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
C1073	Faulty motor drive circuit	Enabled	Prohibited	Prohibited	Prohibited	Prohibited
C2116	Low or high power supply voltage in pump motor	Enabled	Prohibited	Prohibited	Prohibited	Prohibited

DTC	Item		EBD	ABS	Skid control	TCL	HSA
C121D	Abnormality in brake fluid pressure sensor circuit		Enabled	Prohibited	Prohibited	Prohibited	Prohibited
C121E	Abnormality in brake fluid pressure sensor output signal		Enabled	Prohibited	Prohibited	Prohibited	Prohibited
C1000	Abnormality in stop light switch circuit		Enabled	Enabled	Prohibited	Prohibited	Prohibited
C123B	Prolonged operation of ASC		Enabled	Enabled	Prohibited	Prohibited	Prohibited
C2200	Abnormality in ASC-ECU		Prohibited*3	Prohibited*4	Prohibited	Prohibited	Prohibited
C2101	Abnormality in battery voltage (high voltage)	18.0 ± 1.0 V or more	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
C1395	Brake fluid filling not completed		Enabled	Enabled	Enabled	Enabled	Prohibited
C121C	Torque request signal rejection		Enabled	Enabled	Prohibited	Prohibited	Prohibited
C1290	CAN time-out error		Enabled	Enabled	Prohibited	Prohibited	Prohibited
C2203	VIN not recorded		Enabled	Enabled	Enabled	Enabled	Enabled
C2206	Re-execution of variant coding		Enabled	Prohibited	Prohibited	Prohibited	Prohibited
C1210*6	Abnormality in G & yaw rate sensor	Abnormality in longitudinal G-sensor output value	Enabled	Prohibited	Prohibited	Prohibited	Prohibited
C1242*6	Abnormality in G & yaw rate sensor	Abnormality in longitudinal G-sensor output signal	Enabled	Prohibited	Prohibited	Prohibited	Prohibited
C123C	Abnormality in G & yaw rate sensor		Enabled	Enabled	Prohibited	Prohibited	Prohibited
C2204	Internal abnormality in G & yaw rate sensor		Enabled	Enabled*5 Prohibited*4, 6	Prohibited	Prohibited	Prohibited

DTC	Item		EBD	ABS	Skid control	TCL	HSA
C2111	Brake fluid pressure sensor power supply circuit	Low input	Enabled	Prohibited	Prohibited	Prohibited	Prohibited
C2112	Brake fluid pressure sensor power supply circuit	High input	Enabled	Prohibited	Prohibited	Prohibited	Prohibited
C2114*2	Abnormality in G & yaw rate sensor operation voltage	Low voltage	Enabled	Enabled*5 Prohibited*6	Prohibited	Prohibited	Prohibited
C2115	Abnormality in G & yaw rate sensor operation voltage	High voltage	Enabled	Enabled*5 Prohibited*6	Prohibited	Prohibited	Prohibited
C123A	Abnormality in sensor calibration		Enabled	Enabled*5 Prohibited*4,6	Prohibited	Prohibited	Prohibited
C1219	Abnormality in steering wheel sensor signal		Enabled	Enabled	Prohibited	Prohibited	Prohibited
C121A	Abnormality in steering wheel sensor calibration	Steering wheel sensor neutral point not learned	Enabled	Enabled	Prohibited	Prohibited	Prohibited
C2205	Internal abnormality in steering wheel sensor		Enabled	Enabled	Prohibited	Prohibited	Prohibited
C2002	Valve calibration error		Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
C2003	Control parameter not implement		Enabled	Enabled	Prohibited	Prohibited	Prohibited
C1608	Implausible diagnosis data		Enabled	Enabled	Enabled	Enabled	Enabled
U0001	Bus-off		Enabled	Enabled	Enabled	Enabled	Enabled
U0100	Engine time-out error		Enabled	Enabled	Enabled	Enabled	Enabled
U0101	CVT time-out error*5		Enabled	Enabled	Enabled	Enabled	Enabled
	TC-SST time-out error*6		Enabled	Enabled	Enabled	Enabled	Enabled
U0126	Steering wheel sensor time-out error		Enabled	Enabled	Enabled	Enabled	Enabled
U0141	ETACS time-out error		Enabled	Enabled	Enabled	Enabled	Enabled

DTC	Item	EBD	ABS	Skid control	TCL	HSA
U0114*6	AWC time-out error	Enabled	Enabled	Enabled	Enabled	Enabled
U0125	G & yaw rate sensor message time-out error/message error	Enabled	Enabled*5 Prohibited*6	Prohibited	Prohibited	Prohibited
U0401	Engine signal malfunction detected	Enabled	Enabled	Prohibited	Prohibited	Prohibited
U0428	Steering wheel sensor CRC, message error	Enabled	Enabled	Prohibited	Prohibited	Prohibited
U1003	G & yaw rate sensor bus-off	Enabled	Enabled*5 Prohibited*6	Prohibited	Prohibited	Prohibited
U1415	Variant coding not implemented	Enabled	Prohibited	Prohibited	Prohibited	Prohibited
U1417	Variant coding value invalid (includes faulty installation)	Enabled	Prohibited*4	Prohibited	Prohibited	Prohibited

NOTE:

- **1: Turns on when two or more wheels are faulty.*
- **2: This DTC is not set with the vehicle speed of 12 mph (20 km/h) or less.*
- **3: Not prohibited when the brake warning light is not illuminated.*
- **4: Not prohibited when the ABS warning light is not illuminated.*
- **5: FWD*
- **6: AWD*

DIAGNOSTIC TROUBLE CODE CHART

M1355001100939

⚠ CAUTION

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

DTC	Item	Reference page
C100A	Abnormality in FL wheel speed sensor circuit	P.35C-28
C1015	Abnormality in FR wheel speed sensor circuit	P.35C-33
C1020	Abnormality in RL wheel speed sensor circuit	P.35C-38
C102B	Abnormality in RR wheel speed sensor circuit	P.35C-44
C1011	Abnormality in FL wheel speed sensor signal	P.35C-50
C101C	Abnormality in FR wheel speed sensor signal	P.35C-57
C1027	Abnormality in RL wheel speed sensor signal	P.35C-64
C1032	Abnormality in RR wheel speed sensor signal	P.35C-72
C1014	Mutual monitoring of FL wheel speed sensor	P.35C-79
C101F	Mutual monitoring of FR wheel speed sensor	P.35C-83
C102A	Mutual monitoring of RL wheel speed sensor	P.35C-86
C1035	Mutual monitoring of RR wheel speed sensor	P.35C-90
C1041	Abnormality in periodical signal for FL wheel speed sensor	P.35C-93
C1042	Abnormality in periodical signal for FR wheel speed sensor	P.35C-96
C1043	Abnormality in periodical signal for RL wheel speed sensor	P.35C-98
C1044	Abnormality in periodical signal for RR wheel speed sensor	P.35C-101
C1046	FL wheel speed sensor control phase time exceeded	P.35C-104
C1047	FR wheel speed sensor control phase time exceeded	P.35C-110
C1048	RL wheel speed sensor control phase time exceeded	P.35C-116
C1049	RR wheel speed sensor control phase time exceeded	P.35C-123
C104B	Abnormality in FL wheel inlet valve system	P.35C-130
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	Faulty valve power supply circuit	P.35C-132
C1073	Faulty motor drive circuit	P.35C-136

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DTC	Item		Reference page
C2116	Low power supply voltage in pump motor		P.35C-141
C121D	Abnormality in brake fluid pressure sensor circuit		P.35C-146
C121E	Abnormality in brake fluid pressure sensor output signal		P.35C-148
C1000	Abnormality in stop lamp switch circuit		P.35C-152
C123B	Prolonged operation of ASC		P.35C-160
C2200	Abnormality in ASC-ECU		P.35C-163
C2101	Abnormality in battery voltage (high voltage)	18.0 ± 1.0 V or more	P.35C-164
C1395	Brake fluid filling not completed		P.35C-202
C121C	Torque request signal rejection		P.35C-166
C1290	CAN time-out error		P.35C-168
C2203	VIN not recorded		P.35C-171
C2206	Re-execution of variant coding		P.35C-173
C123C	Abnormality in G and yaw rate sensor	Abnormality in lateral G sensor and yaw rare output value (incorrect installation)	P.35C-181
C1210*3	Abnormality in G and yaw rate sensor	Abnormality in longitudinal G-sensor output voltage	P.35C-175
C1242*3	Abnormality in G and yaw rate sensor	Abnormality in longitudinal G-sensor output signal	P.35C-178
C2204	Internal abnormality in G and yaw rate sensor		P.35C-185
C2111	Brake fluid pressure sensor power supply circuit	Low input	P.35C-188
C2112	Brake fluid pressure sensor power supply circuit	High input	
C2114*1	Abnormality in G and yaw rate sensor operation voltage	Low voltage	P.35C-190
C2115	Abnormality in G and yaw rate sensor operation voltage	High voltage	
C123A	Abnormality in sensor calibration		P.35C-194
C1219	Abnormality in steering wheel sensor signal		P.35C-196
C121A	Abnormality in steering wheel sensor calibration	Steering wheel sensor neutral point not learned	P.35C-199
C2205	Internal abnormality in steering wheel sensor		P.35C-200
C1395	Brake fluid filling not completed		P.35C-202
C1608	Implausible diagnosis data		P.35C-203
C2002	Valve calibration not completed		P.35C-208
C2003	Control parameter not implement		P.35C-209
U0001	Bus-off		P.35C-212

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DTC	Item	Reference page
U0100	Engine time-out error	P.35C-214
U0101	CVT time-out error*2	
	TC-SST time-out error*3	
U0126	Steering wheel sensor time-out error	
U0114*3	AWC time-out error	
U0141	ETACS time-out error	
U0125	G and yaw rate sensor message time-out error/message error	P.35C-216
U0401	Engine signal malfunction detected	P.35C-219
U0428	Communication error in steering wheel sensor	P.35C-220
U1003	G and yaw rate sensor bus-off	P.35C-222
U1415	Variant coding not implemented	P.35C-224
U1417	Variant coding value invalid (includes faulty installation)	P.35C-226

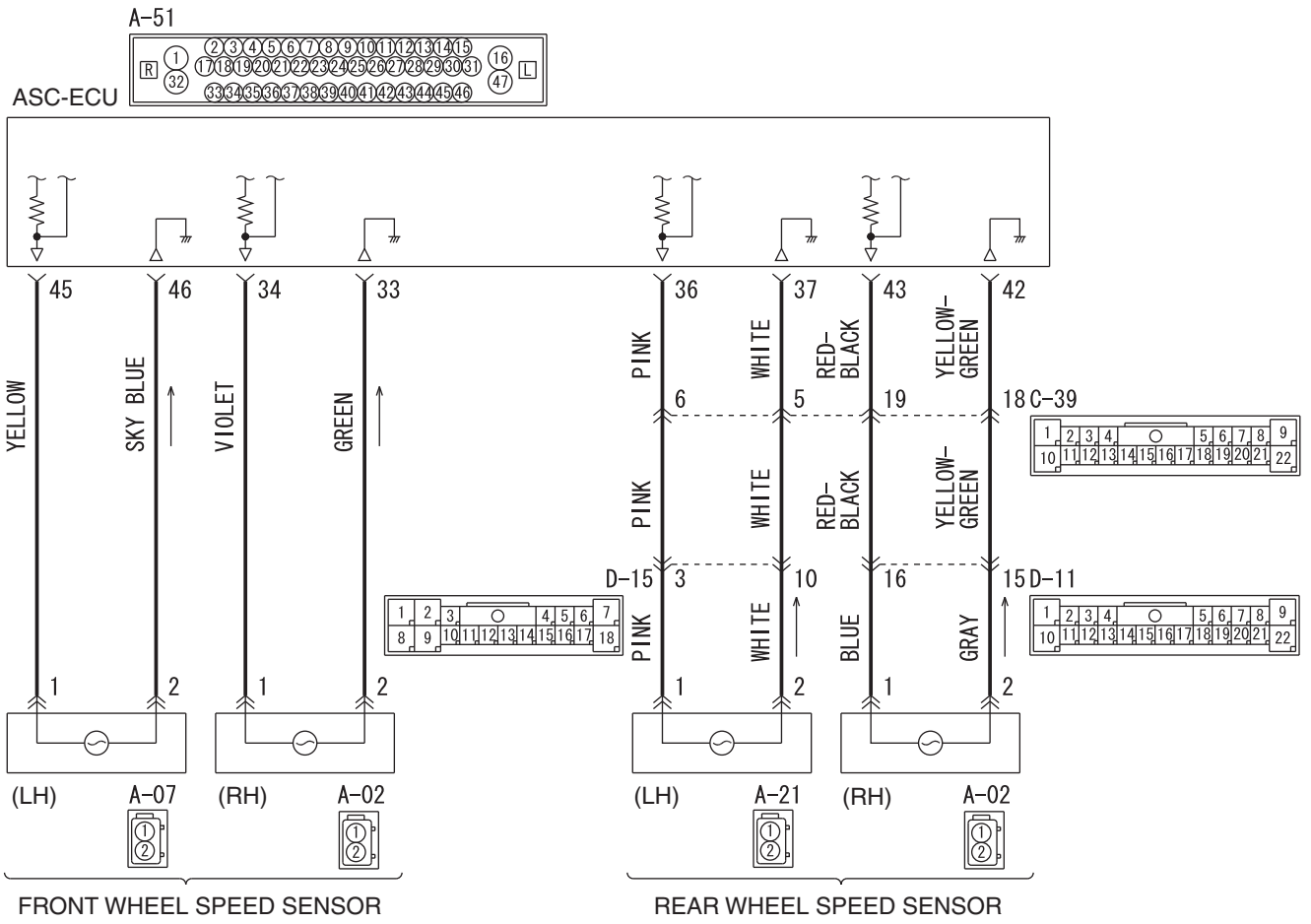
NOTE:

- **1: This DTC is not set with the vehicle speed of 12 mph (20 km/h) or less.*
- **2: FWD*
- **3: AWD*

DIAGNOSTIC TROUBLE CODE PROCEDURES

DTC C100A Abnormality in FL wheel speed sensor circuit

Wheel Speed Sensor Circuit



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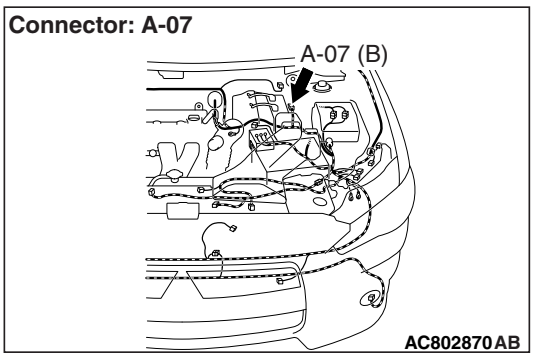

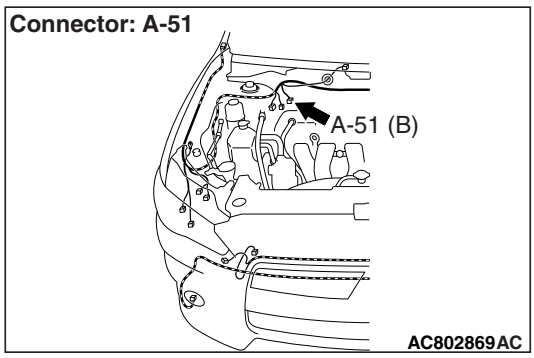

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⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

- Each wheel speed detecting section is a kind of a pulse generator. It consists of the encoder (plate on which the north and south pole of magnet are arranged alternately) for detecting the wheel speed, which rotates at the same speed of the wheels, and the wheel speed sensor. This detecting section outputs the frequency pulse signals in proportion to the wheel speed.
- The pulse signals generated by the wheel speed detecting section 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
- Malfunction of ASC-ECU

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.00-14).

DIAGNOSIS

Required Special Tools:

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

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

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC C100A set?

YES : Go to Step 3.

NO : The procedure is complete.

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

Check the following service data (Refer to P.35C-282).

- Item No.01: FL wheel speed sensor

Q: Is the check result normal?

YES : Go to Step 10.

NO : Go to Step 4.

STEP 4. Connector check: A-51 ASC-ECU connector, A-07 wheel speed sensor <FL> connector

Q: Is the check result normal?

YES : Go to Step 5.

NO : Repair the defective connector. Then go to Step 11.

STEP 5. Voltage measurement at the A-51 ASC-ECU connector

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

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

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

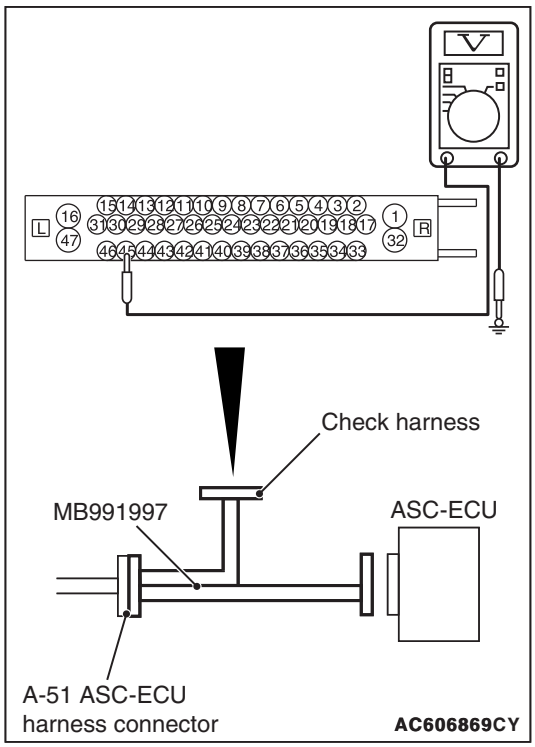
(3) Measure the voltage between the wheel speed sensor power supply terminal (signal terminal) No.45 and the body ground and between the ground terminal No.46 and the body ground.

OK: 1 volt or less

Q: Is the check result normal?

YES : Go to Step 6.

NO (Not normal at the terminal No.45 or No.46) : Go to Step 8.



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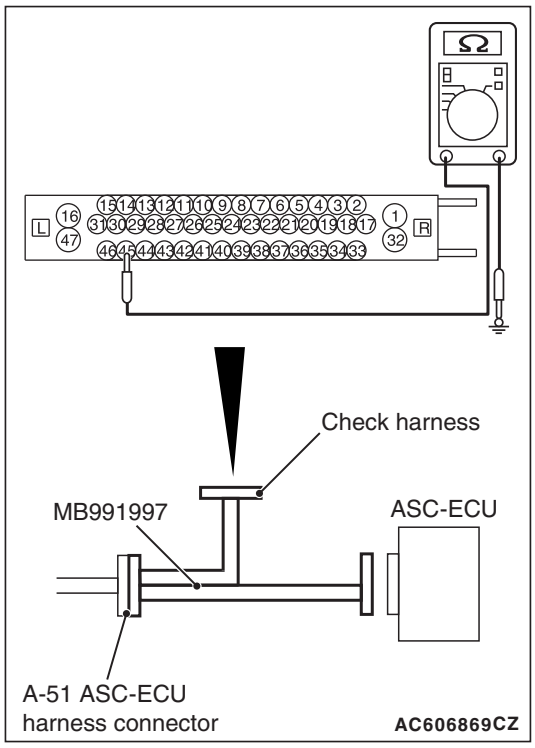


STEP 6. Resistance measurement at A-51 ASC-ECU connector

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

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

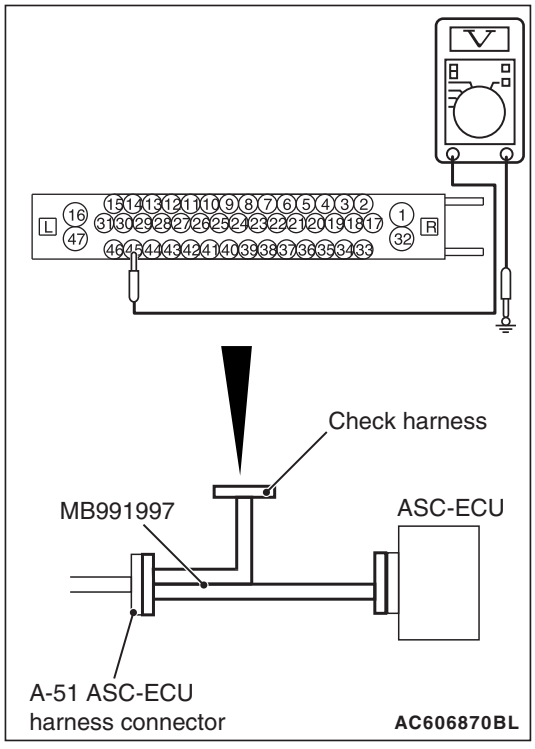
(2) Measure the resistance between the wheel speed sensor power supply terminal (signal terminal) No.45 and the body ground and between the wheel speed sensor ground terminal No.46 and the body ground.

OK: No continuity

Q: Is the check result normal?

YES : Go to Step 7.

NO (Not normal at the terminal No.45 or No.46) : Go to Step 8.



STEP 7. Voltage measurement at the A-51 ASC-ECU connector

(1) Disconnect the ASC-ECU connector, connect special tool ASC check harness (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 power supply terminal (signal terminal) No.45 and body ground, and between the ground terminal No.46 and body ground.

OK:

Terminal No.45 and body ground: Battery positive voltage

Terminal No.46 and body ground: 1 volt or less

Q: Is the check result normal?

YES : Go to Step 8.

NO : Go to Step 10.

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STEP 8. Check for wheel speed sensor as a single unit
Refer to P.35C-307.

Q: Is the check result normal?

YES : Go to Step 9.
NO : Replace the wheel speed sensor <FL> (Refer to P.35C-306). Then go to Step 11.

STEP 9. Wiring harness check between A-51 ASC-ECU connector terminal No.45 and A-07 wheel speed sensor <FL> connector terminal No.1 and between A-51 ASC-ECU connector terminal No.46 and A-07 wheel speed sensor <FL> connector terminal No.2.

- Check for open or short circuit in wheel speed sensor <FL> circuit.

Q: Is the check result normal?

YES : Go to Step 10.
NO : Repair the wiring harness. Then go to Step 11.

STEP 10. Check whether the DTC is reset.
(1) Erase the DTC.
(2) Drive the vehicle at 12 mph (20 km/h) or more.

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

Q: Is DTC C100A set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 11.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

STEP 11. Check whether the DTC is reset.
(1) Erase the DTC.
(2) Drive the vehicle at 12 mph (20 km/h) or more.

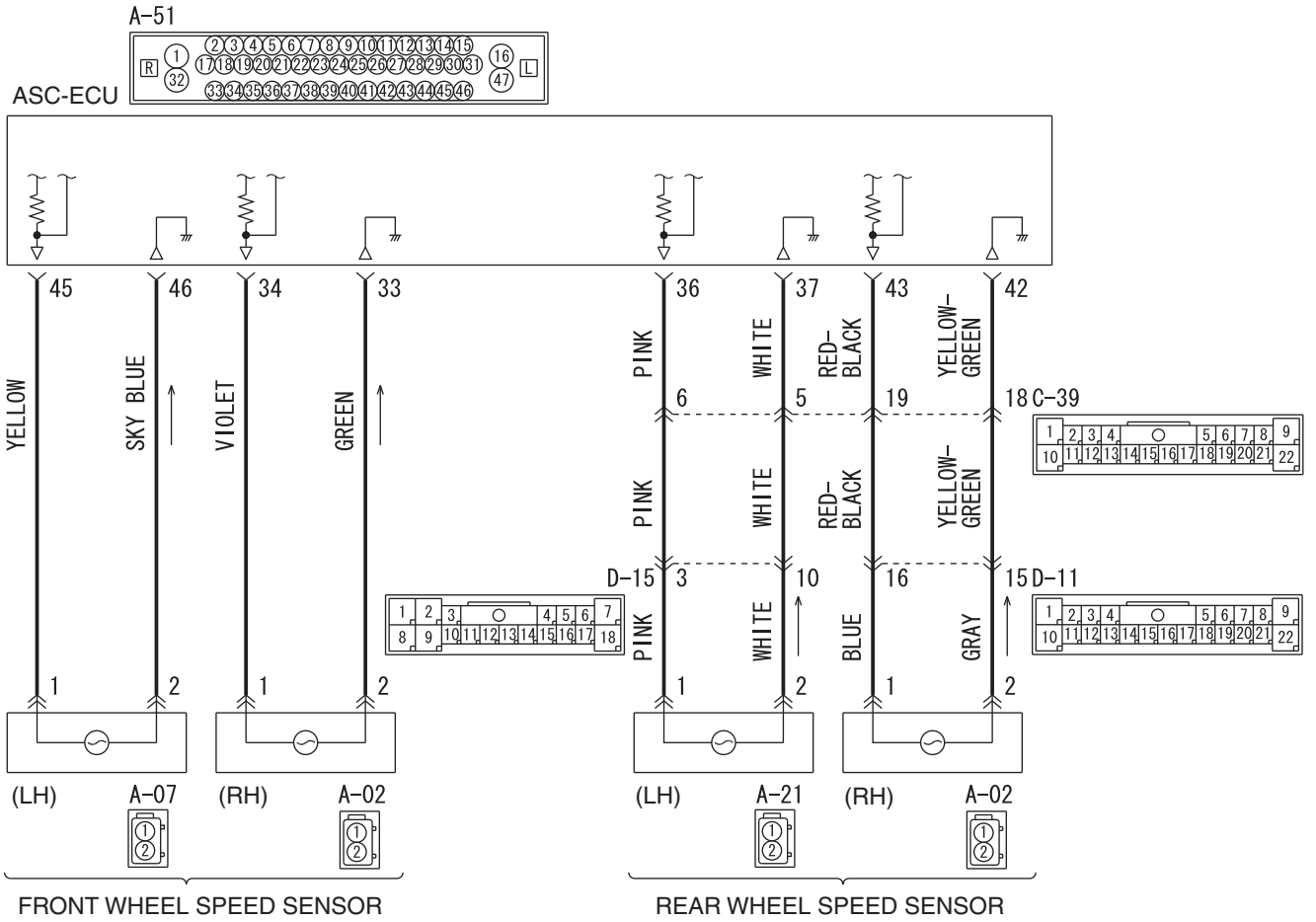
NOTE: The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12 mph (20 km/h) or higher.

Q: Is DTC C100A set?

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

DTC C1015 Abnormality in FR wheel speed sensor circuit

Wheel Speed Sensor Circuit



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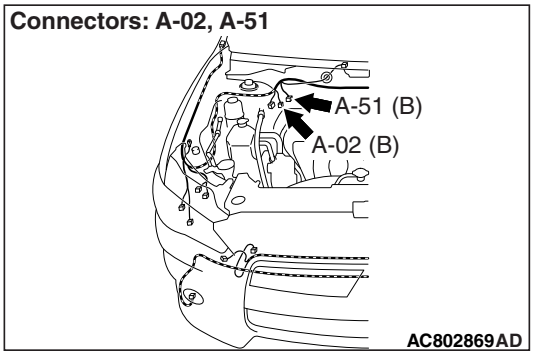


TSB Revision

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

- Each wheel speed detecting section is a kind of a pulse generator. It consists of the encoder (plate on which the north and south pole of magnet are arranged alternately) for detecting the wheel speed, which rotates at the same speed of the wheels, and the wheel speed sensor. This detecting section outputs the frequency pulse signals in proportion to the wheel speed.
- The pulse signals generated by the wheel speed detecting section 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
- Malfunction of ASC-ECU

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.00-14).

DIAGNOSIS

Required Special Tools:

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

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

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC C1015 set?

YES : Go to Step 3.

NO : The procedure is complete.

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

Check the following service data (Refer to P.35C-282).

- Item No.02: FR wheel speed sensor

Q: Is the check result normal?

YES : Go to Step 10.

NO : Go to Step 4.

STEP 4. Connector check: A-51 ASC-ECU connector, A-02 wheel speed sensor <FR> connector

Q: Is the check result normal?

YES : Go to Step 5.

NO : Repair the defective connector. Then go to Step 11.

STEP 5. Voltage measurement at the A-51 ASC-ECU connector

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

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

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

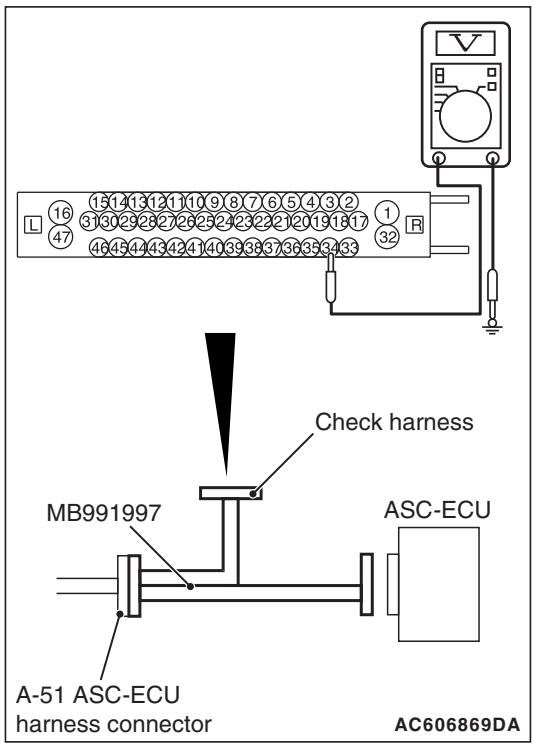
(3) Measure the voltage between the wheel speed sensor power supply terminal (signal terminal) No.34 and the body ground and between the ground terminal No.33 and the body ground.

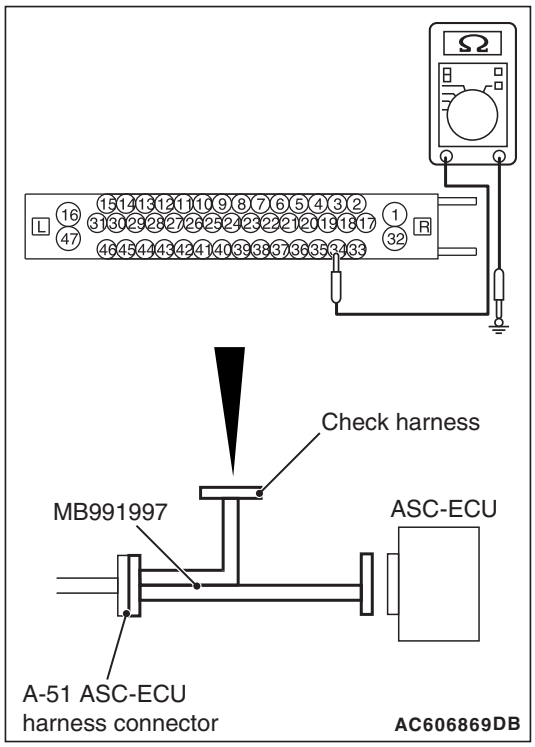
OK: 1 volt or less

Q: Is the check result normal?

YES : Go to Step 6.

NO (Not normal at the terminal No.34 or No.33) : Go to Step 8.





STEP 6. Resistance measurement at A-51 ASC-ECU connector

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

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

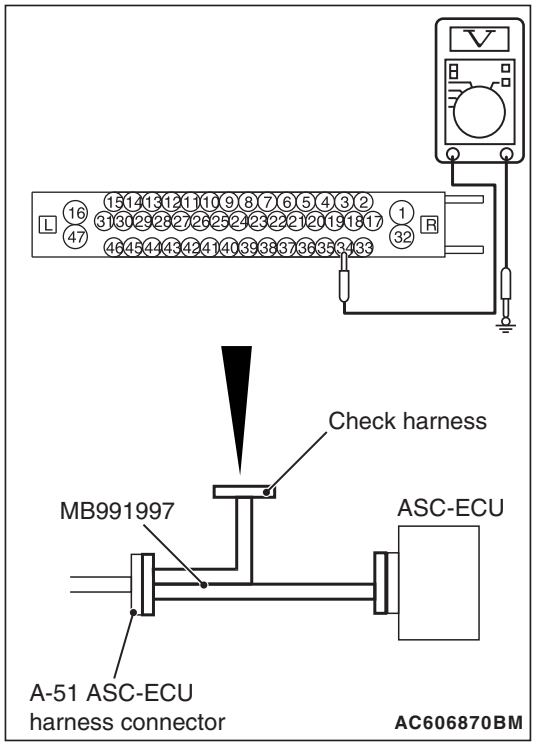
(2) Measure the resistance between the wheel speed sensor power supply terminal (signal terminal) No.34 and the body ground and between the wheel speed sensor ground terminal No.33 and the body ground.

OK: No continuity

Q: Is the check result normal?

YES : Go to Step 7.

NO (Not normal at the terminal No.34 or No.33) : Go to Step 8.



STEP 7. Voltage measurement at the A-51 ASC-ECU connector

(1) Disconnect the ASC-ECU connector, connect special tool ASC check harness (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 power supply terminal (signal terminal) No.34 and body ground, and between the ground terminal No.33 and body ground.

OK:

Terminal No.34 and body ground: Battery positive voltage

Terminal No.33 and body ground: 1 volt or less

Q: Is the check result normal?

YES : Go to Step 8.

NO : Go to Step 10.

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STEP 8. Check for wheel speed sensor as a single unit
Refer to P.35C-307.

Q: Is the check result normal?

YES : Go to Step 9.
NO : Replace the wheel speed sensor <FR> (Refer to P.35C-306). Then go to Step 11.

STEP 9. Wiring harness check between A-51 ASC-ECU connector terminal No.34 and A-02 wheel speed sensor <FR> connector terminal No.1 and between A-51 ASC-ECU connector terminal No.33 and A-02 wheel speed sensor <FR> connector terminal No.2.

- Check for the open or short circuit in wheel speed sensor <FR> circuit.

Q: Is the check result normal?

YES : Go to Step 10.
NO : Repair the wiring harness. Then go to Step 11.

STEP 10. Check whether the DTC is reset.
(1) Erase the DTC.
(2) Drive the vehicle at 12 mph (20 km/h) or more.

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

Q: Is DTC C1015 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 11.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

STEP 11. Check whether the DTC is reset.
(1) Erase the DTC.
(2) Drive the vehicle at 12 mph (20 km/h) or more.

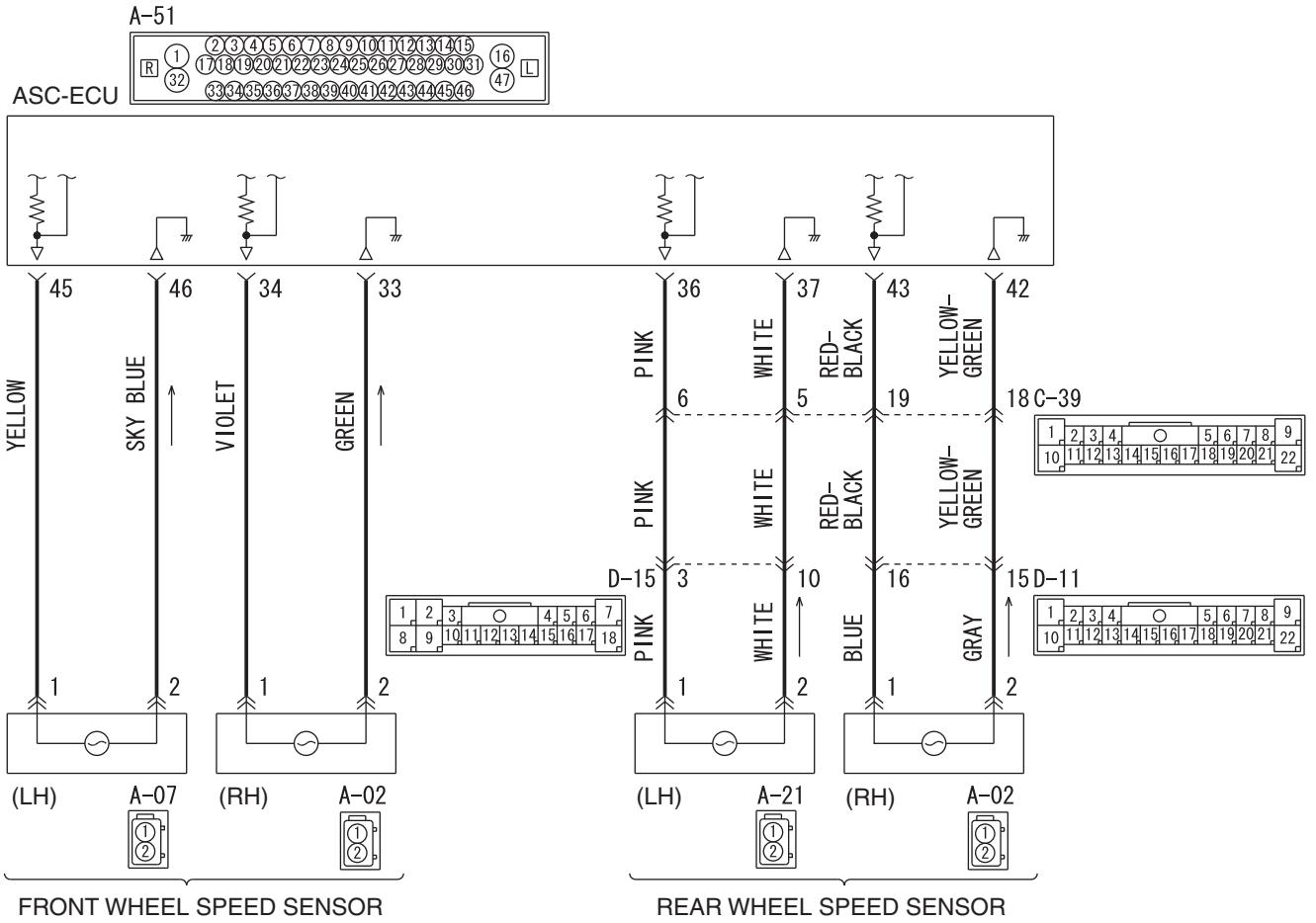
NOTE: The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12 mph (20 km/h) or higher.

Q: Is DTC C1015 set?

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

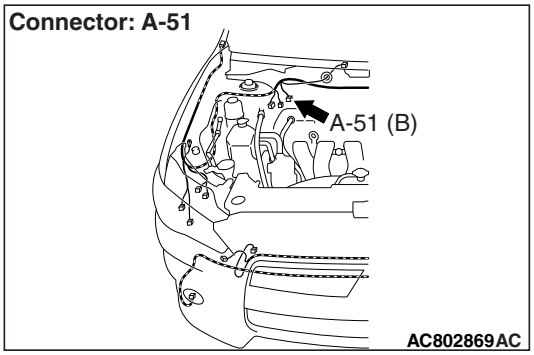
DTC C1020 Abnormality in RL wheel speed sensor circuit

Wheel Speed Sensor Circuit

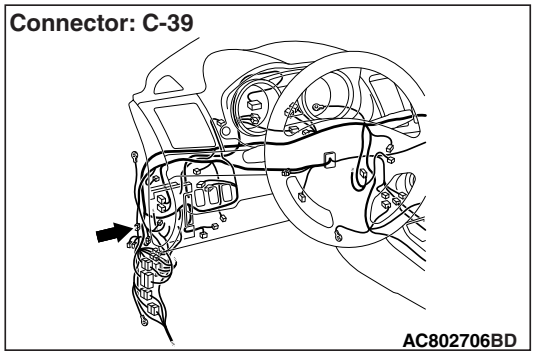


WAH35M000A

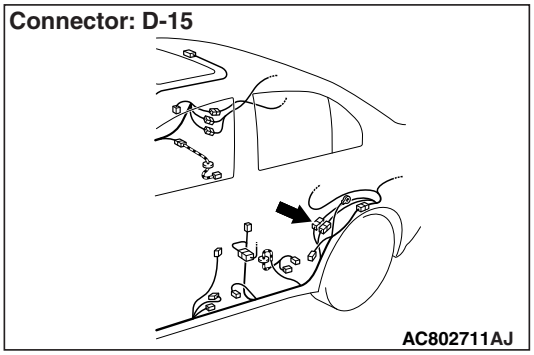
Connector: A-51

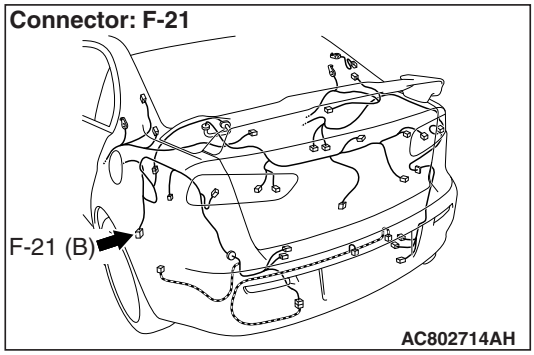


Connector: C-39



TSB Revision





⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

- Each wheel speed detecting section is a kind of a pulse generator. It consists of the encoder (plate on which the north and south pole of magnet are arranged alternately) for detecting the wheel speed, which rotates at the same speed of the wheels, and the wheel speed sensor. This detecting section outputs the frequency pulse signals in proportion to the wheel speed.
- The pulse signals generated by the wheel speed detecting section 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
- Malfunction of ASC-ECU

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.00-14).

DIAGNOSIS

Required Special Tools:

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

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

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC C1020 set?

YES : Go to Step 3.

NO : The procedure is complete.

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

Check the following service data (Refer to P.35C-282).

- Item No.03: RL wheel speed sensor

Q: Is the check result normal?

YES : Go to Step 10.

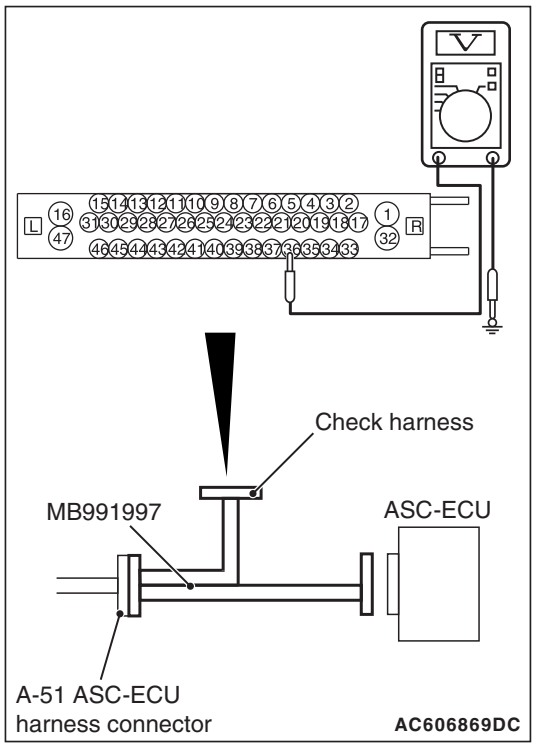
NO : Go to Step 4.

STEP 4. Connector check: A-51 ASC-ECU connector, C-39 intermediate connector, D-15 intermediate connector, F-21 wheel speed sensor <RL> connector

Q: Is the check result normal?

YES : Go to Step 5.

NO : Repair the defective connector. Then go to Step 11.



STEP 5. Voltage measurement at the A-51 ASC-ECU connector

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

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

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

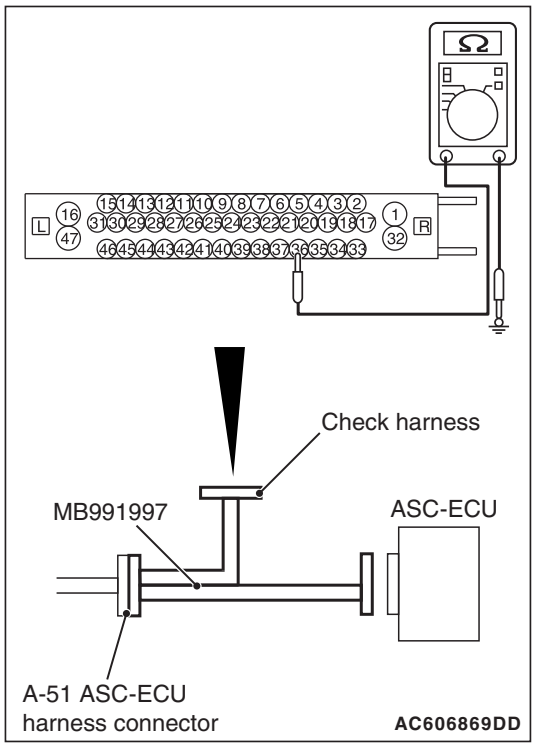
(3) Measure the voltage between the wheel speed sensor power supply terminal (signal terminal) No.36 and the body ground, and between the wheel speed sensor ground terminal No.37 and the body ground.

OK: 1 volt or less

Q: Is the check result normal?

YES : Go to Step 6.

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



STEP 6. Resistance measurement at A-51 ASC-ECU connector

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

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

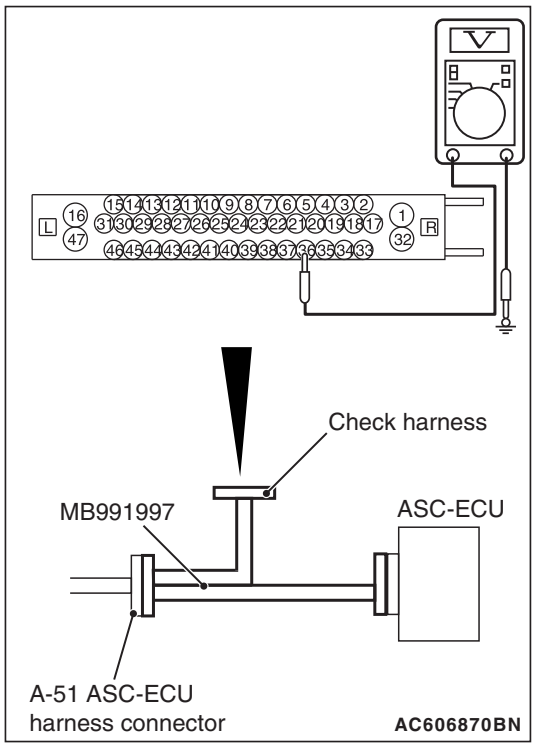
(2) Measure the resistance between the wheel speed sensor power supply terminal (signal terminal) No.36 and the body ground, and between the wheel speed sensor ground terminal No.37 and the body ground.

OK: No continuity

Q: Is the check result normal?

YES : Go to Step 7.

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



STEP 7. Voltage measurement at the A-51 ASC-ECU connector

(1) Disconnect the ASC-ECU connector, connect special tool ASC check harness (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 power supply terminal (signal terminal) No.36 and body ground, and between the ground terminal No.37 and body ground.

OK:
Terminal No.36 and body ground: Battery positive voltage
Terminal No.37 and body ground: 1 volt or less

Q: Is the check result normal?

YES : Go to Step 8.
NO : Go to Step 10.

STEP 8. Check for wheel speed sensor as a single unit

Refer to P.35C-307.

Q: Is the check result normal?

YES : Go to Step 9.
NO : Replace the wheel speed sensor <RL> (Refer to P.35C-306). Then go to Step 11.

STEP 9. Wiring harness check between A-51 ASC-ECU connector terminal No.36 and F-21 wheel speed sensor <RL> connector terminal No.1, and between A-51 ASC-ECU connector terminal No.37 and F-21 wheel speed sensor <RL> connector terminal No.2.

- Check for open or short circuit in wheel speed sensor <RL> circuit

Q: Is the check result normal?

YES : Go to Step 10.
NO : Repair the wiring harness. Then go to Step 11.

STEP 10. Check whether the DTC is reset.

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

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

Q: Is DTC C1020 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 11.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

STEP 11. Check whether the DTC is reset.

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

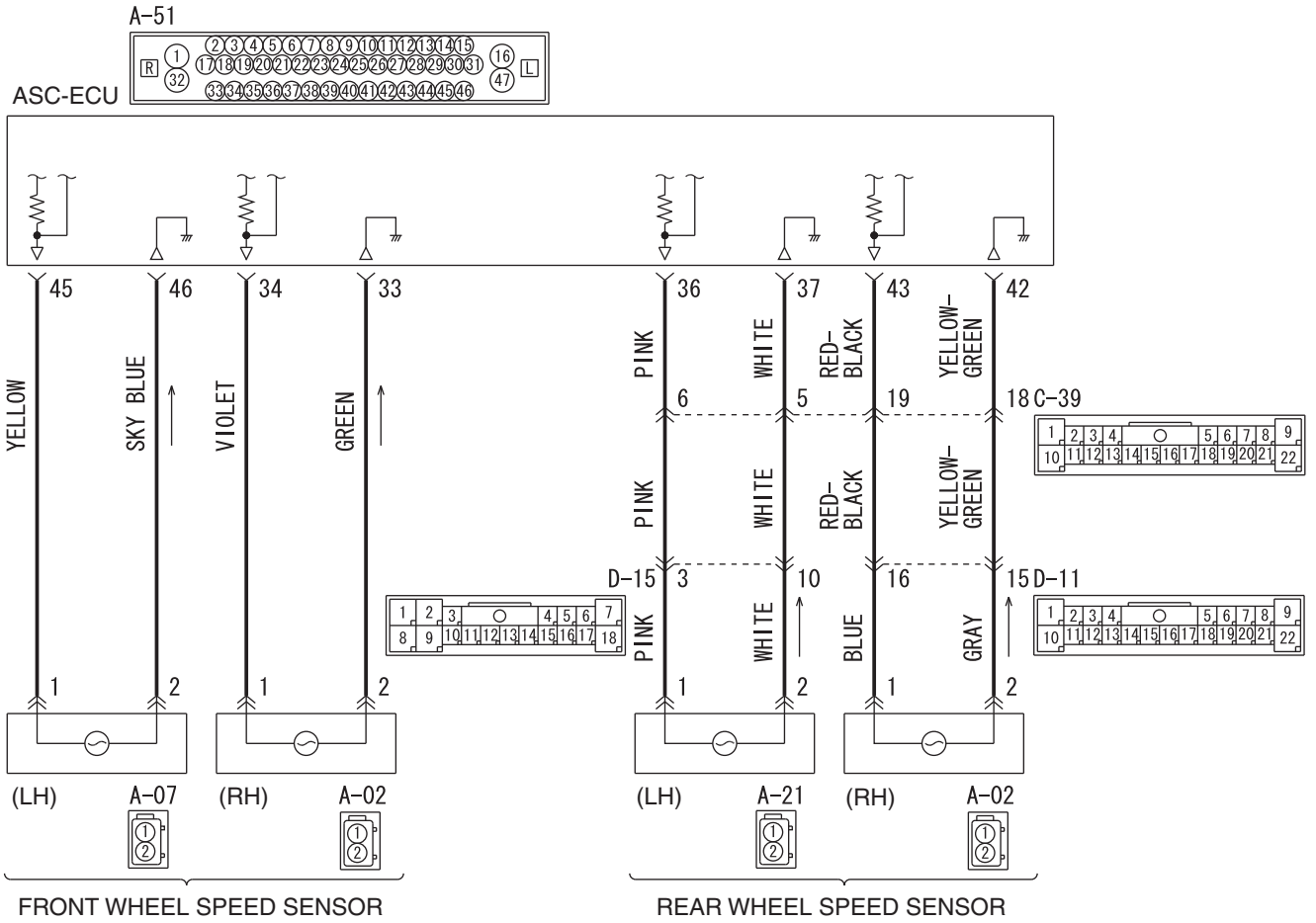
NOTE: The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12 mph (20 km/h) or higher.

Q: Is DTC C1020 set?

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

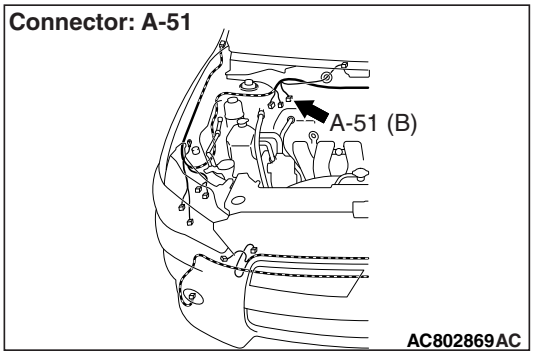
DTC C102B Abnormality in RR wheel speed sensor circuit

Wheel Speed Sensor Circuit

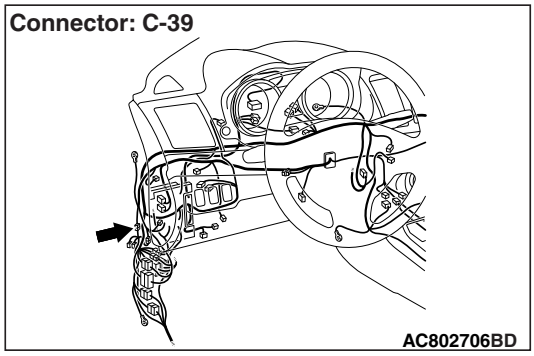


WAH35M000A

Connector: A-51

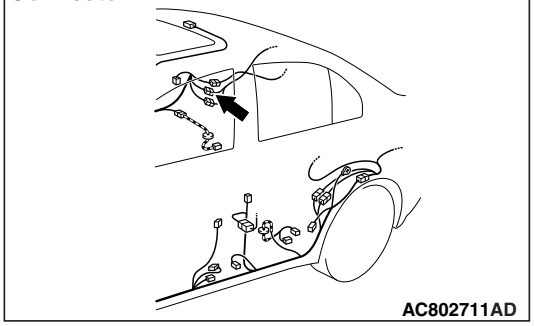


Connector: C-39



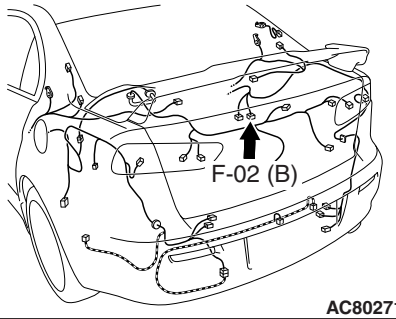
TSB Revision

Connector: D-11



AC802711AD

Connector: F-02



AC802714AI

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

- Each wheel speed detecting section is a kind of a pulse generator. It consists of the encoder (plate on which the north and south pole of magnet are arranged alternately) for detecting the wheel speed, which rotates at the same speed of the wheels, and the wheel speed sensor. This detecting section outputs the frequency pulse signals in proportion to the wheel speed.
- The pulse signals generated by the wheel speed detecting section 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
- Malfunction of ASC-ECU

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.00-14).

DIAGNOSIS

Required Special Tools:

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

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

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC C102B set?

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

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

Check the following service data (Refer to P.35C-282).

- Item No.04: RR wheel speed sensor

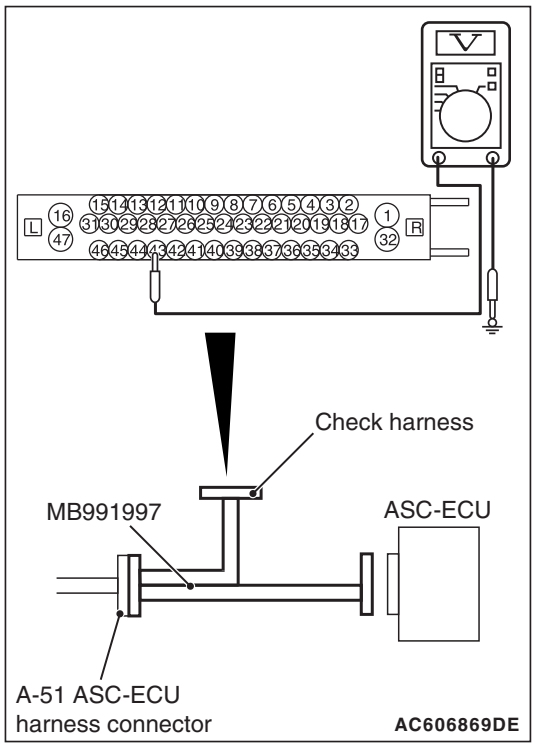
Q: Is the check result normal?

YES : Go to Step 10.
NO : Go to Step 4.

STEP 4. Connector check: A-51 ASC-ECU connector, C-39 intermediate connector, D-11 intermediate connector, F-02 wheel speed sensor <RR> connector

Q: Is the check result normal?

YES : Go to Step 5.
NO : Repair the defective connector. Then go to Step 11.



STEP 5. Voltage measurement at the A-51 ASC-ECU connector

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

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

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

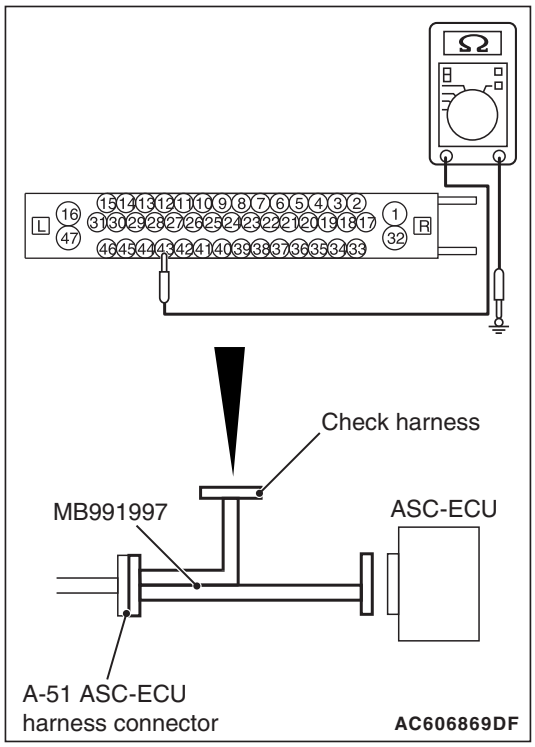
(3) Measure the voltage between the wheel speed sensor power supply terminal (signal terminal) No.43 and the body ground, and between the wheel speed sensor ground terminal No.42 and the body ground.

OK: 1 volt or less

Q: Is the check result normal?

YES : Go to Step 6.

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



STEP 6. Resistance measurement at A-51 ASC-ECU connector

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

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

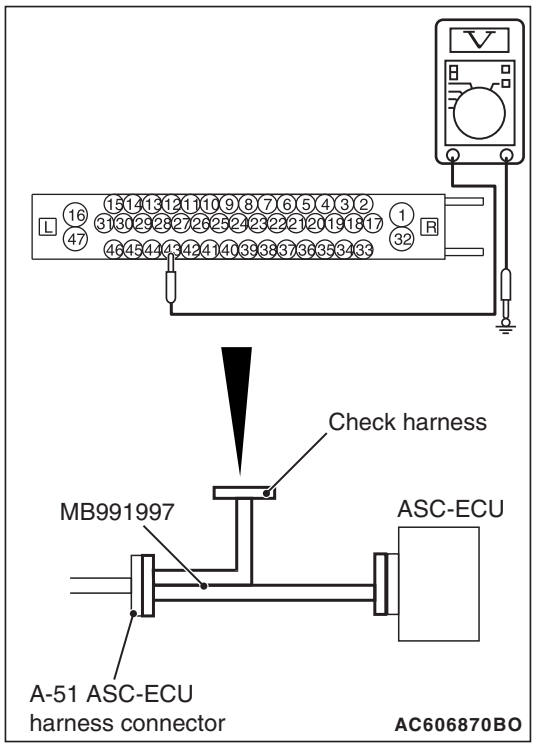
(2) Measure the resistance between the wheel speed sensor power supply terminal (signal terminal) No.43 and the body ground, and between the wheel speed sensor ground terminal No.42 and the body ground.

OK: No continuity

Q: Is the check result normal?

YES : Go to Step 7.

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



STEP 7. Voltage measurement at the A-51 ASC-ECU connector

(1) Disconnect the ASC-ECU connector, connect special tool ASC check harness (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 power supply terminal (signal terminal) No.43 and body ground, and between the ground terminal No.42 and body ground.

OK:
Terminal No.43 and body ground: Battery positive voltage
Terminal No.42 and body ground: 1 volt or less

Q: Is the check result normal?

YES : Go to Step 8.
NO : Go to Step 10.

STEP 8. Check for wheel speed sensor as a single unit

Refer to P.35C-307.

Q: Is the check result normal?

YES : Go to Step 9.
NO : Replace the wheel speed sensor <RR> (Refer to P.35C-306). Then go to Step 11.

STEP 9. Wiring harness check between A-51 ASC-ECU connector terminal No.43 and F-02 wheel speed sensor <RR> connector terminal No.1, and between A-51 ASC-ECU connector terminal No.42 and F-02 wheel speed sensor <RR> connector terminal No.2.

- Check for open or short circuit in wheel speed sensor <RR> circuit

Q: Is the check result normal?

YES : Go to Step 10.
NO : Repair the wiring harness. Then go to Step 11.

STEP 10. Check whether the DTC is reset.

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

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

Q: Is DTC C102B set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 11.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

STEP 11. Check whether the DTC is reset.

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

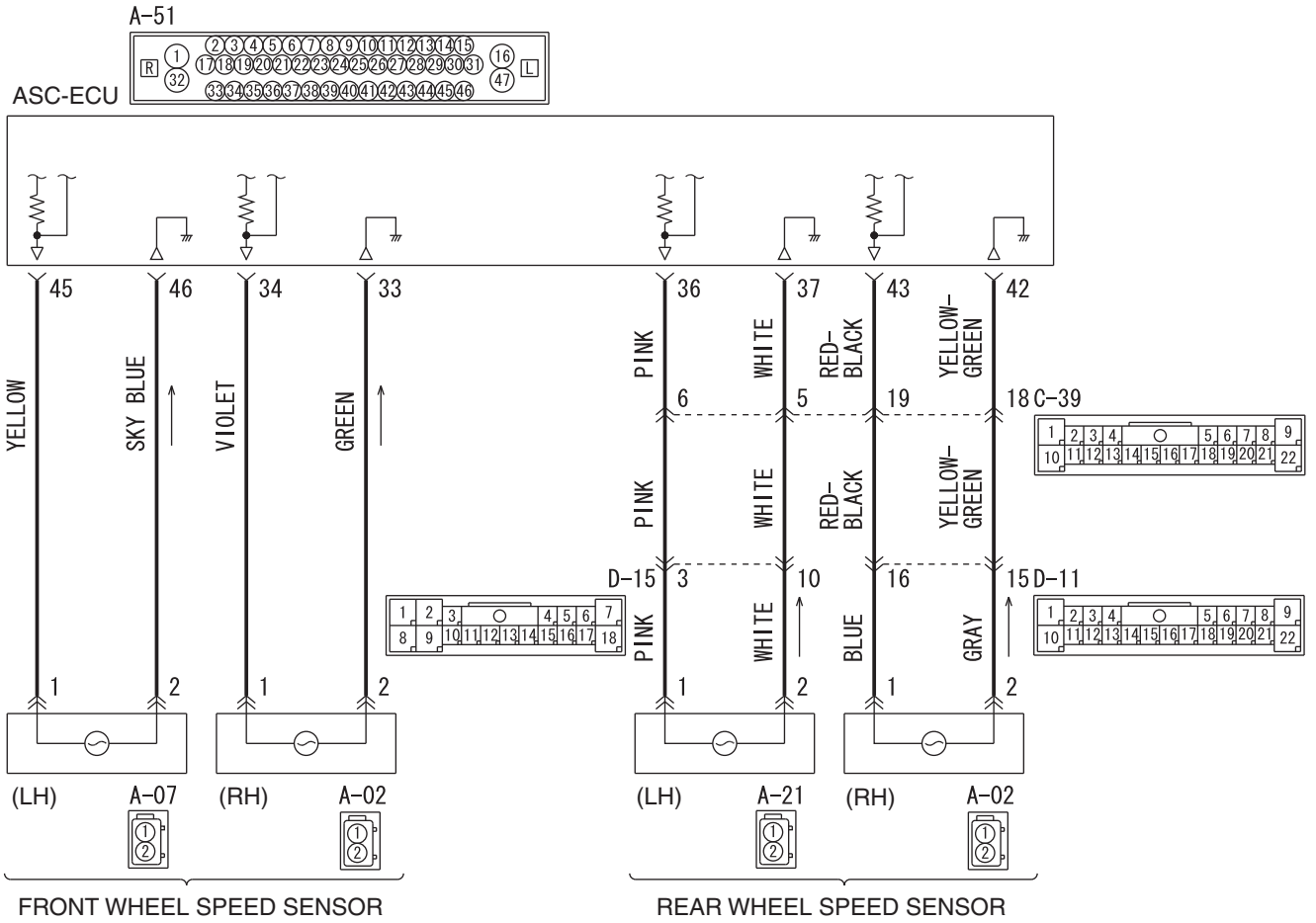
NOTE: The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12 mph (20 km/h) or higher.

Q: Is DTC C102B set?

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

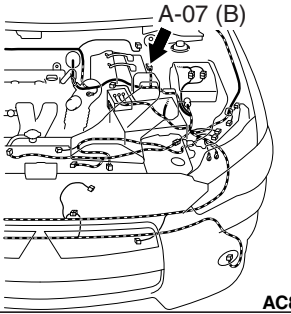
DTC C1011 Abnormality in FL wheel speed sensor signal

Wheel Speed Sensor Circuit

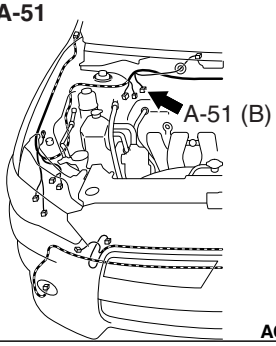


WAH35M000A

Connector: A-07



Connector: A-51



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⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

- Each wheel speed detecting section is a kind of a pulse generator. It consists of the encoder (plate on which the north and south pole of magnet are arranged alternately) for detecting the wheel speed, which rotates at the same speed of the wheels, and the wheel speed sensor. This detecting section outputs the frequency pulse signals in proportion to the wheel speed.
- The pulse signals generated by the wheel speed detecting section 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 DTC.

- 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
- The number of poles on the Magnetic encoder for wheel speed detection (N-pole and S-pole) is changed

Past trouble

- When DTC 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.00-14).
- When DTC C100A is not set, the following conditions may be present:
  - Some wheels slip
  - 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. Using scan tool MB991958, diagnose the CAN bus lines.

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC C1011 set?

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

STEP 3. Using scan tool MB991958, check the DTC

Check that DTC C100A is also set.

Q: Is DTC C100A also set?

YES : Perform the diagnosis for DTC C100A (Refer to P.35C-28).
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 <FL> correctly (Refer to P.35C-306). Then go to Step 16.

STEP 5. Check for wheel speed sensor as a single unit
Refer to P.35C-307.

Q: Is the check result normal?

YES : Go to Step 6.
NO : Replace the wheel speed sensor <FL> (Refer to P.35C-306). Then go to Step 16.

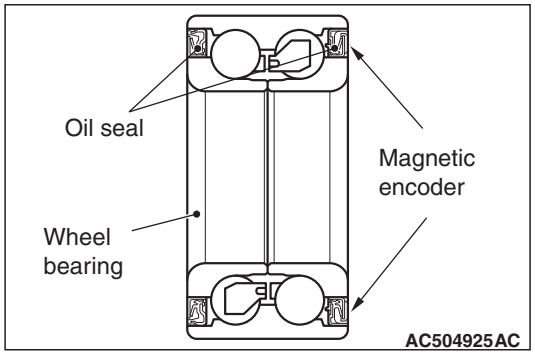
STEP 6. Check for wheel bearing looseness

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.26-10).*

Q: Is the check result normal?

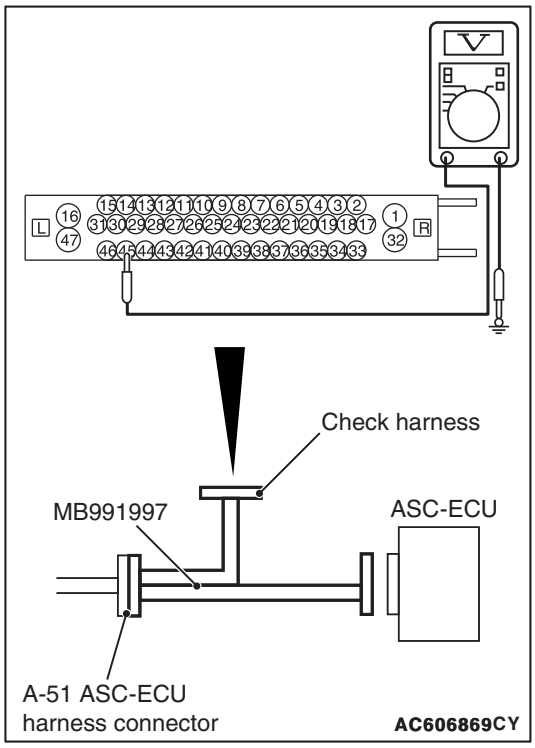
YES : Go to Step 7.
NO : Replace the wheel bearing (Refer to GROUP 26 – Front Axle Hub Assembly P.26-16).

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 (Refer to GROUP 26 – Front Axle Hub Assembly P.26-16).



STEP 8. Voltage measurement at the A-51 ASC-ECU connector

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

NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

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

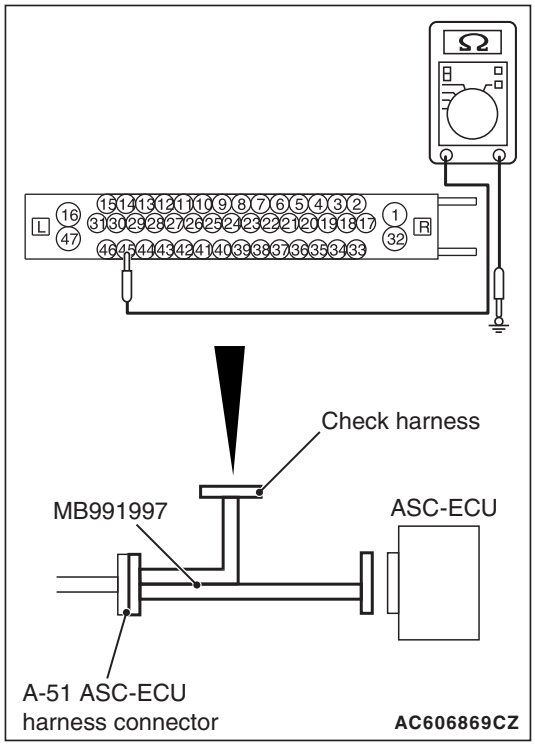
(3) Measure the voltage between the wheel speed sensor power supply terminal (signal terminal) No.45 and the body ground and between the ground terminal No.46 and the body ground.

OK: 1 volt or less

Q: Is the check result normal?

YES : Go to Step 9.

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



STEP 9. Resistance measurement at A-51 ASC-ECU connector

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

NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

(2) Measure the resistance between the wheel speed sensor power supply terminal (signal terminal) No.45 and the body ground and between the ground terminal No.46 and the body ground.

OK: No continuity

Q: Is the check result normal?

YES : Go to Step 12.

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

STEP 10. Connector check: A-51 ASC-ECU connector, A-07 wheel speed sensor <FL> connector

Q: Is the check result normal?

YES : Go to Step 11.
NO : Repair the defective connector. Then go to Step 16.

STEP 11. Wiring harness check between A-51 ASC-ECU connector terminal No.45 and A-07 wheel speed sensor <FL> connector terminal No.1 and between A-51 ASC-ECU connector terminal No.46 and A-07 wheel speed sensor <FL> connector terminal No.2.

- Check for short circuit in wheel speed sensor <FL> circuit.

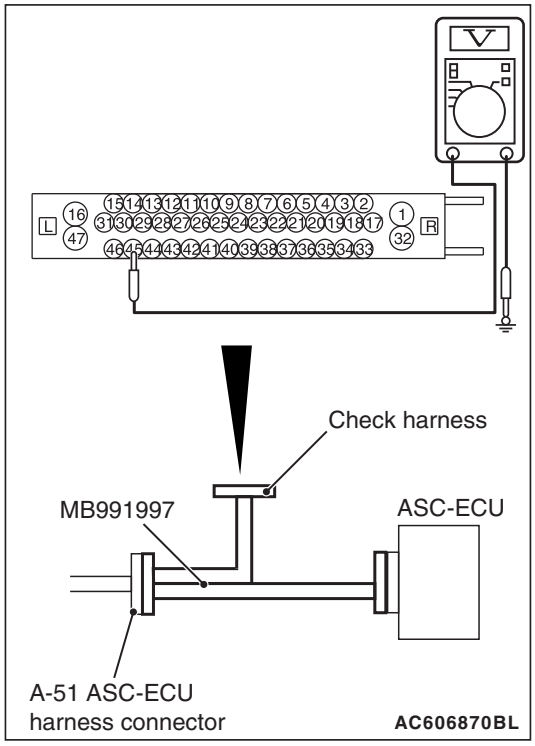
Q: Is the check result normal?

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

STEP 12. Voltage measurement at the A-51 ASC-ECU connector

(1) Disconnect the ASC-ECU connector, connect special tool ASC check harness (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 power supply terminal (signal terminal) No.45 and body ground, and between the ground terminal No.46 and body ground.

OK:
Terminal No.45 and body ground: Battery positive voltage
Terminal No.46 and body ground: 1 volt or less



Q: Is the check result normal?

YES : Go to Step 13.
NO : Go to Step 15.

STEP 13. Connector check: A-51 ASC-ECU connector, A-07 wheel speed sensor <FL> connector

Q: Is the check result normal?

YES : Go to Step 14.
NO : Repair the defective connector. Then go to Step 16.

STEP 14. Wiring harness check between A-51 ASC-ECU connector terminal No.45 and A-07 wheel speed sensor <FL> connector terminal No.1 and between A-51 ASC-ECU connector terminal No.46 and A-07 wheel speed sensor <FL> connector terminal No.2.

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

Q: Is the check result normal?

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

STEP 15. Check whether the DTC is reset.

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

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

Q: Is DTC C1011 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 16.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

STEP 16. Check whether the DTC is reset.

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

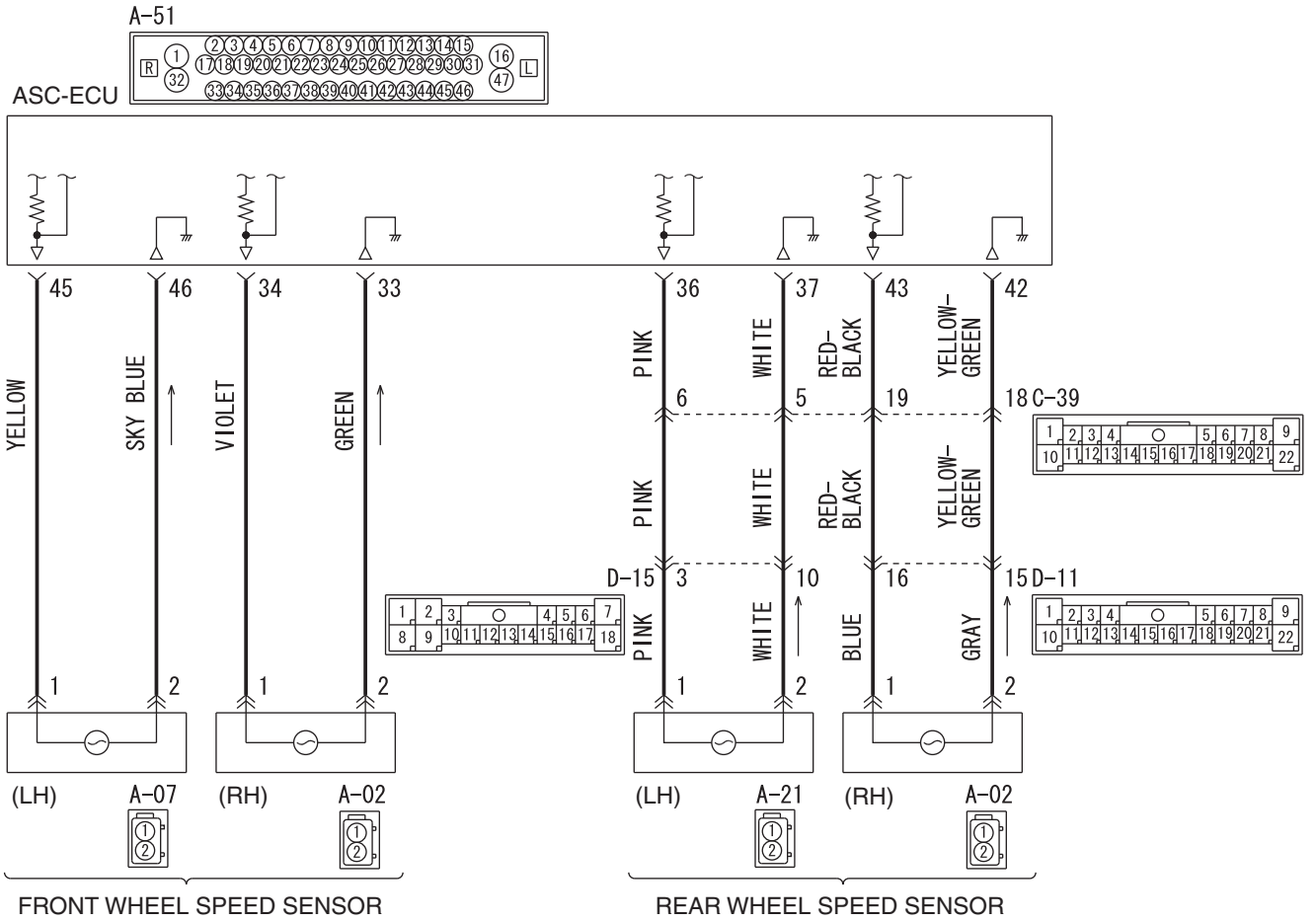
NOTE: The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12 mph (20 km/h) or higher.

Q: Is DTC C1011 set?

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

Code No. C101C Abnormality in FR wheel speed sensor signal

Wheel Speed Sensor Circuit



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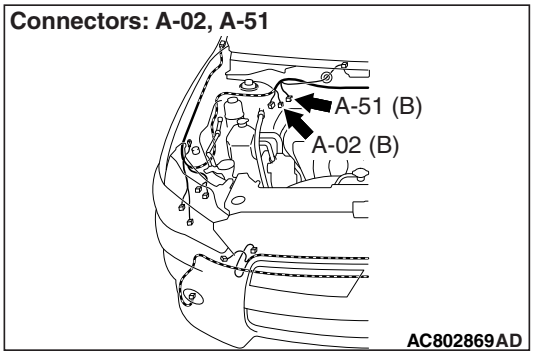

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⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

- Each wheel speed detecting section is a kind of a pulse generator. It consists of the encoder (plate on which the north and south pole of magnet are arranged alternately) for detecting the wheel speed, which rotates at the same speed of the wheels, and the wheel speed sensor. This detecting section outputs the frequency pulse signals in proportion to the wheel speed.
- The pulse signals generated by the wheel speed detecting section 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 DTC.

- 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
- The number of poles on the Magnetic encoder for wheel speed detection (N-pole and S-pole) is changed

Past trouble

- When DTC 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.00-14).
- When DTC C1015 is not set, the following conditions may be present:
  - Some wheels slip
  - 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. Using scan tool MB991958, diagnose the CAN bus lines.

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC C101C set?

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

STEP 3. Using scan tool MB991958, check the DTC

Check that DTC C1015 is also set.

Q: Is DTC C1015 also set?

YES : Perform the diagnosis for DTC C1015 (Refer to P.35C-33).
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 <FR> correctly (Refer to P.35C-306). Then go to Step 16.

STEP 5. Check for wheel speed sensor as a single unit
Refer to P.35C-307.

Q: Is the check result normal?

YES : Go to Step 6.
NO : Replace the wheel speed sensor <FR> (Refer to P.35C-306). Then go to Step 16.

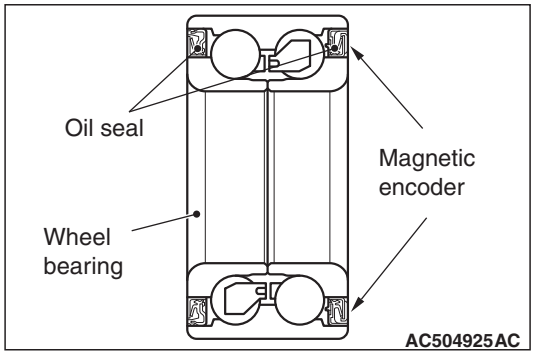
STEP 6. Check for wheel bearing looseness

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.26-10).*

Q: Is the check result normal?

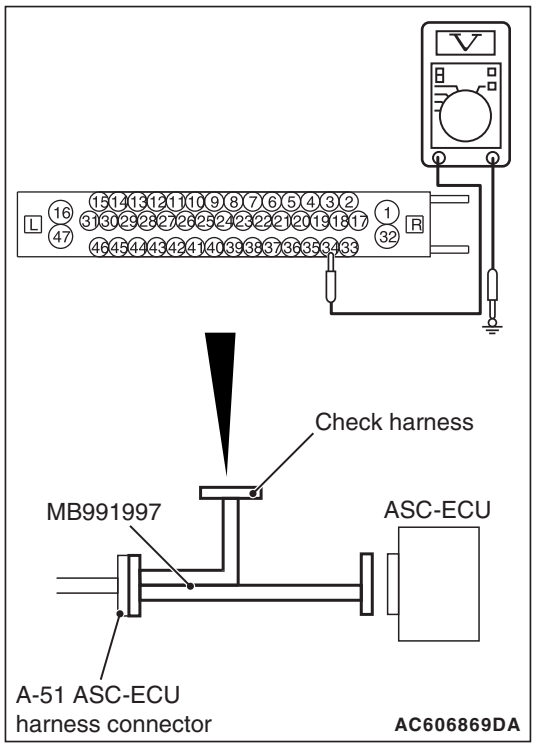
YES : Go to Step 7.
NO : Replace the wheel bearing (Refer to GROUP 26 – Front Axle Hub Assembly P.26-16).

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 (Refer to GROUP 26 – Front Axle Hub Assembly P.26-16).



STEP 8. Voltage measurement at the A-51 ASC-ECU connector

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

NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

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

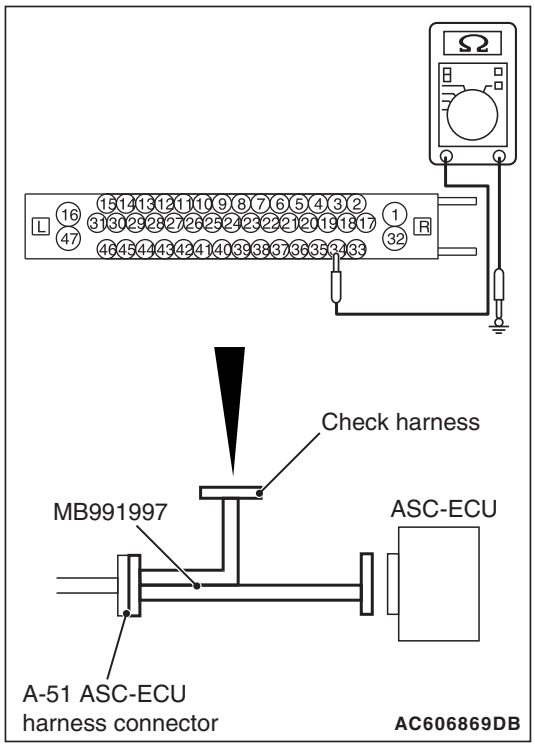
(3) Measure the voltage between the wheel speed sensor power supply terminal (signal terminal) No.34 and the body ground and between the ground terminal No.33 and the body ground.

OK: 1 volt or less

Q: Is the check result normal?

YES : Go to Step 9.

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



STEP 9. Resistance measurement at A-51 ASC-ECU connector

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

NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

(2) Measure the resistance between the wheel speed sensor power supply terminal (signal terminal) No.34 and the body ground and between the wheel speed sensor ground terminal No.33 and the body ground.

OK: No continuity

Q: Is the check result normal?

YES : Go to Step 12.

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

STEP 10. Connector check: A-51 ASC-ECU connector, A-02 wheel speed sensor <FR> connector

Q: Is the check result normal?

YES : Go to Step 11.
NO : Repair the defective connector. Then go to Step 16.

STEP 11. Wiring harness check between A-51 ASC-ECU connector terminal No.34 and A-02 wheel speed sensor <FR> connector terminal No.1 and between A-51 ASC-ECU connector terminal No.33 and A-02 wheel speed sensor <FR> connector terminal No.2.

- Check for short circuit in wheel speed sensor <FR> circuit.

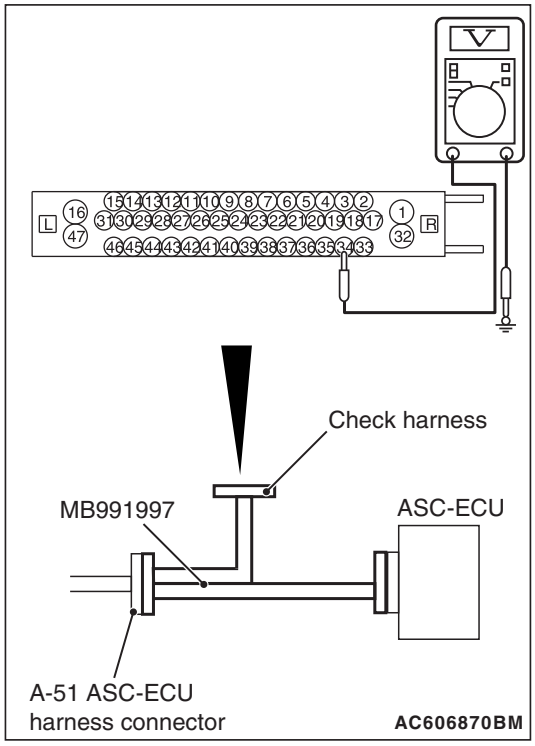
Q: Is the check result normal?

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

STEP 12. Voltage measurement at the A-51 ASC-ECU connector

(1) Disconnect the ASC-ECU connector, connect special tool ASC check harness (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 power supply terminal (signal terminal) No.34 and body ground, and between the ground terminal No.33 and body ground.

OK:
Terminal No.34 and body ground: Battery positive voltage
Terminal No.33 and body ground: 1 volt or less



Q: Is the check result normal?

YES : Go to Step 13.
NO : Go to Step 15.

STEP 13. Connector check: A-51 ASC-ECU connector, A-02 wheel speed sensor <FR> connector

Q: Is the check result normal?

YES : Go to Step 14.
NO : Repair the defective connector. Then go to Step 16.

STEP 14. Wiring harness check between A-51 ASC-ECU connector terminal No.34 and A-02 wheel speed sensor <FR> connector terminal No.1 and between A-51 ASC-ECU connector terminal No.33 and A-02 wheel speed sensor <FR> connector terminal No.2.

- Check for open circuit in wheel speed sensor <FR> circuit.

Q: Is the check result normal?

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

STEP 15. Check whether the DTC is reset.

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

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

Q: Is DTC C101C set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 16.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

STEP 16. Check whether the DTC is reset.

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

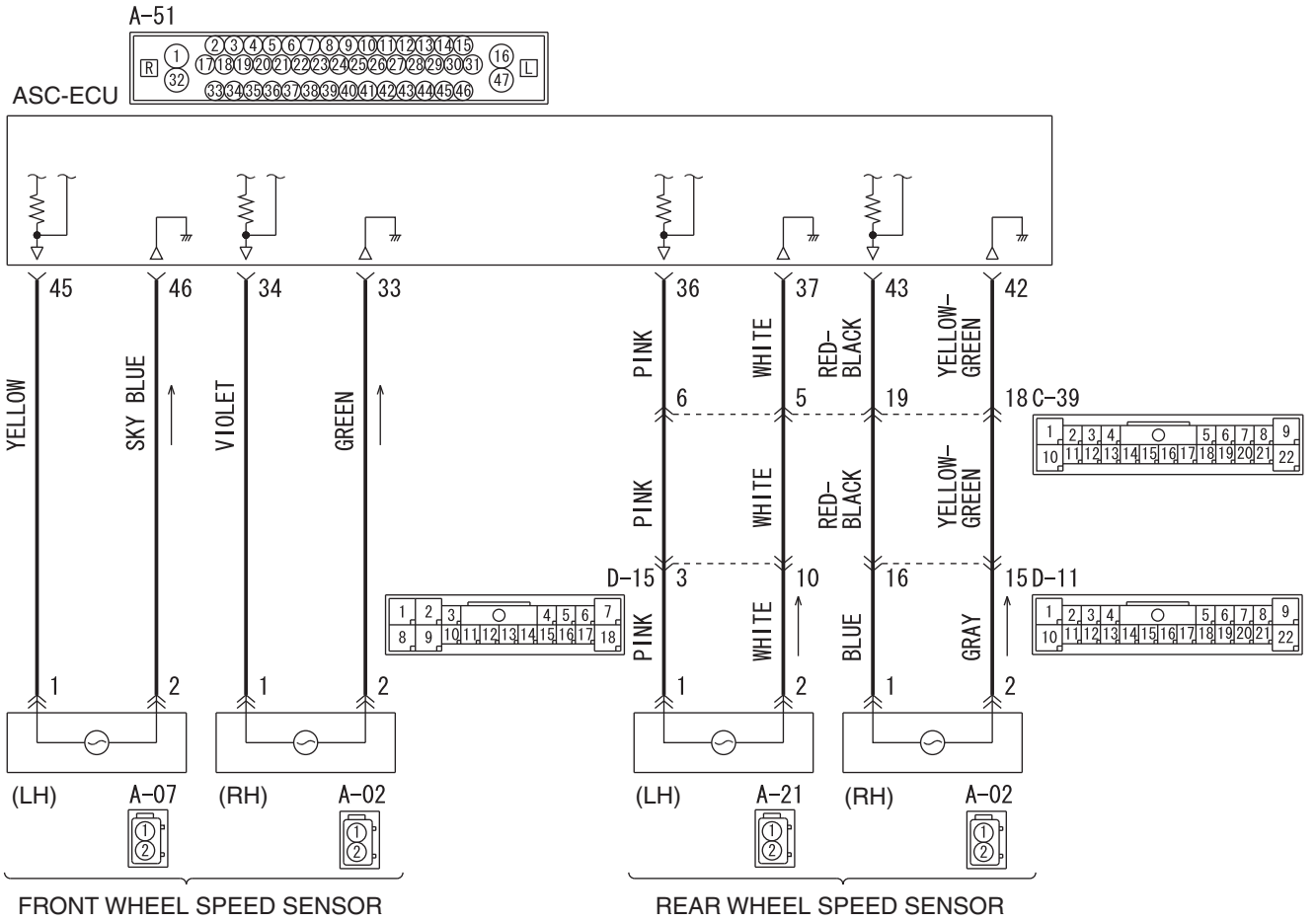
NOTE: The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12 mph (20 km/h) or higher.

Q: Is DTC C101C set?

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

DTC C1027 Abnormality in RL wheel speed sensor signal

Wheel Speed Sensor Circuit



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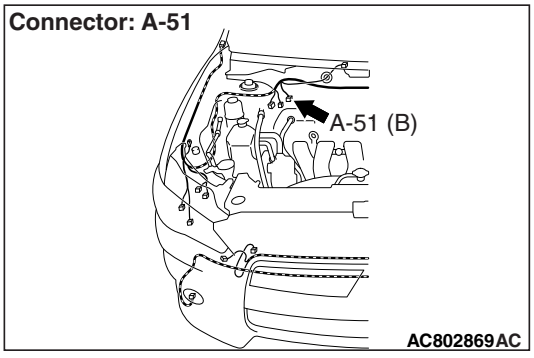

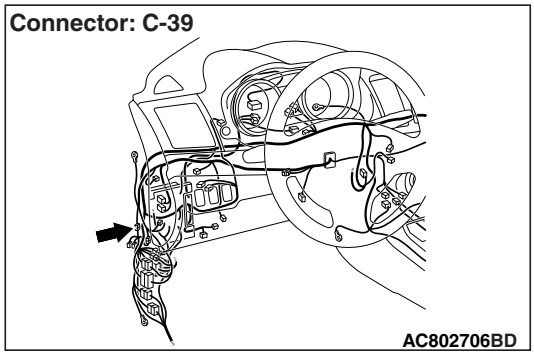

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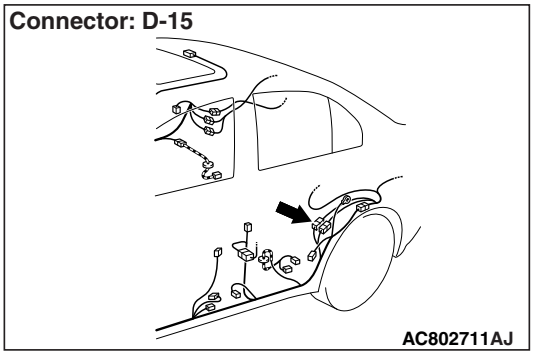

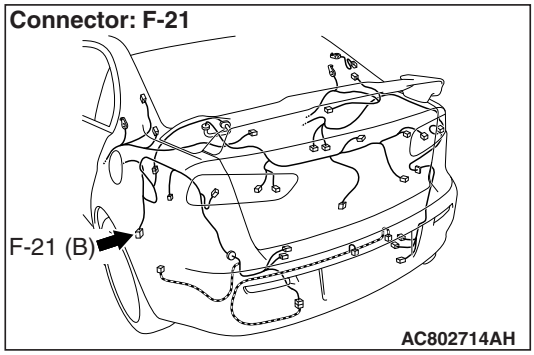

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

- Each wheel speed detecting section is a kind of a pulse generator. It consists of the encoder (plate on which the north and south pole of magnet are arranged alternately) for detecting the wheel speed, which rotates at the same speed of the wheels, and the wheel speed sensor. This detecting section outputs the frequency pulse signals in proportion to the wheel speed.
- The pulse signals generated by the wheel speed detecting section 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 DTC.

- 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

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- 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
- The number of poles on the Magnetic encoder for wheel speed detection (N-pole and S-pole) is changed

Past trouble

- When DTC 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 (GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).
- When DTC C1020 is not set, the following conditions may be present:
  - Some wheels slip
  - 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. Using scan tool MB991958, diagnose the CAN bus lines.

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC C1027 set?

YES : Go to Step 3.

NO : The procedure is complete.

STEP 3. Using scan tool MB991958, check the DTC
Check that the DTC C1020 is also set.

Q: Is DTC C1020 also set?

YES : Perform the diagnosis for the DTC C1020 (Refer to P.35C-38).
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 (Refer to P.35C-306). Then go to Step 16.

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

Q: Is the check result normal?

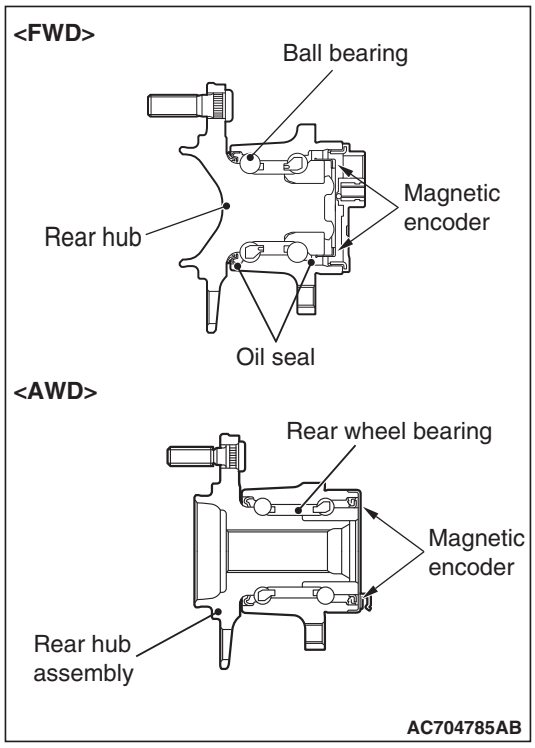
YES : Go to Step 6.
NO : Replace the wheel speed sensor <RL> (Refer to P.35C-306). Then go to Step 16.

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 Rear wheel hub assembly <RL (FWD)> (Refer to GROUP 27A – On-vehicle Service P.27A-5).*
- *Check the wheel bearing <RL (AWD)> for looseness (Refer to GROUP 27B – On-vehicle Service P.27B-16).*

Q: Is the check result normal?

YES : Go to Step 7.
NO (FWD) : Replace the rear wheel hub assembly (Refer to GROUP 27A – Rear axle hub assembly P.27A-7).
NO (AWD) : Replace the wheel bearing (Refer to GROUP 27B – Rear axle hub assembly P.27B-18).



STEP 7. Check of wheel speed detection encoder

Check the encoder for adhesion of foreign materials or deformation.

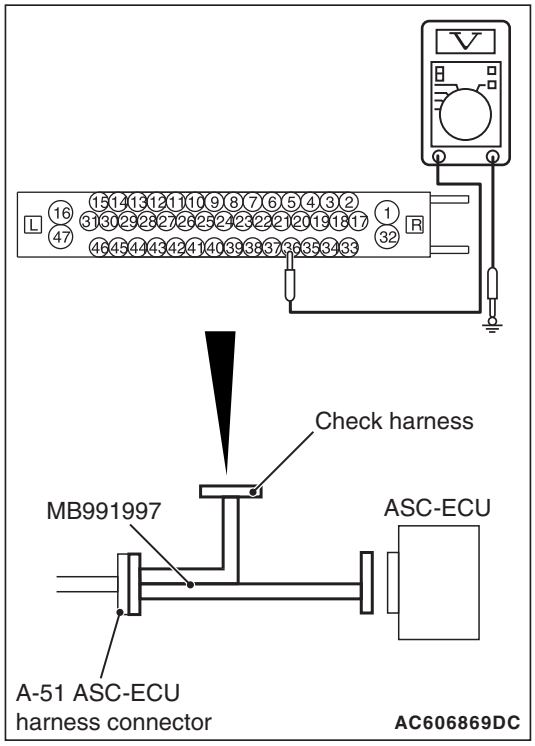
Q: Is the check result normal?

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 (FWD)> : Replace the rear wheel hub assembly (Refer to GROUP 27A – Rear axle hub assembly P.27A-7).

NO <Deformation (AWD)> : Replace the wheel bearing (Refer to GROUP 27B – Rear axle hub assembly P.27B-18).



STEP 8. Voltage measurement at the A-51 ASC-ECU connector

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

NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

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

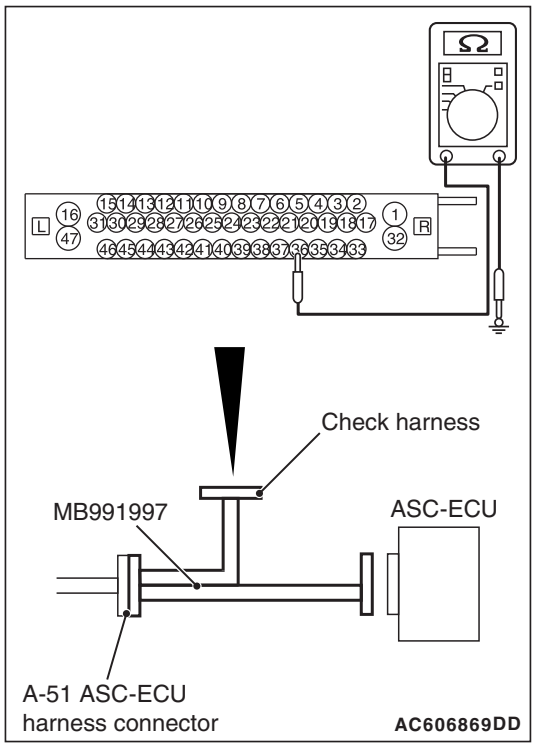
(3) Measure the voltage between the wheel speed sensor power supply terminal (signal terminal) No.36 and the body ground, and between the wheel speed sensor ground terminal No.37 and the body ground.

OK: 1 volt or less

Q: Is the check result normal?

YES : Go to Step 9.

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



STEP 9. Resistance measurement at A-51 ASC-ECU connector

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

NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

(2) Measure the resistance between the wheel speed sensor power supply terminal (signal terminal) No.36 and the body ground, and between the wheel speed sensor ground terminal No.37 and the body ground.

OK: No continuity

Q: Is the check result normal?

YES : Go to Step 12.

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

STEP 10. Connector check: A-51 ASC-ECU connector, C-39 intermediate connector, D-15 intermediate connector, F-21 wheel speed sensor <RL> connector

Q: Is the check result normal?

YES : Go to Step 11.

NO : Repair the defective connector. Then go to Step 16.

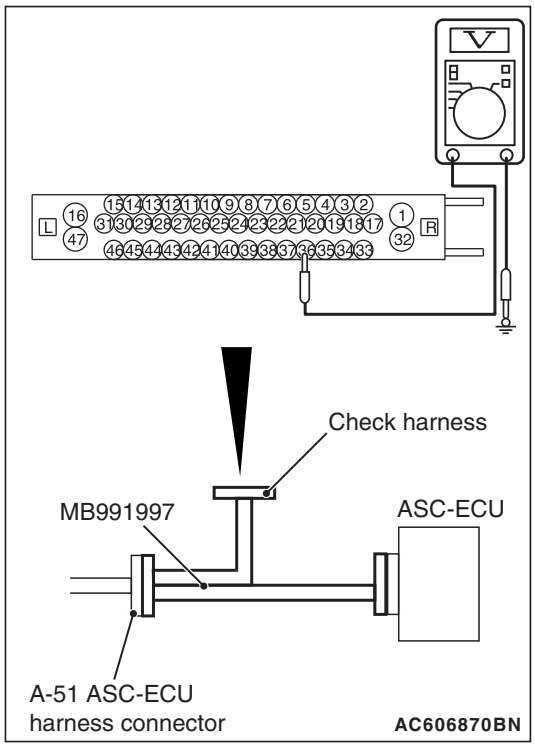
STEP 11. Wiring harness check between A-51 ASC-ECU connector terminal No.36 and F-21 wheel speed sensor <RL> connector terminal No.1, and between A-51 ASC-ECU connector terminal No.37 and F-21 wheel speed sensor <RL> connector terminal No.2.

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

Q: Is the check result normal?

YES : Go to Step 15.

NO : Repair the wiring harness. Then go to Step 16.



STEP 12. Voltage measurement at the A-51 ASC-ECU connector

(1) Disconnect the ASC-ECU connector, connect special tool ASC check harness (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 power supply terminal (signal terminal) No.36 and body ground, and between the ground terminal No.37 and body ground.

OK:
Terminal No.36 and body ground: Battery positive voltage
Terminal No.37 and body ground: 1 volt or less

Q: Is the check result normal?

YES : Go to Step 13.
NO : Go to Step 15.

STEP 13. Connector check: A-51 ASC-ECU connector, C-39 intermediate connector, D-15 intermediate connector, F-21 wheel speed sensor <RL> connector

Q: Is the check result normal?

YES : Go to Step 14.
NO : Repair the defective connector. Then go to Step 16.

STEP 14. Wiring harness check between A-51 ASC-ECU connector terminal No.36 and F-21 wheel speed sensor <RL> connector terminal No.1, and between A-51 ASC-ECU connector terminal No.37 and F-21 wheel speed sensor <RL> connector terminal No.2.

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

Q: Is the check result normal?

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

STEP 15. Check whether the DTC is reset.

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

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

Q: Is DTC C1027 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 16.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

STEP 16. Check whether the DTC is reset.

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

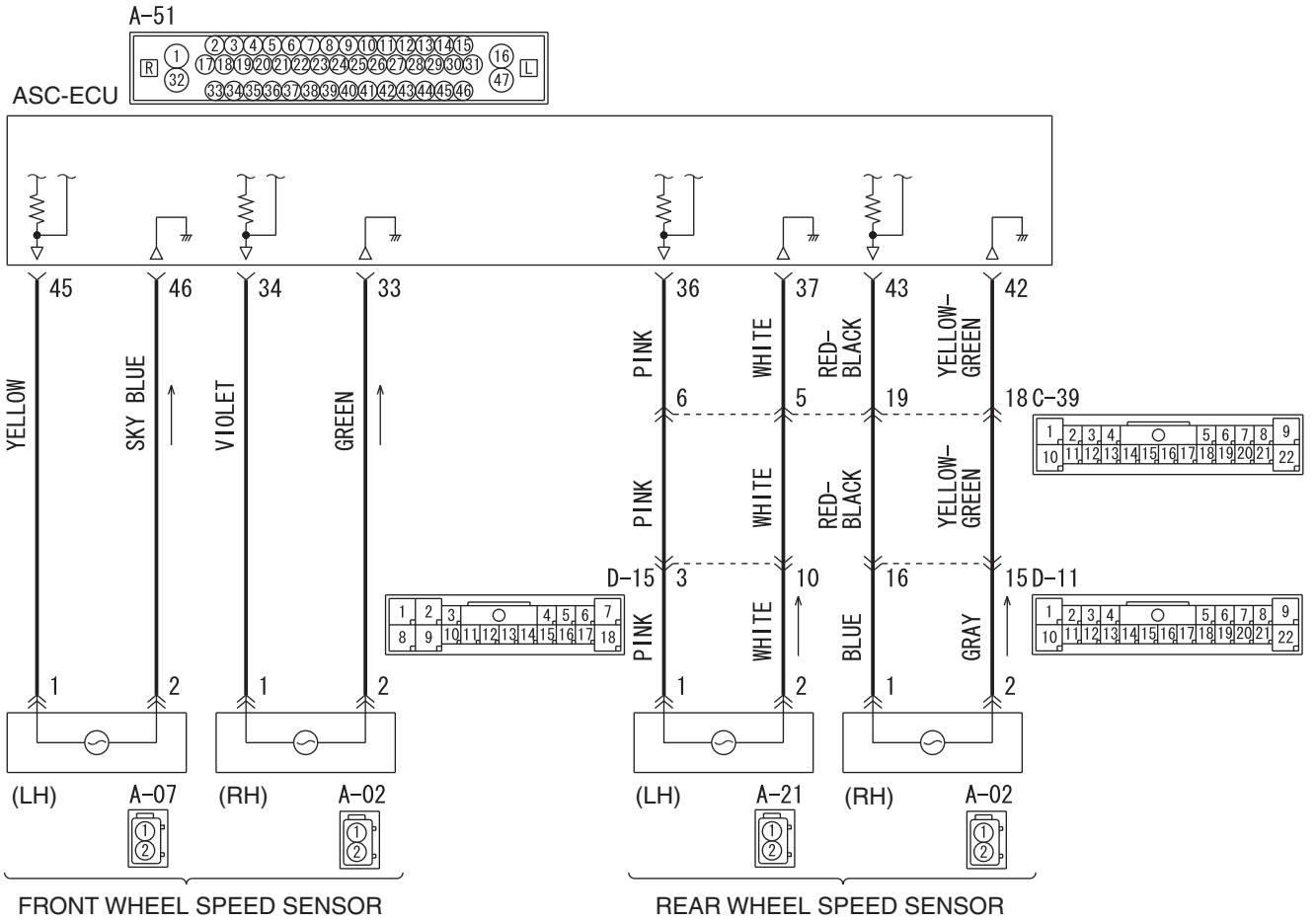
NOTE: The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12 mph (20 km/h) or higher.

Q: Is DTC C1027 set?

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

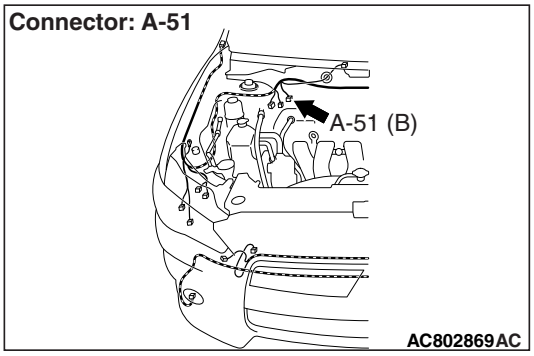
DTC C1032 Abnormality in RR wheel speed sensor signal

Wheel Speed Sensor Circuit

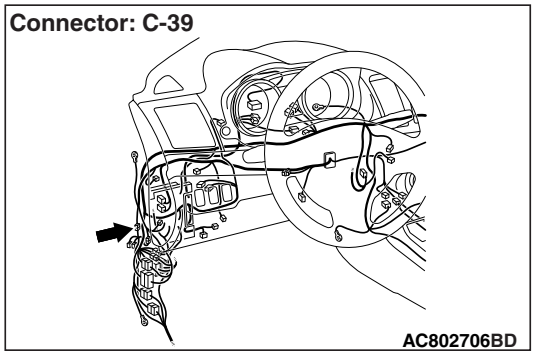


WAH35M000A

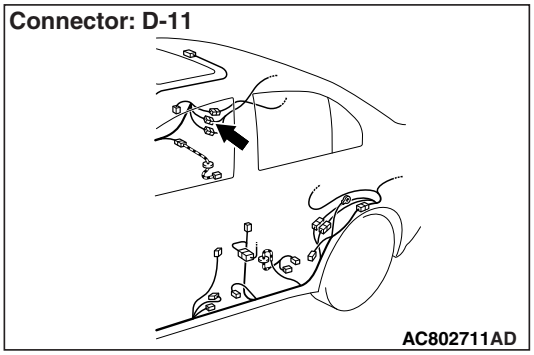
Connector: A-51

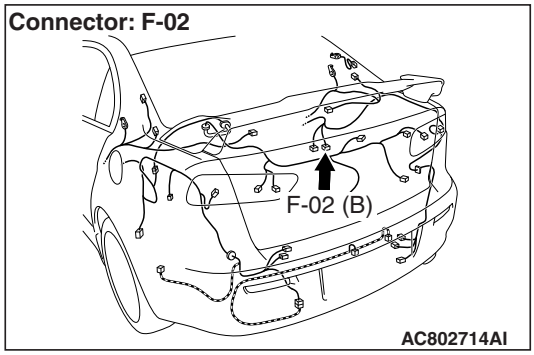


Connector: C-39



TSB Revision





⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

- Each wheel speed detecting section is a kind of a pulse generator. It consists of the encoder (plate on which the north and south pole of magnet are arranged alternately) for detecting the wheel speed, which rotates at the same speed of the wheels, and the wheel speed sensor. This detecting section outputs the frequency pulse signals in proportion to the wheel speed.
- The pulse signals generated by the wheel speed detecting section 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 DTC.

- 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

TSB Revision

- 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
- The number of poles on the Magnetic encoder for wheel speed detection (N-pole and S-pole) is changed

Past trouble

- When DTC 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 (GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).
- When DTC C102B is not set, the following conditions may be present:
  - Some wheels slip
  - 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. Using scan tool MB991958, diagnose the CAN bus lines.

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC C1032 set?

YES : Go to Step 3.

NO : The procedure is complete.

STEP 3. Using scan tool MB991958, check the DTC
Check that the DTC C102B is also set.

Q: Is DTC C102B also set?

YES : Perform the diagnosis for the DTC C102B (Refer to P.35C-44).
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 <RR> correctly (Refer to P.35C-306). Then go to Step 16.

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

Q: Is the check result normal?

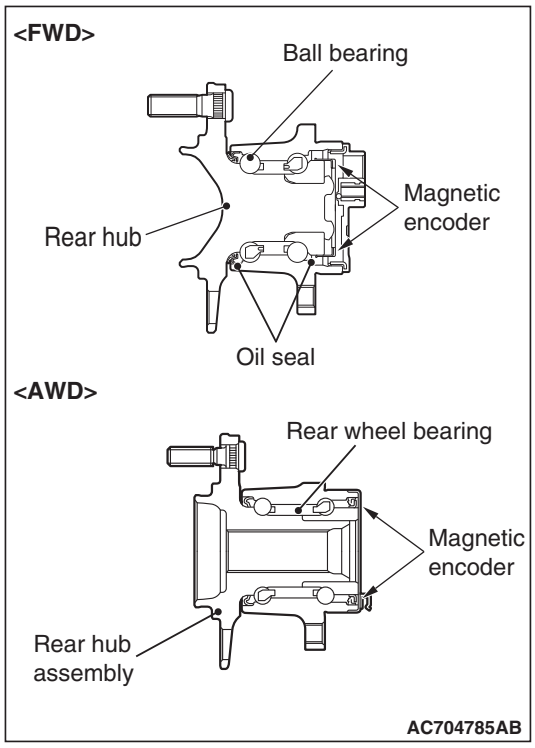
YES : Go to Step 6.
NO : Replace the wheel speed sensor <RR> (Refer to P.35C-306). Then go to Step 16.

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 Rear wheel hub assembly <RL (FWD)> (Refer to GROUP 27A – On-vehicle Service P.27A-5).*
- *Check the wheel bearing <RL (AWD)> for looseness (Refer to GROUP 27B – On-vehicle Service P.27B-16).*

Q: Is the check result normal?

YES : Go to Step 7.
NO (FWD) : Replace the rear wheel hub assembly (Refer to GROUP 27A – Rear axle hub assembly P.27A-7).
NO (AWD) : Replace the wheel bearing (Refer to GROUP 27B – Rear axle hub assembly P.27B-18).



STEP 7. Check of wheel speed detection encoder

Check the encoder for adhesion of foreign materials or deformation.

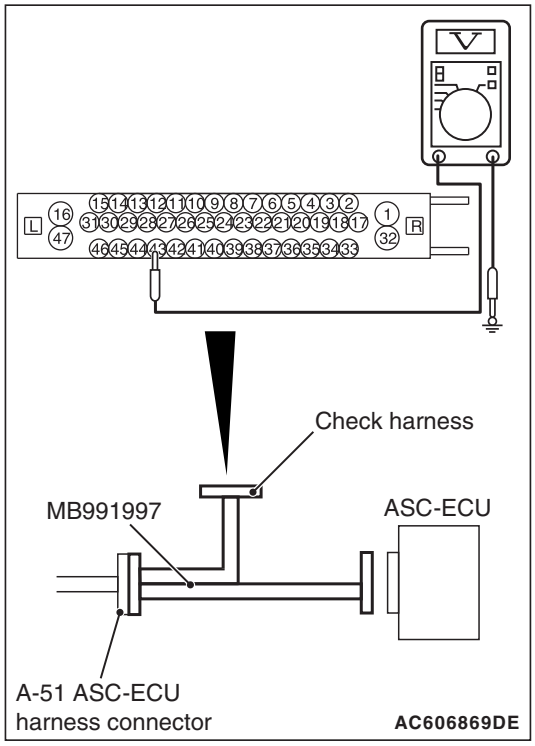
Q: Is the check result normal?

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 (FWD)> : Replace the rear wheel hub assembly (Refer to GROUP 27A – Rear axle hub assembly P.27A-7).

NO <Deformation (AWD)> : Replace the wheel bearing (Refer to GROUP 27B – Rear axle hub assembly P.27B-18).



STEP 8. Voltage measurement at the A-51 ASC-ECU connector

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

NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

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

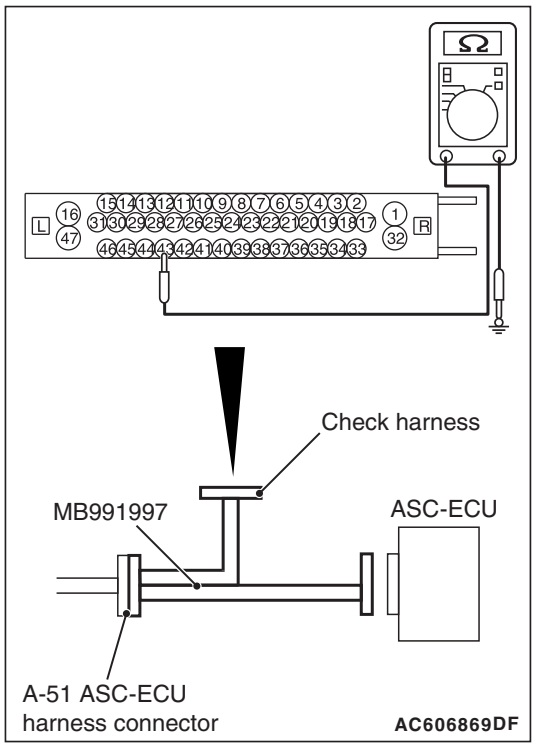
(3) Measure the voltage between the wheel speed sensor power supply terminal (signal terminal) No.43 and the body ground, and between the wheel speed sensor ground terminal No.42 and the body ground.

OK: 1 volt or less

Q: Is the check result normal?

YES : Go to Step 9.

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



STEP 9. Resistance measurement at A-51 ASC-ECU connector

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

NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

(2) Measure the resistance between the wheel speed sensor power supply terminal (signal terminal) No.43 and the body ground, and between the wheel speed sensor ground terminal No.42 and the body ground.

OK: No continuity

Q: Is the check result normal?

YES : Go to Step 12.

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

STEP 10. Connector check: A-51 ASC-ECU connector, C-39 intermediate connector, D-11 intermediate connector, F-02 wheel speed sensor <RR> connector

Q: Is the check result normal?

YES : Go to Step 11.

NO : Repair the defective connector. Then go to Step 16.

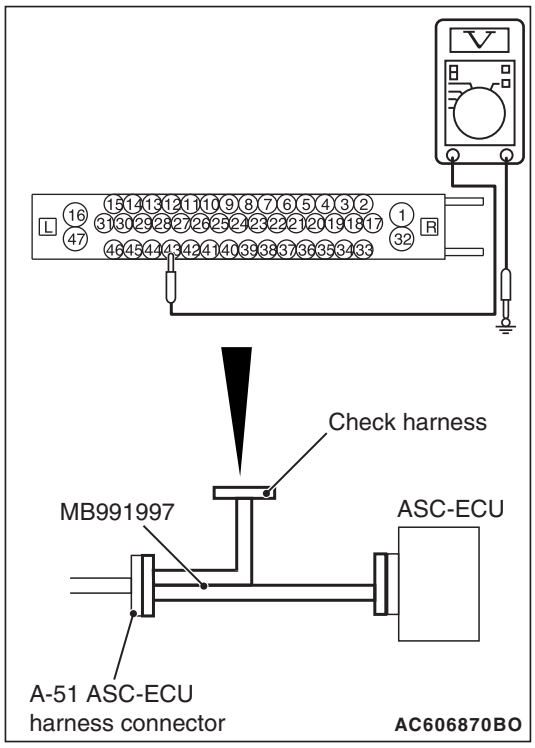
STEP 11. Wiring harness check between A-51 ASC-ECU connector terminal No.43 and F-02 wheel speed sensor <RR> connector terminal No.1, and between A-51 ASC-ECU connector terminal No.42 and F-02 wheel speed sensor <RR> connector terminal No.2.

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

Q: Is the check result normal?

YES : Go to Step 15.

NO : Repair the wiring harness. Then go to Step 16.



STEP 12. Voltage measurement at the A-51 ASC-ECU connector

(1) Disconnect the ASC-ECU connector, connect special tool ASC check harness (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 power supply terminal (signal terminal) No.43 and body ground, and between the ground terminal No.42 and body ground.

OK:
Terminal No.43 and body ground: Battery positive voltage
Terminal No.42 and body ground: 1 volt or less

Q: Is the check result normal?

YES : Go to Step 13.
NO : Go to Step 15.

STEP 13. Connector check: A-51 ASC-ECU connector, C-39 intermediate connector, D-11 intermediate connector, F-02 wheel speed sensor <RR> connector

Q: Is the check result normal?

YES : Go to Step 14.
NO : Repair the defective connector. Then go to Step 16.

STEP 14. Wiring harness check between A-51 ASC-ECU connector terminal No.43 and F-02 wheel speed sensor <RR> connector terminal No.1, and between A-51 ASC-ECU connector terminal No.42 and F-02 wheel speed sensor <RR> connector terminal No.2.

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

Q: Is the check result normal?

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

STEP 15. Check whether the DTC is reset.
(1) Erase the DTC.
(2) Drive the vehicle at 12 mph (20 km/h) or more.

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

Q: Is DTC C1032 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 16.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

STEP 16. Check whether the DTC is reset.
(1) Erase the DTC.
(2) Drive the vehicle at 12 mph (20 km/h) or more.

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

Q: Is DTC C1032 set?

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

DTC C1014 Mutual monitoring of FL wheel speed sensor

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

- Each wheel speed detecting section is a kind of a pulse generator. It consists of the encoder (plate on which the north and south pole of magnet are arranged alternately) for detecting the wheel speed, which rotates at the same speed of the wheels, and the wheel speed sensor. This detecting section outputs the frequency pulse signals in proportion to the wheel speed.
- The pulse signals generated by the wheel speed detecting section 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 DTC.

- 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
- The number of poles on the Magnetic encoder for wheel speed detection (N-pole and S-pole) is changed

Past trouble

- When DTC 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.00-14).
- When DTC C100A is not set, the following conditions may be present:
  - Some wheels slip
  - Unstable vehicle attitude
  - External noise interference
  - Vehicle ran with the parking brake applied.
  - Rotate only two wheels with drum tester

DIAGNOSIS

Required Special Tools:

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

STEP 1. Using scan tool MB991958, diagnose the CAN bus lines.
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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC C1014 set?

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

STEP 3. Using scan tool MB991958, check the DTC
Check that DTC C100A is also set.

Q: Is DTC C100A also set?

YES : Perform the diagnosis for DTC C100A (Refer to P.35C-28).
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 <FL> correctly (Refer to P.35C-306). Then go to Step 9.

STEP 5. Check for wheel speed sensor as a single unit
Refer to P.35C-307.

Q: Is the check result normal?

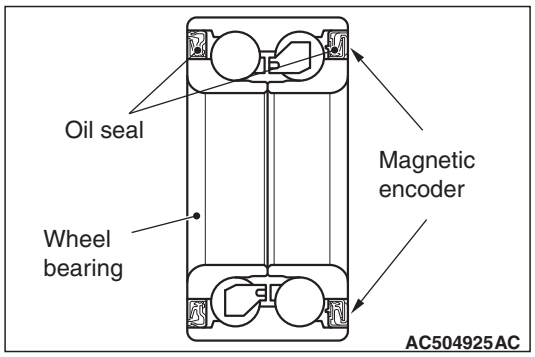
YES : Go to Step 6.
NO : Replace the wheel speed sensor <FL> (Refer to P.35C-306). Then go to Step 9.

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.26-10).*

Q: Is the check result normal?

YES : Go to Step 7.
NO : Replace the wheel bearing (Refer to GROUP 26 – Front axle hub assembly P.26-16).



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 (Refer to GROUP 26 – Front axle hub assembly P.26-16).

STEP 8. Check whether the DTC is reset.

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

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

Q: Is DTC C1014 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 9.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

STEP 9. Check whether the DTC is reset.

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

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

Q: Is DTC C1014 set?

YES : Return to Step 1.

NO : The procedure is complete.

DTC C101F Mutual monitoring of FR wheel speed sensor

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

- Each wheel speed detecting section is a kind of a pulse generator. It consists of the encoder (plate on which the north and south pole of magnet are arranged alternately) for detecting the wheel speed, which rotates at the same speed of the wheels, and the wheel speed sensor. This detecting section outputs the frequency pulse signals in proportion to the wheel speed.
- The pulse signals generated by the wheel speed detecting section 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 DTC.

- 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
- The number of poles on the Magnetic encoder for wheel speed detection (N-pole and S-pole) is changed

Past trouble

- When DTC 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.00-14).
- When DTC C1015 is not set, the following conditions may be present:
  - Some wheels slip
  - Unstable vehicle attitude
  - External noise interference
  - Vehicle ran with the parking brake applied.
  - Rotate only two wheels with drum tester

DIAGNOSIS

Required Special Tools:

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

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

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC C101F set?

YES : Go to Step 3.

NO : The procedure is complete.

STEP 3. Using scan tool MB991958, check the DTC

Check that DTC C1015 is also set.

Q: Is DTC C1015 also set?

YES : Perform the diagnosis for DTC C1015 (Refer to P.35C-33).

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 <FR> correctly (Refer to P.35C-306). Then go to Step 9.

STEP 5. Check for wheel speed sensor as a single unit
Refer to P.35C-307.

Q: Is the check result normal?

YES : Go to Step 6.
NO : Replace the wheel speed sensor <FR> (Refer to P.35C-306). Then go to Step 9.

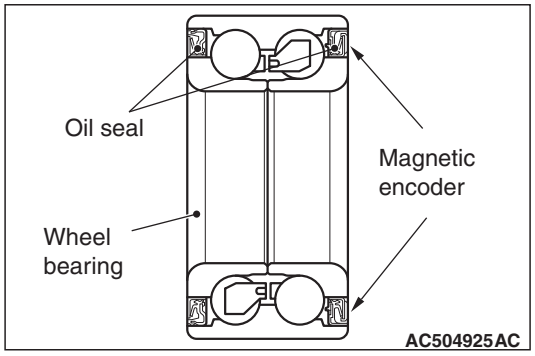
STEP 6. Check for wheel bearing looseness

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.26-10).*

Q: Is the check result normal?

YES : Go to Step 7.
NO : Replace the wheel bearing (Refer to GROUP 26 – Front axle hub assembly P.26-16).

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 (Refer to GROUP 26 – Front axle hub assembly P.26-16).

STEP 8. Check whether the DTC is reset.
(1) Erase the DTC.
(2) Drive the vehicle at 12 mph (20 km/h) or more.

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

Q: Is DTC C101F set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 9.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

STEP 9. Check whether the DTC is reset.
(1) Erase the DTC.
(2) Drive the vehicle at 12 mph (20 km/h) or more.

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

Q: Is DTC C101F set?

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

Code No. C102A: Mutual monitoring of RL wheel speed sensor

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

- Each wheel speed detecting section is a kind of a pulse generator. It consists of the encoder (plate on which the north and south pole of magnet are arranged alternately) for detecting the wheel speed, which rotates at the same speed of the wheels, and the wheel speed sensor. This detecting section outputs the frequency pulse signals in proportion to the wheel speed.
- The pulse signals generated by the wheel speed detecting section 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 DTC.

- 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

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- 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
- The number of poles on the Magnetic encoder for wheel speed detection (N-pole and S-pole) is changed

Past trouble

- When DTC 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 (GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).
- When DTC C1020 is not set, the following conditions may be present:
  - Some wheels slip
  - Unstable vehicle attitude
  - External noise interference
  - Vehicle ran with the parking brake applied.
  - Rotate only two wheels with drum tester

DIAGNOSIS

Required Special Tools:

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

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

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC C102A set?

YES : Go to Step 3.

NO : The procedure is complete.

STEP 3. Using scan tool MB991958, check the DTC
Check that the DTC C1020 is also set.

Q: Is DTC C1020 also set?

YES : Perform the diagnosis for the DTC C1020 (Refer to P.35C-38).
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 (Refer to P.35C-306). Then go to Step 9.

STEP 5. Check for wheel speed sensor as a single unit
Refer to P.35C-307.

Q: Is the check result normal?

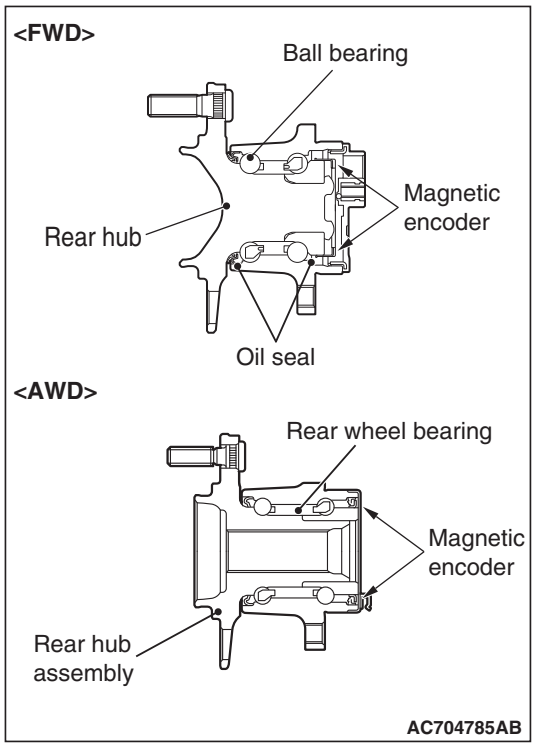
YES : Go to Step 6.
NO : Replace the wheel speed sensor <RL> (Refer to P.35C-306). Then go to Step 9.

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 Rear wheel hub assembly <RL (FWD)> (Refer to GROUP 27A – On-vehicle Service P.27A-5).*
- *Check the wheel bearing <RL (AWD)> for looseness (Refer to GROUP 27B – On-vehicle Service P.27B-16).*

Q: Is the check result normal?

YES : Go to Step 7.
NO (FWD) : Replace the rear wheel hub assembly (Refer to GROUP 27A – Rear axle hub assembly P.27A-7).
NO (AWD) : Replace the wheel bearing (Refer to GROUP 27B – Rear axle hub assembly P.27B-18).



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 (FWD)> : Replace the rear wheel hub assembly (Refer to GROUP 27A – Rear axle hub assembly P.27A-7).

NO <Deformation (AWD)> : Replace the wheel bearing (Refer to GROUP 27B – Rear axle hub assembly P.27B-18).

STEP 8. Check whether the DTC is reset.

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

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

Q: Is DTC C102A set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 9.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

STEP 9. Check whether the DTC is reset.

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

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

Q: Is DTC C102A set?

YES : Return to Step 1.

NO : The procedure is complete.

DTC C1035 Mutual monitoring of RR wheel speed sensor

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

- Each wheel speed detecting section is a kind of a pulse generator. It consists of the encoder (plate on which the north and south pole of magnet are arranged alternately) for detecting the wheel speed, which rotates at the same speed of the wheels, and the wheel speed sensor. This detecting section outputs the frequency pulse signals in proportion to the wheel speed.
- The pulse signals generated by the wheel speed detecting section 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 DTC.

- 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
- The number of poles on the Magnetic encoder for wheel speed detection (N-pole and S-pole) is changed

Past trouble

- When DTC 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 (GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).
- When DTC C102B is not set, the following conditions may be present:
  - Some wheels slip
  - Unstable vehicle attitude
  - External noise interference
  - Vehicle ran with the parking brake applied.
  - Rotate only two wheels with drum tester

DIAGNOSIS

Required Special Tools:

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

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

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC C1035 set?

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

STEP 3. Using scan tool MB991958, check the DTC

Check that the DTC C102B is also set.

Q: Is the DTC C102B also set?

YES : Perform the diagnosis for the DTC C102B (Refer to P.35C-44).
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 <RR> correctly (Refer to P.35C-306). Then go to Step 9.

STEP 5. Check for wheel speed sensor as a single unit
Refer to P.35C-307.

Q: Is the check result normal?

YES : Go to Step 6.
NO : Replace the wheel speed sensor <RR> (Refer to P.35C-306). Then go to Step 9.

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 Rear wheel hub assembly <RR (FWD)> (Refer to GROUP 27A – On-vehicle Service P.27A-5).*
- *Check the wheel bearing <RR (AWD)> for looseness (Refer to GROUP 27B – On-vehicle Service P.27B-16).*

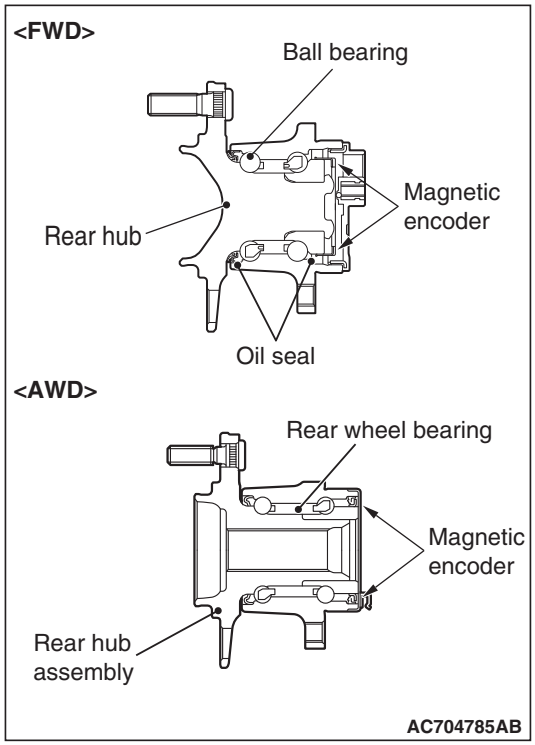
Q: Is the check result normal?

YES : Go to Step 7.
NO (FWD) : Replace the rear wheel hub assembly (Refer to GROUP 27A – Rear axle hub assembly P.27A-7).
NO (AWD) : Replace the wheel bearing (Refer to GROUP 27B – Rear axle hub assembly P.27B-18).

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 (FWD)> : Replace the rear wheel hub assembly (Refer to GROUP 27A – Rear axle hub assembly P.27A-7).
NO <Deformation (AWD)> : Replace the wheel bearing (Refer to GROUP 27B – Rear axle hub assembly P.27B-18).



STEP 8. Check whether the DTC is reset.
(1) Erase the DTC.
(2) Drive the vehicle at 12 mph (20 km/h) or more.

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

Q: Is DTC C1035 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 9.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

STEP 9. Check whether the DTC is reset.
(1) Erase the DTC.
(2) Drive the vehicle at 12 mph (20 km/h) or more.

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

Q: Is DTC C1035 set?

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

DTC C1041 Abnormality in periodical signal for FL wheel speed sensor

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

- Each wheel speed detecting section is a kind of a pulse generator. It consists of the encoder (plate on which the north and south pole of magnet are arranged alternately) for detecting the wheel speed, which rotates at the same speed of the wheels, and the wheel speed sensor. This detecting section outputs the frequency pulse signals in proportion to the wheel speed.
- The pulse signals generated by the wheel speed detecting section 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 DTC.

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
- The number of poles on the Magnetic encoder for wheel speed detection (N-pole and S-pole) is changed

DIAGNOSIS

Required Special Tools:

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

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

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC 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

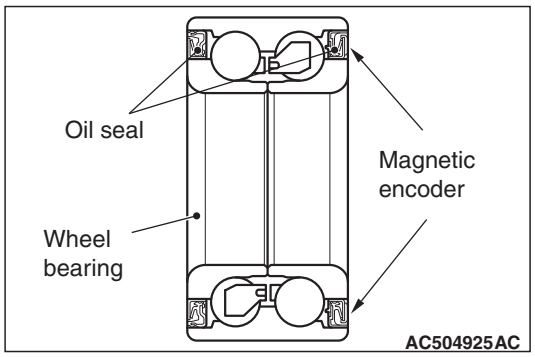
NOTE:

- *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.26-10).*

Q: Is the check result normal?

YES : Go to Step 4.

NO : Replace the wheel bearing (Refer to GROUP 26 – Front axle hub assembly P.26-16).



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 (Refer to GROUP 26 – Front axle hub assembly P.26-16).

STEP 5. Check whether the DTC is reset.

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

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

Q: Is DTC C1041 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 6.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

STEP 6. Check whether the DTC is reset.

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

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

Q: Is DTC C1041 set?

YES : Return to Step 1.

NO : The procedure is complete.

DTC C1042 Abnormality in periodical signal for FR wheel speed sensor

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

- Each wheel speed detecting section is a kind of a pulse generator. It consists of the encoder (plate on which the north and south pole of magnet are arranged alternately) for detecting the wheel speed, which rotates at the same speed of the wheels, and the wheel speed sensor. This detecting section outputs the frequency pulse signals in proportion to the wheel speed.
- The pulse signals generated by the wheel speed detecting section 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 DTC.

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
- The number of poles on the Magnetic encoder for wheel speed detection (N-pole and S-pole) is changed

DIAGNOSIS

Required Special Tools:

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

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

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC 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.26-10).*

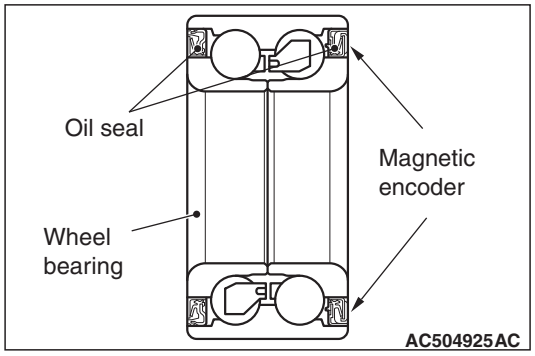
Q: Is the check result normal?

YES : Go to Step 4.

NO : Replace the wheel bearing (Refer to GROUP 26 – Front axle hub assembly P.26-16).

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 (Refer to GROUP 26 – Front axle hub assembly P.26-16).

STEP 5. Check whether the DTC is reset.

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

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

Q: Is DTC C1042 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 6.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

STEP 6. Check whether the DTC is reset.

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

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

Q: Is DTC C1042 set?

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

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

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

- Each wheel speed detecting section is a kind of a pulse generator. It consists of the encoder (plate on which the north and south pole of magnet are arranged alternately) for detecting the wheel speed, which rotates at the same speed of the wheels, and the wheel speed sensor. This detecting section outputs the frequency pulse signals in proportion to the wheel speed.
- The pulse signals generated by the wheel speed detecting section 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 DTC.

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
- The number of poles on the Magnetic encoder for wheel speed detection (N-pole and S-pole) is changed

DIAGNOSIS

Required Special Tools:

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

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

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC C1043 set?

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

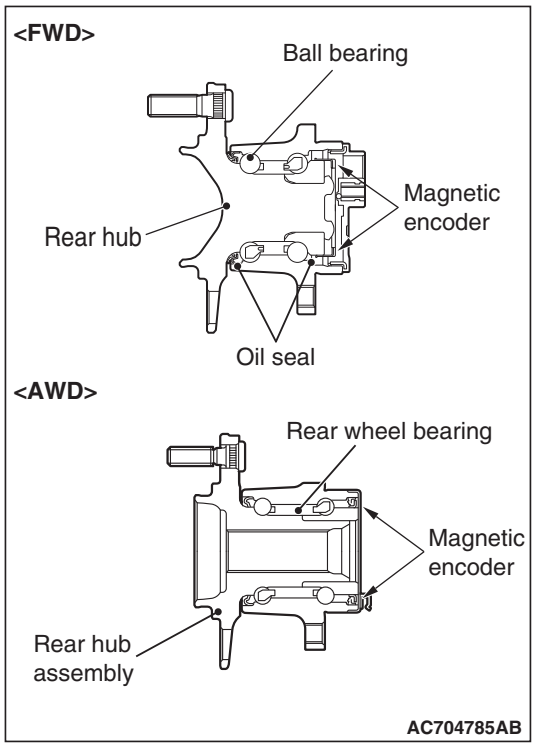
STEP 3. Check for wheel bearing looseness

NOTE:

- *Loose wheel bearing may increase the gap between the wheel speed sensor and the wheel speed detection magnet encoder.*
- *Check the Rear wheel hub assembly <RL (FWD)> (Refer to GROUP 27A – On-vehicle Service P.27A-5).*
- *Check the wheel bearing <RL (AWD)> for looseness (Refer to GROUP 27B – On-vehicle Service P.27B-16).*

Q: Is the check result normal?

YES : Go to Step 4.
NO (FWD) : Replace the rear wheel hub assembly (Refer to GROUP 27A – Rear axle hub assembly P.27A-7).
NO (AWD) : Replace the wheel bearing (Refer to GROUP 27B – Rear axle hub assembly P.27B-18).



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 (FWD)> : Replace the rear wheel hub assembly (Refer to GROUP 27A – Rear axle hub assembly P.27A-7).

NO <Deformation (AWD)> : Replace the wheel bearing (Refer to GROUP 27B – Rear axle hub assembly P.27B-18).

STEP 5. Check whether the DTC is reset.

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

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

Q: Is DTC C1043 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 6.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

STEP 6. Check whether the DTC is reset.

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

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

Q: Is DTC C1043 set?

YES : Return to Step 1.

NO : The procedure is complete.

DTC C1044 Abnormality in periodical signal for RR wheel speed sensor

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

- Each wheel speed detecting section is a kind of a pulse generator. It consists of the encoder (plate on which the north and south pole of magnet are arranged alternately) for detecting the wheel speed, which rotates at the same speed of the wheels, and the wheel speed sensor. This detecting section outputs the frequency pulse signals in proportion to the wheel speed.
- The pulse signals generated by the wheel speed detecting section 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 DTC.

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
- The number of poles on the Magnetic encoder for wheel speed detection (N-pole and S-pole) is changed

DIAGNOSIS

Required Special Tools:

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

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

Use scan tool MB991958 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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC 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:

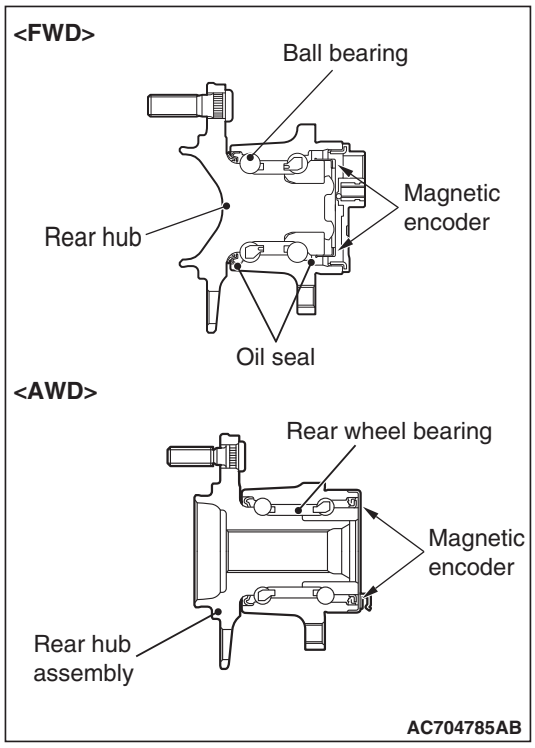
- *Loose wheel bearing may increase the gap between the wheel speed sensor and the wheel speed detection magnet encoder.*
- *Check the Rear wheel hub assembly <RL (FWD)> (Refer to GROUP 27A – On-vehicle Service P.27A-5).*
- *Check the wheel bearing <RL (AWD)> for looseness (Refer to GROUP 27B – On-vehicle Service P.27B-16).*

Q: Is the check result normal?

YES : Go to Step 4.

NO (FWD) : Replace the rear wheel hub assembly (Refer to GROUP 27A – Rear axle hub assembly P.27A-7).

NO (AWD) : Replace the wheel bearing (Refer to GROUP 27B – Rear axle hub assembly P.27B-18).



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 (FWD)> : Replace the rear wheel hub assembly (Refer to GROUP 27A – Rear axle hub assembly P.27A-7).

NO <Deformation (AWD)> : Replace the wheel bearing (Refer to GROUP 27B – Rear axle hub assembly P.27B-18).

STEP 5. Check whether the DTC is reset.

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

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

Q: Is DTC C1044 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 6.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

STEP 6. Check whether the DTC is reset.

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

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

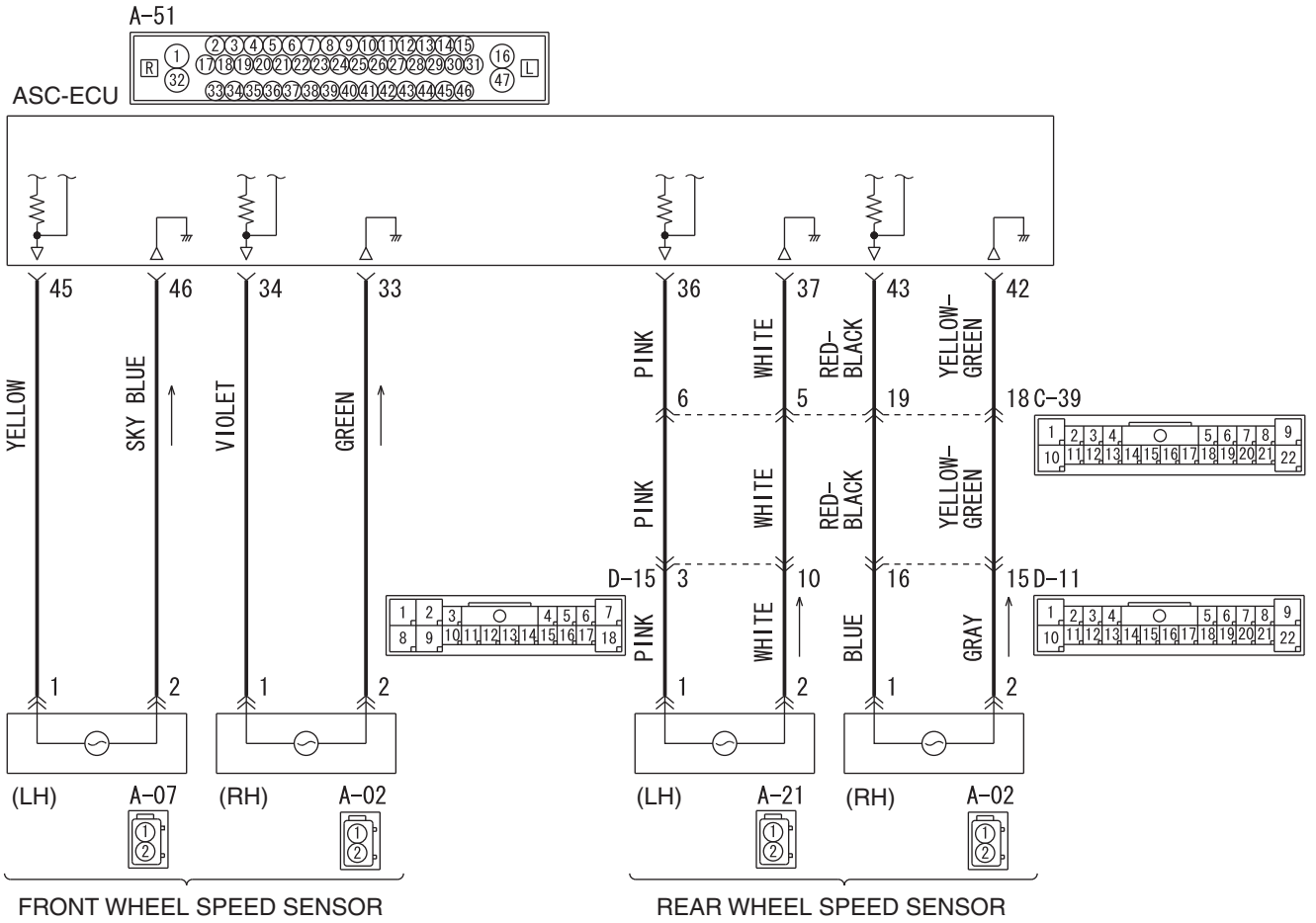
Q: Is DTC C1044 set?

YES : Return to Step 1.

NO : The procedure is complete.

DTC C1046 FL wheel speed sensor control phase time exceeded

Wheel Speed Sensor Circuit



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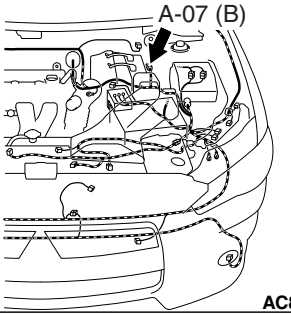
Connector: A-07



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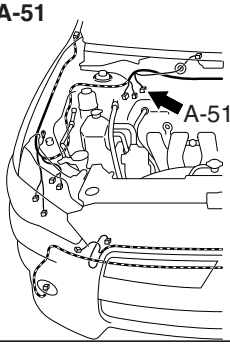
Connector: A-51



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TSB Revision

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

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

DTC SET CONDITIONS

This DTC 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.

NOTE: ASC controls the vehicle based on the wheel speed signal. When the brake fluid pressure is decreased or held for an abnormally long time, the wheel speed sensor signal may have a problem.

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 magnetic encoder for wheel speed detection
- Adhesion of foreign materials on the wheel speed sensor
- Adhesion of foreign materials on the magnetic encoder for wheel speed detection
- Wheel bearing malfunction
- Improper installation of the wheel speed sensor
- Deformation of the magnetic encoder for wheel speed detection
- Disturbance of magnetization pattern for magnetic encoder for wheel speed detection
- Missing teeth of the magnetic encoder for wheel speed detection

TSB Revision

DIAGNOSIS

Required Special Tools:

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

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

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC C1046 set?

YES : Go to Step 3.

NO : The procedure is complete.

STEP 3. Using scan tool MB991958, check the DTC

Check that the DTC C100A, C1011, C1014, or C1041 is also set.

Q: Is the DTC C100A, C1011, C1014, or C1041 also set?

YES : Carry out the diagnosis for the relevant DTC, and then go to Step 5.

NO : Go to Step 4.

STEP 4. Using scan tool MB991958, check the data list

Check the following service data (Refer to P.35C-282).

- Item No.01: FL wheel speed sensor

Q: Is the check result normal?

YES : Go to Step 14.

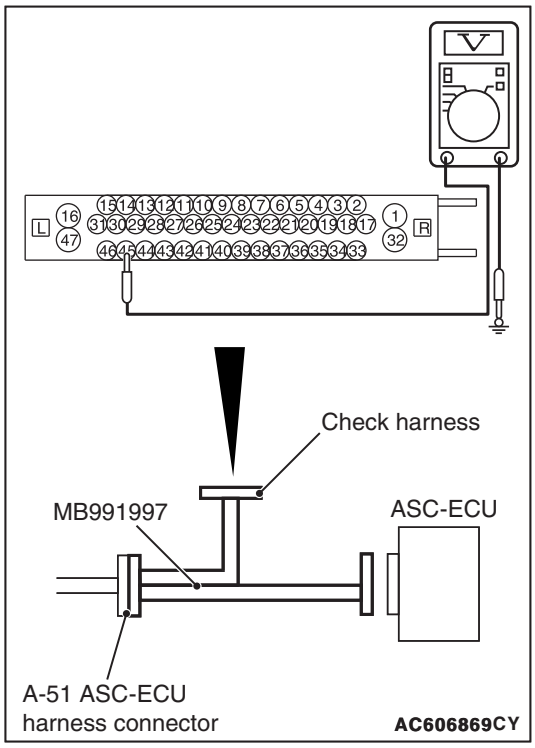
NO : Go to Step 5.

STEP 5. Connector check: A-51 ASC-ECU connector, A-07 wheel speed sensor <FL> connector

Q: Is the check result normal?

YES : Go to Step 6.

NO : Repair the defective connector. Then go to Step 15.



STEP 6. Voltage measurement at the A-51 ASC-ECU connector

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

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

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

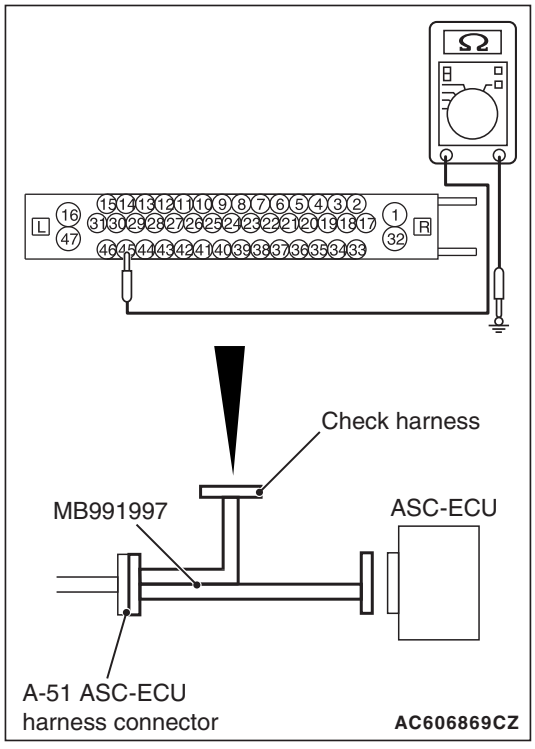
(3) Measure the voltage between the wheel speed sensor power supply terminal (signal terminal) No.45 and the body ground and between the ground terminal No.46 and the body ground.

OK: 1 volt or less

Q: Is the check result normal?

YES : Go to Step 7.

NO (Not normal at the terminal No.45 or No.46) : Go to Step 9.



STEP 7. Resistance measurement at A-51 ASC-ECU connector

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

NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

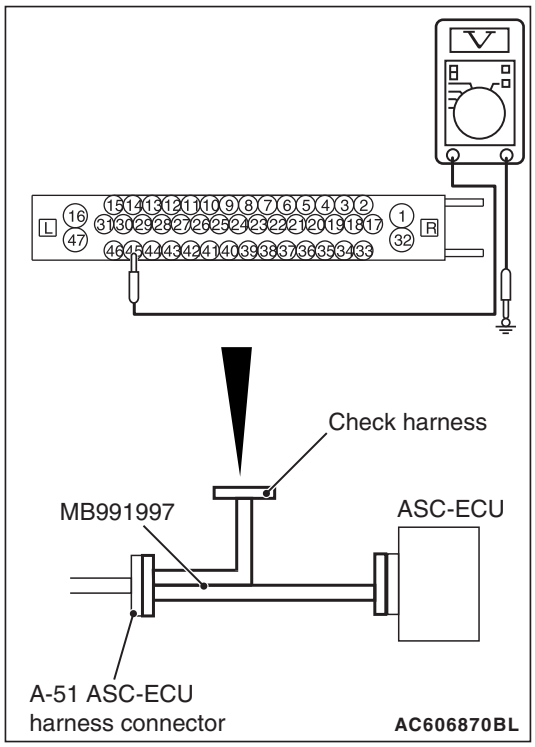
(2) Measure the resistance between the wheel speed sensor power supply terminal (signal terminal) No.45 and the body ground, and between the wheel speed sensor ground terminal No.46 and the body ground.

OK: No continuity

Q: Is the check result normal?

YES : Go to Step 8.

NO (Not normal at the terminal No.45 or No.46) : Go to Step 9.



STEP 8. Voltage measurement at the A-51 ASC-ECU connector

(1) Disconnect the ASC-ECU connector, connect special tool ASC check harness (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 power supply terminal (signal terminal) No.45 and body ground, and between the ground terminal No.46 and body ground.

OK:
Terminal No.45 and body ground: Battery positive voltage
Terminal No.46 and body ground: 1 volt or less

Q: Is the check result normal?

YES : Go to Step 9.
NO : Go to Step 14.

STEP 9. Check for wheel speed sensor as a single unit

Refer to P.35C-307.

Q: Is the check result normal?

YES : Go to Step 10.
NO : Replace the wheel speed sensor <FL> (Refer to P.35C-306). Then go to Step 15.

STEP 10. Wiring harness check between A-51 ASC-ECU connector terminal No.45 and A-07 wheel speed sensor <FL> connector terminal No.1 and between A-51 ASC-ECU connector terminal No.46 and A-07 wheel speed sensor <FL> connector terminal No.2.

- Check for open or short circuit in wheel speed sensor <FL> circuit.

Q: Is the check result normal?

YES : Go to Step 11.
NO : Repair the wiring harness. Then go to Step 15.

STEP 11. 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 12.
NO : Reinstall the wheel speed sensor <FL> correctly (Refer to P.35C-306). Then go to Step 15.

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STEP 12. Check for wheel bearing looseness

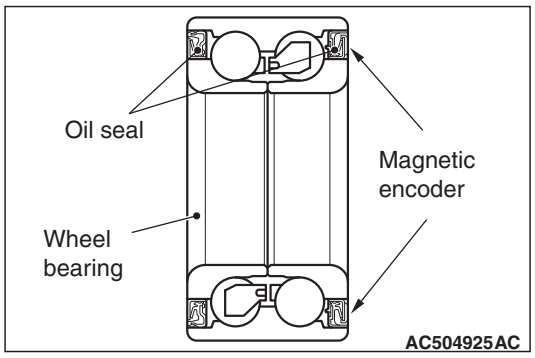
NOTE:
- *Loose wheel bearing may increase the gap between the wheel speed sensor and the wheel speed detection magnet encoder.*
- *Check the wheel bearing <FL> for looseness. (Refer to GROUP 26 – On-vehicle Service P.26-10).*

Q: Is the check result normal?

YES : Go to Step 13.
NO : Replace the wheel bearing (Refer to GROUP 26 – Front axle hub assembly P.26-16). Then go to Step 15.

STEP 13. 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 14.
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. Then go to Step 15.
NO (Deformation) : Replace the wheel bearing (Refer to GROUP 26 – Front axle hub assembly P.26-16). Then go to Step 15.

STEP 14. Check whether the DTC is reset.

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

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

Q: Is DTC C1046 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 15.
NO : The procedure is complete.

STEP 15. Check whether the DTC is reset.

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

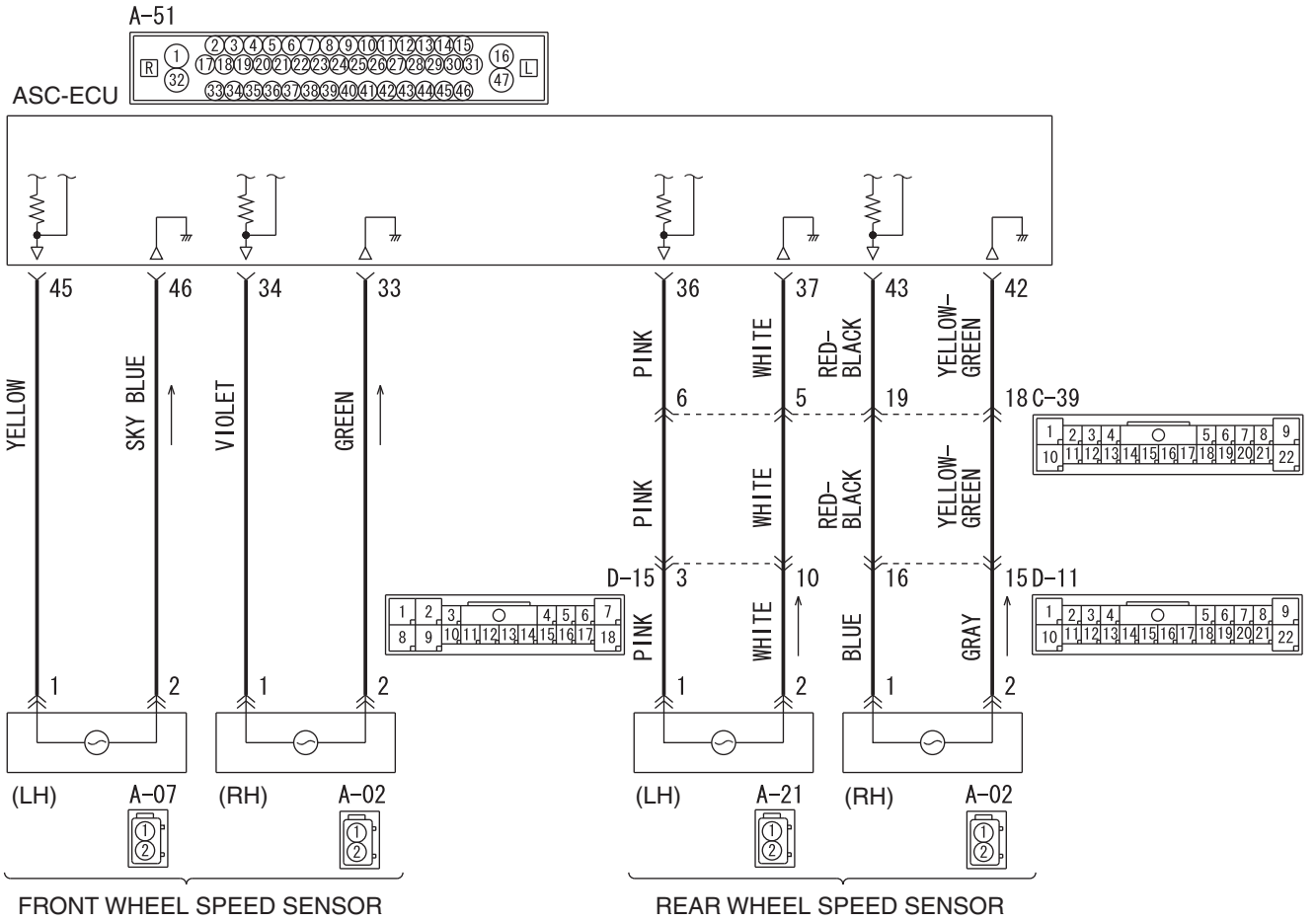
NOTE: The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12 mph (20 km/h) or higher.

Q: Is DTC C1046 set?

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

DTC C1047 FR wheel speed sensor control phase time exceeded

Wheel Speed Sensor Circuit



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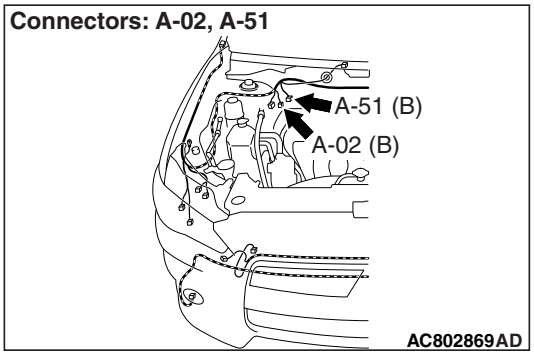


TSB Revision

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

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

DTC SET CONDITIONS

This DTC 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.

NOTE: ASC controls the vehicle based on the wheel speed signal. When the brake fluid pressure is decreased or held for an abnormally long time, the wheel speed sensor signal may have a problem.

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 magnetic encoder for wheel speed detection
- Adhesion of foreign materials on the wheel speed sensor
- Adhesion of foreign materials on the magnetic encoder for wheel speed detection
- Wheel bearing malfunction
- Improper installation of the wheel speed sensor
- Deformation of the magnetic encoder for wheel speed detection
- Disturbance of magnetization pattern for magnetic encoder for wheel speed detection
- Missing teeth of the magnetic encoder for wheel speed detection

TSB Revision

DIAGNOSIS

Required Special Tools:

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

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

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC C1047 set?

YES : Go to Step 3.

NO : The procedure is complete.

STEP 3. Using scan tool MB991958, check the DTC

Check that the DTC C1015, C101C, C101F, or C1042 is also set.

Q: Is the DTC C1015, C101C, C101F, or C1042 also set?

YES : Carry out the diagnosis for the relevant DTCs, and then go to Step 5.

NO : Go to Step 4.

STEP 4. Using scan tool MB991958, check the data list

Check the following service data (Refer to P.35C-282).

- Item No.02: FR wheel speed sensor

Q: Is the check result normal?

YES : Go to Step 14.

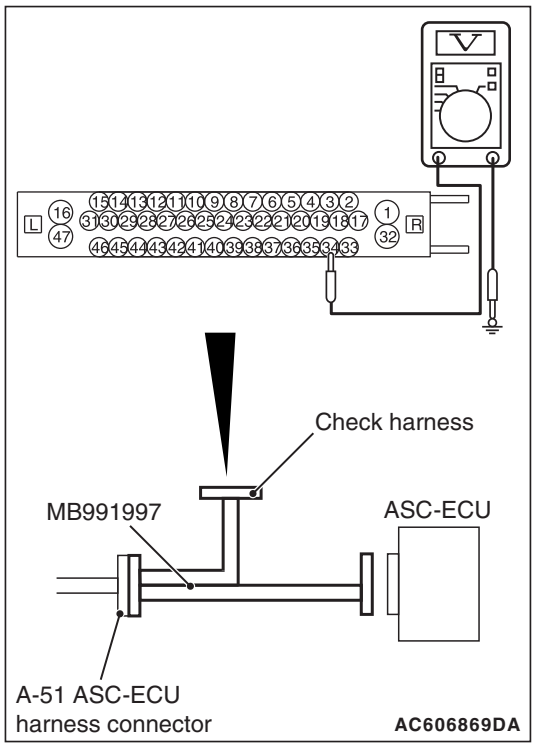
NO : Go to Step 5.

STEP 5. Connector check: A-51 ASC-ECU connector, A-02 wheel speed sensor <FR> connector

Q: Is the check result normal?

YES : Go to Step 6.

NO : Repair the defective connector. Then go to Step 15.



STEP 6. Voltage measurement at the A-51 ASC-ECU connector

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

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

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

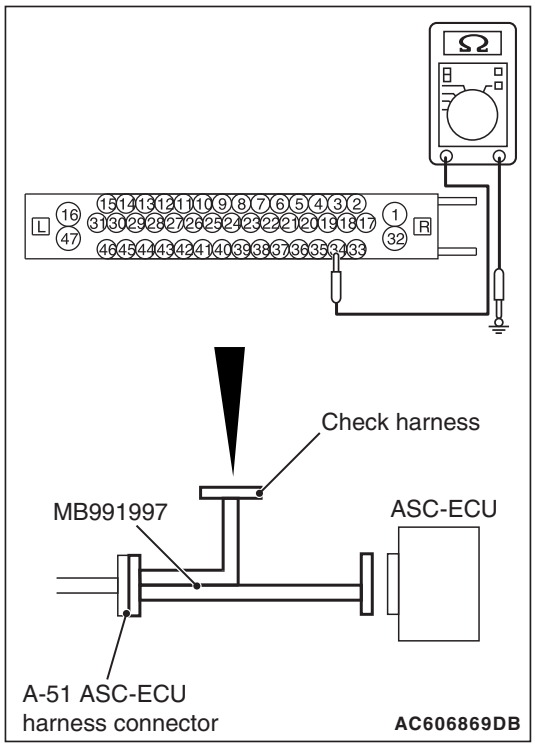
(3) Measure the voltage between the wheel speed sensor power supply terminal (signal terminal) No.34 and the body ground or between the wheel speed sensor ground terminal No.33 and the body ground.

OK: 1 volt or less

Q: Is the check result normal?

YES : Go to Step 7.

NO (Not normal at the terminal No.34 or No.33) : Go to Step 9.



STEP 7. Resistance measurement at A-51 ASC-ECU connector

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

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

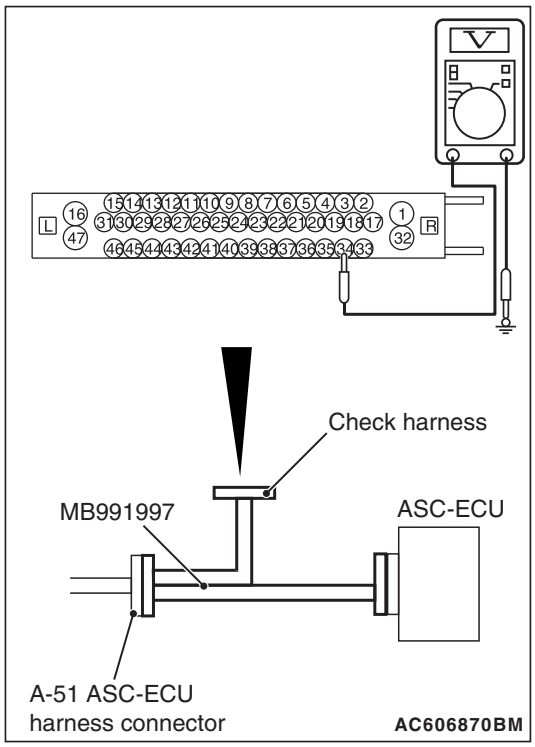
(2) Measure the resistance between the wheel speed sensor power supply terminal (signal terminal) No.34 and the body ground and between the wheel speed sensor ground terminal No.33 and the body ground.

OK: No continuity

Q: Is the check result normal?

YES : Go to Step 8.

NO (Not normal at the terminal No.34 or No.33) : Go to Step 9.



STEP 8. Voltage measurement at the A-51 ASC-ECU connector

(1) Disconnect the ASC-ECU connector, connect special tool ASC check harness (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 power supply terminal (signal terminal) No.34 and body ground, and between the ground terminal No.33 and body ground.

OK:
Terminal No.34 and body ground: Battery positive voltage
Terminal No.33 and body ground: 1 volt or less

Q: Is the check result normal?

YES : Go to Step 9.
NO : Go to Step 14.

STEP 9. Check for wheel speed sensor as a single unit

Refer to P.35C-307.

Q: Is the check result normal?

YES : Go to Step 10.
NO : Replace the wheel speed sensor <FR> (Refer to P.35C-306). Then go to Step 15.

STEP 10. Wiring harness check between A-51 ASC-ECU connector terminal No.34 and A-02 wheel speed sensor <FR> connector terminal No.1 and between A-51 ASC-ECU connector terminal No.33 and A-02 wheel speed sensor <FR> connector terminal No.2.

- Check for open or short circuit in wheel speed sensor <FR> circuit.

Q: Is the check result normal?

YES : Go to Step 11.
NO : Repair the wiring harness. Then go to Step 15.

STEP 11. 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 12.
NO : Reinstall the wheel speed sensor <FR> correctly (Refer to P.35C-306). Then go to Step 15.

TSB Revision

STEP 12. Check for wheel bearing looseness

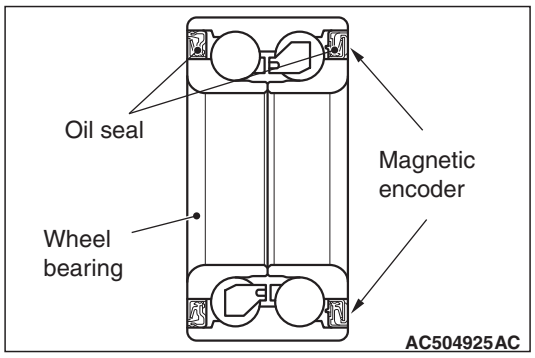
NOTE:
- *Loose wheel bearing may increase the gap between the wheel speed sensor and the wheel speed detection magnet encoder.*
- *Check the wheel bearing <FR> for looseness. (Refer to GROUP 26 – On-vehicle Service P.26-10).*

Q: Is the check result normal?

YES : Go to Step 13.
NO : Replace the wheel bearing (Refer to GROUP 26 – Front axle hub assembly P.26-16). Then go to Step 15.

STEP 13. 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 14.
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. Then go to Step 15.
NO (Deformation) : Replace the wheel bearing (Refer to GROUP 26 – Front axle hub assembly P.26-16). Then go to Step 15.

STEP 14. Check whether the DTC is reset.

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

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

Q: Is DTC C1047 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 15.
NO : The procedure is complete.

STEP 15. Check whether the DTC is reset.

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

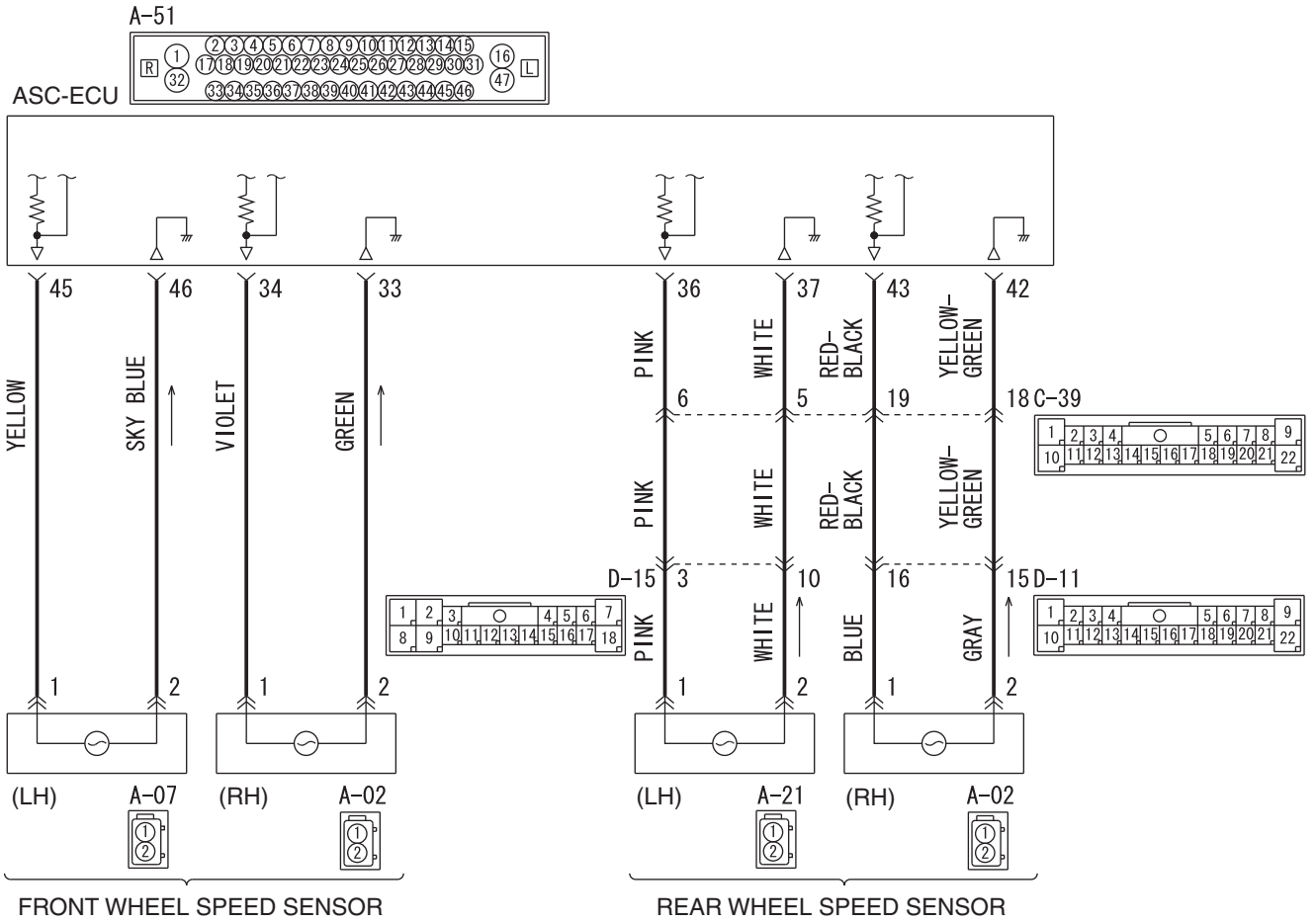
NOTE: The ABS warning light does not turn OFF in some cases unless the vehicle runs at 12 mph (20 km/h) or higher.

Q: Is DTC C1047 set?

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

DTC C1048 RL wheel speed sensor control phase time exceeded

Wheel Speed Sensor Circuit



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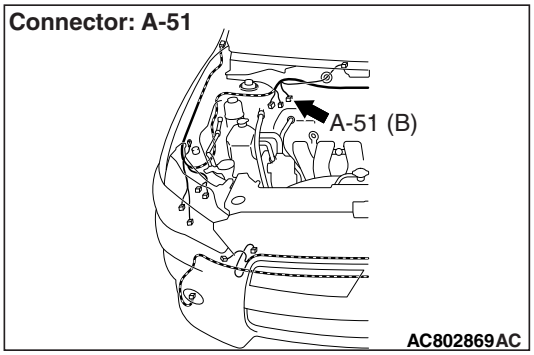
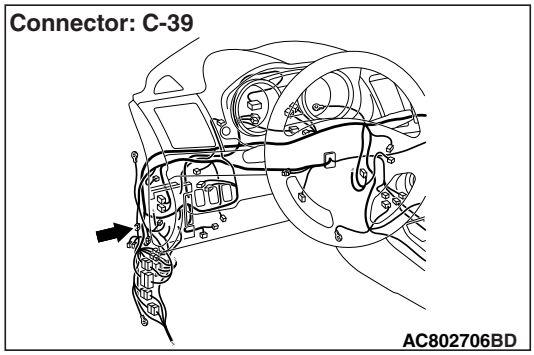
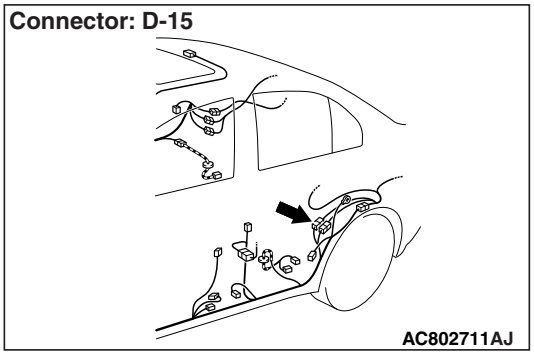
Connector: A-51

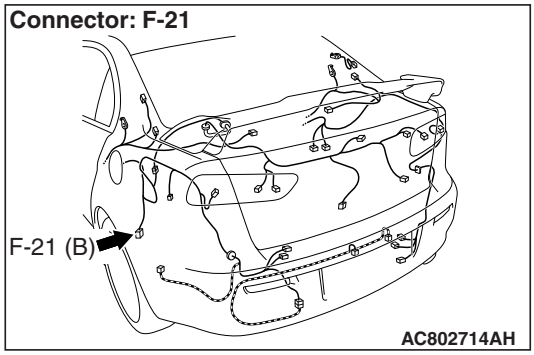


Connector: C-39



TSB Revision





⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

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

DTC SET CONDITIONS

This DTC 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.

NOTE: ASC controls the vehicle based on the wheel speed signal. When the brake fluid pressure is decreased or held for an abnormally long time, the wheel speed sensor signal may have a problem.

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

TSB Revision

- 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. Using scan tool MB991958, diagnose the CAN bus lines.

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC C1048 set?

YES : Go to Step 3.

NO : The procedure is complete.

STEP 3. Using scan tool MB991958, check the DTC

Check that the DTC C1020, C1027, C102A, or C1043 is also set.

Q: Is the DTC C1020, C1027, C102A, or C1043 also set?

YES : Carry out the diagnosis for the relevant DTC, and then go to Step 5.

NO : Go to Step 4.

STEP 4. Using scan tool MB991958, check the data list

Check the following service data (Refer to P.35C-282).

- Item No.03: RL wheel speed sensor

Q: Is the check result normal?

YES : Go to Step 14.

NO : Go to Step 5.

STEP 5. Connector check: A-51 ASC-ECU connector, C-39 intermediate connector, D-15 intermediate connector, F-21 wheel speed sensor <RL> connector

Q: Is the check result normal?

YES : Go to Step 6.
NO : Repair the defective connector. Then go to Step 15.

STEP 6. Voltage measurement at the A-51 ASC-ECU connector

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

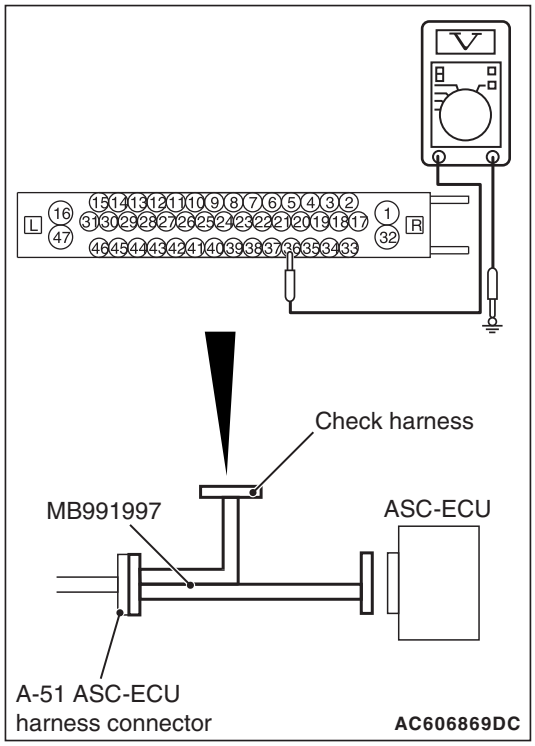
NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

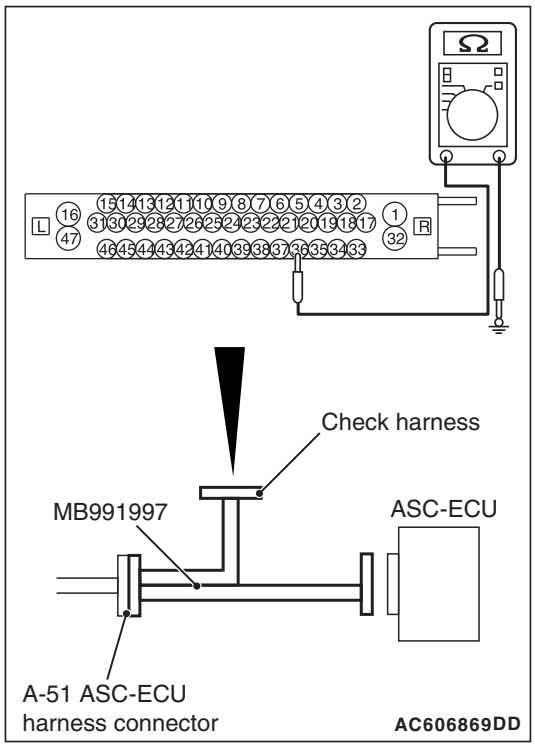
(2) Turn the ignition switch to the ON position.
(3) Measure the voltage between the wheel speed sensor power supply terminal (signal terminal) No.36 and the body ground, and between the wheel speed sensor ground terminal No.37 and the body ground.

OK: 1 volt or less

Q: Is the check result normal?

YES : Go to Step 7.
NO (Not normal at the terminal No.36 or No.37) : Go to Step 9.





STEP 7. Resistance measurement at A-51 ASC-ECU connector

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

NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

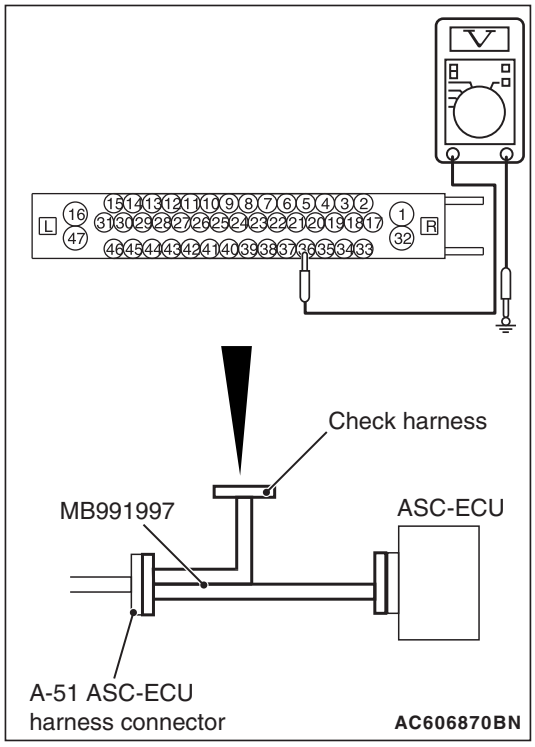
(2) Measure the resistance between the wheel speed sensor power supply terminal No.36 and the body ground, and between the wheel speed sensor ground terminal No.37 and the body ground.

OK: No continuity

Q: Is the check result normal?

YES : Go to Step 8.

NO (Not normal at the terminal No.36 or No.37) : Go to Step 9.



STEP 8. Voltage measurement at the A-51 ASC-ECU connector

(1) Disconnect the ASC-ECU connector, connect special tool ASC check harness (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 power supply terminal (signal terminal) No.36 and body ground, and between the ground terminal No.37 and body ground.

OK:

Terminal No.36 and body ground: Battery positive voltage

Terminal No.37 and body ground: 1 volt or less

Q: Is the check result normal?

YES : Go to Step 9.

NO : Go to Step 14.

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STEP 9. Check for wheel speed sensor as a single unit
Refer to P.35C-307.

Q: Is the check result normal?

YES : Go to Step 10.
NO : Replace the wheel speed sensor <RL> (Refer to P.35C-306). Then go to Step 15.

STEP 10. Wiring harness check between A-51 ASC-ECU connector terminal No.36 and F-21 wheel speed sensor <RL> connector terminal No.1, and between A-51 ASC-ECU connector terminal No.37 and F-21 wheel speed sensor <RL> connector terminal No.2.

- Check for open or short circuit in wheel speed sensor <RL> circuit

Q: Is the check result normal?

YES : Go to Step 11.
NO : Repair the wiring harness. Then go to Step 15.

STEP 11. 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 12.
NO : Reinstall the wheel speed sensor <RL> correctly (Refer to P.35C-306). Then go to Step 15.

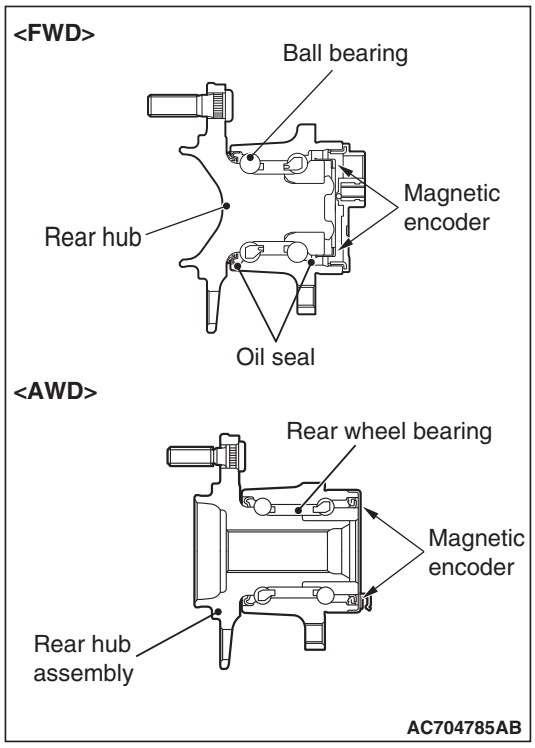
STEP 12. Check for wheel bearing looseness

NOTE:

- *Loose wheel bearing may increase the gap between the wheel speed sensor and the wheel speed detection magnet encoder.*
- *Check the Rear wheel hub assembly <RL (FWD)> (Refer to GROUP 27A – On-vehicle Service P.27A-5).*
- *Check the wheel bearing <RL (AWD)> for looseness (Refer to GROUP 27B – On-vehicle Service P.27B-16).*

Q: Is the check result normal?

YES : Go to Step 13.
NO (FWD) : Replace the rear wheel hub assembly (Refer to GROUP 27A – Rear axle hub assembly P.27A-7). Then go to Step 15.
NO (AWD) : Replace the wheel bearing (Refer to GROUP 27B – Rear axle hub assembly P.27B-18). Then go to Step 15.



STEP 13. 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 14.

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 (FWD)> : Replace the rear wheel hub assembly (Refer to GROUP 27A – Rear axle hub assembly P.27A-7). Then go to Step 15.

NO <Deformation (AWD)> : Replace the wheel bearing (Refer to GROUP 27B – Rear axle hub assembly P.27B-18). Then go to Step 15.

STEP 14. Check whether the DTC is reset.

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

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

Q: Is DTC C1048 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 15.

NO : The procedure is complete.

STEP 15. Check whether the DTC is reset.

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

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

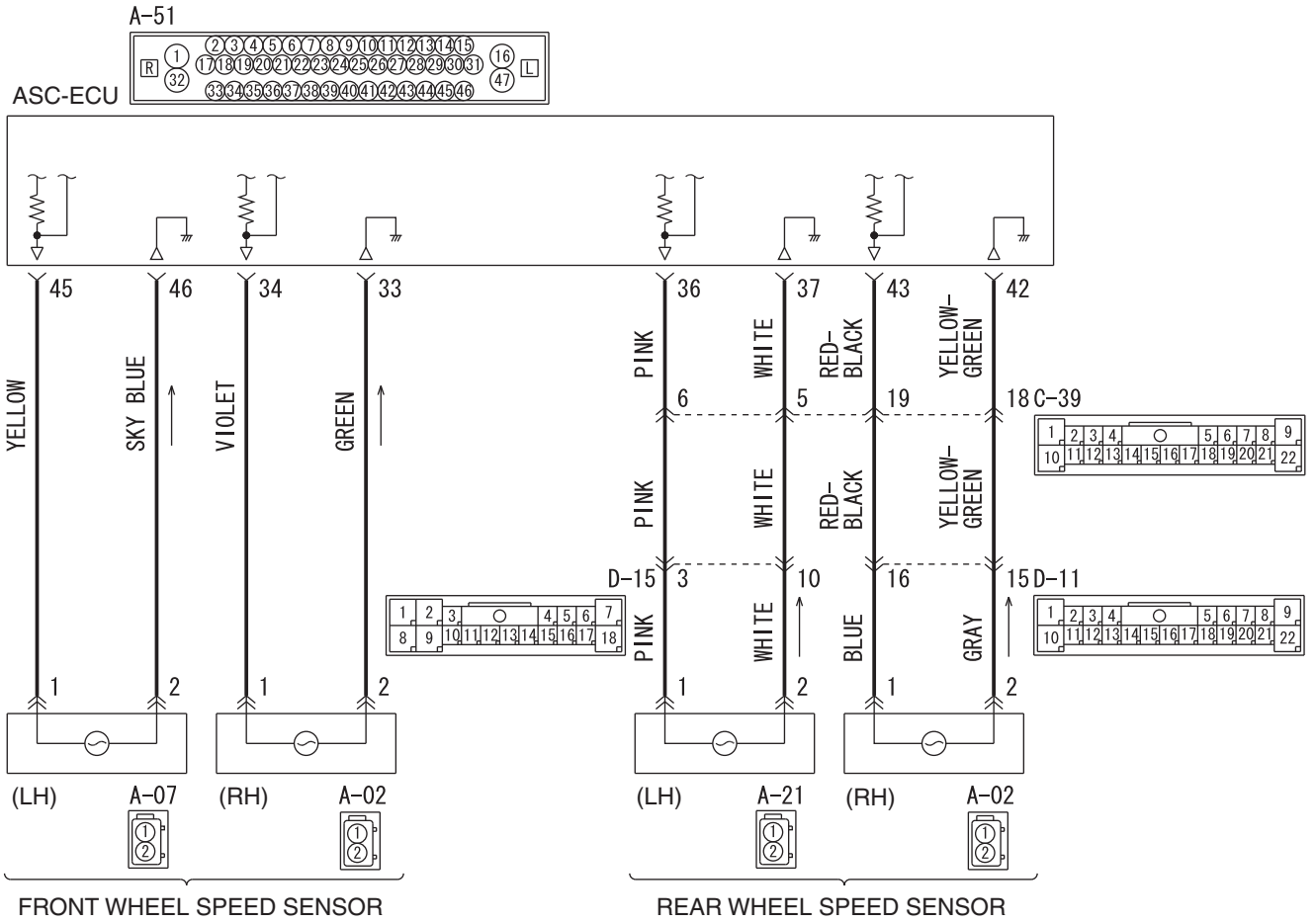
Q: Is DTC C1048 set?

YES : Return to Step 1.

NO : The procedure is complete.

DTC C1049 RR wheel speed sensor control phase time exceeded

Wheel Speed Sensor Circuit



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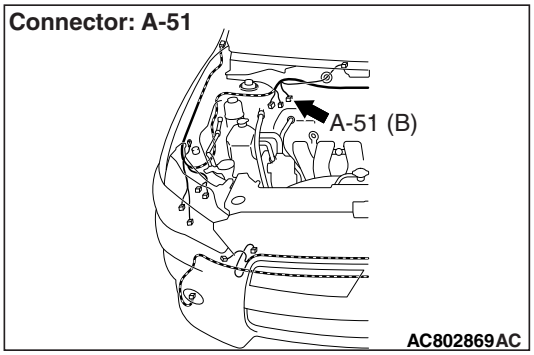
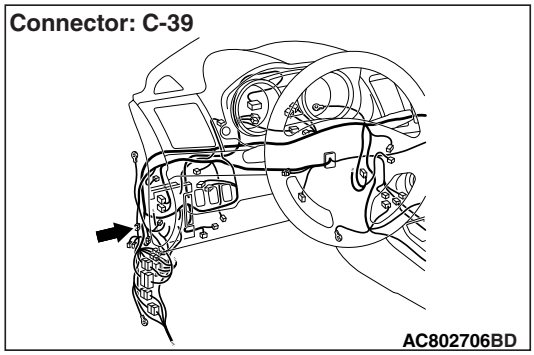
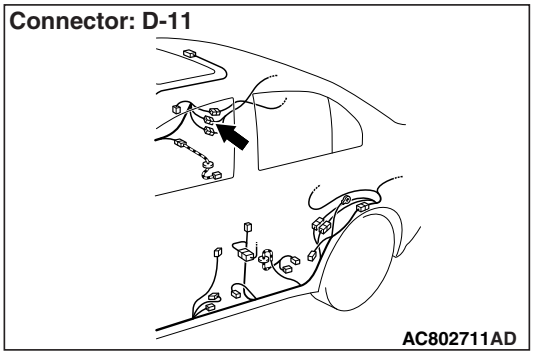
Connector: A-51

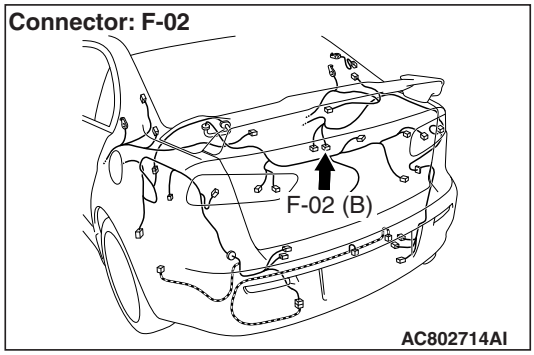


Connector: C-39



TSB Revision





⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

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

DTC SET CONDITIONS

This DTC 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.

NOTE: ASC controls the vehicle based on the wheel speed signal. When the brake fluid pressure is decreased or held for an abnormally long time, the wheel speed sensor signal may have a problem.

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. Using scan tool MB991958, diagnose the CAN bus lines.

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 54C – CAN Bus Diagnosis table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC C1049 set?

YES : Go to Step 3.

NO : The procedure is complete.

STEP 3. Using scan tool MB991958, check the DTC

Check that the DTC C102B, C1032, C1035, or C1044 is also set.

Q: Is the DTC C102B, C1032, C1035, or C1044 also set?

YES : Carry out the diagnosis for the relevant DTC, and then go to Step 5.

NO : Go to Step 4.

STEP 4. Using scan tool MB991958, check the data list

Check the following service data (Refer to P.35C-282).

- Item No.04: RR wheel speed sensor

Q: Is the check result normal?

YES : Go to Step 14.
NO : Go to Step 5.

STEP 5. Connector check: A-51 ASC-ECU connector, C-39 intermediate connector, D-11 intermediate connector, F-02 wheel speed sensor <RR> connector

Q: Is the check result normal?

YES : Go to Step 6.
NO : Repair the defective connector. Then go to Step 15.

STEP 6. Voltage measurement at the A-51 ASC-ECU connector

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

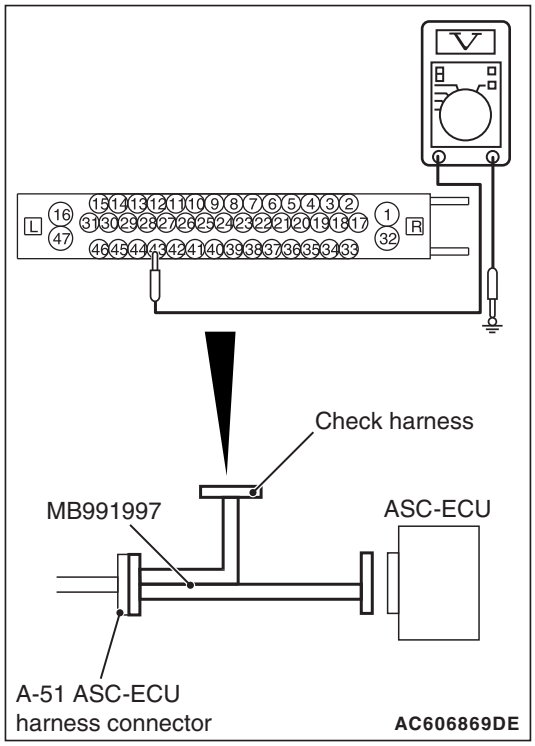
NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

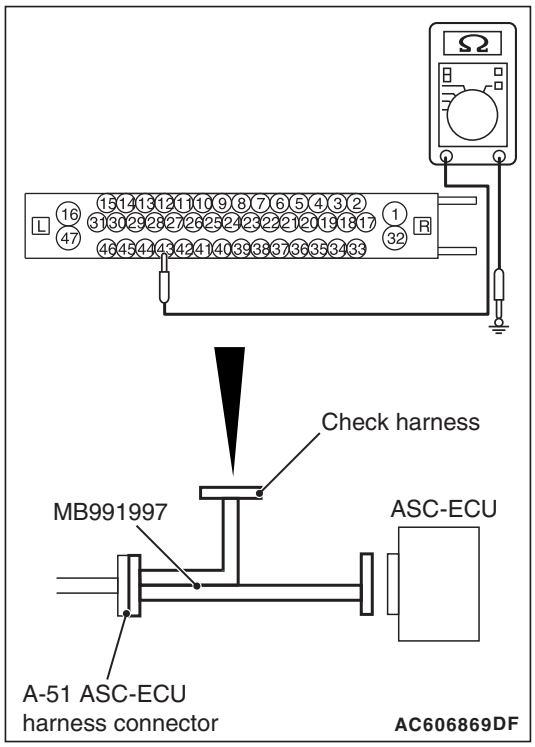
(2) Turn the ignition switch to the ON position.
(3) Measure the voltage between the wheel speed sensor power supply terminal (signal terminal) No.43 and the body ground, and between the wheel speed sensor ground terminal No.42 and the body ground.

OK: 1 volt or less

Q: Is the check result normal?

YES : Go to Step 7.
NO (Not normal at the terminal No.43 or No.42) : Go to Step 9.





STEP 7. Resistance measurement at A-51 ASC-ECU connector

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

NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

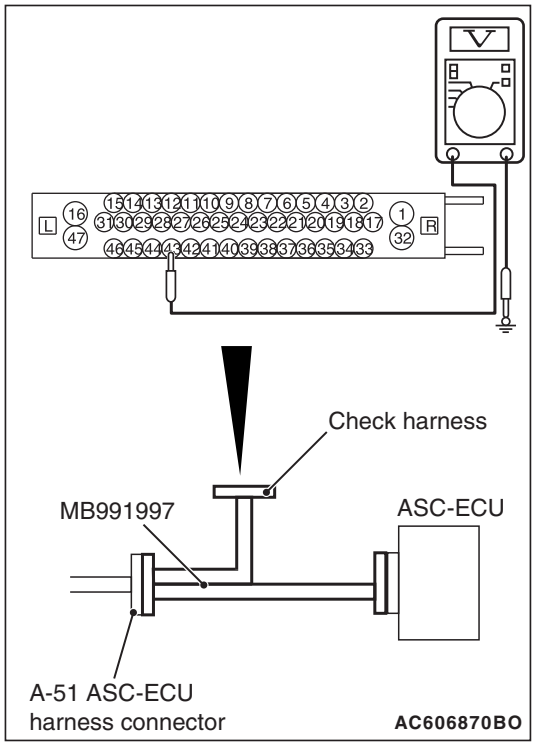
(2) Measure the resistance between the wheel speed sensor power supply terminal (signal terminal) No.43 and the body ground, and between the wheel speed sensor ground terminal No.42 and the body ground.

OK: No continuity

Q: Is the check result normal?

YES : Go to Step 8.

NO (Not normal at the terminal No.43 or No.42) : Go to Step 9.



STEP 8. Voltage measurement at the A-51 ASC-ECU connector

(1) Disconnect the ASC-ECU connector, connect special tool ASC check harness (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 power supply terminal (signal terminal) No.43 and body ground, and between the ground terminal No.42 and body ground.

OK:

Terminal No.43 and body ground: Battery positive voltage

Terminal No.42 and body ground: 1 volt or less

Q: Is the check result normal?

YES : Go to Step 9.

NO : Go to Step 14.

TSB Revision

STEP 9. Check for wheel speed sensor as a single unit
Refer to P.35C-307.

Q: Is the check result normal?

YES : Go to Step 10.
NO : Replace the wheel speed sensor <RR> (Refer to P.35C-306). Then go to Step 15.

STEP 10. Wiring harness check between A-51 ASC-ECU connector terminal No.43 and F-02 wheel speed sensor <RR> connector terminal No.1, and between A-51 ASC-ECU connector terminal No.42 and F-02 wheel speed sensor <RR> connector terminal No.2.

- Check for open or short circuit in wheel speed sensor <RR> circuit

Q: Is the check result normal?

YES : Go to Step 11.
NO : Repair the wiring harness. Then go to Step 15.

STEP 11. 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 12.
NO : Reinstall the wheel speed sensor <RR> correctly (Refer to P.35C-306). Then go to Step 15.

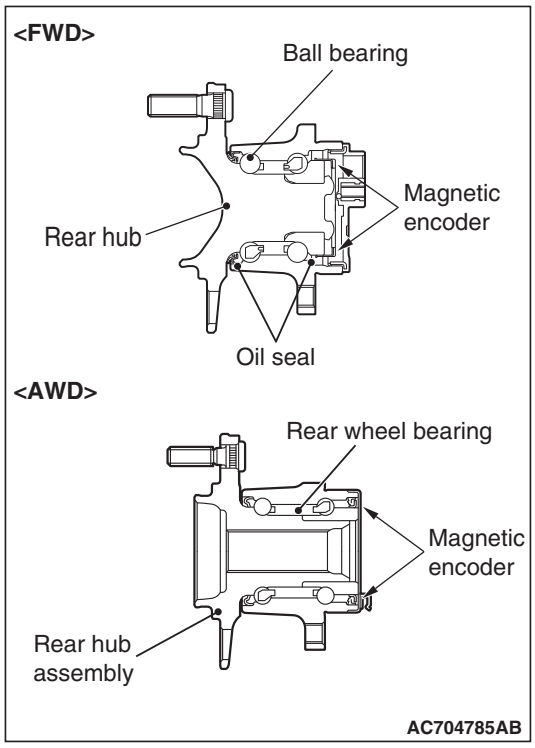
STEP 12. Check for wheel bearing looseness

NOTE:

- *Loose wheel bearing may increase the gap between the wheel speed sensor and the wheel speed detection magnet encoder.*
- *Check the Rear wheel hub assembly <RR (FWD)> (Refer to GROUP 27A – On-vehicle Service P.27A-5).*
- *Check the wheel bearing <RR (AWD)> for looseness (Refer to GROUP 27B – On-vehicle Service P.27B-16).*

Q: Is the check result normal?

YES : Go to Step 13.
NO (FWD) : Replace the rear wheel hub assembly (Refer to GROUP 27A – Rear axle hub assembly P.27A-7). Then go to Step 15.
NO (AWD) : Replace the wheel bearing (Refer to GROUP 27B – Rear axle hub assembly P.27B-18). Then go to Step 15.



STEP 13. 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 14.

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 (FWD)> : Replace the rear wheel hub assembly (Refer to GROUP 27A – Rear axle hub assembly P.27A-7). Then go to Step 15.

NO <Deformation (AWD)> : Replace the wheel bearing (Refer to GROUP 27B – Rear axle hub assembly P.27B-18). Then go to Step 15.

STEP 14. Check whether the DTC is reset.

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

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

Q: Is DTC C1049 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 15.

NO : The procedure is complete.

STEP 15. Check whether the DTC is reset.

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

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

Q: Is DTC C1049 set?

YES : Return to Step 1.

NO : The procedure is complete.

DTC C104B Abnormality in FL wheel inlet valve system
DTC C104F Abnormality in FR wheel inlet valve system
DTC C1053 Abnormality in RL wheel inlet valve system
DTC C1057 Abnormality in RR wheel inlet valve system
DTC C105F Abnormality in FL wheel outlet valve system
DTC C1063 Abnormality in FR wheel outlet valve system
DTC C1067 Abnormality in RL wheel outlet valve system
DTC C105B Abnormality in RR wheel outlet valve system
DTC C1200 Abnormality in FL/RR wheel cut valve system
DTC C1204 Abnormality in FR/RL wheel cut valve system
DTC C1208 Abnormality in FL/RR wheel suction valve system
DTC C120C Abnormality in FR/RL wheel suction valve system

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

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, and the recurrent system check is in progress.
- ASC-ECU activates the solenoid valve by turning on its driving transistor.

DTC SET CONDITIONS

These DTCs will be set under the cases below:

- The solenoid valve is not energized even after ASC-ECU has turned on the driving transistor (Open circuit is present in the power supply circuit to the ASC-ECU solenoid valve, 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

TSB Revision

DIAGNOSIS

Required Special Tools:

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

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

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is the relevant DTC set?

YES : Go to Step 3.

NO : The procedure is complete.

STEP 3. Check whether the DTC is reset.

Q: Is the relevant DTC set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 4.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

STEP 4. Check whether the DTC is reset.

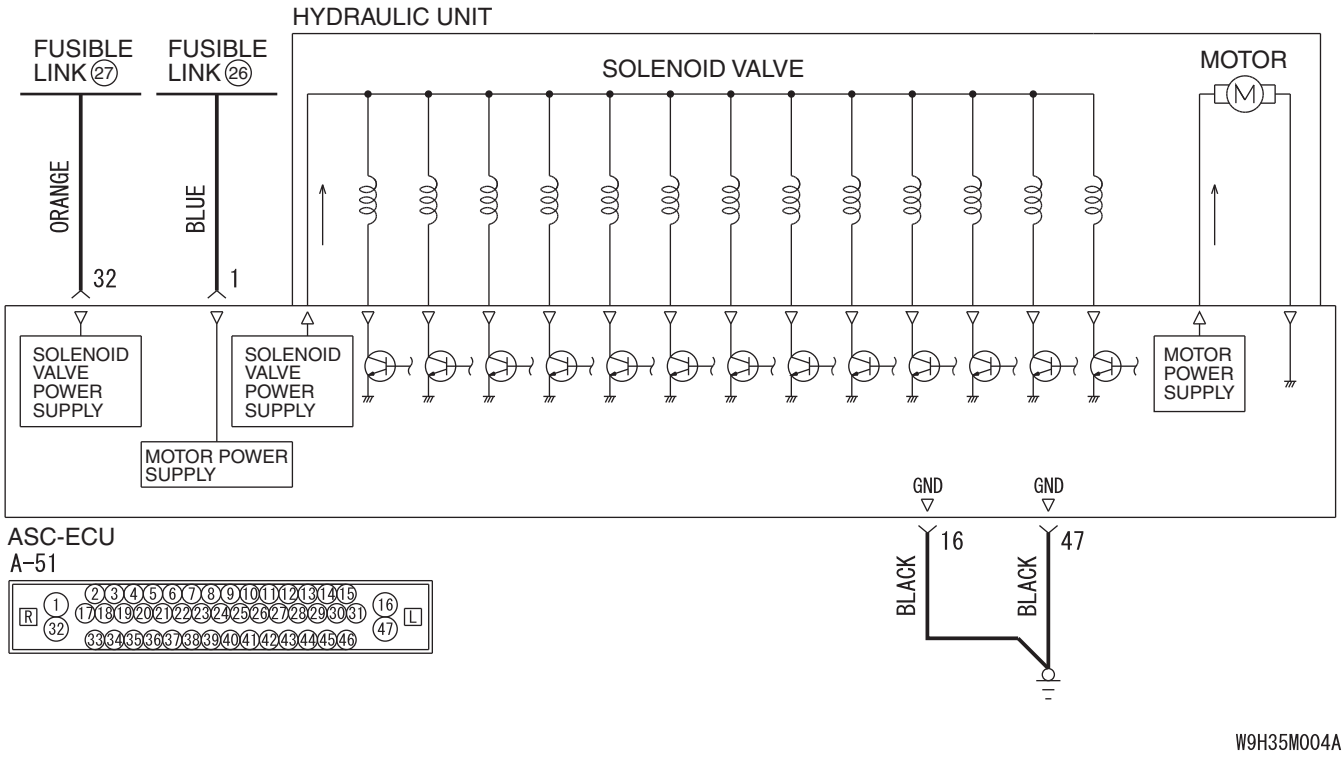
Q: Is the relevant DTC set?

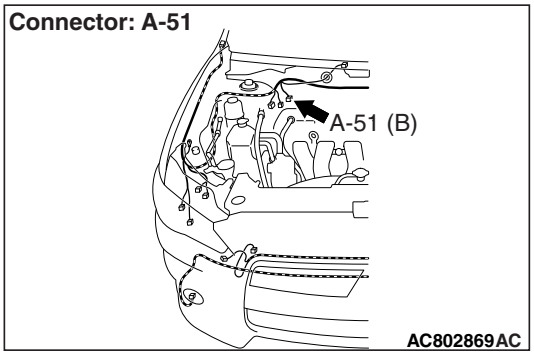
YES : Return to Step 1.

NO : The procedure is complete.

DTC C2104 Faulty valve power supply circuit

Solenoid Valve and Motor Power Supply Circuit





⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

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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 DTC will be set 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 and 47). For diagnosis procedures, refer to How to treat past trouble (GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

DIAGNOSIS

Required Special Tools:

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

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

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC C2104 set?

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

STEP 3. Battery check

Refer to GROUP 54A – Battery Test P.54A-8.

Q: Is the battery in good condition?

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

STEP 4. Charging system check

Refer to GROUP 16 – Charging System P.16-5.

Q: Is the charging system in good condition?

YES : Go to Step 5.
NO : Repair or replace the charging system component(s). Then go to Step 11.

STEP 5. Connector check: A-51 ASC-ECU connector

Q: Is the check result normal?

YES : Go to Step 6.
NO : Repair the defective connector. Then go to Step 11.

STEP 6. 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 8.
NO : Go to Step 7.

STEP 7. Resistance measurement at A-51 ASC-ECU connector

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

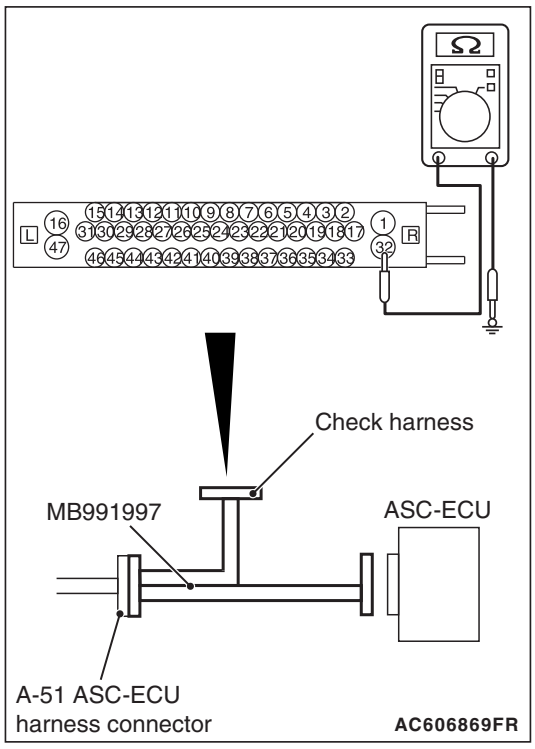
NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

(2) Disconnect the fusible link No.27.
(3) Measure the resistance between the terminal No.32 and the body ground.

OK: No continuity

Q: Is the check result normal?

YES : Replace the fusible link No.27. Then go to Step 11.
NO : The short circuit may be present in the power supply circuit. Repair the wiring harness between the A-51 ASC-ECU connector terminal No.32 and the fusible link No.27, and then replace the fusible link No.27. Then go to Step 11.



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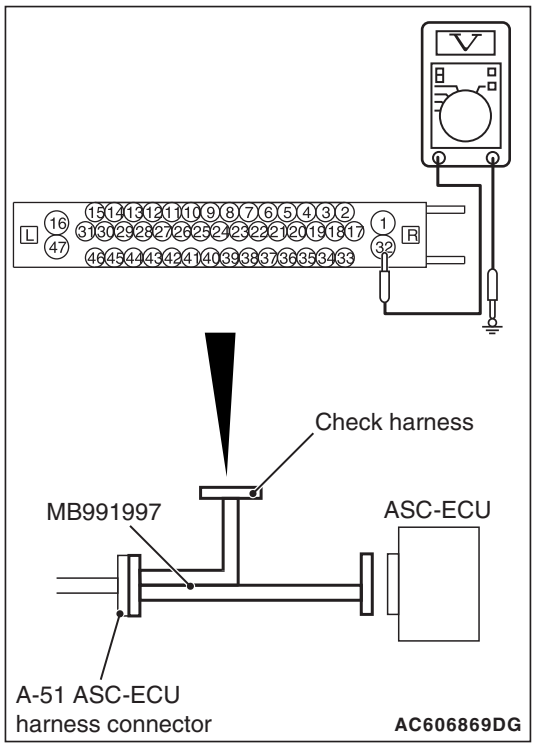


STEP 8. Voltage measurement at the A-51 ASC-ECU connector

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

NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

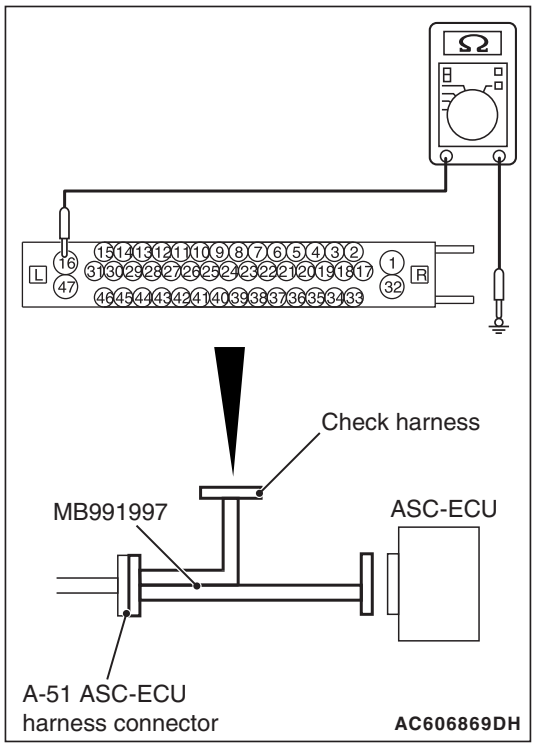
(2) Measure the voltage between the terminal No.32 and the body ground.

OK: Battery positive voltage

Q: Is the check result normal?

YES : Go to Step 9.

NO : The open circuit may be present in the power supply circuit. Repair the wiring harness between the A-51 ASC-ECU connector terminal No.32 and the fusible link No.27. Then go to Step 11.



STEP 9. Resistance measurement at A-51 ASC-ECU connector

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

NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

(2) Measure the resistance between the terminal No.16 and the body ground, and between the terminal No.47 and the body ground.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?

YES : Go to Step 10.

NO : An open circuit may be present in the ground circuit. Repair the wiring harness between the A-51 ASC-ECU connector terminal No.16 and the body ground, and between the A-51 ASC-ECU connector terminal No.47 and the body ground. Then go to Step 11.

STEP 10. Check whether the DTC is reset.

Q: Is DTC C2104 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 11.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

STEP 11. Check whether the DTC is reset.

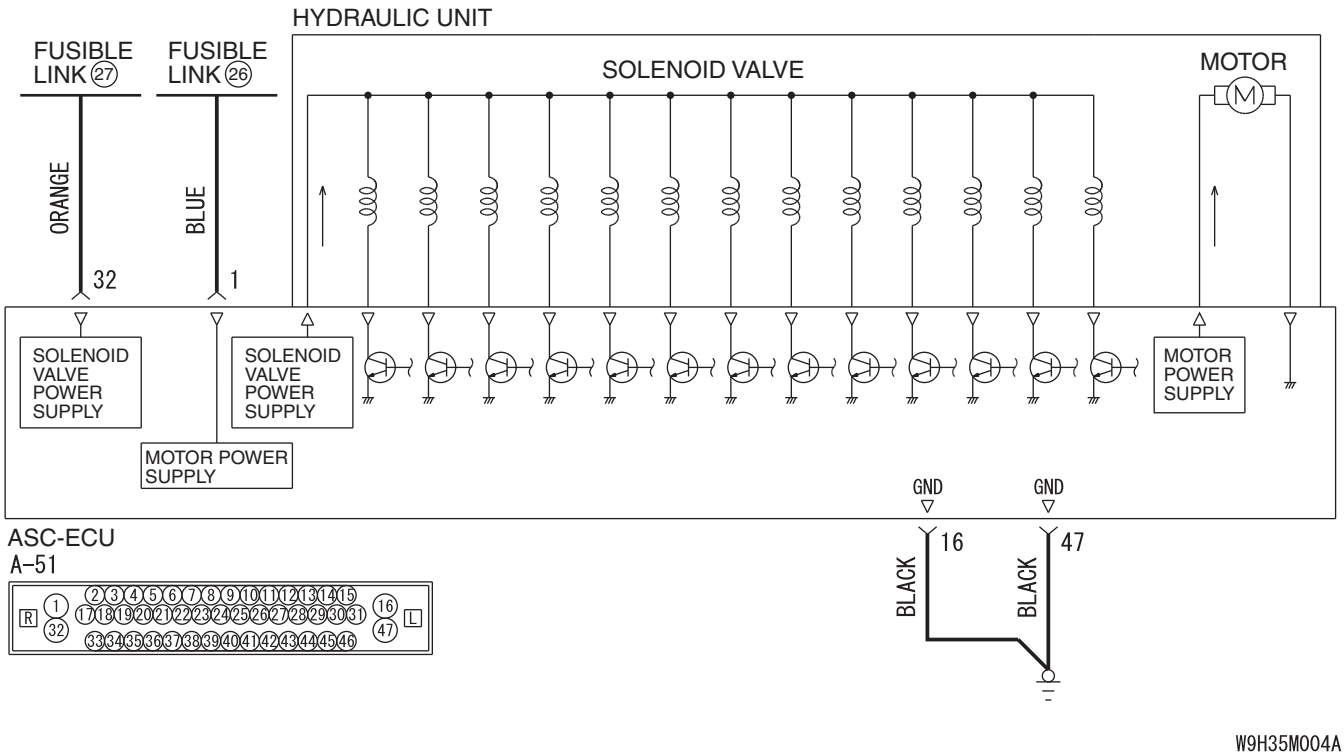
Q: Is DTC C2104 set?

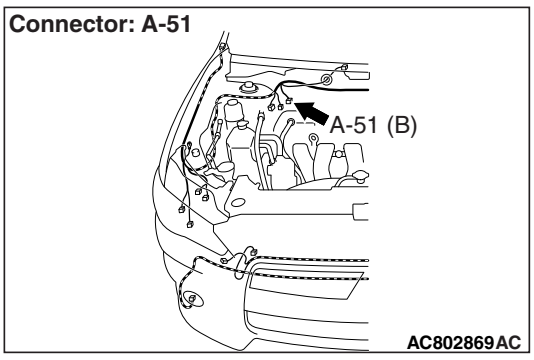
YES : Return to Step 1.

NO : The procedure is complete.

DTC C1073 Faulty motor drive circuit

Solenoid Valve and Motor Power Supply Circuit





TSB Revision

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

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 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 DTC is set.

PROBABLE CAUSES

Current trouble

- Fusible link malfunction
- Damaged wiring harness and connectors
- Abnormality in battery or alternator
- ASC-ECU malfunction

Past trouble

- Carry out diagnosis with particular emphasis on wiring harness and connector failures between the power supply circuit (A-51 ASC-ECU connector terminal No.1) to the ASC-ECU motor and the ground circuit (A-51 ASC-ECU connector terminal No.16 and 47). For diagnosis procedures, refer to How to treat past trouble (GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

DIAGNOSIS

Required Special Tools:

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

STEP 1. Using scan tool MB991958, diagnose the CAN bus lines.
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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC C1073 set?

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

STEP 3. Battery check
Refer to GROUP 54A – Battery Test P.54A-8.

Q: Is the battery in good condition?

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

STEP 4. Charging system check
Refer to GROUP 16 – Charging System P.16-5.

Q: Is the charging system in good condition?

YES : Go to Step 5.
NO : Repair or replace the charging system component(s). Then go to Step 11.

STEP 5. Connector check: A-51 ASC-ECU connector

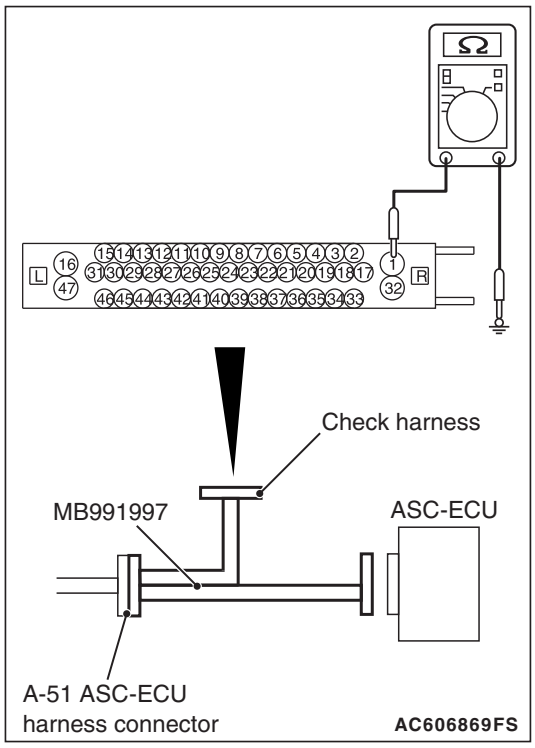
Q: Is the check result normal?

YES : Go to Step 6.
NO : Repair the defective connector. Then go to Step 11.

STEP 6. Fusible link check: Check the fusible link No.26.
Visually check for open circuit in the fusible link No.26.

Q: Is the check result normal?

YES : Go to Step 8.
NO : Go to Step 7.



STEP 7. Resistance measurement at A-51 ASC-ECU connector

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

NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

(2) Disconnect the fusible link No.26.

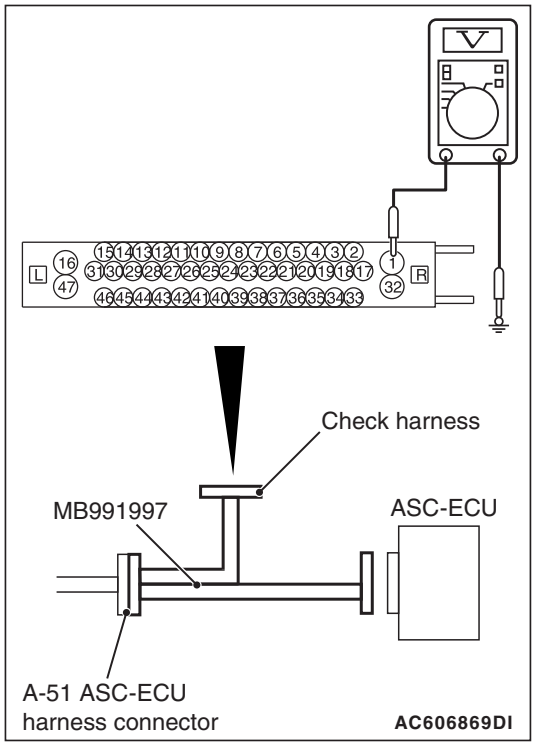
(3) Measure the resistance between the terminal No.1 and the body ground.

OK: No continuity

Q: Is the check result normal?

YES : Replace the fusible link No.26. Then go to Step 11.

NO : The short circuit may be present in the power supply circuit. Repair the wiring harness between the A-51 ASC-ECU connector terminal No.1 and the fusible link No.26, and then replace the fusible link No.26. Then go to Step 11.



STEP 8. Voltage measurement at the A-51 ASC-ECU connector

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

NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

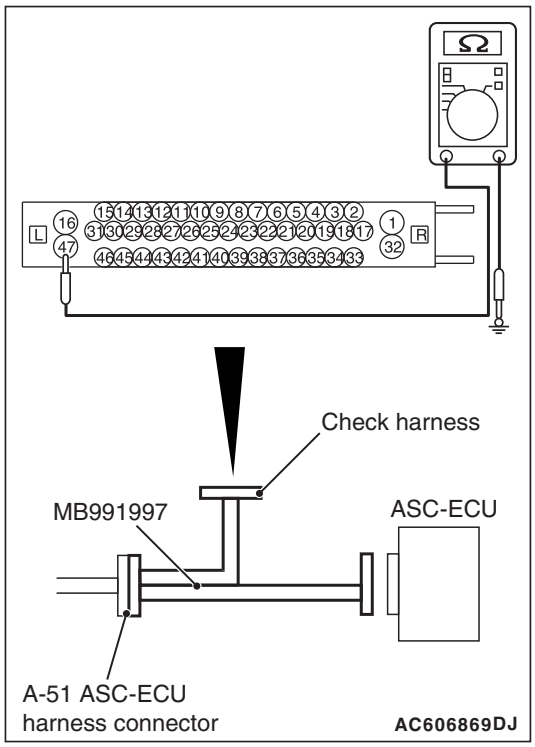
(2) Measure the voltage between the terminal No.1 and the body ground.

OK: Battery positive voltage

Q: Is the check result normal?

YES : Go to Step 9.

NO : The open circuit may be present in the power supply circuit. Repair the wiring harness between the A-51 ASC-ECU connector terminal No.1 and the fusible link No.26. Then go to Step 11.



STEP 9. Resistance measurement at A-51 ASC-ECU connector

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

NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

(2) Measure the resistance between the terminal No.16 and the body ground, and between the terminal No.47 and the body ground.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?

YES : Go to Step 10.

NO : An open circuit may be present in the ground circuit. Repair the wiring harness between the A-51 ASC-ECU connector terminal No.16 and the body ground, and between the A-51 ASC-ECU connector terminal No.47 and the body ground. Then go to Step 11.

STEP 10. Check whether the DTC is reset.

(1) Erase the DTC.

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

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

Q: Is DTC C1073 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 11.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

STEP 11. Check whether the DTC is reset.

(1) Erase the DTC.

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

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

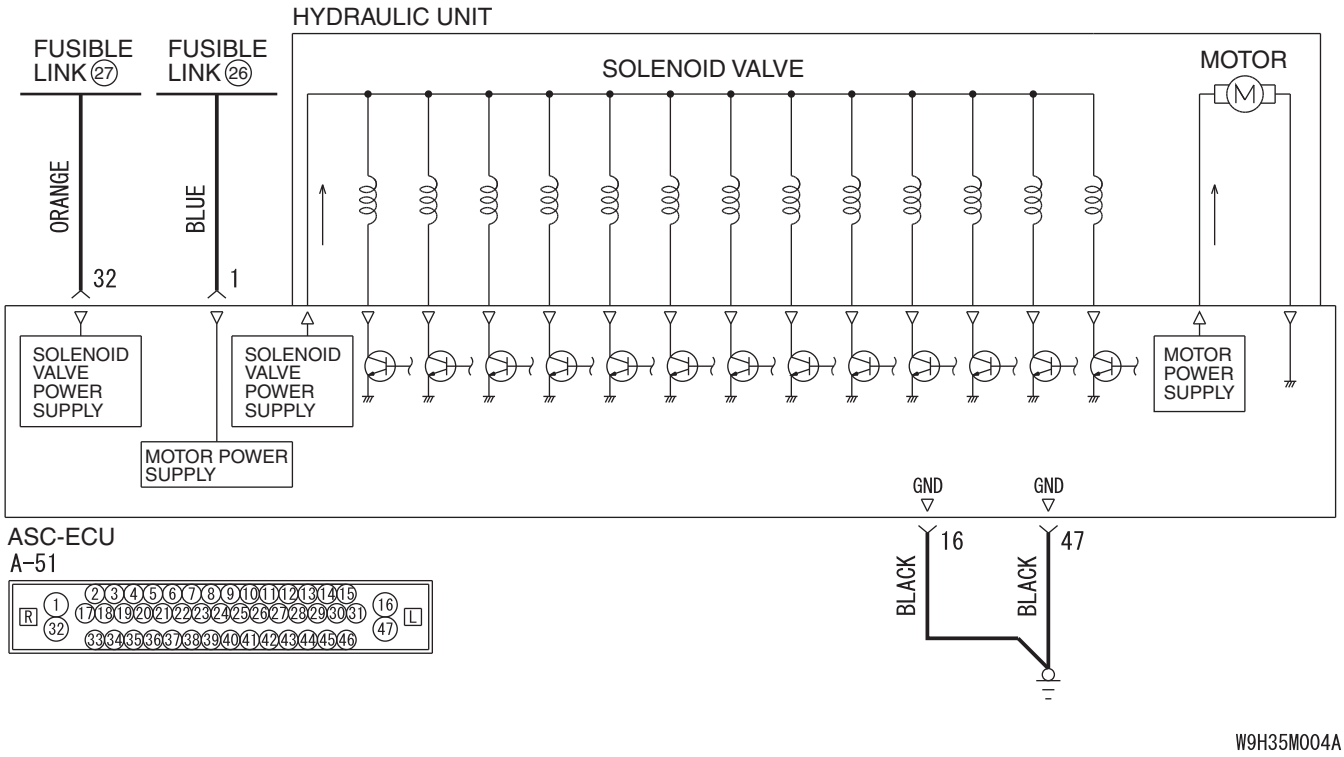
Q: Is DTC C1073 set?

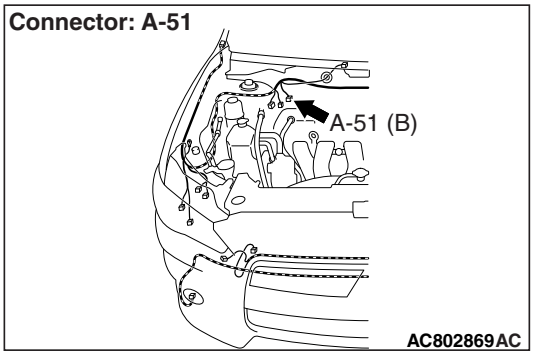
YES : Return to Step 1.

NO : The procedure is complete.

DTC C2116 Low or high power supply voltage in pump motor

Solenoid Valve and Motor Power Supply Circuit





⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

TSB Revision

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 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

- 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 alternator
- ASC-ECU malfunction

Past trouble

- Carry out diagnosis with particular emphasis on wiring harness and connector failures between the power supply circuit (A-51 ASC-ECU connector terminal No.1) to the ASC-ECU motor and the ground circuit (A-51 ASC-ECU connector terminal No.16 and 47). For diagnosis procedures, refer to How to treat past trouble (GROUP 00 – How to Use Troubleshooting/Inspection Service Points 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. Using scan tool MB991958, diagnose the CAN bus lines.

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC C2116 set?

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

STEP 3. Battery check

Refer to GROUP 54A – Battery Test P.54A-8.

Q: Is the battery in good condition?

YES : Go to Step 4.
NO : Replace the battery. Then go to Step 11.

STEP 4. Charging system check

Refer to GROUP 16 – Charging System P.16-5.

Q: Is the charging system in good condition?

YES : Go to Step 5.
NO : Repair or replace the charging system component(s). Then go to Step 11.

STEP 5. Connector check: A-51 ASC-ECU connector

Q: Is the check result normal?

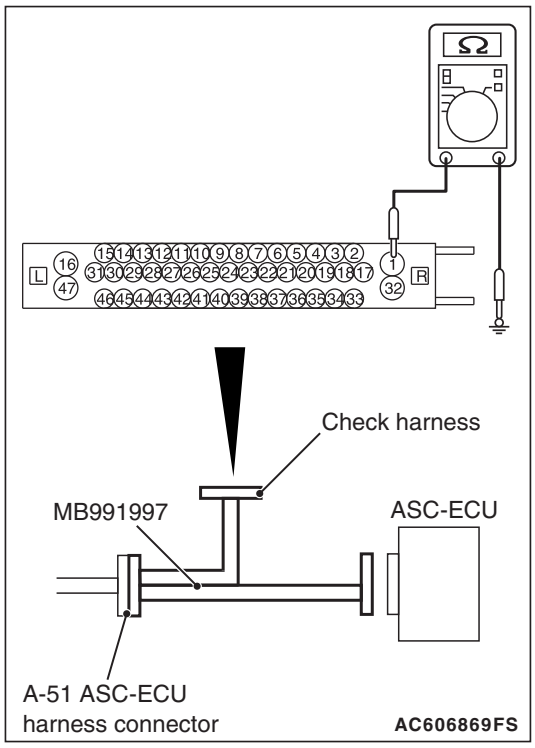
YES : Go to Step 6.
NO : Repair the defective connector. Then go to Step 11.

STEP 6. Fusible link check: Check the fusible link No.26.

Visually check for open circuit in the fusible link No.26.

Q: Is the check result normal?

YES : Go to Step 8.
NO : Go to Step 7.



STEP 7. Resistance measurement at A-51 ASC-ECU connector

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

NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

(2) Disconnect the fusible link No.26.

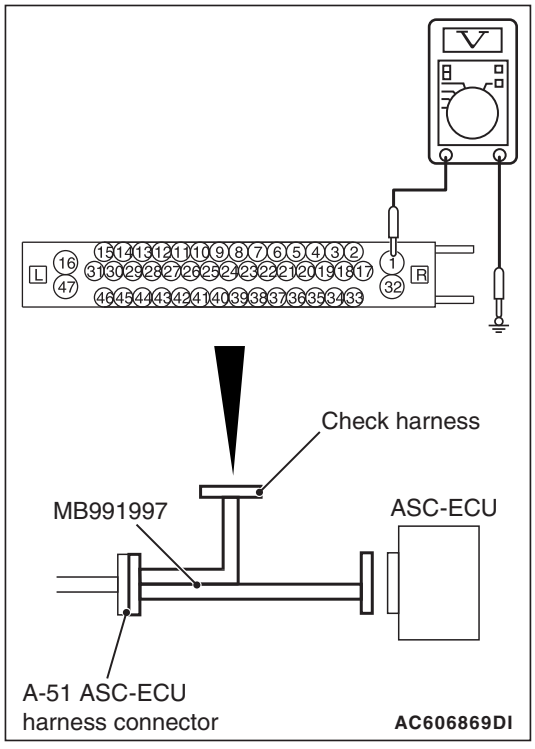
(3) Measure the resistance between the terminal No.1 and the body ground.

OK: No continuity

Q: Is the check result normal?

YES : Replace the fusible link No.26. Then go to Step 11.

NO : The short circuit may be present in the power supply circuit. Repair the wiring harness between the A-51 ASC-ECU connector terminal No.1 and the fusible link No.26, and then replace the fusible link No.26. Then go to Step 11.



STEP 8. Voltage measurement at the A-51 ASC-ECU connector

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

NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

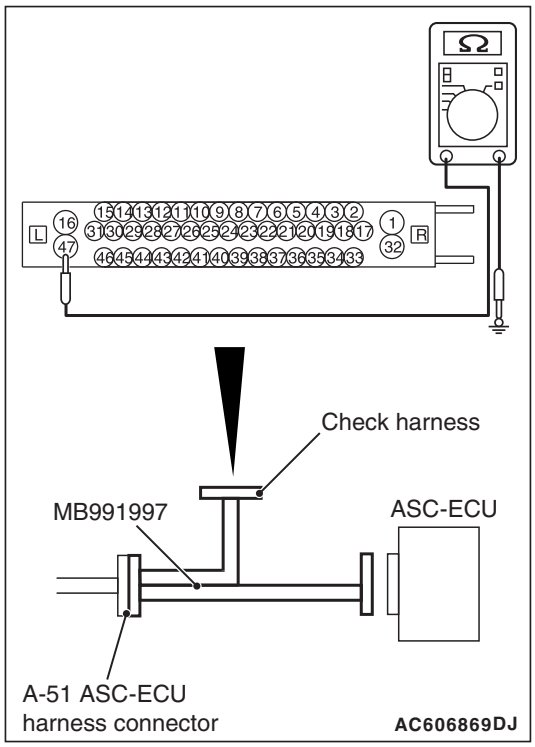
(2) Measure the voltage between the terminal No.1 and the body ground.

OK: Battery positive voltage

Q: Is the check result normal?

YES : Go to Step 9.

NO : The open circuit may be present in the power supply circuit. Repair the wiring harness between the A-51 ASC-ECU connector terminal No.1 and the fusible link No.26. Then go to Step 11.



STEP 9. Resistance measurement at A-51 ASC-ECU connector

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

NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

(2) Measure the resistance between the terminal No.16 and the body ground, and between the terminal No.47 and the body ground.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?

YES : Go to Step 10.

NO : An open circuit may be present in the ground circuit. Repair the wiring harness between the A-51 ASC-ECU connector terminal No.16 and the body ground, and between the A-51 ASC-ECU connector terminal No.47 and the body ground. Then go to Step 11.

STEP 10. Check whether the DTC is reset.

(1) Erase the DTC.

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

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

Q: Is DTC C2116 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 11.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

STEP 11. Check whether the DTC is reset.

(1) Erase the DTC.

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

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

Q: Is DTC C2116 set?

YES : Return to Step 1.

NO : The procedure is complete.

DTC C121D Abnormality in brake fluid pressure sensor circuit

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION
The hydraulic 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 sets this DTC.

PROBABLE CAUSES
- Incorrect brake pedal height
- Incorrect adjustment of the stoplight switch
- 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

STEP 1. Using scan tool MB991958, diagnose the CAN bus lines.
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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC C121D set?

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

STEP 3. Brake pedal check

Refer to GROUP 35A – On-vehicle Service P.35A-14.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Go to GROUP 35A – On-vehicle Service P.35A-14. Then go to Step 7.

STEP 4. Check the installation condition of the stoplight switch.

Refer to GROUP 35A – On-vehicle Service P.35A-16.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Install the stoplight switch correctly, and then go to Step 7.

STEP 5. Brake booster check

Refer to GROUP 35A – On-vehicle Service P.35A-16.

Q: Is the check result normal?

YES : Go to Step 6.
NO : After replacing the brake booster, go to Step 7.

STEP 6. Check whether the DTC is reset.

Q: Is DTC C121D set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 7.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

STEP 7. Check whether the DTC is reset.

Q: Is DTC C121D set?

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

DTC C121E Abnormality in brake fluid pressure sensor output signal

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

The hydraulic 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 DTCs 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 stoplight switch
- Malfunction of the stoplight switch
- Brake drag
- 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. Using scan tool MB991958, diagnose the CAN bus lines.

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC C121E set?

YES : Go to Step 3.

NO : The procedure is complete.

STEP 3. Brake pedal check

Refer to GROUP 35A – On-vehicle Service P.35A-14.

Q: Is the check result normal?

YES : Go to Step 4.

NO : Adjust the brake pedal height.(Refer to GROUP 35A – On-vehicle Service P.35A-14). Then go to Step 9.

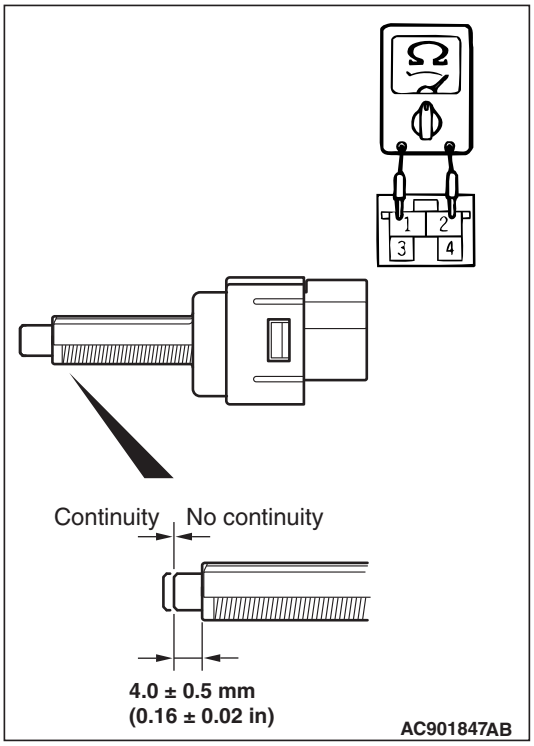
STEP 4. Check for stoplight switch installation

Refer to GROUP 35A – On-vehicle Service P.35A-14.

Q: Is the check result normal?

YES : Go to Step 5.

NO : Install the stoplight switch correctly (Refer to GROUP 35A – On-vehicle Service P.35A-14), and then go to Step 9.



STEP 5. stoplight switch continuity check

(1) Remove the stoplight switch (Refer to GROUP 35A –Brake Pedal P.35A-33).
(2) Connect the circuit tester (Ω range) to the stoplight 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 stoplight switch is in good condition.

Q: Is the check result normal?

YES : Go to Step 6.
NO : Replace the stoplight switch (Refer to GROUP 35A –Brake Pedal P.35A-33), and then go to Step 9.

STEP 6. Brake drag check

Check the brake system for drag.

Q: Is the check result normal?

YES : Go to Step 7.
NO : Repair the brake drag, and then go to Step 9.

STEP 7. Brake booster check

Refer to GROUP 35A – On-vehicle Service P.35A-16.

Q: Is the check result normal?

YES : Go to Step 8.
NO : Replace the brake booster (Refer to GROUP 35A – Master Cylinder Assembly and Brake Booster P.35A-36 <FWD>, P.35A-39 <AWD>), and then go to Step 9.

STEP 8. Check whether the DTC is reset.

Q: Is DTC C121E set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 9.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

TSB Revision

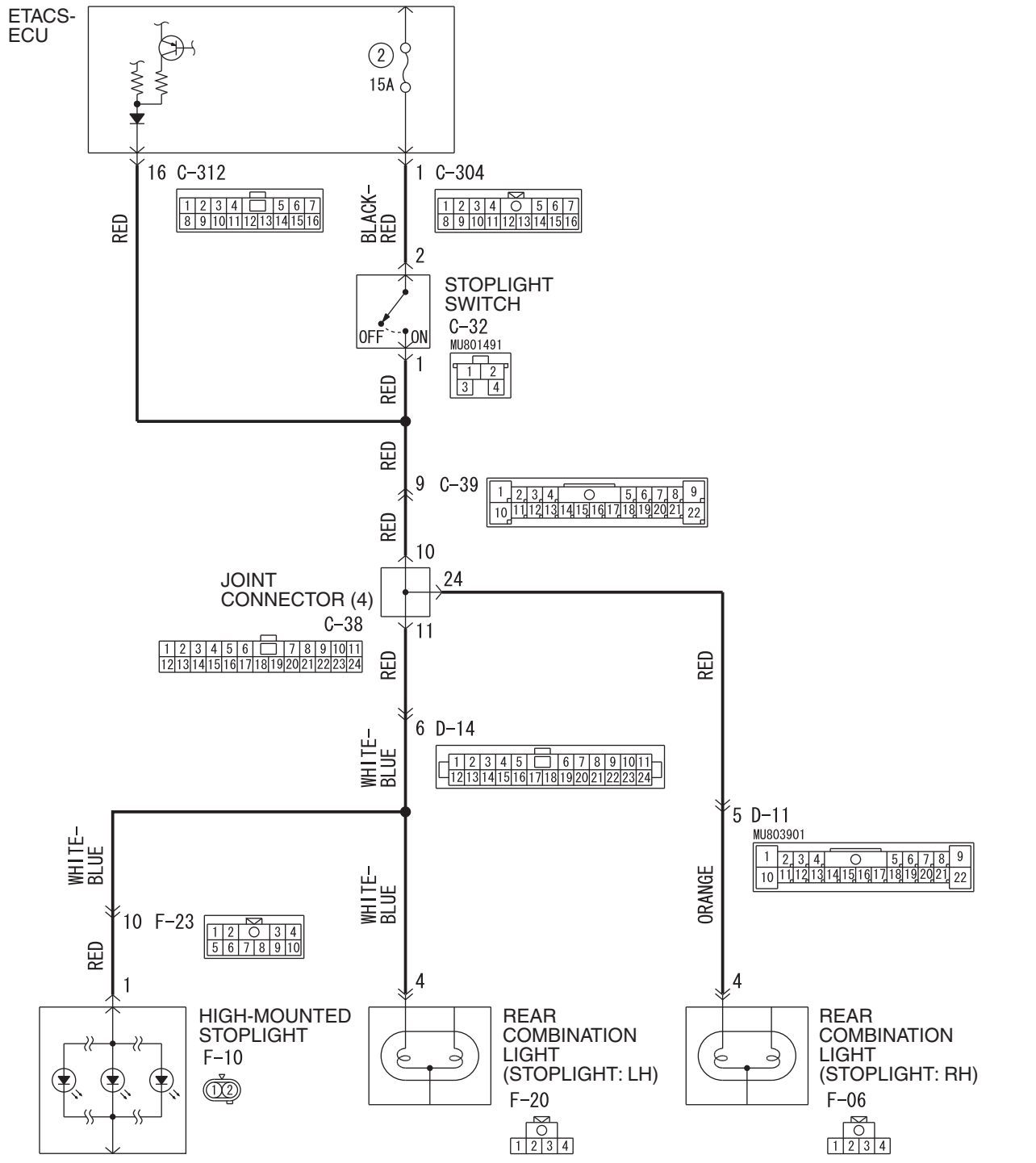
STEP 9. Check whether the DTC is reset.

Q: Is DTC C121E set?

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

DTC C1000: Abnormality in stoplight switch circuit

Stoplight Switch Circuit



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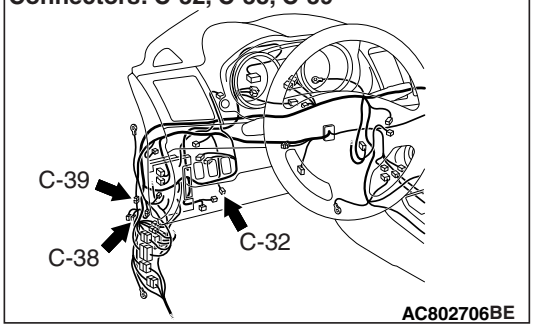
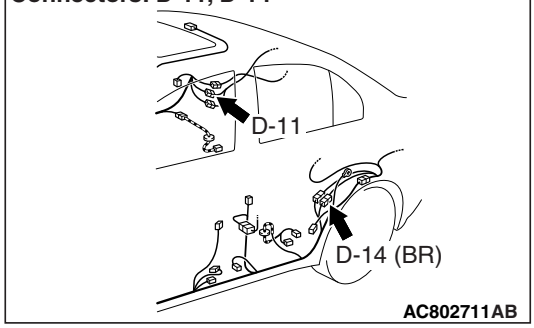
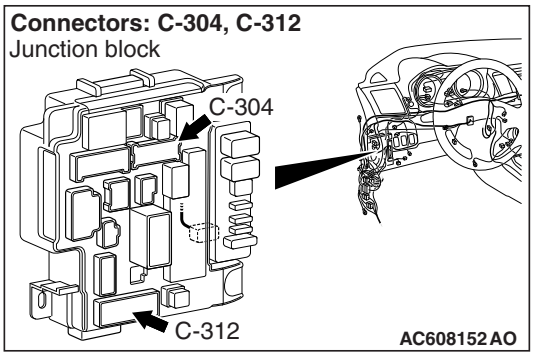
Connectors: C-32, C-38, C-39



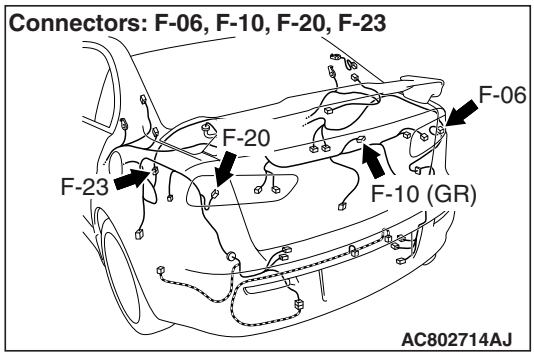
Connectors: D-11, D-14



Connectors: C-304, C-312
Junction block



Connectors: F-06, F-10, F-20, F-23



⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

CIRCUIT OPERATION

ETACS-ECU sends the ON signal generated when the brake pedal is depressed and OFF signal generated when it is released to ABS-ECU via the CAN bus lines.

DTC SET CONDITIONS

This DTC is set in the following case.

- When the vehicle has run for a long time with the stoplight switch turned ON.
- When the OFF status of the stoplight switch does not match the vehicle attitude

PROBABLE CAUSES

- Improper adjustment of stoplight switch installation position
- Malfunction of the stoplight switch
- 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
- MB991997: ASC check harness

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

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 54C – CAN Bus Diagnostic table P.54C-9). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC C1000 set?

YES : Go to Step 3.

NO : The procedure is complete.

STEP 3. Battery check

Refer to GROUP 54A – Battery Test P.54A-8.

Q: Is the battery in good condition?

YES : Go to Step 4.

NO : Charge or replace the battery, and go to Step 17.

STEP 4. Stoplight operation check

Check the stoplight operation when the brake pedal is depressed. Check that the stoplight 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: Illuminates

Q: Is the check result normal?

YES : Go to Step 18.

NO : Go to Step 5.

STEP 5. Check stoplight switch installation

Refer to GROUP 35A – On-vehicle Service, Brake Pedal Check and Adjustment P.35A-14.

Q: Is the check result normal?

YES : Go to Step 6.

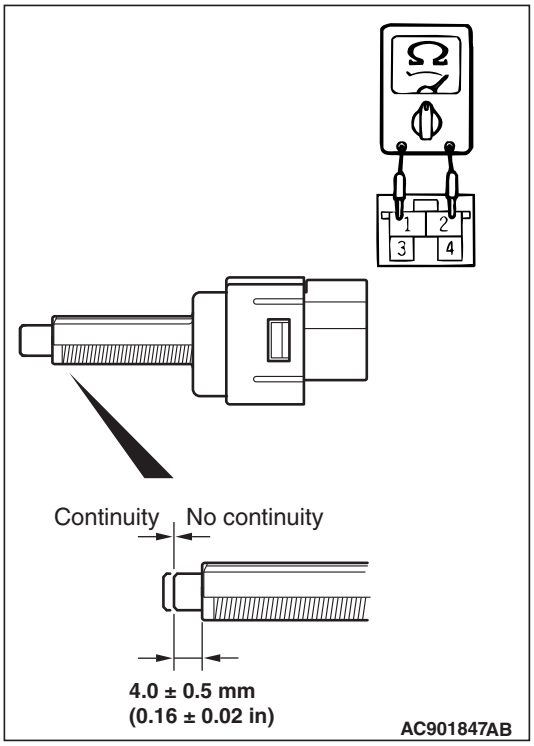
NO : Install the stop light switch correctly. (Refer to GROUP 35A – On-vehicle Service, Brake Pedal Check and Adjustment P.35A-14.) Then go to Step 22.

STEP 6. stop light switch continuity check

(1) Remove the stoplight switch (Refer to GROUP 35A – Brake Pedal P.35A-33).

(2) Connect the circuit tester (Ω range) to the stoplight 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 stoplight switch is in good condition.



Q: Is the check result normal?

YES : Go to Step 7.

NO : Replace the stoplight switch. (Refer to GROUP 35A – Brake Pedal P.35A-33.) Then go to Step 22.

STEP 7. ETACS-ECU fuse No.2 check

Q: Is the check result normal?

YES : Go to Step 12.

NO : Go to Step 8.

STEP 8. Connector check: C-304 ETACS-ECU connector, C-312 ETACS-ECU connector, C-32 stoplight switch connector, C-39 Intermediate connector, C-38 joint connector, D-11 Intermediate connector, D-14 Intermediate connector, F-23 Intermediate connector, F-06 rear combination light (stoplight: RH) connector, F-20 rear combination light (stoplight: LH) connector, F-10 high-mounted stoplight connector

Q: Is the check result normal?

YES : Go to Step 9.

NO : Repair the damaged connector, and then replace fuse No.2. Then go to Step 22.

STEP 9. Resistance measurement at C-32 stoplight switch connector

(1) Disconnect C-32 stop light switch connector, and measure at the wiring harness side.
(2) Disconnect C-312 ETACS-ECU connector and C-38 joint connector.
(3) Measure the resistance between the terminal No.1 and the body ground.

OK: No continuity

Q: Is the check result normal?

YES : Go to Step 10.

NO : A short circuit may be present in the wiring harness between C-38 joint connector terminal No.10 and C-32 stoplight switch connector terminal No.1 or between C-312 ETACS-ECU connector terminal No.16 and C-32 stoplight switch connector terminal No.1. Repair the wiring harness if necessary, and then replace fuse No.2. Then go to Step 22.

STEP 10. Resistance measurement at C-32 stop light switch connector

(1) Disconnect C-32 stop light switch connector, and measure at the wiring harness side.
(2) Disconnect C-304 ETACS-ECU connector.
(3) Measure the resistance between the terminal No.2 and the body ground.

OK: No continuity

Q: Is the check result normal?

YES : Go to Step 11.

NO : A short circuit may be present in the wiring harness between C-304 ETACS-ECU connector terminal No.1 and C-32 stoplight switch connector terminal No.2. Repair the wiring harness if necessary, and then replace fuse No.2. Then go to Step 22.

STEP 11. Resistance measurement at C-38 joint connector

(1) Disconnect C-38 joint connector, and measure at the wiring harness side.
(2) Disconnect F-06 rear combination light (stoplight: RH) connector, F-20 rear combination light (stoplight: LH) connector, F-10 high-mounted stoplight connector.
(3) Measure the resistance between the terminal No.10 and the body ground.

OK: No continuity

Q: Is the check result normal?

YES : Replace fuse No.2. Then go to Step 21.
NO : A short circuit may be present in the wiring harness between C-38 joint connector terminal No.24 and F-06 rear combination light (stoplight: RH) connector terminal No.4 or between C-38 joint connector terminal No.11 and F-20 rear combination light (stoplight: LH) connector terminal No.4 or between C-38 joint connector terminal No.11 and F-10 high-mounted stoplight connector terminal No.1. Repair the wiring harness if necessary, and then replace fuse No.2. Then go to Step 22.

STEP 12. Connector check: C-304 ETACS-ECU connector

Q: Is the check result normal?

YES : Go to Step 13.
NO : Repair the damaged connector.

STEP 13. Measure the voltage at the C-304 ETACS-ECU connector.

⚠ CAUTION
Measure while the brake pedal is not depressed.
Measure the voltage between terminal No.1 and the body ground by backprobing.

OK: Battery positive voltage

Q: Is the check result normal?

YES : Go to Step 14.
NO : Replace the ETACS-ECU (Refer to GROUP 54A – ETACS-ECU P.54A-772). Then go to Step 22.

STEP 14. Connector check: C-32 Stoplight switch connector

Q: Is the check result normal?

YES : Go to Step 15.
NO : Repair the damaged connector. Then go to Step 22.

STEP 15. Measure the voltage at C-32 stoplight switch connector.

(1) Disconnect C-32 stoplight switch connector, and measure the voltage at harness connector side.
(2) Measure the voltage between the terminal No.2 and the body ground.

OK: Battery positive voltage

Q: Is the check result normal?

YES : Go to Step 16.
NO : An open circuit may be present in the wiring harness between C-304 ETACS-ECU connector terminal No. 1 and C-32 stoplight switch connector terminal No. 2. Repair the wiring harness. Then go to Step 22.

STEP 16. Connector check: C-38 joint connector

Q: Is the check result normal?

YES : Go to Step 17.
NO : Repair the damaged connector. Then go to Step 22.

STEP 17. Voltage measurement at C-38 joint connector

⚠ CAUTION

Measure while the brake pedal is depressed.

(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the voltage between the terminal No.10 and the body ground.

OK: Battery positive voltage

Q: Is the check result normal?

YES : Go to Step 18.
NO : An open circuit may be present in the wiring harness between C-38 joint connector terminal No.10 and C-32 stoplight switch connector terminal No.1. Repair the wiring harness.

STEP 18. Connector check: C-312 ETACS-ECU connector

Q: Is the check result normal?

YES : Go to Step 19.
NO : Repair the damaged connector.

STEP 19. Measure the voltage at the C-312 ETACS-ECU connector.

(1) Measure by backprobing without disconnecting the connector.
(2) Measure the voltage between the terminal No.16 and the body earth.

OK:
When the brake pedal is released: 0 V - 5V (pulse)
When the brake pedal is depressed: Approximately battery positive voltage

Q: Is the check result normal?

YES : Go to Step 21.
NO : Go to Step 20.

STEP 20. Check the wiring harness between C-312 ETACS-ECU connector terminal No.16 and C-32 stoplight switch connector terminal No.1

- Check the signal line for open circuit.

Q: Is the check result normal?

YES : Go to Step 23.
NO : Replace the wiring harness.

STEP 21. Diagnostic trouble code recheck

Q: Is diagnostic trouble code No.C1000 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 22.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14.)

STEP 22. Diagnostic trouble code recheck

Q: Is diagnostic trouble code No.C1000 set?

YES : Return to Step 1.
NO : This diagnosis is complete.

STEP 23. Diagnostic trouble code recheck

Q: Is diagnostic trouble code No.C1000 set?

YES : Replace the ETACS-ECU.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14.)

DTC C123B: Prolonged operation of ASC

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **Do not drop or shock the G and yaw rate sensor.**
- **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-292).**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

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 DTC is set when ASC operates for a prolonged period.

NOTE: This DTC may be set when the vehicle runs on a slippery or rough road.

PROBABLE CAUSES

- Steering wheel sensor malfunction
- G and yaw rate sensor malfunction
- Improper installation of steering wheel sensor, or G and yaw rate sensor
- ASC-ECU malfunction
- Different steering wheel
- Wheel alignment not performed

DIAGNOSIS

Required Special Tools:

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

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

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 54C – CAN Bus Diagnostic table P.54C-17.) On completion, go to Step 2.

STEP 2. DTC recheck after repairing the CAN bus line

Q: Is DTC C123B set?

YES : Go to Step 3.

NO : The procedure is complete.

STEP 3. Check the wheel speed sensor, and G and yaw rate sensor-related DTC.

Check that DTCs No.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 DTC that is set. (Refer to P.35C-25.) Then go to Step 10.

NO : Go to Step 4.

STEP 4. Check of G and yaw rate sensor installation status

Check that the G and yaw rate sensor is installed correctly.

Q: Is the check result normal?

YES : After checking the G and yaw rate sensor, perform the calibration of the G and yaw rate sensor to make ASC-ECU relearn the neutral point. (Refer to P.35C-292.) Then go to Step 5.

NO : Reinstall the G and yaw rate sensor correctly. (Refer to P.35C-309.) Then go to Step 10.

STEP 5. Using scan tool MB991958, check the service data

Check the following service data. (Refer to P.35C-282.)

- Item 08: Lateral G sensor
- Item 09: 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. (Refer to P.35C-309.) Then go to Step 10.

STEP 6. Check of steering wheel sensor installation status
Check that the steering wheel sensor is installed correctly.

Q: Is the check result normal?

YES : Go to Step 7.
NO : Install the steering wheel sensor correctly. (Refer to P.35C-310.) Then go to Step 7.

STEP 7. Wheel alignment check
Refer to GROUP 33 – On-vehicles service P.33-8.

Q: Is the check result normal?

YES : After checking the wheel alignment, perform the calibration of steering wheel sensor to make ASC-ECU relearn the neutral point. (Refer to P.35C-294.) Then go to Step 8.
NO : After adjusting the wheel alignment, perform the calibration of steering wheel sensor to make ASC-ECU relearn the neutral point. (Refer to P.35C-294.) Then go to Step 8.

STEP 8. Using scan tool MB991958, check the service data
Check the following service data. (Refer to P.35C-282.)

- Item 11: Steering angle

Q: Is the check result normal?

YES : Go to Step 9.
NO : Replace the steering wheel sensor. (Refer to P.35C-310.) Then go to Step 10.

STEP 9. Check whether the DTC is reset.

Q: Is DTC C123B set?

YES : Replace the hydraulic unit (ASC-ECU). (Refer to P.35C-301.) Then go to Step 10.
NO : Intermittent malfunction. (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14.)

STEP 10. Check whether the DTC is reset.

Q: Is DTC C123B set?

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

DTC C2200 Abnormality in ASC-ECU

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

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 DTC is set when ASC-ECU has malfunction.

PROBABLE CAUSES

- Damaged wiring harness and connectors
- ASC-ECU malfunction
- Battery terminal 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. Using scan tool MB991958, diagnose the CAN bus lines.

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC C2200 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 3.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

TSB Revision

STEP 3. DTC recheck after resetting CAN bus lines

Q: Is DTC C2200 set?

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

DTC C2101 Abnormality in battery voltage (high voltage)

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

The ASC-ECU is energized by the valve power supply circuit (terminal No.32). 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.4) energizes the ASC-ECU.

DTC SET CONDITIONS

This DTC is set when the ASC-ECU power supply voltage is more than 18.0 ± 1.0 V.

PROBABLE CAUSES

- Battery failure
- ASC-ECU malfunction
- Charging system failed

DIAGNOSIS

Required Special Tools:

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

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

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC C2101 set?

YES : Go to Step 3.

NO : The procedure is complete.

STEP 3. Battery check

Refer to GROUP 54A – Battery Test P.54A-8.

Q: Is the battery in good condition?

YES : Go to Step 5.

NO : Charge or replace the battery. Then go to Step 4.

STEP 4. Charging system check

Refer to GROUP 16 – Charging System P.16-5.

Q: Is the check result normal?

YES : Go to Step 5.

NO : Repair or replace the charging system component(s).

STEP 5. Check whether the DTC is reset.

Q: Is DTC C2101 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 6.

NO : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

STEP 6. Check whether the DTC is reset.

Q: Is DTC C2101 set?

YES : Return to Step 1.

NO : The procedure is complete.

DTC C121C Torque request signal rejection

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **Do not drop or shock the G and yaw rate sensor.**
- **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-292).**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

ASC-ECU sends the signal to the engine control module (ECM) as necessary to decrease the engine output for the ASC system operation.

DTC SET CONDITIONS

This DTC is set when the request for the decrease of output is rejected by the engine control module (ECM).

PROBABLE CAUSES

- Wrong coding of engine control module (ECM)
- engine control module (ECM) malfunction
- ASC-ECU malfunction
- External noise interference

DIAGNOSTIC PROCEDURE

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

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC C121C set?

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

STEP 3. Using scan tool MB991958, check the other system DTC

Use scan tool to check that the DTC is set in the engine control module (ECM).

Q: Is the DTC set?

YES : Troubleshoot the engine control module (ECM) (Refer to GROUP 13A – Troubleshooting, Diagnosis function P.13A-12 <2.0L engine non-turbo> or GROUP 13B – Troubleshooting, Diagnosis function P.13B-10 <2.0L engine turbo> or GROUP 13C – Troubleshooting, Diagnosis function P.13C-11 <2.4L engine>), and then go to Step 7.

NO : Go to Step 4.

STEP 4. Using scan tool MB991958, check the DTC

Check that DTC U1417 is set in ASC-ECU.

Q: Is DTCU1417 set?

YES : Troubleshoot for DTC U1417 (Refer to P.35C-226). Then go to Step 5.

NO : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 7.

STEP 5. Using scan tool MB991958, check the data list

Check the following service data (Refer to P.35C-282).

- Item 68: Allow ESP torque request

Q: Is the check result normal?

YES : Go to Step 6.

NO : Replace the engine control module (ECM) (Refer to GROUP 13A – Troubleshooting, Diagnosis function P.13A-12 <2.0L engine non-turbo> or GROUP 13B – Troubleshooting, Diagnosis function P.13B-10 <2.0L engine turbo> or GROUP 13C – Troubleshooting, Diagnosis function P.13C-11 <2.4L engine>), and then go to Step 7.

STEP 6. Check whether the DTC is reset.

Q: Is DTC C121C set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 7.

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.00-14).

STEP 7. Check whether the DTC is reset

Q: Is DTC C121C set?

YES : Return to Step 1.

NO : The procedure is complete.

DTC C1290 CAN time-out error

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **If the DTC C1290 is set in ASC-ECU, always diagnose the CAN bus line. If there is any fault in the CAN bus lines, an incorrect DTC may be set. In this case, the set DTC is not highly reliable.**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**
- **When the DTC C1290 is set in ASC-ECU, the DTC for another system may also be set. When the DTC for another system is set, carry out diagnosis for that system first.**

OPERATION

ASC-ECU receives signals necessary for the operations of ABS, ASC, and TCL from the engine control module (ECM), TCM or TC-SST-ECU, AWC-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 control module (ECM), TCM or TC-SST-ECU, AWC-ECU, ETACS-ECU, and steering wheel sensor via CAN bus lines. This DTC is stored when ASC-ECU cannot receive the signals necessary for the operations of ABS, ASC, and TCL from the engine control module (ECM), TCM or TC-SST-ECU, AWC-ECU, ETACS-ECU, and steering wheel sensor.

PROBABLE CAUSES

- Engine control module (ECM) malfunction
- TCM or TC-SST-ECU malfunction
- AWC-ECU malfunction
- Steering wheel sensor malfunction
- Malfunction of the CAN bus
- ASC-ECU malfunction
- Malfunction of ETACS-ECU
- ETACS-ECUs have been interchanged between two vehicles.

DIAGNOSIS PROCEDURE

STEP 1. Using scan tool MB991958, diagnose the CAN bus lines.
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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 6.

STEP 2. Using scan tool MB991958, check the DTC
Check that the DTCs U0100, U0101, U0126, and U0141 are set in ASC-ECU.

Q: Is the DTC set?

YES : Troubleshoot for the relevant DTC (Refer to P.35C-25). Then go to Step 6.
NO : Go to Step 3.

STEP 3. Using scan tool MB991958, other system check the DTC.
Using scan tool, check if the DTCs are set from the engine control module (ECM), TCM or TC-SST-ECU, AWC-ECU, ETACS-ECU, and steering wheel sensor or not.

Q: Is the DTC set?

YES : Troubleshoot the relevant DTC, and then go to Step 6.
NO : Go to Step 4.

STEP 4. ETACS-ECU coding data check

Refer to GROUP 00 – Coding List P.00-33.

Vehicle line
OK: LANCER

Transmission
OK (M/T): 5MT
OK (CVT): CVT
OK (TC-SST): TC-SST

Engine type
OK (2.4L engine): 2.4L D4 MPI VVT
OK (2.0L Non-Turbo engine): 2.0L D4 MPI VVT
OK (2.0L Turbo engine): 2.0L D4 VVT T/C

Engine power
OK: Normal

Chassis type for A.S.C.
OK (2.4L engine, 2.0L Non-Turbo engine): Type 4
OK (2.0L Turbo engine): Type 6

Final drive
OK (2.4L engine, 2.0L Non-Turbo engine): Front Drive
OK (2.0L Turbo engine): AWD FF Base

Transfer
OK (2.4L engine, 2.0L Non-Turbo engine): 2WD
OK (2.0L Turbo engine): ACD

SAS
OK: Present

4WD/AWD
OK: Not present

TCM
OK (M/T): Not present
OK (CVT, TC-SST): Present

ACDAYC
OK (2.4L engine, 2.0L Non-Turbo engine): Not present
OK (2.0L Turbo engine): Present

Q: Is the check result normal?

YES : Go to Step 5.
NO : Replace the ETACS-ECU (Refer to GROUP 54A – ETACS-ECU P.54A-772), and then go to Step 6.

STEP 5. Check whether the DTC is reset.

Q: Is DTC C1290 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 6.

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.00-14).

STEP 6. Check whether the DTC is reset.

Q: Is DTC C1290 set?

YES : Return to Step 1.

NO : The procedure is complete.

DTC C2203 VIN not recorded

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **When other DTC for ASC-ECU is set, troubleshoot that DTC first.**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

ASC-ECU receives vehicle information from the engine control module (ECM) and stores it.

DTC SET CONDITIONS

This DTC is set when ASC-ECU cannot receive the vehicle information from the engine control module (ECM).

PROBABLE CAUSES

- Malfunction of the CAN bus
- Engine control module (ECM) malfunction
- ASC-ECU malfunction
- When the ignition switch is turned to the "ON" position for the first time after the ASC-ECU is replaced.

DIAGNOSIS

Required Special Tools:

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

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

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

(1) Ignition switch "LOCK" (OFF)
(2) Ignition switch "ON"

Q: Is DTC C2203 set?

YES : Go to Step 3.

NO : The procedure is complete.

STEP 3. Using scan tool MB991958, check the DTC

Check that the engine control module (ECM) sets a DTC.

Q: Is any DTC set?

YES <2.0L engine-turbo> : Troubleshoot the engine control module (ECM) DTC (Refer to GROUP 13A – Troubleshooting P.13A-50), and then go to Step 5.

YES <2.4L engine> : Troubleshoot the engine control module (ECM) DTC (Refer to GROUP 13C – Troubleshooting P.13C-48), and then go to Step 5.

YES <2.0L engine non-turbo> : Troubleshoot the engine control module (ECM) DTC (Refer to GROUP 13B – Troubleshooting P.13B-51), and then go to Step 5.

NO : Go to Step 4.

STEP 4. Check whether the DTC is reset.

Q: Is DTC C2203 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301), and then go to Step 5.

NO : If a trouble is solved, it is determined that there is an intermittent malfunction such as poor engaged connector(s) or open circuit (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

STEP 5. Check whether the DTC is reset.
(1) Ignition switch "LOCK" (OFF)
(2) Ignition switch "ON"

Q: Is DTC C2203 set?

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

DTC C2206 Re-execution of variant coding

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Before replacing the ECU, ensure that the communication circuit is normal.**
- **When DTC C2206 is set in ASC-ECU, the DTC may also be set in ETACS-ECU. When the DTC is set in ETACS-ECU, carry out the diagnosis of the DTC for ETACS-ECU first.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

ASC-ECU receives the vehicle information stored in the ETACS-ECU via CAN bus lines.

DTC SET CONDITIONS

ASC-ECU compares the last vehicle information received from ETACS-ECU with the previous vehicle information. If they do not match, ASC-ECU sets this DTC.

PROBABLE CAUSES

- ETACS-ECUs have been interchanged between two vehicles.
- Malfunction of ETACS-ECU
- Malfunction of ASC-ECU
- 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. Using scan tool MB991958, diagnose the CAN bus lines.
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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines
Check if DTC U1415 or U1417 is also set.

Q: Is DTC U1415 or U1417 set?

YES : Perform troubleshooting for the diagnostic trouble code that is set. (Refer to P.35C-25.)
NO : Go to Step 3.

STEP 3. Using scan tool MB991958, diagnostic trouble code of other systems
Use scan tool to check that the vehicles information-related DTC is set by the ETACS-ECU.

Q: Is any DTC set?

YES : Troubleshoot the relevant diagnostic trouble code, and then go to Step 7.
NO : Go to Step 4.

STEP 4. ETACS-ECU coding data check
Refer to GROUP 00 – Coding List P.00-33.

Q: Is the check result normal?

YES : Go to Step 6.
NO : Go to Step 5.

STEP 5. ETACS-ECU variant coding
Perform the variant coding to the ETACS-ECU.

Q: Does variant coding succeed?

YES : Go to Step 7.
NO : Replace the ETACS-ECU (Refer to GROUP 54A – ETACS-ECU P.54A-772), and then go to Step 7.

STEP 6. Check whether the diagnostic trouble code is reset.

Q: Is DTC C2206 set?

YES : Replace the hydraulic unit (incorporates in ASC-ECU) (Refer to P.35C-301), and then go to Step 7.
NO : The procedure is complete.

STEP 7. Check whether the diagnostic trouble code is reset.

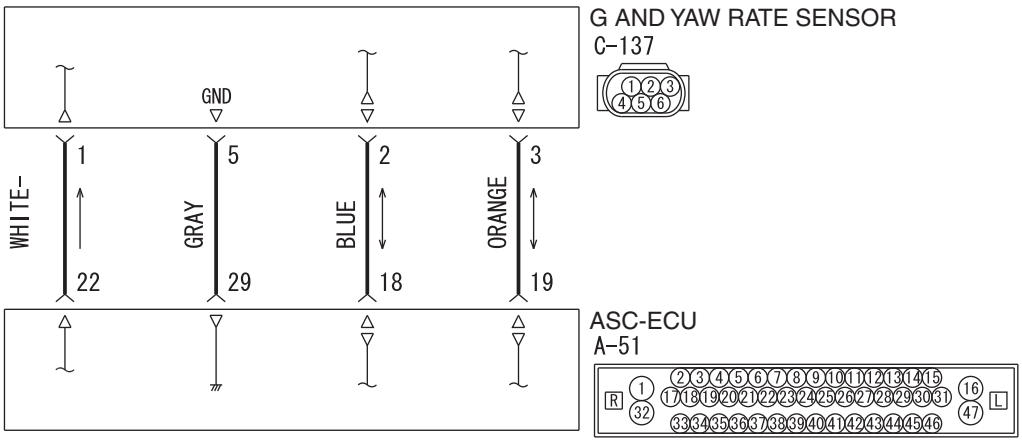
Q: Is DTC C2206 set?

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

TSB Revision

DTC C1210 Abnormality in G and yaw rate sensor (Abnormality in longitudinal G sensor output voltage) <AWD>

G and Yaw Rate Sensor Circuit



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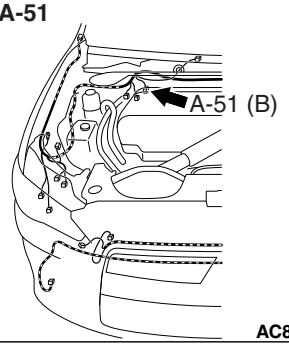
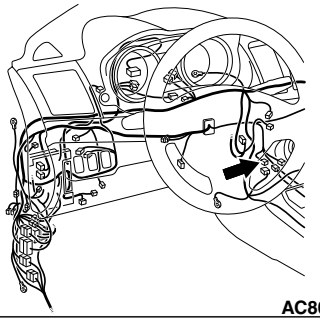
Connector: A-51



AC802702AF

Connector: C-137



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⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **Do not drop or shock the G and yaw rate sensor.**
- **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-292).**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

TSB Revision

OPERATION

- ABS-ECU monitors if the output of G and yaw rate sensor is normal or not.

DTC SET CONDITIONS

This DTC is set if any malfunction below is found:

- When the output value of the longitudinal G-sensor is abnormal
- When abnormality is detected by the self-diagnosis of the longitudinal G-sensor

PROBABLE CAUSES

- Wiring harness or connector failure for the special CAN bus lines between ASC-ECU and the G and yaw rate sensor
- 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. Using scan tool MB991958, diagnose the CAN bus lines.

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC C1210 set?

YES : Go to Step 3.

NO : The procedure is complete.

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

Check the following service data (Refer to P.35C-282).

- Item 09: G sensor

Q: Is the check result normal?

YES : Go to Step 6.

NO : Go to Step 4.

STEP 4. Connector check: A-51 ASC-ECU connector, C-137 G and yaw rate sensor connector

Q: Is the check result normal?

YES : Go to Step 5.
NO : Repair the connector, and then go to Step 8.

STEP 5. Wiring harness check between A-51 ASC-ECU connector terminal No. 18 and C-137 G and yaw rate sensor connector terminal No. 2 as well as between A-51 ASC-ECU connector terminal No. 19 and C-137 G and yaw rate sensor connector terminal No. 3

- Check the communication circuit for open and short circuit.

Q: Is the check result normal?

YES : Replace the G and yaw rate sensor (Refer to P.35C-309) and then go to Step 7.
NO : Repair the wiring harness, and then go to Step 8.

STEP 6. Check whether the DTC is reset.

Q: Is DTC C1210 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301), and then go to Step 8.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

STEP 7. Check whether the DTC is reset.

Q: Is DTC C1210 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301), and then go to Step 8.
NO : The procedure is complete.

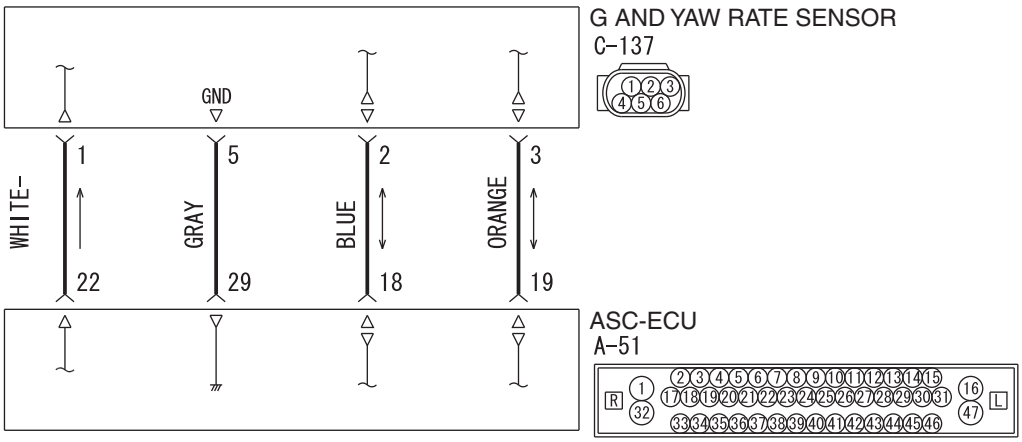
STEP 8. Check whether the DTC is reset.

Q: Is DTC C1210 set?

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

DTC C1242 Abnormality in G and yaw rate sensor (Abnormality in longitudinal G sensor output signal) <AWD>

G and Yaw Rate Sensor Circuit



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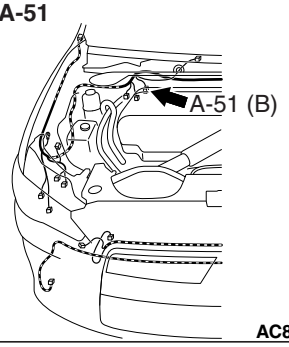
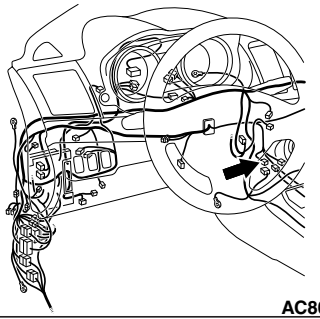
Connector: A-51



AC802702AF

Connector: C-137



AC802706BG

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **Do not drop or shock the G and yaw rate sensor.**
- **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-292).**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

TSB Revision

OPERATION

ABS-ECU monitors if the output of G and yaw rate sensor is normal or not.

DTC SET CONDITIONS

This DTC 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

- Wiring harness or connector failure for the special CAN bus lines between ASC-ECU and the G and yaw rate sensor
- 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

NOTE: When rotated on the four-wheel drum tester, this DTC may be set.

DIAGNOSIS

Required Special Tools:

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

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

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. Using scan tool MB991958, check the DTC

Check that the DTC U0125 is set in ASC-ECU.

Q: Is DTC U0125 set?

YES : Troubleshoot for the DTC (Refer to P.35C-216). Then go to Step 3.

NO : Go to Step 3.

STEP 3. DTC recheck after resetting CAN bus lines

Q: Is DTC C1242 set?

YES : Go to Step 4.

NO : The procedure is complete.

STEP 4. Check the wheel speed sensor-related DTC.
Use the scan tool to check whether the wheel speed sensor-related DTC is set or not.

Q: Is the DTC set?

YES : Troubleshoot for the relevant DTC (Refer to P.35C-25).
NO : Go to Step 5.

STEP 5. Using scan tool MB991958, check the data list
Check the following service data under curb weight condition or one occupant (driver) only in the vehicle, on a flat road.(Refer to P.35C-282)

- Item 09: G sensor
- Item 96: G sensor offset

Q: Is the check result normal?

YES : Turn the ignition switch to the ON from OFF position. Then go to Step 9.
NO : Go to Step 6.

STEP 6. 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 7.
NO : Reinstall the G and yaw rate sensor correctly (Refer to P.35C-309), and then go to Step 10.

STEP 7. Connector check: A-51 ASC-ECU connector, C-137 G and yaw rate sensor connector

Q: Is the check result normal?

YES : Go to Step 8.
NO : Repair the connector, and then go to Step 10.

STEP 8. Wiring harness check between A-51 ASC-ECU connector terminal No. 18 and C-137 G and yaw rate sensor connector terminal No. 2 as well as between A-51 ASC-ECU connector terminal No. 19 and C-137 G and yaw rate sensor connector terminal No. 3

- Check the communication circuit for open and short circuit.

Q: Is the check result normal?

YES : Replace the G and yaw rate sensor.(Refer to P.35C-309.) Then go to Step 9.
NO : Repair the wiring harness, and then go to Step 10.

STEP 9. Check whether the DTC is reset.

Q: Is DTC C1242 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301), and then go to Step 10.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

TSB Revision

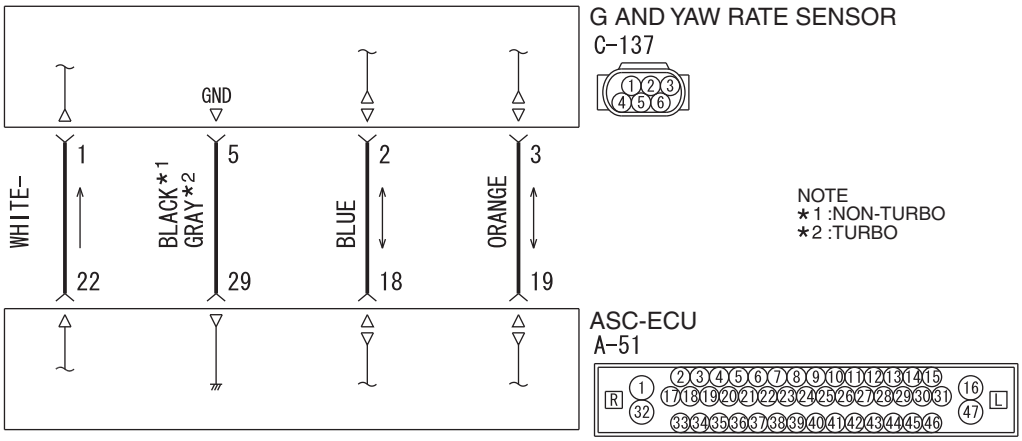
STEP 10. Check whether the DTC is reset.

Q: Is DTC C1242 set?

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

DTC C123C Abnormality in G and yaw rate sensor [Abnormality in lateral G sensor and yaw rate output value (incorrect installation)]

G and Yaw Rate Sensor Circuit



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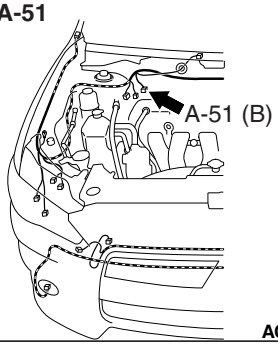
Connector: A-51



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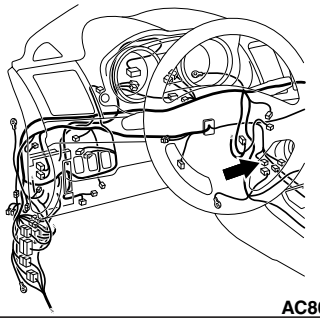
Connector: C-137



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TSB Revision

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **Do not drop or shock the G and yaw rate sensor.**
- **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-292).**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

ABS-ECU monitors if the output of G and yaw rate sensor is normal or not.

DTC SET CONDITIONS

This DTC is set if any malfunction below is found:

- The output value of lateral G and yaw rate is abnormal.
- When abnormality is detected by comparing the value output of the lateral G and yaw rate with the one from the steering wheel sensor and wheel speed sensor

PROBABLE CAUSES

- Wiring harness or connector failure for the special CAN bus lines between ASC-ECU and the G and yaw rate sensor
- Improper installation of the G and yaw rate sensor
- G and yaw rate sensor malfunction
- Steering wheel sensor malfunction
- Improperly installed steering wheel sensor
- 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. Using scan tool MB991958, diagnose the CAN bus lines.
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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. Using scan tool MB991958, check the DTC
Check that the DTC U0125 is set in ASC-ECU.

Q: Is DTC U0125 set?

YES : Troubleshoot for the DTC (Refer to P.35C-216). Then go to Step 3.
NO : Go to Step 3.

STEP 3. DTC recheck after resetting CAN bus lines

Q: Is DTC C123C set?

YES : Go to Step 4.
NO : The procedure is complete.

STEP 4. Check the wheel speed sensor-related DTC.
Use scan tool to check whether the wheel speed sensor-related or steering wheel sensor-related DTC is set or not.

Q: Is the DTC set?

YES : Troubleshoot for the relevant DTC (Refer to P.35C-25).
NO : Go to Step 5.

STEP 5. 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 : After checking the G and yaw rate sensor, carry out calibration of the G and yaw rate sensor to make ASC-ECU relearn the neutral point. (Refer to P.35C-292.) Then go to Step 6.
NO : Reinstall the G and yaw rate sensor correctly (Refer to P.35C-309), and then go to Step 12.

STEP 6. Using scan tool MB991958, check the data list
Check the following service data (Refer to P.35C-282).

- Item 08: Lateral G-sensor
- Item 12: Yaw rate sensor

Q: Is the check result normal?

YES : Go to Step 9.
NO : Go to Step 7.

STEP 7. Connector check: A-51 ASC-ECU connector, C-137 G and yaw rate sensor connector

Q: Is the check result normal?

YES : Go to Step 8.
NO : Repair the connector, and then go to Step 13.

STEP 8. Wiring harness check between A-51 ASC-ECU connector terminal No. 18 and C-137 G and yaw rate sensor connector terminal No. 2 as well as between A-51 ASC-ECU connector terminal No. 19 and C-137 G and yaw rate sensor connector terminal No. 3

- Check the communication circuit for open and short circuit.

Q: Is the check result normal?

YES : Replace the G and yaw rate sensor (Refer to P.35C-309), and then go to Step 12.
NO : Repair the wiring harness, and then go to Step 13.

STEP 9. Steering wheel sensor installation check

Check that the steering wheel sensor is installed correctly.

Q: Is the check result normal?

YES : Go to Step 10.
NO : Reinstall the steering wheel sensor correctly (Refer to P.35C-310), and then go to Step 10.

STEP 10. Wheel alignment check

Refer to GROUP 33 – On-vehicles service P.33-8.

Q: Is the check result normal?

YES : After checking the wheel alignment, carry out calibration of steering wheel sensor to make ASC-ECU relearn the neutral point. (Refer to P.35C-294). Then go to Step 11.
NO : After adjusting the wheel alignment, carry out calibration of steering wheel sensor to make ASC-ECU relearn the neutral point (Refer to P.35C-294). Then go to Step 11.

STEP 11. Using scan tool MB991958, check the data list

Check the following service data (Refer to P.35C-282).

- Item 11: Steering angle

Q: Is the check result normal?

YES : Go to Step 12.
NO : Replace the steering wheel sensor (Refer to P.35C-310), and then go to Step 12.

STEP 12. Check whether the DTC is reset.

Q: Is DTC C123C set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301), and then go to Step 13.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

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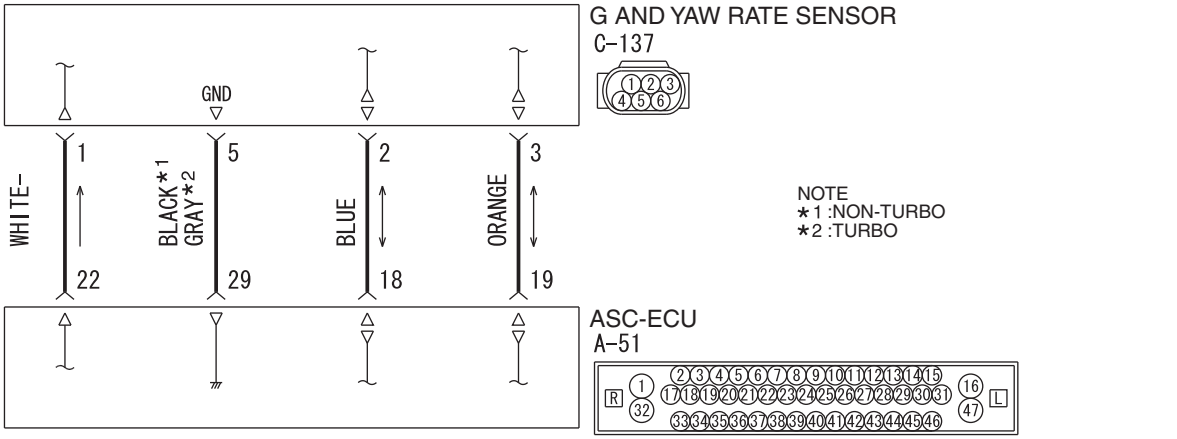
STEP 13. Check whether the DTC is reset.

Q: Is DTC C123C set?

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

DTC C2204 Internal abnormality in G and yaw rate sensor

G and Yaw Rate Sensor Circuit



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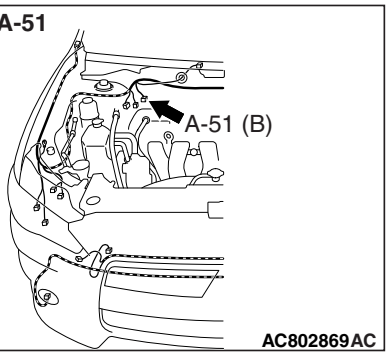
Connector: A-51



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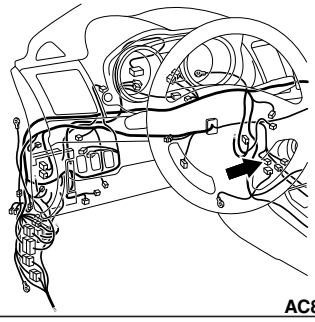
Connector: C-137



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⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **Do not drop or shock the G and yaw rate sensor.**
- **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-292).**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

ABS-ECU monitors if the output of G and yaw rate sensor is normal or not.

DTC SET CONDITIONS

This DTC is set if any malfunction below is found:

- When abnormality is detected by the self-diagnosis of the lateral G and yaw rate
- When the output value of the lateral G and yaw rate is not within the standard value range

NOTE: This DTC may be set when G and yaw rate sensor is put on the turntable turning at high speed.

PROBABLE CAUSES

- Wiring harness or connector failure for the special CAN bus lines between ASC-ECU and the G and yaw rate sensor
- 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. Using scan tool MB991958, diagnose the CAN bus lines.
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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. Using scan tool MB991958, check the DTC
Check that the DTC U0125 is set in ASC-ECU.

Q: Is DTC U0125 set?

YES : Troubleshoot for the DTC (Refer to P.35C-216). Then go to Step 3.
NO : Go to Step 3.

STEP 3. DTC recheck after resetting CAN bus lines

Q: Is DTC C2204 set?

YES : Go to Step 4.
NO : The procedure is complete.

STEP 4. Using scan tool MB991958, check the data list
Check the following service data under curb weight condition or one occupant (driver) only in the vehicle, on a flat road.(Refer to P.35C-282)

- Item 08: Lateral G-sensor
- Item 09: G-sensor
- Item 12: Yaw rate sensor
- Item 73: Lateral G sensor offset
- Item 97: Yaw rate sensor offset

Q: Is the check result normal?

YES : Turn the ignition switch to the ON from OFF position. Then go to Step 8.
NO : Go to Step 5.

STEP 5. 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 6.
NO : Reinstall the G and yaw rate sensor correctly (Refer to P.35C-309), and then go to Step 9.

STEP 6. Connector check: A-51 ASC-ECU connector, C-137 G and yaw rate sensor connector

Q: Is the check result normal?

YES : Go to Step 7.
NO : Repair the connector, and then go to Step 9.

STEP 7. Wiring harness check between A-51 ASC-ECU connector terminal No. 18 and C-137 G and yaw rate sensor connector terminal No. 2 as well as between A-51 ASC-ECU connector terminal No. 19 and C-137 G and yaw rate sensor connector terminal No. 3

- Check the communication circuit for open and short circuit.

Q: Is the check result normal?

YES : Replace the G and yaw rate sensor (Refer to P.35C-309), and then go to Step 8.
NO : Repair the wiring harness, and then go to Step 9.

STEP 8. Check whether the DTC is reset.

Q: Is DTC C2204 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301), and then go to Step 9.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

STEP 9. Check whether the DTC is reset.

Q: Is DTC C2204 set?

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

DTC C2111 Brake Fluid Pressure Sensor Power Supply Circuit (Low input)
DTC C2112 Brake Fluid Pressure Sensor Power Supply Circuit (High input)

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

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 DTC is set when the voltage applied to the pressure sensor is not within the standard value range.

TSB Revision

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. Using scan tool MB991958, diagnose the CAN bus lines.

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is the DTC C2111 or C2112 set?

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

STEP 3. Battery check

Refer to GROUP 54A – Battery Test P.54A-8.

Q: Is the battery in good condition?

YES : Go to Step 4.
NO : Charge or replace the battery, and then go to Step 6.

STEP 4. Charging system check

Refer to GROUP 16 – Charging System P.16-5.

Q: Is the charging system in good condition?

YES : Go to Step 5.
NO : Repair or replace the charging system component(s), and then go to Step 6.

STEP 5. Check whether the DTC is reset.

Q: Is the DTC C2111 or C2112 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301), and then go to Step 6.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

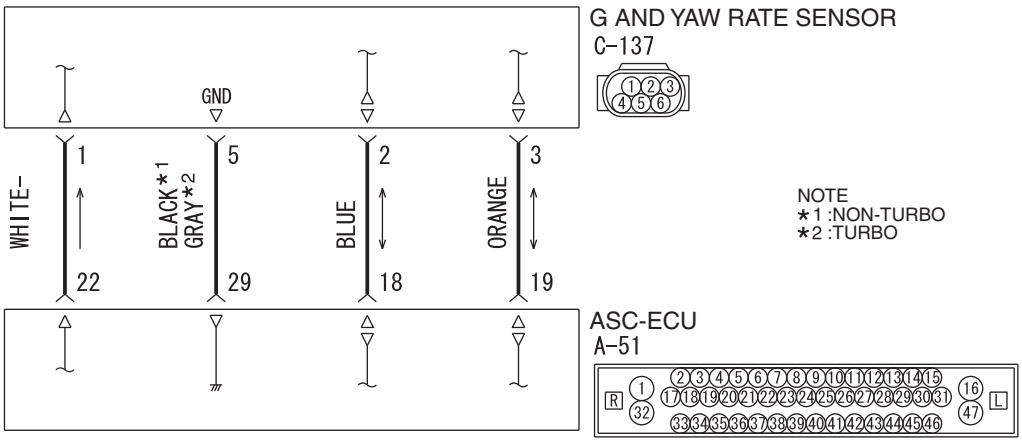
STEP 6. Check whether the DTC is reset.

Q: Is the DTC C2111 or C2112 set?

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

DTC C2114 Abnormality in G and yaw rate sensor operation voltage (Low voltage)
DTC C2115 Abnormality in G and yaw rate sensor operation voltage (High voltage)

G and Yaw Rate Sensor Circuit



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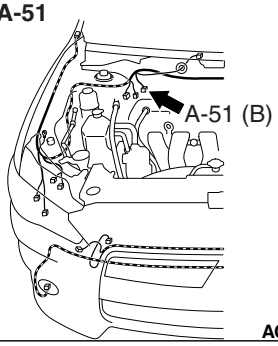
Connector: A-51



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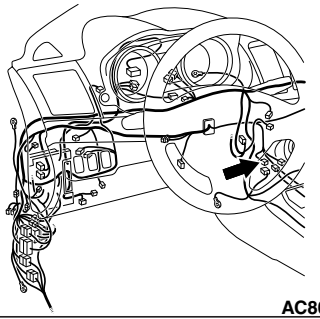
Connector: C-137



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⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **Do not drop or shock the G and yaw rate sensor.**
- **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-292).**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

TSB Revision

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 DTC 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 voltage (6.5 ± 0.5 V or less)>

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 voltage (18.0 ± 1.0 V or more)>

PROBABLE CAUSES

- Wiring harness or connector failure for the special CAN bus lines between ASC-ECU and 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. Using scan tool MB991958, diagnose the CAN bus lines.

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 54C – CAN Bus Diagnosis table P.54C-17). On completion, go to Step 2.

STEP 2. Using scan tool MB991958, check the DTC.

Check that the DTC U0125 is set in ASC-ECU.

Q: Is DTC U0125 set?

YES : Troubleshoot for the DTC (Refer to P.35C-216). Then go to Step 3.

NO : Go to Step 3.

STEP 3. DTC recheck
Drive the vehicle at 12 mph (20 km/h) or more.

Q: Is DTC C2114 or C2115 set?

YES : Go to Step 4.
NO : The procedure is complete.

STEP 4. Using scan tool MB991958, check the data list
Check the following service data (Refer to P.35C-282).

- Item 08: Lateral G sensor
- Item 09: G sensor
- Item 12: Yaw rate sensor

Q: Is the check result normal?

YES : Go to Step 12.
NO : Go to Step 5.

STEP 5. Connector check: A-51 ASC-ECU connector, C-137 G and yaw rate sensor connector

Q: Is the check result normal?

YES : Go to Step 6.
NO : Repair the connector, and then go to Step 13.

STEP 6. Wiring harness check between A-51 ASC-ECU connector terminal No. 18 and C-137 G and yaw rate sensor connector terminal No. 2 as well as between A-51 ASC-ECU connector terminal No. 19 and C-137 G and yaw rate sensor connector terminal No. 3

- Check the communication circuit for open and short circuit.

Q: Is the check result normal?

YES : Go to Step 7.
NO : Repair the wiring harness, and then go to Step 13.

STEP 7. G and yaw rate sensor installation check
Check that the G and yaw rate sensor is installed correctly.

Q: Is the check result normal?

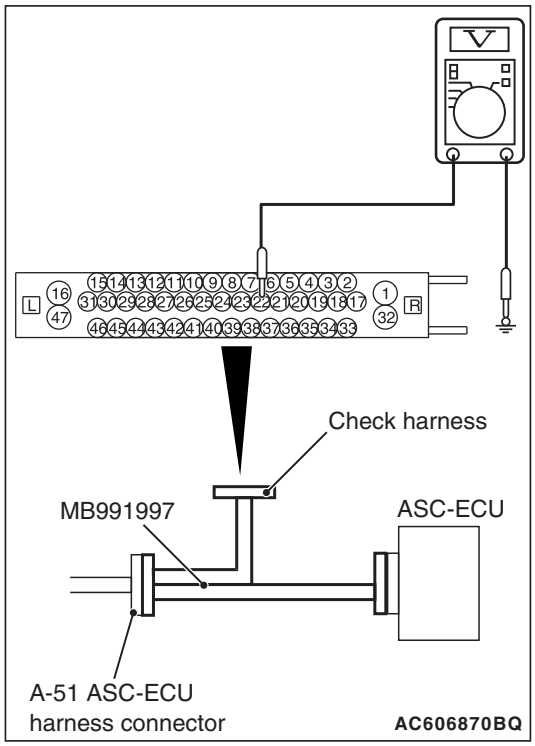
YES : Go to Step 8.
NO : Reinstall the G and yaw rate sensor correctly (Refer to P.35C-309), and then go to Step 13.

STEP 8. Voltage measurement at C-137 G and yaw rate sensor connector
(1) Disconnect the C-137 G and yaw rate sensor connector.
(2) Turn the ignition switch to the ON position.
(3) Measure the voltage at the harness side between the terminal No.1 and the body ground.

OK: 6.5 - 18 volt

Q: Is the check result normal?

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



STEP 9. Voltage measurement at A-51 ASC-ECU connector

(1) Disconnect the ASC-ECU connector, connect the ASC check harness (Special tool: MB991997) to the ASC-ECU-side connector and harness-side connector, and then measure at the special tool connector side.
(2) Disconnect the C-137 G and yaw rate sensor connector.
(3) Turn the ignition switch to the ON position.
(4) Measure the voltage between the terminal No.22 and the body ground.

OK: 6.5 - 18 volt

Q: Is the check result normal?

YES : Go to Step 10.
NO : Go to Step 12.

STEP 10. Wiring harness check between A-51 ASC-ECU connector terminal No.22 and C-137 G and yaw rate sensor connector terminal No.1.

- Check the power supply circuit for open and short circuit.

Q: Is the check result normal?

YES : Go to Step 12.
NO : Repair the wiring harness between A-51 ASC-ECU connector terminal No. 22 and C-137 G and yaw rate sensor connector terminal No. 1.

STEP 11. Wiring harness check between A-51 ASC-ECU connector terminal No.29 and C-137 G and yaw rate sensor connector terminal No.5.

- Check the ground circuit for open circuit.

Q: Is the check result normal?

YES : Replace the G and yaw rate sensor (Refer to P.35C-309) and then go to Step 12.
NO : Repair the wiring harness between A-51 ASC-ECU connector terminal No.29 and C-137 G and yaw rate sensor connector terminal No.5.

STEP 12. Check whether the DTC is reset.
Drive the vehicle at 12 mph (20 km/h) or more.

Q: Is DTC C2114 or C2115 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301), and then go to Step 13.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

STEP 13. Check whether the DTC is reset.
Drive the vehicle at 12 mph (20 km/h) or more.

Q: Is DTC C2114 or C2115 set?

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

DTC C123A: Abnormality in sensor calibration

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **Do not drop or shock the G and yaw rate sensor.**
- **When the steering wheel sensor is replaced, always carry out calibration to make ASC-ECU learn the neutral point (Refer to P.35C-294).**
- **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-292).**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

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 DTC 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
- Abnormality in neutral position of the brake fluid pressure sensor

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PROBABLE CAUSES

- Improper installation of G and yaw rate sensor or steering wheel 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. Using scan tool MB991958, diagnose the CAN bus lines.

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC C123A set?

YES : Go to Step 3.

NO : The procedure is complete.

STEP 3. Check other DTC is set.

Check if the DTC related to the G and yaw rate sensor and the steering wheel sensor is set.

Q: Is any DTC set?

YES : Perform the diagnosis for the relevant DTC (Refer to P.35C-25.)

NO : Go to Step 4.

STEP 4. G and yaw rate sensor calibration

Perform the calibration of G and yaw rate sensor (Refer to P.35C-292.)

Q: Has the calibration succeeded?

YES : Go to Step 5.

NO : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301), and then go to Step 8.

STEP 5. Steering wheel sensor calibration

Perform the calibration of steering wheel sensor (Refer to P.35C-294).

Q: Has the calibration succeeded?

YES : Go to Step 6.

NO : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301), and then go to Step 8.

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STEP 6. Brake fluid pressure sensor calibration

Perform the calibration of brake fluid pressure sensor (Refer to P.35C-298).

Q: Has the calibration succeeded?

YES : Go to Step 7.
NO : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301), and then go to Step 8.

STEP 7. Check whether the DTC is reset.

Q: Is DTC C123A set?

NO : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301), and then go to Step 8.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

STEP 8. Check whether the DTC is reset.

Q: Is DTC C123A set?

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

DTC C1219 Abnormality in steering wheel sensor signal

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the steering wheel sensor is replaced, always carry out calibration to make ASC-ECU learn the neutral point (Refer to P.35C-294).**
- **Do not drop or shock the G and yaw rate sensor.**
- **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-292).**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

Steering wheel sensor outputs the signal to ASC-ECU via the CAN bus lines.

DTC SET CONDITIONS

This DTC is set if any malfunction below is found:

- The tolerance of 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
- Wrong steering wheel is attached

DIAGNOSIS

Required Special Tools:

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

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

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC C1219 set?

YES : Go to Step 3.

NO : The procedure is complete.

STEP 3. Using scan tool MB991958, check the DTC

Check that the wheel speed sensor-related, G and yaw rate sensor-related, or steering wheel sensor-related DTC is set.

Q: Is the DTC set?

YES : Troubleshoot the relevant DTC, and then go to Step 8.

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-310).

Q: Is the check result normal?

YES : Go to Step 5.
NO : Install the steering wheel sensor correctly (Refer to P.35C-310), and then go to Step 5.

STEP 5. Wheel alignment check

Q: Is the check result normal?

YES : After the wheel alignment check, perform the steering wheel sensor calibration to make ASC-ECU learn the neutral point again (Refer to P.35C-294). Then go to Step 6.
NO : After the adjustment of the wheel alignment, perform the steering wheel sensor calibration to make ASC-ECU learn the neutral position again (Refer to P.35C-294). Then go to Step 6.

STEP 6. Using scan tool MB991958, check the data list
Check the following service data (Refer to P.35C-282).

- Item 11: Steering angle

Q: Is the check result normal?

YES : Go to Step 7.
NO : After the steering wheel sensor is replaced, perform the steering wheel sensor calibration to make ASC-ECU learn the neutral point again (Refer to P.35C-294). Then go to Step 8.

STEP 7. Check whether the DTC is reset.
Drive the vehicle at 12 mph (20 km/h) or more.

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

Q: Is DTC C1219 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301), and then go to Step 8.
NO : The procedure is complete.

STEP 8. Check whether the DTC is reset.
Drive the vehicle at 12 mph (20 km/h) or more.

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

Q: Is DTC C1219 set?

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

DTC C121A Abnormality in steering wheel sensor calibration

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the steering wheel sensor is replaced, always carry out calibration to make ASC-ECU learn the neutral point (Refer to P.35C-294).**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

Steering wheel sensor stores the neutral position learned by 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 DTC is set when ASC-ECU detects that the steering wheel sensor has not learned the neutral position yet.

PROBABLE CAUSES

- Neutral position of steering wheel sensor not learned
- Steering wheel 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. Using scan tool MB991958, diagnose the CAN bus lines.

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC 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-294).

Q: Has the calibration succeeded?

YES : Go to Step 4.
NO : After the steering wheel sensor is replaced, perform the steering wheel sensor calibration to make ASC-ECU learn the neutral point again (Refer to P.35C-294). Then go to Step 4.

STEP 4. Check whether the DTC is reset.

Q: Is DTC C121A set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301), and then go to Step 5.
NO : The procedure is complete.

STEP 5. Check whether the DTC is reset.

Q: Is DTC C121A set?

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

DTC C2205: Internal malfunction of steering wheel sensor

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the steering wheel sensor is replaced, always carry out calibration to make ASC-ECU learn the neutral point (Refer to P.35C-294).**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

Steering wheel sensor sends its status signal to ASC-ECU.

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DTC SET CONDITIONS

This DTC 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. Using scan tool MB991958, diagnose the CAN bus lines.

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 4.

STEP 2. Check whether the DTC is reset.

Q: Is DTC C2205 set?

YES : Replace the steering wheel sensor (Refer to P.35C-310), and then go to Step 3.

NO : The procedure is complete.

STEP 3. Check whether the DTC is reset.

Q: Is DTC C2205 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301), and then go to Step 4.

NO : The procedure is complete.

STEP 4. Check whether the DTC is reset.

Q: Is DTC C2205 set?

YES : Return to Step 1.

NO : The procedure is complete.

DTC C1395 Brake fluid filling not completed

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

DTC SET CONDITIONS

This DTC 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: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

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

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. Check whether the DTC is reset.

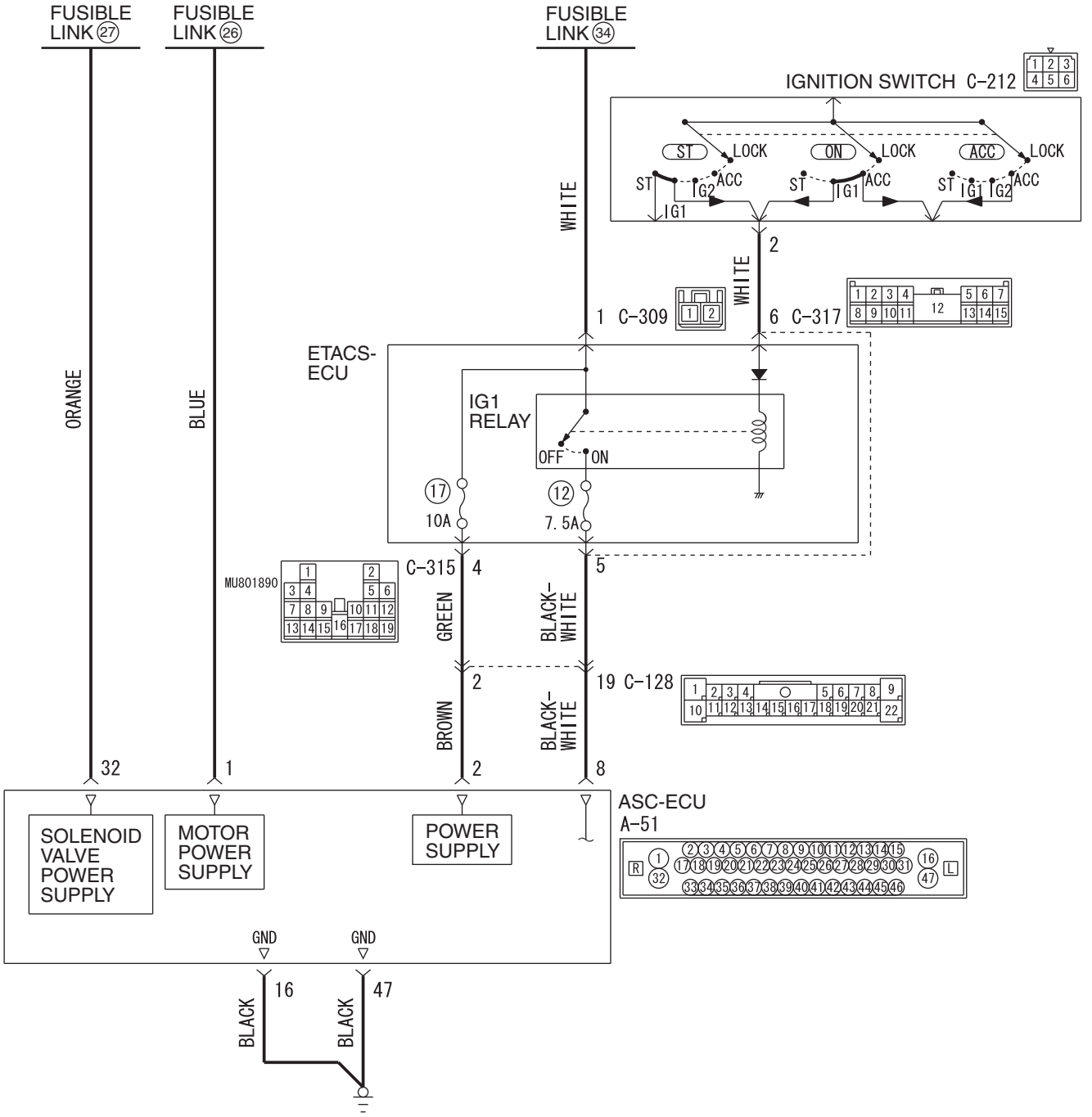
Q: Is DTC C1395 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301).

NO : The procedure is complete.

DTC C1608 Implausible diagnosis data

Solenoid Valve, Motor and ASC-ECU Power Supply Circuit



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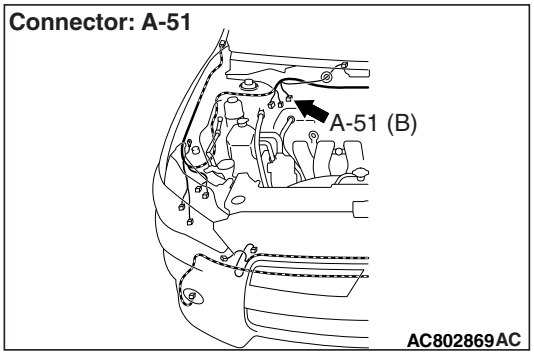


⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

The ASC-ECU stores diagnostic trouble codes and failure information in the EEPROM*.

ASC-ECU (EEPROM*)contains the power supply circuit (terminal No.2).

*NOTE: *:EEPROM (Electrical Erasable and Programmable ROM)*

DTC SET CONDITIONS

- This DTC is set when the failure information stored in the EEPROM is not reliable. The failure information stored in the past is not output, and only this DTC is set.
- This DTC may occur when ASC-ECU power supply shutdown or drop between ASC-ECU is writing a data to the EEPROM.

PROBABLE CAUSES

- Disconnection of the ASC-ECU connector or the battery terminal when the ignition switch is ON
- Loose battery terminal
- Abnormality in battery
- Damaged wiring harness and connectors
- 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.Using scan tool MB991958, diagnose the CAN bus line.

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 54C – CAN Bus Diagnostics table P.54C-9). On completion, and then go to Step 2.

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

Q: Is DTC C1608 set?

YES : Go to Step 3.

NO : The procedure is complete.

STEP 3. Battery check

Refer to GROUP 54A – Battery Test P.54A-8.

Q: Is the battery in good condition?

YES : Go to Step 5.

NO : Go to Step 4.

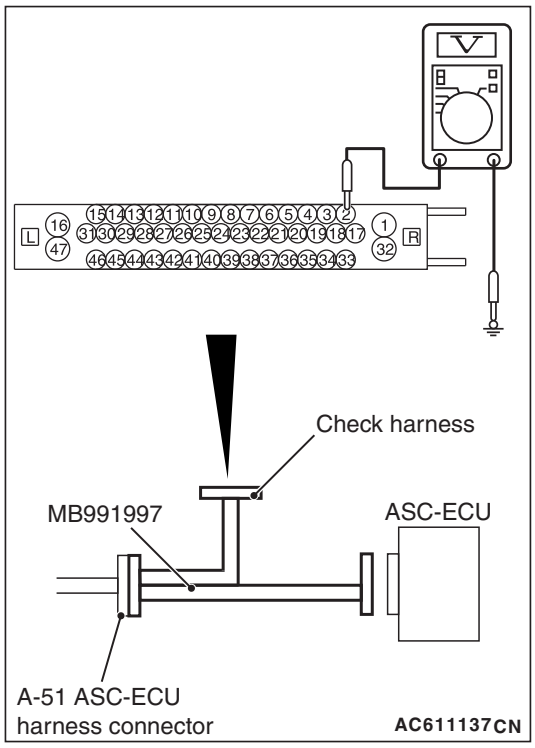
STEP 4. Charging system check

Refer to GROUP 16 – Output Current Test P.16-10.

Q: Is the charging system in good condition?

YES : Replace the battery. Then go to Step 11.

NO : Repair or replace the charging system component(s).



STEP 5. Voltage measurement at the A-51 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) Measure the voltage between the terminal No.2 and the body ground.

OK: Approximately battery positive voltage

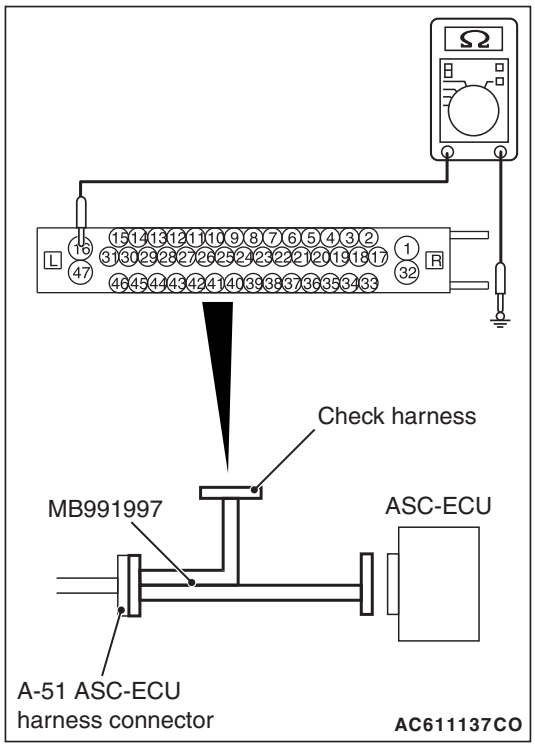
Q: Is the check result normal?

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

STEP 6. Connector check: A-51 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-51 ASC-ECU connector terminal No.02 and fuse No.17.
NO : Repair the defective connector.



STEP 7. Resistance measurement at A-51 ASC-ECU connector

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

NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

(2) Resistance between the terminal No.16 and the body ground, and between the terminal No.47 and the body ground

OK: Continuity exists (2 ohms or less)

Q: Is the check result normal?

YES : Go to Step 9.
NO : Go to Step 8.

STEP 8. Connector check: A-51 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-51 ASC-ECU terminal No.16 and body ground, and between the A-51 ASC-ECU terminal No.47 and body ground.
NO : Repair the defective connector.

STEP 9. Check whether the DTC is reset.

(1) Erase the DTC.
(2) Turn the ignition switch to the "LOCK" (OFF) position.
(3) Turn the ignition switch to the "ON" position.

Q: Is DTC C1608 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 10.
NO : Go to Step 11.

STEP 10. Check whether the DTC is reset.

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 C1608 set?

YES : Return to Step 1.
NO : Go to Step 11.

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STEP 11. Check the other DTCs.
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 any DTC set?

YES : Carry out the applicable troubleshooting for the DTC (Refer to P.35C-25).

NO : The procedure is complete.

DTC C2002: Valve calibration not completed

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION
Perform the master cylinder pressure sensor calibration to store the calibrated value in the ASC-ECU. At the same time, the calibrated value of cut valve and inlet valve are stored.

DTC SET CONDITIONS
This DTC is set when the calibrated values for cut valve and inlet valve stored in ASC-ECU are not within the predetermined range.

PROBABLE CAUSES
- ASC-ECU malfunction
- 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. Using scan tool MB991958, diagnose the CAN bus lines.

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC C2002 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 3.

NO : The procedure is complete.

STEP 3. Check whether the DTC is reset.

Q: Is DTC C2002 set?

YES : Return to Step 1.

NO : The procedure is complete.

DTC C2003: Control parameter not implement

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **If DTC C2003 is set in ASC-ECU, always diagnose the CAN bus line. If there is any fault in the CAN bus lines, an incorrect DTC may be set. In this case, the set DTC is not highly reliable.**
- **Before replacing the ECU, ensure that the communication circuit is normal.**
- **When DTC C2003 is set in ASC-ECU, the DTC may also be set in ETACS-ECU. When the DTC is set in ETACS-ECU, carry out the diagnosis of the DTC for ETACS-ECU first.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

ASC-ECU receives the vehicle information stored in the ETACS-ECU via CAN bus lines.

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DTC SET CONDITIONS

When received unset coding data from the ETACS-ECU, this DTC is set.

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.
- ETACS-ECU or ASC-ECU installation error
- Malfunction of ETACS-ECU coding data

DIAGNOSIS

Required Special Tools:

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

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

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC C2003 set?

YES : Go to Step 3.

NO : The procedure is complete.

STEP 3. Using scan tool MB991958, check the other system DTC

Use scan tool to check whether any coding-related diagnostic trouble code is set by ETACS-ECU.

Q: Is the DTC set?

YES : Troubleshoot for the relevant diagnostic trouble code (Refer to GROUP 54A – ETACS-ECU, Check chart for diagnostic trouble codes P.54A-678). Then go to Step 8.

NO : Go to Step 4.

STEP 4. Check part number of ASC-ECU
Check the part number of ASC-ECU.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 8.

STEP 5. ETACS-ECU coding data check
Refer to GROUP 00 – Coding List P.00-33.

Vehicle line
OK: LANCER

Transmission
OK (M/T): 5MT
OK (CVT): CVT
OK (TC-SST): TC-SST

Engine type
OK (2.4L engine): 2.4L D4 MPI VVT
OK (2.0L Non-Turbo engine): 2.0L D4 MPI VVT
OK (2.0L Turbo engine): 2.0L D4 VVT T/C

Engine power
OK: Normal

Chassis type for A.S.C.
OK (2.4L engine, 2.0L Non-Turbo engine): Type 4
OK (2.0L Turbo engine): Type 6

Final drive
OK (2.4L engine, 2.0L Non-Turbo engine): Front Drive
OK (2.0L Turbo engine): AWD FF Base

Transfer
OK (2.4L engine, 2.0L Non-Turbo engine): 2WD
OK (2.0L Turbo engine): ACD

SAS
OK: Present

4WD/AWD
OK: Not present

TCM
OK (M/T): Not present
OK (CVT, TC-SST): Present

ACDAYC
OK (2.4L engine, 2.0L Non-Turbo engine): Not present
OK (2.0L Turbo engine): Present

Q: Is the check result normal?

YES : Go to Step 6.
NO : Replace the ETACS-ECU (Refer to GROUP 54A – ETACS-ECU P.54A-772).

STEP 6. Check part number of ETACS-ECU
Check the part number of ETACS-ECU.

Q: Is the check result normal?

YES : Go to Step 7.
NO : Replace the ETACS-ECU (Refer to GROUP 54A – ETACS-ECU P.54A-772).

STEP 7. Check whether the DTC is reset.

Q: Is DTC C2003 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301). Then go to Step 8.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

STEP 8. Check whether the DTC is reset.

Q: Is DTC C2003 set?

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

DTC U0001 Bus-off

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **If DTC U0001 is set in ASC-ECU, always diagnose the CAN bus line. If there is any fault in the CAN bus lines, an incorrect DTC may be set. In this case, the set DTC is not highly reliable.**
- **Before replacing the ECU, ensure that the communication circuit is normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

DTC SET CONDITIONS

This DTC 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
- Other 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. Using scan tool MB991958, diagnose the CAN bus lines.

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 3.

STEP 2. Check whether the DTC is reset.

Q: Is DTC U0001 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301), and then go to Step 3.

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.00-14).

STEP 3. Check whether the DTC 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 CVT or TC-SST time-out error
DTC U0126 Steering wheel sensor time-out error
DTC U0141 ETACS time-out error
DTC U0114 AWC time-out error

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **If DTCs U0100, U0101, U0126, U0141, and U0114 are set in ASC-ECU, always diagnose the CAN bus line. If there is any fault in the CAN bus lines, an incorrect DTC may be set. In this case, the set DTC is not highly reliable.**
- **Before replacing the ECU, ensure that the communication circuit is normal.**
- **When the steering wheel sensor is replaced, always carry out calibration to make ASC-ECU learn the neutral point (Refer to P.35C-294).**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

DTC SET CONDITIONS

This DTC is set if ASC-ECU cannot receive the signal sent from other ECU for a certain period.

OPERATION

ASC-ECU communicates with the engine control module (ECM), TCM or TC-SST-ECU the steering wheel sensor, ETACS-ECU and AWC-ECU via the CAN bus lines.

PROBABLE CAUSES

DTC U0100
- Wiring harness or connector failure of CAN bus line
- Engine control module (ECM) malfunction
- ASC-ECU malfunction

DTC U0101
- Wiring harness or connector failure of CAN bus line
- TCM or TC-SST-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

DTC U0114
- Wiring harness or connector failure of CAN bus line
- Malfunction of AWC-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. Using scan tool MB991958, diagnose the CAN bus lines.

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 4.

STEP 2. Check whether the DTC is reset.

Q: Is DTC U0100, U0101, U0126, U0141 or U0114 set?

YES : Go to Step 3.

NO : The procedure is complete.

STEP 3. Using scan tool MB991958, check read the DTC other system.

Use scan tool to check that other DTC is set in the ECU corresponding to the relevant diagnosis.

Q: Is other DTC set?

YES : Troubleshoot for the relevant DTC.

NO : Go to Step 4.

TSB Revision

STEP 4. Using scan tool MB991958, check read the DTC other system.

Use scan tool to check if the same DTC (time-out) is set in the other ECU (CAN-C).

Q: Is any DTC set?

YES (DTC U0100 is set) : Replace the engine control module (ECM), and then go to Step 5.

YES (DTC U0101 is set) : Replace the TCM or TC-SST-ECU, and then go to Step 5.

YES (DTC U0126 is set) : Replace steering wheel sensor, and then go to Step 5.

YES (DTC U0141 is set) : Replace the ETACS-ECU, and then go to Step 5.

YES (DTC U0114 is set) : Replace the AWC-ECU, and then go to Step 5.

NO (No DTC is set.) : The procedure is complete.

STEP 5. Check whether the DTC is reset.

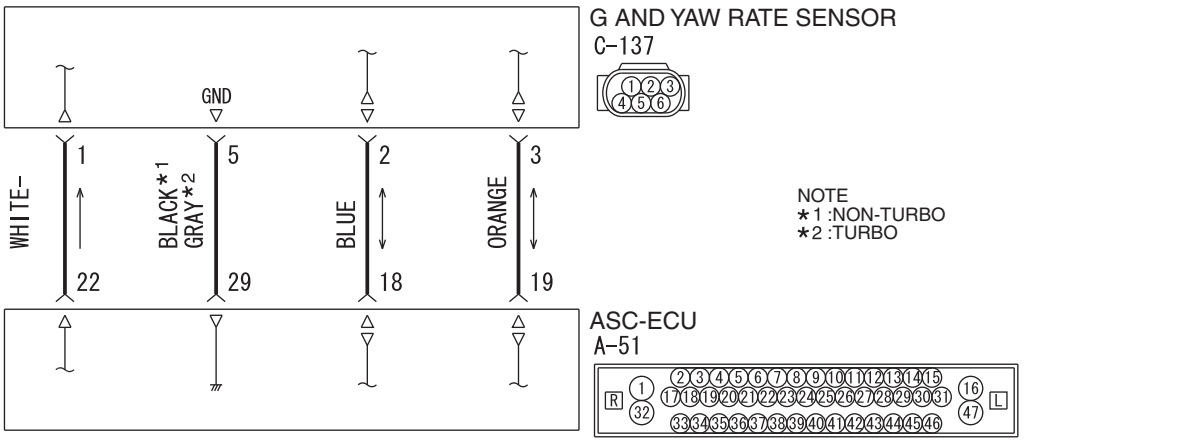
Q: Is DTC U0100, U0101, U0126, U0141 or U0114 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301).

NO : The procedure is complete.

DTC U0125 G and yaw rate sensor message time-out error/message error

G and Yaw Rate Sensor Circuit



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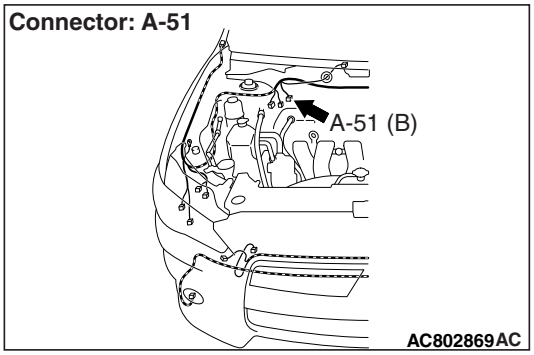
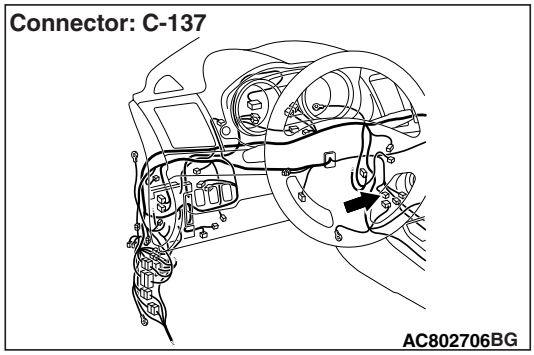




⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **Do not drop or shock the G and yaw rate sensor.**
- **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-292).**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

The G and yaw rate sensor outputs the signal to ASC-ECU via the special CAN bus lines.

DTC SET CONDITIONS

This DTC is set when the ASC-ECU cannot receive the signal from the G and yaw rate sensor although there is no abnormality in ASC-ECU supply voltage.

NOTE: When an abnormality is present in the ASC-ECU supply voltage, DTC C2100 (low voltage error) is set, and DTC U0125 is not set.

PROBABLE CAUSES

- Wiring harness or connector failure for the special CAN bus lines between ASC-ECU and the G and yaw rate sensor
- G and yaw rate sensor malfunction
- ASC-ECU malfunction
- External noise interference

TSB Revision

DIAGNOSIS

Required Special Tools:

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

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

Use M.U.T.-III 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 54C – CAN Bus Diagnostic table P.54C-17.) On completion, go to Step 2.

STEP 2. DTC 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-51 ASC-ECU connector, C-137 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 7.

STEP 4. Wiring harness check between A-51 ASC-ECU connector terminal No.18 and C-137 G and yaw rate sensor connector terminal No.2 as well as between A-51 ASC-ECU connector terminal No.19 and C-137 G and yaw rate sensor connector terminal No.3

- Check the communication circuit for open and short circuit.

Q: Is the check result normal?

YES : Go to Step 5.

NO : Repair the wiring harness, and then go to Step 7.

STEP 5. DTC recheck

Q: Is DTC U0125 set?

YES : Replace the G and yaw rate sensor.(Refer to P.35C-309.) Then go to Step 6.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14.)

STEP 6. DTC recheck

Q: Is DTC U0125 set?

YES : Replace the hydraulic unit (ASC-ECU). (Refer to P.35C-301.) Then go to Step 7.

NO : The procedure is complete.

TSB Revision

STEP 7. DTC recheck

Q: Is DTC U0125 set?

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

DTC U0401 Engine signal malfunction detected

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **If DTC U0401 is set in ASC-ECU, always diagnose the CAN bus line. If there is any fault in the CAN bus lines, an incorrect DTC may be set. In this case, the set DTC is not highly reliable.**
- **Before replacing the ECU, ensure that the communication circuit is normal.**

OPERATION

Engine-related signals are sent or received to and from between ASC-ECU and engine control module (ECM) via CAN bus lines.

DTC SET CONDITIONS

This DTC is set when the engine control module (ECM) malfunction has been detected.

PROBABLE CAUSES

- Malfunction of engine system
- Malfunction of engine control module (ECM)
- Malfunction of ASC-ECU
- 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. Using scan tool MB991958, diagnose the CAN bus lines.

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 5.

TSB Revision

STEP 2. Using scan tool MB991958, check the DTC
Use scan tool to check that any DTC other than the DTC U0401 is set in ASC-ECU.

Q: Is the DTC set?

YES : Troubleshoot the relevant DTC, and then go to Step 5.
NO : Go to Step 3.

STEP 3. Using scan tool MB991958, check the other system DTC
Use scan tool to check that the DTC is set by the engine control module (ECM).

Q: Is the DTC set?

YES : Troubleshoot the relevant DTC, and then go to Step 5.
NO : Go to Step 4.

STEP 4. Check whether the DTC is reset.

Q: Is DTC U0401 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301), and then go to Step 5.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

STEP 5. Check whether the DTC 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

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **If DTC U0428 is set in ASC-ECU, always diagnose the CAN bus line. If there is any fault in the CAN bus lines, an incorrect DTC may be set. In this case, the set DTC is not highly reliable.**
- **Before replacing the ECU, ensure that the communication circuit is normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

TSB Revision

OPERATION

The steering wheel sensor outputs the steering wheel status to ASC-ECU via the CAN bus lines.

DTC SET CONDITIONS

This DTC 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. Using scan tool MB991958, diagnose the CAN bus lines.

Use scan tool to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Replace the steering wheel sensor (Refer to P.35C-310). Then go to Step 2.

NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 3.

STEP 2. Check whether the DTC is reset.

Q: Is DTC U0428 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301).

NO : The procedure is complete.

STEP 3. Check whether the DTC is reset.

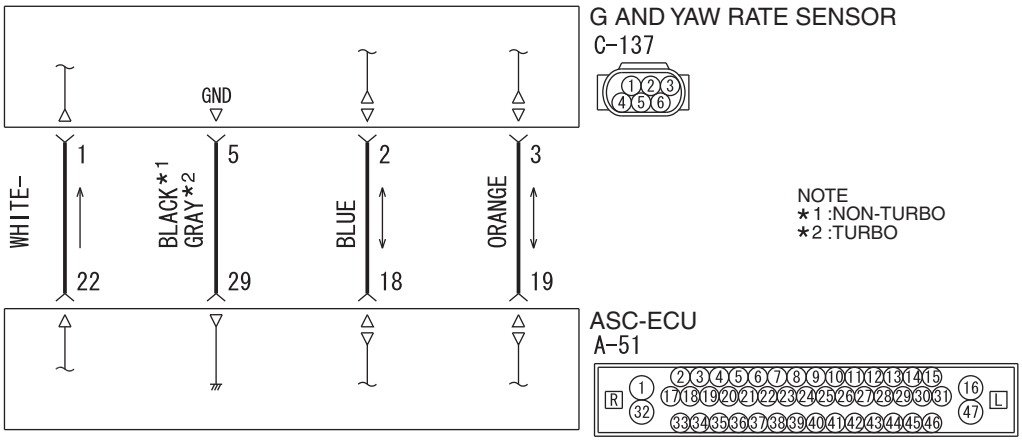
Q: Is DTC U0428 set?

YES : Return to Step 1.

NO : The procedure is complete.

DTC U1003 G and yaw rate sensor bus-off

G and Yaw Rate Sensor Circuit



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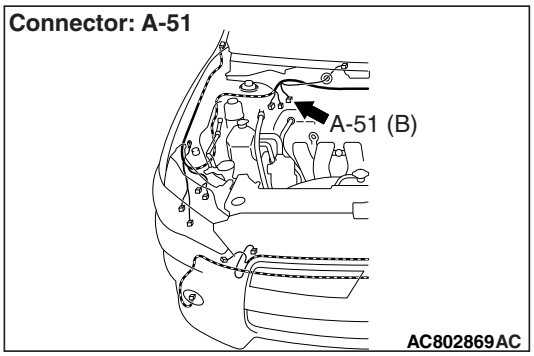
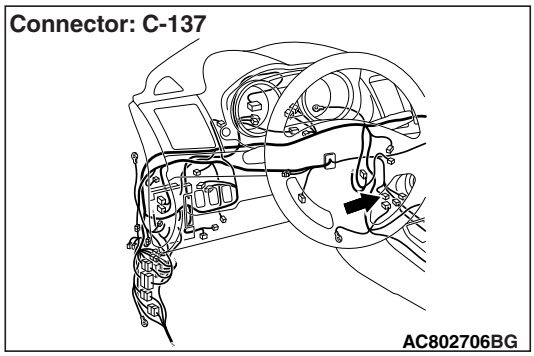
Connector: A-51



Connector: C-137



⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **Do not drop or shock the G and yaw rate sensor.**
- **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-292).**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

The G and yaw rate sensor outputs the signal to ASC-ECU via the special CAN bus lines.

TSB Revision

DTC SET CONDITIONS

This DTC is set when the communication error occurs in the exclusive CAN bus communication between the ASC-ECU and 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
- Malfunction of 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. Using scan tool MB991958, diagnose the CAN bus lines.

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 54C – CAN Bus Diagnostic table P.54C-17.) On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC U1003 set?

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

STEP 3. Connector check: A-51 ASC-ECU connector, C-137 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 7.

STEP 4. Wiring harness check between A-51 ASC-ECU connector terminal No.18 and C-137 G and yaw rate sensor connector terminal No.2 as well as between A-51 ASC-ECU connector terminal No.19 and C-137 G and yaw rate sensor connector terminal No.3

- Check the communication circuit for open and short circuit.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Repair the wiring harness, and then go to Step 7.

STEP 5. DTC recheck

Q: Is DTC U1003 set?

YES : Replace the G and yaw rate sensor. (Refer to P.35C-309.) Then go to Step 6.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14.)

STEP 6. DTC recheck

Q: Is DTC U1003 set?

YES : Replace the hydraulic unit (ASC-ECU). (Refer to P.35C-301.) Then go to Step 7.
NO : The procedure is complete.

STEP 7. DTC recheck

Q: Is DTC U1003 set?

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

DTC U1415 Variant coding not implemented

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the DTC U1415 is set in ASC-ECU, the DTC may also be set in ETACS-ECU. When the DTC is set in ETACS-ECU, carry out the diagnosis of the DTC for ETACS-ECU first.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

ASC-ECU receives the vehicle information stored in the ETACS-ECU via CAN bus lines.

DTC SET CONDITIONS

This DTC is set when the variant coding for ETACS-ECU has not been implemented.

PROBABLE CAUSES

- Variant coding for ETACS-ECU has not been implemented.
- ASC-ECU malfunction

TSB Revision

DIAGNOSIS

Required Special Tools:

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

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

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 4.

STEP 2.Using scan tool MB991958, check the other system DTC.

Use scan tool to check that the DTC B222C is set in the ETACS-ECU.

Q: Is the DTC set?

YES : Troubleshoot the relevant DTC, and then go to Step 4.

NO : Go to Step 3.

STEP 3. Check whether the DTC is reset.

(1) Erase the DTC.
(2) Turn the ignition switch to the "OFF" position.
(3) Turn the ignition switch to the "ON" position.
(4) Check that the ABS warning light goes out.

NOTE: If the DTC U1415 is not deleted, the ABS warning light keeps illuminating.

Q: Is DTC U1415 set?

YES : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301), and then go to Step 4.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

STEP 4. Check whether the DTC is reset.

(1) Erase the DTC.
(2) Turn the ignition switch to the "OFF" position.
(3) Turn the ignition switch to the "ON" position.
(4) Check that the ABS warning light goes out when the ignition switch is turned to the "ON" position.

NOTE: If the DTC U1415 is not deleted, the ABS warning light keeps illuminating.

Q: Is DTC U1415 set?

YES : Return to Step 1.

NO : The procedure is complete.

DTC U1417 Variant coding value invalid (includes faulty installation)

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **If DTC U1417 is set in ASC-ECU, always diagnose the CAN bus lines. If there is any fault in the CAN bus lines, an incorrect DTC may be set. In this case, the set DTC is not highly reliable.**
- **Before replacing the ECU, ensure that the communication circuit is normal.**
- **When DTC U1417 is set in ASC-ECU, the DTC may also be set in ETACS-ECU. When the DTC is set in ETACS-ECU, carry out the diagnosis of the DTC for ETACS-ECU first.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

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 DTC is set when the vehicle information received from the ETACS-ECU is invalid.

PROBABLE CAUSES

- Malfunction of ETACS-ECU
- Malfunction of engine control module (ECM)
- ETACS-ECUs have been interchanged between two vehicles.
- Malfunction of ASC-ECU
- External noise interference
- 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. Using scan tool MB991958, diagnose the CAN bus lines.

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 54C – CAN Bus Diagnostic table P.54C-17). On completion, go to Step 2.

STEP 2. DTC recheck after resetting CAN bus lines

Q: Is DTC U1417 set?

YES : Go to Step 3.

NO : The procedure is complete.

STEP 3. Using scan tool MB991958, other system diagnostic trouble code

Use scan tool to check whether any diagnostic trouble code related to vehicles information is set or not by the ETACS-ECU or engine control module (ECM).

Q: Is the DTC set?

YES : Troubleshoot for the relevant DTC.

NO : Go to Step 4.

STEP 4. ETACS-ECU coding data check

Refer to GROUP 00 – Coding List P.00-33.

Vehicle line
OK: LANCER

Transmission
OK (M/T): 5MT
OK (CVT): CVT
OK (TC-SST): TC-SST

Engine type
OK (2.4L engine): 2.4L D4 MPI VVT
OK (2.0L Non-Turbo engine): 2.0L D4 MPI VVT
OK (2.0L Turbo engine): 2.0L D4 VVT T/C

Engine power
OK: Normal

Chassis type for A.S.C.
OK (2.4L engine, 2.0L Non-Turbo engine): Type 4
OK (2.0L Turbo engine): Type 6

Final drive
OK (2.4L engine, 2.0L Non-Turbo engine): Front Drive
OK (2.0L Turbo engine): AWD FF Base

Transfer
OK (2.4L engine, 2.0L Non-Turbo engine): 2WD
OK (2.0L Turbo engine): ACD

SAS
OK: Present

4WD/AWD
OK: Not present

TCM
OK (M/T): Not present
OK (CVT, TC-SST): Present

ACDAYC
OK (2.4L engine, 2.0L Non-Turbo engine): Not present
OK (2.0L Turbo engine): Present

Q: Is the check result normal?

YES : Go to Step 5.
NO : Replace the ETACS-ECU (Refer to GROUP 54A – ETACS-ECU P.54A-772), and then go to Step 7.

STEP 5. Engine control module (ECM) coding data check
Refer to GROUP 00 – Coding List P.00-33.

Q: Is the check result normal?

YES : Go to Step 6.
NO <2.0L engine-turbo> : Replace the engine control module (ECM) <Refer to GROUP 13A – engine control module (ECM) P.13A-985>, and then go to Step 7.
NO <2.4L engine> : Replace the engine control module (ECM) <Refer to GROUP 13C – engine control module (ECM) P.13C-972>, and then go to Step 7.
NO <2.0L engine non-turbo> : Replace the engine control module (ECM) <Refer to GROUP 13B – engine control module (ECM) P.13B-883>, and then go to Step 7.

STEP 6. Check the part number of ETACS-ECU
Check the part number of ETACS-ECU.

Q: Is the check result normal?

YES : Go to Step 7.
NO : Replace the ETACS-ECU (Refer to GROUP 54A – ETACS-ECU P.54A-772), and then go to Step 7.

STEP 7. Check the part number of ASC-ECU
Check the part number of ASC-ECU.

Q: Is the check result normal?

YES : Go to Step 8.
NO : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301), and then go to Step 9.

STEP 8. Check whether the DTC is reset.

Q: Is DTC U1417 set?

YES : Replace the ASC-ECU (Refer to P.35C-301), and then go to Step 9.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

STEP 9. Check whether the DTC is reset.

Q: Is DTC U1417 set?

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

SYMPTOM CHART

M1355006900576

⚠ CAUTION

- **ABS may operate in the following conditions without hard braking: Low mu 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 DTC associated with other system may be set when the ignition switch is turned on with connector(s) disconnected. On completion, confirm all systems for DTC(s). If DTC(s) are set, erase them all.**

Trouble symptom		Inspection procedure number	Reference page
Scan tool cannot communicate with the ABS/ASC system.	Scan tool cannot communicate with all systems.	–	Refer to GROUP 54C – Troubleshooting P.54C-17.
	Scan tool cannot communicate only with ASC-ECU.	1	P.35C-231
ASC OFF display flashes at a rate of 2Hz.		2	P.35C-232
Brake warning light stays ON with the parking brake lever released (ABS warning light is OFF).		3	P.35C-233
ABS warning light does not illuminate when ignition switch is turned to the ON position (Engine stopped).		4	P.35C-238
Brake warning light does not illuminate when the ignition switch is turned to ON position (Engine stopped).		5	P.35C-241
ABS warning light stays ON after the engine is started.		6	P.35C-243
ASC warning display and light stay and light ON after the engine is started.		7	P.35C-245
ASC OFF display stays ON after the engine is started.		8	P.35C-248
The skid control/TCL system cannot be disabled when ASC OFF switch is pressed for 3 seconds or more to turn the system OFF.		9	P.35C-252
Abnormality in brake operation		10	P.35C-254
Skid control/TCL does not work.		11	P.35C-256
ASC-ECU power supply circuit system		12	P.35C-258
ABS/skid control/TCL operates too frequently.		13	P.35C-269
Steering wheel sensor power supply circuit system		14	P.35C-272
HSA (Hill Start Assist) does not work.		15	P.35C-276
HSA (Hill Start Assist) works on a flat road.		16	P.35C-280

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SYMPTOM PROCEDURES

Inspection Procedure 1: Scan tool communication with ABS/ASC system is impossible.

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – Diagnostic trouble code diagnosis P.54C-15).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **If the power is supplied with the ground circuit of CAN communication device open circuited, an electric potential abnormality may occur to the CAN bus lines.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

COMMENTS ON TROUBLE SYMPTOM

When scan tool cannot communicate with the ABS/ASC system, the CAN bus lines, ASC-ECU power supply circuit system, ground, or ASC-ECU may be faulty.

PROBABLE CAUSES

- Damaged wiring harness and connectors
- ASC-ECU malfunction
- Wrong routing of scan tool 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

Scan tool CAN bus diagnosis

Use scan tool to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Check the power supply circuit, and repair if necessary (Refer to P.35C-258).

NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnosis table P.54C-17).

Inspection Procedure 2: ASC OFF display flashes at a rate of 2Hz.

OPERATION

When the ASC OFF display flashes at a rate of 2 Hz, the TCL control (brake control only) is prohibited.

COMMENTS ON TROUBLE SYMPTOM

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 reaches the specified value or more, ASC-ECU flashes the ASC OFF indicator light at a rate of 2 Hz to warn the driver that the brake controllability by TCL is decreased by the reduced braking force. Consequently, ASC-ECU prohibits the TCL control (brake control only) until it determines that the estimated temperature of the brake pad is normal.

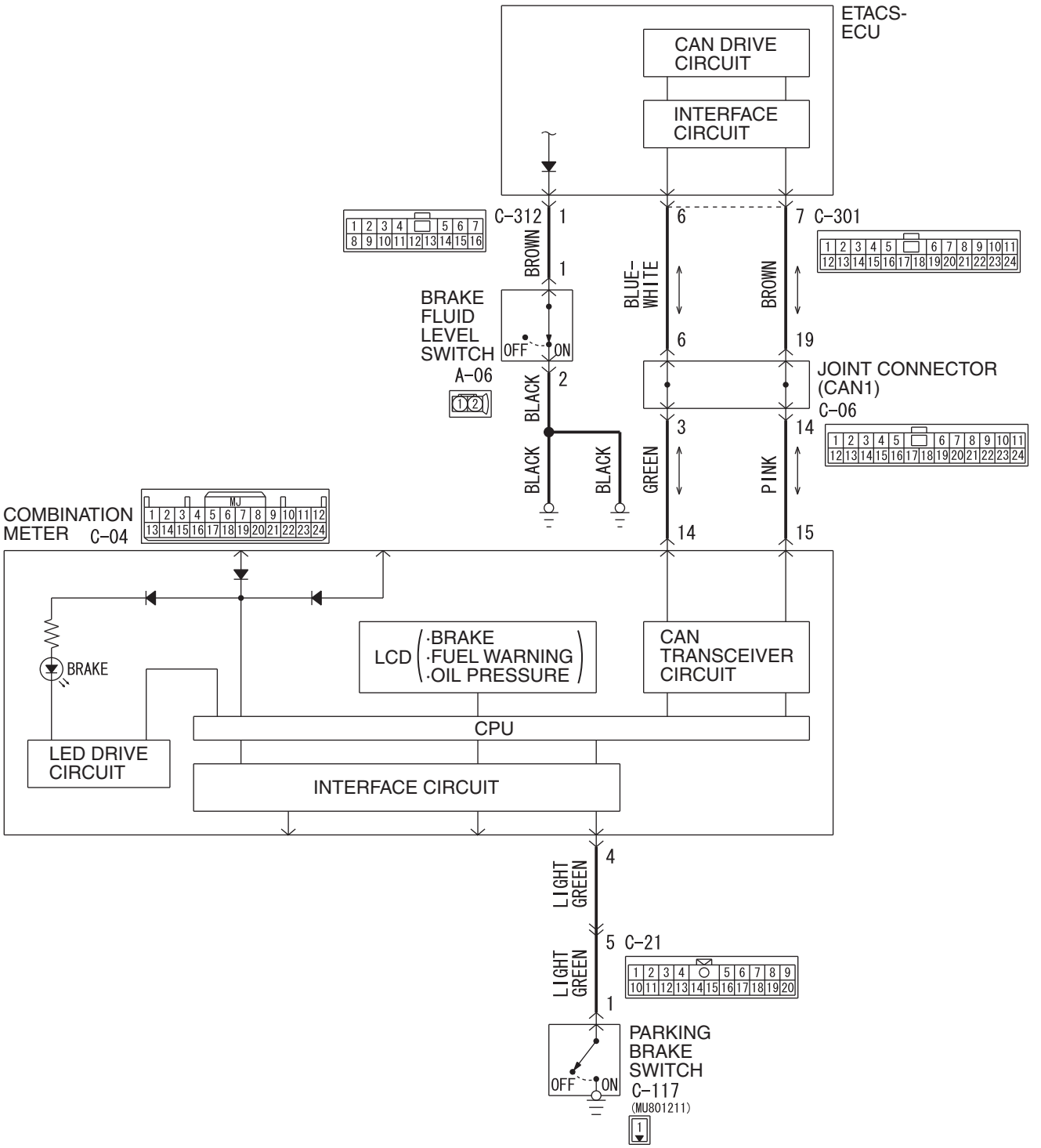
NOTE: In addition to severe driving, brake pad condition and brake drag are suspected as the cause of overheating. After the ASC OFF display has turned off, check the brake pad condition and brake drag.

PROBABLE CAUSES

- Overheat of brake pad

Inspection Procedure 3: Brake warning light stays ON with the parking brake lever released.

Brake Fluid Level Switch and Parking Brake Switch Circuit



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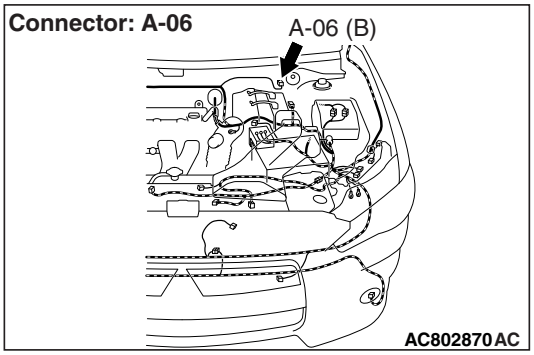

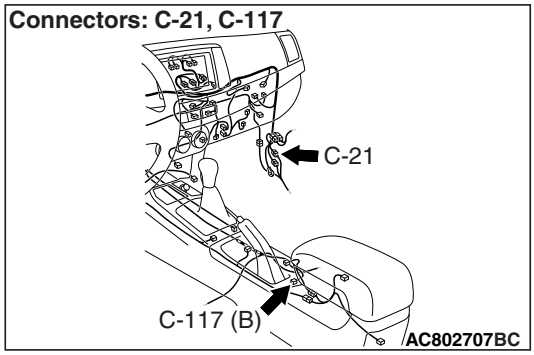

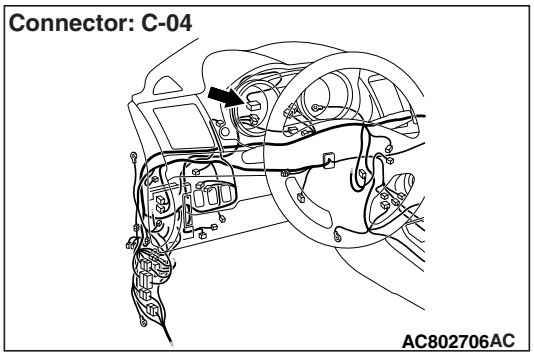

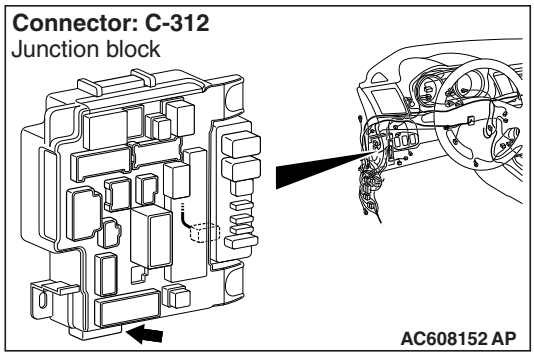

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C, Trouble code diagnosis P.54C-9).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**

CIRCUIT OPERATION

- When the parking brake switch is turned ON, the combination meter terminal No.4 is grounded, and then the brake warning light illuminates.
- When reduction of the brake fluid amount is detected, the brake fluid level switch is turned from ON to OFF. ETACS-ECU monitors the brake fluid level switch, and instructs the combination meter via the CAN bus line to illuminate the brake warning light.

COMMENTS ON TROUBLE SYMPTOM

This may be caused by the ground fault in the parking brake switch circuit and the open circuit in the brake fluid level switch circuit.

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PROBABLE CAUSES

- The brake pad thickness is at the limit value or less.
- The brake fluid amount is at the "LOWER" level or lower.
- Poor adjustment of the parking brake lever
- Damaged wiring harness and connectors
- Parking brake switch malfunction
- Brake fluid level switch malfunction
- Combination meter 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. Using scan tool MB991958, diagnose the CAN bus lines.

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 54C – CAN Bus Diagnostics table P.54C-9). On completion, go to Step 2.

STEP 2. DTC check after resetting CAN bus lines

Use scan tool to check that the DTC is set in the combination meter and ETACS-ECU.

Q: Is any DTC set?

YES : Carry out the diagnosis for the DTC.

NO : Go to Step 3.

STEP 3. Brake fluid level check

Check that the brake fluid is filled up to the "MIN" level or higher.

Q: Is the check result normal?

YES : Go to Step 5.

NO : Go to Step 4.

STEP 4. Brake pad check

Refer to GROUP 35A – On-vehicle Service, Brake Pad Check P.35A-20.

Q: Is the check result normal?

YES : Fill the brake fluid up to the "MAX" level. Then go to Step 18.

NO : Replace the brake pad. (Refer to GROUP 35A – On-vehicle Service, Brake Pad Replacement P.35A-21 <FWD>, P.35A-25 <AWD>.) Then go to Step 18.

STEP 5. Brake fluid level switch check

Refer to GROUP 35A – On-vehicle Service, Brake Fluid Level Switch Check P.35A-19.

Q: Is the check result normal?

YES : Go to Step 6.

NO : Replace the reservoir tank assembly. (Refer to GROUP 35A – Master Cylinder Assembly · Brake Booster Assembly P.35A-36 <FWD>, P.35A-39 <AWD>.) Then go to Step 18.

STEP 6. Connector check: A-06 brake fluid level switch connector, C-312 ETACS-ECU connector

Q: Is the check result normal?

YES : Go to Step 7.

NO : Repair the damaged connector.

STEP 7. Measure the voltage at A-06 brake fluid level switch connector.

(1) Disconnect the connector, and measure at the wiring harness side.
(2) Turn the ignition switch to the ON position.
(3) Measure the voltage between the terminal No. 1 and the body ground.

OK: Battery positive voltage

Q: Is the check result normal?

YES : Go to Step 10.

NO : Go to Step 8.

STEP 8. Measure the voltage at the C-312 ETACS-ECU connector.

⚠ CAUTION

With the C-312 ETACS-ECU connector kept connected, disconnect the A-06 brake fluid level switch connector.

(1) Turn the ignition switch to the ON position.
(2) Measure the voltage between terminal No.1 and the body ground by backprobing.

OK: Battery positive voltage

Q: Is the check result normal?

YES : Go to Step 9.

NO : Replace the ETACS-ECU. (Refer to GROUP 54A – ETACS P.54A-772.) Then go to Step 18.

STEP 9. Wiring harness check: between A-06 brake fluid level switch connector and C-312 ETACS-ECU connector

Check for open circuit in the harness wire between A-06 brake fluid level switch connector terminal No.1 and C-312 ETACS-ECU connector terminal No.1.

Q: Is the check result normal?

YES : Go to Step 16.

NO : Repair the wiring harness. Then go to Step 18.

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STEP 10. Wiring harness check: between A-06 brake fluid level switch connector and body ground

Check for open circuit in the harness wire between A-06 brake fluid level switch connector terminal No.2 and body ground.

Q: Is the check result normal?

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

STEP 11. Parking brake lever stroke check

Refer to GROUP 36 – On-vehicle Service P.36-8.

Q: Is the check result normal?

YES : Go to Step 12.
NO : Adjust the parking brake lever stroke. (Refer to GROUP 36 – On-vehicle Service P.36-8.) Then go to Step 18.

STEP 12. Parking brake switch check

Refer to GROUP 36 – On-vehicle Service P.36-8.

Q: Is the check result normal?

YES : Go to Step 13.
NO : Replace the parking brake switch. (Refer to GROUP 36 – Parking Brake Lever P.36-10.) Then go to Step 18.

STEP 13. Connector check: C-117 parking brake switch connector

Q: Is the check result normal?

YES : Go to Step 14.
NO : Repair the damaged connector.

STEP 14. Measure the voltage at C-117 parking brake switch connector.

(1) Disconnect the connector, and measure at the wiring harness side.
(2) Turn the ignition switch to the ON position.
(3) Measure the voltage between the terminal No.1 and the body ground.

OK: Battery positive voltage

Q: Is the check result normal?

YES : Go to Step 17.
NO : Go to Step 15.

STEP 15. Connector check: C-04 Combination meter connector, C-21 intermediate connector

Q: Is the check result normal?

YES : Go to Step 16.
NO : Repair the defective connector.

STEP 16. Wiring harness check: between the C-04 combination meter connector and the C-117 parking brake switch connector

Check for short circuit in the harness wire between the C-04 combination meter connector terminal No.4 and the C-117 parking brake switch connector terminal No.1.

Q: Is the check result normal?

YES : Go to Step 17.
NO : Repair the wiring harness. Then go to Step 18.

STEP 17. Retest the system.

Q: Does the brake warning light turn ON and OFF normally according to the parking brake lever operation?

YES : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14.)
NO : Replace the combination meter assembly. (Refer to GROUP 54A – Combination Meter P.54A-126.) Then go to Step 18.

STEP 18. 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).

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C, Trouble code diagnosis P.54C-9).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

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.

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COMMENTS ON TROUBLE SYMPTOM

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
- Malfunction of coding data for 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. Using scan tool MB991958, diagnose the CAN bus lines.

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 54C – Troubleshooting P.54C-17).

STEP 2. Using scan tool MB991958, diagnostic trouble code

Use scan tool to check the diagnostic trouble code for the ASC system.

Q: Is the DTC set?

YES : Carry out the diagnosis for the diagnostic trouble code (Refer to P.35C-25).

NO : Go to Step 3.

STEP 3. Using scan tool MB991958, actuator test

Perform the actuator test No.07 of the combination meter system, and check if the ABS warning light illuminates. (Refer to GROUP 54A – Combination Meter, Actuator Test Table P.54A-101 <Vehicles without color liquid crystal display> or P.54A-101 <Vehicles with color liquid crystal display>.)

Q: Is the check result normal?

YES : Go to Step 4.

NO : Diagnose the combination meter. (Refer to GROUP 54A – Combination Meter, Trouble Symptom Chart P.54A-73.) Then go to Step 8.

STEP 4. ETACS-ECU coding data check

Use scan tool to check if coding data stored in ETACS-ECU is normal. (Refer to GROUP 00 – Coding List P.00-33.)

Q: Is the check result normal?

YES : Go to Step 5.
NO : Replace the ETACS-ECU, and then go to Step 8.

STEP 5. Using scan tool MB991958, other system diagnostic trouble code

Using scan tool, check that the DTC U0141 is not set by the combination meter system.

Q: Is the DTC U0141 set?

YES : Troubleshoot the combination meter, and then go to Step 8.
NO : Go to Step 6.

STEP 6. Using scan tool MB991958, other system diagnostic trouble code

Using scan tool, check that the DTC U0121 is not set by the ETACS system.

Q: Is the DTC U0121 set?

YES : Troubleshoot the ETACS-ECU (Refer to GROUP 54A – ETACS-ECU, Troubleshooting P.54A-675), and then go to Step 8.
NO : Go to Step 7.

STEP 7. Retest the system.

Q: Does the ABS warning light turn ON and OFF normally?

YES : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14.)
NO : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301), and then go to Step 8.

STEP 8. 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).

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C, Trouble code diagnosis P.54C-9).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

- ASC-ECU sends the illumination request signal of the break warning light to the combination meter through ETACS-ECU via the CAN communication.
- ASC-ECU illuminates brake warning light via ETACS-ECU for approximately 3 seconds for bulb check with the ignition switch turned to the ON position.

COMMENTS ON TROUBLE SYMPTOM

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
- Malfunction of the combination meter
- 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. Using scan tool MB991958, diagnose the CAN bus lines.

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 54C – CAN Bus Diagnostic table P.54C-17.) Then go to Step 7.

STEP 2. Using scan tool MB991958, check the DTC
Use scan tool to check the DTC for the ASC system.

Q: Is the DTC set?

YES : Carry out the diagnosis for the DTC (Refer to P.35C-25).
NO : Go to Step 3.

STEP 3. Actuator test of combination meter
Perform the following actuator test by the combination meter system, and check if the brake warning light illuminates. (Refer to GROUP 54A – Combination Meter, Actuator Test Table P.54A-101 <Vehicles without color liquid crystal display> or P.54A-101 <Vehicles with color liquid crystal display>.)

- Item No.07: Indicator 1

Q: Is the check result normal?

YES : Go to Step 4.
NO : Diagnose the combination meter. (Refer to GROUP 54A – Combination Meter, Trouble Symptom Chart P.54A-73.) Then go to Step 7.

STEP 4. Using scan tool MB991958, check the other system DTC
Using scan tool, check that DTC U0141 is not set by the combination meter system.

Q: Is the DTC set?

YES : Diagnose the combination meter. (Refer to GROUP 54A – Combination Meter, Troubleshooting P.54A-55.) Then go to Step 7.
NO : Go to Step 5.

STEP 5. Using scan tool MB991958, check the other system DTC
Using scan tool, check that DTC U0121 is not set by the ETACS system.

Q: Is the DTC set?

YES : Perform troubleshooting on ETACS-ECU. (Refer to GROUP 54A – ETACS, Troubleshooting P.54A-687.) Then go to Step 7.
NO : Go to Step 6.

STEP 6. Retest the system.

Q: Does the brake warning light turn ON and OFF

YES : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14.)
NO : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301), and then go to Step 7.

STEP 7. 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 after the engine is started.

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C, Trouble code diagnosis P.54C-9).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

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.

COMMENTS ON TROUBLE SYMPTOM

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
- Control stop due to the low voltage

  NOTE: Due to the abnormality in the supply voltage, the DTC may not be set even when the ABS warning light is illuminated.

DIAGNOSIS

Required Special Tools:

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

STEP 1. Using scan tool MB991958, diagnose the CAN bus lines.
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 54C – Troubleshooting P.54C-17.) Then go to Step 8.

STEP 2. Using scan tool MB991958, check the DTC
Use scan tool to check the DTC for the ASC system.

Q: Is the DTC set?

YES : Carry out the diagnosis for the DTC (Refer to P.35C-25).
NO : Go to Step 3.

STEP 3. Actuator test of combination meter
Perform the following actuator test by the combination meter system, and check if the ABS warning light illuminates normally. (Refer to GROUP 54A – Combination Meter, Actuator Test Table P.54A-101 <Vehicles without color liquid crystal display> or P.54A-101 <Vehicles with color liquid crystal display>.)

- Item No.07: Indicator 1

Q: Is the check result normal?

YES : Go to Step 4.
NO : Replace the combination meter. (Refer to GROUP 54A – Combination Meter P.54A-126.) Then go to Step 8.

STEP 4. Check the ASC-ECU power supply circuit system.
Refer to P.35C-258.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Diagnose the power supply circuit of the ASC-ECU (Refer to P.35C-258).

STEP 5. Using scan tool MB991958, check the other system DTC
Using scan tool, check that DTC U0141 is not set by the combination meter system.

Q: Is the DTC set?

YES : Diagnose the combination meter. (Refer to GROUP 54A – Combination Meter, Troubleshooting P.54A-55.) Then go to Step 8.
NO : Go to Step 6.

STEP 6. Using scan tool MB991958, check the other system DTC

Using scan tool, check that DTC U0121 is not set by the ETACS system.

Q: Is the DTC set?

YES : Perform troubleshooting on ETACS-ECU. (Refer to GROUP 54A – ETACS, Troubleshooting P.54A-687.) Then go to Step 8.

NO : Go to Step 7.

STEP 7. Retest the system.

Q: Does the ABS warning light turn ON and OFF normally?

YES : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14.)

NO : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301), and then go to Step 8.

STEP 8. 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 warning display and light stays ON after the engine is started.

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C, Trouble code diagnosis P.54C-9).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

ASC-ECU sends the illumination request signal of the ASC warning display and light to the combination meter through ETACS-ECU via the CAN communication.

COMMENTS ON TROUBLE SYMPTOM

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
- Control is disabled due to the low voltage

NOTE: Due to the abnormality in the supply voltage, the DTC may not be set even when the ASC warning display illuminates.

DIAGNOSIS

Required Special Tools:

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

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

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 54C – CAN Bus Diagnostics table P.54C-17.) Then go to Step 8.

STEP 2. Using scan tool MB991958, check the DTC

Use scan tool to check the DTC for the ASC system.

Q: Is the DTC set?

YES : Carry out the diagnosis for the DTC. (Refer to P.35C-25.)

NO : Go to Step 3.

STEP 3. Actuator test of combination meter

Perform the following actuator test by the combination meter system, and check if the ASC warning display illuminates normally. (Refer to GROUP 54A – Combination Meter, Actuator Test Table P.54A-101 <Vehicles without color liquid crystal display> or P.54A-101 <Vehicles with color liquid crystal display>.)

- Item No.13: Indicator 4

Q: Is the check result normal?

YES : Go to Step 4.

NO : Replace the combination meter. (Refer to GROUP 54A – Combination Meter P.54A-126.) Then go to Step 8.

STEP 4. Check the ASC-ECU power supply circuit system.
Refer to P.35C-258.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Diagnose the power supply circuit of the ASC-ECU (Refer to P.35C-258).

STEP 5. Using scan tool MB991958, check the other system DTC
Using scan tool, check that DTC U0141 is not set by the combination meter system.

Q: Is the DTC set?

YES : Diagnose the combination meter. (Refer to GROUP 54A – Combination Meter, Troubleshooting P.54A-55.) Then go to Step 8.
NO : Go to Step 6.

STEP 6. Using scan tool MB991958, check the other system DTC
Using scan tool, check that DTC U0121 is not set by the ETACS system.

Q: Is the DTC set?

YES : Perform troubleshooting on ETACS-ECU. (Refer to GROUP 54A – ETACS, Troubleshooting P.54A-687.) Then go to Step 8.
NO : Go to Step 7.

STEP 7. Retest the system.

Q: Does the ASC warning display and light turn ON and OFF normally?

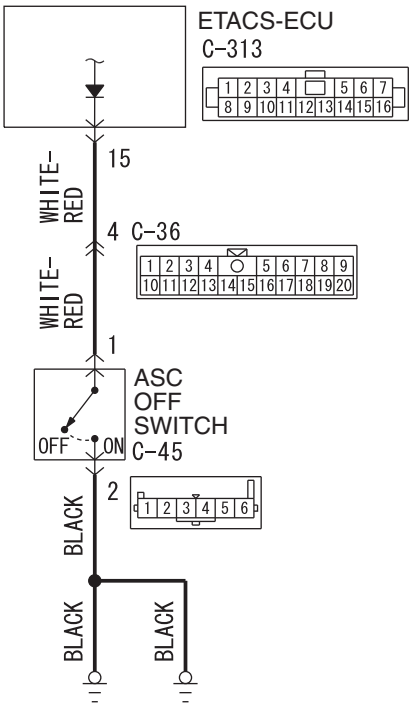
YES : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14.)
NO : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301), and then go to Step 8.

STEP 8. Retest the system.

Q: Does the ASC warning display and light turn ON and OFF normally?

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

Inspection Procedure 8: ASC OFF display stays ON after the engine is started.



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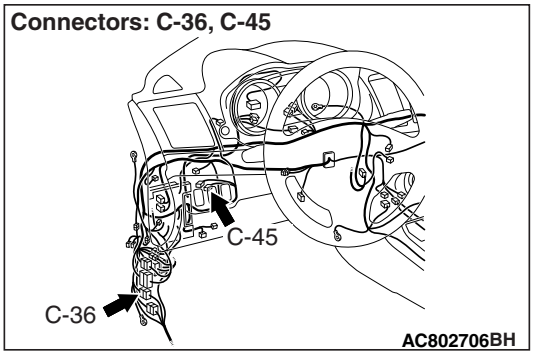

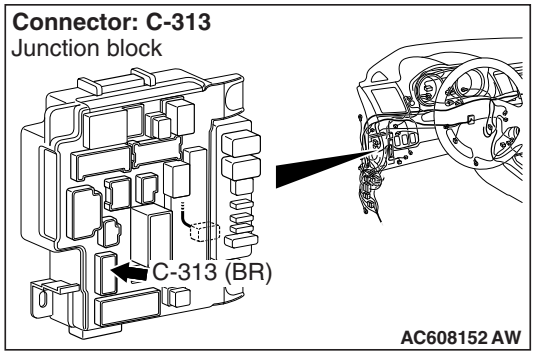

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⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C, Trouble code diagnosis P.54C-9).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

OPERATION

- ASC-ECU sends the illumination request signal of ASC OFF display or ASC OFF light to the combination meter through ETACS-ECU via CAN communication.
- By the operation of ASC OFF switch, the ASC OFF display or ASC OFF light illuminates when the ASC function is stopped.
- When the ASC OFF switch is pressed for 3 seconds or more, the ASC system turns OFF.
- When the ASC OFF switch is pressed for 15 seconds or more, the ASC is kept in ON state and the system cannot be turned OFF until the ignition switch is turned to the ON position next time.

COMMENTS ON TROUBLE SYMPTOM

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. Using scan tool MB991958, diagnose the CAN bus lines.

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 54C – CAN Bus Diagnostics table P.54C-17.) Then go to Step 10.

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STEP 2. Using scan tool MB991958, check the DTC
Use scan tool to check the DTC for the ASC system.

Q: Is the DTC set?

YES : Carry out the diagnosis for the DTC. (Refer to P.35C-25.)
NO : Go to Step 3.

STEP 3. Actuator test of combination meter
Perform the following actuator test by the combination meter system, and check if the ASC OFF display or light illuminates normally. (Refer to GROUP 54A – Combination Meter, Actuator Test Table P.54A-101 <Vehicles without color liquid crystal display> or P.54A-101 <Vehicles with color liquid crystal display>.)

- Item No.7: Indicator 1

Q: Is the check result normal?

YES : Go to Step 4.
NO : Replace the combination meter. (Refer to GROUP 54A – Combination Meter P.54A-126.) Then go to Step 9.

STEP 4. ASC OFF switch check
Refer to P.35C-300.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Replace ASC OFF switch. (Refer to P.35C-299.) Then go to Step 10.

STEP 5. Connector check: C-313 ETACS-ECU connector, C-36 intermediate connector, C-45 ASC OFF switch connector

Q: Is the check result normal?

YES : Go to Step 6.
NO : Repair the damaged connector.

STEP 6. Wiring harness check between C-313 ETACS-ECU connector terminal No.15 and C-45 ASC OFF switch connector terminal No.1

- Check the power supply circuit for short circuit.

Q: Is the check result normal?

YES : Go to Step 7.
NO : Repair the wiring harness between C-313 ETACS-ECU connector terminal No.15 and C-45 ASC OFF switch connector terminal No.1.

STEP 7. Using scan tool MB991958, check the DTC for other systems

Using scan tool, check that DTC U0141 is not set by the combination meter system.

Q: Is the DTC set?

YES : Diagnose the combination meter. (Refer to GROUP 54A – Combination Meter, Troubleshooting P.54A-55.) Then go to Step 10.

NO : Go to Step 8.

STEP 8. Using scan tool MB991958, check the DTC for other systems

Using scan tool, check that DTC U0121 is not set by the ETACS system.

Q: Is the DTC set?

YES : Perform troubleshooting on ETACS-ECU. (Refer to GROUP 54A – ETACS, Troubleshooting P.54A-687.) Then go to Step 9.

NO : Go to Step 9.

STEP 9. Retest the system.

Q: Does ASC OFF display turn OFF normally?

YES : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14.)

NO : Replace the hydraulic unit (integrated with ASC-ECU). (Refer to P.35C-301.) Then go to Step 10.

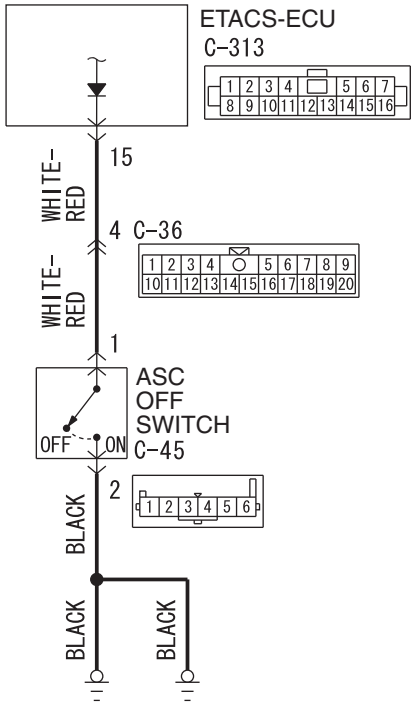
STEP 10. Retest the system.

Q: Does ASC OFF display turn OFF normally?

YES : The procedure is complete.

NO : Return to Step 1.

Inspection Procedure 9: The skid control/TCL system cannot be disabled when ASC OFF switch is pressed for 3 seconds or more to turn the system OFF.



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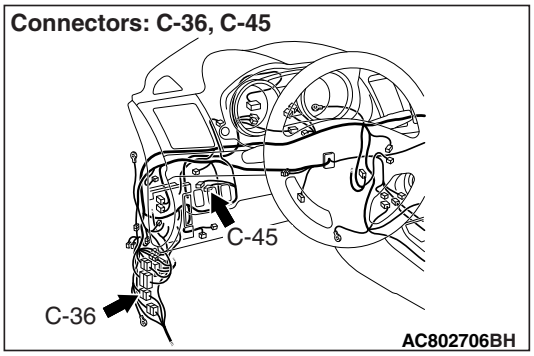

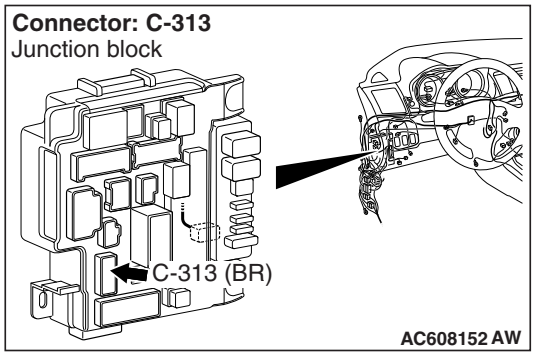

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C, Trouble code diagnosis P.54C-9).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**

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OPERATION

- ETACS-ECU terminal No.15 is grounded by pressing ASC OFF switch. The ON/OFF state of ASC OFF switch is transferred from ETACS-ECU to ASC-ECU via CAN bus line.
- When the ASC OFF switch is pressed for 3 seconds or more, the ASC system turns OFF.
- When the ASC OFF switch is pressed and held for 15 seconds or more, ASC turns ON.

COMMENTS ON TROUBLE SYMPTOM

This may be caused by the open and short circuit in the ASC OFF switch circuit.

PROBABLE CAUSES

- Damaged wiring harness and connectors
- ASC OFF 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. Using scan tool MB991958, diagnose the CAN bus lines.

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 54C – CAN Bus Diagnostics table P.54C-17.) Then go to Step 7.

STEP 2. ASC OFF switch check

Refer to P.35C-300.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Replace ASC OFF switch. (Refer to P.35C-299.) Then go to Step 7.

STEP 3. Connector check: C-313 ETACS-ECU connector, C-36 intermediate connector, C-45 ASC OFF switch connector

Q: Is the check result normal?

YES : Go to Step 4.

NO : Repair the damaged connector.

STEP 4. Wiring harness check between C-313 ETACS-ECU connector terminal No.15 and C-45 ASC OFF switch connector terminal No.1

- Check the signal circuit for open and short circuit.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Repair the wiring harness between C-313 ETACS-ECU connector terminal No.15 and C-45 ASC OFF switch connector terminal No.1.

STEP 5. Wiring harness check between C-45 ASC OFF switch connector terminal No.2 and the body ground

- Check the ground wires for open circuit.

Q: Is the check result normal?

YES : Go to Step 6.
NO : Repair the wiring harness between C-45 ASC OFF switch connector terminal No.2 and the body ground.

STEP 6. Retest the system.

Q: Does ASC turn ON and OFF normally using ASC OFF switch?

YES : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14.)
NO : Replace the ETACS-ECU. (Refer to GROUP 54A – ETACS-ECU P.54A-772.) Then go to Step 7.

STEP 7. Retest the system.

Q: Does ASC turn ON and OFF normally using ASC OFF switch?

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

Inspection Procedure 10: Abnormality in brake operation

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C, Trouble code diagnosis P.54C-9).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

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COMMENTS ON TROUBLE SYMPTOM

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 DTC is not detected.

PROBABLE CAUSES

- Hydraulic unit (Integrated with ASC-ECU) malfunction
- Malfunction of hydraulic circuit
- Malfunction of brake assembly
- Malfunction of brake booster
- Malfunction of master cylinder assembly

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. DTC check

Use scan tool to check the DTC for the ASC system. (Refer to P.35C-25.)

Q: Is the check result normal?

YES : Go to Step 2.
NO : Troubleshoot for the relevant DTC (Refer to P.35C-25).

STEP 2. Hydraulic unit (Integrated with ASC-ECU) check

Check that the brake tube is installed to the hydraulic unit (integrated with ASC-ECU) correctly (Refer to P.35C-289).

Q: Is the check result normal?

YES : Go to Step 3.
NO : Connect the brake tubes correctly, repair the external brake lines, or replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301).

STEP 3. Brake operation check

Perform the following checks.

- Brake pedal check (Refer to GROUP 35A – On-vehicle Service, Brake Pedal Check and Adjustment P.35A-14.)
- Brake booster check (Refer to GROUP 35A – On-vehicle Service, Brake Booster Check P.35A-16.)
- Check valve check (Refer to GROUP 35A – On-vehicle Service, Check Valve Check P.35A-19.)

Q: Can any fault be found with the brake operation?

YES : Check the brake-related parts, and repair if necessary. Then, go to Step 4.
NO : Go to Step 4.

STEP 4. Hydraulic unit check

Perform the following actuator tests.

- Item No.01: FL wheel ABS drive
- Item No.02: FR wheel ABS drive
- Item No.03: RL wheel ABS drive
- Item No.04: RR wheel ABS drive
- Item No.05: FL wheel TCL drive
- Item No.06: FR wheel TCL drive
- Item No.07: RL wheel TCL drive
- Item No.08: RR wheel TCL drive

Q: Is the check result normal?

YES : The procedure is complete.

NO : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301).

Inspection Procedure 11: ASC does not operate or faulty ASC operate.

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C, Trouble code diagnosis P.54C-9).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

COMMENTS ON TROUBLE SYMPTOM

In case of this trouble symptom, the skid control/TCL system operation may be disabled. DTC may be set by the skid control/TCL system using scan tool.

PROBABLE CAUSES

- Low battery output
- Wiring harness or connector failure of CAN bus line
- ASC-ECU malfunction
- Engine coding data problem

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. DTC check

Use scan tool to check the DTC for the ASC system. (Refer to P.35C-25.)

Q: Is the check result normal?

YES : Go to Step 2.

NO : Carry out the diagnosis for the DTC. (Refer to P.35C-25.)

STEP 2. Engine ECU coding data check

Using scan tool, check if any abnormality is present to the coding data below which are stored in the ECM. (Refer to GROUP 00 – Coding List P.00-33.)

A.S.C.
OK: Available

Q: Is the check result normal?

YES : Go to Step 3.

NO : Replace the engine ECU. (Refer to GROUP 13A – ECM P.13A-985 <2.0L engine-turbo> or GROUP 13C – ECM P.13C-972 <2.4L engine> or GROUP 13B – ECM P.13B-883 <2.0L engine-non-turbo>.) Then go to Step 4 .

STEP 3. Hydraulic unit (integrated with ASC-ECU) check

Check that the brake tube is correctly mounted to the hydraulic unit (integrated with ASC-ECU). (Refer to P.35C-289.)

Q: Is the check result normal?

YES : Replace the hydraulic unit (integrated with ASC-ECU).(Refer to P.35C-289.) Then go to Step 4.

NO : Connect the brake tubes correctly, and repair or replace the external brake lines of the hydraulic unit (integrated with ASC-ECU).

STEP 4. Operation check

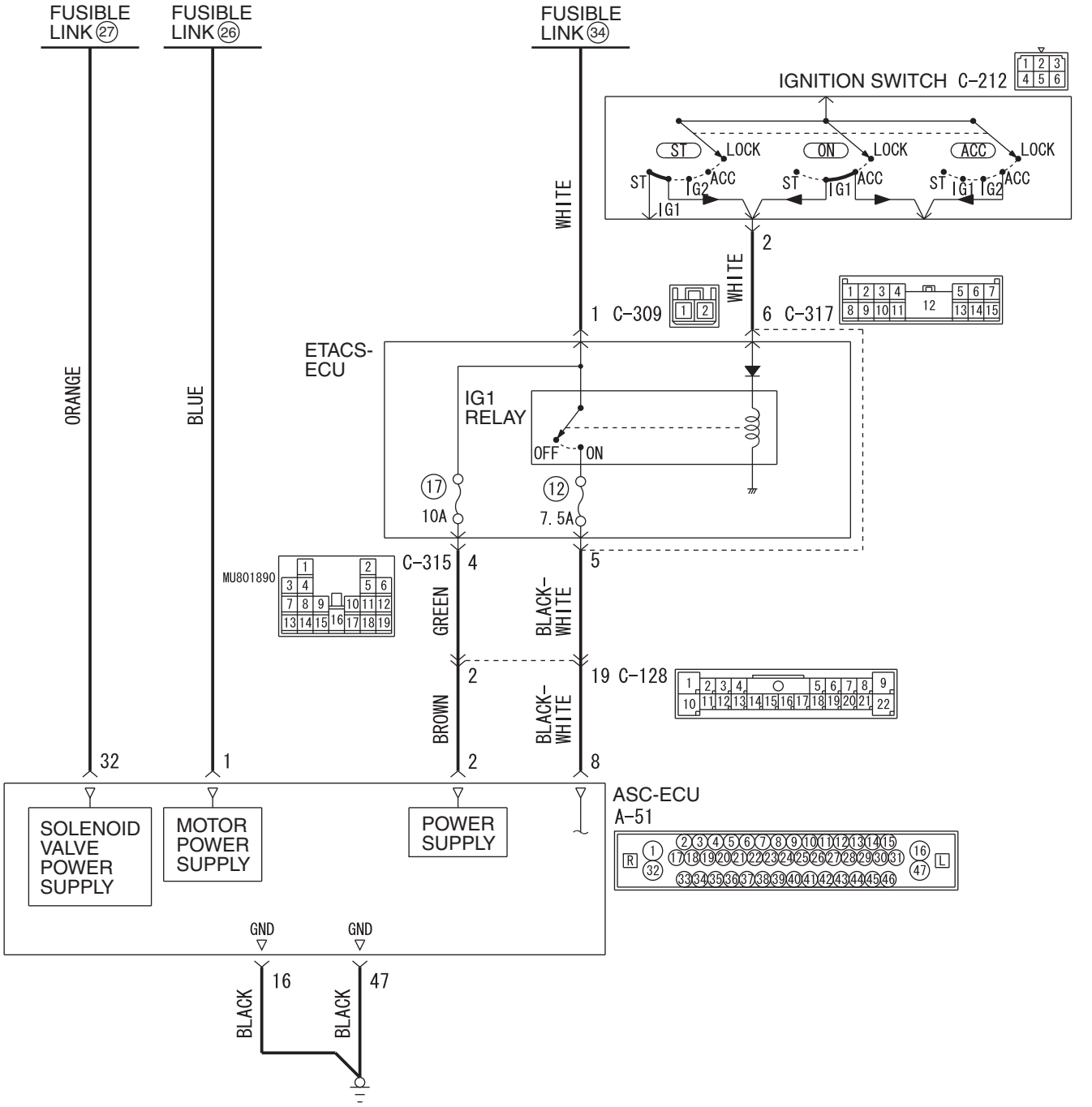
Q: Does skid control/TCL operate normally?

YES : The procedure is complete.

NO : Check the brake system related components other than the skid control/TCL system.

Inspection Procedure 12: ASC-ECU power supply circuit system

Solenoid Valve, Motor and ASC-ECU Power Supply Circuit



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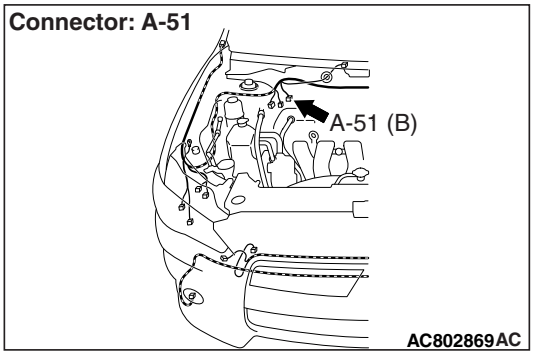
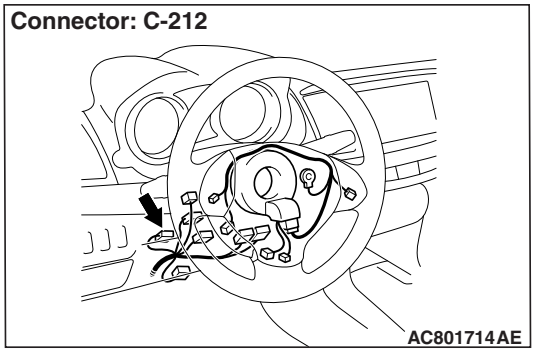
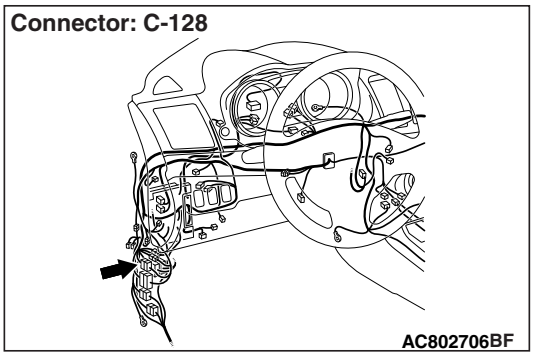
Connector: A-51



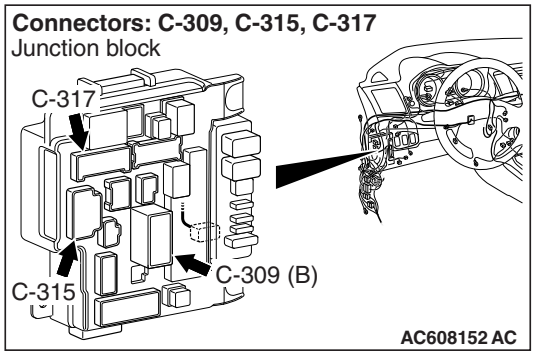
Connector: C-212



Connector: C-128



Connectors: C-309, C-315, C-317
Junction block



⚠ CAUTION

- **When the ASC-ECU power supply voltage becomes 9.7 ± 0.3 V or less, the ABS warning lamp, ASC warning display, and ASC OFF display illuminate, and the ABS, stability control, and TCL controls are prohibited.**
- **If the battery terminal is not tightened properly, a dump surge may occur and the power supply voltage may become abnormally high for a short time.**
- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C, Trouble code diagnosis P.54C-9).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

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.
- ASC-ECU contains the power supply circuit (terminal No.2) for ASC-ECU. The power is supplied from the fusible link No.34 through the multi-purpose fuse No.17.

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- ASC-ECU contains the power supply circuit (terminal No.8) for ASC-ECU. When the ignition switch (IG1) is turned ON, the voltage is applied to the relay incorporated in ETACS-ECU to turn ON the relay, and the power is supplied from the fusible link No.34 through multi-purpose fuse No.12.
- 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.
- When malfunction occurs in ASC-ECU power supply, the communication with scan tool becomes unavailable.

PROBABLE CAUSES

- Damaged wiring harness and connectors
- Fuse and fusible link malfunction
- Improper tightening of battery terminal
- Improper tightening of ground bolt
- 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. Battery check

Refer to GROUP 54A – Battery Test P.54A-8.

Q: Is the battery in good condition?

YES : Go to Step 3.
NO : Charge or replace the battery. Then go to Step 2.

STEP 2. Charging system check

Refer to GROUP 16 – Charging System P.16-5.

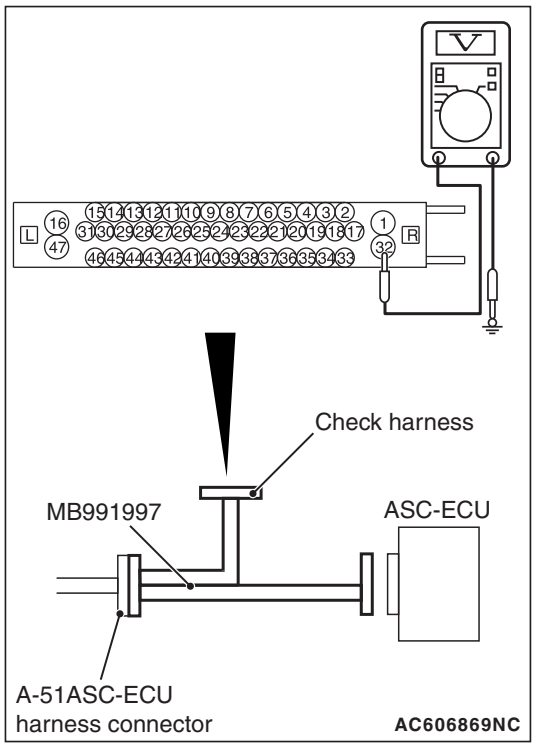
Q: Is the charging system in good condition?

YES : Go to Step 3.
NO : Repair or replace the charging system component(s).

STEP 3. Connector check: A-51 ASC-ECU connector, C-128 intermediate connector, C-317 ETACS-ECU connector, C-315 ETACS-ECU connector

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair the damaged connector.



STEP 4. Voltage measurement at the A-51 ASC-ECU connector

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

NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

(2) Measure the voltage between terminal No.32 and body ground.

OK: Approximately battery positive voltage

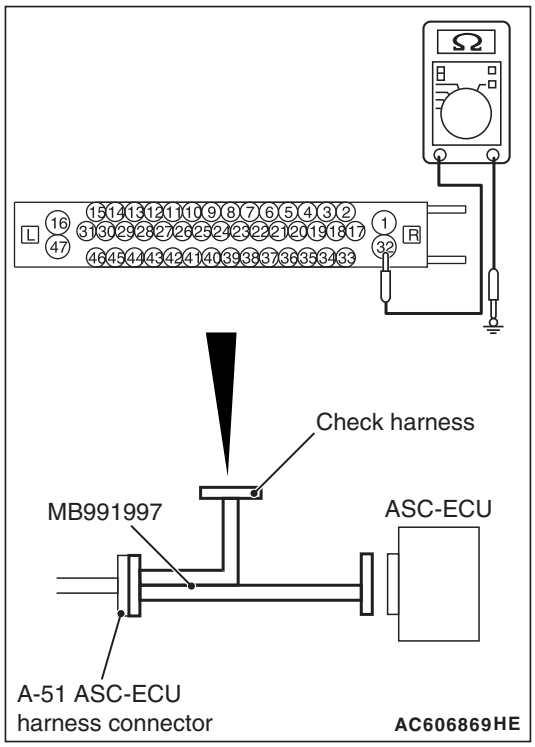
Q: Is the check result normal?

YES : Go to Step 7.
NO : Go to Step 5.

STEP 5. Fusible link check: Check the fusible link No.27.

Q: Is the check result normal?

YES : The open circuit may be present in the power supply circuit. Repair the wiring harness between the A-51 ASC-ECU connector terminal No.32 and the fusible link No.27. Then go to Step 20.
NO : Go to Step 6.



STEP 6. Resistance measurement at A-51 ASC-ECU connector

(1) Removal the fusible link No.27.
(2) Disconnect the ASC-ECU connector, connect special tool ASC check harness (MB991997) to the harness-side connector, and then measure the resistance at the special tool connector side.

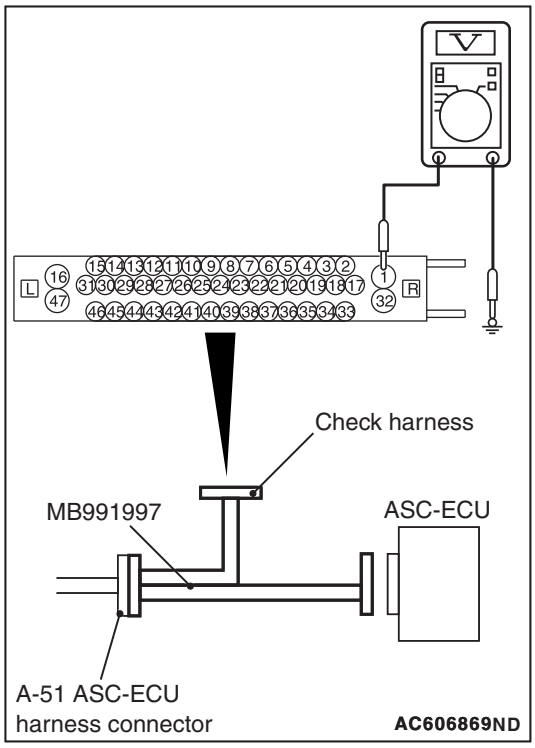
NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

(3) Measure the resistance between the terminal No.32 and the body ground.

OK: No continuity

Q: Is the check result normal?

YES : Replace the fusible link No.27. Then go to Step 20.
NO : The short circuit may be present in the power supply circuit. Repair the wiring harness between the A-51 ASC-ECU connector terminal No.32 and the fusible link No.27, and then replace the fusible link No.27. Then go to Step 20.



STEP 7. Voltage measurement at the A-51 ASC-ECU connector

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

NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

(2) Measure the voltage between terminal No.1 and body ground.

OK: Approximately battery positive voltage

Q: Is the check result normal?

YES : Go to Step 10.
NO : Go to Step 8.

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STEP 8. Check the fusible link No.26.

Q: Is the check result normal?

YES : The open circuit may be present in the power supply circuit. Repair the wiring harness between the A-51 ASC-ECU connector terminal No.1 and the fusible link No.26. Then go to Step 20.

NO : Go to Step 9.

STEP 9. Resistance measurement at A-51 ASC-ECU connector

(1) Removal the fusible link No.26.

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

NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

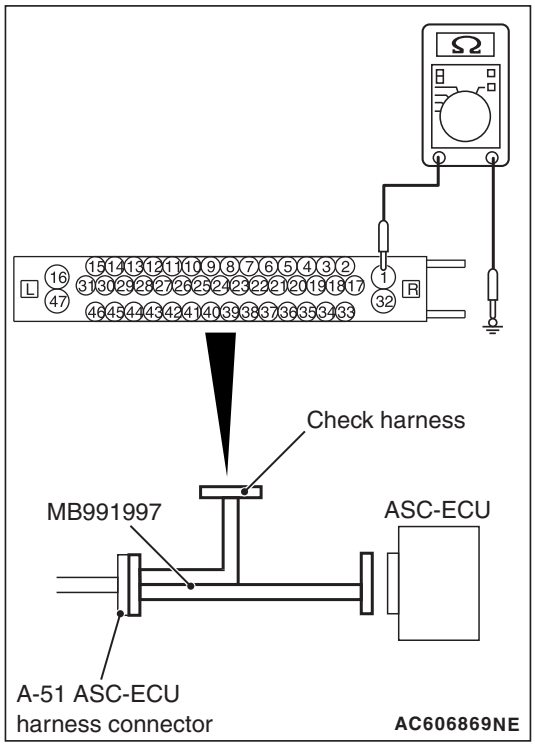
(3) Measure the resistance between the terminal No.1 and the body ground.

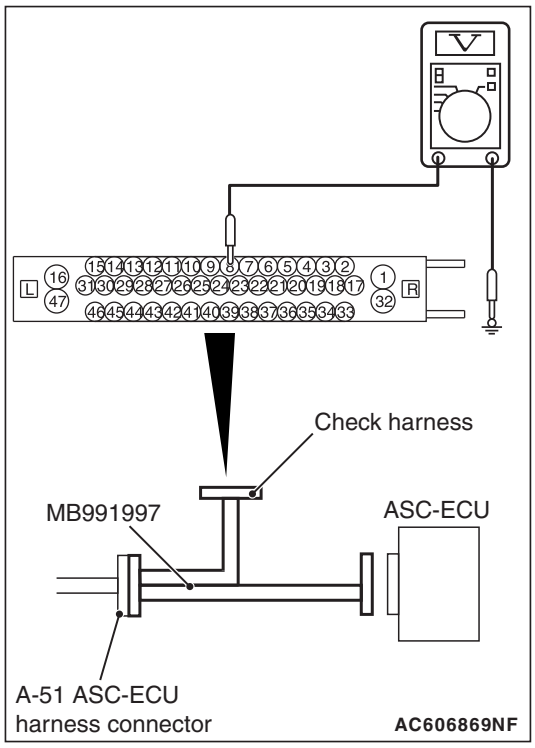
OK: No continuity

Q: Is the check result normal?

YES : Replace the fusible link No.26. Then go to Step 20.

NO : The short circuit may be present in the power supply circuit. Repair the wiring harness between the A-51 ASC-ECU connector terminal No.1 and the fusible link No.26, and then replace the fusible link No.26. Then go to Step 20.





STEP 10. Voltage measurement at the A-51 ASC-ECU connector

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

NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

(2) Ignition switch: ON position.

(3) Measure the voltage between terminal No.8 and body ground.

OK: Approximately battery positive voltage

Q: Is the check result normal?

YES : Go to Step 14.

NO : Go to Step 11.

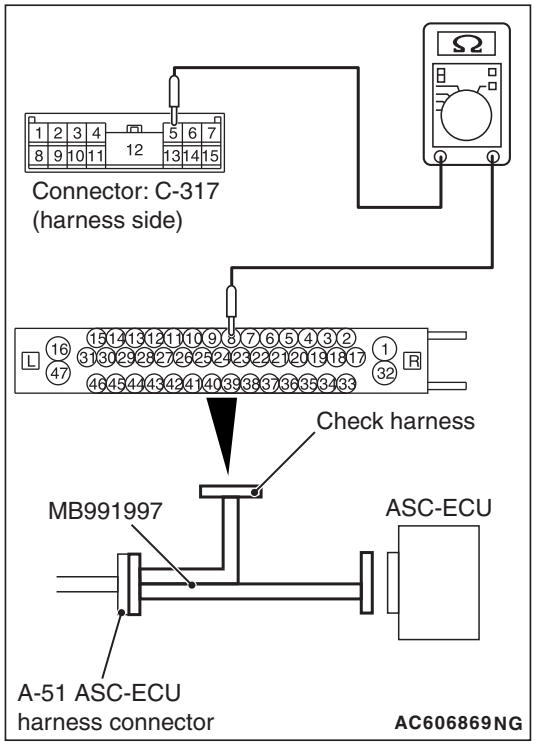
STEP 11. Check the fuse No.12.

Visually check for open circuit in fuse No.12.

Q: Is the check result normal?

YES : Go to Step 12.

NO : Go to Step 13.



STEP 12. Resistance measurement at A-51 ASC-ECU connector

(1) Disconnect the C-317 ETACS-ECU connector.
(2) Disconnect the A-51 ASC-ECU connector, connect special tool ASC check harness (MB991997) to the harness-side connector, and then measure the resistance at the special tool connector side.

NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

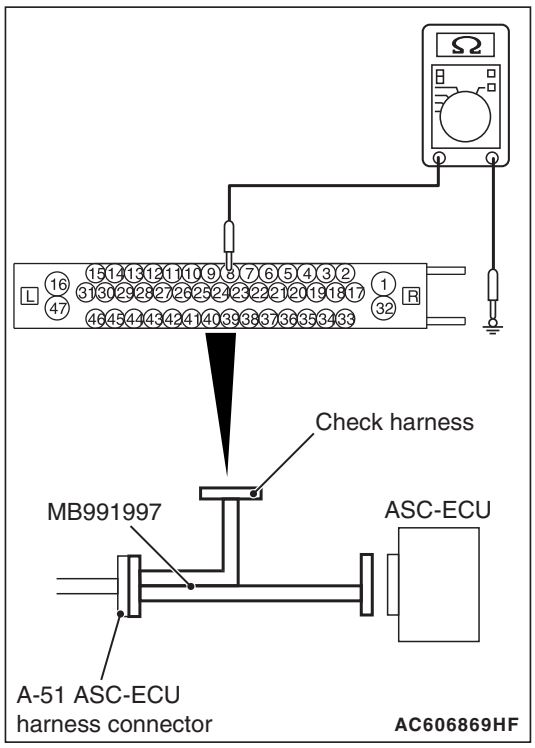
(3) Measure the resistance between the A-51 ASC-ECU connector terminal No.8 and the C-317 ETACS-ECU connector terminal No.5.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunction P.00-14).

NO : The open circuit may be present in the power supply circuit. Repair the wiring harness between the A-51 ASC-ECU connector terminal No.8 and the C-317 ETACS-ECU connector terminal No.5. Then go to Step 20.



STEP 13. Resistance measurement at A-51 ASC-ECU connector

(1) Disconnect the C-317 ETACS-ECU connector.
(2) Disconnect the ASC-ECU connector, connect special tool ASC check harness (MB991997) to the harness-side connector, and then measure the resistance at the special tool connector side.

NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

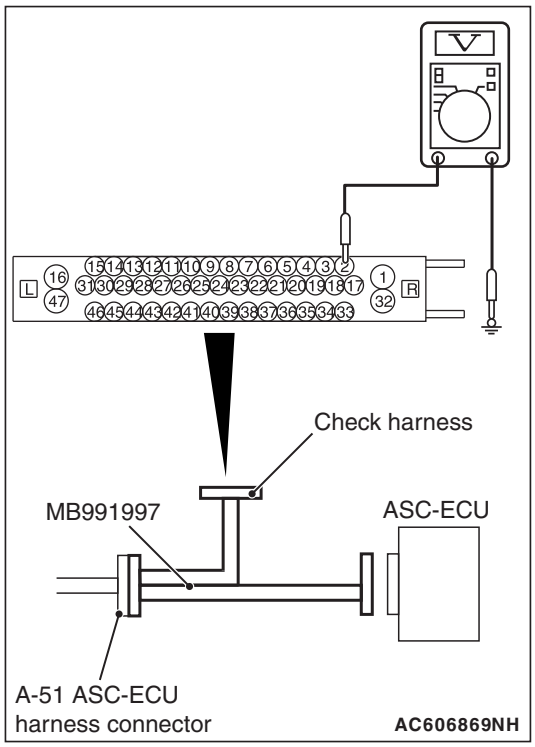
(3) Measure the resistance between the terminal No.8 and the body ground.

OK: No continuity

Q: Is the check result normal?

YES : Replace the fuse No.12. Then go to Step 20.

NO : The short circuit may be present in the power supply circuit. Repair the wiring harness between the A-51 ASC-ECU connector terminal No.8 and the C-317 ETACS-ECU connector terminal No.5, and then replace the fuse No.12. Then go to Step 20.



STEP 14. Voltage measurement at the A-51 ASC-ECU connector

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

NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

(2) Measure the voltage between terminal No.2 and body ground.

OK: Approximately battery positive voltage

Q: Is the check result normal?

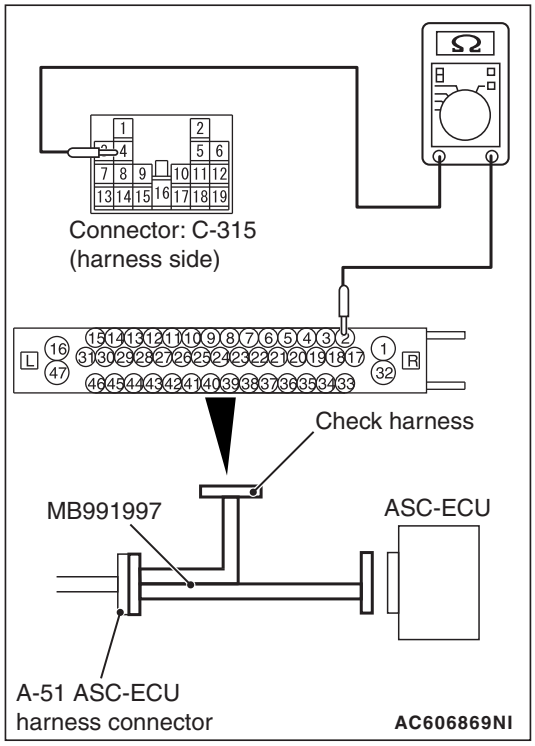
YES : Go to Step 18.
NO : Go to Step 15.

STEP 15. Check the fuse No.17.

Visually check for open circuit in fuse No.17.

Q: Is the check result normal?

YES : Go to Step 16.
NO : Go to Step 17.



STEP 16. Resistance measurement at A-51 ASC-ECU connector

(1) Disconnect the C-315 ETACS-ECU connector.
(2) Disconnect the A-51 ASC-ECU connector, connect special tool ASC check harness (MB991997) to the harness-side connector, and then measure the resistance at the special tool connector side.

NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

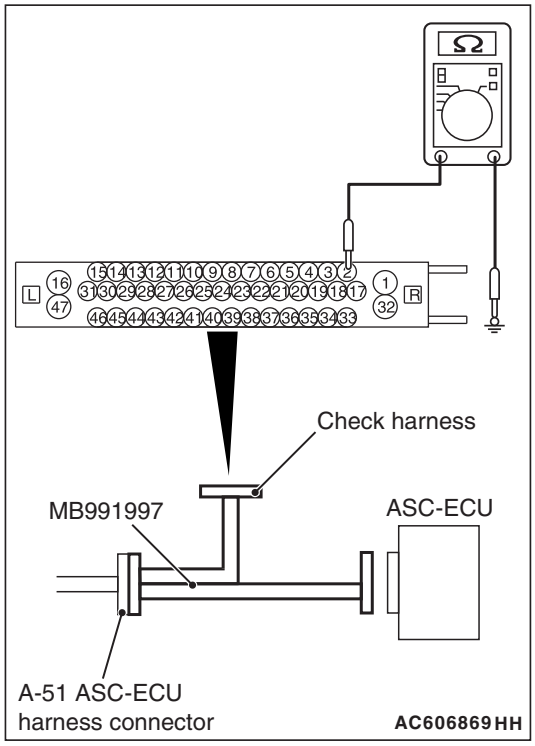
(3) Measure the resistance between the A-51 ASC-ECU connector terminal No.2 and the C-315 ETACS-ECU connector terminal No.4.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunction P.00-14).

NO : The open circuit may be present in the power supply circuit. Repair the wiring harness between the A-51 ASC-ECU connector terminal No.2 and the C-315 ETACS-ECU connector terminal No.4. Then go to Step 20.



STEP 17. Resistance measurement at A-51 ASC-ECU connector

(1) Disconnect the C-315 ETACS-ECU connector.
(2) Disconnect the ASC-ECU connector, connect special tool ASC check harness (MB991997) to the harness-side connector, and then measure the resistance at the special tool connector side.

NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

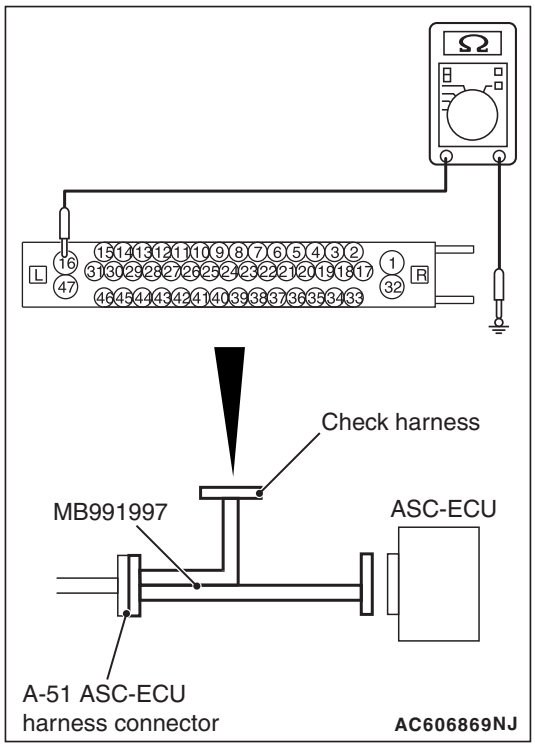
(3) Measure the resistance between the terminal No.2 and the body ground.

OK: No continuity

Q: Is the check result normal?

YES : Replace the fuse No.17. Then go to Step 20.

NO : The short circuit may be present in the power supply circuit. Repair the wiring harness between the A-51 ASC-ECU connector terminal No.2 and the C-315 ETACS-ECU connector terminal No.4, and then replace the fuse No.17. Then go to Step 20.



STEP 18. Resistance measurement at the A-51 ASC-ECU connector

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

NOTE: Do not connect the special tool ASC check harness (MB991997) to ASC-ECU.

(2) Measure the resistance between terminal No.16 and body ground, and between terminal No.47 and body ground.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?

YES : Go to Step 19.

NO : An open circuit may be present in the ground circuit. Repair the wiring harness between the A-51 ASC-ECU connector terminal No.16 and the body ground, and between the A-51 ASC-ECU connector terminal No.47 and the body ground.

STEP 19. Retest the system.

Make sure that the scan tool cable is properly connected and the V.C.I. switch is ON.

Q: Is the communication with scan tool possible?

YES : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

NO : Replace the ASC-ECU (Refer to P.35C-301). Then go to Step 20.

STEP 20. Retest the system.

Q: Is the communication with scan tool possible?

YES : Return to Step 1.

NO : This diagnosis is complete.

Inspection Procedure 13: ABS/skid control/TCL operates too frequently.

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C, Trouble code diagnosis P.54C-9).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**

COMMENTS ON TROUBLE SYMPTOM

- 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 diagnosis code is not detected.
- If wheels and tires other than the ones with genuine specified size are mounted, the ABS/skid control/TCL may be activated prematurely.
- If a non-genuine braking device or non-genuine impact reduction device is mounted, the ABS/skid control/TCL may be activated prematurely.

PROBABLE CAUSES

- Mounting of wheels and tires other than with genuine specified size
- Tire pressure abnormality
- Tire wear and deterioration
- Mounting of non-genuine braking device or impact reduction device
- Wheel alignment abnormality
- Malfunction of brake related parts
- Malfunction of the wheel speed sensor
- Malfunction of the G and yaw rate sensor
- Steering wheel sensor malfunction
- Malfunction of hydraulic unit (integrated with ASC-ECU)
- Malfunction of hydraulic circuit
- External radio wave 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. Check the wheels and the tires.
Carry out the following check.
- Size check of wheels and tires
- Tire wear and deterioration statuses
- Check the tire pressure.

NOTE: For the tire pressure, refer to the tire pressure label attached to the lower section of driver's side door striker.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Correct the wheels and tires in good condition. Then go to Step 9.

STEP 2. Diagnosis code check
Use M.U.T.-III to check the diagnosis code for the ASC system. (Refer to P.35C-25.)

Q: Is the check result normal?

YES : Go to Step 3.
NO : Carry out the diagnosis for the diagnosis code. (Refer to P.35C-25.) Then go to Step 9.

STEP 3. Check of brake system related components other than hydraulic unit (integrated with ABS-ECU)
At the same time with the following checks, also check that no parts other than the genuine parts are mounted.
- Brake pad check (Refer to GROUP 35A – On-vehicle Service, Brake Pad Check P.35A-20.)
- Brake disc runout check (Refer to GROUP 35A – On-vehicle Service, Brake Disc Rotor Check P.35A-29.)
- Brake drag force check (Refer to GROUP 35A – On-vehicle Service, Brake Drag Force Check P.35A-32.)

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair or replace the part(s) having damage or other problems. Then go to Step 9.

STEP 4. Wheel alignment check
At the same time with the following checks, also check that no parts other than the genuine parts are mounted.
- Front wheel alignment check (Refer to GROUP 33 – On-vehicle Service, Front Wheel Alignment Check and Adjustment P.33-8.)
- Rear wheel alignment check (Refer to GROUP 34 – On-vehicle Service, Rear Wheel Alignment Check and Adjustment P.34-8.)

Q: Is the check result normal?

YES : Go to Step 5.
NO : Repair or replace the part(s) having damage or other problems. Then go to Step 9.

STEP 5. Wheel speed sensor check

Check that no non-genuine electronic device or no wiring harness of other than genuine electronic device is mounted near the wheel speed sensor (at wheel speed detection section and wiring harness section). (Refer to P.35C-306.)

Q: Is the check result normal?

YES : Go to Step 6.

NO : Remove the non-genuine electronic device or the wiring harness of non-genuine electronic device. Then go to Step 9.

STEP 6. M.U.T.-III data list

Check the following service data. (Refer to P.35C-282.)

- Item 01: FL wheel speed sensor
- Item 02: FR wheel speed sensor
- Item 03: RL wheel speed sensor
- Item 04: RR wheel speed sensor
- Item 08: Lateral G-sensor
- Item 11: Steering angle sensor
- Item 12: Yaw rate sensor

Q: Is the check result normal?

YES : Go to Step 7.

NO (Abnormality with items 01 to 04) : Check the installation status of corresponding wheel speed sensor. (Refer to P.35C-306.)

NO (Abnormality with items 08, 12) : Check the installation status of G and yaw rate sensor. (Refer to P.35C-309.)

NO (Abnormality with item 11) : Check the installation status of steering wheel sensor. (Refer to P.35C-310.)

STEP 7. Hydraulic unit check

Carry out the following actuator tests, and check if they work normally. (Refer to P.35C-285.)

- Item No. 01: FL wheel ABS
- Item No.02: FR wheel ABS
- Item No.03: RL wheel ABS
- Item No.04: RR wheel ABS
- Item No.05: FL wheel TCL
- Item No.06: FR wheel TCL
- Item No.07: RL wheel TCL
- Item No.08: RR wheel TCL

Q: Is the check result normal?

YES : Go to Step 8.

NO : Replace the hydraulic unit (integrated with ASC-ECU).(Refer to P.35C-301.) Then go to Step 9.

STEP 8. ABS/skid control/TCL operation check

Q: Is the check result normal?

YES : Intermittent malfunction (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14.)

NO : Replace the hydraulic unit (integrated with ASC-ECU).(Refer to P.35C-301.) Then go to Step 9.

STEP 9. ABS/skid control/TCL operation check

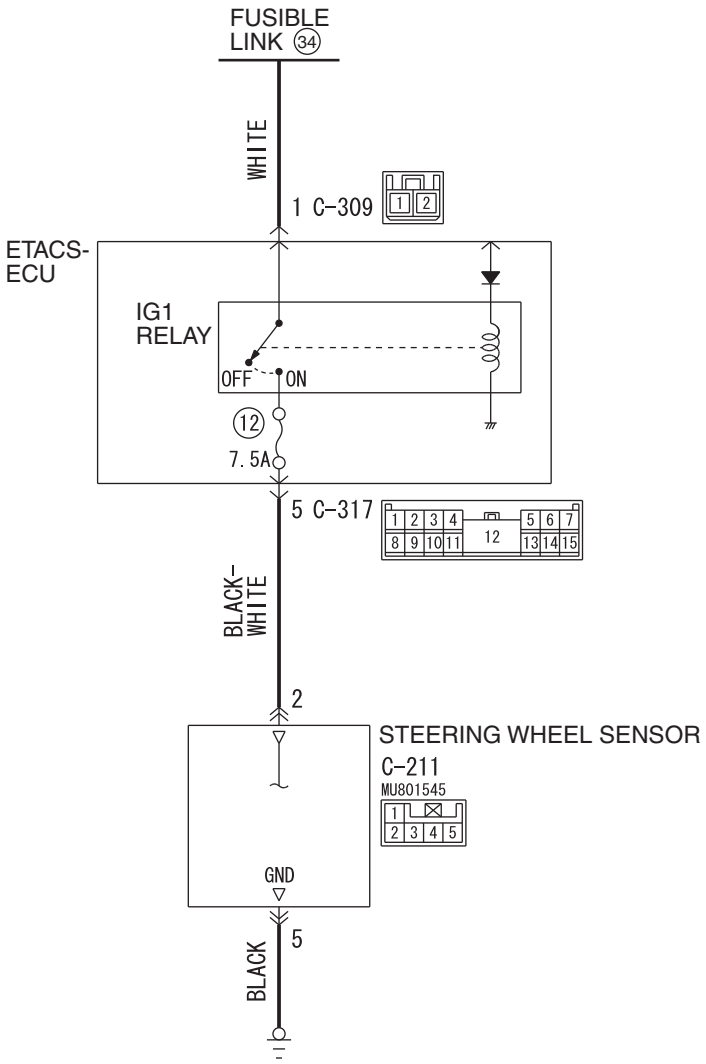
Q: Is the check result normal?

YES : The procedure is complete.

NO : Return to Step 1.

Inspection Procedure 14: Steering wheel sensor power supply circuit system

Steering Wheel Sensor Power Supply Circuit



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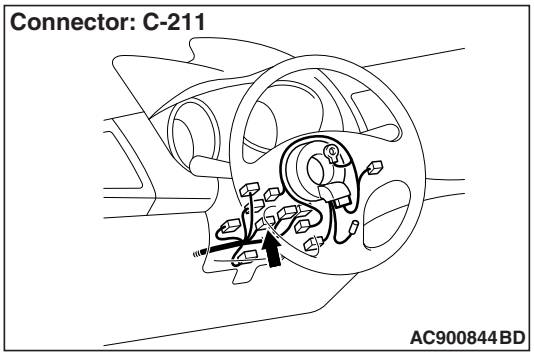
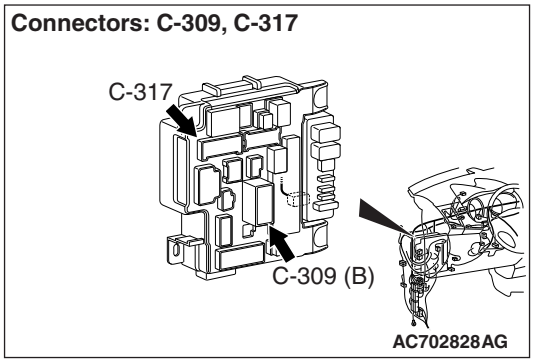




⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C, Trouble code diagnosis P.54C-17).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the steering wheel sensor is replaced, always carry out calibration to make ASC-ECU learn the neutral point (Refer to P.35C-294).**

OPERATION

- Steering wheel sensor contains the power supply circuit (terminal No.2) for Steering wheel sensor. The power is supplied from the ETACS-ECU (terminal No.5). The power is supplied from the fusible link No.33 through the multi-purpose fuse No.12.
- When malfunction occurs in Steering wheel sensor power supply, the communication with scan tool becomes unavailable.

PROBABLE CAUSES

- Damaged wiring harness and connectors
- Fuse and fusible link malfunction
- Improper tightening of battery terminal
- Battery failure
- Charging system failed
- Steering wheel sensor 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. Connector check: C-211 steering wheel sensor connector

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the damaged connector.

STEP 2. Resistance measurement at C-211 steering wheel sensor connector.

(1) Disconnect C-211 steering wheel sensor connector and measure the resistance available at the wiring harness side of the connector.
(2) Check the continuity between C-211 steering wheel sensor connector terminal No.5 and body ground.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?

YES : Go to Step 4.
NO : Go to Step 3.

STEP 3. Check the wiring harness between C-211 steering wheel sensor connector terminal No.5 and the body ground.

- Check the ground wires for open circuit.

Q: Is the check result normal?

YES : If a trouble is solved, it is determined that there is an intermittent malfunction such as poor engaged connector(s) or open circuit (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).
NO : Repair the wiring harness.

STEP 4. Connector check: C-309 ETACS-ECU connector, C-317 ETACS-ECU connector

Q: Is the check result normal?

YES : Go to Step 5.
NO : Repair the damaged connector.

STEP 5. Voltage measurement at C-309 ETACS-ECU connector

(1) Disconnect C-306 ETACS-ECU connector and measure the voltage available at the wiring harness side of the connector.
(2) Measure the voltage between C-309 ETACS-ECU connector terminal No.1 and body ground.

OK: Battery positive voltage

Q: Is the check result normal?

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

STEP 6. Check the wiring harness between fusible link No. 34 and C-309 ETACS-ECU connector terminal No.1.

- Check the power supply lines (battery power supply) for open circuit and short circuit.

Q: Is the check result normal?

YES : If a trouble is solved, it is determined that there is an intermittent malfunction such as poor engaged connector(s) or open circuit (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).

NO : Repair the wiring harness.

STEP 7. Measure the voltage at the C-211 steering wheel sensor connector.

(1) Disconnect C-211 steering wheel sensor connector and measure the voltage at the wiring harness side of the connector.
(2) Turn the ignition switch to the ON position.
(3) Measure the voltage between the terminal No.2 and the body ground.

OK: Approximately battery positive voltage

Q: Is the check result normal?

YES : Go to Step 10.

NO : Go to Step 8.

STEP 8. Check the fuse No.12.

Visually check for open circuit in fuse No.12.

Q: Is the check result normal?

YES : Go to Step 9.

NO : The short circuit may be present in the power supply circuit. Check the wiring harness between the C-211 steering wheel sensor connector terminal No.2 and the C-317 ETACS-ECU connector terminal No.5, and repair if necessary. And then replace the fuse No.12.

STEP 9. Check the wiring harness between C-211 steering wheel sensor connector terminal No.2 and C-317 ETACS-ECU connector terminal No.5.

- Check the power supply lines (battery power supply) for open circuit.

Q: Is the check result normal?

YES : Go to Step 10.

NO : Repair the wiring harness between the C-211 steering wheel sensor connector terminal No.2 and the C-317 ETACS-ECU connector terminal No.5.

STEP 10. Using scan tool MB991958, check the ETACS system data list

Check the input signal of IG1 relay.

- Turn the ignition switch to the ON position.

Item No.	Item name	Normal condition
Item 254	IG voltage	System voltage

OK: Normal condition is displayed.

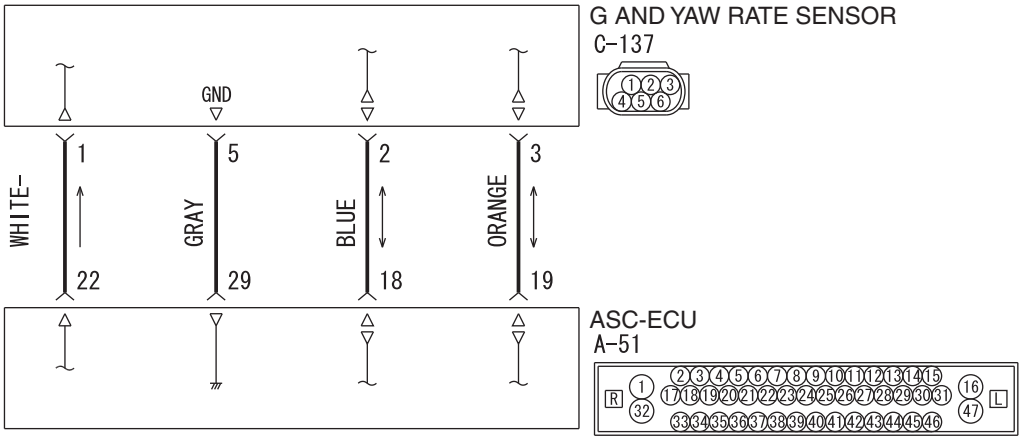
Q: Is the check result normal?

YES : Replace the steering wheel sensor.

NO : Refer to GROUP 54A - ETACS – Input Signal Procedure 2 "The ignition switch (IG1) signal is not received." P.54A-735.

Inspection Procedure 15: HSA (Hill Start Assist) does not work.

G and Yaw Rate Sensor Circuit



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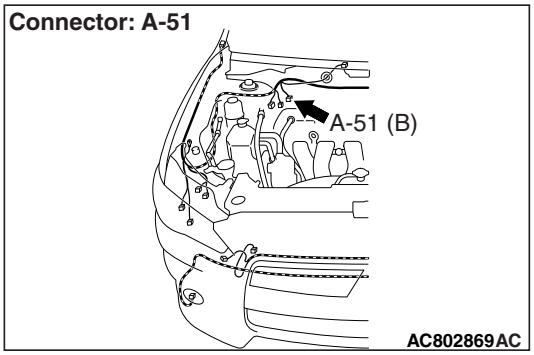
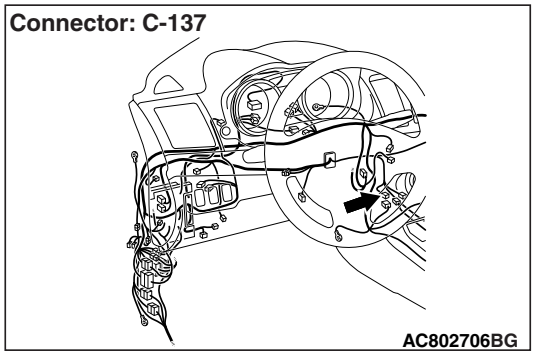
Connector: A-51



Connector: C-137



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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 54C, CAN Bus Diagnosis Table P.54C-17).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

COMMENTS ON TROUBLE SYMPTOM

- The slope gradient may be low.
- The vehicle is not completely stationary.
- A failure may have occurred in the calibration of the G and yaw rate sensor or brake fluid pressure sensor.
- The parking brake switch may be seized, which causes the HSA to fail to start the operation.
- A problem (noise interference) may have occurred in the CAN bus line, resulting in an improper communication with ASC-ECU or each ECU.

NOTE:

- *The HSA does not work even when the wheel speed sensor outputs pulse (vehicle moved) while the vehicle is parked.*
- *The HSA is affected by the loading conditions and vehicle posture at the occurrence of phenomenon. When checking the HSA operation in actual driving, carry out the check on the vehicle with one occupant (driver) only.*

PROBABLE CAUSES

- Improper installation of the G and yaw rate sensor
- G and yaw rate sensor malfunction
- Calibration failure of the brake fluid pressure sensor
- Seizure of the parking brake switch
- Malfunction of wheel speed sensor
- Malfunction of hydraulic unit (integrated with ASC-ECU)
- Wiring harness or connector failure of CAN bus line
- Damaged wiring harness and connectors

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. HSA operation check
Check if the HSA works with one occupant (driver) only in the vehicle.

Q: Is the check result normal?

YES : This diagnosis is complete.
NO : Go to Step 2.

STEP 2. Parking brake check
With the parking brake not pulled, check if the brake warning light is illuminated.

Q: Is the brake warning light illuminated with the parking brake not pulled?

YES : Carry out the Inspection procedure 3 "Brake Warning light Stays ON with the Parking Brake Lever Released (ABS warning light is OFF)."(Refer to P.35C-233.)
NO : Go to Step 3.

STEP 3. Using scan tool MB991958, diagnose the CAN bus line.
Use scan tool to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17.) Then go to Step 14.

STEP 4. Using scan tool MB991958, check the DTC
Use scan tool MB991958 to check the DTC for the ASC system.

Q: Is the DTC set?

YES : Carry out the diagnosis for the diagnostic trouble code (Refer to P.35C-25).
NO : Go to Step 5.

STEP 5. Using scan tool MB991958, check the data list
Check the following service data (Refer to P.35C-282).

- Item 120: Parking brake switch (Input)

Q: Is the check result normal?

YES : Go to Step 6.
NO : Carry out the Inspection procedure 3 "Brake Warning light Stays ON with the Parking Brake Lever Released (ABS warning light is OFF)."(Refer to P.35C-233.), and then go to Step 14.

STEP 6. Using scan tool MB991958, check the data list
Check the following service data (Refer to P.35C-282).

- Item 09: G sensor
- Item 12: Yaw rate sensor

Q: Is the check result normal?

YES : Go to Step 10
NO : Go to Step 7

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STEP 7. Connector check: A-51 ASC-ECU connector, C-137 G and yaw rate sensor

Q: Is the check result normal?

YES : Go to Step 8.
NO : Repair the connector, and then go to Step 14.

STEP 8. Check the harness wire between C-137 G and yaw rate sensor connector terminal No. 2, 3 and A-51 ASC-ECU connector No. 18, 19.

- Check the communication lines for open circuit and short circuit.

Q: Is the check result normal?

YES : Go to Step 9.
NO : Repair the wiring harness, and then go to Step 14.

STEP 9. 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 : Carry out the calibration of the G and yaw rate sensor. (Refer to P.35C-292.). Then go to Step 10
NO : Reinstall the G and yaw rate sensor correctly (Refer to P.35C-309), and then go to Step 14.

STEP 10. Using scan tool MB991958, chech the data list

Check the following service data (Refer to P.35C-282).

- Item 10: Master cylinder pressure

Q: Is the check result normal?

YES : Go to Step 11
NO : Carry out the calibration of the brake fluid pressure sensor. (Refer to P.35C-292.) Then go to Step 12

STEP 11. Using scan tool MB991958, check the DTC the other system.

Use scan tool MB991958 to check that the diagnostic trouble code is set in the TS-SST-ECU.

Q: Is the diagnostic trouble code set?

YES : Carry out the diagnosis for the diagnostic trouble code. (Refer to GROUP - 22C, Diagnosis Troubleshooting P.22C-33)
NO : Go to Step 12.

STEP 12. Retest the system.
Check if the HSA works with one occupant (driver) only in the vehicle.

Q: Is the check result normal?

YES : If a trouble is solved, it is determined that there is an intermittent malfunction such as poor engaged connector(s) or open circuit (Refer to GROUP 00 – How to Cope with Intermittent Malfunction P.00-14).
NO : Replace the G and yaw rate sensor.(Refer to P.35C-309.) Then go to Step 13.

STEP 13. Retest the system.
Check if the HSA works with one occupant (driver) only in the vehicle.

Q: Is the check result normal?

YES : This diagnosis is complete.
NO : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-301) Then go to Step 14.

STEP 14. Retest the system.
Check if the HSA works with one occupant (driver) only in the vehicle.

Q: Is the check result normal?

YES : This diagnosis is complete.
NO : Return to Step 1.

Inspection Procedure 16: HSA (Hill Start Assist) works on a flat road.

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C, CAN Bus Diagnostics Table P.54C-17).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-292, P.35C-294 and P.35C-298).**

COMMENTS ON TROUBLE SYMPTOM

- A failure may have occurred in the calibration or the G and yaw rate sensor.
- Some drivers mistake a brake dragging for HSA operation.
- If the suspension is modified, the vehicle posture changes, and the ASC-ECU judges that the vehicle is on a steep slope and may activate HSA.

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PROBABLE CAUSES

- Improper installation of the G and yaw rate sensor
- G and yaw rate sensor malfunction
- ASC-ECU malfunction
- Brake drag
- Damaged wiring harness and connectors

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. HSA operation check

Check if the HSA works on a flat road with one occupant (driver) only in the vehicle.

Q: Does the HSA work on a flat road?

YES : Go to Step 2
NO : This diagnosis is complete.

STEP 2. Using scan tool MB991958, check the data list

Check the following service data (Refer to P.35C-282).

- Item 09: G sensor

Q: Is the check result normal?

YES : Go to Step 5.
NO : Go to Step 3

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 : Carry out the calibration of the G and yaw rate sensor. (Refer to P.35C-292.) Then go to Step 4
NO : Reinstall the G and yaw rate sensor correctly (Refer to P.35C-309), and then go to Step 6.

STEP 4. Brake drag check

Check the brake system for drag.

Q: Is the check result normal?

YES : Go to Step 5
NO : Repair the brake drag, and then go to Step 5.

STEP 5. Retest the system.

Check if the HSA works on a flat road with one occupant (driver) only in the vehicle.

Q: Does the HSA work on a flat road?

YES : Replace the G and yaw rate sensor.(Refer to P.35C-309.) Then go to Step 6.
NO : Go to Step 6.

STEP 6. Retest the system.
Check if the HSA works on a flat road with one occupant (driver) only in the vehicle.

Q: Does the HSA work on a flat road?

YES : Return to Step 2.
NO : This diagnosis is complete.

DATA LIST REFERENCE TABLE

M1355001500625

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 condition		Normal condition
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. <During stop: approximately 0.4 mph (0.7km/h)>
02	FR wheel speed sensor			
03	RL wheel speed sensor			
04	RR wheel speed sensor			
05	Power supply voltage			Battery positive voltage (10 to 18 V ASC operatable range)
07	Brake switch (input)	The brake pedal is depressed.		ON
		The brake pedal is released.		OFF
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)	FWD	0 G[*1] (fixed value)
			AWD	• -0.11 to 0.11 G <Except vehicles with HSA> • -0.04 to 0.04 G <Vehicles with HSA>
		Running	FWD	0 G[*1] (fixed value)
			AWD	-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 (the steering wheel is in the neutral position)		-6 to 6 deg
		Running		Nearly the same as the steering wheel operation angle <-720 to 720 deg (ASC-ECU normal detection value)>
				Nearly the same as the steering wheel operation angle <-850 to 850 deg (Sensor normal value as a single unit)>

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Item No.	Check item	Check condition	Normal condition
12	Yaw rate sensor (+: left turn, -: right turn)	Vehicle stopped (level)	-3.6 to 3.6 deg/s
		Running	-100 to 100 deg/s
14	Brake switch	The brake pedal is depressed.	ON
		The brake pedal is released.	OFF
15	Emission test mode	Emission test mode: ON	ON
		Emission test mode: OFF	OFF
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
28	ASC/TCL off switch	When the ASC OFF switch is not operated (when the ASC control is available)	ON
		When the ASC OFF switch is operated (pressed and held for 3 seconds or more)(when the ASC control is prohibited)	OFF
		When the ASC OFF switch is operated (pressed and held for 15 seconds or more)(when the ASC OFF control is prohibited by fail-safe function)*2	ON
45	SAS OK flag	When the steering wheel sensor neutral point is learned	Comp
		When the steering wheel sensor neutral point is not learned	Not Comp
		When the steering wheel sensor is defective	SAS fail
			SAS fail&No 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		Displays the engine torque.
67	APS		Displays the accelerator pedal opening angle.
68	Allow ESP torque request		Permitted
70	Target gear	When the selector lever is operated	Displays the selector lever position.
71	Actual gear		
72	Master cylinder pressure Offset	The difference between the neutral position that was input to the ASC-ECU before the master cylinder pressure sensor calibration and the neutral position after the calibration.	-8 to 8 bar

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Item No.	Check item	Check condition		Normal condition
73	Lateral G sensor offset	The difference between the neutral position that was input to the ASC-ECU before the G and yaw rate sensor calibration and the neutral position after the calibration.		-0.15 to 0.15 G
86	Ignition switch	Ignition switch: ON		ON
87	Ignition switch (input)	Ignition switch: ON		ON
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
96	G sensor offset	The difference between the neutral positions before the calibration and after the calibration received in the ASC-ECU at G & yaw rate sensor calibration.	FWD	0 G*3 (Fixed value)
			AWD	• -0.15 to 0.15 G <Except vehicles with HSA> • -0.08 to 0.08 G <Vehicles with HSA>
97	Yaw rate sensor offset	The difference between the neutral position that was input to the ASC-ECU before the G and yaw rate sensor calibration and the neutral position after the calibration.		-6.0 to 6.0 deg/s
105	Power supply voltage (input)			Battery positive voltage (10 to 18 V ASC operatable range)
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)	The ASC OFF switch is pressed.		ON
		The ASC OFF switch is not operated.		OFF

NOTE:

- **1: The G and yaw rate sensor does not detect longitudinal acceleration of a vehicle, thus "0 G" is always set.*
- **2: When the ASC OFF switch is pressed and held for 15 seconds, the ASC system returns to the ON status.*
- **3: The G & yaw rate sensor for FWD vehicle always sends 0 G because it does not detect the longitudinal acceleration of a vehicle.*

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

M1355001600235

Using scan tool, the following actuators can be forcibly operated:

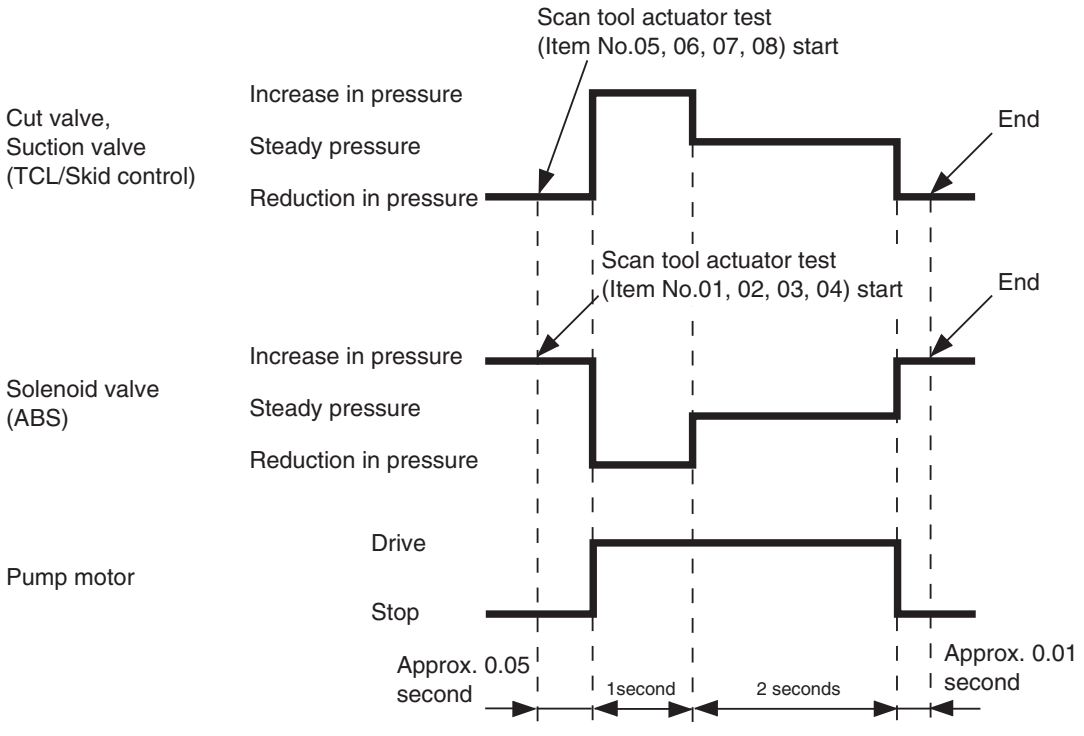
NOTE:

- *ABS 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 operation display, and ASC OFF display 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 control module (ECM) for three seconds.

Operation pattern of items 01 to 08



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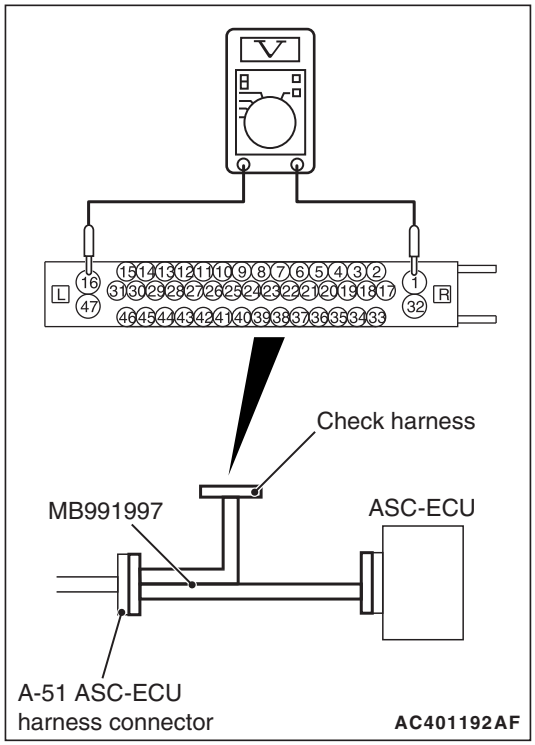
CHECK AT ECU TERMINALS

M1355001700511

TERMINAL VOLTAGE CHECK

Connect the special tool ASC check harness (MB991997) to measure the voltage between each check connector terminal and the ground terminal (No.16 or 47).



Terminal No.	Check item	Check condition	Normal condition
1	Motor power supply	Ignition switch: ON (OFF)	Battery positive voltage
2	ASC-ECU power supply	Ignition switch: ON	Battery positive voltage
		Ignition switch: OFF	Battery positive voltage
8	Ignition switch signal for ASC-ECU activation	Ignition switch: ON	Battery positive voltage
		Ignition switch: OFF	1 volt or less
22	G and yaw rate sensor power supply	Ignition switch: ON	Battery positive voltage
32	Solenoid valve power supply	Ignition switch: ON (OFF)	Battery positive voltage
34	Wheel speed sensor (FR) power supply	Ignition switch: ON	Battery positive voltage
36	Wheel speed sensor (RL) power supply	Ignition switch: ON	Battery positive voltage
43	Wheel speed sensor (RR) power supply	Ignition switch: ON	Battery positive voltage
45	Wheel speed sensor (FL) power supply	Ignition switch: ON	Battery positive voltage

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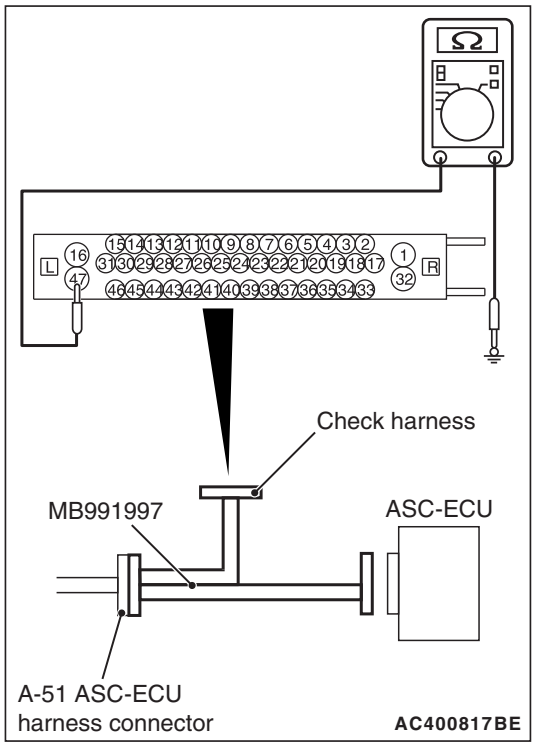
CONTINUITY CHECK AT WIRING HARNESS-SIDE CONNECTOR

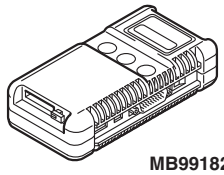
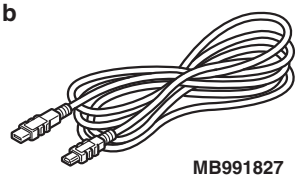
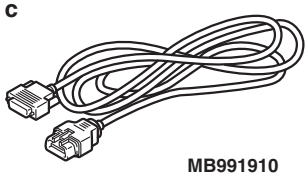
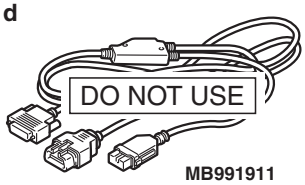
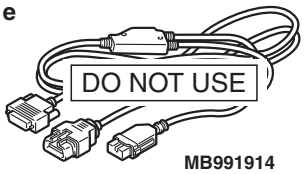
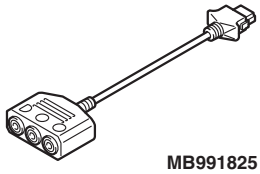
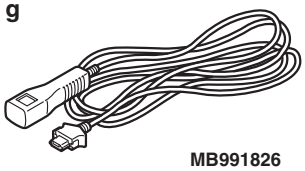


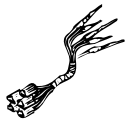
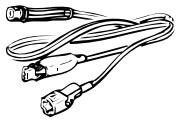
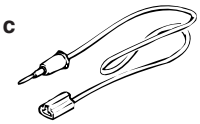
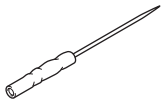
1. When performing the continuity check, turn the ignition switch to LOCK (OFF) position, connect the special tool ASC check harness (MB991997) as shown in the figure, and disconnect the ASC-ECU connector.
2. Check for continuity between terminals shown in the chart below.
3. Terminal layout is shown in the figure.

Terminal No.	Signal	Normal condition
16 – body ground	Ground	Continuity exists (2Ω or less)
47 – body ground	Ground	

SPECIAL TOOLS

M1355005800286

Tool	Tool number and name	Supersession	Application
a  MB991824 b  MB991827 c  MB991910 d  MB991911 e  MB991914 f  MB991825 g  MB991826 MB991958	MB991958 a. MB991824 b. MB991827 c. MB991910 d. MB991911 e. MB991914 f. MB991825 g. MB991826 M.U.T.-III sub assembly a. Vehicle communication interface (V.C.I.) b. M.U.T.-III USB cable c. M.U.T.-III main harness A (Vehicles with CAN communication system) d. M.U.T.-III main harness B (Vehicles without CAN communication system) e. M.U.T.-III main harness C (for Chrysler models only) f. M.U.T.-III measurement adapter g. M.U.T.-III trigger harness	MB991824-KIT *NOTE: G: MB991826 M.U.T.-III Trigger Harness is not necessary when pushing V.C.I. ENTER key.*	**⚠ CAUTION** **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.** ASC check (Diagnostic trouble code display, service data display and calibration by scan tool)
 MB991997	MB991997	ASC check harness	Voltage inspection at ASC-ECU terminals

Tool	Tool number and name	Supersession	Application
a  b  c  d MB991223	MB991223 a. MB991219 b. MB991220 c. MB991221 d. MB991222 Harness set a. Test harness b. LED harness c. LED harness adaptor d. Probe	General service tools	Continuity check and voltage measurement at harness wire or connector for loose, corroded or damaged terminals, or terminals pushed back in the connector. a. Connector pin contact pressure inspection b. Power circuit inspection c. Power circuit inspection d. Commercial tester connection
 MB992006	MB992006 Extra fine probe	–	Continuity check and voltage measurement at harness wire or connector for loose, corroded or damaged terminals, or terminals pushed back in the connector.

ON-VEHICLE SERVICE

HYDRAULIC UNIT CHECK

M1355006100183

Required Special Tools:

- MB991958: scan tool Sub Assembly
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: scan tool USB Cable
  - MB991910: scan tool 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.

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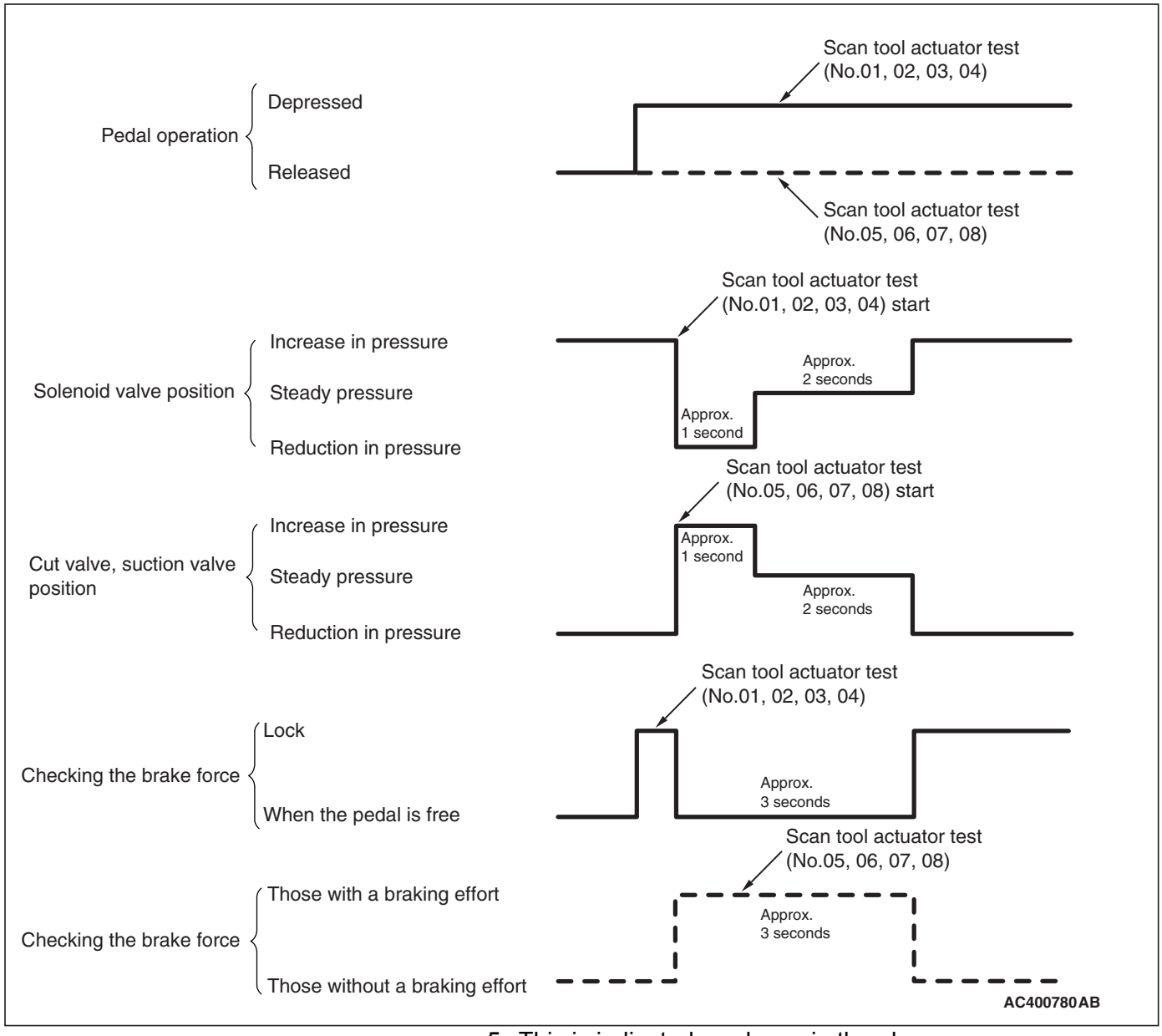
NOTE:

- *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 scan tool actuator test cannot be performed.*
- *After the actuator test has been performed, the ABS warning light, brake waning light, and ASC OFF light or ASC OFF display 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	Test result	Judgment	Cause	Measure
01 FL wheel ABS drive 02 FR wheel ABS drive 03 RL wheel ABS drive 04 RR wheel ABS drive	• Depress the brake pedal to lock the wheel. • Select the vehicle to be inspected using scan tool, perform the actuator test. • Rotate the selected wheel by hands to confirm the braking force.	Braking force decreases for 3 seconds from the lock status.	Normal	–	–
		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.
				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

M1355006200168

⚠ *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.

ALL SENSOR CALIBRATION (G AND YAW RATE SENSOR, STEERING WHEEL SENSOR, BRAKE FLUID PRESSURE SENSOR)

M1357003900012

⚠ **CAUTION**

Before carrying out the calibration, check that the diagnostic trouble code related to the steering wheel sensor, G and yaw rate sensor, or brake fluid pressure sensor is not set.

⚠ **CAUTION**

When the next operation has been completed, carry out the calibration to make ASC-ECU learn the neutral point of the steering wheel sensor, G and yaw rate sensor, and brake fluid pressure sensor.

- **ASC-ECU replacement**

⚠ **CAUTION**

Carry out the calibration under the following conditions.

- **The vehicle has one occupant (driver) only.**
- **Turn the steering wheel to set the wheels in the straight-ahead positions.**
- **The brake pedal is not depressed. (The stop light switch is OFF.)**

1. Park the vehicle on a level surface.

⚠ **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. Turn the ignition switch to the ON position.
4. Select "ABS/ASC/ASTC."
5. Select "Special function."
6. Select "Sensor calibration."
7. Select "all sensor calibration."
8. Before removing scan tool from the vehicle, turn the ignition key to the LOCK (OFF) position.

G AND YAW RATE SENSOR CALIBRATION

M1355009300175

⚠ **CAUTION**

Before performing calibration, check that the G and yaw rate sensor-related diagnostic trouble code is not set.

⚠ **CAUTION**

After the next operation has been completed, carry out the calibration to make ASC-ECU learn the neutral position of the G and yaw rate sensor.

- **G and yaw rate sensor replacement**
- **ASC-ECU replacement**

<Vehicles without TC-SST>

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/WSS" from the system lists in "System select", and press "OK" button.
6. Select "Special function" in "ABS/ASC/ASTC/WSS".
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.

<Vehicles with TC-SST (when the G and yaw rate sensor is replaced)>

1. Carry out steps 1 to 13 of the G and yaw rate sensor calibration for vehicles without TC-SST.
2. Select the relevant system from the menu.
3. Select "ACD/AYC" from the system lists in "System select", and press "OK" button.
4. Select "Special function" in "ACD/AYC".
5. Select "Sensor calibration" in "Special function".
6. Select "Lateral G sensor calibration" from the selected item, and press "OK" button.
7. The screen displays "Lateral G sensor calibration: The selected command will be executed. Are you sure? Caution: Please check the execution conditions." Then press "OK" button.
8. "Execute: The command was executed." will be shown. Then press "OK" button.

9. Select "Longitudinal G SNS.calibration" from the selected item, and press "OK" button.
10. The screen displays "Longitudinal G SNS.calibration: The selected command will be executed. Are you sure? Caution: Please check execution conditions." Then press "OK" button.
11. "Executed: The command was executed." will be shown. Then press "OK" button.
12. Learning neutral point complete
13. Turn the ignition switch to "LOCK" (OFF) position and then disconnect the scan tool.

STEERING WHEEL SENSOR CALIBRATION

M1355009200189

<Vehicles without TC-SST>

⚠ CAUTION

After the next operation has been completed, carry out the following two operations:

- **Alignment adjustment <Front>**
- **Steering wheel sensor (column switch assembly) replacement, removal, installation**
- **ASC-ECU replacement**

1. **Update the neutral position stored in the steering wheel sensor.**
2. **Reset the calibrated value of the steering angle stored in ASC-ECU.**

⚠ CAUTION

- **Before performing the calibration, check if the steering wheel sensor-related diagnostic trouble code is set in ASC-ECU.**
- **When the diagnostic trouble code other than C121A is set, carry out inspection according to each trouble-shooting procedure.**

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 dear 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/WSS" from the system list under "System select", and press "OK" button.
16. Select "Special function" under "ABS/ASC/ASTC/WSS".
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/WSS". 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.

<Vehicles with TC-SST>

⚠ CAUTION

After the next operation has been completed, carry out the following two operations:

- **Alignment adjustment <Front>**
- **Steering wheel sensor (column switch assembly) replacement, removal, installation**
- **ASC-ECU replacement**

1. **Update the neutral position stored in the steering wheel sensor.**
2. **Reset the calibrated value of the steering angle stored in ASC-ECU.**
3. **Reset the calibrated value of the steering angle stored in AWC-ECU <Only when the steering wheel sensor (column switch assembly) is replaced, removed, or installed>**

⚠ CAUTION

- **Before performing the calibration, check if the steering wheel sensor-related diagnostic trouble code is set in ASC-ECU.**
- **When the diagnostic trouble code other than C121A is set, carry out inspection according to each trouble-shooting procedure.**

<When the ASC-ECU is replaced>

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 dear DTCs". Then, press "OK" button.
9. The display should show "Completed." Press "OK" button.
10. Press the OK button.

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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/WSS" from the system list under "System select", and press "OK" button.
16. Select "Special function" under "ABS/ASC/ASTC/WSS".
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/WSS". 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.

<When the steering wheel sensor is replaced>

1. Carry out steps 1 to 21 of the steering wheel sensor calibration for when the ASC-ECU is replaced.
2. Select the relevant system from the menu.
3. Select "ACD/AYC" from the system list in "System select", and press "OK" button.
4. Select "Special function" under "ACD/AYC".
5. Select "Sensor 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.

6. As "SAS Calibration" is selected under "Sensor 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 dear DTCs". Then, press "OK" button.

7. The display should show "Completed." Press "OK" button.
8. Press the OK button.
9. 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.

10. The display should show "Completed." Press "OK" button.
11. Turn the ignition switch to "LOCK" (off) position, and then turn the ignition switch ON again.
12. Select the relevant system from the menu.
13. Select "ACD/AYC" from the system list under "System select", and press "OK" button.
14. Select "Special function" under "ACD/AYC".
15. Select "Sensor calibration" under "Special function".
16. Select "SAS calibration" under "Sensor calibration", and press "OK" button.
17. The screen displays "SAS calibration: The selected command will be executed. Are you sure? Caution: Confirm the execution conditions." Then press "OK" button.
18. "Executed: The command was executed." will be shown. Then press "OK" button.
19. Select "Diagnostic trouble code" under "ACD/AYC". If the diagnostic trouble code "U1428 G and Yaw Rate Sensor Data Error (past trouble)" is set, clear it.
20. Learning neutral point complete
21. Turn the ignition switch to "LOCK" (OFF) position and then disconnect the scan tool.

BRAKE FLUID PRESSURE SENSOR CALIBRATION

M1355024100112

⚠ 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.

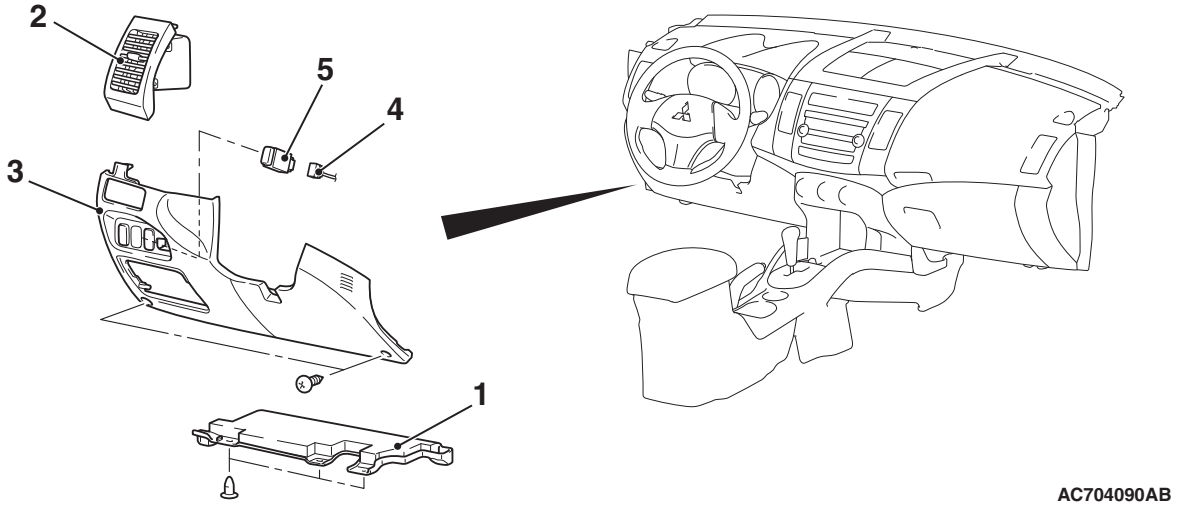
6. Select "Special function" under "ABS/ASC/ASTC".
7. Select "Sensor calibration" under "Special function".
8. Select "M/C pressure sensor calibration" from the selected item, and press "OK" button.
9. The screen displays "M/C pressure sensor calibration: The selected command will be executed. Are you 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

M1355020100143

NOTE: Refer to GROUP 52A – Instrument Panel Assembly for the clip location P.52A-3.



Removal steps

1. Bottom cover assembly (driver side)
2. Side air outlet

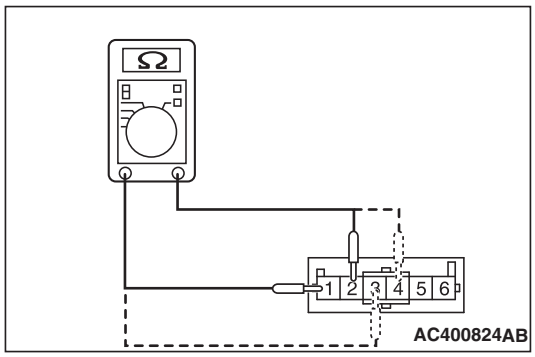
Removal steps (Continued)

3. Lower panel assembly
4. ASC OFF switch connector
5. ASC OFF switch

INSPECTION

M1355020200195

ASC OFF SWITCH CONTINUITY CHECK



1. As shown in the figure, connect the circuit tester to the ASC OFF switch as a single unit.
2. Check the continuity when the ASC OFF switch is pressed and released.

Item	When the ASC OFF switch is released (No operation status)	When the ASC OFF switch is pressed
Continuity between terminal No. 1 and No. 2	No continuity	Continuity exists. (2 Ω or less)
Continuity between terminal No. 3 and No. 4	Continuity exists.	Continuity exists.

HYDRAULIC UNIT

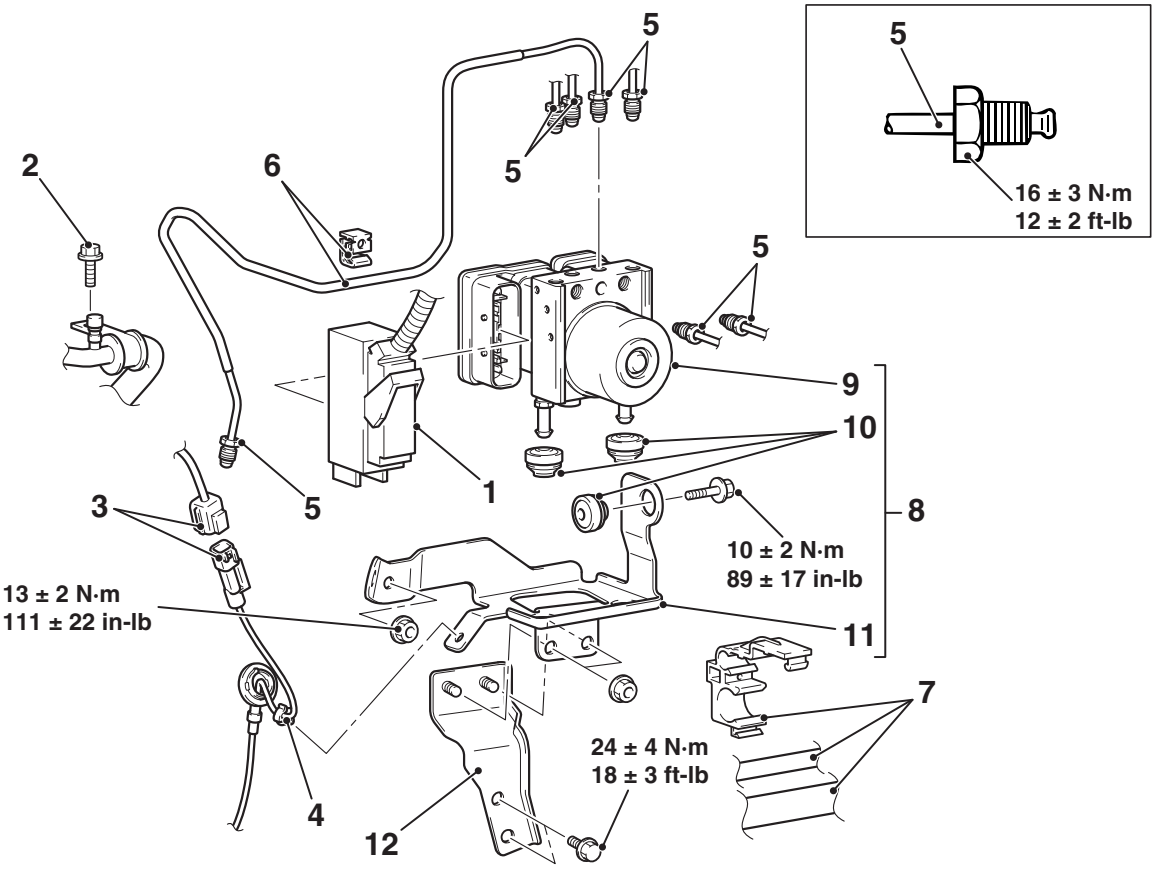
REMOVAL AND INSTALLATION

M1355005600646

⚠ CAUTION

When the hydraulic unit (integrated with ASC-ECU) is replaced, after turning the ignition switch ON or OFF (vehicle information from ETACS-ECU is registered), always carry out the calibration of all sensors (steering wheel sensor, G and yaw rate sensor, and brake fluid pressure sensor) at one time.(Refer to P.35C-292.)

Pre-removal operation	Post-installation operation
• Strut tower bar removal (Refer to GROUP 42A – Strut Tower Bar P.42A-16.) • Brake fluid draining • Intake manifold plenum removal (Refer to GROUP 15 – Intake Manifold Plenum P.15-9 <2.4L engine>, P.15-9 <2.0L ENGINE Non-Turbo>, P.15-10 <2.0L ENGINE Turbo>.)	• Intake manifold plenum installation (Refer to GROUP 15 – Intake Manifold Plenum P.15-9 <2.4L engine>, P.15-9 <2.0L ENGINE Non-Turbo>, P.15-10 <2.0L ENGINE Turbo>.) • Brake fluid refilling and air bleeding (Refer to GROUP 35A – On-vehicle Service, Brake Fluid Level Inspection and Bleeding P.35A-19.) • Strut tower bar installation (Refer to GROUP 42A – Strut Tower Bar P.42A-16.) • Hydraulic unit check (Refer to P.35C-289.)



AC703833 AB

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<< 5. Brake tube connection

6. Brake tube and clip connection

Removal steps (Continued)

7. Suction pipe, liquid pipe and clip connection
8. Hydraulic unit (ASC-ECU) and hydraulic unit bracket

<<A>> 9. Hydraulic unit (ASC-ECU)

10. Hydraulic unit bracket insulator
11. Hydraulic unit bracket B
12. Hydraulic unit bracket A

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REMOVAL SERVICE POINT

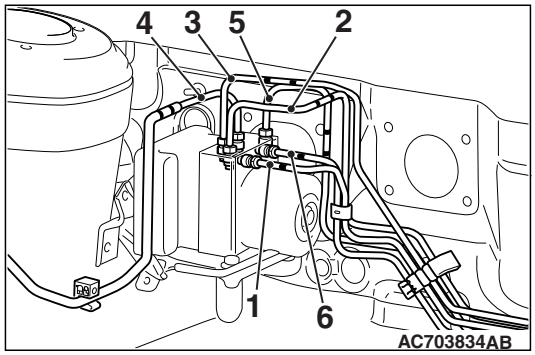
<<A>> HYDRAULIC UNIT (ASC-ECU) REMOVAL

⚠ 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 POINT

>>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 <FWD>

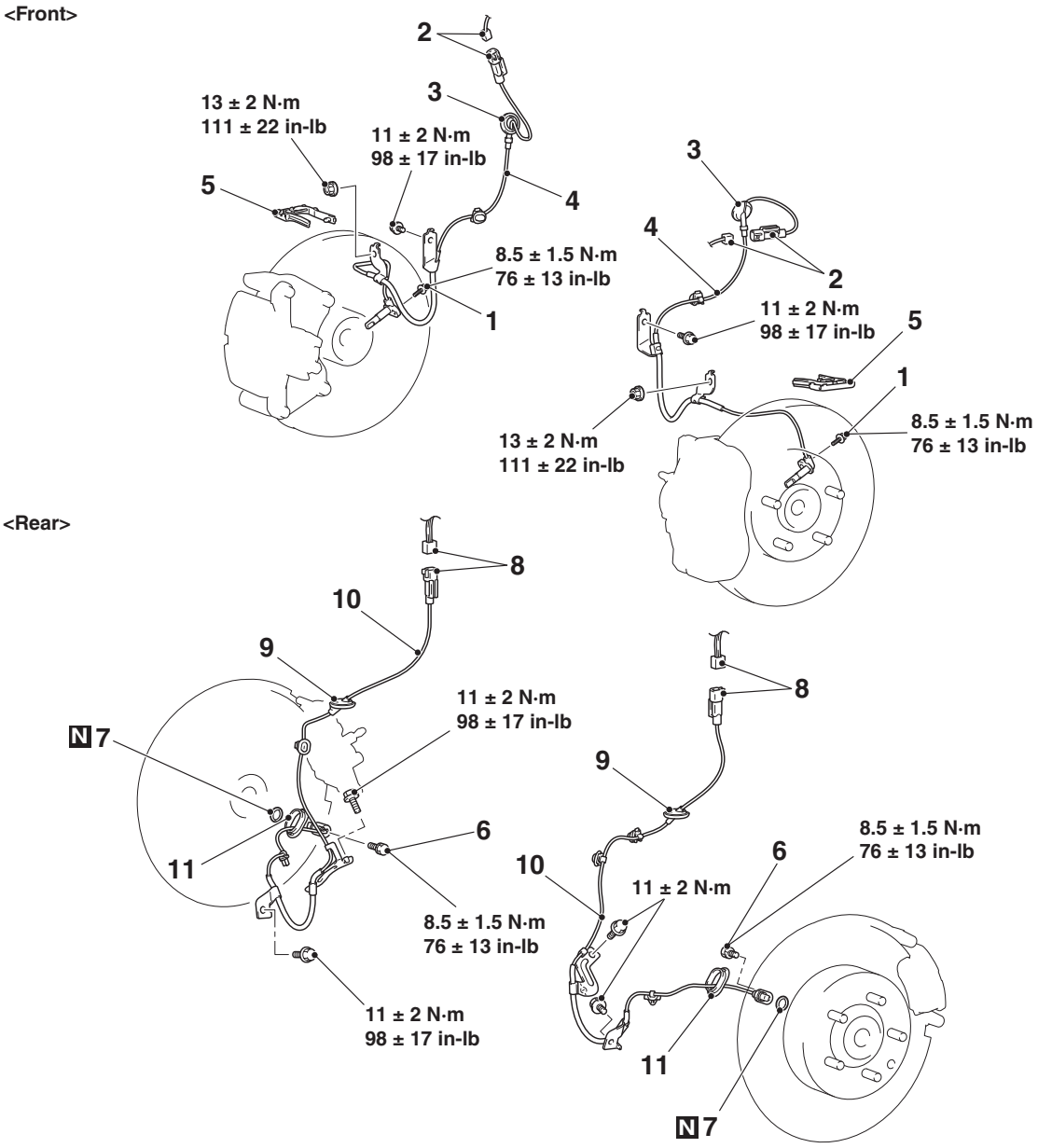
M1352008301392

⚠ CAUTION

The vehicle speed detection encoder collects any metallic particle easily, because it is magnetized. Make sure that the encoder should not collect any metallic particle. Check that there is not any trouble prior to reassembling it.

Pre-removal and post-installation operation

- Air cleaner body assembly removal and installation (Refer to GROUP 15 – Air Cleaner P.15-9 <2.0L ENGINE Non-Turbo, 2.4L ENGINE>, P.15-10 <2.0L ENGINE Turbo>).<Front wheel speed sensor: LH>
- Rear scuff plate, rear door opening trim, cargo floor box, trunk room rear end trim, flexible floor plug, flexible floor guide, quarter trim removal and installation (Refer to GROUP 52A – Interior trim P.52A-12) <Rear wheel speed sensor>



AC807224AB

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Front wheel speed sensor removal steps

1. Bolt (front wheel speed sensor and knuckle connection)
2. Front wheel speed sensor connector

>>C<< 3. Front wheel speed sensor grommet

4. Front wheel speed sensor

>>B<< 5. Harness clip

Rear wheel speed sensor removal steps

>>A<< 6. Bolt (rear wheel speed sensor and rear wheel hub assembly connection)

>>A<< 7. O-ring

8. Rear wheel speed sensor connector

>>C<< 9. Rear wheel speed sensor grommet

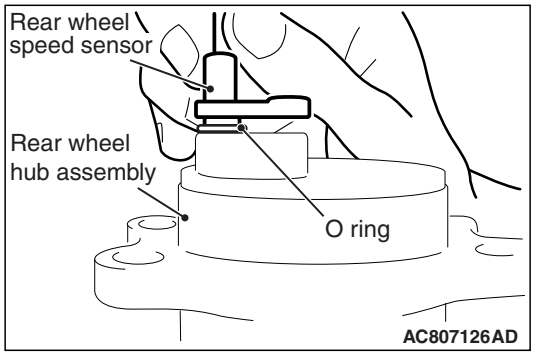
>>A<< 10. Rear wheel speed sensor

11. Protector

NOTE: The vehicle speed detection encoder is integrated with the front wheel bearing and the rear wheel hub assembly, which cannot be disassembled.

INSTALLATION SERVICE POINTS

>>A<< REAR WHEEL SPEED SENSOR, O-RING, AND BOLT (CONNECTION OF REAR WHEEL SPEED SENSOR WITH REAR WHEEL HUB ASSEMBLY) INSTALLATION

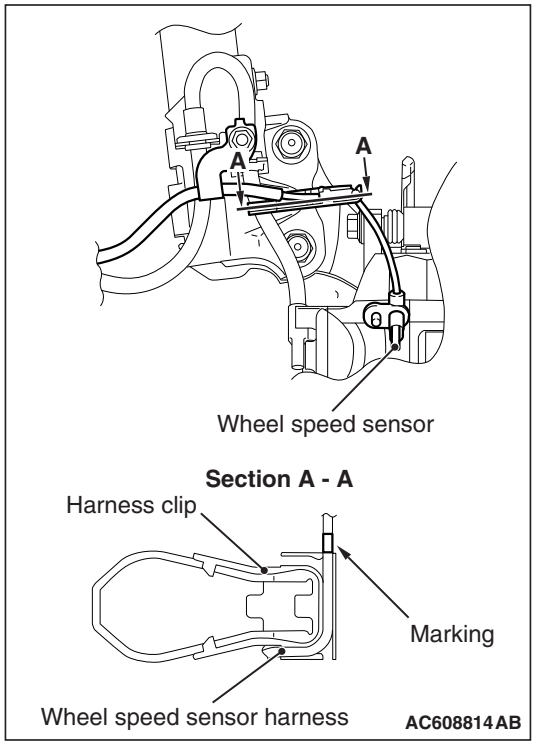


1. Align the mounting bolt hole position of rear wheel speed sensor with the mounting bolt hole position of rear wheel hub assembly.

⚠ CAUTION

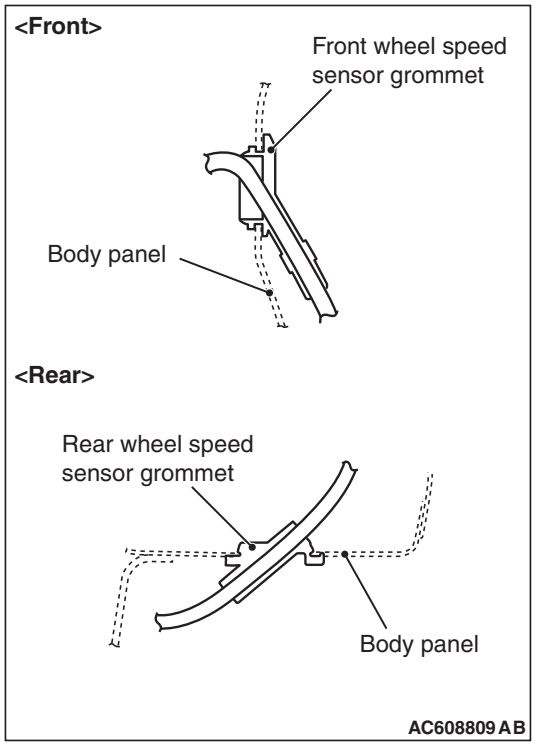
- **Do not insert the rear wheel speed sensor at an angle or by prying the sensor because it may be possible that the O-ring of rear wheel speed sensor cannot be mounted properly.**
- **After the insertion, do not perform an alignment of mounting bolt hole positions by rotating the rear wheel speed sensor.**

2. As shown in the figure, mount the rear wheel speed sensor while keeping the sensor perpendicular to the rear wheel hub assembly.



>>B<< HARNESS CLIP INSTALLATION

Install the front wheel speed sensor to the harness clip as shown in the figure.



>>C<< FRONT WHEEL SPEED SENSOR GROMMET/REAR WHEEL SPEED SENSOR GROMMET INSTALLATION

Install the front wheel speed sensor grommet and the rear wheel speed sensor grommet to the body panel snugly as shown in the figure.

REMOVAL AND INSTALLATION <AWD>

M1355005300430

<FRONT>

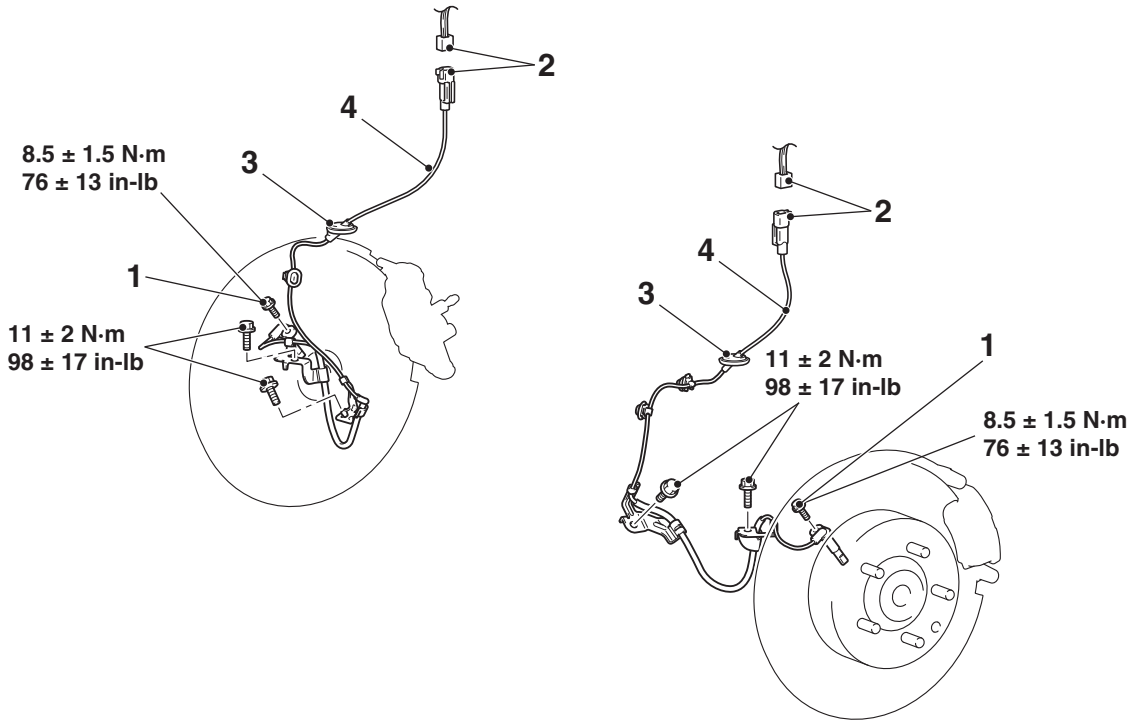
As for removal and installation of the front wheel speed sensor, refer to Wheel Speed Sensor Removal and Installation P.35C-303 <FWD>.

<REAR>

⚠ CAUTION

The vehicle speed detection encoder collects any metallic particle easily, because it is magnetized. Make sure that the encoder should not collect any metallic particle. Check that there is not any trouble prior to reassembling it.

Pre-removal and post-installation operation
Rear scuff plate, rear door opening trim, cargo floor box, trunk room rear end trim, flexible floor plug, flexible floor guide, quarter trim removal and installation (Refer to GROUP 52A – Interior trim P.52A-12) <Rear wheel speed sensor>



AC800398AC

Removal steps

1. Bolt (rear wheel speed sensor and trailing arm assembly connection)
2. Rear wheel speed sensor connector

>>A<< 3. Rear wheel speed sensor grommet

4. Rear wheel speed sensor

NOTE: The vehicle speed detection encoder is integrated with the rear wheel hub assembly, which is non-serviceable.

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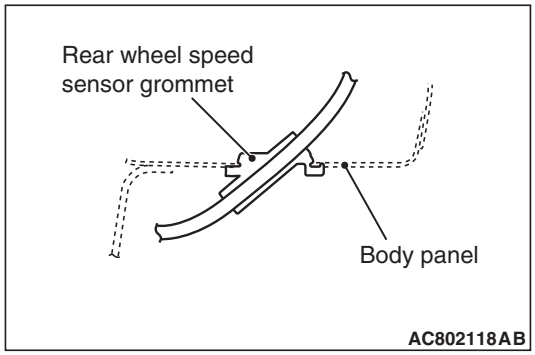
INSTALLATION SERVICE POINT

>>A<< REAR WHEEL SPEED SENSOR GROMMET INSTALLATION

Install the rear wheel speed sensor grommet to the body panel snugly as shown in the figure.



INSPECTION

M1352008400783

WHEEL SPEED SENSOR CURRENT CHECK

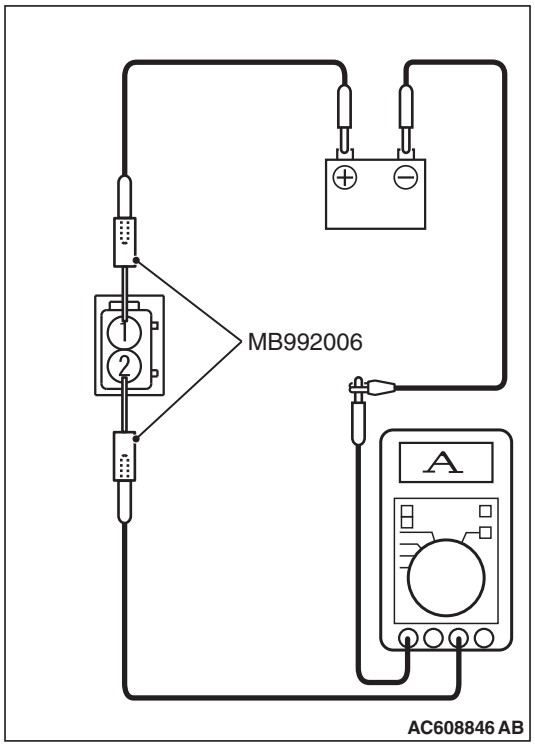
⚠ CAUTION

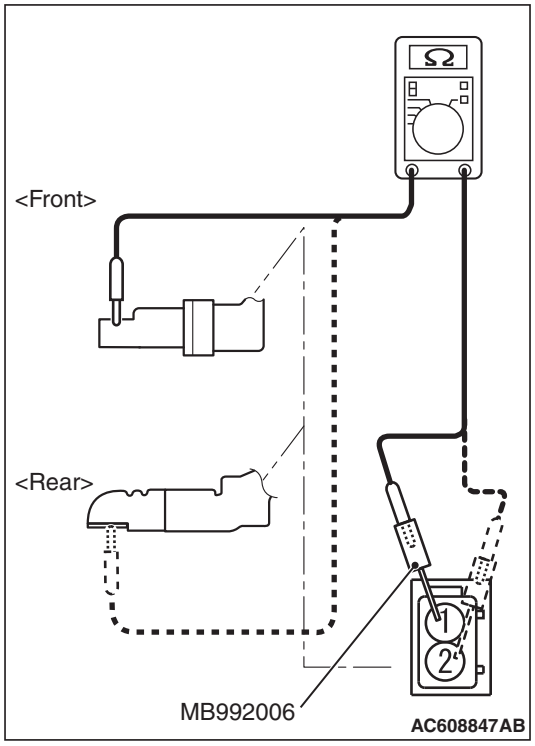
Do not connect the battery terminals in reverse as the wheel speed sensor may be damaged.

1. Connect the circuit tester to the wheel speed sensor using the special tool extra fine probe (MB992006), and measure the sensor current as a single unit.

   Standard value: 5.9 to 8.4 mA or 11.8 to 16.8 mA

2. If the measurement value is not within the standard value range, replace the wheel speed sensor with a new one.





WHEEL SPEED SENSOR INSULATION CHECK

1. Connect the circuit tester to the wheel speed sensor using the special tool extra fine probe (MB992006), and measure the insulation resistance between terminal No. 1/2 and the wheel speed sensor body as a single unit.

   Standard value: 5 MΩ or more

2. If the insulation resistance is not within the standard value range, replace the wheel speed sensor with a new one.

G AND YAW RATE SENSOR

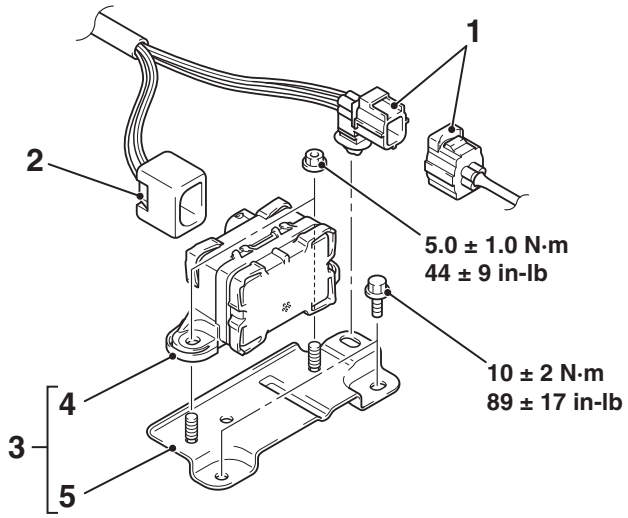
REMOVAL AND INSTALLATION

M1355004500185

⚠ CAUTION

- **Do not use impact wrench.**
- **Do not drop or shock the G and yaw rate sensor.**
- **When the G and yaw rate sensor is replaced or reinstalled, always carry out calibration to make ASC-ECU learn the neutral point (Refer to P.35C-292).**

Pre-removal and post-installation steps
- Instrument panel console cover removal and installation (Refer to GROUP 52A – Instrument panel assembly P.52A-3).



AC613540AC

Removal steps
1. Oxygen sensor (front) connector
2. G and yaw rate sensor harness connector

Removal steps (Continued)
3. G and yaw rate sensor and G and yaw rate sensor bracket
4. G and yaw rate sensor
5. G and yaw rate sensor bracket

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STEERING WHEEL SENSOR

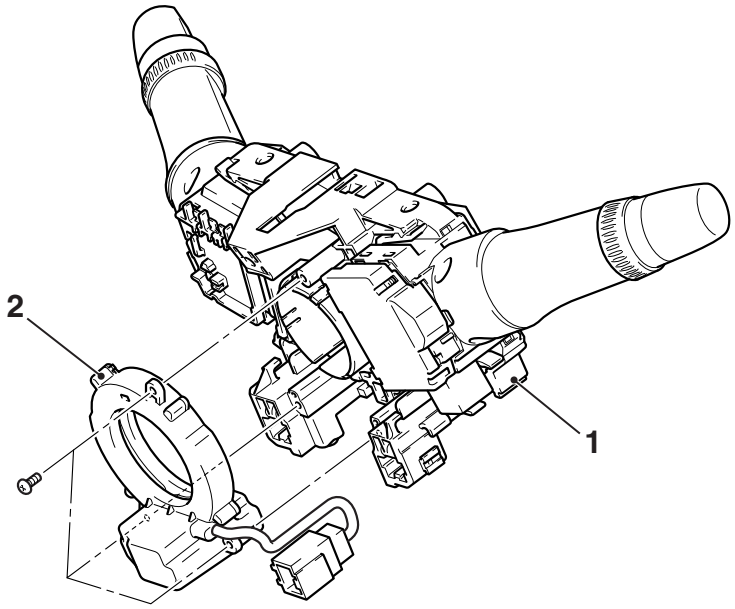
REMOVAL AND INSTALLATION

M1355005100339

⚠ CAUTION

- **Be sure to remove the clock spring from the column switch and center the clock spring to prevent the damage of steering wheel sensor.**
- **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.**
- **Before removing the steering wheel/air bag module assembly, refer to GROUP 52B – Service Precautions P.52B-26 and Driver's Air Bag Module Clock Spring P.52B-419 <FWD>, P.52B-427 <AWD>.**
- **When the steering wheel sensor is replaced or reinstalled, always carry out calibration to make ASC-ECU learn the neutral point (Refer to P.35C-294).**

Pre-removal operation	Post-installation operation
• Driver's airbag module assembly and steering wheel assembly removal (Refer to GROUP 37 – Steering Wheel P.37-32).	• Driver's airbag module assembly and steering wheel assembly installation (Refer to GROUP 37 – Steering Wheel P.37-32). • Perform steering wheel calibration (Refer to P.35C-294).



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Removal steps

- Position the front wheels in a straight ahead direction.

Removal steps (Continued)

>>A<< 1. Clock spring/column switch assembly (Refer to GROUP 52B – SRS Control Unit P.52B-416).
>>A<< 2. Steering wheel sensor

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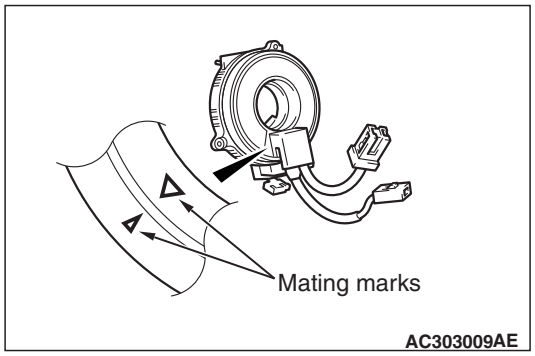
INSTALLATION SERVICE POINT

>>A<< STEERING WHEEL SENSOR/CLOCK SPRING/COLUMN SWITCH ASSEMBLY INSTALLATION

⚠ CAUTION

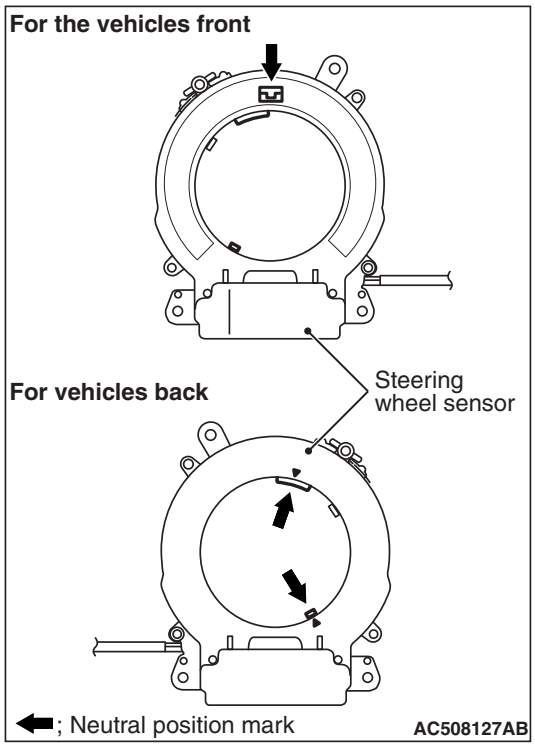
- **Be sure to remove the clock spring from the column switch and center the clock spring to prevent the damage of steering wheel sensor.**
- **If the center of the clock spring is not correctly aligned, the steering wheel may not be turned fully or the cable inside the clock spring may be broken, causing 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.

⚠ 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.

NOTES