GROUP 35C

TRACTION CONTROL/ACTIVE STABILITY CONTROL SYSTEM

CONTENTS

GENERAL INFORMATION

M1355000200029

FEATURES

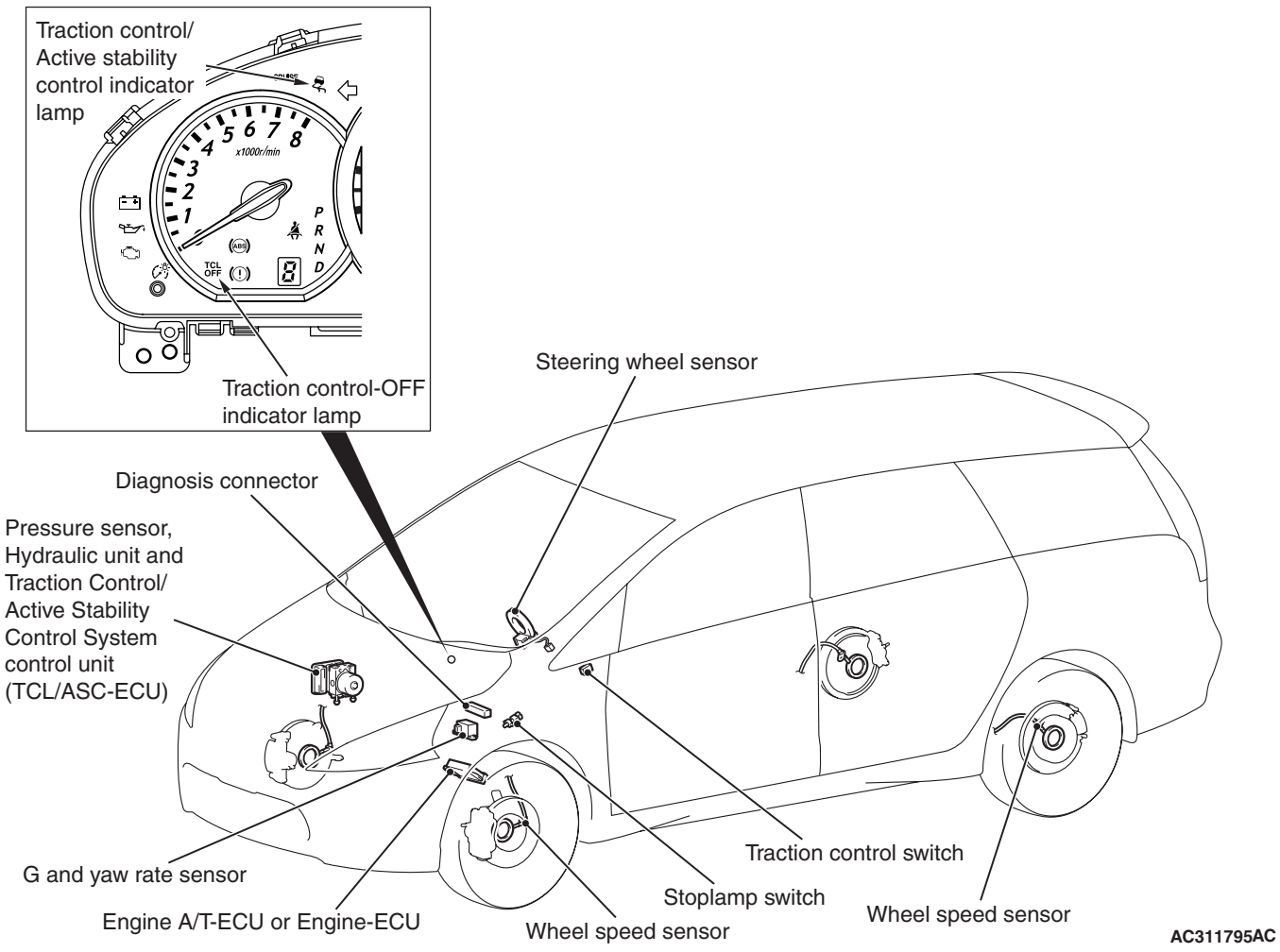
Traction Control/Active Stability Control System (TCL/ASC) is available for all models as optional equipment.

- The Traction Control/Active Stability Control System is a combination system of active stability control system and traction control system. The active stability control system avoids a dangerous vehicle attitude by limiting the engine output and braking wheels according to driving conditions. The traction control system prevents wheel spinning at vehicle start.
- Fail-safe function ensures safety is maintained
- Improved serviceability
- To shorten the lines and enhance data transmission reliability, communication with other ECU is performed over a CAN (Controller Area Network).

NOTE: For further details on CAN communication, refer to GROUP 54D, CANP.54D-3.

NOTE: On vehicles with ASC, the TCL/ASC-ECU controls ABS as well.

CONSTRUCTION DIAGRAM



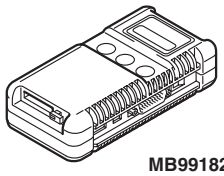
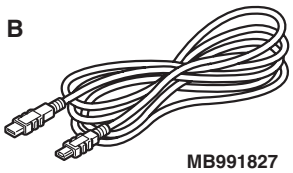
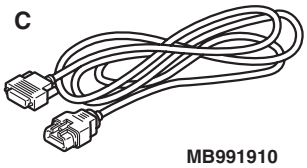
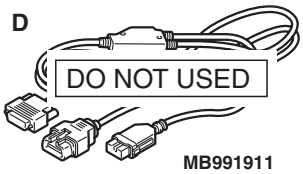
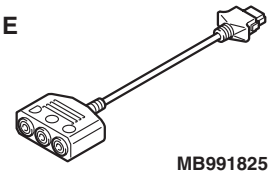
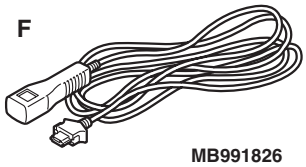
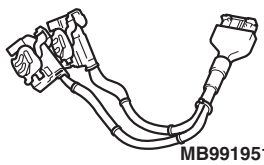
SERVICE SPECIFICATIONS

M1355008200023

Item	Standard value
Wheel speed sensor internal resistance kΩ	1.24 – 1.64

SPECIAL TOOLS

M1355005800037

Tool	Number	Name	Use
A  MB991824 B  MB991827 C  MB991910 D  MB991911 E  MB991825 F  MB991826 MB991955	MB991955 A: MB991824 B: MB991827 C: MB991910 D: MB991911 E: MB991825 F: MB991826	MUT-III sub-assembly A: Vehicle Communication Interface (V.C.I.) B: MUT-III USB cable C: MUT-III main harness A (Vehicles with CAN communication system) D: MUT-III main harness B (Vehicles without CAN communication system) E: MUT-III measurement adapter F: MUT-III trigger harness	Checking the TCL/ASC **⚠ CAUTION** **MUT-III main harness A (MB991911) should be used. MUT-III main harness B should not be used for this vehicle.**
 MB991951	MB991997	ASC check harness	Checking the TCL/ASC-ECU
 MB991348	MB991348	Test harness set	Checking the G and yaw late sensor

TROUBLESHOOTING

STANDARD FLOW OF DIAGNOSTIC TROUBLESHOOTING

M1355000900028

Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-5.

NOTES WITH REGARD TO DIAGNOSIS

M1355009500016

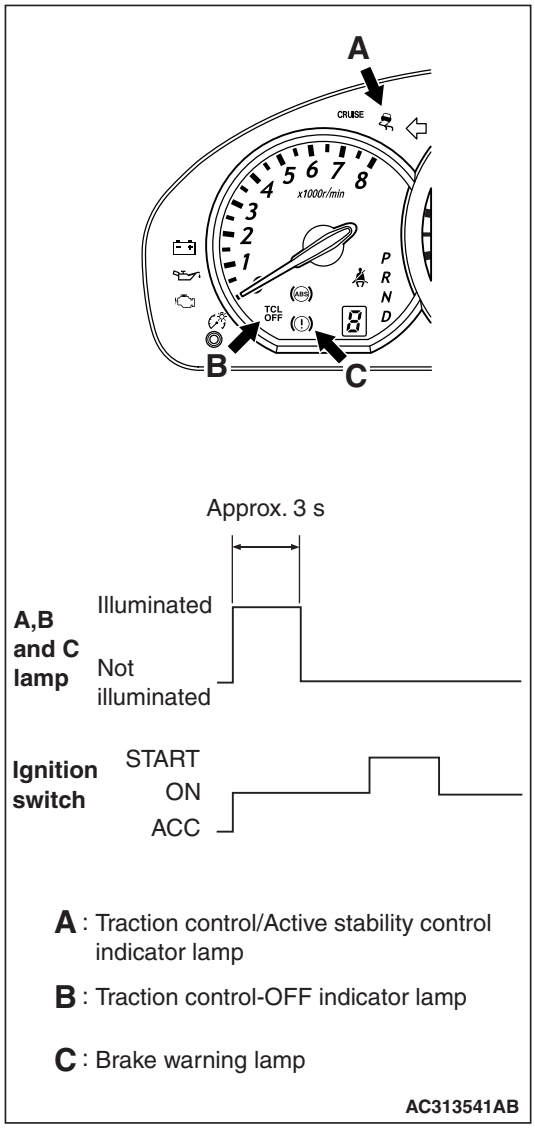
1. The TCL/ASC is a system which controls the brake pressure and engine power by means of the operation of the ECU. Accordingly, the following symptoms may occur at times, but these are a sign of normal TCL/ASC operation, and do not indicate a malfunction.

Phenomenon	Explanation of phenomenon
When the engine starts, a knocking sound can be heard coming from the engine compartment.	This sound occurs as a result of system operation checking, and is not a malfunction.
• Sound of the motor inside the ABS hydraulic unit operation. (whine) • Sound is the generated along with vibration of the brake pedal. (scraping) • When TCL/ASC operates, sound is generated from the vehicle chassis due to repeated brake application and release. (Thump: suspension; squeak: tyres)	This is the sound of normal system operation, and is not a malfunction.
Shocks are felt if the brake pedal is depressed when driving at low speed.	This is due to system operation checking (starting-of check when the vehicle speed reaches a certain number of km/h) and is not a malfunction.

2. For road surfaces such as snow-covered roads and gravel roads, the braking distance for vehicles with ABS can sometimes be longer than that for other vehicles. Accordingly, advise the customer to drive safely on such roads by lowering the vehicle speed and not being too overconfident.
3. Diagnosis detection condition can vary depending on the diagnosis code. Make sure that checking requirements listed in the "Comment" are satisfied when checking the trouble symptom again.

TCL/ASC INDICATOR LAMP, TCL OFF INDICATOR LAMP, BRAKE WARNING LAMP INSPECTION

M1355009600013



Check that the TCL/ASC indicator lamp, TCL OFF indicator lamp and brake warning lamp illuminates as follows.

1. When the ignition switch is turned to the "ON" position, the TCL/ASC indicator lamp, TCL OFF indicator lamp and brake warning lamp illuminates for approximately 3 seconds and then switches off.
2. When the voltage is restored by operating the starter motor, the TCL/ASC indicator lamp and the TCL OFF indicator lamp may illuminate.
3. If the illumination is other than the above, check the diagnosis codes.

NOTE: For more information about warning lamp, refer to GROUP 35B P.35B-7.

DIAGNOSTIC FUNCTION

M1355001000028

HOW TO READ DIAGNOSIS CODE

Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to read diagnosis code P.00-5.

ERASING DIAGNOSIS CODE

Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to read diagnosis code P.00-5.

DIAGNOSIS CODE CHART

M1355001100036

⚠ CAUTION

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

Follow the inspection chart that is appropriate for the diagnosis code.

<ABS/TCL/ASC DIAGNOSIS CODE>

Diagnosis code No.	Inspection item	Diagnostic content	Reference page
C1200	Front right wheel speed sensor	Open circuit or short circuit	P.35C-9
C1205	Front left wheel speed sensor		
C1210	Rear right wheel speed sensor		
C1215	Rear left wheel speed sensor		
C1201	Front right wheel speed sensor		P.35C-23
C1206	Front left wheel speed sensor		
C1211	Rear right wheel speed sensor		
C1216	Rear left wheel speed sensor		

Diagnosis code No.	Inspection item	Diagnostic content	Reference page
C1226	Control solenoid valve (FR) pressure holding system		P.35C-36
C1231	Control solenoid valve (FR) decompressing system		
C1236	Control solenoid valve (FL) pressure holding system		
C1241	Control solenoid valve (FL) pressure reducing system		
C1246	Control solenoid valve (RR) pressure holding system		
C1251	Control solenoid valve (RR) pressure reducing system		
C1256	Control solenoid valve (RL) pressure holding system		
C1261	Control solenoid valve (RL) decompressing system		
C1271	Motor system		P.35C-42
C1276	Valve relay system		P.35C-47
C1300	Front-right cut valve (Primary)		P.35C-36
C1305	Front-right suction valve (Primary)		P.35C-36
C1310	Front-left cut valve (secondly)		P.35C-36
C1315	Front-left suction valve (secondly)		P.35C-36
C1340	Abnormal stop lamp switch signal		P.35C-52
C1361	Abnormal pressure sensor characteristics		P.35C-60
C1364	Pressure sensor malfunction		P.35C-60
C1366	Lateral G sensor signal malfunction		P.35C-62
C1371	Yaw late sensor signal malfunction		P.35C-62
C1377	Combination sensor communication abnormality		P.35C-72
C1505	Steering wheel sensor abnormality (detected at TCL/ASC-ECU-side)		P.35C-81
C1506	Steering wheel sensor abnormality (self-detection at steering wheel sensor-side)		P.35C-81
C1607	TCL/ASC-ECU failure		P.35C-86
C1640	Improperly installed TCL/ASC-ECU		P.35C-87
C1860	High voltage at TCL/ASC-ECU power supply (18.0±1.0V or more)		P.35C-89
C1861	Low voltage at TCL/ASC-ECU power supply (9.7±0.3V or less, 8.0±0.5V or more)		P.35C-89
	TCL/ASC-ECU power supply low voltage (8.0±0.5 V or below) <when vehicle stopped>		
C1864	Combination sensor power supply abnormality		P.35C-96
U1073	Bus-off		P.35C-104
U1100	Engine-related CAN Timeout error		P.35C-106
U1101*	A/T-related CAN Timeout error		P.35C-109
U1104	Steering wheel sensor CAN Timeout error		P.35C-112
U1120	Engine malfunction detected		P.35C-114

<STEERING WHEEL SENSOR DIAGNOSIS CODE>

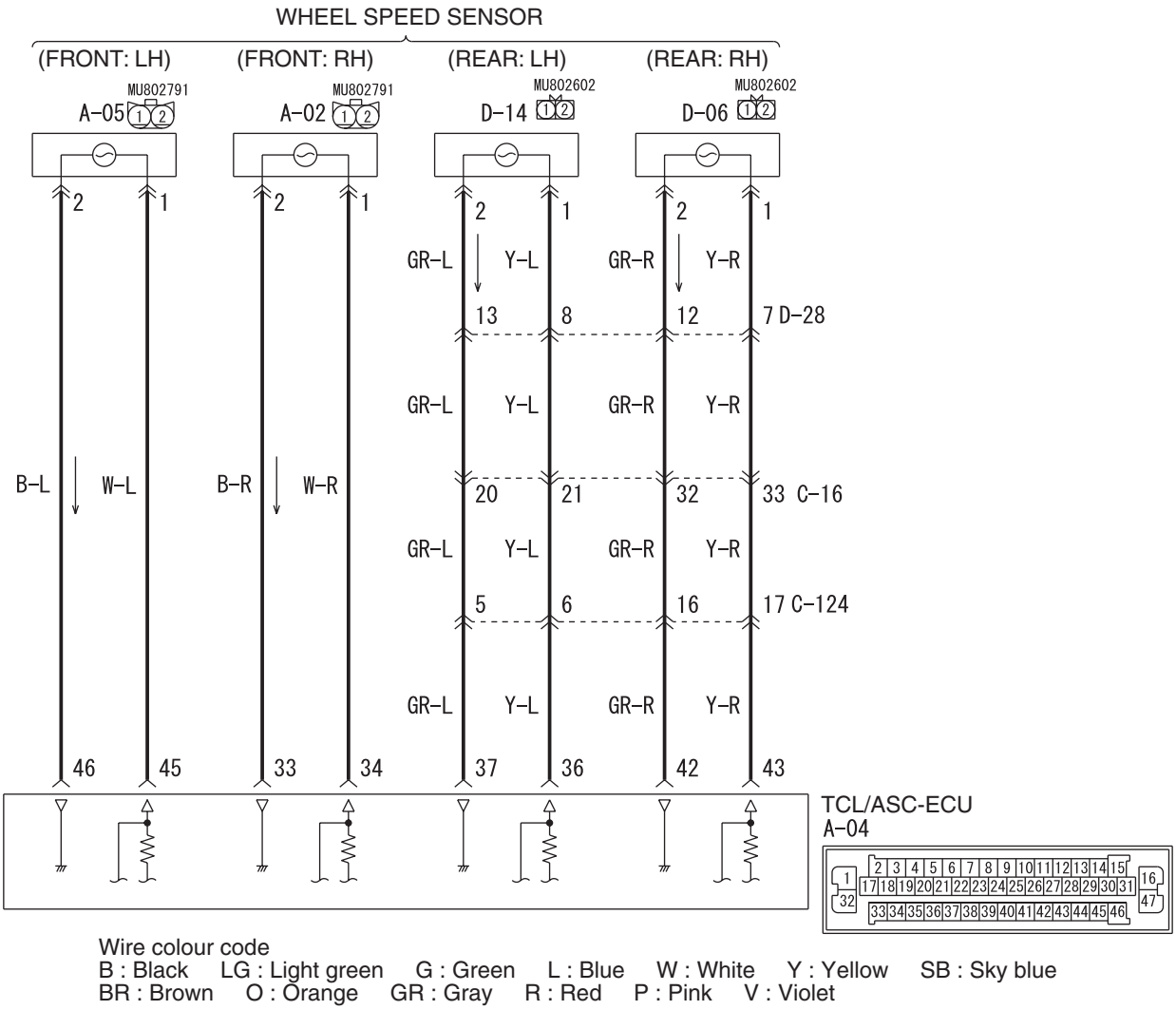
Diagnosis code No.	Inspection item	Reference page
C1551	Improper output voltage of steering wheel sensor	P.35C-118
C1552	Abnormal steering wheel sensor output pattern	P.35C-118
C1553	Abnormal optical sensor output pattern	P.35C-118
C1554	Steering wheel sensor speed is out of range	P.35C-118
C1555	Steering wheel sensor out of range	P.35C-118
C1608	EEPROM failure	P.35C-118
U1073	Bus-off	P.35C-119

*: Vehicles with A/T only

DIAGNOSTIC TROUBLE CODE PROCEDURES <TCL/ASC-ECU>

Code No.C1200: Front Right Wheel Speed Sensor (Open Circuit or Short Circuit)
Code No.C1205: Front Left wheel Speed Sensor (Open Circuit or Short Circuit)
Code No.C1210: Rear Right wheel Speed Sensor (Open Circuit or Short Circuit)
Code No.C1215: Rear Left wheel Speed Sensor (Open Circuit or Short Circuit)

Wheel Speed Sensor Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

W4X35E000A

⚠ CAUTION
If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Diagnose the CAN bus lines before the diagnosis codes (Refer to GROUP 54D, CAN bus-line diagnostic flow P.54D-9).

OPERATION

- Wheel speed sensor is a kind of a pulse alternator. It consists of encoders (a plate on which north and south pole sides of the magnets are arranged alternately) for detecting wheel speed which rotates at the same speed of the wheels and speed sensors. This sensor outputs frequency pulse signals in proportion to wheel speed.

- The wheel speed sensors transmit the frequency of the current pulses and the amount of voltage generated by each pulse to the TCL/ASC-ECU.

DIAGNOSIS CODE SET CONDITIONS

Diagnosis codes No.C1200, C1205, 1210 and 1215 are set when breakage of the wires of the four wheel speed sensors occur.

PROBABLE CAUSES

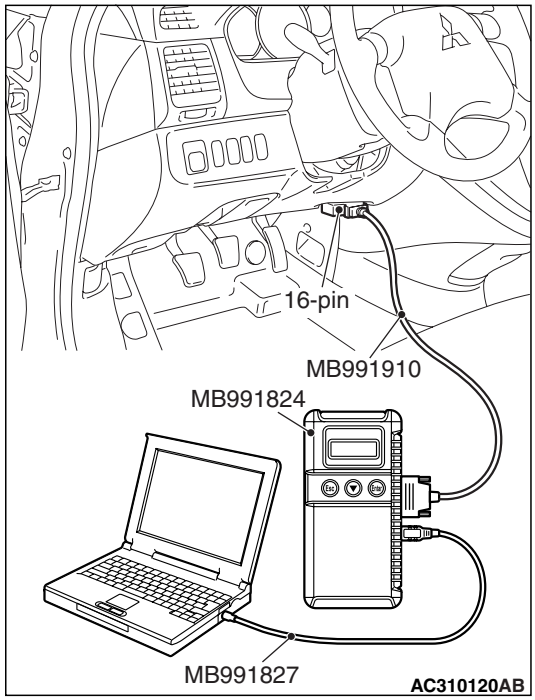
The most likely causes for these diagnosis codes to set are:

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

DIAGNOSIS

STEP 1. MUT-III CAN bus diagnostics

⚠ CAUTION



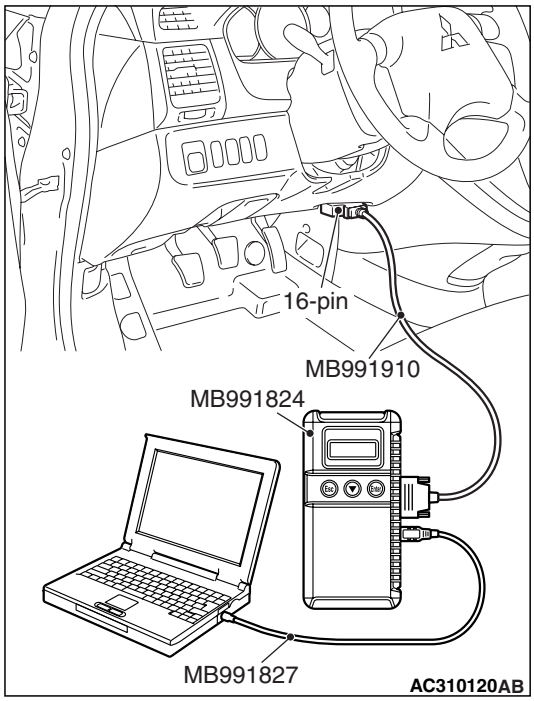
Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

(1) Connect MUT-III to the 16-pin diagnosis connector.
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result normal?
YES : Go to Step 3
NO : Repair the CAN bus line (Refer to GROUP 54D, CAN bus line Diagnostic flow P.54D-9). Then go to Step 2.

STEP 2. Check whether the diagnosis code is reset.

⚠ CAUTION



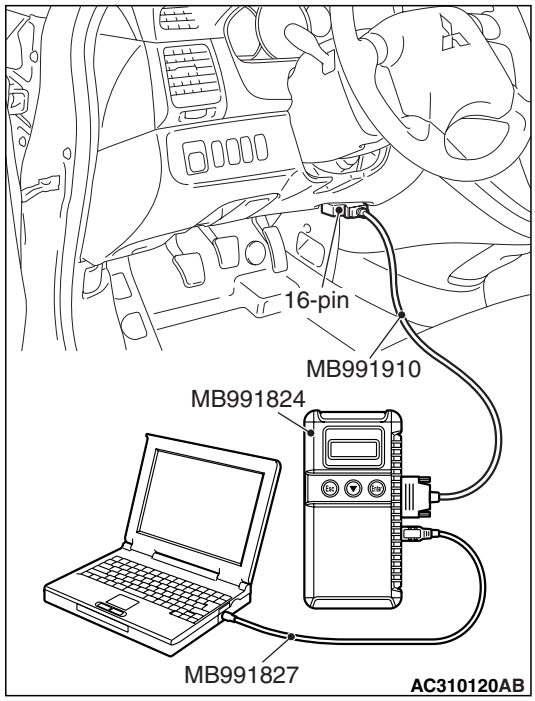
Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

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

Q: Is code No.C1200, C1205, C1210 or C1215 set?
YES : Go to Step 3
NO : The procedure is complete.

STEP 3. MUT-III data list

⚠ CAUTION



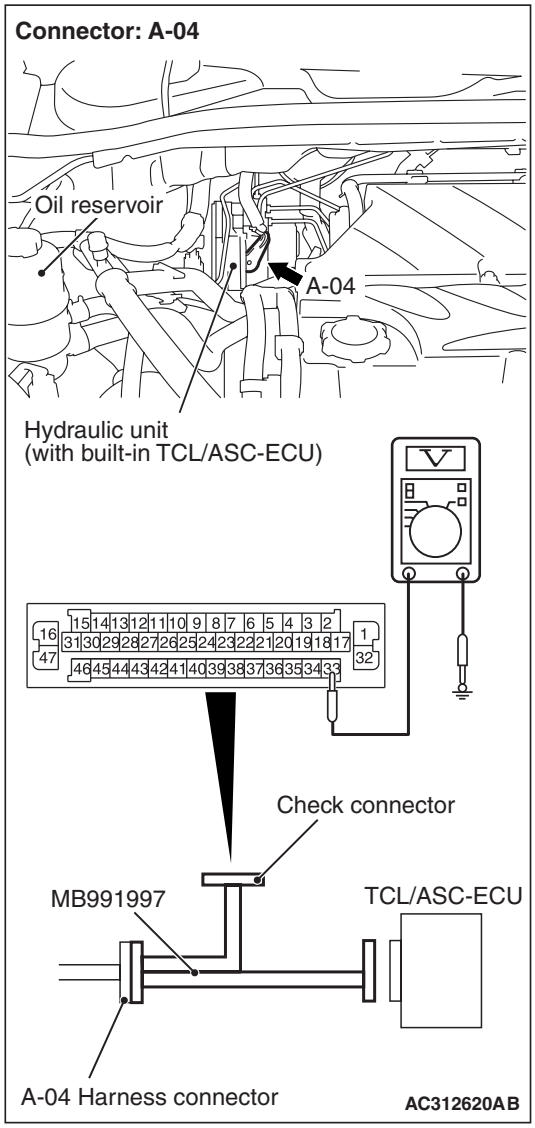
Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

(1) Connect MUT-III to the 16-pin diagnosis connector.
(2) Start the engine.
(3) Set MUT-III to the data reading mode, and check the data list items by driving the vehicle.
- Item 01 (Code No.C1200 is set): Front right wheel speed sensor
- Item 02 (Code No.C1205 is set): Front left wheel speed sensor
- Item 03 (Code No.C1210 is set): Rear right wheel speed sensor
- Item 04 (Code No.C1215 is set): Rear left wheel speed sensor

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

Q: Does the speedometer indication match the MUT-III indication?
YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5.
NO : Go to Step 4.

STEP 4. Voltage measurement at TCL/ASC-ECU connector A-04.



(1) Disconnect the connector A-04, and connect special tool ABS Check Harness (MB991997) to the wiring harness-side connector.
NOTE: Do not connect special tool ABS Check Harness (MB991997) to the TCL/ASC-ECU.
(2) Turn the ignition switch to the "ON" position.
(3) Measure the voltage between the relevant signal and earth terminals in the wheel speed sensor

circuit and body earth.

OK: less than 1V or less

- Code No.C1200 is set: Between signal terminal 33 and body earth, and between earth terminal 34 and body earth
- Code No.C1205 is set: Between signal terminal 45 and body earth, and between earth terminal 46 and body earth
- Code No.C1210 is set: Between signal terminal 42 and body earth, and between earth terminal 43 and body earth
- Code No.C1215 is set: Between signal terminal 36 and body earth, and between earth terminal 37 and body earth

Q: Is the check result normal?

YES : Go to Step 5.

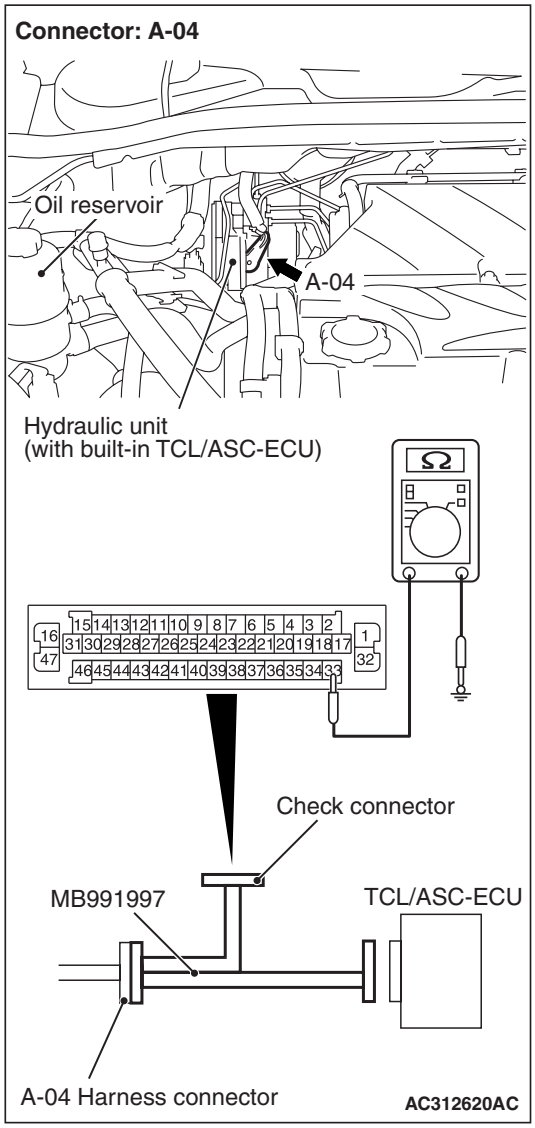
NO (When the voltage between terminal 33 or 34 and body earth measures more than 1 V) : Go to Step 6.

NO (When the voltage between terminal 45 or 46 and body earth measures more than 1 V) : Go to Step 8.

NO (When the voltage between terminal 42 or 43 and body earth measures more than 1 V) : Go to Step 10.

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

STEP 5. Resistance measurement at TCL/ASC-ECU connector A-04.



(1) Disconnect the connector A-04, and connect special tool ABS Check Harness (MB991997) to the wiring harness-side connector.

NOTE: Do not connect special tool ABS Check Harness (MB991997) to the TCL/ASC-ECU.

(2) Measure the resistance between the relevant signal and earth terminals in the wheel speed

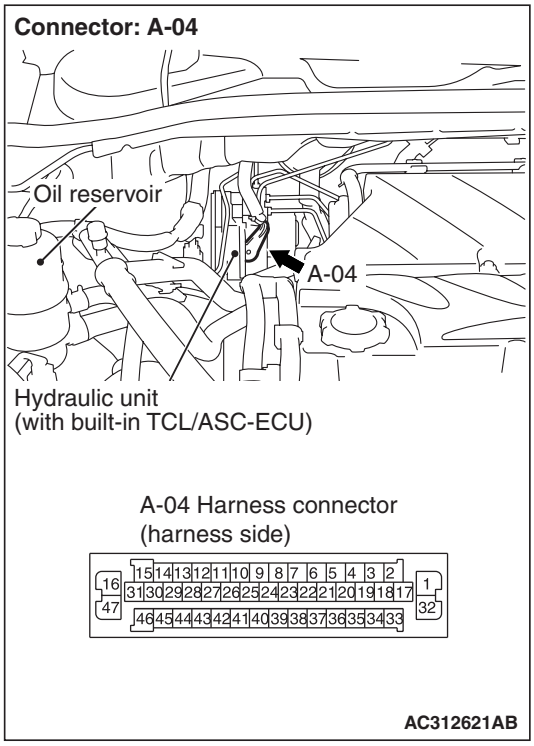
sensor circuit and body earth.

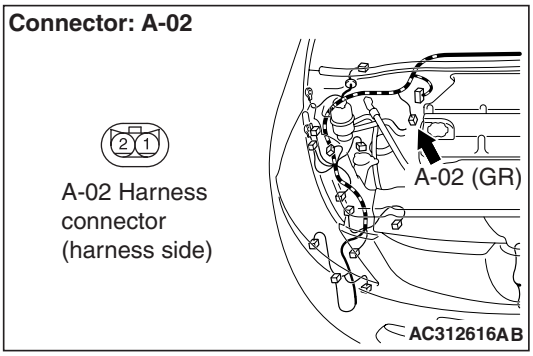
OK: No continuity

- Code No.C1200 is set: Between signal terminal 33 and body earth, and between earth terminal 34 and body earth
- Code No.C1205 is set: Between signal terminal 45 and body earth, and between earth terminal 46 and body earth
- Code No.C1210 is set: Between signal terminal 42 and body earth, and between earth terminal 43 and body earth
- Code No.C1215 is set: Between signal terminal 36 and body earth, and between earth terminal 37 and body earth

Q: Is the check result normal?
YES : Go to Step 14.
NO (Continuity exists between terminal 33 or terminal 34 and body earth) : Go to Step 6.
NO (Continuity exists between terminal 45 or terminal 46 and body earth) : Go to Step 8.
NO (Continuity exists between terminal 42 or terminal 43 and body earth) : Go to Step 10.
NO (Continuity exists between terminal 36 or terminal 37 and body earth) : Go to Step 12.

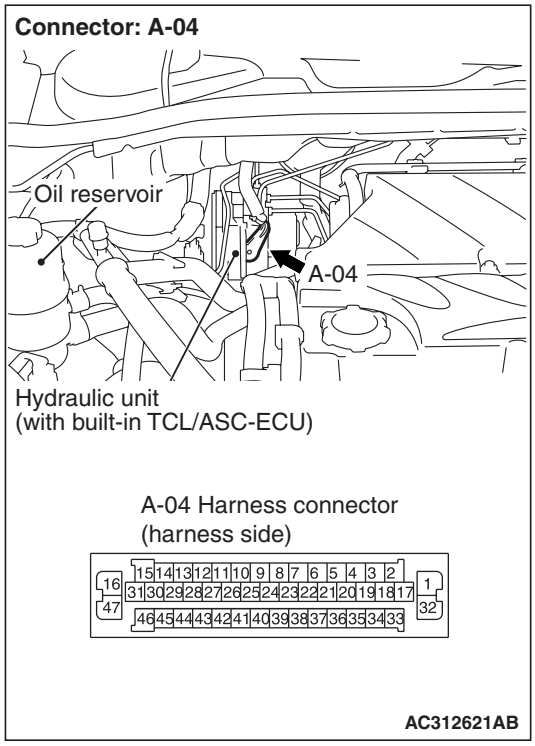
STEP 6. Check TCL/ASC-ECU connector A-04 and wheel speed sensor <front: RH> connector A-02 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

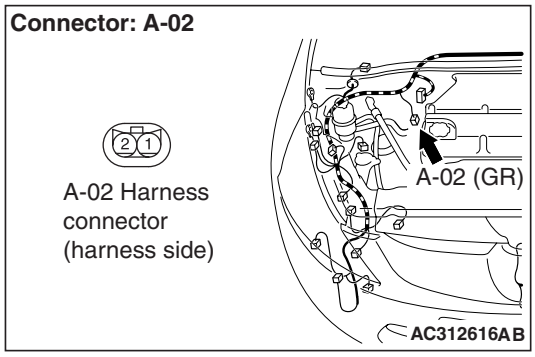




Q: Is the check result normal?
YES : Go to Step 7.
NO : Repair or replace the damaged component(s). Then go to Step 16.

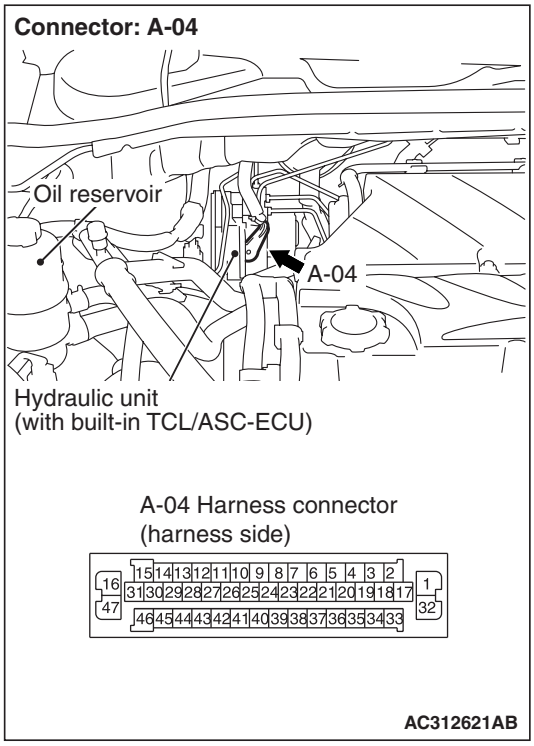
STEP 7. Check the harness wires between TCL/ASC-ECU connector A-04 (terminal 33, 34) and wheel speed sensor <front: RH> connector A-02 (terminal 2, 1).

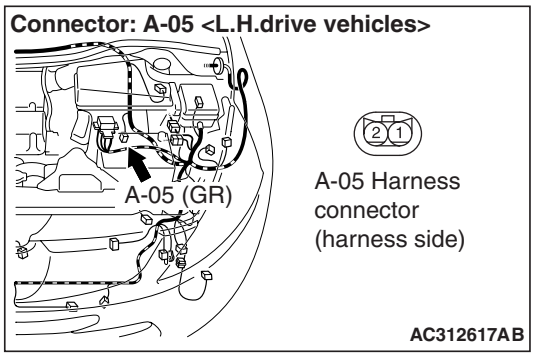


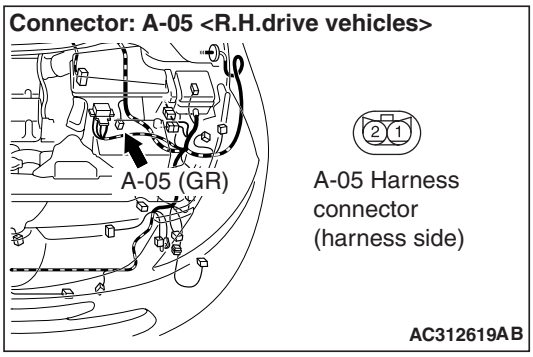


Q: Is the check result normal?
YES : Go to Step 14.
NO : Repair the wiring harness. Then go to Step 16.

STEP 8. Check TCL/ASC-ECU connector A-04 and wheel speed sensor <front: LH> connector A-05 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

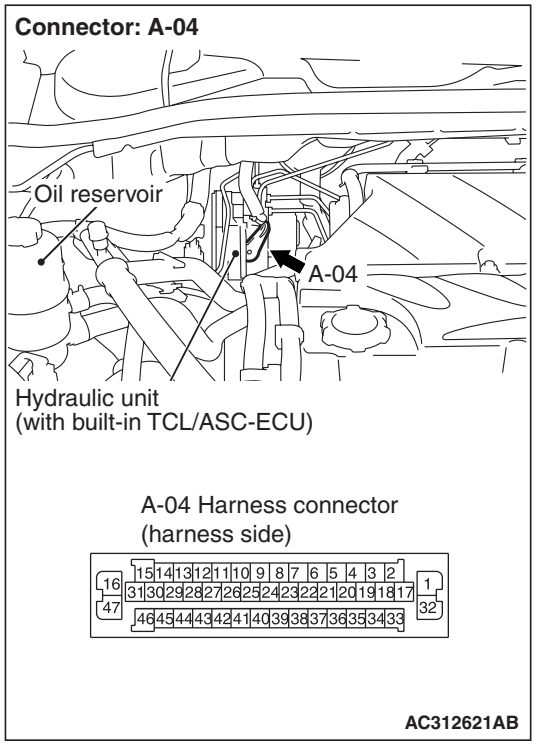


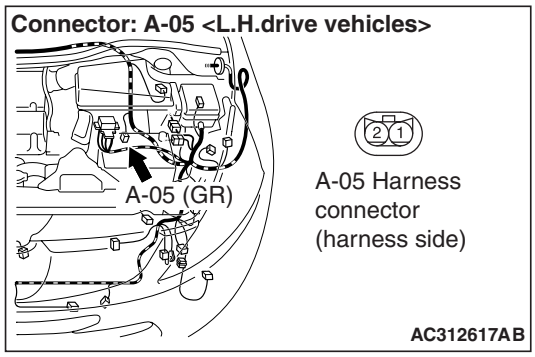


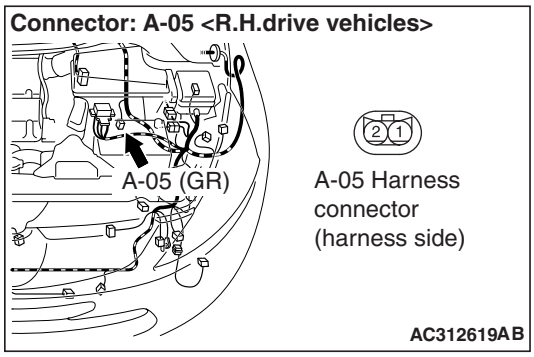


Q: Is the check result normal?
YES : Go to Step 9.
NO : Repair or replace the damaged component(s). Then go to Step 16.

STEP 9. Check the harness wires between TCL/ASC-ECU connector A-04 (terminal 45, 46) and wheel speed sensor <front: LH> connector A-05 (terminal 1, 2).



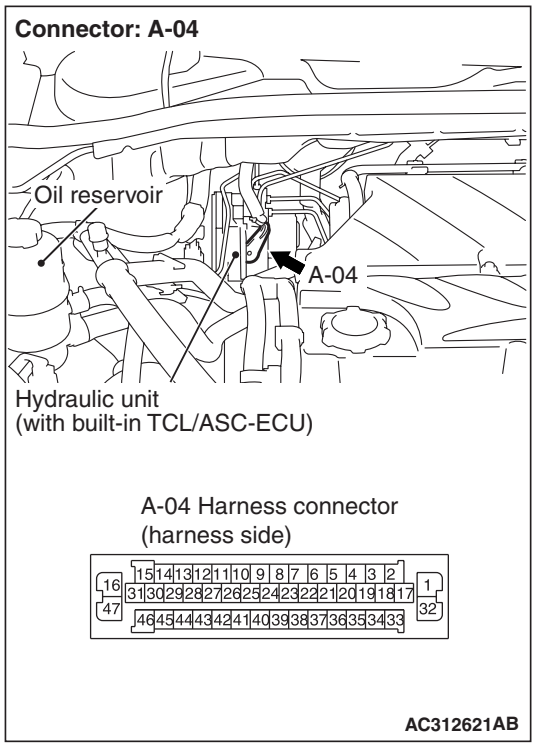


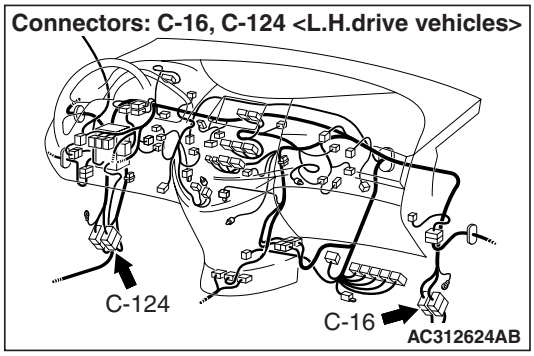


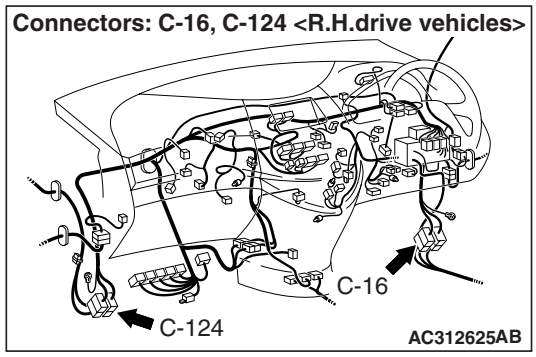
Q: Is the check result normal?

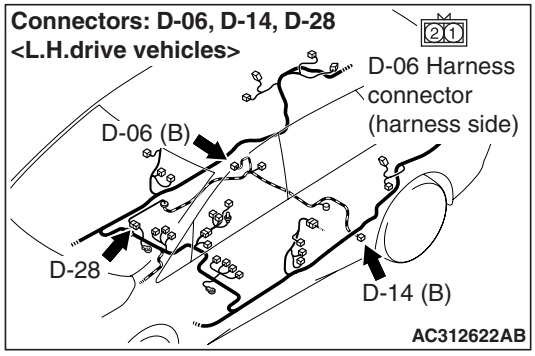
YES : Go to Step 14.
NO : Repair the wiring harness. Then go to Step 16.

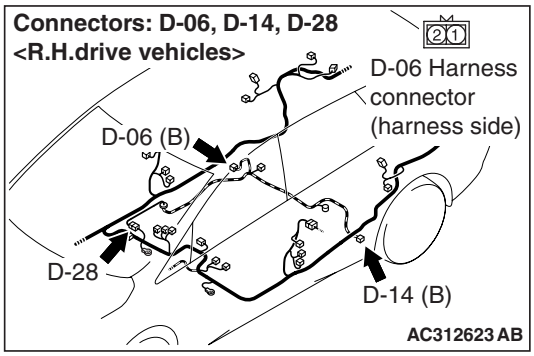
STEP 10. Check TCL/ASC-ECU connector A-04, intermediate connector C-16, C-124, D-28 and wheel speed sensor <rear: RH> connector D-06 for loose, corroded or damaged terminals, or terminals pushed back in the connector.





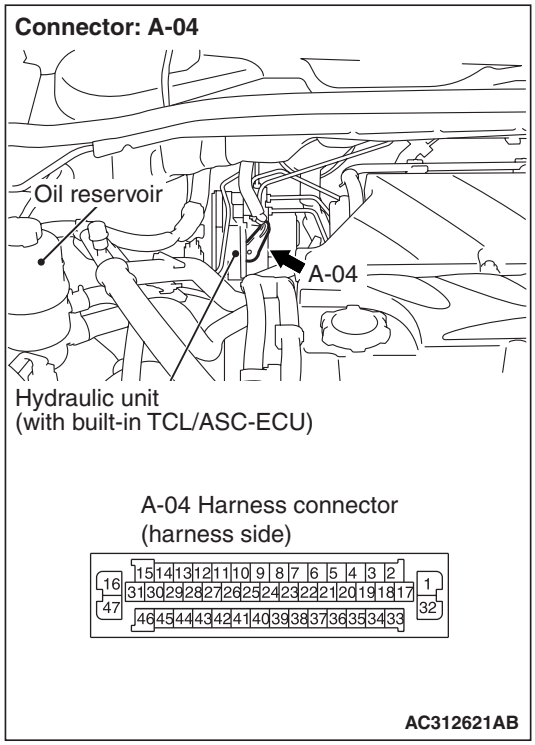


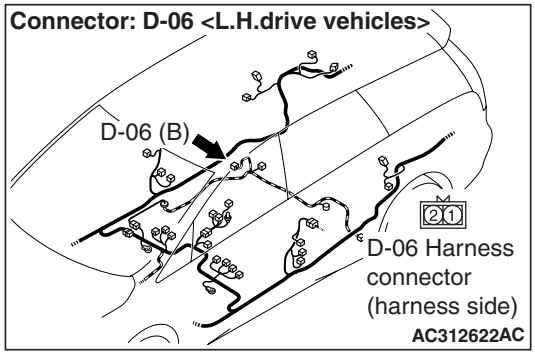


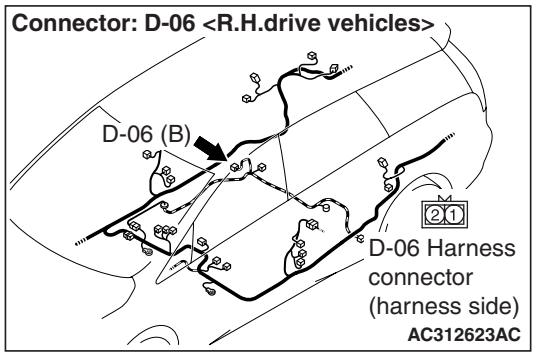


Q: Is the check result normal?
YES : Go to Step 11.
NO : Repair or replace the damaged component(s). Then go to Step 16.

STEP 11. Check the harness wires between TCL/ASC-ECU connector A-04 (terminal 42, 43) and wheel speed sensor <rear: RH> connector D-06 (terminal 2, 1).





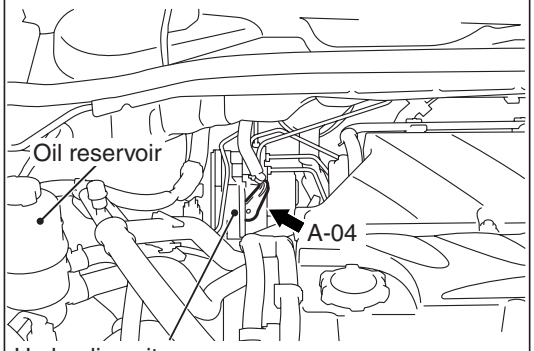


Q: Is the check result normal?

YES : Go to Step 14.
NO : Repair the wiring harness. Then go to Step 16.

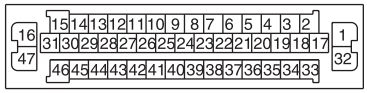
STEP 12. Check TCL/ASC-ECU connector A-04, intermediate connector C-16, C-124, D-28 and wheel speed sensor <rear: LH> connector D-14 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Connector: A-04



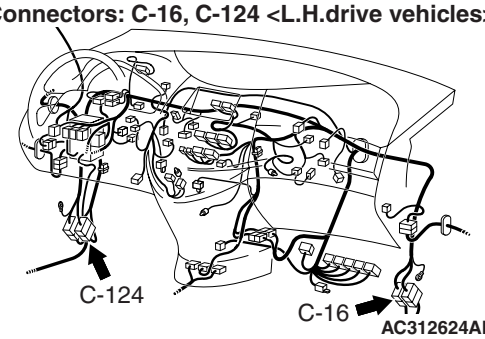
Hydraulic unit
(with built-in TCL/ASC-ECU)

A-04 Harness connector
(harness side)



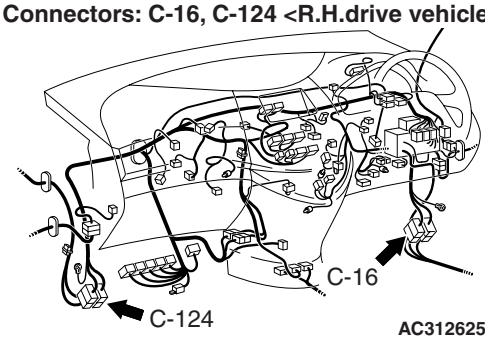
AC312621AB

Connectors: C-16, C-124 <L.H.drive vehicles>



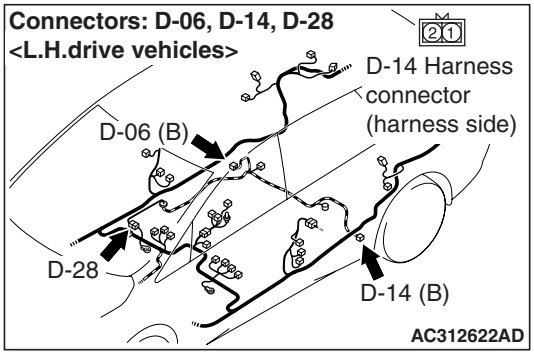
AC312624AB

Connectors: C-16, C-124 <R.H.drive vehicles>



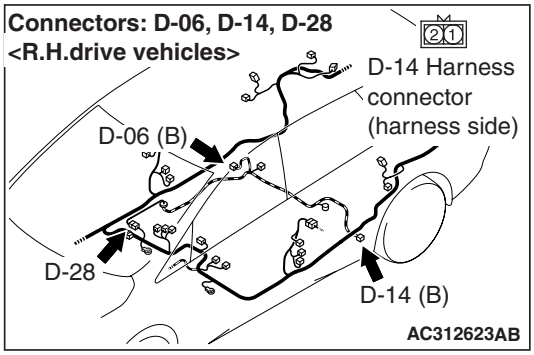
AC312625AB

Connectors: D-06, D-14, D-28 <L.H.drive vehicles>



AC312622AD

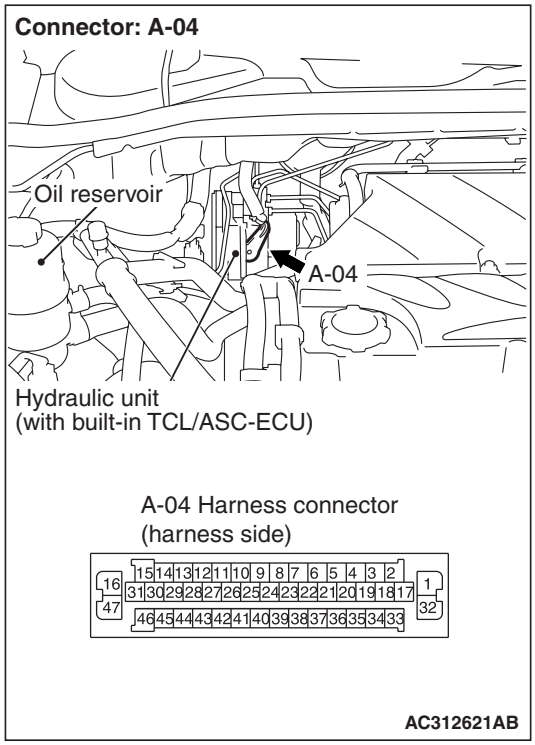
Connectors: D-06, D-14, D-28 <R.H.drive vehicles>

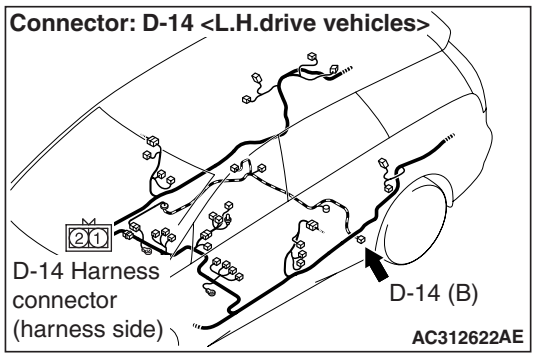


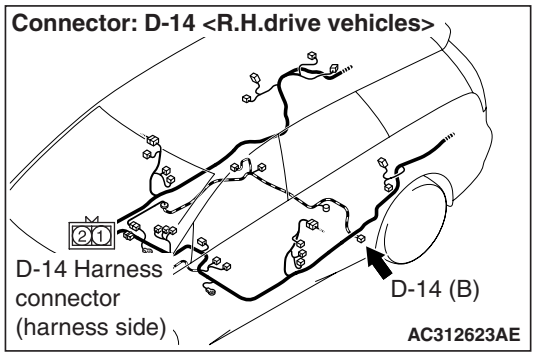
AC312623AB

Q: Is the check result normal?
YES : Go to Step 13.
NO : Repair or replace the damaged component(s). Then go to Step 16.

STEP 13. Check the harness wires between TCL/ASC-ECU connector A-04 (terminal 36, 37) and wheel speed sensor <rear: LH> connector D-14 (terminal 1, 2).







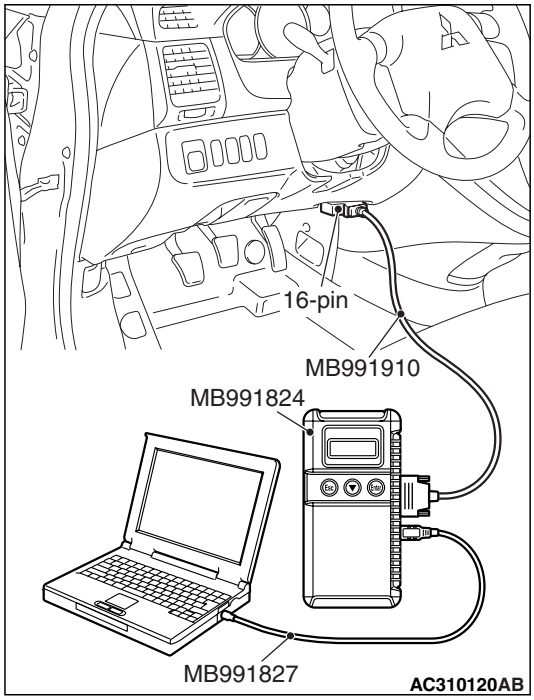
Q: Is the check result normal?
YES : Go to Step 14.
NO : Repair the wiring harness. Then go to Step 16.

STEP 14. Inspect the wheel speed sensor.
Check the wheel speed sensor relevant to the diagnosis code. For the applicable inspection procedure, refer to P.35B-81.

- When code No.C1200 is set: Front right wheel speed sensor
- When code No.C1205 is set: Front left wheel speed sensor
- When code No.C1210 is set: Rear right wheel speed sensor
- When code No.C1215 is set: Rear left wheel speed sensor

Q: Is the check result normal?
YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5.
NO : Replace the wheel speed sensor. Then go to Step 16.

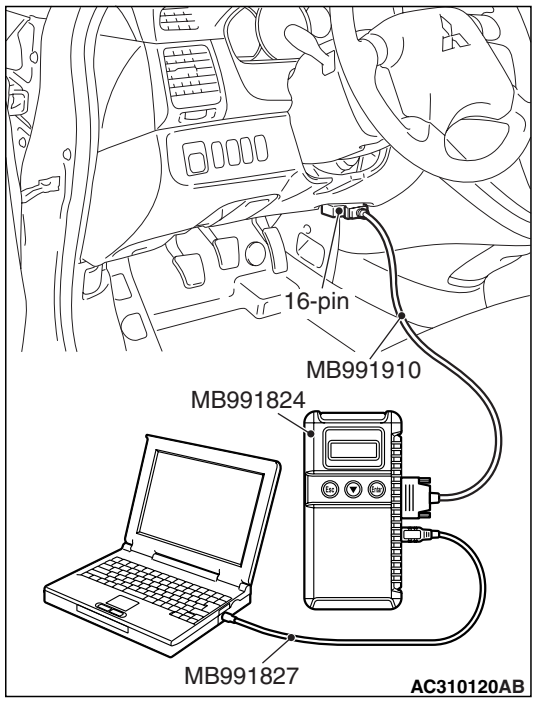
STEP 15. Check whether the diagnosis code is reset.



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

Q: Is code No.C1200, C1205, C1210 or C1215 set?
YES : Replace the hydraulic unit (integrated with TCL/ASC-ECU). Then go to Step 16.
NO : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5.

STEP 16. Check whether the diagnosis code is reset.

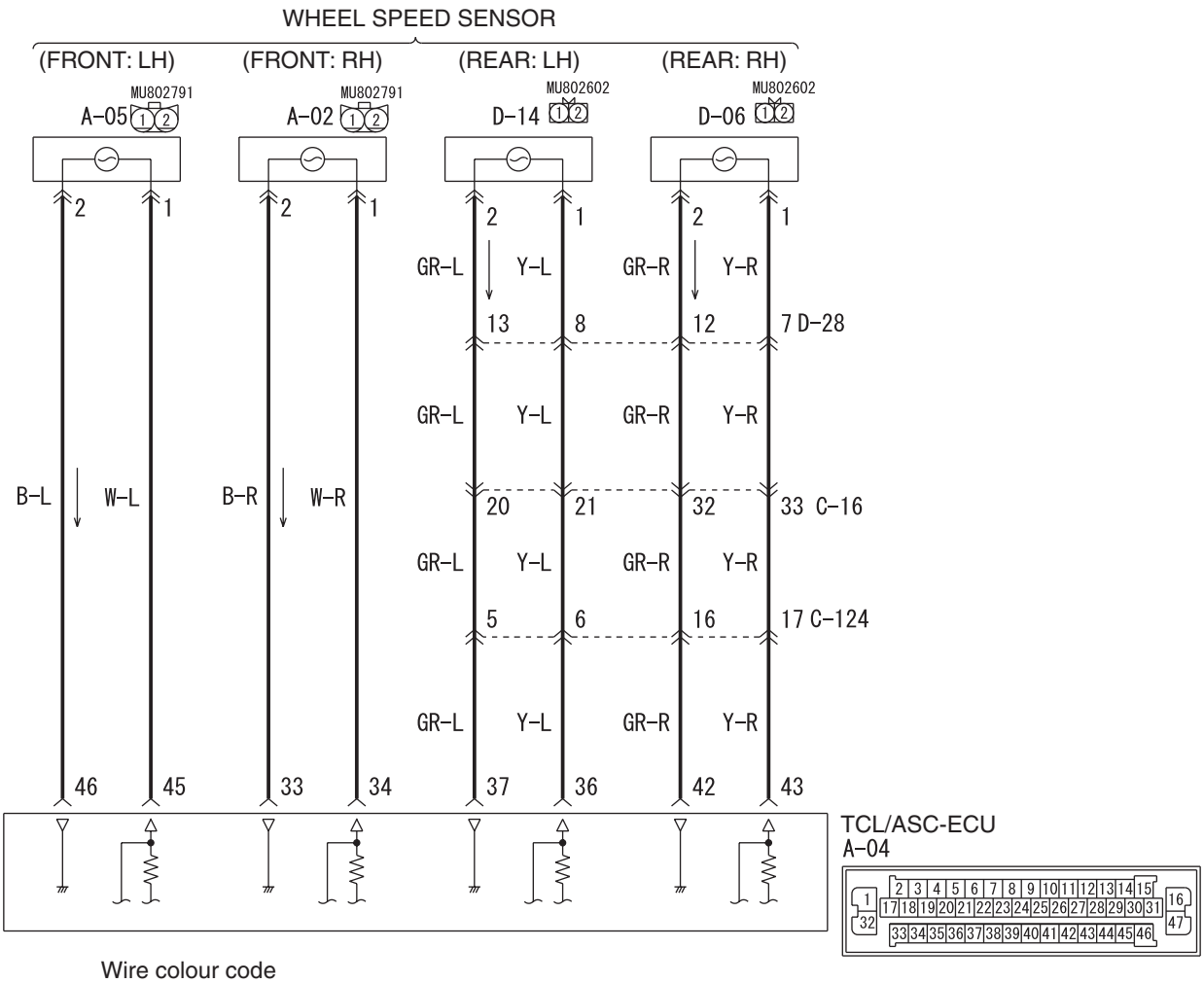


(1) Turn the ignition switch to the "ON" position.
(2) After repair, drive the vehicle at 20km/h or more for 30 seconds or more.
(3) Erase the diagnosis code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Turn the ignition switch to the "ON" position.
(6) After repair, drive the vehicle at 20km/h or more for 30 seconds or more.
(7) Check if the diagnosis code is set.
(8) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is code No.C1200, C1205, C1210 or C1215 set?
YES : Repeat the troubleshooting from Step 1.
NO : The procedure is complete.

Code No.C1201: Front Right Wheel Speed Sensor
Code No.C1206: Front Left wheel Speed Sensor
Code No.C1211: Rear Right wheel Speed Sensor
Code No.C1216: Rear Left wheel Speed Sensor

Wheel Speed Sensor Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

W4X35E000A

⚠ CAUTION
If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Diagnose the CAN bus lines before the diagnosis codes (Refer to GROUP 54D, CAN bus-line diagnostic flow P.54D-9).

OPERATION

- Wheel speed sensor is a kind of a pulse alternator. It consists of encoders (a plate on which north and south pole sides of the magnets are arranged alternately) for detecting wheel speed which rotates at the same speed of the wheels and speed sensors. This sensor outputs frequency pulse signals in proportion to wheel speed.
- The wheel speed sensors transmit the frequency of the current pulses and the amount of voltage generated by each pulse to the TCL/ASC-ECU.

DIAGNOSIS CODE SET CONDITIONS

The TCL/ASC-ECU monitors the signals from each ABS sensor while the vehicle is being driven. If any faults below are found in these sensor signals, the ECU will set the relevant diagnosis code.

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

PROBABLE CAUSES

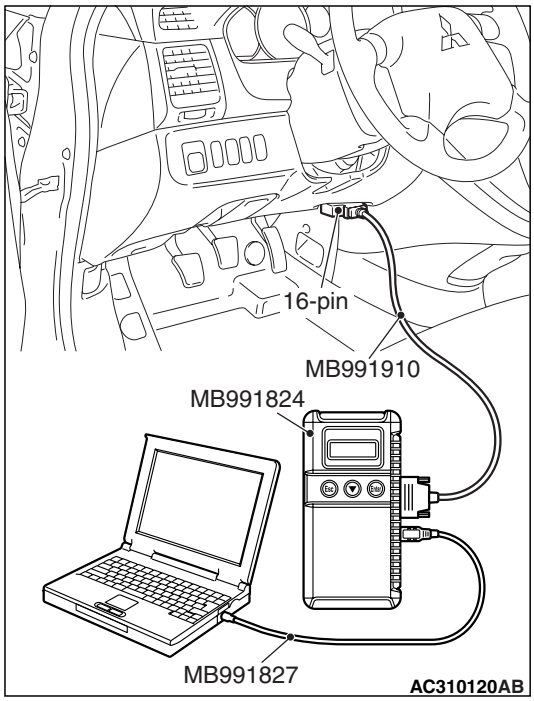
The most likely causes for these diagnosis codes to set are:

- Stiking metal shards to vehicle speed detection encoder
- Damage of vehicle speed detection encoder
- Incorrect installation of vehicle speed sensor
- Malfunction of vehicle speed sensor and encoder installing parts (bearing, knuckle)
- Malfunction of the wheel speed sensor
- Damaged wiring harness or connector
- Malfunction of the hydraulic unit (integrated with TCL/ASC-ECU)

DIAGNOSIS

STEP 1. MUT-III CAN bus diagnostics

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

(1) Connect MUT-III to the 16-pin diagnosis connector.
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

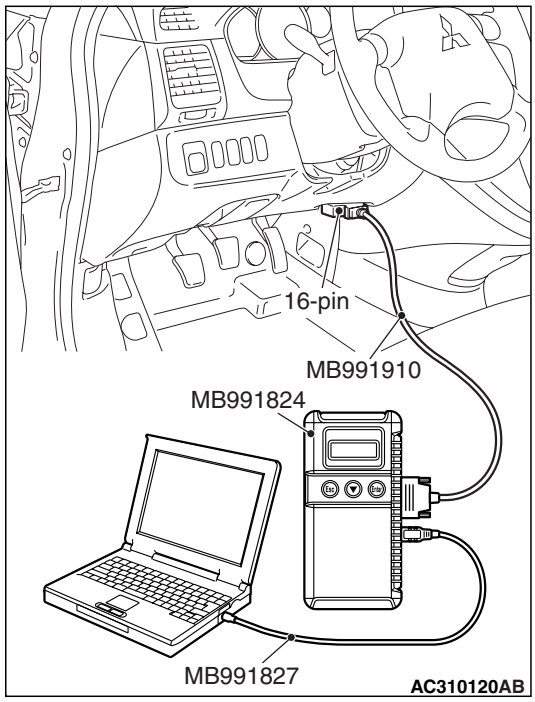
Q: Is the check result normal?

YES : Go to Step 3

NO : Repair the CAN bus line (Refer to GROUP 54D, CAN bus line Diagnostic flow P.54D-9). Then go to Step 2.

STEP 2. Check whether the diagnosis code is reset.

⚠ CAUTION



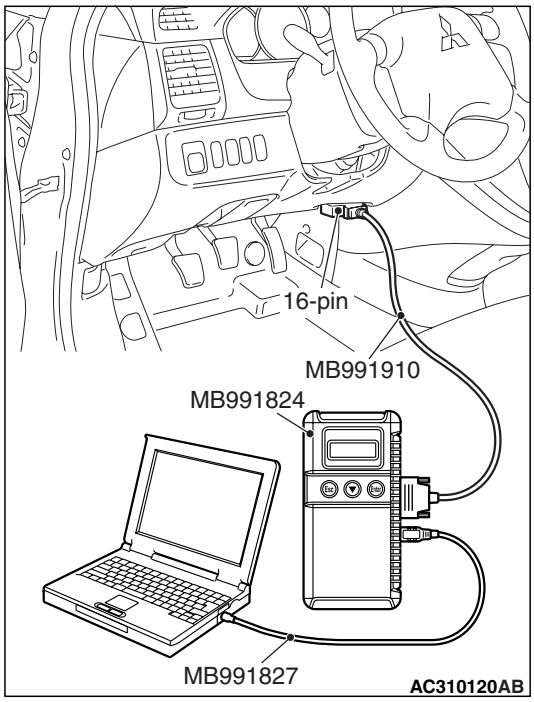
Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

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

Q: Is code No.C1201, C1206, C1211 and C1216 set?
YES : Go to Step 3.
NO : The procedure is complete.

STEP 3. Check whether the diagnosis code is reset.

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

Use MUT-III to check whether diagnosis codes No.C1200, C1205, C1210 and C1215 have been set simultaneously.

(1) Connect MUT-III to the 16-pin diagnosis connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check whether diagnosis codes No.C1200, C1205, C1210 or C1215 have been set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is codes No.C1200, C1205, C1210 or C1215 set?
YES : Carry out diagnosis relevant to diagnosis codes No.C1200, C1205, C1210 or C1215 (Refer to P.35B-9).
NO : Go to Step 4.

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

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

- Code No.C1201 is set: Front right wheel speed sensor
- Code No.C1206 is set: Front left wheel speed sensor
- Code No.C1211 is set: Rear right wheel speed sensor
- Code No.C1216 is set: Rear left wheel speed sensor

Q: Is the check result normal?

YES : Go to Step 5.

NO : Reinstall the wheel speed sensor correctly. Then go to Step 15.

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

Check the wheel speed sensor, which the diagnosis code indicates (Refer to P.35B-81).

- Code No.C1201 is set: Front right wheel speed sensor
- Code No.C1206 is set: Front left wheel speed sensor
- Code No.C1211 is set: Rear right wheel speed sensor
- Code No.C1216 is set: Rear left wheel speed sensor

Q: Is the check result normal?

YES : Go to Step 6.

NO : Replace the wheel speed sensor. Then go to Step 15.

STEP 6. Check the wheel bearing for looseness.

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

- Code No.C1201 is set: Check the front right wheel bearing (Refer to GROUP 26, On-vehicle service – Hub axial play check P.26-6).
- Code No.C1206 is set: Check the front left wheel bearing (Refer to GROUP 26, On-vehicle service – Hub axial play check P.26-6).
- Code No.C1211 is set: Check the rear right wheel bearing (Refer to GROUP 27, On-vehicle service – Wheel bearing axial play check P.27-3).
- Code No.C1216 is set: Check the rear left wheel bearing (Refer to GROUP 27, On-vehicle service – Wheel bearing axial play check P.27-3).

Q: Is the check result normal?

YES : Go to Step 7.

NO (front hub axial play is not within the standard value) : Replace the front hub assembly (Refer to GROUP 26, Front axle hub assembly P.26-8). Then go to Step 15.

NO (rear wheel bearing axial play is not within the standard value) : Replace the rear hub assembly (Refer to GROUP 27, Rear axle hub assembly P.27-5). Then go to Step 15.

STEP 7. Check the vehicle speed detection encoder.

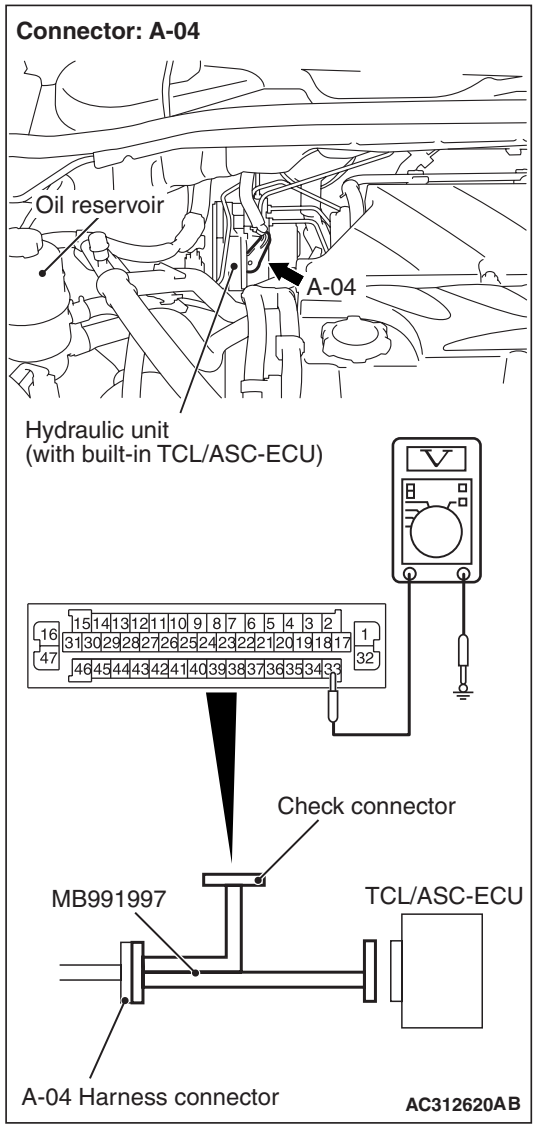
Check the vehicle speed detection encoder, which diagnosis code indicates, for foreign material or deformation.

- Code No.C1201 is set: Front right wheel speed sensor
- Code No.C1206 is set: Front left wheel speed sensor
- Code No.C1211 is set: Rear right wheel speed sensor
- Code No.C1216 is set: Rear left wheel speed sensor

Q: Is the check result normal?

YES : Go to Step 8.
NO (front hub axial play is not within the standard value) : If the vehicle speed detection encoder is contaminated with foreign material, clean it. If the front hub assembly is deformed, replace it (Refer to GROUP 26, Front axle hub assembly P.26-8). Then go to Step 15.
NO (rear wheel bearing axial play is not within the standard value) : If the vehicle speed detection encoder is contaminated with foreign material, clean it. If the rear axle hub assembly is deformed, replace it (Refer to GROUP 27, Rear axle hub assembly P.27-5). Then go to Step 15.

STEP 8. Voltage measurement at TCL/ASC-ECU connector A-04.



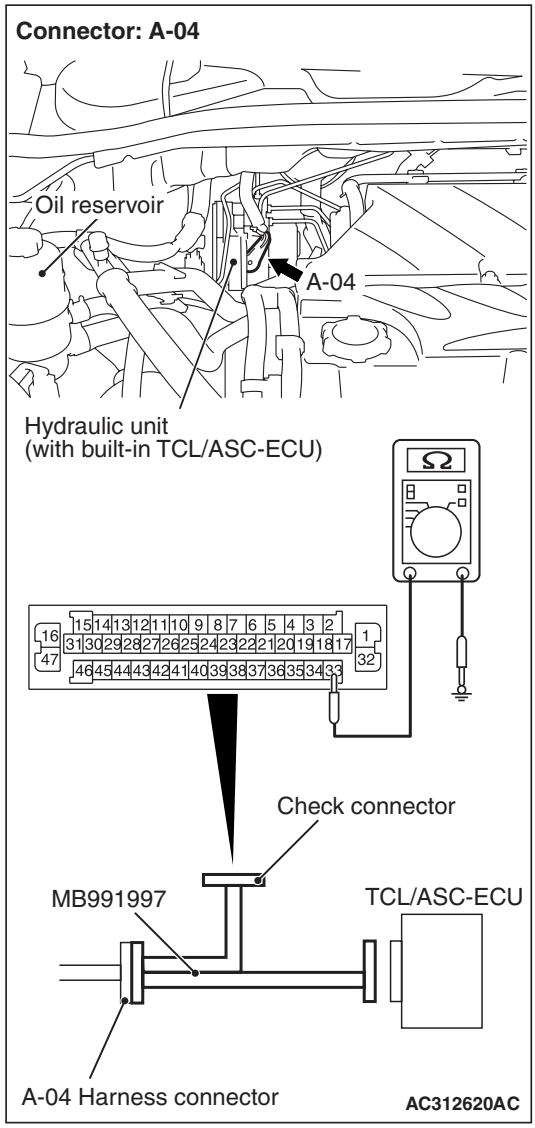
(1) Disconnect the connector A-04, and connect special tool ABS Check Harness (MB991997) to the wiring harness-side connector.
NOTE: Do not connect special tool ABS Check Harness (MB991997) to the TCL/ASC-ECU.
(2) Turn the ignition switch to the "ON" position.
(3) Measure the voltage between the relevant signal and earth terminals in the wheel speed sensor circuit and body earth.

OK: Less than 1V

- Code No.C1201 is set: Between signal terminal 33 and body earth, and between earth terminal 34 and body earth
- Code No.C1206 is set: Between signal terminal 45 and body earth, and between earth terminal 46 and body earth
- Code No.C1211 is set: Between signal terminal 42 and body earth, and between earth terminal 43 and body earth
- Code No.C1216 is set: Between signal terminal 36 and body earth, and between earth terminal 37 and body earth

Q: Is the check result normal?
YES : Go to Step 9.
NO (When the voltage between terminal 33 or 34 – and body earth measures more than 1 V) : Go to Step 10.
NO (When the voltage between terminal 45 or 46 – and body earth measures more than 1 V) : Go to Step 11.
NO (When the voltage between terminal 42 or 43 – and body earth measures more than 1 V) : Go to Step 12.
NO (When the voltage between terminal 36 or 37 – and body earth measures more than 1 V) : Go to Step 13.

STEP 9. Resistance measurement at TCL/ASC-ECU connector A-04.



(1) Disconnect the connector A-04, and connect special tool ABS Check Harness (MB991997) to the wiring harness-side connector.

NOTE: Do not connect special tool ABS Check Harness (MB991997) to the TCL/ASC-ECU.

(2) Measure the resistance between the relevant signal and earth terminals in the wheel speed sensor circuit and body earth.

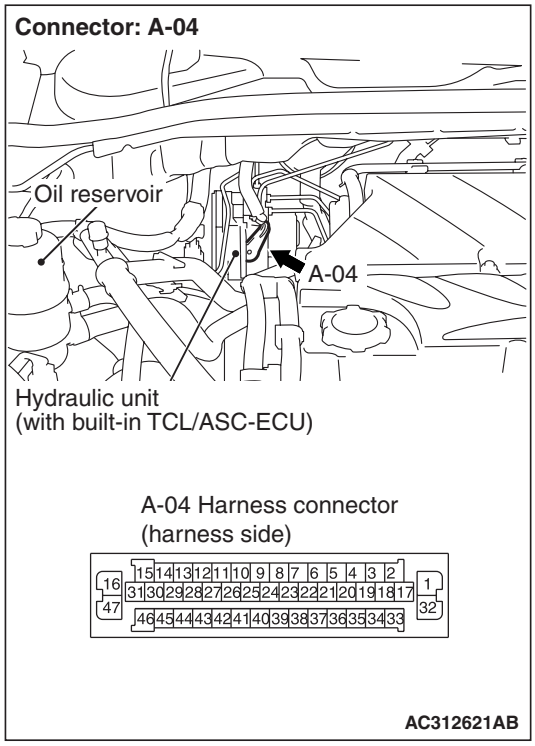
OK: No continuity

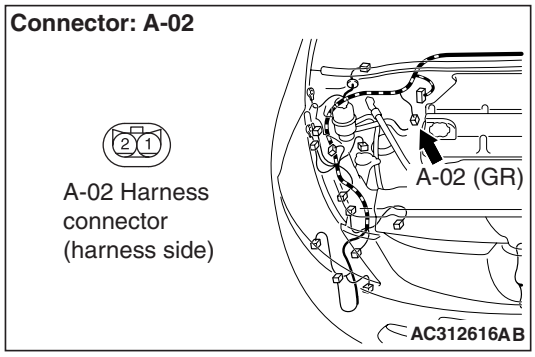
- Code No.C1201 is set: Between signal terminal 34 and body earth, and between earth terminal 33 and body earth
- Code No.C1206 is set: Between signal terminal 45 and body earth, and between earth terminal 46 and body earth
- Code No.C1211 is set: Between signal terminal 43 and body earth, and between earth terminal 42 and body earth
- Code No.C1216 is set: Between signal terminal 36 and body earth, and between earth terminal 37 and body earth

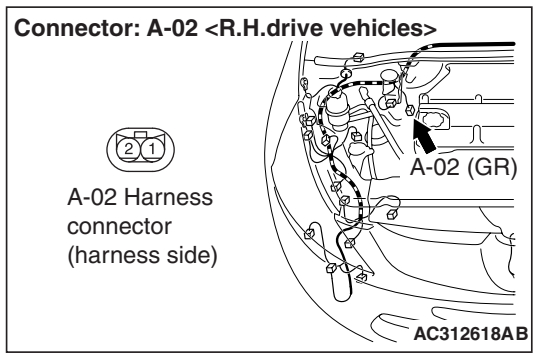
Q: Is the check result normal?

YES (Continuity exists between terminal 33 or terminal 34 and body earth) : Go to Step 10.
YES (Continuity exists between terminal 45 or terminal 46 and body earth) : Go to Step 11.
YES (Continuity exists between terminal 42 or terminal 43 and body earth) : Go to Step 12.
YES (Continuity exists between terminal 36 or terminal 37 and body earth) : Go to Step 13.
NO : Go to Step 14.

STEP 10. Check TCL/ASC-ECU connector A-04 and wheel speed sensor <front: RH> connector A-02 for loose, corroded or damaged terminals, or terminals pushed back in the connector.





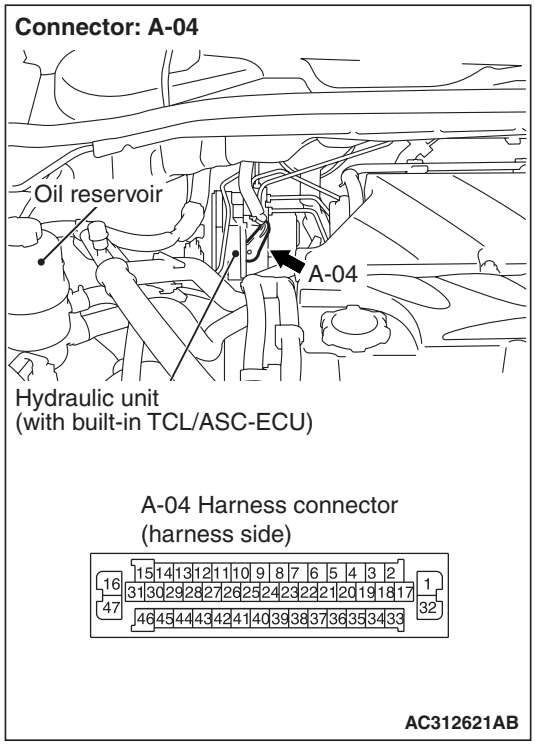


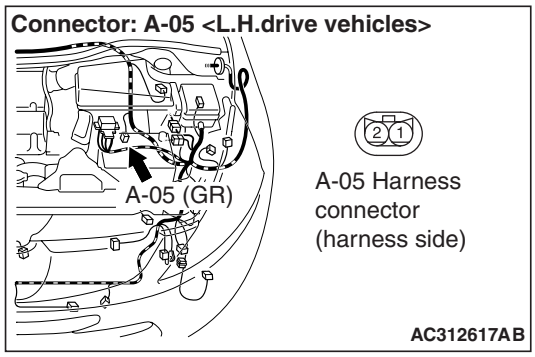
Q: Is the check result normal?

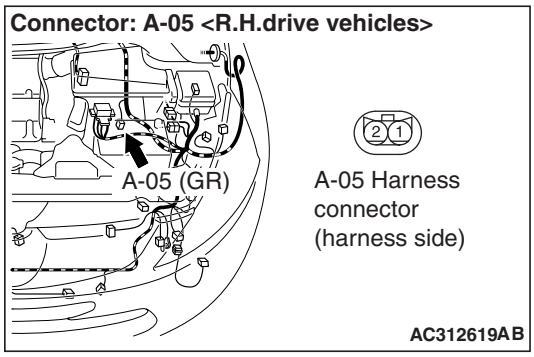
YES : Open or short circuit may be present in the front right wheel speed sensor circuit. Repair the wiring harness between TCL/ASC-ECU connector A-04 (terminals 33 and 34) and front right wheel speed sensor A-02 (terminals 2 and 1). Then go to Step 15.

NO : Repair or replace the damaged component(s). Then go to Step 15.

STEP 11. Check TCL/ASC-ECU connector A-04 and wheel speed sensor <front: LH> connector A-05 for loose, corroded or damaged terminals, or terminals pushed back in the connector.





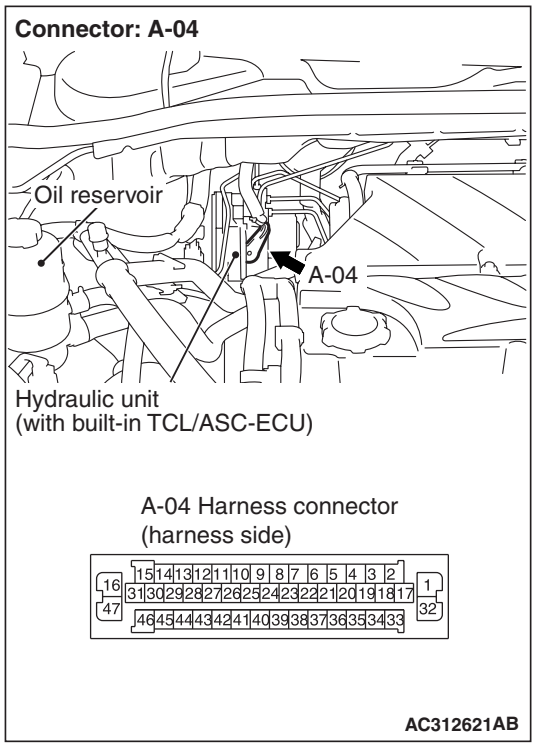


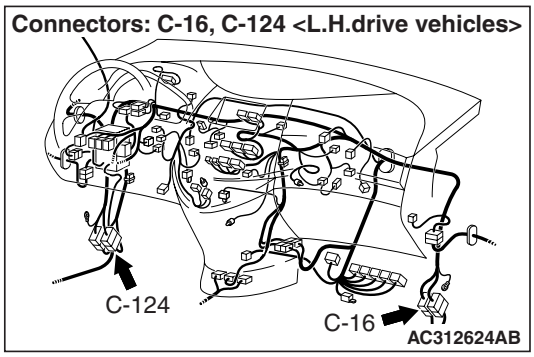
Q: Is the check result normal?

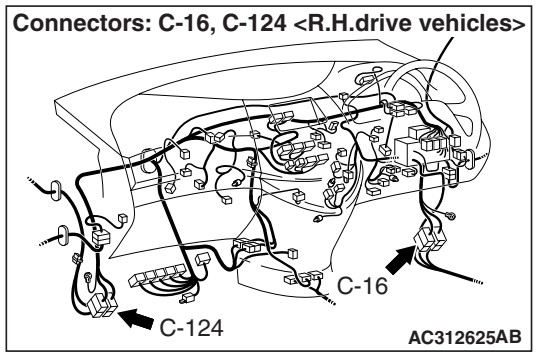
YES : Open or short circuit may be present in the front right wheel speed sensor circuit. Repair the wiring harness between TCL/ASC-ECU connector A-04 (terminals 45 and 46) and front left wheel speed sensor A-05 (terminals 1 and 2). Then go to Step 15.

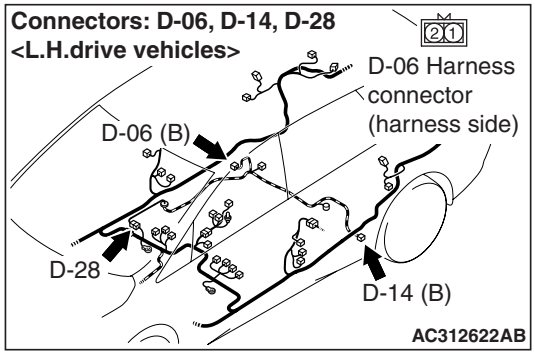
NO : Repair or replace the damaged component(s). Then go to Step 15.

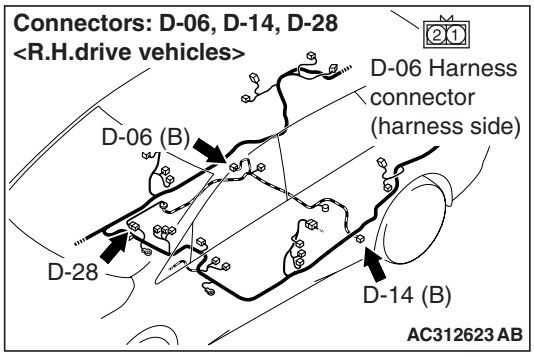
STEP 12. Check TCL/ASC-ECU connector A-04, intermediate connector C-16, C-124, D-28 and wheel speed sensor <rear: RH> connector D-06 for loose, corroded or damaged terminals, or terminals pushed back in the connector.









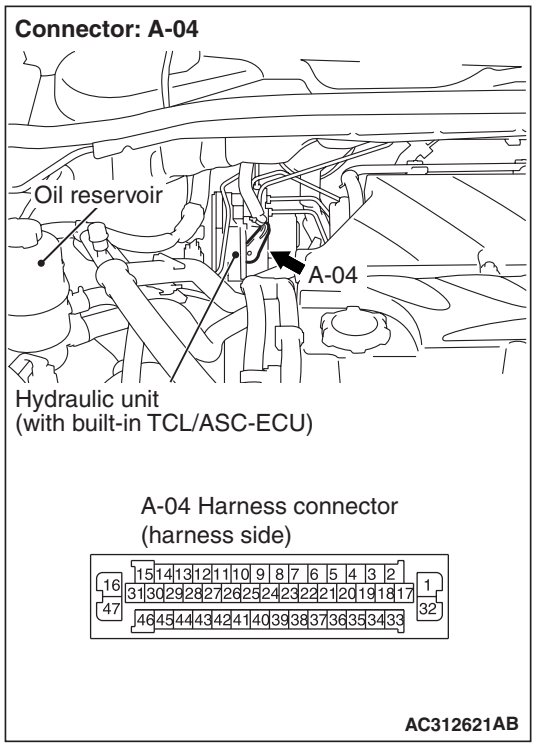


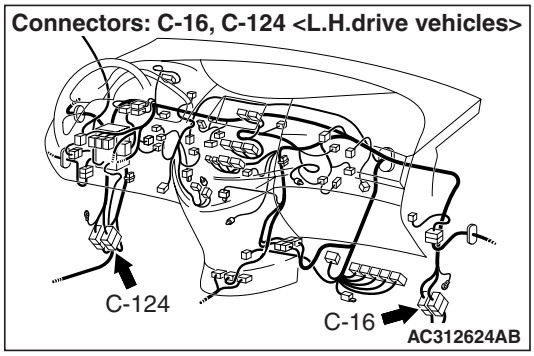
Q: Is the check result normal?

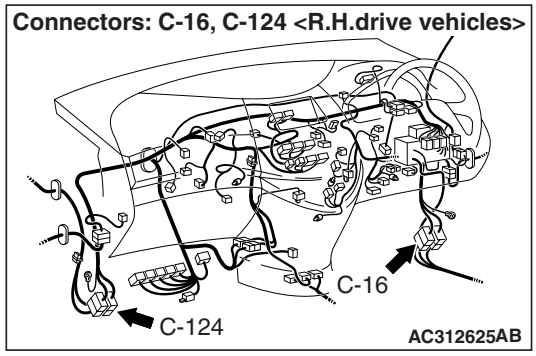
YES : Open or short circuit may be present in the rear right wheel speed sensor circuit. Repair the wiring harness between TCL/ASC-ECU connector A-04 (terminals 42 and 43) and rear right wheel speed sensor D-06 (terminals 2 and 1). Then go to Step 15.

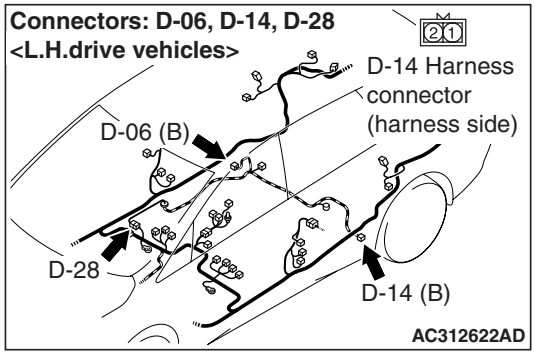
NO : Repair or replace the damaged component(s). Then go to Step 15.

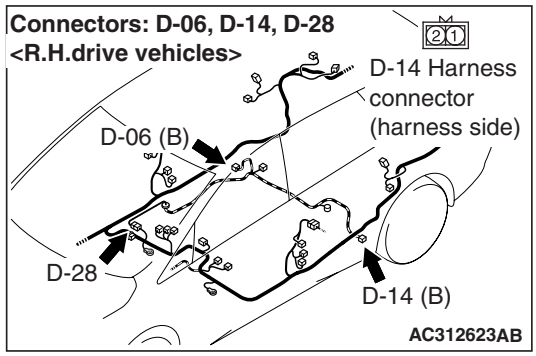
STEP 13. Check TCL/ASC-ECU connector A-04, intermediate connector C-16, C-124, D-28 and wheel speed sensor <rear: LH> connector D-14 for loose, corroded or damaged terminals, or terminals pushed back in the connector.









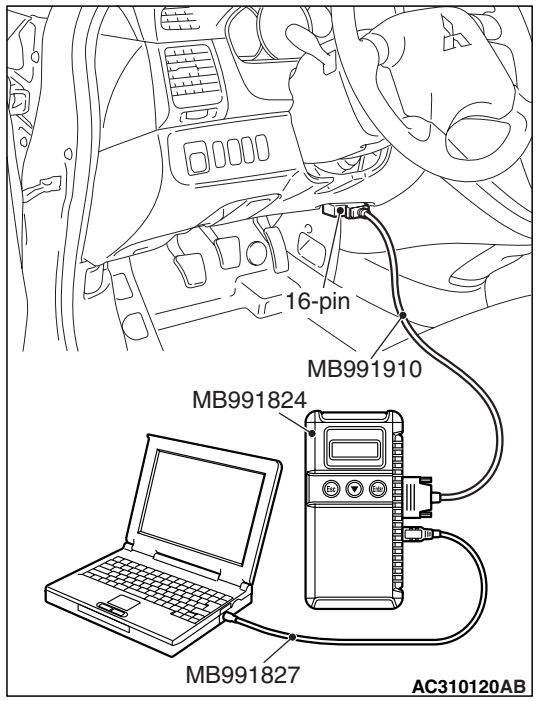


Q: Is the check result normal?

NO : Repair or replace the damaged component(s). Then go to Step 15.

YES : Open or short circuit may be present in the rear left wheel speed sensor circuit. Repair the wiring harness between TCL/ASC-ECU connector A-04 (terminals 36 and 37) and rear left wheel speed sensor D-14 (terminals 1 and 2). Then go to Step 15.

STEP 14. Check whether the diagnosis code is reset.



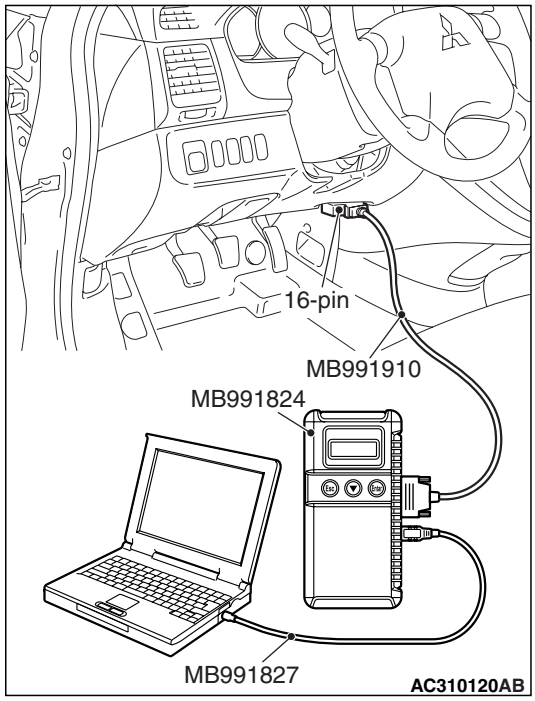
Check again if the diagnosis code is set.

(1) Turn the ignition switch to the "ON" position.
(2) Drive the vehicle at 20km/h or more for 30 seconds or more.
(3) Erase the diagnosis code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Turn the ignition switch to the "ON" position.
(6) Drive the vehicle at 20km/h or more for 30 seconds or more.

(7) Check if the diagnosis code is set.
(8) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is code No.C1201, C1206, C1211 or C1216 set?
YES : Replace the hydraulic unit (integrated with TCL/ASC-ECU). Then go to Step 15.
NO : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5.

STEP 15. Check whether the diagnosis code is reset.

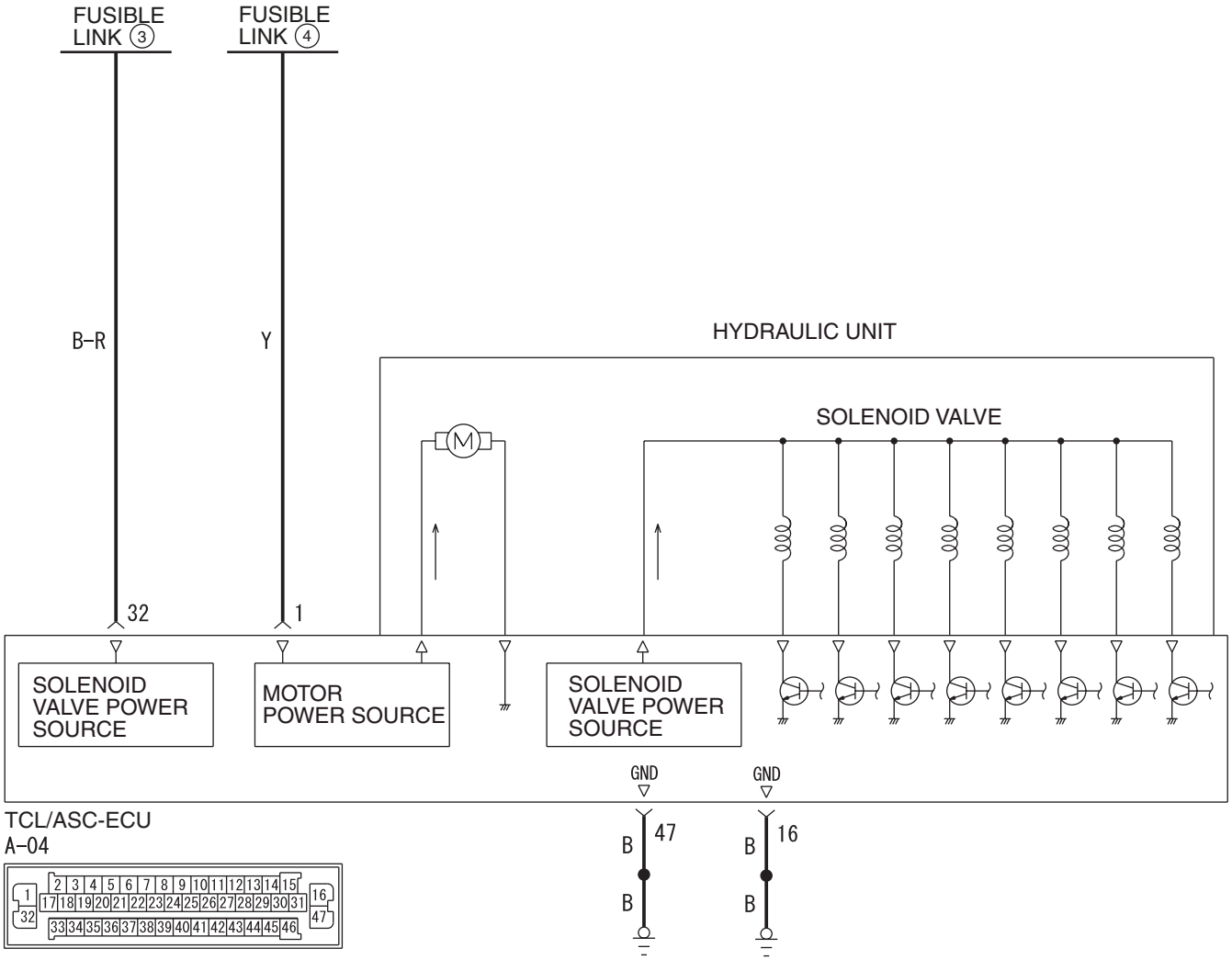


Check again if the diagnosis code is set.
(1) Turn the ignition switch to the "ON" position.
(2) Drive the vehicle at 20km/h or more for 30 seconds or more.
(3) Erase the diagnosis code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Turn the ignition switch to the "ON" position.
(6) Drive the vehicle at 20km/h or more for 30 seconds or more.
(7) Check if the diagnosis code is set.
(8) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is code No.C1201, C1206, C1211 or C1216 set?
YES : Go to Step 1.
NO : The procedure is complete.

Code No.C1226: Control solenoid valve (FR) pressure holding system
Code No.C1236: Control solenoid valve (FL) pressure holding system
Code No.C1246: Control solenoid valve (RR) pressure holding system
Code No.C1256: Control solenoid valve (RL) pressure holding system
Code No.C1300: Front-right cut valve (Primary)
Code No.C1310: Front-left cut valve (secondly)
Code No.C1231: Control solenoid valve (FR) decompressing system
Code No.C1241: Control solenoid valve (FL) pressure reducing system
Code No.C1251: Control solenoid valve (RR) pressure reducing system
Code No.C1261: Control solenoid valve (RL) decompressing system
Code No.C1305: Front-right suction valve (Primary)
Code No.C1315: Front-left suction valve (secondly)

Solenoid Valve and Motor Power Supply Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

AC313584AB
W4X35E003A

⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines.

OPERATION

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

DIAGNOSIS CODE SET CONDITIONS

These diagnosis codes will be set under the cases below.

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

PROBABLE CAUSES

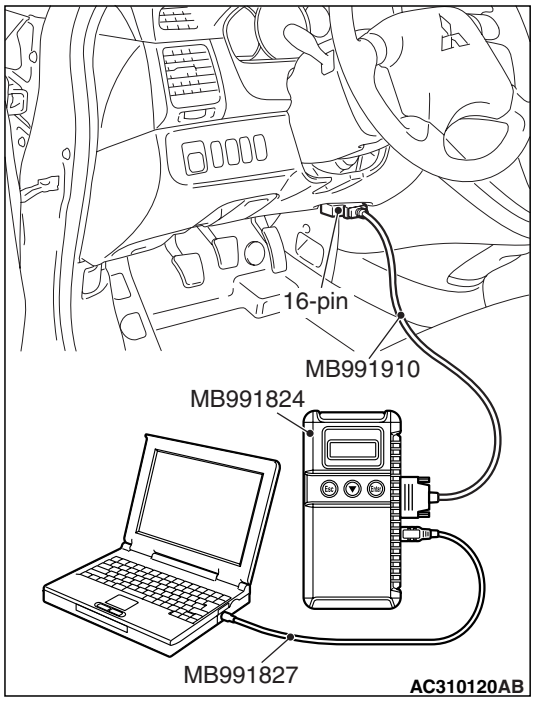
The most likely causes for these diagnosis codes to set are:

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

DIAGNOSIS

STEP 1. MUT-III CAN bus diagnostics.

⚠ CAUTION



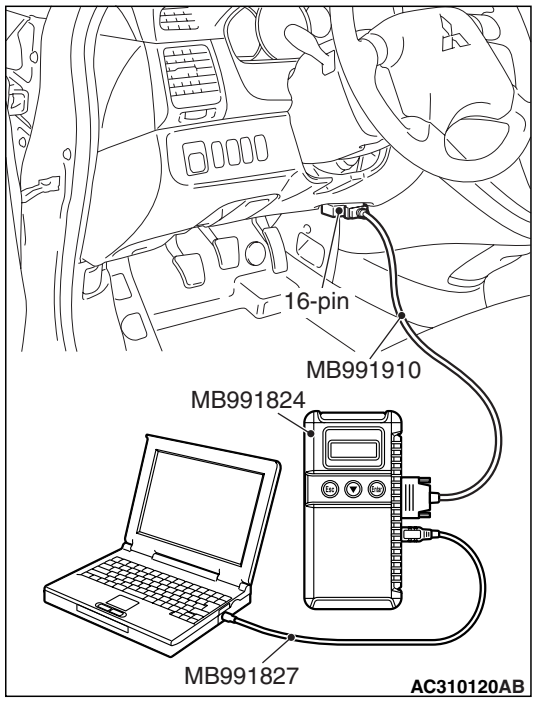
Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

(1) Connect MUT-III to the 16-pin diagnosis connector.
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result?
YES : Go to Step 3.
NO : Repair the CAN bus line (Refer to GROUP 54D, CAN bus line Diagnostic flow P.54D-9). Then go to Step 2.

STEP 2. Check whether the diagnosis code is reset.

⚠ CAUTION

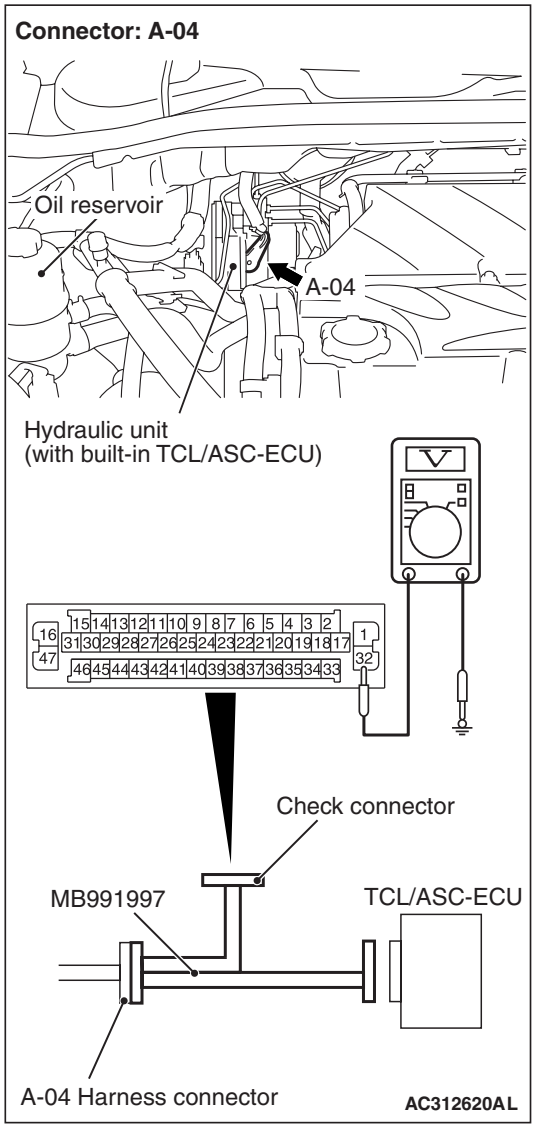


Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

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

Q: Is code No.C1226, C1231, C1236, C1241, C1246, C1251, C1256, C1261, C1300, C1305, C1310 or C1315 set?
YES : Go to Step 3.
NO : The procedure is complete.

STEP 3. Voltage measurement at TCL/ASC-ECU connector A-04.

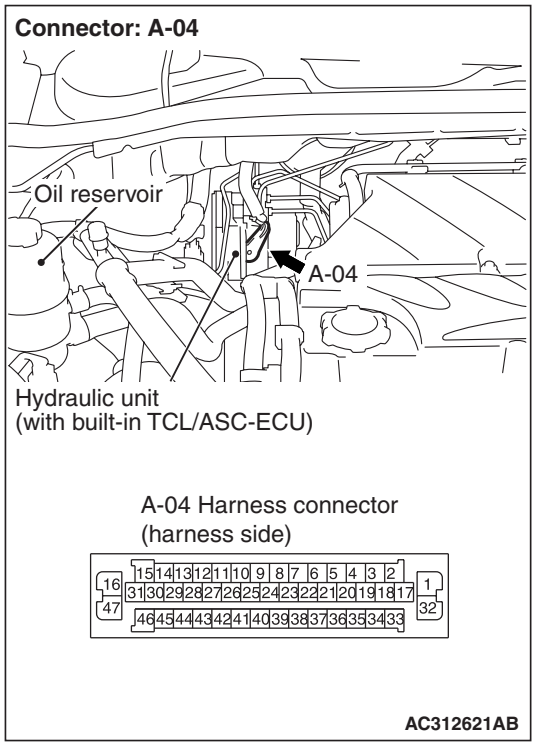


(1) Disconnect the connector A-04, and connect special tool ABS Check Harness (MB991997) to the wiring harness-side connector.
NOTE: Do not connect special tool ABS Check Harness (MB991997) to the TCL/ASC-ECU.
(2) Turn the ignition switch to the "ON" position.
(3) Measure the voltage between terminal 32 and earth.

OK: System voltage

Q: Is the check result normal?
YES : Go to Step 5.
NO : Go to Step 4.

STEP 4. Check TCL/ASC-ECU connector A-04 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

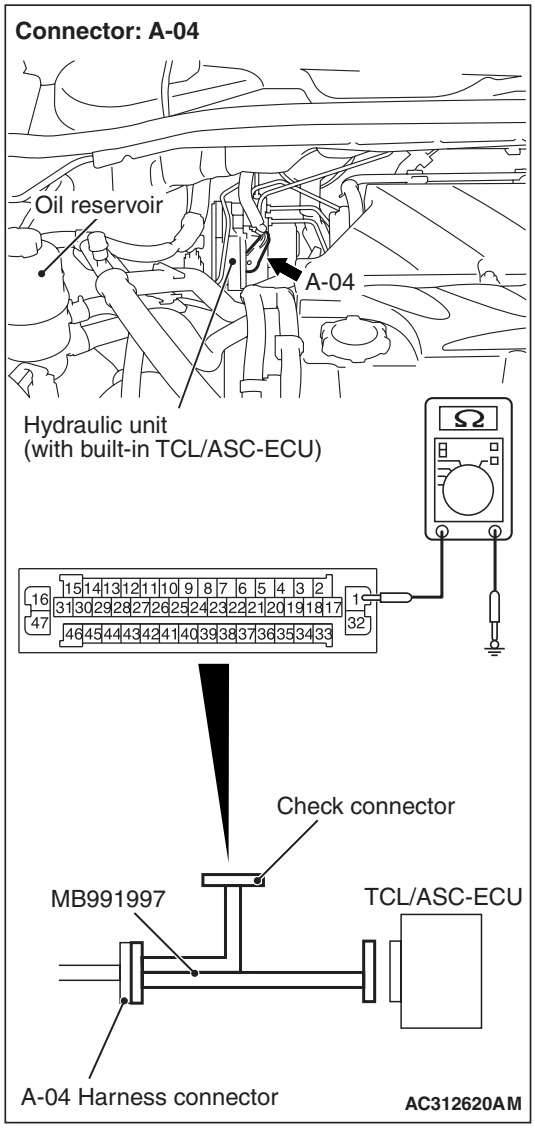


Q: Is the check result normal?

YES : An open or short circuit may be present in the solenoid valve power supply circuit. Repair the wiring harness between TCL/ASC-ECU connector A-04 terminal 32 and fusible link No.3. Then go to Step 8.

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

STEP 5. Resistance measurement at TCL/ASC-ECU connector A-04.



(1) Disconnect the connector A-04, and connect special tool ABS Check Harness (MB991997) to the wiring harness-side connector.

NOTE: Do not connect special tool ABS Check Harness (MB991997) to the TCL/ASC-ECU.

(2) Measure the resistance between terminal 16 and earth.

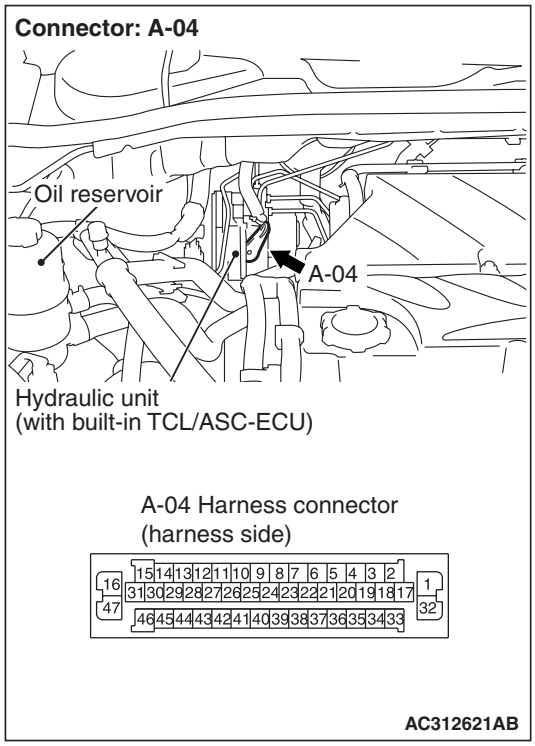
OK: 2 ohm or less

Q: Is the check result normal?

YES : Go to Step 7.

NO : Go to Step 6.

STEP 6. Check TCL/ASC-ECU connector A-04 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

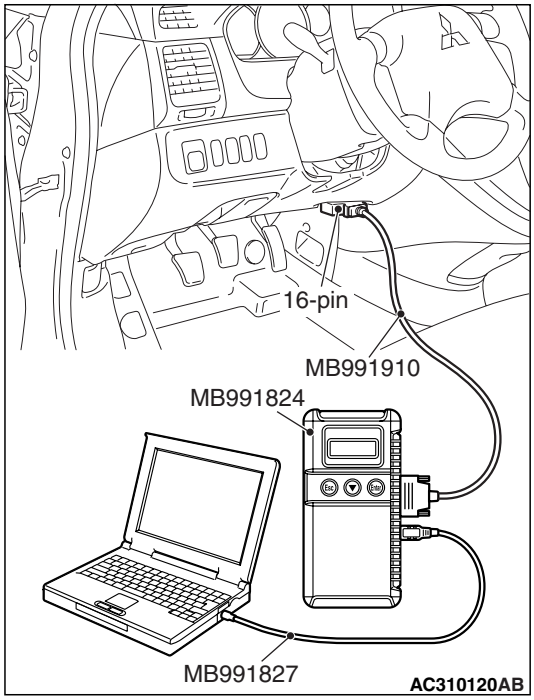


Q: Is the check result normal?

YES : An open circuit may be present in the earth circuit. Repair the wiring harness between TCL/ASC-ECU connector A-04 terminal 16 and the body earth. Then go to Step 8 .

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

STEP 7. Check whether the diagnosis code is reset.



Check again if the diagnosis code is set.

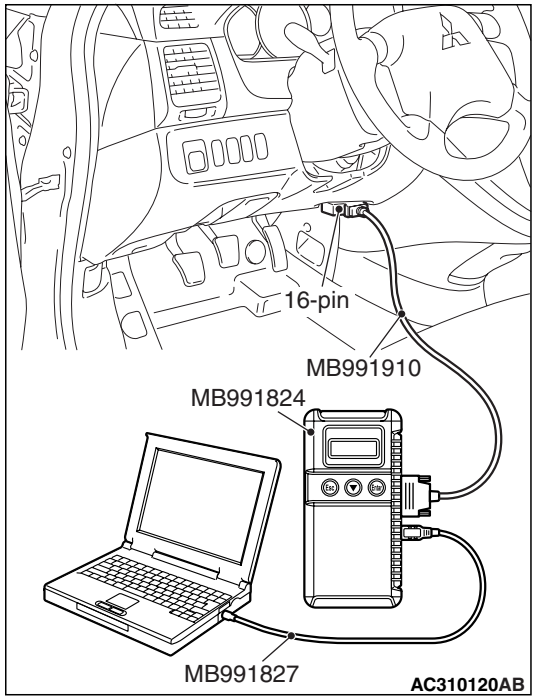
(1) Turn the ignition switch to the "ON" position.
(2) Erase the diagnosis code.
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to the "ON" position.
(5) Drive the vehicle at 20 km/h or more for 30 seconds or more.
(6) Check if the diagnosis code is set.
(7) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is code No.C1226, C1231, C1236, C1241, C1246, C1251, C1256, C1261, C1300, C1305, C1310 or C1315 set?

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

NO : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5.

STEP 8. Check whether the diagnosis code is reset.

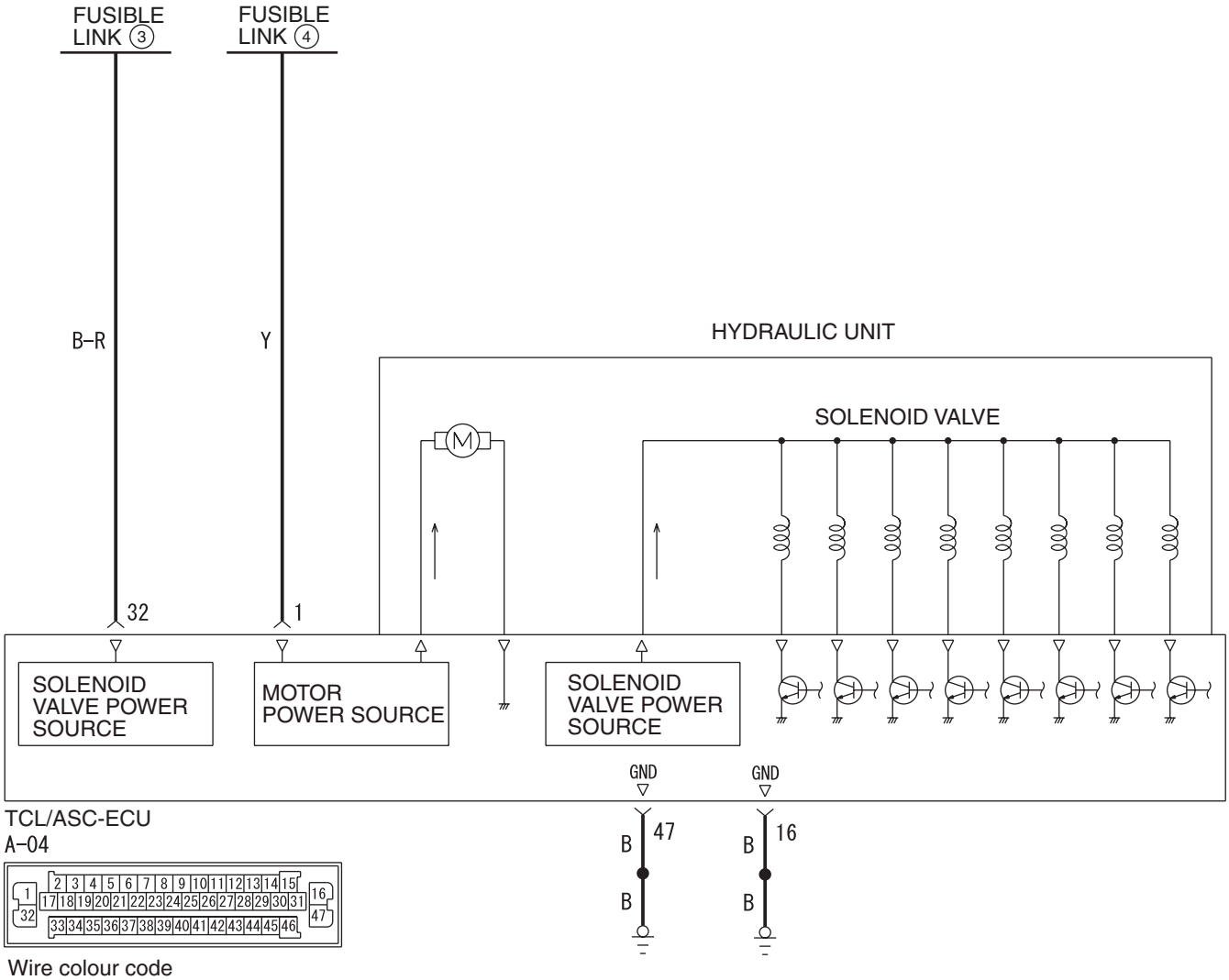


Check again if the diagnosis code is set.
(1) Turn the ignition switch to the "ON" position.
(2) Erase the diagnosis code.
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to the "ON" position.
(5) Drive the vehicle at 20 km/h or more for 30 seconds or more.
(6) Check if the diagnosis code is set.
(7) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is code No.C1226, C1231, C1236, C1241, C1246, C1251, C1256, C1261, C1300, C1305, C1310 or C1315 set?
YES : Go to Step 1.
NO : The procedure is complete.

Code No. C1271: Motor drive circuit (Abnormal power supply voltage)

Solenoid Valve and Motor Power Supply Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

AC313584AB
W4X35E003A

⚠ CAUTION
If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Diagnose the CAN bus lines before the Diagnosis codes (Refer to GROUP 54D, CAN bus-line diagnostic flow P.54D-9).

OPERATION

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

DIAGNOSIS CODE SET CONDITIONS

The most likely causes for these diagnosis codes to set are:

- This code is set if the pump motor power supply voltage is abnormally low for long time when the pump motor does not operate.

- This code is set if the pump motor voltage is abnormally high for long time when the pump motor does not operate.
- This code is set if the pump motor switch voltage drop indicates high value when the pump motor operates.
- If code No.C1860 or C1861 is not set and the pump motor power supply voltage is not normal when the pump motor operates, the ECU determines that the pump motor is defective, and sets this diagnosis code.

PROBABLE CAUSES

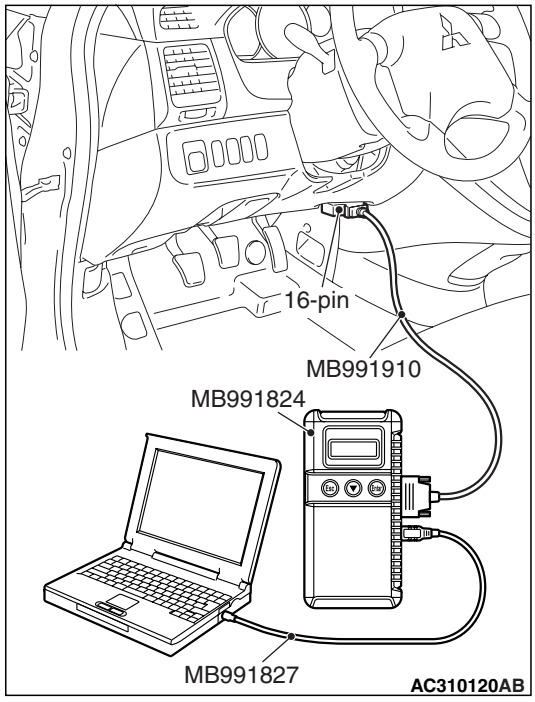
The most likely causes for these diagnosis codes to set are:

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

DIAGNOSIS

STEP 1. MUT-III CAN bus diagnostics

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

(1) Connect MUT-III to the 16-pin diagnosis connector.
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

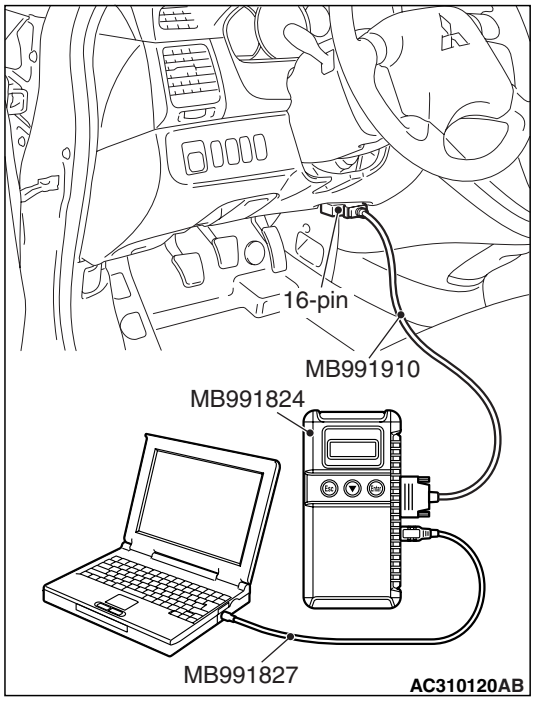
Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus line (Refer to GROUP 54D, CAN bus line Diagnostic flow P.54D-9). Then go to Step 2.

STEP 2. Check whether the diagnosis code is reset.

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

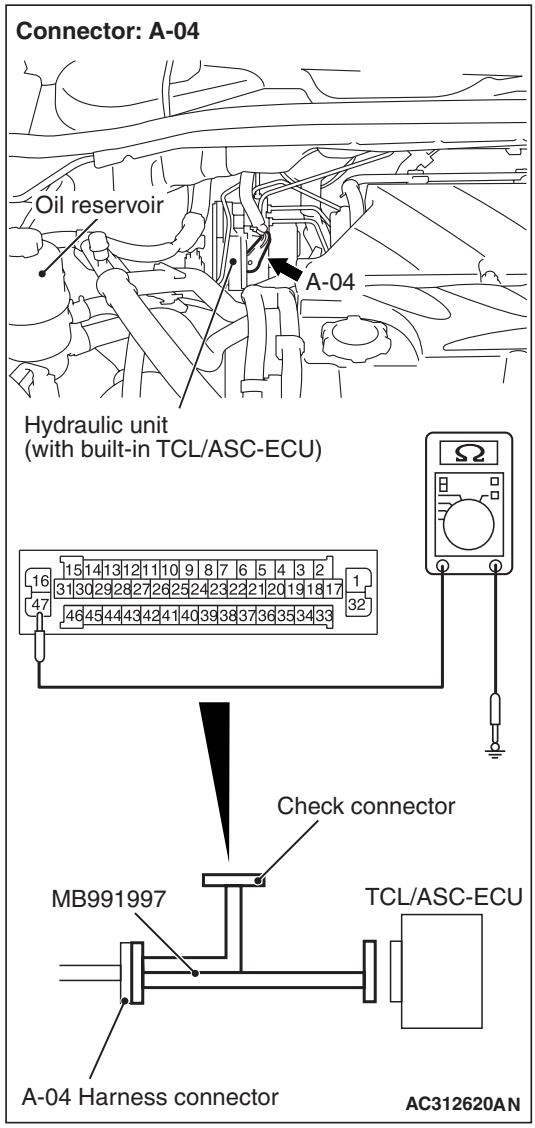
(1) Turn the ignition switch to the "ON" position.
(2) Erase the diagnosis code.
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to the "ON" position.
(5) Check if the diagnosis code is set.
(6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is code No.C1271 set?

YES : Go to Step 3.

NO : The procedure is complete.

STEP 3. Voltage measurement at TCL/ASC-ECU connector A-04.

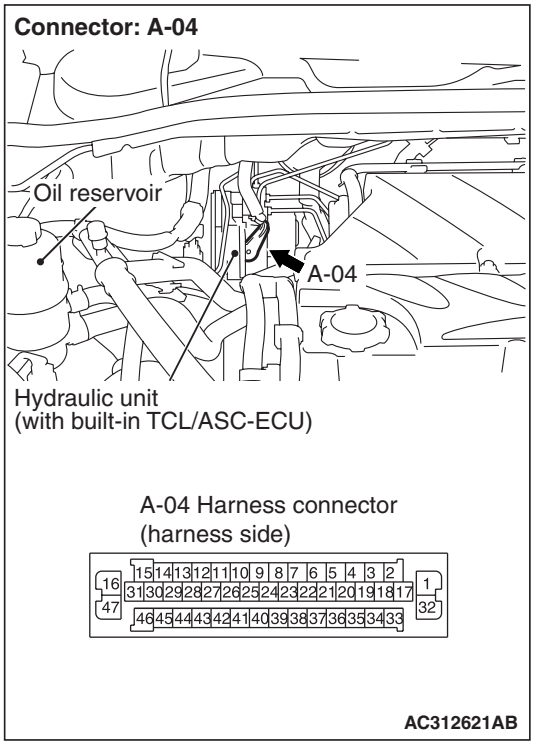


(1) Disconnect the connector A-04, and connect special tool ABS Check Harness (MB991997) to the wiring harness-side connector.
NOTE: Do not connect special tool ABS Check Harness (MB991997) to the TCL/ASC-ECU.
(2) Turn the ignition switch to the "ON" position.
(3) Measure the voltage between terminal 1 and earth.

OK: System voltage

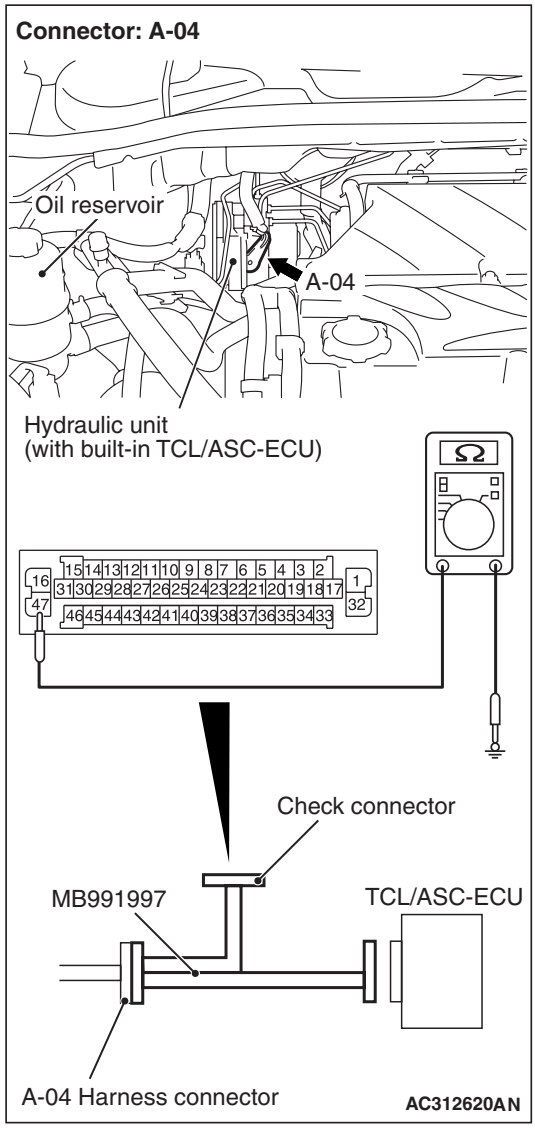
Q: Is the check result normal?
YES : Go to Step 5.
NO : Go to Step 4.

STEP 4. Check TCL/ASC-ECU connector A-04 for loose, corroded or damaged terminals, or terminals pushed back in the connector.



Q: Is the check result normal?
YES : An open or short circuit may be present in the solenoid valve power supply circuit. Repair the wiring harness between TCL/ASC-ECU connector A-04 terminal 1 and fusible link No.4. Then go to Step 8.
NO : Repair or replace the damaged component(s). Then go to Step 8.

STEP 5. Resistance measurement at TCL/ASC-ECU connector A-04.



(1) Disconnect the connector A-04, and connect special tool ABS Check Harness (MB991997) to the wiring harness-side connector.

NOTE: Do not connect special tool ABS Check Harness (MB991997) to the TCL/ASC-ECU.

(2) Measure the resistance between terminal 47 and earth.

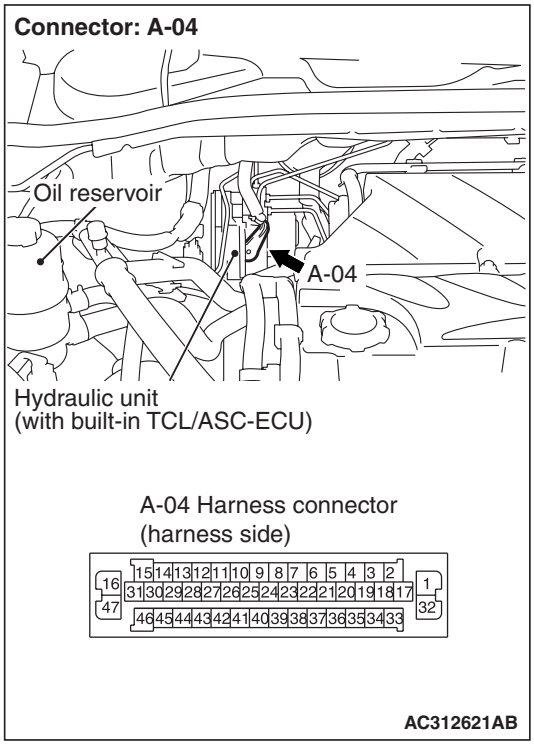
OK: 2 ohm or less

Q: Is the result normal?

YES : Go to Step 7.

NO : Go to Step 6.

STEP 6. Check TCL/ASC-ECU connector A-04 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

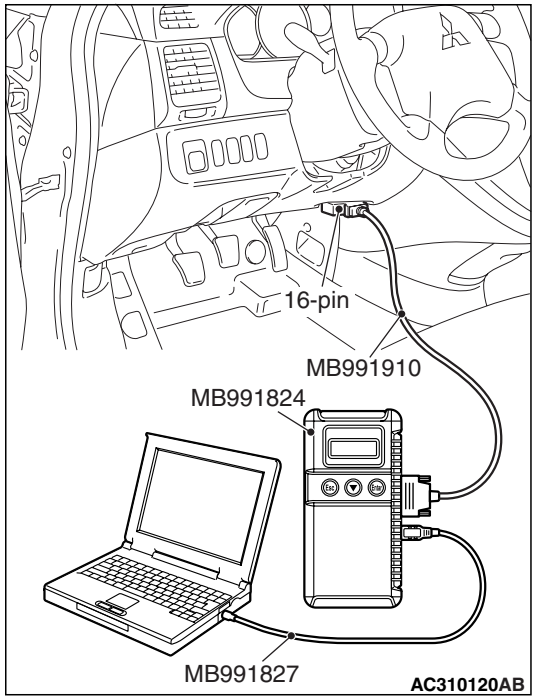


Q: Is the result normal?

YES : An open circuit may be present in the earth circuit. Repair the wiring harness between TCL/ASC-ECU connector A-04 terminal 47 and the body earth. Then go to Step 8.

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

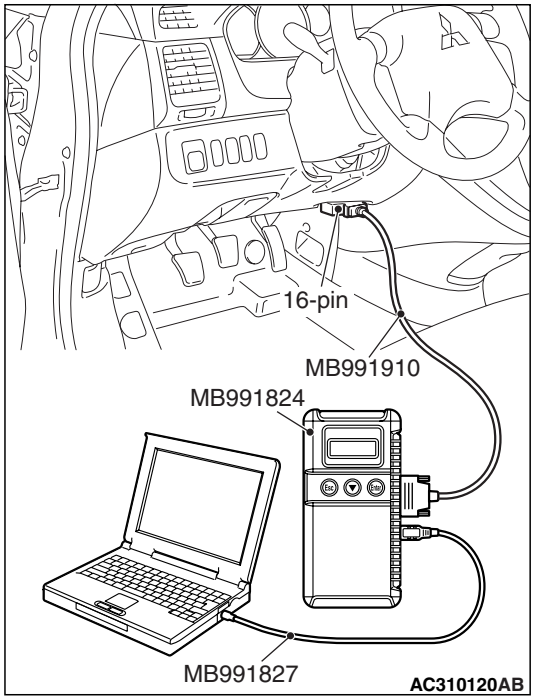
STEP 7. Check whether the diagnosis code is reset.



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

Q: Is code No.C1271 set?
YES : Replace the hydraulic unit (integrated with TCL/ASC-ECU). Then go to Step 8.
NO : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5.

STEP 8. Check whether the diagnosis code is reset.

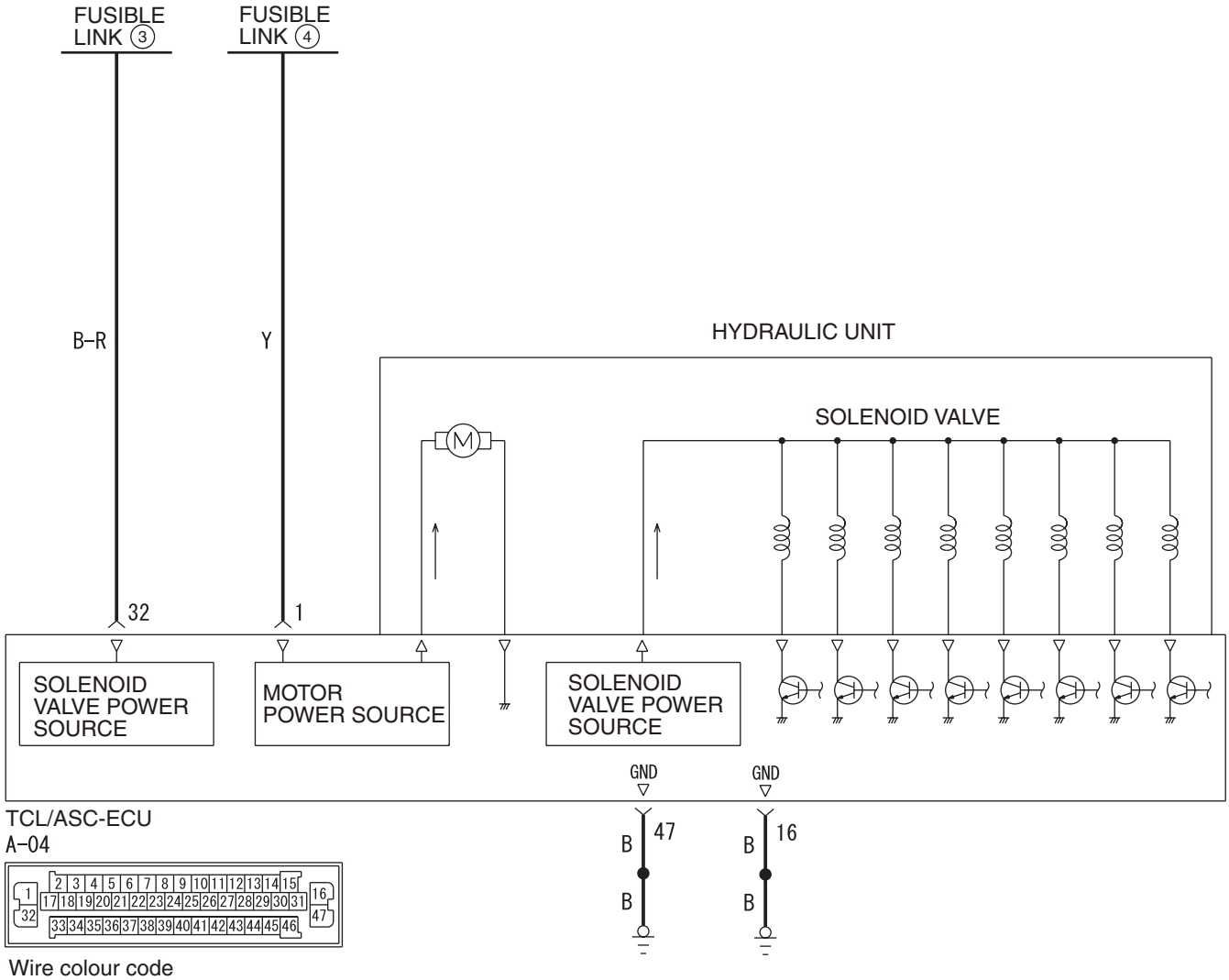


Check again if the diagnosis code is set.
(1) Turn the ignition switch to the "ON" position.
(2) Erase the diagnosis code.
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to the "ON" position.
(5) Check if the diagnosis code is set.
(6) Turn the ignition switch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

Q: Is code No.C1271 set?
YES : Go to Step 1.
NO : The procedure is complete.

Code No.C1276: Valve system

Solenoid Valve and Motor Power Supply Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

AC313584AB
W4X35E003A

OPERATION

- The TCL/ASC-ECU contains the power supply circuit (terminal 32) for solenoid valve. The solenoid valve is energized by the valve relay, which is incorporated in the TCL/ASC-ECU.
- The valve relay, which is incorporated in the TCL/ASC-ECU, is always energizing the solenoid valve unless the initial check is in progress when the ignition switch is turned on, or the recurrent system check is in progress.
- Malfunction of the hydraulic unit (integrated with

DIAGNOSIS CODE SET CONDITIONS

These diagnosis codes will be set under the cases below.

- The ECU monitors the power supply voltage to the solenoid valve. If the voltage is lower than the predetermined value, the ECU sets this diagnosis code as a failure in the valve relay circuit.

PROBABLE CAUSES

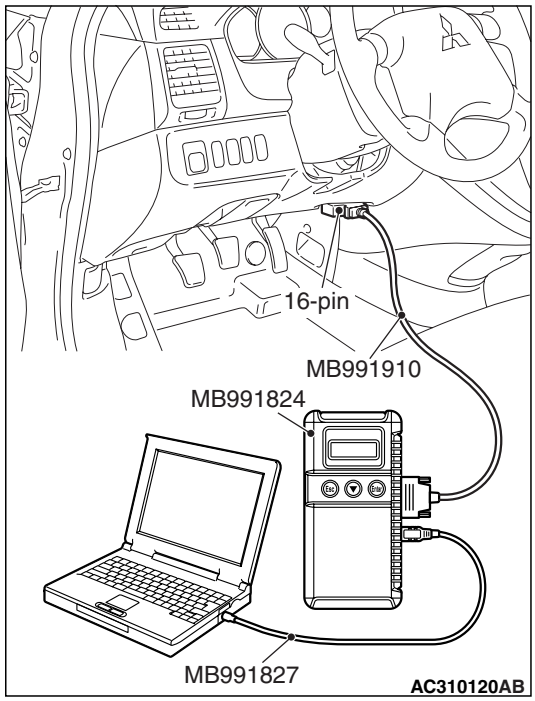
The most likely causes for these diagnosis codes to set are:

- Damaged wiring harness or connector TCL/ASC-ECU)

DIAGNOSIS

STEP 1. MUT-III CAN bus diagnostics

⚠ CAUTION



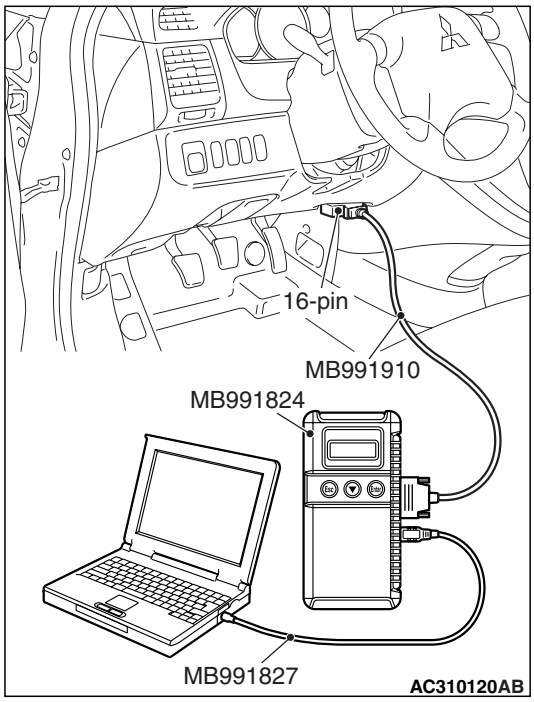
Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

(1) Connect MUT-III to the 16-pin diagnosis connector.
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the CAN bus line (Refer to GROUP 54D, CAN bus line Diagnostic flow P.54D-9). Then go to Step 2.

STEP 2. Check whether the diagnosis code is reset.

⚠ CAUTION

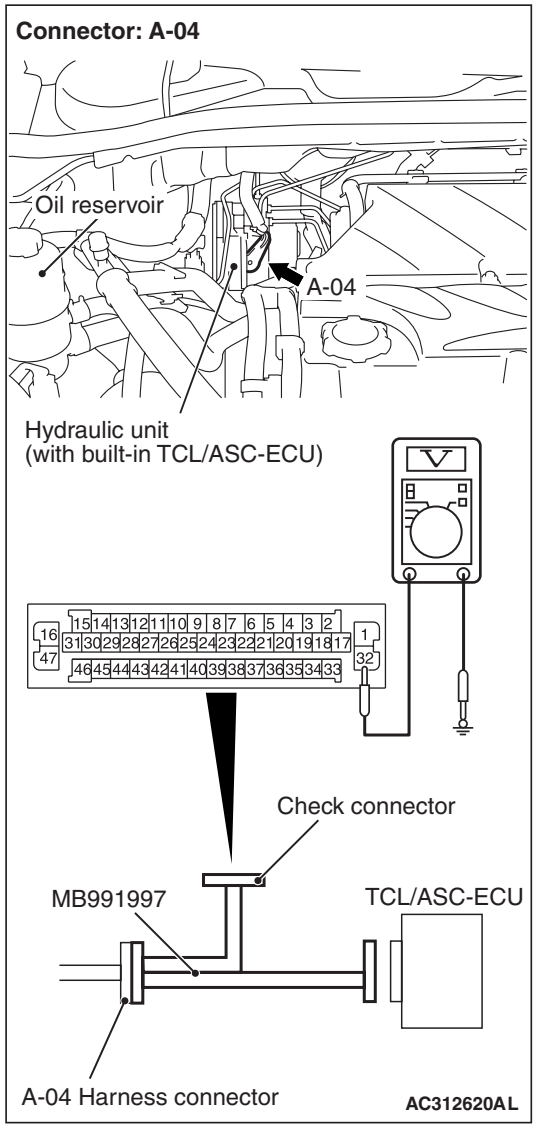


Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

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

Q: Is code No.C1276 set?
YES : Go to Step 3.
NO : The procedure is complete.

STEP 3. Voltage measurement at TCL/ASC-ECU connector A-04.

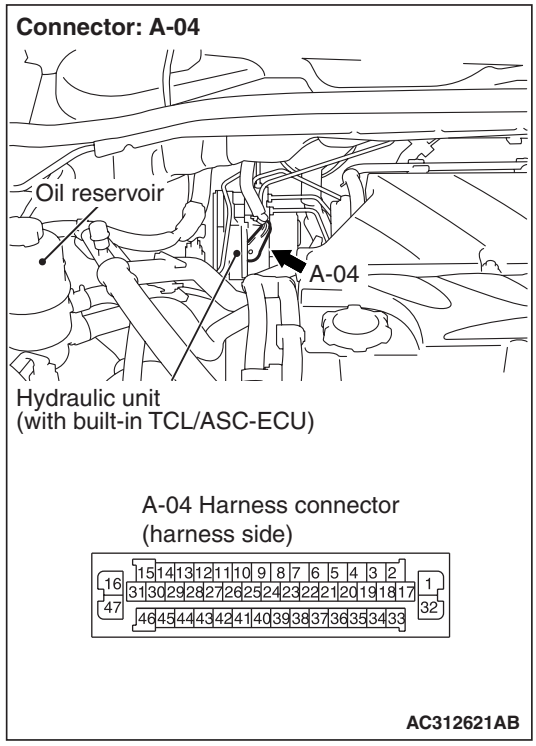


(1) Disconnect the connector A-04, and connect special tool ABS Check Harness (MB991997) to the wiring harness-side connector.
NOTE: Do not connect special tool ABS Check Harness (MB991997) to the TCL/ASC-ECU.
(2) Turn the ignition switch to the "ON" position.
(3) Measure the voltage between terminal 32 and earth.

OK: System voltage

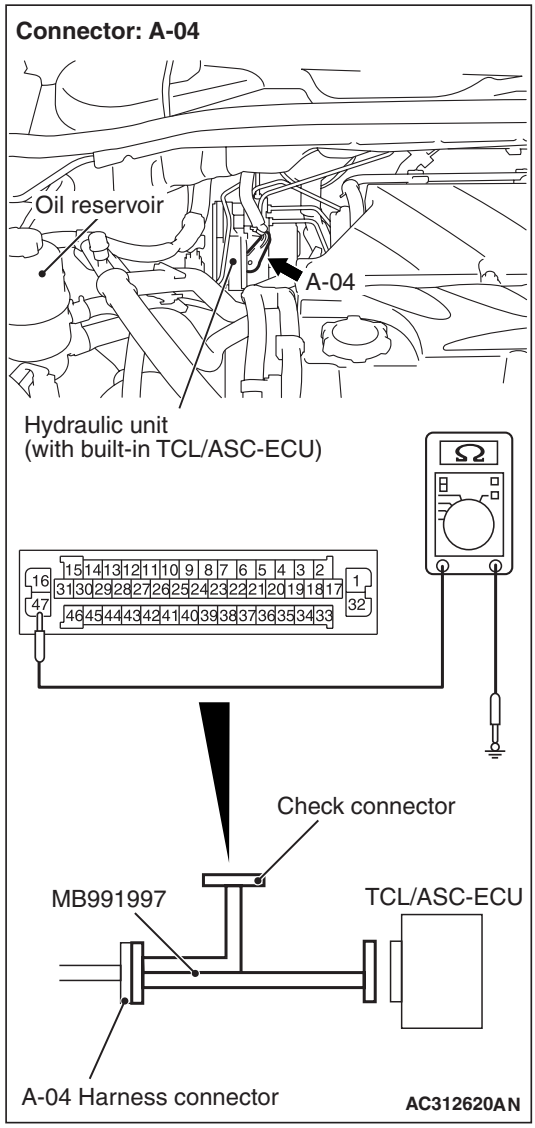
Q: Is the check result normal?
YES : Go to Step 5.
NO : Go to Step 4.

STEP 4. Check TCL/ASC-ECU connector A-04 for loose, corroded or damaged terminals, or terminals pushed back in the connector.



Q: Is the check result normal?
YES : An open or short circuit may be present in the solenoid valve power supply circuit. Repair the wiring harness between TCL/ASC-ECU connector A-04 terminal 32 and fusible link No.3. Then go to Step 8.
NO : Repair or replace the damaged component(s). Then go to Step 8.

STEP 5. Measure the resistance at TCL/ASC-ECU connector A-04.



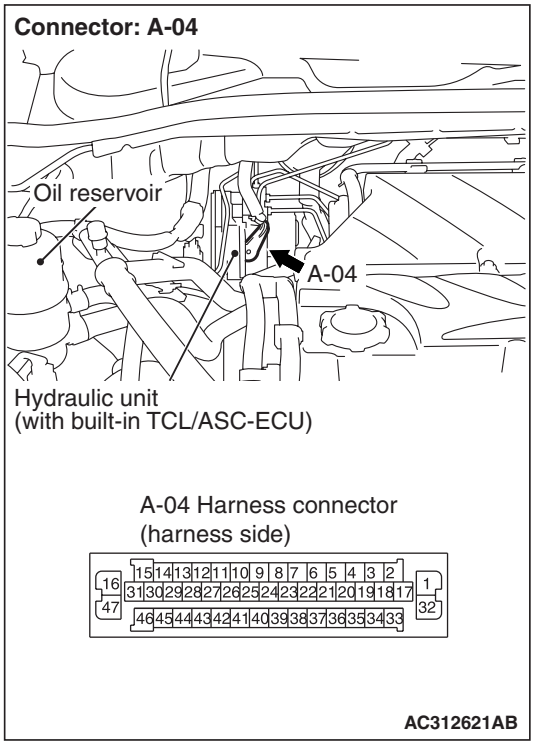
(1) Disconnect the connector A-04, and connect special tool ABS Check Harness (MB991997) to the wiring harness-side connector.
NOTE: Do not connect special tool ABS Check Harness (MB991997) to the TCL/ASC-ECU.

(2) Measure the resistance between terminal 16 and earth.

OK: 2 ohm or less

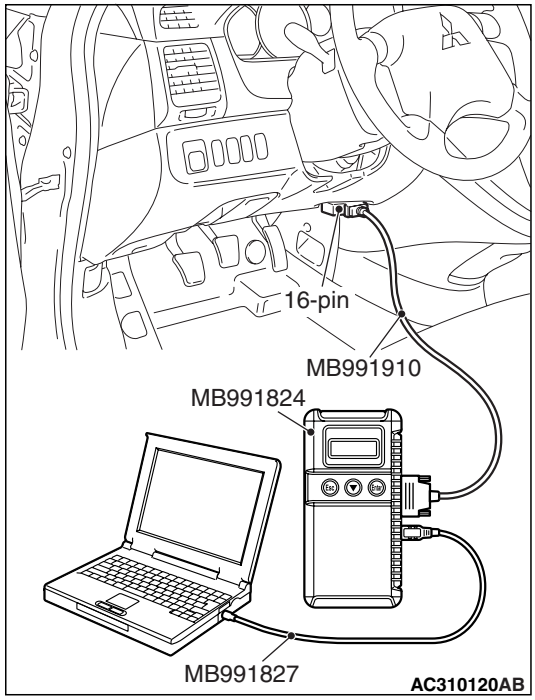
Q: Is the result normal?
YES : Go to Step 7.
NO : Go to Step 6.

STEP 6. Check TCL/ASC-ECU connector A-04 for loose, corroded or damaged terminals, or terminals pushed back in the connector.



Q: Is the result normal?
YES : An open circuit may be present in the earth circuit. Repair the wiring harness between TCL/ASC-ECU connector A-04 terminal 16 and the body earth. Then go to Step 8.
NO : Repair or replace the damaged component(s). Then go to Step 8.

STEP 7. Check whether the diagnosis code is reset.



Check again if the diagnosis code is set.

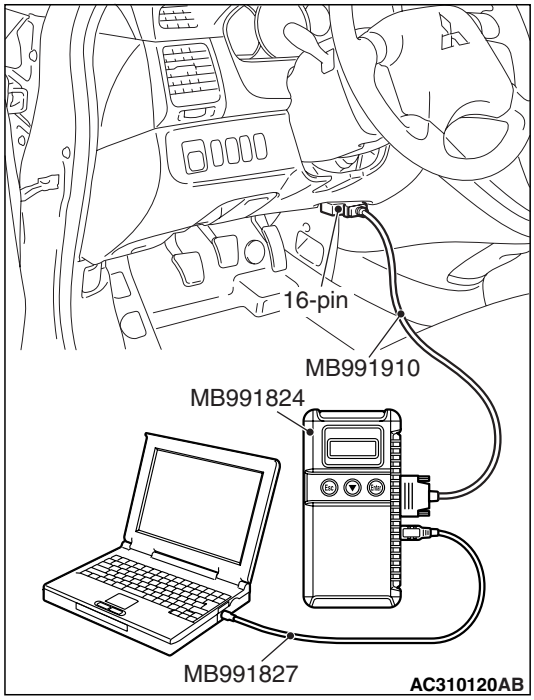
(1) Turn the ignition switch to the "ON" position.
(2) Erase the diagnosis code.
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to the "ON" position.
(5) Check if the diagnosis code is set.
(6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is code No.C1276 set?

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

NO : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5.

STEP 8. Check whether the diagnosis code is reset.



Check again if the diagnosis code is set.

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

Q: Is code No.C1276 set?

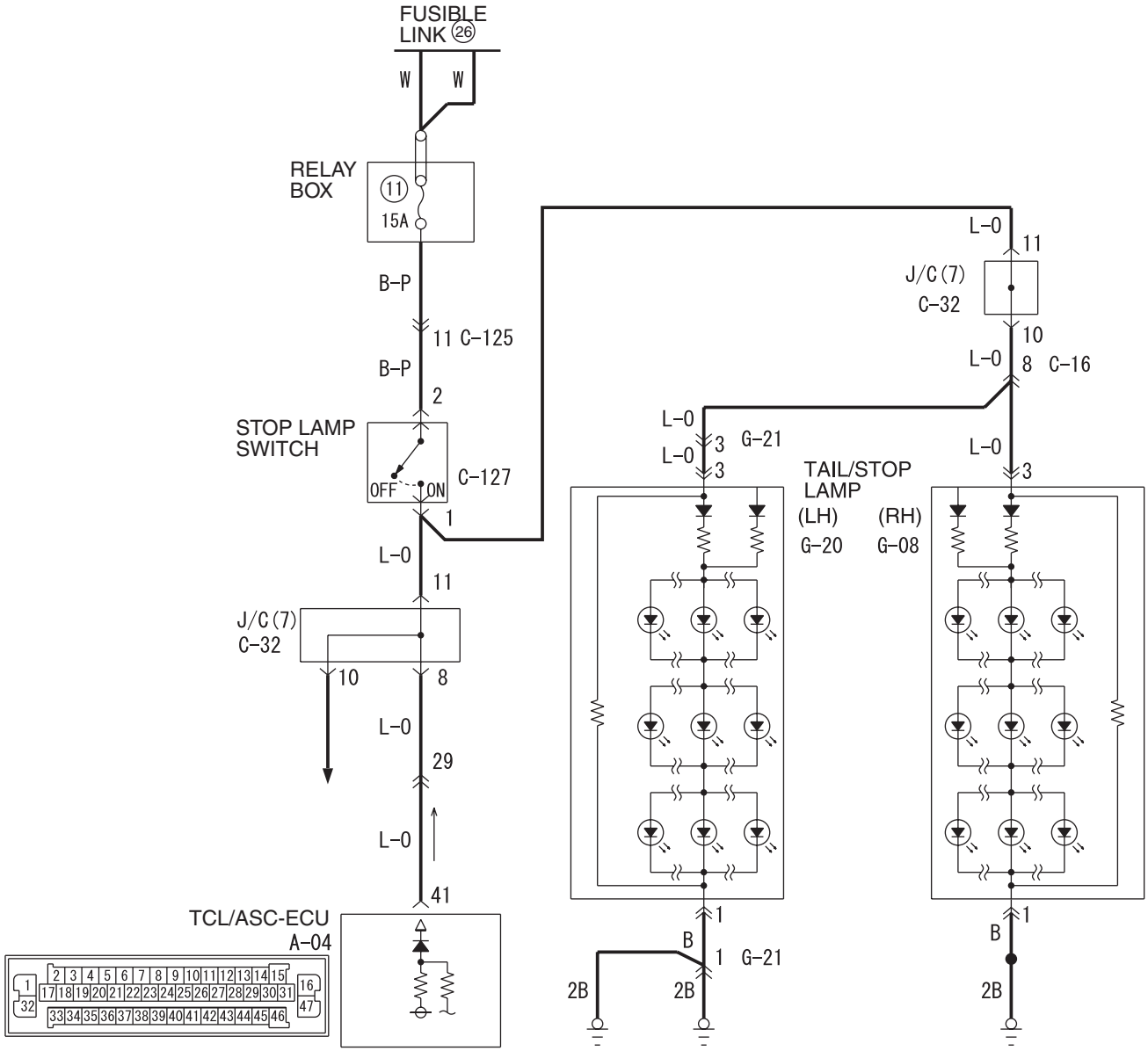
YES : Go to Step 1.

NO : The procedure is complete.

Code No.C1340: Stop lamp switch system

<LH drive vehicles>

Stop Lamp Switch Circuit

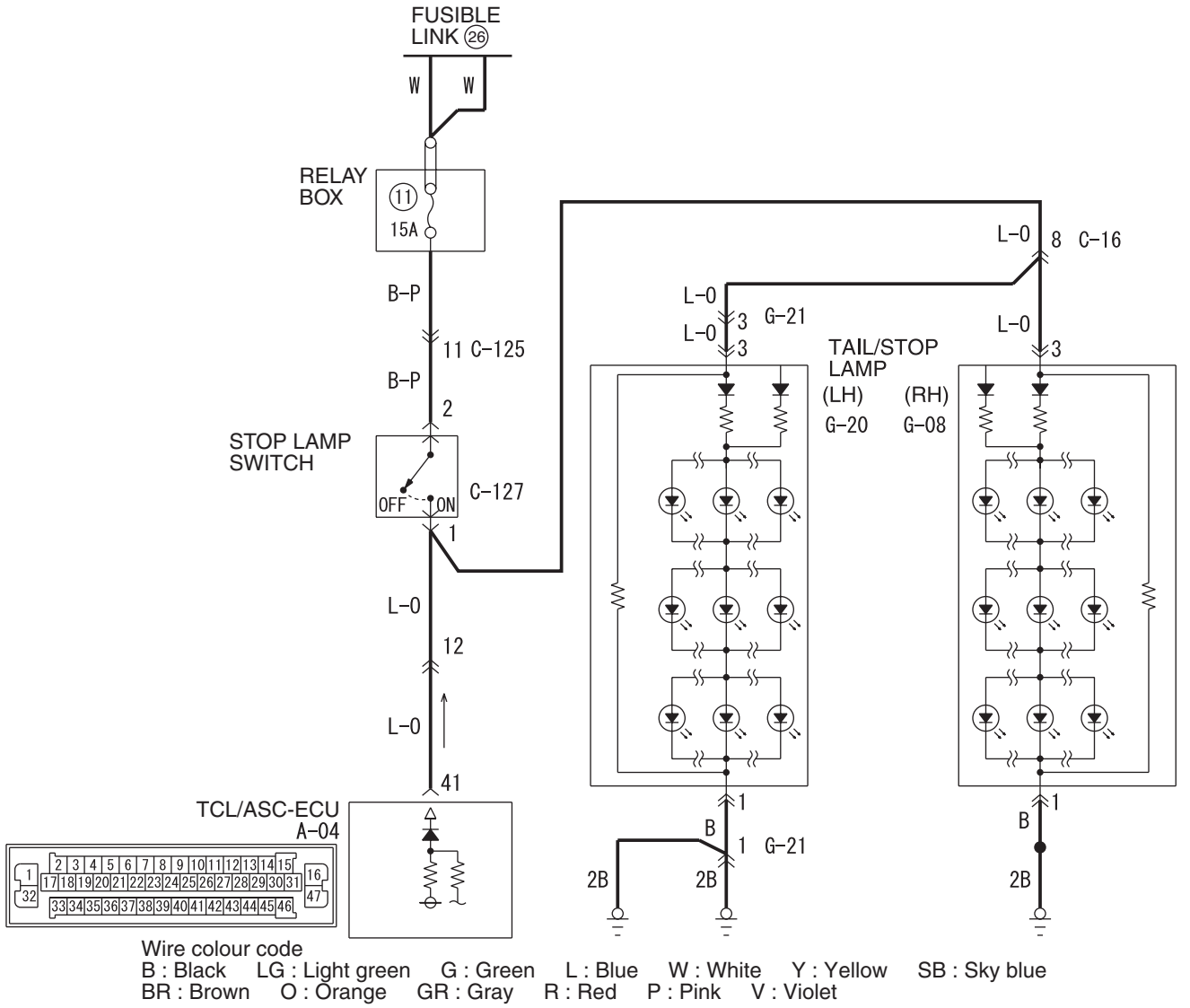


Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

AC313600AB

<RH drive vehicles>

Stop Lamp Switch Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

AC313601AB

⚠ CAUTION
If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines.

OPERATION

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

DIAGNOSIS CODE SET CONDITIONS

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

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

PROBABLE CAUSES

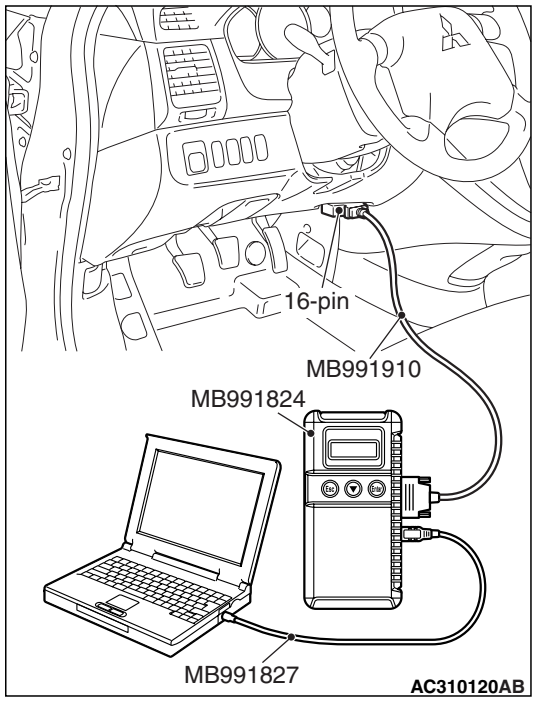
The most likely causes for this diagnosis code to set are:

- Malfunction of the stop lamp switch
- Incorrect positioning of stop lamp switch
- Malfunction of bypass resistance integrated in stop lamp switch
- Damaged wiring harness or connector
- Malfunction of the hydraulic unit (integrated with TCL/ASC-ECU)

DIAGNOSIS

STEP 1. MUT-III CAN bus diagnostics

⚠ CAUTION



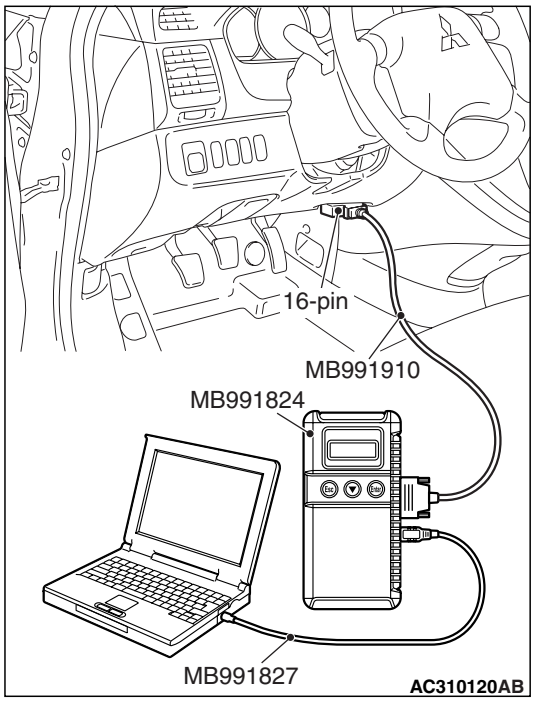
Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

(1) Connect MUT-III to the 16-pin diagnosis connector.
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the CAN bus line (Refer to GROUP 54D, CAN bus line Diagnostic flow P.54D-9). Then go to Step 2.

STEP 2. Check whether the diagnosis code is reset.

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

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

Q: Is code No.C1340 set?
YES : Go to Step 3.
NO : The procedure is complete.

STEP 3. Check the stop lamp operation.

Q: Does the stop lamp come on and go out correctly?
YES : Go to Step 6.
NO : Go to Step 4.

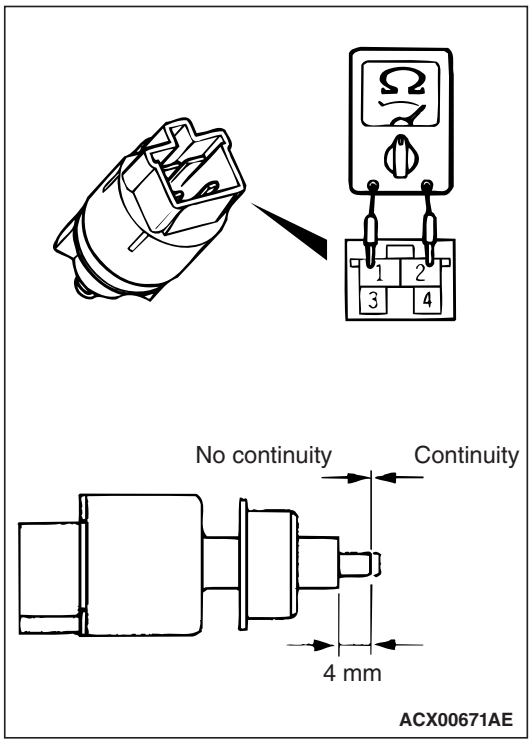
STEP 4. Check the stop lamp switch installation condition.

Q: Is the stop lamp switch installed properly?
YES : Go to Step 5.
NO : Repair it and then go to Step 11.

STEP 5. Check the stop lamp switch continuity.

(1) Remove the stop lamp switch (Refer to GROUP

35A, Brake Pedal P.35A-12).

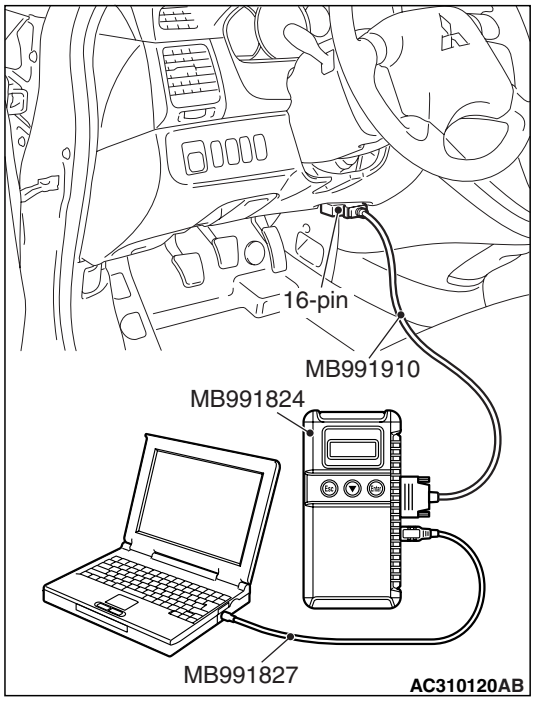


(2) Connect an ohmmeter to stop lamp switch terminals 1 and 2, and check whether there is continuity when the plunger of the stop lamp switch is pushed in and when it is released.
(3) The stop lamp switch is in good condition if there is no continuity when the plunger is pushed in to a depth of within 4 mm from the outer case edge surface, and if there is continuity when it is released.

Q: Is the check result normal?
YES : Check the stop lamp circuit and repair and then go to Step 6.
NO : Replace the stop lamp switch and then go to Step 11.

STEP 6. MUT-III data list

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

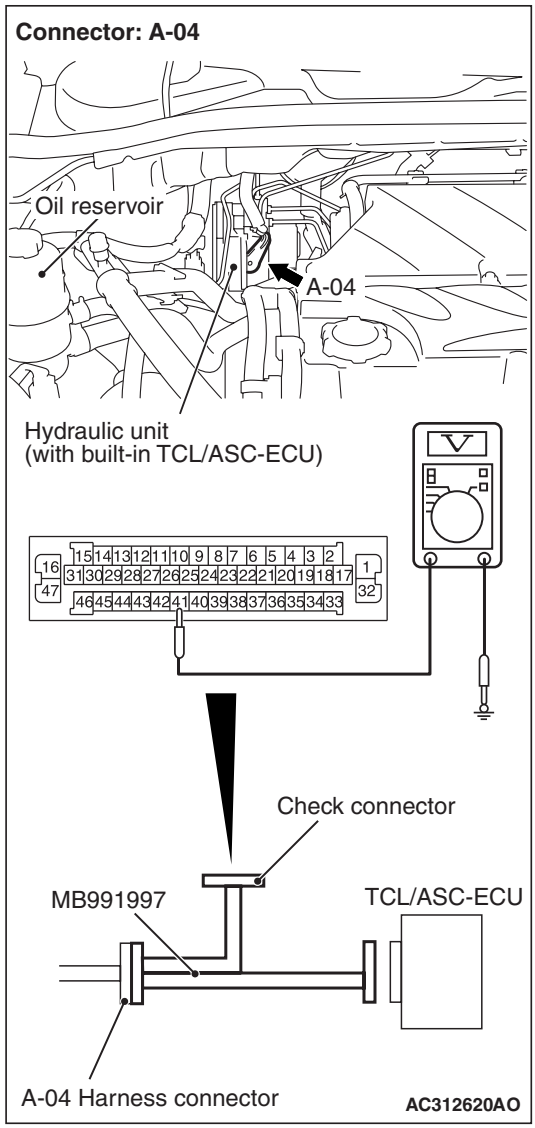
(1) Turn the ignition switch to the "ON" position.
(2) Select "Interactive Diagnosis" from the start-up screen.
(3) Select "System Select."
(4) Choose "ABS/ASC/ASTC" from the "CHASSIS" tab.
(5) Select "Data List."
(6) Choose an item 06 and select the "OK" button.
- Item 06: Stop lamp switch

OK:
Brake pedal stepped down: ON
Brake pedal released: OFF

Q: Is the check result normal?
YES : This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope With Intermittent Malfunction P.00-5.
NO : Go to Step 7.

STEP 7. Voltage measurement at TCL/ASC-ECU connector A-04.

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



(2) Disconnect TCL/ASC-ECU connector A-04 and measure at the harness side.

(3) Measure the voltage between terminal 41 and earth.

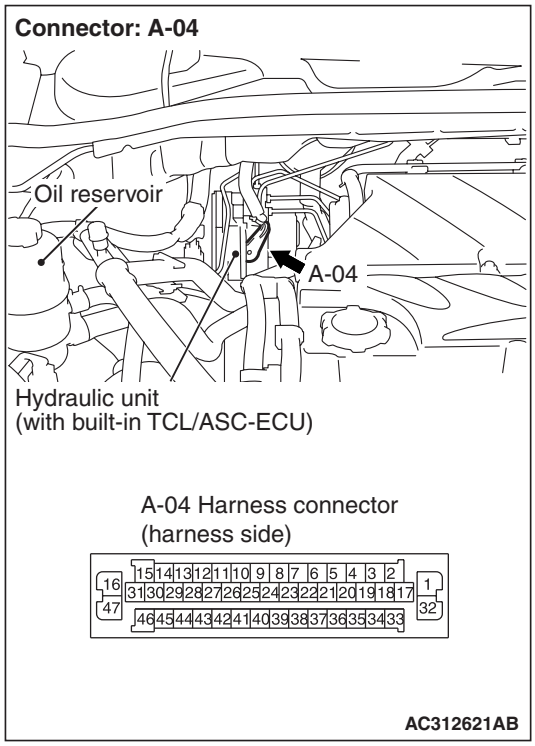
OK:
Stop lamp switch OFF: Less than 1V
Stop lamp switch ON (Depress the brake pedal): System voltage

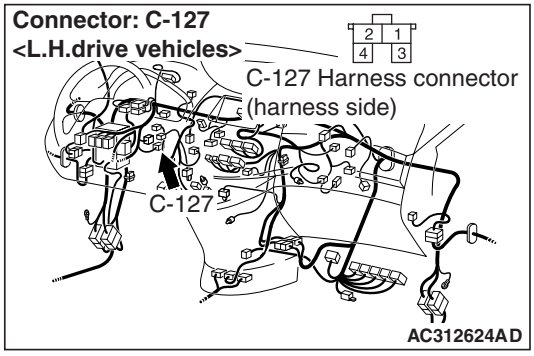
Q: Is the check result normal?

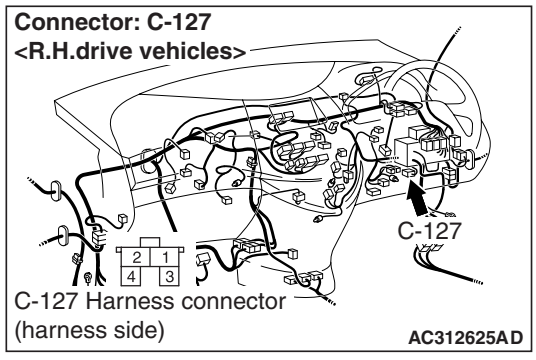
YES : Erase the diagnosis code memory, and recheck if any diagnosis code sets. If diagnosis code No.C1340 set, replace the hydraulic unit (integrated with TCL/ASC-ECU). Then go to Step 11.

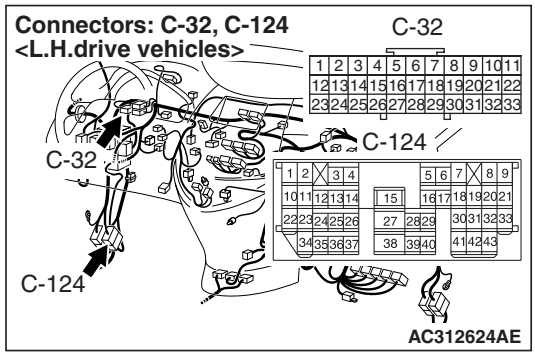
NO : Go to Step 8.

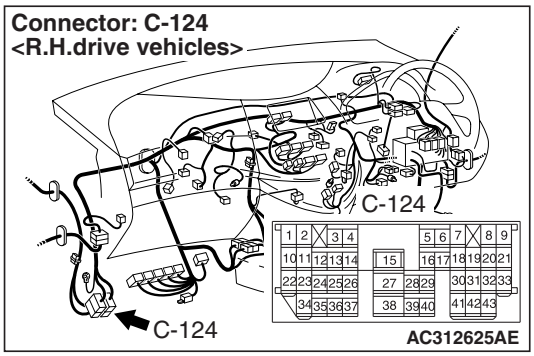
STEP 8. Check the harness wire between TCL/ASC-ECU connector A-04 terminal 41 and stop lamp switch connector C-127 terminal 1.









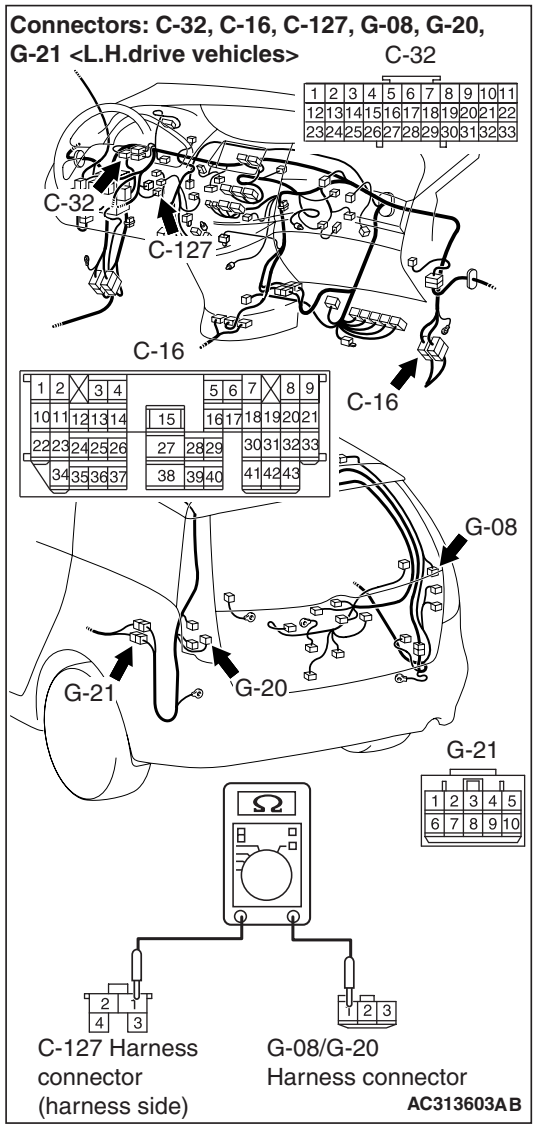


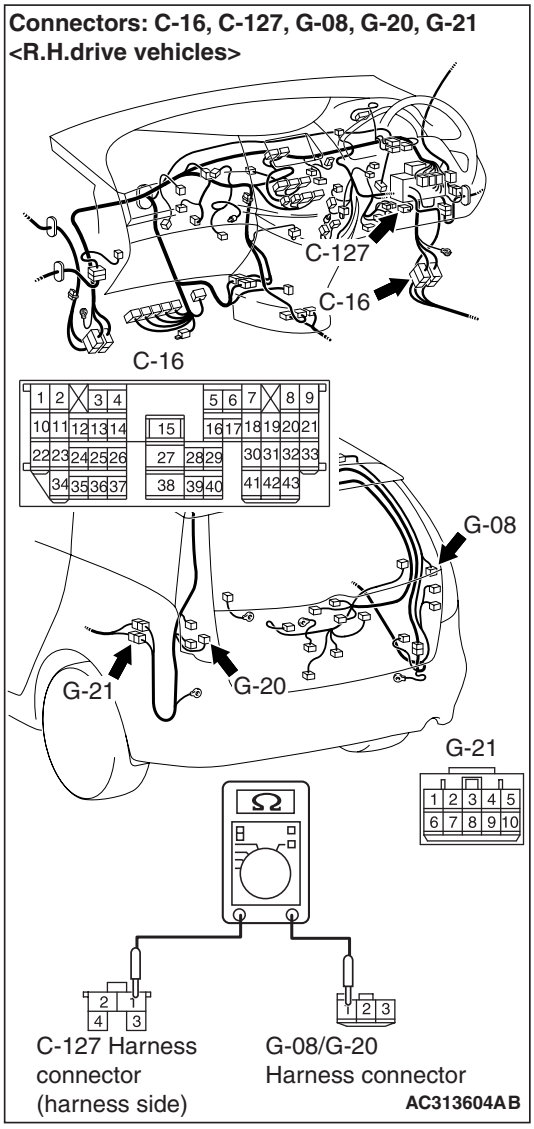
After inspecting TCL/ASC-ECU connector A-04, intermediate connectors C-32 <L.H.drive vehicles>, C-124 and stop lamp switch connector C-127, inspect the wire. If any of these connectors is damaged, repair or replace it. Then go to Step 11.

Q: Is the check result normal?
YES : Disconnect the connection between the combination meter and the engine-A/T-ECU or the engine-ECU, and then go to Step 9.
NO : Go to Step 11.

NOTE:

STEP 9. Check the harness wire between stop lamp switch connector C-127 terminal 1 and stop lamp connector G-20 terminal 1 and stop lamp connector G-08 terminal 1.





⚠ CAUTION

- **The lamp circuit contains a diode. If the tester is connected with polarity reversed, the measurement resistance may vary.**
- **The measurement value varies according to the tester voltage.**

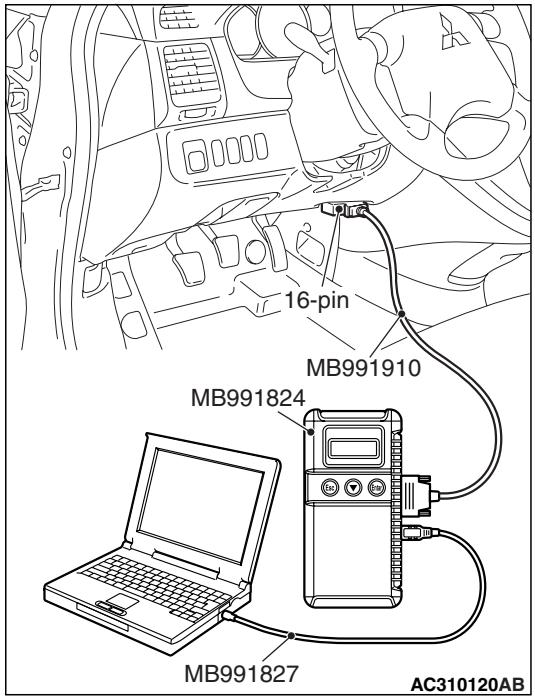
NOTE: After inspecting intermediate connectors C-16, C-32 <L.H.drive vehicles>, G-21, stop lamp switch connector C-127 and atop lamp connector G-08 and G-20, inspect the wire. If any of these connectors is damaged, repair or replace it. Then go to Step 11.

Q: Is the check result normal?

YES : Check the combination meter and the engine-A/T-ECU or the engine-ECU.

NO : Repair it and then go to Step 10.

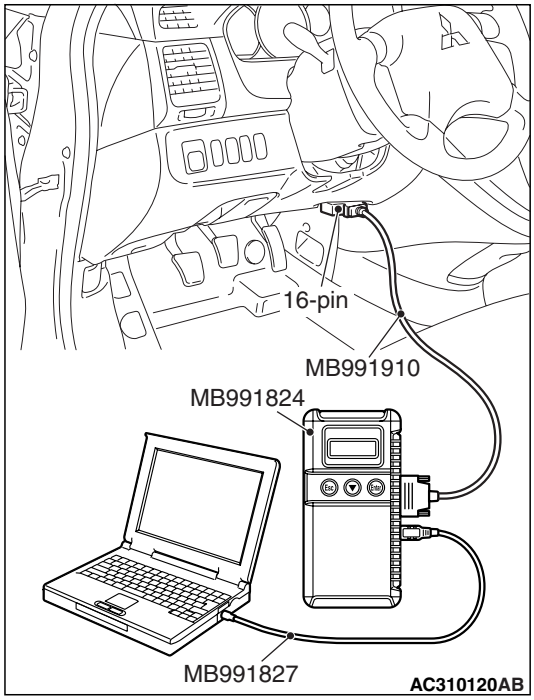
STEP 10. Check whether the diagnosis code is reset.



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

Q: Is code No.C1340 set?
YES : Replace the hydraulic unit (integrated with TCL/ASC-ECU). Then go to Step 11.
NO : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5.

STEP 11. Check whether the diagnosis code is reset.



Check again if the diagnosis code is set.
(1) Turn the ignition switch to the "ON" position.
(2) Erase the diagnosis code.
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to the "ON" position.
(5) Drive the vehicle at 20km/h or more for 6 minutes or more. (there is no need to drive continuously.)
(6) Stop the vehicle with braking at 40km/h or more.
(7) Check if the diagnosis code is set.
(8) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is code No.C1340 set?
YES : Go to Step 1.
NO : The procedure is complete.

Code No.C1361: Abnormal pressure sensor characteristics
Code No.C1364: Pressure sensor malfunction

⚠ CAUTION
If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines.

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

OPERATION

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

DIAGNOSIS CODE SET CONDITIONS

This diagnosis code is set if the master cylinder pressure sensor is defective.

PROBABLE CAUSES

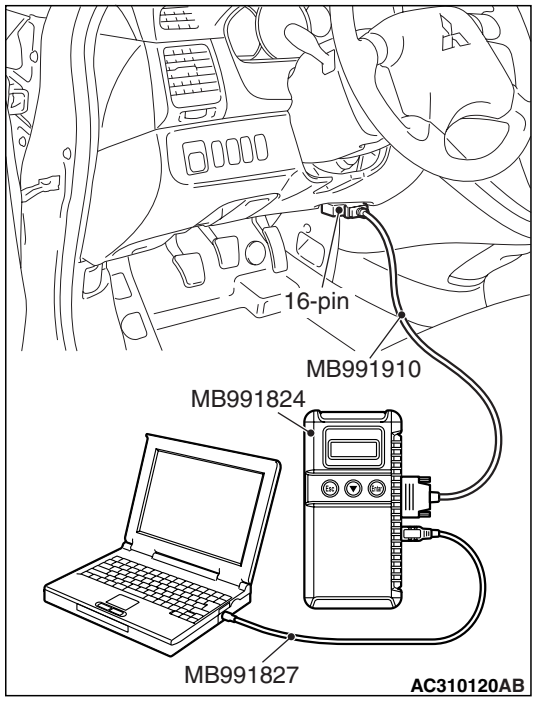
The most likely cause for this diagnosis code to set is:

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

DIAGNOSIS

STEP 1. MUT-III CAN bus diagnostics

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

(1) Connect MUT-III to the 16-pin diagnosis connector.
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

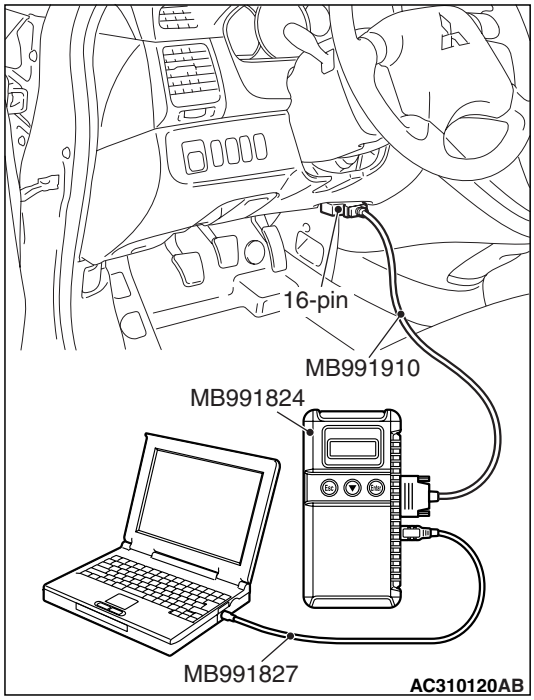
Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the CAN bus line (Refer to GROUP 54D, CAN bus line Diagnostic flow P.54D-9). Then go to Step 2.

STEP 2. Check whether the diagnosis code is reset.

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

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

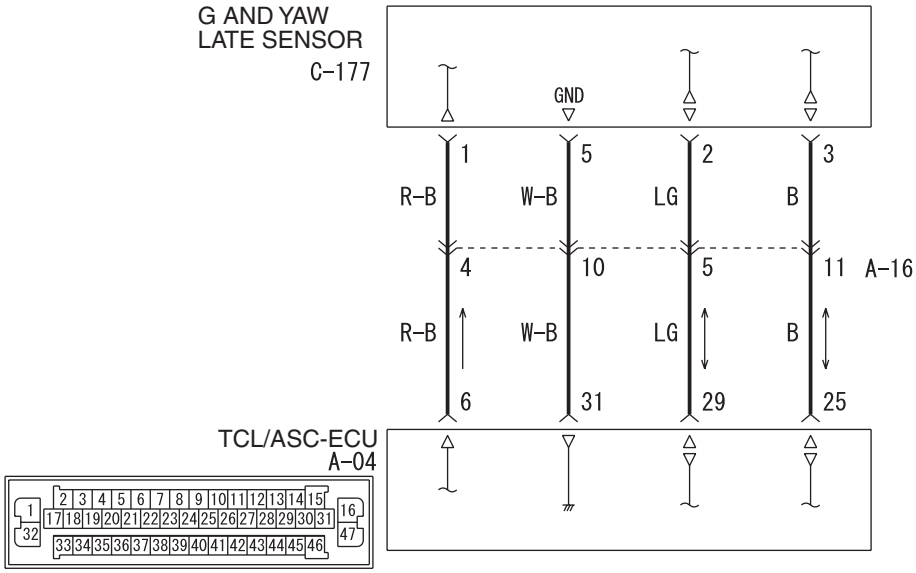
Q: Is code No.C1361 or C1364 set?

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

NO : The procedure is complete.

Code No.C1366: Lateral G-sensor (seizure or abnormal output signal)
Code No.C1371: Yaw rate sensor (seizure or abnormal output signal)

G and Yaw Late Sensor Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

W4X35E006A

⚠ CAUTION
If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines.

OPERATION

- The G and yaw rate sensor is energized by the TCL/ASC-ECU and the G and yaw rate sensor terminal 1.
- The G and yaw rate sensor output signal is sent to the TCL/ASC-ECU via the private CAN bus line.

DIAGNOSIS CODE SET CONDITIONS

These codes are set at the following cases:

Code No.C1366: Lateral G-sensor (seizure or abnormal output signal)

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

Code No.C1371: Yaw rate G-sensor (seizure or abnormal output signal)

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

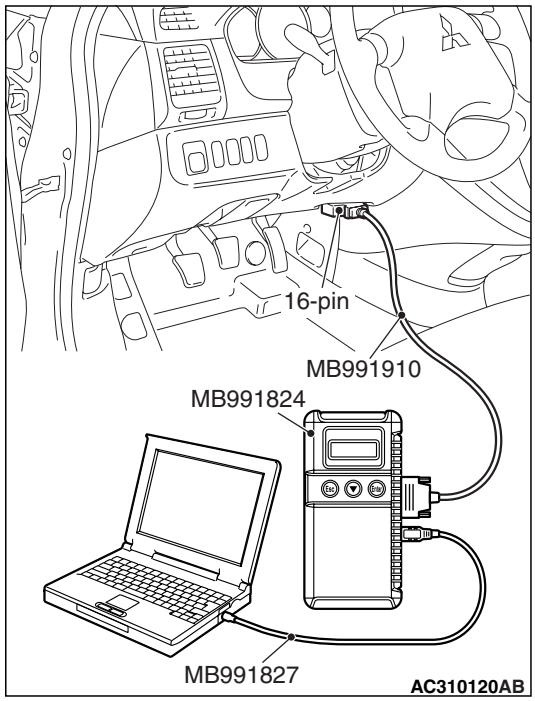
PROBABLE CAUSES

- Malfunction of the G and yaw rate sensor
- Incorrect installing of G and yaw rate sensor
- Steering wheel sensor-related abnormality
- Damaged wiring harness or connector
- Malfunction of the hydraulic unit (integrated with TCL/ASC-ECU)

DIAGNOSIS

STEP 1. MUT-III CAN bus diagnostics

⚠ CAUTION



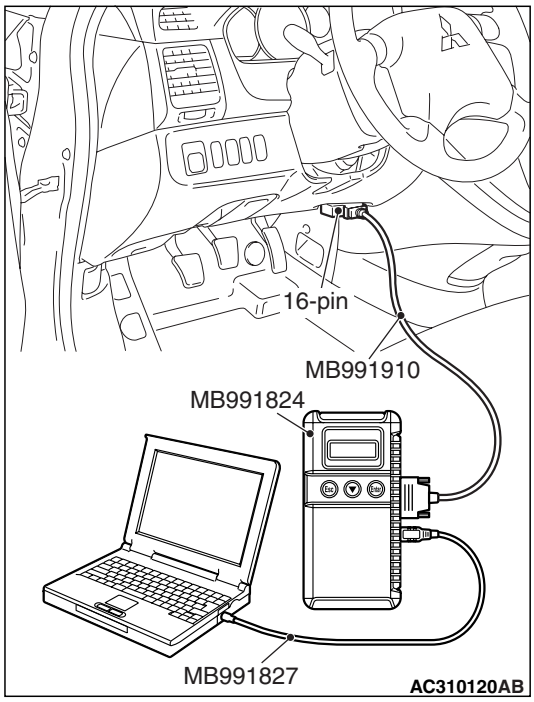
Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

(1) Connect MUT-III to the 16-pin diagnosis connector.
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the CAN bus line (Refer to GROUP 54D, CAN bus line Diagnostic flow P.54D-9). Then go to Step 2.

STEP 2. Check whether the diagnosis code is reset.

⚠ CAUTION



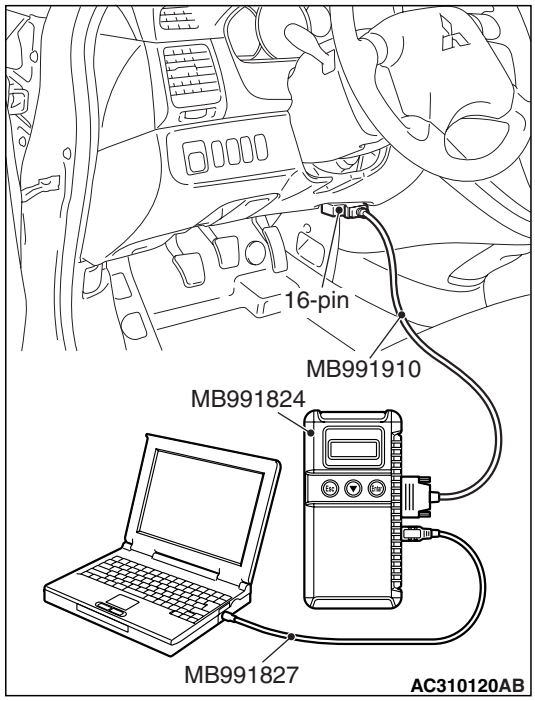
Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

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

Q: Is code No.C1366 or 1371 set?
YES : Go to Step 3.
NO : The procedure is complete.

STEP 3. MUT-III data list

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

(1) Connect the MUT-III to the 16-pin diagnosis connector.
(2) Turn the ignition switch to the "ON" position.
(3) Use MUT-III to read the following data list.

Item 31: Lateral G sensor

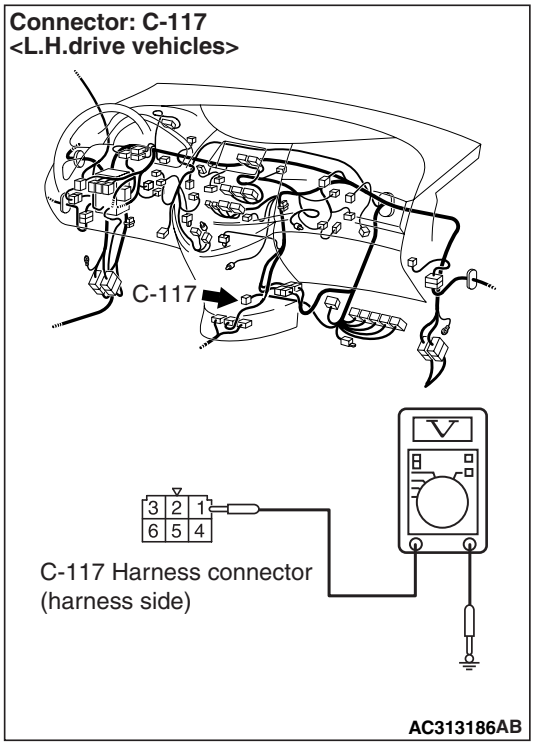
- Acceleration should measure nearly 0G when the vehicle is stopped at a level surface.
- Acceleration should change within the range of -1.7 – 1.7 G during running.

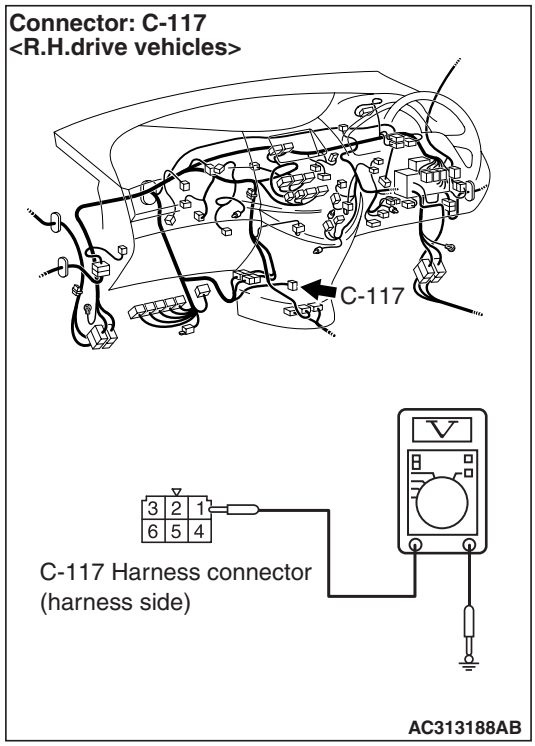
Item 33: Yaw rate sensor

- Angular velocity should measure nearly 0 deg/s (-3 –3 deg/s) when the vehicle is stopped at a level surface.
- Angular velocity should change within the range of -75 –75 deg/s during running.

Q: Is the check result normal?
YES : Then go to step 9.
NO : Go to Step 4.

STEP 4. Voltage measurement at G and yaw rate sensor connector C-117.





(1) Disconnect the G and yaw rate sensor connector C-117, and measure at the harness side connector.
(2) Turn the ignition switch to the "ON" position.
(3) Measure the voltage between terminal 1 and

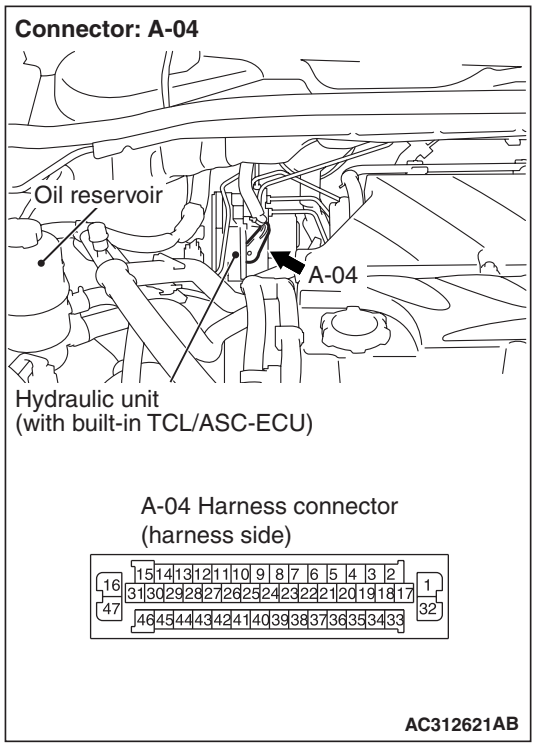
body earth.

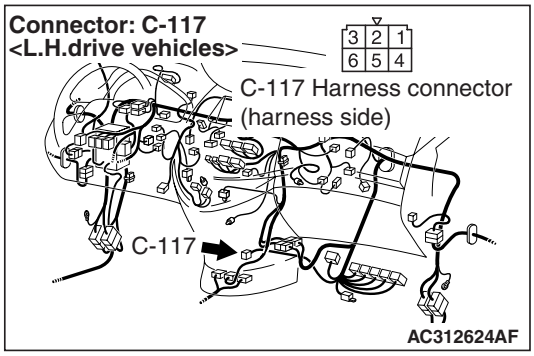
OK: System voltage

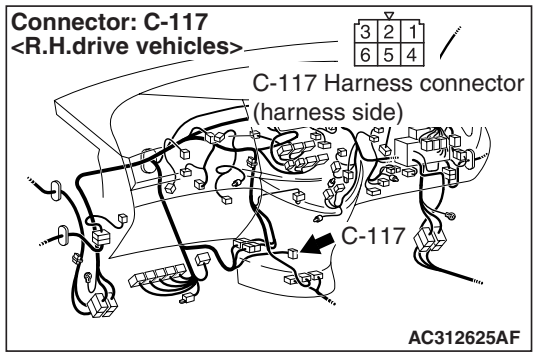
Q: Is the check result normal?

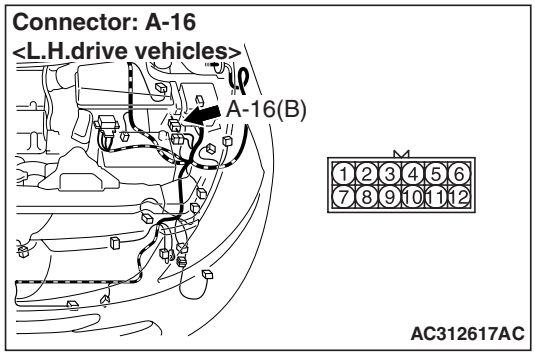
YES : Go to Step 6.
NO : Go to Step 5.

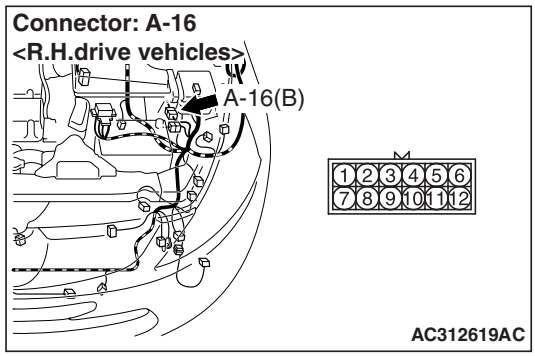
STEP 5. Check the harness wire between TCL/ASC-ECU connector A-04 terminal 6 and G and yaw rate sensor connector C-117 terminal 1.







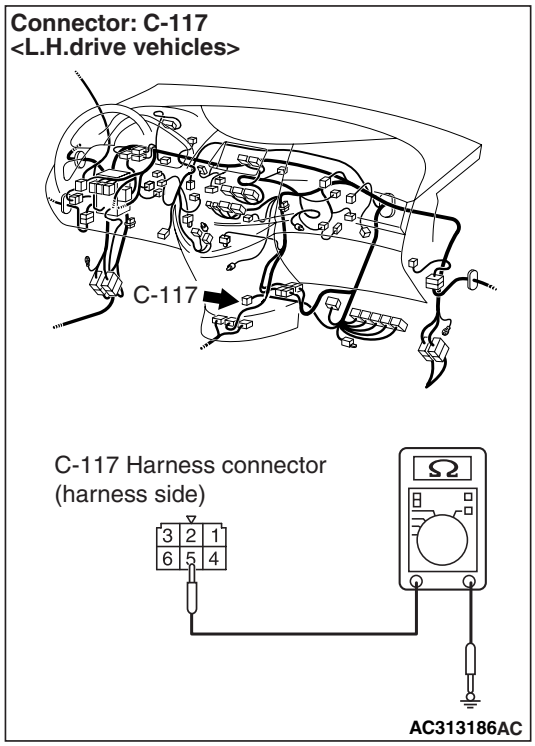


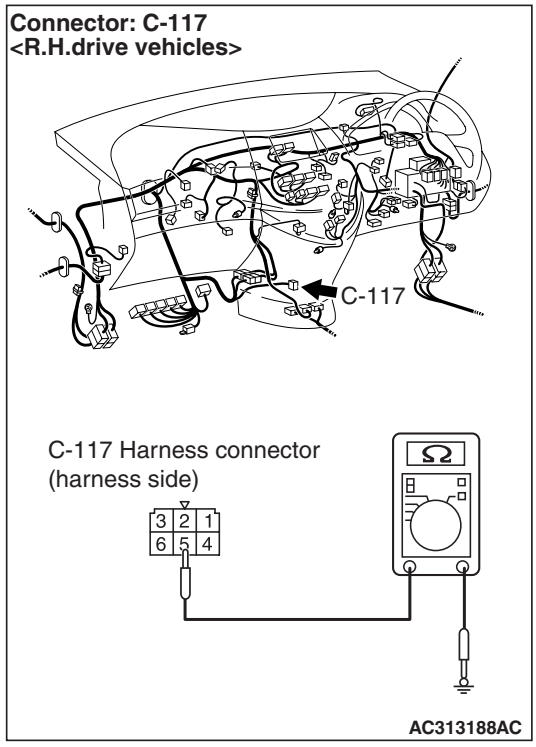


NOTE: After inspecting the TCL/ASC-ECU connector A-04, intermediate connector A-16 and G and yaw rate sensor connector C-117, inspect the wire. If any of these connector is damaged, repair or replace it. Then go to Step 10.

Q: Is the check result normal?
YES : Go to Step 9.
NO : Repair it and go to Step 10.

STEP 6. Resistance measurement the harness wire between G and yaw rate sensor connector C-117 terminal 5 and ground.



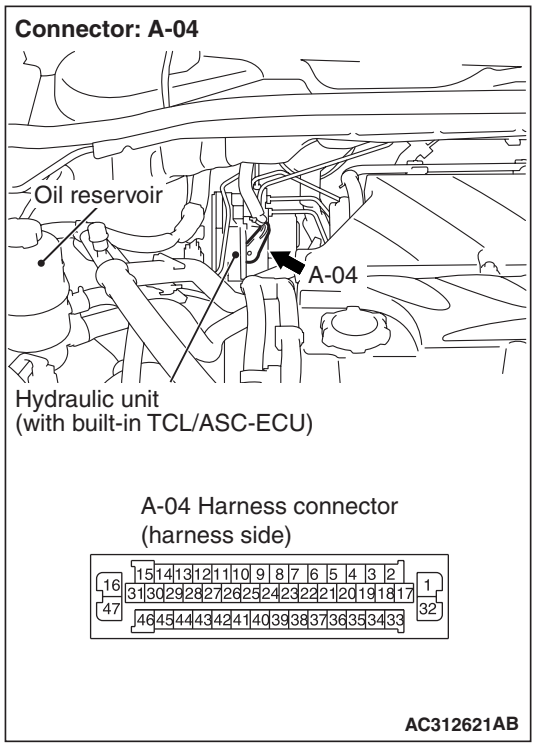


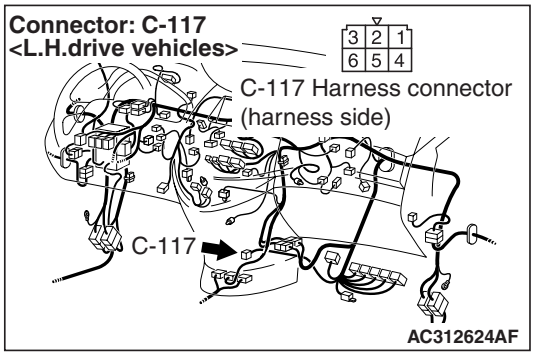
(1) Disconnect the G and yaw rate sensor connector C-117, and measure at the harness side connector.
(2) Measurement the resistance between terminal 5 and ground.

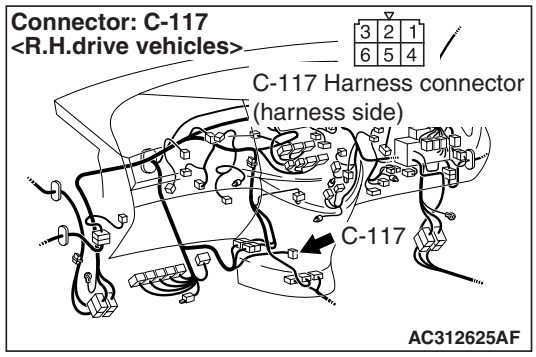
OK: 2 ohms or less

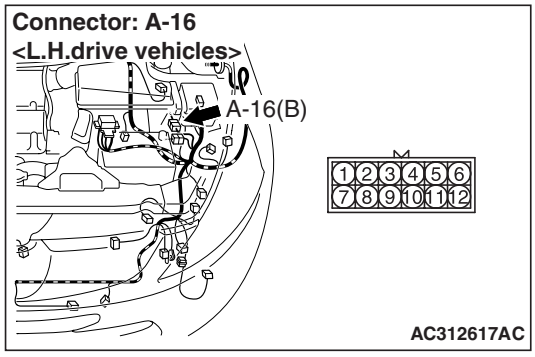
Q: Is the check result normal?
YES : Go to Step 8.
NO : Go to Step 7.

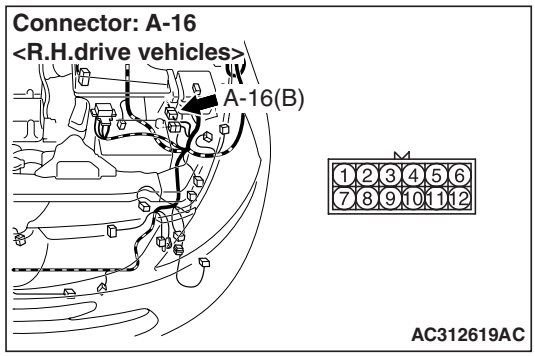
STEP 7. Check the harness wire between TCL/ASC-ECU connector A-04 terminal 31 and G and yaw rate sensor connector C-117 terminal 5.









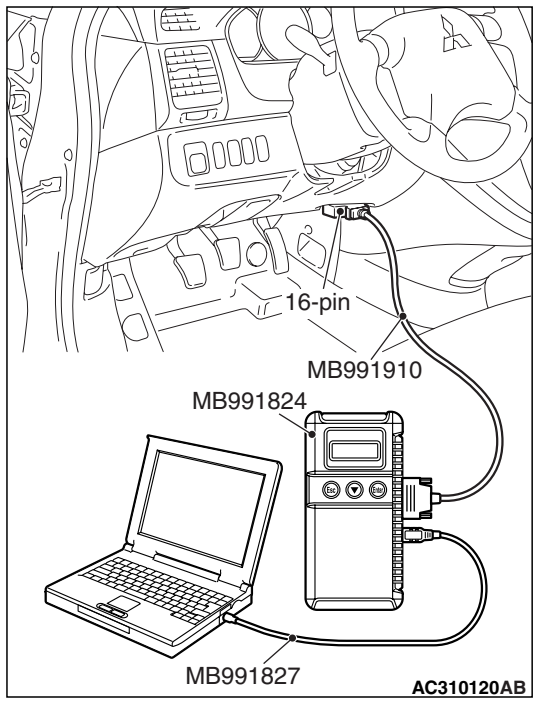


NOTE: After inspecting the TCL/ASC-ECU connector A-04, intermediate connector A-16 and G and yaw rate sensor connector C-117, inspect the wire. If any of these connector is damaged, repair or replace it. Then go to Step 10.

Q: Is the check result normal?
YES : Go to Step 8.
NO : Repair it and go to Step 10.

STEP 8. Check whether the diagnosis code is reset.

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

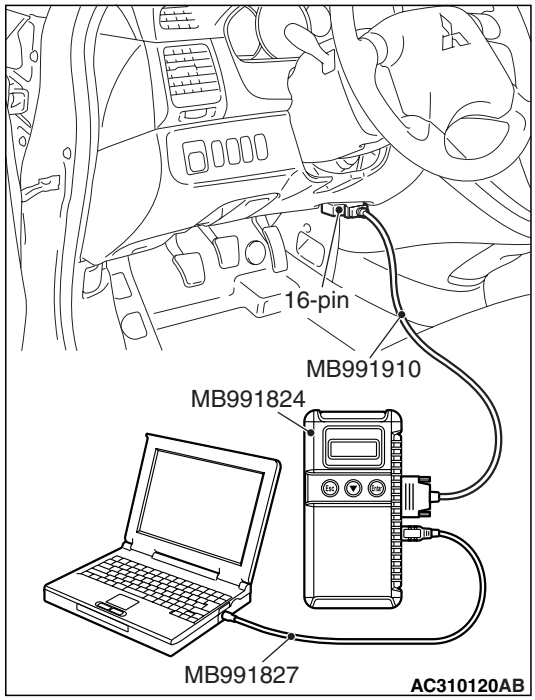
Replace the G and yaw rate sensor, and check whether diagnosis code C1366 or C1371 is reset.

(1) Replace the G and yaw rate sensor.
(2) Connect MUT-III to the 16-pin diagnosis connector.
(3) Turn the ignition switch to the "ON" position.

(4) Erase the diagnosis code.
(5) Turn the ignition switch to the "LOCK" (OFF) position.
(6) Turn the ignition switch to the "ON" position.
(7) Check if the diagnosis code is set.
(8) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is code No.C1366 or C1371 set?
YES : Replace the hydraulic unit (integrated with TCL/ASC-ECU). Then go to Step 10.
NO : The procedure is complete.

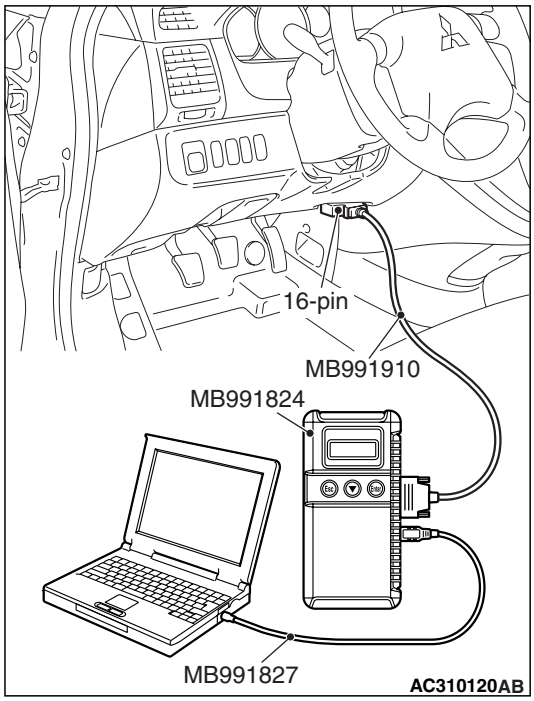
STEP 9. Check whether the diagnosis code is reset.



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

Q: Is code No.C1366 or C1371 set?
YES : Replace the hydraulic unit (integrated with TCL/ASC-ECU). Then go to Step 10.
NO : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5.

STEP 10. Recheck for diagnosis code.

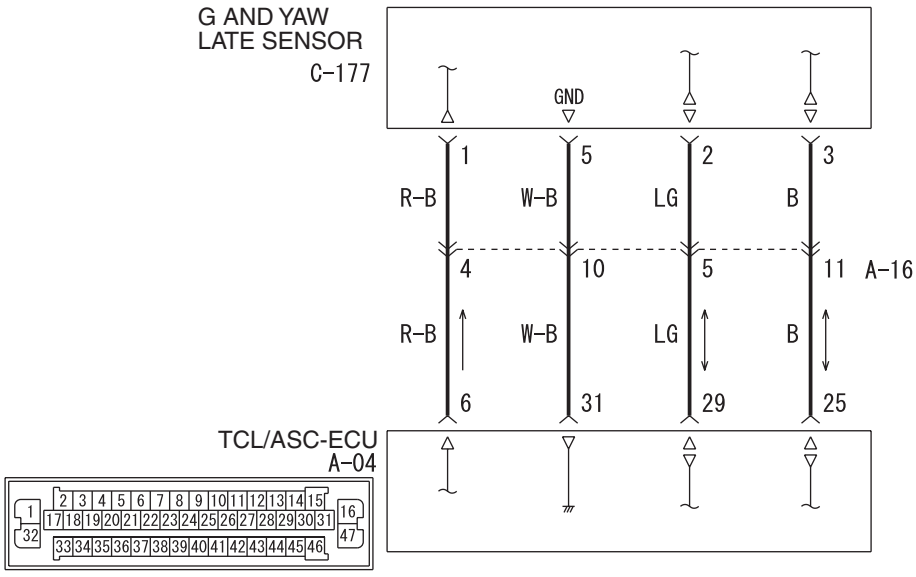


Check again if the diagnosis code is set.
(1) Turn the ignition switch to the "ON" position.
(2) Erase the diagnosis code.
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to the "ON" position.
(5) Check if the diagnosis code is set.
(6) Turn the ignition switch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

Q: Is code No.C1366 or C1371 set?
YES : Go to Step 1.
NO : The procedure is complete.

Code No.C1377: Sensor cluster communication abnormality

G and Yaw Late Sensor Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

W4X35E006A

⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines.

OPERATION

- The G and yaw rate sensor is energized by the TCL/ASC-ECU and the G and yaw rate sensor terminal 1.
- The G and yaw rate sensor output signal is sent to the TCL/ASC-ECU via the private CAN bus line.

DIAGNOSIS CODE SET CONDITIONS

This code is set when the signal from the G and yaw rate sensor is not normal.

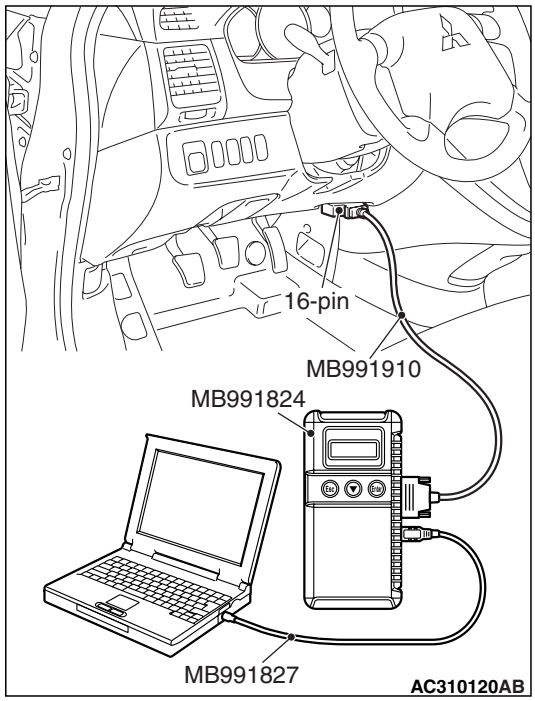
PROBABLE CAUSES

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

DIAGNOSIS

STEP 1. MUT-III CAN bus diagnostics

⚠ CAUTION



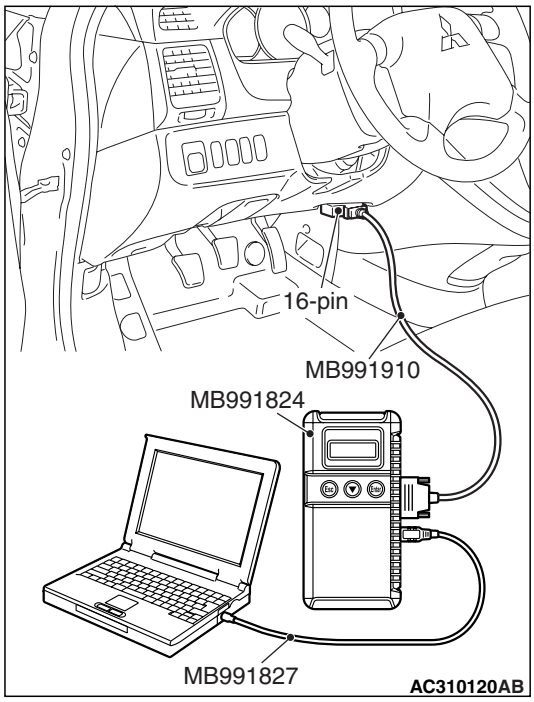
Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

(1) Connect MUT-III to the 16-pin diagnosis connector.
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the CAN bus line (Refer to GROUP 54D, CAN bus line Diagnostic flow P.54D-9). Then go to Step 2.

STEP 2. Check whether the diagnosis code is reset.

⚠ CAUTION

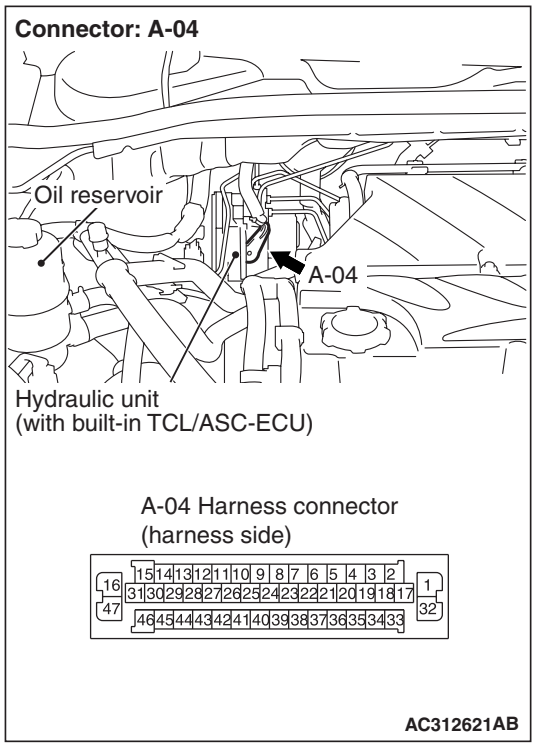


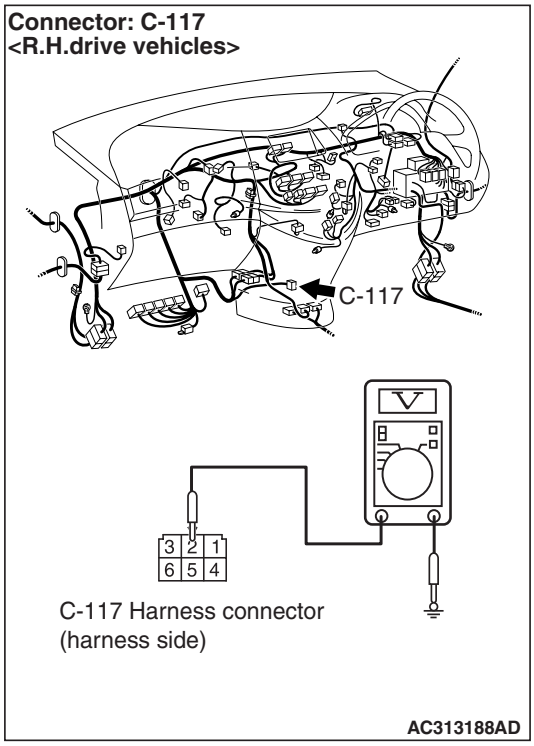
Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

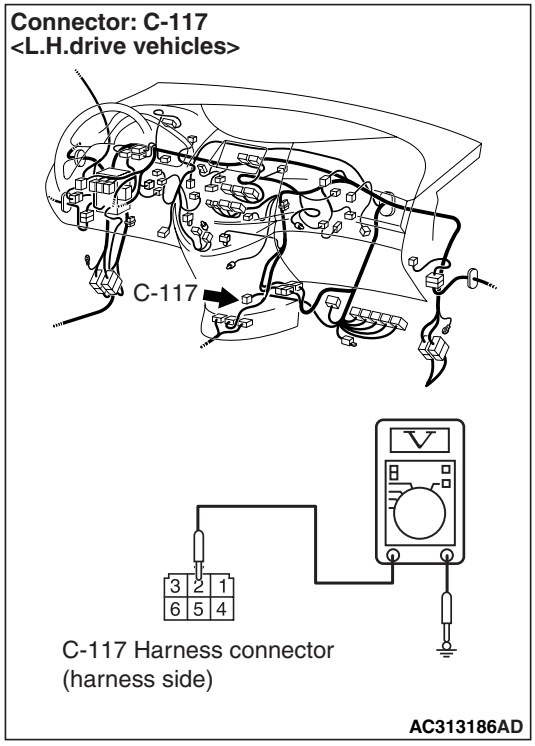
(1) Turn the ignition switch to the "ON" position.
(2) Erase the diagnosis code.
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to the "ON" position.
(5) Check if the diagnosis code is set.
(6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is code No.C1377 set?
YES : Go to Step 3.
NO : The procedure is complete.

STEP 3. Voltage measurement at G and yaw rate sensor connector C-117.







(1) Disconnect TCL/ASC-ECU connector A-04 and G and yaw rate sensor connector C-117
(2) Turn the ignition switch to the "ON" position.
(3) Measure the voltage between the relevant signal terminals 2, 3 and earth.

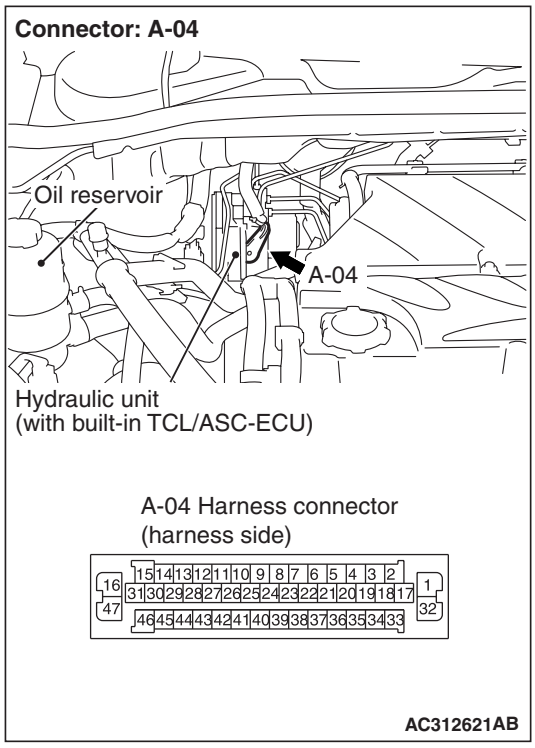
OK: Less than 1V

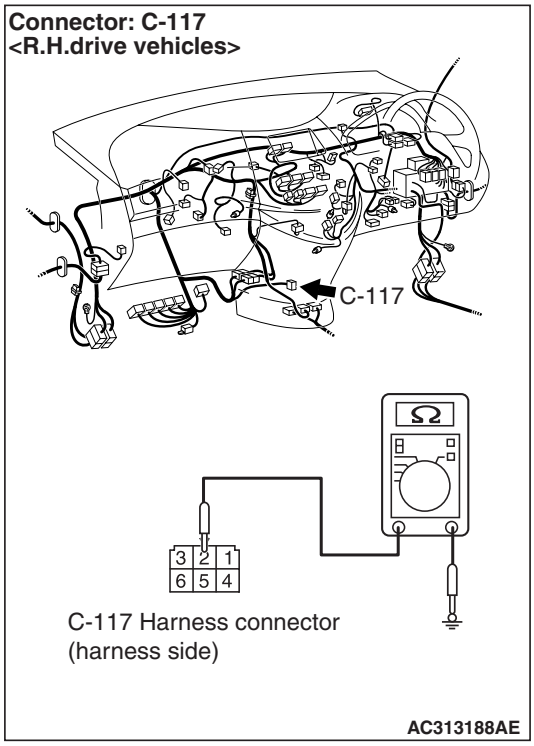
Q: Is the check result normal?

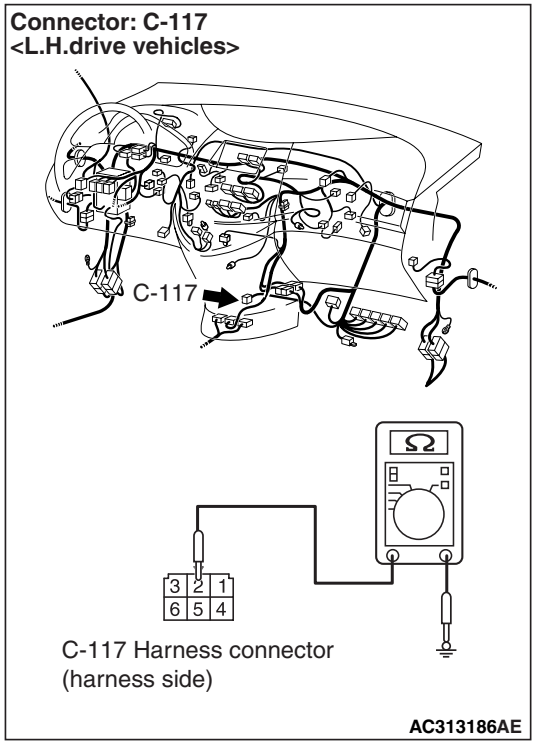
YES : Go to Step 4.

NO : Check the harness wire between TCL/ASC-ECU and the G and yaw rate sensor for short to power supply. Repair if necessary, and then go to Step 8.

STEP 4. Resistance measurement at G and yaw rate sensor connector C-117.







(1) Disconnect TCL/ASC-ECU connector A-04 and G and yaw rate sensor connector C-117
(2) Turn the ignition switch to the "ON" position.
(3) Measure the resistance between the relevant signal terminals 2, 3 and earth.

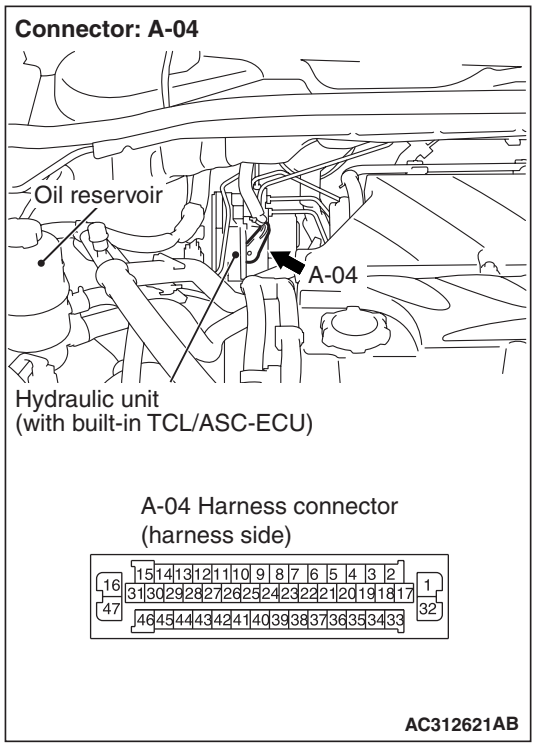
OK: No continuity

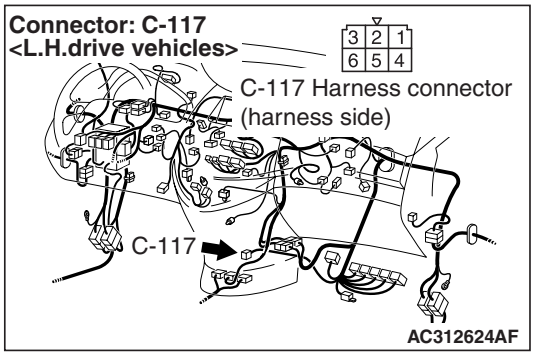
Q: Is the check result normal?

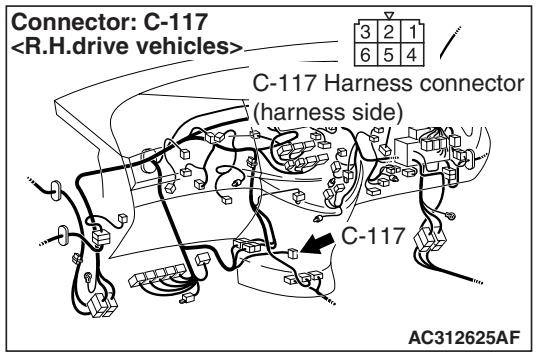
YES : Go to Step 5.

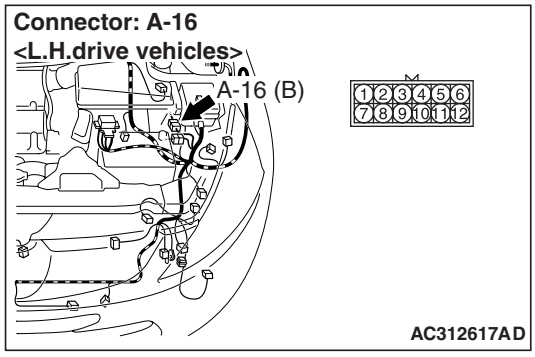
NO : Check the harness wire between TCL/ASC-ECU and the G and yaw rate sensor for short to earth. Repair if necessary, and then go to Step 8.

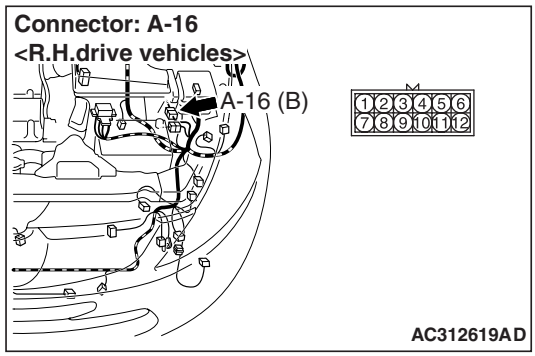
STEP 5. Check TCL/ASC-ECU connector A-04, intermediate connector A-16 and G and yaw rate sensor connector C-117 for loose, corroded or damaged terminals, or terminals pushed back in the connector.





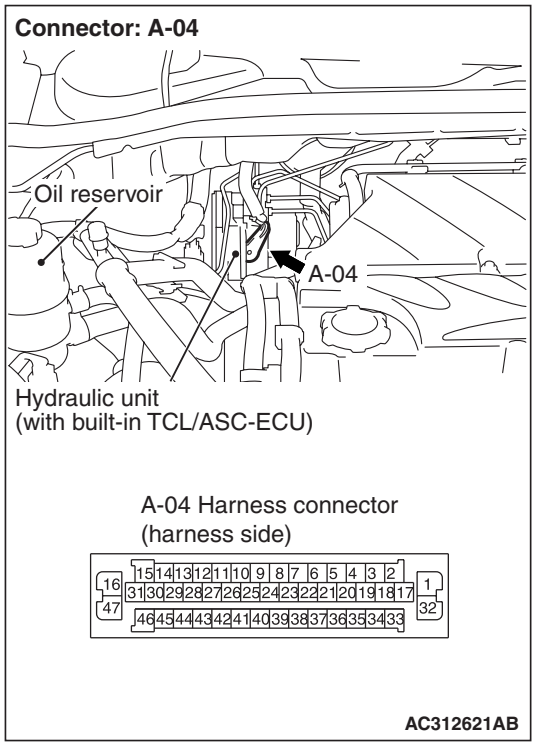


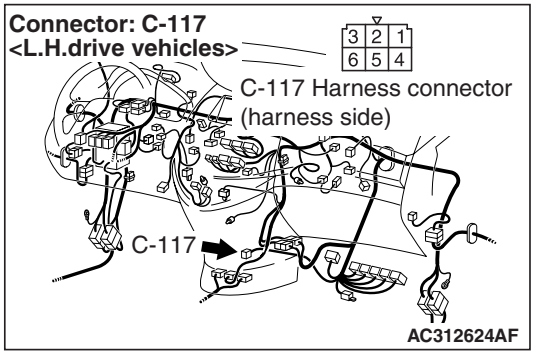


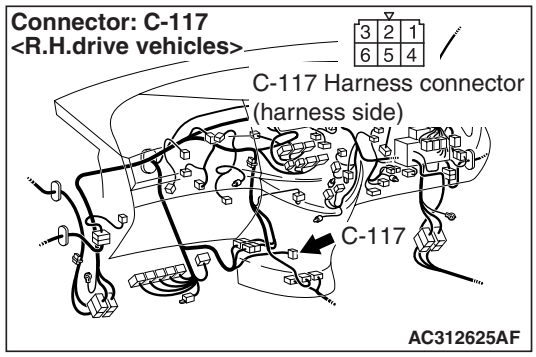


Q: Is the check result normal?
YES : Go to Step 6.
NO : Repair or replace the damaged component(s). Then go to Step 8.

STEP 6. Check the harness wires between TCL/ASC-ECU connector A-04 and G and yaw rate sensor connector C-117.







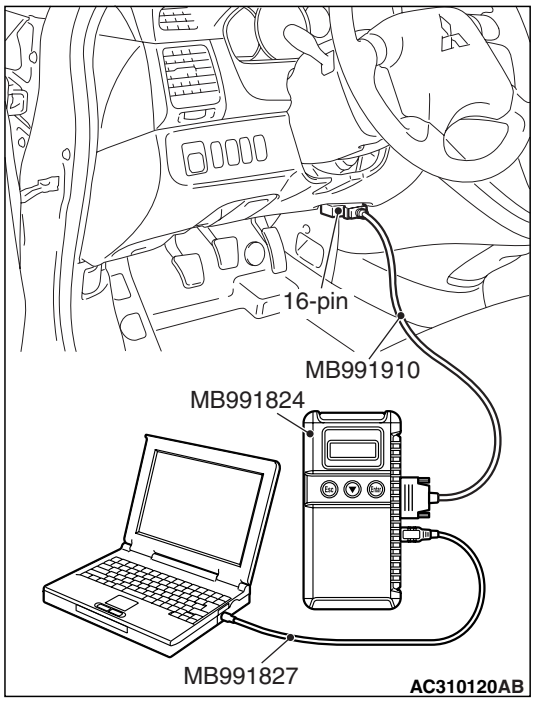
Check the harness for short circuit.

Q: Is the check result normal?

YES : Go to Step 7.
NO : Repair the wiring harness. Then go to Step 8.

STEP 7. Check whether the diagnosis code is reset.

⚠ CAUTION



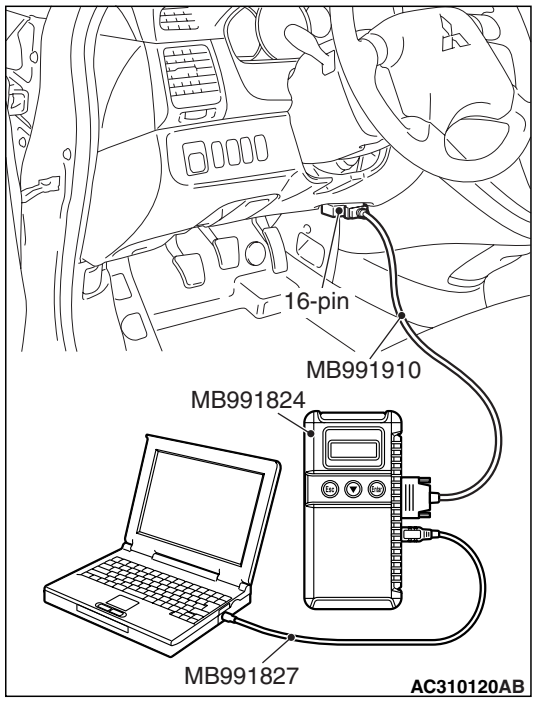
Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

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

Q: Is code No.C1377 set?
YES : Replace the hydraulic unit (integrated with TCL/ASC-ECU). Then go to Step 8.
NO : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5.

STEP 8. Check whether the diagnosis code is reset.

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

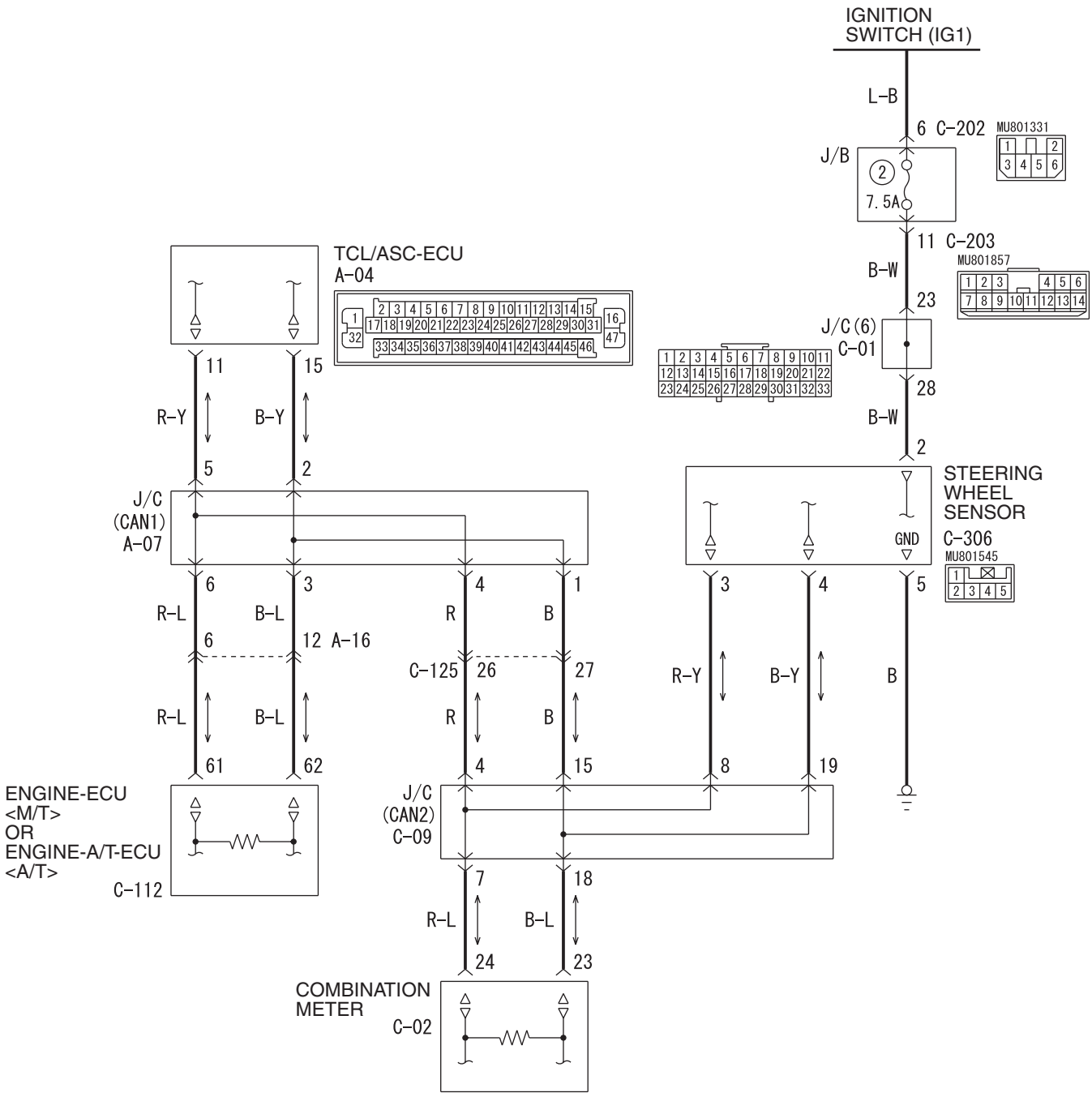
(1) Turn the ignition switch to the "ON" position.
(2) Erase the diagnosis code.
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to the "ON" position.
(5) Check if the diagnosis code is set.
(6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is code No.C1377 set?
YES : Repeat the troubleshooting from Step 1.
NO : The procedure is complete.

Code No.C1505: Steering wheel sensor (signal seizure or abnormal neutral point)
Code No.C1506: Steering wheel sensor (steering sensor malfunction)

<LH drive vehicles>

Steering Wheel Sensor Communication Circuit

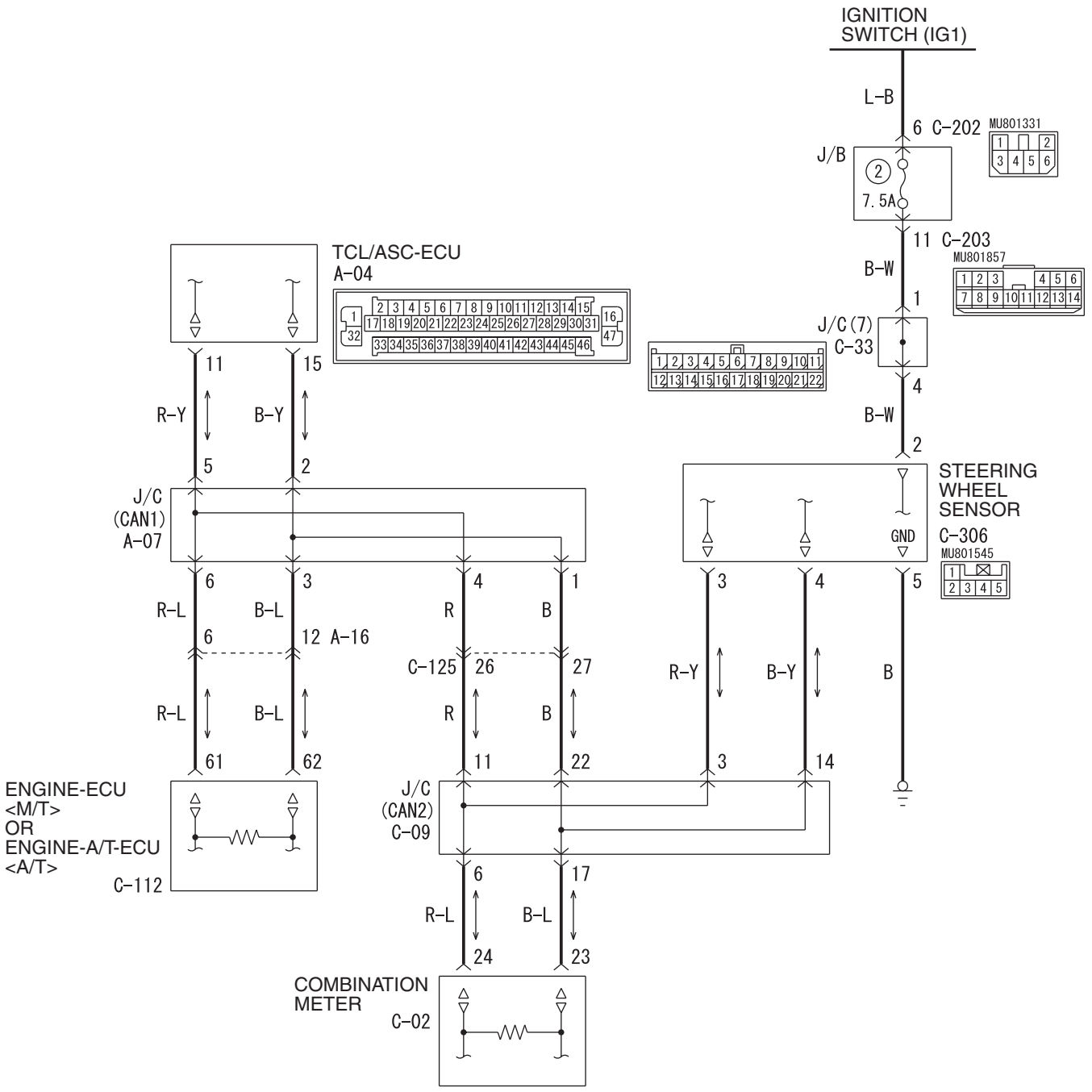


Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

W4X35E009A

<RH drive vehicles>

Steering Wheel Sensor Communication Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

W4X35E010A

⚠ CAUTION
If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines.

⚠ CAUTION
The steering wheel sensor-related diagnosis code may be set when diagnosis code No.C1506 is set. Diagnose the steering wheel sensor first when the steering wheel sensor-related diagnosis code is set.

OPERATION

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

DIAGNOSIS CODE SET CONDITIONS

- These diagnosis codes will be set under the cases below.

Code No.C1505: Steering Wheel Sensor (signal seizure or abnormal neutral point)

- The steering wheel sensor output value does not fluctuate for more than 60 seconds although the vehicle speed is 50 km/h or more and the G and yaw late sensor output value is fluctuating.
- The neutral point has been ±15 deg or more and running more than 30 km with speed exceeds 10 km.

Code No.C1506: Steering Wheel Sensor (steering sensor malfunction)

- The steering wheel sensor sets the diagnosis code.

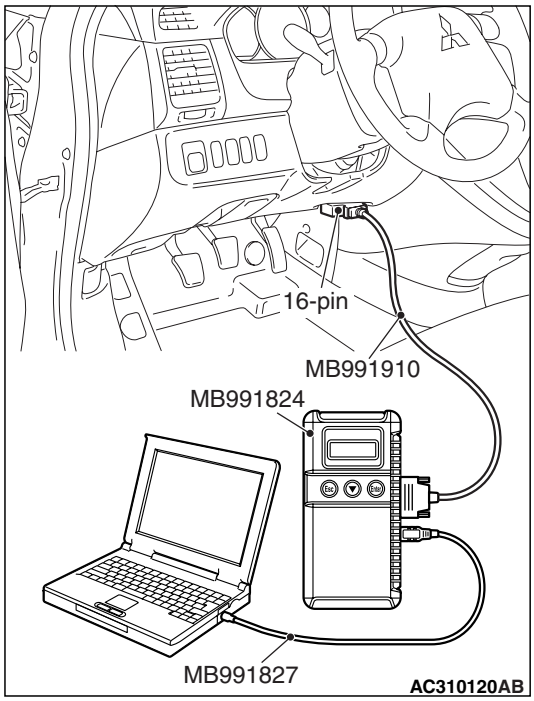
PROBABLE CAUSES

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

DIAGNOSIS

STEP 1. MUT-III CAN bus diagnostics

⚠ CAUTION



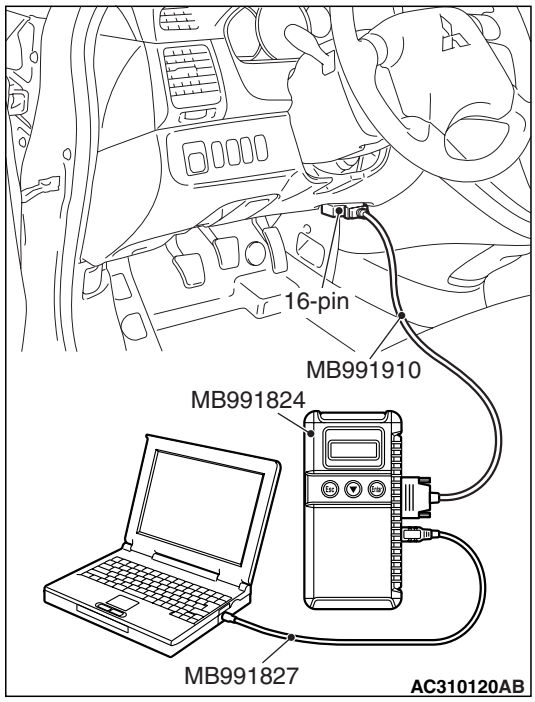
Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

(1) Connect MUT-III to the 16-pin diagnosis connector.
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the CAN bus line (Refer to GROUP 54D, CAN bus line Diagnostic flow P.54D-9). Then go to Step 2.

STEP 2. Check whether the diagnosis code is reset.

⚠ CAUTION



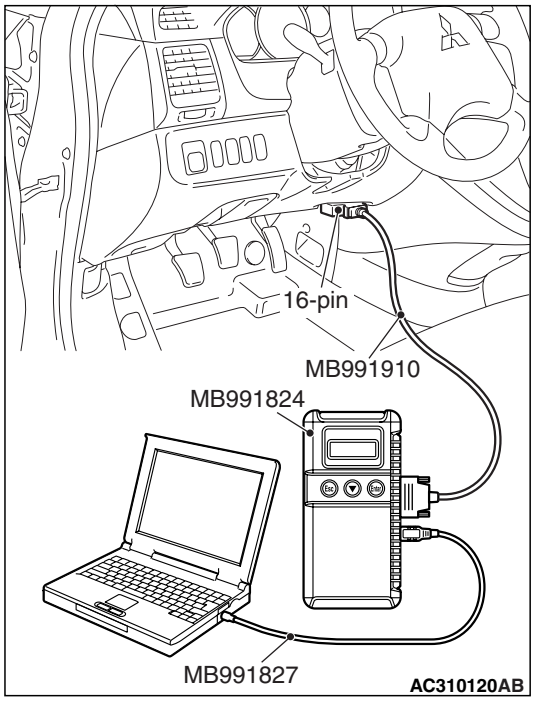
Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

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

Q: Is code No.C1505 or C1506 set?
YES <C1505 is set> : Go to Step 3.
YES <C1506 is set> : Check the steering wheel sensor diagnosis code, and diagnose the diagnosis code (Refer to P.35C-118).
NO : The procedure is complete.

STEP 3. MUT-III data list

⚠ CAUTION



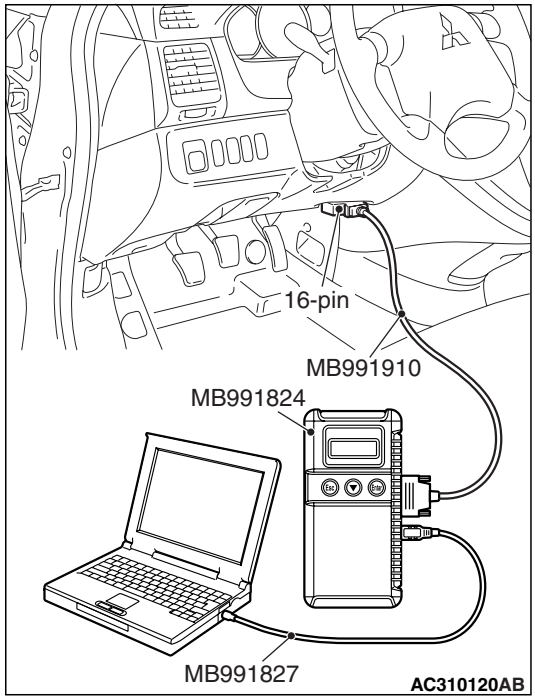
Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

(1) Connect MUT-III to the 16-pin diagnosis connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set MUT-III to data reading mode.
- Item 32: Steering angle

OK: Correct angle is displayed as the steering wheel is turned.

Q: Is the check result normal?
YES : Go to step 6.
NO : Align the steering wheel sensor neutral point and carry out calibration (Refer to P.35C-168). Then go to Step 4.

STEP 4. Check whether the diagnosis code is reset.



Check again if the diagnosis code is set.

(1) Turn the ignition switch to the "ON" position.
(2) Erase the diagnosis code.
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to the "ON" position.
(5) Turn the steerng wheel full left and right.
(6) Check if the diagnosis code is set.
(7) Turn the ignition switch to the "LOCK" (OFF) position.

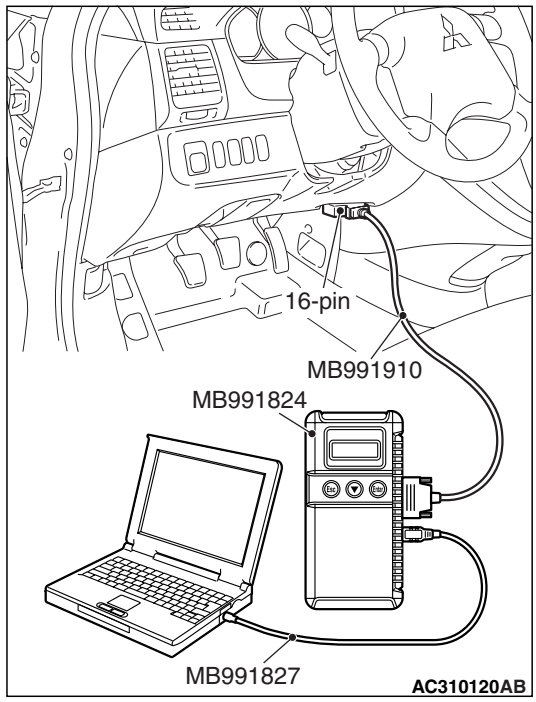
Q: Is code No.C1505 or C1506 set?

YES : <C1505 is set> Go to Step 5. <C1506 is set> Check the steering wheel sensor diagnosis code, and diagnose the diagnosis code.

NO : The procedure is complete.

STEP 5. Check whether the diagnosis code is reset.

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

Replace the steering sensor, and check whether diagnosis code No.C1505 or C1506 is reset.

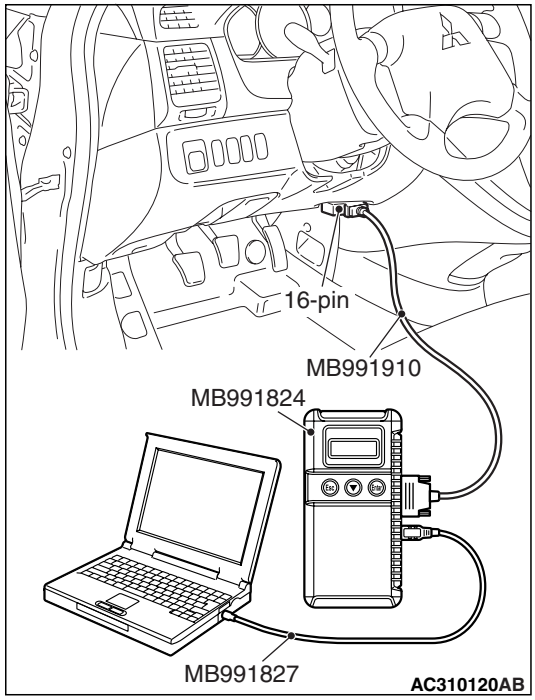
(1) Replace the steering sensor.
(2) Connect MUT-III to the 16-pin diagnosis connector.
(3) Turn the ignition switch to the "ON" position.
(4) Erase the diagnosis code.
(5) Turn the ignition switch to the "LOCK" (OFF) position.
(6) Turn the ignition switch to the "ON" position.
(7) Check if the diagnosis code is set.
(8) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is code No.C1505 set?

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

NO : The procedure is complete.

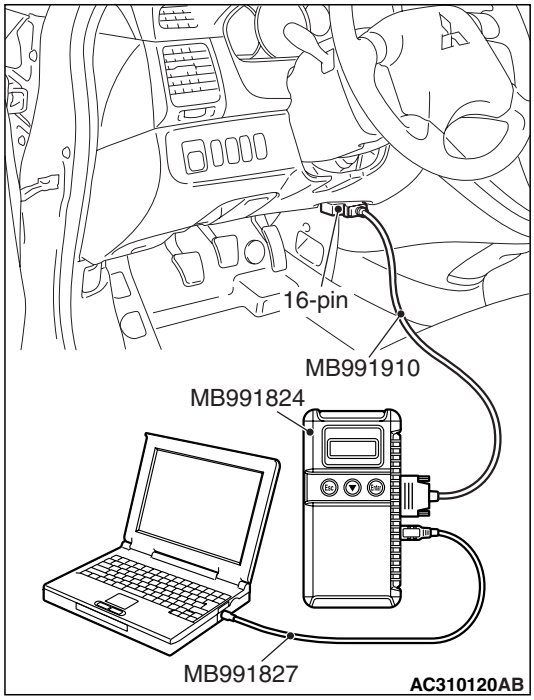
STEP 6. Check whether the diagnosis code is reset.



Check again if the diagnosis code is set.
(1) Turn the ignition switch to the "ON" position.
(2) Erase the diagnosis code.
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to the "ON" position.
(5) Turn the steerng wheel full left and right.
(6) Check if the diagnosis code is set.
(7) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is code No.C1505 or C1506 set?
YES : Replace the hydraulic unit (integrated with TCL/ASC-ECU). <C1505 is set> Then go to Step 7. <C1506 is set> Check the steering wheel sensor diagnosis code, and diagnose the diagnosis code.
NO : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5.

STEP 7. Check whether the diagnosis code is reset.



Check again if the diagnosis code is set.
(1) Turn the ignition switch to the "ON" position.
(2) Erase the diagnosis code.
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to the "ON" position.
(5) Turn the steerng wheel full left and right.
(6) Check if the diagnosis code is set.
(7) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is code No.C1505 or C1506 set?
YES : Go to Step 1.
NO : The procedure is complete.

Code No.C1607: Trouble in TCL/ASC-ECU

⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines.

⚠ CAUTION

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

DIAGNOSIS CODE SET CONDITIONS

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

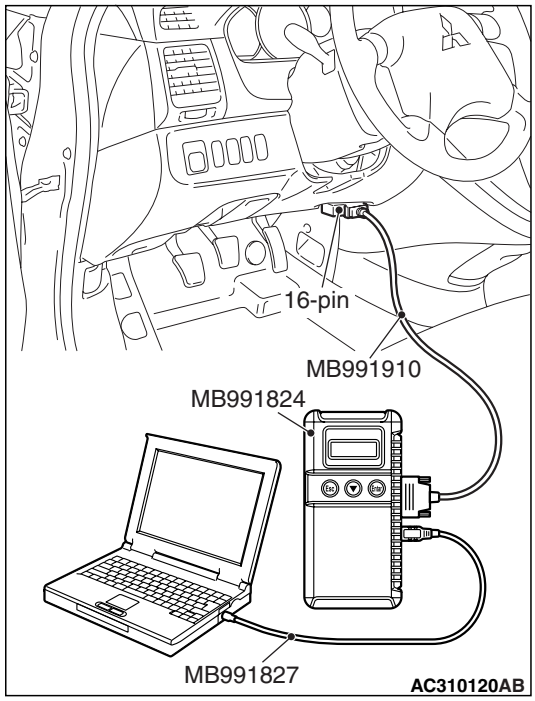
PROBABLE CAUSES

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

DIAGNOSIS

STEP 1. MUT-III CAN bus diagnostics

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

(1) Connect MUT-III to the 16-pin diagnosis connector.
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

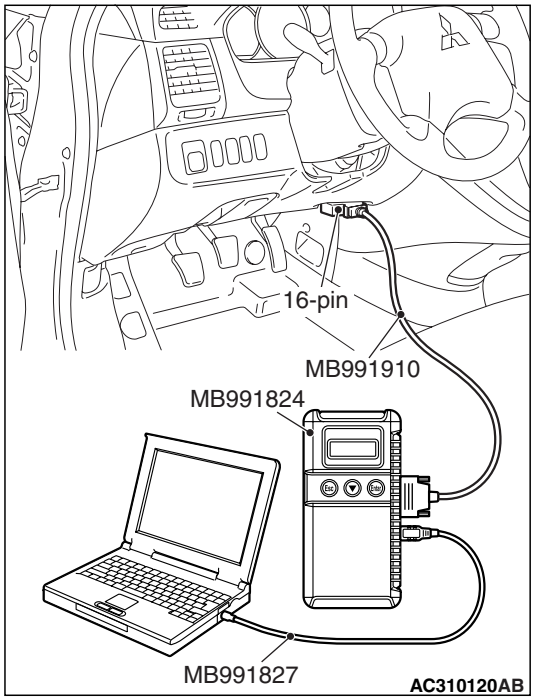
Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the CAN bus line (Refer to GROUP 54D, CAN bus line Diagnostic flow P.54D-9). Then go to Step 2.

STEP 2. MUT-III diagnosis code

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

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

Q: Is code No.C1607 set?

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

NO : The procedure is complete.

Code No.C1640: Incorrectly installed TCL/ASC-ECU

⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines.

⚠ CAUTION

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

DIAGNOSIS CODE SET CONDITIONS

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

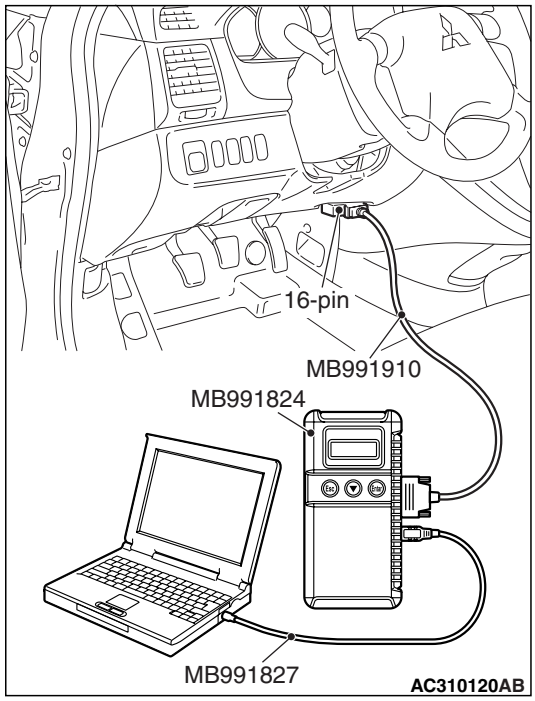
PROBABLE CAUSES

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

DIAGNOSIS

STEP 1. MUT-III CAN bus diagnostics

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

(1) Connect MUT-III to the 16-pin diagnosis connector.
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

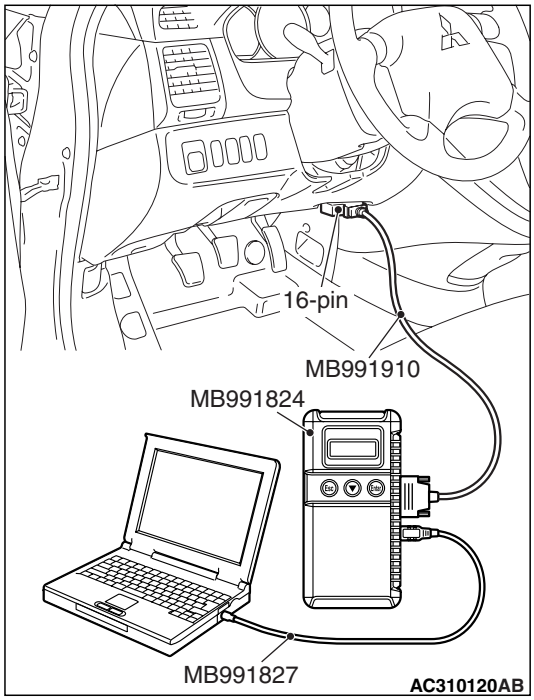
Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the CAN bus line (Refer to GROUP 54D, CAN bus line Diagnostic flow P.54D-9). Then go to Step 2.

STEP 2. MUT-III diagnosis code

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

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

Q: Is code No.C1640 set?

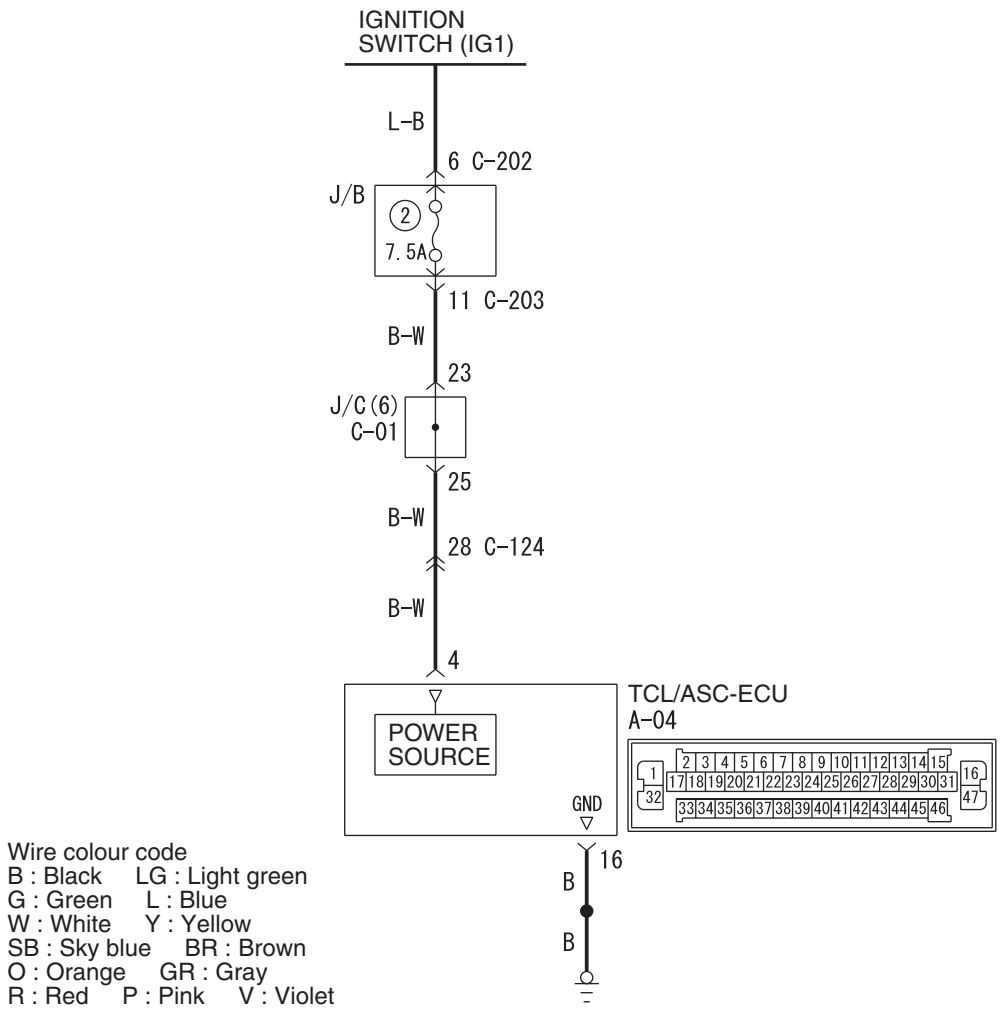
YES : Replace the hydraulic unit (integrated with TCL/ASC-ECU).

NO : The procedure is complete.

Code No.C1860: Power supply high voltage
Code No.C1861: Power supply low voltage

<LH drive vehicles>

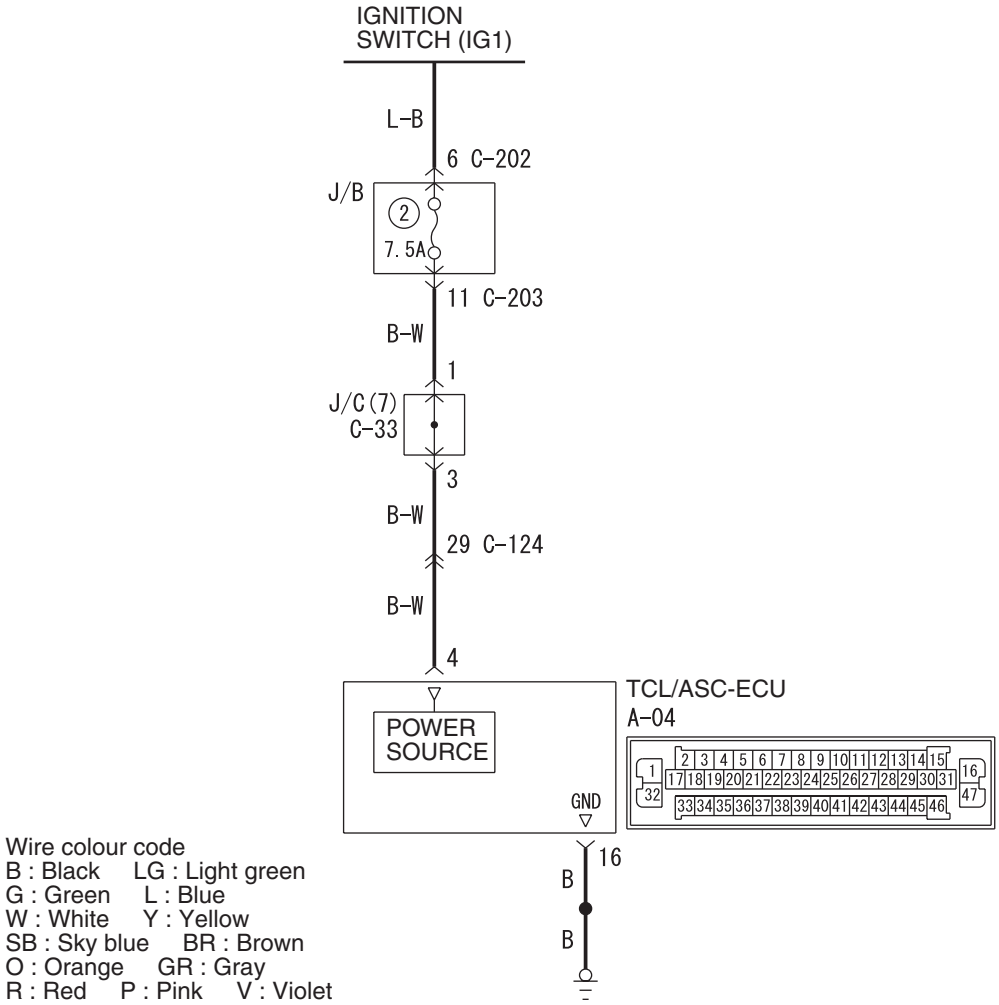
TCL/ASC-ECU Power Supply and Ground Circuit



W4X35E007A

<RH drive vehicles>

TCL/ASC-ECU Power Supply and Ground Circuit



W4X35E008A

⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines.

OPERATION

The TCL/ASC-ECU is energized by the ignition switch (IG1) through multi-purpose fuse 2 and the TCL/ASC-ECU terminal 4.

DIAGNOSIS CODE SET CONDITIONS

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

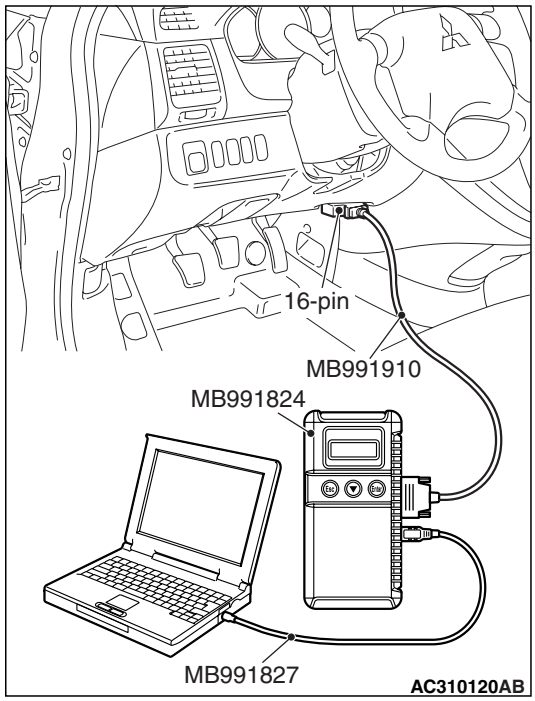
PROBABLE CAUSES

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

DIAGNOSIS

STEP 1. MUT-III CAN bus diagnostics

⚠ CAUTION



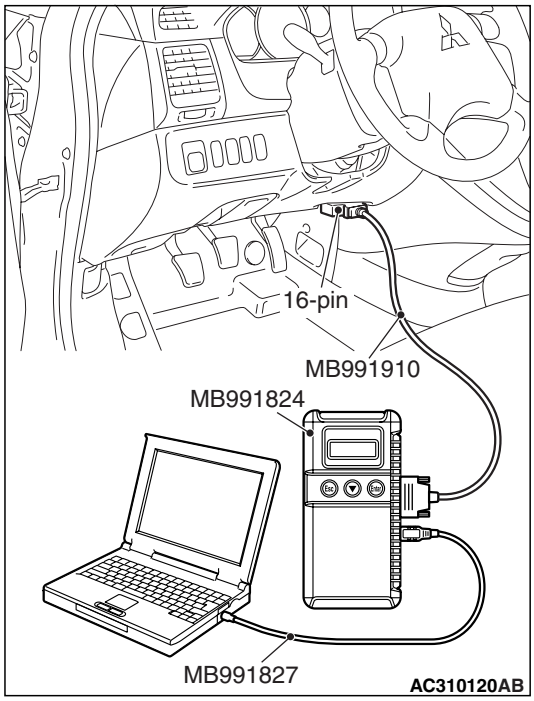
Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

(1) Connect MUT-III to the 16-pin diagnosis connector.
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the CAN bus line (Refer to GROUP 54D, CAN bus line Diagnostic flow P.54D-9). Then go to Step 2.

STEP 2. MUT-III diagnosis code

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

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

Q: Is code No.C1860 or C1861 set?
YES : Go to Step 3.
NO : The procedure is complete.

STEP 3. Check the battery.

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

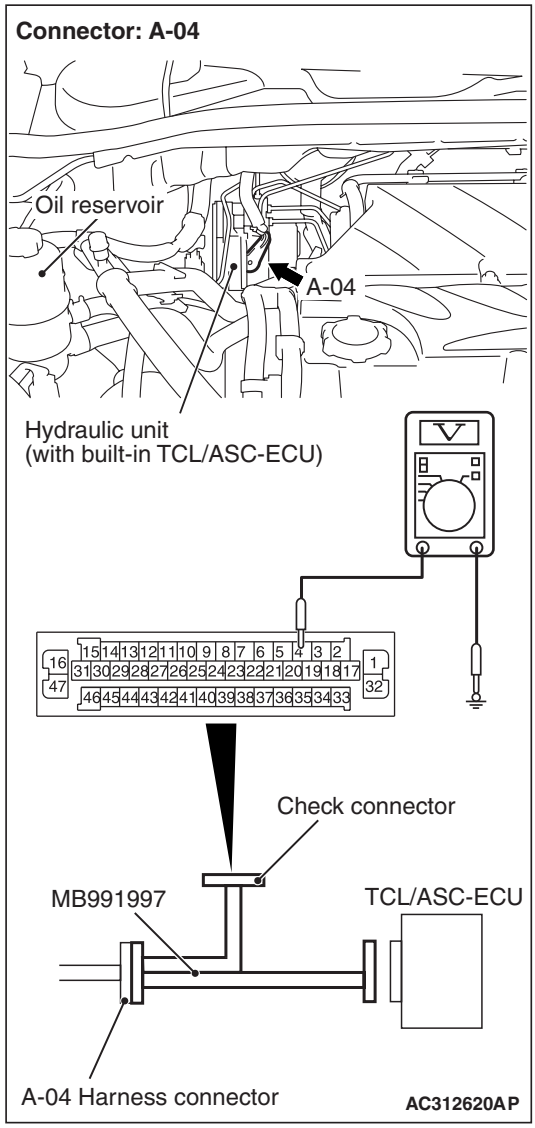
Q: Is the check result normal?
YES : Go to Step 4.
NO : Charge or replace the battery.

STEP 4. Check the charging system.

Check the charging system (Refer to GROUP 16, Charging system diagnosis P.16-5).

Q: Is the check result normal?
YES : Go to Step 5.
NO : Repair or replace the charging system component(s).

STEP 5. Voltage measurement at TCL/ASC-ECU connector A-04.



(1) Disconnect the connector A-04, and connect special tool ABS Check Harness (MB991997) to the wiring harness-side connector.

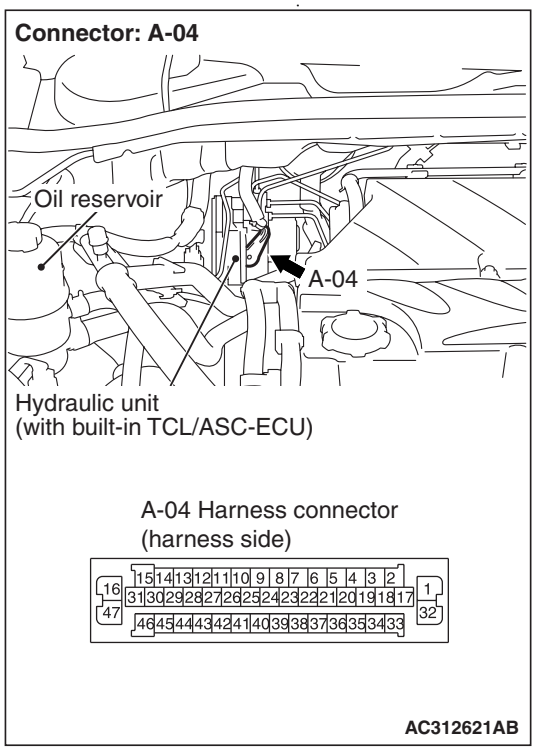
NOTE: Do not connect special tool ABS Check Harness (MB991997) to the TCL/ASC-ECU.

(2) Turn the ignition switch to the "ON" position.
(3) Measure the voltage between terminal 4 and earth.

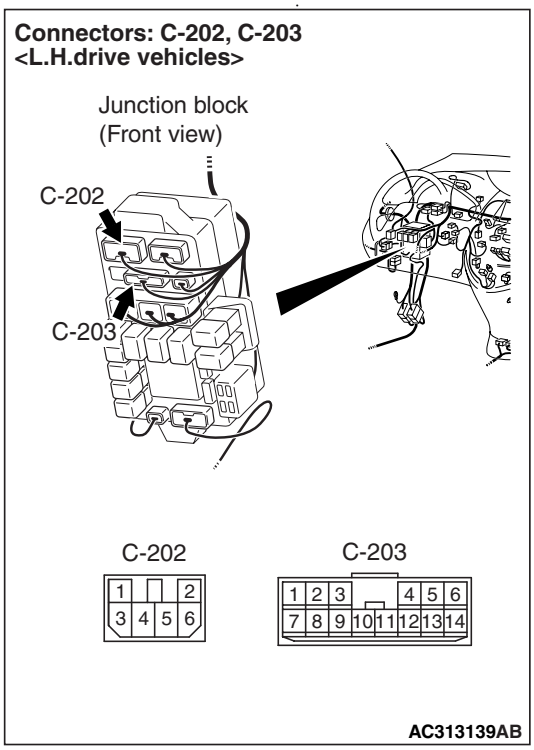
OK: System voltage

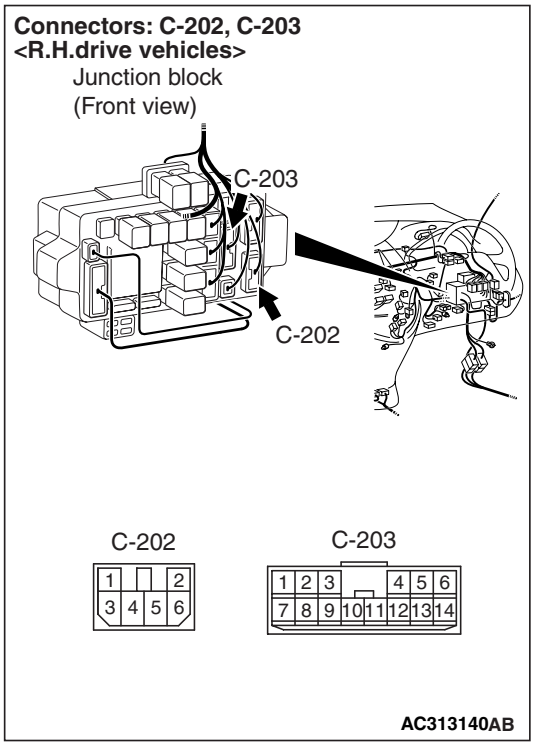
Q: Is the check result normal?
YES : Go to Step 7.
NO : Go to Step 6.

STEP 6. Check the following connectors.

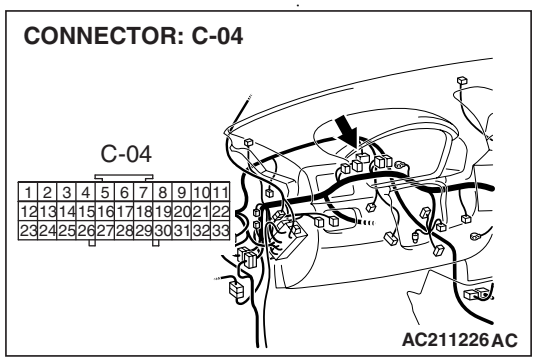


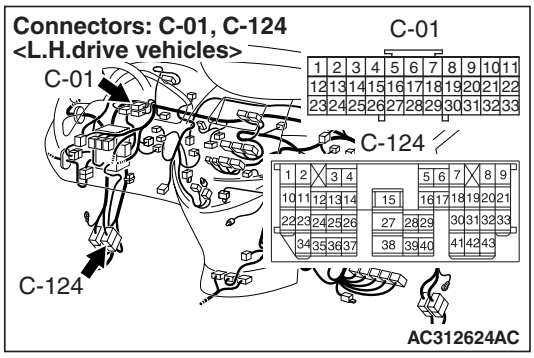
TCL/ASC-ECU connector A-04

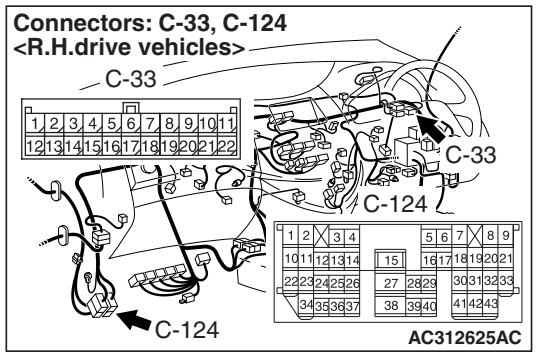




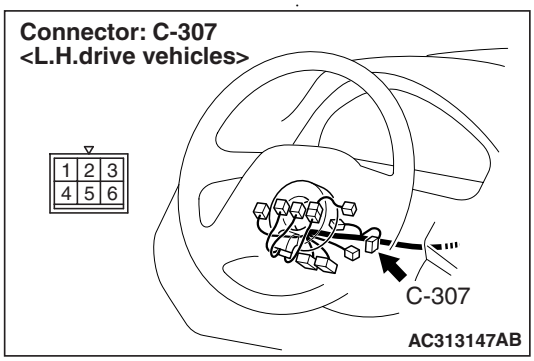
Junction block connectors C-202 and C-203

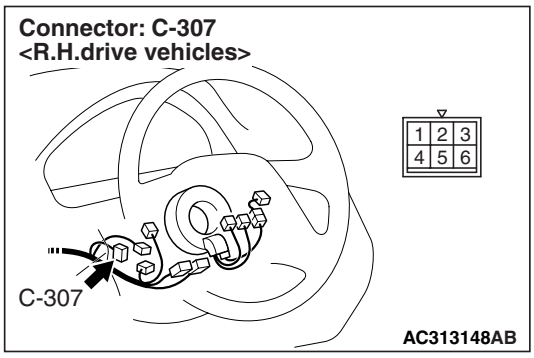






Joint connector C-01 <LH drive vehicles> or C-33 <RH drive vehicles> and intermediate connector C-124





Ignition switch connector C-307

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

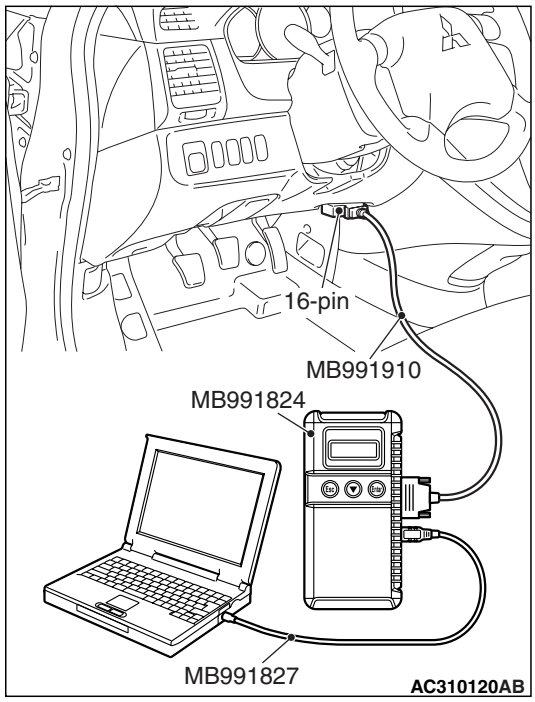
Q: Is the check result normal?

YES : An open or short circuit may be present in the power supply line to the TCL/ASC-ECU. Repair the wiring harness between TCL/ASC-ECU connector A-04 terminal 32 and ignition switch connector C-307 terminal 2. Then go to Step 8.

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

STEP 7. Check whether the diagnosis code is reset.

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

Check again if the diagnosis code is set.

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

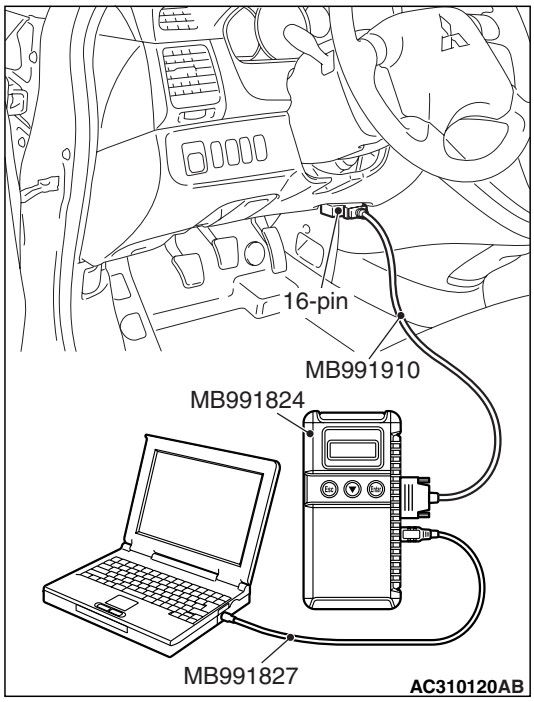
Q: Is code No.C1860 or C1861 set?

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

NO : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5.

STEP 8. Check whether the diagnosis code is reset.

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

Check again if the diagnosis code is set.

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

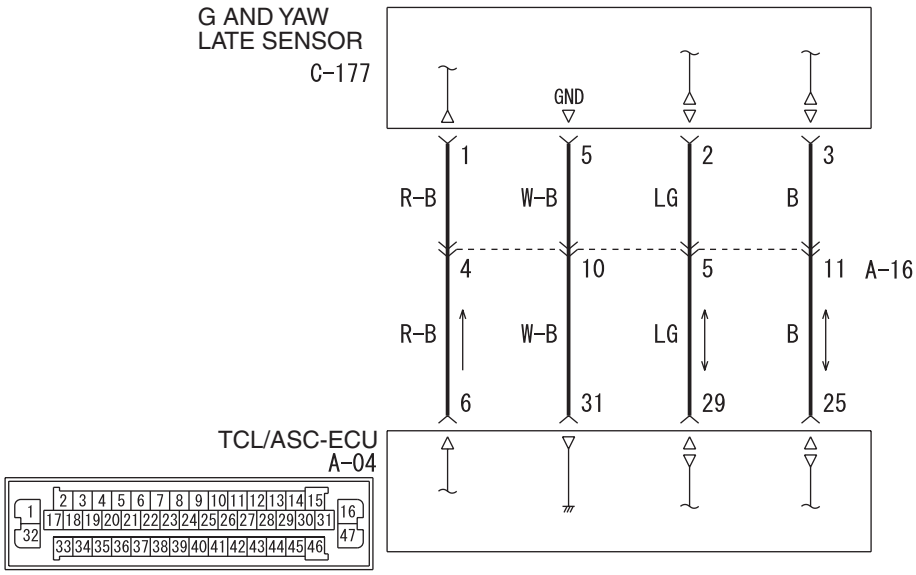
Q: Is code No.C1860 or C1861 set?

YES : Go to Step 1.

NO : The procedure is complete.

Code No.C1864: Sensor cluster power supply abnormality

G and Yaw Late Sensor Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

W4X35E006A

⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines.

OPERATION

- The G and yaw late sensor is energized by the TCL/ASC-ECU and the G and yaw late sensor terminal 1.
- The G and yaw late sensor output signal is sent to the TCL/ASC-ECU via the CAN bus line.

DIAGNOSIS CODE SET CONDITIONS

These codes are set when the power supply to the G and yaw late sensor is not normal.

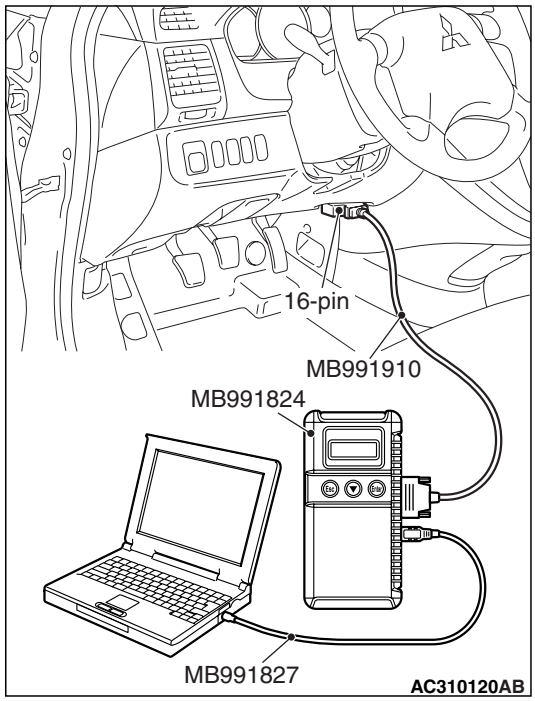
PROBABLE CAUSES

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

DIAGNOSIS

STEP 1. MUT-III CAN bus diagnostics

⚠ CAUTION



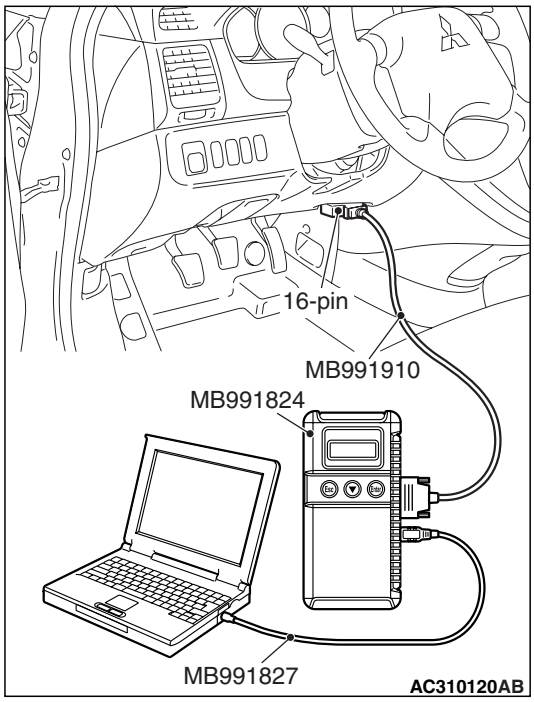
Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

(1) Connect MUT-III to the 16-pin diagnosis connector.
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the CAN bus line (Refer to GROUP 54D, CAN bus line Diagnostic flow P.54D-9). Then go to Step 2.

STEP 2. Check whether the diagnosis code is reset.

⚠ CAUTION



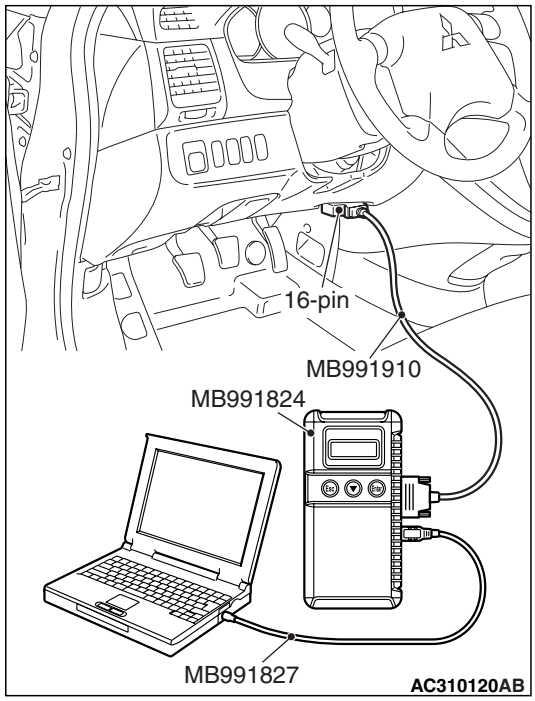
Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

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

Q: Is code No.C1864 set?
YES : Go to Step 3.
NO : The procedure is complete.

STEP 3. MUT-III data list

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

(1) Connect the MUT-III to the 16-pin diagnosis connector.
(2) Turn the ignition switch to the "ON" position.
(3) Use MUT-III to read the following data list.

Item 30: Straight G sensor/Item 31: Lateral G sensor

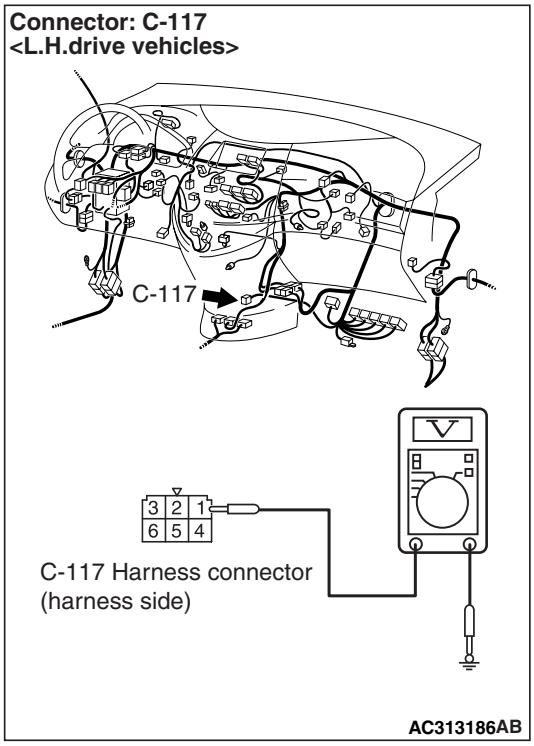
- Acceleration should measure -1.7 – 1.7 G when the vehicle is stopped at a level surface.
- Acceleration should change within the range of -1.7 – 1.7 G during running.

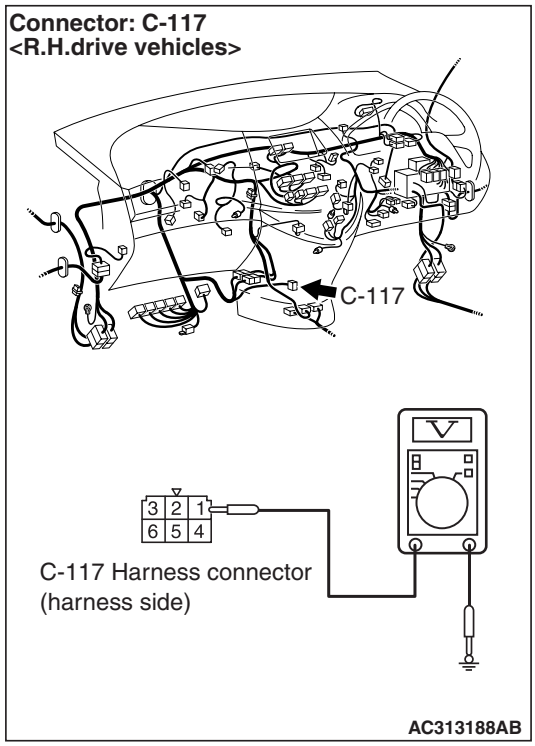
Item 33: Yaw late sensor

- Angular velocity should measure -75 – 75 deg/s when the vehicle is stopped at a level surface.
- Angular velocity should change within the range of -75 –75 deg/s during running.

Q: Is the check result normal?
YES : Then go to step 8.
NO : Go to Step 4.

STEP 4. Voltage measurement at G and yaw late sensor connector C-117.



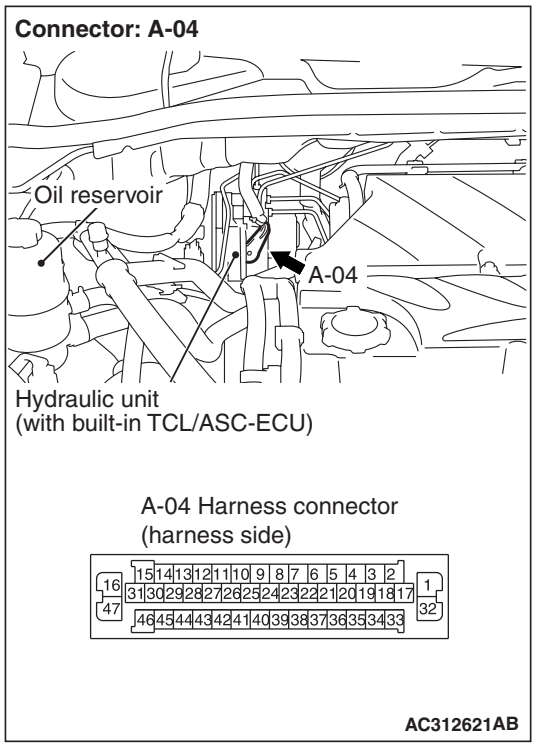


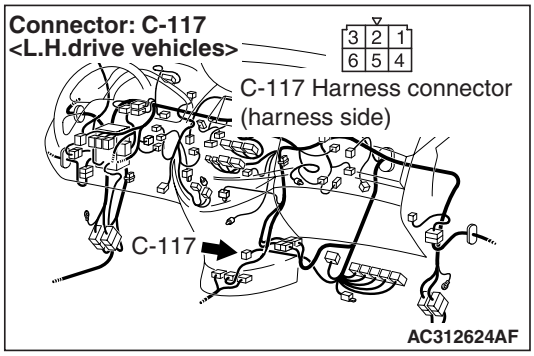
(1) Disconnect the G and yaw late sensor connector C-117, and measure at the harness side connector.
(2) Turn the ignition switch to the "ON" position.
(3) Measure the voltage between terminal 1 and body earth.

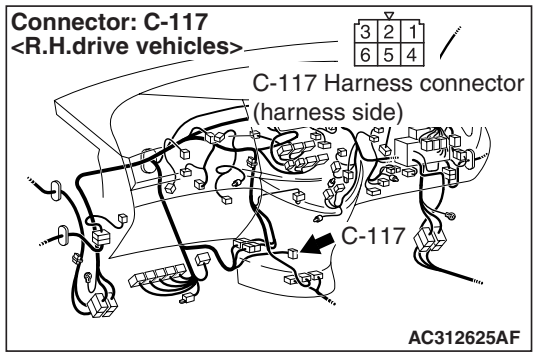
OK: System voltage

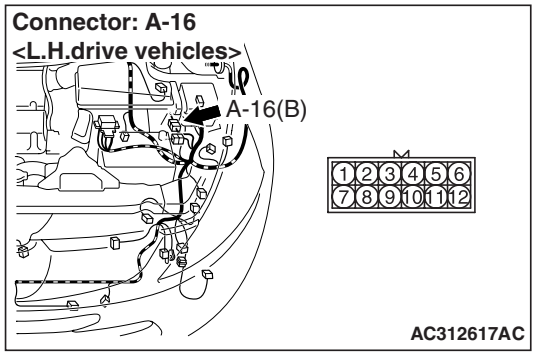
Q: Is the check result normal?
YES : Go to Step 6.
NO : Go to Step 5.

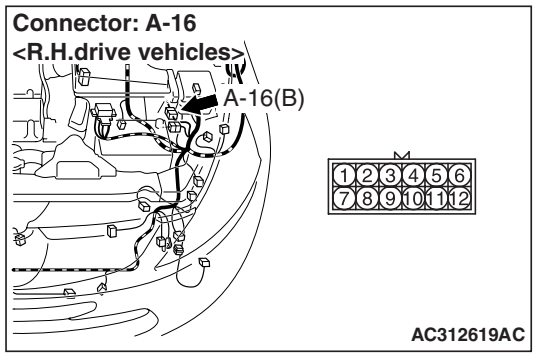
STEP 5. Check the harness wire between TCL/ASC-ECU connector A-04 terminal 6 and G and yaw late sensor connector C-117 terminal 1.











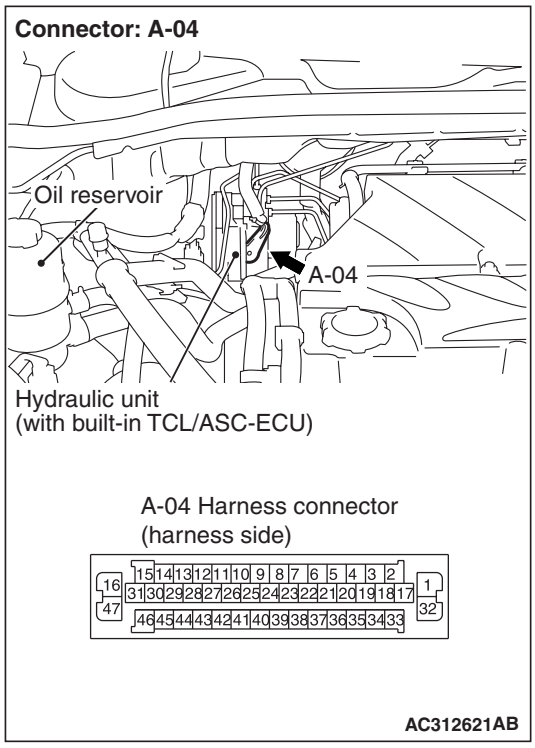
NOTE: After inspecting the TCL/ASC-ECU connector A-04, intermediate connector A-16 and G and yaw late sensor connector C-117, inspect the wire. If any of these connector is damaged, repair or replace it. Then go to Step 8.

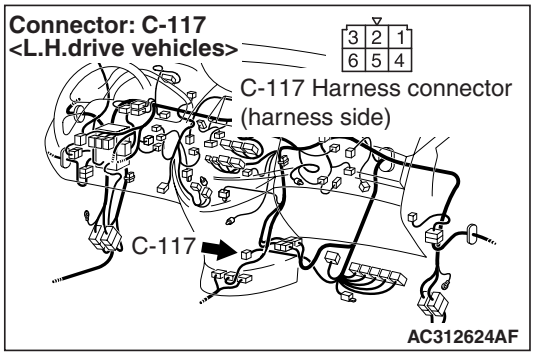
Q: Is the check result normal?

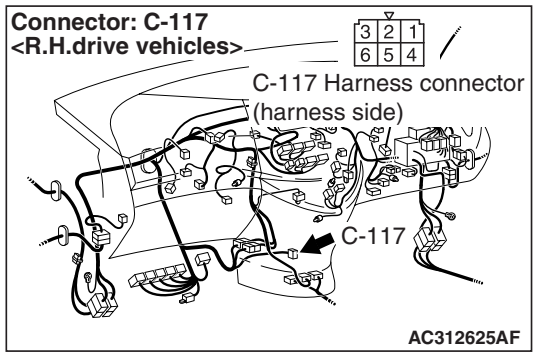
YES : This malfunctions is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5.

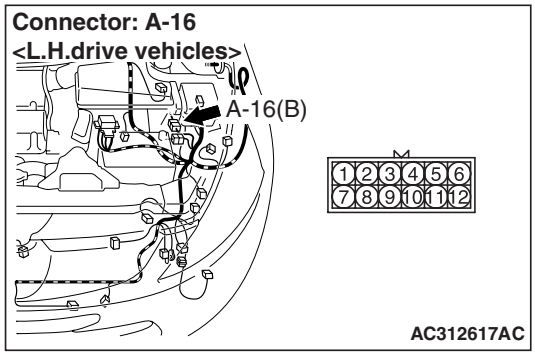
NO : Repair it and go to Step 8.

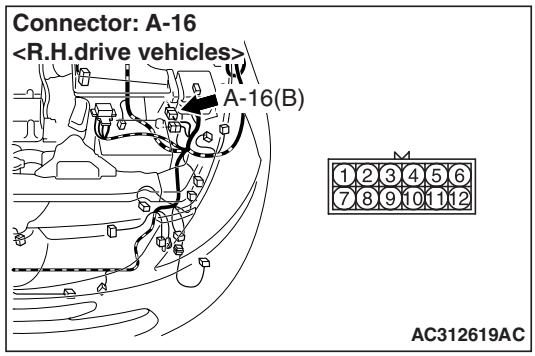
STEP 6. Check the harness wire between TCL/ASC-ECU connector A-04 terminal 31 and G and yaw late sensor connector C-117 terminal 5.











NOTE: After inspecting the TCL/ASC-ECU connector A-04, intermediate connector A-16 and G and yaw late sensor connector C-117, inspect the wire. If any of these connector is damaged, repair or replace it. Then go to Step 8.

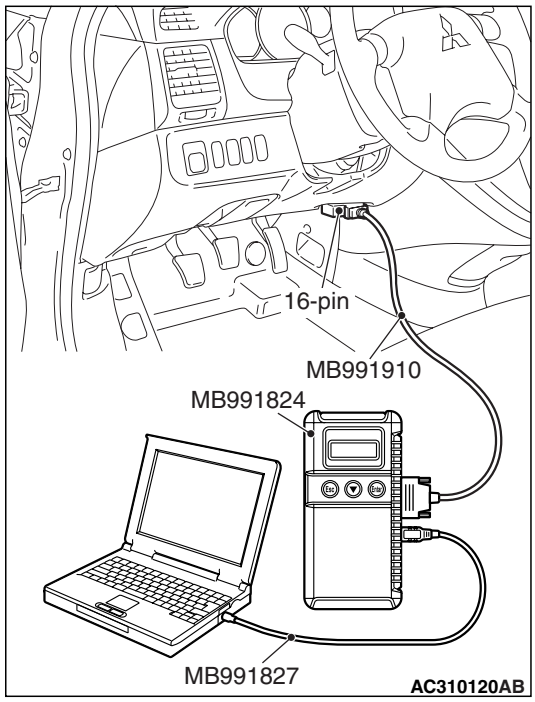
Q: Is the check result normal?

YES : This malfunctions is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5.

NO : Repair it and go to Step 8.

STEP 7. Check whether the diagnosis code is reset.

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

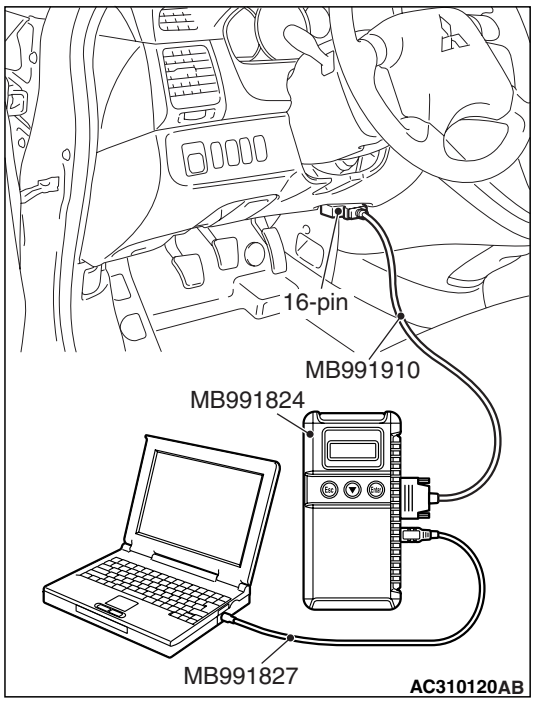
Replace the G and yaw late sensor, and check whether diagnosis code C1366 or C1371 is reset.

(1) Replace the G and yaw late sensor.
(2) Connect MUT-III to the 16-pin diagnosis connector.
(3) Turn the ignition switch to the "ON" position.
(4) Erase the diagnosis code.
(5) Turn the ignition switch to the "LOCK" (OFF) position.
(6) Turn the ignition switch to the "ON" position.
(7) Check if the diagnosis code is set.
(8) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is code No.C1864 set?

YES : Replace the hydraulic unit (integrated with TCL/ASC-ECU). Then go to Step 9.
NO : The procedure is complete.

STEP 8. Check whether the diagnosis code is reset.



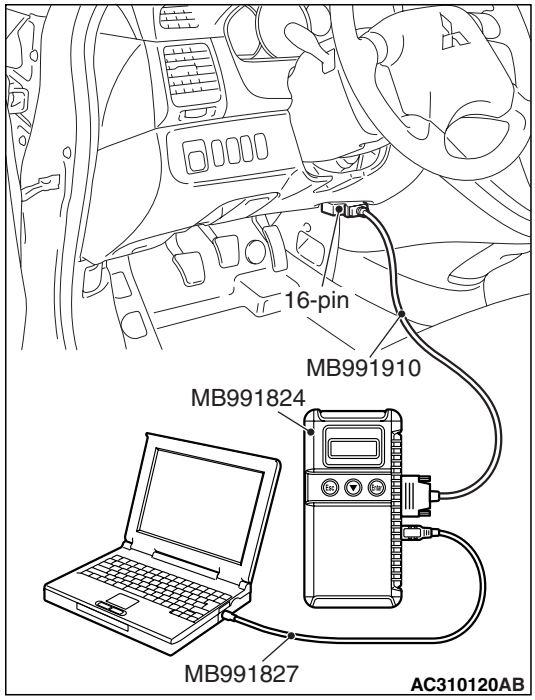
Check again if the diagnosis code is set.

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

Q: Is code No.C1864 set?

YES : Replace the hydraulic unit (integrated with TCL/ASC-ECU). Then go to Step 9.
NO : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5.

STEP 9. Check whether the diagnosis code is reset.



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

Q: Is code No.C1864 set?
YES : Go to Step 1.
NO : The procedure is complete.

Code No.U1073: Bus off

⚠ CAUTION
- **If diagnosis code U1073 is set in the TCL/ASC-ECU, always diagnose the CAN main bus line. If there is any fault in the CAN bus lines, an incorrect diagnosis code may be set.**
- **Whenever the ECU is replaced, ensure that the communication circuit is normal.**

TROUBLE JUDGMENT

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

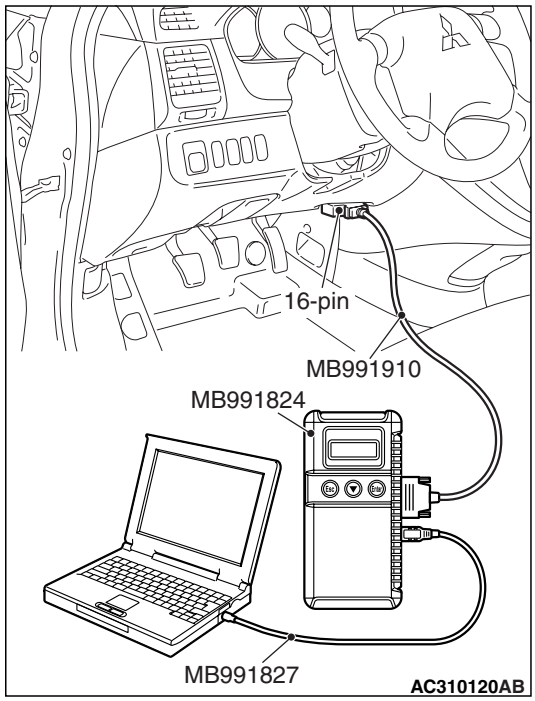
PROBABLE CAUSES

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

DIAGNOSIS

STEP 1. MUT-III CAN bus diagnostics

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

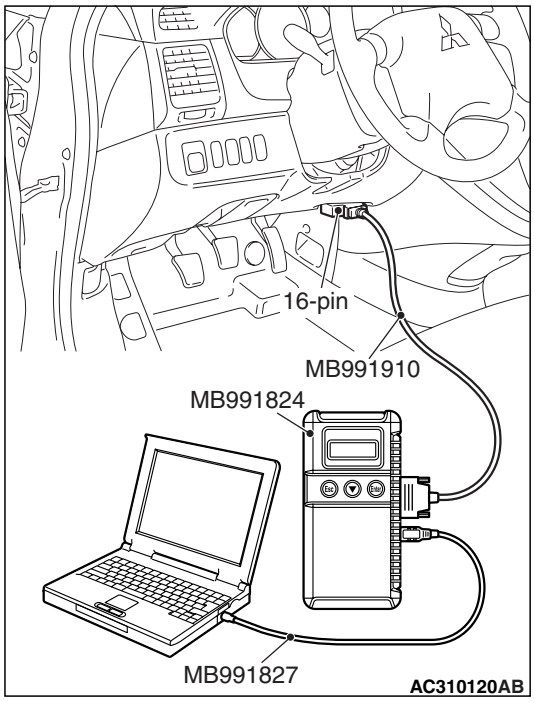
(1) Connect MUT-III to the 16-pin diagnosis connector.
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the CAN bus line (Refer to GROUP 54D, CAN bus line Diagnostic flow P.54D-9). Then go to Step 2.

STEP 2. MUT-III diagnosis code



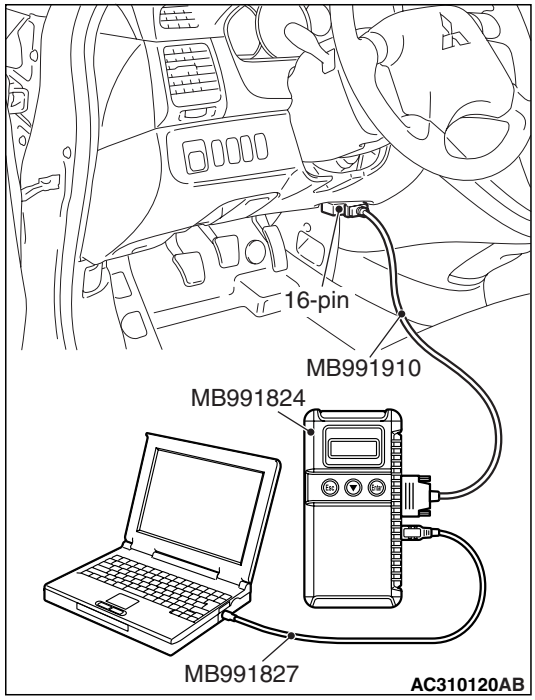
Check again if the diagnosis code is set.
(1) Turn the ignition switch to the "ON" position.
(2) Erase the diagnosis code.
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to the "ON" position.
(5) Check if the diagnosis code is set.
(6) Turn the ignition switch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

Q: Is code No.U1073 set?

YES : Replace the hydraulic unit (integrated with TCL/ASC - ECU). Then go to Step 3 .

NO : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5.

STEP 3. Check whether the diagnosis code is reset.



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

Q: Is code No.U1073 set?
YES : Go to Step 1.
NO : The procedure is complete.

Code No. U1100 CAN communications system time out error engine related data

⚠ CAUTION

- **If diagnosis code No.U1100 is set in the TCL/ASC-ECU, always diagnose the CAN main bus line. If there is any fault in the CAN bus lines, an incorrect diagnosis code may be set.**
- **Whenever the ECU is replaced, ensure that the communication circuit is normal.**

DIAGNOSIS CODE SET CONDITIONS

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

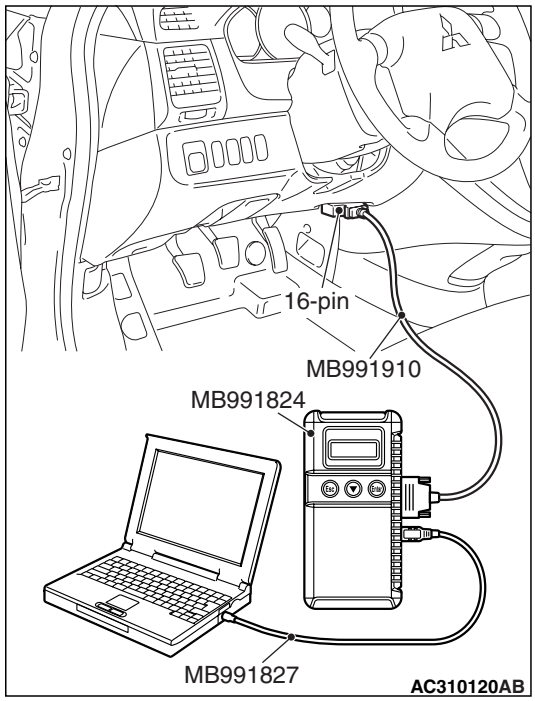
PROBABLE CAUSES

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

DIAGNOSIS

STEP 1. MUT-III CAN bus diagnostics

⚠ CAUTION



To prevent damage to MUT-III, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting MUT-III.

(1) Connect the MUT-III to the diagnosis connector as shown in the illustration.
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line. (Refer to GROUP 54D, CAN bus line Diagnostic flow P.54D-9).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect MUT-III.

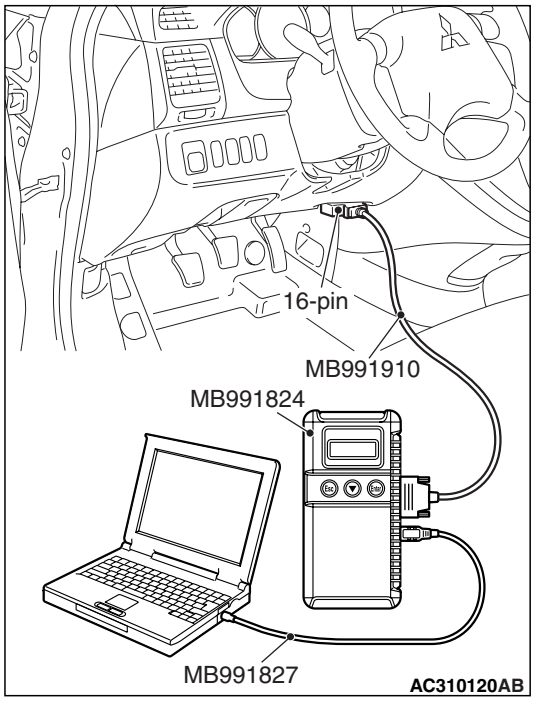
Q: Is the check result normal?

YES : Go to Step 2 .

NO : Repair the CAN bus line (Refer to GROUP 54D, CAN bus line Diagnostic flow P.54D-9). Then go to Step 6 .

STEP 2. MUT-III diagnosis code

⚠ CAUTION



To prevent damage to MUT-III, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting MUT-III.

(1) Connect the MUT-III to the diagnosis connector as shown in the illustration.
(2) Turn the ignition switch to the "ON" position.
(3) Check for MPI system diagnosis code (Refer to GROUP 13A, MPI Diagnosis - How to Read and Erase Diagnosis Code P.13A-11).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect MUT-III.

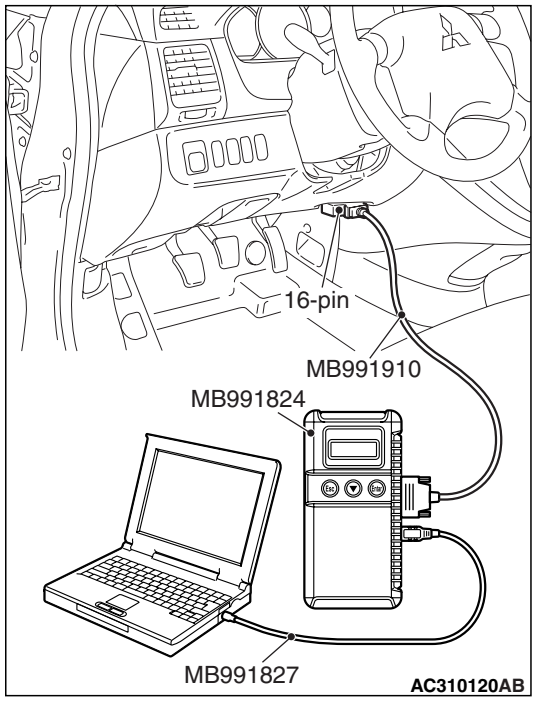
Q: Is any diagnosis code set?

YES : Repair the MPI control system. (Refer to GROUP 13A, MPI Diagnosis – Diagnosis Code Chart P.13A-20). Then go to Step 6 .

NO : Go to Step 3 .

STEP 3. MUT-III diagnosis code

⚠ CAUTION



To prevent damage to MUT-III, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting MUT-III.

(1) Connect the MUT-III to the diagnosis connector as shown in the illustration.
(2) Turn the ignition switch to the "ON" position.
(3) Check if a diagnosis code, which relates to CAN communication-linked systems below, is set.

Combination meter

- Code No.011: Power train control module time-out (related to engine)

A/C-ECU

- Code No.U1100: Power train control module time-out (related to engine)

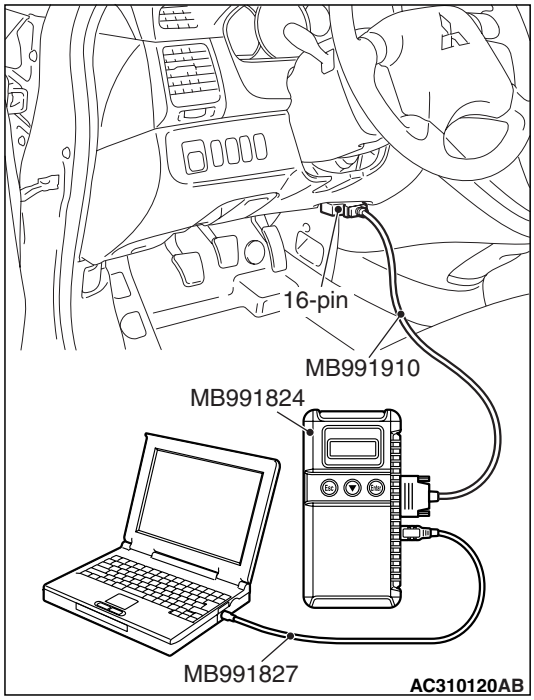
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect MUT-III.

Q: Is code No.011 or U1100 set?
YES : Go to Step 4 .
NO : Go to Step 5 .

STEP 4. Check whether the diagnosis code is reset.

Check again if the diagnosis code is set.

⚠ CAUTION



To prevent damage to MUT-III, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting MUT-III.

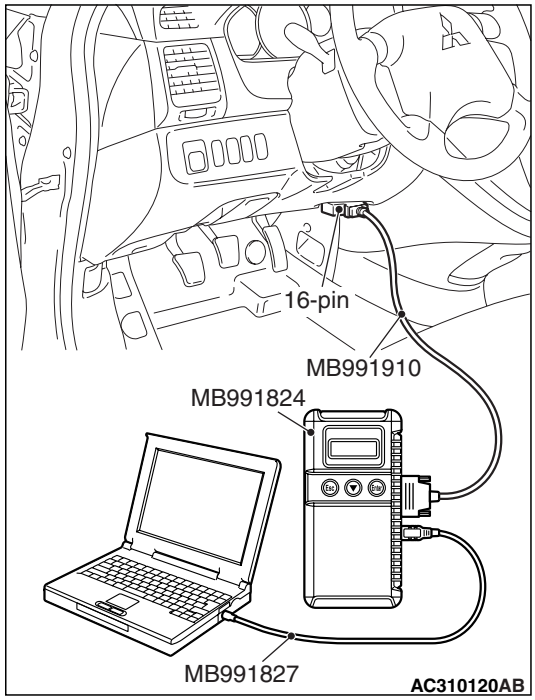
(1) Connect the MUT-III to the diagnosis connector as shown in the illustration.
(2) Turn the ignition switch to the "ON" position.
(3) Erase the diagnosis code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Turn the ignition switch to the "ON" position.
(6) Check if the diagnosis code is set.
(7) Turn the ignition switch to the "LOCK" (OFF) position.
(8) Disconnect MUT-III.

Q: Is code No.U1100 set?
YES : Replace the Engine-ECU <M/T> or Engine-A/T-ECU <A/T> (Refer to GROUP 13A, Engine-ECU and Engine-A/T-ECU P.13A-399). Then go to Step 6.
NO : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5.

STEP 5. Check whether the diagnosis code is reset.

Check again if the diagnosis code is set.

⚠ CAUTION



To prevent damage to MUT-III, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting MUT-III.

(1) Connect the MUT-III to the diagnosis connector as shown in the illustration.
(2) Turn the ignition switch to the "ON" position.
(3) Erase the diagnosis code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Turn the ignition switch to the "ON" position.
(6) Check if the diagnosis code is set.
(7) Turn the ignition switch to the "LOCK" (OFF) position.
(8) Disconnect MUT-III.

Q: Is code No.U1100 set?

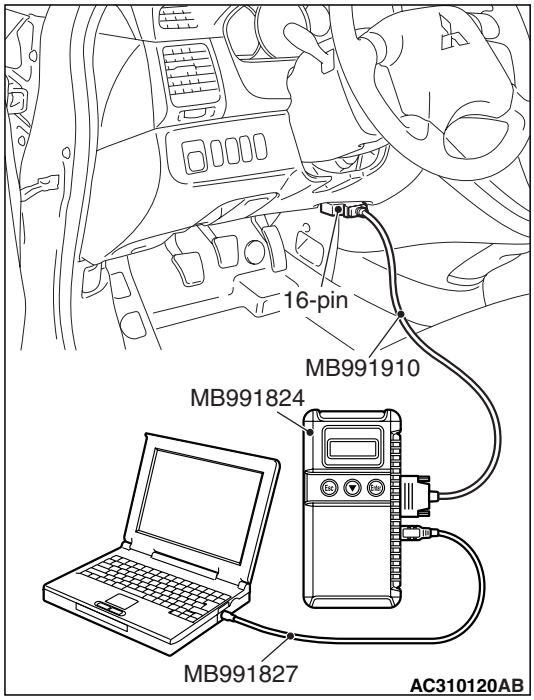
YES : Replace the hydraulic unit (integrated with TCL/ASC-ECU) (Refer to P.35B-77). Then go to Step 6 .

NO : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5.

STEP 6. Check whether the diagnosis code is reset.

Check again if the diagnosis code is set.

⚠ CAUTION



To prevent damage to MUT-III, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting MUT-III.

(1) Connect the MUT-III to the diagnosis connector as shown in the illustration.
(2) Turn the ignition switch to the "ON" position.
(3) Erase the diagnosis code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Turn the ignition switch to the "ON" position.
(6) Check if the diagnosis code is set.
(7) Turn the ignition switch to the "LOCK" (OFF) position.
(8) Disconnect MUT-III.

Q: Is code No.U1100 set?

YES : Return to Step 1 .

NO : The procedure is complete.

Code No.U1101 CAN communications system time out error A/T related data

⚠ CAUTION

- **If diagnosis code No.U1101 is set in the TCL/ASC-ECU, always diagnose the CAN main bus line. If there is any fault in the CAN bus lines, an incorrect diagnosis code may be set.**
- **Whenever the ECU is replaced, ensure that the communication circuit is normal.**

DIAGNOSIS CODE SET CONDITION

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

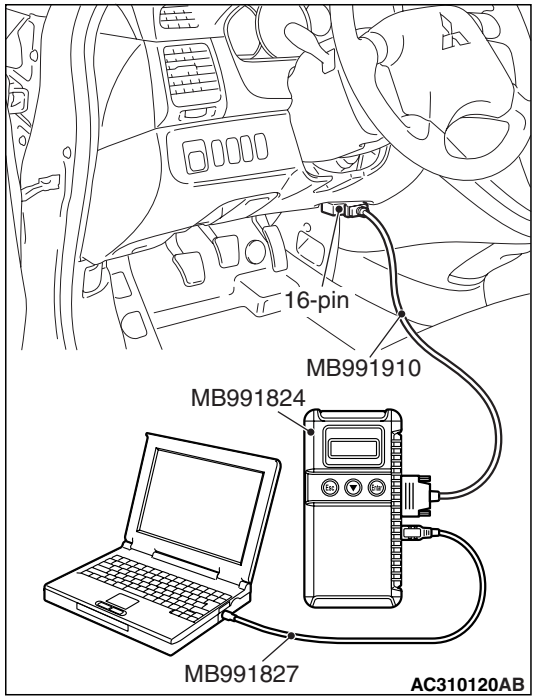
PROBABLE CAUSES

- Damaged harness or connector.
- Malfunction of the Engine-A/T-ECU.
- Malfunction of the TCL/ASC-ECU.

DIAGNOSIS

STEP 1. MUT-III CAN bus diagnostics

⚠ CAUTION



To prevent damage to MUT-III, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting MUT-III.

(1) Connect the MUT-III to the diagnosis connector as shown in the illustration.
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line. (Refer to GROUP 54D, CAN bus line Diagnostic flow P.54D-9).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect MUT-III.

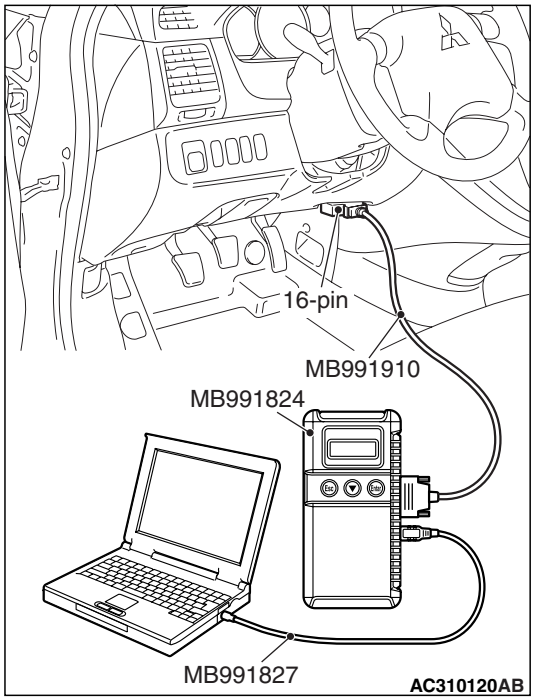
Q: Is the check result normal?

YES : Go to Step 2 .

NO : Repair the CAN bus line (Refer to GROUP 54D, CAN bus line Diagnostic flow P.54D-9). Then go to Step 2.

STEP 2. MUT-III other system diagnosis code

⚠ CAUTION



To prevent damage to MUT-III, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting MUT-III.

(1) Connect the MUT-III to the diagnosis connector as shown in the illustration.
(2) Turn the ignition switch to the "ON" position.
(3) Check for A/T system diagnosis code (Refer to GROUP 23A, A/T Diagnosis - Diagnosis Function P.23A-7).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect MUT-III.

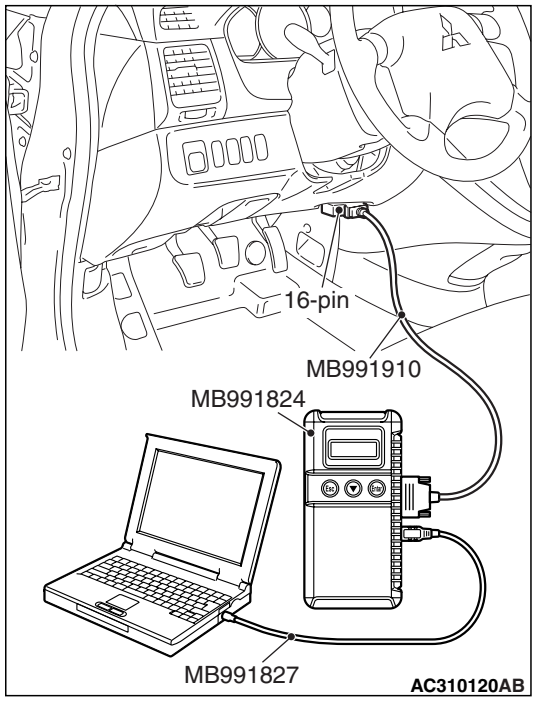
Q: Is any diagnosis code set?

YES : Repair the automatic transmission control system. (Refer to GROUP 23A, A/T Diagnosis - Check Chart For Diagnosis Codes P.23A-17). Then go to Step 6 .

NO : Go to Step 3 .

STEP 3. MUT-III other system diagnosis code

⚠ CAUTION



To prevent damage to MUT-III, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting MUT-III.

(1) Connect the MUT-III to the diagnosis connector as shown in the illustration.
(2) Turn the ignition switch to the "ON" position.
(3) Check if a diagnosis code, which relates to CAN communication-linked systems below, is set.

ETACS-ECU
- Code No.012: Power train control module time-out (related to A/T)

Combination meter
- Code No.012: Power train control module time-out (related to A/T)

Centre display unit
- Code No.012: Power train control module time-out (related to A/T)

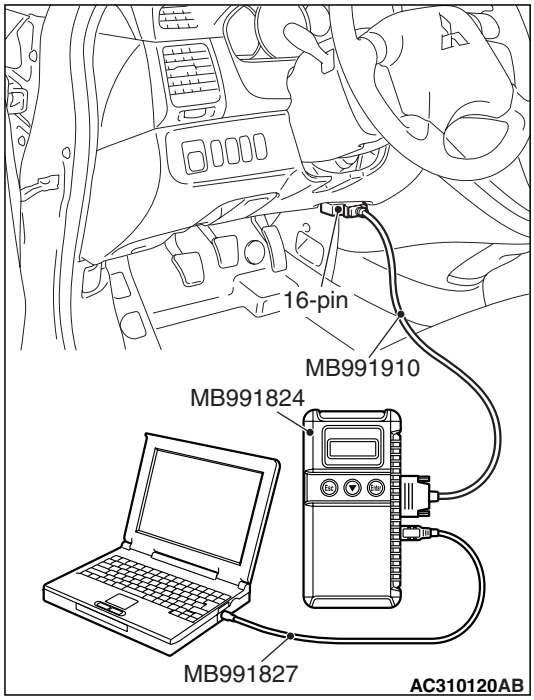
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect MUT-III.

Q: Is code No.012 set?
YES : Go to Step 4 .
NO : Go to Step 5 .

STEP 4. Check whether the diagnosis code is reset.

Check again if the diagnosis code is set.

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

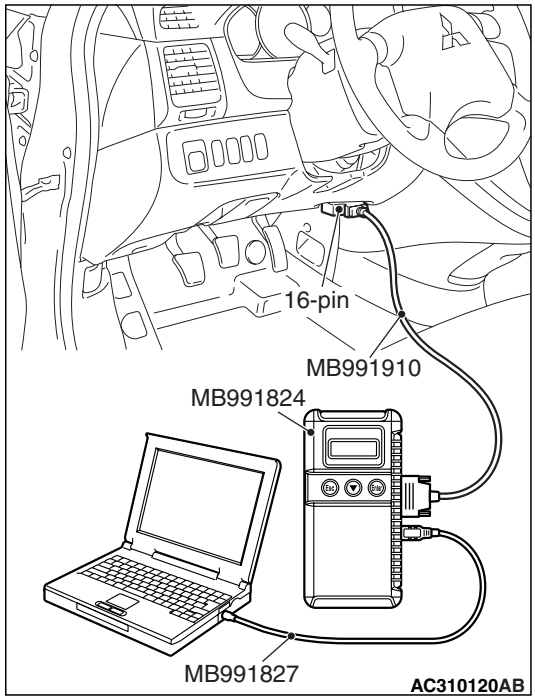
(1) Connect the MUT-III to the diagnosis connector as shown in the illustration.
(2) Turn the ignition switch to the "ON" position.
(3) Erase the diagnosis code (Refer to P.35C-6).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Turn the ignition switch to the "ON" position.
(6) Check if the diagnosis code is set.
(7) Turn the ignition switch to the "LOCK" (OFF) position.
(8) Disconnect MUT-III.

Q: Is code No.U1101 set?
YES : Replace the Engine-A/T-ECU [Refer to GROUP 13A Engine-ECU-and Engine-A/T-ECU P.13A-399]. Then go to Step 6.
NO : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5.

STEP 5. Check whether the diagnosis code is reset.

Check again if the diagnosis code is set.

⚠ CAUTION



To prevent damage to MUT-III, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting MUT-III.

(1) Connect the MUT-III to the diagnosis connector as shown in the illustration.
(2) Turn the ignition switch to the "ON" position.
(3) Erase the diagnosis code (Refer to P.35C-6).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Turn the ignition switch to the "ON" position.
(6) Check if the diagnosis code is set.
(7) Turn the ignition switch to the "LOCK" (OFF) position.
(8) Disconnect MUT-III.

Q: Is code No.U1101 set?

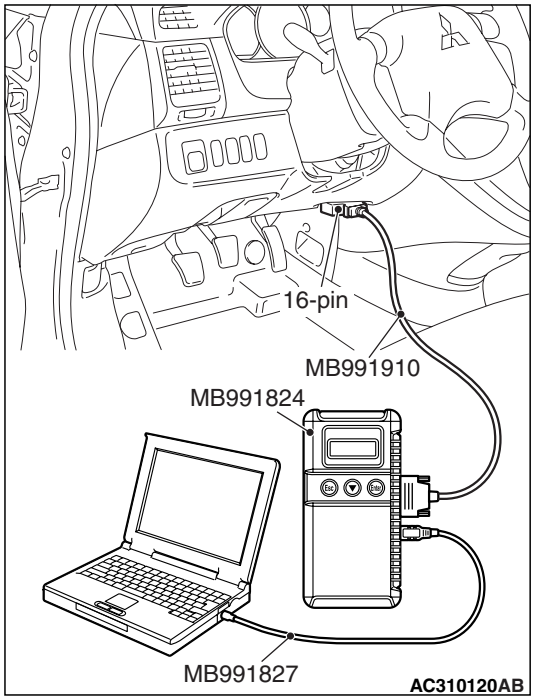
YES : Replace the hydraulic unit (integrated with TCL/ASC-ECU) (Refer to P.35C-165). Then go to Step 6 .

NO : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5.

STEP 6. Check whether the diagnosis code is reset.

Check again if the diagnosis code is set.

⚠ CAUTION



To prevent damage to MUT-III, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting MUT-III.

(1) Connect the MUT-III to the diagnosis connector as shown in the illustration.
(2) Turn the ignition switch to the "ON" position.
(3) Erase the diagnosis code (Refer to P.35C-6).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Turn the ignition switch to the "ON" position.
(6) Check if the diagnosis code is set.
(7) Turn the ignition switch to the "LOCK" (OFF) position.
(8) Disconnect MUT-III.

Q: Is code No.U1101 set?

YES : Return to Step 1 .

NO : The procedure is complete.

Code No.U1104: SAS CAN Timeout/Not equipped

⚠ CAUTION

If diagnosis code No.U1104 is set in the TCL/ASC-ECU, always diagnose the CAN bus lines.

⚠ CAUTION

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

OPERATION

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

DIAGNOSIS CODE SET CONDITIONS

Current trouble

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

Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness in the CAN bus lines between the steering wheel sensor and the TCL/ASC-ECU, and the power supply system to the steering wheel sensor. For diagnosis procedures, refer to "How to cope with past trouble" (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-5).

NOTE: For a past trouble, you may not find it by the MUT-III CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5). and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the diagnosis code, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54D, CAN bus line Diagnostic flow P.54D-9).

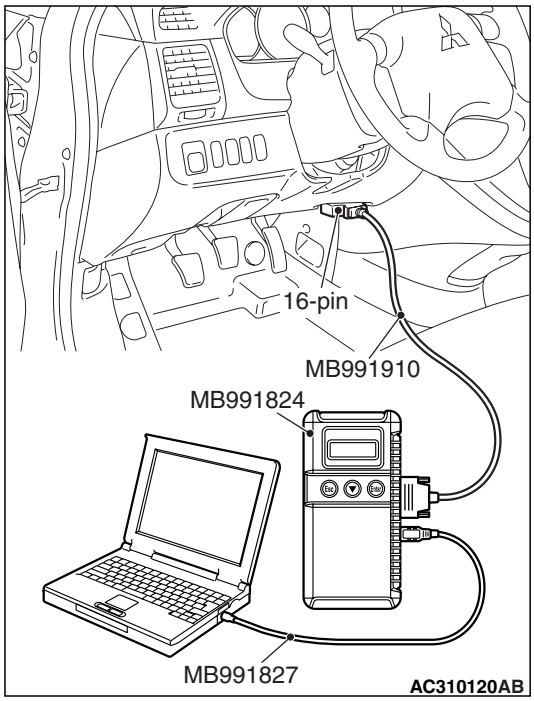
PROBABLE CAUSES

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

DIAGNOSIS

STEP 1. MUT-III CAN bus diagnostics

⚠ CAUTION



To prevent damage to MUT-III, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting MUT-III.

(1) Connect the MUT-III to the diagnosis connector as shown in the illustration.
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line. (Refer to GROUP 54D, CAN bus line Diagnostic flow P.54D-9).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect MUT-III.

Q: Is the check result normal?
YES : Go to Step 2
NO : Repair the CAN bus lines (Refer to GROUP 54D, CAN bus line Diagnostic flow P.54D-9). On completion, go to Step 6.

STEP 2. MUT-III steering wheel sensor diagnosis code

Check if a steering wheel sensor diagnosis code is set.

Q: Is the diagnosis code set?
YES : Diagnose the steering wheel sensor by referring to P.35C-6.
NO : Go to Step 3.

STEP 3. MUT-III other system diagnosis code
Check if a diagnosis code, which relates to CAN communication-linked systems below, is set.

Engine-A/T-ECU <A/T> or Engine-ECU <M/T>
- Code No.U1100: TCL/ASC-ECU time-out

Combination meter
- Code No.011: TCL/ASC-ECU time-out

Q: Is the diagnosis code set?
YES : Go to Step 4.
NO : Go to Step 5.

STEP 4. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Turn the ignition switch to "ON" position.
(3) Check if the diagnosis code is set.

Q: Is any diagnosis code set?
YES : A poor connection, open circuit or other intermittent malfunction is present in the CAN bus lines between the steering wheel sensor and the TCL/ASC-ECU (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5).
NO : Replace hydraulic unit (integrated with TCL/ASC-ECU) and then go to Step 6.

STEP 5. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Turn the ignition switch to "ON" position.
(3) Check if the diagnosis code is set.

Q: Is any diagnosis code set?
YES : A poor connection, open circuit or other intermittent malfunction is present in the CAN bus lines between the steering wheel sensor and the TCL/ASC-ECU (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5).
NO : Replace steering wheel sensor and then go to Step 6.

STEP 6. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Turn the ignition switch to "ON" position.
(3) Check if the diagnosis code is set.

Q: Is any diagnosis code set?
YES : The procedure is complete.
NO : Go to Step 1.

Code No.U1120 CAN communications system TCL uncontrollable by engine malfunction

⚠ CAUTION
- **If diagnosis code No.U1120 is set in the TCL/ASC-ECU, always diagnose the CAN main bus line. If there is any fault in the CAN bus lines, an incorrect diagnosis code may be set.**
- **Whenever the ECU is replaced, ensure that the communication circuit is normal.**

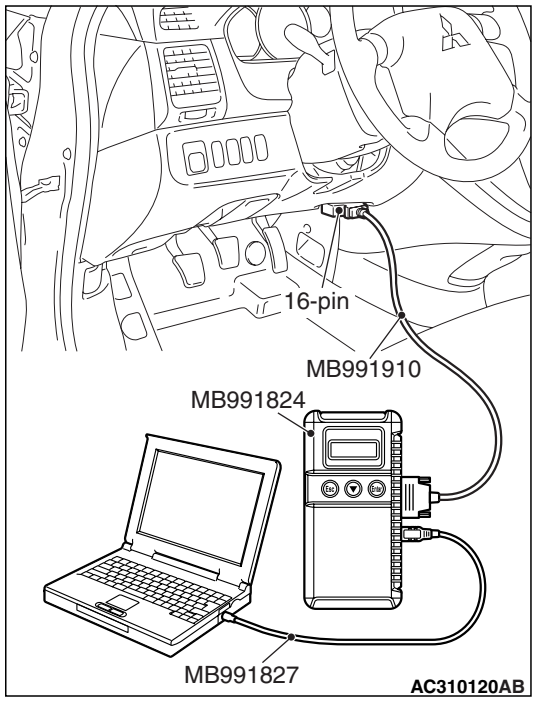
DIAGNOSIS CODE SET CONDITION
The TCL/ASC-ECU receives engine system-related signals from the Engine-ECU <M/T> or Engine-A/T-ECU <A/T> via CAN bus lines. If a fail-safe related data is contained in the signal from the Engine-ECU <M/T> or Engine-A/T-ECU <A/T>, diagnosis code No.U1120 will be stored.

PROBABLE CAUSES
- Damaged harness or connector.
- Malfunction of the Engine-ECU <M/T> or Engine-A/T-ECU <A/T>.
- Malfunction of the TCL/ASC-ECU.

DIAGNOSIS

STEP 1. MUT-III other system diagnosis code

⚠ CAUTION



To prevent damage to MUT-III, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting MUT-III.

(1) Connect the MUT-III to the diagnosis connector as shown in the illustration.
(2) Turn the ignition switch to the "ON" position.
(3) Check for MPI system diagnosis code (Refer to GROUP 13A, MPI Diagnosis - Diagnosis Function P.13A-11).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect MUT-III.

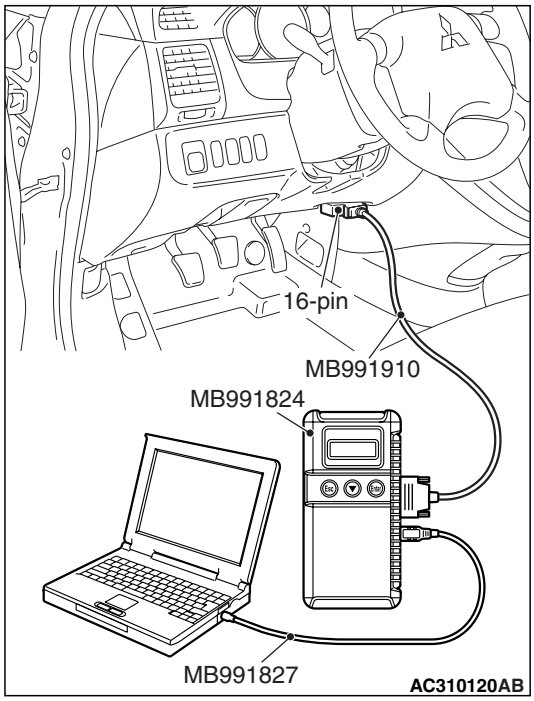
Q: Is any diagnosis code set?

YES : Repair the MPI control system. (Refer to GROUP 13A, MPI Diagnosis - Diagnosis Function P.13A-11). Then go to Step 6 .

NO : Go to Step 2 .

STEP 2. MUT-III CAN bus diagnostics

⚠ CAUTION



To prevent damage to MUT-III, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting MUT-III.

(1) Connect the MUT-III to the diagnosis connector as shown in the illustration.
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line. (Refer to GROUP 54D, CAN bus line Diagnostic flow P.54D-9).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect MUT-III.

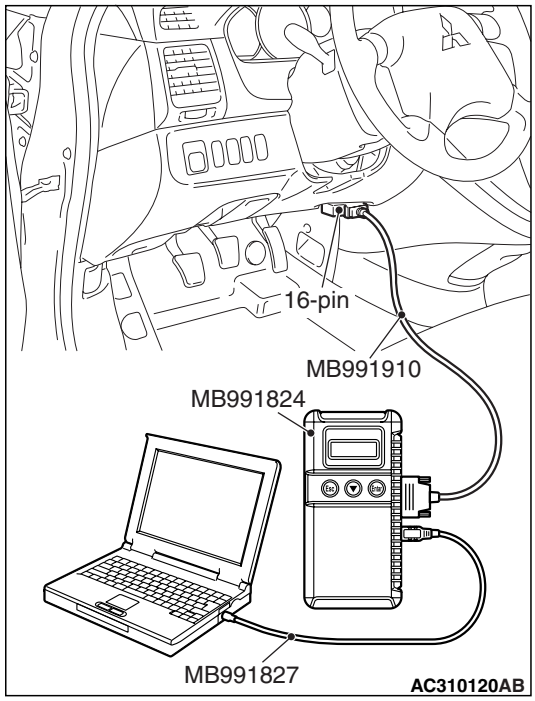
Q: Is the check result normal?

YES : Go to Step 3 .

NO : Repair the CAN bus line (Refer to GROUP 54D, CAN bus line Diagnostic flow P.54D-9). Then go to Step 6.

STEP 3. MUT-III other system diagnosis code

⚠ CAUTION



To prevent damage to MUT-III, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting MUT-III.

(1) Connect the MUT-III to the diagnosis connector as shown in the illustration.
(2) Turn the ignition switch to the "ON" position.
(3) Check if a diagnosis code, which relates to CAN communication-linked systems below, is set.

A/C-ECU

- Code No.U1120: Engine-related CAN communication failure information

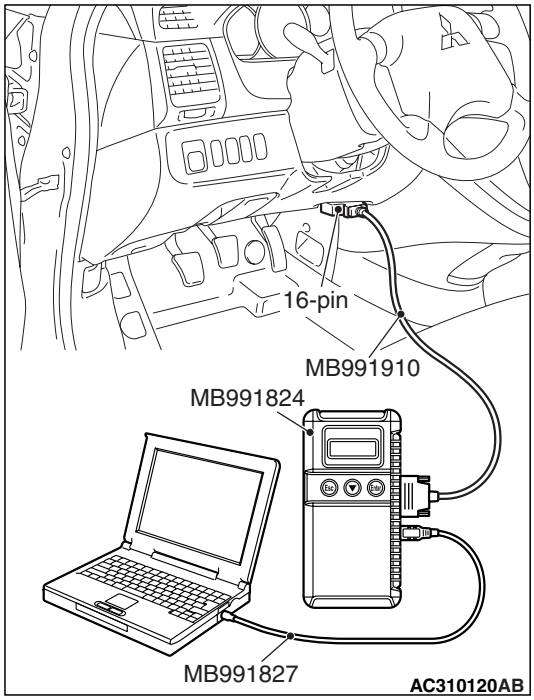
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect MUT-III.

Q: Is code No.U1120 set?
YES : Go to Step 4 .
NO : Go to Step 5 .

STEP 4. Check whether the diagnosis code is reset.

Check again if the diagnosis code is set.

⚠ CAUTION



To prevent damage to MUT-III, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting MUT-III.

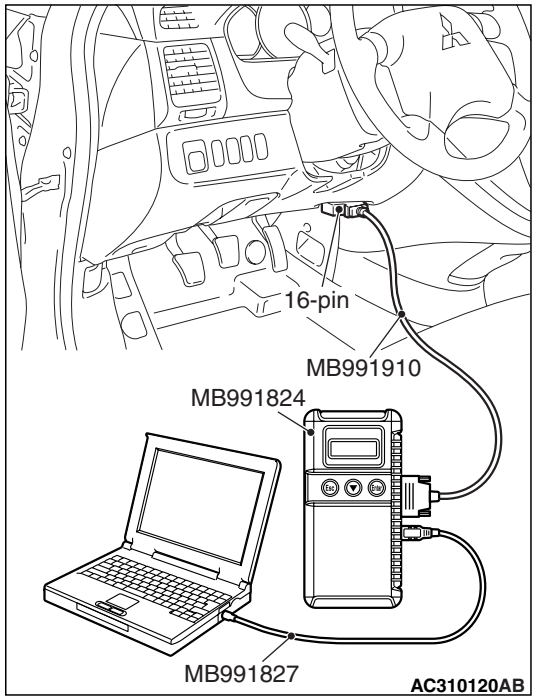
(1) Connect the MUT-III to the diagnosis connector as shown in the illustration.
(2) Turn the ignition switch to the "ON" position.
(3) Erase the diagnosis code (Refer to P.35C-6).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Turn the ignition switch to the "ON" position.
(6) Check if the diagnosis code is set.
(7) Turn the ignition switch to the "LOCK" (OFF) position.
(8) Disconnect MUT-III.

Q: Is code No.U1120 set?
YES : Replace the Engine-ECU <M/T> or Engine-A/T-ECU <A/T> (Refer to GROUP 13A, Engine-ECU and Engine-A/T-ECU P.13A-399). Then go to Step 6 .
NO : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5.

STEP 5. Check whether the diagnosis code is reset.

Check again if the diagnosis code is set.

⚠ CAUTION



To prevent damage to MUT-III, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting MUT-III.

(1) Connect the MUT-III to the diagnosis connector as shown in the illustration.
(2) Turn the ignition switch to the "ON" position.
(3) Erase the diagnosis code (Refer to P.35C-6).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Turn the ignition switch to the "ON" position.
(6) Check if the diagnosis code is set.
(7) Turn the ignition switch to the "LOCK" (OFF) position.
(8) Disconnect MUT-III.

Q: Is code No.U1120 set?

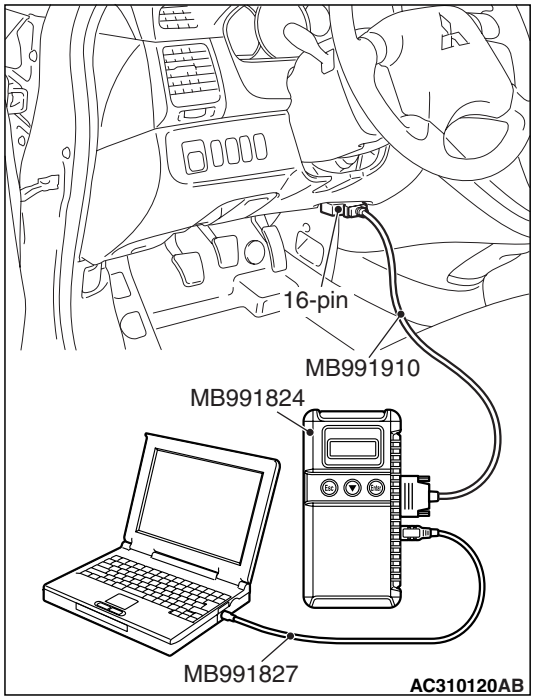
YES : Replace the hydraulic unit (integrated with TCL/ASC-ECU) (Refer to GROUP 35C - Hydraulic Unit P.35C-165). Then go to Step 6 .

NO : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5.

STEP 6. Check whether the diagnosis code is reset.

Check again if the diagnosis code is set.

⚠ CAUTION



To prevent damage to MUT-III, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting MUT-III.

(1) Connect the MUT-III to the diagnosis connector as shown in the illustration.
(2) Turn the ignition switch to the "ON" position.
(3) Erase the diagnosis code (Refer to P.35C-6).
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Turn the ignition switch to the "ON" position.
(6) Check if the diagnosis code is set.
(7) Turn the ignition switch to the "LOCK" (OFF) position.
(8) Disconnect MUT-III.

Q: Is code No.U1120 set?

YES : Return to Step 1 .

NO : The procedure is complete.

DIAGNOSTIC TROUBLE CODE PROCEDURES <STEERING WHEEL SENSOR>

Code No.C1551: Improper output voltage of steering wheel sensor
Code No.C1552: Abnormal steering wheel sensor output pattern
Code No.C1553: Abnormal optical sensor output pattern
Code No.C1554: Steering wheel sensor speed is out of range
Code No.C1555: Steering wheel sensor out of range
Code No.C1608: EEPROM failure

⚠ CAUTION
If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines.

⚠ CAUTION
If these diagnosis codes has been set, TCL/ASC-ECU related diagnosis code No.C1506 is also set. After these diagnosis codes has been diagnosed, don't forget to erase diagnosis code No.C1506.

OPERATION

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

DIAGNOSIS CODE SET CONDITIONS

These diagnosis codes will be set under the cases below.

Code No.C1551: Improper output voltage of steering wheel sensor
- The Hall cell sends incorrect voltage signal for at least one second.

Code No.C1552: Abnormal steering wheel sensor output pattern
- Invalid Hall cell pattern fluctuates at least once.

Code No.C1553: Abnormal optical sensor output pattern
- The optical sensor output is invalid.

Code No.C1554: Steering wheel sensor speed is out of range
- The sensor speed is -25°/10 ms or more.

Code No.C1555: Steering wheel sensor out of range
- The sensor is out of a predetermined operation range.

Code No.C1608: EEPROM failure
- The sensor detects an EEPROM error.

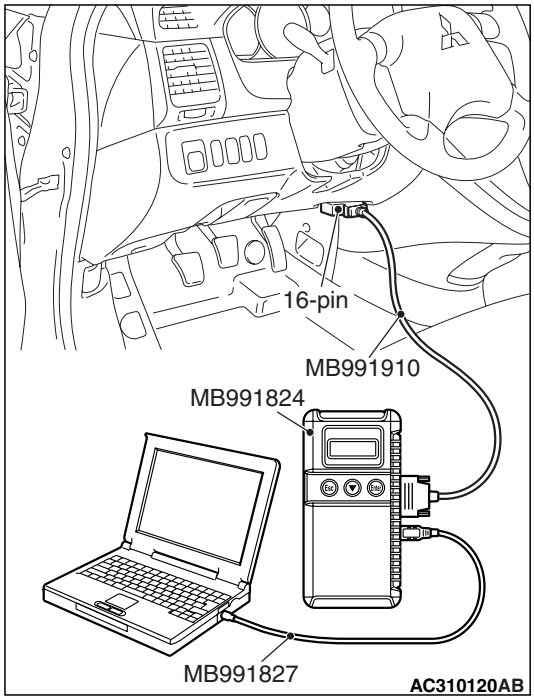
PROBABLE CAUSES

Malfunction of the steering wheel sensor

DIAGNOSIS

STEP 1. MUT-III CAN bus diagnostics

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

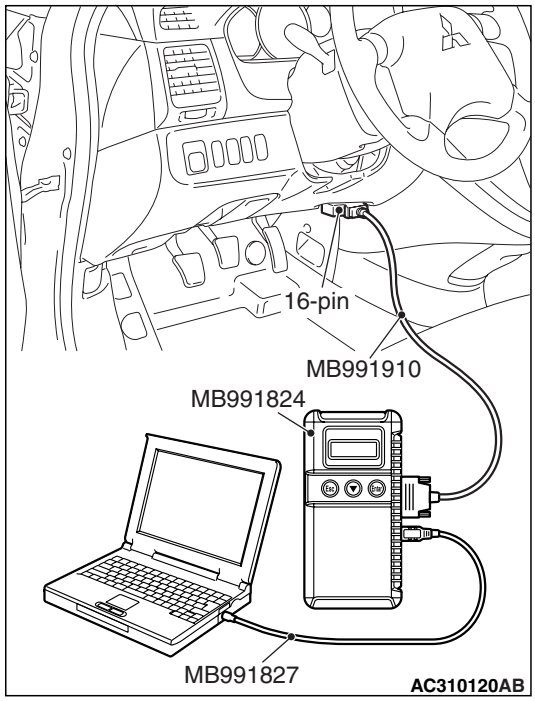
(1) Connect MUT-III to the 16-pin diagnosis connector.

(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the CAN bus line (Refer to GROUP 54D, CAN bus line Diagnostic flow P.54D-9). Then go to Step 2.

STEP 2. Check whether the diagnosis code is reset.

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.
(1) Turn the ignition switch to the "ON" position.
(2) Erase the diagnosis code.
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to the "ON" position.
(5) Check if the diagnosis code is set.
(6) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is code No.C1551, C1552, C1553, C1554, C1555 or C1608 set?
YES : Replace steering wheel sensor.
NO : The procedure is complete.

Code No.U1073: Bus off

⚠ CAUTION

- **If diagnosis code No.U1073 is set in the steering wheel sensor, always diagnose the CAN main bus line. If there is any fault in the CAN bus lines, an incorrect diagnosis code may be set.**
- **Whenever the ECU is replaced, ensure that the communication circuit is normal.**

⚠ CAUTION

If diagnosis code No.U1073 has been set, TCL/ASC-ECU related diagnosis code No.C1506 is also set. After diagnosis code No.U1073 has been diagnosed, don't forget to erase diagnosis code No.C1506.

TROUBLE JUDGMENT

This code is stored when the steering wheel sensor has ceased the CAN communication (bus off). Then, if a penalty mode is entered after approximately five minutes, regular data transmission will be cancelled.

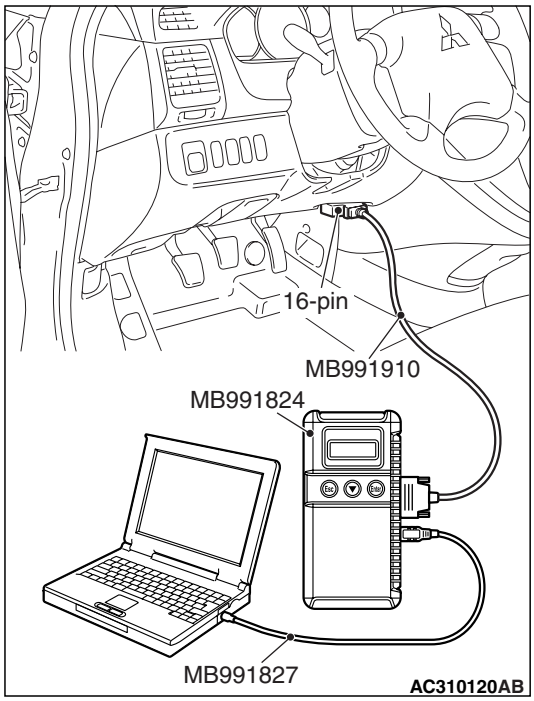
PROBABLE CAUSES

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

DIAGNOSIS

STEP 1. MUT-III CAN bus diagnostics

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

(1) Connect MUT-III to the 16-pin diagnosis connector.
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result normal?

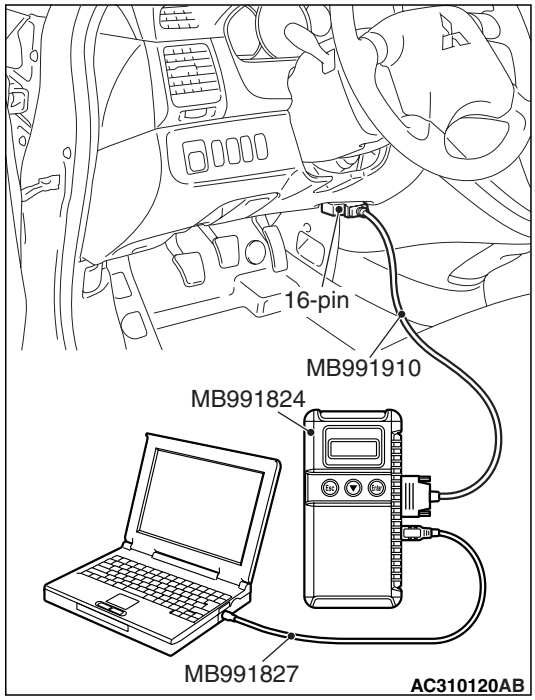
YES : Go to Step 2.

NO : Repair the CAN bus line (Refer to GROUP 54D, CAN bus line Diagnostic flow P.54D-9). Then go to Step 3.

STEP 2. Check whether the diagnosis code is reset.

Check again if the diagnosis code is set.

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

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

Q: Is code No.U1073 set?

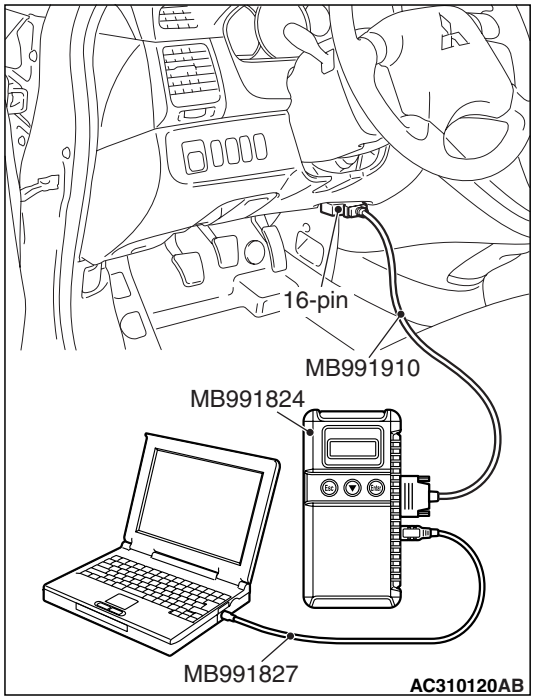
YES : Replace the steering wheel sensor. Then go to Step 3.

NO : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5.

STEP 3. Check whether the diagnosis code is reset.

Check again if the diagnosis code is set.

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

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

Q: Is code No.U1073 set?

YES : Go to Step 1.

NO : The procedure is complete.

SYMPTOM CHART

M1355006900026

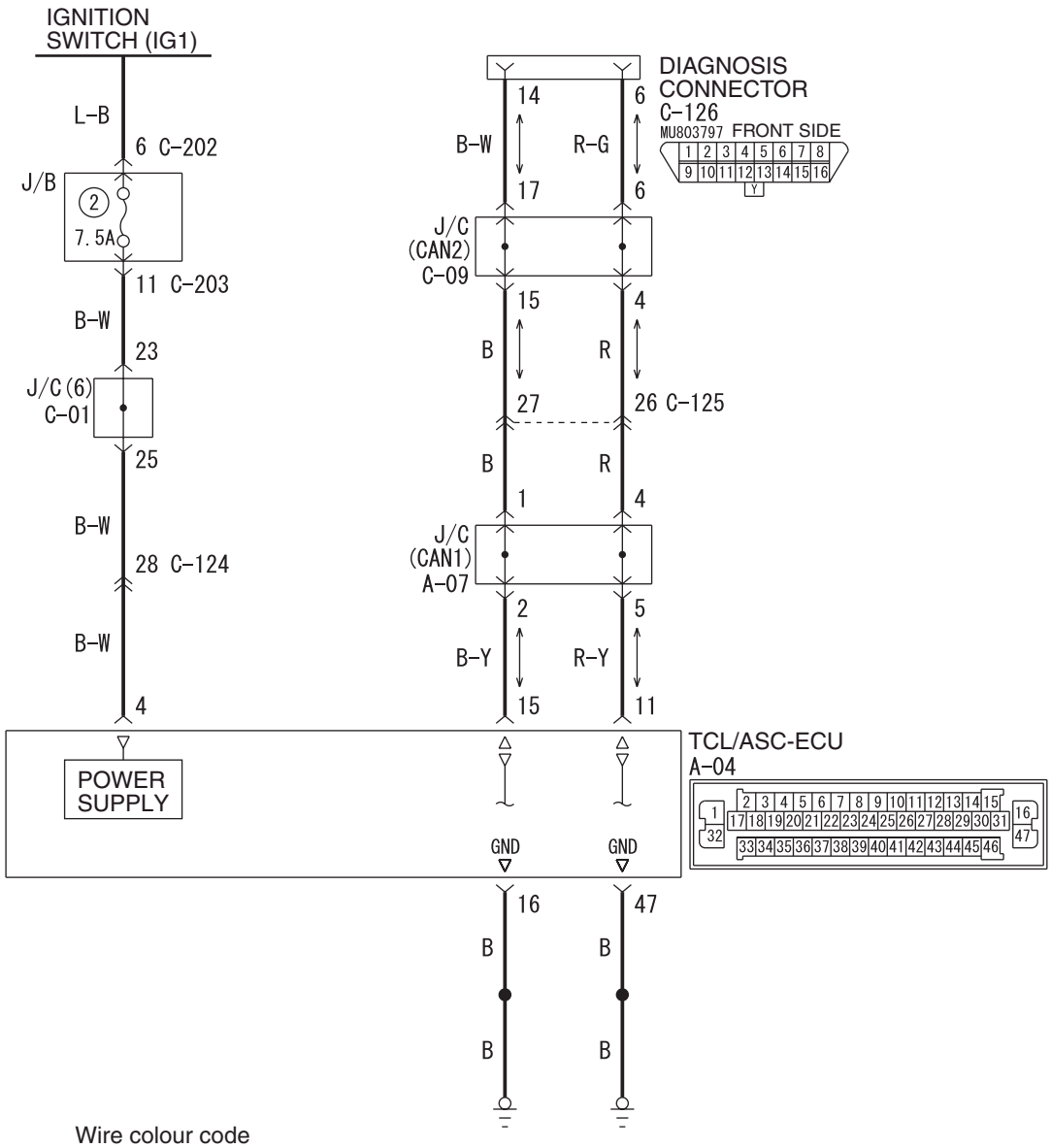
Symptom		Inspection procedure No.	Reference page
Communication with MUT-III is not possible	Communication with all systems is impossible	-	Group 54D, Diagnosis P.54D-16.
	Communication with the TCL/ASC-ECU only is impossible	1	P.35C-123
	Communication with the steering wheel sensor only is impossible	2	P.35C-126
TCL/ASC-ECU power supply circuit system		3	P.35C-129
Steering wheel sensor power supply circuit system		4	P.35C-135
G and yaw late sensor power supply circuit system		5	P.35C-141
When the ignition switch is turned to the "ON" position (engine stopped), the TCL OFF indicator lamp dose not illuminate.		6	P.35C-150
When the ignition switch is turned to the "ON" position (engine stopped), the TCL/ASC indicator lamp dose not illuminate.		7	
The TCL OFF indicator lamp remains illuminated after the engine is started.		8	
The TCL/ASC indicator lamp remains illuminated after the engine is started.		9	
When the TCL switch is push on, TCL system does not be cancelled.		10	P.35C-152
TCL/ASC system dose not operate.		11	P.35C-156

SYMPTOM PROCEDURES

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

<LH drive vehicles>

Data Link Connector Circuit

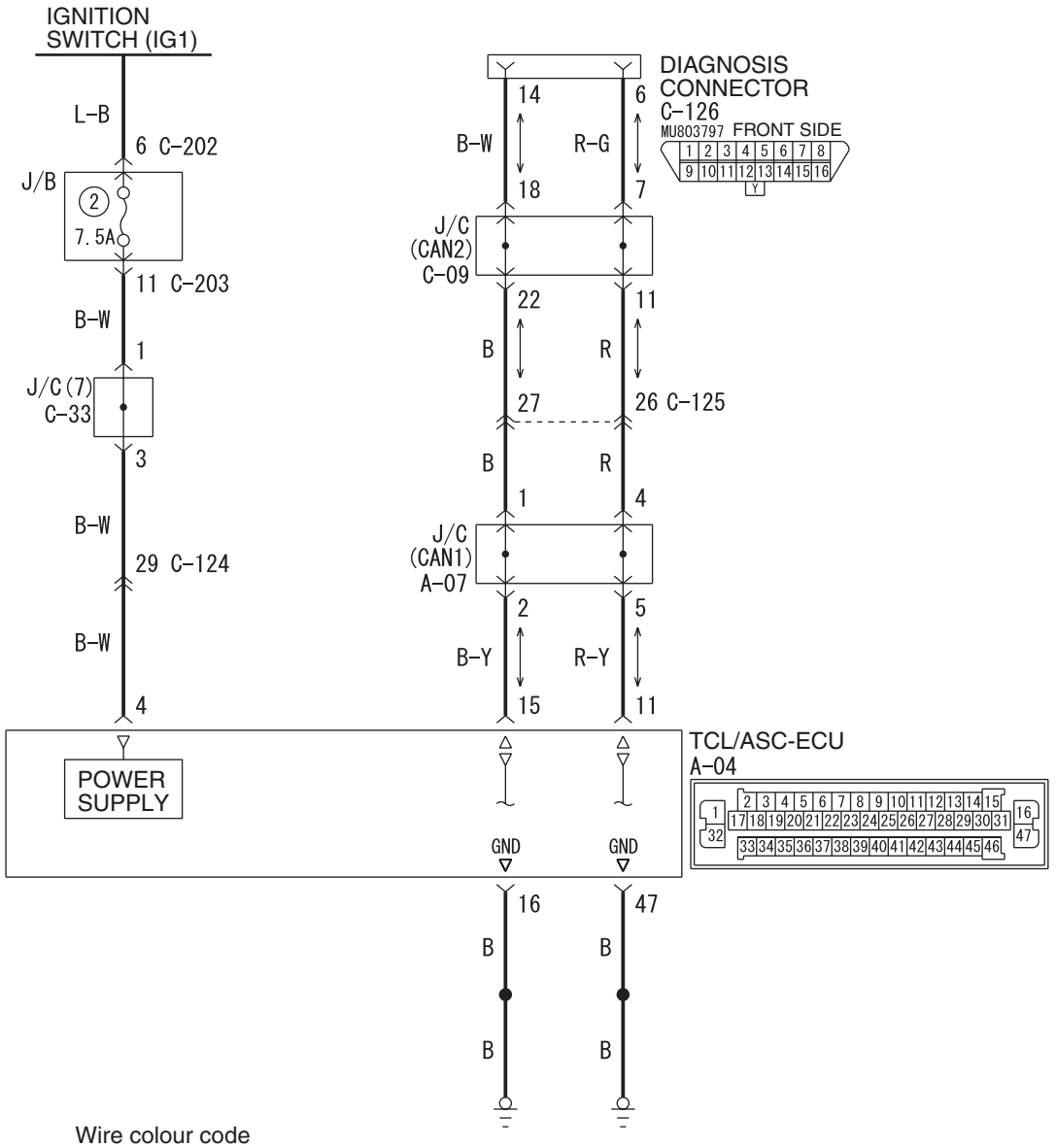


Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

W4X35E011A

<RH drive vehicles>

Data Link Connector Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

W4X35E012A

TECHNICAL DESCRIPTION (COMMENT)

If the MUT-III can not communicate with the TCL/ASC system, the CAN bus lines may be defective. If the TCL/ASC system does not work, the TCL/ASC-ECU or its power supply circuit may be defective.

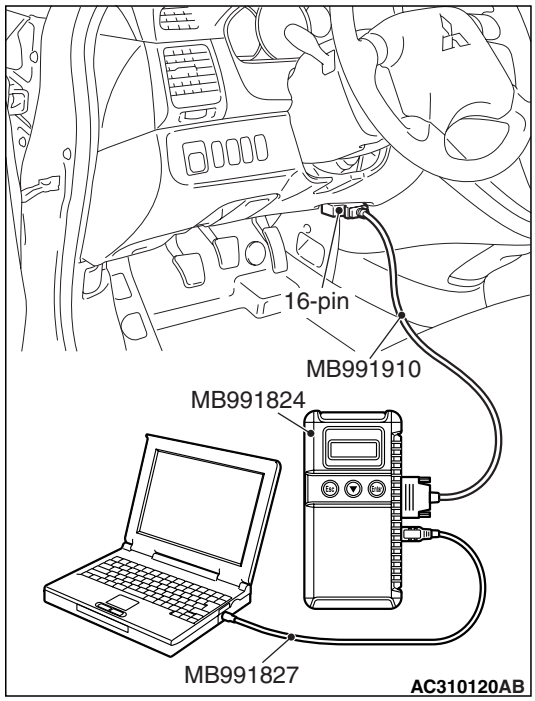
PROBABLE CAUSES

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

DIAGNOSIS

STEP 1. MUT-III CAN bus diagnostics

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

Use MUT-III to diagnose the CAN bus lines.

(1) Connect MUT-III to the 16-pin diagnosis connector.

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

(3) Diagnose the CAN bus line.

Q: Is the check result normal?

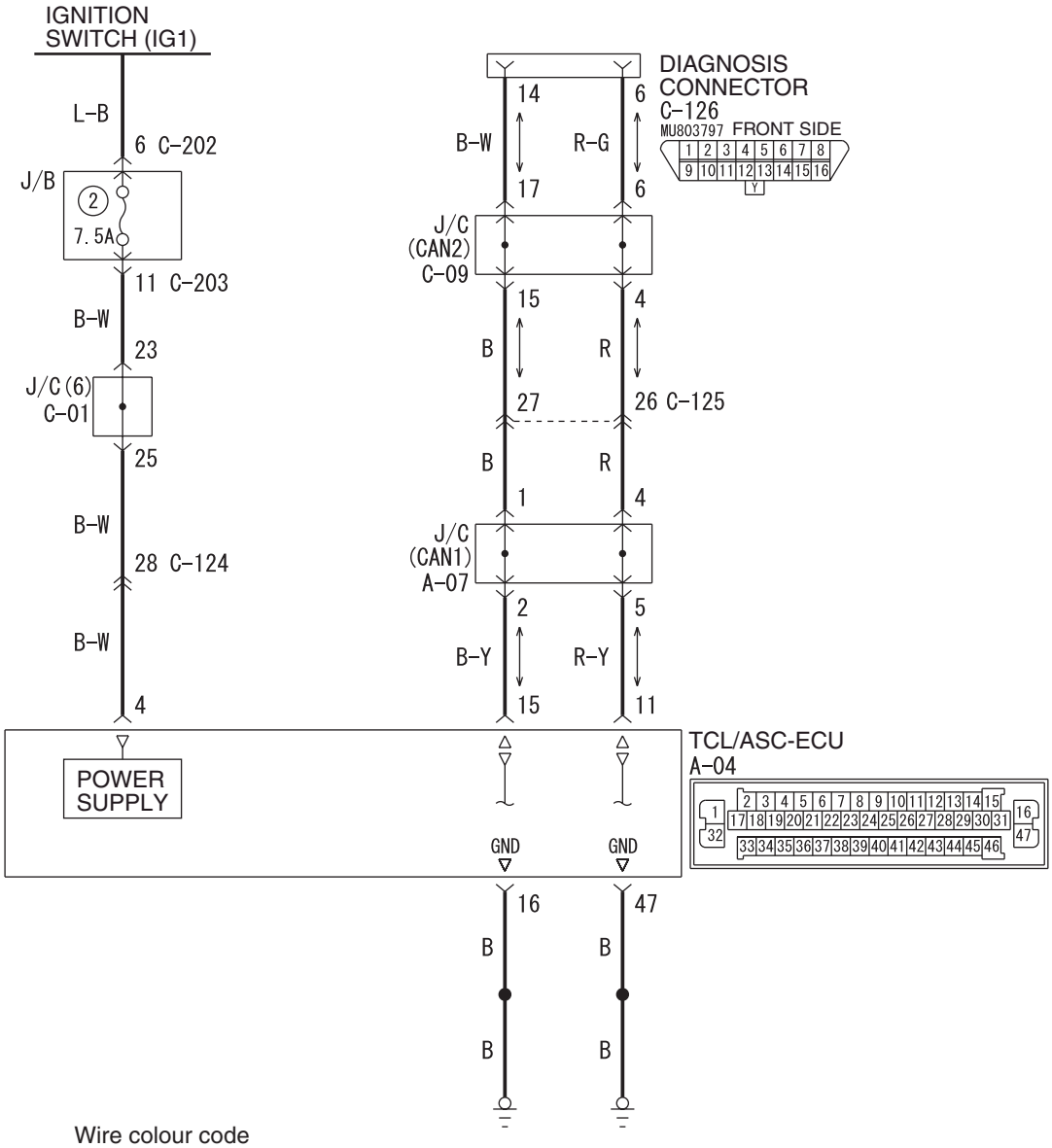
YES : Check and repair the power supply circuit system (Refer to P.35B-65).

NO : Repair the CAN bus lines (Refer to GROUP 54D, CAN bus line Diagnostic flow P.54D-9).

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

<LH drive vehicles>

Data Link Connector Circuit

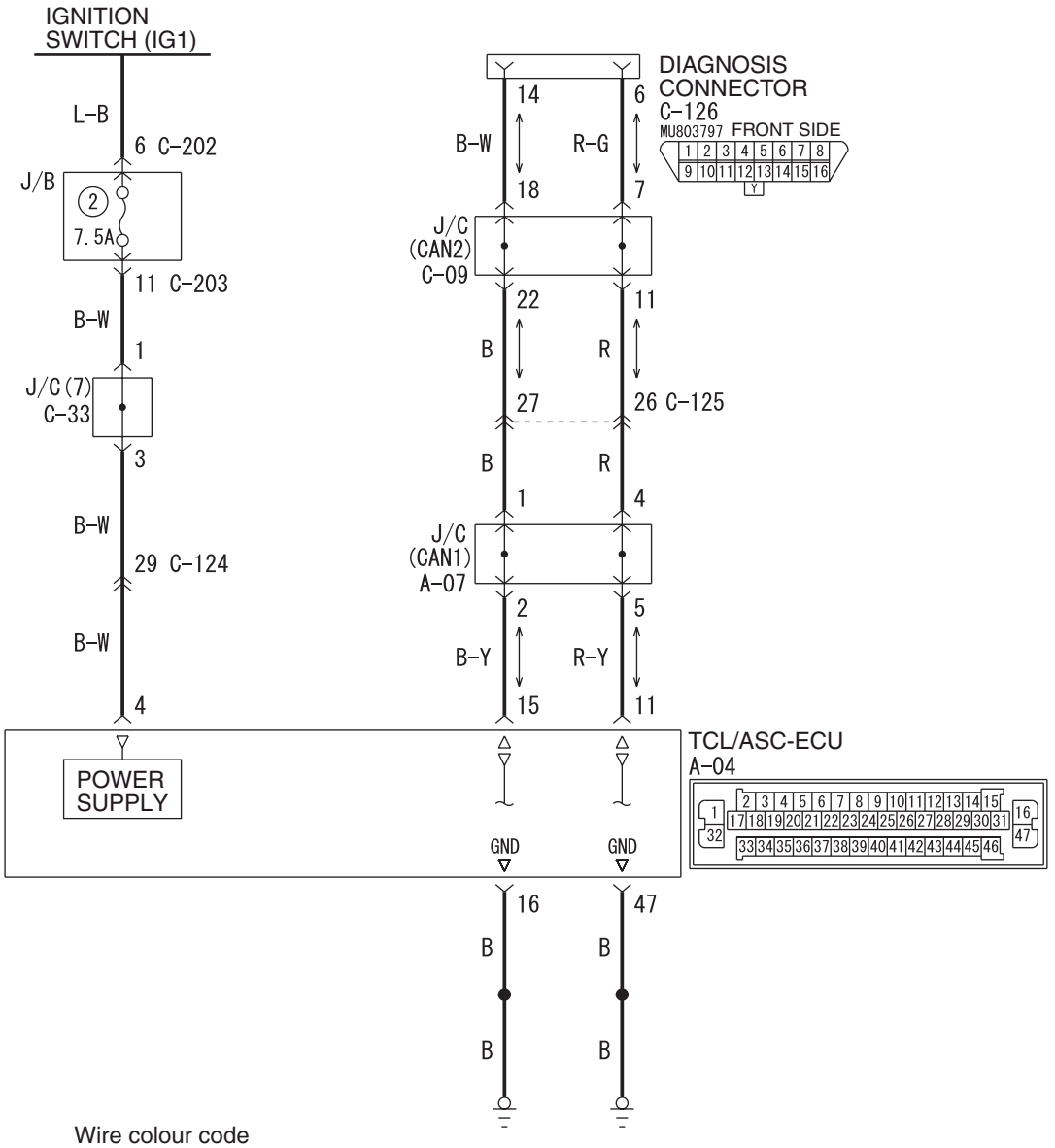


Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

W4X35E011A

<RH drive vehicles>

Data Link Connector Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

W4X35E012A

TECHNICAL DESCRIPTION (COMMENT)

If the MUT-III can not communicate with the steering wheel sensor, the CAN bus lines may be defective. If the ASC system does not work, the steering wheel sensor or its power supply circuit may be defective.

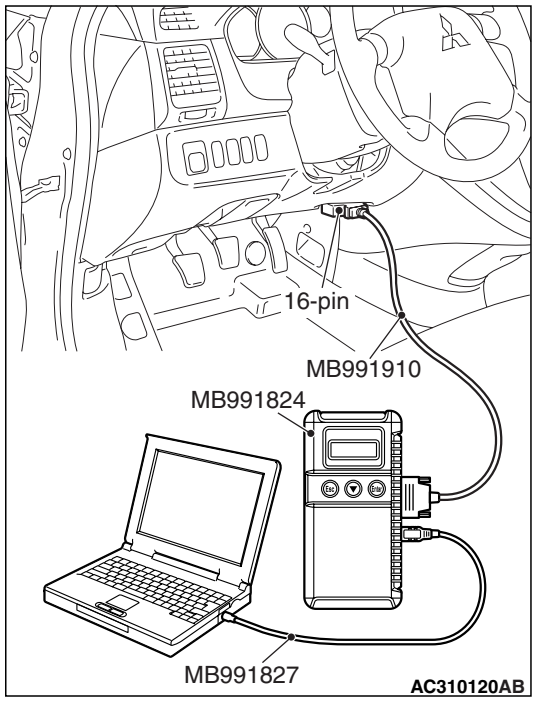
PROBABLE CAUSES

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

DIAGNOSIS

STEP 1. MUT-III CAN bus diagnostics

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

Use MUT-III to diagnose the CAN bus lines.

(1) Connect MUT-III to the 16-pin diagnosis connector.

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

(3) Diagnose the CAN bus line.

Q: Is the check result normal?

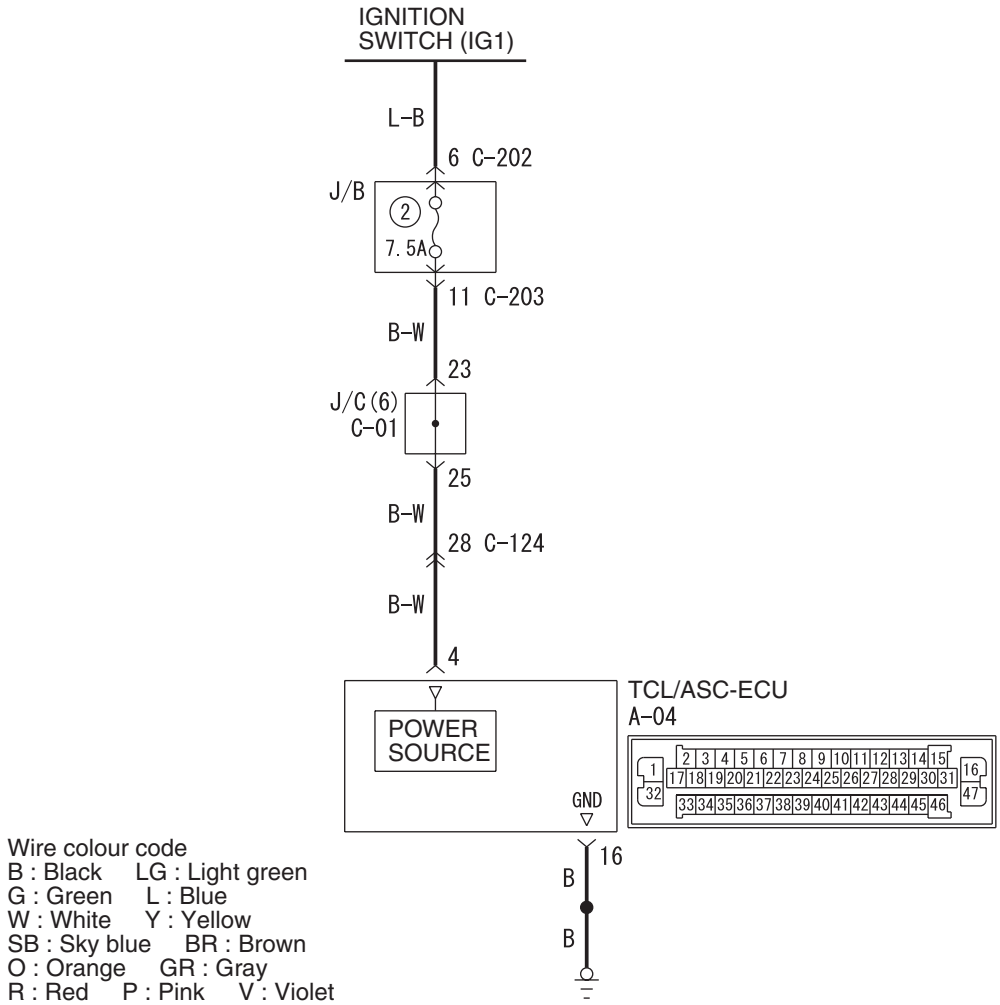
YES : Check and repair the power supply circuit system (Refer to P.35C-135).

NO : Repair the CAN bus lines (Refer to GROUP 54D, CAN bus line Diagnostic flow P.54D-9).

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

<LH drive vehicles>

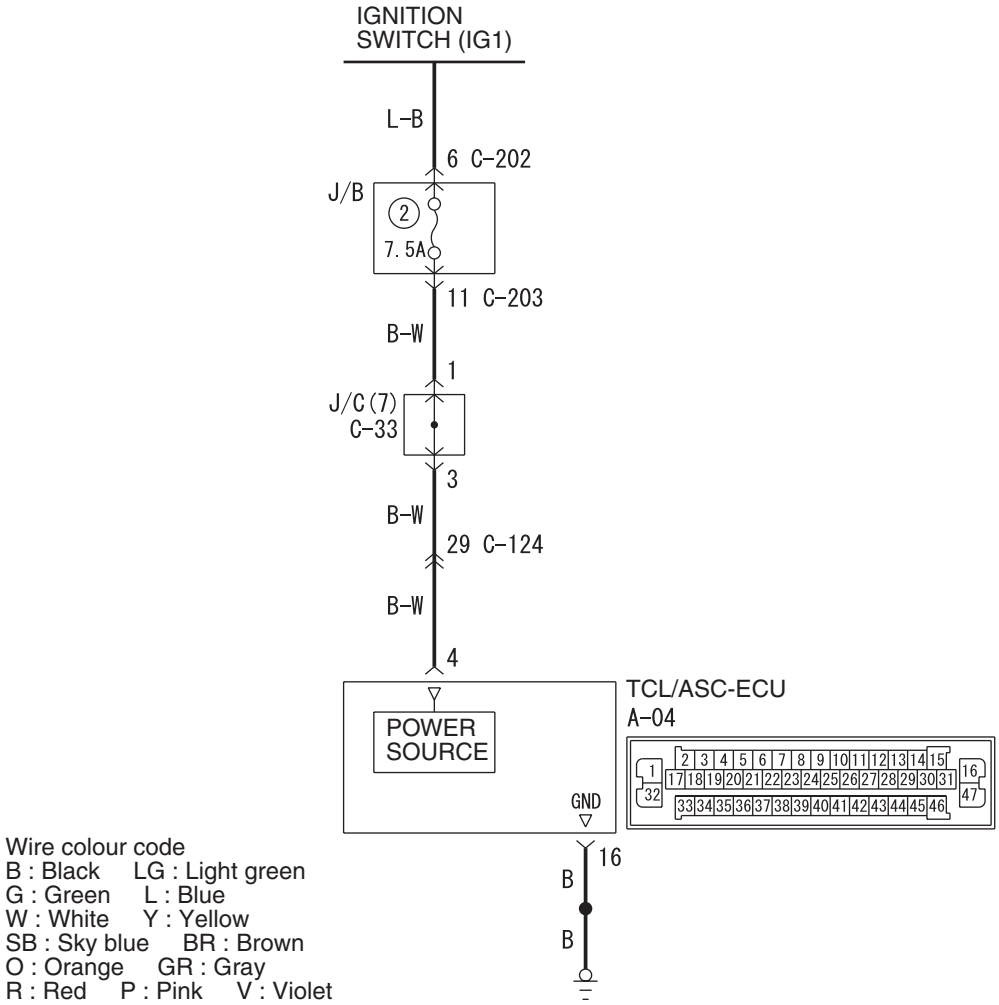
TCL/ASC-ECU Power Supply and Ground Circuit



W4X35E007A

<RH drive vehicles>

TCL/ASC-ECU Power Supply and Ground Circuit



W4X35E008A

OPERATION

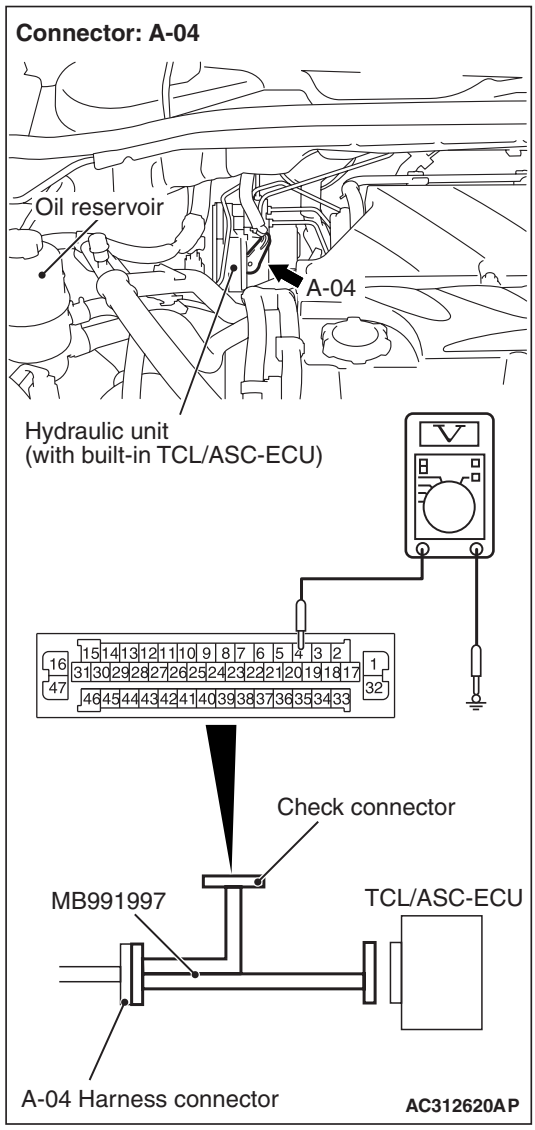
- The TCL/ASC-ECU is energized by the ignition switch (IG1) through multi-purpose fuse 2 and the TCL/ASC-ECU terminal 16.
- If the power supply to the TCL/ASC-ECU has failed, MUT-III will not be able to communicate with it.

PROBABLE CAUSES

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

DIAGNOSIS

STEP 1. Voltage measurement at TCL/ASC-ECU connector A-04.



(1) Disconnect the connector A-04, and connect special tool ABS Check Harness (MB991997) to the wiring harness-side connector.

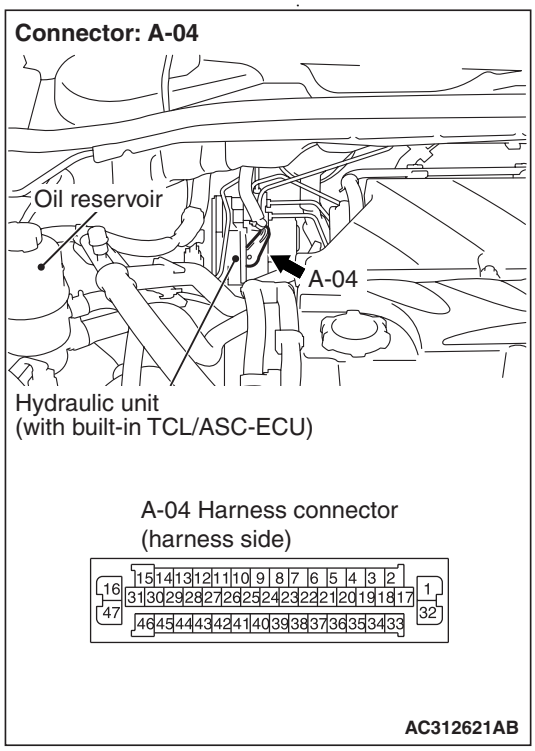
NOTE: Do not connect special tool ABS Check Harness (MB991997) to the TCL/ASC-ECU.

(2) Turn the ignition switch to the "ON" position.
(3) Measure the voltage between terminal 4 and earth.

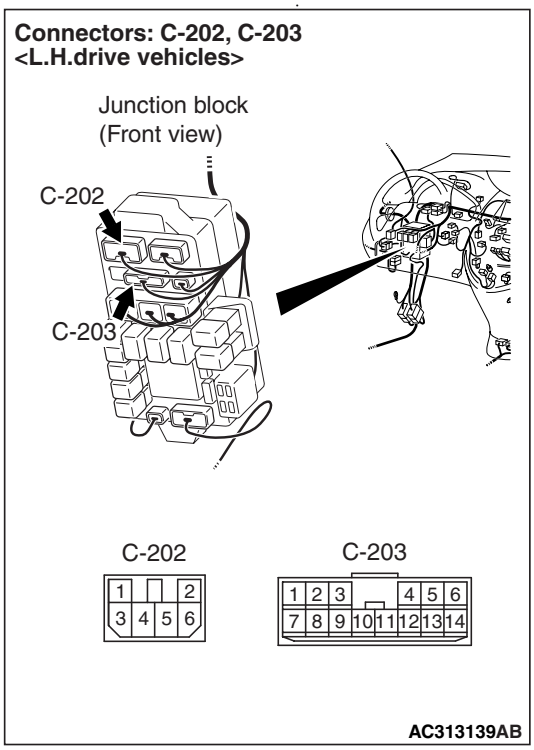
OK: System voltage

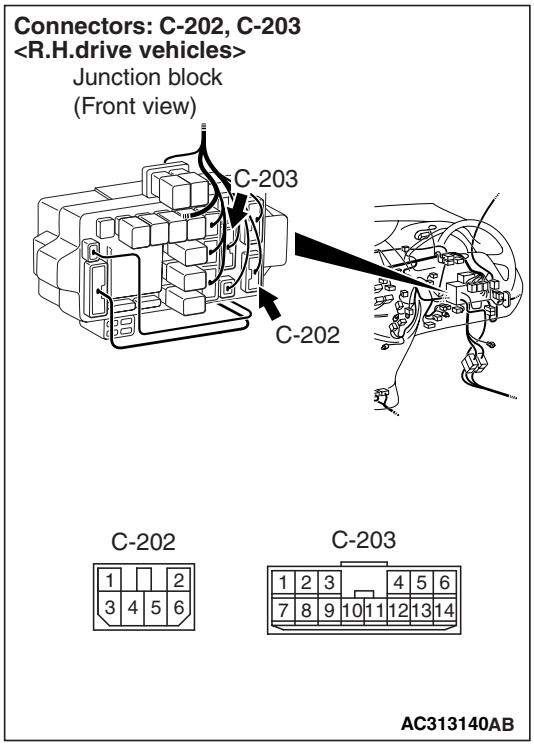
Q: Is the check result normal?
YES : Go to Step 3.
NO : Go to Step 2.

STEP 2. Check the following connectors.

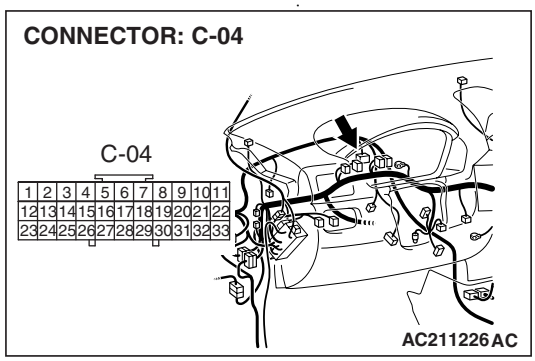


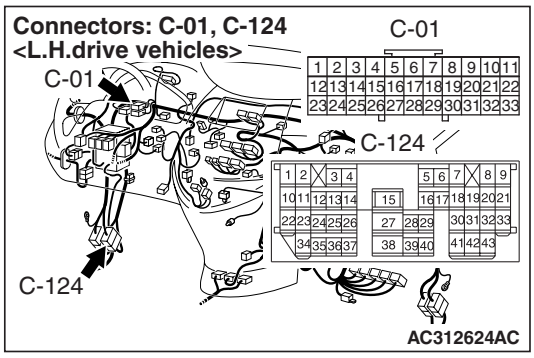
TCL/ASC-ECU connector A-04

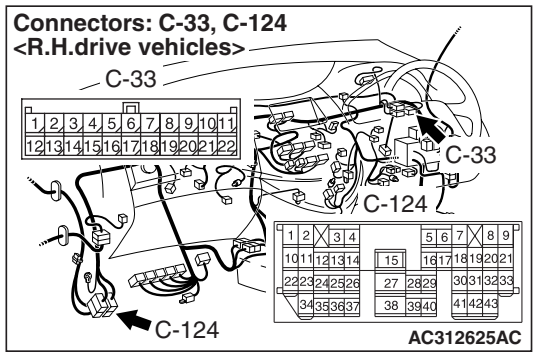




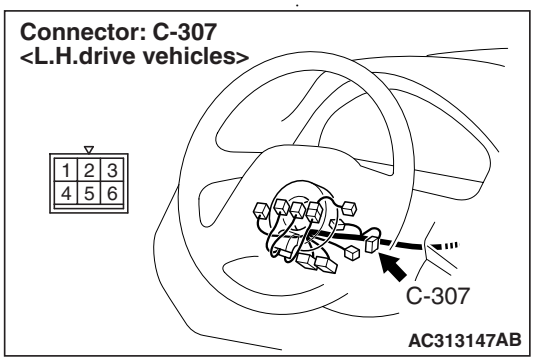
Junction block connectors C-202 and C-203

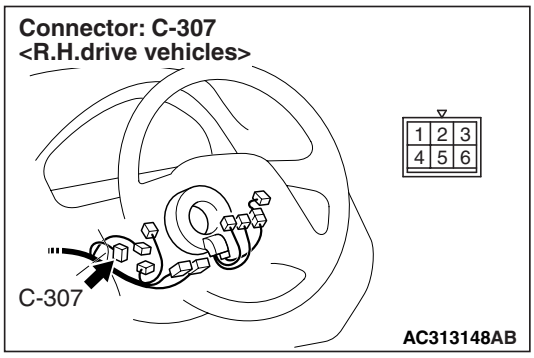






Joint connector C-01 <LH drive vehicles> or C-33 <RH drive vehicles> and intermediate connector C-124





Ignition switch connector C-307

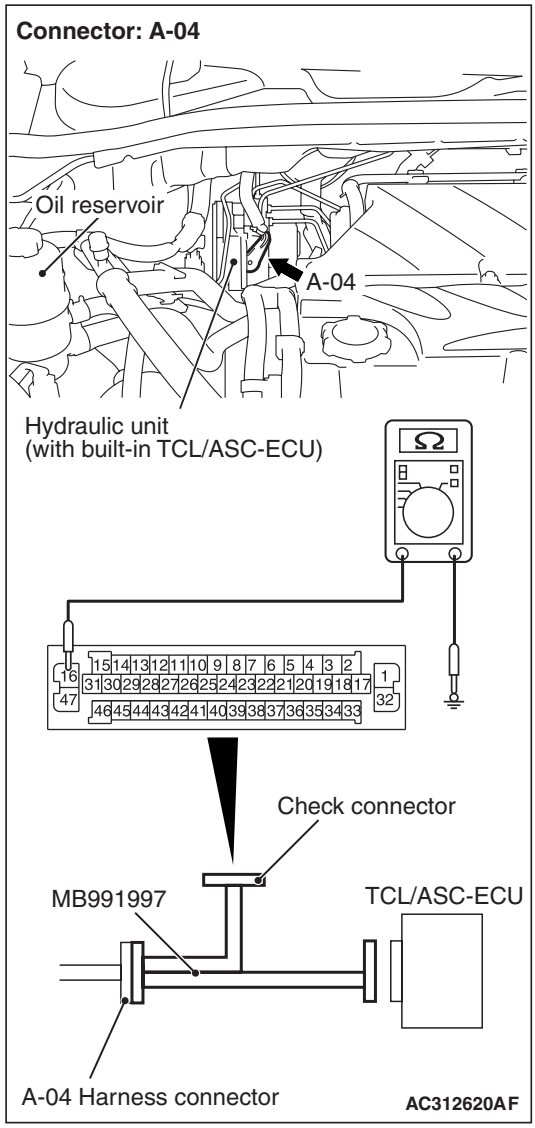
Check the connectors, for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is the check result normal?

YES : An open or short circuit may be present in the power supply line to the TCL/ASC-ECU. Repair the wiring harness between TCL/ASC-ECU connector A-04 terminal 4 and ignition switch connector C-307 terminal 2. Go to Step 8.

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

STEP 3. Resistance measurement at TCL/ASC-ECU connector A-04.



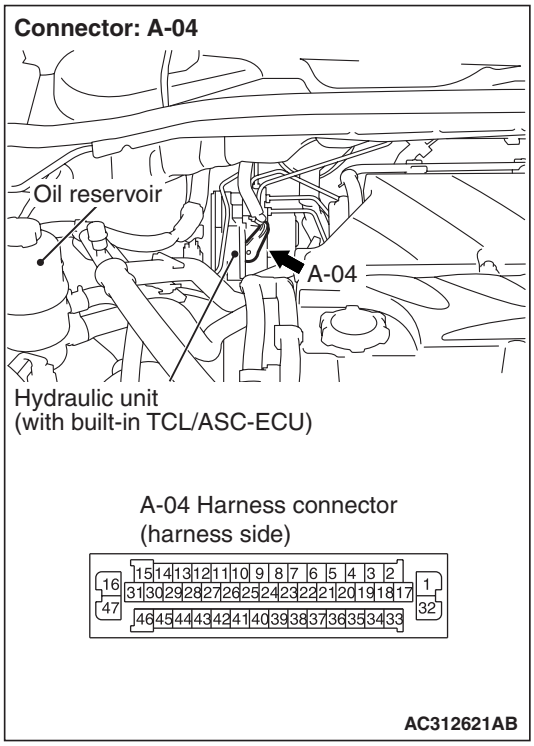
(1) Disconnect the connector A-04, and connect special tool ABS Check Harness (MB991997) to the wiring harness-side connector.
NOTE: Do not connect special tool ABS Check Harness (MB991997) to the TCL/ASC-ECU.

(2) Measure the resistance between terminal 16 and earth.

OK: 2 ohm or less

Q: Is the check result normal?
YES : Go to Step 5.
NO : Go to Step 4.

STEP 4. Check TCL/ASC-ECU connector A-04 for loose, corroded or damaged terminals, or terminals pushed back in the connector.



Q: Is the check result normal?
YES : An open circuit may be present in the earth circuit. Repair the wiring harness between TCL/ASC-ECU connector A-04 terminals 16 and the body earth. Then go to Step 8.
NO : Repair or replace the damaged component(s). Then go to Step 8.

STEP 5. Check the battery.
Check the battery (Refer to GROUP 54A, Battery test P.54A-6).

Q: Is the check result normal?
YES : Go to Step 6.
NO : Charge or replace the battery. Then go to Step 8.

STEP 6. Check the charging system.
Check the charging system (Refer to GROUP 16, Charging system P.16-5).

Q: Is the check result normal?
YES : Go to Step 7.
NO : Repair or replace the charging system component(s).Then go to Step 8.

STEP 7. Retest the system.

Q: Can the TCL/ASC-ECU communicate with the MUT-III?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5.

NO : Replace the TCL/ASC-ECU. Then go to Step 8.

STEP 8. Retest the system.

Q: Can the TCL/ASC-ECU communicate with the MUT-III?

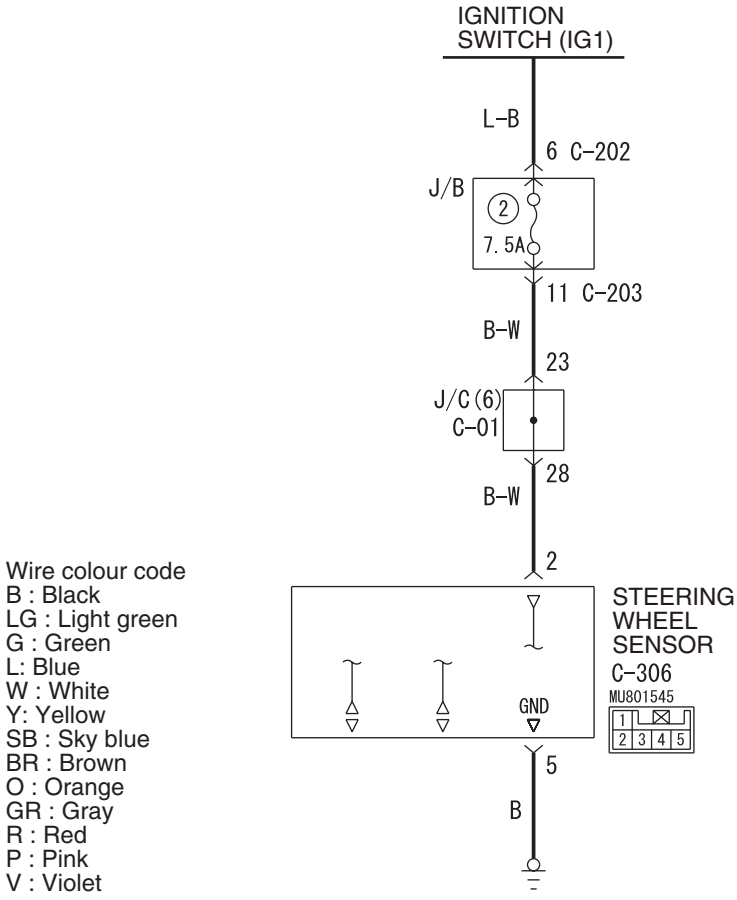
YES : The procedure is complete.

NO : Go to Step 1.

INSPECTION PROCEDURE 4: Steering wheel sensor power supply supply system

<LH drive vehicles>

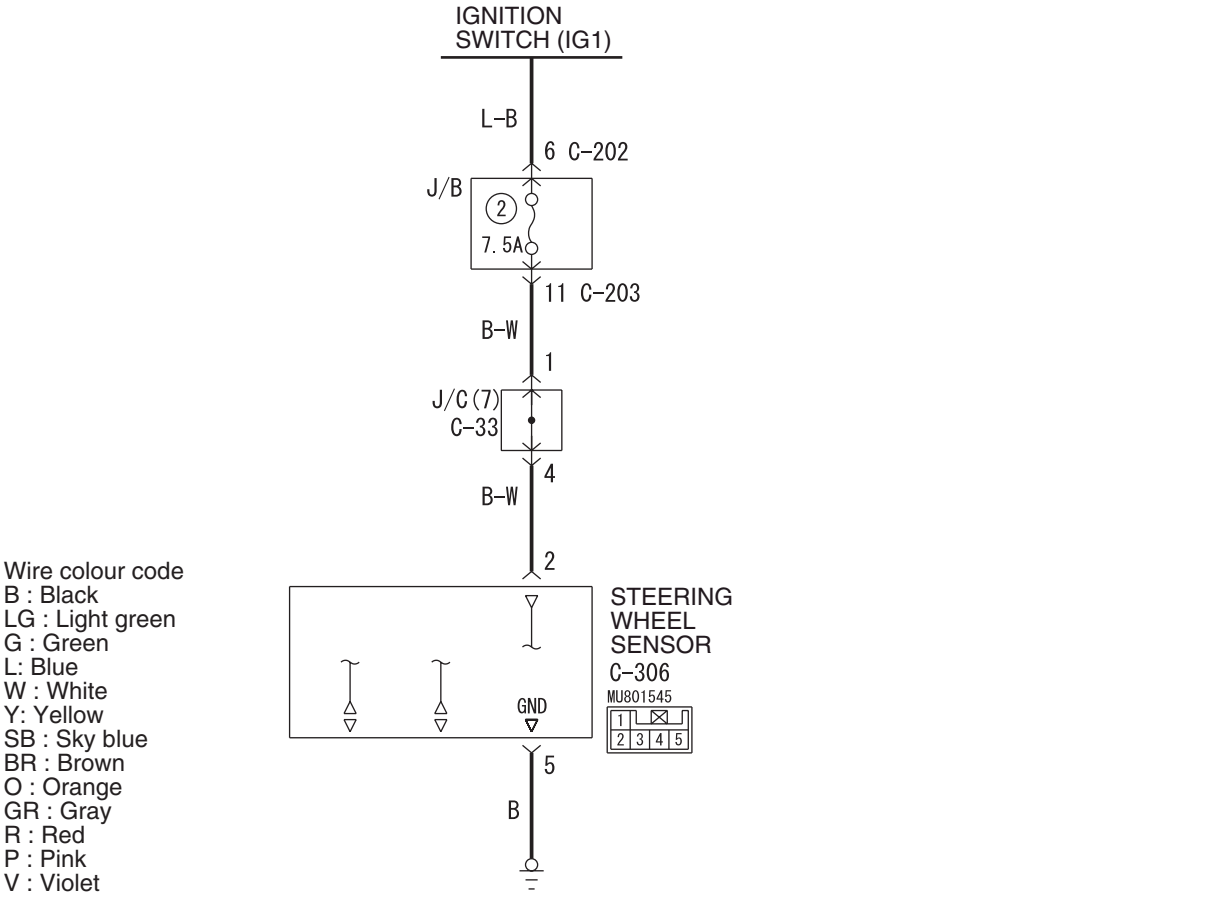
Steering Wheel Sensor Power Supply Circuit



W4X35E013A

<RH drive vehicles>

Steering Wheel Sensor Power Supply Circuit



W4X35E014A

OPERATION

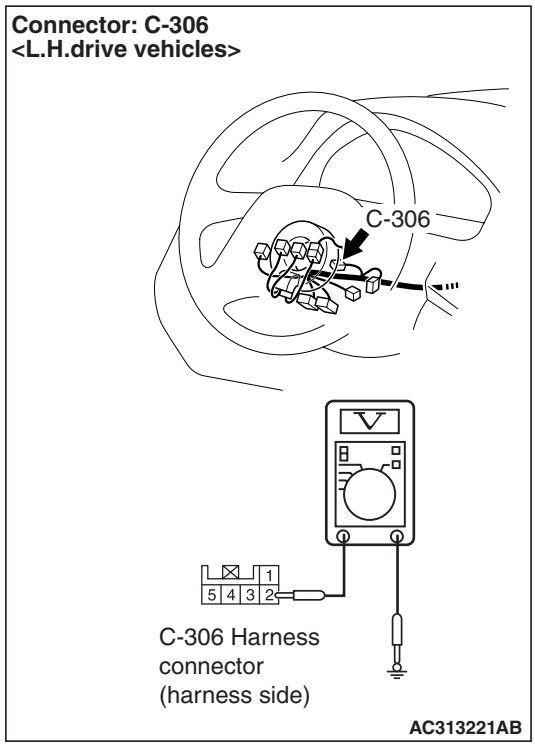
- The steering wheel sensor is energized by the ignition switch (IG1) through multi-purpose fuse 2 and the steering wheel sensor terminal 2.
- If the power supply to the steering wheel sensor has failed, MUT-III will not be able to communicate with it.

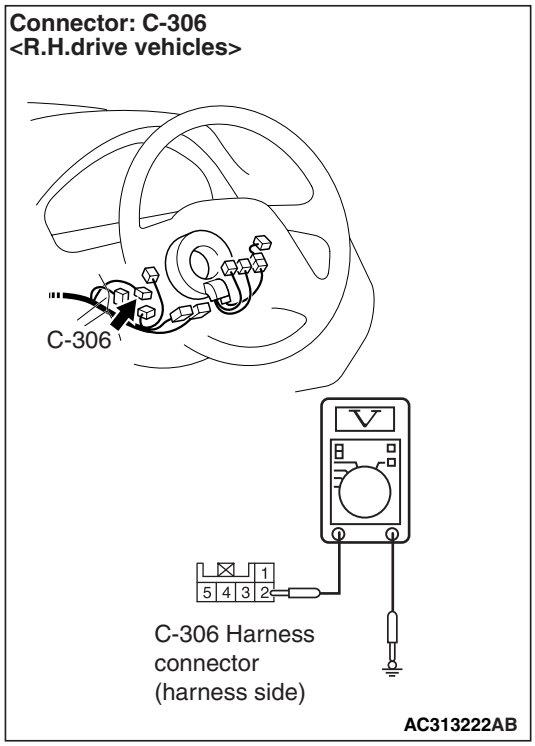
PROBABLE CAUSES

- Damaged wiring harness or connector
- Defective battery
- Charging system failed
- Malfunction of the steering wheel sensor

DIAGNOSIS

STEP 1. Voltage measurement at steering wheel sensor connector C-306.



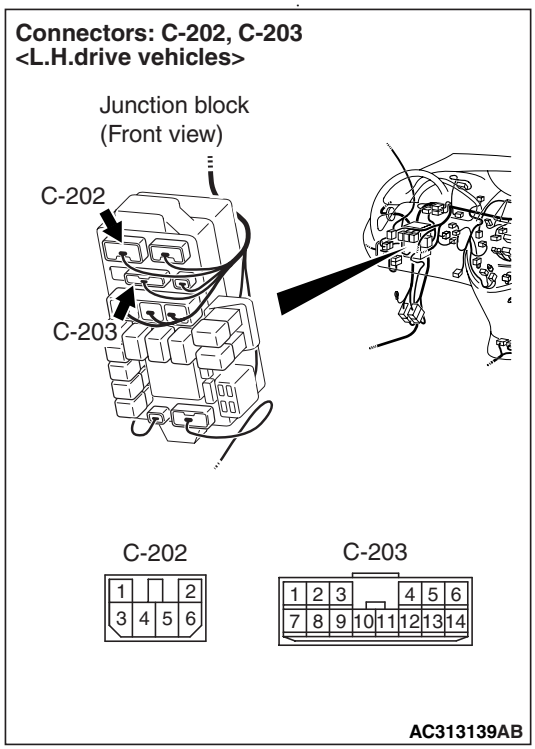


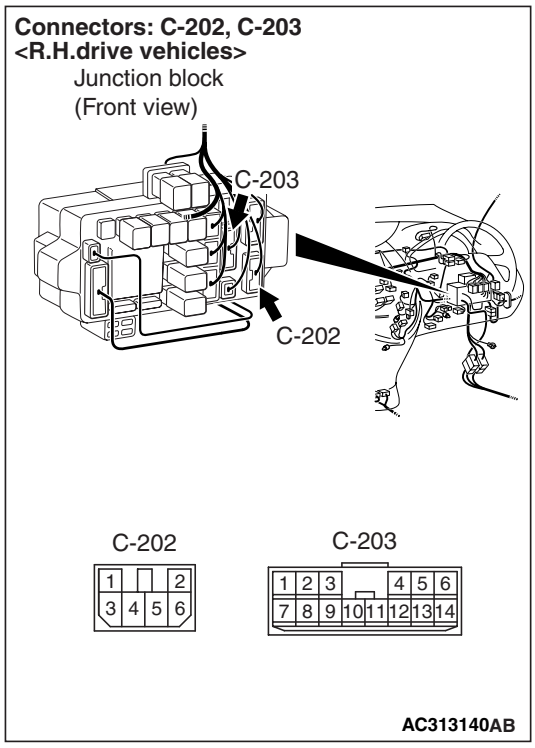
(1) Disconnect the connector C-306.
(2) Turn the ignition switch to the "ON" position.
(3) Measure the voltage between terminal 2 and earth.

OK: System voltage

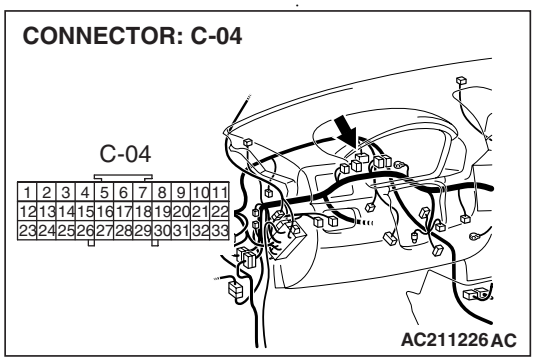
Q: Is the check result normal?
YES : Go to Step 3.
NO : Go to Step 2.

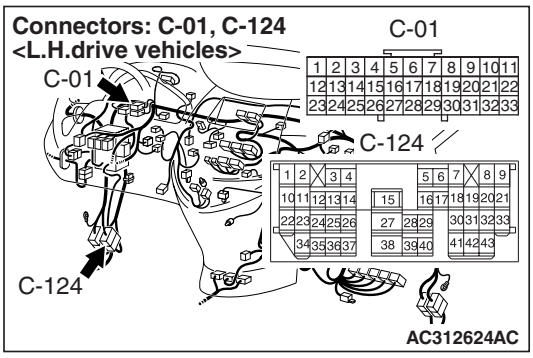
STEP 2. Check the following connectors.

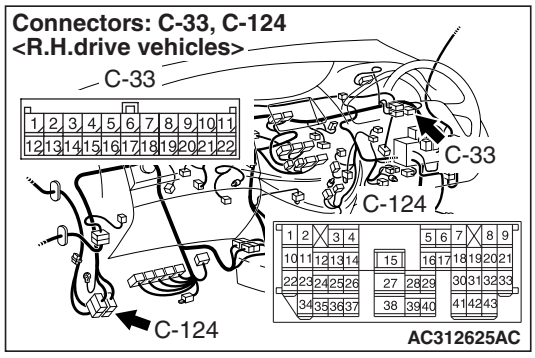




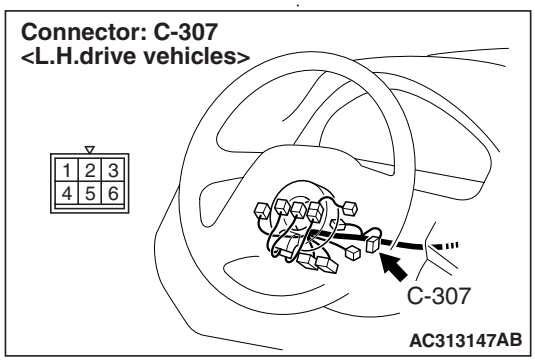
Junction block connectors C-202 and C-203

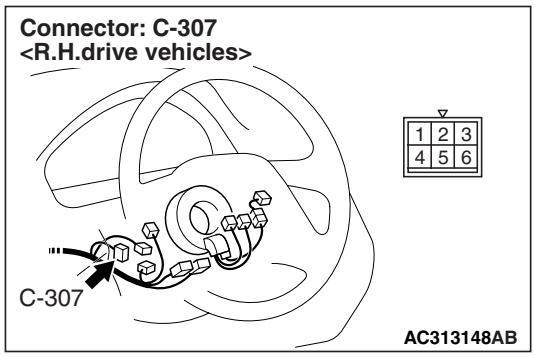




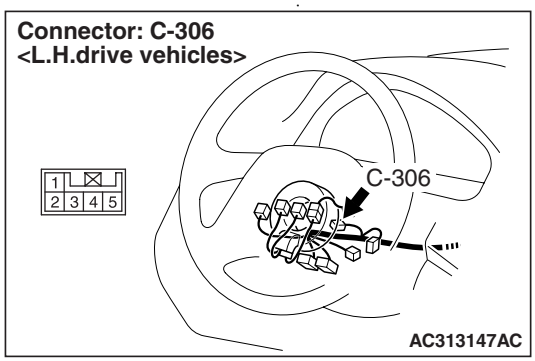


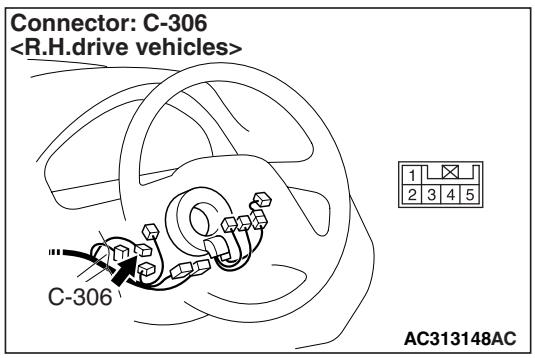
Joint connector C-01 <LH drive vehicles> or C-33 <RH drive vehicles> and intermediate connector C-124





Ignition switch connector C-307





Steering wheel sensor connector C-306

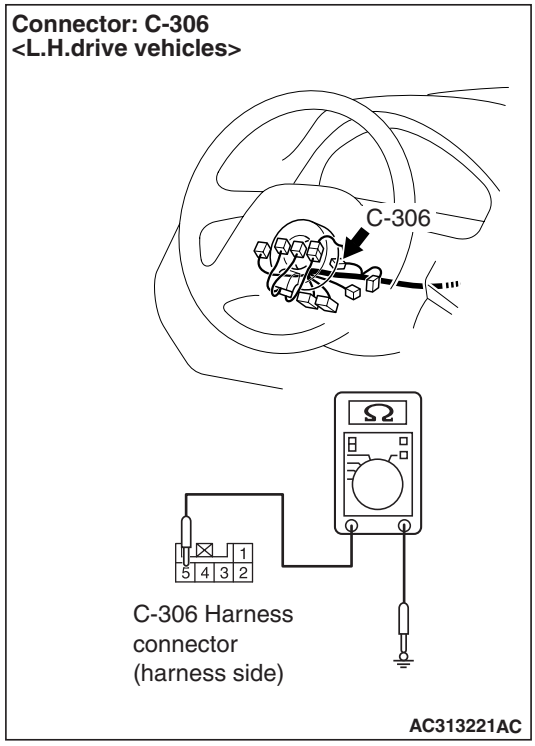
Check the connectors, for loose, corroded or damaged terminals, or terminals pushed back in the connector.

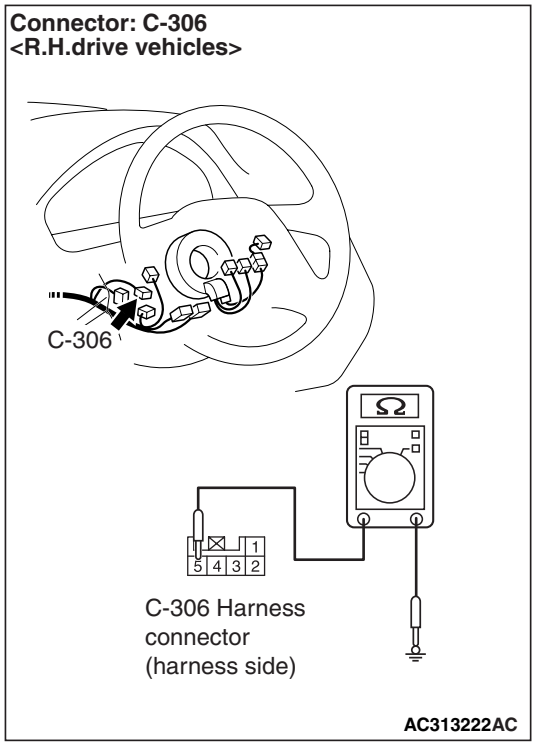
Q: Is the check result normal?

YES : An open or short circuit may be present in the power supply line to the steering wheel sensor. Repair the wiring harness between steering wheel sensor connector C-306 terminal 2 and ignition switch connector C-307 terminal 2. Go to Step 8.

NO : Repair or replace the damaged component(s). Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5. Then go to Step 8.

STEP 3. Resistance measurement at steering wheel sensor connector C-306.





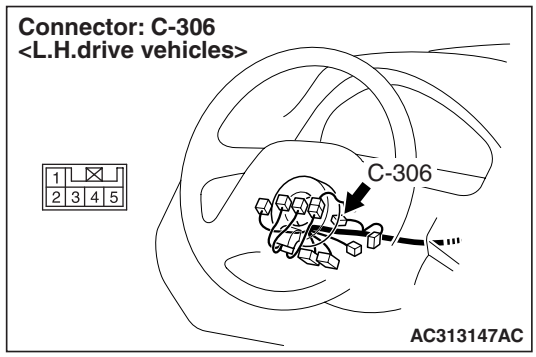
(1) Disconnect the steering sensor connector C-306, and measure at the harness side connector.
(2) Measure the resistance between terminal 5 and body earth.

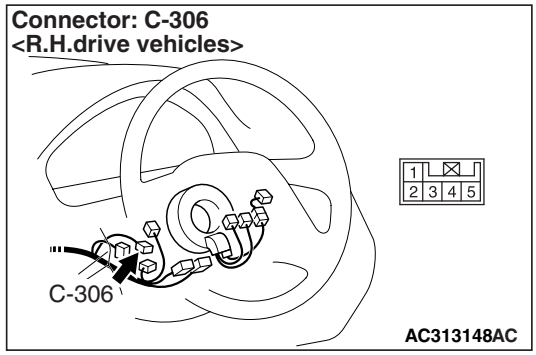
OK: 2 ohm or less

Q: Is the check result normal?

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

STEP 4. Check steering wheel sensor connector C-306 for loose, corroded or damaged terminals, or terminals pushed back in the connector.





Q: Is the check result normal?

YES : An open circuit may be present in the earth circuit. Repair the wiring harness between steering wheel sensor connector C-306 terminals 5 and the body earth. Then go to Step 8.
NO : Repair or replace the damaged component(s). Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5. Then go to Step 8.

STEP 5. Check the battery.
Check the battery (Refer to GROUP 54A, Battery test P.54A-6).

Q: Is the check result normal?

YES : Go to Step 6.
NO : Charge or replace the battery. Then go to Step 8.

STEP 6. Check the charging system.
Check the charging system (Refer to GROUP 16, Charging system diagnosis P.16-5).

Q: Is the check result normal?

YES : Go to Step 7.
NO : Repair or replace the charging system component(s).Then go to Step 8.

STEP 7. Retest the system.

Q: Can the steering wheel sensor communicate with the MUT-III?

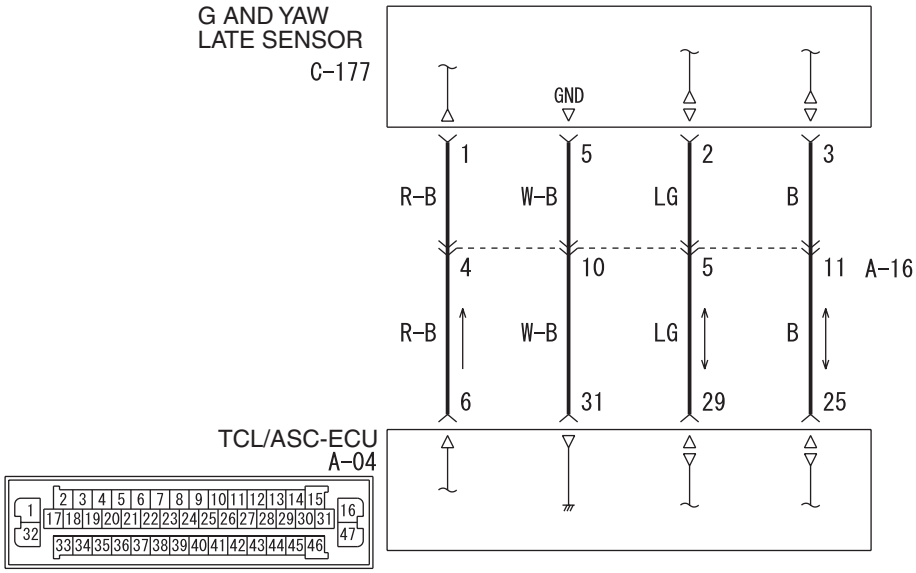
YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5.
NO : Replace the steering wheel sensor. Then go to Step 8.

STEP 8. Retest the system.

Q: Can the steering wheel sensor communicate with the MUT-III?
YES : The procedure is complete.
NO : Go to Step 1.

INSPECTION PROCEDURE 5: G and yaw rate sensor power supply supply system

G and Yaw Late Sensor Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

W4X35E006A

CIRCUIT OPERATION

- G and yaw rate sensor terminal 1 is energized from the TCL/ASC-ECU by the G and yaw rate sensor.
- If the power supply to the G and yaw rate sensor has failed, TCL/ASC-ECU related diagnosis code No.C1864 is set.

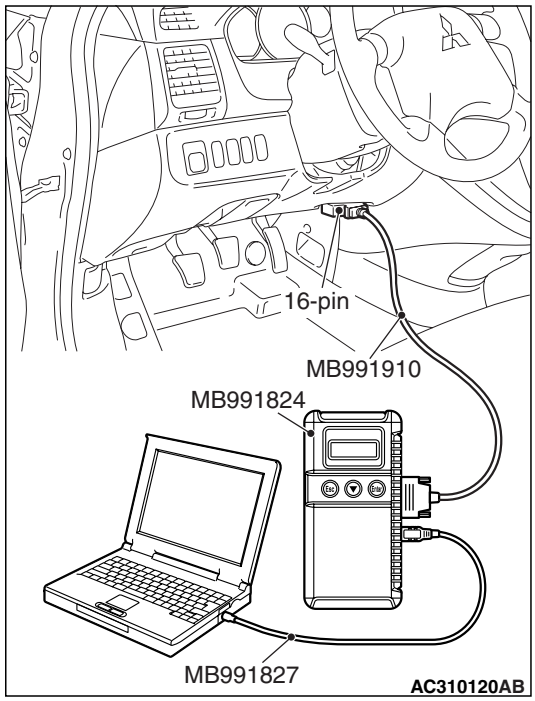
PROBABLE CAUSES

- Damaged wiring harness or connector
- Malfunction of the G and yaw rate sensor
- Malfunction of the TCL/ASC-ECU.

DIAGNOSIS

STEP 1. MUT-III CAN bus diagnostics

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

(1) Connect MUT-III to the 16-pin diagnosis connector.
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

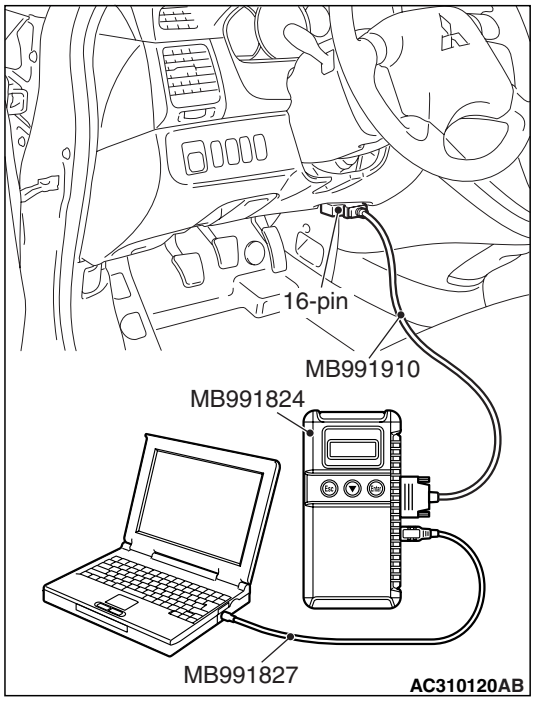
Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus line (Refer to GROUP 54D, CAN bus line Diagnostic flow P.54D-9). Then go to Step 2.

STEP 2. MUT-III diagnosis code

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

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

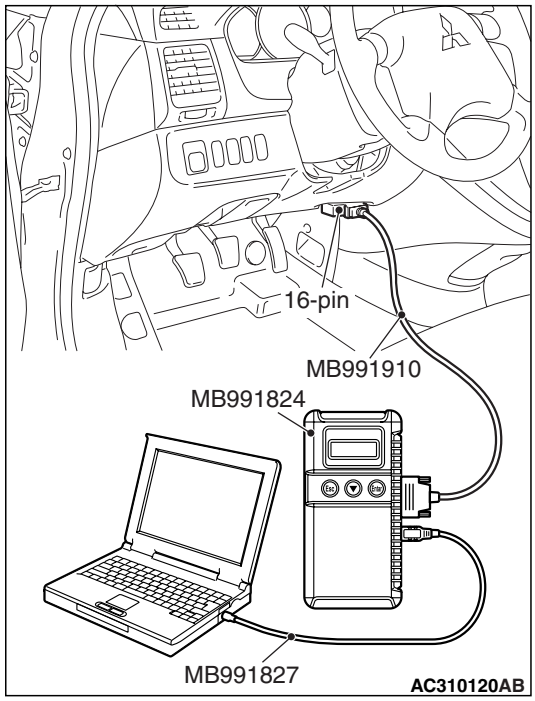
Q: Is code No.C1864 set?

YES : Go to Step 3.

NO : The procedure is complete.

STEP 3. MUT-III data list

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

(1) Connect the MUT-III to the 16-pin diagnosis connector.
(2) Turn the ignition switch to the "ON" position.
(3) Use MUT-III to read the following data list.

Item 31: Lateral G sensor

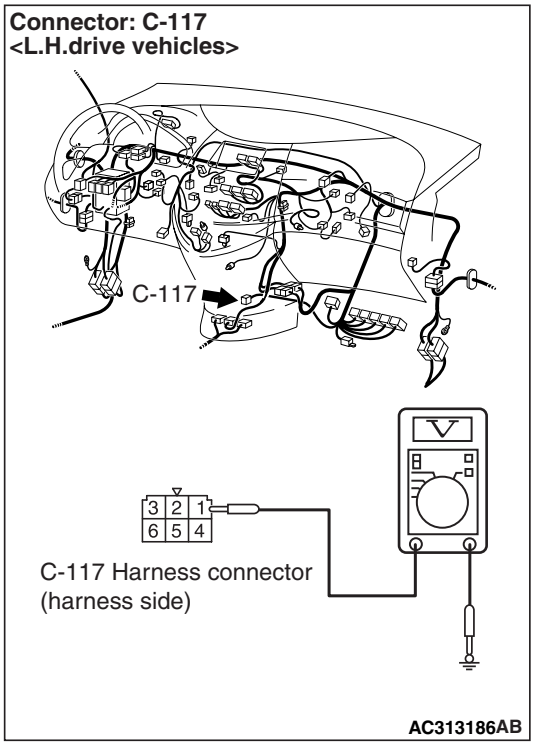
- Acceleration should measure nearly 0 G when the vehicle is stopped at a level surface.
- Acceleration should change within the range of -1.7 – 1.7 G during running.

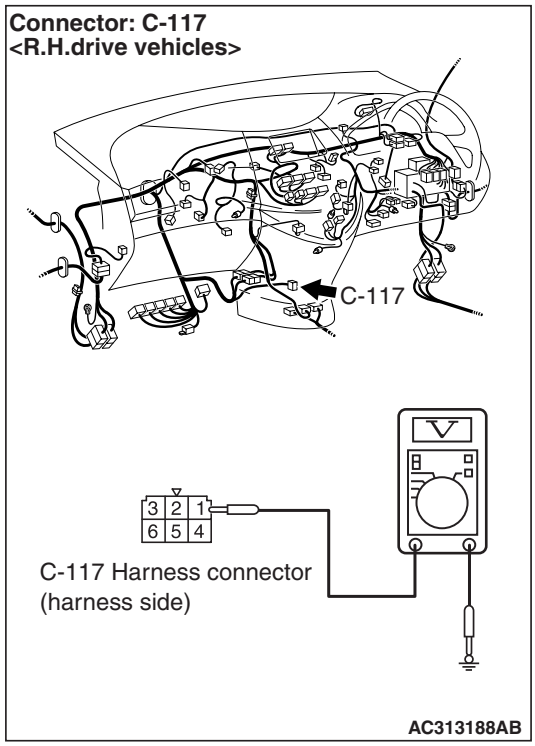
Item 33: Yaw rate sensor

- Angular velocity should measure nearly 0 deg/s (-3 – 3 deg/s) when the vehicle is stopped at a level surface.
- Angular velocity should change within the range of -100 –100 deg/s during running.

Q: Is the check result normal?
YES : Then go to step 8.
NO : Go to Step 4.

STEP 4. Voltage measurement at G and yaw rate sensor connector C-117.





(1) Disconnect the G and yaw rate sensor connector C-117, and measure at the harness side connector.
(2) Turn the ignition switch to the "ON" position.
(3) Measure the voltage between terminal 1 and

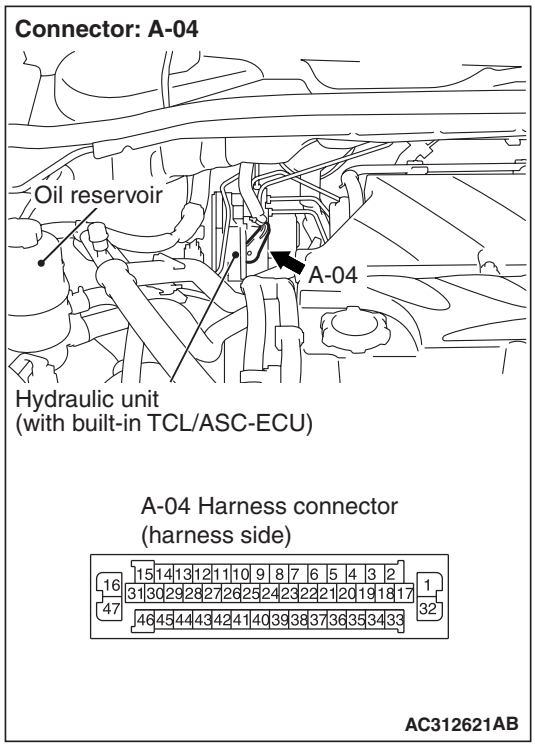
body earth.

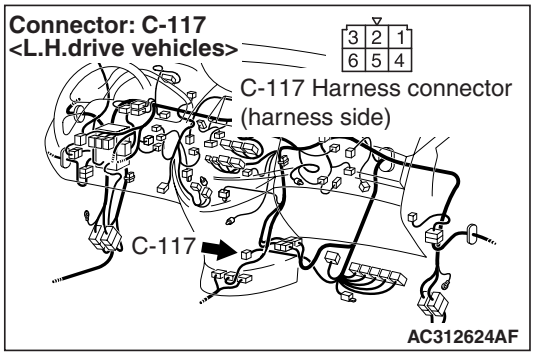
OK: System voltage

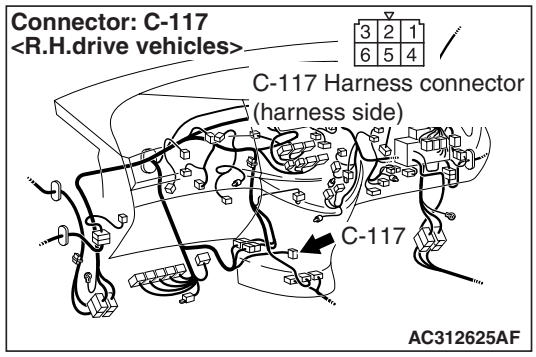
Q: Is the check result normal?

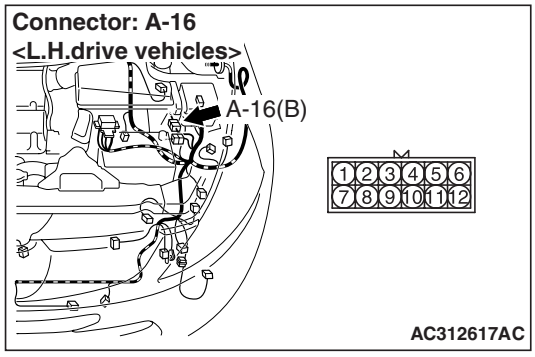
YES : Go to Step 6.
NO : Go to Step 5.

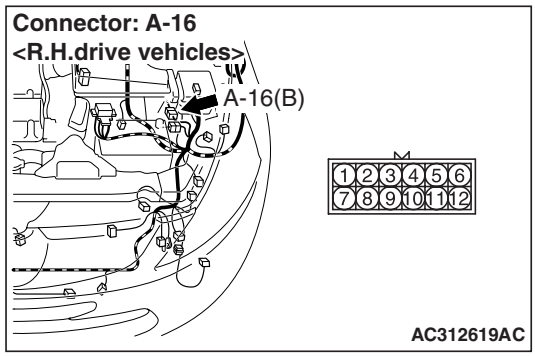
STEP 5. Check the harness wire between TCL/ASC-ECU connector A-04 terminal 6 and G and yaw rate sensor connector C-117 terminal 1.











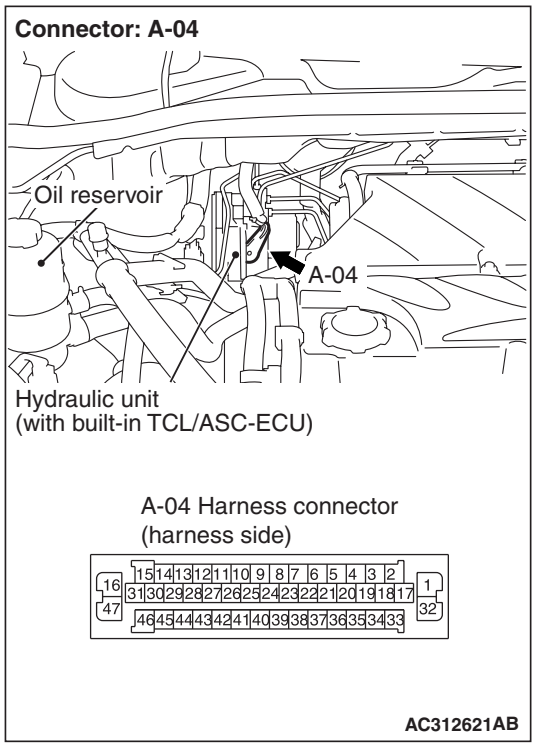
NOTE: After inspecting the TCL/ASC-ECU connector A-04, intermediate connector A-16 and G and yaw rate sensor connector C-117, inspect the wire. If any of these connector is damaged, repair or replace it. Then go to Step 8.

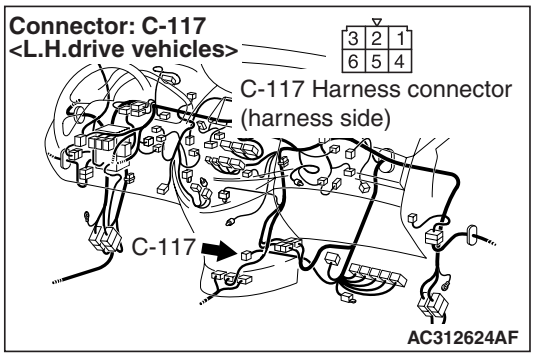
Q: Is the check result normal?

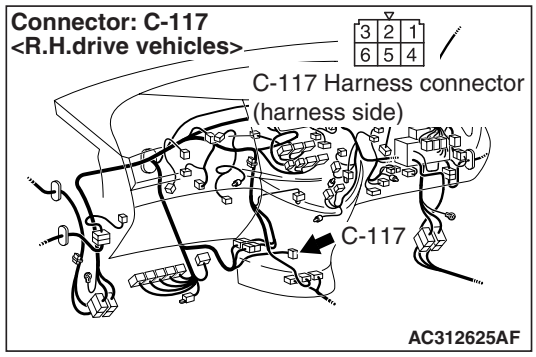
YES : Repair it and go to Step 8.

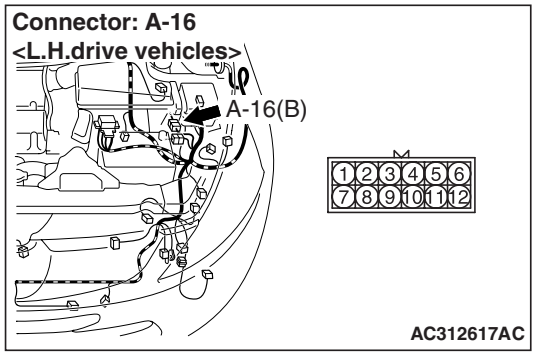
NO : This malfunctions is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5.

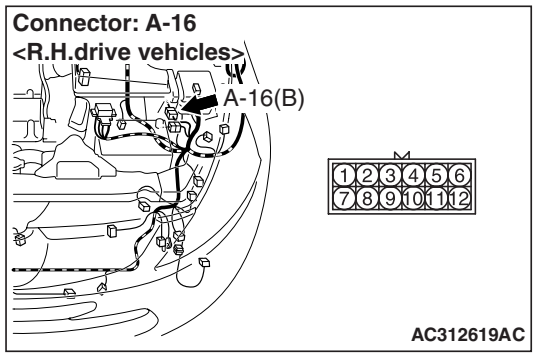
STEP 6. Check the harness wire between TCL/ASC-ECU connector A-04 terminal 31 and G and yaw rate sensor connector C-117 terminal 5.









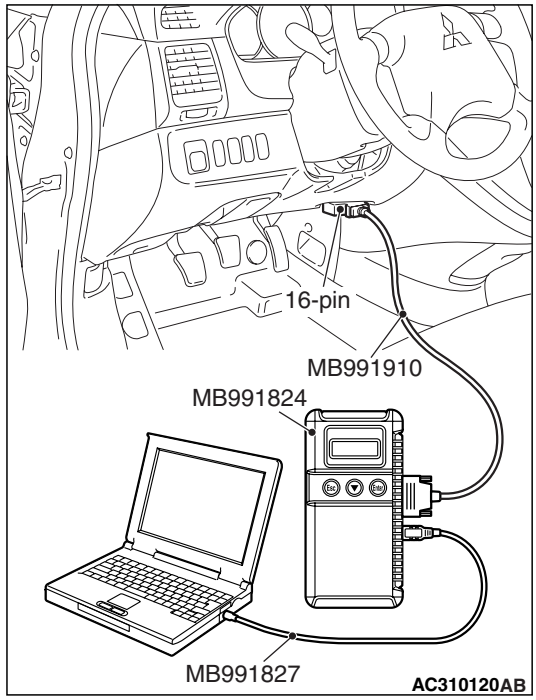


NOTE: After inspecting the TCL/ASC-ECU connector A-04, intermediate connector A-16 and G and yaw rate sensor connector C-117, inspect the wire. If any of these connector is damaged, repair or replace it. Then go to Step 8.

Q: Is the check result normal?
YES : Repair it and go to Step 8.
NO : This malfunctions is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5.

STEP 7. MUT-III diagnosis code

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

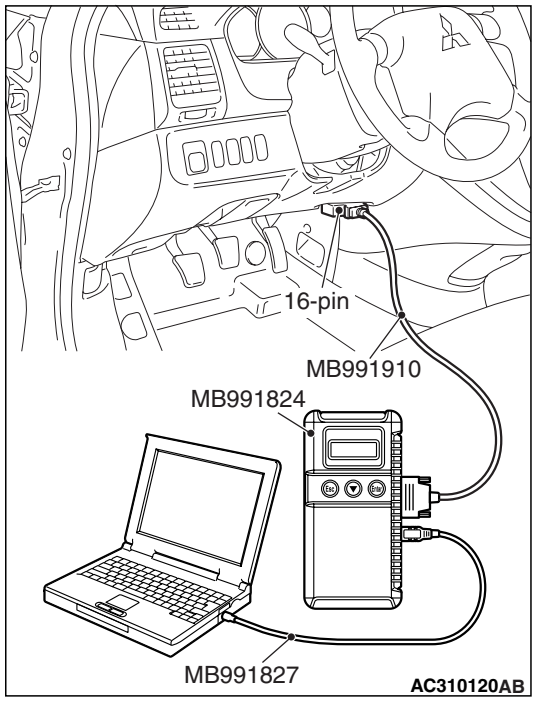
Replace the G and yaw rate sensor, and check whether diagnosis code C1366 or C1371 is reset.

(1) Replace the G and yaw rate sensor.

(2) Connect MUT-III to the 16-pin diagnosis connector.
(3) Turn the ignition switch to the "ON" position.
(4) Erase the diagnosis code.
(5) Turn the ignition switch to the "LOCK" (OFF) position.
(6) Turn the ignition switch to the "ON" position.
(7) Check if the diagnosis code is set.
(8) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is code No.C1864 set?
YES : Replace the hydraulic unit (integrated with TCL/ASC-ECU). Then go to Step 8.
NO : The procedure is complete.

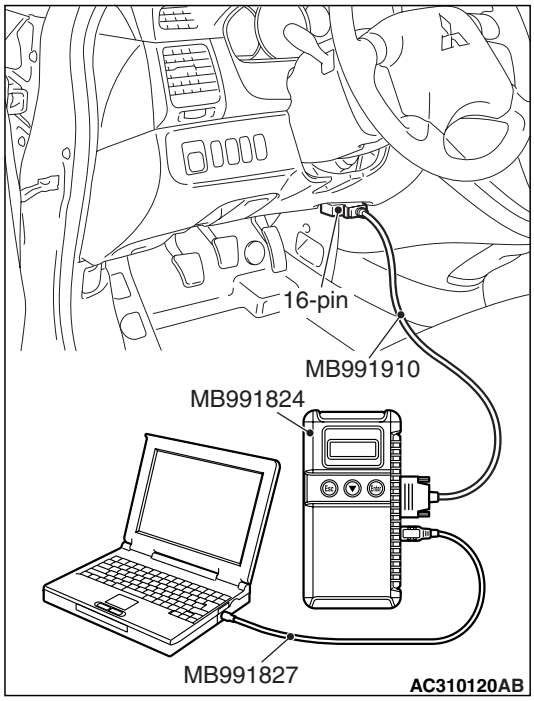
STEP 8. MUT-III diagnosis code



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

Q: Is code No.C1864 set?
YES : Replace the hydraulic unit (integrated with TCL/ASC-ECU). Then go to Step 9.
NO : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5.

STEP 9. MUT-III diagnosis code



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

Q: Is code No.C1864 set?
YES : Go to Step 1.
NO : The procedure is complete.

INSPECTION PROCEDURE 6: When the Ignition Switch is Turned to the "ON" Position (Engine Stopped), the "TCL OFF" Indicator Lamp does not Illuminate.
INSPECTION PROCEDURE 7: When the Ignition Switch is Turned to the "ON" Position (Engine Stopped), the TCL Indicator Lamp does not Illuminate.
INSPECTION PROCEDURE 8: The "TCL OFF" Indicator Lamp Remains Illuminated After the Engine is Started.
INSPECTION PROCEDURE 9: The TCL Indicator Lamp Remains Illuminated After the Engine is Started.

OPERATION

- TCL/ASC-ECU send the illumination signal of "TCL OFF" indicator lamp and TCL indicator lamp to the combination meter via the CAN communication.
- TCL/ASC-ECU operates the "TCL OFF" indicator lamp and the TCL indicator lamp for three seconds after the ignition switch is turned "ON" position for bulb check.

COMMENT

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

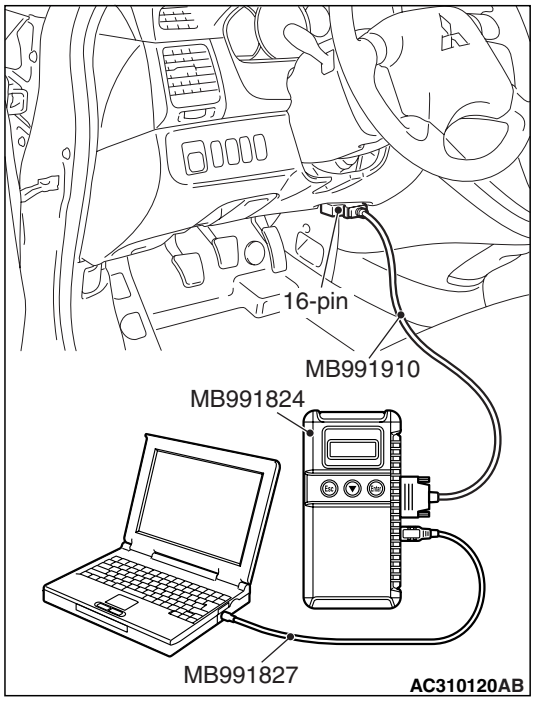
PROBABLE CAUSES

- Malfunction of the combination meter
- Damaged harness, connector
- Malfunction of the TCL/ASC-ECU

DIAGNOSIS

STEP 1. MUT-III CAN bus diagnostics
Use MUT-III to diagnose the CAN bus lines.

⚠ CAUTION

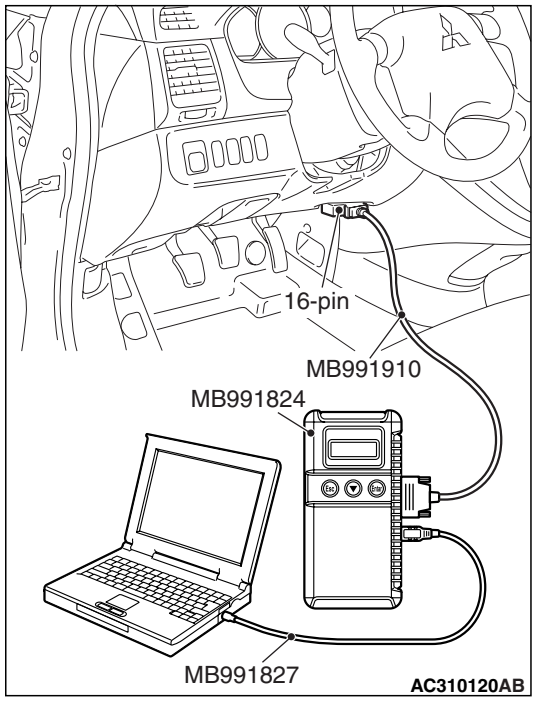


Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.
(1) Connect MUT-III to the 16-pin diagnosis connector.
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the check result normal?
YES : Go to Step 2
NO : Repair the CAN bus lines. (Refer to GROUP 54D, Diagnosis-Can Bus Diagnostic Chart P.54D-16). Then go to Step 4.

STEP 2. MUT-III diagnosis code

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

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

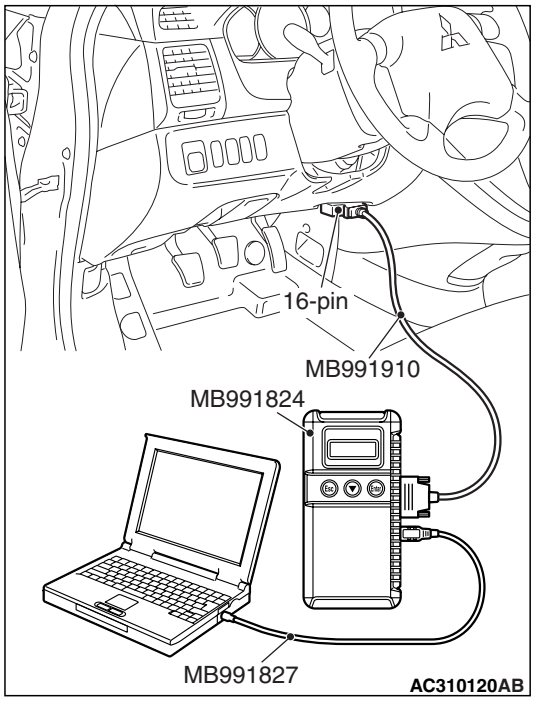
Q: Is any diagnosis code set?

YES : Refer to P.35C-6, Diagnosis Code Chart. Then go to Step 4 .

NO : Go to Step 3.

STEP 3. MUT-III other system diagnosis code

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

(1) Connect MUT-III to the 16-pin diagnosis connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for Combination meter system diagnosis code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect MUT-III.

Q: Is code No.U1102 set?

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

NO : Replace the combination meter assembly. (Refer to GROUP 54A, Combination Meter Assembly P.54A-84). Then go to Step 4.

STEP 4. Retest the system

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

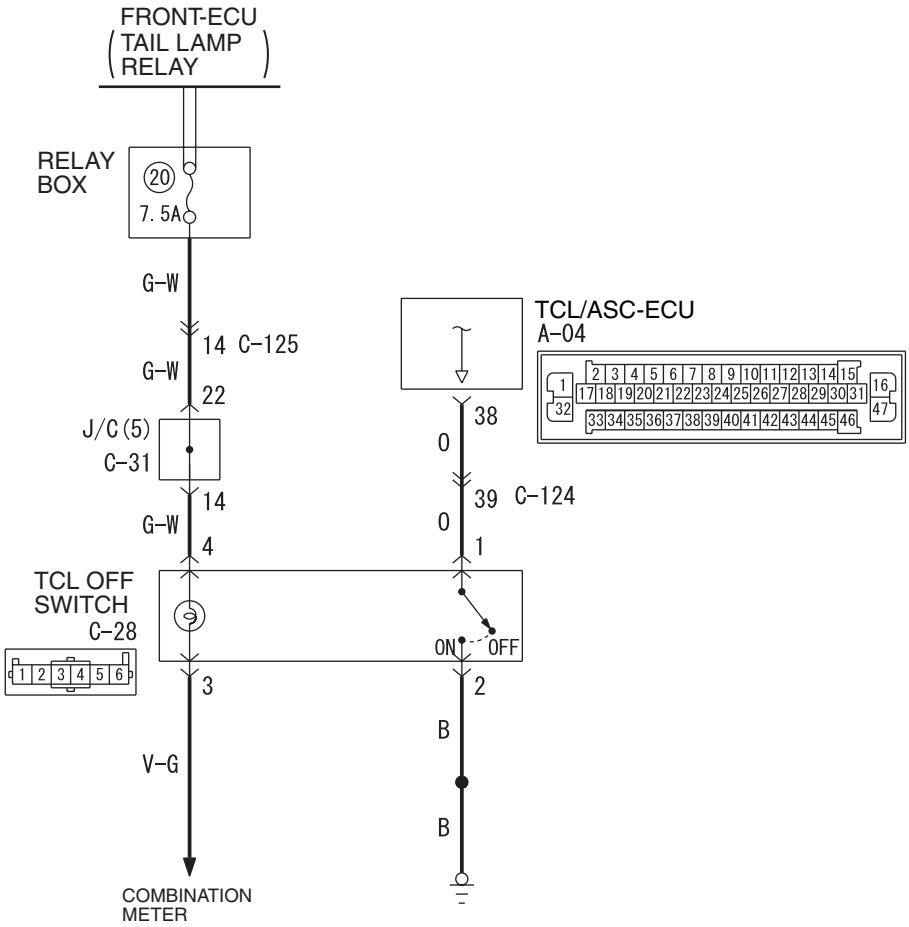
YES : The procedure is complete.

NO : Return to Step 1.

INSPECTION PROCEDURE 10: When the TCL Switch is Push On, TCL System does not Cancelled.

<LH drive vehicles>

TCL Switch Circuit

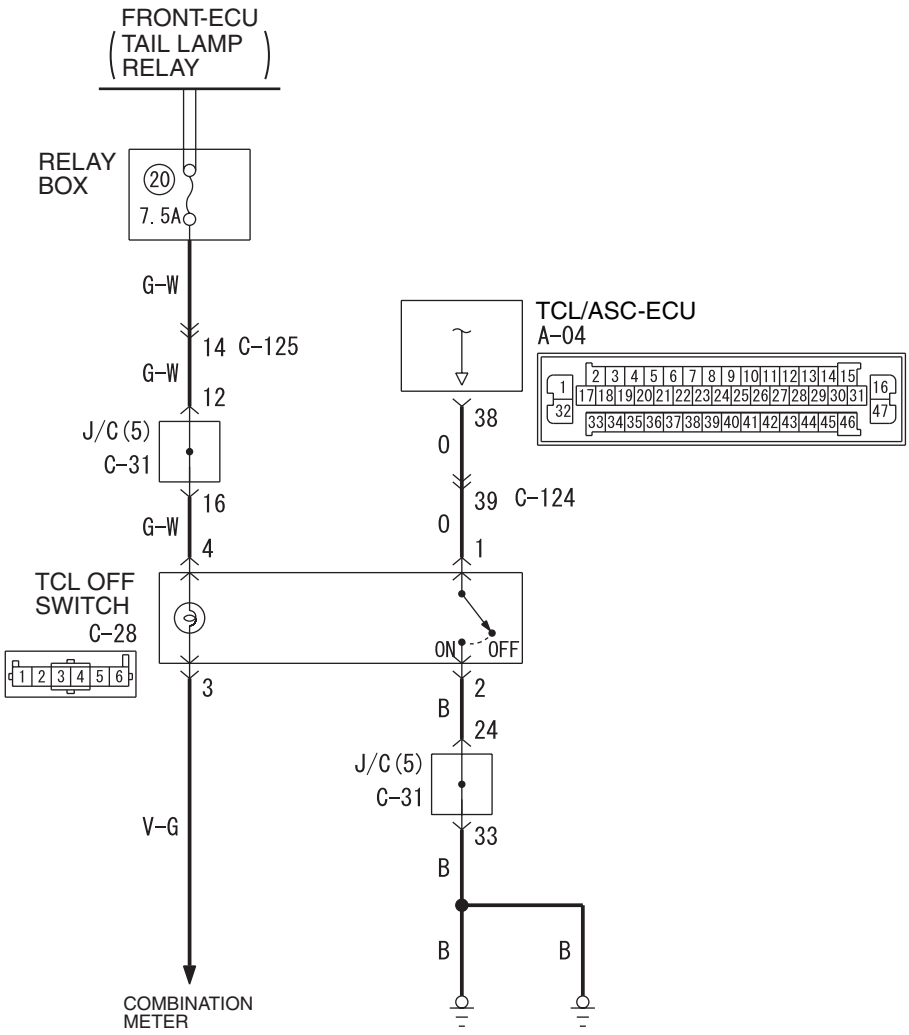


Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

W4X35E016A

<RH drive vehicles>

TCL Switch Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

W4X35E015A

OPERATION

TCL/ASC-ECU terminal 38 is earthed every time the TCL switch is pressed. TCL/ASC-ECU monitors this operation state and turns the TCL system ON or OFF.

COMMENT

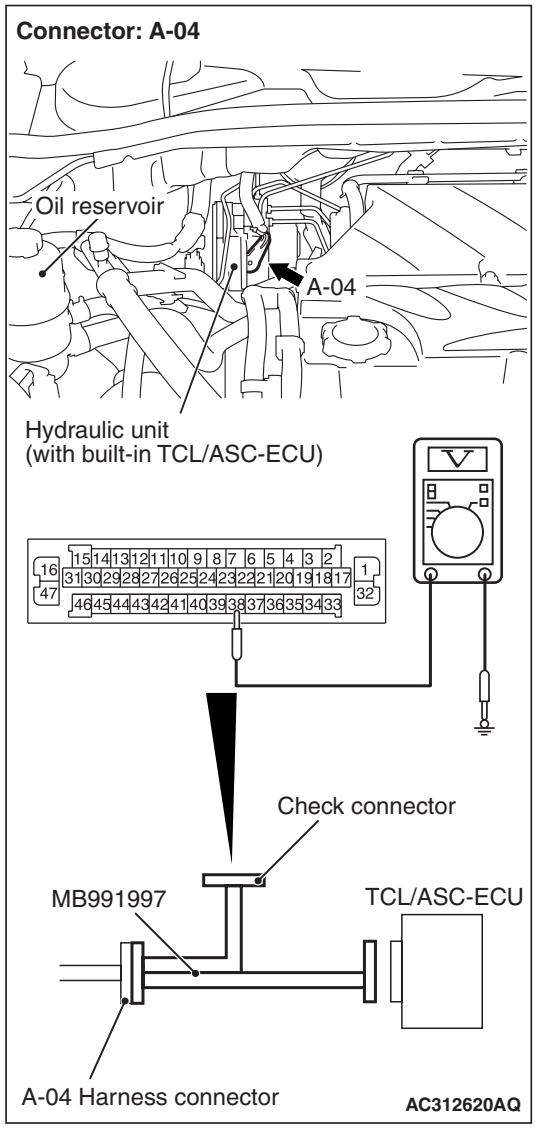
The cause is probably an open-circuit in the TCL switch circuit.

PROBABLE CAUSES

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

DIAGNOSIS

STEP 1. Voltage measurement at TCL/ASC-ECU connector A-04.



(1) Disconnect the connector A-04, and connect special tool ABS Check Harness (MB991997) to the wiring harness-side connector.

NOTE: Do not connect special tool ABS Check Harness (MB991997) to the TCL/ASC-ECU.

(2) Turn the ignition switch to the "ON" position.
(3) Measure the terminal voltage between special tool MB991997 connector terminal 38 (TCL/ASC-ECU connector A-04 terminal 38) and earth.

OK:

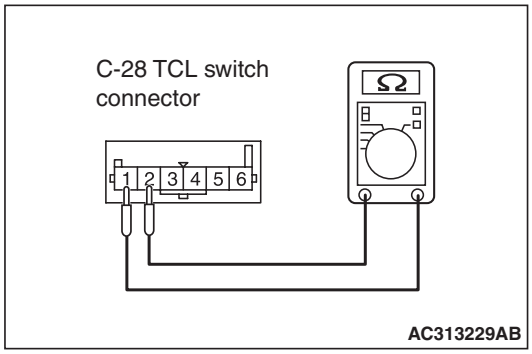
- **When the TCL switch is not pressed, the voltage should measure battery positive voltage (approximately 12 volts).**
- **When the TCL switch is pressed, the voltage should measure 1 volt or less.**

(4) Turn the ignition switch to the "LOCK" (OFF) position.
(5) Disconnect special tool MB991997 between the TCL/ASC-ECU and the body-side harness connector.
(6) Connect all the connectors from the TCL/ASC-ECU.

Q: Is the check result normal?
YES : Go to Step 6.
NO : Go to Step 2.

STEP 2. Check the TCL switch.

(1) Remove the TCL switch. (Refer to P.35C-163).



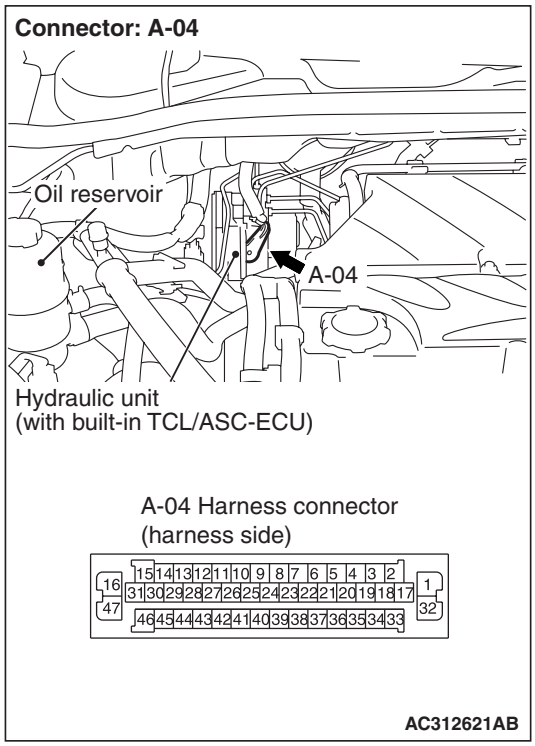
(2) Connect an ohmmeter to the TCL switch between terminals 1 and 2.
(3) Check for continuity between terminals 1 and 2 when the TCL switch is operated.

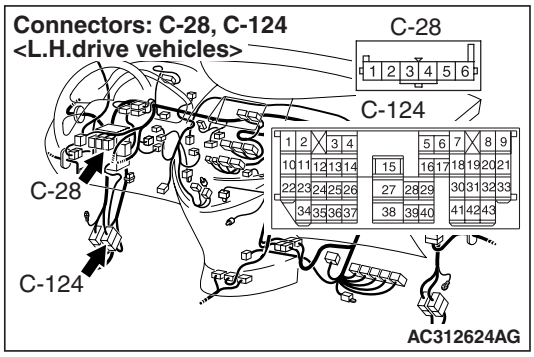
OK:

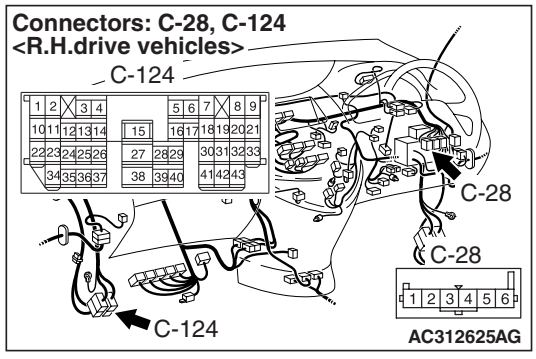
- **There is no continuity between terminals 1 and 2 when the TCL switch is not pressed.**
- **There is continuity between terminals 1 and 2 when the TCL switch is pressed.**

Q: Is the check result normal?
YES : Install the TCL switch. (Refer to P.35C-163). Then go to Step 6.
NO : Replace the TCL switch. (Refer to P.35C-163). Then go to Step 7.

STEP 3. Check TCL/ASC-ECU connector A-04, intermediate connector C-124 and TCL switch connector C-28 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

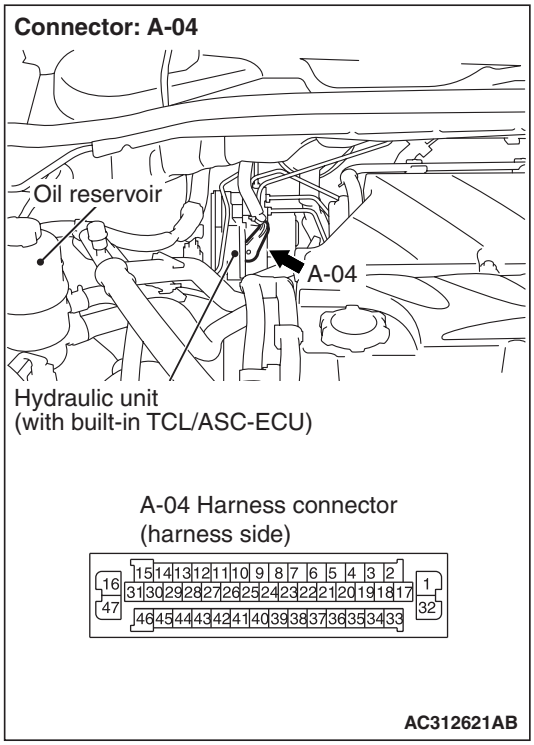


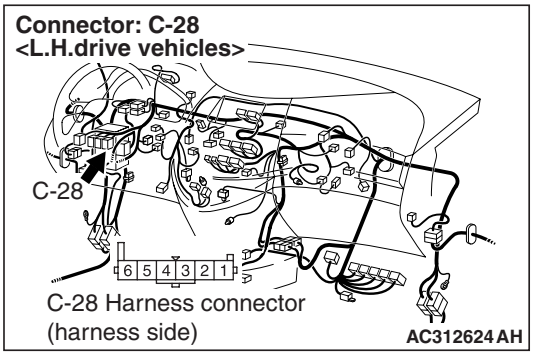


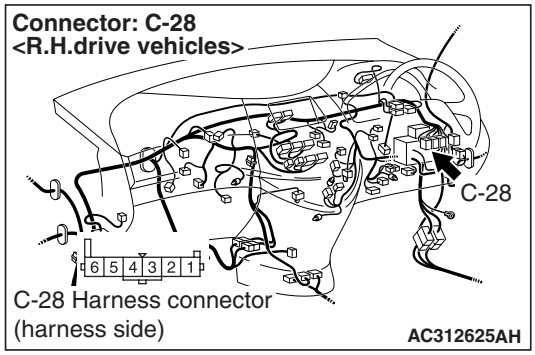


Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair or replace the faulty connector. Then go to Step 7.

STEP 4. Check the harness wire between TCL/ASC-ECU connector A-04 terminal 38 and TCL switch connector C-28 terminal 1 for damage.

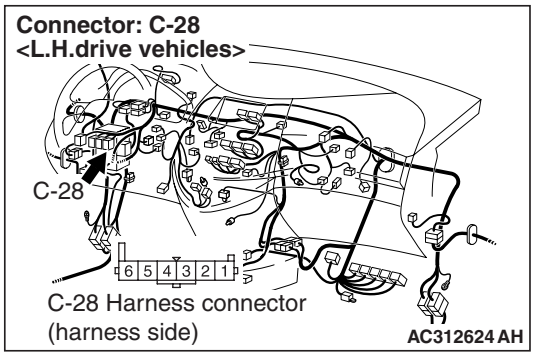


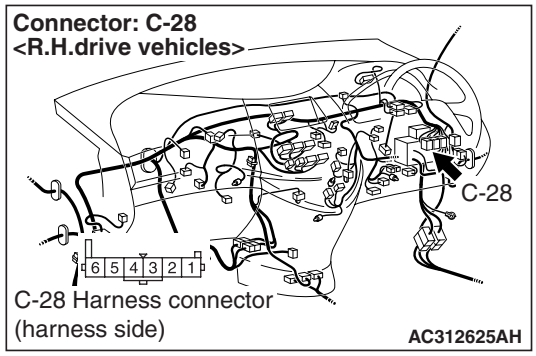




Q: Is the check result normal?
YES : Go to Step 5.
NO : Repair the damaged harness wire. Then go to Step 7.

STEP 5. Check the harness wire between TCL switch connector C-28 terminal 2 and earth for damage.





Q: Is the check result normal?

YES : Go to Step 6.
NO : Repair the damaged harness wire. Then go to Step 7.

STEP 6. Retest the system

Q: Is TCL system cancelled when the TCL switch is push on?
YES : It can be assumed that this malfunction is intermittent. (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-5).
NO : Replace the hydraulic unit (integrated with TCL/ASC-ECU). Then go to Step 7.

STEP 7. Retest the system

Q: Does TCL system cancelled, when the TCL switch is push on?
YES : The procedure is complete.
NO : Return to Step 1.

INSPECTION PROCEDURE 11: TCL/ASC System dose not Operate.

COMMENT

The fail-safe function is probably canceling TCL/ASC system. In this case, MUT-III can be used to Retest each system by checking the diagnosis codes.

PROBABLE CAUSES

- Malfunction of the CAN bus line.
- Malfunction of the TCL/ASC-ECU.
- Battery voltage low.

DIAGNOSIS

STEP 1. Hydraulic unit check
Refer to P.35B-75.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Connect the brake pipes correctly, repair the external brake lines, or replace the hydraulic unit.

STEP 2. Verify that the condition described by the customer exists.

Q: Can any faults be found with the brake operation?
YES : Check the brake system related components except the ASC system.
NO : The procedure is complete.

DATA LIST REFERENCE TABLE

M1355001500023

The following items can be read by the MUT-III from the TCL/ASC-ECU input data.

Item No.	Check item	Checking requirements	Normal valve
01	Front-right wheel speed sensor	Drive the vehicle	Vehicle speeds displayed on the speedometer and MUT-III are identical.
02	Front-left wheel speed sensor		
03	Rear-right wheel speed sensor		
04	Rear-left wheel speed sensor		
05	TCL/ASC-ECU power supply voltage	Ignition switch power supply voltage and valve monitor voltage	Battery positive voltage
06	Stoplamp switch	Depress the brake pedal.	ON
		Release the brake pedal.	OFF
31	Lateral G		-1.7 – 1.7 G
32	Steering angle		-900 – 900 deg
33	Yaw rate		-100 – 100 deg/s
34	Master cylinder pressure	Depress the brake pedal.	–
		Release the brake pedal.	nearly 0 bar
35	TCL mode	TCL switch: ON	ON
		TCL switch: OFF	OFF

ACTUATOR TEST REFERENCE TABLE

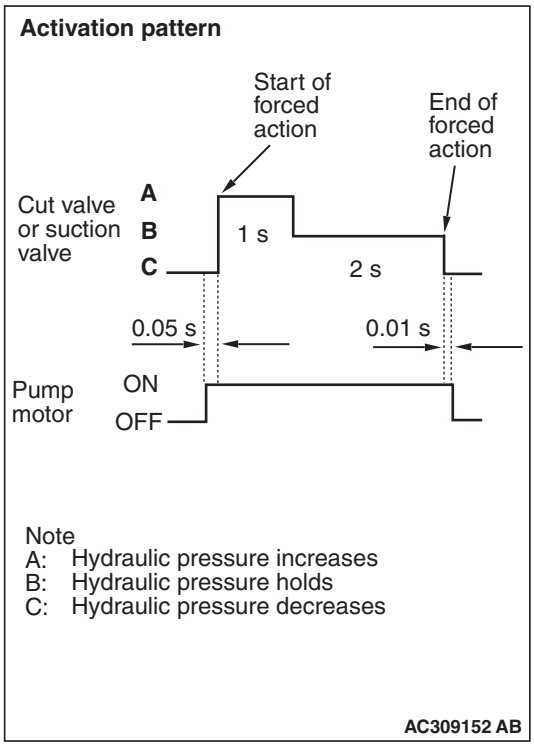
M1355001600020

The MUT-III activates the following actuators for testing.

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

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

ACTUATOR TEST SPECIFICATIONS

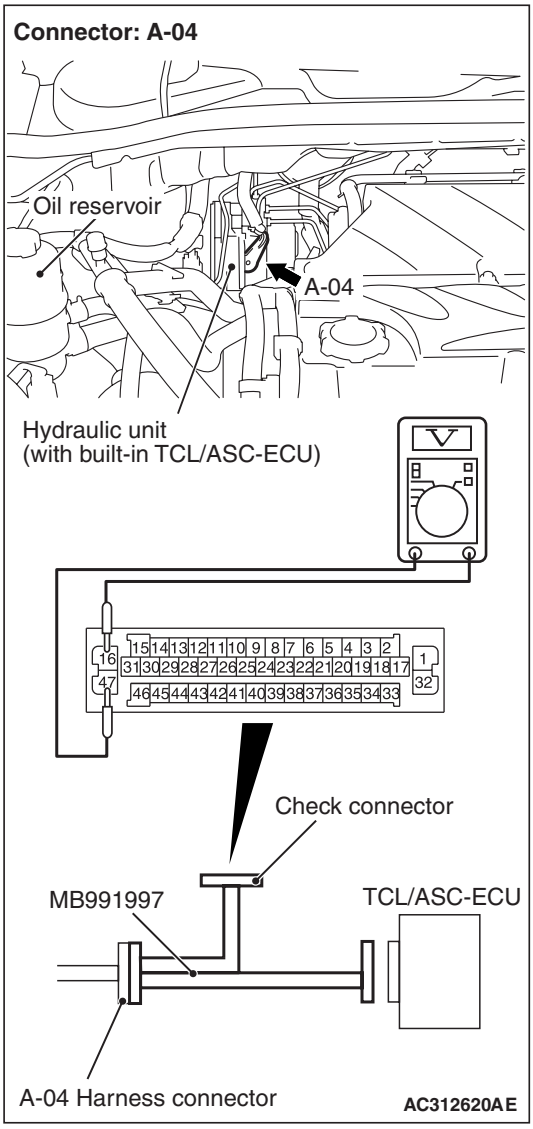


No.	Item	Parts to be activated
05	FR wheel TCL Drive	Solenoid valves and pump motors in the hydraulic unit (simple inspection mode)
06	FL wheel TCL Drive	
07	RR wheel TCL Drive	
08	RL wheel TCL Drive	

CHECK AT ABS-ECU

M1355001700027

TERMINAL VOLTAGE CHECK CHART



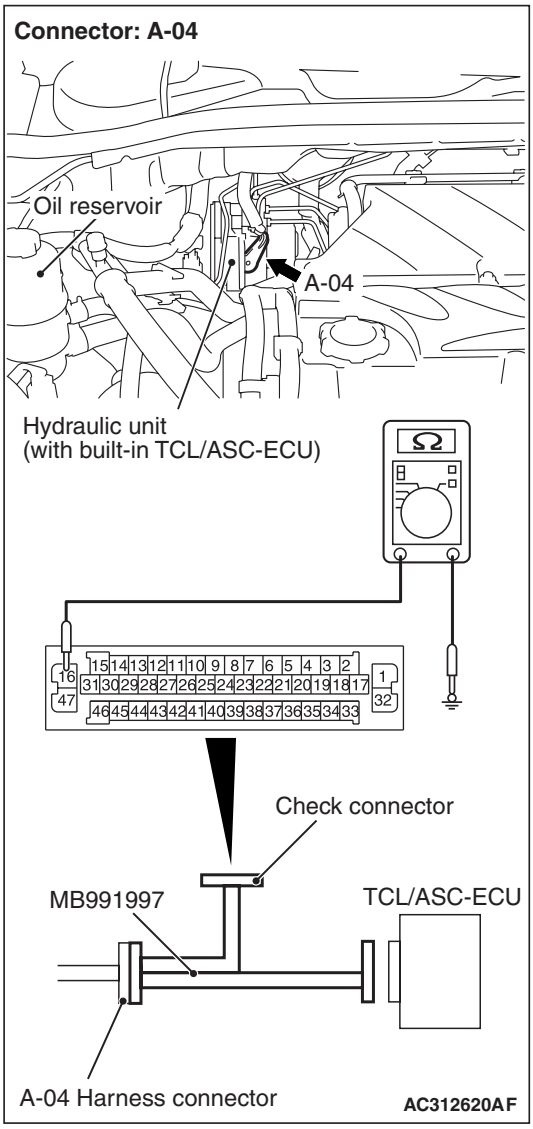
1. Disconnect the TCL/ASC-ECU connector A-04, and then use special tool MB991997 to measure the voltages between terminals (16) and each terminal other than terminal (47) as well as between terminal (47) and each terminal other than terminal (16).

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

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

Terminal No.	Check item	Checking requirements		Normal condition
1	Motor power supply	Ignition switch: "ON"		System voltage
	Motor power supply	Ignition switch: "LOCK"(OFF)		System voltage
4	TCL/ASC-ECU power supply	Ignition switch: "ON"		System voltage
		Ignition switch: "START"		Approximately 0 V
5	G and yaw late sensor power supply	Always		System voltage
32	Solenoid valve power supply	Always		System voltage
38	TCL switch output	Ignition switch: "ON"		System voltage
41	Stop lamp switch input	Ignition switch: "ON"	Stop lamp switch: "ON"	System voltage
			Stop lamp switch: "OFF"	Approximately 0 V

RESISTANCE AND CONTINUITY BETWEEN HARNESS-SIDE CONNECTOR TERMINALS



1. Disconnect the connector A-04, and connect special tool ABS Check Harness (MB991997) to the wiring harness-side connector.

   NOTE: Do not connect special tool ABS Check Harness (MB991997) to the TCL/ASC-ECU.
2. Measure the resistance and continuity between the terminals indicated in the table below.

Terminal No.	Signal	Normal condition
16 – body earth	Earth	Less than 2 ohms
47 – body earth	Earth	Less than 2 ohms

ON-VEHICLE SERVICE

HYDRAULIC UNIT CHECK

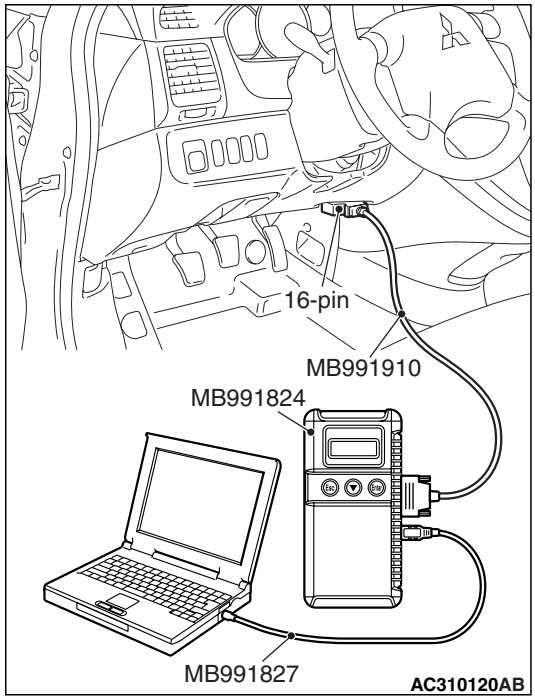
M1355006100020

⚠ CAUTION

- **The roller of the braking force tester and the tyre should be dry during testing.**
- **When testing the front brakes, apply the parking brake. When testing the rear brakes, stop the front wheels with chocks.**

1. Jack up the vehicle. Then support the vehicle with rigid racks at the specified jack-up points or place the front or rear wheels on the rollers of the braking force tester.
2. Release the parking brake, and feel the drag force (drag torque) on each road wheel. When using the braking force tester, take a reading of the brake drag force.

⚠ CAUTION

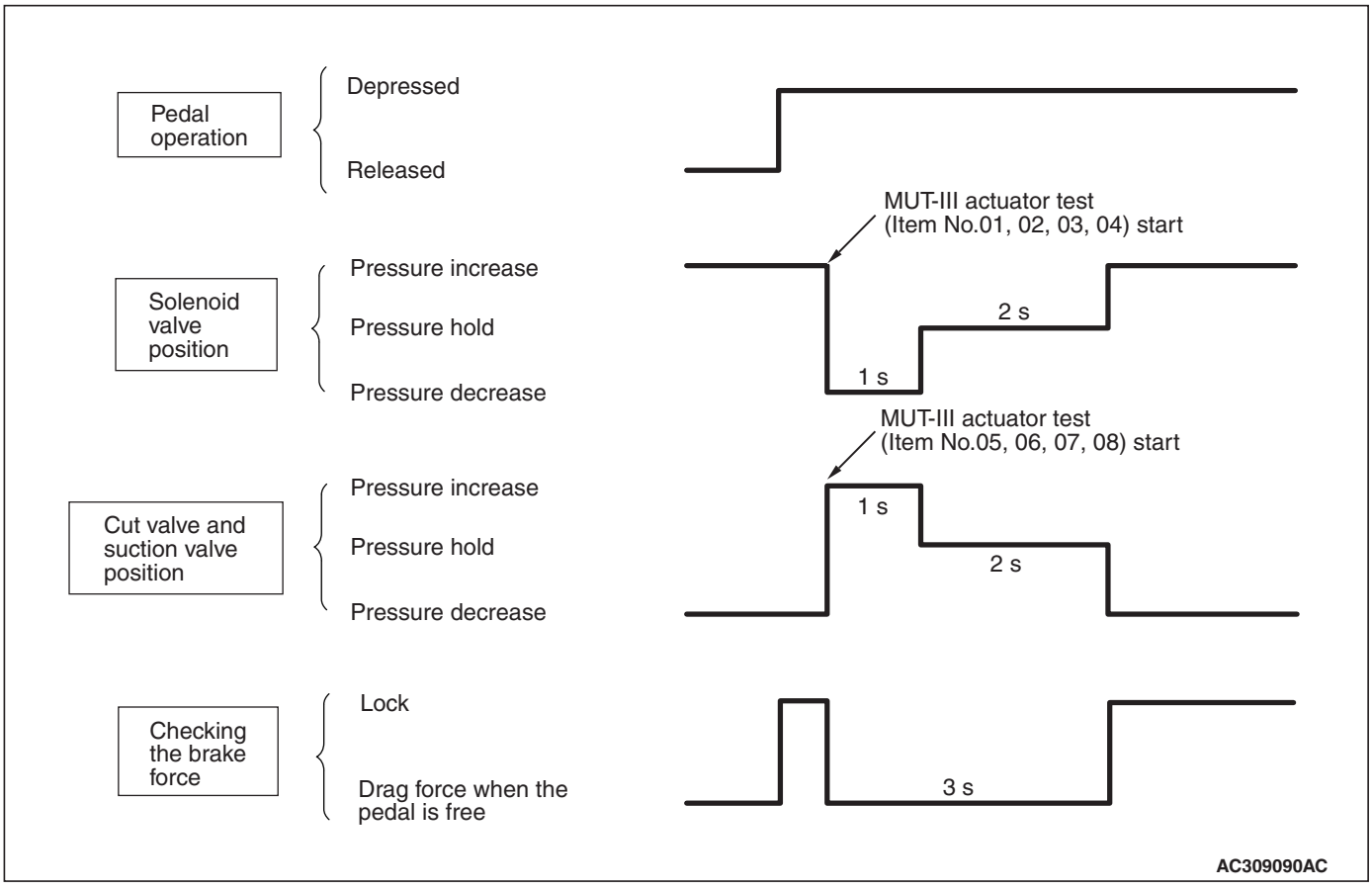


Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

3. Connect MUT-III to the 16-pin diagnosis connector.
4. After checking that the selector lever is in "P" range, start the engine.
5. Select "Interactive Diagnosis" from the start-up screen.
6. Select "System Select."
7. Choose "ABS/ASC/ASTC" from the "CHASSIS" tab.
8. Select "Actuator Test" from "ABS/ASC/ASTC" screen
9. Choose an appropriate item for hydraulic unit check.

   NOTE: The TCL/ASC system will switch to the MUT-III mode and the ABS warning lamp, TCL/ASC indicator and TCL OFF indicator will illuminates.

   NOTE: When the ABS and TCL/ASC has been interrupted by the fail-safe function, MUT-III actuator testing cannot be used.



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

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

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

Diagnosis Table

MUT-III Display	Operation	Inspection result	Judgment	Probable cause	Remedy
01 FR VALVE 02 FL VALVE 03 RR VALVE 04 RL VALVE	• Depress brake pedal to lock wheel. • Using MUT-III, select the wheel to be checked and force the actuator to operate. • Turn the selected wheel manually to check the change of brake force.	Brake force is released for three seconds after wheels have been locked.	Normal	–	–
		Wheel does not lock when brake pedal is depressed.	Abnormal	Clogged brake line other than hydraulic unit	Check and clean brake line
				Clogged hydraulic circuit in hydraulic unit	Replace hydraulic unit assembly
		Brake force is not released		Incorrect hydraulic unit brake tube connection	Connect correctly
				Hydraulic unit solenoid valve not functioning correctly	Replace hydraulic unit assembly

12.After inspection, disconnect MUT-III immediately after turning the ignition switch to the "LOCK" (OFF) position.

IN THE EVENT OF A DISCHARGED BATTERY

M1355006200027

⚠ ***WARNING***

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

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

G AND YAW LATE SENSOR CALIBRATION

M1355009300023

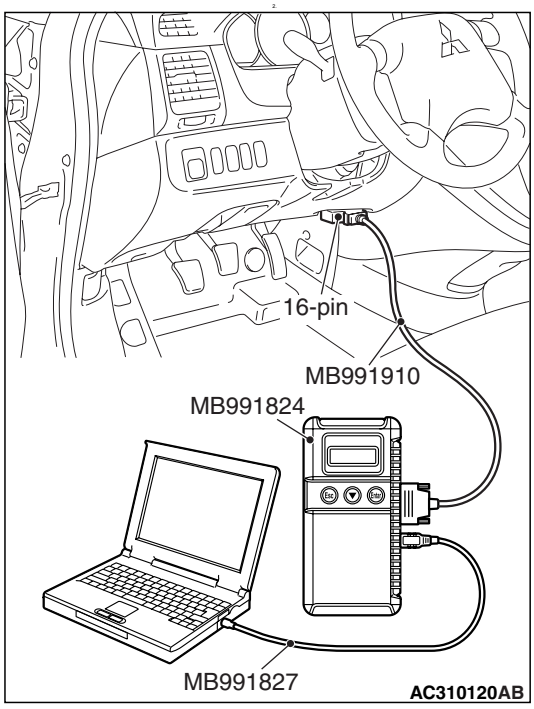
⚠ **CAUTION**

If the work below is done, finally calibrate the G and yaw late sensor. This is necessary because the TCL/ASC-ECU should update the G and yaw late sensor neutral point.

- **G and yaw late sensor replacement**
- **TCL/ASC-ECU replacement**

1. Park the vehicle on a level surface.

⚠ **CAUTION**



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

Connect MUT-III to the 16-pin diagnosis connector.

3. Turn the ignition switch to the "ON" position.
4. Select "Interactive Diagnosis".
5. Select "Special function".
6. Select "G and yaw rate sensor".
7. Select "Calibration".
8. Turn the ignition switch to the "LOCK" (OFF) position.
9. Disconnect MUT-III.

STEERING WHEEL SENSOR CALIBRATION

M1355009200026

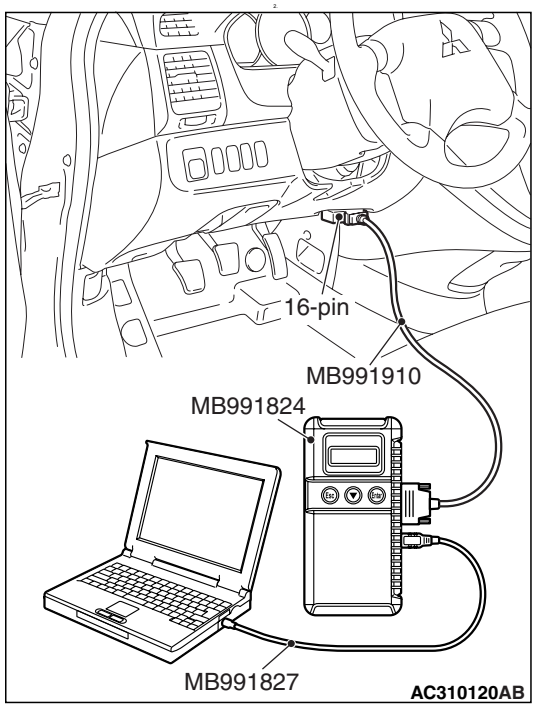
⚠ **CAUTION**

If the work below is done, finally calibrate the steering wheel sensor. This is necessary because the TCL/ASC-ECU should update the steering wheel sensor neutral point.

- **Front alignment adjustment**
- **Steering wheel sensor removal and installation**
- **TCL/ASC-ECU replacement**

1. Park the vehicle on a level surface.

⚠ CAUTION



Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.

Connect MUT-III to the 16-pin diagnosis connector.

3. Turn the ignition switch to the "ON" position.
4. Select "Interactive Diagnosis".
5. Select "Special function".
6. Select "Steering angle sensor".
7. Select "Calibration".
8. Turn the ignition switch to the "LOCK" (OFF) position.
9. Disconnect MUT-III.

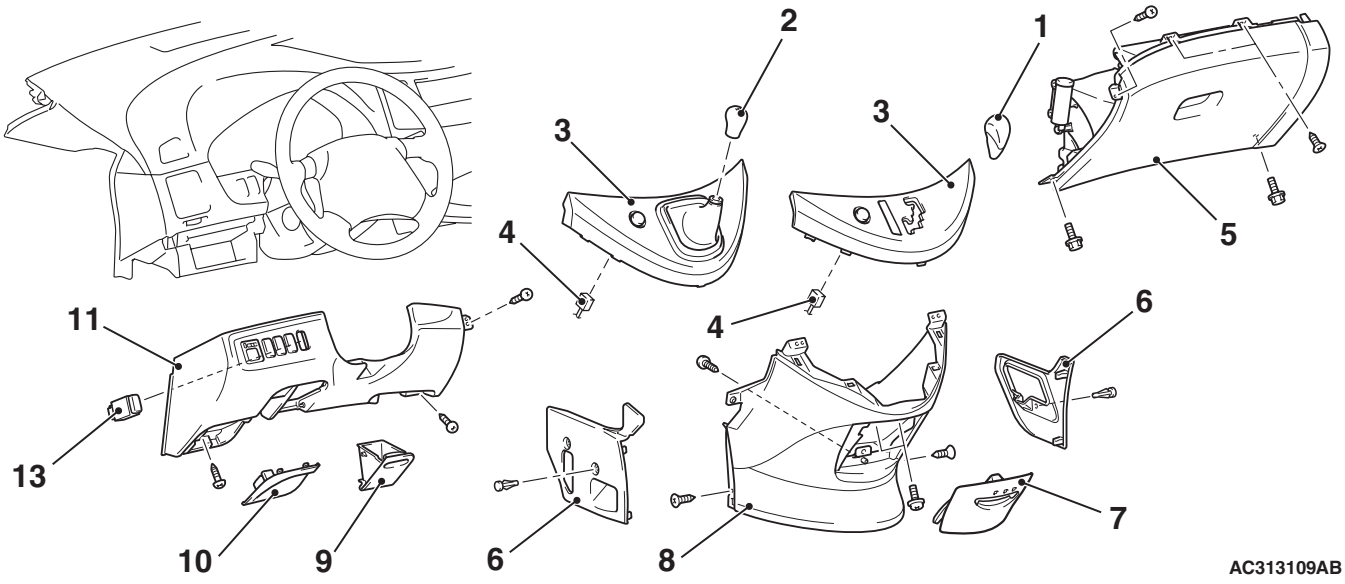
TCL switch

REMOVAL AND INSTALLATION

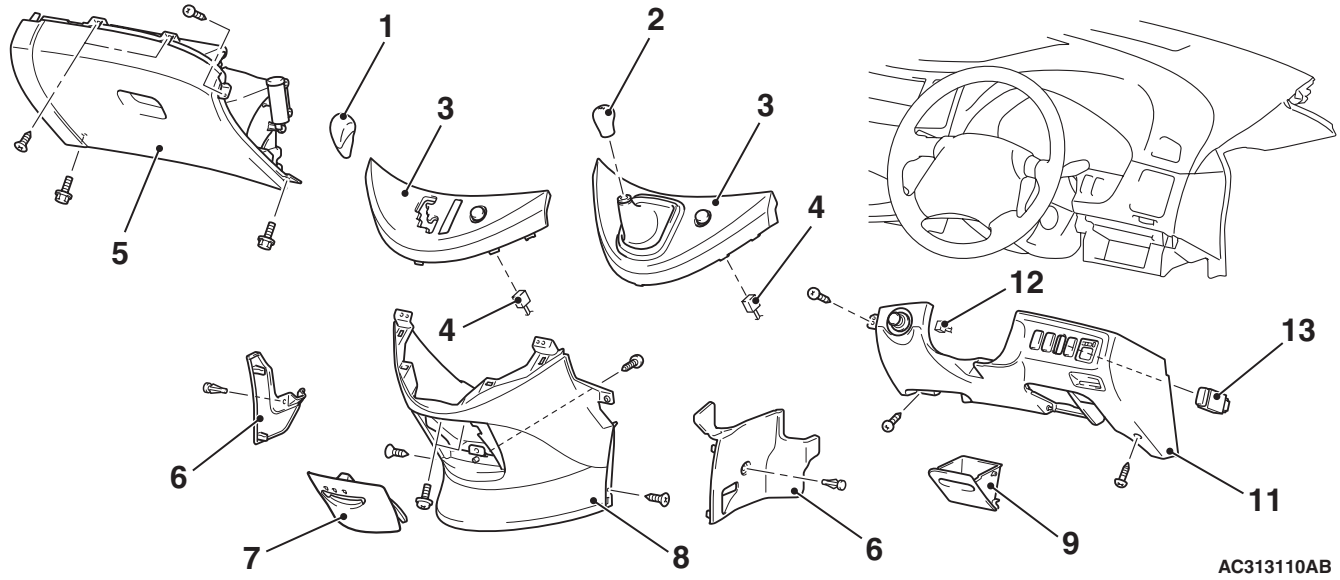
M1355010800011

NOTE: For the clip position, refer to GROUP 52A - Instrument Panel Assembly P.52A-2.

<L.H. drive vehicles>



<R.H. drive vehicles>



Removal steps

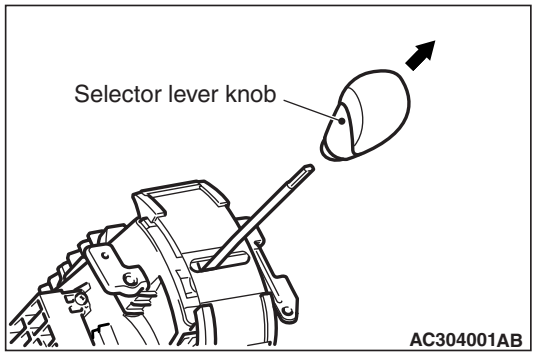
<<A>>
1. Selector lever knob (A/T)
2. Gear shift lever knob (M/T)

<<B>>
3. Selector lever panel
4. Hazard warning lamp switch connector
   - Cowl side trim (L.H). (Refer to GROUP 52A, Interior Trim P.52A-10).

<<C>>
5. Glove box assembly
6. Console side cover
7. Ashtray
8. Centre console
9. Parcel box
10. Fuse box lid <LH drive vehicles>
11. Lower panel
12. Cigar lighter connector <RH drive vehicles>
13. TCL switch

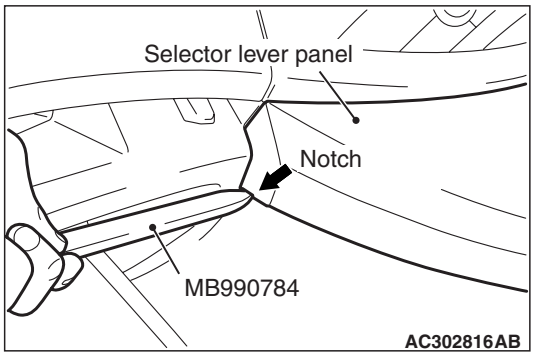
REMOVAL SERVICE POINTS

<<A>> Selector lever knob removal



Pull out the selector knob to the direction shown.

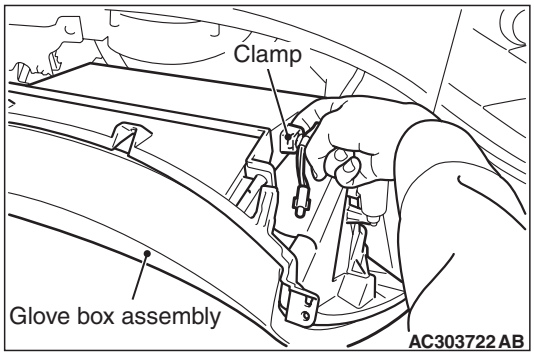
<<B>> Selector lever panel removal



Open the glove box door, insert the special tool Ornament Remover (MB990784) into the shown position to remove the selector lever panel.

<<C>> Glove box assembly removal

1. Remove the glove box screws and the glove box lamp.



2. Slide the glove box towards you to gain access to the glox box lamp wiring harness clamp. Then release the clamp to remove the glove box assembly.

HYDRAULIC UNIT

REMOVAL AND INSTALLATION

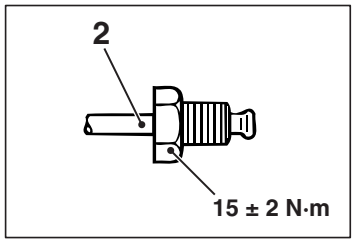
M1355005600033

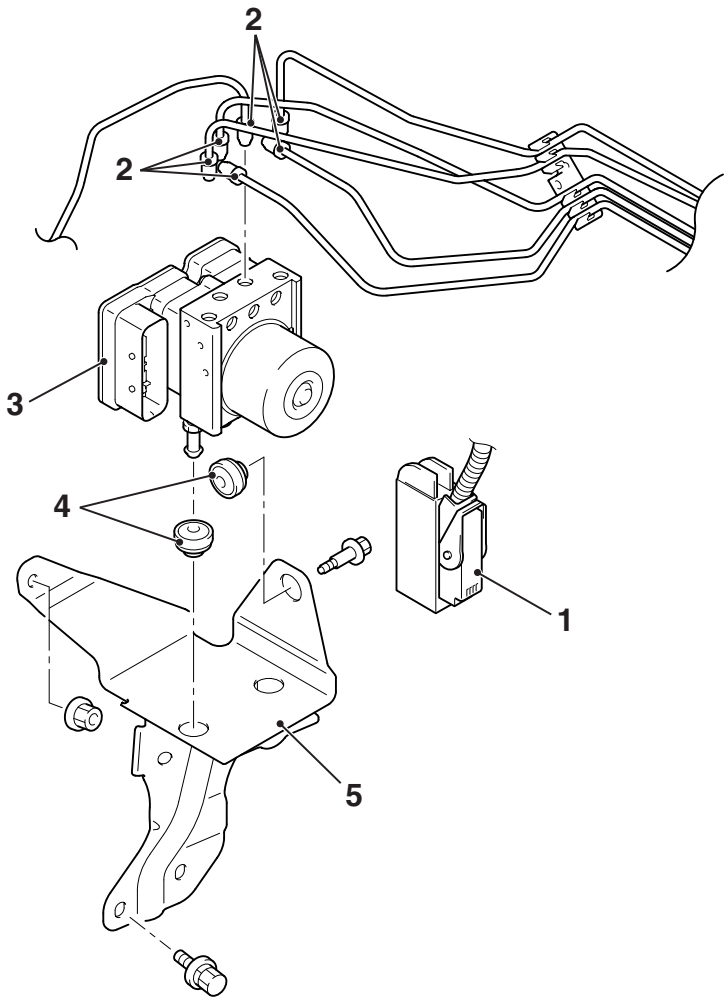
NOTE: The TCL/ASC-ECU is integrated in the hydraulic unit.

⚠ CAUTION

Always calibrate the steering wheel sensor and the G and yaw rate sensor if the hydraulic unit (integrated in the TCL/ASC-ECU) is replaced.(Refer to P.35C-162 and P.35C-162)

Pre-removal Operation	Post-installation Operation
• Brake Fluid Draining • Engine cover removal (Refer to GROUP 11A - Camshaft and valve stem seal P.11A-16.) • Air cleaner body assembly removal (Refer to GROUP 15 - Air Cleaner P.15-3). • Canister removal (Refer to GROUP 17 - Canister P.17-64.) <LH drive vehicles>	• Canister installation (Refer to GROUP 17 - canister P.17-64.) <LH drive vehicles> • Air cleaner body assembly installation (Refer to GROUP 15 - Air Cleaner P.15-3). • Engine cover installation (Refer to GROUP 11A - Camshaft and valve stem seal P.11A-16.) • Brake Fluid Filling • Brake Line Bleeding (Refer to GROUP 35A, On-vehicle Service – Bleeding P.35A-6). • Hydraulic Unit Check (Refer to P.35C-159).





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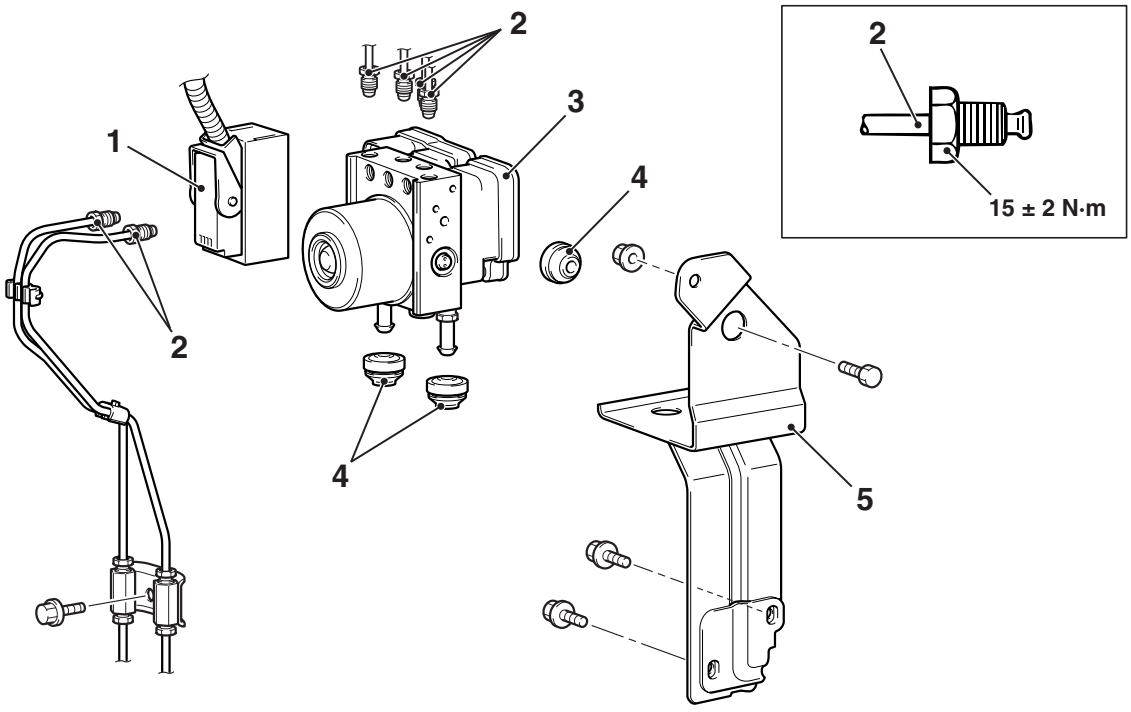


AC303013AC

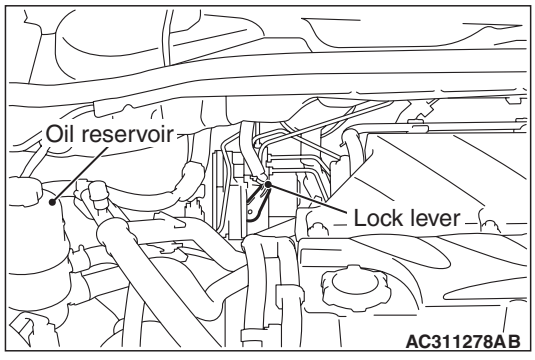
Removal steps

<<A>> 1. ABS-ECU harness connector
2. Brake tube connection
- Brake tube and master cylinder connection <LH drive vehicles>
- Brake tube and brake hose (LH) <LH drive vehicles>

<<B>> 3. Hydraulic unit (TCL/ASC-ECU)
4. Hydraulic unit bracket insulator
5. Hydraulic unit bracket

REMOVAL SERVICE POINTS

<<A>> TCL/ASC-ECU HARNESS CONNECTOR DISCONNECTION



Operate the lock lever to disconnect the ABS-ECU harness connector as shown.

<<B>> HYDRAULIC UNIT (INTEGRATED WITH TCL/ASC-ECU) REMOVAL

⚠ ***WARNING***

The hydraulic unit is heavy. Use care when removing it.

⚠ **CAUTION**

- **The hydraulic unit cannot be disassembled. Never loosen its nuts or bolts.**
- **Do not drop or shock the hydraulic unit.**
- **Do not turn the hydraulic unit upside down or lay it on its side.**

WHEEL SPEED SENSOR

REMOVAL AND INSTALLATION

M1355005300021

Refer to GROUP 35B, Wheel Speed Sensor P.35B-80.

G AND YAW RATE SENSOR

REMOVAL AND INSTALLATION

M1355004500033

⚠ CAUTION

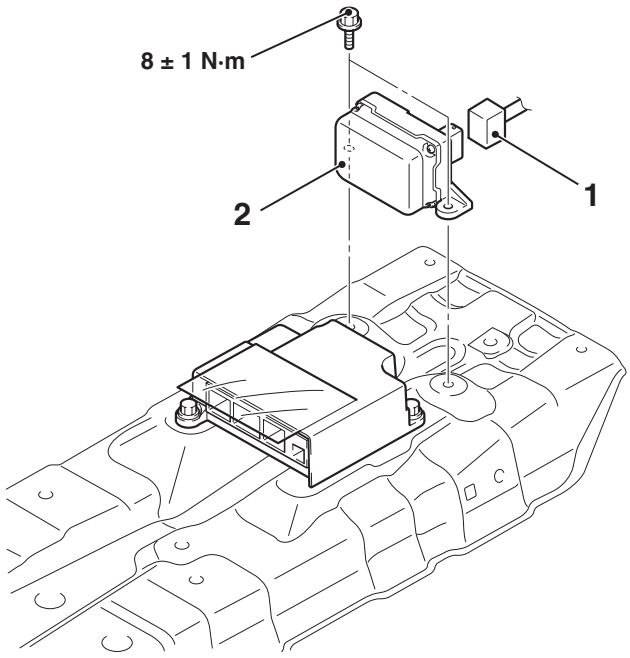
Do not drop or shock the G and yaw late sensor.

⚠ CAUTION

Always carry out calibration if steering angle is adjusted (Refer to P.35C-162). This is necessary because the TCL/ASC-ECU should update the G and yaw late sensor neutral point.

Pre-removal and Post-installation Operation

- Centre Console Removal and Installation (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2).
- Gearshift Lever Assembly Removal and Installation (Refer to GROUP 22A, Transmission Control P.22A-7) <M/T>.
- Selector Lever Assembly Removal and Installation (Refer to GROUP 23A, Transmission Control P.23A-141) <A/T>.



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Removal steps

1. Harness connector
2. G and yaw late sensor

STEERING WHEEL SENSOR

REMOVAL AND INSTALLATION

M1355005100038

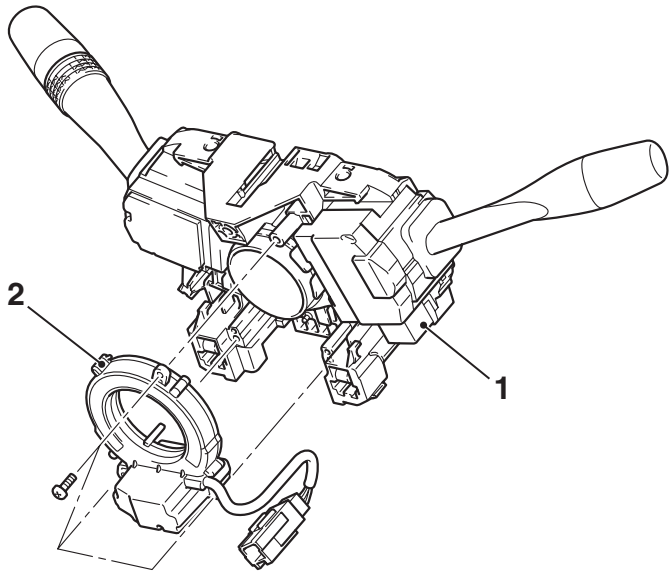
⚠ WARNING

Before removing the steering wheel and air bag module assembly, refer to GROUP 52B, Service Precautions P.52B-7 and Air Bag Module and Clock Spring P.52B-225.

⚠ CAUTION

Always carry out steering wheel sensor calibration after the steering wheel sensor has been installed (Refer to P.35C-162). This is necessary because the TCL/ASC-ECU should update the steering neutral point.

Pre-removal Operation	Post-installation Operation
• Steering Wheel and Air Bag Module Assembly Removal (Refer to GROUP 37A, Steering Wheel P.37-14).	• Steering Wheel and Air Bag Module Assembly Installation (Refer to GROUP 37A, Steering Wheel P.37-14). • Steering Wheel Sensor Calibration (Refer to P.35C-162).



AC312304AB

Removal steps

- Turn the front wheels to the straight-ahead position.

Removal steps (Continued)

>>A<< 1. Clock spring and column switch assembly (Refer to GROUP 52B, SRS control unit P.52B-223).

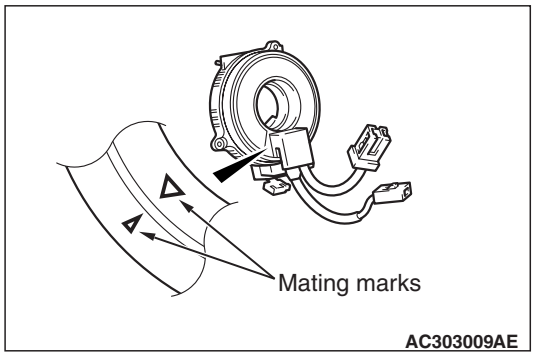
>>A<< 2. Steering wheel sensor

INSTALLATION SERVICE POINT

>>A<< STEERING WHEEL SENSOR NEUTRAL POINT ALIGNMENT

⚠ *WARNING*

Ensure that the clock spring's mating marks are properly aligned. If not, the steering wheel may not rotate completely during a turn, or the flat cable in the clock spring could be damaged, This would prevent normal SRS operation and possibly cause serious injury to the driver.

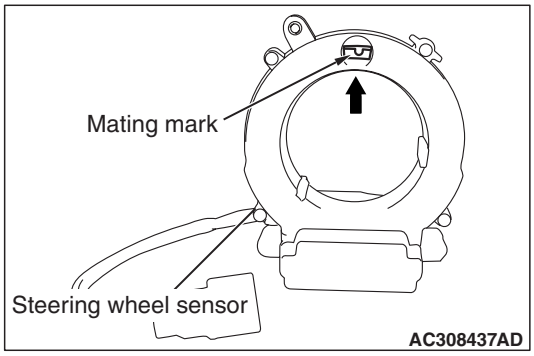


1. Align the mating marks of the clock spring.

   <Mating Mark Alignment>

   (1) Turn the clock spring clockwise fully. Then turn it back approximately 3-3/4 turns counterclockwise to align the mating marks.

   (2) Turn the front wheels to the straight-ahead position. Then install the clock spring to the column switch.



⚠ CAUTION

Ensure that the steering wheel sensor's mating marks are properly aligned. If not, the steering wheel sensor could be damaged.

2. Align the mating marks of the steering wheel sensor as follows.

   <Mating Mark Alignment>

   (1) Turn the steering wheel sensor to the arrow direction shown to align the mating marks.

   (2) Align the mating marks on the clock spring and the steering wheel sensor, and install the steering wheel sensor to the column switch assembly.

   (3) Connect the steering wheel sensor connector.