

GROUP 35C

mitsubishi active skid and traction control system

CONTENTS

GENERAL DESCRIPTION	35C-2	SOLENOID VALVE CHECK	35C-203
M-ASTC DIAGNOSIS	35C-3	IN THE EVENT OF A DISCHARGED BATTERY	35C-203
INTRODUCTION TO MITSUBISHI ACTIVE SKID AND TRACTION CONTROL SYSTEM			
DIAGNOSIS	35C-3	M-ASTC CONTROL UNIT (M-ASTC-ECU)	35C-205
TROUBLESHOOTING STRATEGY	35C-3	REMOVAL AND INSTALLATION	35C-205
TROUBLE CODE DIAGNOSIS	35C-4		
DIAGNOSTIC TROUBLE CODE CHART ..	35C-5	ABS SENSOR	35C-206
DIAGNOSTIC TROUBLE CODE PROCEDURES	35C-7	REMOVAL AND INSTALLATION	35C-206
SYMPTOM CHART	35C-180	G AND YAW RATE SENSOR	35C-207
SYMPTOM PROCEDURES	35C-181	REMOVAL AND INSTALLATION	35C-207
DATA LIST REFERENCE TABLE	35C-199		
ACTUATOR TEST REFERENCE	35C-199	STEERING WHEEL SENSOR	35C-208
CHECK AT M-ASTC-ECU	35C-201	REMOVAL AND INSTALLATION	35C-208
SPECIAL TOOLS	35C-202		
ON-VEHICLE SERVICE	35C-203	SPECIFICATIONS	35C-209
ABS SENSOR OUTPUT VOLTAGE CHECK	35C-203	FASTENER TIGHTENING SPECIFICATIONS	35C-209
		SERVICE SPECIFICATIONS	35C-209

GENERAL DESCRIPTION

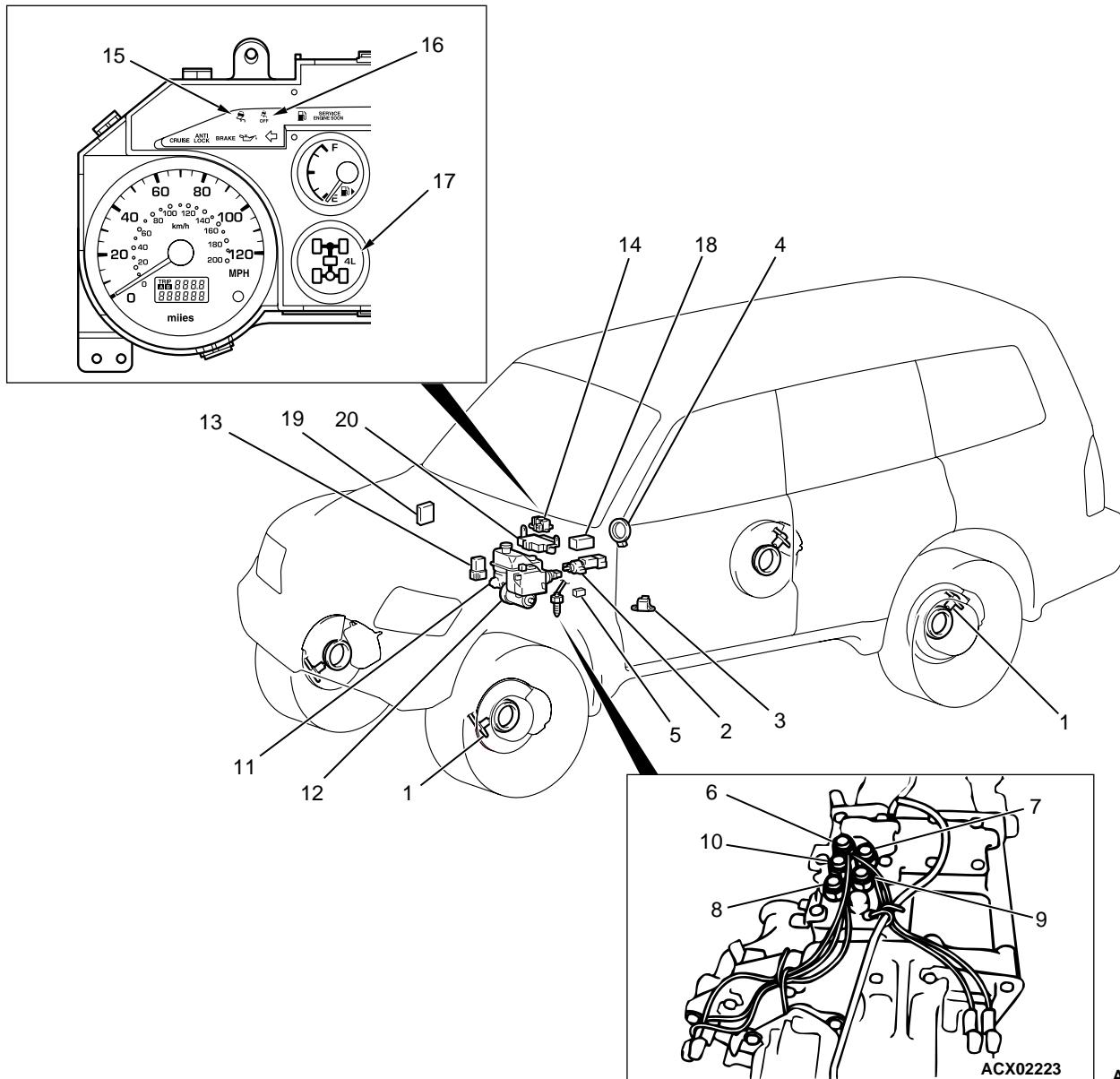
The Mitsubishi active skid and traction control system (M-ASTC) consists of the following components; ABS sensors, stoplight switch, hydraulic unit in hydraulic brake booster (HBB), master cylinder pressure sensor, M-ASTC-ECU, ABS rotor, steering wheel sensor, G and yaw rate sensor, PCM, Active skid control system operation indicator light/Active traction control system operation indicator light, Active skid control system OFF indicator light, 4WD

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indicator light, HBB buzzer, brake system warning light and Anti-lock braking system warning light. If a problem occurs in the system, the malfunctioning components can be identified and the trouble symptoms will be memorized by the diagnostic function. In addition, reading of diagnostic trouble codes and data list and actuator testing are possible by using the Scan Tool.

The M-ASTC-ECU runs a self-check for three seconds upon start-up (also ignition switch ON, engine stopped). The anti-lock braking system warning light should be illuminated during the self-check and turn off when the self-check completes.

CONSTRUCTION DIAGRAM



ACX02223

1. ABS SENSOR
2. STOPLIGHT SWITCH
3. G AND YAW RATE SENSOR
4. STEERING WHEEL SENSOR
5. ACTIVE SKID CONTROL OFF SWITCH
6. 2WD/4WD DETECTION SWITCH
7. 4LLc DETECTION SWITCH
8. CENTER DIFFERENTIAL LOCK DETECTION SWITCH
9. 2WD DETECTION SWITCH
10. 4H DETECTION SWITCH
11. MASTER CYLINDER PRESSURE SENSOR
12. HYDRAULIC UNIT IN HYDRAULIC BRAKE BOOSTER (HBB)
13. VALVE RELAY
14. HBB BUZZER
15. ACTIVE SKID CONTROL SYSTEM OPERATION INDICATOR LIGHT/ ACTIVE TRACTION CONTROL SYSTEM OPERATION INDICATOR LIGHT
16. ACTIVE SKID CONTROL SYSTEM OFF INDICATOR LIGHT
17. 4WD INDICATOR LIGHT
18. DATA LINK CONNECTOR
19. POWER CONTROL MODULE (PCM)
20. MITUBISHI ACTIVE SKID AND ACTIVE TRACTION CONTROL UNIT(M-ASTC-ECU)

System Check Sound

When starting the engine, a thudding sound can sometimes be heard coming from the engine compartment. This is a normal sound during the Active skid control system self-check.

Active Skid Control System Operation Sounds and Sensations

During normal operation, the Active skid control system makes several sounds that may seem unusual at first:

- A whining sound is caused by the ABS hydraulic unit motor.
- When pressure is applied to the brake pedal, the pulsation of the pedal causes a scraping sound.

M-ASTC DIAGNOSIS

INTRODUCTION TO MITUBISHI ACTIVE SKID AND TRACTION CONTROL SYSTEM DIAGNOSIS

The M-ASTC system controls the vehicle by braking force and engine output. If any maladjustment or trouble related to these elements is present, its performance may be deteriorated.

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TROUBLESHOOTING STRATEGY

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

1. Gather information about the problem from the customer.
2. Verify that the condition described by the customer exists.
3. Check the vehicle for any M-ASTC DTC.
4. If you cannot verify the condition and there are no M-ASTC DTCs, the malfunction is intermittent. Refer to GROUP 00, How to use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions [P.00-6](#).

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5. If you can verify the condition but there are no M-ASTC DTCs, or the system cannot communicate with the scan tool, check that the basic brake system is operating properly.
 - If the basic brake system is not operating properly, refer to the GROUP 35A, Basic Brake System Diagnosis [P.35A-6](#).
 - If the basic brake system is operating properly, refer to [P.35B-80](#).
6. If there is an M-ASTC DTC, record the number of the DTC, then erase the DTC from the memory using the scan tool.
7. Duplicate the M-ASTC DTC set conditions to see if the same M-ASTC DTC will set again.

- If the same M-ASTC DTC sets again, perform the diagnostic procedures for the DTC. Refer to [P.35B-5](#).
- If you cannot get the same M-ASTC DTC to set again, the malfunction is intermittent. Refer to GROUP 00, How to use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions [P.00-6](#).

TROUBLE CODE DIAGNOSIS

M1353000900022

Retrieving M-ASTC Diagnostic Trouble Codes

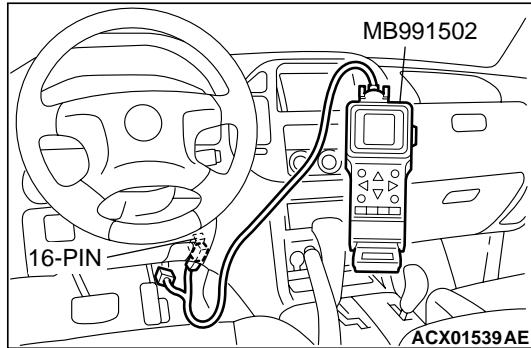
Required Special Tool:

- MB991502: Scan Tool (MUT-II)

CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

1. Connect scan tool MB991502 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Use scan tool MB991502 to check for M-ASTC diagnostic trouble codes.
4. Turn the ignition switch to the "LOCK" (OFF) position.
5. Disconnect scan tool MB991502.



Erasing M-ASTC Diagnostic Trouble Codes

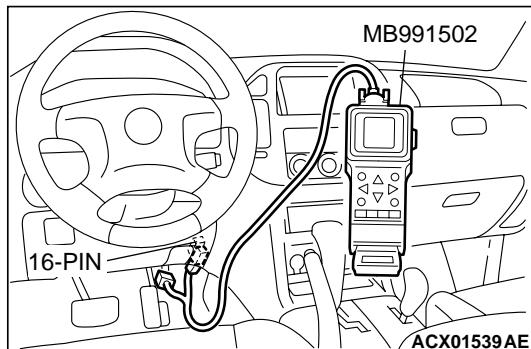
Required Special Tool:

- MB991502: Scan Tool (MUT-II)

CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

1. Connect scan tool MB991502 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Use scan tool MB991502 to erase M-ASTC diagnostic trouble codes.
4. Turn the ignition switch to the "LOCK" (OFF) position.
5. Disconnect scan tool MB991502.



DIAGNOSTIC TROUBLE CODE CHART

M1353001000033

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

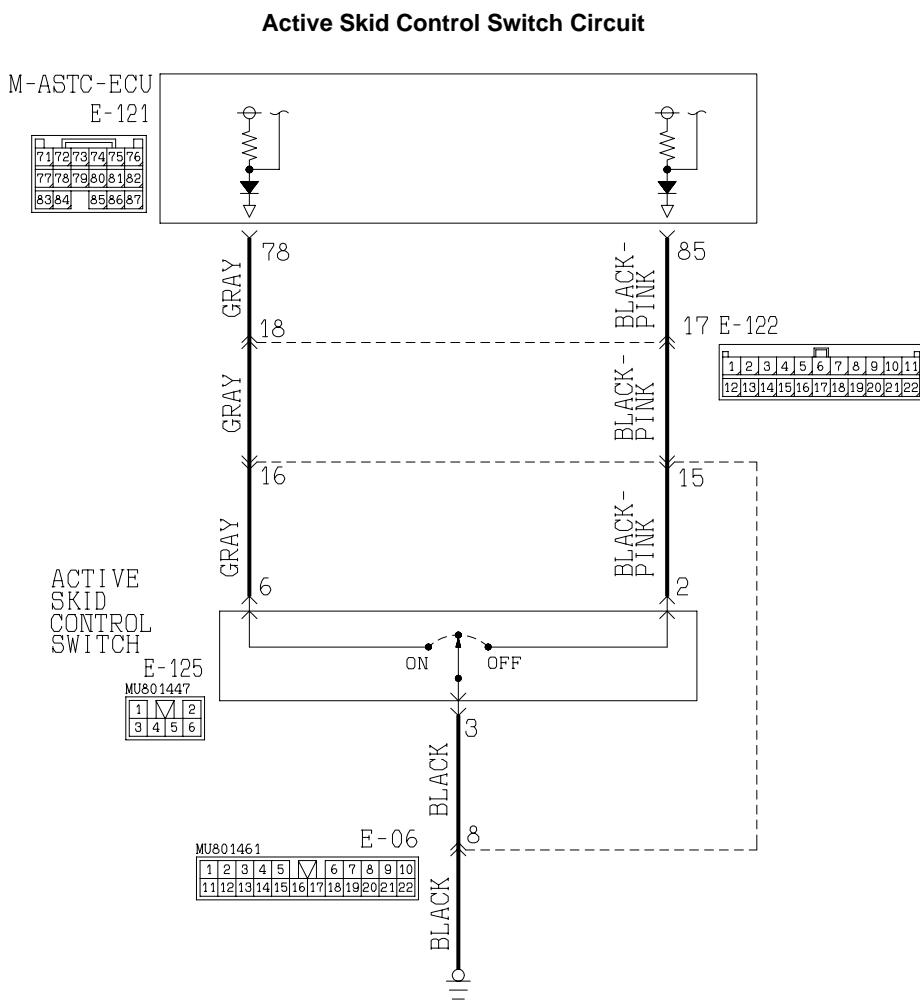
DIAGNOSTIC TROUBLE CODE NO.	INSPECTION ITEM	DIAGNOSTIC CONTENT	REFERENCE PAGE	
11	Front right ABS sensor	Open circuit or short circuit	Refer to GROUP 35B, ABS Trouble Code Diagnosis P.35B-8 .	
12	Front left ABS sensor			
13	Rear right ABS sensor			
14	Rear left ABS sensor			
16*	Battery positive voltage	M-ASTC-ECU power supply voltage is extremely low or high	Refer to GROUP 35A, HBB Trouble Code Diagnosis P.35A-16 .	
17	Active skid control switch	Abnormal output signal	P.35C-7	
21	Front right ABS sensor		Refer to GROUP 35B, ABS Trouble Code Diagnosis P.35B-20 .	
22	Front left ABS sensor			
23	Rear right ABS sensor			
24	Rear left ABS sensor			
25	Incorrect diameter tire		Refer to GROUP 35B, ABS Trouble Code Diagnosis P.35B-32 .	
31	Ignition switch (IG2) system	Open circuit	Refer to GROUP 35A, HBB Trouble Code Diagnosis P.35A-18 .	
33	Stoplight switch system	Open circuit or ON failure	Refer to GROUP 35B, ABS Trouble Code Diagnosis P.35B-36 .	
34	CAN communication system		P.35C-13	
35	PCM (engine) system	Abnormal output signal	P.35C-15	
36	Communication line with PCM (engine)		P.35C-17	
37	PCM (A/T) system	Abnormal output signal	P.35C-15	
38	Communication line with PCM (A/T)		P.35C-17	
41	Front right control solenoid valve	No response to the solenoid valve drive signal corresponding to the respective item	Refer to GROUP 35B, ABS Trouble Code Diagnosis P.35B-43 .	
42	Front left control solenoid valve			
43	Rear right control solenoid valve			
44	Rear left control solenoid valve			
45	Front right select solenoid valve			
46	Front left select solenoid valve			
47	Active traction control system select solenoid valve		P.35C-19	
48	Active traction control system select solenoid valve			
51	Valve relay system	Short circuit or ON failure	Refer to GROUP 35B, ABS Trouble Code Diagnosis P.35B-58 .	

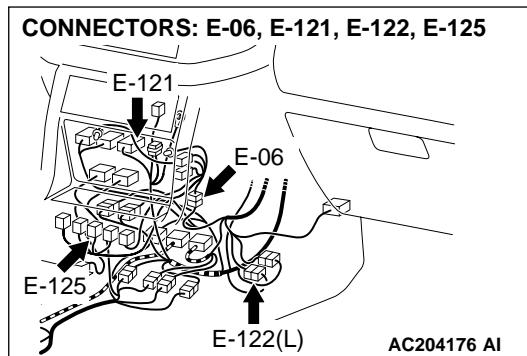
DIAGNOSTIC TROUBLE CODE NO.	INSPECTION ITEM	DIAGNOSTIC CONTENT	REFERENCE PAGE
52	Valve relay system	Open circuit or OFF failure	Refer to GROUP 35B, ABS Trouble Code Diagnosis P.35B-62 .
53	Pump motor	<ul style="list-style-type: none"> • Seizure of the pump motor* • Abnormality at the current detection circuit of the M-ASTC-ECU 	Refer to GROUP 35A, HBB Trouble Code Diagnosis P.35A-23 .
54	Motor relay	Open circuit, short circuit or failure of the motor relay coil	Refer to GROUP 35A, HBB Trouble Code Diagnosis P.35A-31 .
55	Pump motor circuit	Pump motor energized abnormally for long period*	Refer to GROUP 35A, HBB Trouble Code Diagnosis P.35A-56 .
56	Pressure switch	Open circuit or short circuit	Refer to GROUP 35A, HBB Trouble Code Diagnosis P.35A-69 .
57	Accumulator	Accumulator low-pressure abnormality*	Refer to GROUP 35A, HBB Trouble Code Diagnosis P.35A-77 .
58	M-ASTC-ECU (Power supply drive circuit)	Pump motor drive circuit in the M-ASTC-ECU abnormality	Replace the M-ASTC-ECU P.35C-205 .
61	Master cylinder pressure sensor system		Refer to GROUP 35B, ABS Trouble Code Diagnosis P.35B-71 .
62	G-sensor system	Open circuit or short circuit	P.35C-24
63	G-sensor system	Abnormal output signal	
64	G-sensor system	G sensor seized	
65	G-sensor system	Trouble in self-diagnosis	
66	Steering wheel sensor system	Trouble in self-diagnosis	P.35C-30
67	Steering wheel sensor system	Trouble in communication line	P.35C-38
68	Steering wheel sensor system	Abnormal output signal	P.35C-30
71	Yaw rate sensor system	Trouble in self-diagnosis	P.35C-24
72	Yaw rate sensor system	Incorrectly set reference value	
73	Yaw rate sensor system	Abnormal output signal	
74	Abnormal communication of the G and yaw rate sensor		P.35C-46
75	Center differential lock switch		P.35C-52
76	G-sensor system		P.35C-24
77	Yaw rate sensor system		
78	Incorrect PCM fitted		P.35C-15

DIAGNOSTIC TROUBLE CODE NO.	INSPECTION ITEM	DIAGNOSTIC CONTENT	REFERENCE PAGE
81	G sensor not initialized		P.35C-56
82	Yaw rate sensor not initialized		
83	Steering wheel sensor not initialized		P.35C-57
84	Transfer switch not initialized		P.35C-58
85	Master cylinder pressure sensor not initialized		P.35C-58

DIAGNOSTIC TROUBLE CODE PROCEDURES

DTC 17: Defective active skid control switch





CIRCUIT OPERATION

If the active skid control switch is turned on, current flows from the M-ASTC-ECU terminal 78 through the active skid control switch to ground. If the active skid control switch is turned off, current flows from the M-ASTC-ECU terminal 85 through the active skid control switch to ground.

M-ASTC DTC SET CONDITION

DTC 17 is set when the active skid control switch is turned on and off simultaneously.

TROUBLESHOOTING HINTS

The most likely causes for DTC 17 to set are:

- The active skid control switch is defective.
- Damaged harness wires and connectors
- The M-ASTC-ECU is defective.

DIAGNOSIS

Required Special Tools:

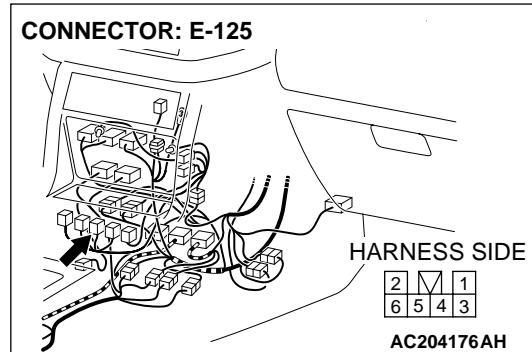
- MB991223: Harness Set
- MB991502: Scan tool (MUT-II)

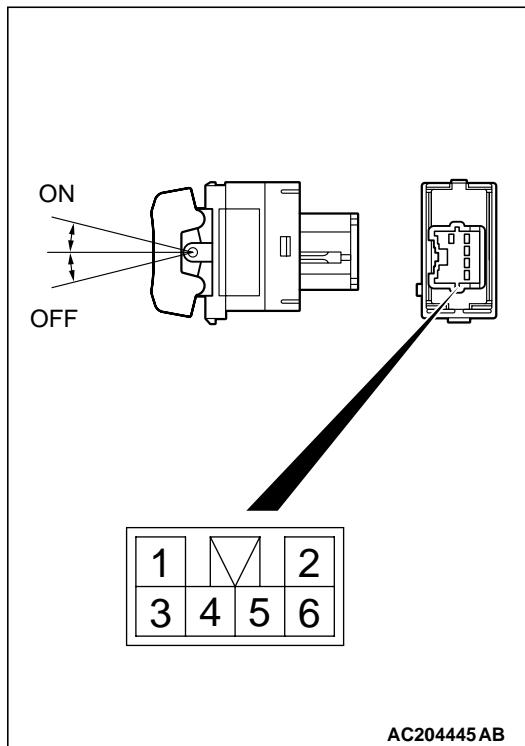
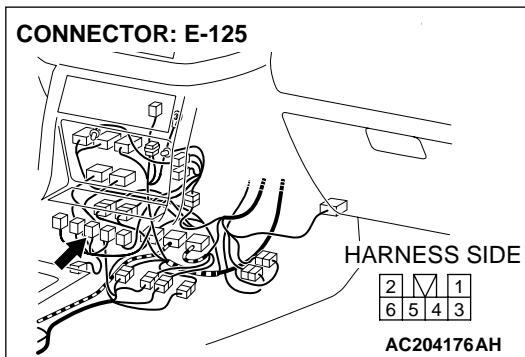
STEP 1. Check active skid control switch connector E-125.

Q: Is active skid control switch connector E-125 in good condition?

YES : Go to Step 2.

NO : Repair or replace the connector.





STEP 2. Check the active skid control switch continuity.

(1) Remove the active skid control switch (Refer to [P.35A-132](#)).

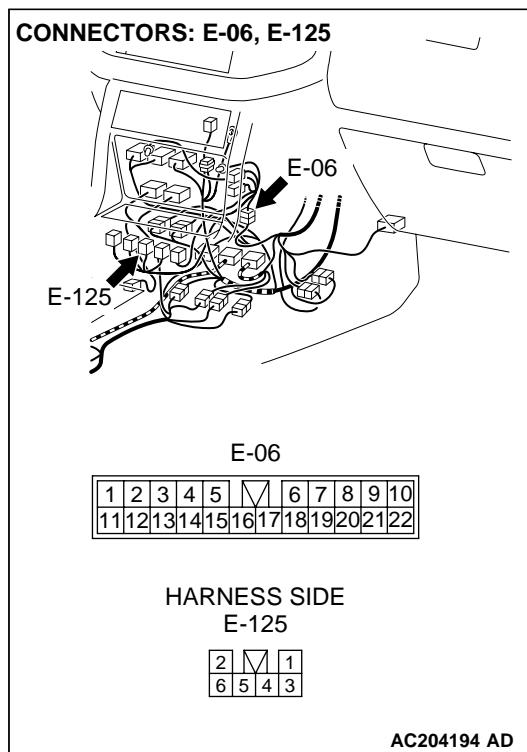
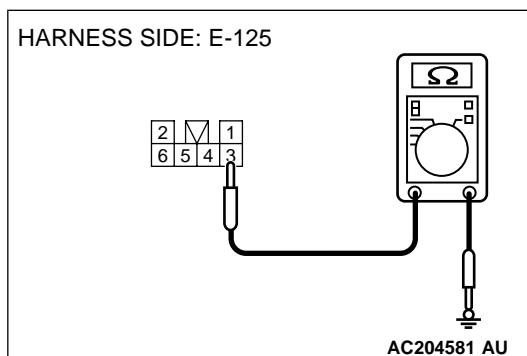
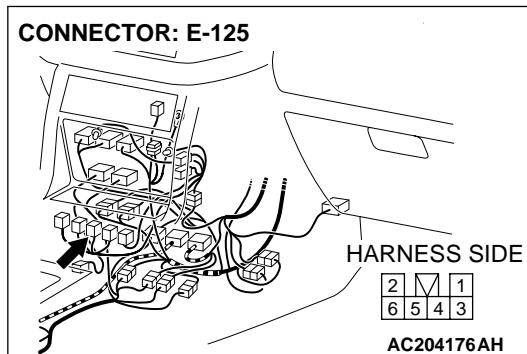
(2) Connect an ohmmeter between to active skid control switch connector terminals.

ACTIVE SKID CONTROL SWITCH CONDITION	TESTER CONNECTION	SPECIFIED CONDITION
ON	3 – 6	Less than 2 ohms
	2 – 3, 2 – 6	Open circuit
Neutral	2 – 3, 2 – 6, 3 – 6	Open circuit
OFF	2 – 3	Less than 2 ohms
	2 – 6, 3 – 6	Open circuit

Q: Is the active skid control switch in good condition?

YES : Go to Step 3.

NO : Replace the active skid control switch, and then go to Step 9.



STEP 3. Check the ground to the active skid control switch. Measure the resistance at active skid control switch connector E-125.

(1) Disconnect active skid control switch connector E-125, and measure the resistance at the harness-side connector.

(2) Measure the resistance between active skid control switch connector E-125 terminal 3 and body ground.

- The resistance should measure 2 ohms or less.

Q: Does the resistance measure 2 ohms or less?

YES : Go to Step 5.

NO : Go to Step 4.

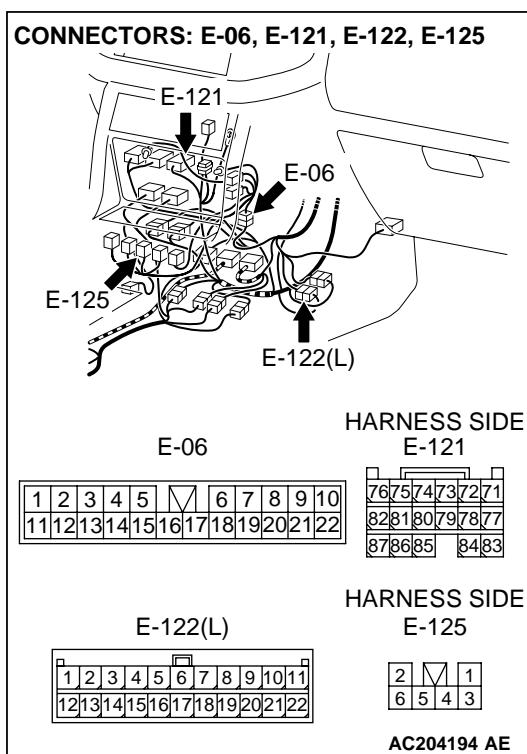
STEP 4. Check the wiring harness between active skid control switch connector E-125 terminal 3 and the body ground.

NOTE: Also check intermediate connector E-06 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector E-06 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection [P.00E-2](#). If the connector has been repaired or replaced, go to STEP 9.

Q: Is the wiring harness between active skid control switch connector E-125 terminal 3 and the body ground in good condition?

YES : Go to Step 9.

NO : Repair the wiring harness, and then go to Step 9.



STEP 5. Check the wiring harness between M-ASTC-ECU connector E-121 terminal 78 and the body ground.

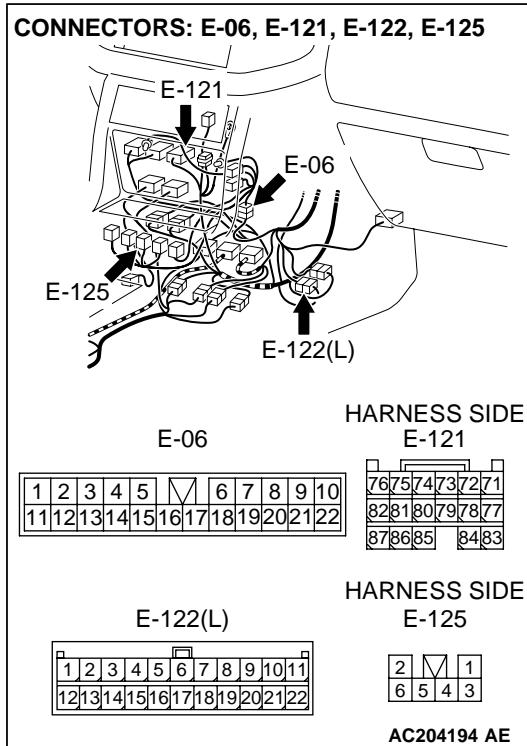
NOTE: Also check intermediate connector E-06 and E-122 for loose, corroded, or damaged terminals, or terminals pushed back in connectors. If intermediate connector E-06 or E-122 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection

P.00E-2. If the connector has been repaired or replaced, go to STEP 9.

Q: Is the wiring harness between M-ASTC-ECU connector E-121 terminal 78 and the body ground in good condition?

YES : Go to Step 6.

NO : Go to Step 7.



STEP 6. Check the wiring harness between active skid control switch connector E-125 terminal 6 and M-ASTC-ECU connector E-121 terminal 78.

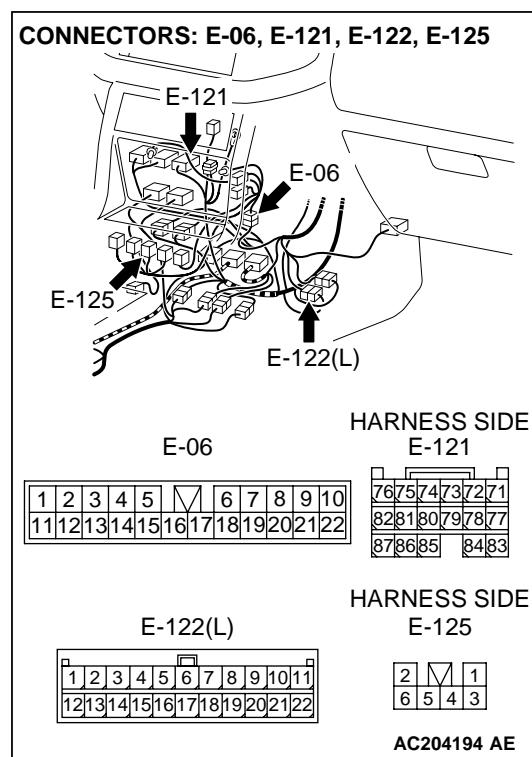
NOTE: Also check intermediate connector E-06 and E-122 for loose, corroded, or damaged terminals, or terminals pushed back in connectors. If intermediate connector E-06 or E-122 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection

P.00E-2. If the connector has been repaired or replaced, go to STEP 9.

Q: Is the wiring harness between active skid control switch connector E-125 terminal 6 and M-ASTC-ECU connector E-121 terminal 78 in good condition?

YES : Go to Step 7.

NO : Repair the wiring harness, and then go to Step 9.



STEP 7. Check the wiring harness between M-ASTC-ECU connector E-121 terminal 85 and the body ground.

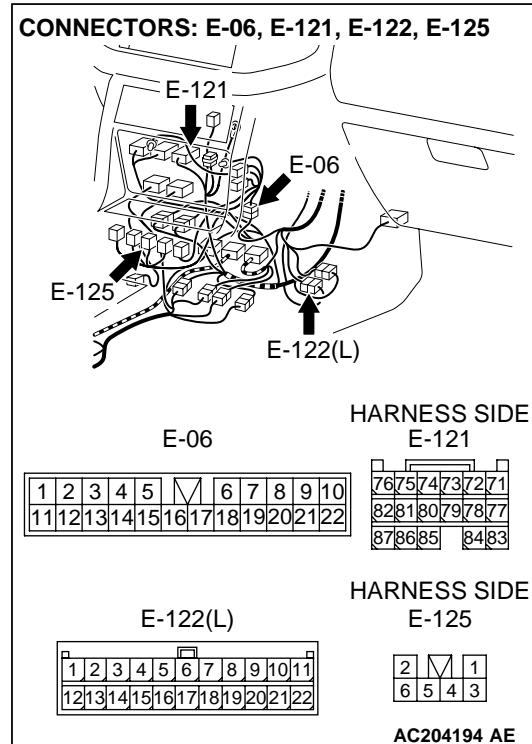
NOTE: Also check intermediate connector E-06 and E-122 for loose, corroded, or damaged terminals, or terminals pushed back in connectors. If intermediate connector E-06 or E-122 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection

P.00E-2. If the connector has been repaired or replaced, go to STEP 9.

Q: Is the wiring harness between M-ASTC-ECU connector E-121 terminal 85 and the body ground in good condition?

YES : Go to Step 9.

NO : Go to Step 8.



STEP 8. Check the wiring harness between active skid control switch connector E-125 terminal 2 and M-ASTC-ECU connector E-121 terminal 85.

NOTE: Also check intermediate connector E-06 and E-122 for loose, corroded, or damaged terminals, or terminals pushed back in connectors. If intermediate connector E-06 or E-122 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection

P.00E-2. If the connector has been repaired or replaced, go to STEP 9.

Q: Is the wiring harness between active skid control switch connector E-125 terminal 2 and M-ASTC-ECU connector E-121 terminal 85 in good condition?

YES : Replace the M-ASTC-ECU, and then go to Step 9.

NO : Repair the wiring harness, and then go to Step 9.

STEP 9. Check the diagnostic trouble code.

Q: Does DTC 17 reset?

YES : Return to Step 1.

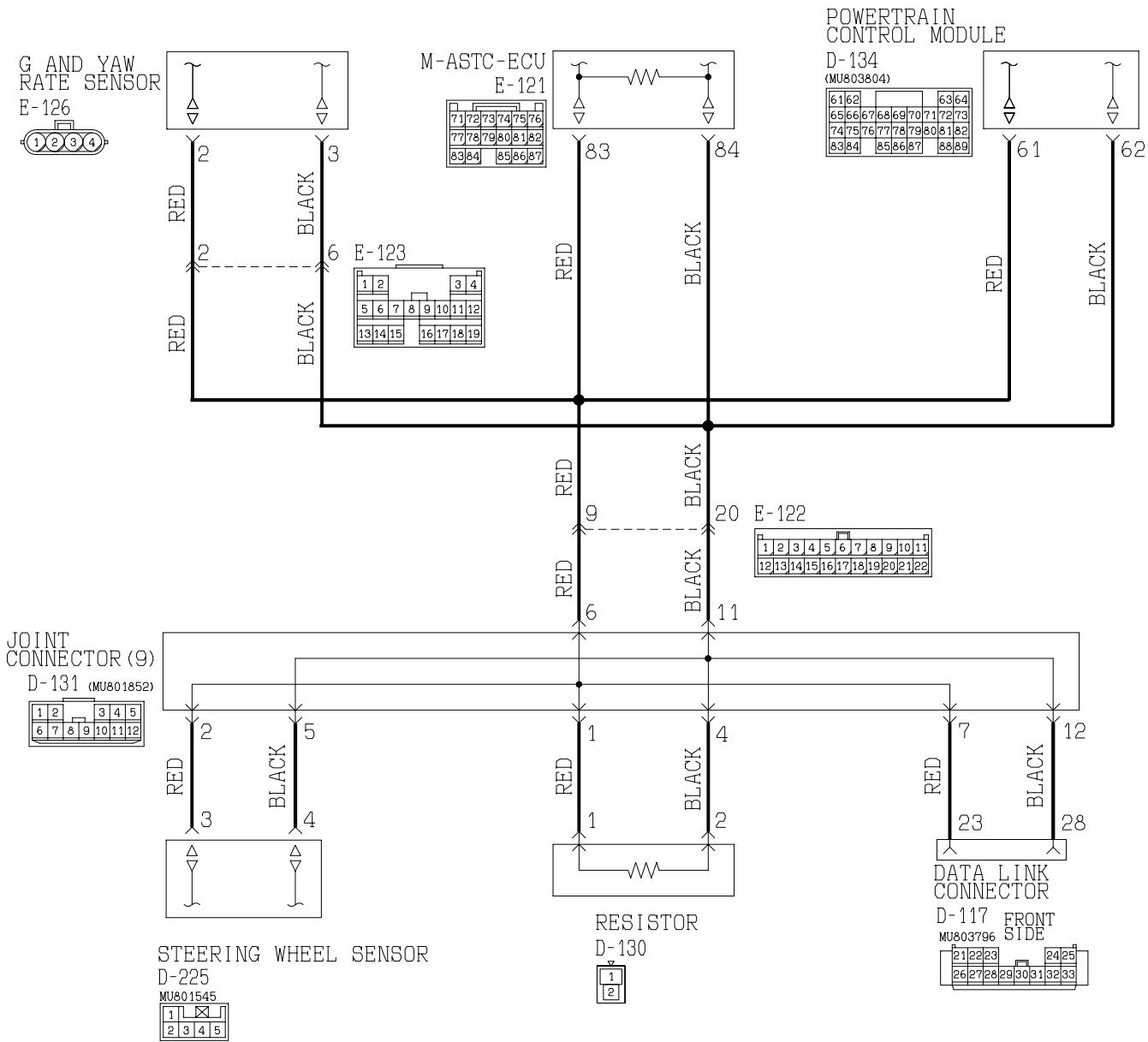
NO : The procedure is complete.

DTC 34: Defective CAN bus line

! CAUTION

If the diagnostic trouble code(s), which indicate a defective CAN bus line, has been set, diagnose the CAN main bus line.

Can Bus Communication Circuit



CIRCUIT OPERATION

The M-ASTC-ECU gathers information through CAN_H (terminal 83) and CAN_L (terminal 84) bus lines from the power control module, the G and yaw rate sensor and the steering wheel sensor.

M-ASTC DTC SET CONDITION

DTC 34 is set if communication errors have happened in at least two of the relevant ECUs and/or sensors simultaneously, which are connected to each other through the CAN bus line.

TROUBLESHOOTING HINTS

The most likely causes for DTC 34 to set are:

- The CAN bus line is defective.
- The register is defective.

DIAGNOSIS**Required Special Tools:**

- MB991223: Harness Set
- MB991502: Scan Tool (MUT-II)

Diagnose CAN main bus line.

⚠ CAUTION

If DTC 34 is set, diagnose the CAN main bus line.

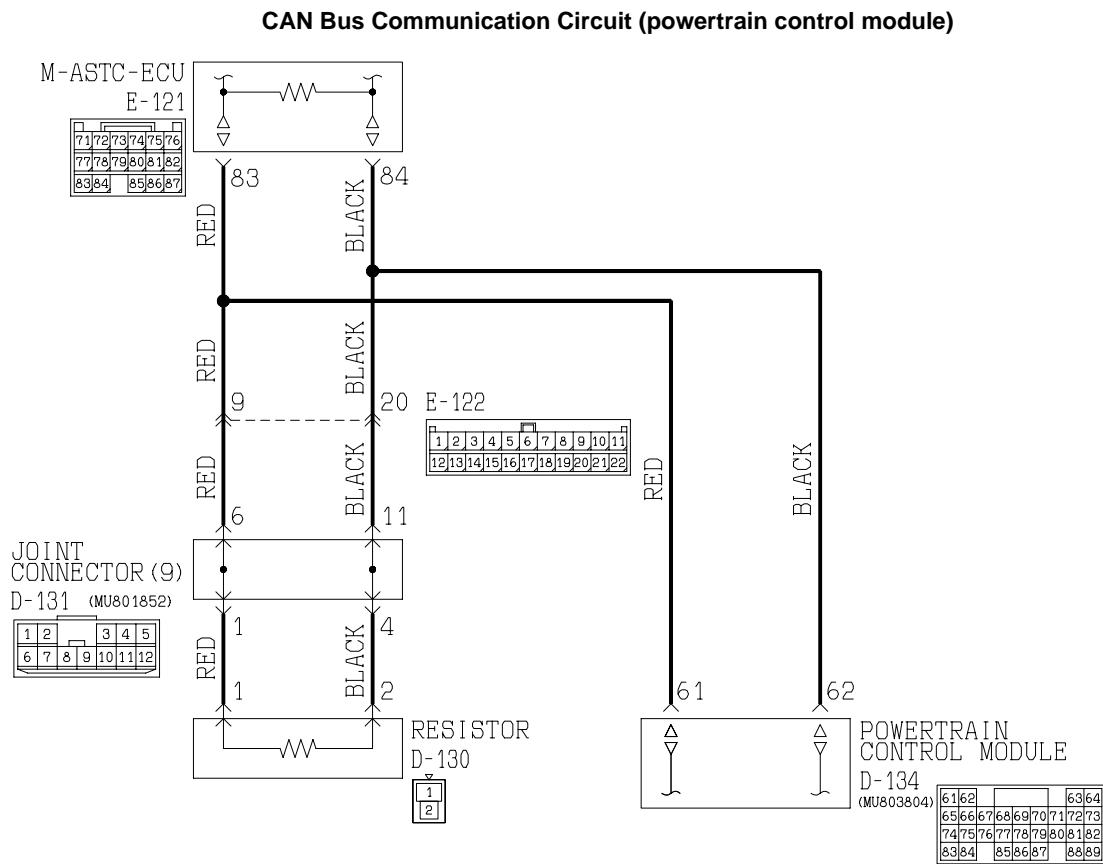
Diagnose the CAN main bus line. Refer to [P.35C-60](#).

Q: Have you completed checking or repairing the CAN main bus line?

YES : Check for DTC reset.

NO : Diagnose the CAN main bus line. Refer to [P.35C-60](#).

DTC 35, 37, 78: Defective power control module



W3Q01M02AA
AC205062AB

CIRCUIT OPERATION

The M-ASTC-ECU gathers information regarding the engine and automatic transmission, through the CAN bus line from the power control module.

M-ASTC DTC SET CONDITION

DTC 35 is set if the engine related data contains an error. DTC 37 is set if the automatic transmission related data contains an error. In this case, the PCM is sending data to the ECU, but the data contains a fault.

TROUBLESHOOTING HINTS

The most likely causes for DTC 35, 37, 78 to set are:

- The power control module is defective
- The M-ASTC-ECU is defective.

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB991502: Scan Tool (MUT-II)

STEP 1. Check that the power control module sets a DTC.

Check that the power control module sets a DTC.

Q: Does the power control module set any DTC?

YES : Diagnose the power control module. Refer to [P.13Ab-22](#).

NO : Go to Step 3.

STEP 2. Check by the substitution of a known good M-ASTC-ECU.

- (1) Replace the M-ASTC-ECU with a known good unit.
- (2) Check for DTC.

Q: Is any DTC reset?

YES : Replace the power control module, and then go to Step 3.

NO : Go to Step 3.

STEP 3. Recheck for diagnostic trouble code.

Q: Does DTC 35, 37 or 78 reset?

YES : Return to Step 1.

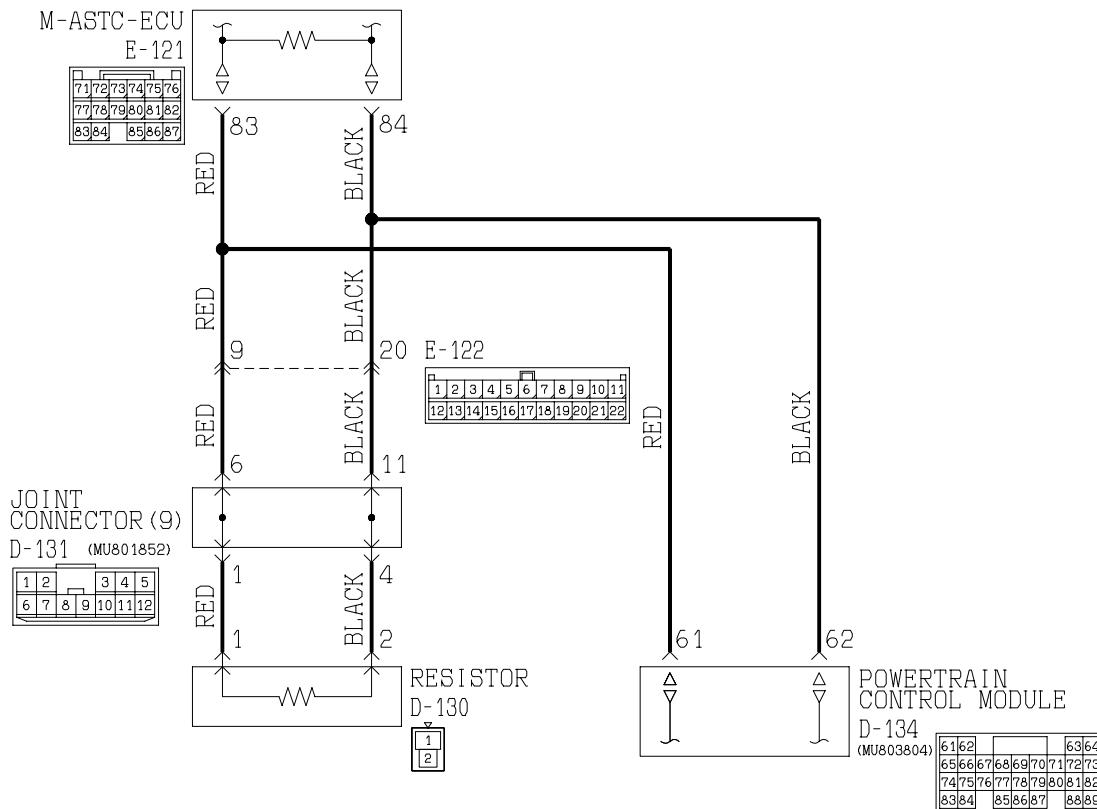
NO : The procedure is complete.

DTC 36, 38: Communication error in power control module

⚠ CAUTION

If the diagnostic trouble code(s), which indicate a communication error in the power control module, has been set, diagnose the CAN main bus line.

CAN Bus Communication Circuit (powertrain control module)



W3Q01M02AA
AC205062AB

CIRCUIT OPERATION

The M-ASTC-ECU gathers information regarding the engine and automatic transmission, through the CAN bus line from the power control module.

M-ASTC DTC SET CONDITION

DTC 36 is set if the M-ASTC-ECU cannot gather all information regarding the engine from the PCM. DTC 38 is set if the ECU cannot gather all information regarding the automatic transmission from the PCM.

TROUBLESHOOTING HINTS

The most likely causes for DTC 36, 38 to set are:

- The CAN bus line is defective.
- Damaged connector(s)
- The power control module is defective
- The M-ASTC-ECU is defective.

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB991502: Scan Tool (MUT-II)

STEP 1. CAN main bus line diagnostics

CAUTION

If DTC 36 or 38 is set, diagnose the CAN main bus line. Diagnose the CAN main bus line. Refer to [P.35C-60](#). If the CAN main bus line is repaired, check that the diagnostic trouble code resets.

Q: Have you completed checking or repairing the CAN main bus line?

YES : • If the CAN main bus line is repaired, go to Step 3 .
• If the CAN main bus line is not defective, go to Step 2.

NO : Diagnose the CAN main bus line. Refer to [P.35C-60](#).

STEP 2. Check for engine and automatic transmission DTCs.

Check whether engine and automatic transmission DTCs are set or not.

Q: Are engine and automatic transmission DTCs set?

YES : Diagnose the power control module. Refer to [P.13Ab-22](#).

NO : Replace the M-ASTC-ECU, and then go to Step 3.

STEP 3. Recheck for diagnostic trouble code.

Q: Does DTC 36 or 38 reset?

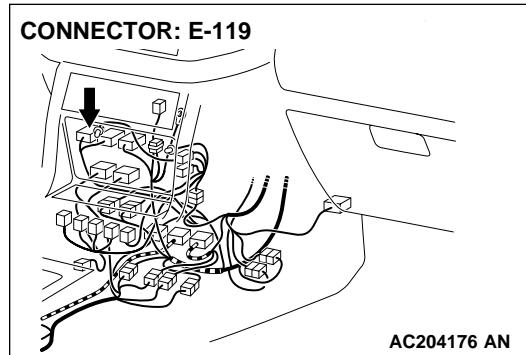
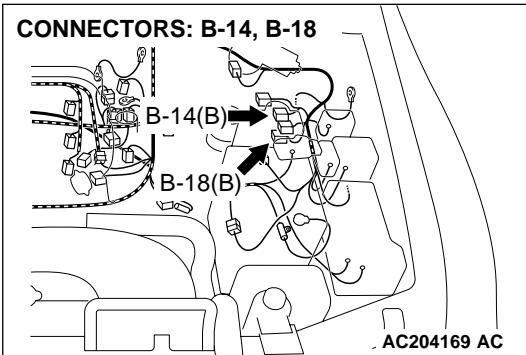
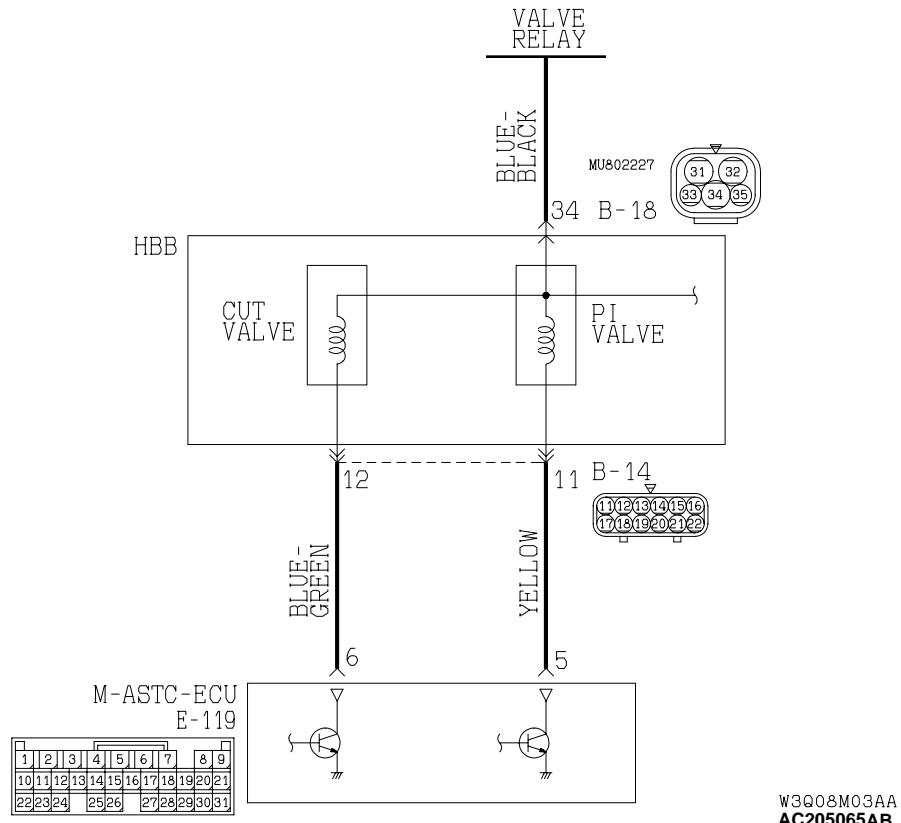
YES : Return to Step 1.

NO : The procedure is complete.

DTC 47: Defective Cut Valve

DTC 48: Defective Pressure-increase Valve

Cut Valve and PI Valve Circuit



CIRCUIT OPERATION

As the ignition switch is turned ON, power is supplied to each solenoid valve via the valve relay. M-ASTC-ECU, by turning ON the transistor, grounds the circuit and turns the solenoid valve ON.

M-ASTC DTC SET CONDITIONS

The M-ASTC-ECU constantly monitors the solenoid valve drive circuits. These codes are output if the M-ASTC-ECU judges that there is an open circuit or short-circuit in a solenoid coil or harness because the solenoid valve is on but no current flows to the solenoid valve, or if current continues flowing to the solenoid valve even though the solenoid valve is off.

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

- The hydraulic brake booster (HBB) is defective.

- Damaged harness wires and connectors
- The M-ASTC-ECU is defective.

DIAGNOSIS**Required Special Tools:**

- MB991223: Harness Set
- MB991502: Scan Tool (MUT-II)

STEP 1. Check for M-ASTC DTC.

Check that the M-ASTC-ECU sets any other DTCs than 47 or 48.

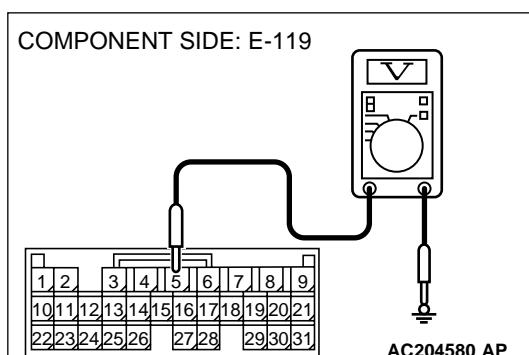
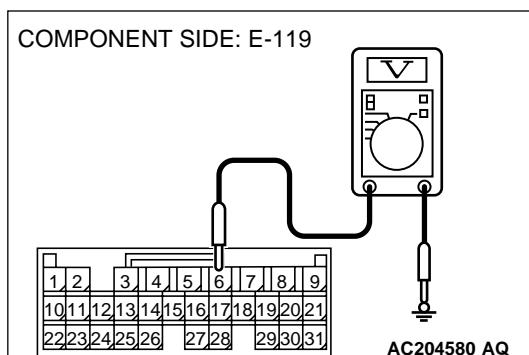
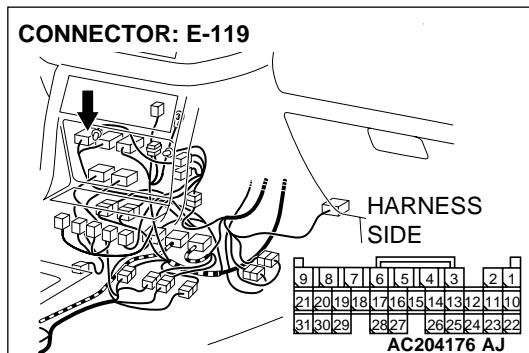
Q: Does the M-ASTC-ECU set any other DTCs than 47 or 48?

YES : First diagnose the other DTCs.

YES : Go to Step 2.

STEP 2. Check the solenoid valve drive circuit. Measure at M-ASTC-ECU connector E-119 by backprobing.

- (1) Measure the voltage by backprobing (i.e. without disconnecting M-ASTC-ECU connector E-119).
- (2) Turn the ignition switch to the "ON" position.
- (3) Measure voltage between the following terminals. It should be approximately 12 volts (battery positive voltage).

**When DTC 47 is set:**

- M-ASTC-ECU connector E-119 terminal 6 and ground
- The voltage should measure battery voltage (approximately 12 volts).

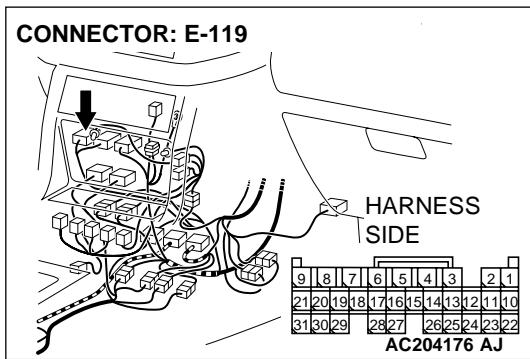
When DTC 48 is set:

- M-ASTC-ECU connector E-119 terminal 5 and ground
- The voltage should measure battery voltage (approximately 12 volts).

Q: Does the voltage measure battery voltage (approximately 12 volts)?

YES : Go to Step 3.

NO : Go to Step 4.

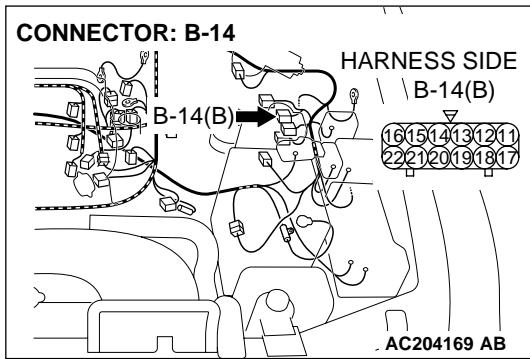


STEP 3. Check M-ASTC-ECU connector E-119.

Q: Is M-ASTC-ECU connector E-119 in good condition?

YES : Go to Step 5.

NO : Repair or replace the connector, and then go to Step 6.



STEP 4. Check the wiring harness between HBB connector B-14 terminal 6 or 5 and M-ASTC-ECU connector E-119 terminal 12 or 11.

When DTC 47 is set:

- M-ASTC-ECU connector E-119 terminal 6 and HBB connector B-14 terminal 12

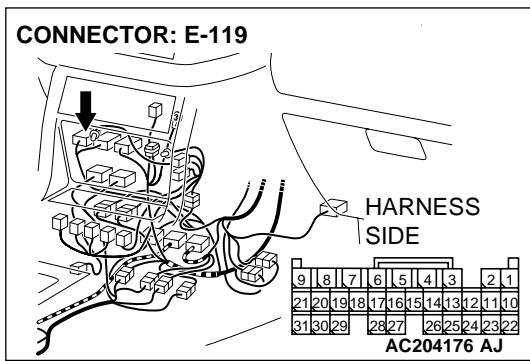
When DTC 48 is set:

- M-ASTC-ECU connector E-119 terminal 5 and HBB connector B-14 terminal 11

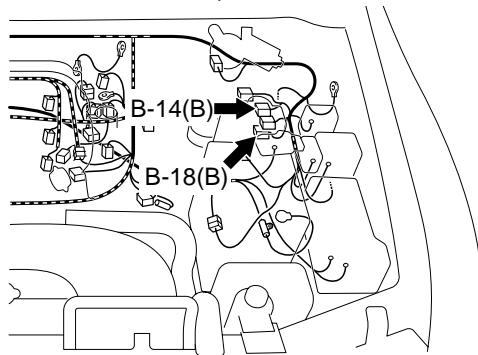
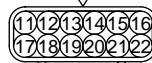
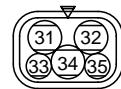
Q: Is the wiring harness between HBB connector B-14 terminal 6 or 5 and M-ASTC-ECU connector E-119 terminal 12 or 11 in good condition?

YES : Go to Step 5.

NO : Repair the wiring harness, and then go to Step 6.



CONNECTORS: B-14, B-18

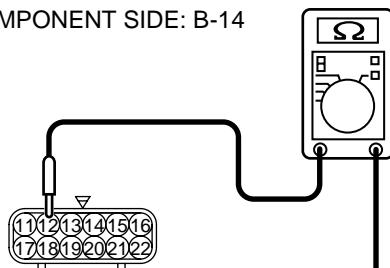
COMPONENT SIDE
B-14(B)COMPONENT SIDE
B-18(B)

AC204187 AB

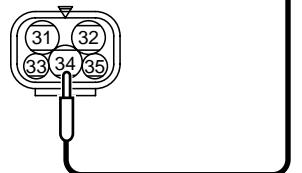
STEP 5. Check the solenoid valve for continuity. Measure at HBB connectors B-14 and B-18.

(1) Disconnect HBB connectors B-14 and B-18, and measure the resistance at the component-side connector.

COMPONENT SIDE: B-14



COMPONENT SIDE: B-18

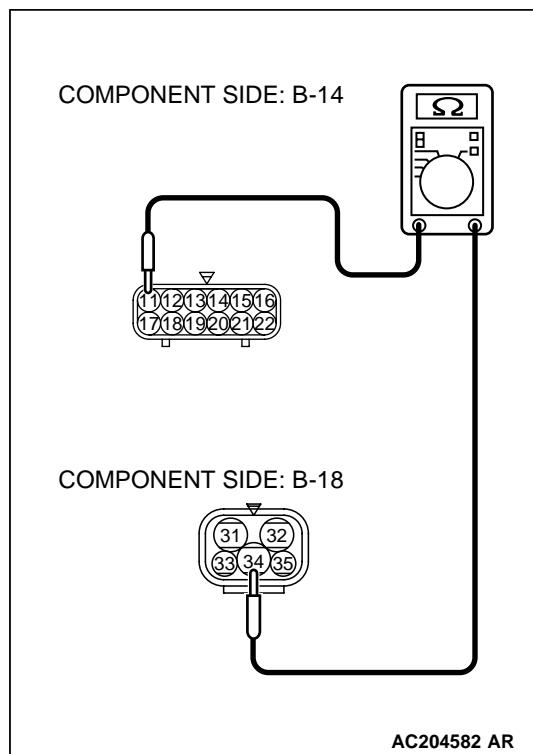


AC204582 AS

(2) Measure the resistance between the following terminals.

When DTC 47 is set:

- Measure the resistance between HBB connector B-14 terminal 12 and HBB connector B-18 terminal 34.
 - Select solenoid valve: 3.5 – 3.9 ohms



When DTC 48 is set:

- Measure the resistance between HBB connector B-14 terminal 11 and HBB connector B-18 terminal 34.
- Select solenoid valve: 3.5 – 3.9 ohms

Q: Is the solenoid valve normal?

YES : Replace the M-ASTC-ECU, and then go to Step 6.
NO : Replace the HBB master cylinder and hydraulic unit assembly, and then go to STEP 6.

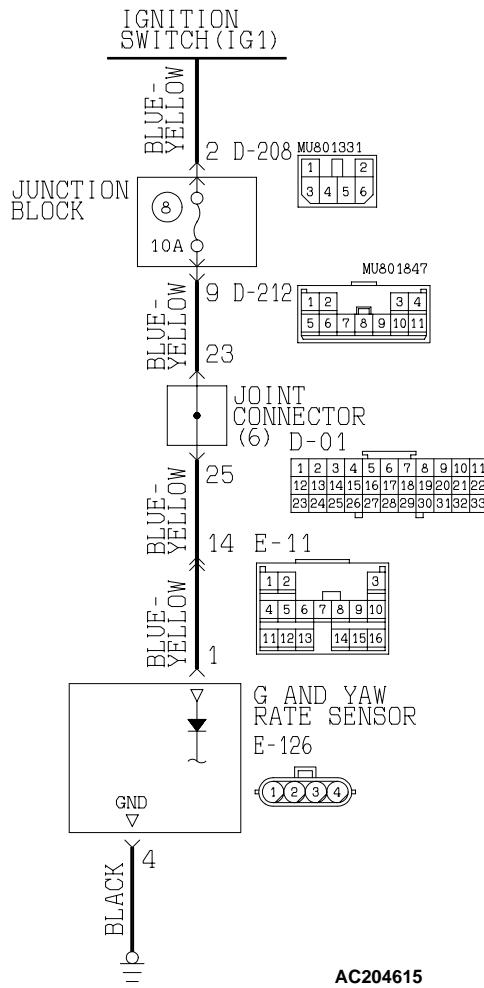
STEP 6. Recheck for diagnostic trouble codes.

Q: Does DTC 47 or 48 reset?

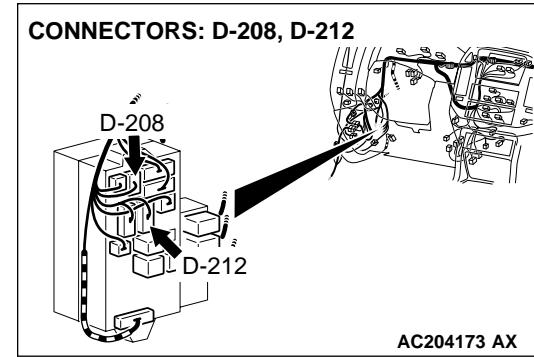
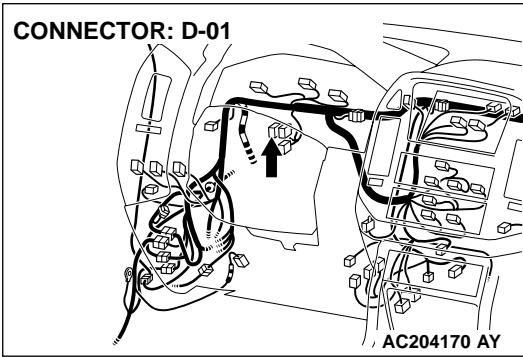
YES : Go to Step 1.
NO : The procedure is complete.

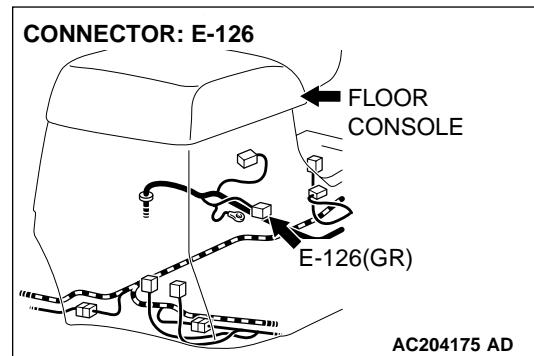
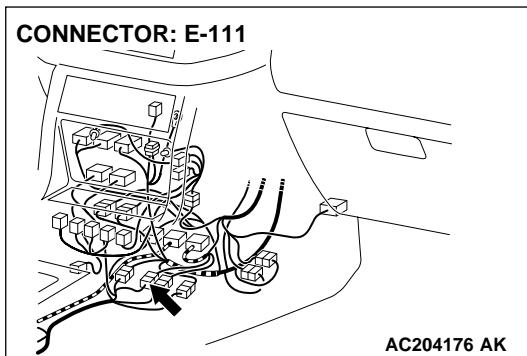
DTC 62, 63, 64, 65, 71, 72, 73, 76, 77: Trouble in G and yaw rate sensor system

G and Yaw Rate Sensor Power Supply Circuit



AC204615





CIRCUIT OPERATION

The M-ASTC-ECU gathers information regarding lateral and longitudinal gravities and yaw rate, through the CAN bus line from the G and yaw rate sensor.

M-ASTC DTC SET CONDITION

DTC 62, 63, 64, 65, 71, 72, 73, 76 or 77 is set if the M-ASTC-ECU detects any trouble in the G and yaw rate sensor system. In this case, the G and yaw rate sensor is sending data to the ECU, but the data contains a fault.

TROUBLESHOOTING HINTS

The most likely causes for DTC 74 to set are:

- The G and yaw rate sensor is defective.
- Damaged harness wires and connectors
- The M-ASTC-ECU is defective.

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB991502: Scan Tool (MUT-II)

STEP 1. Using scan tool MB991502, check data list items 27, 28 and 29.

(1) Confirm that the vehicle is not canted to one side or corner.

CAUTION

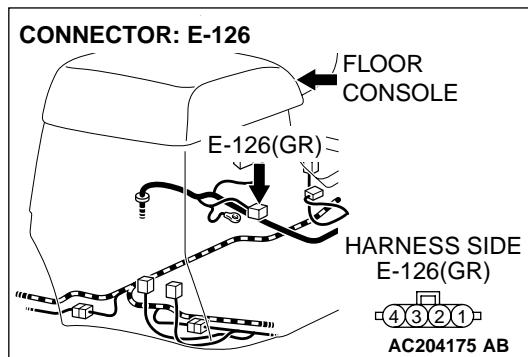
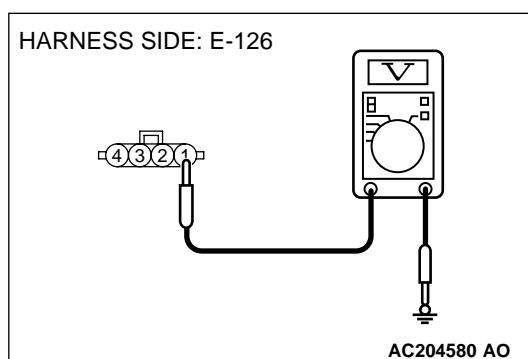
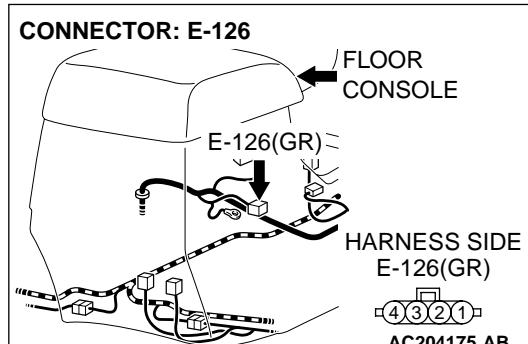
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

- (2) Connect scan tool MB991502 to the data link connector (16-pin).
- (3) Turn the ignition switch to the "ON" position.
- (4) Check that the G and yaw rate sensor output signal is approximately 0 m/s^2 .
- (5) Remove the G and yaw rate sensor with the wire and connector attached.
- (6) When the G and yaw rate sensor is inclined, the readings on data list items 27, 28 and 29 should change.

Q: When the G and yaw rate sensor is inclined, do the readings on data list items 27, 28 and 29 change?

YES : Go to Step 8.

NO : Go to Step 2.



STEP 2. Check the power supply system from the ignition switch (IG1) to the G and yaw rate sensor. Measure at G and yaw rate sensor connector E-126.

- (1) Disconnect G and yaw rate sensor connector E-126, and measure the voltage at the harness-side connector.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between G and yaw rate sensor connector E-126 terminal 1 and body ground.

- The voltage should measure battery voltage (approximately 12 volts).

Q: Does the voltage measure battery voltage (approximately 12 volts)?

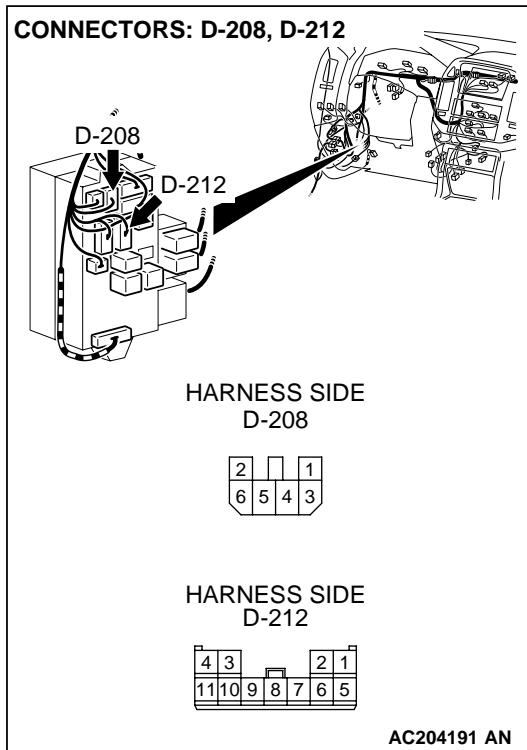
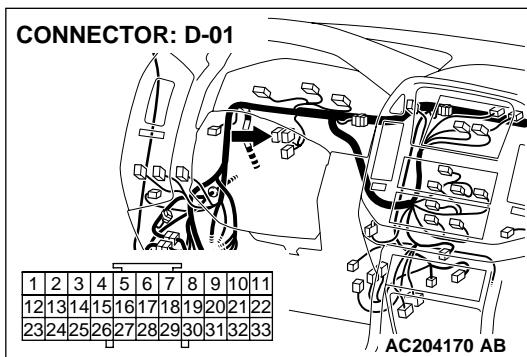
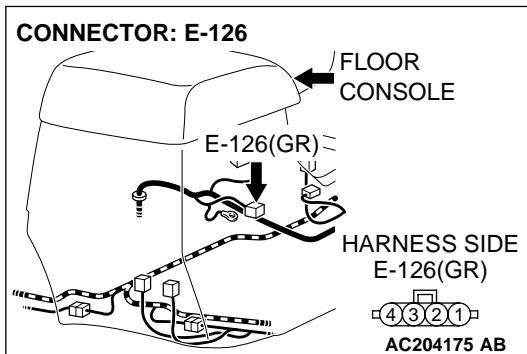
YES : Go to Step 5.
NO : Go to Step 3.

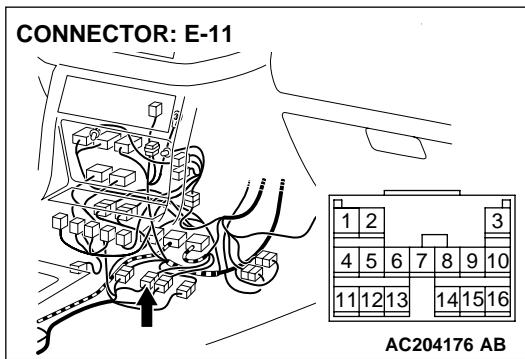
STEP 3. Check G and yaw rate sensor connector E-126.

Q: Is G and yaw rate sensor connector E-126 in good condition?

YES : Go to Step 4.
NO : Repair or replace the connector, and then go to Step 9.

STEP 4. Check the wiring harness between G and yaw rate sensor connector E-126 terminal 1 and the ignition switch (IG1).



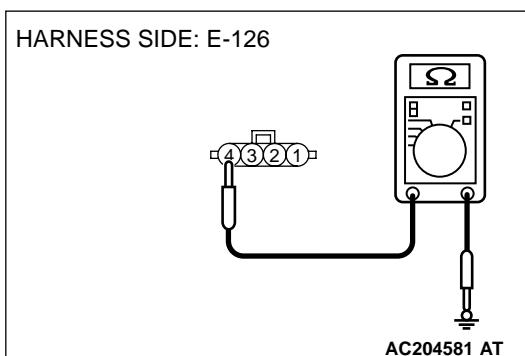
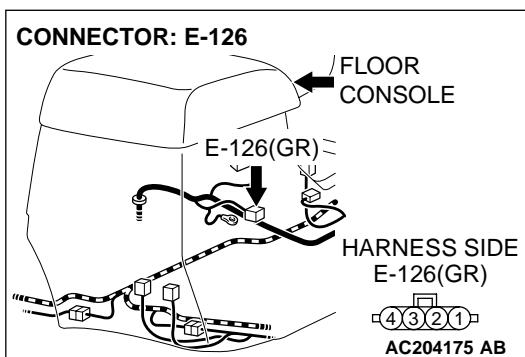


NOTE: Also check joint connector D-01 and junction block connector D-208 and D-212 and intermediate connector E-11 for loose, corroded, or damaged terminals, or terminals pushed back in the connectors. If joint connector D-01 or junction block connector D-208 or D-212 or intermediate connector E-11 are damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P.00E-2. If the connector has been repaired or replaced, go to Step 9.

Q: Is the wiring harness between G and yaw rate sensor connector E-126 terminal 1 and the ignition switch (IG1) in good condition?

YES : Go to Step 9.

NO : Repair the wiring harness, and then go to Step 9.



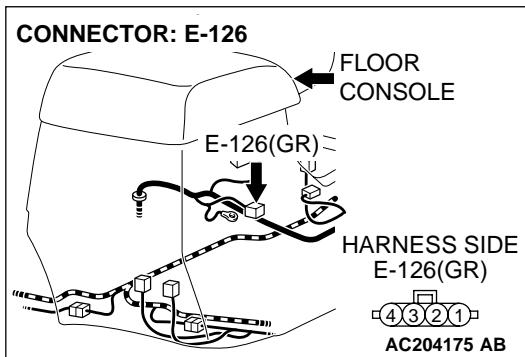
(2) Measure the resistance between G and yaw rate sensor connector E-126 terminal 4 and body ground.

- The resistance should measure 2 ohms or less.

Q: Does the resistance measure 2 ohms or less?

YES : Go to Step 8.

NO : Go to Step 6.

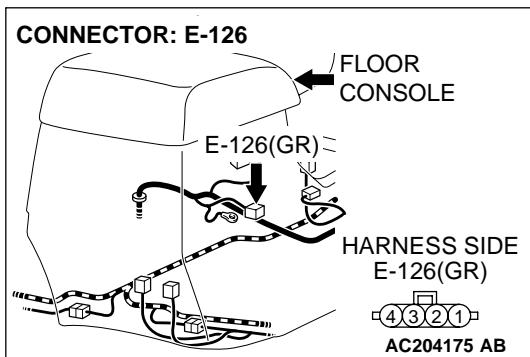


STEP 6. Check G and yaw rate sensor connector E-126.

Q: Is G and yaw rate sensor connector E-126 in good condition?

YES : Go to Step 7.

NO : Repair or replace the connector, and then go to Step 9.



STEP 7. Check the wiring harness between G and yaw rate sensor connector E-126 terminal 4 and body ground.

Q: Is the wiring harness between G and yaw rate sensor connector E-126 terminal 4 and the body ground in good condition?

YES : Go to Step 9.

NO : Repair the wiring harness, and then go to Step 9.

STEP 8. Replace the G and yaw rate sensor.

Replace the G and yaw rate sensor, and check that the DTC sets.

Q: Does the M-ASTC-ECU set any DTC?

YES : Replace the M-ASTC-ECU, and then go to Step 9.

NO : The procedure is complete.

STEP 9. Recheck for diagnostic trouble code.

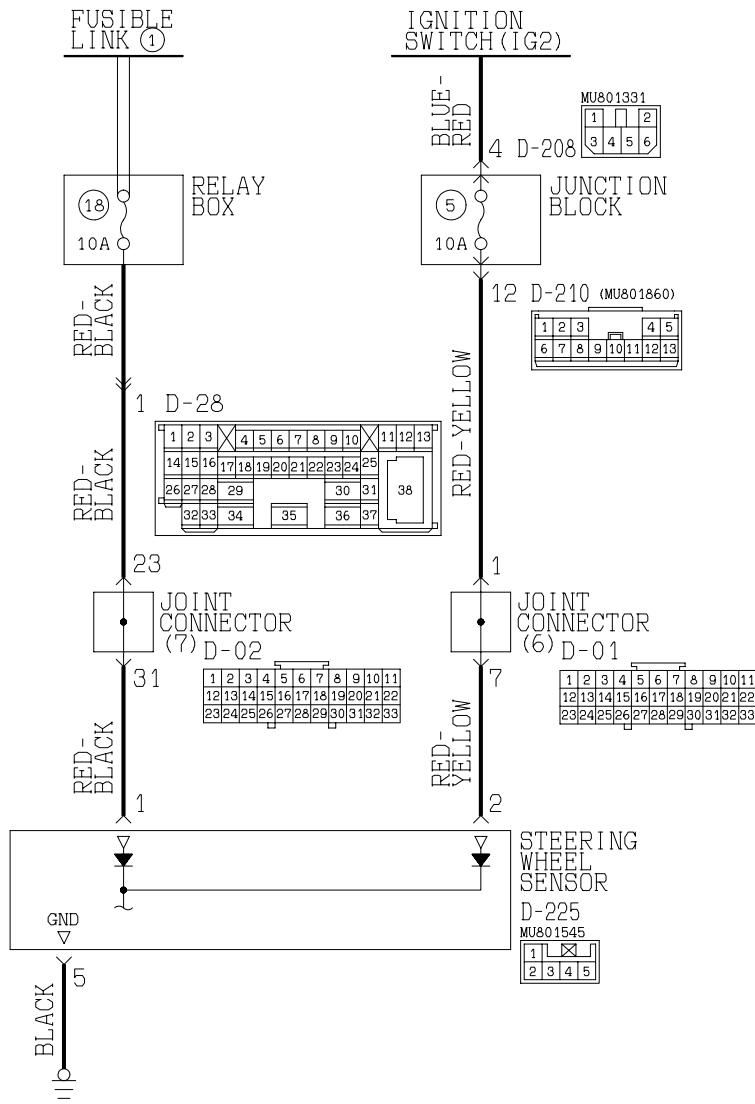
Q: Does DTC 62, 63, 64, 65, 71, 72, 73, 76 or 77 reset?

YES : Return to Step 1.

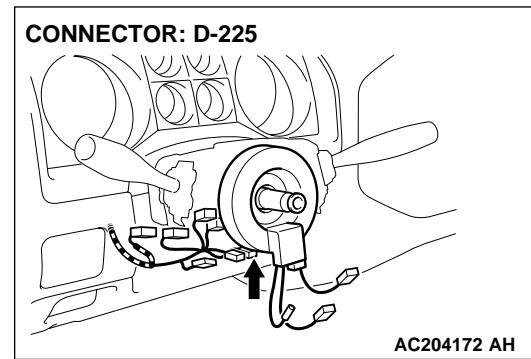
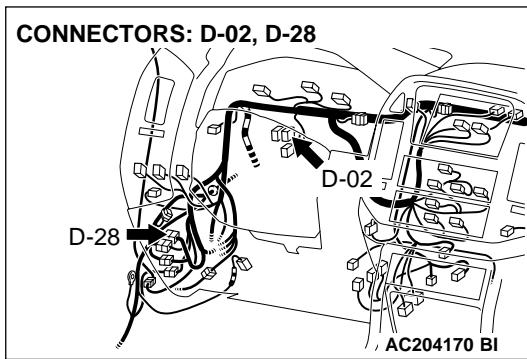
NO : The procedure is complete.

DTC 66, 68, 83: Trouble in steering wheel sensor system

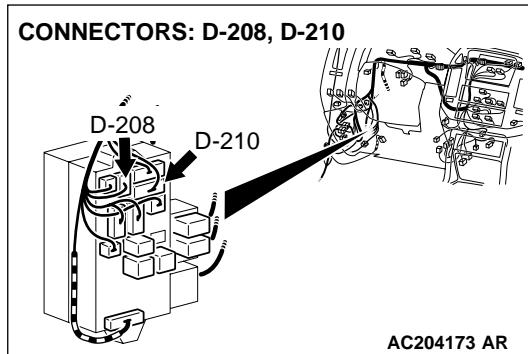
Steering Wheel Sensor Power Supply Circuit



AC204614



AC204172 AH



CIRCUIT OPERATION

The M-ASTC-ECU gathers information regarding the steering operation, through the CAN bus line from the steering wheel sensor.

M-ASTC DTC SET CONDITION

DTC 66, 68 or 83 is set if there is a fault in the data which M-ASTC-ECU receives from the steering wheel sensor. In this case, the steering wheel sensor is sending data to the ECU, but the data contains a fault.

TROUBLESHOOTING HINTS

The most likely causes for DTC 66, 68 or 83 to set are:

- The steering wheel sensor is defective.
- Damaged harness wires and connectors
- The M-ASTC-ECU is defective.

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB991502: Scan Tool (MUT-II)

STEP 1. Using scan tool MB991502, check data list item 25.

CAUTION

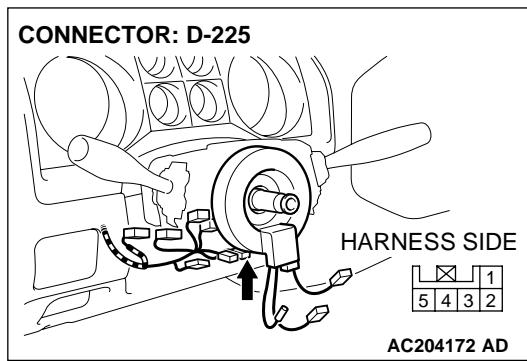
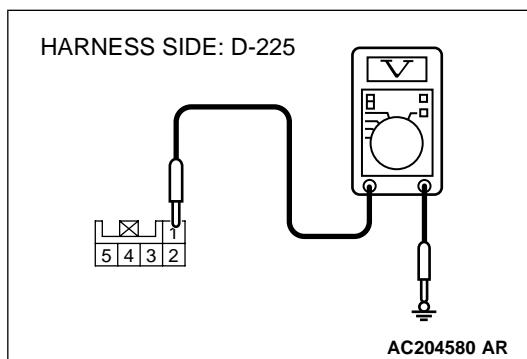
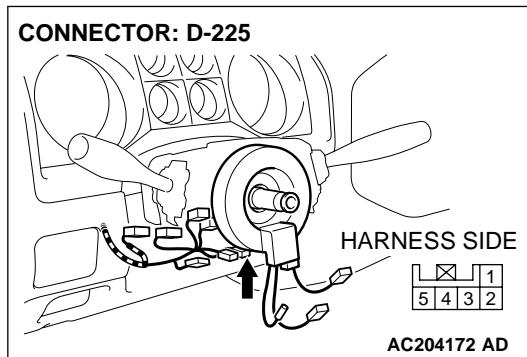
To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

- (1) Connect scan tool MB991502 to the data link connector (16-pin).
- (2) Turn the ignition switch to the "ON" position.
- (3) When the steering wheel is turned, data list item 25 should change.

Q: When the steering wheel is turned, does data list item 25 change?

YES : Go to Step 11.

NO : Go to Step 2.



STEP 2. Check the battery power supply to the steering wheel sensor. Measure at steering wheel sensor connector D-225.

(1) Disconnect steering wheel sensor connector D-225, and measure the voltage at the harness-side connector.

(2) Measure the voltage between steering wheel sensor connector D-225 terminal 1 and body ground.

- The voltage should measure battery voltage (approximately 12 volts).

Q: Does the voltage measure battery voltage (approximately 12 volts)?

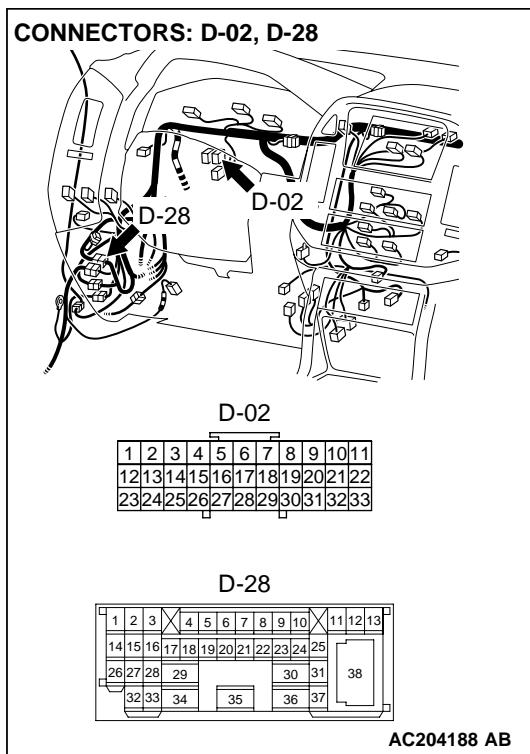
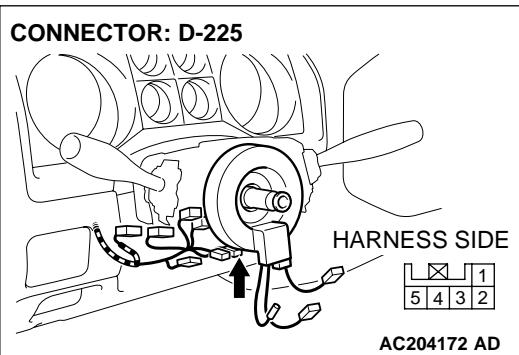
YES : Go to Step 5.
NO : Go to Step 3.

STEP 3. Check steering wheel sensor connector D-225.

Q: Is steering wheel sensor connector D-225 in good condition?

YES : Go to Step 4.
NO : Repair or replace the connector, and then go to Step 12.

STEP 4. Check the wiring harness between steering wheel sensor connector D-225 terminal 1 and fusible link No.1.

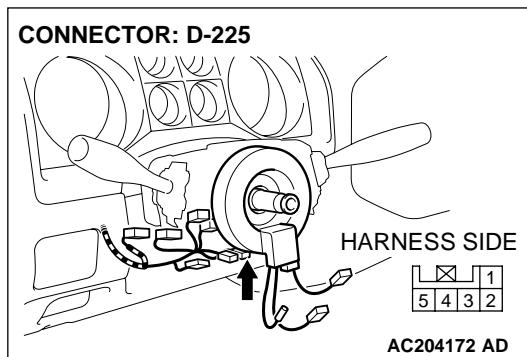
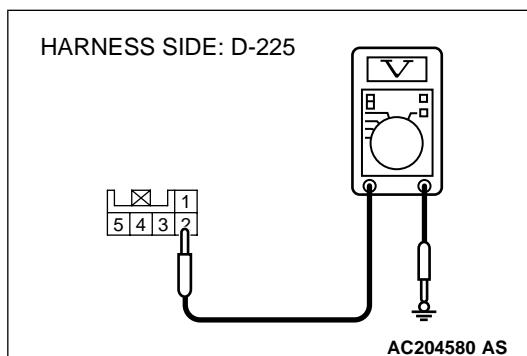
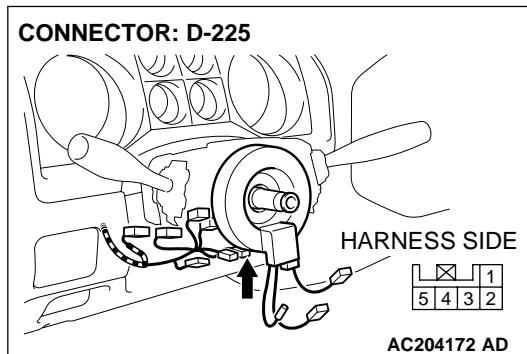


NOTE: Also check joint connector D-02 and intermediate connector D-28 for loose, corroded, or damaged terminals, or terminals pushed back in the connectors. If joint connector D-02 or intermediate connector D-28 are damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection [P.00E-2](#). If the connector has been repaired or replaced, go to Step 12.

Q: Is the wiring harness between steering wheel sensor connector D-225 terminal 1 and the fusible link No.1 in good condition?

YES : Go to Step 12.

NO : Repair the wiring harness, and then go to Step 12.



STEP 5. Check the battery power supply to the steering wheel sensor. Measure at steering wheel sensor connector D-225.

- (1) Disconnect steering wheel sensor connector D-225, and measure the voltage at the harness-side connector.
- (2) Turn the ignition switch to the "ON" position.

- (3) Measure the voltage between steering wheel sensor connector D-225 terminal 2 and body ground.

- The voltage should measure battery voltage (approximately 12 volts).

Q: Does the voltage measure battery voltage (approximately 12 volts)?

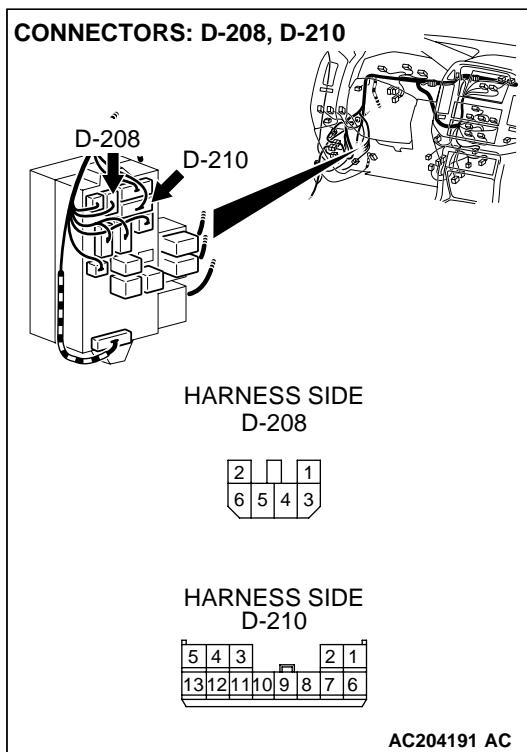
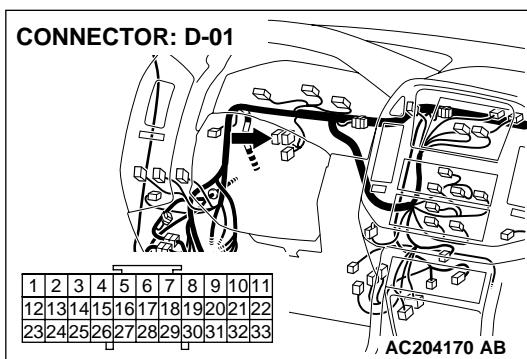
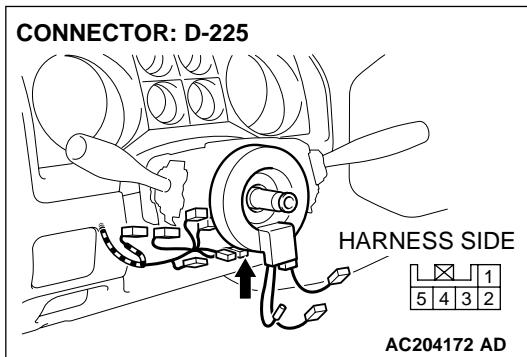
YES : Go to Step 8.
NO : Go to Step 6.

STEP 6. Check steering wheel sensor connector D-225.

Q: Is steering wheel sensor connector D-225 in good condition?

YES : Go to Step 7.
NO : Repair or replace the connector, and then go to Step 12.

STEP 7. Check the wiring harness between steering wheel sensor connector D-225 terminal 2 and ignition switch (IG2).



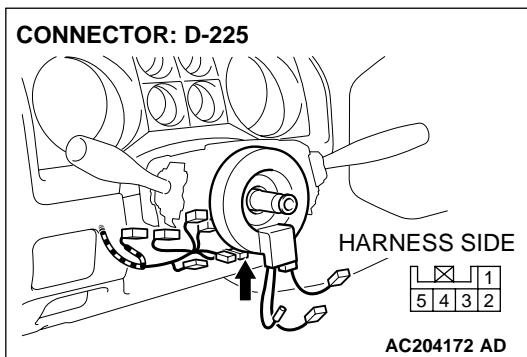
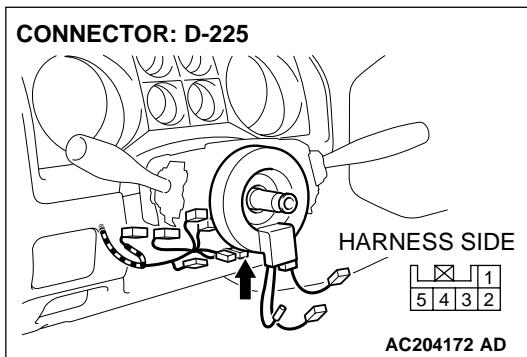
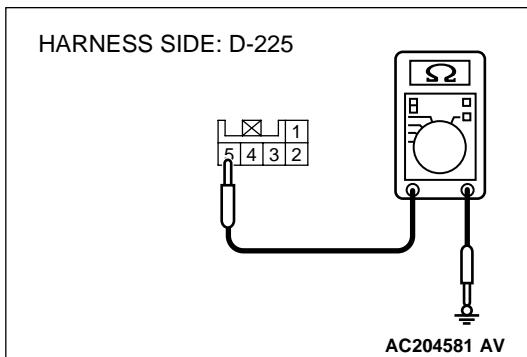
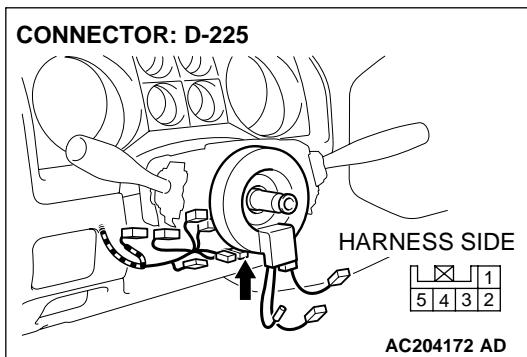
NOTE: Also check joint connector D-01 and junction block connector D-208 and D-210 for loose, corroded, or damaged terminals, or terminals pushed back in the connectors. If joint connector D-01 or junction block connector D-208 or D-210 are damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection

P.00E-2. If the connector has been repaired or replaced, go to Step 12.

Q: Is the wiring harness between steering wheel sensor connector D-225 terminal 2 and the ignition switch (IG2) in good condition?

YES : Go to Step 12.

NO : Repair the wiring harness, and then go to Step 12.



STEP 8. Check the steering wheel sensor for ground circuit. Measure at steering wheel sensor connector D-225.

(1) Disconnect steering wheel sensor connector D-225, and measure the resistance at the harness-side connector.

(2) Measure the resistance between steering wheel sensor connector D-225 terminal 5 and body ground.

- The resistance should measure 2 ohms or less.

Q: Does the resistance measure 2 ohms or less?

YES : Go to Step 11.

NO : Go to Step 9.

STEP 9. Check steering wheel sensor connector D-225.

Q: Is steering wheel sensor connector D-225 in good condition?

YES : Go to Step 10.

NO : Repair or replace the connector, and then go to Step 12.

STEP 10. Check the wiring harness between steering wheel sensor connector D-225 terminal 5 and the body ground.

Q: Is the wiring harness between steering wheel sensor connector D-225 terminal 5 and the body ground in good condition?

YES : Go to Step 12.

NO : Repair the wiring harness, and then go to Step 12.

STEP 11. Replace the steering wheel sensor.

Replace the steering wheel sensor, and check that the DTC sets.

Q: Does the M-ASTC-ECU set any DTC?

YES : Replace the M-ASTC-ECU, and then go to Step 12.

NO : The procedure is complete.

STEP 12. Recheck for diagnostic trouble code.

Q: Does DTC 66, 68 or 83 reset?

YES : Return to Step 1.

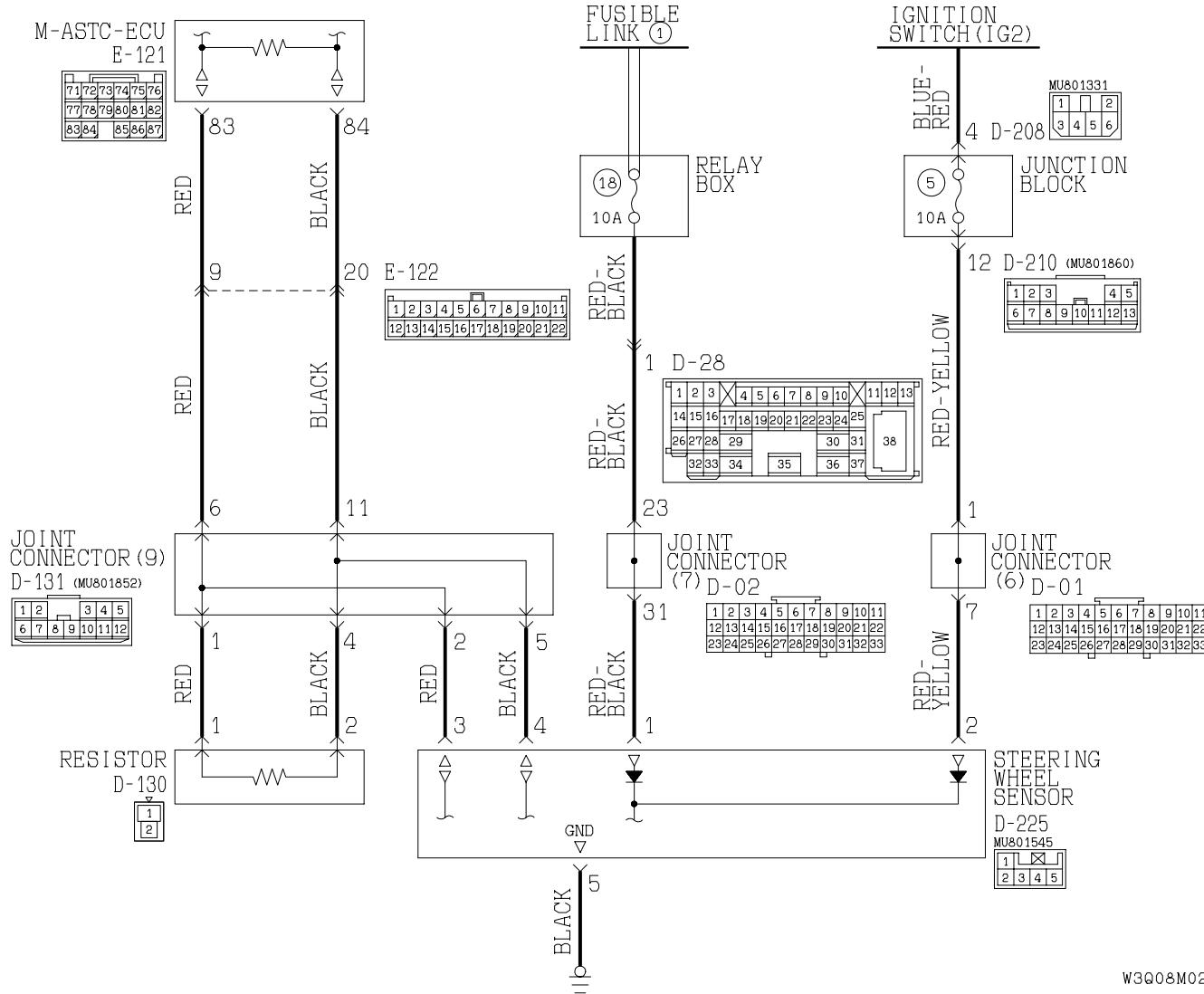
NO : The procedure is complete.

DTC 67: Communication error in steering wheel sensor

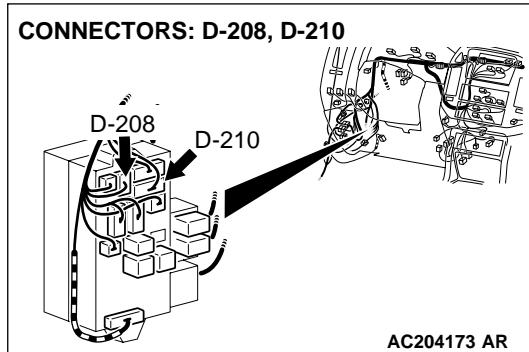
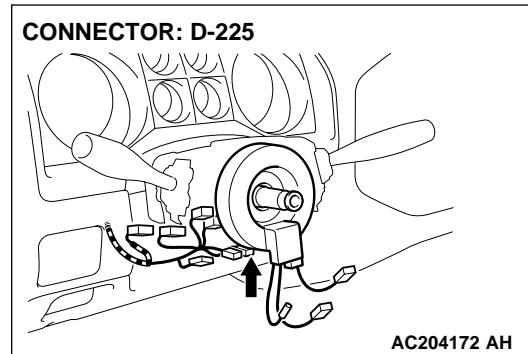
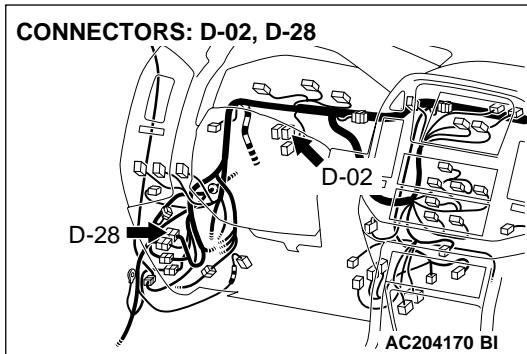
CAUTION

If the diagnostic trouble code(s), which indicate a communication error in the steering wheel sensor, has been set, diagnose the CAN main bus line.

Steering Wheel Sensor Communication Circuit



W3Q08M02AA
AC205072AB



CIRCUIT OPERATION

The M-ASTC-ECU gathers information regarding the steering operation, through the CAN bus line from the steering wheel sensor.

M-ASTC DTC SET CONDITION

DTC 67 is set if the M-ASTC-ECU cannot gather information from the steering wheel sensor at all.

TROUBLESHOOTING HINTS

The most likely causes for DTC 67 to set are:

- The CAN bus line is defective.
- Damaged connector(s)
- The steering wheel sensor is defective.
- The M-ASTC-ECU is defective.

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB991502: Scan Tool (MUT-II)

STEP 1. Diagnose CAN main bus line.

CAUTION

If DTC 67 is set, diagnose the CAN main bus line. Diagnose the CAN main bus line. Refer to [P.35C-60](#).

Q: Have you completed checking or repairing the CAN main bus line?

YES :

- If the CAN main bus line is repaired, go to Step 11
- If the CAN main bus line is not defective, go to Step 2.

NO : Diagnose the CAN main bus line. Refer to [P.35C-60](#).

STEP 2. Using scan tool MB991502, check data list item 25.**⚠ CAUTION**

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

- (1) Connect scan tool MB991502 to the data link connector (16-pin).
- (2) Turn the ignition switch to the "ON" position.
- (3) When the steering wheel is turned, data list item 25 should change.

Q: When the steering wheel is turned, does data list item 25 change?

YES : Go to Step 10.

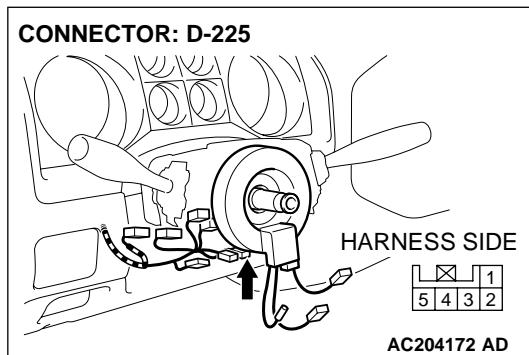
NO : Go to Step 3.

STEP 3. Check steering wheel sensor connector D-225.

Q: Is steering wheel sensor connector D-225 in good condition?

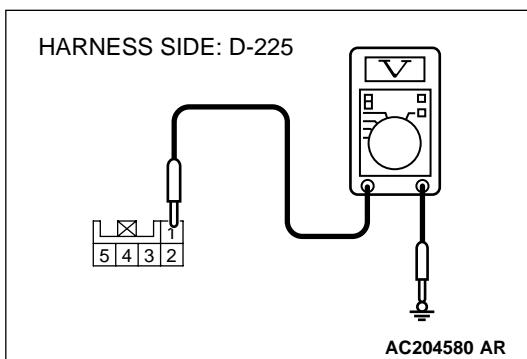
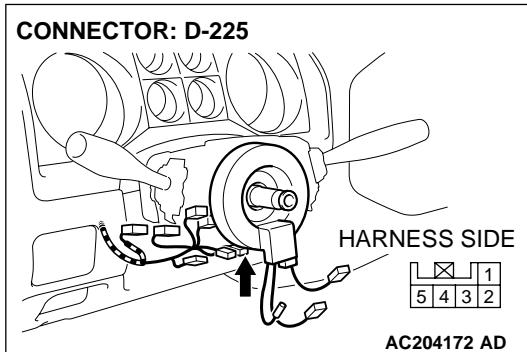
YES : Go to Step 11.

NO : Repair or replace the connector, and then go to Step 11.



STEP 4. Check the battery power supply to the steering wheel sensor. Measure at steering wheel sensor connector D-225.

(1) Disconnect steering wheel sensor connector D-225, and measure the voltage at the harness-side connector.



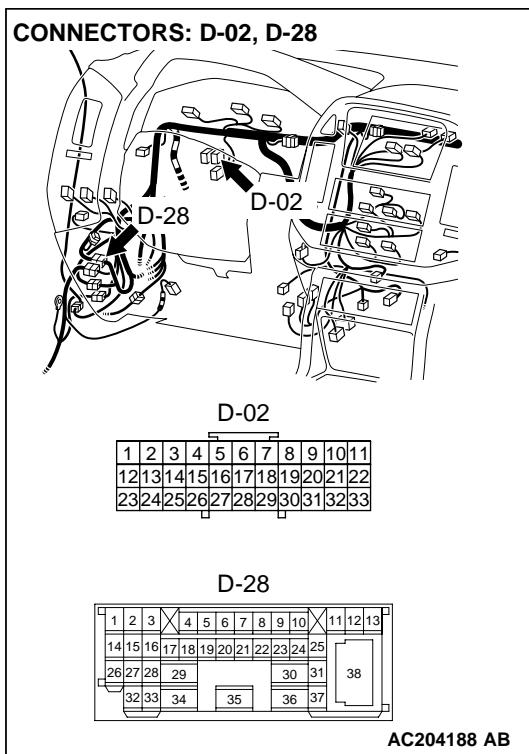
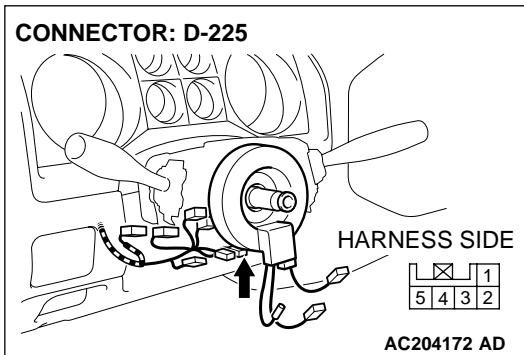
(2) Measure the voltage between steering wheel sensor connector D-225 terminal 1 and body ground.

- The voltage should measure battery voltage (approximately 12 volts).

Q: Does the voltage measure battery voltage (approximately 12 volts)?

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

STEP 5. Check the wiring harness between steering wheel sensor connector D-225 terminal 1 and fusible link No.1.

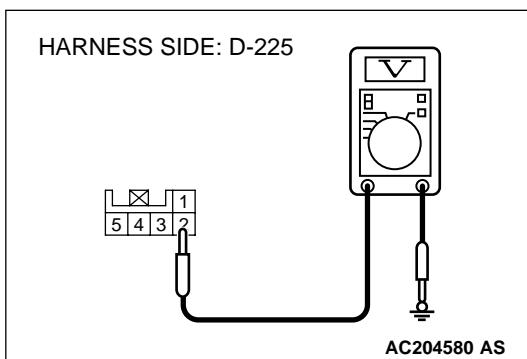
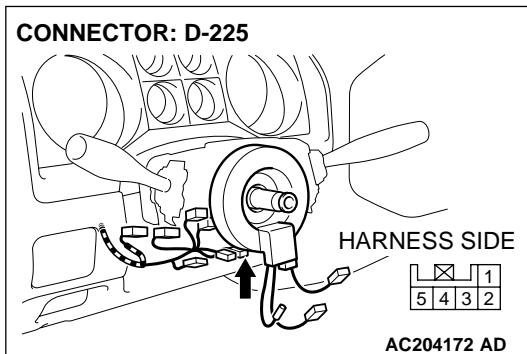


NOTE: Also check joint connector D-02 and intermediate connector D-28 for loose, corroded, or damaged terminals, or terminals pushed back in the connectors. If joint connector D-02 or intermediate connector D-28 are damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection [P.00E-2](#). If the connector has been repaired or replaced, go to Step 11.

Q: Is the wiring harness between steering wheel sensor connector D-225 terminal 1 and the fusible link No.1 in good condition?

YES : Go to Step 11.

NO : Repair the wiring harness, and then go to Step 11.



STEP 6. Check the battery power supply to the steering wheel sensor. Measure at steering wheel sensor connector D-225.

- (1) Disconnect steering wheel sensor connector D-225, and measure the voltage at the harness-side connector.
- (2) Turn the ignition switch to the "ON" position.

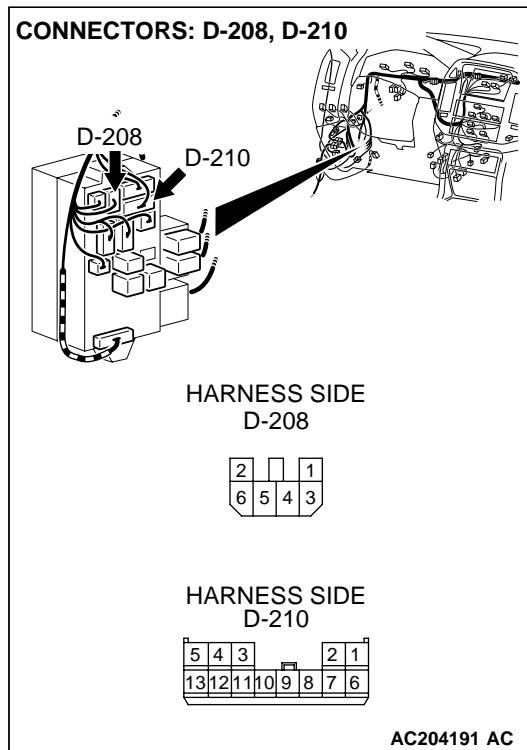
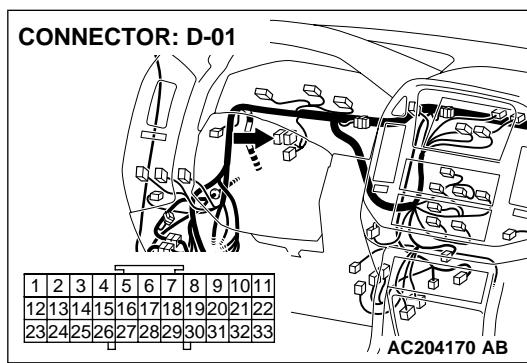
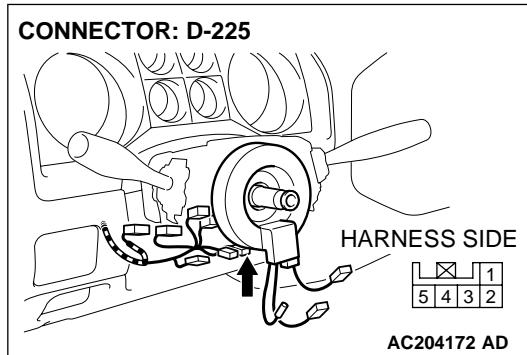
- (3) Measure the voltage between steering wheel sensor connector D-225 terminal 2 and body ground.

- The voltage should measure battery voltage (approximately 12 volts).

Q: Does the voltage measure battery voltage (approximately 12 volts)?

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

STEP 7. Check the wiring harness between steering wheel sensor connector D-225 terminal 2 and ignition switch (IG2).



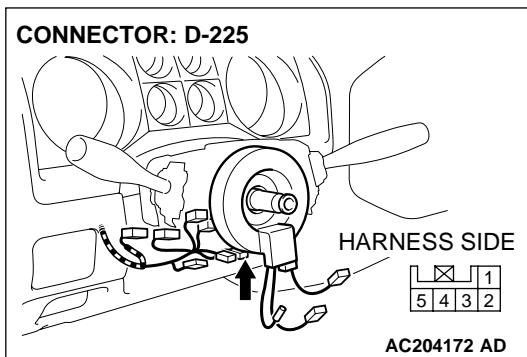
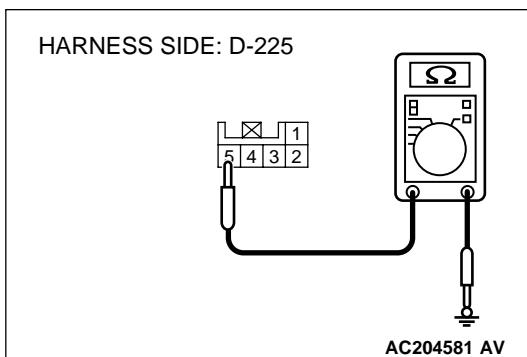
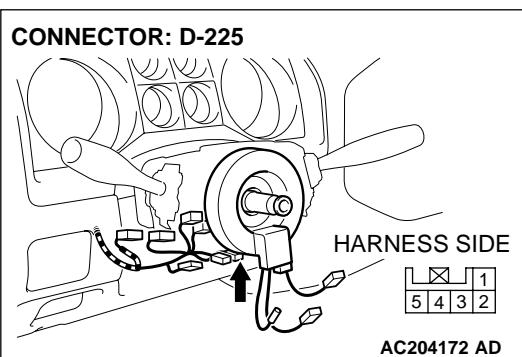
NOTE: Also check joint connector D-01 and junction block connector D-208 and D-210 for loose, corroded, or damaged terminals, or terminals pushed back in the connectors. If joint connector D-01 or junction block connector D-208 or D-210 are damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection

P.00E-2. If the connector has been repaired or replaced, go to Step 11.

Q: Is the wiring harness between steering wheel sensor connector D-225 terminal 2 and the ignition switch (IG2) in good condition?

YES : Go to Step 11.

NO : Repair the wiring harness, and then go to Step 11.



STEP 8. Check the steering wheel sensor for ground circuit. Measure at steering wheel sensor connector D-225.

(1) Disconnect steering wheel sensor connector D-225, and measure the resistance at the harness-side connector.

(2) Measure the resistance between steering wheel sensor connector D-225 terminal 5 and body ground.

- The resistance should measure 2 ohms or less.

Q: Does the resistance measure 2 ohms or less?

YES : Go to Step 10.

NO : Go to Step 9.

STEP 9. Check the wiring harness between steering wheel sensor connector D-225 terminal 5 and the body ground.

Q: Is the wiring harness between steering wheel sensor connector D-225 terminal 5 and the body ground in good condition?

YES : Go to Step 11.

NO : Repair the wiring harness, and then go to Step 11.

STEP 10. Replace the steering wheel sensor.

Replace the steering wheel sensor, and check that the DTC sets.

Q: Does the M-ASTC-ECU set any DTC?

YES : Replace the M-ASTC-ECU, and then go to Step 11.

NO : The procedure is complete.

STEP 11. Recheck for diagnostic trouble code.

Q: Does DTC 67 reset?

YES : Return to Step 1.

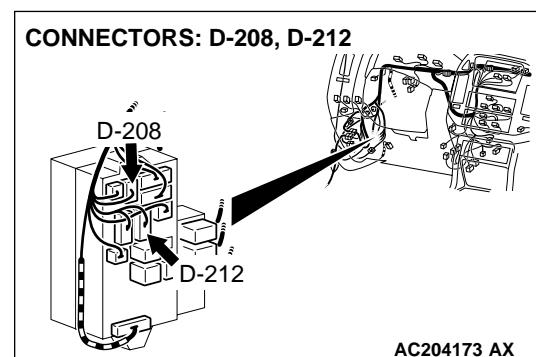
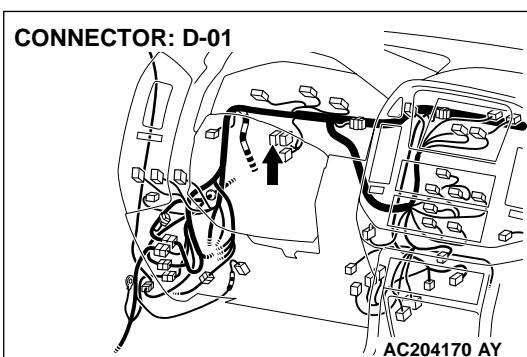
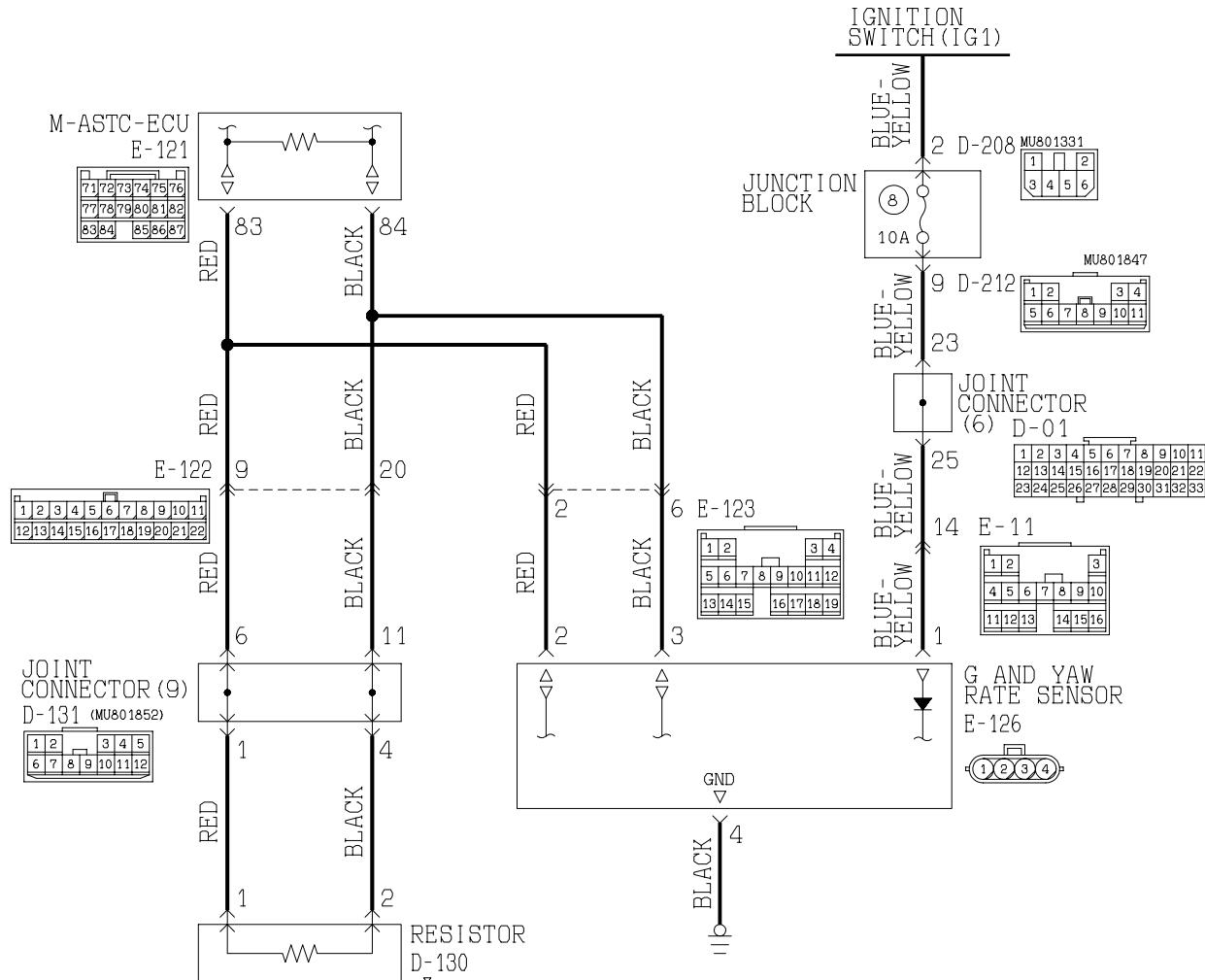
NO : The procedure is complete.

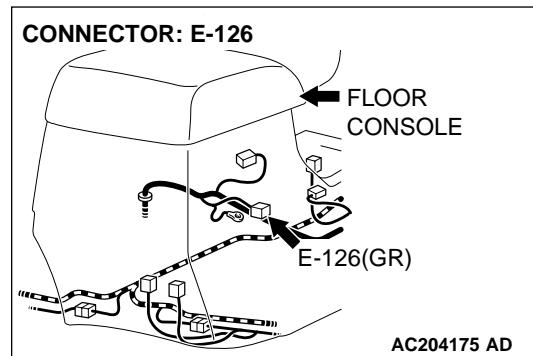
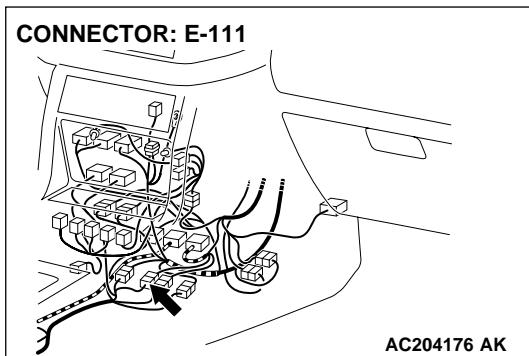
DTC 74: Communication error in G and yaw rate sensor

CAUTION

If the diagnostic trouble code(s), which indicate a communication error in the G and yaw rate sensor, has been set, diagnose the CAN main bus line.

G and Yaw Rate Sensor Communication Circuit





CIRCUIT OPERATION

The M-ASTC-ECU gathers information regarding lateral and longitudinal gravities and yaw rate, through the CAN bus line from the G and yaw rate sensor.

M-ASTC DTC SET CONDITION

DTC 74 is set if the M-ASTC-ECU cannot gather any information from the G and yaw rate sensor.

TROUBLESHOOTING HINTS

The most likely causes for DTC 74 to set are:

- The CAN bus line is defective.
- Damaged connector(s)
- The G and yaw rate sensor is defective.
- The M-ASTC-ECU is defective.

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB991502: Scan Tool (MUT-II)

STEP 1. CAN main bus line diagnostics

CAUTION

If DTC 74 is set, diagnose the CAN main bus line. Diagnose the CAN main bus line. Refer to [P.35C-60](#).

Q: Have you completed checking or repairing the CAN main bus line?

YES :

- If the CAN main bus line is repaired, go to Step 9 .
- If the CAN main bus line is not defective, go to Step 2.

NO : Diagnose the CAN main bus line. Refer to [P.35C-60](#).

STEP 2. Using scan tool MB991502, check data list items 27, 28 and 29.

(1) Confirm that the vehicle is not canted to one side or corner.

⚠ CAUTION

To prevent damage to scan tool MB991502, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991502.

(2) Connect scan tool MB991502 to the data link connector (16-pin).

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

(4) Check that the G and yaw rate sensor output signal is approximately 0 m/s².

(5) When the G and yaw rate sensor is inclined, the readings on data list items 27, 28 and 29 should change.

Q: When the G and yaw rate sensor is inclined, do the readings on data list items 27, 28 and 29 change?

YES : Go to Step 8.

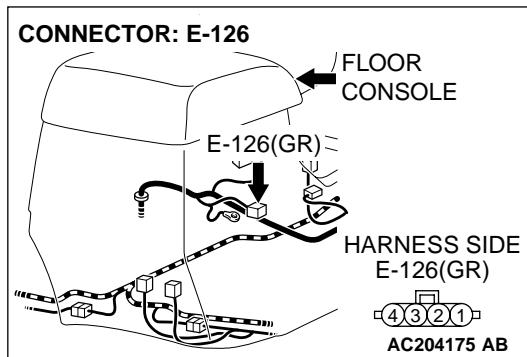
NO : Go to Step 3.

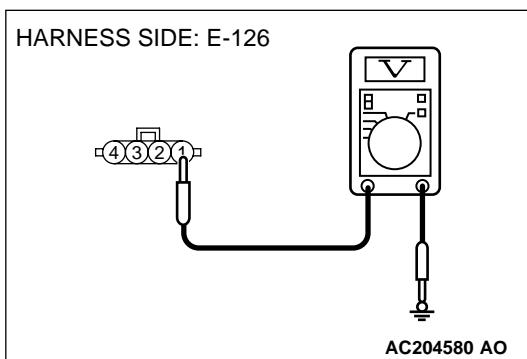
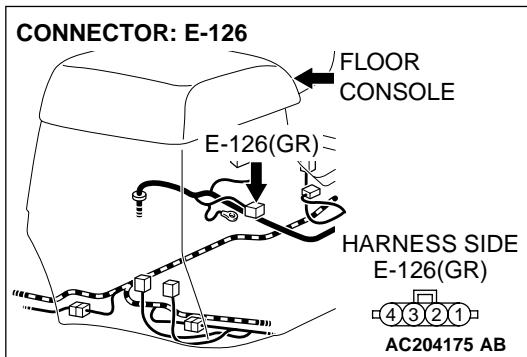
STEP 3. Check G and yaw rate sensor connector E-126.

Q: Is G and yaw rate sensor connector E-126 in good condition?

YES : Go to Step 4.

NO : Repair or replace the connector, and then go to Step 10.





STEP 4. Check the power supply system from the ignition switch (IG1) to the G and yaw rate sensor. Measure at G and yaw rate sensor connector E-126.

- (1) Disconnect G and yaw rate sensor connector E-126, and measure the voltage at the harness-side connector.
- (2) Turn the ignition switch to the "ON" position.

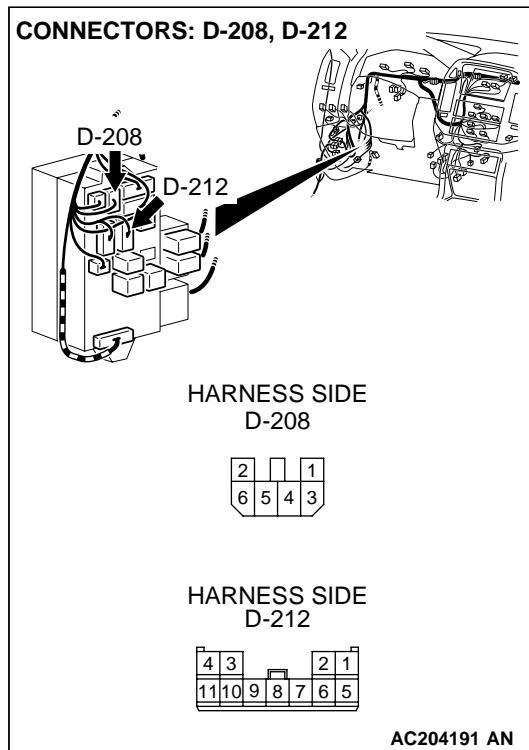
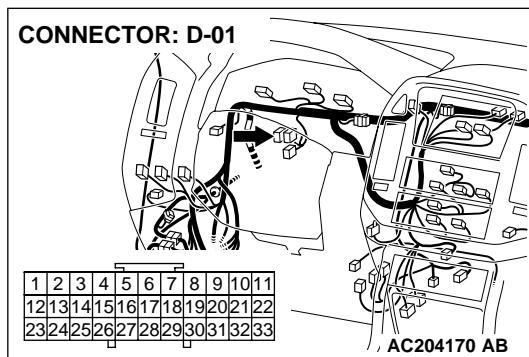
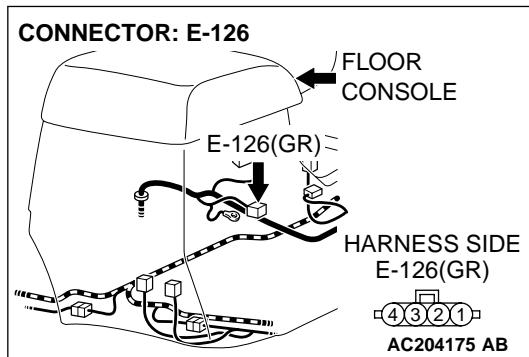
- (3) Measure the voltage between G and yaw rate sensor connector E-126 terminal 1 and body ground.

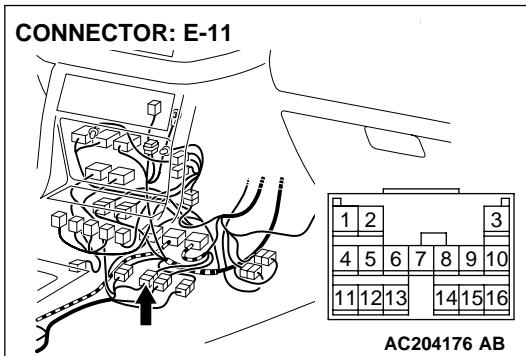
- The voltage should measure battery voltage (approximately 12 volts).

Q: Does the voltage measure battery voltage (approximately 12 volts)?

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

STEP 5. Check the wiring harness between G and yaw rate sensor connector E-126 terminal 1 and the ignition switch (IG1).



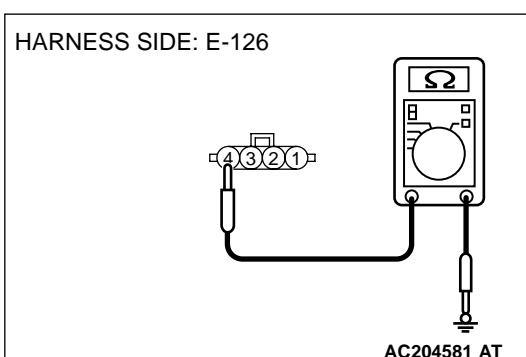
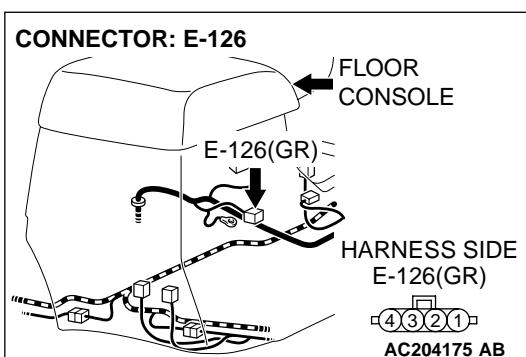


NOTE: Also check joint connector D-01 and junction block connector D-208 and D-212 and intermediate connector E-11 for loose, corroded, or damaged terminals, or terminals pushed back in the connectors. If joint connector D-01 or junction block connector D-208 or D-212 or intermediate connector E-11 are damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P.00E-2. If the connector has been repaired or replaced, go to Step 9.

Q: Is the wiring harness between G and yaw rate sensor connector E-126 terminal 1 and the ignition switch (IG1) in good condition?

YES : Go to Step 9.

NO : Repair the wiring harness, and then go to Step 9.



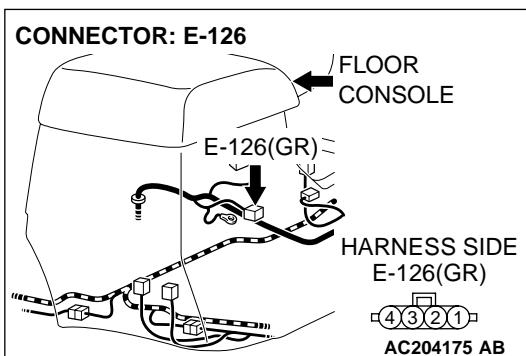
(2) Measure the resistance between G and yaw rate sensor connector E-126 terminal 4 and body ground.

- The resistance should measure 2 ohms or less.

Q: Does the resistance measure 2 ohms or less?

YES : Go to Step 8.

NO : Go to Step 7.



STEP 7. Check the wiring harness between G and yaw rate sensor connector E-126 terminal 4 and body ground.

Q: Is the wiring harness between G and yaw rate sensor connector E-126 terminal 4 and the body ground in good condition?

YES : Go to Step 9.

NO : Repair the wiring harness, and then go to Step 9.

STEP 8. Replace the G and yaw rate sensor.

Replace the G and yaw rate sensor, and check that the DTC sets.

Q: Does the M-ASTC-ECU set DTC 67?

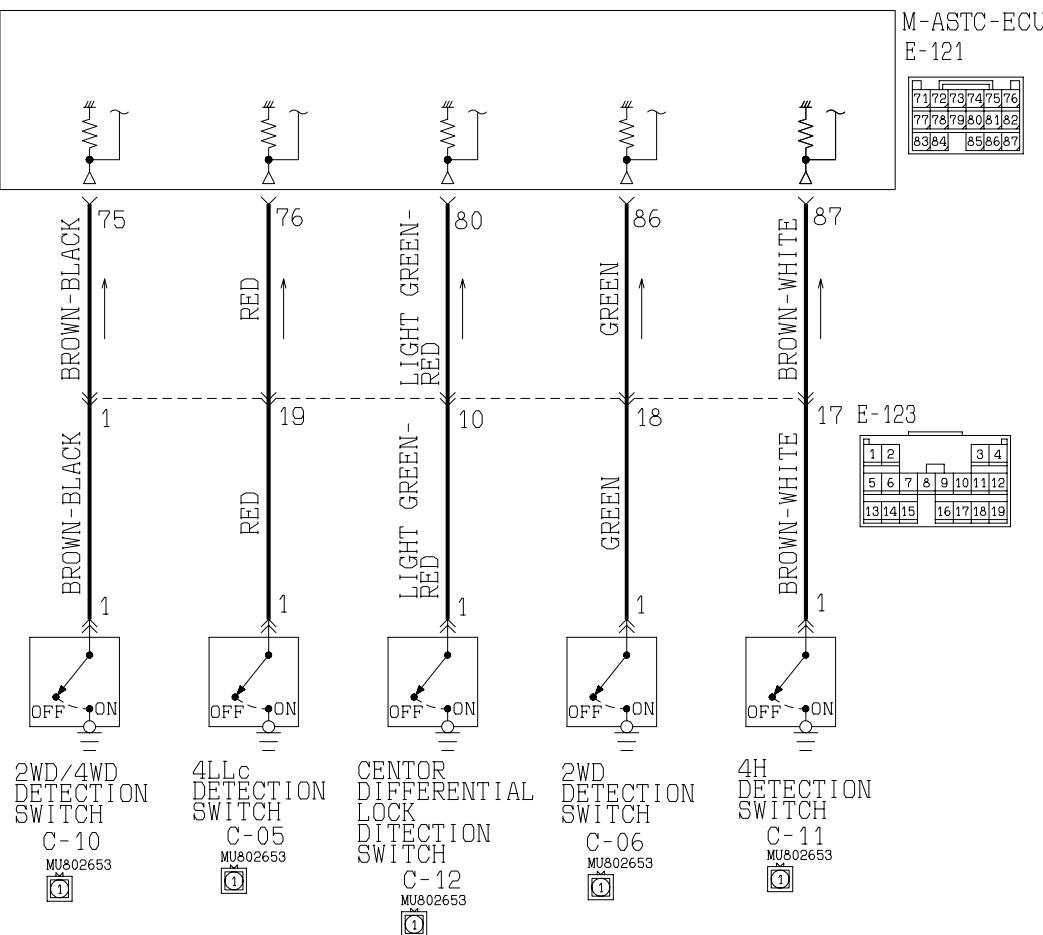
YES : Replace the M-ASTC-ECU, and then go to Step 9.

NO : The procedure is complete.

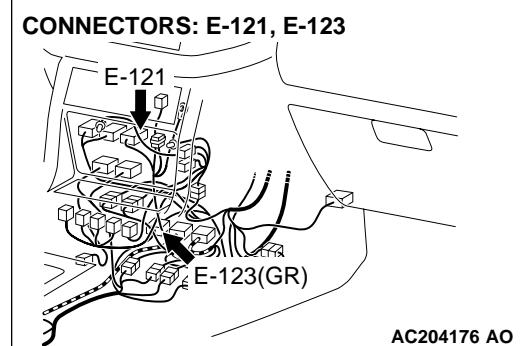
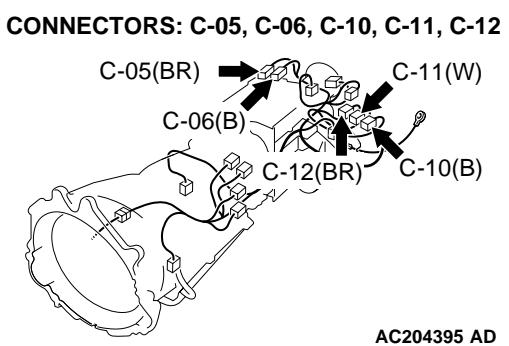
STEP 9. Recheck for diagnostic trouble code.**Q: Does DTC 67 reset?**

YES : Return to Step 1.

NO : The procedure is complete.

DTC 75: Defective transfer switch**Transfer Switch Circuit**

W3Q10M01AA



CIRCUIT OPERATION

If the transfer gear is engaged, a relevant switch is turned on. When the switch is turned on, the current from the M-ASTC-ECU is grounded.

M-ASTC DTC SET CONDITION

DTC 75 is set when the 2WD/4WD detection switch, the center differential detection switch, the 2WD detection switch, 4LLc detection switch or the 4H detection switch or their relevant circuits is defective.

TROUBLESHOOTING HINTS

The most likely causes for DTC 75 to set are:

- The 2WD/4WD detection switch is defective.
- The center differential detection switch is defective.
- The 2WD detection switch is defective.
- The 4LLc detection switch is defective.
- The 4H detection switch is defective.
- Damaged harness wires and connectors
- The M-ASTC-ECU is defective.

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB991502: Scan Tool (MUT-II)

STEP 1. Using scan tool MB991502, check the transfer diagnostic trouble code (DTC).

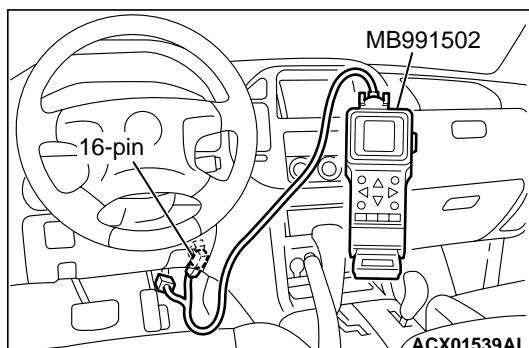
CAUTION

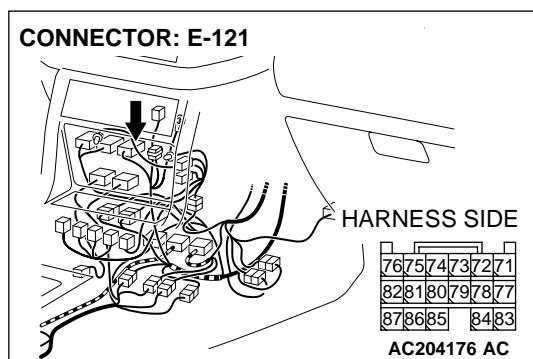
To prevent damage to the scan tool always turn the ignition switch to "LOCK" (OFF) position before connecting or disconnecting the scan tool.

1. Connect scan tool MB991502 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Check the transfer diagnostic trouble code.

Q: Does the transfer set any DTC?

YES : Diagnose the transfer-ECU. Refer to [P.23Ab-43](#).
NO : Go to Step 2.





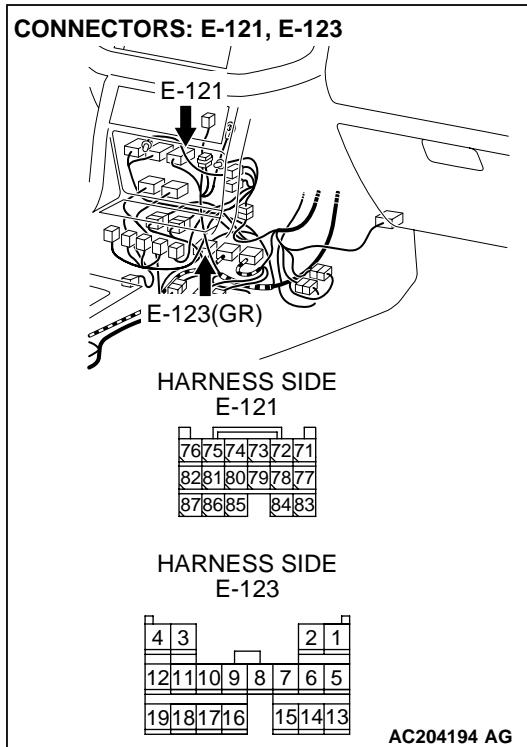
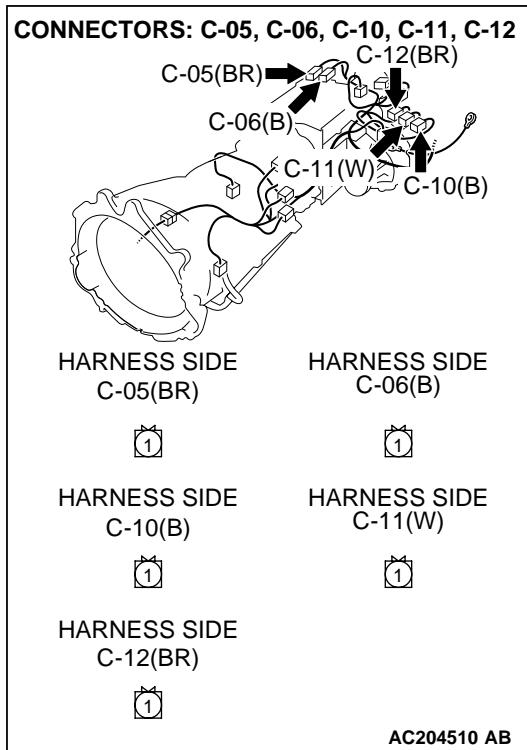
STEP 2. Check M-ASTC-ECU connector E-121.**Q: Is M-ASTC-ECU connector E-121 in good condition?****YES** : Go to Step 3.**NO** : Repair or replace the connector, and then go to Step 4.

STEP 3. Check the wiring harness from the M-ASTC-ECU connector E-121 (terminals 75, 80, 86, 76 and 87) to 2WD/4WD detection switch connector C-10 (terminal 1), the center differential detection switch connector C-12 (terminal 1), the 2WD detection switch connector C-06 (terminal 1), the 4LLc detection switch connector C-05 (terminal 1) and 4H detection switch connector C-11 (terminal 1).

NOTE: Also check intermediate connector E-123 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector E-123 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection [P.00E-2](#). If the connector has been repaired or replaced, go to Step 4.

Q: Is the wiring harness from the M-ASTC-ECU connector E-121 (terminals 75, 80, 86, 76 and 87) to 2WD/4WD detection switch connector C-10 (terminal 1), the center differential detection switch connector C-12 (terminal 1), the 2WD detection switch connector C-06 (terminal 1), the 4LLc detection switch connector C-05 (terminal 1) and 4H detection switch connector C-11 (terminal 1) in good condition?

YES : Replace the M-ASTC-ECU, and then go to Step 4.
NO : Repair the wiring harness, and then go to Step 4.



STEP 4. Check the diagnostic trouble code.

Q: Does DTC 75 reset?

YES : Return to Step 1.

NO : The procedure is complete.

DTC 81: G sensor not initializedDTC 82: Yaw rate sensor not initialized

M-ASTC DTC SET CONDITION

DTCs 81 and 82 will be set when a new G and yaw rate sensor is not initialized (i.e. reference point positioning) executing No.16 "G SNSR: " and No.15 "YAWRATE SNS: 0" on the Actuator test.

TROUBLESHOOTING HINTS

The most likely causes for DTC 81, 82 to set are:

- The G and yaw rate sensor is defective
- The M-ASTC-ECU is defective.

DIAGNOSIS**Required Special Tools:**

- MB991502: Scan Tool (MUT-II)

STEP 1. Execute the Actuator test.

1. Confirm that the vehicle is not canted to one side or corner.
2. Place the selector lever in the "P" position.
3. Execute the Actuator test as follows.
 - No.15 YAWRATE SNS: 0
 - No.16 G SNSR: 0

Q: Does the M-ASTC-ECU set DTC 81 or 82?YES : Replace the G and yaw rate sensor. Refer to [P.35C-207](#). Then go to STEP 2.

NO : Go to Step 2.

STEP 2. Check the diagnostic trouble code.**Q: Does DTC 81, 82 reset?**

YES : Replace the M-ASTC-ECU.

NO : The procedure is complete.

DTC 83: Steering wheel sensor not initialized**M-ASTC DTC SET CONDITION**

DTC 83 will be set when the battery is removed and then the neutral point of the steering wheel sensor is erased. The Active skid control system OFF indicator light may also be illuminated.

TROUBLESHOOTING HINTS

The most likely causes for DTC 83 to set are:

- The steering wheel sensor is defective
- The M-ASTC-ECU is defective.

DIAGNOSIS**Required Special Tools:**

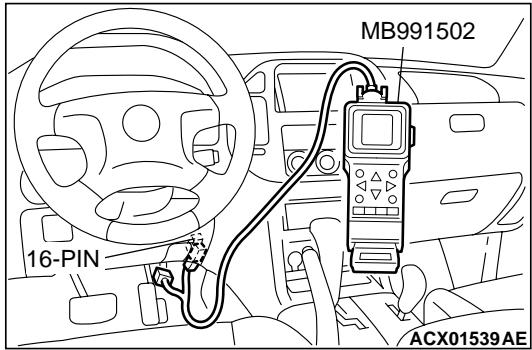
- MB991502: Scan Tool (MUT-II)

STEP 1. Make the system learn the neutral point of the steering wheel sensor.

Make the system learn the neutral point by following the procedure below.

Using scan tool MB991502

1. Connect scan tool MB991502 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Turn the steering wheel 8° or more, and then return it to the neutral (straight forward) position.
4. Execute item No.14 "ST SNSR: 0 " on the Actuator test.
5. Ensure that the Active skid control system OFF indicator light is off.
6. Turn the ignition switch to the "LOCK" (OFF) position.
7. Disconnect scan tool MB991502.

**Not using scan tool MB991502****CAUTION**

1. If a different diameter or size of tires are equipped, the M-ASTC-ECU may not learn the neutral position.
Turn the steering wheel 8° or more, and then return the steering wheel to straight-ahead position.
2. Drive the vehicle straight forward at 35 km/h (25 mph) for approximately one second.
3. Ensure that the Active skid control system OFF indicator light is off.

Q: Does the M-ASTC-ECU set DTC 83?

YES : Replace the steering wheel sensor. Refer to [P.35C-207](#). then go to STEP 2.

NO : Go to Step 2.

STEP 2. Check the diagnostic trouble code.**Q: Does DTC 83 reset?**

YES : Replace the M-ASTC-ECU.

NO : The procedure is complete.

DTC 84: Transfer switch not initialized

CIRCUIT OPERATION

If the transfer gear is engaged, a relevant switch is turned on. When the switch is turned on, the current from the M-ASTC-ECU is grounded.

M-ASTC DTC SET CONDITION

DTC 84 will be set when a new M-ASTC-ECU is not initialized.

TROUBLESHOOTING HINTS

The most likely causes for DTC 84 to set are:

- The transfer switch information in the M-ASTC-ECU is not initialized.
- The M-ASTC-ECU is defective.

DIAGNOSIS**Required Special Tools:**

- MB991223: Harness Set
- MB991502: Scan Tool (MUT-II)

Initialize the M-ASTC-ECU.

Initialize the M-ASTC-ECU. Refer to [P.35C-205](#).

Q: Is DTC 84 set again?

YES : Replace the M-ASTC-ECU.

NO : Retest the system.

DTC 85: Master cylinder pressure sensor not initialized

CIRCUIT OPERATION

The pressure sensor, which is energized by the M-ASTC-ECU, monitors the brake fluid pressure applied by the master cylinder. If this pressure becomes low, the signal from this pressure sensor turns on the pressure switch.

M-ASTC DTC SET CONDITION

DTC 85 will be set when a new M-ASTC-ECU is not initialized.

TROUBLESHOOTING HINTS

The most likely causes for DTC 84 to set are:

- M-ASTC-ECU not initialized
- The M-ASTC-ECU is defective.

DIAGNOSIS**Required Special Tools:**

- MB991223: Harness Set
- MB991502: Scan Tool (MUT-II)

Initialize the M-ASTC-ECU.

Initialize the M-ASTC-ECU. Refer to [P.35C-205](#).

Q: Is DTC 85 set again?

YES : Replace the M-ASTC-ECU.

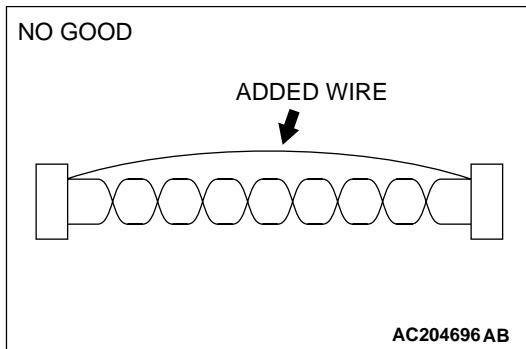
NO : Retest the system.

CAN BUS LINE DIAGNOSTICS

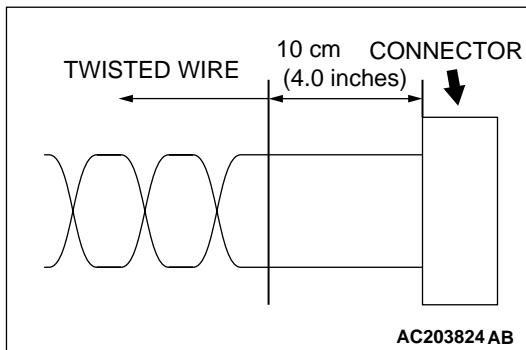
Precautions on how to repair the CAN communication lines

M1353006000016

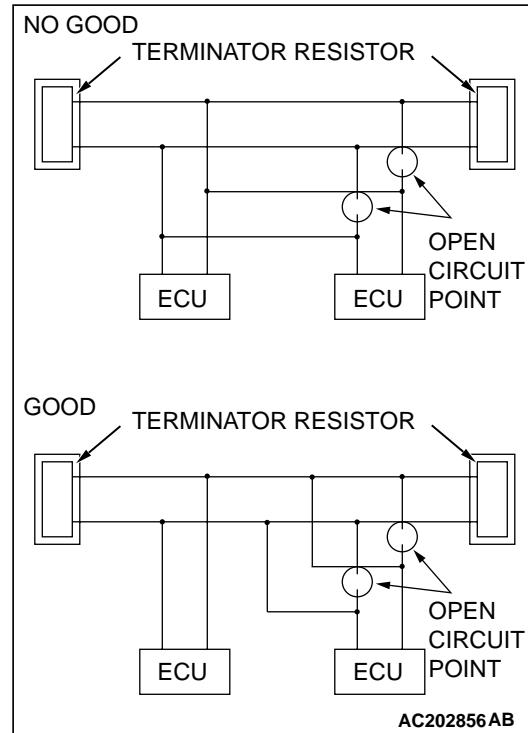
Precautions on how to repair the CAN bus lines



- If the CAN_L or CAN_H line on the main bus line or branch line is repaired, renew all the twisted wires between the end connectors. If the wiring harness is partially repaired, or only CAN_L or CAN_H line is repaired, noise suppression is deteriorated, causing a communication error.



- If the connector or wire on the main bus line or the branch wire is replaced, the frayed end of the twisted wire should be within 10 cm (4.0 inches) from the connector. If it exceeds 10 cm (4.0 inches), twist the wiring harness just like the original twisted wire. If the frayed end exceeds 10 cm (4.0 inches), noise suppression is deteriorated, causing a communication error.



- If a branch wire is repaired, splice a new wire directly into the main bus line. If a new wire is spliced into the branch line, which is connected to another device, a CAN communication error will be caused.

Precautions on how to repair the terminator resistor

If one-side terminator resistor is broken, the CAN communication will continue although noise suppression is deteriorated. In this case, no DTC may be set. Check the system regardless of whether a DTC is set or not. If any damage is found, replace the terminator resistor.

Diagnostic Item 1: CAN main bus line diagnostics

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments connected through the CAN bus lines may be damaged.

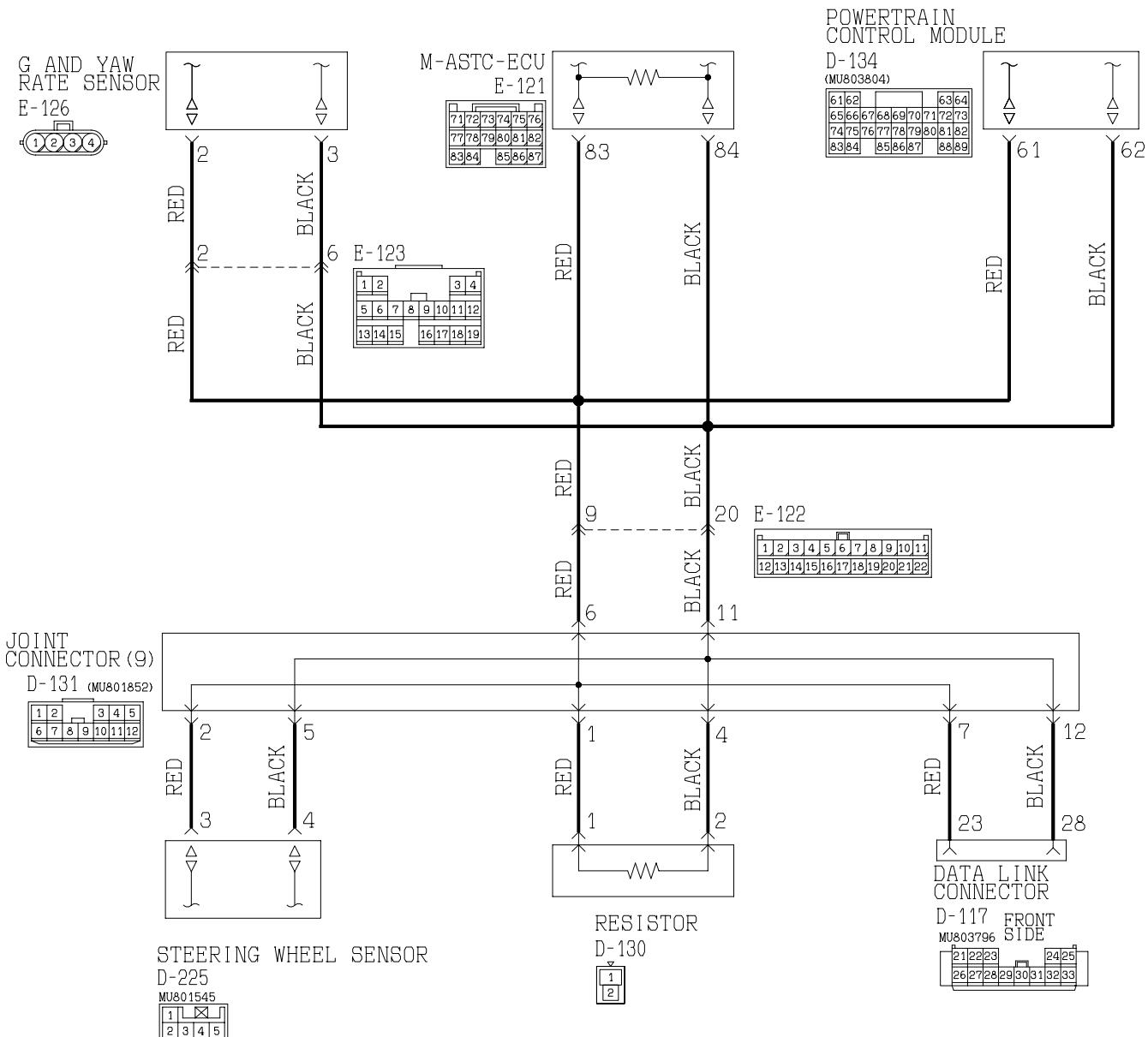
⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments connected through the CAN bus lines may be damaged.

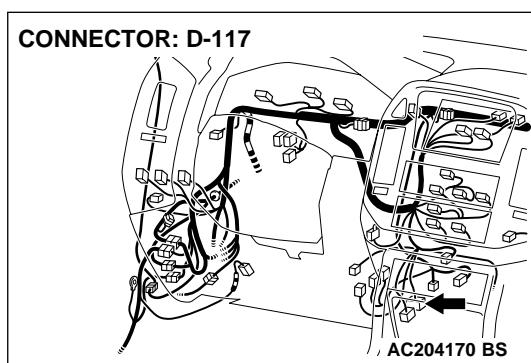
⚠ CAUTION

Always use the test harness when measuring the voltage or resistance at the female connector. If you fail to do so, connectors may be damaged.

Can Bus Communication Circuit



AC204606



CIRCUIT OPERATION

The M-ASTC-ECU receives signals through the CAN bus line from the steering wheel sensor, the G and yaw rate sensor, and the power control module.

TECHNICAL DESCRIPTION (COMMENT)

If the Active skid control system does not work normally, the CAN main bus line or the terminator resistor may be suspected. (ECUs and the sensor may also be suspected, and check the condition of the CAN main bus line according to this diagnosis section.)

TROUBLESHOOTING HINTS

- The CAN main bus line may be defective
- The M-ASTC-ECU integrated or separate terminator resistor may be defective
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector

DIAGNOSIS**Required Special Tools:**

- MB991223: Harness Set

STEP 1. Measure the voltage in the CAN_L line. Measure at data link connector D-117.**CAUTION**

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

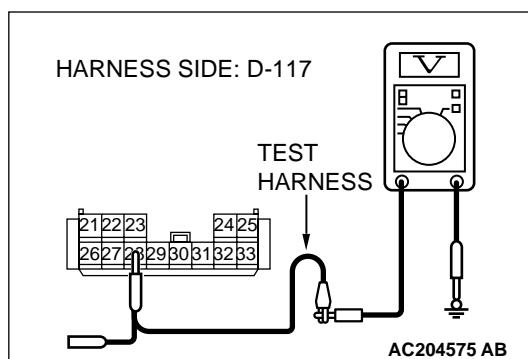
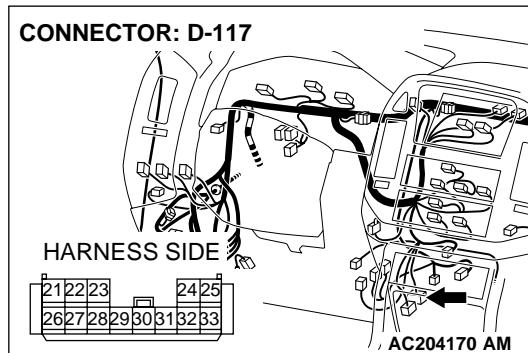
CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments connected through the CAN bus lines may be damaged.

- (1) Disconnect resistor connector D-130 and M-ASTC-ECU connector E-121, and measure the voltage at data link connector D-117.
- (2) Turn the ignition switch to the "ON" position.

CAUTION

Always use the test harness when measuring the voltage or resistance at the female connector. If you fail to do so, connectors may be damaged.



- (3) Measure the voltage between data link connector D-117 terminal 28 and body ground.
 - The voltage should measure 0.5 volts or more, or 4.5 volts or less.

Q: Does the voltage measure 0.5 volts or more, or 4.5 volts or less?

YES : Go to Step 2.

NO : Diagnose the CAN_L side bus line by referring to [P.35C-65](#).

STEP 2. Measure the voltage in the CAN_H line. Measure at DTC connector D-117.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments connected through the CAN bus lines may be damaged.

(1) Disconnect resistor connector D-130 and M-ASTC-ECU connector E-121, and measure the voltage at data link connector D-117.

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

⚠ CAUTION

Always use the test harness when measuring the voltage or resistance at the female connector. If you fail to do so, connectors may be damaged.

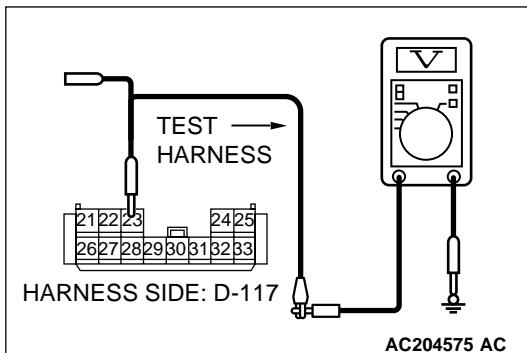
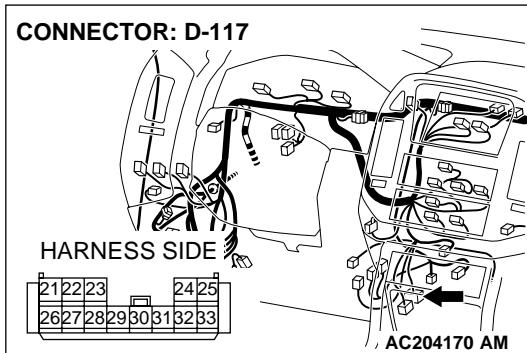
(3) Measure the voltage between data link connector D-117 terminal 23 and body ground.

- The voltage should measure 0.5 volts or more, or 4.5 volts or less.

Q: Does the voltage measure 0.5 volts or more, or 4.5 volts or less?

YES : Go to Step 3.

NO : Diagnose the CAN_H side bus line by referring to [P.35C-92](#).



STEP 3. Check the terminator resistor.**CAUTION**

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments connected through the CAN bus lines may be damaged.

- (1) Measure the resistance at data link connector D-117.
- (2) Turn the ignition switch to the LOCK (OFF) position.

CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments connected through the CAN bus lines may be damaged.

- (3) Disconnect the negative battery terminal.

CAUTION

Always use the test harness when measuring the voltage or resistance at the female connector. If you fail to do so, connectors may be damaged.

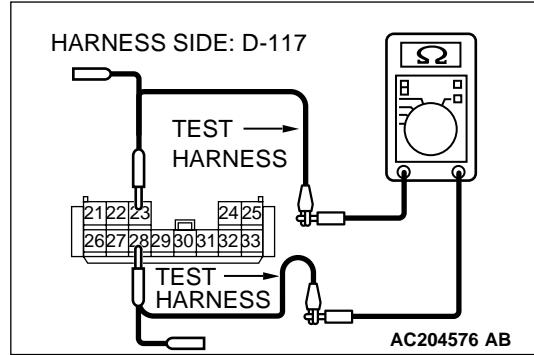
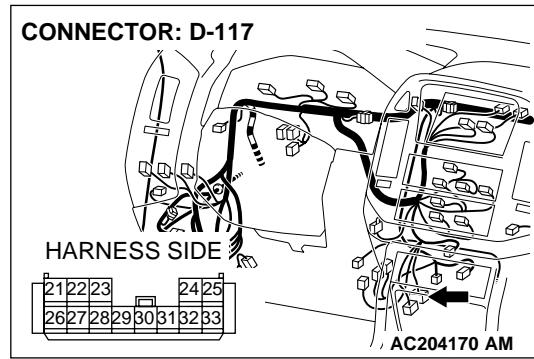
- (4) Measure the resistance between data link connector D-117 terminals 23 and 28.

- The resistance should measure 60 ± 10 ohms.

Q: Does the resistance measure 60 ± 10 ohms?

YES : Go to Step 4.

NO : Diagnose the terminator resistor and the CAN main bus line by referring to [P.35C-119](#).



STEP 4. Check for M-ASTC DTC.

Once the CAN main bus line has been diagnosed, erase all the DTCs, and then recheck for the DTCs.

Q: Is the DTC reset?

YES : Replace the M-ASTC-ECU.

YES <DTC 36 or 38 is set> : Diagnose the CAN bus line (between the main bus line and the power control module). Refer to [P.35C-164](#).

YES <DTC 67 is set> : Diagnose the CAN bus line (between the main bus line and the steering wheel sensor). Refer to [P.35C-168](#).

YES <DTC 74 is set> : Diagnose the CAN bus line (between the main bus line and the G and yaw rate sensor). Refer to [P.35C-174](#).

NO <no DTC is set> : Retest the system.

Diagnostic Item 2: Diagnose the CAN_L side bus line.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

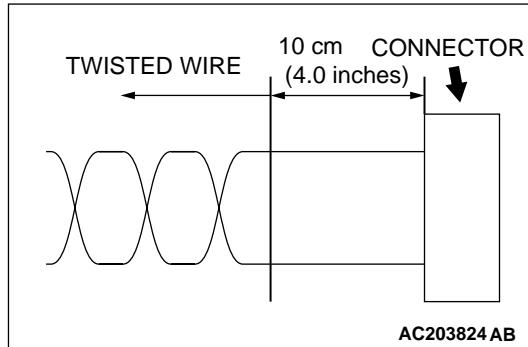
When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments, which are connected through the CAN communication lines, may be damaged.

⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

⚠ CAUTION

AC203824 AB

If there is a problem in the connector(s) (including terminals) or wire(s) of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), cut and repair the defective wire so that the frayed end of the twisted wire should be within 10 cm (4.0 inches). If it exceeds 10 cm (4.0 inches), twist the wiring harness just like the original twisted wire. If the frayed end exceeds 10 cm (4.0 inches), a communication error may be caused.

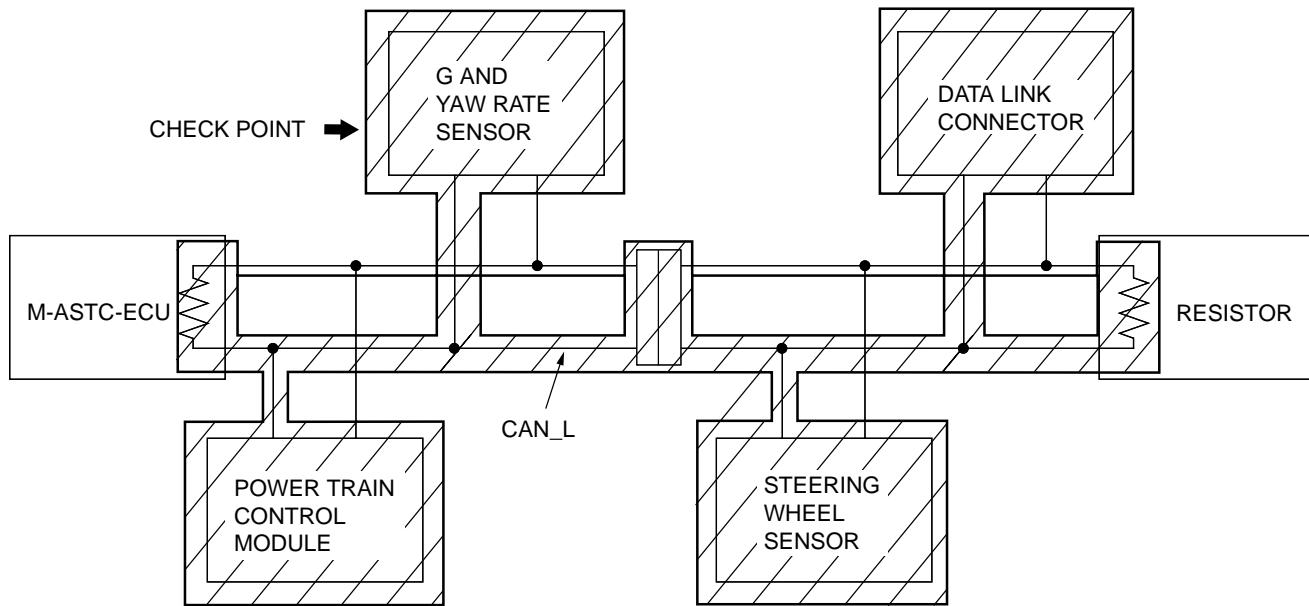
⚠ CAUTION

If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

⚠ CAUTION

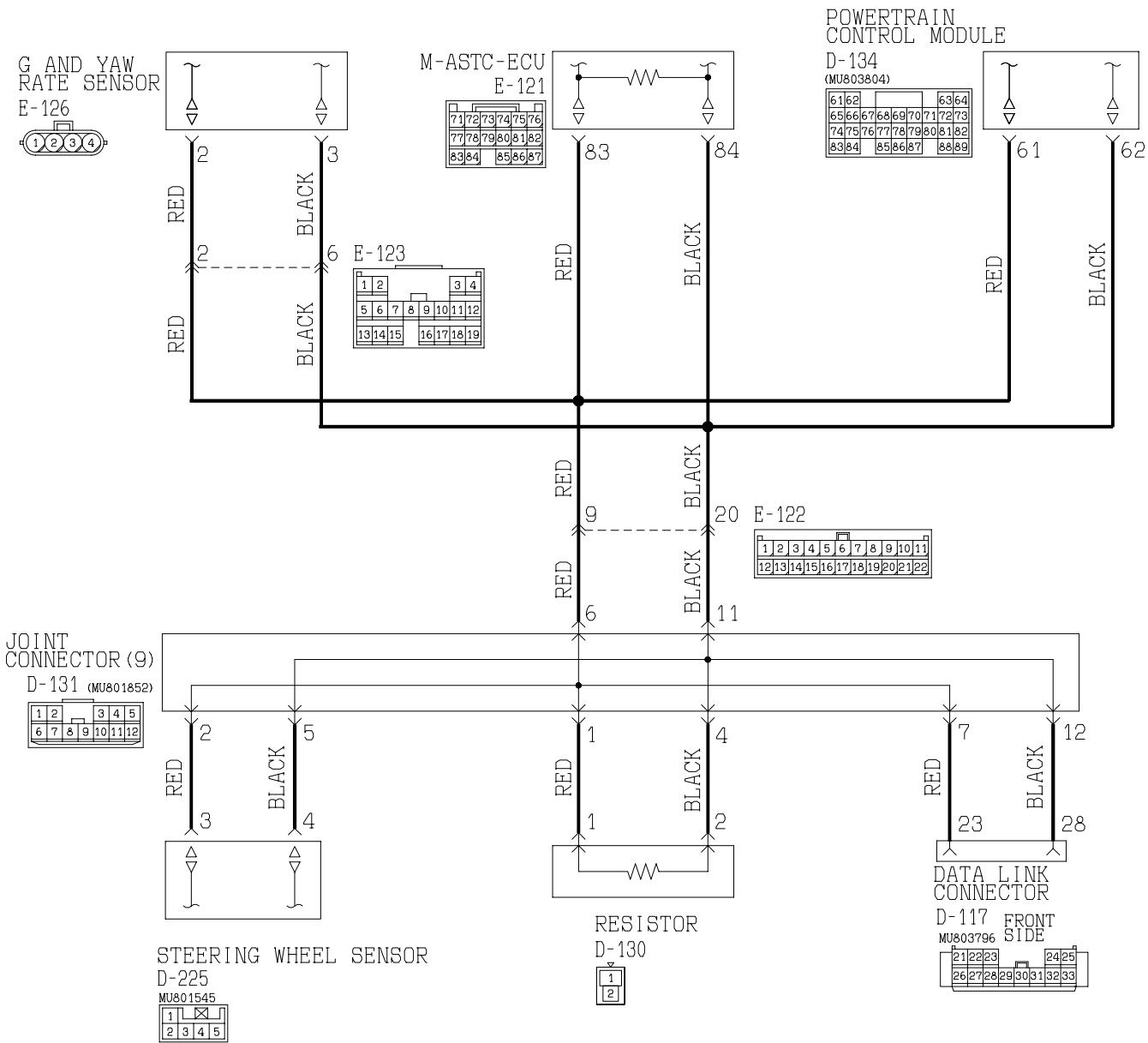
If there is a problem in the CAN bus line or the connectors on the control wiring harness assembly (the wiring harness connected to the M-ASTC-ECU, the power control module and intermediate connector E-123), do not attempt to repair the wiring harness or connector(s), but replace the wiring harness assembly. If a wire is added or the connector(s) are repaired, an error in the CAN communication may be caused.

This procedure diagnoses the shaded portion below.

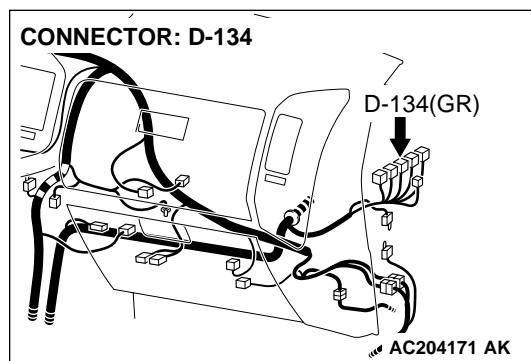
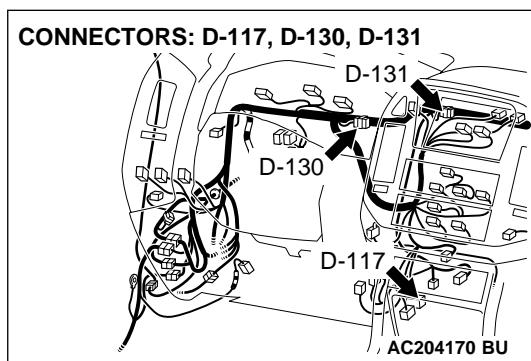


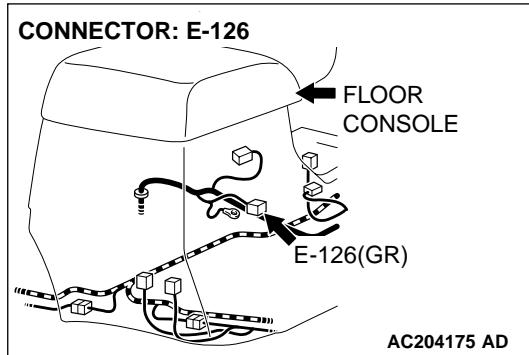
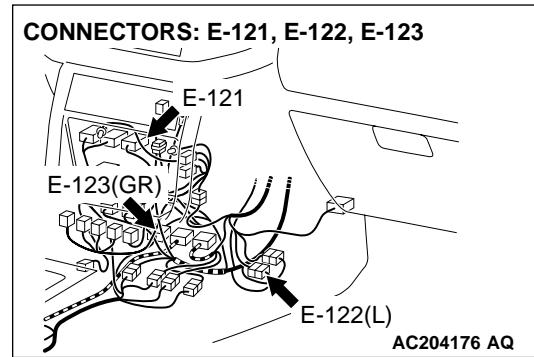
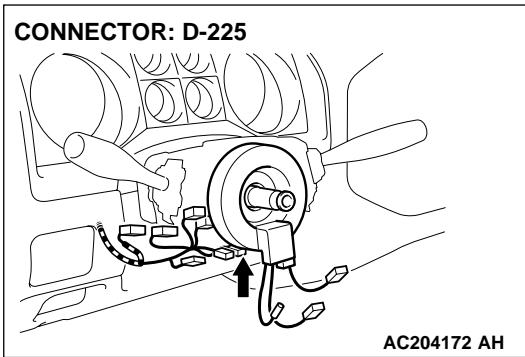
AC203825 AI

Can Bus Communication Circuit



AC204606



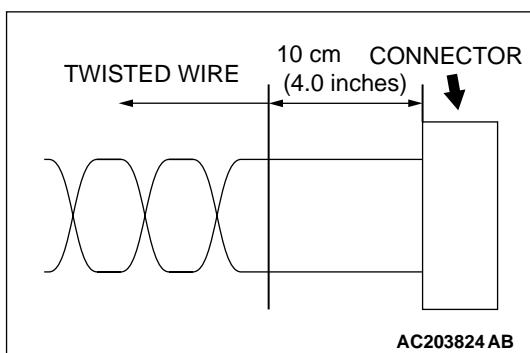
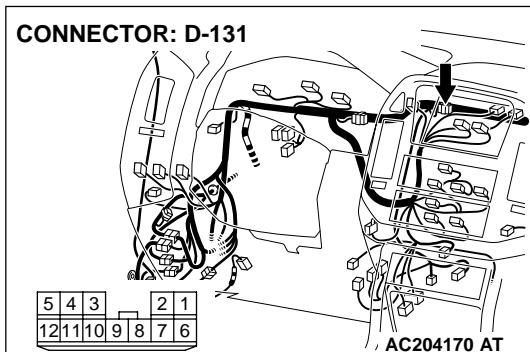


DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set

STEP 1. Check joint connector (9) D-131.

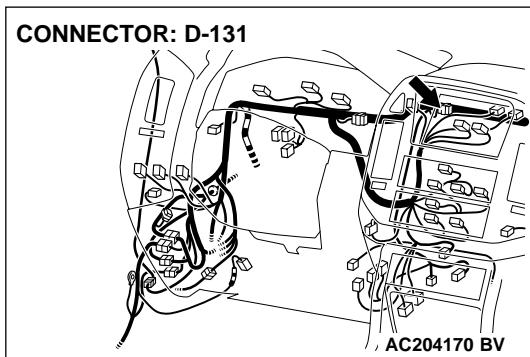
**CAUTION**

If there is a problem in the connector(s) (including terminals) or wire(s) of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), cut and repair the defective wire so that the frayed end of the twisted wire should be within 10 cm (4.0 inches). If it exceeds 10 cm (4.0 inches), twist the wiring harness just like the original twisted wire. If the frayed end exceeds 10 cm (4.0 inches), a communication error may be caused.

Q: Is joint connector D-131 in good condition?

YES : Go to Step 2.

NO : Repair or replace the connector(s).



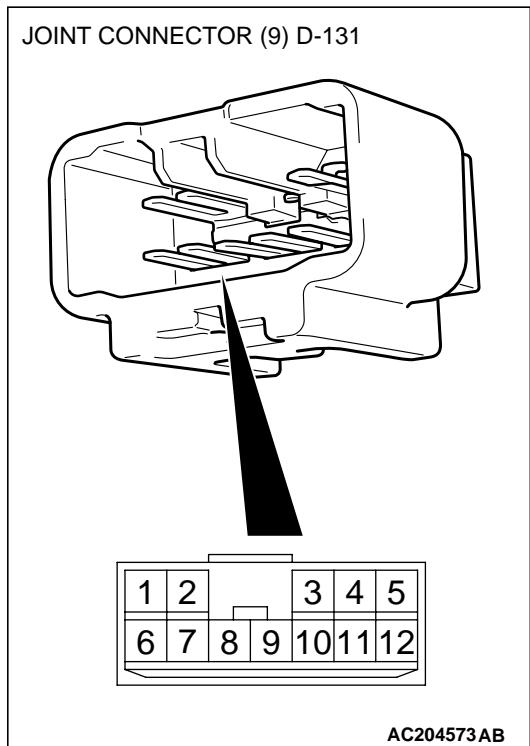
STEP 2. Check the joint connector.

Disconnect joint connector (9), and check the short pin behind the connector for corrosion, deformation and delamination.

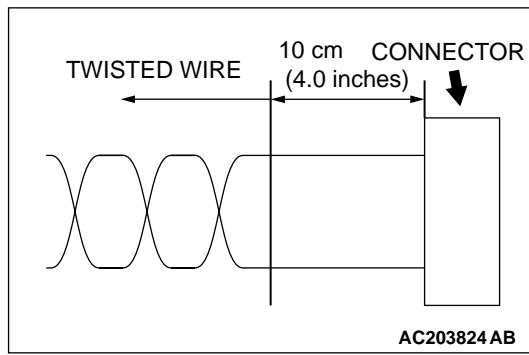
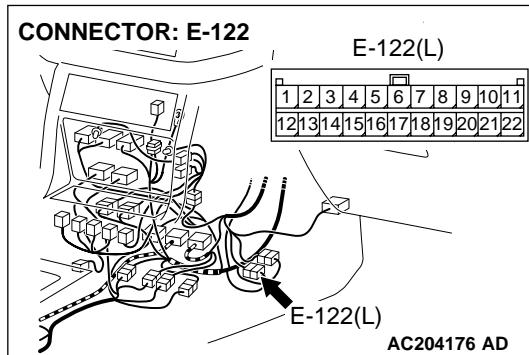
Q: Is joint connector in good condition?

YES : Go to Step 3.

NO : Replace the joint connector.



STEP 3. Check intermediate connector E-122.



CAUTION

If there is a problem in the connector(s) (including terminals) or wire(s) of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), cut and repair the defective wire so that the frayed end of the twisted wire should be within 10 cm (4.0 inches). If it exceeds 10 cm (4.0 inches), twist the wiring harness just like the original twisted wire. If the frayed end exceeds 10 cm (4.0 inches), a communication error may be caused.

CAUTION

If there is a problem in the CAN bus line or the connectors on the control wiring harness assembly (the wiring harness connected to the M-ASTC-ECU, the power control module and intermediate connector E-123), do not attempt to repair the wiring harness or connector(s), but replace the wiring harness assembly. If a wire is added or the connector(s) are repaired, an error in the CAN communication may be caused.

Q: Is intermediate connector E-122 in good condition?

YES : Go to Step 4.

NO :

- If there is a defect at the instrument panel wiring harness assembly side, repair or replace the connector, and then go to Step 4.
- If there is a problem at the control wiring harness assembly side, replace the control wiring harness assembly and then go to Step 4.

STEP 4. Measure the voltage in the CAN_L line. Check at intermediate connector E-122.

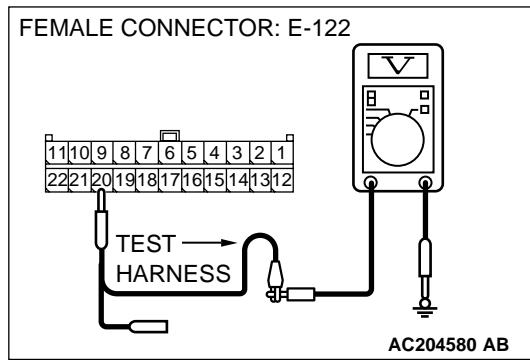
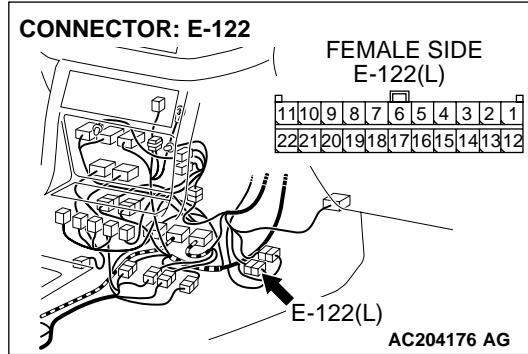
⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect intermediate connector E-122, and measure the voltage at the female intermediate connector (control wiring harness side).
- (2) Turn the ignition switch to the "ON" position.



⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

- (3) Measure the voltage between intermediate connector E-122 terminal 20 and body ground.
 - The voltage should measure 0.5 volts or more, or 4.5 volts or less.

Q: Does the voltage measure 0.5 volts or more, or 4.5 volts or less?

YES : Go to Step 5.

NO : Go to Step 15.

STEP 5. Measure the voltage in the CAN_L line. Check at intermediate connector E-122.

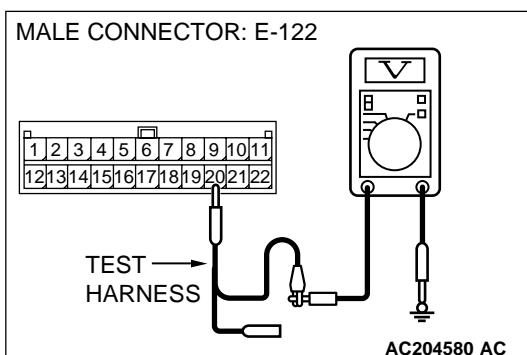
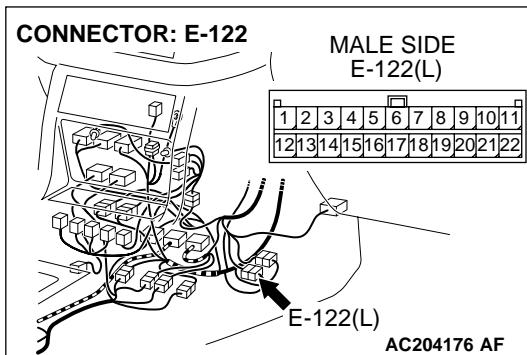
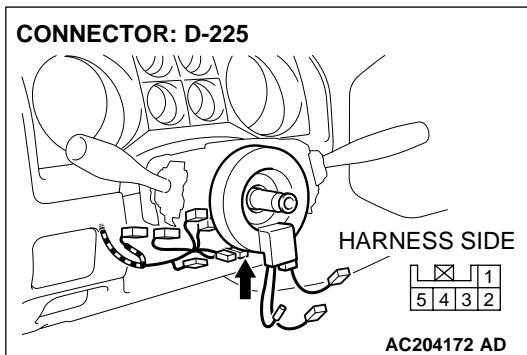
⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect intermediate connector E-122 and steering wheel sensor connector D-225, and measure the voltage at the male intermediate connector (instrument panel wiring harness side).
- (2) Turn the ignition switch to the "ON" position.



- (3) Measure the voltage between intermediate connector E-122 terminal 20 and body ground.

- The voltage should measure one volt or less.

Q: Does the voltage measure one volt or less?

YES : Go to Step 10.

NO : Go to Step 6.

STEP 6. Measure the voltage in the CAN_L line. Measure the voltage at joint connector (9) D-131.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

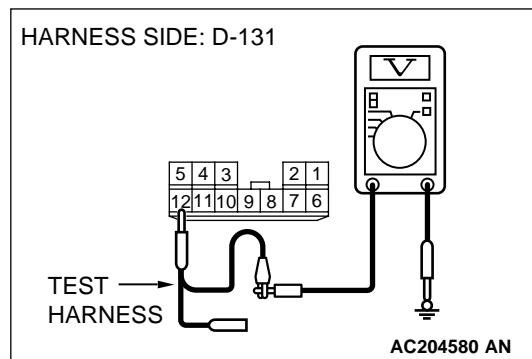
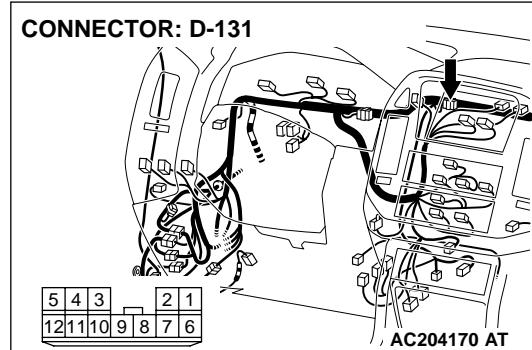
⚠ CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect joint connector (9) D-131, and measure the voltage at joint connector (9).
- (2) Turn the ignition switch to the "ON" position.

⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.



- (3) Measure the voltage between joint connector (9) D-131 terminal 12 and body ground.

- The voltage should measure one volt or less.

⚠ CAUTION

If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

Q: Do the voltage measure one volt or less?

YES : Go to Step 7.

NO : Repair the wiring harness wires between joint connector (9) and the data link connector.

STEP 7. Measure the voltage in the CAN_L line. Measure the voltage at joint connector (9) D-131.

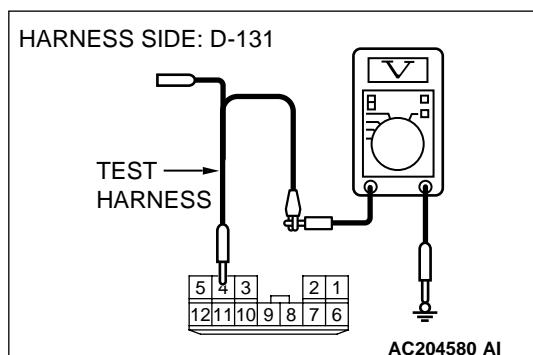
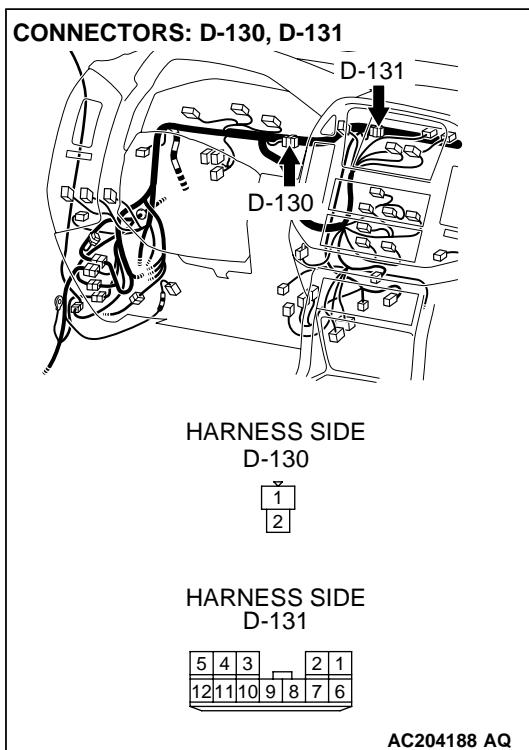
⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect joint connector (9) D-131 and resistor connector D-130, and measure the voltage at joint connector (9).
- (2) Turn the ignition switch to the "ON" position.



⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

- (3) Measure the voltage between joint connector (9) D-131 terminal 4 and body ground.
 - The voltage should measure one volt or less.

⚠ CAUTION

If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

Q: Do the voltage measure one volt or less?

YES : Go to Step 8.

NO : Repair the wiring harness wires between joint connector (9) and the resistor connector.

STEP 8. Measure the voltage in the CAN_L line. Measure the voltage at joint connector (9) D-131.

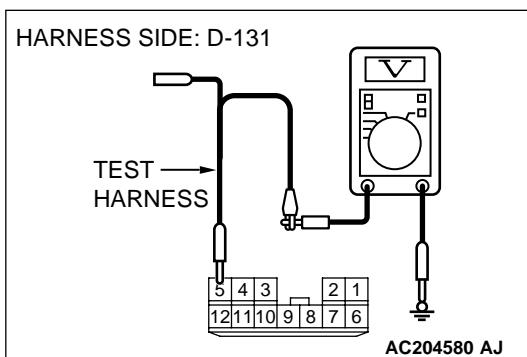
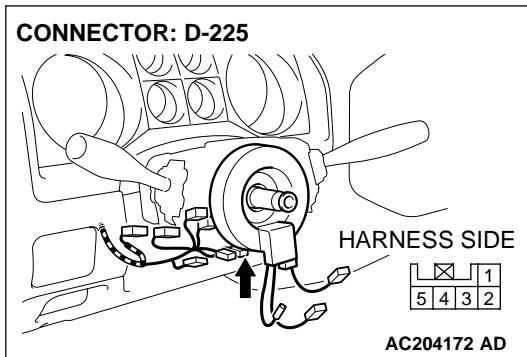
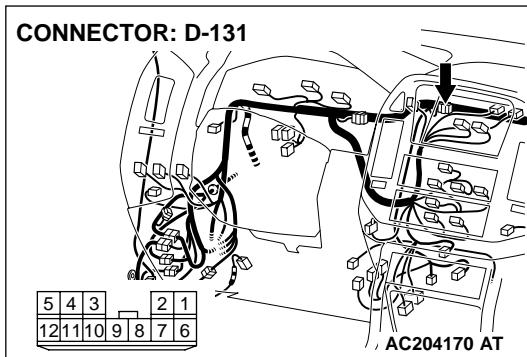
⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect joint connector (9) D-131 and steering wheel sensor connector D-225, and measure the voltage at joint connector (9).
- (2) Turn the ignition switch to the "ON" position.



⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

- (3) Measure the voltage between joint connector (9) D-131 terminal 5 and body ground.
 - The voltage should measure one volt or less.

⚠ CAUTION

If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

Q: Do the voltage measure one volt or less?

YES : Go to Step 9.

NO : Repair the wiring harness wires between joint connector (9) and the steering wheel sensor connector.

STEP 9. Measure the voltage in the CAN_L line. Measure the voltage at joint connector (9) D-131.

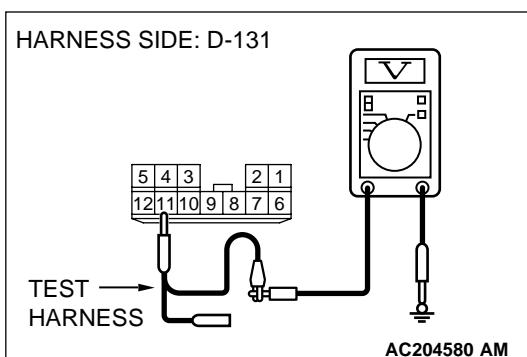
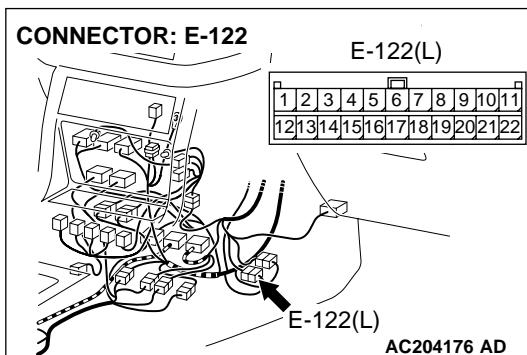
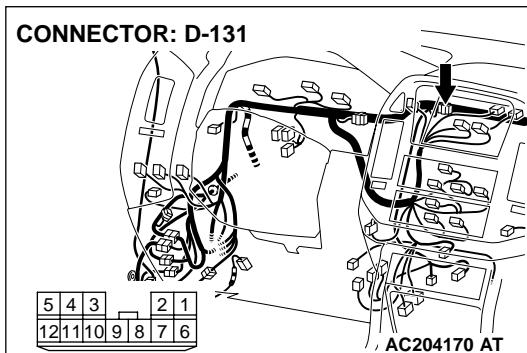
⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect joint connector (9) D-131 and intermediate connector E-122, and measure the voltage at joint connector (9).
- (2) Turn the ignition switch to the "ON" position.



⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

- (3) Measure the voltage between joint connector (9) D-131 terminal 11 and body ground.
- The voltage should measure one volt or less.

⚠ CAUTION

If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

Q: Do the voltage measure one volt or less?

YES : Retest the system.

NO : Repair the wiring harness wires between joint connector (9) and the intermediate connector.

STEP 10. Check the resistance in the CAN_L line. Check at intermediate connector E-122.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

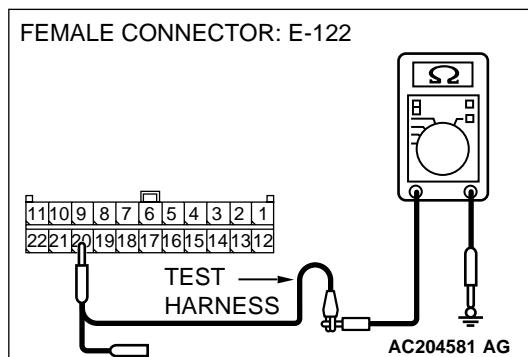
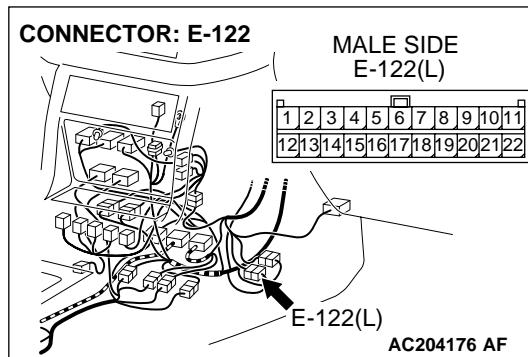
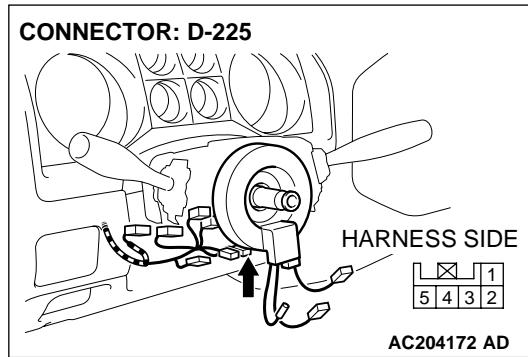
When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect intermediate connector E-122 and steering wheel sensor connector D-225, and measure the resistance at the male intermediate connector (instrument panel wiring harness side).
- (2) Turn the ignition switch to the LOCK (OFF) position.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments, which are connected through the CAN communication lines, may be damaged.

- (3) Disconnect the negative battery terminal.



- (4) Measure the resistance between intermediate connector E-122 terminal 20 and body ground.

- The resistance should be infinite.

Q: Is the resistance infinite?

YES : Replace the steering wheel sensor.

NO : Go to Step 11.

STEP 11. Check the resistance in the CAN_L line. Measure at joint connector (9) D-131.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

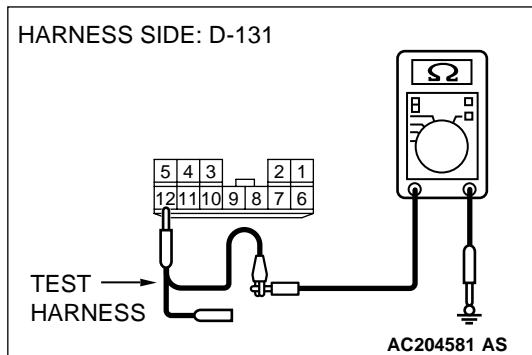
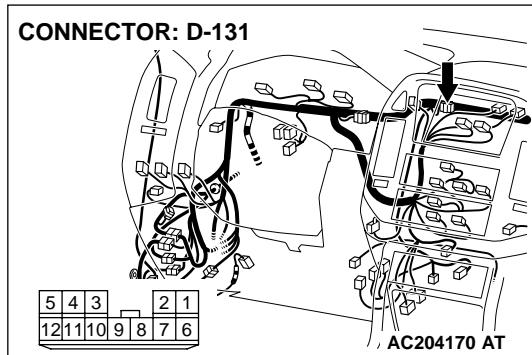
When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect joint connector (9) D-131, and measure the resistance between joint connector (9) and body ground.
- (2) Turn the ignition switch to the LOCK (OFF) position.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments, which are connected through the CAN communication lines, may be damaged.

- (3) Disconnect the negative battery terminal.



⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

- (4) Measure the resistance between joint connector (9) D-131 terminal 12 and body ground.
 - The resistance should be infinite.

⚠ CAUTION

If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

Q: Is the resistance infinite?

YES : Go to Step 12.

NO : Repair the wiring harness wires between joint connector (9) and the data link connector.

STEP 12. Check the resistance in the CAN_L line. Measure at joint connector (9) D-131.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

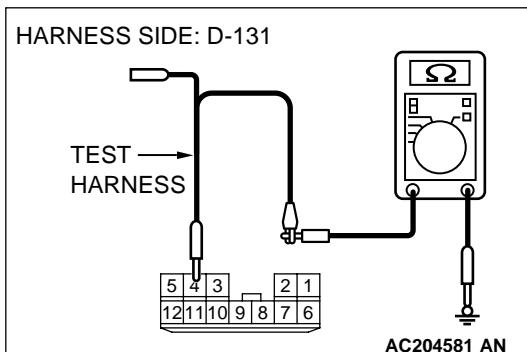
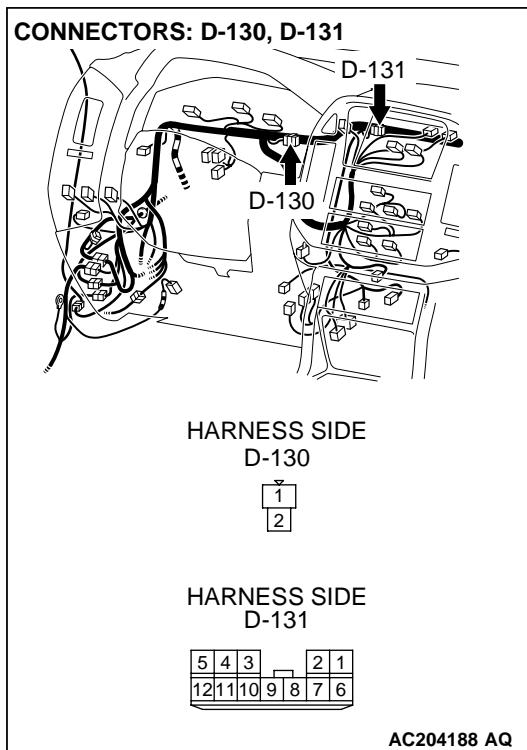
When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect joint connector (9) D-131 and resistor connector D-130, and measure the resistance between joint connector (9) and body ground.
- (2) Turn the ignition switch to the LOCK (OFF) position.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments, which are connected through the CAN communication lines, may be damaged.

- (3) Disconnect the negative battery terminal.



⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

- (4) Measure the resistance between joint connector (9) D-131 terminal 4 and body ground.
 - The resistance should be infinite.

⚠ CAUTION

If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

Q: Is the resistance infinite?

YES : Go to Step 13.

NO : Repair the wiring harness wires between joint connector (9) and the resistor connector.

STEP 13. Check the resistance in the CAN_L line. Measure at joint connector (9) D-131.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

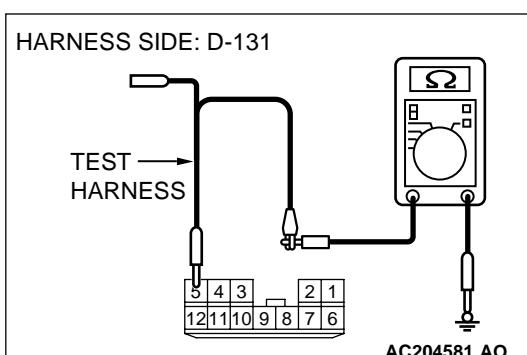
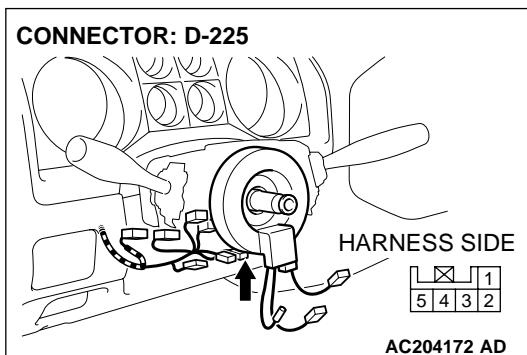
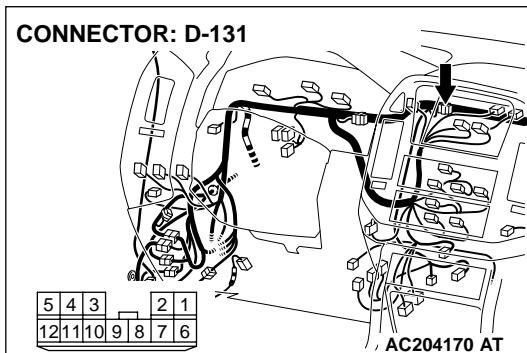
When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect joint connector (9) D-131 and steering wheel sensor connector D-225, and measure the resistance between joint connector (9) and body ground.
- (2) Turn the ignition switch to the LOCK (OFF) position.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments, which are connected through the CAN communication lines, may be damaged.

- (3) Disconnect the negative battery terminal.



⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

- (4) Measure the resistance between joint connector (9) D-131 terminal 5 and body ground.
- The resistance should be infinite.

⚠ CAUTION

If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

Q: Is the resistance infinite?

YES : Go to Step 14.

NO : Repair the wiring harness wires between joint connector (9) and the steering wheel sensor connector.

STEP 14. Check the resistance in the CAN_L line. Measure at joint connector (9) D-131.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

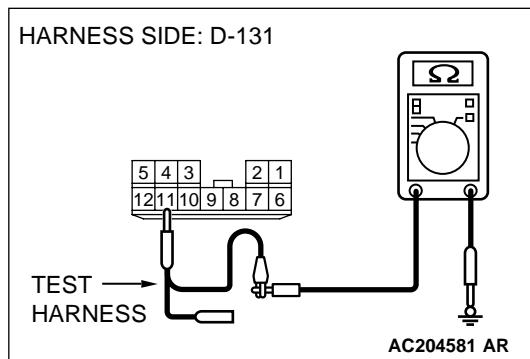
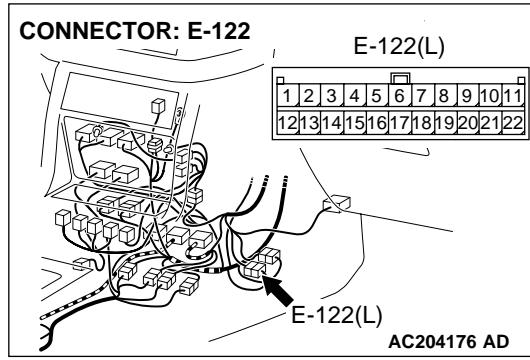
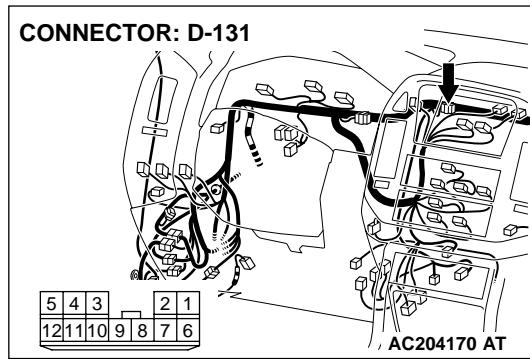
When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect joint connector (9) D-131 and intermediate connector E-122, and measure the resistance between joint connector (9) and body ground.
- (2) Turn the ignition switch to the LOCK (OFF) position.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments, which are connected through the CAN communication lines, may be damaged.

- (3) Disconnect the negative battery terminal.



⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

- (4) Measure the resistance between joint connector (9) D-131 terminal 11 and body ground.
- The resistance should be infinite.

⚠ CAUTION

If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

Q: Is the resistance infinite?

YES : Retest the system.

NO : Repair the wiring harness wires between joint connector (9) and the intermediate connector.

STEP 15. Measure the voltage in the CAN_L line. Check at intermediate connector E-122.

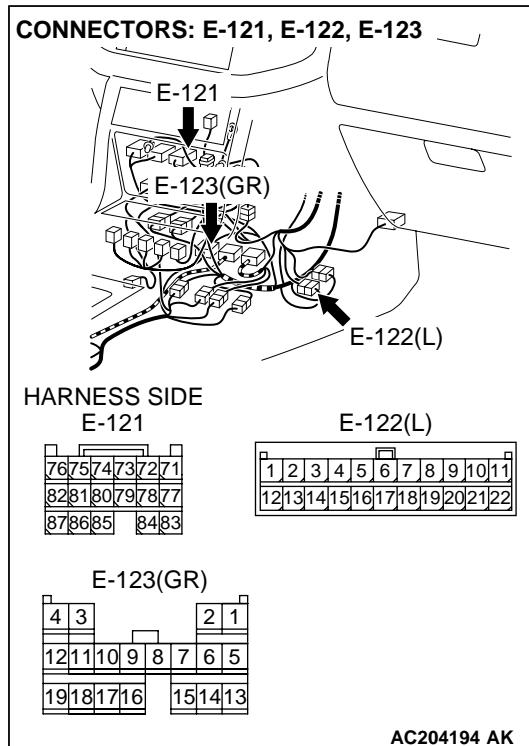
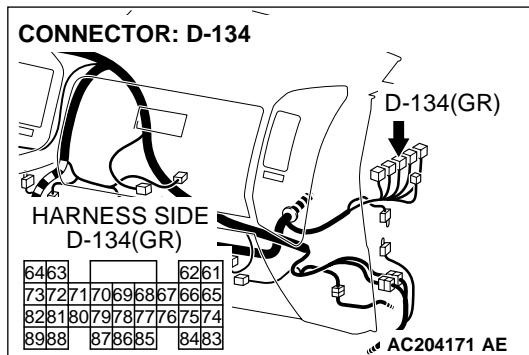
⚠ CAUTION

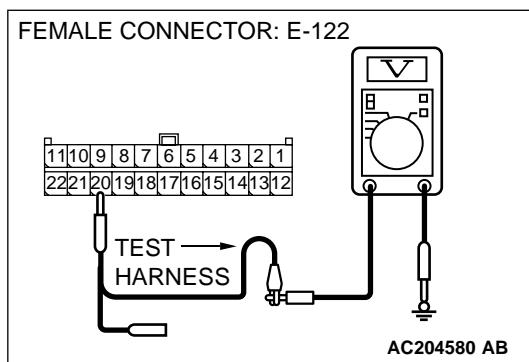
Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect intermediate connectors E-122, E-123, and M-ASTC-ECU connector E-121, power control module connector D-134, and measure the voltage at the female intermediate connector (control panel wiring harness side).
- (2) Turn the ignition switch to the "ON" position.



**CAUTION**

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

(3) Measure the voltage between intermediate connector E-122 terminal 20 and body ground.

- The voltage should measure one volt or less.

Q: Do the voltage measure one volt or less?

YES : Go to Step 16.

NO : Replace the control wiring harness assembly.

STEP 16. Check the resistance in the CAN_L line. Check at intermediate connector E-122.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

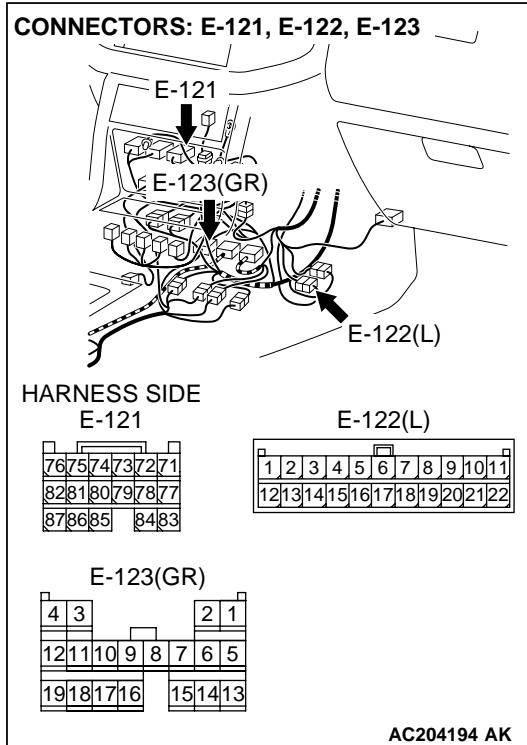
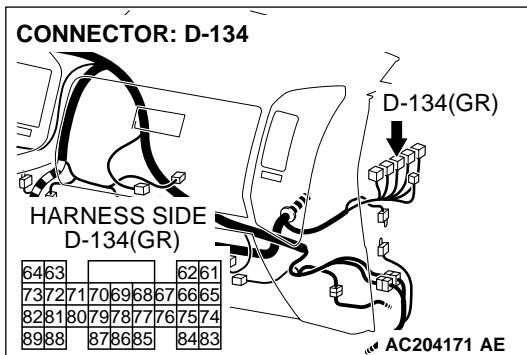
When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

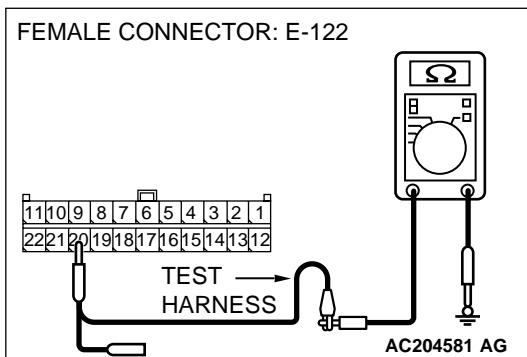
- (1) Disconnect intermediate connectors E-122, E-123, and M-ASTC-ECU connector E-121, power control module connector D-134, and measure the resistance at the female intermediate connector (control panel wiring harness side).
- (2) Turn the ignition switch to the LOCK (OFF) position.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments, which are connected through the CAN communication lines, may be damaged.

- (3) Disconnect the negative battery terminal.



**CAUTION**

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

(4) Measure the resistance between intermediate connector E-122 terminal 20 and body ground.

- The resistance should be infinite.

Q: Is the resistance infinite?

YES : Go to Step 17.

NO : Replace the control wiring harness assembly.

STEP 17. Measure the voltage in the CAN_L line. Check at intermediate connector E-122.

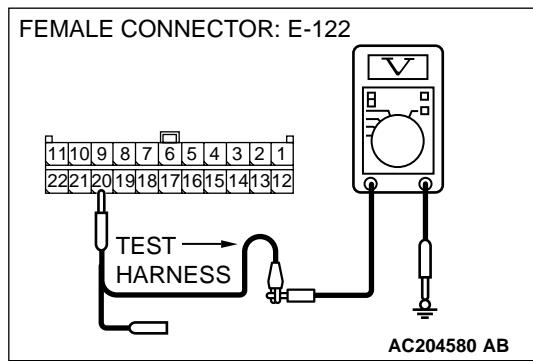
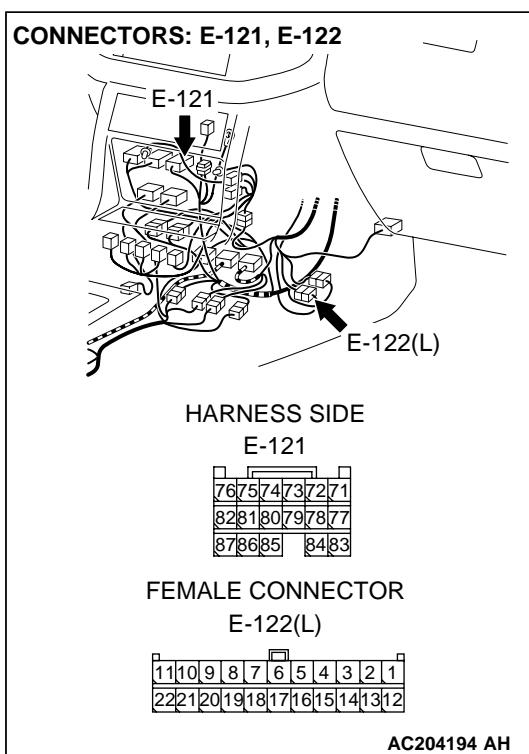
⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect intermediate connector E-122 and M-ASTC-ECU connector E-121, and measure the voltage at the female intermediate connector (control wiring harness side).
- (2) Turn the ignition switch to the "ON" position.



⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

- (3) Measure the voltage between intermediate connector E-122 terminal 20 and body ground.
 - The voltage should measure 0.5 volts or more, or 4.5 volts or less.

Q: Does the voltage measure 0.5 volts or more, or 4.5 volts or less?

YES : Replace the M-ASTC-ECU.

NO : Go to Step 18.

STEP 18. Measure the voltage in the CAN_L line. Check at intermediate connector E-122.

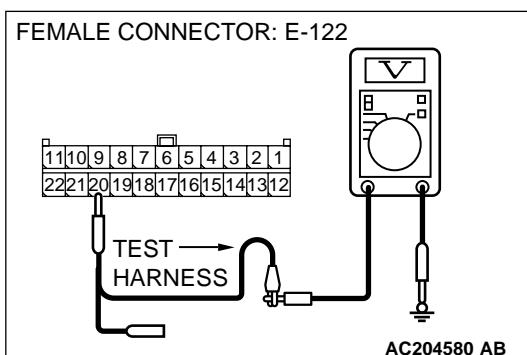
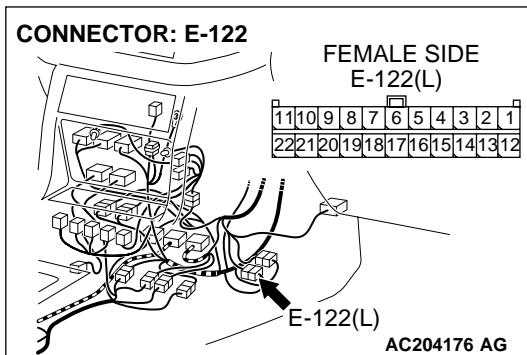
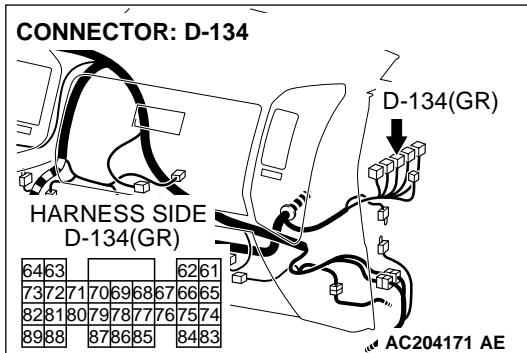
⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect intermediate connector E-122 and power control module connector D-134, and measure the voltage at the female intermediate connector (control wiring harness side).
- (2) Turn the ignition switch to the "ON" position.



⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

- (3) Measure the voltage between intermediate connector E-122 terminal 20 and body ground.
 - The voltage should measure 0.5 volts or more, or 4.5 volts or less.

Q: Does the voltage measure 0.5 volts or more, or 4.5 volts or less?

YES : Replace the power control module.

NO : Go to Step 19.

STEP 19. Measure the voltage in the CAN_L line. Check at intermediate connector E-122.

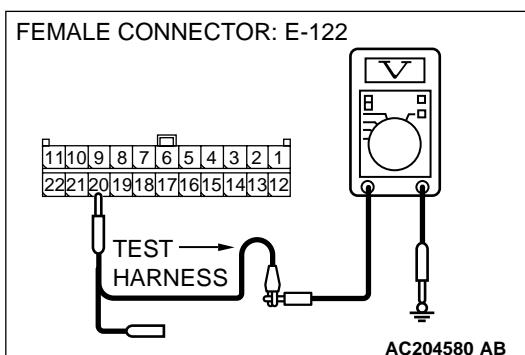
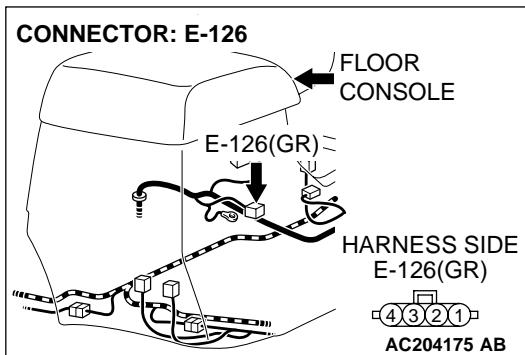
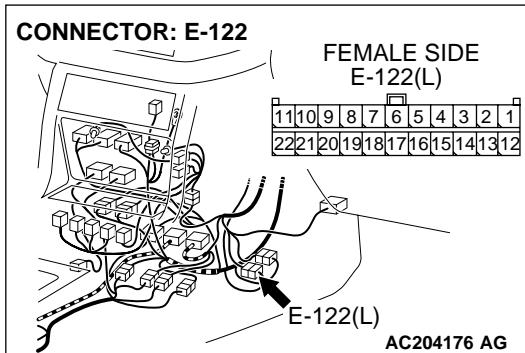
⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect intermediate connector E-122 and G and yaw rate sensor connector E-126, and measure the voltage at the female intermediate connector (control wiring harness side).
- (2) Turn the ignition switch to the "ON" position.



⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

- (3) Measure the voltage between intermediate connector E-122 terminal 20 and body ground.
 - The voltage should measure 0.5 volts or more, or 4.5 volts or less.

Q: Does the voltage measure 0.5 volts or more, or 4.5 volts or less?

YES : Replace the G and yaw rate sensor.

NO : Go to Step 20.

STEP 20. Measure the voltage in the CAN_L line. Check at intermediate connector E-122.

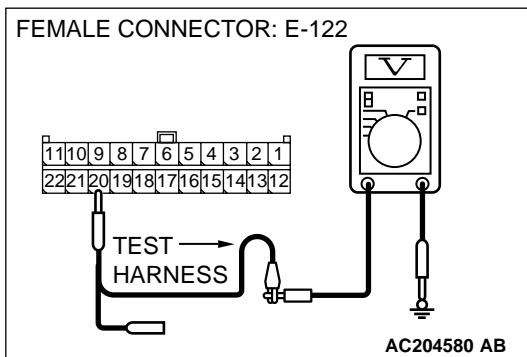
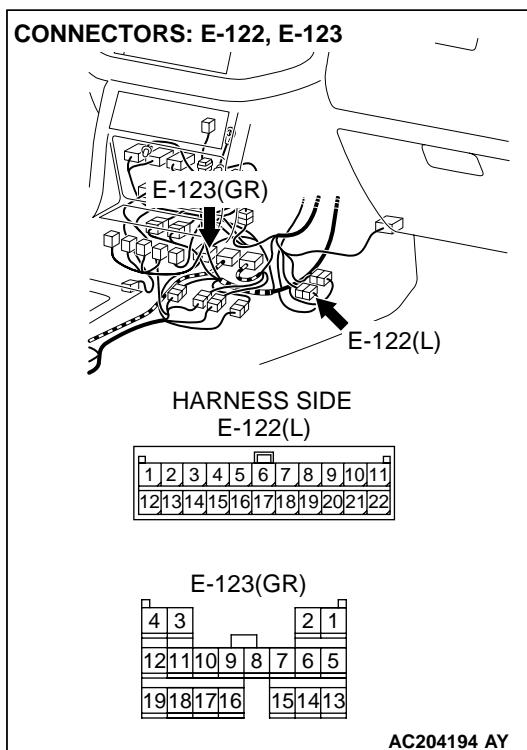
⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect intermediate connectors E-122 and E-123 and power control module connector D-123, and measure the voltage at the female intermediate connector (control wiring harness side).
- (2) Turn the ignition switch to the "ON" position.



⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

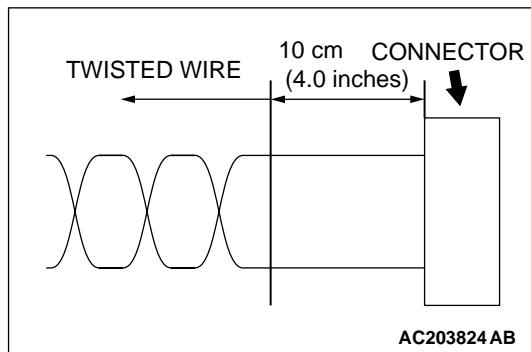
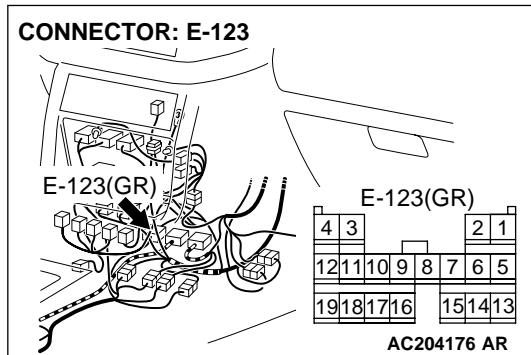
- (3) Measure the voltage between intermediate connector E-122 terminal 20 and body ground.
 - The voltage should measure 0.5 volts or more, or 4.5 volts or less.

Q: Does the voltage measure 0.5 volts or more, or 4.5 volts or less?

YES : Go to Step 21.

NO : Replace the control wiring harness assembly.

STEP 21. Check intermediate connector E-123.



⚠ CAUTION

If there is a problem in the connector(s) (including terminals) or wire(s) of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), cut and repair the defective wire so that the frayed end of the twisted wire should be within 10 cm (4.0 inches). If it exceeds 10 cm (4.0 inches), twist the wiring harness just like the original twisted wire. If the frayed end exceeds 10 cm (4.0 inches), a communication error may be caused.

⚠ CAUTION

If there is a problem in the CAN bus line or the connectors on the control wiring harness assembly (the wiring harness connected to the M-ASTC-ECU, the power control module and intermediate connector E-123), do not attempt to repair the wiring harness or connector(s), but replace the wiring harness assembly. If a wire is added or the connector(s) are repaired, an error in the CAN communication may be caused.

Q: Is intermediate connector E-123 in good condition?

YES : Repair the wiring harness wires between intermediate connector E-123 and the G and yaw rate sensor connector.

NO :

- If there is a problem at the transmission wiring harness assembly side, repair or replace the connector.
- If there is a problem at the control wiring harness assembly side, replace the control wiring harness assembly.

Diagnostic Item 3: Diagnose the CAN_H side bus line.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

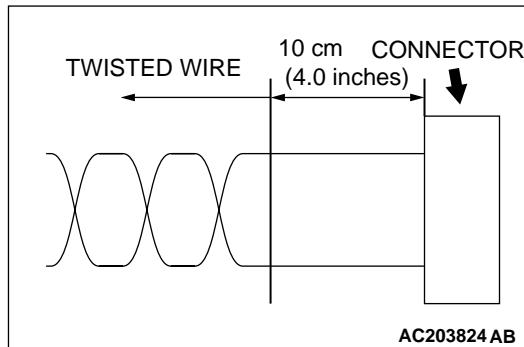
When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments, which are connected through the CAN communication lines, may be damaged.

⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

⚠ CAUTION

If there is a problem in the connector(s) (including terminals) or wire(s) of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), cut and repair the defective wire so that the frayed end of the twisted wire should be within 10 cm (4.0 inches). If it exceeds 10 cm (4.0 inches), twist the wiring harness just like the original twisted wire. If the frayed end exceeds 10 cm (4.0 inches), a communication error may be caused.

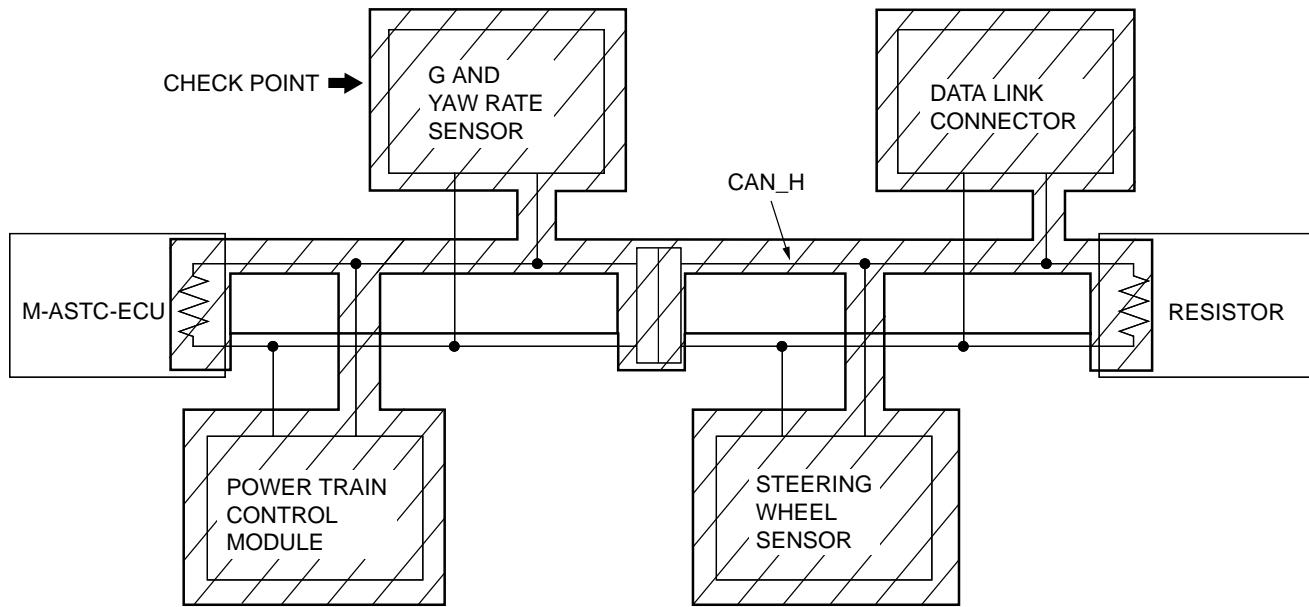
⚠ CAUTION

If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

⚠ CAUTION

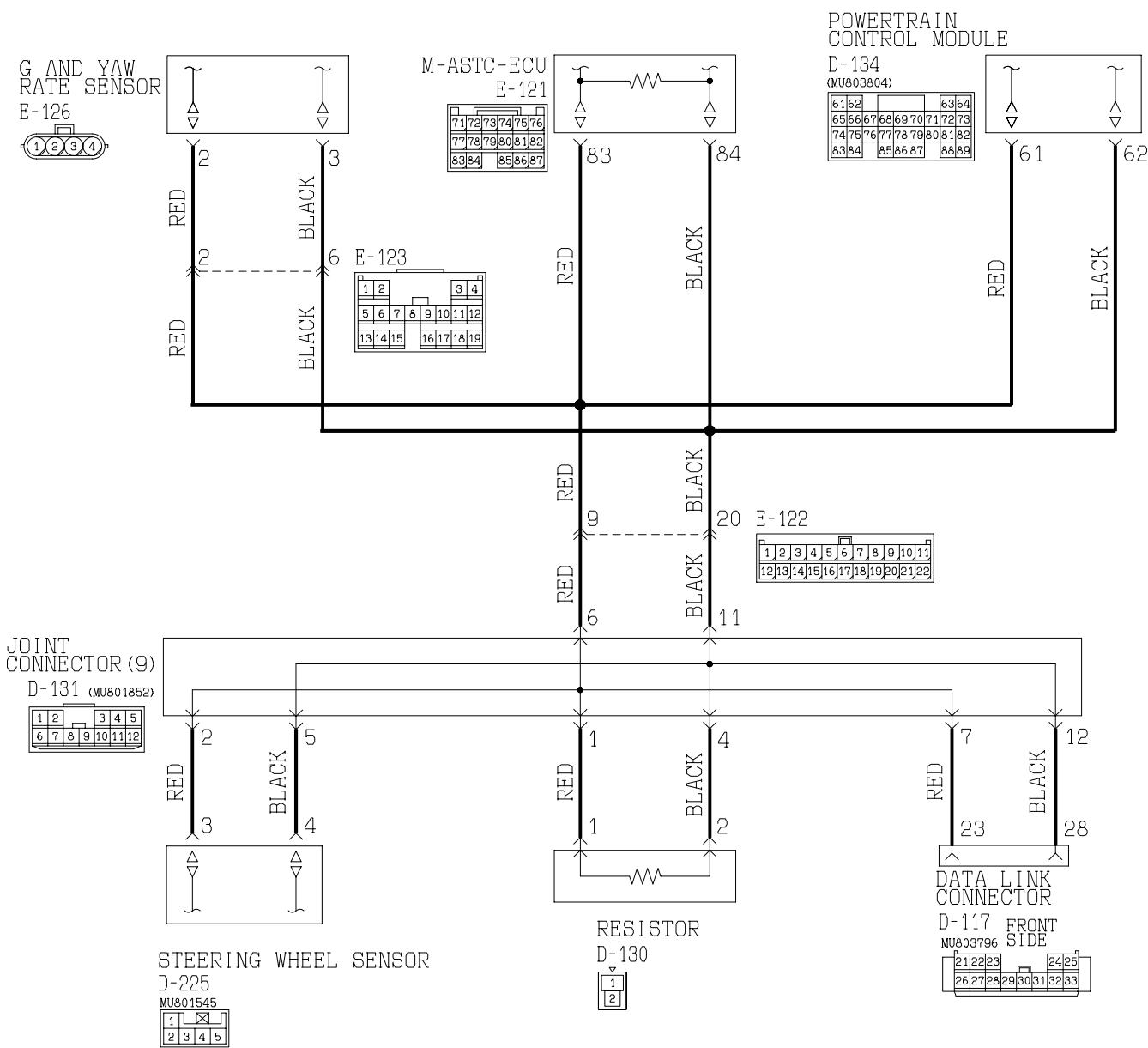
If there is a problem in the CAN bus line or the connectors on the control wiring harness assembly (the wiring harness connected to the M-ASTC-ECU, the power control module and intermediate connector E-123), do not attempt to repair the wiring harness or connector(s), but replace the wiring harness assembly. If a wire is added or the connector(s) are repaired, an error in the CAN communication may be caused.

This procedure diagnoses the shaded portion below.

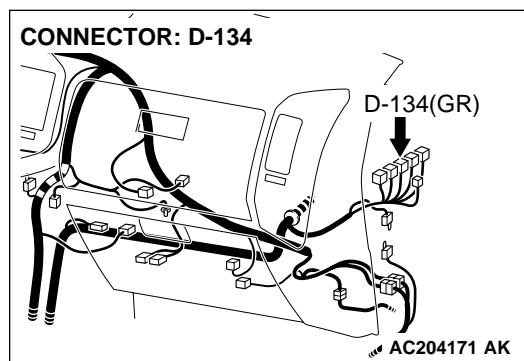
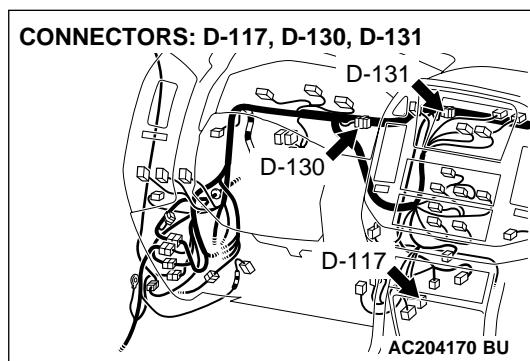


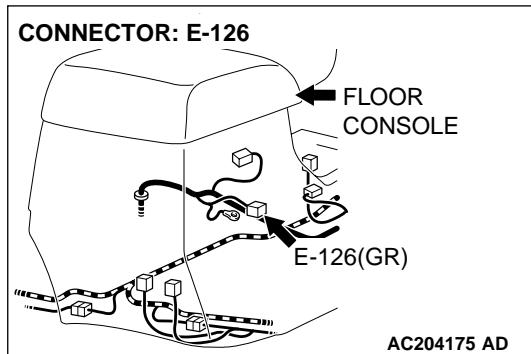
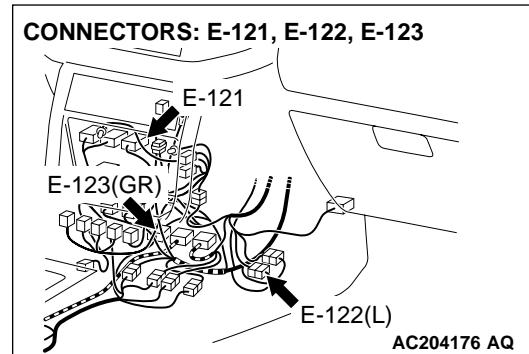
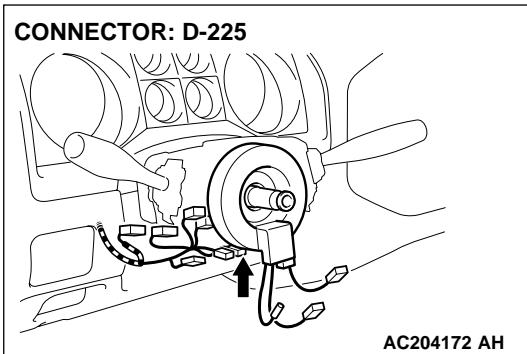
AC203825AJ

Can Bus Communication Circuit



AC204606



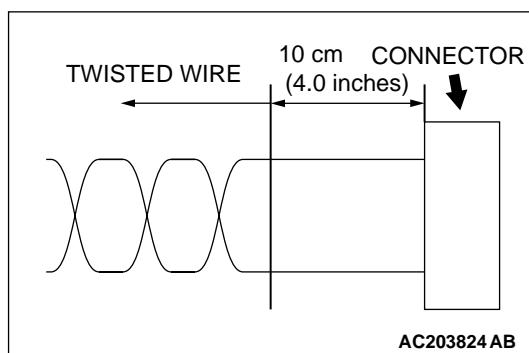
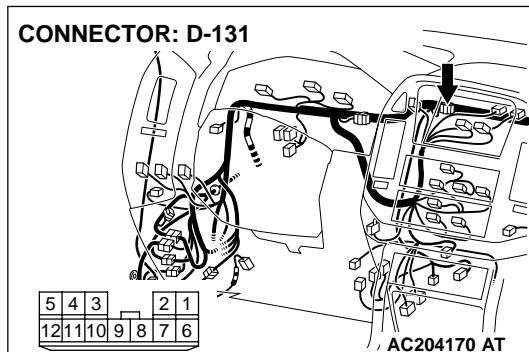


DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set

STEP 1. Check joint connector (9) D-131.

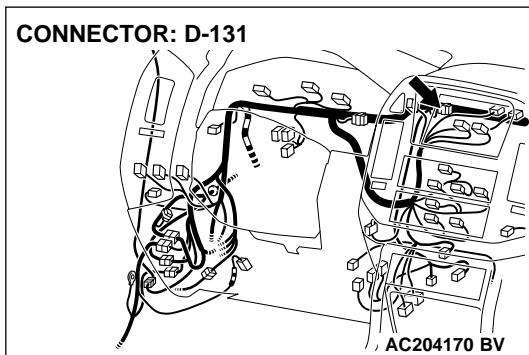
**CAUTION**

If there is a problem in the connector(s) (including terminals) or wire(s) of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), cut and repair the defective wire so that the frayed end of the twisted wire should be within 10 cm (4.0 inches). If it exceeds 10 cm (4.0 inches), twist the wiring harness just like the original twisted wire. If the frayed end exceeds 10 cm (4.0 inches), a communication error may be caused.

Q: Is joint connector D-131 in good condition?

YES : Go to Step 2.

NO : Repair or replace the connector(s).



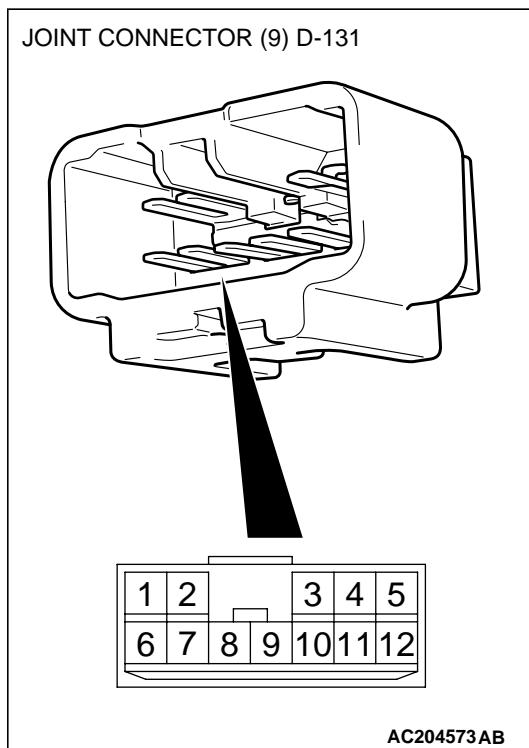
STEP 2. Check the joint connector.

Disconnect joint connector (9), and check the short pin behind the connector for corrosion, deformation and delamination.

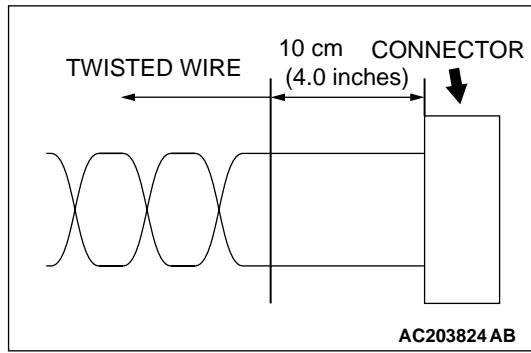
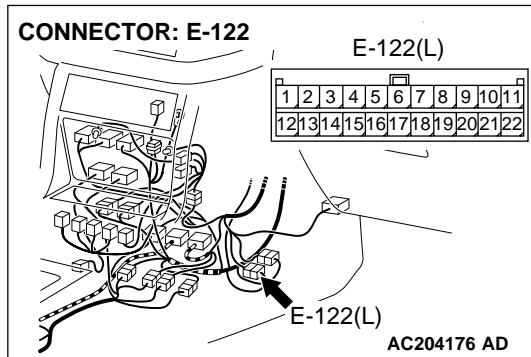
Q: Is joint connector in good condition?

YES : Go to Step 3.

NO : Replace the joint connector.



STEP 3. Check intermediate connector E-122.

**CAUTION**

If there is a problem in the connector(s) (including terminals) or wire(s) of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), cut and repair the defective wire so that the frayed end of the twisted wire should be within 10 cm (4.0 inches). If it exceeds 10 cm (4.0 inches), twist the wiring harness just like the original twisted wire. If the frayed end exceeds 10 cm (4.0 inches), a communication error may be caused.

CAUTION

If there is a problem in the CAN bus line or the connectors on the control wiring harness assembly (the wiring harness connected to the M-ASTC-ECU, the power control module and intermediate connector E-123), do not attempt to repair the wiring harness or connector(s), but replace the wiring harness assembly. If a wire is added or the connector(s) are repaired, an error in the CAN communication may be caused.

Q: Is intermediate connector E-122 in good condition?

YES : Go to Step 4.

NO :

- If there is a problem at the instrument panel wiring harness assembly side, repair or replace the connector.
- If there is a problem at the control wiring harness assembly side, replace the control wiring harness assembly.

STEP 4. Measure the voltage in the CAN_H line. Check at intermediate connector E-122.

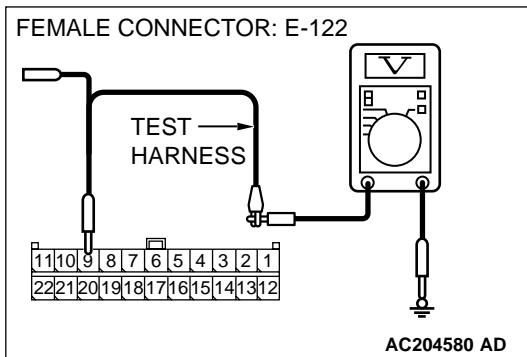
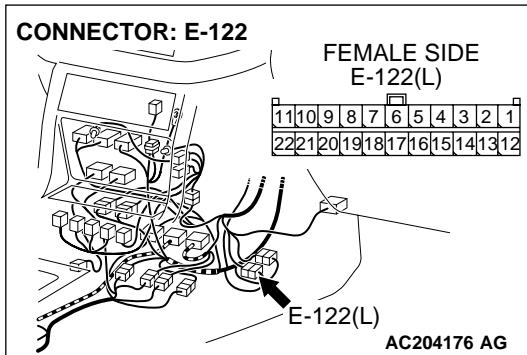
⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect intermediate connector E-122, and measure the voltage at the female intermediate connector (control wiring harness side).
- (2) Turn the ignition switch to the "ON" position.



⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

- (3) Measure the voltage between intermediate connector E-122 terminal 9 and body ground.
 - The voltage should measure 0.5 volts or more, or 4.5 volts or less.

Q: Does the voltage measure 0.5 volts or more, or 4.5 volts or less?

YES : Go to Step 5.

NO : Go to Step 15.

STEP 5. Measure the voltage in the CAN_H line. Check at intermediate connector E-122.

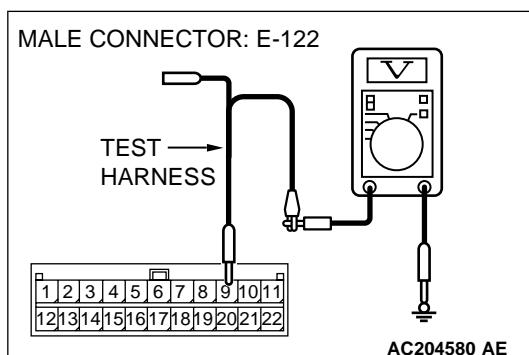
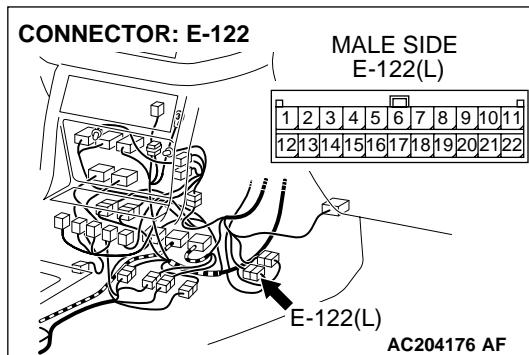
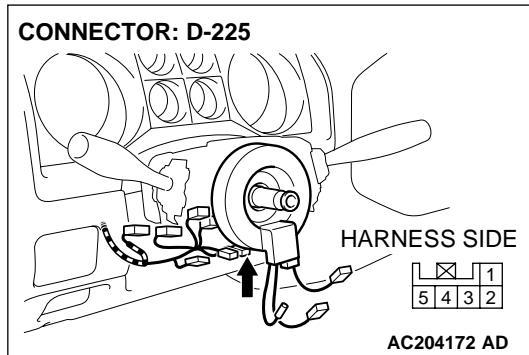
⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect intermediate connector E-122 and steering wheel sensor connector D-225, and measure the voltage at the male intermediate connector (instrument panel wiring harness side).
- (2) Turn the ignition switch to the "ON" position.



- (3) Measure the voltage between intermediate connector E-122 terminal 9 and body ground.

- The voltage should measure one volt or less.

Q: Do the voltage measure one volt or less?

YES : Go to Step 10.

NO : Go to Step 6.

STEP 6. Measure the voltage in the CAN_H line. Measure the voltage at joint connector (9) D-131.

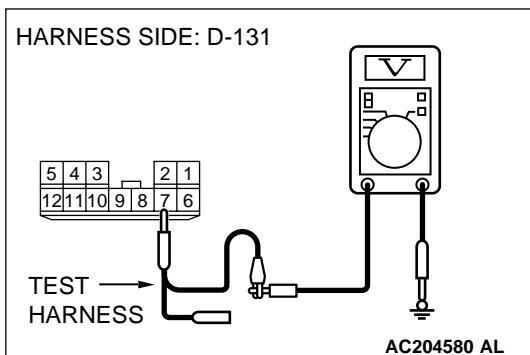
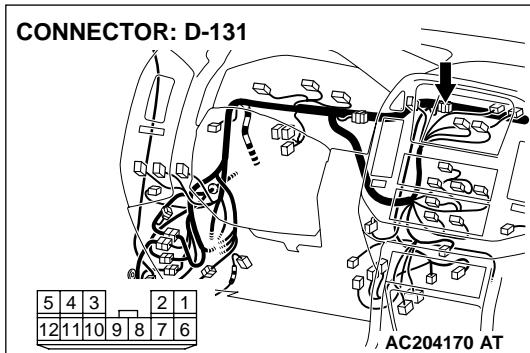
⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect joint connector (9) D-131, and measure the voltage at joint connector (9).
- (2) Turn the ignition switch to the "ON" position.



⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

- (3) Measure the voltage between joint connector (9) D-131 terminal 7 and body ground.
- The voltage should measure one volt or less.

⚠ CAUTION

If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

Q: Do the voltage measure one volt or less?

YES : Go to Step 7.

NO : Repair the wiring harness wires between joint connector (9) and the data link connector.

STEP 7. Measure the voltage in the CAN_H line. Measure the voltage at joint connector (9) D-131.

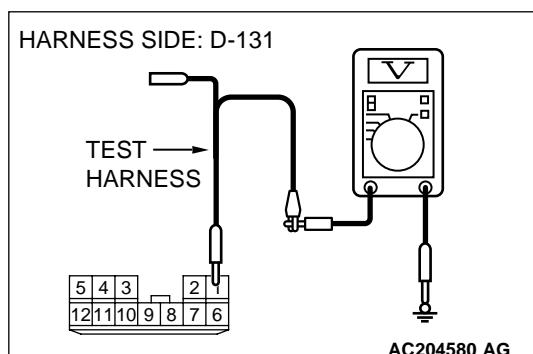
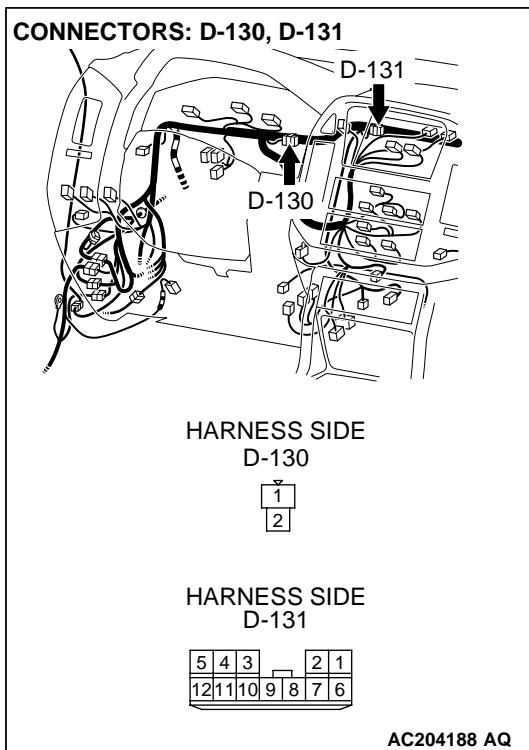
⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect joint connector (9) D-131 and resistor connector D-130, and measure the voltage at joint connector (9).
- (2) Turn the ignition switch to the "ON" position.



⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

- (3) Measure the voltage between joint connector (9) D-131 terminal 1 and body ground.
 - The voltage should measure one volt or less.

⚠ CAUTION

If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

Q: Do the voltage measure one volt or less?

YES : Go to Step 8.

NO : Repair the wiring harness wires between joint connector (9) and the resistor connector.

STEP 8. Measure the voltage in the CAN_H line. Measure the voltage at joint connector (9) D-131.

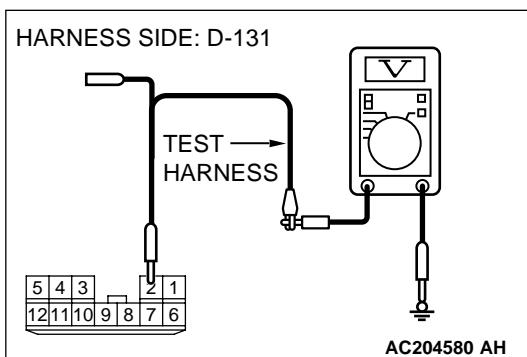
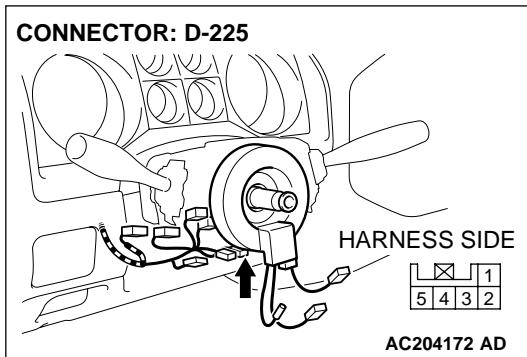
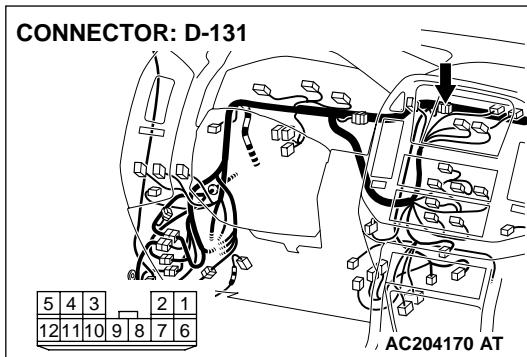
⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect joint connector (9) D-131 and steering wheel sensor connector D-225, and measure the voltage at joint connector (9).
- (2) Turn the ignition switch to the "ON" position.



⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

- (3) Measure the voltage between joint connector (9) D-131 terminal 2 and body ground.
 - The voltage should measure one volt or less.

⚠ CAUTION

If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

Q: Do the voltage measure one volt or less?

YES : Go to Step 9.

NO : Repair the wiring harness wires between joint connector (9) and the steering wheel sensor connector.

STEP 9. Measure the voltage in the CAN_H line. Measure the voltage at joint connector (9) D-131.

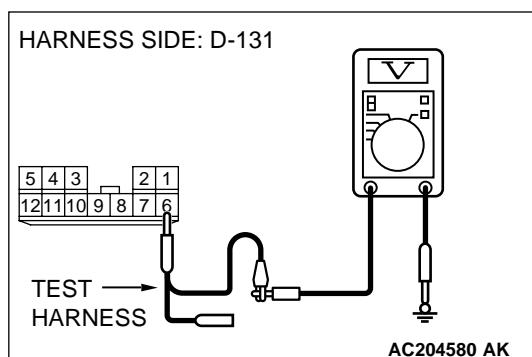
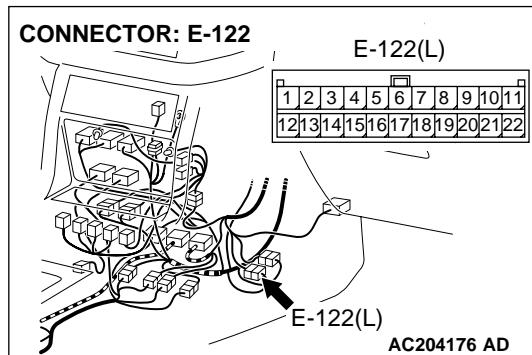
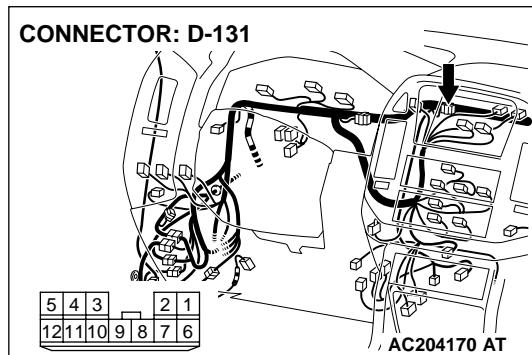
⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect joint connector (9) D-131 and intermediate connector E-122, and measure the voltage at joint connector (9).
- (2) Turn the ignition switch to the "ON" position.



⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

- (3) Measure the voltage between joint connector (9) D-131 terminal 6 and body ground.
- The voltage should measure one volt or less.

⚠ CAUTION

If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

Q: Do the voltage measure one volt or less?

YES : Retest the system.

NO : Repair the wiring harness wires between joint connector (9) and the intermediate connector.

STEP 10. Check the resistance in the CAN_H line. Check at intermediate connector E-122.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

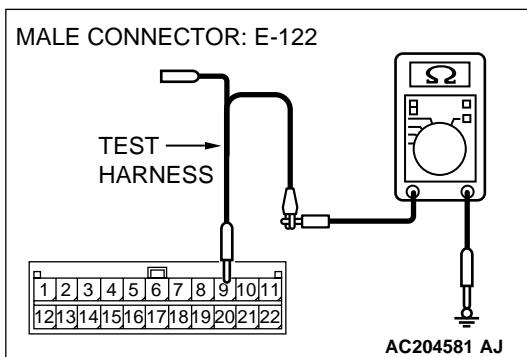
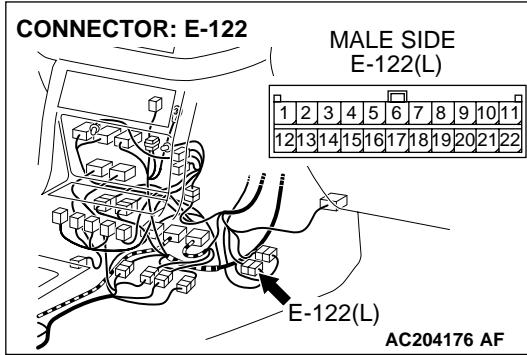
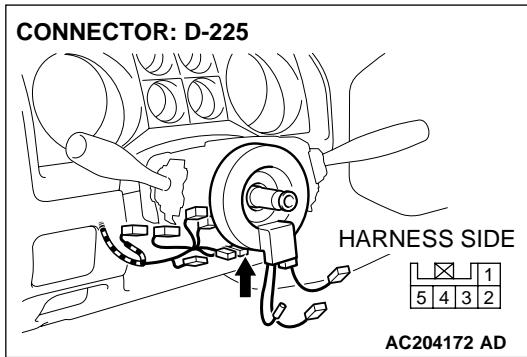
When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect intermediate connector E-122 and steering wheel sensor connector D-225, and measure the resistance at the male intermediate connector (instrument panel wiring harness side).
- (2) Turn the ignition switch to the LOCK (OFF) position.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments, which are connected through the CAN communication lines, may be damaged.

- (3) Disconnect the negative battery terminal.



- (4) Measure the resistance between intermediate connector E-122 terminal 9 and body ground.

- The resistance should be infinite.

Q: Is the resistance infinite?

YES : Replace the steering wheel sensor.

NO : Go to Step 11.

STEP 11. Check the resistance in the CAN_H line. Measure at joint connector (9) D-131.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

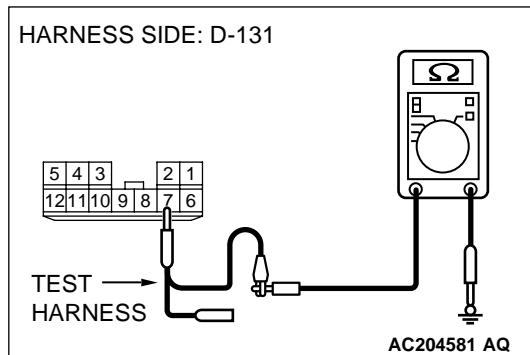
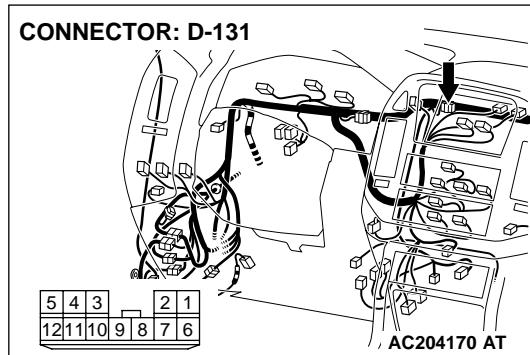
When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect joint connector (9) D-131, and measure the resistance between joint connector (9) and body ground.
- (2) Turn the ignition switch to the LOCK (OFF) position.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments, which are connected through the CAN communication lines, may be damaged.

- (3) Disconnect the negative battery terminal.



⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

- (4) Measure the resistance between joint connector (9) D-131 terminal 7 and body ground.
 - The resistance should be infinite.

⚠ CAUTION

If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

Q: Is the resistance infinite?

YES : Go to Step 12.

NO : Repair the wiring harness wires between joint connector (9) and the data link connector.

STEP 12. Check the resistance in the CAN_H line. Measure at joint connector (9) D-131.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

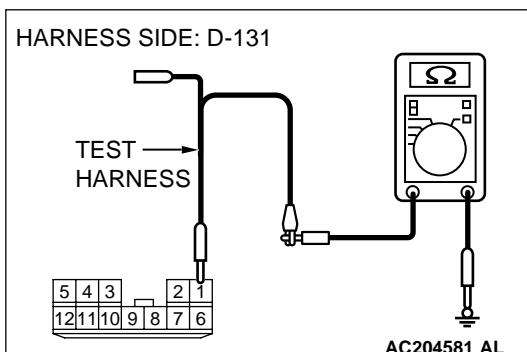
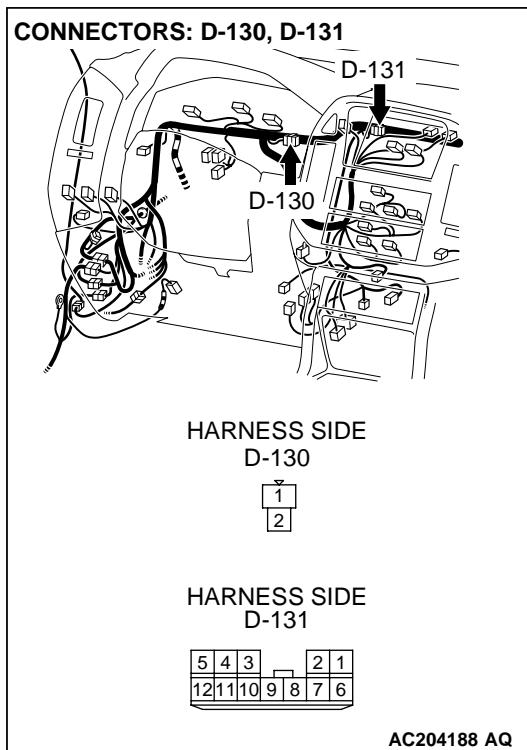
When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect joint connector (9) D-131 and resistor connector D-130, and measure the resistance between joint connector (9) and body ground.
- (2) Turn the ignition switch to the LOCK (OFF) position.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments, which are connected through the CAN communication lines, may be damaged.

- (3) Disconnect the negative battery terminal.



⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

- (4) Measure the resistance between joint connector (9) D-131 terminal 1 and body ground.
 - The resistance should be infinite.

⚠ CAUTION

If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

Q: Is the resistance infinite?

YES : Go to Step 13.

NO : Repair the wiring harness wires between joint connector (9) and the resistor connector.

STEP 13. Check the resistance in the CAN_H line. Measure at joint connector (9) D-131.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

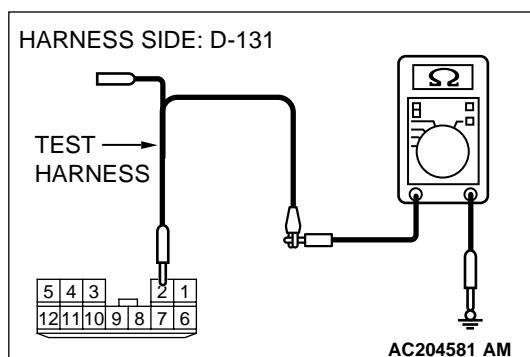
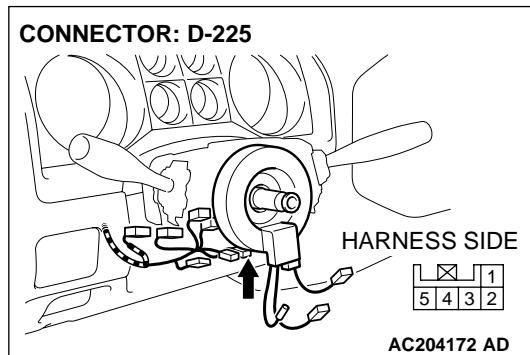
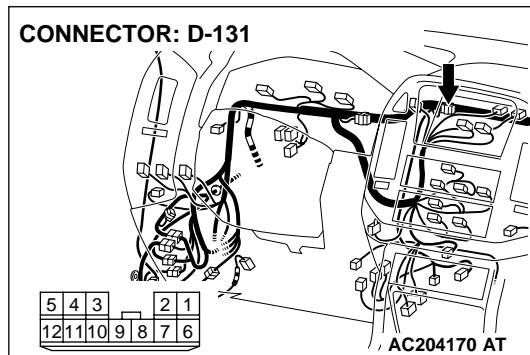
When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect joint connector (9) D-131 and steering wheel sensor connector D-225, and measure the resistance between joint connector (9) and body ground.
- (2) Turn the ignition switch to the LOCK (OFF) position.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments, which are connected through the CAN communication lines, may be damaged.

- (3) Disconnect the negative battery terminal.



⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

- (4) Measure the resistance between joint connector (9) D-131 terminal 2 and body ground.
 - The resistance should be infinite.

⚠ CAUTION

If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

Q: Is the resistance infinite?

YES : Go to Step 14.

NO : Repair the wiring harness wires between joint connector (9) and the steering wheel sensor connector.

STEP 14. Check the resistance in the CAN_H line. Measure at joint connector (9) D-131.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

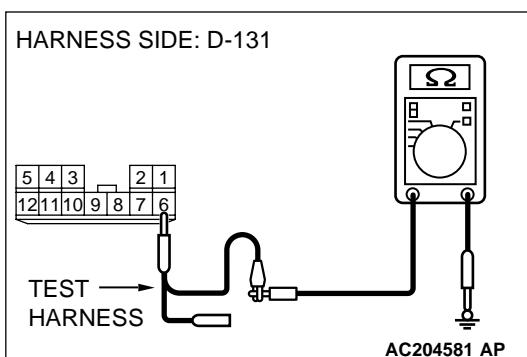
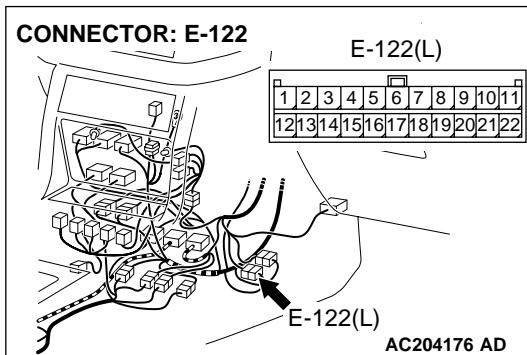
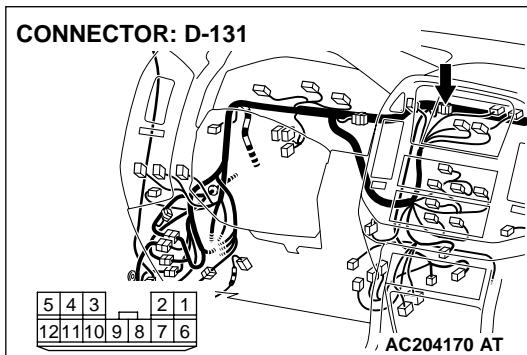
When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect joint connector (9) D-131 and intermediate connector E-122, and measure the resistance between joint connector (9) and body ground.
- (2) Turn the ignition switch to the LOCK (OFF) position.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments, which are connected through the CAN communication lines, may be damaged.

- (3) Disconnect the negative battery terminal.



⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

- (4) Measure the resistance between joint connector (9) D-131 terminal 6 and body ground.
 - The resistance should be infinite.

⚠ CAUTION

If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

Q: Is the resistance infinite?

YES : Retest the system.

NO : Repair the wiring harness wires between joint connector (9) and the intermediate connector.

STEP 15. Measure the voltage in the CAN_H line. Check at intermediate connector E-122.

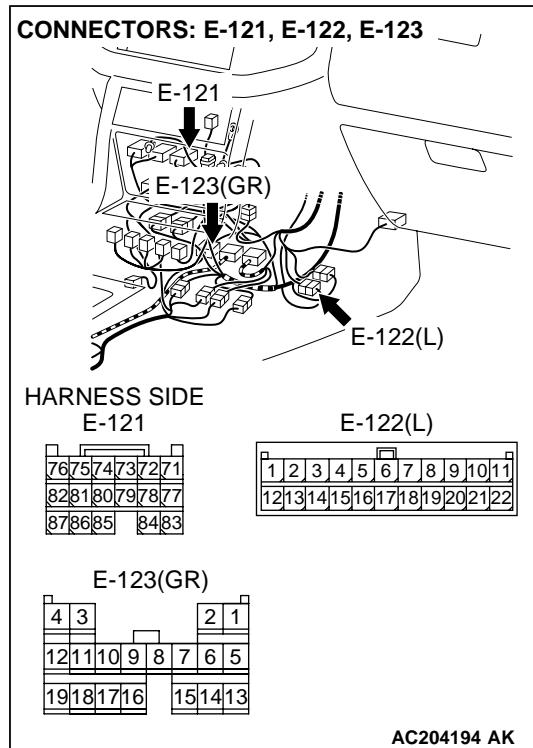
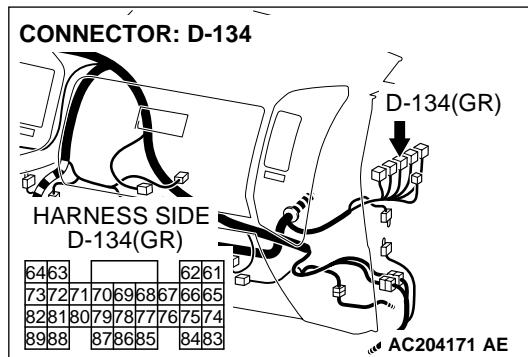
⚠ CAUTION

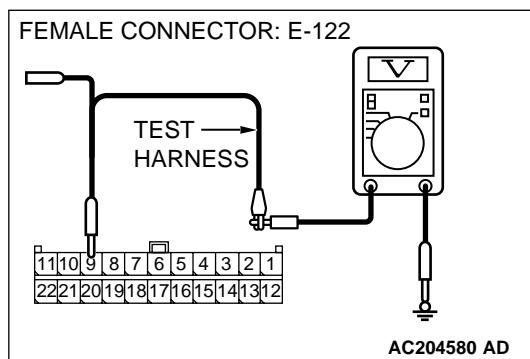
Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect intermediate connectors E-122, E-123, and M-ASTC-ECU connector E-121, power control module connector D-134, and measure the voltage at the female intermediate connector (control panel wiring harness side).
- (2) Turn the ignition switch to the "ON" position.



**⚠ CAUTION**

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

(3) Measure the voltage between intermediate connector E-122 terminal 9 and body ground.

- The voltage should measure one volt or less.

Q: Do the voltage measure one volt or less?

YES : Go to Step 16.

NO : Replace the control wiring harness assembly.

STEP 16. Check the resistance in the CAN_H line. Check at intermediate connector E-122.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

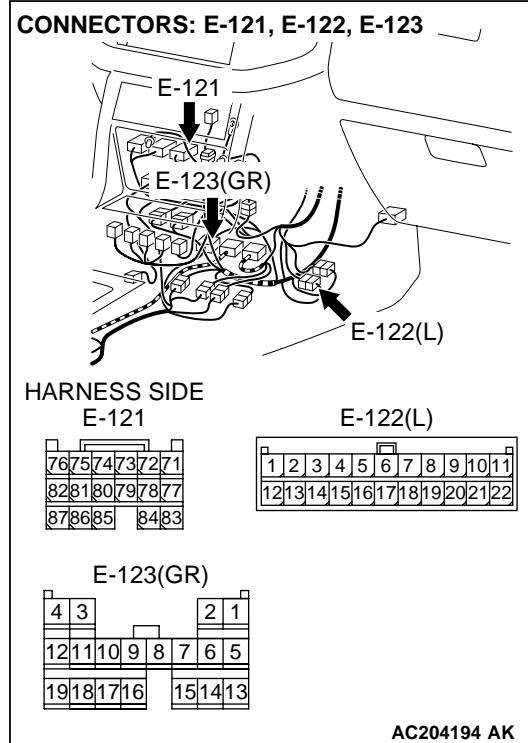
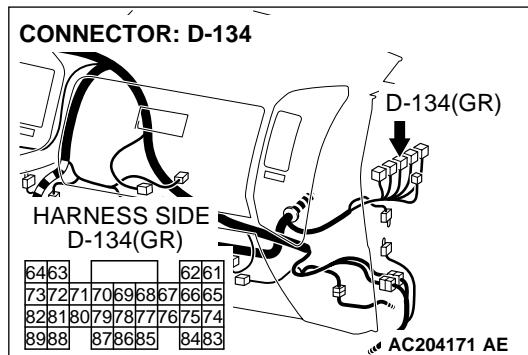
When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

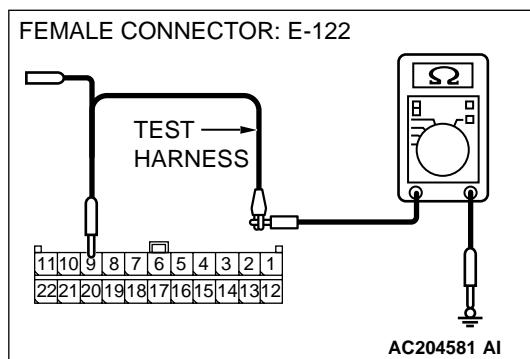
- (1) Disconnect intermediate connectors E-122, E-123, and M-ASTC-ECU connector E-121, power control module connector D-134, and measure the resistance at the female intermediate connector (control panel wiring harness side).
- (2) Turn the ignition switch to the LOCK (OFF) position.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments, which are connected through the CAN communication lines, may be damaged.

- (3) Disconnect the negative battery terminal.



**⚠ CAUTION**

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

(4) Measure the resistance between intermediate connector E-122 terminal 9 and body ground.

- The resistance should be infinite.

Q: Is the resistance infinite?

YES : Go to Step 17.

NO : Replace the control wiring harness assembly.

STEP 17. Measure the voltage in the CAN_H line. Check at intermediate connector E-122.

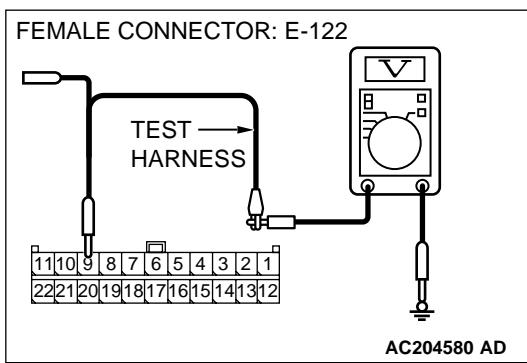
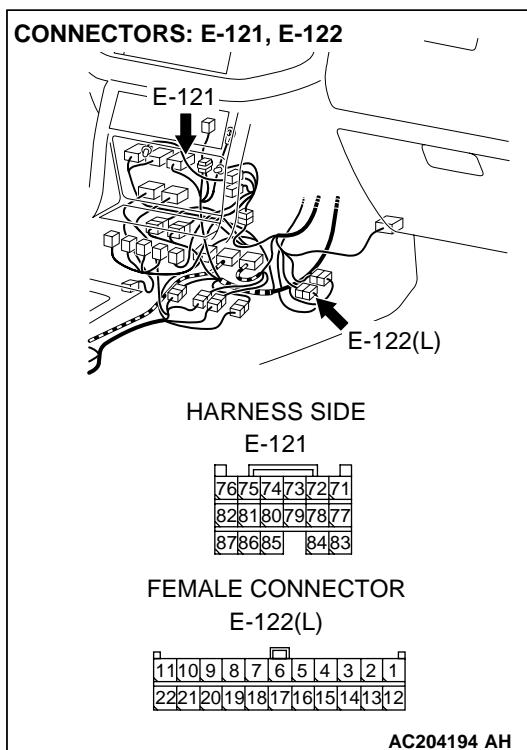
⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect intermediate connector E-122 and M-ASTC-ECU connector E-121, and measure the voltage at the female intermediate connector (control wiring harness side).
- (2) Turn the ignition switch to the "ON" position.



⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

- (3) Measure the voltage between intermediate connector E-122 terminal 9 and body ground.
 - The voltage should measure 0.5 volts or more, or 4.5 volts or less.

Q: Does the voltage measure 0.5 volts or more, or 4.5 volts or less?

YES : Replace the M-ASTC-ECU.

NO : Go to Step 18.

STEP 18. Measure the voltage in the CAN_H line. Check at intermediate connector E-122.

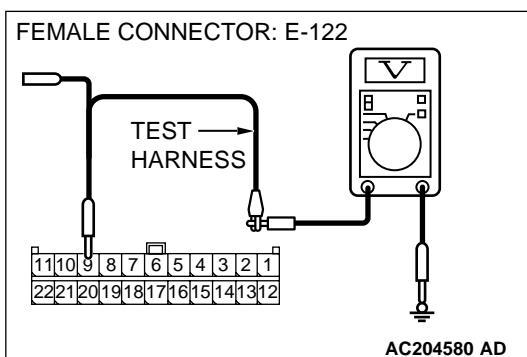
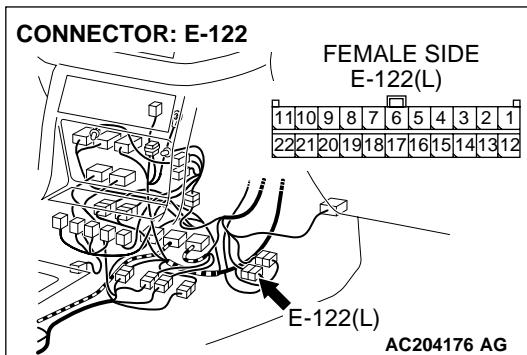
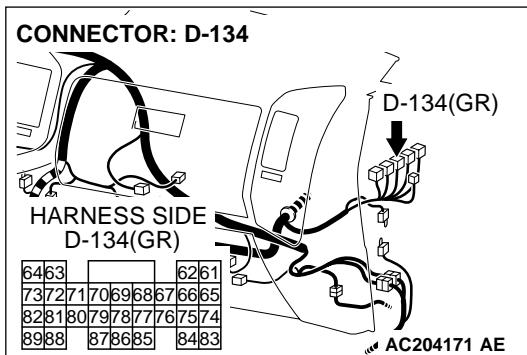
⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect intermediate connector E-122 and power control module connector D-134, and measure the voltage at the female intermediate connector (control wiring harness side).
- (2) Turn the ignition switch to the "ON" position.



⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

- (3) Measure the voltage between intermediate connector E-122 terminal 9 and body ground.
 - The voltage should measure 0.5 volts or more, or 4.5 volts or less.

Q: Does the voltage measure 0.5 volts or more, or 4.5 volts or less?

YES : Replace the power control module.

NO : Go to Step 19.

STEP 19. Measure the voltage in the CAN_H line. Check at intermediate connector E-122.

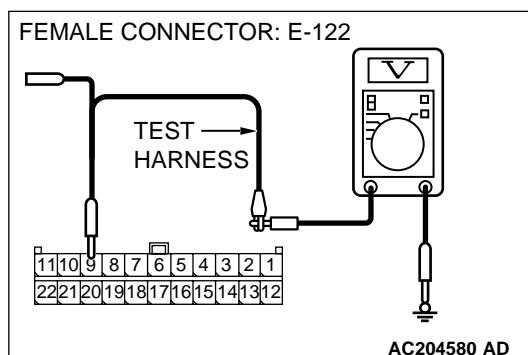
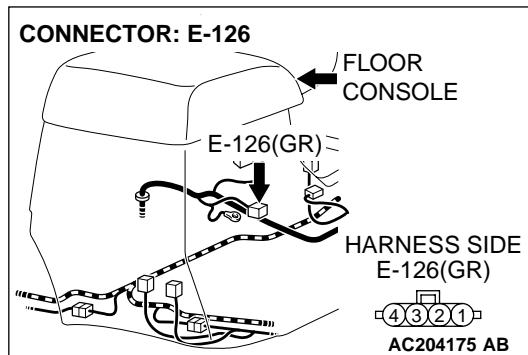
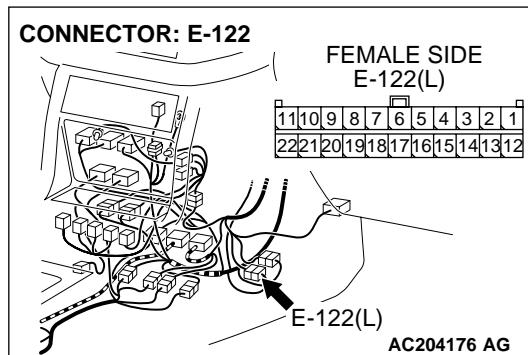
⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect intermediate connector E-122 and G and yaw rate sensor connector E-126, and measure the voltage at the female intermediate connector (control wiring harness side).
- (2) Turn the ignition switch to the "ON" position.



⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

- (3) Measure the voltage between intermediate connector E-122 terminal 9 and body ground.
 - The voltage should measure 0.5 volts or more, or 4.5 volts or less.

Q: Does the voltage measure 0.5 volts or more, or 4.5 volts or less?

YES : Replace the G and yaw rate sensor.

NO : Go to Step 20.

STEP 20. Measure the voltage in the CAN_H line. Check at intermediate connector E-122.

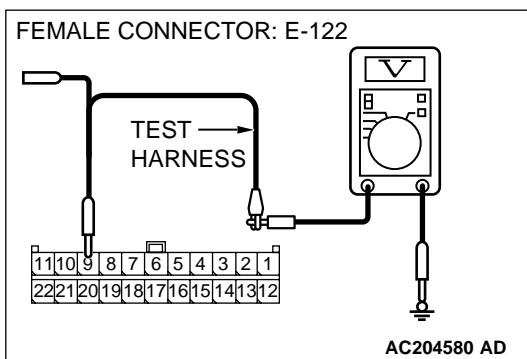
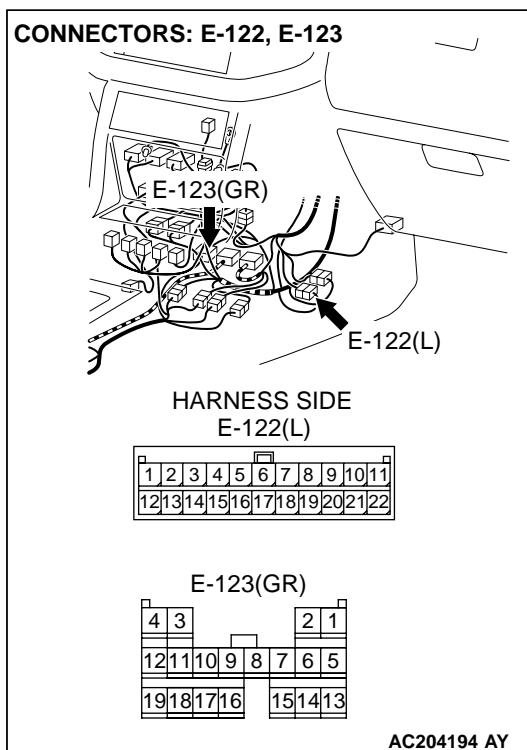
⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect intermediate connectors E-122 and E-123 and power control module connector D-123, and measure the voltage at the female intermediate connector (control wiring harness side).
- (2) Turn the ignition switch to the "ON" position.



⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

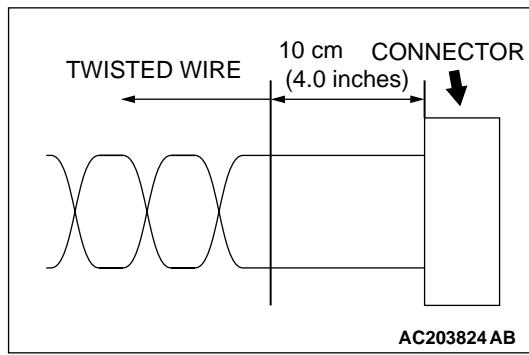
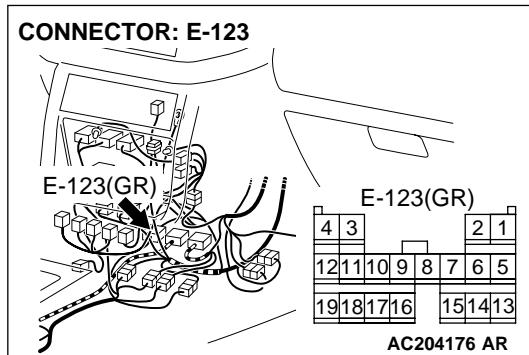
- (3) Measure the voltage between intermediate connector E-122 terminal 9 and body ground.
 - The voltage should measure 0.5 volts or more, or 4.5 volts or less.

Q: Does the voltage measure 0.5 volts or more, or 4.5 volts or less?

YES : Go to Step 21.

NO : Replace the control wiring harness assembly.

STEP 21. Check intermediate connector E-123.

**⚠ CAUTION**

If there is a problem in the connector(s) (including terminals) or wire(s) of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), cut and repair the defective wire so that the frayed end of the twisted wire should be within 10 cm (4.0 inches). If it exceeds 10 cm (4.0 inches), twist the wiring harness just like the original twisted wire. If the frayed end exceeds 10 cm (4.0 inches), a communication error may be caused.

⚠ CAUTION

If there is a problem in the CAN bus line or the connectors on the control wiring harness assembly (the wiring harness connected to the M-ASTC-ECU, the power control module and intermediate connector E-123), do not attempt to repair the wiring harness or connector(s), but replace the wiring harness assembly. If a wire is added or the connector(s) are repaired, an error in the CAN communication may be caused.

Q: Is intermediate connector E-123 in good condition?

YES : Repair the wiring harness wires between intermediate connector E-123 and the G and yaw rate sensor connector.

NO :

- If there is a problem at the transmission wiring harness assembly side, repair or replace the connector.
- If there is a problem at the control wiring harness assembly side, replace the control wiring harness assembly.

Diagnostic Item 4: Diagnose the terminator resistor and the CAN main bus line

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

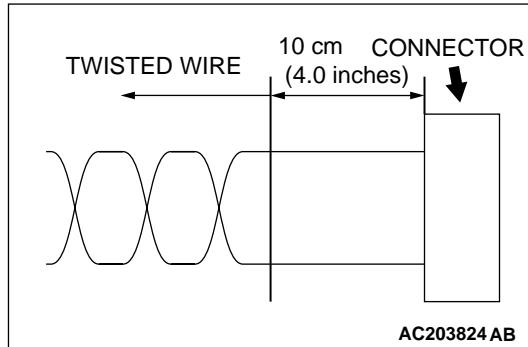
When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments, which are connected through the CAN communication lines, may be damaged.

⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

⚠ CAUTION

If there is a problem in the connector(s) (including terminals) or wire(s) of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), cut and repair the defective wire so that the frayed end of the twisted wire should be within 10 cm (4.0 inches). If it exceeds 10 cm (4.0 inches), twist the wiring harness just like the original twisted wire. If the frayed end exceeds 10 cm (4.0 inches), a communication error may be caused.

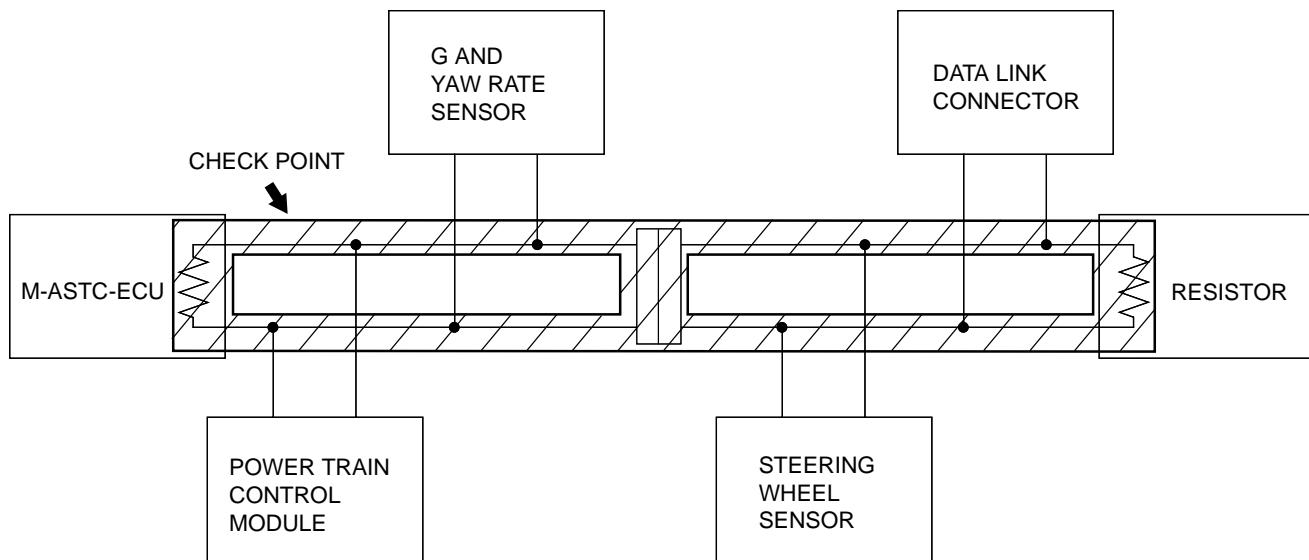
⚠ CAUTION

If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

⚠ CAUTION

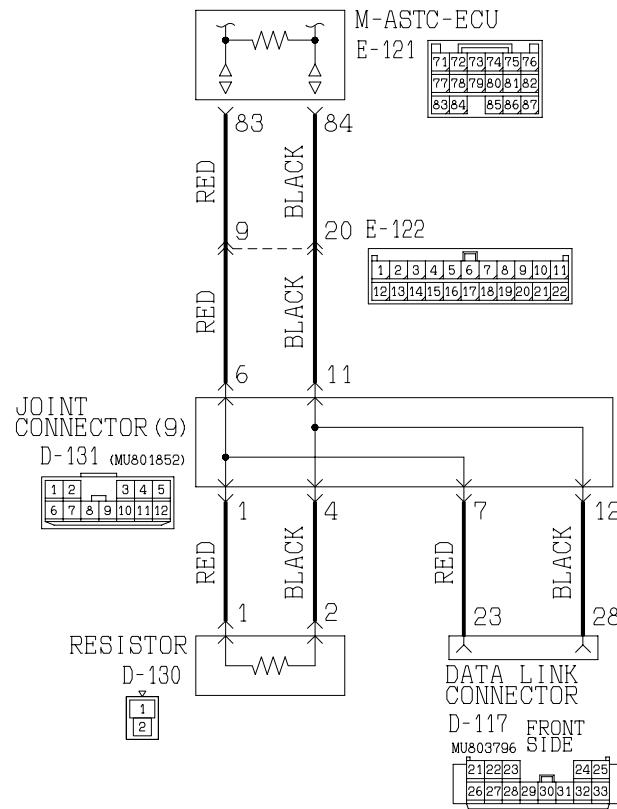
If there is a problem in the CAN bus line or the connectors on the control wiring harness assembly (the wiring harness connected to the M-ASTC-ECU, the power control module and intermediate connector E-123), do not attempt to repair the wiring harness or connector(s), but replace the wiring harness assembly. If a wire is added or the connector(s) are repaired, an error in the CAN communication may be caused.

This procedure diagnoses the shaded portion below.

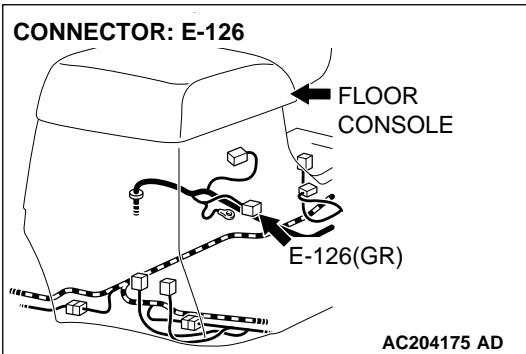
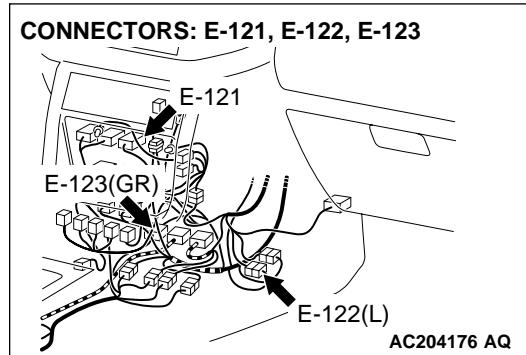
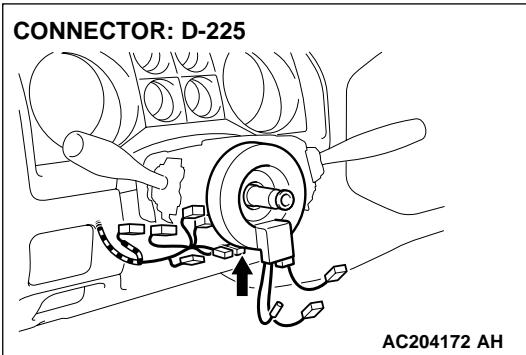
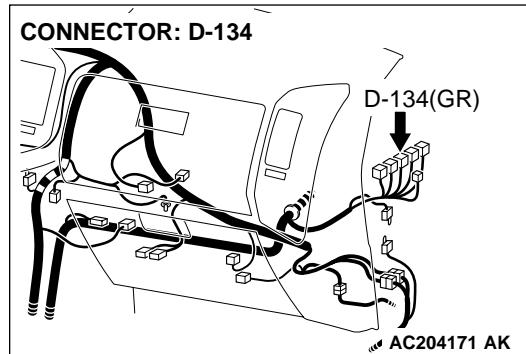
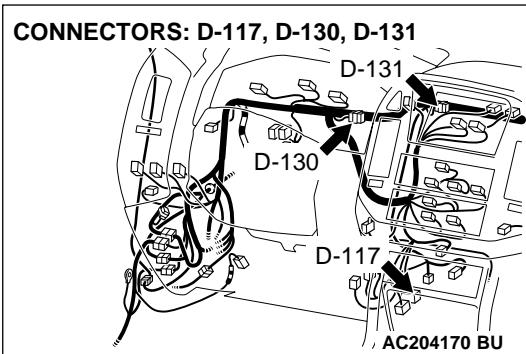


AC203825AB

CAN Bus Communication Circuit (main bus line)



W3Q01M01AA



DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set

STEP 1. Check the terminator resistor.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Measure the resistance at data link connector D-117.
- (2) Turn the ignition switch to the LOCK (OFF) position.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments, which are connected through the CAN communication lines, may be damaged.

- (3) Disconnect the negative battery terminal.

⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

- (4) Measure the resistance between data link connector D-117 terminals 23 and 28.

- The resistance should measure 60 ± 10 ohms.

Q: Does the resistance measure 60 ± 10 ohms?

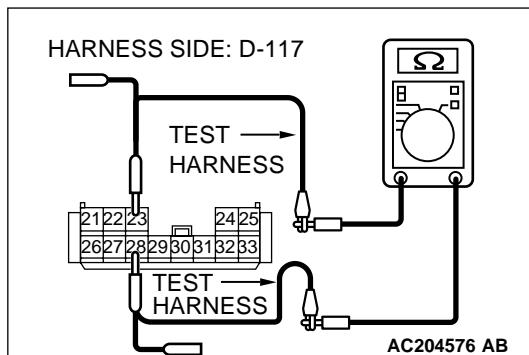
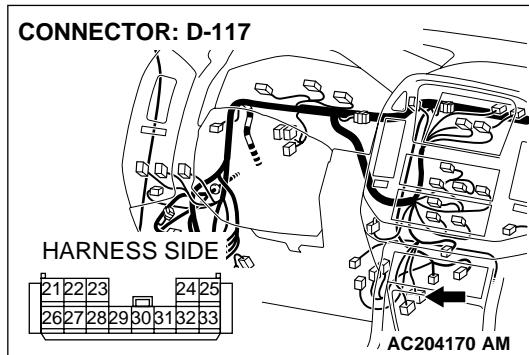
The resistance measures 60 ± 10 ohms. : Retest the system.

The resistance measures 120 ± 20 ohms or more : Go to Step 2.

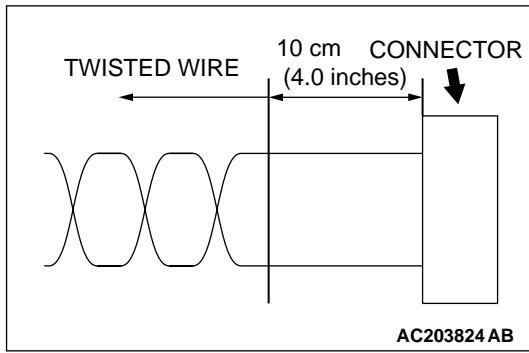
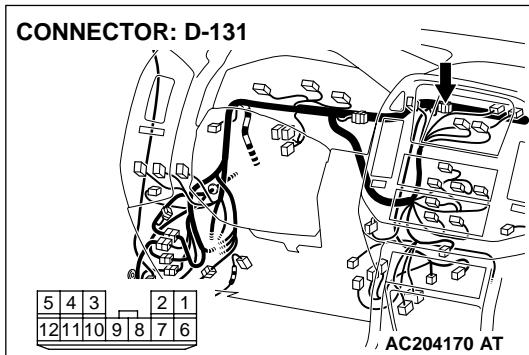
The resistance measures approximately 120 ± 12 ohms (i.e. terminator resistor at one side, wiring harness or connector is defective) : Go to Step 13.

The resistance measure less than 60 ± 10 ohms : Go to Step 13.

Other than above : Go to Step 35.



STEP 2. Check joint connector (9) D-131.



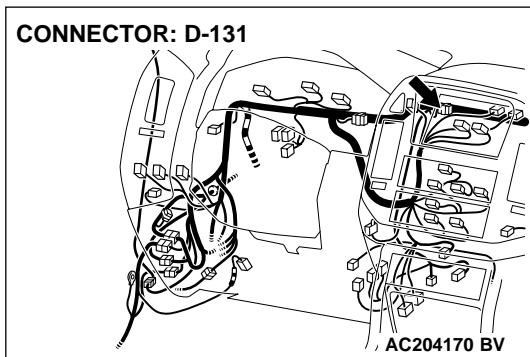
CAUTION

If there is a problem in the connector(s) (including terminals) or wire(s) of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), cut and repair the defective wire so that the frayed end of the twisted wire should be within 10 cm (4.0 inches). If it exceeds 10 cm (4.0 inches), twist the wiring harness just like the original twisted wire. If the frayed end exceeds 10 cm (4.0 inches), a communication error may be caused.

Q: Is joint connector D-131 in good condition?

YES : Go to Step 3.

NO : Repair or replace the connector(s).



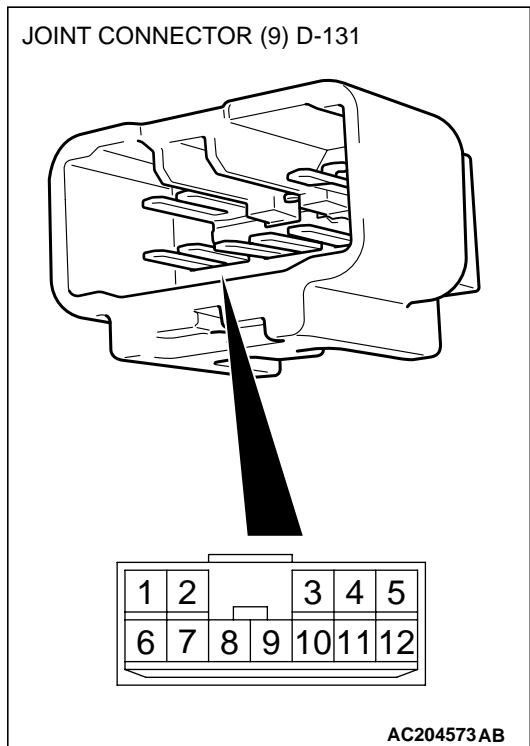
STEP 3. Check the joint connector.

Disconnect joint connector (9), and check the short pin behind the connector for corrosion, deformation and delamination.

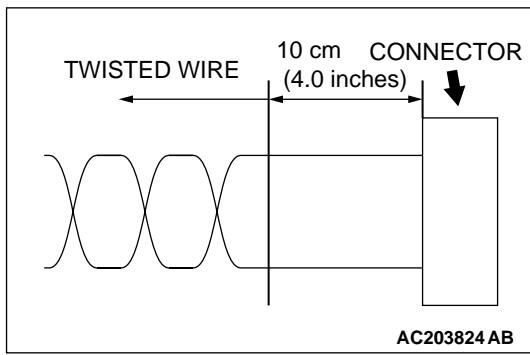
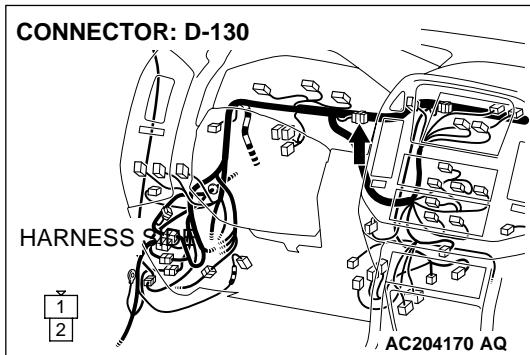
Q: Is joint connector in good condition?

YES : Go to Step 4.

NO : Replace the joint connector.



STEP 4. Check resistor connector D-130.



CAUTION

If there is a problem in the connector(s) (including terminals) or wire(s) of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), cut and repair the defective wire so that the frayed end of the twisted wire should be within 10 cm (4.0 inches). If it exceeds 10 cm (4.0 inches), twist the wiring harness just like the original twisted wire. If the frayed end exceeds 10 cm (4.0 inches), a communication error may be caused.

Q: Is resistor connector D-130 in good condition?

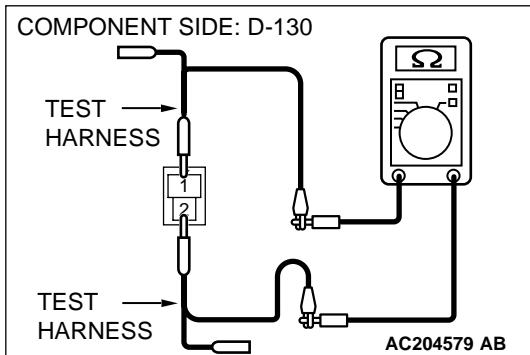
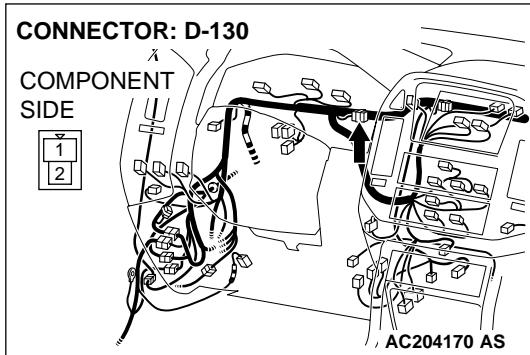
YES : Go to Step 5.

NO : Repair or replace the connector, and then go to Step 5.

STEP 5. Check the terminator resistor. Measure at resistor connector D-130.**⚠ CAUTION**

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

- (1) Disconnect resistor connector D-130, and measure the resistance at the component-side connector.



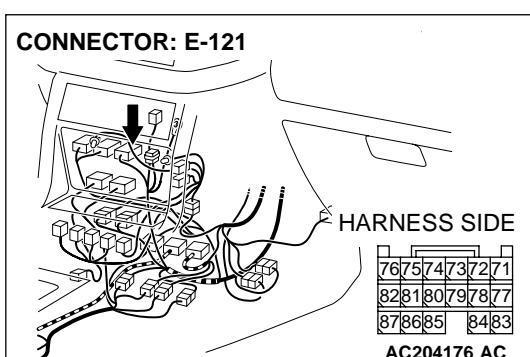
- (2) Measure the resistance between resistor connector D-130 terminals 1 and 2.

- The resistance should measure 120 ± 20 ohms.

Q: Does the resistance measure 120 ± 20 ohms?

YES : Go to Step 6.

NO : Replace the resistor, and then go to Step 6.



STEP 6. Check M-ASTC-ECU connector E-121.**⚠ CAUTION**

If there is a problem in the CAN bus line or the connectors on the control wiring harness assembly (the wiring harness connected to the M-ASTC-ECU, the power control module and intermediate connector E-123), do not attempt to repair the wiring harness or connector(s), but replace the wiring harness assembly. If a wire is added or the connector(s) are repaired, an error in the CAN communication may be caused.

Q: Is M-ASTC-ECU connector E-121 in good condition?

YES : Go to Step 7.

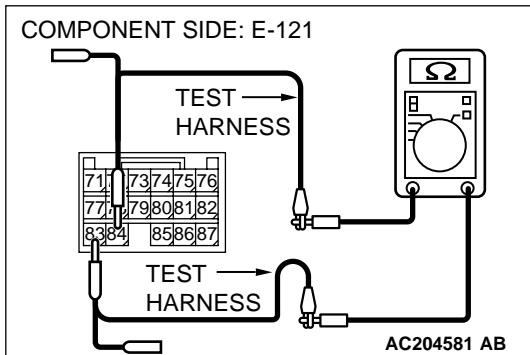
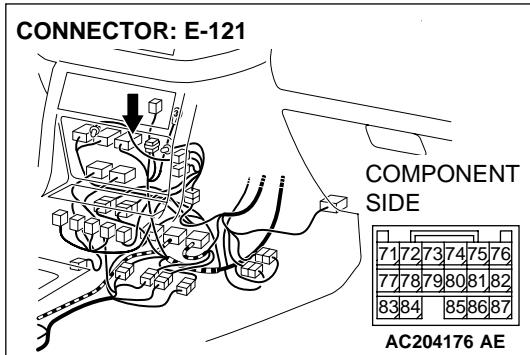
NO : Replace the control wiring harness and then go to Step 7. If the resistor or its connector is repaired or replaced, repair or replace the connector and then retest the system.

STEP 7. Check the terminator resistor inside the M-ASTC-ECU. Measure at M-ASTC-ECU connector E-121.

CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

(1) Disconnect M-ASTC-ECU connector E-121, and measure the resistance at the component-side connector.



(2) Measure the resistance between M-ASTC-ECU connector E-12 terminals 83 and 84.

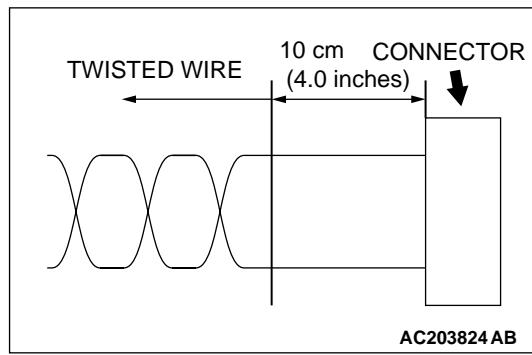
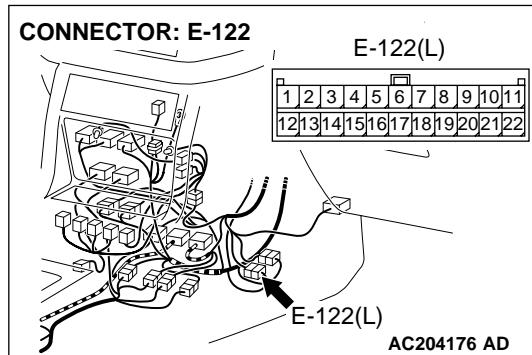
- The resistance should measure 120 ± 20 ohms.

Q: Does the resistance measure 120 ± 20 ohms?

YES : Go to Step 8.

NO : Replace the M-ASTC-ECU and then go to Step 8. If the resistor or its connector is repaired or replaced, replace the M-ASTC-ECU and then retest the system.

STEP 8. Check intermediate connector E-122.

**CAUTION**

If there is a problem in the connector(s) (including terminals) or wire(s) of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), cut and repair the defective wire so that the frayed end of the twisted wire should be within 10 cm (4.0 inches). If it exceeds 10 cm (4.0 inches), twist the wiring harness just like the original twisted wire. If the frayed end exceeds 10 cm (4.0 inches), a communication error may be caused.

CAUTION

If there is a problem in the CAN bus line or the connectors on the control wiring harness assembly (the wiring harness connected to the M-ASTC-ECU, the power control module and intermediate connector E-123), do not attempt to repair the wiring harness or connector(s), but replace the wiring harness assembly. If a wire is added or the connector(s) are repaired, an error in the CAN communication may be caused.

Q: Is intermediate connector E-122 in good condition?

YES : Go to Step 9.

NO :

- If there is a defect at the instrument panel wiring harness assembly side, repair or replace the connector, and then go to Step 9. If the resistor is replaced, repair its connector and then retest the system.
- If there is a problem at the control wiring harness assembly side, replace the control wiring harness assembly and then go to Step 9. If the resistor is replaced, repair its connector and then retest the system.

STEP 9. Check the terminator resistor inside the M-ASTC-ECU. Check at intermediate connector E-122.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

(1) Disconnect intermediate connector E-122, and measure the resistance at the female intermediate connector (control wiring harness side).

(2) Turn the ignition switch to the LOCK (OFF) position.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments, which are connected through the CAN communication lines, may be damaged.

(3) Disconnect the negative battery terminal.

⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

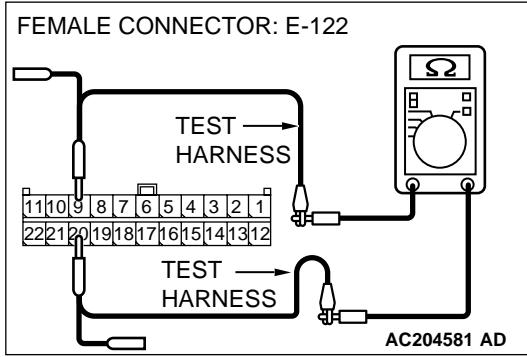
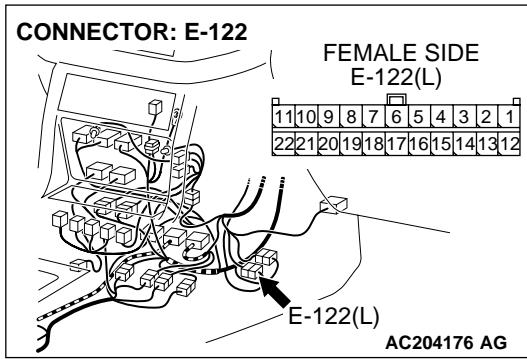
(4) Measure the resistance between intermediate connector E-122 terminals 9 and 20.

- The resistance should measure 120 ± 20 ohms.

Q: Does the resistance measure 120 ± 20 ohms?

YES : Go to Step 10.

NO : Replace the control wiring harness assembly.



STEP 10. Check the CAN bus line for open circuit. Measure at joint connector (9) D-131 and data link connector D-117.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

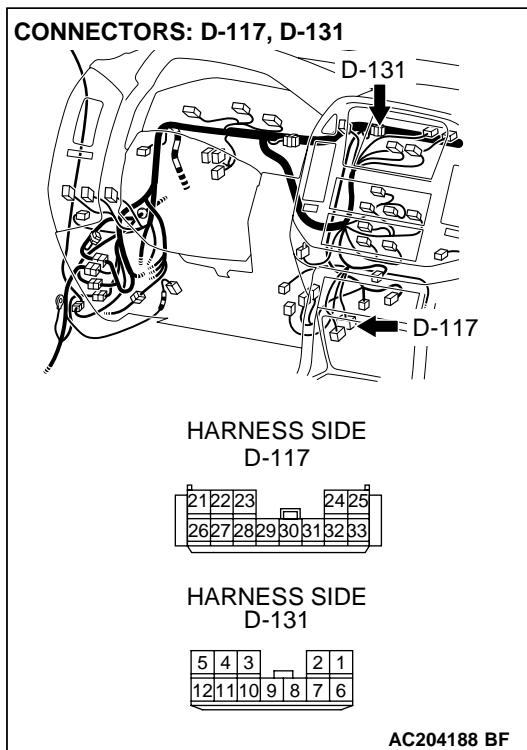
When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

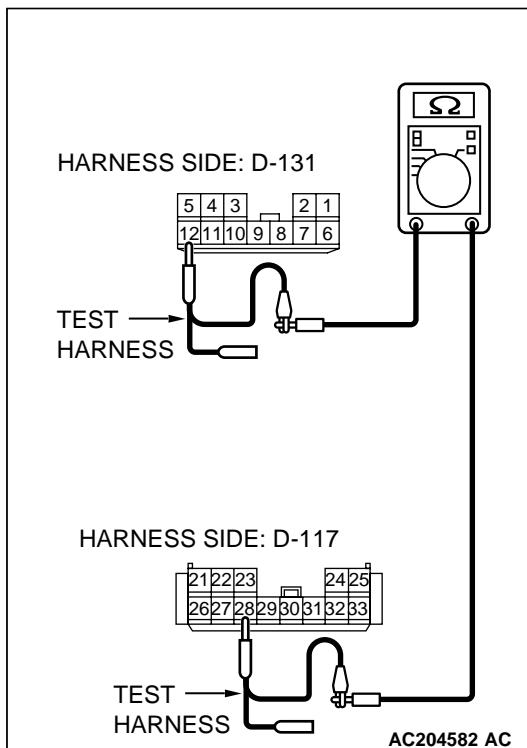
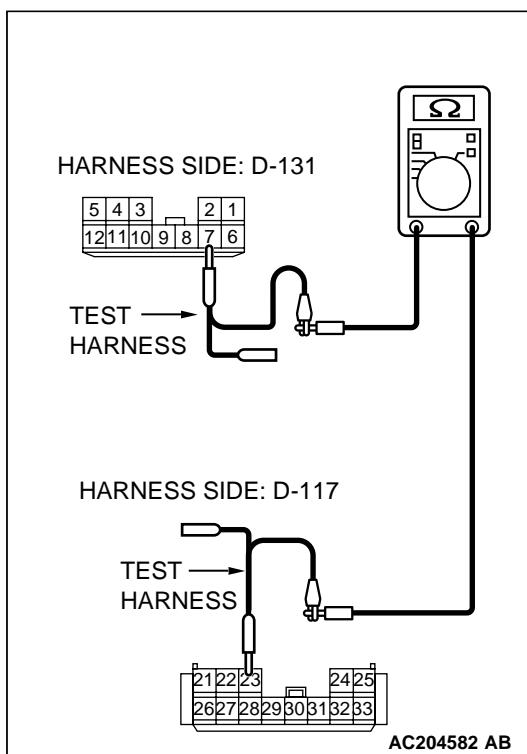
- (1) Disconnect joint connector (9) D-131, and measure the resistance between joint connector (9) and the data link connector.
- (2) Turn the ignition switch to the LOCK (OFF) position.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments, which are connected through the CAN communication lines, may be damaged.

- (3) Disconnect the negative battery terminal.





CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

(4) Measure the resistance values between joint connector (9) D-131 terminal 7 and data link connector D-117 terminal 23, and between joint connector (9) D-131 terminal 12 and data link connector D-117 terminal 28.

- The resistance should measure 2 ohms or less.

CAUTION

If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

Q: Does the resistance measure 2 ohms or less?

YES : Go to Step 11.

NO : Repair the wiring harness wires between joint connector (9) and the data link connector.

STEP 11. Check the CAN bus line for open circuit. Measure at joint connector (9) D-131 and resistor connector D-130.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

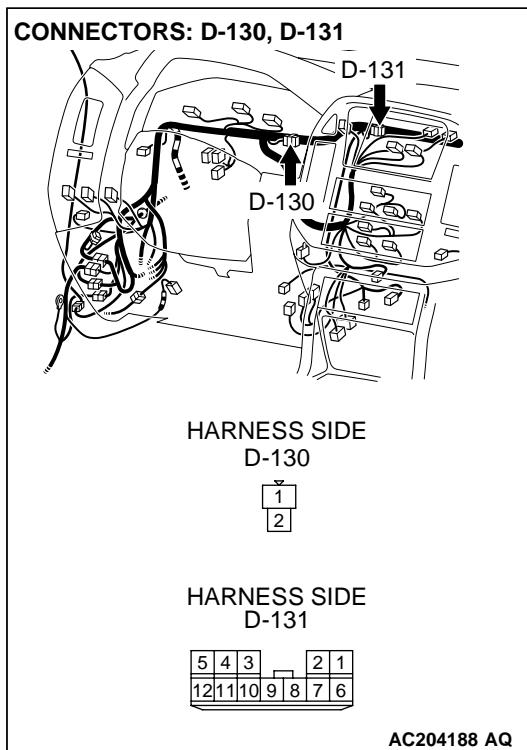
When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

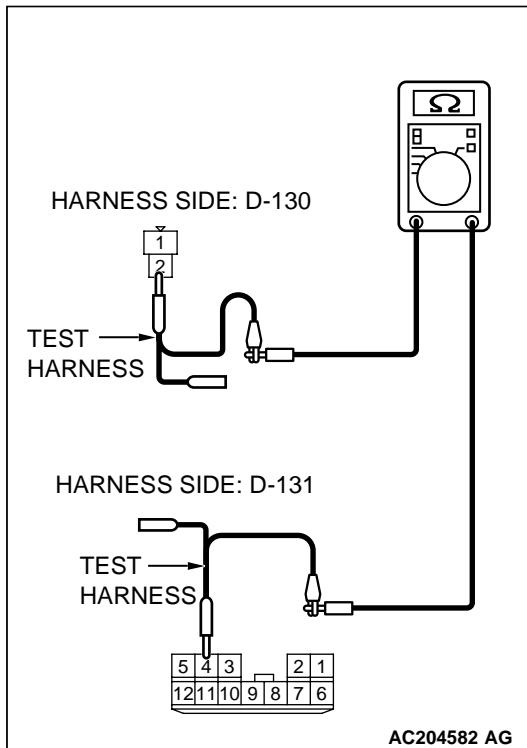
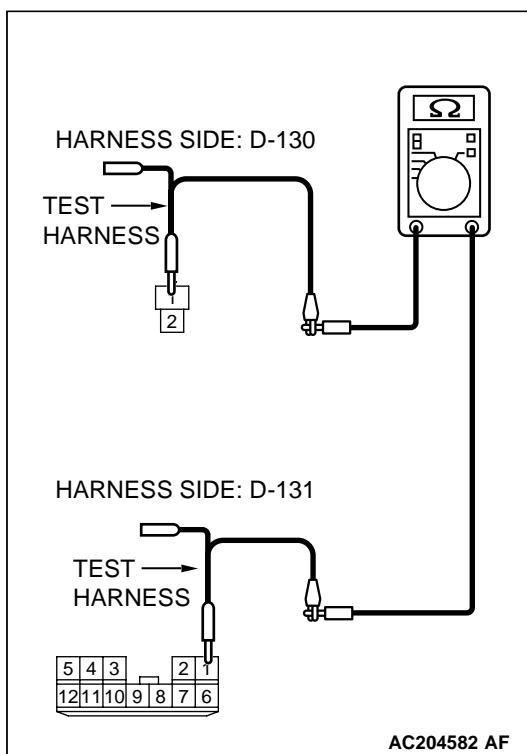
- (1) Disconnect joint connector (9) D-131 and resistor connector D-130, and measure the resistance between joint connector (9) and the resistor connector.
- (2) Turn the ignition switch to the LOCK (OFF) position.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments, which are connected through the CAN communication lines, may be damaged.

- (3) Disconnect the negative battery terminal.





CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

(4) Measure the resistance values between joint connector (9) D-131 terminal 1 and resistor connector D-130 terminal 1, and between joint connector (9) D-131 terminal 4 and resistor connector D-130 terminal 2.

- The resistance should measure 2 ohms or less.

CAUTION

If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

Q: Does the resistance measure 2 ohms or less?

YES : Go to Step 12.

NO : Repair the wiring harness wires between joint connector (9) and the resistor connector.

STEP 12. Check the CAN bus line for open circuit. Measure at joint connector (9) D-131 and intermediate connector E-122.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

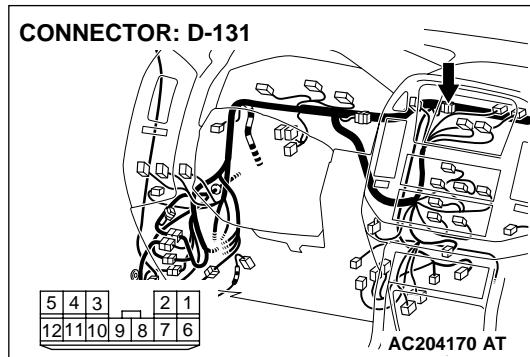
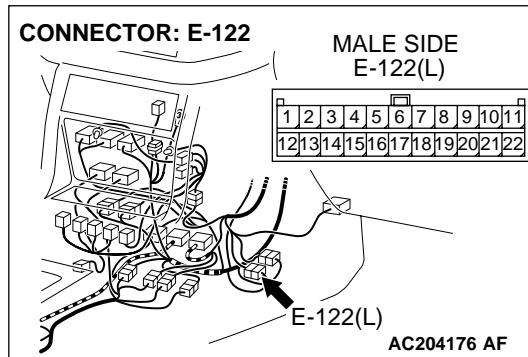
(1) Disconnect joint connector (9) D-131 and intermediate connector E-122, and measure the resistance between joint connector (9) and the male intermediate connector (at the instrument panel wiring harness side).

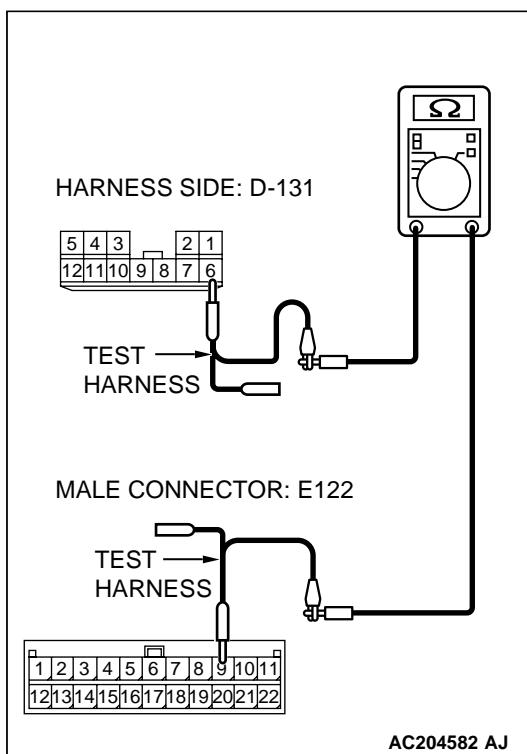
(2) Turn the ignition switch to the LOCK (OFF) position.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments, which are connected through the CAN communication lines, may be damaged.

(3) Disconnect the negative battery terminal.





CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

(4) Measure the resistance values between joint connector (9) D-131 terminal 6 and intermediate connector E-122 terminal 9, and between joint connector (9) D-131 terminal 11 and intermediate connector E-122 terminal 20.

- The resistance should measure 2 ohms or less.

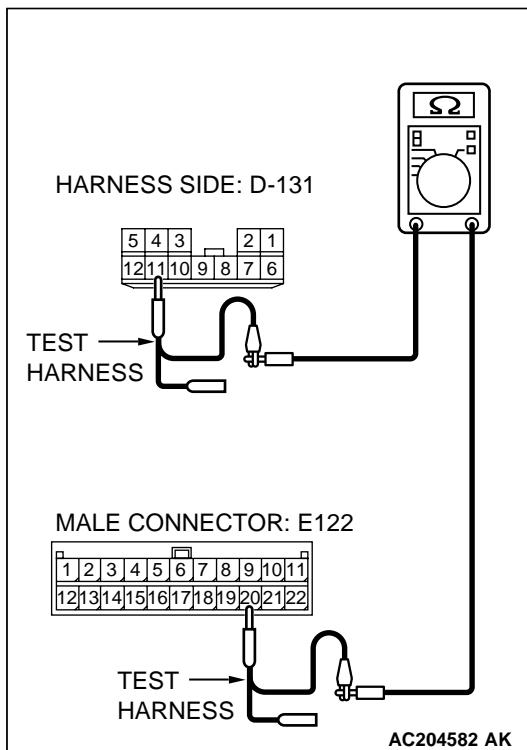
CAUTION

If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

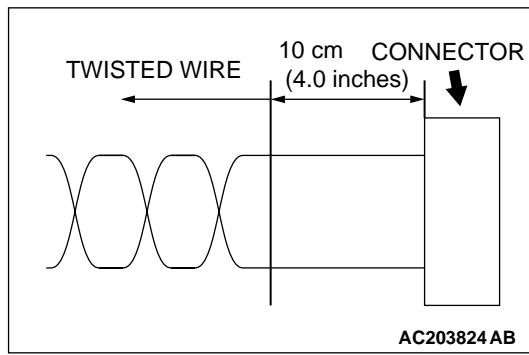
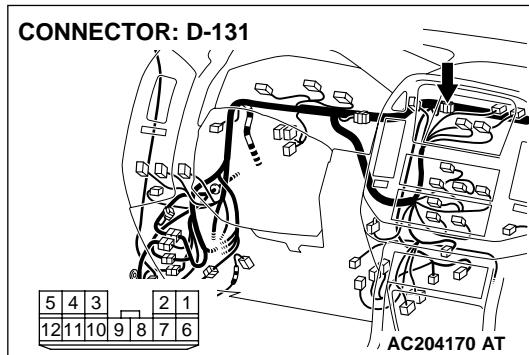
Q: Does the resistance measure 2 ohms or less?

YES : Retest the system.

NO : Repair the wiring harness wires between joint connector (9) and the intermediate connector.



STEP 13. Check joint connector (9) D-131.

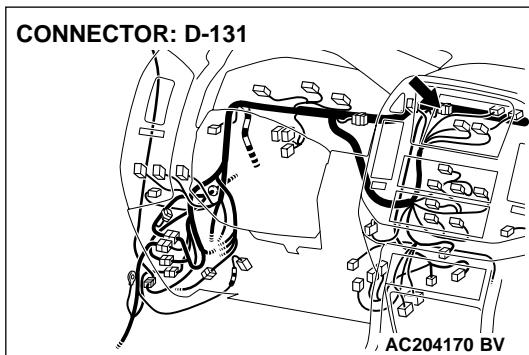
**CAUTION**

If there is a problem in the connector(s) (including terminals) or wire(s) of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), cut and repair the defective wire so that the frayed end of the twisted wire should be within 10 cm (4.0 inches). If it exceeds 10 cm (4.0 inches), twist the wiring harness just like the original twisted wire. If the frayed end exceeds 10 cm (4.0 inches), a communication error may be caused.

Q: Is joint connector D-131 in good condition?

YES : Go to Step 14.

NO : Repair or replace the connector(s).



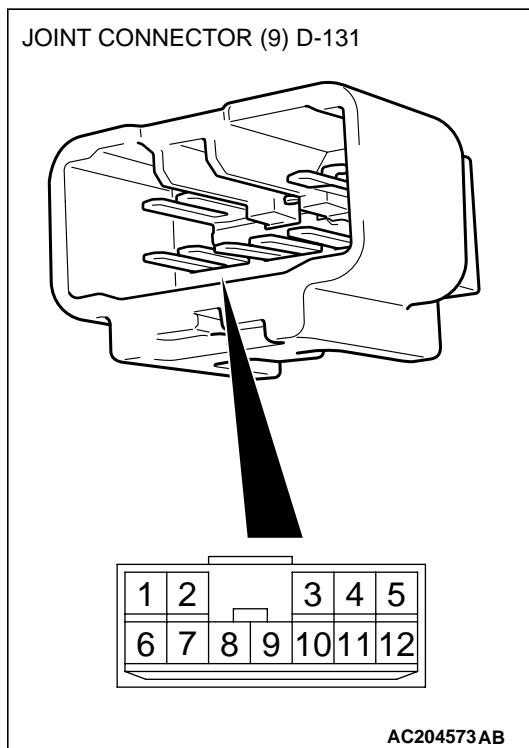
STEP 14. Check the joint connector.

Disconnect joint connector (9), and check the short pin behind the connector for corrosion, deformation and delamination.

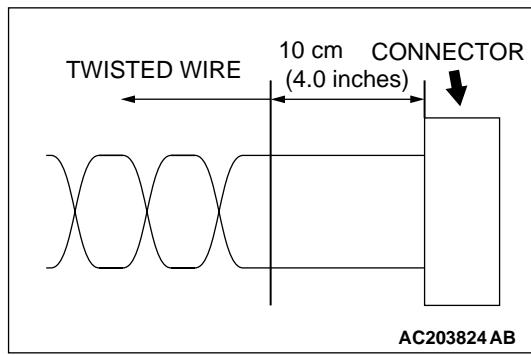
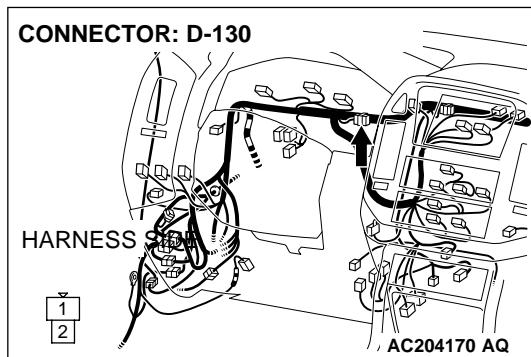
Q: Is joint connector in good condition?

YES : Go to Step 15.

NO : Replace the joint connector.



STEP 15. Check resistor connector D-130.

**⚠ CAUTION**

If there is a problem in the connector(s) (including terminals) or wire(s) of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), cut and repair the defective wire so that the frayed end of the twisted wire should be within 10 cm (4.0 inches). If it exceeds 10 cm (4.0 inches), twist the wiring harness just like the original twisted wire. If the frayed end exceeds 10 cm (4.0 inches), a communication error may be caused.

Q: Is resistor connector D-130 in good condition?

YES : Go to Step 16.

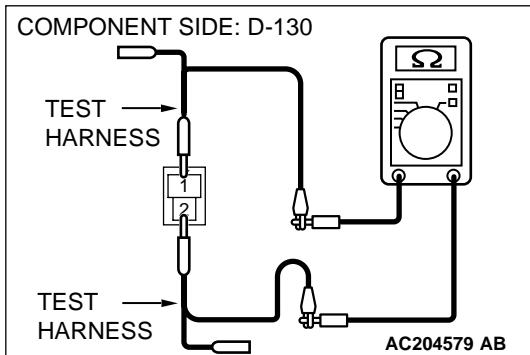
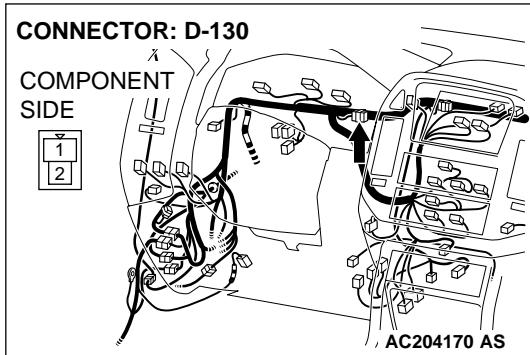
NO : Repair or replace the connector(s).

STEP 16. Check the terminator resistor. Measure at resistor connector D-130.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

- (1) Disconnect resistor connector D-130, and measure the resistance at the component-side connector.



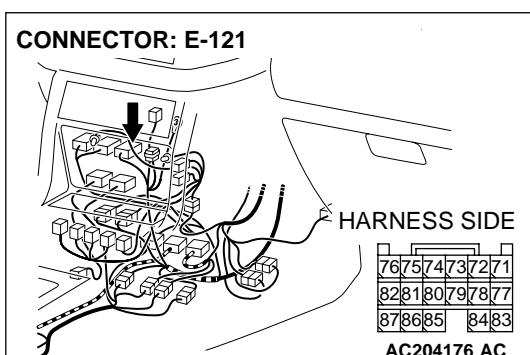
- (2) Measure the resistance between resistor connector D-130 terminals 1 and 2.

- The resistance should measure 120 ± 20 ohms.

Q: Does the resistance measure 120 ± 20 ohms?

YES : Go to Step 17.

NO : Replace the resistor.



STEP 17. Check M-ASTC-ECU connector E-121.

⚠ CAUTION

If there is a problem in the CAN bus line or the connectors on the control wiring harness assembly (the wiring harness connected to the M-ASTC-ECU, the power control module and intermediate connector E-123), do not attempt to repair the wiring harness or connector(s), but replace the wiring harness assembly. If a wire is added or the connector(s) are repaired, an error in the CAN communication may be caused.

Q: Is M-ASTC-ECU connector E-121 in good condition?

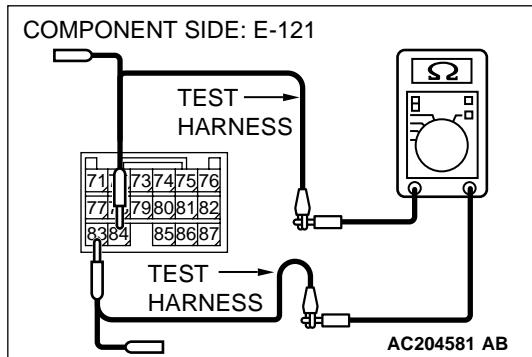
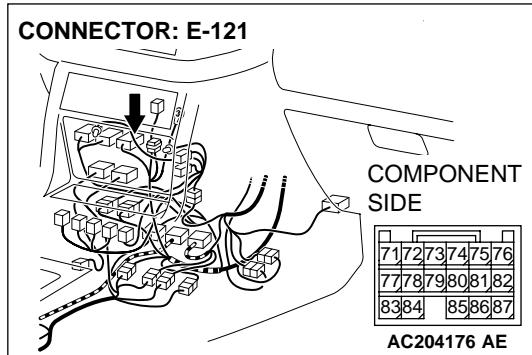
YES : Go to Step 18.

NO : Replace the control wiring harness assembly.

STEP 18. Check the terminator resistor inside the M-ASTC-ECU. Measure at M-ASTC-ECU connector E-121.**CAUTION**

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

- (1) Disconnect M-ASTC-ECU connector E-121, and measure the resistance at the component-side connector.



- (2) Measure the resistance between M-ASTC-ECU connector E-121 terminals 83 and 84.

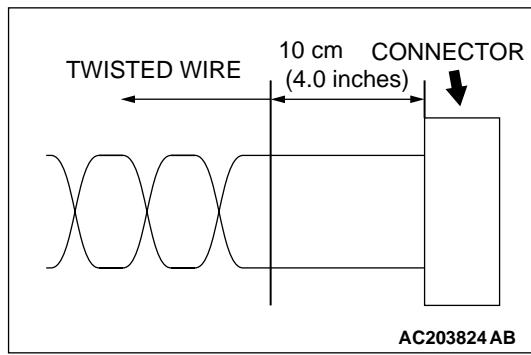
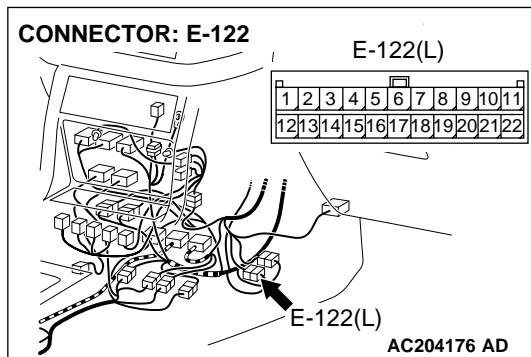
- The resistance should measure 120 ± 20 ohms.

Q: Does the resistance measure 120 ± 20 ohms?

YES : Go to Step 19.

NO : Replace the M-ASTC-ECU.

STEP 19. Check intermediate connector E-122.



⚠ CAUTION

If there is a problem in the connector(s) (including terminals) or wire(s) of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), cut and repair the defective wire so that the frayed end of the twisted wire should be within 10 cm (4.0 inches). If it exceeds 10 cm (4.0 inches), twist the wiring harness just like the original twisted wire. If the frayed end exceeds 10 cm (4.0 inches), a communication error may be caused.

⚠ CAUTION

If there is a problem in the CAN bus line or the connectors on the control wiring harness assembly (the wiring harness connected to the M-ASTC-ECU, the power control module and intermediate connector E-123), do not attempt to repair the wiring harness or connector(s), but replace the wiring harness assembly. If a wire is added or the connector(s) are repaired, an error in the CAN communication may be caused.

Q: Is intermediate connector E-122 in good condition?

YES : Go to Step 20.

NO :

- If there is a problem at the instrument panel wiring harness assembly side, repair or replace the connector.
- If there is a problem at the control wiring harness assembly side, replace the control wiring harness assembly.

**STEP 20. Check the terminator resistor at the resistor side.
Check at intermediate connector E-122.**

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect intermediate connector E-122, and measure the resistance at the male intermediate connector (instrument panel wiring harness side).
- (2) Turn the ignition switch to the LOCK (OFF) position.
- (3) Disconnect the negative battery terminal.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments, which are connected through the CAN communication lines, may be damaged.

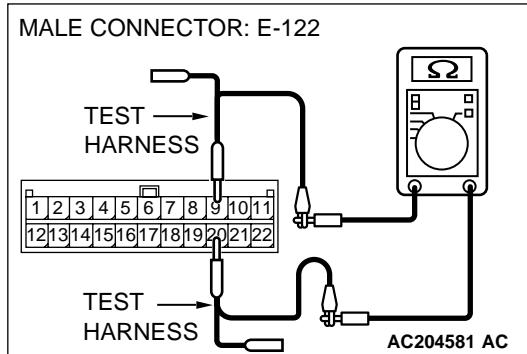
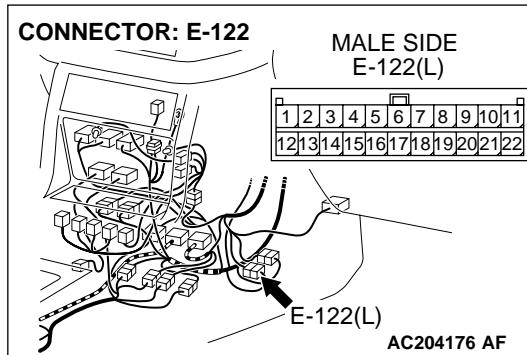
- (4) Measure the resistance between intermediate connector E-122 terminals 9 and 20.
 - The resistance should measure 120 ± 20 ohms.

Q: Does the resistance measure 120 ± 20 ohms?

YES : Go to Step 30.

NO :

- If the resistance is infinite, go to Step 21 .
- If the resistance measures 2 ohms or less, go to Step 24.



STEP 21. Check the CAN bus line for open circuit. Measure at joint connector (9) D-131 and data link connector D-117.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

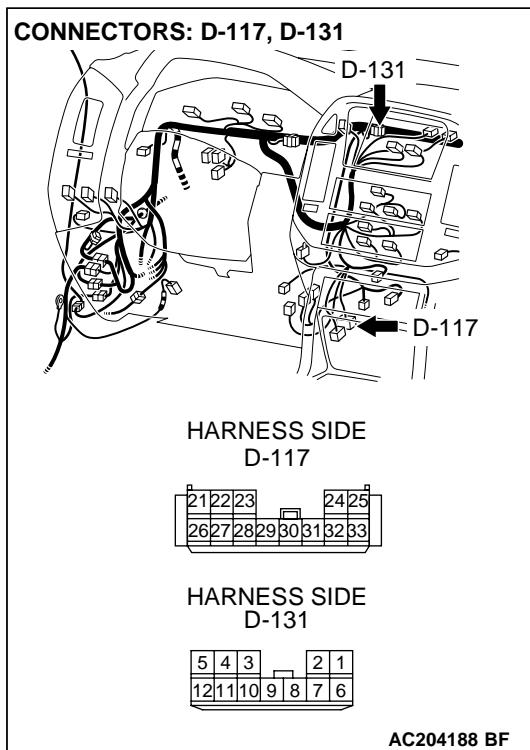
When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

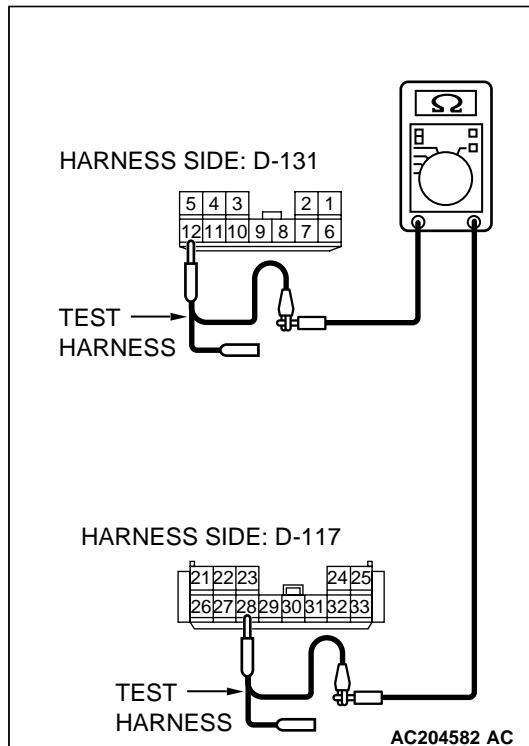
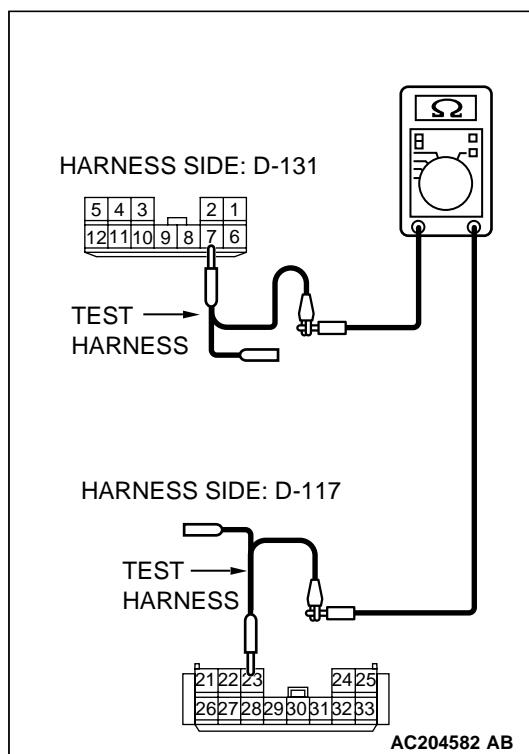
- (1) Disconnect joint connector (9) D-131, and measure the resistance between joint connector (9) and the data link connector.
- (2) Turn the ignition switch to the LOCK (OFF) position.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments, which are connected through the CAN communication lines, may be damaged.

- (3) Disconnect the negative battery terminal.





CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

(4) Measure the resistance values between joint connector (9) D-131 terminal 7 and data link connector D-117 terminal 23, and between joint connector (9) D-131 terminal 12 and data link connector D-117 terminal 28.

- The resistance should measure 2 ohms or less.

CAUTION

If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

Q: Does the resistance measure 2 ohms or less?

YES : Go to Step 22.

NO : Repair the wiring harness wires between joint connector (9) and the data link connector.

STEP 22. Check the CAN bus line for open circuit. Measure at joint connector (9) D-131 and resistor connector D-130.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

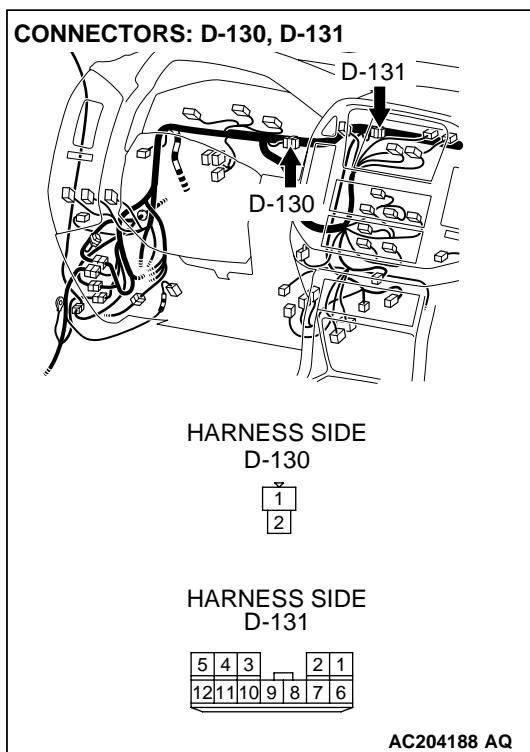
When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

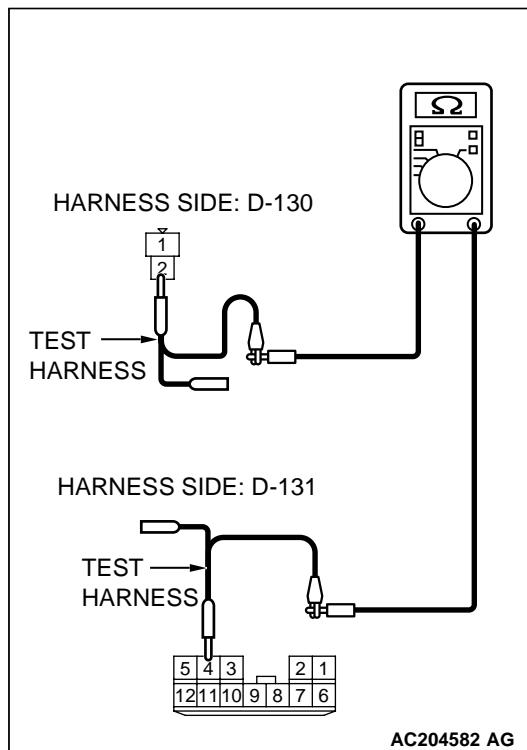
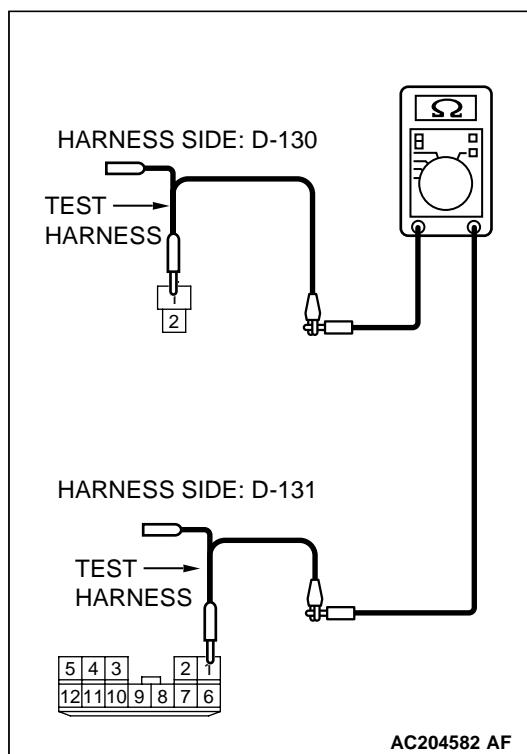
- (1) Disconnect joint connector (9) D-131 and resistor connector D-130, and measure the resistance between joint connector (9) and the resistor connector.
- (2) Turn the ignition switch to the LOCK (OFF) position.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments, which are connected through the CAN communication lines, may be damaged.

- (3) Disconnect the negative battery terminal.




CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

(4) Measure the resistance values between joint connector (9) D-131 terminal 1 and resistor connector D-130 terminal 1, and between joint connector (9) D-131 terminal 4 and resistor connector D-130 terminal 2.

- The resistance should measure 2 ohms or less.

CAUTION

If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

Q: Does the resistance measure 2 ohms or less?

YES : Go to Step 23.

NO : Repair the wiring harness wires between joint connector (9) and the resistor connector.

STEP 23. Check the CAN bus line for open circuit. Measure at joint connector (9) D-131 and intermediate connector E-122.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

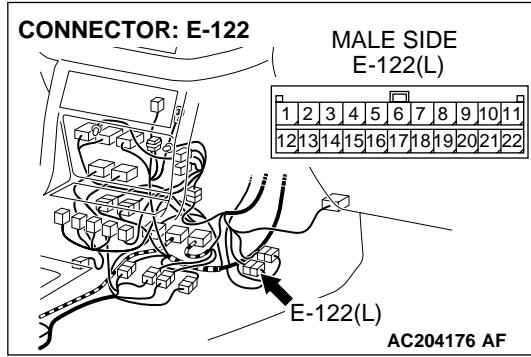
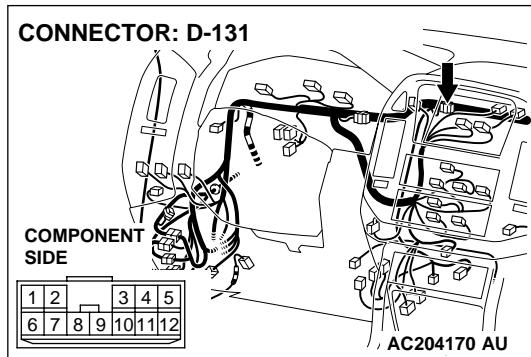
- (1) Disconnect joint connector (9) D-131 and intermediate connector E-122, and measure the resistance between joint connector (9) and the male intermediate connector (at the instrument panel wiring harness side).

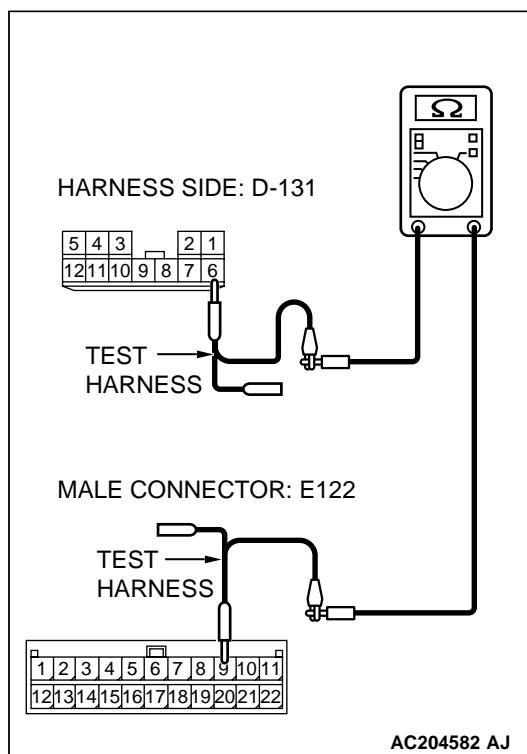
- (2) Turn the ignition switch to the LOCK (OFF) position.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments, which are connected through the CAN communication lines, may be damaged.

- (3) Disconnect the negative battery terminal.



**CAUTION**

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

(4) Measure the resistance values between joint connector (9) D-131 terminal 6 and intermediate connector E-122 terminal 9, and between joint connector (9) D-131 terminal 11 and intermediate connector E-122 terminal 20.

- The resistance should measure 2 ohms or less.

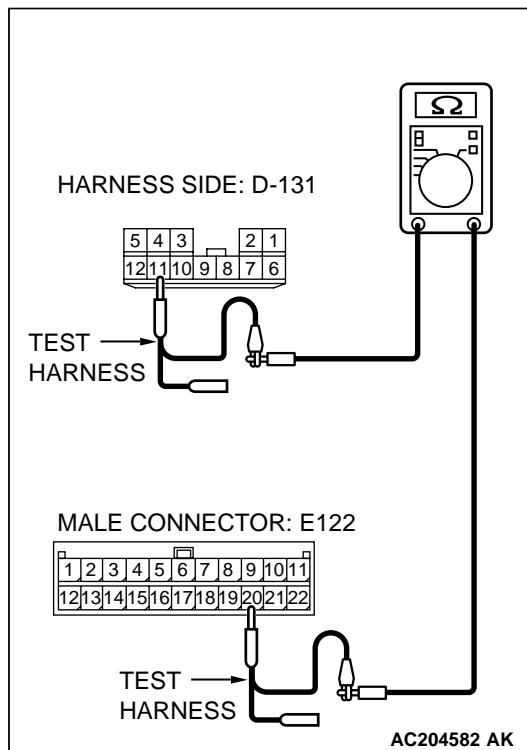
CAUTION

If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

Q: Does the resistance measure 2 ohms or less?

YES : Retest the system.

NO : Repair the wiring harness wires between joint connector (9) and the intermediate connector.



STEP 24. Check for short circuit at the resistor. Check at intermediate connector E-122.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

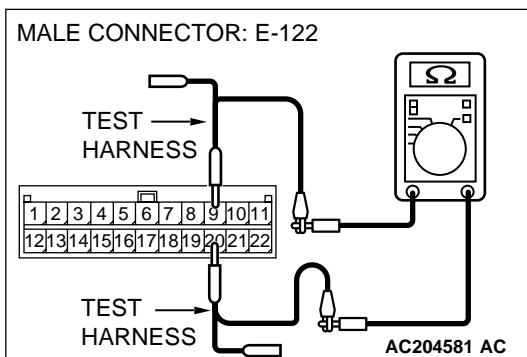
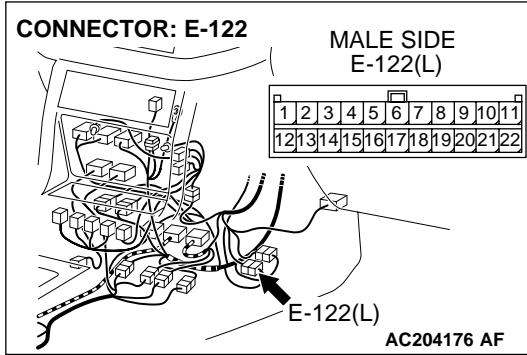
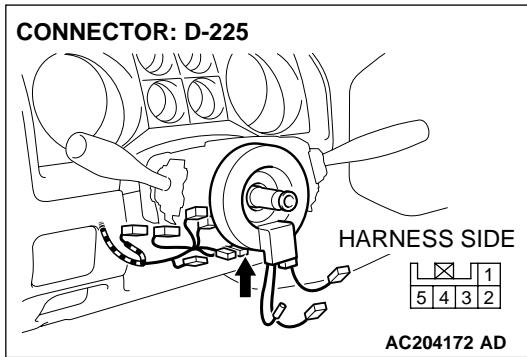
When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect intermediate connector E-122 and steering wheel sensor connector D-225, and measure the resistance at the male intermediate connector (instrument panel wiring harness side).
- (2) Turn the ignition switch to the LOCK (OFF) position.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments, which are connected through the CAN communication lines, may be damaged.

- (3) Disconnect the negative battery terminal.



- (4) Measure the resistance between intermediate connector E-122 terminals 9 and 20.

- The resistance should measure 120 ± 12 ohms.

Q: Does the resistance measure 120 ± 12 ohms?

YES : Go to Step 29.

NO : Go to Step 25.

STEP 25. Check the CAN bus line for short circuit. Measure at joint connector (9) D-131.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

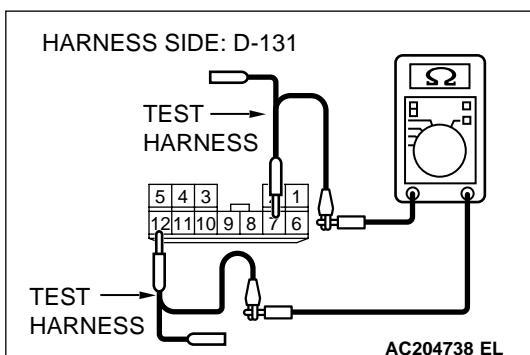
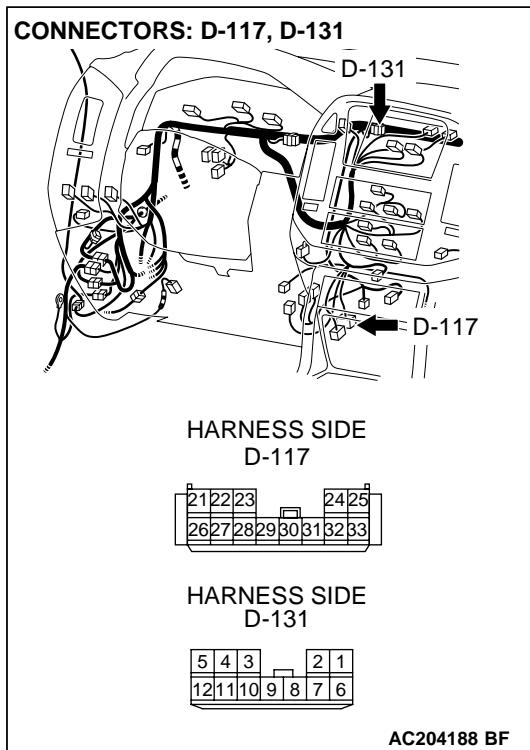
When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect joint connector (9) D-131, and measure the resistance at joint connector (9).
- (2) Turn the ignition switch to the LOCK (OFF) position.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments, which are connected through the CAN communication lines, may be damaged.

- (3) Disconnect the negative battery terminal.



⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

- (4) Measure the resistance between joint connector (9) D-131 terminals 7 and 12.

- The resistance should be infinite.

⚠ CAUTION

If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

Q: Is the resistance infinite?

YES : Go to Step 26.

NO : Repair the wiring harness wires between joint connector (9) and the data link connector.

STEP 26. Check the CAN bus line for short circuit. Measure at joint connector (9) D-131.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

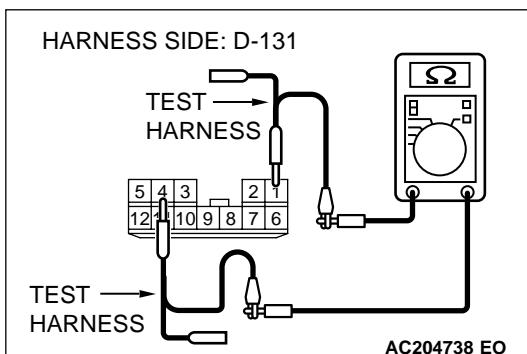
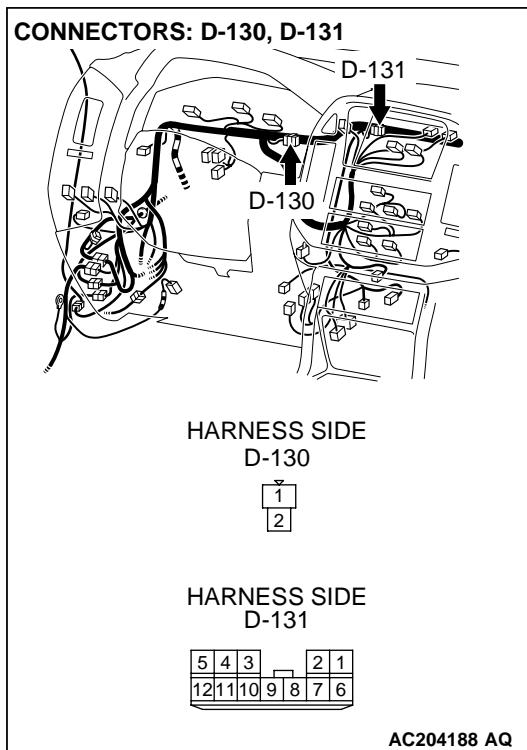
When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect joint connector (9) D-131 and resistor connector D-130, and measure the resistance at joint connector (9).
- (2) Turn the ignition switch to the LOCK (OFF) position.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments, which are connected through the CAN communication lines, may be damaged.

- (3) Disconnect the negative battery terminal.



⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

- (4) Measure the resistance between joint connector (9) D-131 terminals 1 and 4.
- The resistance should be infinite.

⚠ CAUTION

If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

Q: Is the resistance infinite?

YES : Go to Step 27.

NO : Repair the wiring harness wires between joint connector (9) and the resistor connector.

STEP 27. Check the CAN bus line for short circuit. Measure at joint connector (9) D-131.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

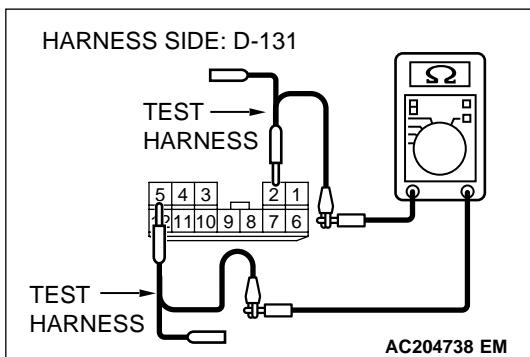
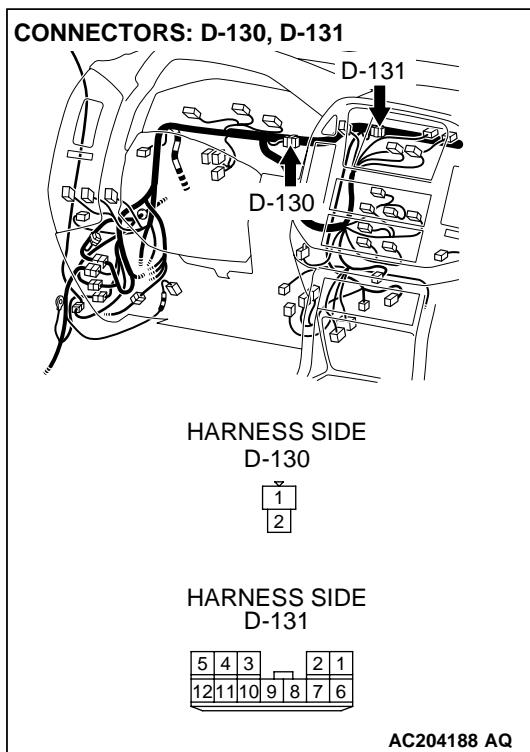
When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect joint connector (9) D-131 and steering wheel sensor connector D-225, and measure the resistance at joint connector (9).
- (2) Turn the ignition switch to the LOCK (OFF) position.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments, which are connected through the CAN communication lines, may be damaged.

- (3) Disconnect the negative battery terminal.



⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

- (4) Measure the resistance between joint connector (9) D-131 terminals 2 and 5.
- The resistance should be infinite.

⚠ CAUTION

If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

Q: Is the resistance infinite?

YES : Go to Step 28.

NO : Repair the wiring harness wires between joint connector (9) and the steering wheel sensor connector.

STEP 28. Check the CAN bus line for short circuit. Measure at joint connector (9) D-131.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

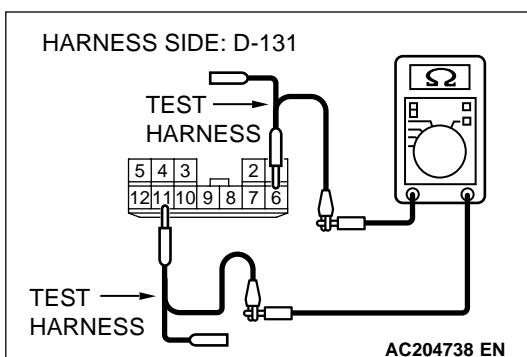
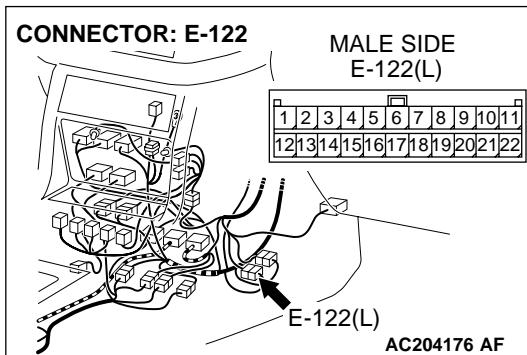
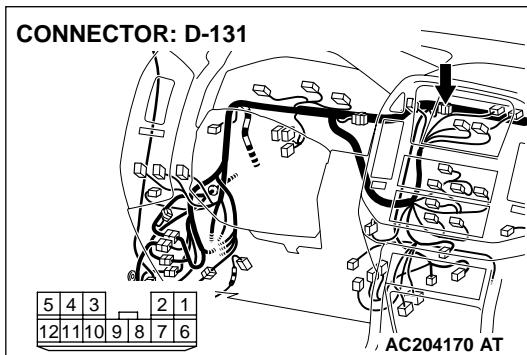
When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect joint connector (9) D-131 and intermediate connector E-122, and measure the resistance at joint connector (9).
- (2) Turn the ignition switch to the LOCK (OFF) position.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments, which are connected through the CAN communication lines, may be damaged.

- (3) Disconnect the negative battery terminal.



⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

- (4) Measure the resistance between joint connector (9) D-131 terminals 6 and 11.

- The resistance should be infinite.

⚠ CAUTION

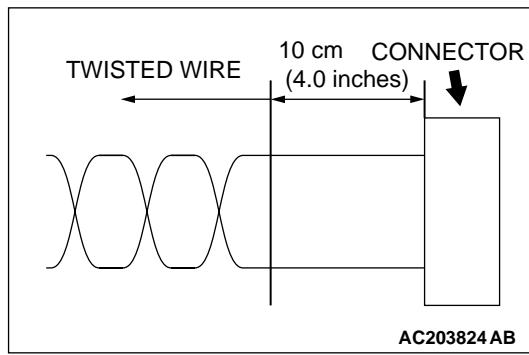
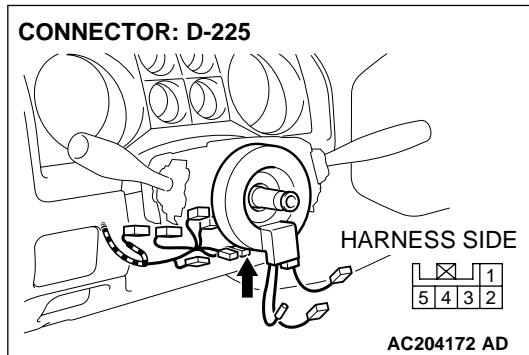
If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

Q: Is the resistance infinite?

YES : Retest the system.

NO : Repair the wiring harness wires between joint connector (9) and the intermediate connector.

STEP 29. Check steering wheel sensor connector D-225.

**⚠ CAUTION**

If there is a problem in the connector(s) (including terminals) or wire(s) of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), cut and repair the defective wire so that the frayed end of the twisted wire should be within 10 cm (4.0 inches). If it exceeds 10 cm (4.0 inches), twist the wiring harness just like the original twisted wire. If the frayed end exceeds 10 cm (4.0 inches), a communication error may be caused.

Q: Is steering wheel sensor connector D-225 in good condition?

YES : Replace the steering wheel sensor.
NO : Repair or replace the connector(s).

STEP 30. Check the terminator resistor inside the M-ASTC-ECU. Check at intermediate connector E-122.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

(1) Disconnect intermediate connector E-122, and measure the resistance at the female intermediate connector (control wiring harness side).

(2) Turn the ignition switch to the LOCK (OFF) position.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments, which are connected through the CAN communication lines, may be damaged.

(3) Disconnect the negative battery terminal.

⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

(4) Measure the resistance between intermediate connector E-122 terminals 9 and 20.

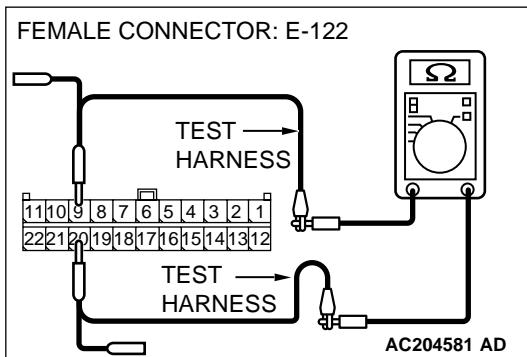
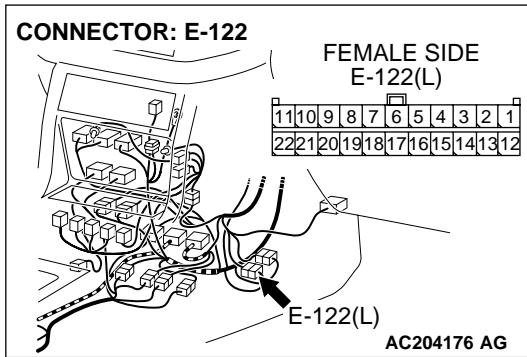
- The resistance should measure 120 ± 12 ohms.

Q: Does the resistance measure 120 ± 12 ohms?

YES : Retest the system.

NO :

- If the resistance is infinite, replace the control wiring harness assembly.
- If the resistance measures 2 ohms or less, go to Step 31.



**STEP 31. Check for short circuit at the M-ASTC-ECU.
Check at intermediate connector E-122.**

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

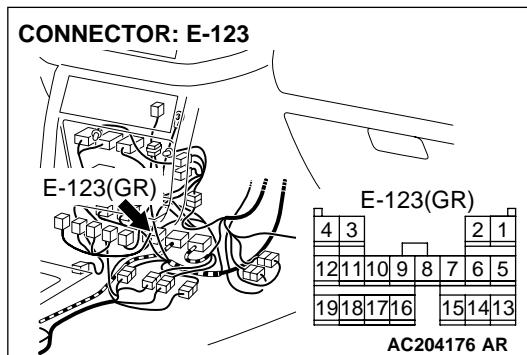
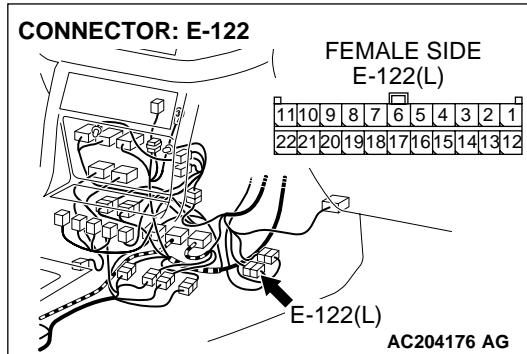
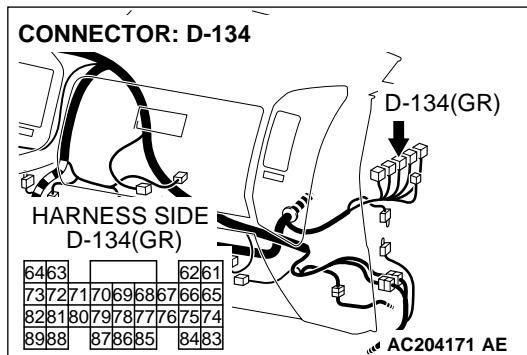
When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

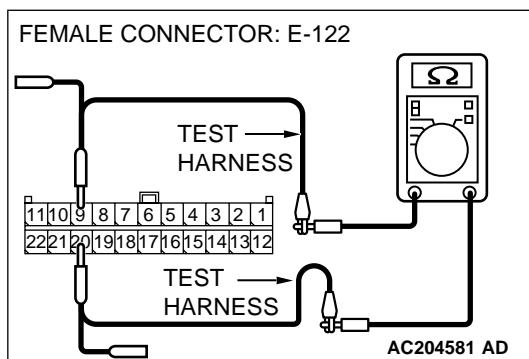
- (1) Disconnect intermediate connectors E-122, E-123, and power control module connector D-134, and measure the resistance at the female intermediate connector (control panel wiring harness side).
- (2) Turn the ignition switch to the LOCK (OFF) position.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments, which are connected through the CAN communication lines, may be damaged.

- (3) Disconnect the negative battery terminal.



**CAUTION**

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

(4) Measure the resistance between intermediate connector E-122 terminals 9 and 20.

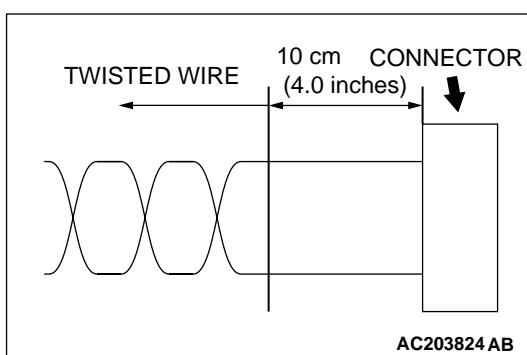
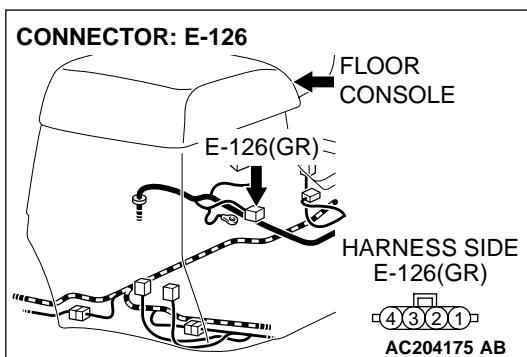
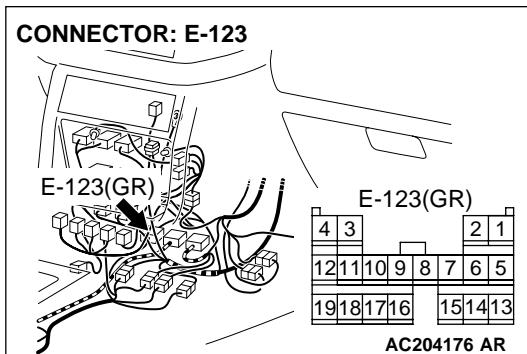
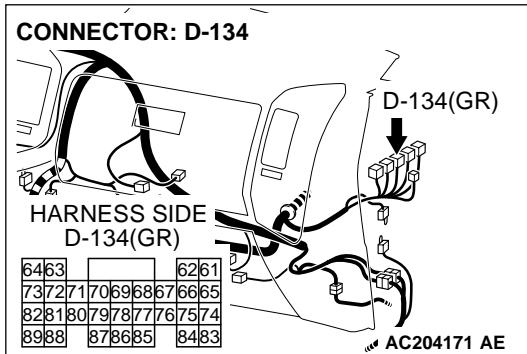
- The resistance should measure 120 ± 12 ohms.

Q: Does the resistance measure 120 ± 12 ohms?

YES : Go to Step 32.

NO : Replace the control wiring harness assembly.

STEP 32. Check power control module connector D-134, G and yaw rate sensor connector E-126 and intermediate connector E-123.



CAUTION

If there is a problem in the connector(s) (including terminals) or wire(s) of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), cut and repair the defective wire so that the frayed end of the twisted wire should be within 10 cm (4.0 inches). If it exceeds 10 cm (4.0 inches), twist the wiring harness just like the original twisted wire. If the frayed end exceeds 10 cm (4.0 inches), a communication error may be caused.

CAUTION

If there is a problem in the CAN bus line or the connectors on the control wiring harness assembly (the wiring har-

ness connected to the M-ASTC-ECU, the power control module and intermediate connector E-123), do not attempt to repair the wiring harness or connector(s), but replace the wiring harness assembly. If a wire is added or the connector(s) are repaired, an error in the CAN communication may be caused.

Q: Are power control module connector D-134, G and yaw rate sensor connector E-126 and intermediate connector E-123 in good condition?

YES : Go to Step 33.

NO :

- If there is a problem at the transmission wiring harness assembly side, repair or replace the connector.
- If there is a problem at the control wiring harness assembly side, replace the control wiring harness assembly.

STEP 33. Check the CAN bus line for short circuit. Check at intermediate connector E-123.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

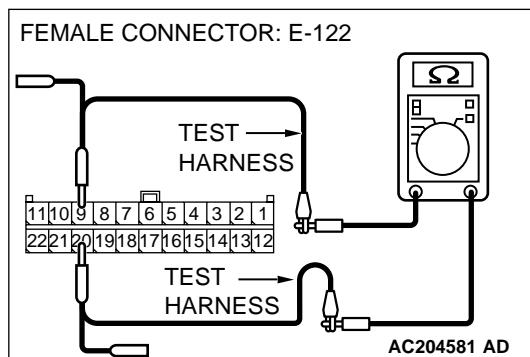
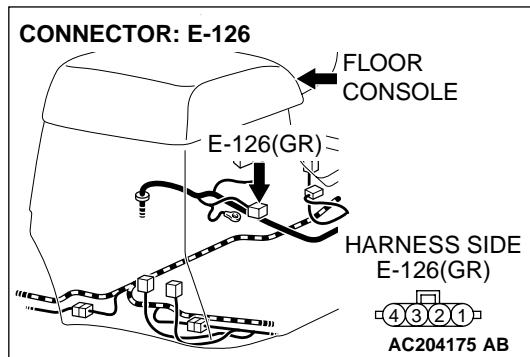
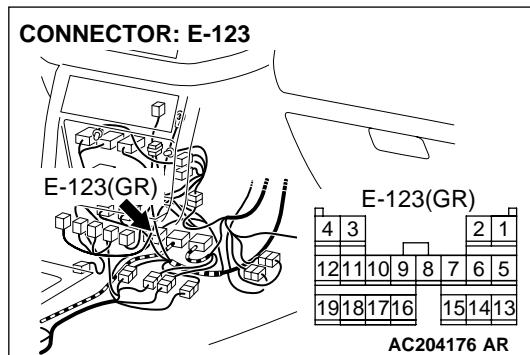
When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments, which are connected through the CAN communication lines, may be damaged.

- (1) Disconnect intermediate connectors E-123, and G and yaw rate sensor connector E-126, and measure the resistance at the female intermediate connector (at the instrument panel wiring harness side).
- (2) Turn the ignition switch to the LOCK (OFF) position.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments, which are connected through the CAN communication lines, may be damaged.

- (3) Disconnect the negative battery terminal.



⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

- (4) Measure the resistance between intermediate connector E-123 terminals 2 and 6.
 - The resistance should be infinite.

Q: Is the resistance infinite?

YES <the resistance is infinite> : Go to Step 34.

NO <the resistance is not infinite> : Repair the wiring harness wires between intermediate connector E-123 and the G and yaw rate sensor connector.

STEP 34. Replace the G and yaw rate sensor.

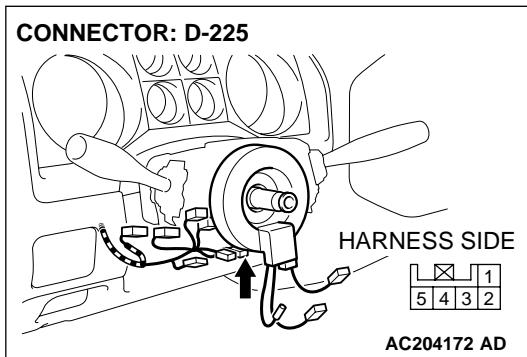
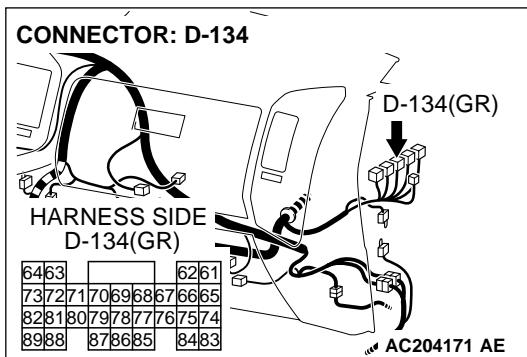
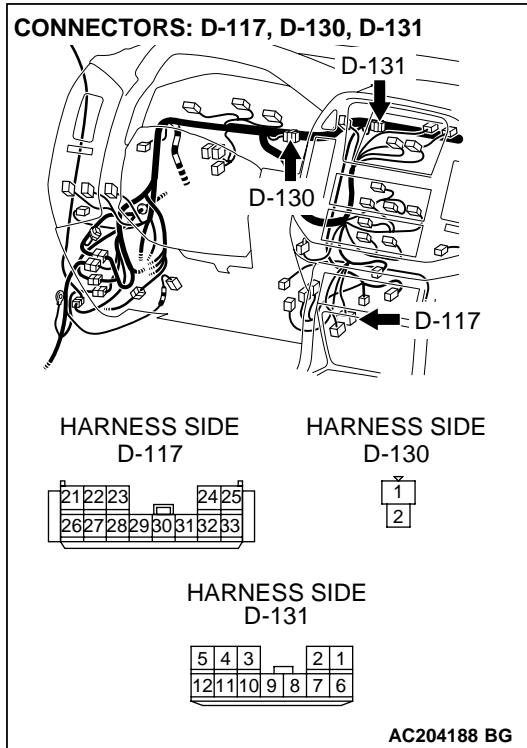
After the G and yaw rate sensor is replaced, retest the system.

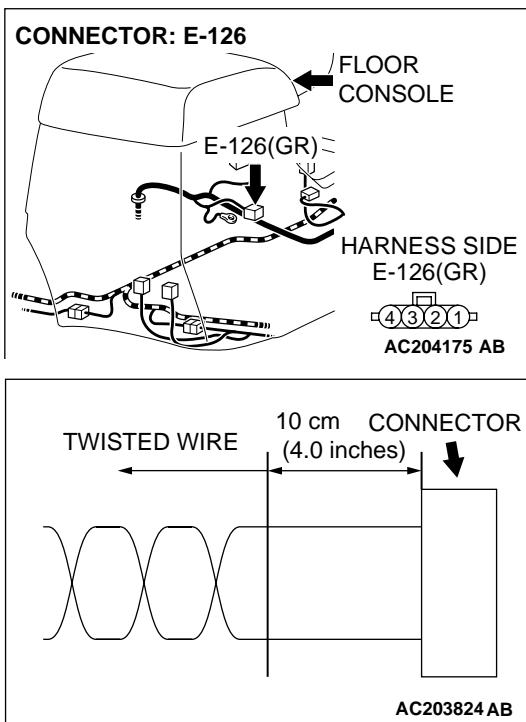
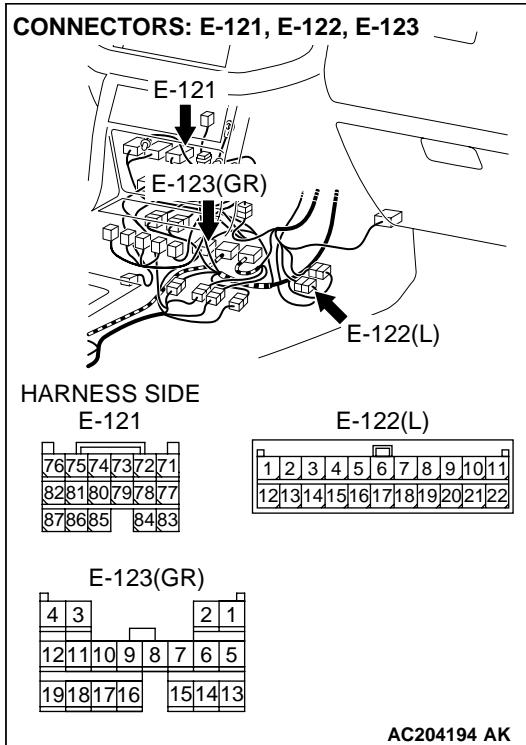
Q: Has the trouble symptom been eliminated?

YES (the trouble symptom has been eliminated) : The procedure is complete.

NO (the trouble symptom has not been eliminated) :
Replace the power control module.

STEP 35. Check intermediate connectors E-122, E-123, joint connector (9) D-131, data link connector D-117, resistor connector D-130, power control module connector D-134, steering wheel sensor connector D-225, M-ASTC-ECU E-121 and G and yaw rate sensor connector E-126.





CAUTION

If there is a problem in the connector(s) (including terminals) or wire(s) of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), cut and repair the defective wire so that the frayed end of the twisted wire should be within 10 cm (4.0 inches). If it exceeds 10 cm (4.0 inches), twist the wiring harness just like the original twisted wire. If the frayed end exceeds 10 cm (4.0 inches), a communication error may be caused.

CAUTION

If there is a problem in the CAN bus line or the connectors on the control wiring harness assembly (the wiring harness connected to the M-ASTC-ECU, the power control module and intermediate connector E-123), do not attempt to repair the wiring harness or connector(s), but replace the wiring harness assembly. If a wire is added or the connector(s) are repaired, an error in the CAN communication may be caused.

Q: Are intermediate connectors E-122, E-123, joint connector (9) D-131, data link connector D-117, resistor connector D-130, power control module connector D-134, steering wheel sensor connector D-225, M-ASTC-ECU E-121 and G and yaw rate sensor connector E-126 in good condition?

YES : Retest the system.

NO : Repair or replace the connector(s).

Diagnostic Item 5: CAN bus line diagnostics (between the main bus line and the power control module)

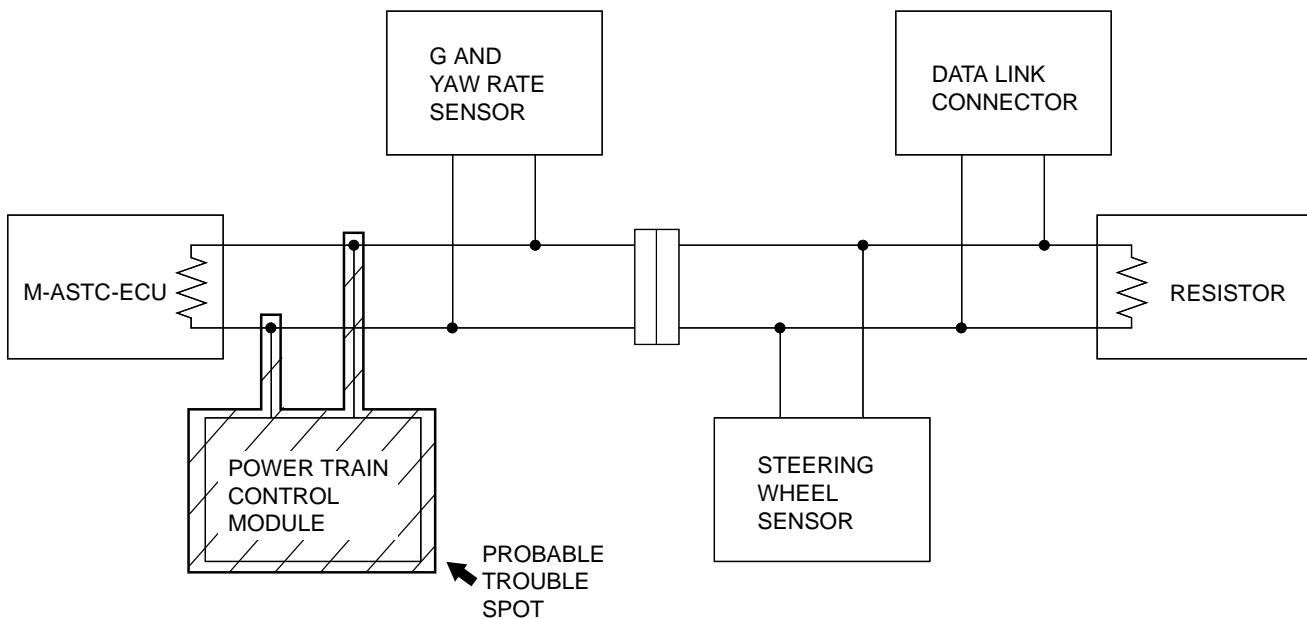
⚠ CAUTION

Prior to this diagnosis procedure, diagnose the CAN main bus line.

⚠ CAUTION

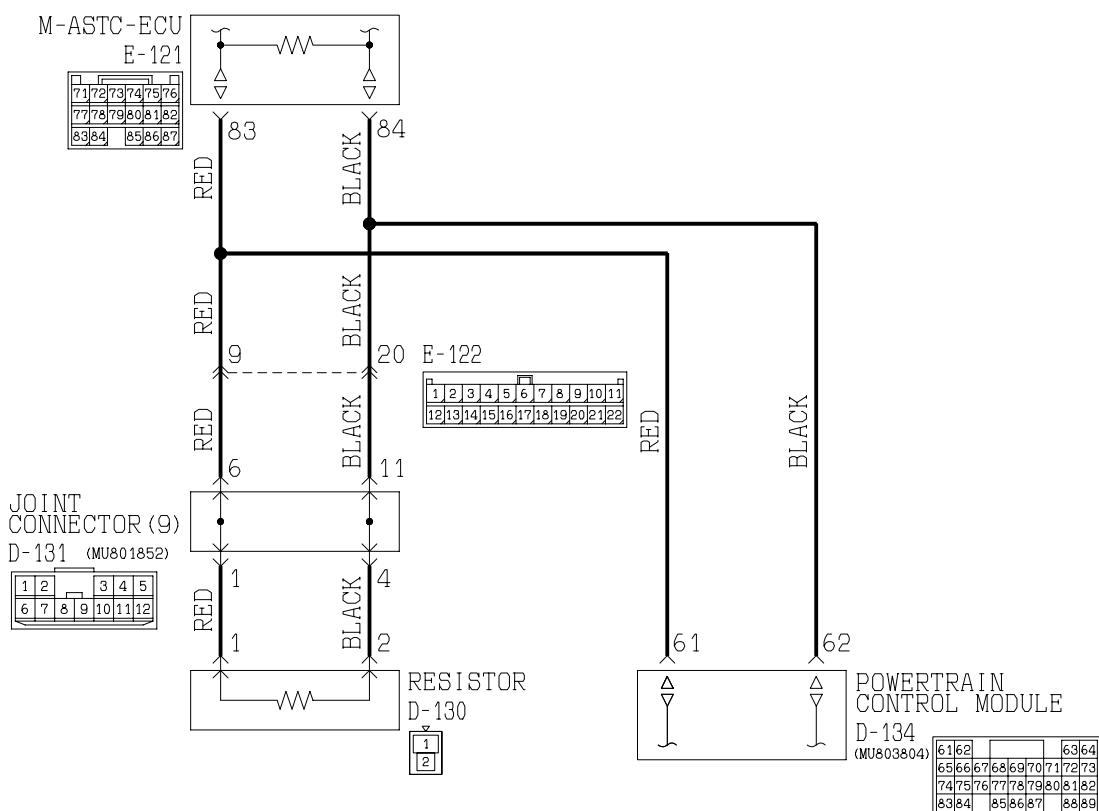
If there is a problem in the CAN bus line or the connectors on the control wiring harness assembly (the wiring harness connected to the M-ASTC-ECU, the power control module and intermediate connector E-123), do not attempt to repair the wiring harness or connector(s), but replace the wiring harness assembly. If a wire is added or the connector(s) are repaired, an error in the CAN communication may be caused.

This procedure diagnoses the shaded portion below.

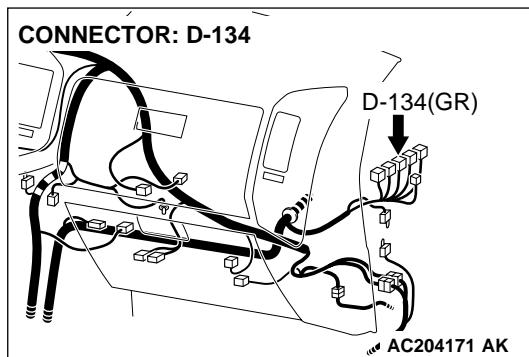


AC203825AE

CAN Bus Communication Circuit (powertrain control module)



W3Q01M02AA



CIRCUIT OPERATION

The M-ASTC-ECU receives signals through the CAN bus line from the power control module.

TECHNICAL DESCRIPTION (COMMENT)

If the M-ASTC-ECU has set DTC code 35 or 36, the wiring harness between the CAN main bus line and the power control module, the power control module or the M-ASTC-ECU may be defective.

TROUBLESHOOTING HINTS

- The CAN bus line between the CAN main bus line and the power control module is defective.
- Damaged connector(s)
- The power control module is defective
- The M-ASTC-ECU is defective.

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB991502: Scan Tool (MUT-II)

STEP 1. Check for engine and automatic transmission DTCs.

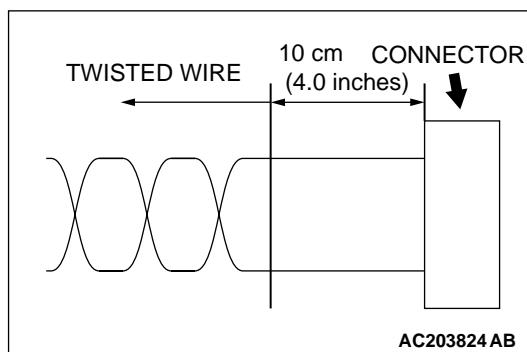
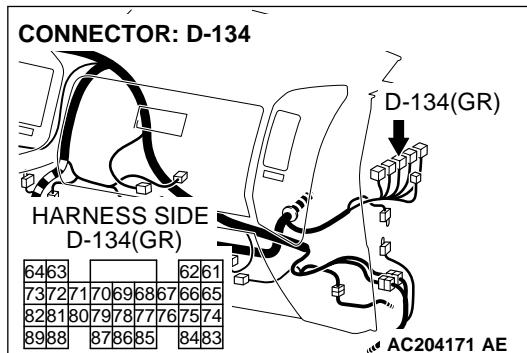
Check whether an engine and automatic transmission DTCs are set or not.

Q: Is the DTC set?

YES : Diagnose the power control module. Refer to [P.13Ab-22](#).

NO : Go to Step 2.

STEP 2. Check power control module connector D-134.



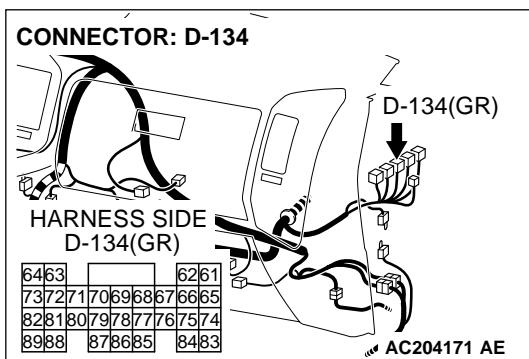
⚠ CAUTION

If there is a problem in the CAN bus line or the connectors on the control wiring harness assembly (the wiring harness connected to the M-ASTC-ECU, the power control module and intermediate connector E-123), do not attempt to repair the wiring harness or connector(s), but replace the wiring harness assembly. If a wire is added or the connector(s) are repaired, an error in the CAN communication may be caused.

Q: Is power control module connector D-134 in good condition?

YES : Go to Step 3.

NO : Replace the control wiring harness assembly.

**STEP 3. Check the wiring harness between power control module connector D-134 and the CAN main bus line.**

NOTE: Also check the joint between the communication line (connected to the power control module) and the CAN main bus line.

CAUTION

If there is a problem in the CAN bus line or the connectors on the control wiring harness assembly (the wiring harness connected to the M-ASTC-ECU, the power control module and intermediate connector E-123), do not attempt to repair the wiring harness or connector(s), but replace the wiring harness assembly. If a wire is added or the connector(s) are repaired, an error in the CAN communication may be caused.

Q: Is the wiring harness between power control module connector D-134 and the CAN main bus line in good condition?

YES : Go to Step 4.

NO : Replace the control wiring harness assembly.

STEP 4. Replace the M-ASTC-ECU.

After the M-ASTC-ECU is replaced, retest the system.

Q: Has the trouble symptom been eliminated?

YES (the trouble symptom has been eliminated) : The procedure is complete.

NO (the trouble symptom has not been eliminated) :
Replace the power control module.

Diagnostic Item 6: CAN bus line diagnostics (between the main bus line and the steering wheel sensor)

⚠ CAUTION

Prior to this diagnosis procedure, diagnose the CAN main bus line.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

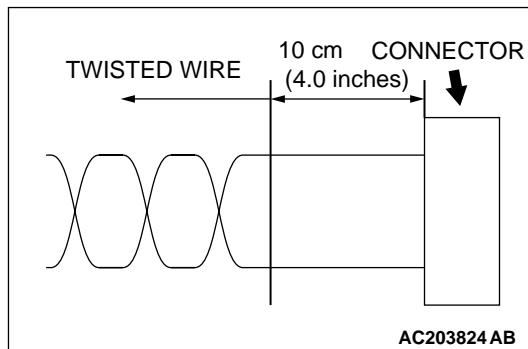
When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments connected through the CAN bus lines may be damaged.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments connected through the CAN bus lines may be damaged.

⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

⚠ CAUTION

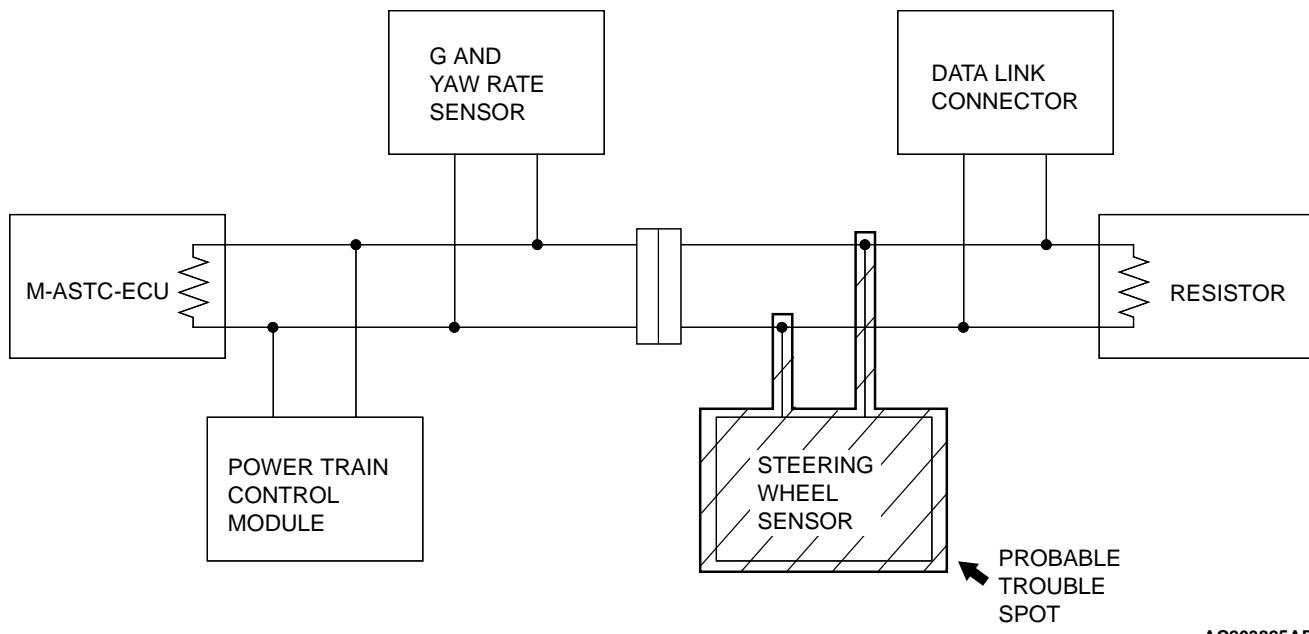
If there is a problem in the connector(s) (including terminals) or wire(s) of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), cut and repair the defective wire so that the frayed end of the twisted wire should be within 10 cm (4.0 inches). If it exceeds 10 cm (4.0

inches), twist the wiring harness just like the original twisted wire. If the frayed end exceeds 10 cm (4.0 inches), a communication error may be caused.

⚠ CAUTION

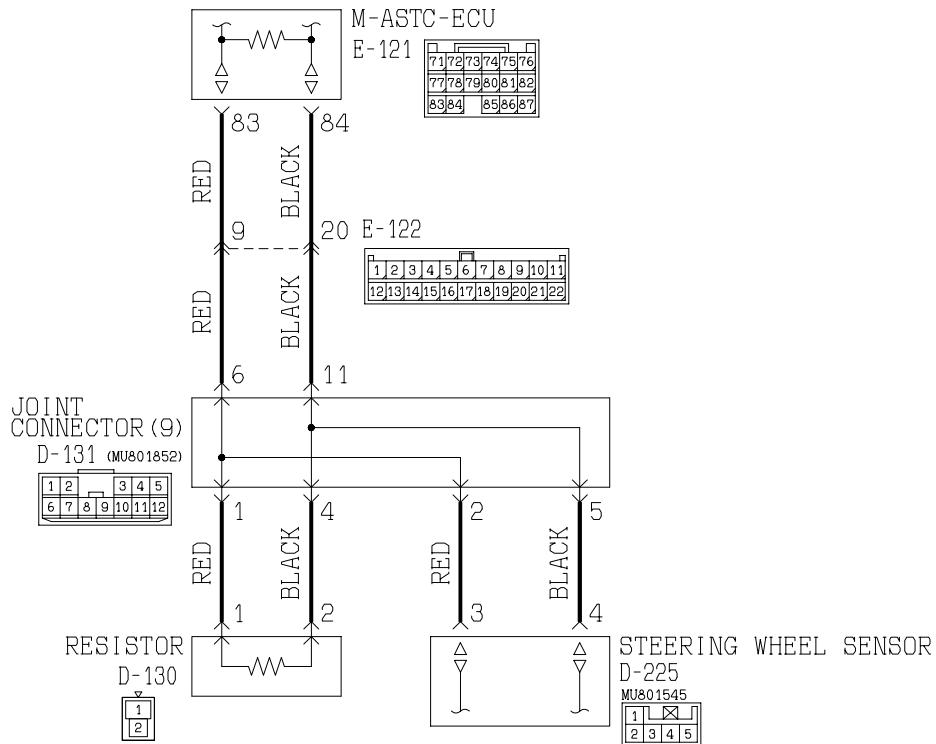
If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

This procedure diagnoses the shaded portion below.

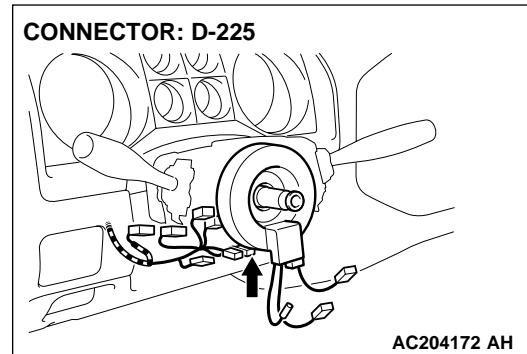
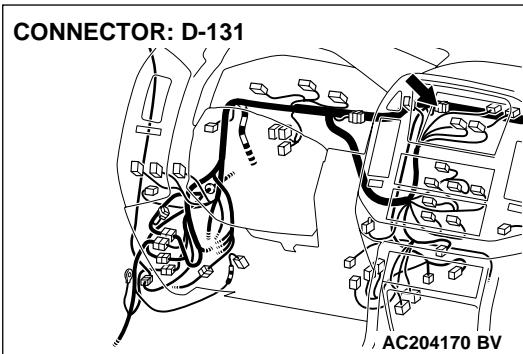


AC203825AF

CAN Bus Communication Circuit (steering wheel sensor)



W3Q01M04AA



CIRCUIT OPERATION

The M-ASTC-ECU receives signals through the CAN bus line from the steering wheel sensor.

TECHNICAL DESCRIPTION (COMMENT)

If the M-ASTC-ECU has set DTC code 67, the wiring harness between the CAN main bus line and the steering wheel sensor, the steering wheel sensor itself or the M-ASTC-ECU may be defective.

TROUBLESHOOTING HINTS

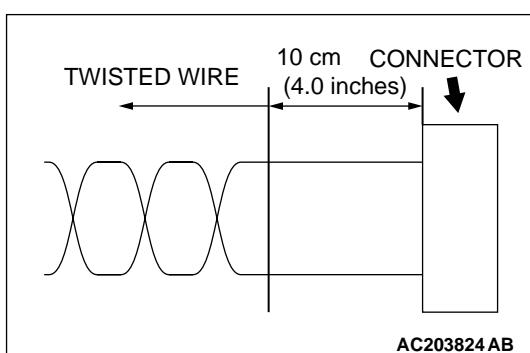
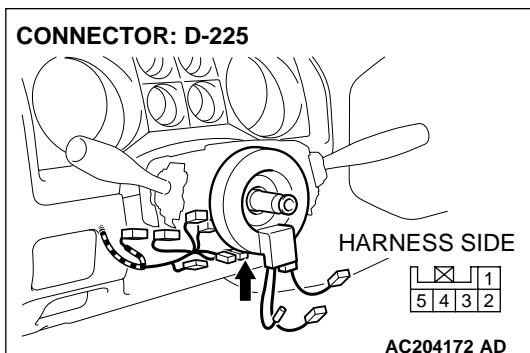
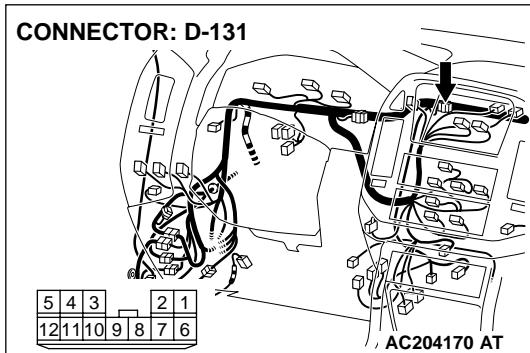
- The CAN bus line between the CAN main bus line and the steering wheel sensor is defective.
- Damaged connector(s)
- The steering wheel sensor is defective.
- The M-ASTC-ECU is defective.

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB991502: Scan Tool (MUT-II)

STEP 1. Check steering wheel sensor connector D-225 and joint connector (9) D-131.



CAUTION

If there is a problem in the connector(s) (including terminals) or wire(s) of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), cut and repair the defective wire so that the frayed end of the twisted wire should be within 10 cm (4.0 inches). If it exceeds 10 cm (4.0 inches), twist the wiring harness just like the original twisted wire. If the frayed end exceeds 10 cm (4.0 inches), a communication error may be caused.

Q: Is steering wheel sensor connector D-225 and joint connector (9) D-131 in good condition?

YES : Go to Step 2.

NO : Repair or replace the connector.

STEP 2. Check the CAN bus line for open circuit. Measure at joint connector (9) D-131 and steering wheel sensor connector D-225.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments connected through the CAN bus lines may be damaged.

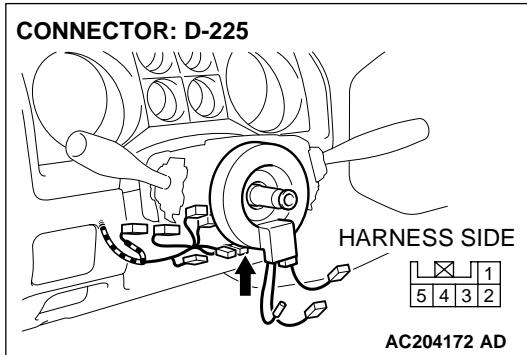
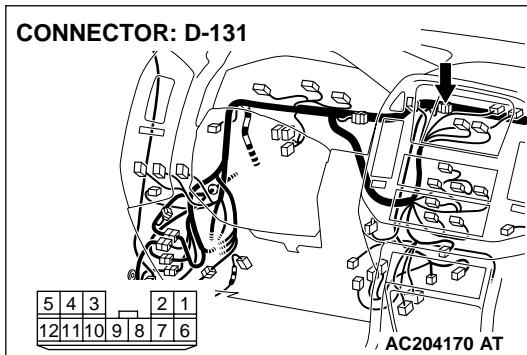
(1) Disconnect joint connector (9) D-131 and steering wheel sensor connector D-225, and measure the resistance between joint connector (9) and the steering wheel sensor connector.

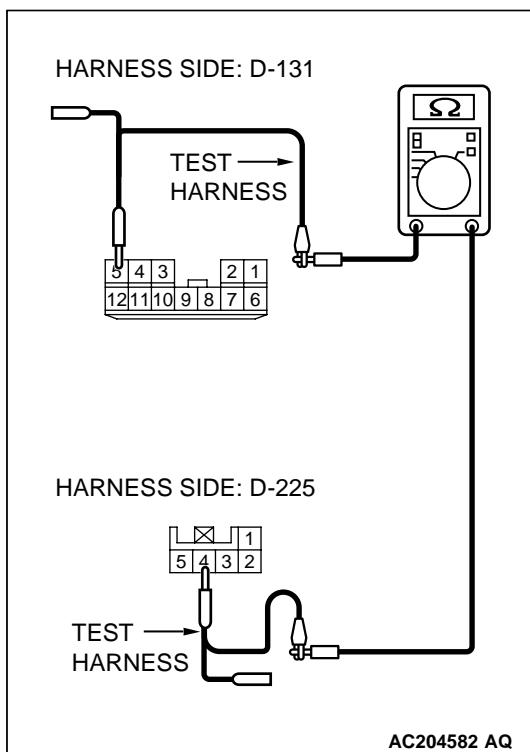
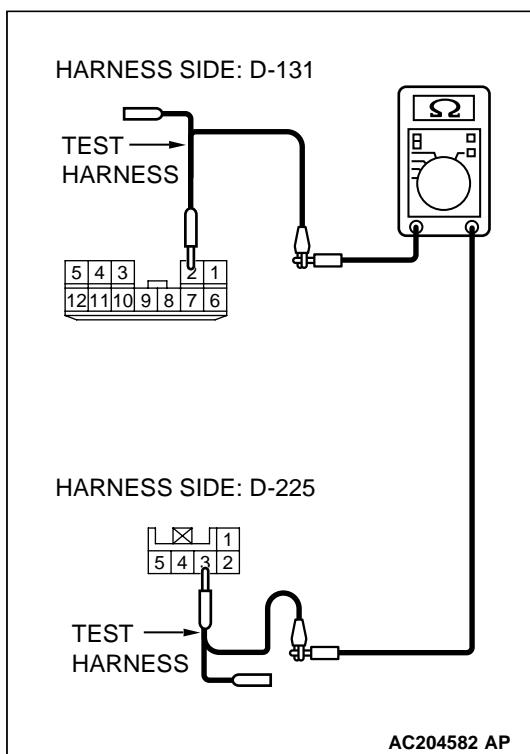
(2) Turn the ignition switch to the LOCK (OFF) position.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments connected through the CAN bus lines may be damaged.

(3) Disconnect the negative battery terminal.





CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

(4) Measure the resistance values between joint connector (9) D-131 terminal 2 and steering wheel sensor connector D-225 terminal 3, and between joint connector (9) D-131 terminal 5 and steering wheel sensor connector D-225 terminal 4.

- The resistance should measure 2 ohms or less.

CAUTION

If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

Q: Does the resistance measure 2 ohms or less?

YES : Diagnose the steering wheel sensor. Refer to [P.35C-30](#).

NO : Repair the wiring harness wires between joint connector (9) and the steering wheel sensor connector.

Diagnostic Item 7: CAN bus line diagnostics (between the main bus line and the G and yaw rate sensor)

⚠ CAUTION

Prior to this diagnosis procedure, diagnose the CAN main bus line.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments connected through the CAN bus lines may be damaged.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments connected through the CAN bus lines may be damaged.

⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

⚠ CAUTION

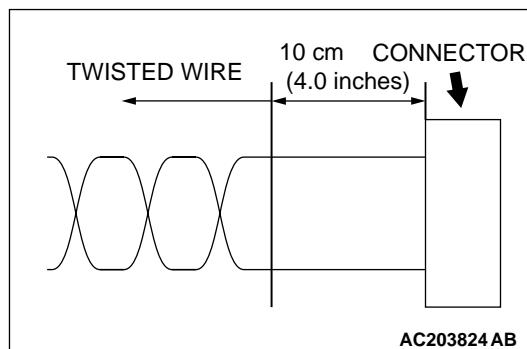
inches), twist the wiring harness just like the original twisted wire. If the frayed end exceeds 10 cm (4.0 inches), a communication error may be caused.

⚠ CAUTION

If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

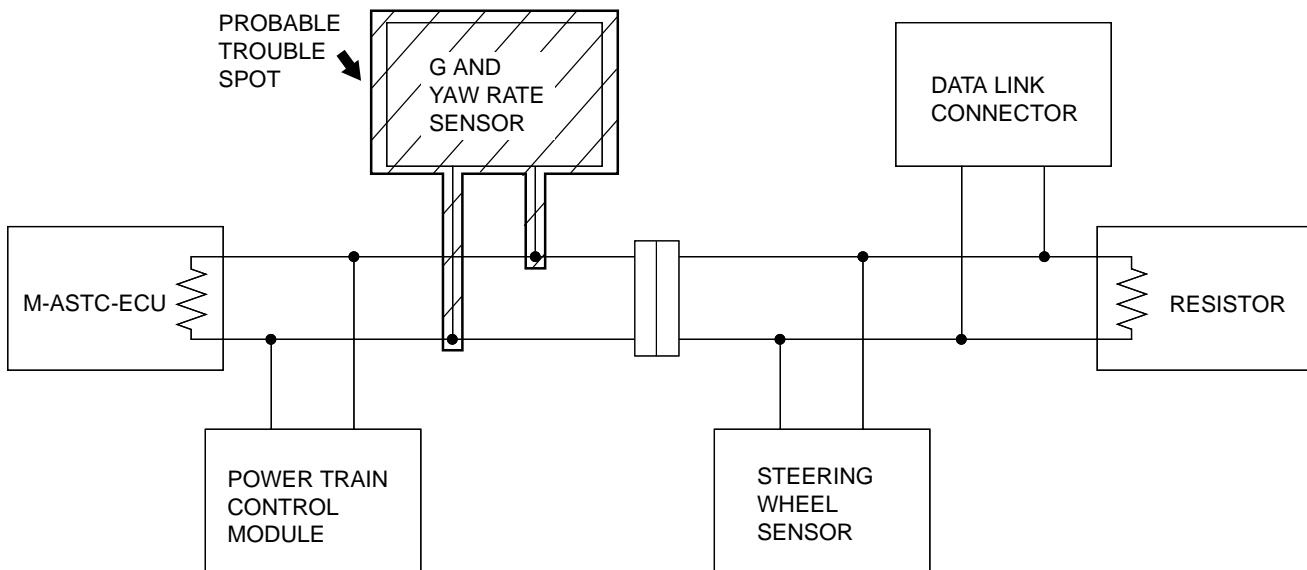
⚠ CAUTION

If there is a problem in the CAN bus line or the connectors on the control wiring harness assembly (the wiring harness connected to the M-ASTC-ECU, the power control module and intermediate connector E-123), do not attempt to repair the wiring harness or connector(s), but replace the wiring harness assembly. If a wire is added or the connector(s) are repaired, an error in the CAN communication may be caused.



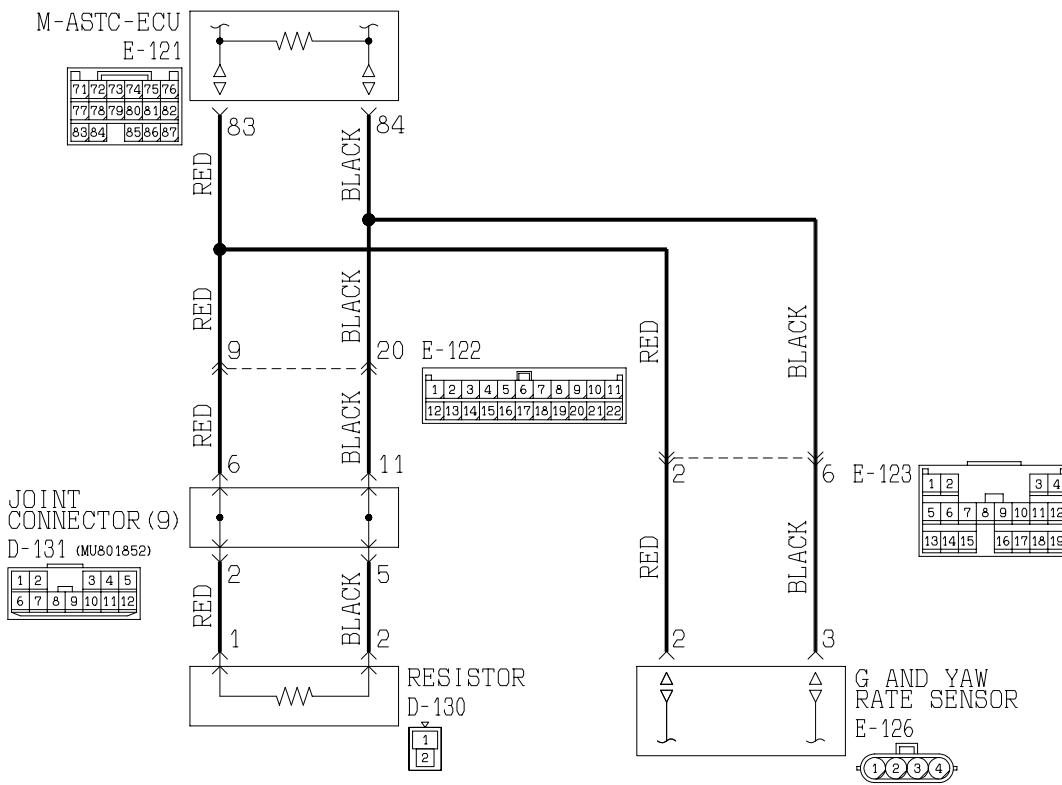
If there is a problem in the connector(s) (including terminals) or wire(s) of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), cut and repair the defective wire so that the frayed end of the twisted wire should be within 10 cm (4.0 inches). If it exceeds 10 cm (4.0

This procedure diagnoses the shaded portion below.

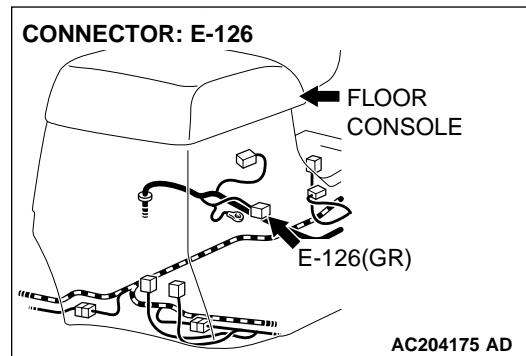
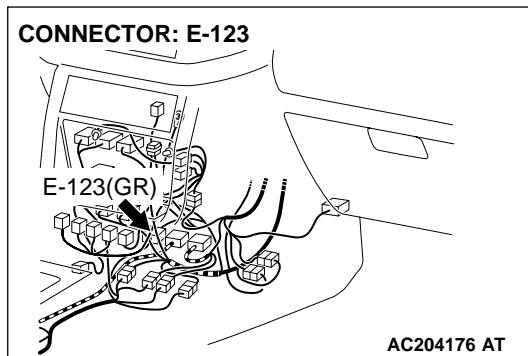


AC203825AC

CAN Bus Communication Circuit (G and yaw rate sensor)



W3Q01M03AA



CIRCUIT OPERATION

The M-ASTC-ECU receives signals through the CAN bus line from the G and yaw rate sensor.

TECHNICAL DESCRIPTION (COMMENT)

If the M-ASTC-ECU has set DTC code 74, the wiring harness between the CAN main bus line and the G and yaw rate sensor, the G and yaw rate sensor itself or the M-ASTC-ECU may be defective.

TROUBLESHOOTING HINTS

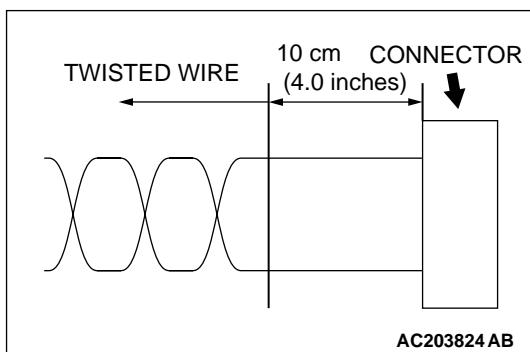
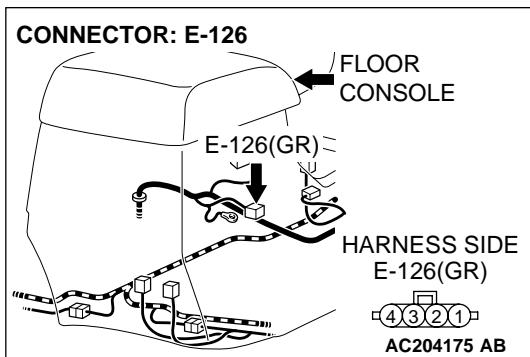
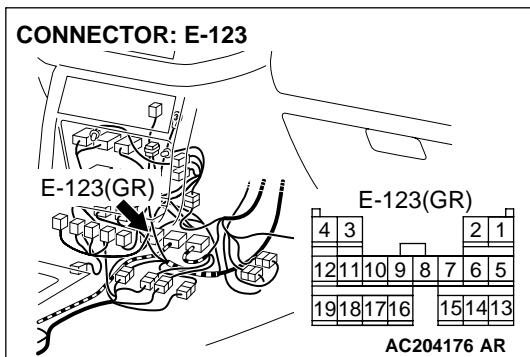
- The CAN bus line between the CAN main bus line and the G and yaw rate sensor is defective
- Damaged connector(s)
- The G and yaw rate sensor is defective.
- The M-ASTC-ECU is defective.

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB991502: Scan Tool (MUT-II)

STEP 1. Check G and yaw rate sensor connector E-126 and intermediate connector E-123.



CAUTION

If there is a problem in the connector(s) (including terminals) or wire(s) of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), cut and repair the defective wire so that the frayed end of the twisted wire should be within 10 cm (4.0 inches). If it exceeds 10 cm (4.0 inches), twist the wiring harness just like the original twisted wire. If the frayed end exceeds 10 cm (4.0 inches), a communication error may be caused.

CAUTION

If there is a problem in the CAN bus line or the connectors on the control wiring harness assembly (the wiring harness connected to the M-ASTC-ECU, the power control module and intermediate connector E-123), do not attempt to repair the wiring harness or connector(s), but replace the wiring harness assembly. If a wire is added or the connector(s) are repaired, an error in the CAN communication may be caused.

Q: Are G and yaw rate sensor connector E-126 and intermediate connector E-123 in good condition?

YES : Go to Step 2.

NO :

- If there is a problem at the transmission wiring harness assembly side, repair or replace the connector.
- If there is a problem at the control wiring harness assembly side, replace the control wiring harness assembly.

STEP 2. Check the CAN bus line for open circuit. Measure at intermediate connector E-123 and G and yaw rate sensor connector E-126.

⚠ CAUTION

Before checking CAN bus lines and their interconnected components, "ground" yourself, by touching a metal object such as an unpainted pipe, this will discharge any potentially damaging static that may have built up.

⚠ CAUTION

When measuring resistance value or voltage in CAN bus lines, use a digital multimeter. If not using a digital multimeter, the equipments connected through the CAN bus lines may be damaged.

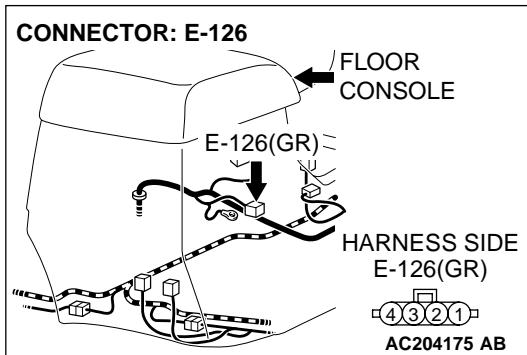
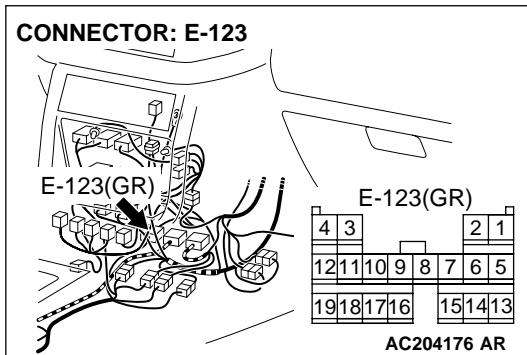
(1) Disconnect intermediate connector E-123 and G and yaw rate sensor connector E-126, and measure the resistance value between the intermediate connector and the G and yaw rate sensor connector.

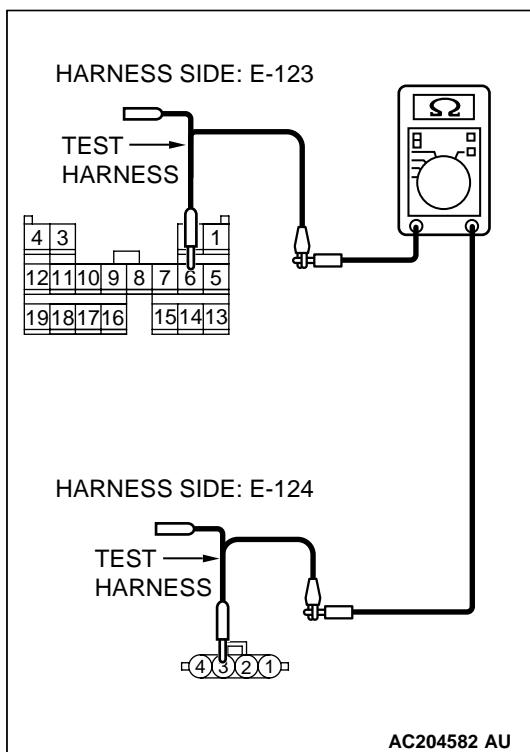
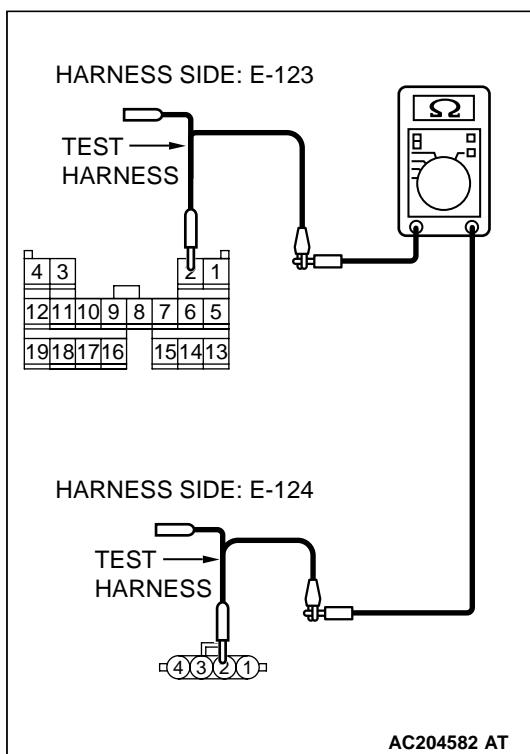
(2) Turn the ignition switch to the LOCK (OFF) position.

⚠ CAUTION

Disconnect the negative battery terminal when measuring the resistance value in the CAN bus line. If you fail to do so, the equipments connected through the CAN bus lines may be damaged.

(3) Disconnect the negative battery terminal.





⚠ CAUTION

Always use the test harness when measuring the voltage or resistance value at the female connector. If you fail to do so, connectors may be damaged.

(4) Measure the resistance values between intermediate connector E-123 terminal 2 and G and yaw rate sensor connector E-126 terminal 2, and between intermediate connector E-123 terminal 6 and G and yaw rate sensor connector E-126 terminal 3.

- The resistance should measure 2 ohms or less.

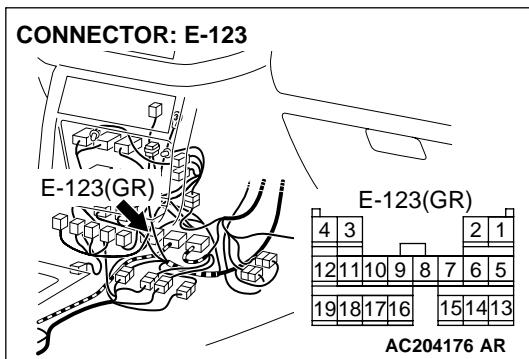
⚠ CAUTION

If you repair the CAN bus line of the instrument panel wiring harness assembly (the wiring harness connected to the steering wheel sensor, the data link connector and the resistor) and the transmission wiring harness assembly (the wiring harness connected to the G and yaw rate sensor connector and intermediate connector E-123), observe the precautions regarding how to repair wiring harness. If a new wire is added or a splice point is modified for the CAN_L or CAN_H line, an error in the CAN communication may be caused.

Q: Does the resistance measure 2 ohms or less?

YES : Go to Step 3.

Resistance does not measure 2 ohms or less> : Repair the wiring harness wires between intermediate connector E-123 and the G and yaw rate sensor connector.



STEP 3. Check the wiring harness between intermediate connector E-123 and the CAN main bus line.

NOTE: Also check the joint between the communication line (connected to intermediate connector E-123) and the CAN main bus line.

CAUTION

If there is a problem in the CAN bus line or the connectors on the control wiring harness assembly (the wiring harness connected to the M-ASTC-ECU, the power control module and intermediate connector E-123), do not attempt to repair the wiring harness or connector(s), but replace the wiring harness assembly. If a wire is added or the connector(s) are repaired, an error in the CAN communication may be caused.

Q: Is the wiring harness between intermediate connector E-123 and the CAN main bus line in good condition?

YES : Diagnose the G and yaw rate sensor. Refer to [P.35C-24](#).

NO : Replace the control wiring harness assembly.

SYMPTOM CHART

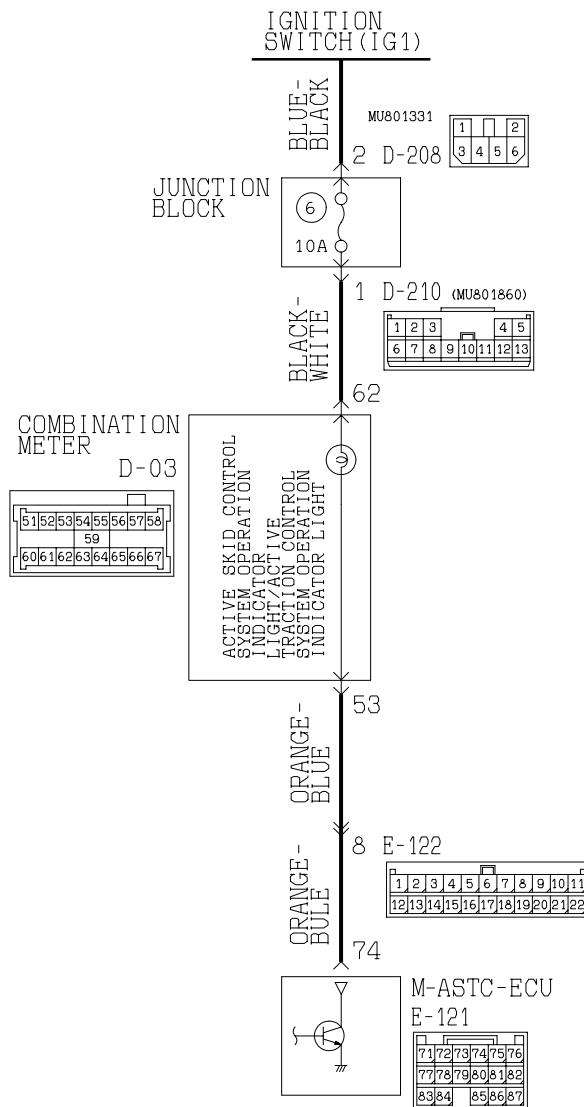
M1353001100030

SYMPTOM	INSPECTION PROCEDURE NO.	REFERENCE PAGE
Communication between the scan tool and the M-ASTC system is not possible.	-	GROUP 13A – Diagnosis P.13Ad-2
Communication with scan tool is not possible. (Communication with Active skid control system only is not possible.)	-	GROUP 35B – Diagnosis P.35B-81
The Active skid control system operation indicator light/Active traction control system operation indicator light does not illuminate when the ignition switch is on (but does not start the engine).	1	P.35C-181
The Active skid control system OFF indicator light does not illuminate when the ignition switch is on (but does not start the engine).	2	P.35C-187
The Active skid control system operation indicator light/Active traction control system operation indicator light does not go off after the engine is started.	3	P.35C-193
The Active skid control system OFF indicator light does not go off after the engine is started.	4	P.35C-196

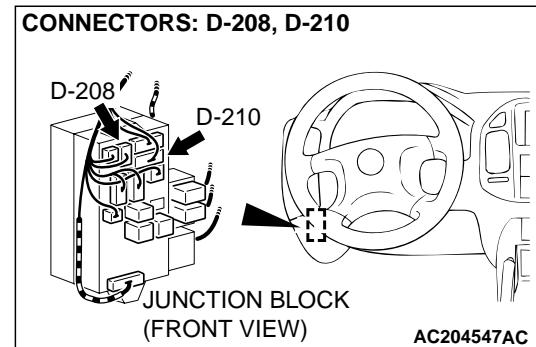
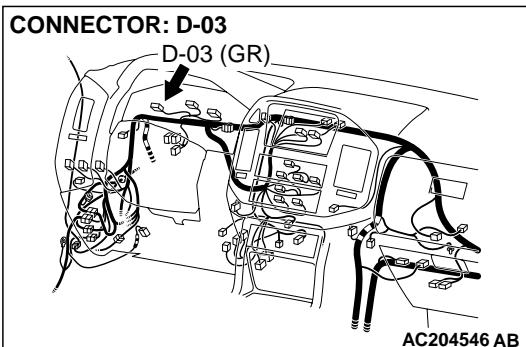
SYMPTOM PROCEDURES

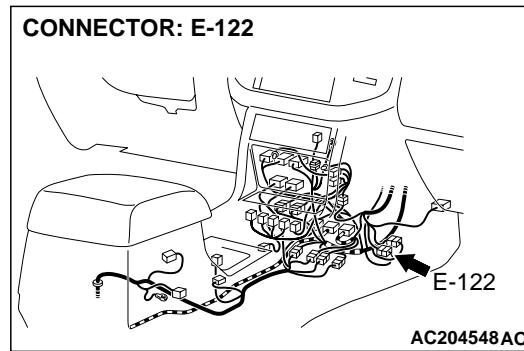
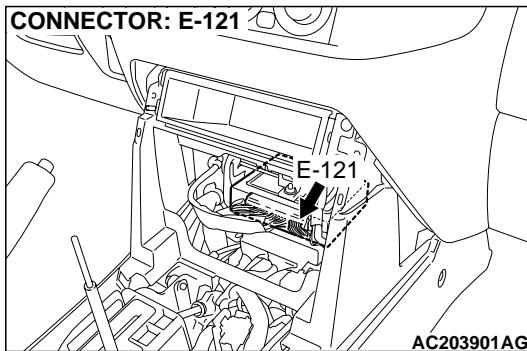
INSPECTION PROCEDURE 1: When the ignition switch is turned "ON" (Engine stopped or after startup), the Active skid control system operation indicator light/Active traction control system operation indicator light does not illuminate.

Active Skid Control System Operation Indicator Light/
Active Traction Control System Operation Indicator Light Circuit



W3Q18M02AA





CIRCUIT OPERATION

The Active skid control system operation indicator light/Active traction control system operation indicator light is connected from the ignition switch (IG1) through multi-purpose fuse No.6 and the combination meter to the M-ASTC-ECU. The M-ASTC-ECU turns on and off the indicator light.

TECHNICAL DESCRIPTION (COMMENT)

This symptom is caused by a shorted or opened Active skid control system operation indicator light/Active traction control system operation indicator light circuit.

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

- Damaged wiring harness
- Burned-out bulb
- Melted fuse
- Malfunction of M-ASTC-ECU

DIAGNOSIS

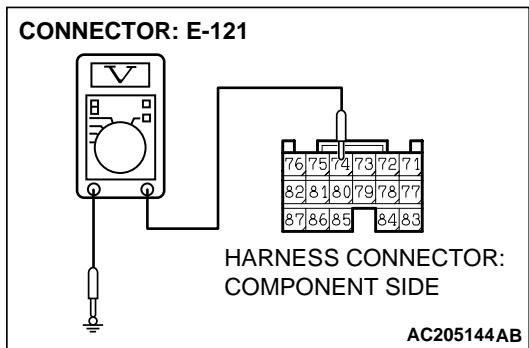
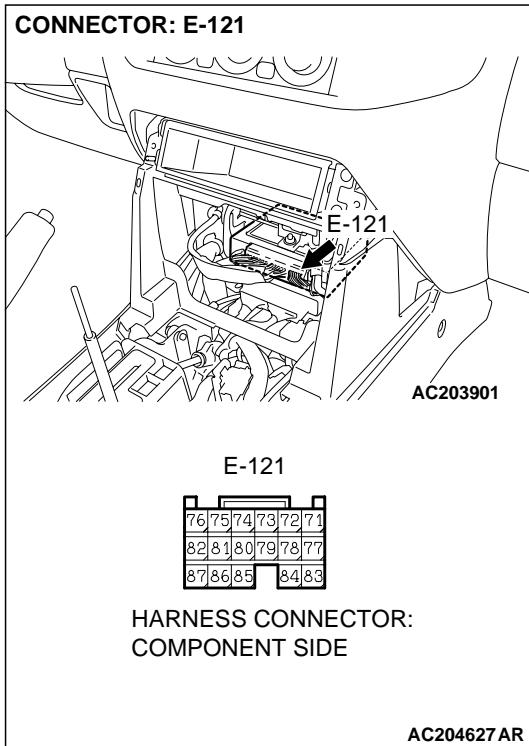
Required Special Tool:

- MB991223: Harness Set

STEP 1. Check the Active skid control system operation indicator light/Active traction control system operation indicator light circuit at M-ASTC-ECU connector E-121.

(1) Disconnect M-ASTC-ECU connector E-121 and measure at the harness side.

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



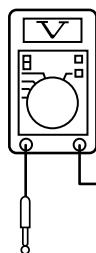
(3) Measure the voltage between terminal 74 and ground. It should be approximately 12 volts (battery positive voltage).

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

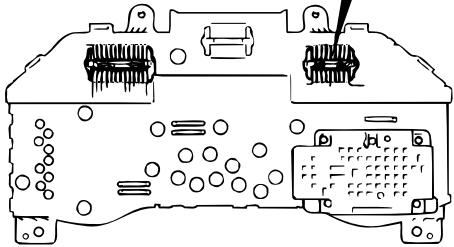
YES : Replace the M-ASTC-ECU and then go to Step 6.

NO : Go to Step 2.

CONNECTOR: D-03



COMBINATION METER SIDE CONNECTOR



AC205146AB

STEP2. Check combination meter connector D-03.

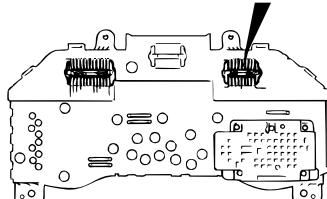
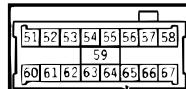
- (1) Disconnect combination meter connector D-03 and measure at the combination meter side.
- (2) Turn the ignition switch to the "ON" position.
- (3) Measure the voltage between terminal 53 and ground. It should be approximately 12 volts (battery positive voltage).

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

YES : Go to Step 5.
NO : Go to Step 3.

CONNECTOR: D-03

COMBINATION METER SIDE CONNECTOR

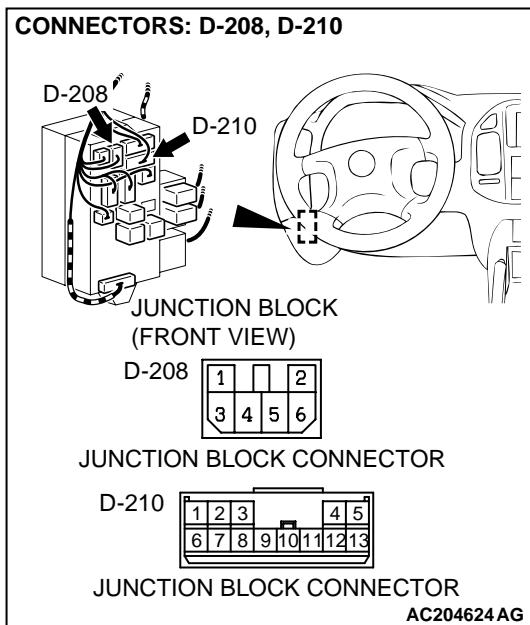
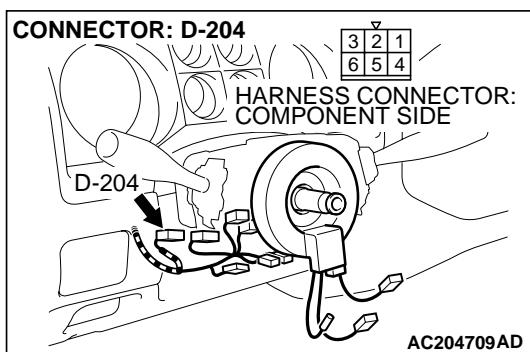
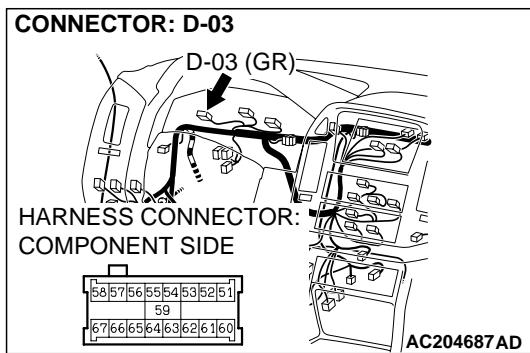


AC205148AB

STEP 3. Check the harness wires between combination meter connector D-03 terminal 53 and terminal 62.

Q: Is the harness wire between combination meter connector D-03 terminal 53 and terminal 62 damaged?

YES : Go to Step 4.
NO : Replace the combination meter (printed circuit board) and go to Step 6.



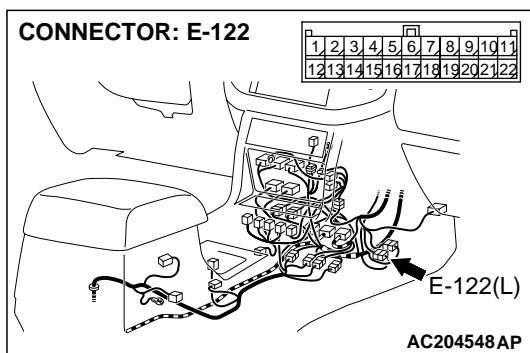
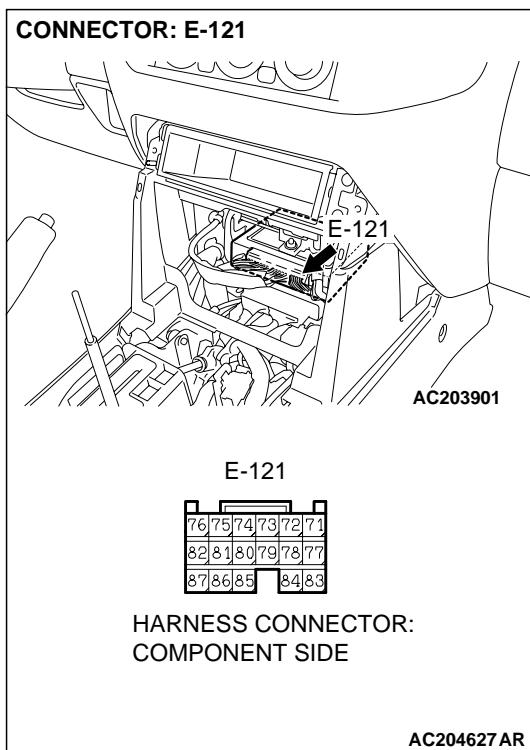
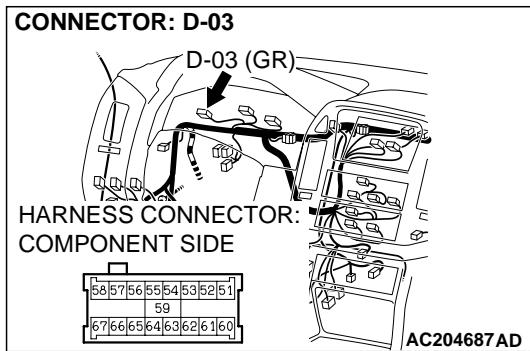
STEP 4. Check the harness wires between ignition switch (IG1) connector D-204 terminal 2 and combination meter connector D-03 terminal 62.

NOTE: After inspecting combination meter connector D-03, ignition switch (IG1) connector D-204, junction block connector D-208 and D-210, inspect the wire. If combination meter connector D-03, ignition switch (IG1) connector D-204, junction block connector D-208 and D-210 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00-6. Then go to Step 6.

Q: Is the harness wire between ignition switch (IG1) connector D-204 terminal 2 and combination meter connector D-03 terminal 62 damaged?

YES : Go to Step 6.

NO : Replace the combination meter (printed circuit board) and go to Step 6.



STEP 5. Check the harness wires between combination meter connector D-03 terminal 62 and M-ASTC-ECU connector E-121 terminal 74.

NOTE: After inspecting combination meter connector combination meter connector D-03, intermediate connector E-122 and M-ASTC-ECU connector E-121, inspect the wire. If combination meter connector D-03, intermediate connector E-122 and M-ASTC-ECU connector E-121 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00-6. Then go to Step 6.

Q: Is the harness wire between combination meter connector D-03 terminal 62 and M-ASTC-ECU connector E-121 terminal 74 damaged?

YES : Go to Step 6.

NO : Repair it and then go to Step 6.

STEP 6. Retest the system.

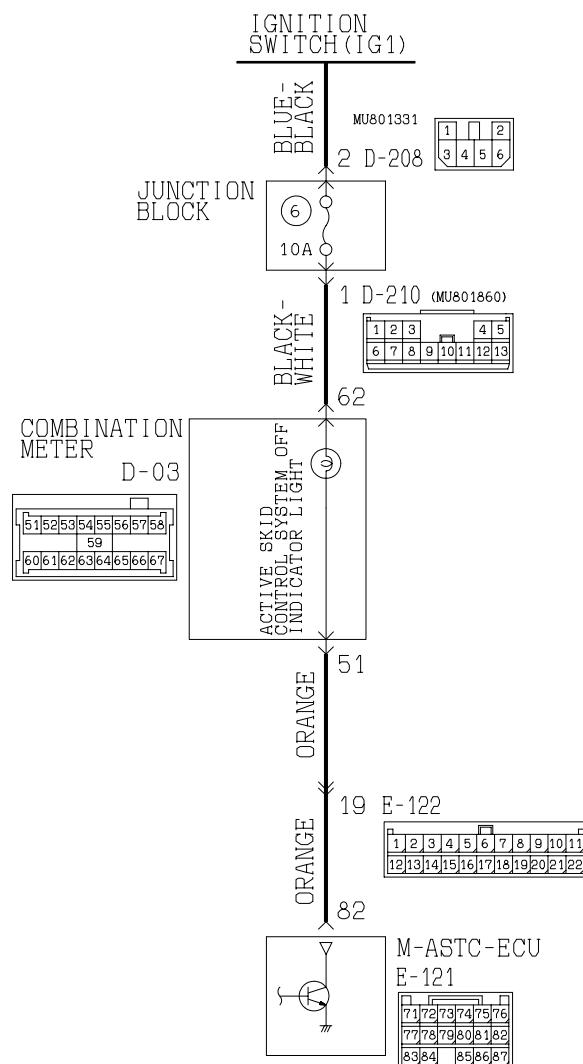
Q: When the ignition switch is turned "ON" (engine stopped or after startup), does the Active skid control system operation indicator light/Active traction control system operation indicator light illuminate?

YES : The procedure is complete.

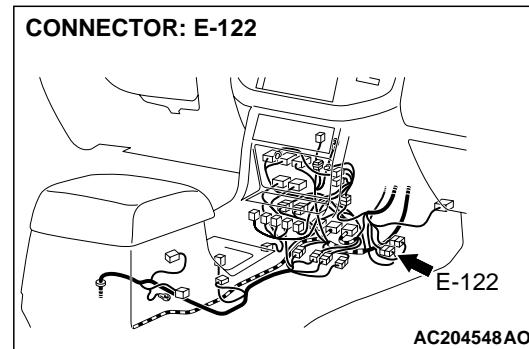
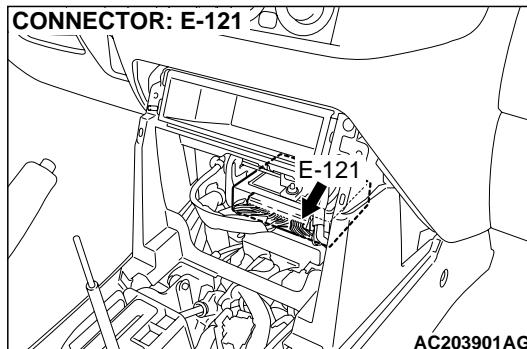
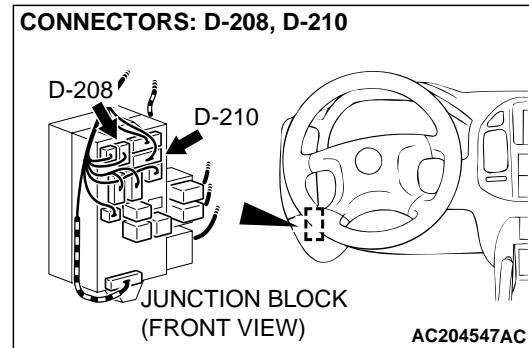
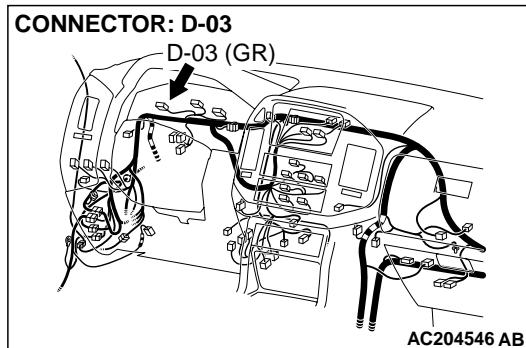
NO : Return to Step 1.

INSPECTION PROCEDURE 2: When the ignition switch is turned "ON" (Engine stopped or after startup), the Active skid control system OFF indicator light does not illuminate.

Active Skid Control System OFF Indicator Light Circuit



W3Q18M01AA



CIRCUIT OPERATION

The Active skid control system OFF indicator light is connected from the ignition switch (IG1) through multi-purpose fuse No.6 and the combination meter to the M-ASTC-ECU. The M-ASTC-ECU turns on and off the indicator light.

TECHNICAL DESCRIPTION (COMMENT)

This symptom is caused by a shorted or opened Active skid control system OFF indicator light circuit.

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

- Damaged wiring harness
- Burned-out bulb
- Melted fuse
- Malfunction of M-ASTC-ECU

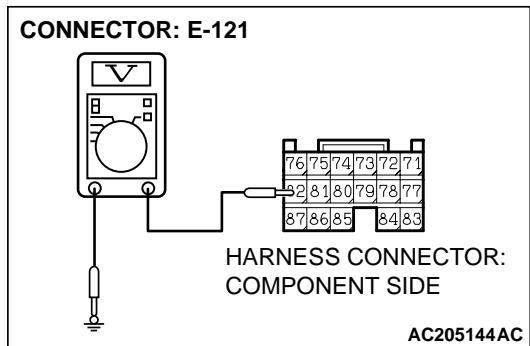
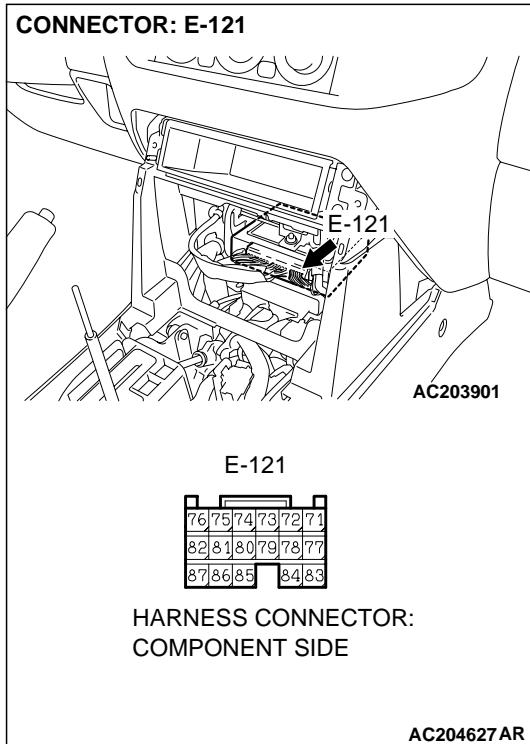
DIAGNOSIS

Required Special Tool:

- MB991223: Harness Set

STEP 1. Check the Active skid control system OFF indicator light circuit at M-ASTC-ECU connector E-121.

- (1) Disconnect M-ASTC-ECU connector E-121 and measure at the harness side.
- (2) Turn the ignition switch to the "ON" position.



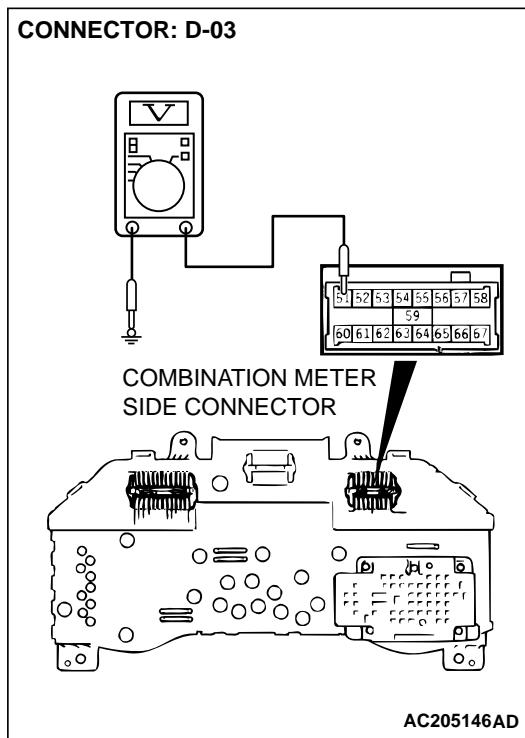
- (3) Measure the voltage between terminal 82 and ground. It should be approximately 12 volts (battery positive voltage).

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

YES : Replace the M-ASTC-ECU and then go to Step 6.
NO : Go to Step 2.

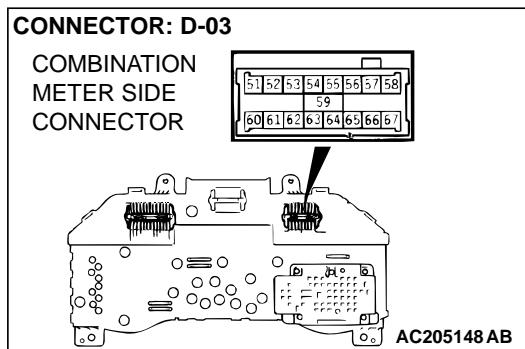
STEP2. Check combination meter connector D-03.

- (1) Disconnect combination meter connector D-03 and measure at the combination meter side.
- (2) Turn the ignition switch to the "ON" position.
- (3) Measure the voltage between terminal 51 and ground. It should be approximately 12 volts (battery positive voltage).



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

YES : Go to Step 5.
NO : Go to Step 3.

**STEP 3. Check the harness wires between combination meter connector D-03 terminal 51 and terminal 62.**

Q: Is the harness wire between combination meter connector D-03 terminal 51 and terminal 62 damaged?

YES : Go to Step 4.
NO : Replace the combination meter (printed circuit board) and go to Step 6.

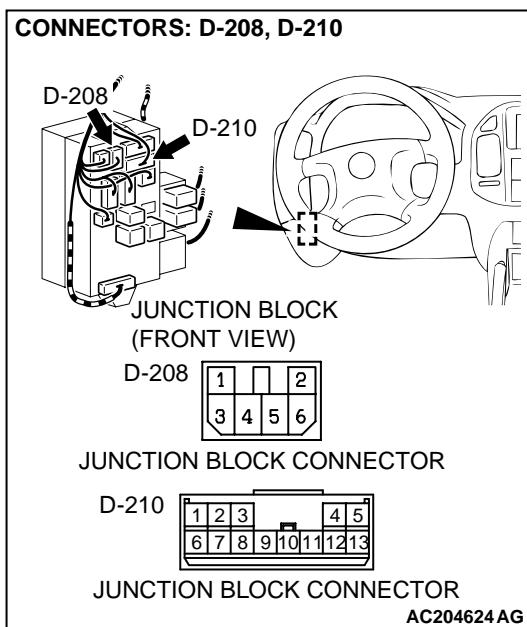
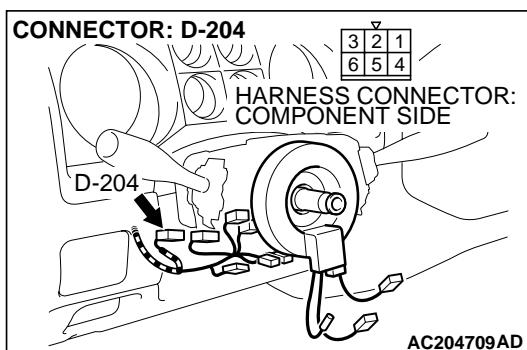
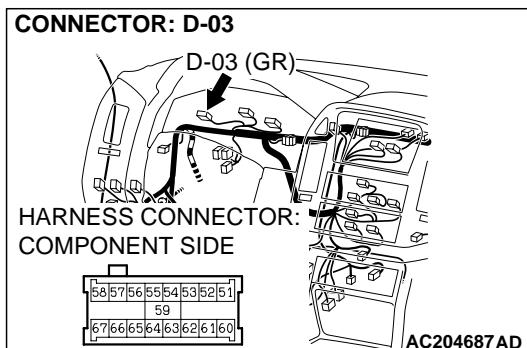
STEP 4. Check the harness wires between ignition switch (IG1) connector D-204 terminal 2 and combination meter connector D-03 terminal 62.

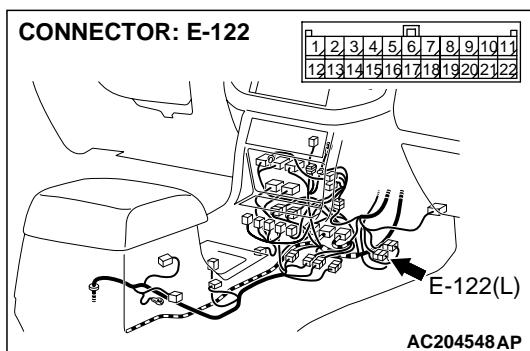
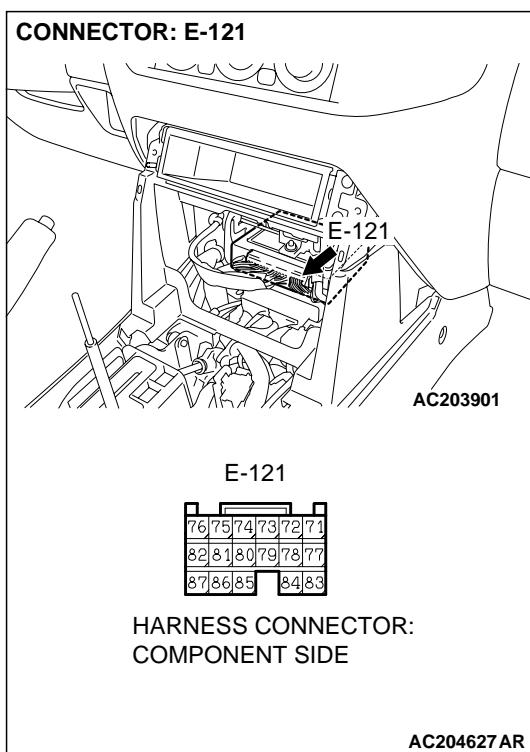
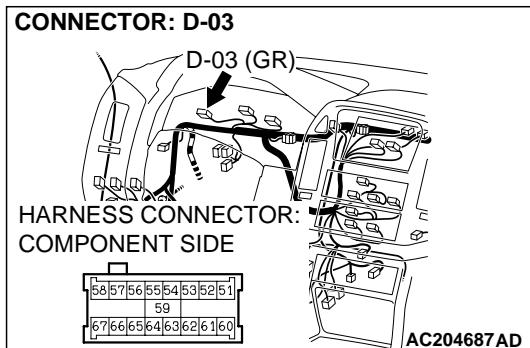
NOTE: After inspecting combination meter connector D-03, ignition switch (IG1) connector D-204, junction block connector D-208 and D-210, inspect the wire. If combination meter connector D-03, ignition switch (IG1) connector D-204, junction block connector D-208 and D-210 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00-6. Then go to Step 6.

Q: Is the harness wire between ignition switch (IG1) connector D-204 terminal 2 and combination meter connector D-03 terminal 62 damaged?

YES : Go to Step 6.

NO : Replace the combination meter (printed circuit board) and go to Step 6.





STEP 5. Check the harness wires between combination meter connector D-03 terminal 51 and M-ASTC-ECU connector E-121 terminal 82.

NOTE: After inspecting combination meter connector combination meter connector D-03, intermediate connector E-122 and M-ASTC-ECU connector E-121, inspect the wire. If combination meter connector D-03, intermediate connector E-122 and M-ASTC-ECU connector E-121 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00-6. Then go to Step 6.

Q: Is the harness wire between combination meter connector D-03 terminal 51 and M-ASTC-ECU connector E-121 terminal 82 damaged?

NO : Go to Step 6.

YES : Repair it and then go to Step 6.

STEP 6. Retest the system.

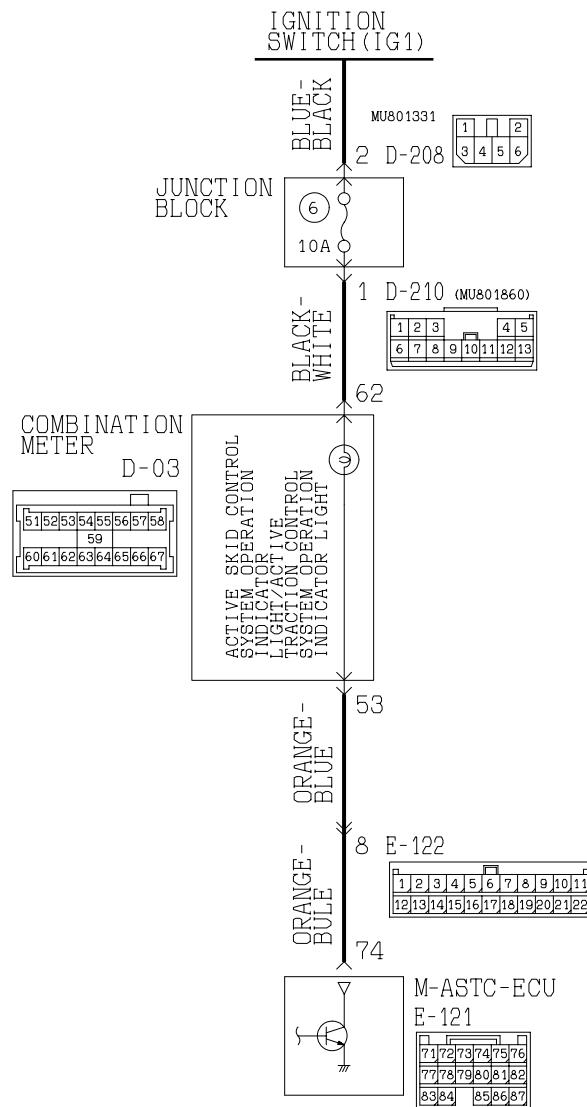
Q: When the ignition switch is turned "ON" (engine stopped or after startup), does the Active skid control system OFF indicator light illuminate?

YES : The procedure is complete.

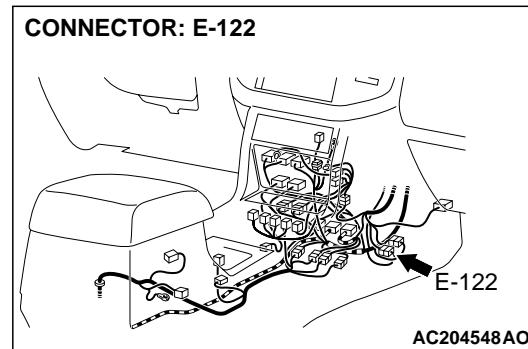
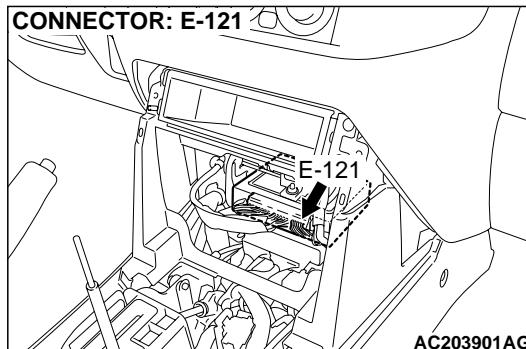
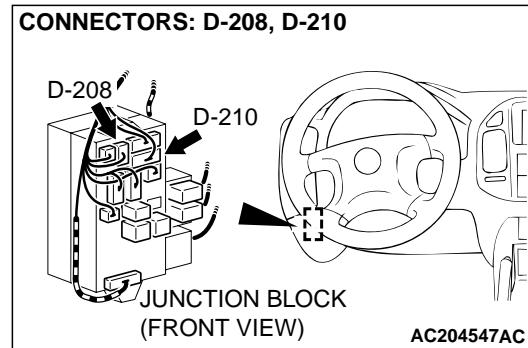
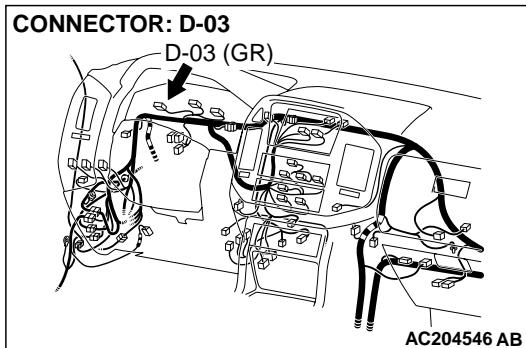
NO : Return to Step 1.

INSPECTION PROCEDURE 3: The Active skid control system operation indicator light/Active traction control system operation indicator light remains illuminated after the engine is started.

Active Skid Control System Operation Indicator Light/
Active Traction Control System Operation Indicator Light Circuit



W3Q18M02AA



CIRCUIT OPERATION

The Active skid control system operation indicator light/Active traction control system operation indicator light is connected from the ignition switch (IG1) through multi-purpose fuse No.6 and the combination meter to the M-ASTC-ECU. The M-ASTC-ECU turns on and off the indicator light.

TECHNICAL DESCRIPTION (COMMENT)

This symptom is caused by a shorted Active skid control system operation indicator light/Active traction control system operation indicator light circuit.

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

- Damaged wiring harness
- Malfunction of M-ASTC-ECU

DIAGNOSIS

Required Special Tool:

- MB991223: Harness Set

STEP 1. Check the harness wires between combination meter connector D-03 terminal 51 and M-ASTC-ECU connector E-121 terminal 82.

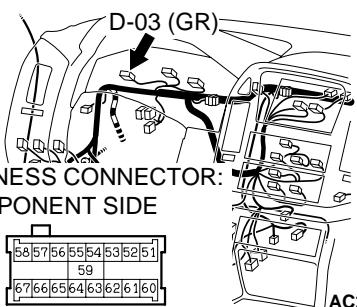
NOTE: After inspecting combination meter connector combination meter connector D-03, intermediate connector E-122 and M-ASTC-ECU connector E-121, inspect the wire. If combination meter connector D-03, intermediate connector E-122 and M-ASTC-ECU connector E-121 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00-6. Then go to Step 2.

Q: Is the harness wire between combination meter connector D-03 terminal 51 and M-ASTC-ECU connector E-121 terminal 82 damaged?

NO : Replace the M-ASTC-ECU and then go to Step 2.

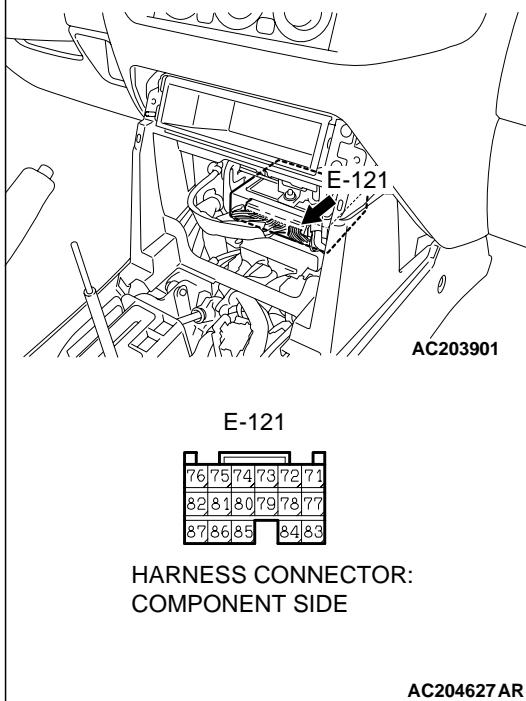
YES : Repair it and then go to Step 2.

CONNECTOR: D-03



AC204687AD

CONNECTOR: E-121

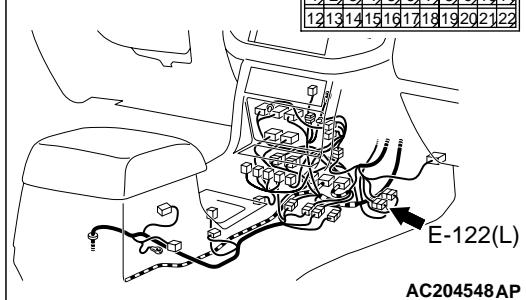


AC204627AR

E-121
HARNESS CONNECTOR:
COMPONENT SIDE

76	75	74	73	72	71
82	81	80	79	78	77
87	86	85	84	83	

CONNECTOR: E-122



1	2	3	4	5	6	7	8	9	10	11
12	13	14	15	16	17	18	19	20	21	22

AC204548AP

STEP 2. Retest the system.

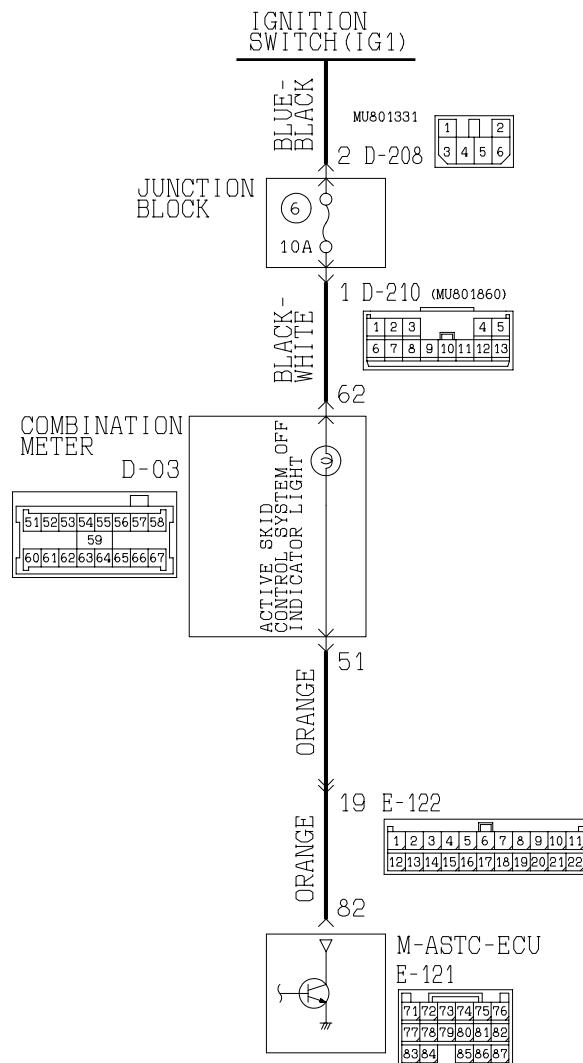
Q: Does the Active skid control system operation indicator light/Active traction control system operation indicator light turn off 3 seconds after start-up?

YES : The procedure is complete.

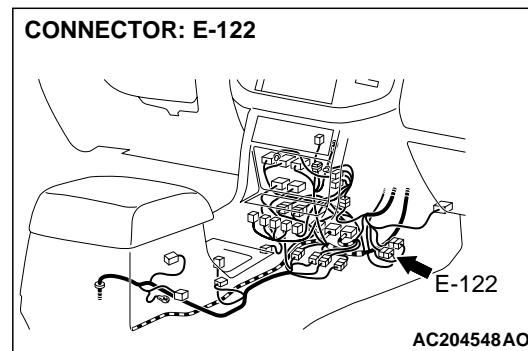
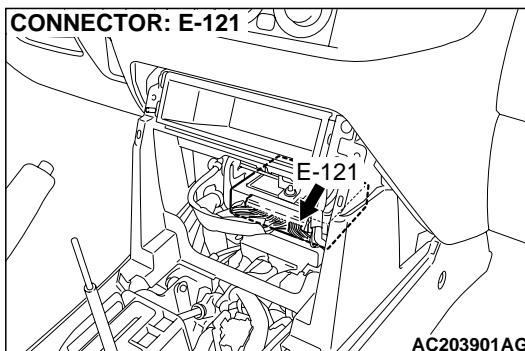
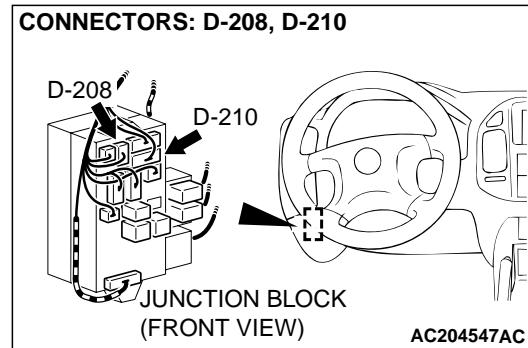
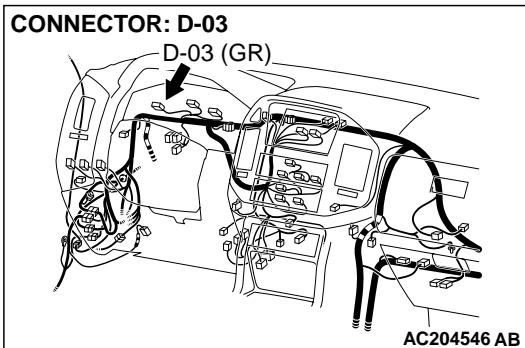
NO : Return to Step 1.

INSPECTION PROCEDURE 4: The Active skid control system OFF indicator light remains illuminated after the engine is started.

Active Skid Control System OFF Indicator Light Circuit



W3Q18M01AA



CIRCUIT OPERATION

The Active skid control system OFF indicator light is connected from the ignition switch (IG1) through multi-purpose fuse No.6 and the combination meter to the M-ASTC-ECU. The M-ASTC-ECU turns on and off the indicator light.

TECHNICAL DESCRIPTION (COMMENT)

This symptom is caused by a shorted Active skid control system OFF indicator light circuit.

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

- Damaged wiring harness
- Malfunction of M-ASTC-ECU

DIAGNOSIS

Required Special Tool:

- MB991223: Harness Set

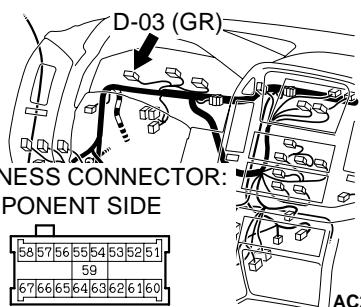
STEP 1. Check the harness wires between combination meter connector D-03 terminal 51 and M-ASTC-ECU connector E-121 terminal 82.

NOTE: After inspecting combination meter connector combination meter connector D-03, intermediate connector E-122 and M-ASTC-ECU connector E-121, inspect the wire. If combination meter connector D-03, intermediate connector E-122 and M-ASTC-ECU connector E-121 are damaged, repair or replace them. Refer to GROUP 00E, Harness Connector Inspection P.00-6. Then go to Step 2.

Q: Is the harness wire between combination meter connector D-03 terminal 51 and M-ASTC-ECU connector E-121 terminal 82 damaged?

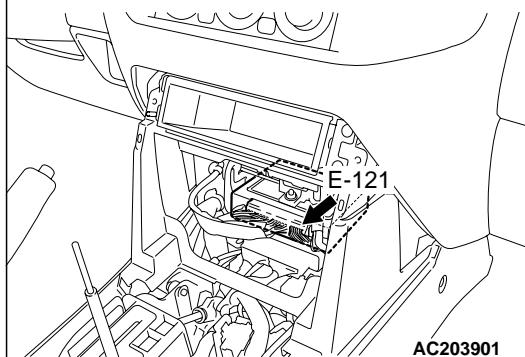
NO : Replace the M-ASTC-ECU and then go to Step 2.

YES : Repair it and then go to Step 2.

CONNECTOR: D-03HARNESS CONNECTOR:
COMPONENT SIDE

58	57	56	55	54	53	52	51
67	66	65	64	63	62	61	60
59							

AC204687AD

CONNECTOR: E-121

AC203901

E-121

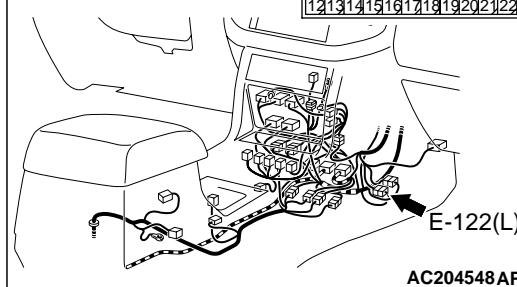
76	75	74	73	72	71
82	81	80	79	78	77
87	86	85	84	83	

HARNESS CONNECTOR:
COMPONENT SIDE

AC204627AR

CONNECTOR: E-122

1	2	3	4	5	6	7	8	9	10	11
12	13	14	15	16	17	18	19	20	21	22



AC204548AP

STEP 2. Retest the system.

Q: Does the Active skid control system OFF indicator light turn off 3 seconds after start-up?

YES : The procedure is complete.

NO : Return to Step 1.

DATA LIST REFERENCE TABLE

M1353001200026

The M-ASTC-ECU also controls the ABS system.
For the Data list reference table, refer to GROUP 35B, Data List Reference Table [P.35B-111](#).

ACTUATOR TEST REFERENCE

The scan tool activates the following actuators for testing.

NOTE: If the M-ASTC-ECU is inoperative, actuator testing cannot be carried out.

NOTE: Actuator testing is only possible when the vehicle is stationary. If the vehicle speed during actuator testing exceeds 10 km/h (6 mph), forced actuation will be canceled.

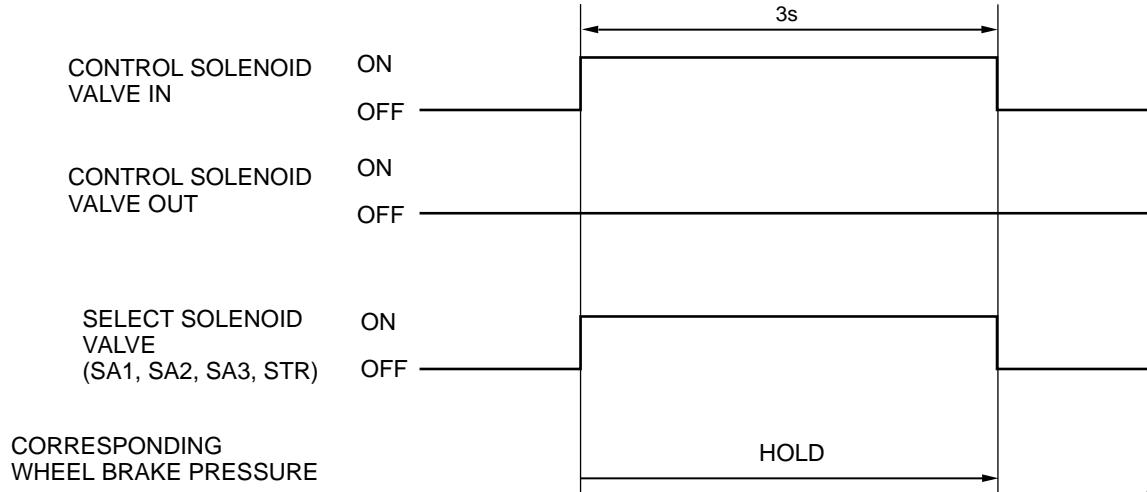
M1353001300023

ACTUATOR TEST SPECIFICATIONS

MUT-II SCAN TOOL DISPLAY	ITEM NO.	CHECK ITEM	PARTS TO BE ACTIVATED	ACTIVATION WHEN THE SYSTEM FAILS
FR ACTIVE SKID CONTROL SYSTEM VALVE	05	Solenoid valve for front-right wheel	ACTIVE SKID CONTROL SYSTEM control solenoid valves for the respective channel	Disabled
FL ACTIVE SKID CONTROL SYSTEM VALVE	06	Solenoid valve for front-left wheel		
RR ACTIVE SKID CONTROL SYSTEM VALVE	07	Solenoid valve for rear-right wheel		
RL ACTIVE SKID CONTROL SYSTEM VALVE	08	Solenoid valve for rear-left wheel		
HBB MOTOR	11	Pump motor	Drives the pump motor for one second.	Disabled
HBB BUZZER	12	Buzzer	Drives the buzzer for three seconds.	Disabled
ENG. TRQ DOWN	13	Engine	Engine torque reduction	Disabled
ST SNSR: 0	14	Steering wheel sensor	Neutral point in steering wheel sensor	Enabled
YAWRATE SNS: 0	15	Yaw rate sensor	Neutral point in yaw rate sensor	Enabled
G SNSR: 0	16	G sensor	Neutral point in G sensor	Enabled

MUT-II SCAN TOOL DISPLAY	ITEM NO.	CHECK ITEM	PARTS TO BE ACTIVATED	ACTIVATION WHEN THE SYSTEM FAILS
BRKE WARN LMP	23	Brake warning light	Blink two times the brake warning light.	Enabled (However, disabled when the brake warning light cannot be activated)
ABS FAIL LMP	24	ABS warning light	Blink two times ABS warning light	Enabled (However, disabled when the ABS warning light cannot be activated)
ACTIVE SKID CONTROL SYSTEM OP LAMP	25	Active skid control system operation indicator light/Active traction control system operation indicator light	Blink two times the Active skid control system operation indicator light/ Active traction control system operation indicator light	Enabled (However, disabled when the Active skid control system operation indicator light/ Active traction control system operation indicator light cannot be activated)
ACTIVE SKID CONTROL SYSTEM OFF LAMP	26	Active skid control system OFF indicator light	Blink two times the Active skid control system OFF indicator light	Enabled (However, disabled when the Active skid control system OFF indicator light cannot be activated)

ITEM No. 05 - 08 DRIVE PATTERN



AC205660AB

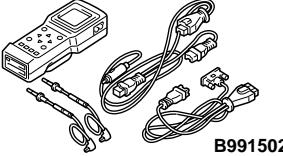
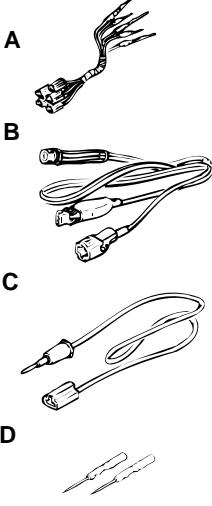
CHECK AT M-ASTC-ECU

M1353001400020

The M-ASTC-ECU also controls the ABS system.
For the terminal voltage reference table, refer to
GROUP 35B, Check at M-ASTC-ECU [P.35B-115](#).

SPECIAL TOOLS

M1353000600021

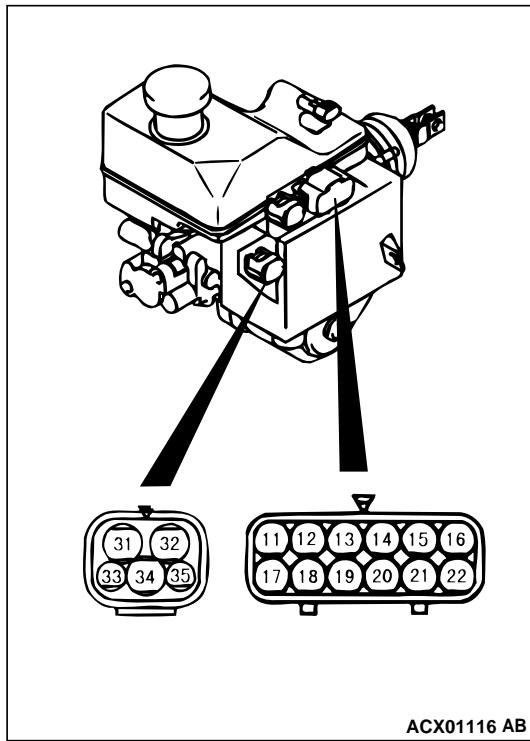
TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
 B991502	MB991502 Scan tool (MUT-II)	MB991496-OD	For checking of Active skid control system [Diagnostic trouble code display when using the scan tool (MUT-II)]
 MB991348	MB991348 Test harness set	MB991496-OD	For checking of G and yaw rate sensor
 A B C D MB991223AB	MB991223 Harness set A:MB991219 Inspection harness	MB991223 MB991709-01	ABS sensor output voltage measurement

ON-VEHICLE SERVICE

ABS SENSOR OUTPUT VOLTAGE CHECK

Refer to GROUP 35B, On-Vehicle service P.35B-119

M1353004700019



SOLENOID VALVE CHECK

M1353001700021

Measure the resistance between the following solenoid valve terminals.

- Control solenoid valve IN (FR): Between terminals (19) – (34)
- Control solenoid valve OUT (FR): Between terminals (20) – (34)
- Control solenoid valve IN (FL): Between terminals (21) – (34)
- Control solenoid valve OUT (FL): Between terminals (22) – (34)
- Control solenoid valve IN (RR): Between terminals (15) – (34)
- Control solenoid valve OUT (RR): Between terminals (16) – (34)
- Control solenoid valve IN (RL): Between terminals (13) – (34)
- Control solenoid valve OUT (RL): Between terminals (14) – (34)
- Select solenoid valve (SA1): Between terminals (18) – (34)
- Select solenoid valve (SA2): Between terminals (17) – (34)
- Select solenoid valve (SA3): Between terminals (12) – (34)
- Select solenoid valve (STR): Between terminals (11) – (34)

Standard value:

Control solenoid valve IN: $4.75 - 5.25 \Omega$ Control solenoid valve OUT: $2.0 - 2.4 \Omega$ Select solenoid valve: $3.5 - 3.9 \Omega$

IN THE EVENT OF A DISCHARGED BATTERY

M1353004900013

⚠ WARNING

If the ABS is not operating, the vehicle posture will be unstable during braking. Do not drive the vehicle with the M-ASTC-ECU connector disconnected or with the ABS not operating.

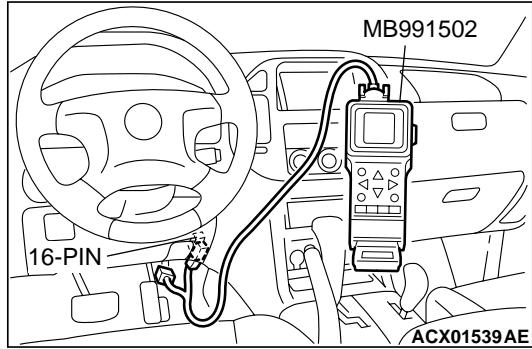
If the engine is started using a booster cable when the battery is completely flat, and the vehicle is then driven without waiting for the battery to be recharged, the engine may misfire and it may not be possible to drive the vehicle. This is because the ABS consumes a large amount of current when carrying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

Initializing the M-ASTC-ECU (Action to be taken when the battery is removed)

When the battery is removed, the neutral point of the steering wheel sensor will be erased, the Active skid control system OFF indicator light will illuminate and DTC 83 (ST NO ADJ) will be set. In this case, make the steering wheel sensor learn the neutral point by following one of the procedures below.

Using scan tool MB991502

1. Connect scan tool MB991502 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Turn the steering wheel 8° or more, and then return it to the neutral (straight forward) position.
4. Execute item No.14 "ST SNSR: 0 " on the Actuator test.
5. Ensure that the Active skid control system OFF indicator light is off.
6. Turn the ignition switch to the "LOCK" (OFF) position.
7. Disconnect scan tool MB991502.



Not using scan tool MB991502

CAUTION

1. **If a different diameter or size of tires are equipped, the M-ASTC-ECU may not learn the neutral position.**
Turn the steering wheel 8° or more, and then return the steering wheel to straight-ahead position.
2. Drive the vehicle straight forward at 35 km/h (25 mph) for approximately one second.
3. Ensure that the Active skid control system OFF indicator light is off.

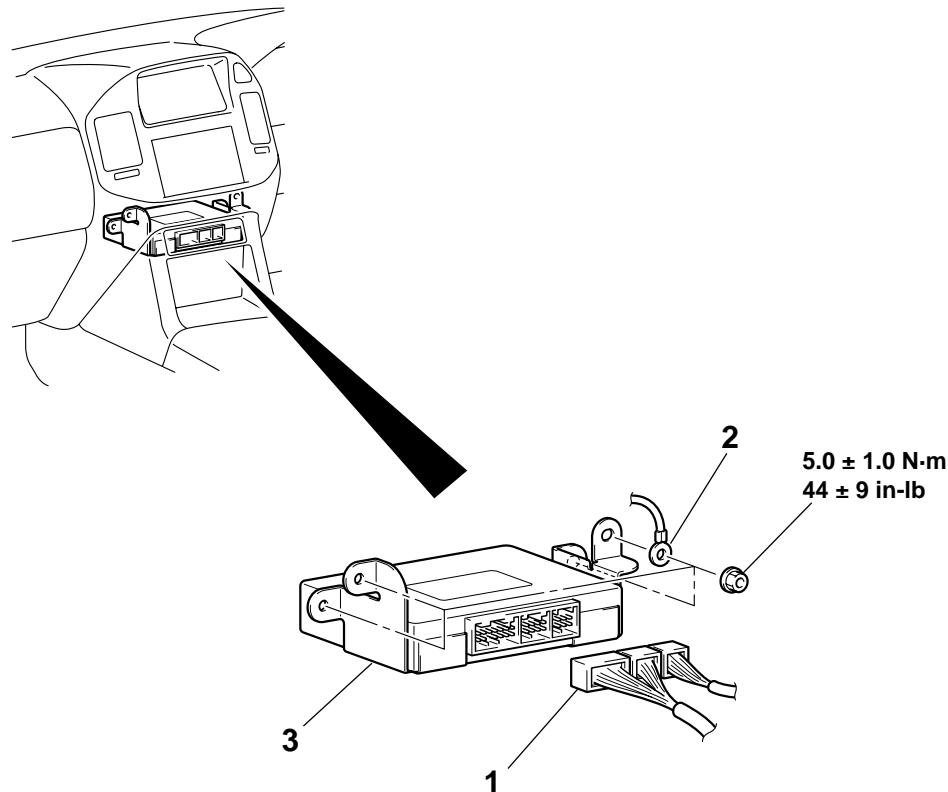
M-ASTC CONTROL UNIT(M-ASTC-ECU)

REMOVAL AND INSTALLATION

M1353002500020

Pre-removal and Post-installation Operation

- Indicator Panel, Lower Center Panel Removal and installation (Refer to GROUP 52A, Floor Console P.52A-7.)



AC204232AB

REMOVAL STEPS

>>B<< • CANCELLING THE HBB BUZZER
OPERATION CHECK MODE (WHEN
REPLACING THE ABS-ECU)
1. M-ASTC-ECU CONNECTOR

REMOVAL STEPS (Continued)

2. GROUND
>>A<< 3. M-ASTC-ECU

INSTALLATION SERVICE POINTS

>>A<< M-ASTC-ECU INSTALLATION

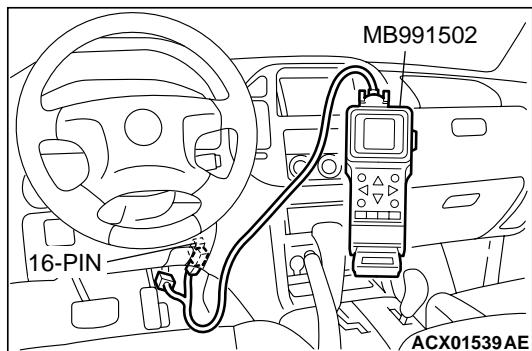
CAUTION

Perform the following initialization procedure, otherwise the following DTCs will be set.

- DTC No.81: G NO ADJ
- DTC No.84: TF NO CHECK
- DTC No.85: M/CYL PRS NO CHECK

When installing a new M-ASTC-ECU, perform the initialization as follows, ensuring that the vehicle remains level.

1. Place the selector lever in the "P" position.



2. Connect scan tool MB991502 to the data link connector.
3. Turn the ignition switch to the "ON" position.
4. Execute item No.16 "G SNSR: " on the Actuator test.
5. Depress the brake pedal by a pressure of approximately 40 kg quickly once.
6. Move the transfer lever through all positions (2H, 4H, 4HLC, 4LLC).
7. Turn the ignition switch to the "LOCK" (OFF) position.
8. Disconnect scan tool MB991502.

>>B<< CANCELLING THE HBB BUZZER OPERATION CHECK MODE (WHEN REPLACING THE ASTC-ECU)

If the ignition switch is turned to the "ON" position after replacing the M-ASTC-ECU, the HBB buzzer will sound for approximately five seconds. This is because the M-ASTC-ECU is at the HBB buzzer operation check mode (for factory production line). To stop the tone alarm, carry out one of the following procedures.

- Erase HBB diagnostic trouble codes by using scan tool MB991502 or special tool MB991529. Refer to GROUP 35A, HBB Trouble Code Diagnosis [P.35A-14](#).
- Drive the vehicle at 40 km/h (25 mph) or more.

ABS SENSOR

REMOVAL AND INSTALLATION

Refer to GROUP 35B, ABS sensor [P.35B-124](#).

M1354004300014

G AND YAW RATE SENSOR

REMOVAL AND INSTALLATION

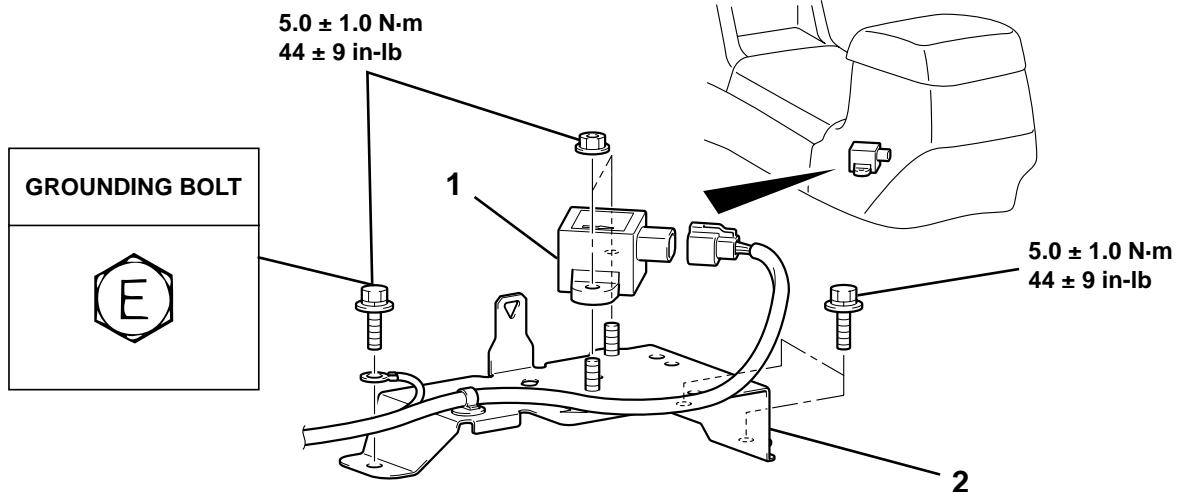
M1354003900013

CAUTION

Do not drop or shock the G and yaw rate sensor.

Pre-removal and Post-installation Operation

- Floor console removal and installation (Refer to GROUP 52A, Floor Console P.52A-7.)



REMOVAL STEPS

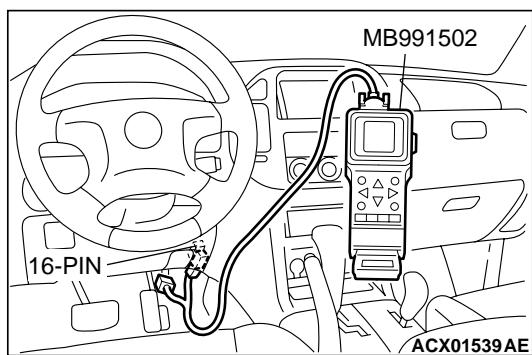
>>A<< 1. G AND YAW RATE SENSOR
2. G AND YAW RATE SENSOR
BRACKET

INSTALLATION SERVICE POINT

>>A<< G AND YAW RATE SENSOR INSTALLATION

If the G and yaw rate sensor is replaced, park the vehicle on a level surface and follow the procedure below.

1. Connect scan tool MB991502 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Execute item No.16 "G SNSR: " on the Actuator test.
4. Turn the ignition switch to the "LOCK" (OFF) position.
5. Disconnect scan tool MB991502.



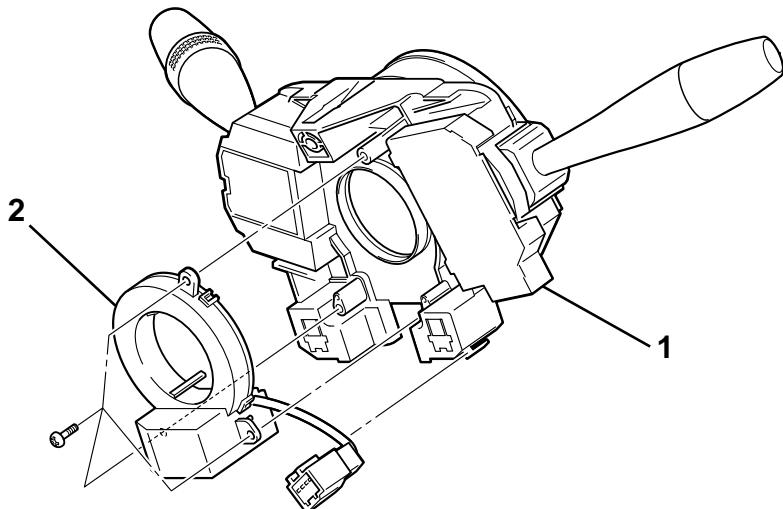
STEERING WHEEL SENSOR

REMOVAL AND INSTALLATION

M1354004100010

Pre-removal and Post-installation Operation

- Steering wheel and Air bag module assembly removal and installation (Refer to GROUP 37A, Steering wheel and shaft assembly P.37A-23.)



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REMOVAL STEPS

1. CLOCK SPRING AND COLUMN SWITCH ASSEMBLY (REFER TO GROUP 52B, AIR BAG MODULE AND CLOCK SPRING P.52Ba-33.)
- >>A<< 2. STEERING WHEEL SENSOR

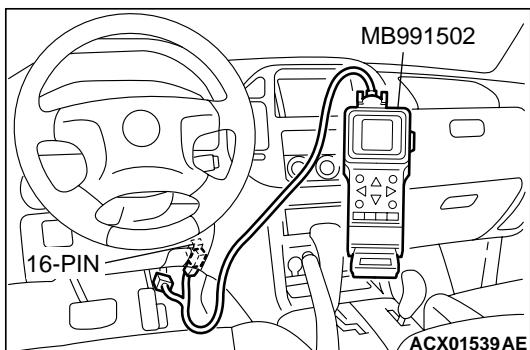
INSTALLATION SERVICE POINT

>>A<< STEERING WHEEL SENSOR INSTALLATION

When the battery is removed, the neutral point of the steering wheel sensor will be erased, the Active skid control system OFF indicator light will illuminate and DTC 83 (ST NO ADJ) will be set. In this case, make the steering wheel sensor learn the neutral point by following one of the procedures below.

Using scan tool MB991502

1. Connect scan tool MB991502 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Turn the steering wheel 8° or more, and then return it to the neutral (straight forward) position.
4. Execute item No.14 "ST SNSR: 0 " on the Actuator test.
5. Ensure that the Active skid control system OFF indicator light is off.
6. Turn the ignition switch to the "LOCK" (OFF) position.
7. Disconnect scan tool MB991502.



Not using scan tool MB991502

CAUTION

1. If a different diameter or size of tires are equipped, the M-ASTC-ECU may not learn the neutral position.

Turn the steering wheel 8° or more, and then return the steering wheel to straight-ahead position.

2. Drive the vehicle straight forward at 35 km/h (25 mph) for approximately one second.
3. Ensure that the Active skid control system OFF indicator light is off.

SPECIFICATIONS**FASTENER TIGHTENING SPECIFICATIONS**

M1353004500015

ITEM	SPECIFICATION
M-ASTC-ECU	
M-ASTC-ECU mounting nut	5.0 ± 1.0 N·m (44 ± 22.86 cm-lb)
HBB buzzer bracket mounting nut	5.0 ± 1.0 N·m (44 ± 22.86 cm-lb)
HBB buzzer mounting nut	5.0 ± 1.0 N·m (44 ± 22.86 cm-lb)
G and yaw rate sensor	
G and yaw rate sensor bracket mounting nut	5.0 ± 1.0 N·m (44 ± 22.86 cm-lb)
G and yaw rate sensor mounting nut	5.0 ± 1.0 N·m (44 ± 22.86 cm-lb)

SERVICE SPECIFICATIONS

M1353000300031

ITEM	STANDARD VALUE	
Control solenoid valve resistance Ω	IN	4.75 – 5.25
	OUT	2.0 – 2.4
Select solenoid valve resistance Ω		3.5 – 3.9
ABS sensor internal resistance $k\Omega$		1.0 – 1.5

NOTES