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1995 MAZDA MX-6 OEM Service and Repair Workshop Manual

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4.Verify the ECT PID value is above 60 °C {140 °F}.

5.Select the following items from the initialization screen of the M-MDS.

(1)Select “Self Test”.

(2)Select “Modules”.

(3)Select “PCM”.

6.Then, select the “KOER On Demand Self Test” and perform procedures according to the directions on the M-MDS screen.

7.Verify the DTC according to the directions on the M-MDS screen.

• If any DTCs are displayed, perform troubleshooting according to the corresponding DTC inspection.

8.After completion of repairs, clear all DTCs stored in the PCM, while referring to “AFTER REPAIR PROCEDURE”.

OPERATION INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)

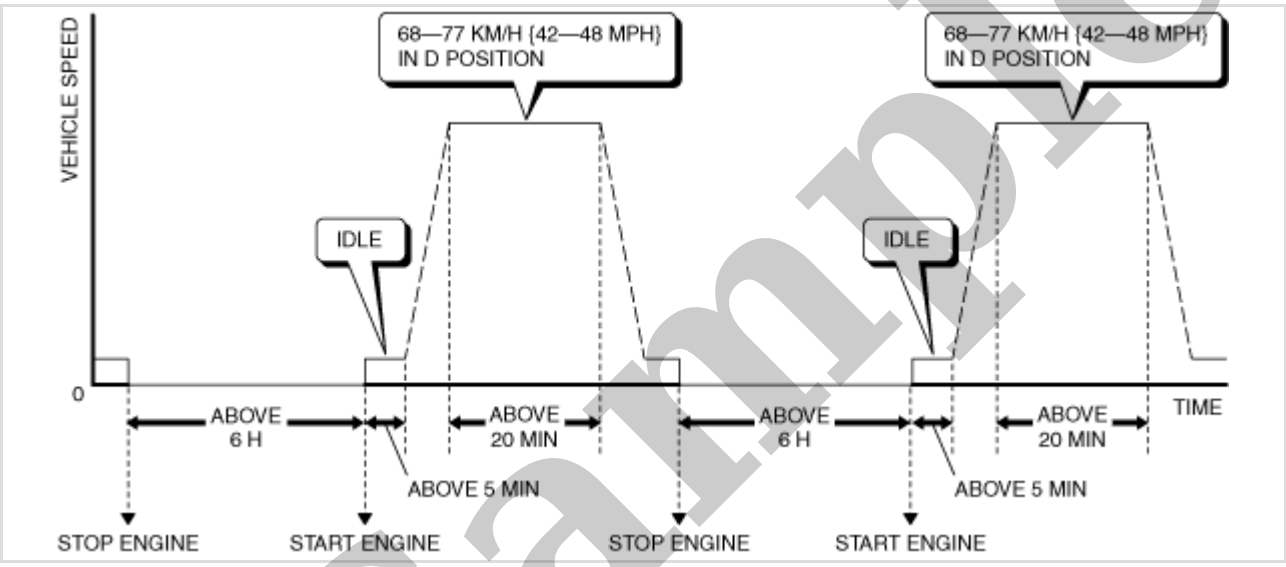
1.Verify that all of the following PIDs are within the following specifications. All PIDs must be within specifications before the engine is started to initiate the evaporative system test.

- IAT: 5−35 °C {41−95 °F}
- FLI: 15−85 %
- BARO: Above 72.2 kPa {0.736 kgf/cm^2, 10.5 psi}

2.Start the engine and warm it up completely.

3.Clear the DTCs from the PCM memory using the M-MDS. (See CLEARING DTC [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)

4.Drive the vehicle as shown in the graph.



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5.To verify the completion of the drive mode, stop the vehicle and display the following menu from the M-MDS initial screen. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)

(1)Select “Tool Box”.

(2)Select “Powertrain”.

(3)Select “OBD Test Modes”.

(4)Select “Mode 1 Powertrain Data”.

- If the drive mode has been completed, ***_EVAL of the PID ***SUP item indicating Yes changes from No to Yes.
- If not completed, switch the ignition off then go back to Step 1.

6.Access the DIAGNOSTIC MONITORING TEST RESULTS to verify the monitor results. (See DIAGNOSTIC MONITORING TEST RESULTS [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)

- If detected values are not within specification, repair has not been completed.

INAPPROPRIATE OPERATION AND CONTROL RECORD 0x43 (UNUSUAL VOLTAGE OF A BATTERY) [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))]

SM2896649

id0102s904360

Caution

Inappropriate operation and control code 0x43 is more likely to be recorded than DTC P2504:00. Inappropriate operation and control code 0x43 may be recorded when the operation conditions are met due to signal noise. Therefore, if there is no malfunction in the related part, do not replace the part.

Outline

• If there is a malfunction in the generator output control, the parts damage may occur inhibiting driving or compromising occupant safety. To prevent this, the PCM performs protection control when the following operation conditions are met.

Operation Conditions

• Almost same as detection condition for DTC P2504:00 (See DTC P2504:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)

Protection Control

• Almost same as detection condition for DTC P2504:00 (See DTC P2504:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)

Diagnosis Procedure and Explanation to Customer

STEP	INSPECTION	RESULTS	ACTION
1	PURPOSE: VERIFY DTCs • Has any DTC been recorded?	Yes	Repair the malfunctioning location according to the applicable DTC troubleshooting. (See DTC TABLE [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)
		No	Go to the next step.
2	PURPOSE: VERIFY CONDITION OF BATTERY AND GENERATOR • Inspect the battery and generator referring to the troubleshooting procedure for DTC P2504:00. (See DTC P2504:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Is there any malfunctioning location?	Yes	Repair the malfunctioning location.
		No	Explain to the customer that the vehicle is normal and the protection control was performed temporarily due to signal noise.

DTC U060F:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))]

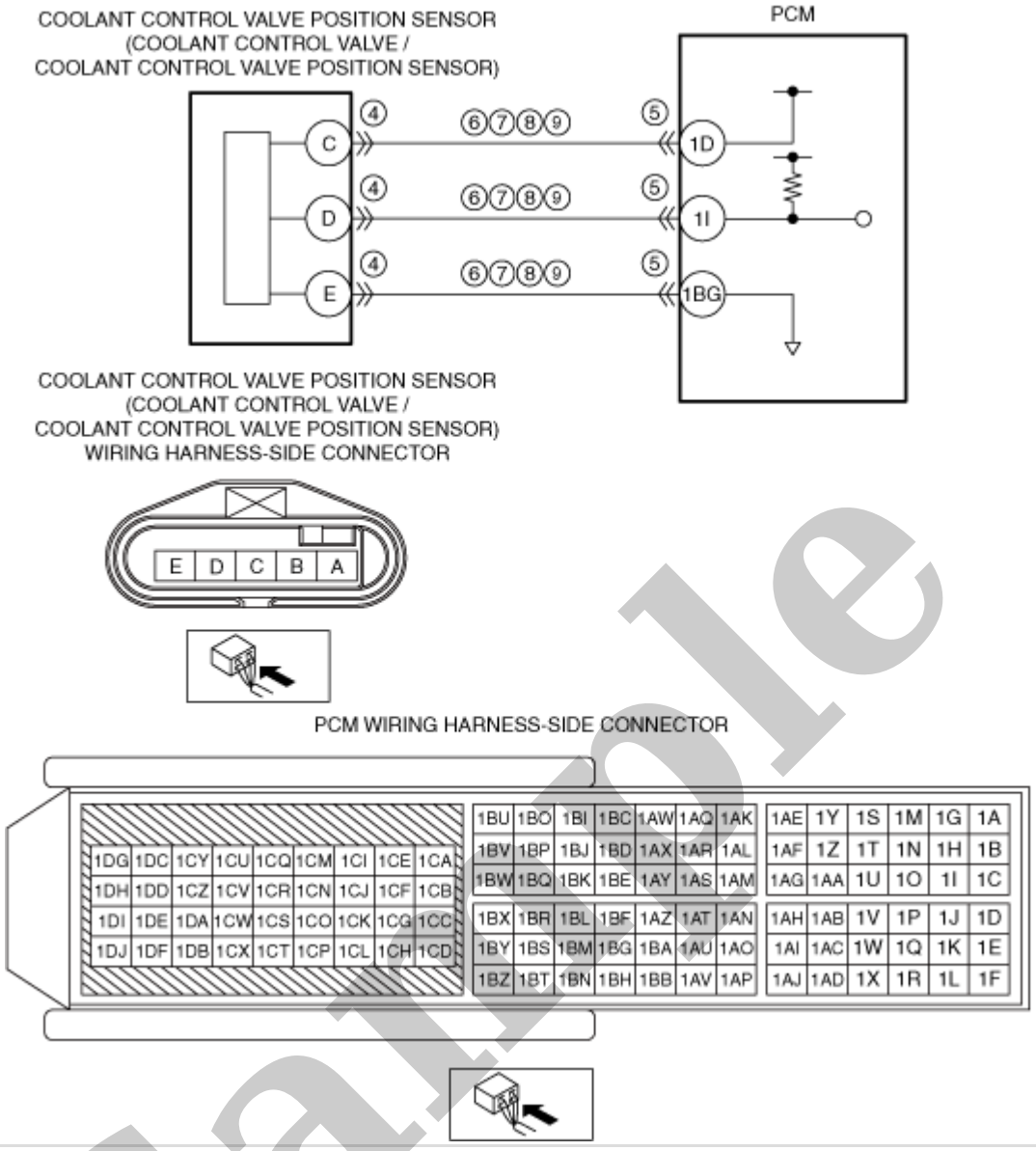
SM2896651

id0102s905350

DTC U060F:00	SENT communication: Communication error between MAF sensor/IAT sensor No.1 and PCM
DETECTION CONDITION	• When any of the following conditions is met: — SENT communication line malfunction between MAF sensor/IAT sensor No.1 and PCM — The PCM detected a SENT communication type communication error from the MAF sensor/IAT sensor No.1. **Diagnostic support note** • This is a continuous monitor (CCM). • The check engine light does illuminate. • FREEZE FRAME DATA/Snapshot data is available. • DTC is stored in the PCM memory.
FAIL-SAFE FUNCTION	• Not applicable
POSSIBLE CAUSE	• SENT communication line error between MAF sensor/IAT sensor No.1 and PCM • MAF sensor/IAT sensor No.1 connector or terminals malfunction • PCM connector or terminals malfunction • Open circuit in wiring harness between the following terminals: — MAF sensor/IAT sensor No.1 terminal A—PCM terminal 2AI — MAF sensor/IAT sensor No.1 terminal B—PCM terminal 2BE — MAF sensor/IAT sensor No.1 terminal C—PCM terminal 2AT • Short to ground in wiring harness between the following terminals: — MAF sensor/IAT sensor No.1 terminal A—PCM terminal 2AI — MAF sensor/IAT sensor No.1 terminal B—PCM terminal 2BE — MAF sensor/IAT sensor No.1 terminal C—PCM terminal 2AT • Short to power supply in wiring harness between the following terminals: — MAF sensor/IAT sensor No.1 terminal A—PCM terminal 2AI — MAF sensor/IAT sensor No.1 terminal B—PCM terminal 2BE — MAF sensor/IAT sensor No.1 terminal C—PCM terminal 2AT • MAF sensor/IAT sensor No.1 circuits are shorted to each other • MAF sensor/IAT sensor No.1 malfunction • PCM malfunction

STEP	INSPECTION	RESULTS	ACTION
8	**INSPECT MAF SENSOR/IAT SENSOR No.1 CIRCUIT FOR SHORT TO POWER SUPPLY** • Verify that the MAF sensor/IAT sensor No.1 and PCM connectors are disconnected. • Switch the ignition ON (engine off). **Note** **• Another DTC may be stored by the PCM detecting an open circuit.** • Measure the voltage at the following terminals (wiring harness-side): — MAF sensor/IAT sensor No.1 terminal A–PCM terminal 2AI — MAF sensor/IAT sensor No.1 terminal B–PCM terminal 2BE — MAF sensor/IAT sensor No.1 terminal C–PCM terminal 2AT • Is the voltage 0 V?	Yes	Go to the next step.
		No	Refer to the wiring diagram and verify whether or not there is a common connector between the following terminals: • MAF sensor/IAT sensor No.1 terminal A–PCM terminal 2AI • MAF sensor/IAT sensor No.1 terminal B–PCM terminal 2BE • MAF sensor/IAT sensor No.1 terminal C–PCM terminal 2AT **If there is a common connector:** • Determine the malfunctioning part by inspecting the common connector and the terminal for corrosion, damage, or pin disconnection, and the common wiring harness for a short to power supply. • Repair or replace the malfunctioning part. **If there is no common connector:** • Repair or replace the wiring harness which has a short to power supply. Go to Step 11.
9	**INSPECT MAF SENSOR/IAT SENSOR No.1 CIRCUITS FOR SHORT TO EACH OTHER** • Verify that the MAF sensor/IAT sensor No.1 and PCM connectors are disconnected. • Inspect for continuity between MAF sensor/IAT sensor No.1 terminals A, C and B (wiring harness-side). • Is there continuity?	Yes	Refer to the wiring diagram and verify whether or not there is a common connector between the following terminals: • MAF sensor/IAT sensor No.1 terminal A–PCM terminal 2AI • MAF sensor/IAT sensor No.1 terminal B–PCM terminal 2BE • MAF sensor/IAT sensor No.1 terminal C–PCM terminal 2AT **If there is a common connector:** • Determine the malfunctioning part by inspecting the common connector and the terminal for corrosion, damage, or pin disconnection, and the common wiring harness for a short to each other. • Repair or replace the malfunctioning part. **If there is no common connector:** • Repair or replace the wiring harness which has a short to each other. Go to Step 11.
		No	Go to the next step.
10	**INSPECT MAF SENSOR/IAT SENSOR No.1** • Inspect the MAF sensor/IAT sensor No.1. (See MASS AIR FLOW (MAF) SENSOR INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) (See INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) • Is there any malfunction?	Yes	Replace the MAF sensor/IAT sensor No.1, then go to the next step. (See MASS AIR FLOW (MAF) SENSOR/INTAKE AIR TEMPERATURE (IAT) SENSOR NO.1 REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)
		No	Go to the next step.
11	**VERIFY DTC TROUBLESHOOTING COMPLETED** • Always reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. (See CLEARING DTC [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Perform the KOEO or KOER self test. (See KOEO/KOER SELF TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Is the same Pending DTC present?	Yes	Repeat the inspection from Step 1. • If the malfunction recurs, replace the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) Go to the next step.
		No	Go to the next step.

DTC U63F:00	SENT communication: Communication error between coolant control valve position sensor and PCM



Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	RECORD VEHICLE STATUS AT TIME OF DTC DETECTION TO UTILIZE WITH REPEATABILITY VERIFICATION Note • Recording can be facilitated using the screen capture function of the PC. • Record the snapshot data on the repair order.	–	Go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
9	**INSPECT COOLANT CONTROL VALVE/COOLANT CONTROL VALVE POSITION SENSOR CIRCUITS FOR SHORT TO EACH OTHER** • Verify that the coolant control valve/coolant control valve position sensor and PCM connectors are disconnected. • Inspect for continuity between coolant control valve/coolant control valve position sensor terminals C, D and E (wiring harness-side). • Is there continuity?	Yes	Refer to the wiring diagram and verify whether or not there is a common connector between the following terminals: • Coolant control valve/coolant control valve position sensor terminal C—PCM terminal 1D • Coolant control valve/coolant control valve position sensor terminal D—PCM terminal 1I • Coolant control valve/coolant control valve position sensor terminal E—PCM terminal 1BG **If there is a common connector:** • Determine the malfunctioning part by inspecting the common connector and the terminal for corrosion, damage, or pin disconnection, and the common wiring harness for a short to each other. • Repair or replace the malfunctioning part. **If there is no common connector:** • Repair or replace the wiring harness which has a short to each other. Go to Step 11.
		No	Go to the next step.
10	**INSPECT COOLANT CONTROL VALVE POSITION SENSOR** • Inspect the coolant control valve position sensor. (See COOLANT CONTROL VALVE POSITION SENSOR INSPECTION [SKYACTIV-G (WITHOUT EGR COOLER)].) • Is there any malfunction?	Yes	Replace the coolant control valve, then go to Step 11. (See COOLANT CONTROL VALVE REMOVAL/INSTALLATION [SKYACTIV-G (WITHOUT EGR COOLER)].)
		No	Go to the next step.
11	**VERIFY DTC TROUBLESHOOTING COMPLETED** • Always reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. (See CLEARING DTC [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Perform the KOEO or KOER self test. (See KOEO/KOER SELF TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Is the same Pending DTC present?	Yes	Repeat the inspection from Step 1. • If the malfunction recurs, replace the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) Go to the next step.
		No	Go to the next step.
12	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)
		No	DTC troubleshooting completed.

STEP	INSPECTION	RESULTS	ACTION
3	**VERIFY RELATED PENDING CODE AND/OR DTC** • Switch the ignition off, then ON (engine off). • Perform the Pending Trouble Code Access Procedure and DTC Reading Procedure. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Is the PENDING CODE/DTC P0462:00, P0463:00 or U0323:00 also present?	Yes	Go to the applicable PENDING CODE or DTC inspection. (See DTC P0462:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) (See DTC P0463:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) (See DTC U0323:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)
		No	Go to the next step.
4	**INSPECT NON-GENUINE ACCESSORY FOR MALFUNCTION** • Remove any non-genuine accessory. • Clear the DTC from the PCM memory using the M-MDS. (See CLEARING DTC [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Perform the KOER self test. (See KOEO/KOER SELF TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Is the PENDING CODE for this DTC present?	Yes	Go to the next step.
		No	Explain to the customer that the vehicle is normal. • Go to Step 18.
5	**INSPECT FUEL GAUGE SENDER UNIT (MAIN) CONNECTOR CONDITION** • Switch the ignition off. • Disconnect the fuel gauge sender unit (main) connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the connector and/or terminals, then go to Step 18.
		No	**2WD:** • Go to Step 7. **AWD:** • Go to the next step.
6	**INSPECT FUEL GAUGE SENDER UNIT (SUB) CONNECTOR CONDITION** • Switch the ignition off. • Disconnect the fuel gauge sender unit (sub) connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the connector and/or terminals, then Go to Step 18.
		No	Go to the next step.
7	**INSPECT REAR BODY CONTROL MODULE (RBCM) CONNECTOR CONDITION** • Disconnect the rear body control module (RBCM) connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the connector and/or terminals, then go to Step 18.
		No	Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
14	**INSPECT FUEL GAUGE SENDER UNIT (MAIN) CIRCUIT FOR OPEN CIRCUIT** • Verify that the fuel gauge sender unit (main) and rear body control module (RBCM) connectors are disconnected. • Inspect for continuity between the following terminals (wiring harness-side): — Fuel gauge sender unit (main) terminal D—Rear body control module (RBCM) terminal 3I — Fuel gauge sender unit (main) terminal C—Rear body control module (RBCM) terminal 3C • Is there continuity?	Yes	**2WD:** • Go to Step 16. **AWD:** • Go to the next step.
		No	Refer to the wiring diagram and verify whether or not there is a common connector between the following terminals: • Fuel gauge sender unit (main) terminal D—Rear body control module (RBCM) terminal 3I • Fuel gauge sender unit (main) terminal C—Rear body control module (RBCM) terminal 3C **If there is a common connector:** • Determine the malfunctioning part by inspecting the common connector and the terminal for corrosion, damage, or pin disconnection, and the common wiring harness for an open circuit. • Repair or replace the malfunctioning part. **If there is no common connector:** • Repair or replace the wiring harness which has an open circuit. Go to Step 18.
15	**INSPECT FUEL GAUGE SENDER UNIT (SUB) CIRCUIT FOR OPEN CIRCUIT** • Verify that the fuel gauge sender unit (sub) and rear body control module (RBCM) connectors are disconnected. • Inspect for continuity between the following terminals (wiring harness-side): — Fuel gauge sender unit (sub) terminal A—Rear body control module (RBCM) terminal 3K — Fuel gauge sender unit (sub) terminal B—Rear body control module (RBCM) terminal 3C • Is there continuity?	Yes	Go to the next step.
		No	Refer to the wiring diagram and verify whether or not there is a common connector between the following terminals: • Fuel gauge sender unit (sub) terminal A—Rear body control module (RBCM) terminal 3K • Fuel gauge sender unit (sub) terminal B—Rear body control module (RBCM) terminal 3C **If there is a common connector:** • Determine the malfunctioning part by inspecting the common connector and the terminal for corrosion, damage, or pin disconnection, and the common wiring harness for an open circuit. • Repair or replace the malfunctioning part. **If there is no common connector:** • Repair or replace the wiring harness which has an open circuit. Go to Step 18.
16	**INSPECT FUEL GAUGE SENDER UNIT** • Inspect the fuel gauge sender unit (main) or fuel gauge sender unit (sub) (AWD). (See FUEL GAUGE SENDER UNIT INSPECTION [2WD].) (See FUEL GAUGE SENDER UNIT INSPECTION [AWD].) • Is there any malfunction?	Yes	Replace the fuel gauge sender unit (main) or fuel gauge sender unit (sub) (AWD), then go to Step 18. (See FUEL GAUGE SENDER UNIT REMOVAL/INSTALLATION [2WD].) (See FUEL GAUGE SENDER UNIT REMOVAL/INSTALLATION [AWD].)
		No	Go to the next step.
17	**INSPECT RBCM** • Inspect the rear body control module (RBCM). (See REAR BODY CONTROL MODULE (RBCM) INSPECTION.) • Is there any malfunction?	Yes	Replace the rear body control module (RBCM), then go to the next step. (See REAR BODY CONTROL MODULE (RBCM) REMOVAL/INSTALLATION.)
		No	Go to the next step.