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1993 MAZDA Xedos 6 OEM Service and Repair Workshop Manual

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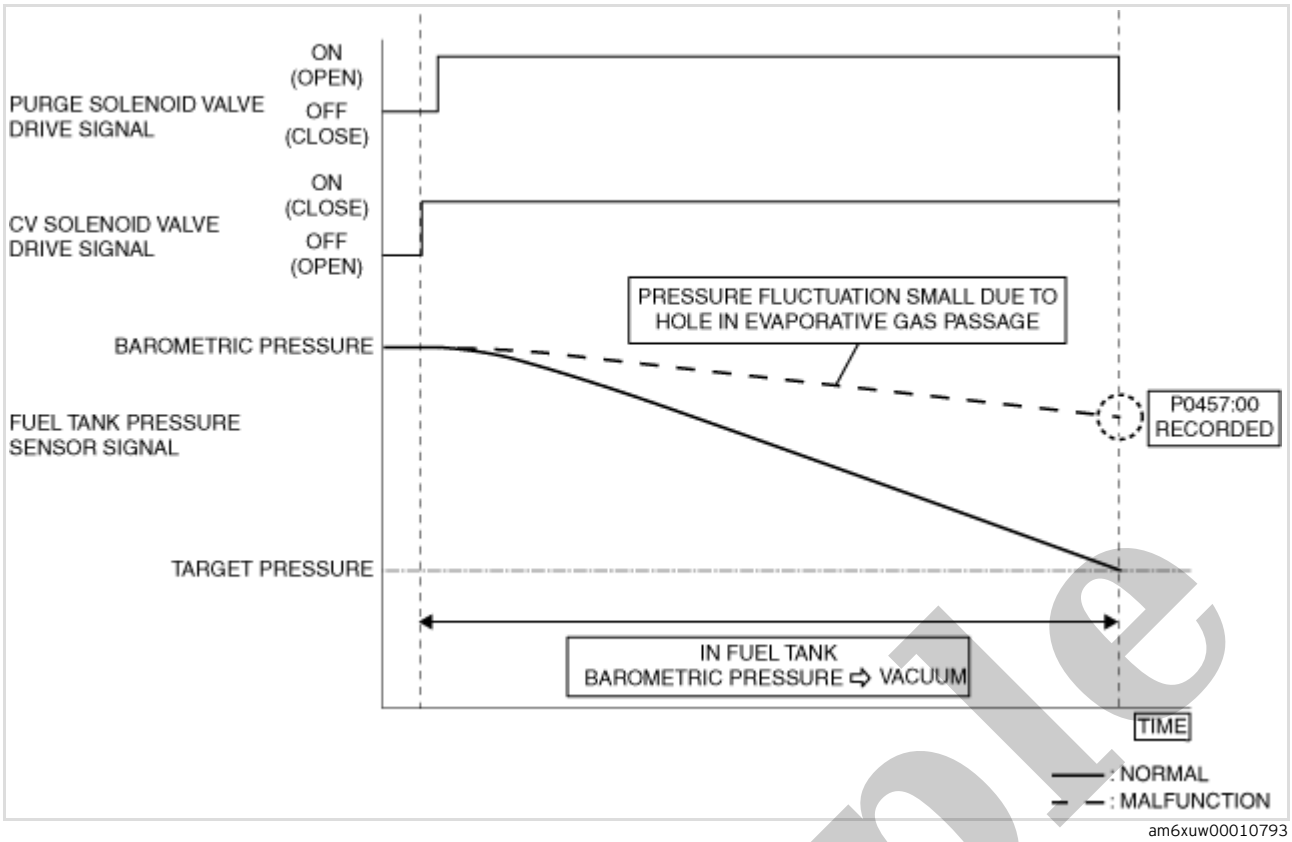
• If the fuel tank level increases after the engine starts, the PCM determines that refueling is performed by comparing the fuel tank level before one drive cycle with the fuel tank level after engine start.



Repeatability Verification Procedure

1. Set the remaining fuel quantity in the fuel tank between 30–85%.
2. Verify that OBD-II information (such as FREEZE FRAME DATA) has been obtained and recorded.
3. Clear the DTC from the PCM memory using the M-MDS. (See CLEARING DTC [PCM (SKYACTIV-G 2.5T)].)
4. Start the engine and switch the ignition off after 5 s have elapsed.
5. Leave the vehicle for 6 h or more.
6. Start the engine and leave it idling for 2 min.
7. Drive the vehicle for 30 min at a speed of 50 km/h {31 mph} or more (to increase temperature in fuel tank and generate evaporative gas).

Note

• If driving the vehicle for 30 min at a speed of 50 km/h {31 mph} or more is not feasible, the vehicle can be driven for a continuous 15 min or more with the engine coolant temperature at 80 °C {176 °F} or more.

8. Stop the engine.
9. Leave the vehicle for 1 h or more.

PID Item/Simulation Item Used In Diagnosis

PID/DATA monitor item table

DTC P0460:00 [PCM (SKYACTIV-G 2.5T)]

SM2896497

id0102s830140

DTC P0460:00	Fuel level sensor circuit malfunction
DETECTION CONDITION	• The PCM monitors the fuel tank level sensor output signal. If the difference between maximum and minimum value of input signal is 25% or more for 14 s, the PCM determines that there is a fuel level sensor circuit malfunction. MONITORING CONDITIONS — The following DTCs are not detected: • Fuel gauge sender unit: P0462:00, P0463:00 Diagnostic support note • This is a continuous monitor (CCM). • The check engine light illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA/Snapshot data is available. • DTC is stored in the PCM memory.
FAIL-SAFE FUNCTION	• Not applicable
POSSIBLE CAUSE	• Instrument cluster malfunction — Incorrectly installed fuel gauge — Fuel level input signal circuit malfunction • Fuel gauge sender unit (main) connector or terminals malfunction • Fuel gauge sender unit (sub) connector or terminals malfunction (AWD) • Rear body control module (RBCM) connector or terminals malfunction • Short to power supply in wiring harness 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 — Fuel gauge sender unit (sub) terminal A—Rear body control module (RBCM) terminal 3K (AWD) — Fuel gauge sender unit (sub) terminal B—Rear body control module (RBCM) terminal 3C (AWD) • Short to ground in wiring harness 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 — Fuel gauge sender unit (sub) terminal A—Rear body control module (RBCM) terminal 3K (AWD) — Fuel gauge sender unit (sub) terminal B—Rear body control module (RBCM) terminal 3C (AWD) • Fuel gauge sender unit (main) signal circuit and ground circuit are shorted to each other • Fuel gauge sender unit (sub) signal circuit and ground circuit are shorted to each other (AWD) • Open circuit in wiring harness 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 — Fuel gauge sender unit (sub) terminal A—Rear body control module (RBCM) terminal 3K (AWD) — Fuel gauge sender unit (sub) terminal B—Rear body control module (RBCM) terminal 3C (AWD) • Fuel gauge sender unit (main) malfunction • Fuel gauge sender unit (sub) malfunction (AWD) • Rear body control module (RBCM) malfunction • PCM malfunction

STEP	INSPECTION	RESULTS	ACTION
9	**INSPECT FUEL GAUGE SENDER UNIT (SUB) CIRCUIT FOR SHORT TO POWER SUPPLY** • Verify that the fuel gauge sender unit (sub) and rear body control module (RBCM) 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): — Fuel gauge sender unit (sub) terminal A — Fuel gauge sender unit (sub) terminal B • 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: • 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 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 18.
10	**INSPECT FUEL GAUGE SENDER UNIT (MAIN) SIGNAL CIRCUIT FOR SHORT TO GROUND** • Verify that the fuel gauge sender unit (main) and rear body control module (RBCM) connectors are disconnected. • Switch the ignition off. • Inspect for continuity between fuel gauge sender unit (main) terminal D (wiring harness-side) and body ground. • Is there continuity?	Yes	Refer to the wiring diagram and verify whether or not there is a common connector between fuel gauge sender unit (main) terminal D and rear body control module (RBCM) terminal 3I. **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 ground. • Repair or replace the malfunctioning part. **If there is no common connector:** • Repair or replace the wiring harness which has a short to ground. Go to Step 18.
		No	**2WD:** • Go to Step 12. **AWD:** • Go to the next step.
11	**INSPECT FUEL GAUGE SENDER UNIT (SUB) SIGNAL CIRCUIT FOR SHORT TO GROUND** • Verify that the fuel gauge sender unit (sub) and rear body control module (RBCM) connectors are disconnected. • Switch the ignition off. • Inspect for continuity between fuel gauge sender unit (sub) terminal A (wiring harness-side) and body ground. • Is there continuity?	Yes	Refer to the wiring diagram and verify whether or not there is a common connector between fuel gauge sender unit (sub) terminal A and rear body control module (RBCM) terminal 3K. **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 ground. • Repair or replace the malfunctioning part. **If there is no common connector:** • Repair or replace the wiring harness which has a short to ground. Go to Step 18.
		No	Go to the next step.

DTC P0461:00 [PCM (SKYACTIV-G 2.5T)]

SM2896498

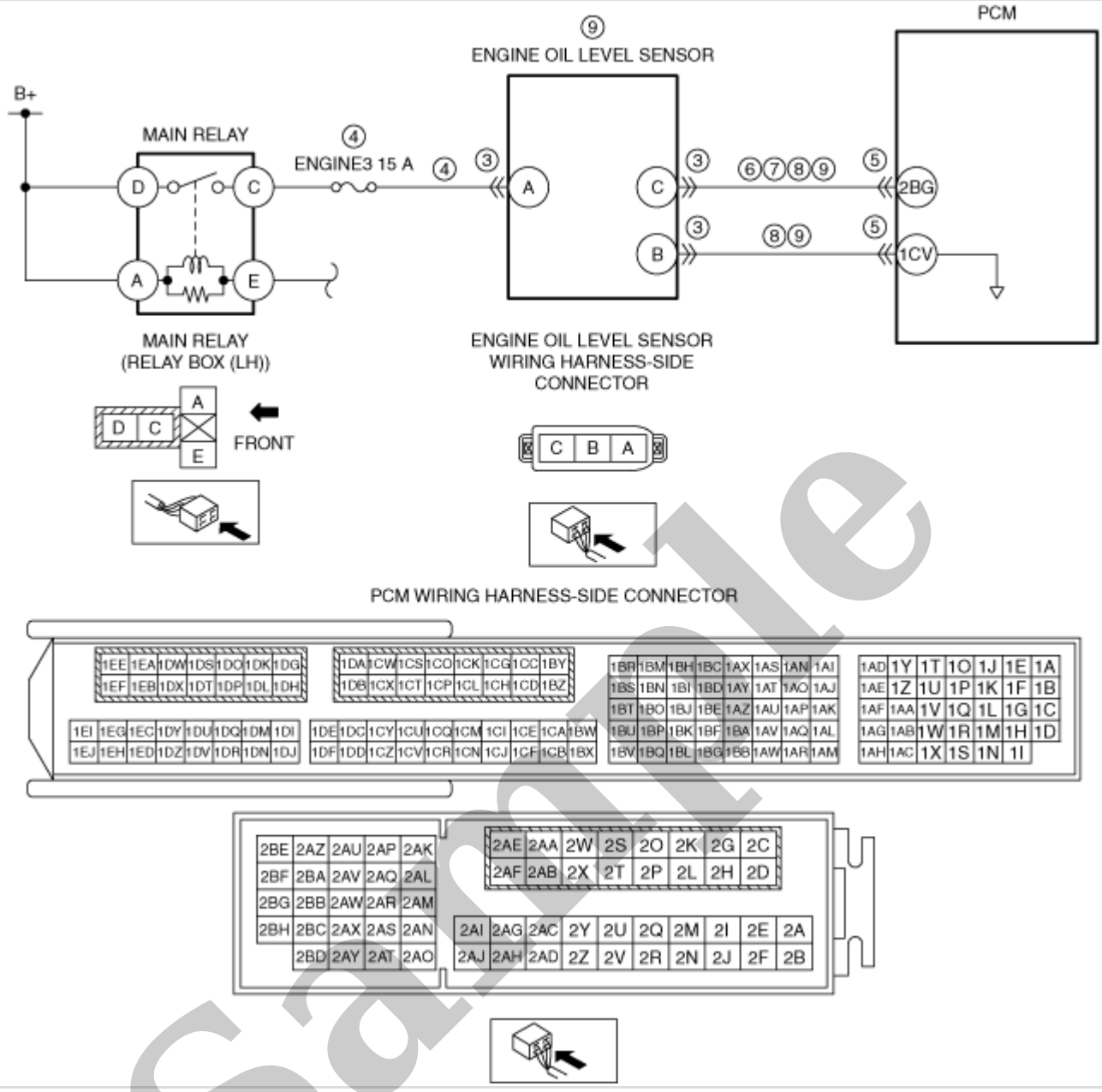
id0102s830150

DTC P0461:00	Fuel gauge sender unit circuit range/performance problem
DETECTION CONDITION	• The change in the remaining fuel quantity in the fuel tank is less than 5% when the amount of fuel consumption by fuel injection reaches 25 L {6.6 US gal, 5.5 Imp gal}. Diagnostic support note • This is a continuous monitor (CCM). • The check engine light illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. (The check engine light may be illuminated depending on the malfunction conditions.) • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA/Snapshot data is available. • DTC is stored in the PCM memory.
FAIL-SAFE FUNCTION	• Not applicable
POSSIBLE CAUSE	• Fuel gauge sender unit malfunction • Instrument cluster malfunction • PCM malfunction
SYSTEM WIRING DIAGRAM	• Not applicable

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 FREEZE FRAME DATA/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.
3	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 5. (See FUEL GAUGE SENDER UNIT REMOVAL/INSTALLATION [2WD].) (See FUEL GAUGE SENDER UNIT REMOVAL/INSTALLATION [AWD].)
		No	Go to the next step.

DTC P250C:00	Engine oil level sensor power supply circuit malfunction



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.

STEP	INSPECTION	RESULTS	ACTION
9	**INSPECT ENGINE OIL LEVEL SENSOR CIRCUIT FOR OPEN CIRCUIT** • Verify that the engine oil level sensor and PCM connectors are disconnected. • Inspect for continuity between the following terminals (wiring harness-side): — Engine oil level sensor terminal C—PCM terminal 2BG — Engine oil level sensor terminal B—PCM terminal 1CV • Is there continuity?	Yes	Replace the engine oil level sensor, then go to the next step. (See ENGINE OIL LEVEL SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5T].)
		No	Refer to the wiring diagram and verify whether or not there is a common connector between the following terminals: • Engine oil level sensor terminal C—PCM terminal 2BG • Engine oil level sensor terminal B—PCM terminal 1CV **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 the next step.
10	**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 2.5T)].) • Perform the DTC Reading Procedure. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5T)].) • 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 2.5T].) Go to the next step.
		No	Go to the next step.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE [PCM (SKYACTIV-G 2.5T)].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-G 2.5T)].)
		No	DTC troubleshooting completed.

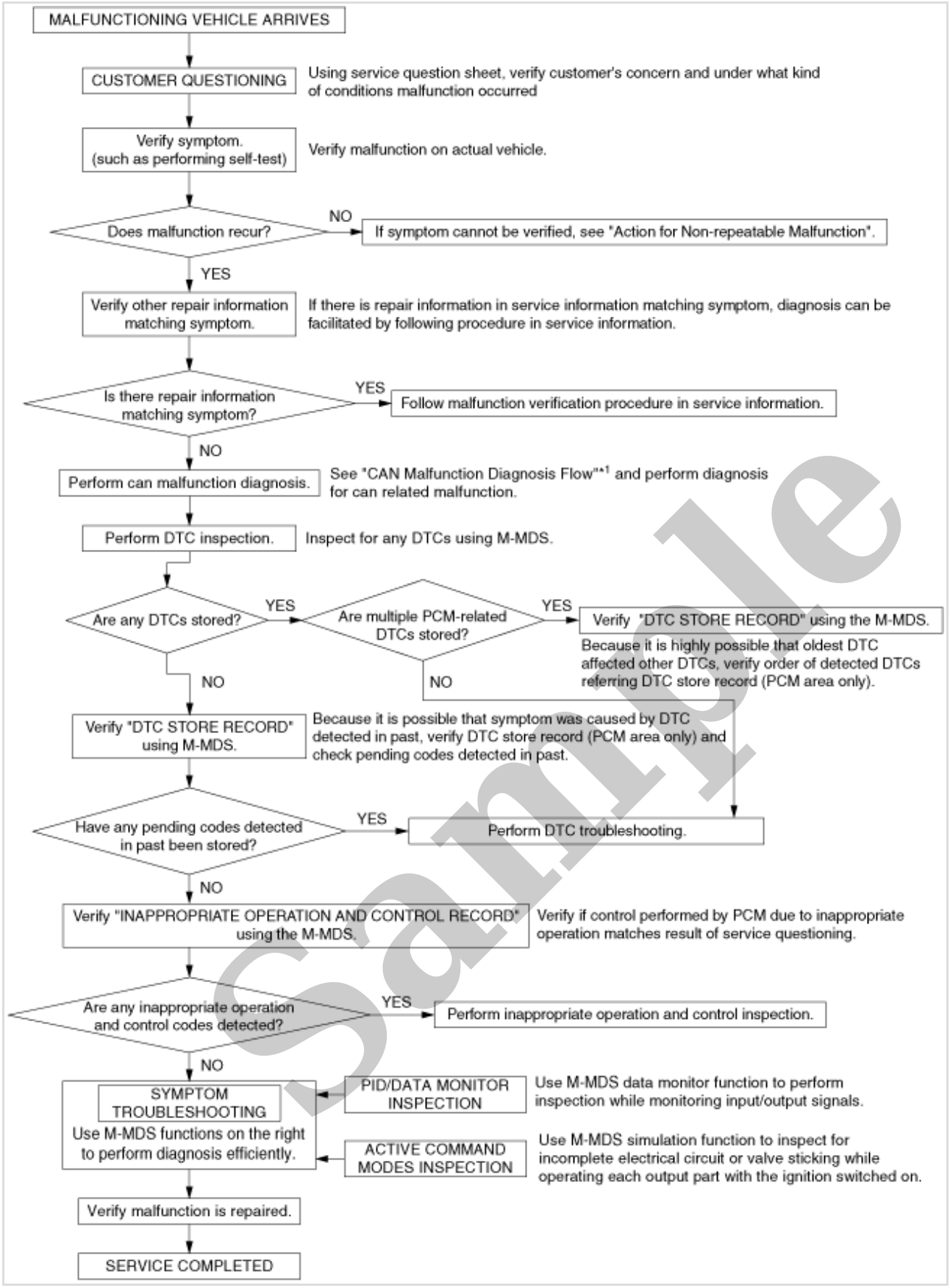
STEP	INSPECTION	RESULTS	ACTION
4	PURPOSE: VERIFY IF THERE IS PID ITEM CAUSING DRASTIC CHANGES OF ACCELERATION FLUCTUATION BY INPUT SIGNAL TO PCM • Access the following PID using the M-MDS: (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5T)].) — OIL_LEVEL • Is there any signal that is far out of specification? (See ENGINE OIL LEVEL SENSOR INSPECTION [SKYACTIV-G 2.5T].)	Yes	Go to the next step.
		No	Go to Troubleshooting Diagnostic Procedure to perform the procedure from Step 1.
5	PURPOSE: VERIFY CONNECTOR CONNECTIONS • Access the following PID using the M-MDS: (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5T)].) — OIL_LEVEL • When the following parts are shaken, does the PID value include a PID item which has changed? — Engine oil level sensor — PCM	Yes	Repair or replace the applicable connector parts. Go to Troubleshooting Diagnostic Procedure to perform the procedure from Step 3.
		No	Go to Troubleshooting Diagnostic Procedure to perform the procedure from Step 1.

Troubleshooting Diagnostic Procedure

Intention of troubleshooting procedure

- Step 1
  - — Perform inspection of engine oil leakage.
- Step 2
  - — Perform inspection of engine oil level.
- Step 3–4
  - — Verify that the primary malfunction is resolved and there are no other malfunctions.

STEP	INSPECTION	RESULTS	ACTION
1	PURPOSE: INSPECT ENGINE OIL LEAKAGE • Start the engine. • Verify that there is no engine oil leakage in the hydraulic circuit. • Is there any leakage?	Yes	Repair or replace the malfunctioning part according to the inspection results, then add genuine engine oil. (See ENGINE OIL REPLACEMENT [SKYACTIV-G 2.5T].) Go to Step 3.
		No	Replace the engine oil level sensor, then go to the next step. (See ENGINE OIL LEVEL SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5T].
2	PURPOSE: INSPECT ENGINE OIL LEVEL • Inspect the engine oil level. (See ENGINE OIL LEVEL INSPECTION [SKYACTIV-G 2.5T].) • Is the engine oil level sufficient?	Yes	Go to the next step.
		No	Add genuine engine oil, then go to the next step. (See ENGINE OIL REPLACEMENT [SKYACTIV-G 2.5T].)



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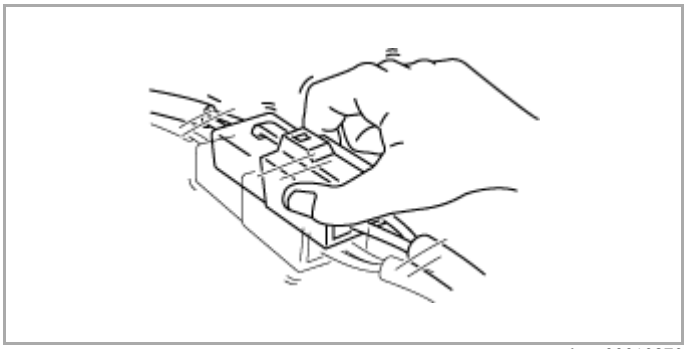
*1:(See CONTROLLER AREA NETWORK (CAN) MALFUNCTION DIAGNOSIS FLOW [TYPE-A (SKYACTIV-G 2.5T, SKYACTIV-D 2.2)].) (See CONTROLLER AREA NETWORK (CAN) MALFUNCTION DIAGNOSIS FLOW [TYPE-B].)

Repair Order Form

— Shake the wiring harness or connector of the electrical component which is suspected to be the cause of the malfunction, and inspect for occurrence of any malfunction or DTCs.



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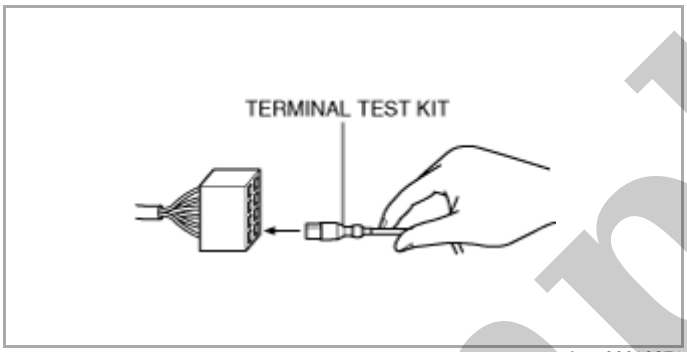
— Inspect the female terminals on the connector of the electric component which is suspected to be the cause of the malfunction for poor connection. (See ELECTRICAL SYSTEM.)

Note

• Tool used (Reference): terminal test kit (49US-15-KIT)



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