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1994 MAZDA MX-3 OEM Service and Repair Workshop Manual

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DTC P0073:00 [PCM (SKYACTIV-G 2.5T)]

SM2896440

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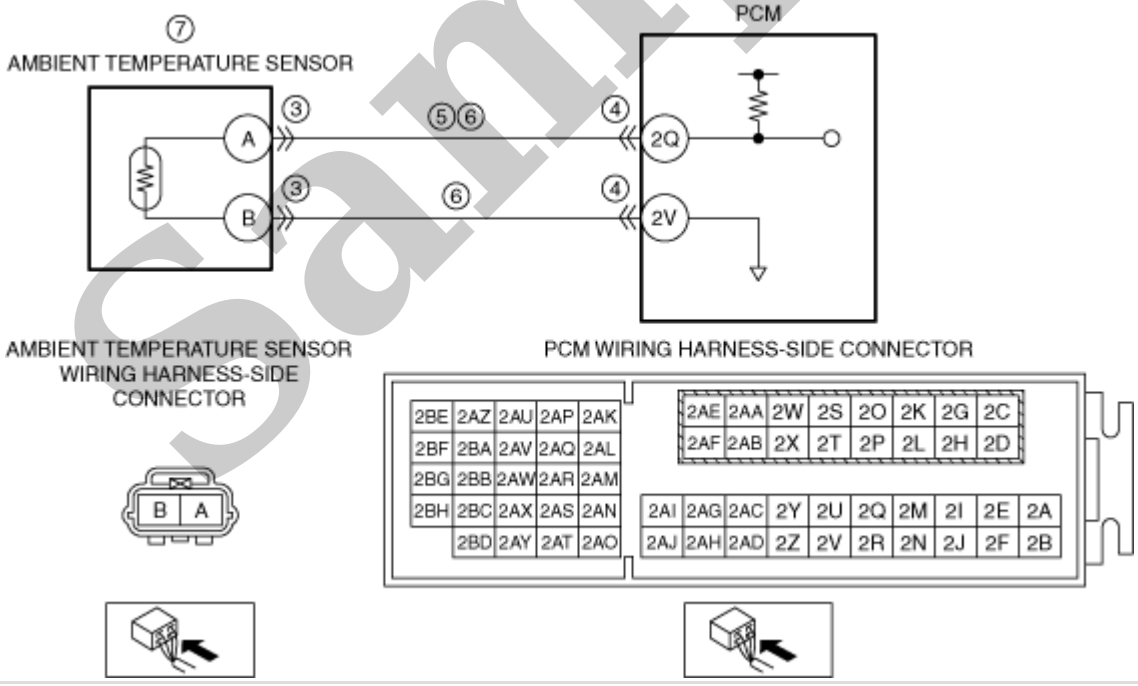
DTC P0073:00	Ambient temperature sensor circuit high input
DETECTION CONDITION	• The PCM monitors the input signal from the ambient temperature sensor. If the voltage from the ambient temperature sensor is above 4.89 V, the PCM determines that the ambient temperature sensor circuit has a malfunction. Diagnostic support note • This is a continuous monitor (other). • The check engine light does not illuminate. • FREEZE FRAME DATA is not available. • Snapshot data is available. • DTC is stored in the PCM memory.
FAIL-SAFE FUNCTION	• Not applicable
POSSIBLE CAUSE	• Ambient temperature sensor connector or terminals malfunction • PCM connector or terminals malfunction • Short to power supply in wiring harness between ambient temperature sensor terminal A and PCM terminal 2Q • Open circuit in wiring harness between the following terminals: — Ambient temperature sensor terminal A–PCM terminal 2Q — Ambient temperature sensor terminal B–PCM terminal 2V • Ambient temperature sensor malfunction • PCM malfunction



Diagnostic Procedure

DTC P0096:00 [PCM (SKYACTIV-G 2.5T)]

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DTC P0096:00	IAT sensor No.2 circuit range/performance problem
DETECTION CONDITION	• Any one of the following conditions is met: — The condition has continued for 2 s in which difference in intake air temperature measured by the IAT sensor No.2 and IAT sensor No.1 is 17 °C {31 °F} or more or −26 °C {−47 °F} or less. — The condition has continued for 2 s in which difference in intake air temperature measured by the boost air temperature sensor and IAT sensor No.2 is 17 °C {31 °F} or more or −26 °C {−47 °F} or less. MONITORING CONDITIONS • Period vehicle being left: 6 h or more • Battery voltage: 8 V or more • Within 20 s after engine start • The following DTCs are not detected: — Boost air temperature sensor: P007C:00 and P007D:00 — IAT sensor No.1: P0112:00, P0113:00 — IAT sensor No.2: P0097:00 and P0098:00 Diagnostic support note • This is a continuous monitor (CCM). • The check engine light illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA/Snapshot data is available. • DTC is stored in the PCM memory.
FAIL-SAFE FUNCTION	• Not applicable
POSSIBLE CAUSE	• MAP sensor/IAT sensor No.2 connector or terminals malfunction • IAT sensor No.2 malfunction • PCM connector or terminals 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.

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 MAP SENSOR/IAT SENSOR No.2 CONNECTOR CONDITION** • Switch the ignition off. • Disconnect the MAP sensor/IAT sensor No.2 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 9.
		No	Go to the next step.
4	**DETERMINE IF IAT SENSOR No.2 OR WIRING HARNESS MALFUNCTION** • Verify that the MAP sensor/IAT sensor No.2 connector is 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 MAP sensor/IAT sensor No.2 terminal B (wiring harness-side). • Is the voltage approx. 5 V?	Yes	Replace the MAP sensor/IAT sensor No.2, then go to Step 9. (See MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR/INTAKE AIR TEMPERATURE (IAT) SENSOR NO.2 REMOVAL/INSTALLATION [SKYACTIV-G 2.5T].)
		No	Go to the next step.

DTC P0524:00 [PCM (SKYACTIV-G 2.5T)]

SM2896521

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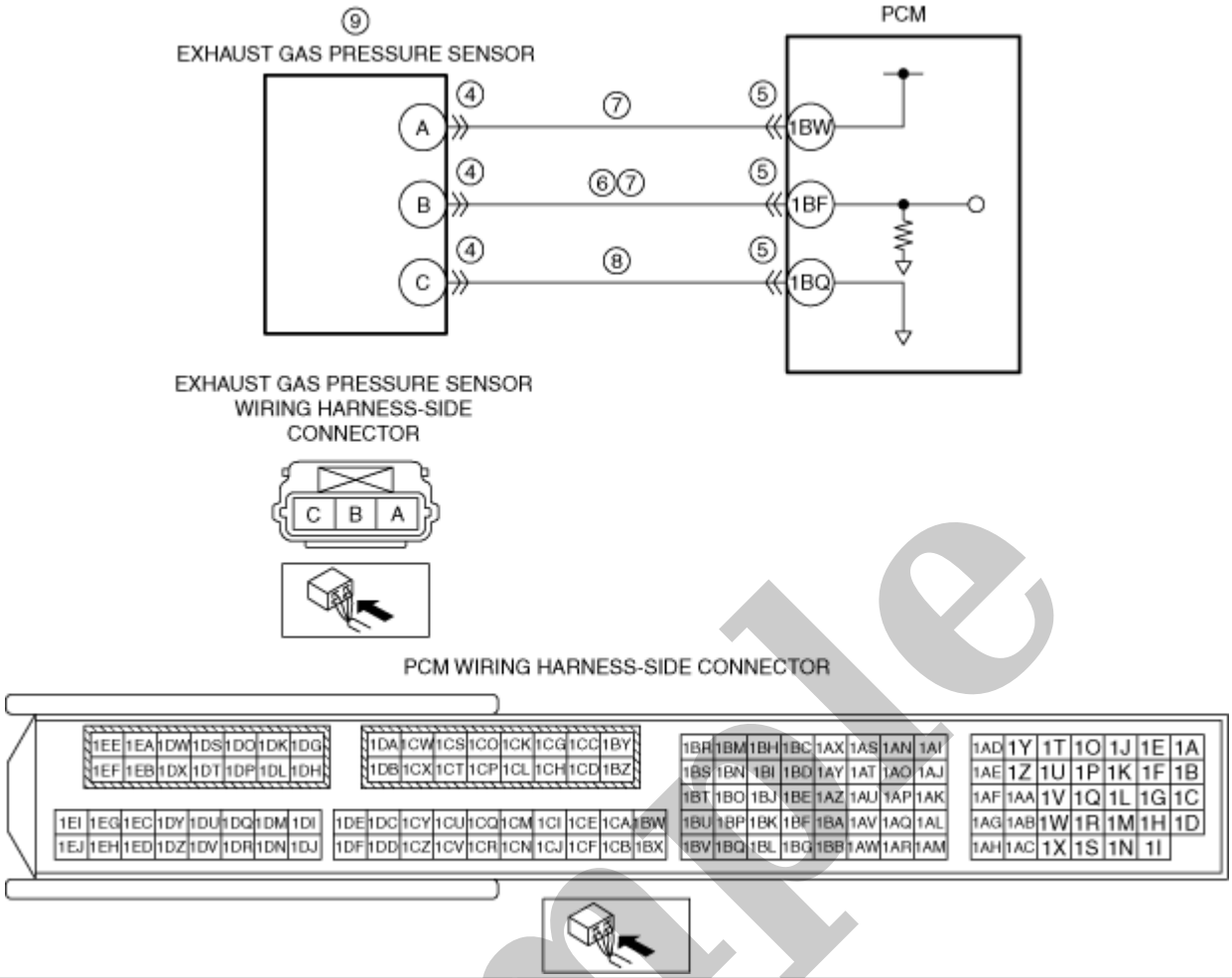
DTC P0524:00	Engine oil pressure too low
DETECTION CONDITION	• 3 s have elapsed while the actual measured value of the engine oil pressure is lower than the threshold after 10 s have elapsed since the engine was started. Diagnostic support note • This is a continuous monitor (other). • The check engine light illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA/Snapshot data is available. • DTC is stored in the PCM memory.
FAIL-SAFE FUNCTION	• Restricts the upper limit of the engine speed. • Restricts engine load.
POSSIBLE CAUSE	• Engine oil leakage • Improper engine oil level • Engine oil pressure sensor/engine oil temperature sensor connector or terminals malfunction • PCM connector or terminals malfunction • Engine oil pressure sensor malfunction • Oil pump 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 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 9.
		No	Go to the next step.

DTC P0473:00	Exhaust gas pressure sensor circuit high input



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.

DTC P0324:00 [PCM (SKYACTIV-G 2.5T)]

SM3065983

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DTC P0324:00	Pre-ignition detected
DETECTION CONDITION	• Pre-ignition is detected a few times continuously. Diagnostic support note • This is a continuous monitor (other). • The PCM turns the master warning light on in the first drive cycle, and turns the master warning light and check engine light on in the second drive cycle. • FREEZE FRAME DATA/Snapshot data is available. • DTC is stored in the PCM memory.
FAIL-SAFE FUNCTION	• The PCM performs fuel cut or restricts the engine torque.
POSSIBLE CAUSE	• Fuel having octane rating lower than specified fuel is used • Carbon accumulated in combustion chamber • PCM malfunction
SYSTEM WIRING DIAGRAM	• Not applicable

Diagnostic Procedure

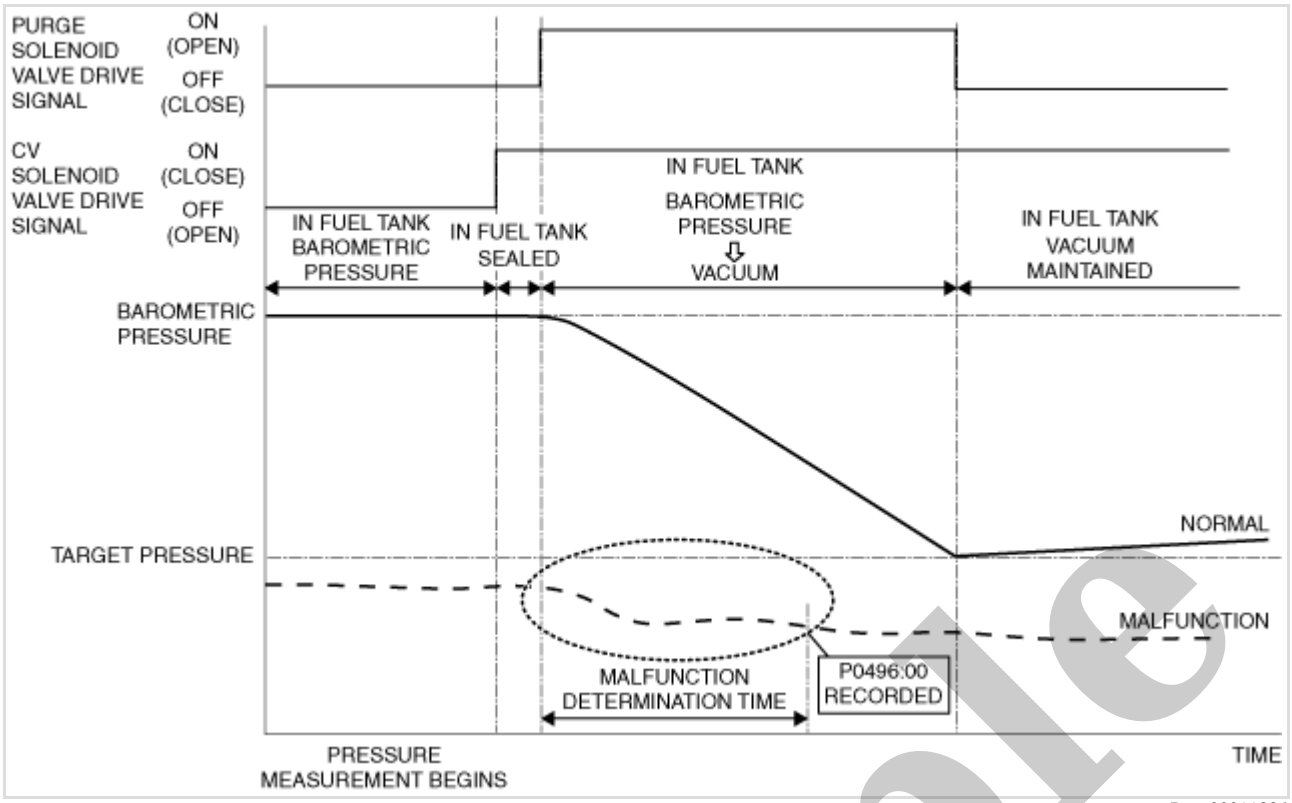
STEP	INSPECTION	RESULTS	ACTION
1	RECORD VEHICLE STATUS AT TIME OF DTC DETECTION TO UTILIZE WITH REPEATABILITY VERIFICATION Note • Recording can be facilitated using the screen capture function of the PC. • Record the FREEZE FRAME DATA/snapshot data on the repair order.	–	Go to the next step.
2	VERIFY 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	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 2.5T)].) • Are any other PENDING CODEs and/or DTCs present?	Yes	Go to the applicable PENDING CODE or DTC inspection. (See DTC TABLE [PCM (SKYACTIV-G 2.5T)].)
		No	Go to the next step.
4	VERIFY IF MALFUNCTION CAUSED BY ABNORMAL FUEL • Switch the ignition off. • Drain the fuel and add the specified fuel. (See FUEL DRAINING PROCEDURE [SKYACTIV-G 2.5T].)	–	Go to the next step.

1. Clear the DTC from the PCM memory using the M-MDS. (See CLEARING DTC [PCM (SKYACTIV-G 2.5T)].)
2. Start the engine.

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.
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 2.5T)].) • Are any other PENDING CODEs and/or DTCs present?	Yes	Go to the applicable PENDING CODE or DTC inspection. (See DTC TABLE [PCM (SKYACTIV-G 2.5T)].)
		No	Go to the next step.
4	CONFIRM TCM DTC • Perform the TCM DTC inspection using the M-MDS. (See ON-BOARD DIAGNOSTIC SYSTEM DTC INSPECTION [TCM (GW6A-EL, GW6AX-EL)].) • Are any DTCs present?	Yes	DTC U0074:00 or U0115:00 is displayed: • CAN communication line can be considered the cause. — Repair or replace the wiring harness between PCM and TCM, then go to the next step. DTC other than U0074:00 and U0115:00 is displayed: • Go to the applicable DTC inspection. (See ON-BOARD DIAGNOSTIC SYSTEM DTC TABLE [TCM (GW6A-EL, GW6AX-EL)].)
		No	TCM can be considered the cause. • Replace the control valve body, then go to the next step. (See CONTROL VALVE BODY REMOVAL/INSTALLATION [GW6A-EL, GW6AX-EL].)
5	VERIFY DTC TROUBLESHOOTING COMPLETED • Clear the DTC from the PCM memory using the M-MDS. (See CLEARING DTC [PCM (SKYACTIV-G 2.5T)].) • Implement the repeatability verification procedure. (See Repeatability Verification Procedure.) • Perform the DTC Reading Procedure. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5T)].) • Is the same Pending DTC present?	Yes	Replace the PCM, then go to the next step. (See PCM REMOVAL/INSTALLATION [SKYACTIV-G 2.5T].)
		No	Go to the next step.
6	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.

fuel tank decreases below the target negative pressure for the specified period from the pressure measurement, the PCM determines that abnormal negative pressure in the fuel tank is being generated and stores a DTC.



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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

Item	Definition	Unit	Condition/Specification
FTP	Fuel tank pressure	Pa {KPA}, mBar {BAR}, psi, in H20	• Displays fuel tank pressure
	Fuel tank pressure sensor voltage	V	• Fuel tank pressure is equal to barometric pressure: Approx. 2.6 V

Intention of troubleshooting procedure

- Step 1
  - — Perform a PCM input signal part-related inspection.
- Step 2–4
  - — Verify if there is restriction in atmosphere release passage.
- Step 5
  - — Perform the inspection for a purge solenoid valve stuck open.
- Step 6–7
  - — Verify that the primary malfunction is resolved and there are no other malfunctions.

STEP	INSPECTION	RESULTS	ACTION
1	PURPOSE: DETERMINE INTEGRITY OF FUEL TANK PRESSURE SENSOR • Inspect the fuel tank pressure sensor. (See FUEL TANK PRESSURE SENSOR INSPECTION [SKYACTIV-G 2.5T].) • Is there any malfunction?	Yes	Replace the charcoal canister, then go to Step 6. (See CHARCOAL CANISTER REMOVAL/INSTALLATION [SKYACTIV-G 2.5T].)
		No	Go to the next step.
2	PURPOSE: DETERMINE INTEGRITY OF CV SOLENOID VALVE • Inspect the CV solenoid valve. (See CANISTER VENT (CV) SOLENOID VALVE INSPECTION [SKYACTIV-G 2.5T].) • Is there any malfunction?	Yes	Replace the CV solenoid valve, then go to Step 6. (See CANISTER VENT (CV) SOLENOID VALVE REMOVAL/INSTALLATION [SKYACTIV-G 2.5T].)
		No	Go to the next step.
3	PURPOSE: VERIFY IF THERE IS RESTRICTION BETWEEN CHARCOAL CANISTER AND ATMOSPHERE RELEASE PASSAGE • Verify the following passage hoses, pipe connection condition, and that there is no restriction. — Between charcoal canister and CV solenoid valve — Between CV solenoid valve and atmosphere release • Is there any poor connection or restriction?	Yes	Repair or replace the malfunctioning part according to the inspection results, then go to Step 6.
		No	Go to the next step.
4	PURPOSE: DETERMINE INTEGRITY OF CHARCOAL CANISTER • Inspect the charcoal canister. (See CHARCOAL CANISTER INSPECTION [SKYACTIV-G 2.5T].) • Is there any malfunction?	Yes	Replace the charcoal canister, then go to Step 6. (See CHARCOAL CANISTER REMOVAL/INSTALLATION [SKYACTIV-G 2.5T].)
		No	Go to the next step.
5	PURPOSE: DETERMINE INTEGRITY OF PURGE SOLENOID VALVE • Inspect the purge solenoid valve. (See PURGE SOLENOID VALVE INSPECTION [SKYACTIV-G 2.5T].) • Is there any malfunction?	Yes	Replace the purge solenoid valve, then go to the next step. (See PURGE SOLENOID VALVE REMOVAL/INSTALLATION [SKYACTIV-G 2.5T].)
		No	Go to the next step.