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1996 MAZDA 121/ Revue (Mk.2) OEM Service and Repair Workshop Manual

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STEP	INSPECTION	RESULTS	ACTION
8	PURPOSE: VERIFICATION OF VEHICLE REPAIR COMPLETION • 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))].) • Implement the repeatability verification procedure. (See Repeatability Verification Procedure.) • Perform the DTC Reading Procedure. (See ON-BOARD DIAGNOSTIC 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.
9	PURPOSE: VERIFY IF THERE IS ANY OTHER MALFUNCTION • Is any other DTC or pending code stored?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)
		No	DTC troubleshooting completed.

DTC P061F:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))]

SM2896703

id0102s930260

DTC P061F:00	Internal control module throttle valve actuator controller performance problem
DETECTION CONDITION	• When any of the following conditions is met: — Start stop unit internal malfunction — CAN communication line malfunction between start stop unit and PCM — PCM internal 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	• CAN communication line malfunction between start stop unit and PCM — Start stop unit terminal 2M–Front body control module (FBCM) terminal 2K — Start stop unit terminal 2O–Front body control module (FBCM) terminal 2I — Front body control module (FBCM) terminal 2P–PCM terminal 1H (With EGR cooler) — Front body control module (FBCM) terminal 2N–PCM terminal 1L (With EGR cooler) — Front body control module (FBCM) terminal 2P–PCM terminal 2S (Without EGR cooler) — Front body control module (FBCM) terminal 2N–PCM terminal 2T (Without EGR cooler) • Start stop unit connector or terminals malfunction • PCM connector or terminals malfunction • Start stop unit malfunction • PCM malfunction

DTC P064D:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))]

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id0102s930270

Note

• To determine the malfunctioning part, proceed with the diagnostics from "Function Inspection Using M-MDS".

Details On DTCs

DESCRIPTION	Internal control module A/F sensor processor performance problem	
DETECTION CONDITION	Determination conditions	• Malfunction in A/F sensor signal circuit in PCM occurs.
	Preconditions	• Battery voltage: 11–18 V *1 *1: Standard can be verified by displaying PIDs using M-MDS
	Malfunction determination period	• 0.1 s period
	Drive cycle	• 1
	Self test type	• CMDTC self test, KOER self test
	Sensor used	• PCM
FAIL-SAFE FUNCTION	• Not applicable	
VEHICLE STATUS WHEN DTCs ARE OUTPUT	• Illuminates check engine light.	
POSSIBLE CAUSE	• PCM malfunction	

System Wiring Diagram

• Not applicable

Function Explanation (DTC Detection Outline)

• If there is communication error between the A/F signal control driver and the CPU, the PCM stores a DTC.

Repeatability Verification Procedure

1. Warm up the engine to allow the engine coolant temperature to reach 80 °C {176 °F} or more.
2. Start the engine and leave it idling for 1 min.

Note

• Match the engine coolant temperature in the recorded FREEZE FRAME DATA/snapshot data, the vehicle speed, and engine speed values to the best extent possible while driving the vehicle.

3. Try to reproduce the malfunction by driving the vehicle for 5 min based on the values in the FREEZE FRAME DATA/snapshot data.

PID Item/Simulation Item Used In Diagnosis

• Not applicable

DESCRIPTION	Evaporator system: clogging between fuel tank and fuel tank pressure sensor
VEHICLE STATUS WHEN DTCs ARE OUTPUT	• Illuminates check engine light.
POSSIBLE CAUSE	• Erratic signal to PCM — Fuel tank pressure sensor signal malfunction • Fuel gauge sender unit malfunction • Fuel tank pressure sensor malfunction • Clogging between fuel tank and fuel tank pressure sensor • Fuel shut-off valve malfunction • Rollover valve malfunction • Purge solenoid valve malfunction • PCM malfunction

System Wiring Diagram

• Not applicable

Function Explanation (DTC Detection Outline)

• The PCM closes the purge solenoid valve and CV solenoid valve while the vehicle is being driven and seals the fuel tank. Then, gas in the fuel tank is inducted into the intake manifold and the pressure in the fuel tank is decreased by opening the purge solenoid valve, and the pressure change in the fuel tank is measured using the fuel tank pressure sensor. If the pressure in the fuel tank decreases below the target negative pressure during the specified period from the pressure measurement (malfunction determination time (1)), positive pressure is inducted to the fuel tank via the intake manifold by closing the purge solenoid valve and opening the CV solenoid valve. After positive pressure is inducted to the fuel tank, the fuel tank is sealed, opening/closing of the purge solenoid valve is performed repeatedly, and the pressure change in the fuel tank is monitored at that time (malfunction determination time (2)). If the amount of pressure change veers towards negative pressure exceeding the malfunction determination threshold, the PCM determines that there is clogging between the fuel tank pressure sensor and fuel tank, and stores a DTC.

STEP	INSPECTION	RESULTS	ACTION
1	**PURPOSE: 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.
2	**PURPOSE: RECORD FREEZE FRAME DATA/SNAPSHOT DATA AND DIAGNOSTIC MONITORING TEST RESULTS 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 and DIAGNOSTIC MONITORING TEST RESULTS (EVAP system related) on the repair order.	–	Go to the next step.
3	**PURPOSE: VERIFY IF FUEL GAUGE SENDER UNIT HAS MALFUNCTION** • 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 P0460:00, P0461:00, P0462:00 or P0463:00 also present?	Yes	Perform the DTC troubleshooting for the fuel gauge sender unit first because the fuel gauge sender unit cannot detect the fuel tank level and determines that a malfunction is occurring. (See DTC P0460:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) (See DTC P0461:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) (See DTC P0462:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) (See DTC P0463:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)
		No	Go to the next step.
4	**PURPOSE: VERIFY FUEL TANK PRESSURE SENSOR MEASURED CORRECTLY** • Start the engine and idle it. • Access the following simulation items using the M-MDS: (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) — EVAPCP — EVAPCV • Change to the following conditions using the simulation function. — EVAPCP: 100 % — EVAPCV: On • Access the FTP PID using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Does the negative pressure change when racing the engine?	Yes	The fuel tank pressure sensor measures correctly. • Go to the next step.
		No	The possibility of a fuel tank pressure sensor malfunction is high. • Go to Troubleshooting Diagnostic Procedure to perform the procedure from Step 1.

DTC P0685:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))]

SM2896705

id0102s930280

DTC P0685:00	Main relay control circuit open
DETECTION CONDITION	• The period of time in which the PCM power supply remains on after the ignition is switched off is not within the specified time. 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	• Main relay malfunction • Short to ground or open circuit in main relay power supply circuit: — Short to ground in wiring harness between MAIN 200 A fuse and main relay terminal D — MAIN 200 A fuse and/or ENG.MAIN 40 A fuse malfunction — Open circuit in wiring harness between battery positive terminal and main relay terminal D • Short to ground in wiring harness between the following terminals: — Main relay terminal C—PCM terminal 2BO — Main relay terminal C—PCM terminal 2BR • PCM connector or terminals malfunction • Open circuit in wiring harness between the following terminals: — PCM terminal 2BQ—Body ground — PCM terminal 2BT—Body ground • Open circuit in wiring harness between the following terminals: — Main relay terminal C—PCM terminal 2BO — Main relay terminal C—PCM terminal 2BR • PCM malfunction

STEP	INSPECTION	RESULTS	ACTION
6	INSPECT PCM POWER SUPPLY CIRCUIT FOR SHORT TO GROUND • Verify that main relay is removed. • Verify that the PCM connector is disconnected. • Inspect for continuity between main relay terminal C (wiring harness-side) and body ground. • Is there continuity?	Yes	Refer to the wiring diagram and verify whether or no there is a common connector between the following terminals: • Main relay terminal C—PCM terminal 2BO • Main relay terminal C—PCM terminal 2BR 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 9.
		No	Go to the next step.
7	INSPECT PCM GROUND CIRCUIT FOR OPEN CIRCUIT • Verify that main relay is removed. • Verify that the PCM connector is disconnected. • Inspect for continuity between the following terminals (wiring harness-side): — PCM terminal 2BQ—Body ground — PCM terminal 2BT—Body ground • Is there continuity?	Yes	Go to the next step.
		No	Refer to the wiring diagram and verify whether or no there is a common connector between the following terminals: • PCM terminal 2BQ—Body ground • PCM terminal 2BT—Body ground 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: • Inspect for the following: — Open circuit between PCM and body ground — Loose or lifting ground point • Repair or replace the malfunctioning part. Go to Step 9.
8	INSPECT PCM POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT • Verify that main relay is removed. • Verify that the PCM connector is disconnected. • Inspect for continuity between the following terminals (wiring harness-side): — Main relay terminal C—PCM terminal 2BO — Main relay terminal C—PCM terminal 2BR • Is there continuity?	Yes	Go to the next step.
		No	Refer to the wiring diagram and verify whether or no there is a common connector between the following terminals: • Main relay terminal C—PCM terminal 2BO • Main relay terminal C—PCM terminal 2BR 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.

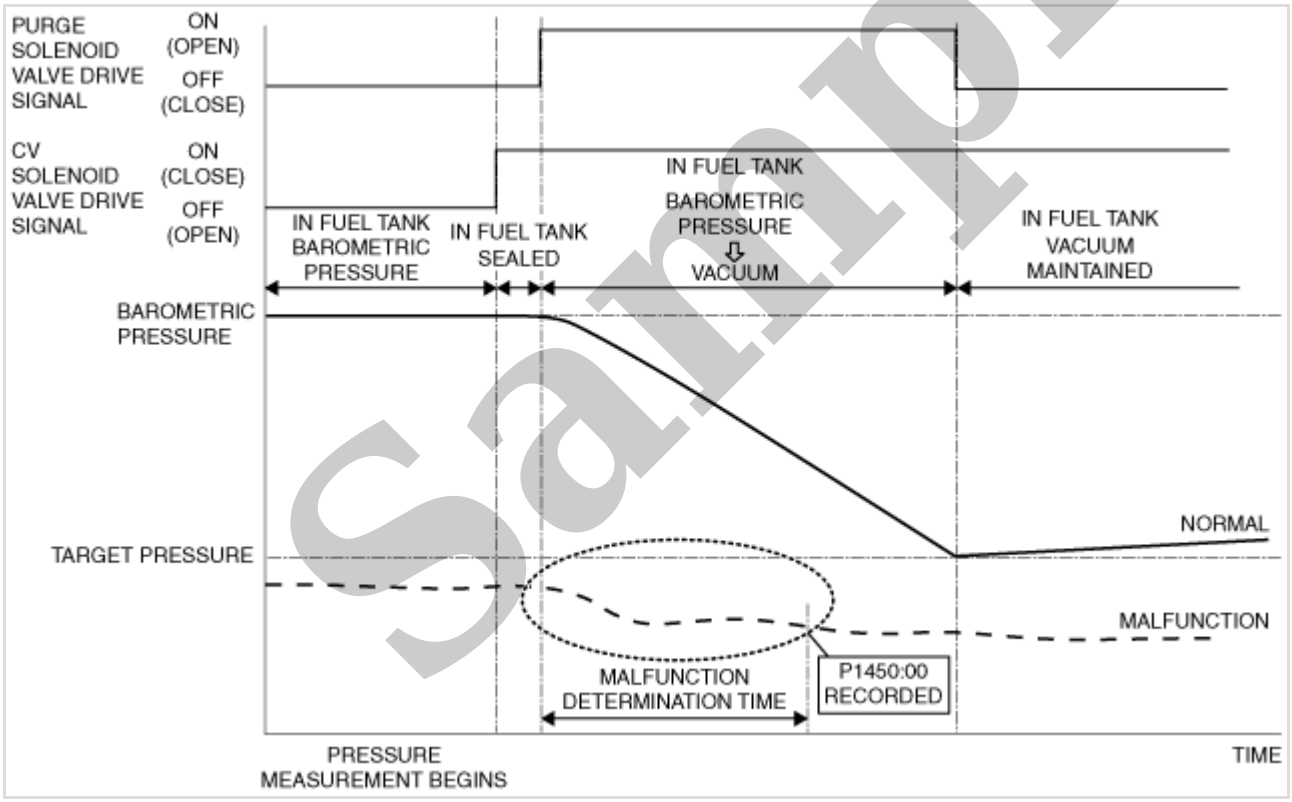
DESCRIPTION	Evaporator system: abnormal negative pressure in fuel tank
POSSIBLE CAUSE	• Fuel tank pressure sensor malfunction • Restriction between charcoal canister and release-side passage — CV solenoid valve malfunction — Charcoal canister malfunction • Clogging between fuel tank and fuel tank pressure sensor • Purge solenoid valve malfunction • PCM malfunction

System Wiring Diagram

• Not applicable

Function Explanation (DTC Detection Outline)

• The PCM closes the purge solenoid valve and CV solenoid valve while the vehicle is being driven and seals the fuel tank. Then, the evaporative gas in the fuel tank is inducted into the intake manifold and the pressure in the fuel tank is decreased by opening the purge solenoid valve, and the pressure change of the fuel tank is measured using the fuel tank pressure sensor. If the pressure in the 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 2.5 (WITH CYLINDER DEACTIVATION))].)
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.

STEP	INSPECTION	RESULTS	ACTION
4	PURPOSE: VERIFY FUEL TANK PRESSURE SENSOR MEASURED CORRECTLY • Start the engine and idle it. • Access the following simulation items using the M-MDS: (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) — EVAPCP — EVAPCV • Change to the following conditions using the simulation function. — EVAPCP: 100 % — EVAPCV: On • Access the FTP PID using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Does the negative pressure change when racing the engine?	Yes	Go to the next step.
		No	Go to Troubleshooting Diagnostic Procedure to perform the procedure from Step 1.
5	PURPOSE: VERIFY IF ATMOSPHERE BETWEEN CV SOLENOID VALVE AND ATMOSPHERE CAN RELEASE • Access the following simulation items using the M-MDS: (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) — EVAPCP — EVAPCV • Change to the following conditions using the simulation function. — EVAPCP: 0 % — EVAPCV: Off • Access the FTP PID using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Is the displayed PID value as follows? — Approx. 2.6 V (barometric pressure)	Yes	Go to the next step.
		No	Go to Troubleshooting Diagnostic Procedure to perform the procedure from Step 2.
6	PURPOSE: VERIFY IF PURGE SOLENOID VALVE IS STUCK OPEN • Access the following simulation items using the M-MDS: (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) — EVAPCP — EVAPCV • Change to the following conditions using the simulation function. — EVAPCP: 0 % — EVAPCV: On • Access the FTP PID using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Is the FTP PID value negative pressure?	Yes	Go to Troubleshooting Diagnostic Procedure to perform the procedure from Step 5.
		No	Go to Troubleshooting Diagnostic Procedure to perform the procedure from Step 1.

Troubleshooting Diagnostic Procedure

Intention of troubleshooting procedure