Your Ultimate Source for OEM Repair Manuals

FactoryManuals.net is a great resource for anyone who wants to save money on repairs by doing their own work. The manuals provide detailed instructions and diagrams that make it easy to understand how to fix a vehicle.

1997 MAZDA 626 (Mk.5) Hatchback OEM Service and Repair Workshop Manual

Go to manual page

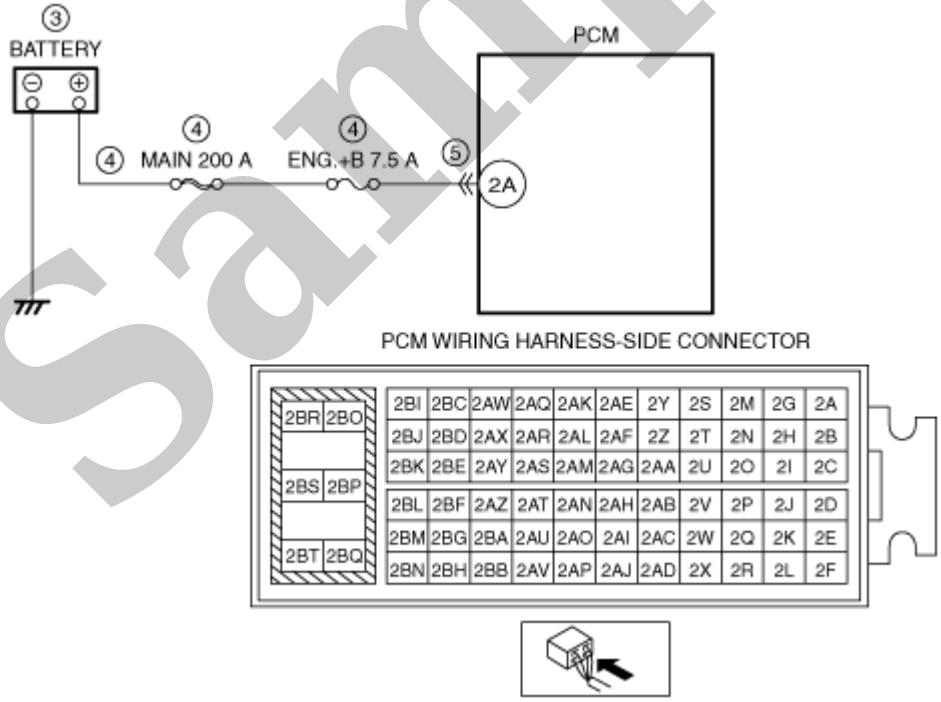
Sample

© FactoryManuals.

DTC P2507:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))]

SM2896788

id0102s970980

DTC P2507:00	PCM battery voltage low input
DETECTION CONDITION	• The PCM monitors the voltage of backup battery positive terminal. If the PCM detects that the battery positive terminal voltage is below 6 V for the specified time, the PCM determines that the backup voltage circuit has a malfunction. 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	• Battery malfunction • Short to ground or open circuit in backup voltage circuit: — Short to ground in wiring harness between MAIN 200 A fuse and PCM terminal 2A — MAIN 200 A fuse and/or ENG.+B 7.5 A fuse malfunction — Open circuit in wiring harness between battery positive terminal and PCM terminal 2A • PCM connector or terminals malfunction • PCM malfunction
	

Diagnostic Procedure

Sample

STEP	INSPECTION	RESULTS	ACTION
6	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.
7	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.

Sample

STEP	INSPECTION	RESULTS	ACTION
1	PURPOSE: 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 Troubleshooting Diagnostic Procedure to perform the procedure from Step 1.

Troubleshooting Diagnostic Procedure

Intention of troubleshooting procedure
• Step 1–6
— Perform an inspection of each signal transmission system.
• Step 7
— Perform a unit inspection of the generator.
• Step 8–10
— Verify that the primary malfunction is resolved and there are no other malfunctions.

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: VERIFY IF POOR CONNECTION OF EACH PART AFFECTS DIAGNOSTIC RESULTS • Switch the ignition off. • Inspect the connection condition (part installation condition, connector connection condition) for the following parts: — Battery — Generator — PCM • Is the connection condition (part installation condition, connector connection condition) for each part normal?	Yes	Go to the next step.
		No	Connect each part or the connector correctly, then go to Step 8.
3	PURPOSE: VERIFY IF CONNECTOR DAMAGE OF EACH PART AFFECTS DIAGNOSTIC RESULTS • Disconnect the connector of the following parts. — Battery — Generator — PCM • 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 8.
		No	Go to the next step.

Sample

DTC P2503:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))]

SM2896786

id0102s970960

Note

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

Details On DTCs

DESCRIPTION	**Generator system: Voltage generated by generator is low**	
DETECTION CONDITION	Determination conditions	• A condition continues for a specified period of time in which the target generator output current calculated by the PCM is 20 A or more and the generator output voltage is 8.5 V or less.
	Preconditions	• While engine is running
	Malfunction determination period	• 5 s period
	Drive cycle	• 1
	Self test type	• CMDTC self test
	Sensor used	• PCM • Generator
FAIL-SAFE FUNCTION	• Generator control is inhibited.	
VEHICLE STATUS WHEN DTCs ARE OUTPUT	• A warning message is displayed in the display. • Illuminates charging system warning light. (without multi-information display) • The charging system warning indication is displayed on the multi-information display. (with multi-information display) • The following vehicle conditions differ depending on the type of malfunction: — Vehicle shock may occur due to generator load. — Idling feel due to generator-stop may occur.	

Sample

STEP	INSPECTION	RESULTS	ACTION
2	**PURPOSE: VERIFY IF POOR CONNECTION OF EACH PART AFFECTS DIAGNOSTIC RESULTS** • Switch the ignition off. • Inspect the connection condition (part installation condition, connector connection condition) for the following parts: — Battery — Generator — PCM • Is the connection condition (part installation condition, connector connection condition) for each part normal?	Yes	Go to the next step.
		No	Connect each part or the connector correctly, then go to Step 9.
3	**PURPOSE: VERIFY IF CONNECTOR DAMAGE OF EACH PART AFFECTS DIAGNOSTIC RESULTS** • Disconnect the connector of the following parts. — Battery — Generator — PCM • 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	**PURPOSE: INSPECT FUSE** • Remove the STR 250 A fuse. • Inspect the STR 250 A fuse. • Is there any malfunction?	Yes	If the fuse is blown: • Refer to the wiring diagram and verify whether or not there is a common connector between battery positive terminal and generator terminal 1A. **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. — Replace the fuse. If the fuse is damaged: • Replace the fuse. Go to Step 9.
		No	Reinstall the STR 250 A fuse, then go to the next step.

Sample

DTC P2504:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))]

SM2896787

id0102s970970

Note

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

Details On DTCs

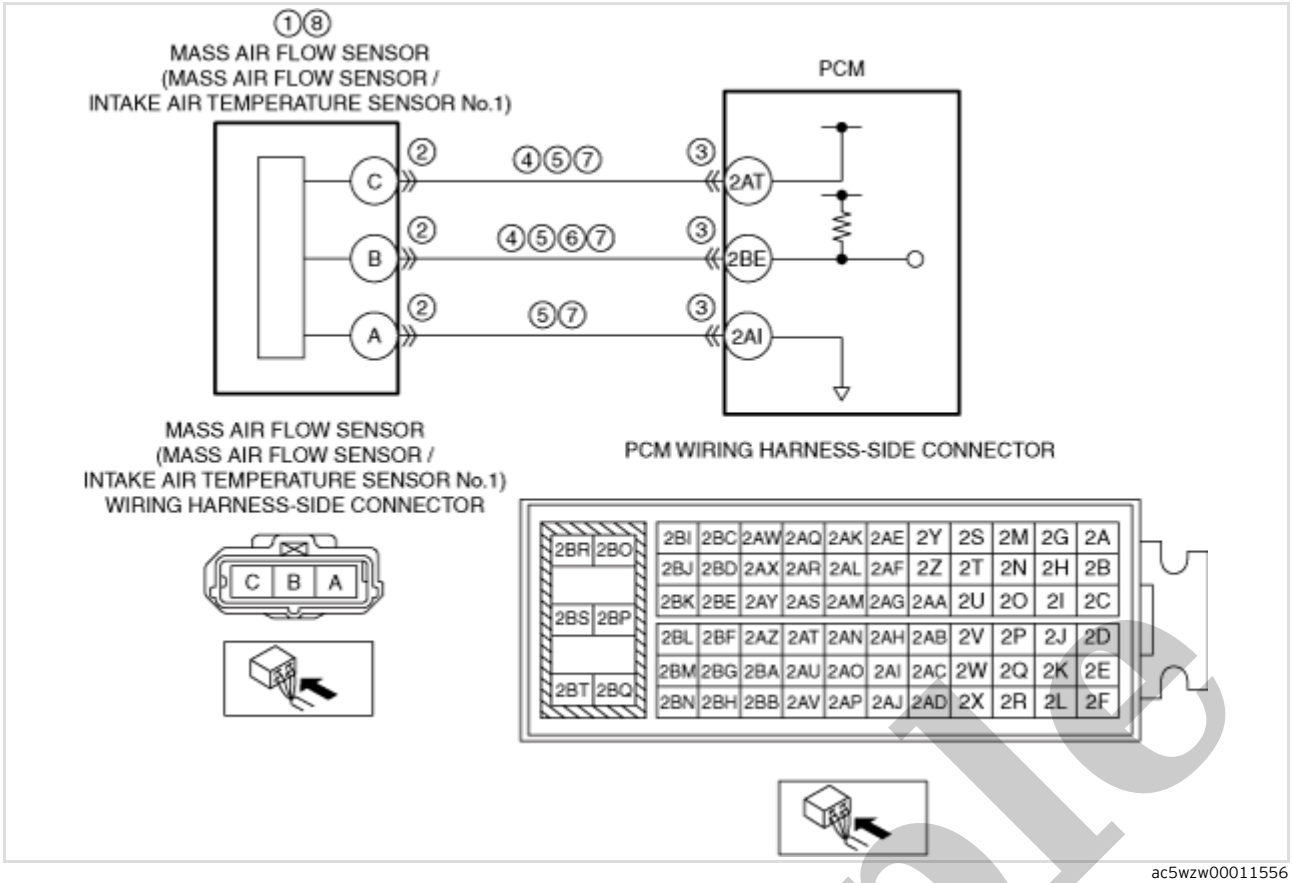
DESCRIPTION	**Generator system: Voltage generated by generator is high**	
DETECTION CONDITION	Determination conditions	• The voltage generated by the generator is 18.5 V or higher or the battery voltage is 16 V or higher for a continuous specified time.
	Preconditions	• While engine is running
	Malfunction determination period	• 5 s period
	Drive cycle	• 1
	Self test type	• CMDTC self test
	Sensor used	• PCM • Generator
FAIL-SAFE FUNCTION	• Generator control is inhibited.	
VEHICLE STATUS WHEN DTCs ARE OUTPUT	• A warning message is displayed in the display. • Illuminates charging system warning light. (without multi-information display) • The charging system warning indication is displayed on the multi-information display. (with multi-information display) • The following vehicle conditions differ depending on the type of malfunction: — Vehicle shock may occur due to generator load. — Idling feel due to generator-stop may occur.	
POSSIBLE CAUSE	• Poor connection of the following parts: — Battery — Generator — PCM • Connector or terminal malfunction of the following parts: — Battery — Generator — PCM • Short to power supply in wiring harness between battery positive terminal and generator terminal 1A • STR 250 A fuse malfunction • Open circuit in wiring harness between battery positive terminal and generator terminal 1A • Generator malfunction • Battery malfunction • PCM malfunction	

Sample

System Wiring Diagram

STEP	INSPECTION	RESULTS	ACTION
4	**PURPOSE: VERIFY IF SHORT TO POWER SUPPLY IN GENERATOR CHARGE/DISCHARGE CIRCUIT AFFECTS DIAGNOSTIC RESULTS** • Verify that the battery, generator 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 generator terminal 1A (wiring harness-side). • 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 battery positive terminal and generator terminal 1A. **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 8.
5	**PURPOSE: INSPECT FUSE** • Switch the ignition off. • Remove the STR 250 A fuse. • Inspect the STR 250 A fuse. • Is there any malfunction?	Yes	If the fuse is blown: • Refer to the wiring diagram and verify whether or not there is a common connector between battery positive terminal and generator terminal 1A. **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. — Replace the fuse. If the fuse is damaged: • Replace the fuse. Go to Step 8.
		No	Reinstall the STR 250 A fuse, then go to the next step.
6	**PURPOSE: VERIFY IF OPEN CIRCUIT IN GENERATOR CHARGE/DISCHARGE CIRCUIT AFFECTS DIAGNOSTIC RESULTS** • Verify that the battery, generator and PCM connectors are disconnected. • Inspect for continuity between battery positive terminal (wiring harness-side) and generator terminal 1A (wiring harness-side). • 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 battery positive terminal and generator terminal 1A. **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 8.
7	**PURPOSE: DETERMINE INTEGRITY OF GENERATOR** • Inspect the generator. (See GENERATOR INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) • Is there any malfunction?	Yes	Replace the generator, then go to the next step. (See GENERATOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)
		No	Go to the next step.
8	**PURPOSE: VERIFY CONDITIONS OF BATTERY** • Inspect the battery. (See BATTERY INSPECTION.)	–	Follow the inspection instructions, then go to the next step.

Sample



ac5wzw00011556

Function Explanation (DTC Detection Outline)

• The MAF sensor corrects the intake airflow amount inside the sensor based on the IAT sensor No.1 information. When there is an internal malfunction in IAT sensor No.1, the MAF sensor determines that there is a malfunction in itself and it sends a malfunction signal to the PCM. When the PCM receives a malfunction signal from the MAF sensor/IAT sensor No.1, the MAF sensor/IAT sensor No.1 determines an internal malfunction and stores a DTC. In addition, when the PCM receives a value other than the preset standard for the output value from the MAF sensor continuously, the PCM determines that there is an internal malfunction in the MAF sensor/IAT sensor No.1 and stores a DTC.

Repeatability Verification Procedure

• Not applicable

PID Item/Simulation Item Used In Diagnosis

PID/DATA monitor item table

–: Not applicable

Item	Definition	Unit	Condition/Specification
MAF	Mass air flow input from MAF sensor	g/Sec	• Displays MAF
	MAF sensor voltage	V	• Ignition switched ON (engine off) (MAF: 0.00 g/s {0 lb/min}): Approx. 1.69 V (ECT is 53 °C {127 °F}) • Idle (after warm up) (MAF: 2.50 g/s {0.331 lb/min}): Approx. 1.89 V (ECT is 93 °C {199 °F}) • Racing (engine speed is 2,000 rpm) (MAF: 3.80 g/s {0.503 lb/min}): Approx. 2.02 V (ECT is 95 °C {203 °F})

Sample

STEP	INSPECTION	RESULTS	ACTION
5	**INSPECT MAF SENSOR/IAT SENSOR No.1 CIRCUIT FOR OPEN CIRCUIT** • Verify that the MAF sensor/IAT sensor No.1 and PCM connectors are disconnected. • Inspect for continuity between 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 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: • 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 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 9.
6	**INSPECT MAF SENSOR/IAT SENSOR No.1 SIGNAL 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 on). **Note** **• Another DTC may be stored by the PCM detecting an open circuit.** • Measure the voltage at the MAF sensor/IAT sensor No.1 terminal B (wiring harness-side). • 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 MAF sensor/IAT sensor No.1 terminal B and PCM terminal 2BE. **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 9.
7	**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 9.
		No	Go to the next step.

Sample