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1994 MAZDA 121/ Revue (Mk.2) OEM Service and Repair Workshop Manual

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STEP	INSPECTION	RESULTS	ACTION
13	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 KOEO or KOER self test. (See KOEO/KOER SELF 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.
14	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
3	**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 13.
		No	**2WD:** • Go to Step 5. **AWD:** • Go to the next step.
4	**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 13.
		No	Go to the next step.
5	**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 13.
		No	Go to the next step.
6	**INSPECT FUEL GAUGE SENDER UNIT (MAIN) SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Verify that the fuel gauge sender unit (main) 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 fuel gauge sender unit (main) terminal D (wiring harness-side). • Is the voltage 0 V?	Yes	**2WD:** • Go to Step 8. **AWD:** • Go to the next step.
		No	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 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 13.
7	**INSPECT FUEL GAUGE SENDER UNIT (SUB) SIGNAL 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 fuel gauge sender unit (sub) terminal A (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 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 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 13.

DTC P050B:00 [PCM (SKYACTIV-G 2.5T)]

SM2896502

id0102s830190

DTC P050B:00	Cold start ignition timing performance problem
DETECTION CONDITION	• PCM internal RAM malfunction. Diagnostic support note • This is a continuous monitor (cold start emission reduction strategy monitoring). • 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	• PCM internal RAM malfunction
SYSTEM WIRING DIAGRAM	• Not applicable

Diagnostic Procedure

STEP	INSPECTION	RESULTS	ACTION
1	IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA • Perform the Freeze Frame PID Data Access Procedure. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5T)].) • Is the DTC P050B:00 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to the troubleshooting procedure for DTC on FREEZE FRAME DATA. (See DTC TABLE [PCM (SKYACTIV-G 2.5T)].)
2	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.
3	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.
4	VERIFY DTC TROUBLESHOOTING COMPLETED • Clear the DTC from the PCM memory using the M-MDS. (See CLEARING DTC [PCM (SKYACTIV-G 2.5T)].) • Leave the vehicle for 7 h or more. • Start the engine and leave it idling for 1 min. • Perform the Pending Trouble Code Access 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.

Repeatability Verification Procedure

1. Leave the vehicle for 7 h or more.
2. Start the engine and leave it idling for 1 min.

PID Item/Simulation Item Used In Diagnosis

PID/DATA monitor item table

Item	Definition	Unit	Condition/Specification
ETC_ACT	Actual throttle valve opening angle	° (deg)	Ignition switched ON (engine off) • Accelerator pedal released: Approx. 12.89° • Accelerator pedal fully depressed: Approx. 86.03° Idle (after warm up) • Accelerator pedal released: Approx. 2.77–2.84 ° (ECT is 89 °C {192 °F})

Function Inspection Using M-MDS

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: IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA • Perform the Freeze Frame PID Data Access Procedure. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5T)].) • Is the DTC P050A:00 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to the troubleshooting procedure for DTC on FREEZE FRAME DATA. (See DTC TABLE [PCM (SKYACTIV-G 2.5T)].)
3	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 FREEZE FRAME DATA/snapshot data on the repair order.	–	Go to the next step.
4	PURPOSE: 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)].) Go to the next step.
		No	Go to the next step.

DTC P061B:00 [PCM (SKYACTIV-G 2.5T)]

SM2896503

id0102s830240

DTC P061B:00	Internal control module torque calculation performance problem
DETECTION CONDITION	• Indicates an error occurred in the PCM. • There is a malfunction in the sensor input signal to the PCM. 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	• Restricts the upper limit of the engine speed.
POSSIBLE CAUSE	• 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.
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	INSPECT PCM CONNECTOR CONDITION • Switch the ignition off. • Disconnect the PCM 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 the next step.
		No	Go to the next step.

ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5T)]

SM2896601

id0102s880100

DTC Reading Procedure

1.Connect the M-MDS to the DLC-2.

2.After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

(1)Select "Self Test".

(2)Select "Modules".

(3)Select "PCM".

3.Then, select the "Retrieve CMDTCs" and perform procedures according to the directions on the M-MDS screen.

4.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.

5.After completion of repairs, clear all DTCs stored in the PCM, while referring to "AFTER REPAIR PROCEDURE".

Pending Trouble Code Access Procedure

1.Connect the M-MDS to the DLC-2.

2.After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

(1)Select "Self Test".

(2)Select "Modules".

(3)Select "PCM".

3.Then, select the "Retrieve CMDTCs" and perform procedures according to the directions on the M-MDS screen.

4.Retrieve the pending trouble codes according to the directions on the M-MDS screen.

Freeze Frame PID Data Access Procedure

Snapshot data item	Unit	Definition	Data read/use method	Corresponding PID data monitor item
ALT_CUR_DSD	A	Generator current desired	–	–
ALTT_V	V	Generator output voltage	–	ALTT V
APP1	%	Accelerator pedal position No.1	–	APP1
APP2	%	Accelerator pedal position No.2	–	APP2
BARO	KPa {MPA}, mBar {BAR}, psi, in H20	Barometric pressure	–	BARO
BATT_RES	mΩ	Battery inferred internal resistance	–	BATT_RES
CATT11_DSD	°C, °F	Estimated catalytic converter temperature	–	CATT11_DSD
CLR_CNT	–	Number of warm-up cycle after DTC cleared	–	–
CLR_DIST	km, ft, mi	Mileage after DTC cleared	–	CLR_DIST
ECT	°C, °F	Engine coolant temperature	–	ECT
ECT2	°C, °F	Engine coolant temperature No.2	–	–
ECT2_SUP	No/Yes	Engine coolant temperature No.2 support	–	–
EG_RUN_TIME	hh:mm:ss	Time from engine start	–	–
EQ_RAT11_DSD	–	Target equivalence ratio (lambda)	–	EQ_RAT11_DSD
ETC_DSD	%	Target throttle valve position	–	ETC_DSD
EVAPCP	%	Purge solenoid valve controlled value	–	–
FLI	%	Fuel level in fuel tank	–	FLI
FRP	KPa {MPA}, mBar {BAR}, psi, in H20	Fuel pressure (absolute)	–	FUEL_PRES
FTP	Pa {KPA}, mBar {BAR}, psi, in H20	Fuel tank pressure	–	FTP
FUEL_LO_P	KPa {MPA}, mBar {BAR}, psi, in H20	Fuel pressure (low pressure side)	–	–
FUEL_PRES	KPa {MPA}, mBar {BAR}, psi, in H20	Fuel pressure	–	–
FUEL_TYP	NONE/Gas/METH/ETH/DSL/ELEC	Type of fuel currently being utilized by the vehicle	–	–
FUELSYS	OL/CL/OL-Drive/OL-Fault/CL-Fault	Fuel system status	–	FUELSYS
IAT	°C, °F	Intake air temperature No.1	–	IAT
IAT12	°C, °F	Intake air temperature No.2	–	IAT2
LOAD	%	Engine load	–	LOAD
LOAD_C	%	Calculated engine load	–	LOAD
LONGFT1	%	Long term fuel trim	–	LONGFT1
LONGFT12	%	Long term fuel trim (HO2S)	–	LONGFT12
MAF	g/sec	Mass airflow	–	MAF

2.After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

(1)Select “DataLogger”.

(2)Select “Modules”.

(3)Select “PCM”.

3.Select the simulation items from the PID table.

4.Using the active command modes function, inspect the operation of each part.

• If the operation of output parts cannot be verified after the active command mode inspection is performed, this could indicate the possibility of an open or short circuit, sticking, or operation malfunction in the output parts.

DTC P0092:00 [PCM (SKYACTIV-G 2.5T)]

SM2896424

id0102s800920

DTC P0092:00	Fuel pressure regulator control circuit high input
DETECTION CONDITION	• When the PCM turns the spill valve control solenoid valve on but the spill valve control solenoid valve circuit voltage is high for 5 s, the PCM determines that the spill valve control solenoid valve control circuit has a malfunction. MONITORING CONDITIONS — The following conditions are met: • Engine speed: 5,700 rpm or less • Battery voltage: 10.5 V or more 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	• Stops high pressure fuel pump control • Limits intake air amount
POSSIBLE CAUSE	• High pressure fuel pump connector or terminals malfunction • PCM connector or terminals malfunction • Short to power supply in wiring harness between high pressure fuel pump terminal B and PCM terminal 1EF • Spill valve control solenoid valve (built-into high pressure fuel pump) malfunction • PCM malfunction