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1995 MAZDA MX-5 / Miata OEM Service and Repair Workshop Manual

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DTC P0134:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))]

SM2896750

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Note

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

Details On DTCs

DESCRIPTION	**A/F sensor circuit no activity detected**	
DETECTION CONDITION	Determination conditions	• The condition in which the A/F sensor element impedance is the specified value or more continues for specified period.
	Preconditions	• Battery voltage: 11−18 V *1 • The following DTCs are not detected: — A/F sensor heater: P0031:00, P0032:00 — A/F sensor: P0131:00, P0132:00 *1: Standard can be verified by displaying PIDs using M-MDS
	Drive cycle	• 2
	Self test type	• CMDTC self test
	Sensor used	• A/F sensor
FAIL-SAFE FUNCTION	• Fixes duty value of A/F sensor heater • Stops fuel feedback control of A/F sensor	
VEHICLE STATUS WHEN DTCs ARE OUTPUT	• Illuminates check engine light.	
POSSIBLE CAUSE	• A/F sensor malfunction — A/F sensor connector or terminals malfunction — A/F sensor related wiring harness malfunction — A/F sensor loose — A/F sensor deterioration • PCM connector or terminals malfunction • PCM malfunction	

System Wiring Diagram

• Not applicable

Function Explanation (DTC Detection Outline)

• The PCM performs verification as to whether a condition in which A/F (air/fuel ratio) detection is not implemented due to poor A/F sensor activation by a decrease in A/F sensor performance or other malfunction has occurred. A DTC is stored if the A/F sensor cannot implement feedback (non-active condition (resistance value is specified value or more)) for a continuous specified period unde the condition in which the A/F sensor heater control has been normally implemented. However, under a condition prior to the A/F sensor performing activation (such as ignition switched off), and if there is an open/short circuit (P2251:00) between the A/F sensor terminal D and PCM terminal 1S (COM terminal), or an open/short circuit (P2243:00) between A/F sensor terminal F and PCM terminal 1T (B+ terminal), A/F sensor activation determination is not performed and A/F sensor non-activation (P0134:00) is determined. In addition, if a temporary malfunction is determined in the previous drive cycle because poor A/F sensor activation was

STEP	INSPECTION	RESULTS	ACTION
7	PURPOSE: INSPECT RELATED SENSOR WIRING HARNESS AND CONNECTOR • Access the O2S11 PID using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Does the PID value fluctuate when the PCM and A/F sensor connectors are shaken?	Yes	Inspect the related wiring harness and connector. • Repair or replace the malfunctioning part. 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 1–2
  - — Perform inspection of A/F sensor signal related parts.
- Step 3–4
  - — Verify that the primary malfunction is resolved and there are no other malfunctions.

STEP	INSPECTION	RESULTS	ACTION
1	PURPOSE: INSPECT INSTALLATION OF A/F SENSOR • Inspect installation of A/F sensor. • Is the A/F sensor installed securely?	Yes	Replace the A/F sensor, then go to Step 3. (See AIR FUEL RATIO (A/F) SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)
		No	Retighten the A/F sensor, then go to Step 3. (See AIR FUEL RATIO (A/F) SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)
2	PURPOSE: INSPECT INSTALLATION OF A/F SENSOR • Inspect installation of A/F sensor. • Is the A/F sensor installed securely?	Yes	Go to the next step.
		No	Retighten the A/F sensor, then go to the next step. (See AIR FUEL RATIO (A/F) SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)
3	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 Pending Trouble Code Access Procedure. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Is the PENDING CODE for this 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.
4	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.

Item	Definition	Unit	Condition/Specification
O2S11	A/F sensor current	µA	• Idle (after warm up): Approx. −39 µA • Deceleration fuel cut (accelerator pedal released from engine speed of 4,000 rpm or more): Approx. 3.84 mA

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: 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 (A/F sensor, HO2S related) on the repair order.	–	Go to Troubleshooting Diagnostic Procedure to perform the procedure from Step 1.

Troubleshooting Diagnostic Procedure

Intention of troubleshooting procedure

• Step 1−3

— Perform an inspection of the A/F sensor and PCM-related connectors and wiring harnesses.

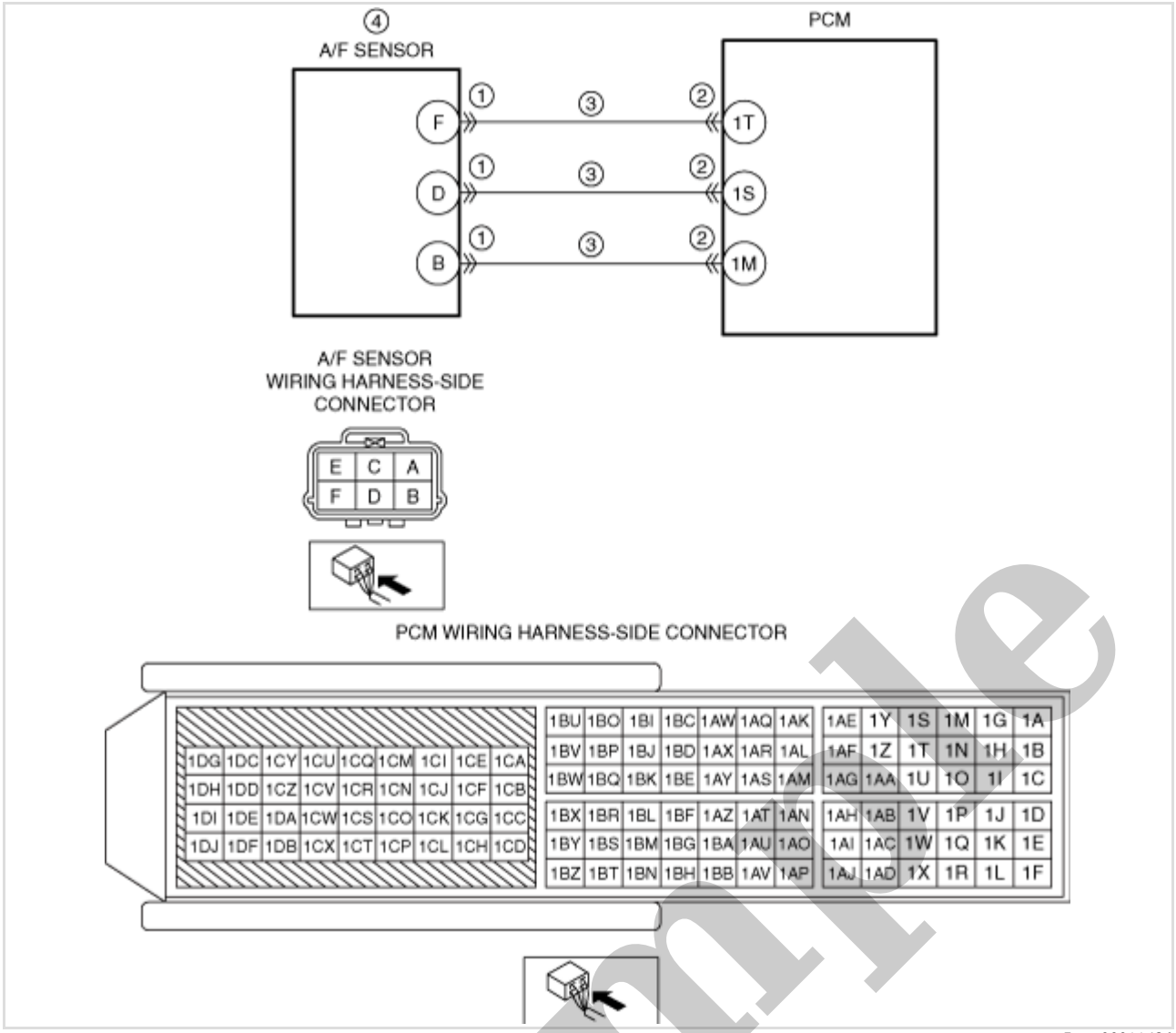
• Step 4

— Perform a unit inspection of the A/F sensor.

• Step 5−6

— Verify that the primary malfunction is resolved and there are no other malfunctions.

STEP	INSPECTION	RESULTS	ACTION
1	PURPOSE: INSPECT A/F SENSOR CONNECTOR CONDITION • Switch the ignition off. • Disconnect the A/F sensor 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 5.
		No	Go to the next step.
2	PURPOSE: INSPECT PCM CONNECTOR CONDITION • 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 Step 5.
		No	Go to the next step.



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Function Explanation (DTC Detection Outline)

• If any of the following conditions is detected, the PCM determines a short to the power supply between the A/F sensor terminal and the PCM terminal and stores a DTC.

— Voltage of A/F sensor terminal F is above specified value
— Voltage of A/F sensor terminal D is above specified value
— Voltage of A/F sensor terminal B is above specified value

Repeatability Verification Procedure

1. Start the engine and leave it idling for 1 min.

PID Item/Simulation Item Used In Diagnosis

PID/DATA monitor item table

DTC P0133:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))]

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Note

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

Details On DTCs

DESCRIPTION	**A/F sensor circuit slow response**	
DETECTION CONDITION	Determination conditions	• The response speed of the A/F sensor input signal when the air/fuel ratio is fluctuated is slow.
	Preconditions	• Engine speed: Within specified range • Engine coolant temperature: Specified value or more • Mass airflow: Specified value or more • A/F sensor voltage: Within specified range • Time until fuel-cut in all of cylinders is completed: Within specified time • Not during cylinder deactivation control • The following DTCs are not detected: — A/F sensor heater: P0031:00, P0032:00 — ECT sensor No.1: P0117:00, P0118:00 — MAF sensor: P0100:00, P0101:00, U060F:00 — BARO sensor: P2226:00, P2228:00, P2229:00 — MAP sensor: P0107:00, P0108:00 — Misfire: P0300:00, P0301:00, P0302:00, P0303:00, P0304:00 — Fuel injection correction: P0171:00, P0172:00, P2096:00, P2097:00
	Drive cycle	• 2
	Self test type	• CMDTC self test
	Sensor used	• A/F sensor
FAIL-SAFE FUNCTION	• Fixes duty value of A/F sensor heater • Stops fuel feedback control of A/F sensor	
VEHICLE STATUS WHEN DTCs ARE OUTPUT	• Illuminates check engine light.	
POSSIBLE CAUSE	• A/F sensor signal malfunction — A/F sensor connector or terminals malfunction — A/F sensor loose — Exhaust system leakage • A/F sensor deterioration • A/F sensor heater malfunction • PCM malfunction	

System Wiring Diagram

• Not applicable

STEP	INSPECTION	RESULTS	ACTION
6	PURPOSE: VERIFY A/F SENSOR HEATER • Start the engine and idle it. • Access the HTR11 PID using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) • Is the HTR11 PID value normal? (See PCM INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)	Yes	Go to the next step.
		No	Go to Troubleshooting Diagnostic Procedure to perform the procedure from Step 5.
7	PURPOSE: VERIFY DTC • Switch the ignition off, then ON (engine off). • Retrieve the PCM DTCs using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [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))].) Go to Troubleshooting Diagnostic Procedure to perform the procedure from Step 1.
		No	Go to Troubleshooting Diagnostic Procedure to perform the procedure from Step 1.

Troubleshooting Diagnostic Procedure

Intention of troubleshooting procedure

- Step 1–5
  - — Perform inspection of A/F sensor signal related parts.
- Step 6
  - — Verify that the primary malfunction is resolved and there are no other malfunctions.

STEP	INSPECTION	RESULTS	ACTION
1	PURPOSE: INSPECT A/F SENSOR CONNECTOR CONDITION • Switch the ignition off. • Disconnect the A/F sensor 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 6.
		No	Go to the next step.
2	PURPOSE: INSPECT INSTALLATION OF A/F SENSOR • Inspect installation of A/F sensor. • Is the A/F sensor installed securely?	Yes	Go to the next step.
		No	Retighten the A/F sensor, then go to Step 6. (See AIR FUEL RATIO (A/F) SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)
3	PURPOSE: VERIFY IF MALFUNCTION RELATED TO EMISSION SYSTEM AFFECTS A/F SENSOR SIGNAL • Inspect for exhaust gas leakage from the exhaust system. (between A/F sensor and HO2S) • Is there any malfunction?	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 A/F SENSOR • Reconnect all disconnected connectors. • Inspect the A/F sensor. (See AIR FUEL RATIO (A/F) SENSOR INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) • Is there any malfunction?	Yes	Replace the A/F sensor, then go to Step 6. (See AIR FUEL RATIO (A/F) SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)
		No	Go to the next step.

Freeze Frame PID Data 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 freeze frame PID data according to the directions on the M-MDS screen.

Note

• Freeze frame data/snapshot data appears at the top of the help screen when the displayed DTC is selected.
Freeze frame data
• The freeze frame data consists of data for vehicle and engine control system operation conditions when malfunctions in the engine control system are detected and stored in the PCM.
• Freeze frame data is stored at the instant the check engine light illuminates, and only a part of the DTC data is stored.
• For the freeze frame data, if there are several malfunctions in the engine control system, the data for the malfunction which occurred initially is stored. Thereafter, if a misfire or fuel injection control malfunction occurs, data from the misfire or fuel injection control malfunction is written over the initially stored data. However, if the initially stored freeze frame data is a misfire or fuel injection control malfunction, it is not overwritten.
Snapshot data
• The snapshot data stores the currently detected DTC data.
• The recording timing for the freeze frame data/snapshot data differs depending on the number of DTC drive cycles.

— For a DTC with a drive cycle number 1, only the malfunction determination data is recorded.
— For a DTC with a drive cycle number 2, both the malfunction determination and undetermined data is recorded.

Freeze frame data table

–: Not applicable

Freeze frame data item	Unit	Description	Corresponding PID data monitor item
FUELSYS1	Open Loop/Closed Loop/OL-Drive/OL-Fault/CL-Fault	Fuel system status	FUELSYS
LOAD	%	Calculated engine load	LOAD
ECT	°C, °F	Engine coolant temperature	ECT
SFT1	%	Short term fuel trim	SHRTFT1
LFT1	%	Long term fuel trim	LONGFT1
MAP	KPa {MPA}, mBar {BAR}, psi, in H20	Manifold absolute pressure	MAP
RPM	RPM	Engine speed	RPM
VS	KPH, MPH	Vehicle speed	VSS
SPARKADV	°(deg)	Ignition timing (BTDC)	SPARKADV
IAT	°C, °F	Intake air temperature	IAT

Snapshot data item	Unit	Definition	Data read/use method	Corresponding PID data monitor item
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
MAP	KPa {MPA}, mBar {BAR}, psi, in H20	Manifold absolute pressure	–	MAP
MIL	Off/On	Check engine light	–	MIL
MIL_DIS	km, ft, mi	Travelled distance since the check engine light illuminated	–	MIL_DIS
O2S12	V	HO2S	–	O2S12
RPM	RPM	Engine speed	–	RPM
SEGRP_DSD	%	Target EGR valve position	–	–
SHRTFT1	%	Short term fuel trim	–	SHRTFT1
SHRTFT12	%	Short term fuel trim (HO2S)	–	SHRTFT12
SPARKADV	°(BTDC)	Ignition timing	–	SPARKADV
TOTAL_DIST	km, ft, mi	Total distance	The distance traveled when the PCM detected a DTC can be calculated by performing the following procedure. 1. Verify the odometer value in the instrument cluster. 2. Verify the snapshot data item TOTAL_DIST. 3. Subtract 2 from 1.	–
TOTAL_TIME	hh:mm:ss	Total time	The elapsed time when the PCM detected a DTC can be calculated by performing the following procedure. 1. Verify the instrument cluster PID item TOTAL_TIME. 2. Verify the snapshot data item TOTAL_TIME. 3. Subtract 2 from 1.	–
TP_REL	%	Relative throttle position	–	TP_REL
TP1	%	Throttle valve position No.1	–	TP1
TP2	%	Throttle valve position No.2	–	TP2
VPWR	V	Module supply voltage	–	VPWR
VSS	KPH, MPH	Vehicle speed	–	VSS

Note

• Refer to the PID monitor table to confirm the engine control system operation status when the PCM does not store a DTC. (See PCM INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)
• Snapshot data items are not displayed according to detected DTC.

AFTER REPAIR PROCEDURE [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))]

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1.Switch the ignition off.

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

3.Switch the ignition ON (engine off).

4.Verify the DTC according to the directions on the M-MDS screen.

- Press the clear button on the DTC screen to clear the DTC.

5.Switch the ignition off for 30 s or more.

Caution

- **Always switch the ignition off after clearing the DTC.**
- **If the engine is accidentally started, disconnect the negative battery terminal and reconnect it. (See NEGATIVE BATTERY TERMINAL DISCONNECTION/CONNECTION.)**

6.Switch the ignition ON (engine on).

7.Verify all accessory loads are off.

8.Start the engine and maintain the engine speed at 2,800−3,200 rpm until the cooling fan starts running (for A/F sensor and HO2S activation).

Note

- **If the engine speed is maintained at 2,800 to 3,200 rpm, the engine speed may decrease to the idle speed. This is due to the fuel cut control operation, which prevents overheating, and it does not indicate a malfunction. The engine control returns to normal when the accelerator pedal is released.**

9.When the cooling fan starts running, idle the engine.

10.Maintain idle for 30 s or more after the cooling fan has stopped (for fuel learning).