DTC P0131:00 [SKYACTIV-G 2.0, SKYACTIV-G 2.5]

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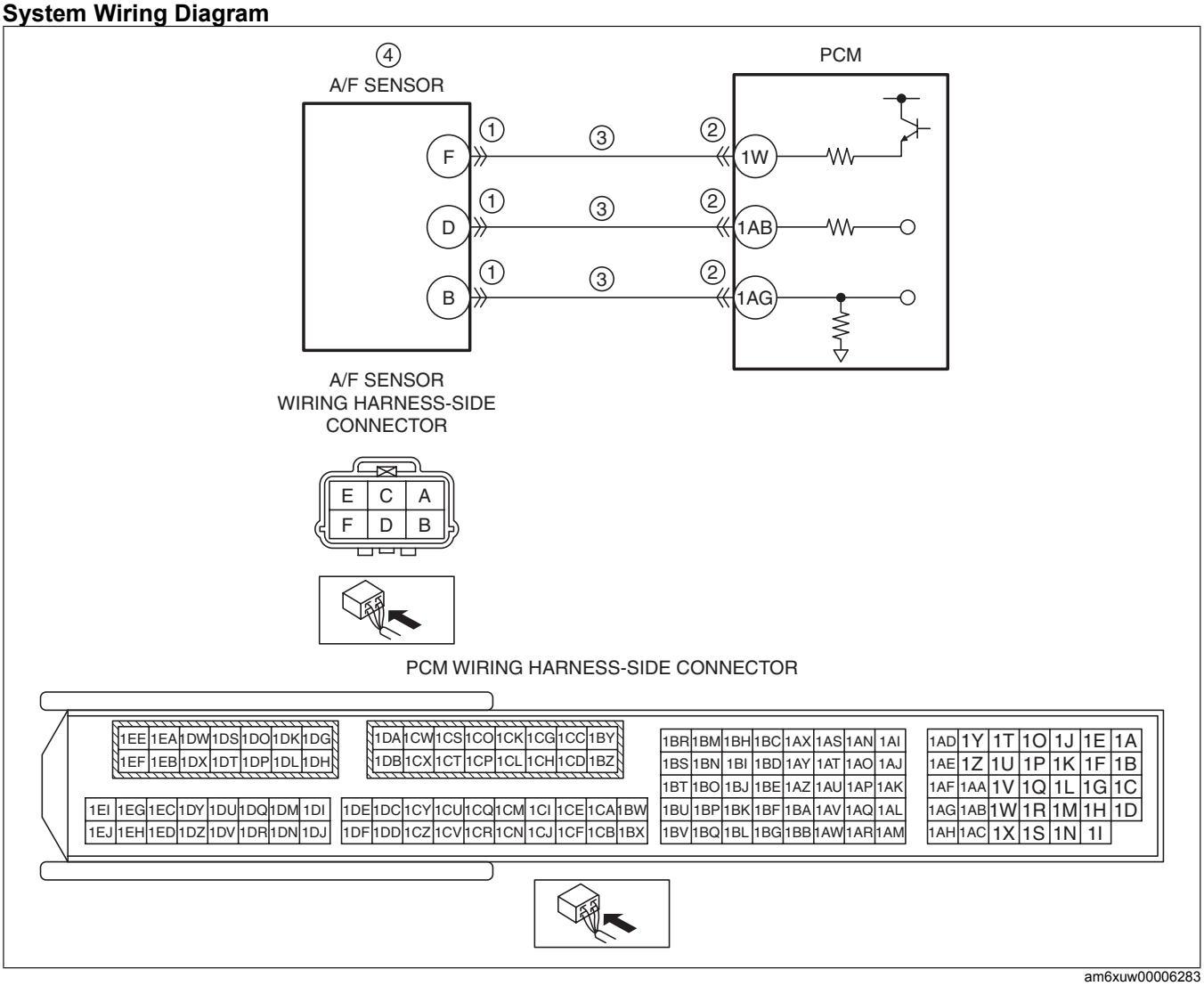
Note
- To determine the malfunctioning part, proceed with the diagnostics from "Function Inspection Using M-MDS".

Details On DTCs

DESCRIPTION	**A/F sensor circuit low input**	
DETECTION CONDITION	Determination conditions	• Any one of the following conditions is met: — Voltage of A/F sensor terminal F is less than specified value — Voltage of A/F sensor terminal D is less than specified value — Voltage of A/F sensor terminal B is less than specified value
	Preconditions	• Switch the ignition ON (engine off) • Battery voltage: **11—18 V** *1 • The following DTC is not detected: — Internal PCM malfunction: P064D:00 *1: Value can be verified by displaying PIDs using M-MDS
	Drive cycle	• 2
	Self test type	• CMDTC self test, KOER 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 connector or terminals malfunction • PCM connector or terminals malfunction • Short to ground in wiring harness between the following terminals: — A/F sensor terminal F—PCM terminal 1W — A/F sensor terminal D—PCM terminal 1AB — A/F sensor terminal B—PCM terminal 1AG • A/F sensor malfunction • PCM malfunction	

System Wiring Diagram



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Function Explanation (DTC Detection Outline)

- If any of the following conditions is detected, the PCM determines a short to ground between the A/F sensor terminal and PCM terminal and stores a DTC.
  - — Voltage of A/F sensor terminal F is less than specified value
  - — Voltage of A/F sensor terminal D is less than specified value
  - — Voltage of A/F sensor terminal B is less than 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

Item	Definition	Unit/ Condition	Condition/Specification (Reference)
O2S11	A/F sensor	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 SERVICE INFORMATION AVAILABILITY** • Verify related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to the available Service Information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
2	**PURPOSE: RECORD VEHICLE STATUS AT TIME OF DTC DETECTION TO UTILIZE WITH REPEATABILITY VERIFICATION** • Has the FREEZE FRAME DATA (Mode 2)/ snapshot data been recorded?	Yes	Go to the troubleshooting procedure to perform the procedure from Step 1.
		No	Record the FREEZE FRAME DATA (Mode 2)/snapshot data on the repair order. **Note** • Recording can be facilitated using the screen capture function of the PC. Go to the troubleshooting 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.
3	**PURPOSE: INSPECT A/F SENSOR CIRCUIT FOR SHORT TO GROUND** • Verify that the A/F sensor and PCM connectors are disconnected. • Inspect for continuity between the following terminals (wiring harness-side) and body ground: — A/F sensor terminal F — A/F sensor terminal D — A/F sensor terminal B • Is there continuity?	Yes	Refer to the wiring diagram and verify whether or not there is a common connector between the following terminals: • A/F sensor terminal F—PCM terminal 1W • A/F sensor terminal D—PCM terminal 1AB • A/F sensor terminal B—PCM terminal 1AG **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 5.
		No	Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
4	**PURPOSE: DETERMINE INTEGRITY OF A/F SENSOR** • Start the engine and warm it up completely. • Access the O2S11 PID using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-G 2.0, SKYACTIV-G 2.5].) • Drive the vehicle under the following conditions. **Warning** **• When the M-MDS is used to observe monitor system status while driving, be sure to have another technician with you, or record the data in the M-MDS using the PID/DATA MONITOR AND RECORD capturing function and inspect later.** **• While performing this step, always operate the vehicle in a safe and lawful manner.** — After increasing the engine speed to **3,000 rpm**, decelerate using engine braking. • Is the displayed PID value as follows? — O2S11: **0.25 mA or more**	Yes	Go to the next step.
		No	Replace the A/F sensor, then go to the next step. (See AIR FUEL RATIO (A/F) SENSOR REMOVAL/ INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)
5	**PURPOSE: VERIFICATION OF VEHICLE REPAIR COMPLETION** • Always reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. (See AFTER REPAIR PROCEDURE [SKYACTIV-G 2.0, SKYACTIV-G 2.5].) • Perform the KOER self test. (See KOEO/KOER SELF TEST [SKYACTIV-G 2.0, SKYACTIV-G 2.5].) • 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 2.0, SKYACTIV-G 2.5].) Go to the next step.
		No	Go to the next step.
6	**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 [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)
		No	DTC troubleshooting completed.