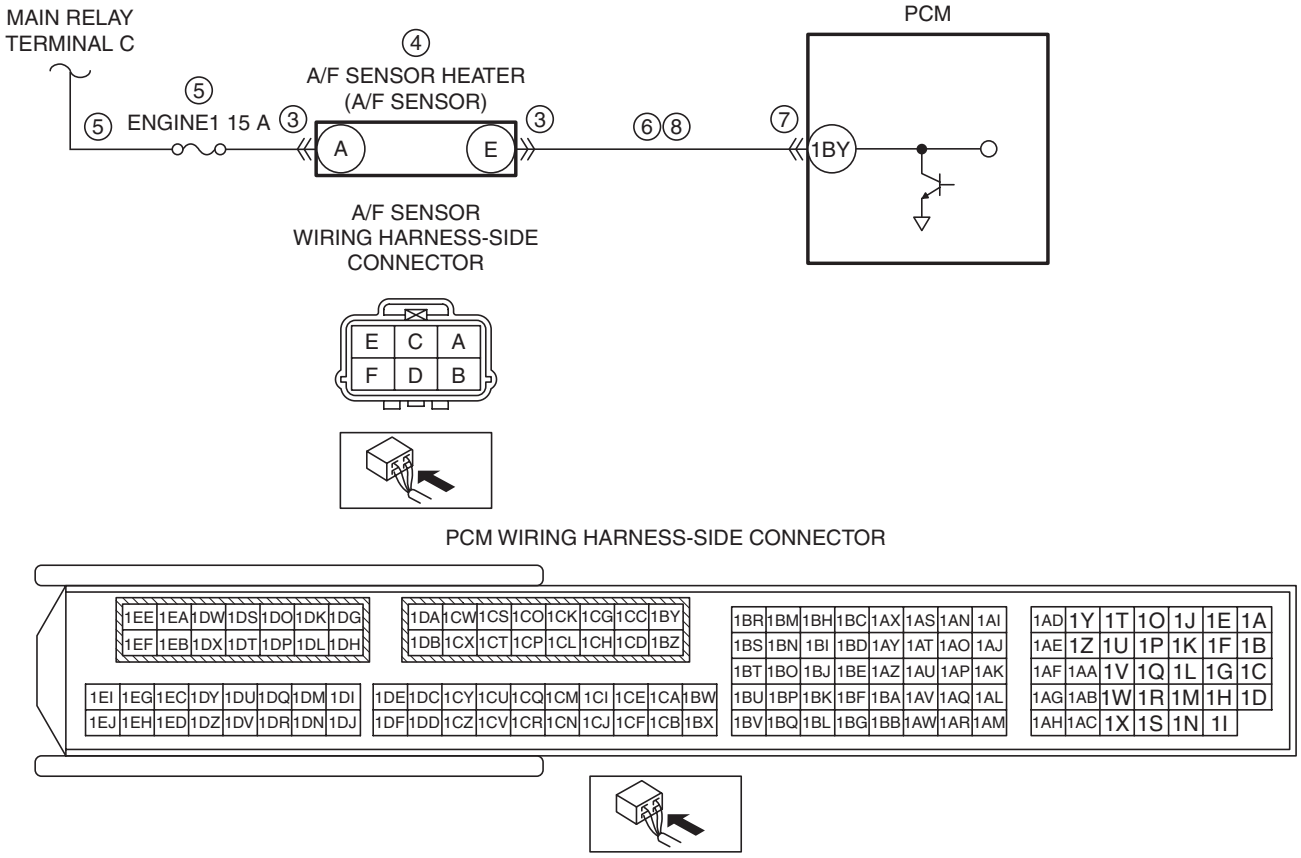
DTC P0031:00 [SKYACTIV-G 2.0]

id0102h1700400

DTC P0031:00	A/F sensor heater control circuit low input
DETECTION CONDITION	• The PCM monitors the A/F sensor heater output voltage. If the PCM turns the A/F sensor heater off but the A/F sensor heater circuit remains low voltage, the PCM determines that the A/F sensor heater circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (A/F sensor heater, HO2S heater). • 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 (Mode 2)/Snapshot data is available. • The DTC is stored in the PCM memory.
FAIL-SAFE FUNCTION	• Stops the fuel feedback control.
POSSIBLE CAUSE	• A/F sensor connector or terminals malfunction • A/F sensor heater malfunction • Short to ground or open circuit in A/F sensor heater power supply circuit: — Short to ground in wiring harness between ENGINE1 15 A fuse and A/F sensor terminal A — ENGINE1 15 A fuse malfunction — Open circuit in wiring harness between main relay terminal C and A/F sensor terminal A • Short to ground in wiring harness between A/F sensor terminal E and PCM terminal 1BY • PCM connector or terminals malfunction • Open circuit in wiring harness between A/F sensor terminal E and PCM terminal 1BY • PCM malfunction



Diagnostic Procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA (MODE 2)/ SNAPSHOT DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA (Mode 2)/ snapshot data and DIAGNOSTIC MONITORING TEST RESULTS (A/F sensor heater, HO2S heater related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA (Mode 2)/snapshot data and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**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.
3	**INSPECT A/F SENSOR CONNECTOR CONDITION** • Switch the ignition to 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 9.
		No	Go to the next step.
4	**INSPECT A/F SENSOR HEATER** • Inspect the A/F sensor heater. (See AIR FUEL RATIO (A/F) SENSOR INSPECTION [SKYACTIV-G 2.0].) • Is there any malfunction?	Yes	Replace the A/F sensor, then go to Step 9. (See AIR FUEL RATIO (A/F) SENSOR REMOVAL/ INSTALLATION [SKYACTIV-G 2.0].)
		No	Go to the next step.
5	**INSPECT A/F SENSOR HEATER POWER SUPPLY CIRCUIT FOR SHORT TO GROUND OR OPEN CIRCUIT** • Verify that the A/F sensor connector is disconnected. • Switch the ignition ON (engine off or on). • Measure the voltage at the A/F sensor terminal A (wiring harness-side). • Is the voltage **B+**?	Yes	Go to the next step.
		No	Inspect the ENGINE1 15 A fuse. • If the fuse is blown: — Repair or replace the wiring harness for a possible short to ground. — Replace the fuse. • If the fuse is deteriorated: — Replace the fuse. • If the fuse is normal: — Repair or replace the wiring harness for a possible open circuit. Go to Step 9.
6	**INSPECT A/F SENSOR HEATER CONTROL CIRCUIT FOR SHORT TO GROUND** • Verify that the A/F sensor connector is disconnected. • Switch the ignition to off. • Inspect for continuity between A/F sensor terminal E (wiring harness-side) and body ground. • Is there continuity?	Yes	If the short to ground circuit could be detected in the wiring harness: • Repair or replace the wiring harness for a possible short to ground. If the short to ground circuit could not be detected in the wiring harness: • Replace the PCM (short to ground in the PCM internal circuit). (See PCM REMOVAL/INSTALLATION [SKYACTIV-G 2.0].) Go to Step 9.
		No	Go to the next step.
7	**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 9.
		No	Go to the next step.
8	**INSPECT A/F SENSOR HEATER CONTROL CIRCUIT FOR OPEN CIRCUIT** • Verify that the A/F sensor and PCM connectors are disconnected. • Inspect for continuity between A/F sensor terminal E (wiring harness-side) and PCM terminal 1BY (wiring harness-side). • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to the next step.

STEP	INSPECTION		ACTION
9	**VERIFY DTC TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. (See AFTER REPAIR PROCEDURE [SKYACTIV-G 2.0].) • Perform the KOER self test. (See KOEO/KOER SELF TEST [SKYACTIV-G 2.0].) • 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].) Go to the next step.
		No	Go to the next step.
10	**VERIFY AFTER REPAIR PROCEDURE** • Perform the “AFTER REPAIR PROCEDURE”. (See AFTER REPAIR PROCEDURE [SKYACTIV-G 2.0].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [SKYACTIV-G 2.0].)
		No	DTC troubleshooting completed.