DTC P0405:00 [SKYACTIV-D 2.2]

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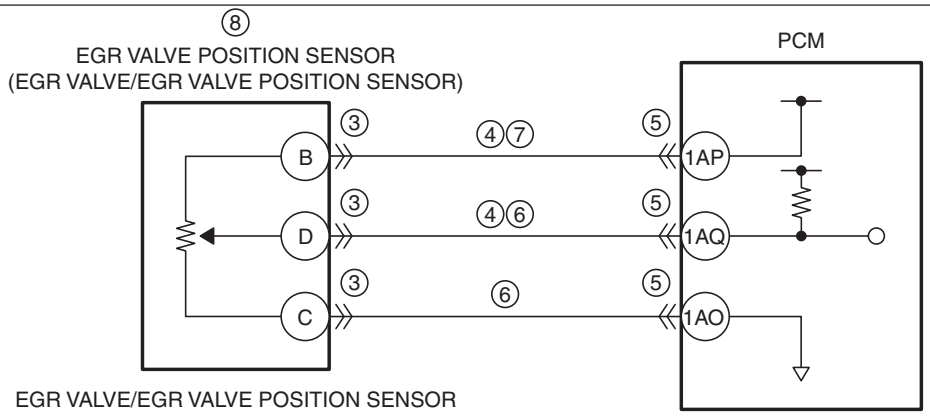
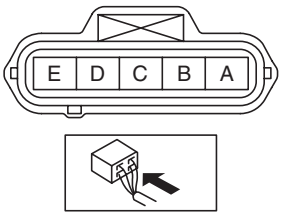
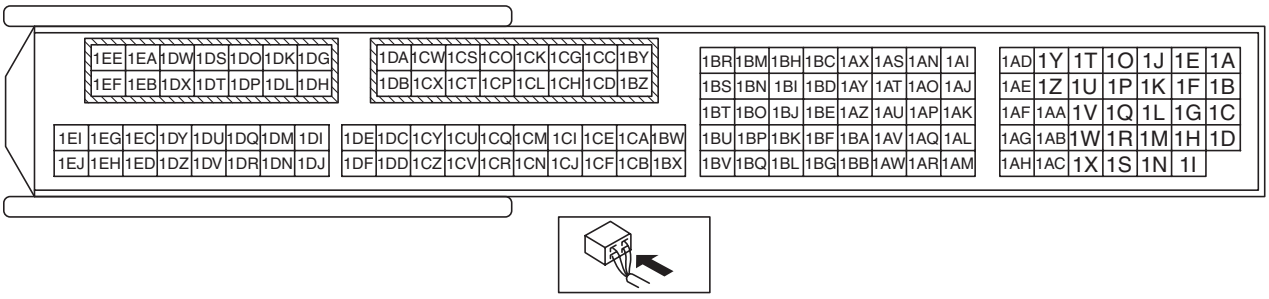
DTC P0405:00	EGR valve position sensor circuit low input
DETECTION CONDITION	• If the input voltage at the PCM terminal 1AQ is **less than 0.2 V** for **5 s**, the PCM determines that the EGR valve position sensor circuit is low. **Diagnostic support note** • This is a continuous monitor (CCM). • The check engine light illuminates if the PCM detects the above malfunction condition during the first drive cycle. • FREEZE FRAME DATA (Mode 2)/Snapshot data is available. • DTC is stored in the PCM memory.
FAIL-SAFE FUNCTION	• Inhibits the two-stage turbo control. • Inhibits the EGR control. • Inhibits engine-stop by operating the i-stop function. • PCM restricts engine-transaxle integration control.
POSSIBLE CAUSE	• EGR valve/EGR valve position sensor connector or terminals malfunction • Short to ground in wiring harness between the following terminals: — EGR valve/EGR valve position sensor terminal B—PCM terminal 1AP — EGR valve/EGR valve position sensor terminal D—PCM terminal 1AQ • PCM connector or terminals malfunction • EGR valve position sensor signal circuit and ground circuit are shorted to each other • Open circuit in wiring harness between EGR valve/EGR valve position sensor terminal B and PCM terminal 1AP • EGR valve position sensor malfunction • PCM malfunction



EGR VALVE/EGR VALVE POSITION SENSOR WIRING HARNESS-SIDE CONNECTOR



PCM WIRING HARNESS-SIDE CONNECTOR



Diagnostic Procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA (MODE 2)/ SNAPSHOT DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA (Mode 2)/ snapshot data been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA (Mode 2)/snapshot data 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 EGR VALVE/EGR VALVE POSITION SENSOR CONNECTOR CONDITION** • Switch the ignition off. • Disconnect the EGR valve/EGR valve position 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 EGR VALVE POSITION SENSOR CIRCUIT FOR SHORT TO GROUND** • Verify that the EGR valve/EGR valve position sensor connector is disconnected. • Inspect for continuity between the following terminals (wiring harness-side) and body ground: — EGR valve/EGR valve position sensor terminal B — EGR valve/EGR valve position sensor terminal D • 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-D 2.2].) Go to Step 9.
		No	Go to the next step.
5	**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.
6	**INSPECT EGR VALVE POSITION SENSOR SIGNAL CIRCUIT AND GROUND CIRCUIT FOR SHORT TO EACH OTHER** • Verify that the EGR valve/EGR valve position sensor and PCM connectors are disconnected. • Inspect for continuity between EGR valve/EGR valve position sensor terminals D and C (wiring harness-side). • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to each other, then go to Step 9.
		No	Go to the next step.
7	**INSPECT EGR VALVE POSITION SENSOR POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT** • Verify that the EGR valve/EGR valve position sensor and PCM connectors are disconnected. • Inspect for continuity between EGR valve/EGR valve position sensor terminal B (wiring harness-side) and PCM terminal 1AP (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 Step 9.
8	**INSPECT EGR VALVE POSITION SENSOR** • Reconnect all disconnected connectors. • Inspect the EGR valve position sensor. (See EGR VALVE POSITION SENSOR INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction**?**	Yes	Replace the EGR valve, then go to the next step. (See EGR VALVE REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
9	**VERIFY DTC TROUBLESHOOTING COMPLETED** • Always reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. (See AFTER REPAIR PROCEDURE [SKYACTIV-D 2.2].) • Perform the KOEO or KOER self test. (See KOEO/KOER SELF TEST [SKYACTIV-D 2.2].) • Is the same DTC present?	Yes	Repeat the inspection from Step 1. • If the malfunction recurs, replace the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-D 2.2].) 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-D 2.2].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [SKYACTIV-D 2.2].)
		No	DTC troubleshooting completed.