DTC P0685:00 [SKYACTIV-G 2.0, SKYACTIV-G 2.5]

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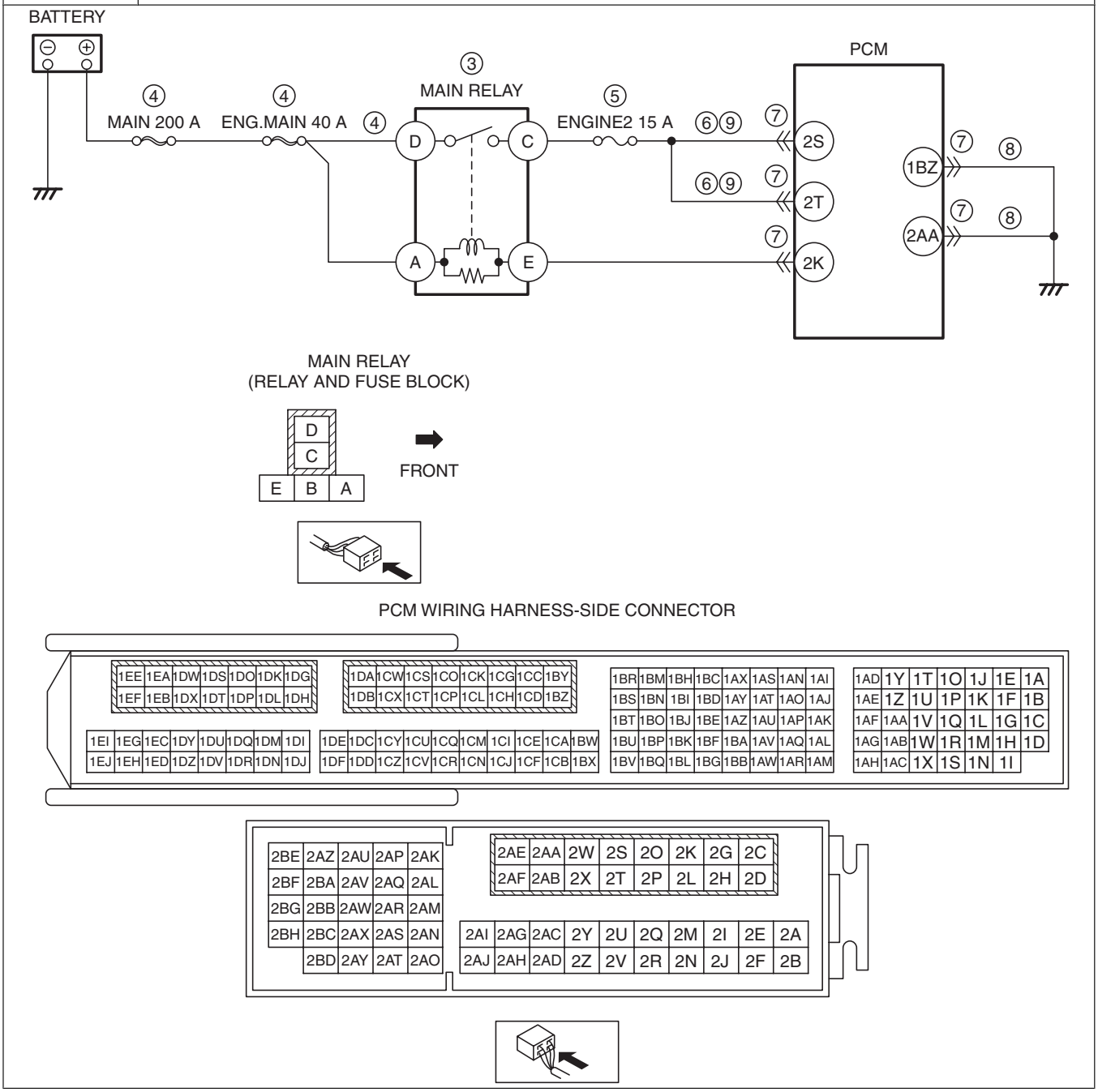
DTC P0685:00	**Main relay control circuit open**
DETECTION CONDITION	• The period of time in which the PCM power supply remains on after the ignition is switched off is not within the specified time. **Diagnostic support note** • This is a continuous monitor (CCM). • The check engine light illuminates 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 the first drive cycle. • FREEZE FRAME DATA (Mode 2)/Snapshot data is available. • DTC is stored in the PCM memory.
FAIL-SAFE FUNCTION	Not applicable
POSSIBLE CAUSE	• Main relay malfunction • Short to ground or open circuit in main relay power supply circuit: — Short to ground in wiring harness between MAIN 200 A fuse and main relay terminal D — MAIN 200 A fuse and/or ENG.MAIN 40 A fuse malfunction — Open circuit in wiring harness between battery positive terminal and main relay terminal D • ENGINE2 15 A fuse malfunction • Short to ground in wiring harness between the following terminals: — Main relay terminal C—PCM terminal 2S — Main relay terminal C—PCM terminal 2T • PCM connector or terminals malfunction • Open circuit in wiring harness between PCM terminal 1BZ and body ground • Open circuit in wiring harness between PCM terminal 2AA and body ground • Open circuit in wiring harness between the following terminals: — Main relay terminal C—PCM terminal 2S — Main relay terminal C—PCM terminal 2T • PCM malfunction

DTC P0685:00	Main relay control circuit open



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 MAIN RELAY** • Switch the ignition off. • Remove the main relay. • Inspect the main relay. (See RELAY INSPECTION.) • Is there any malfunction?	Yes	Replace the main relay, then go to Step 10.
		No	Go to the next step.

STEP	INSPECTION		ACTION
4	**INSPECT MAIN RELAY POWER SUPPLY CIRCUIT FOR SHORT TO GROUND OR OPEN CIRCUIT** • Main relay is removed. • Measure the voltage at the main relay terminal D (wiring harness-side). • Is the voltage **B+**?	Yes	Go to the next step.
		No	Inspect the MAIN 200 A fuse and ENG.MAIN 40 A fuse. • If the fuse is blown: — Repair or replace the wiring harness for a possible short to ground. — Replace the malfunctioning fuse. • If the fuse is deteriorated: — Replace the malfunctioning fuse. • If all fuses are normal: — Repair or replace the wiring harness for a possible open circuit. Go to Step 10.
5	**INSPECT ENGINE2 15 A FUSE** • Remove the ENGINE2 15 A fuse. • Inspect the ENGINE2 15 A fuse. • Is there any malfunction?	Yes	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. Go to Step 10.
		No	Reinstall the ENGINE2 15 A fuse, then go to the next step.
6	**INSPECT PCM POWER SUPPLY CIRCUIT FOR SHORT TO GROUND** • Main relay is removed. • Inspect for continuity between main relay terminal C (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, SKYACTIV-G 2.5].) Go to Step 10.
		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 10.
		No	Go to the next step.
8	**INSPECT PCM GROUND CIRCUIT FOR OPEN CIRCUIT** • Main relay is removed. • Verify that the PCM connector is disconnected. • Inspect for continuity between the following harnesses: — PCM terminal 1BZ (wiring harness-side)—Body ground — PCM terminal 2AA (wiring harness-side)—Body ground • 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 10.
9	**INSPECT PCM POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT** • Main relay is removed. • Verify that the PCM connector is disconnected. • Inspect for continuity between the following terminals (wiring harness-side): — Main relay terminal C—PCM terminal 2S — Main relay terminal C—PCM terminal 2T • 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
10	**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-G 2.0, SKYACTIV-G 2.5].) • Start the engine and warm it up completely. • Perform the Pending Trouble Code Access Procedure. (See ON-BOARD DIAGNOSTIC 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.
11	**VERIFY AFTER REPAIR PROCEDURE** • Perform the “AFTER REPAIR PROCEDURE”. (See AFTER REPAIR PROCEDURE [SKYACTIV-G 2.0, SKYACTIV-G 2.5].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)
		No	DTC troubleshooting completed.