DTC P0481:00 [SKYACTIV-D 2.2]

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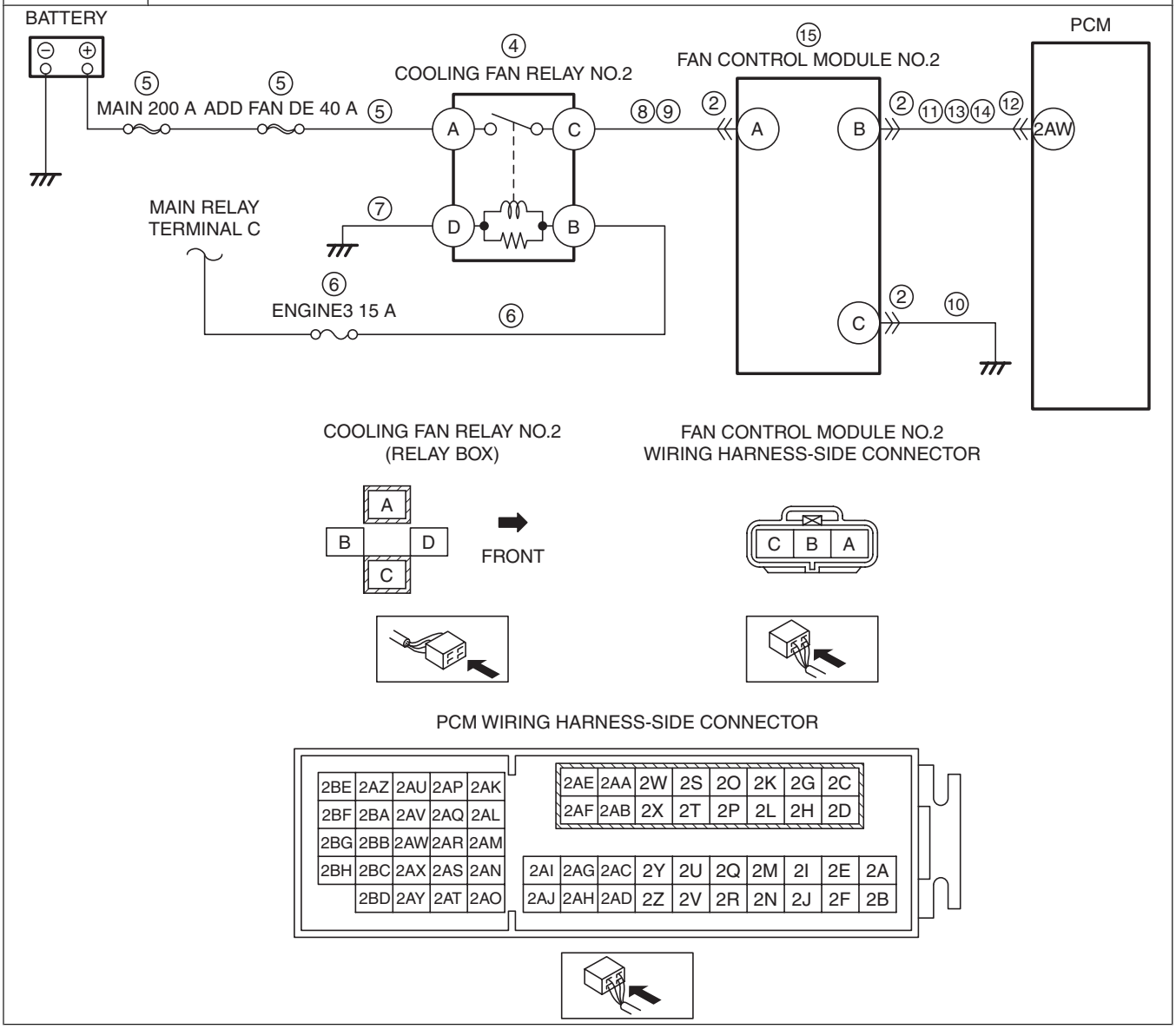
DTC P0481:00	Fan control module No.2 control circuit problem
DETECTION CONDITION	• The PCM monitors the input voltage from the fan control module No.2. If the voltage at the PCM terminal 2AW remains low or high for **5 s**, the PCM determines that the fan control circuit has a malfunction. **Diagnostic support note** • This is a continuous monitor (other). • The check engine light does not illuminate. • FREEZE FRAME DATA (Mode 2)/Snapshot data is not available. • DTC is stored in the PCM memory.
FAIL-SAFE FUNCTION	Not applicable
POSSIBLE CAUSE	• Fan control module No.2 connector or terminals malfunction • Cooling fan relay No.2 malfunction • Short to ground or open circuit in cooling fan relay No.2 power supply circuit — Short to ground in wiring harness between battery positive terminal and cooling fan relay No.2 terminal A — MAIN 200 A fuse malfunction — ADD FAN DE 40 A fuse malfunction — Open circuit in wiring harness between battery positive terminal and cooling fan relay No.2 terminal A • Short to ground or open circuit in cooling fan relay No.2 power supply circuit — Short to ground in wiring harness between main relay terminal C and cooling fan relay No.2 terminal B — ENGINE3 15 A fuse malfunction — Open circuit in wiring harness between main relay terminal C and cooling fan relay No.2 terminal B • Open circuit in wiring harness between cooling fan relay No.2 terminal D and body ground • Short to ground in wiring harness between cooling fan relay No.2 terminal C and fan control module No.2 terminal A • Open circuit in wiring harness between cooling fan relay No.2 terminal C and fan control module No.2 terminal A • Open circuit in wiring harness between fan control module No.2 terminal C and body ground • Short to ground in wiring harness between fan control module No.2 terminal B and PCM terminal 2AW • PCM connector or terminals malfunction • Short to power supply in wiring harness between fan control module No.2 terminal B and PCM terminal 2AW • Open circuit in wiring harness between fan control module No.2 terminal B and PCM terminal 2AW • Fan control module No.2 malfunction • PCM malfunction

DTC P0481:00	Fan control module No.2 control circuit problem



Diagnostic Procedure

STEP	INSPECTION		ACTION
1	**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	**INSPECT FAN CONTROL MODULE NO.2 CONNECTOR CONDITION** • Switch the ignition off. • Disconnect the fan control module No.2 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 16.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**DETERMINE IF MALFUNCTION CAUSE IS FAN CONTROL MODULE NO.2 POWER SUPPLY CIRCUIT OR OTHER** • Verify that the fan control module No.2 connector is disconnected. • Switch the ignition ON (engine off). • Measure the voltage at the fan control module No. 2 terminal A (wiring harness-side). • Is the voltage **B+**?	Yes	Go to Step 10.
		No	Go to the next step.
4	**INSPECT COOLING FAN RELAY NO.2** • Switch the ignition off. • Remove the cooling fan relay No.2. • Inspect the cooling fan relay No.2. (See RELAY INSPECTION.) • Is there any malfunction?	Yes	Replace the cooling fan relay No.2, then go to Step 16.
		No	Go to the next step.
5	**INSPECT COOLING FAN RELAY NO.2 POWER SUPPLY CIRCUIT FOR SHORT TO GROUND OR OPEN CIRCUIT** • Cooling fan relay No.2 is removed. • Verify that the fan control module No.2 connector is disconnected. • Measure the voltage at the cooling fan relay No.2 terminal A (wiring harness-side). • Is the voltage **B+**?	Yes	Go to the next step.
		No	Inspect the MAIN 200 A fuse and ADD FAN DE 40 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 16.
6	**INSPECT COOLING FAN RELAY NO.2 POWER SUPPLY CIRCUIT FOR SHORT TO GROUND OR OPEN CIRCUIT** • Cooling fan relay No.2 is removed. • Verify that the fan control module No.2 connector is disconnected. • Switch the ignition ON (engine off). • Measure the voltage at the cooling fan relay No.2 terminal B (wiring harness-side). • Is the voltage **B+**?	Yes	Go to the next step.
		No	Inspect the ENGINE3 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 16.
7	**INSPECT COOLING FAN RELAY NO.2 GROUND CIRCUIT FOR OPEN CIRCUIT** • Cooling fan relay No.2 is removed. • Verify that the fan control module No.2 connector is disconnected. • Switch the ignition off. • Inspect for continuity between cooling fan relay No.2 terminal D (wiring harness-side) and 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 16.
8	**INSPECT FAN CONTROL MODULE NO.2 POWER SUPPLY CIRCUIT FOR SHORT TO GROUND** • Cooling fan relay No.2 is removed. • Verify that the fan control module No.2 connector is disconnected. • Inspect for continuity between cooling fan relay No.2 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-D 2.2].) Go to Step 16.
		No	Go to the next step.

STEP	INSPECTION		ACTION
9	**INSPECT FAN CONTROL MODULE NO.2 POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT** • Cooling fan relay No.2 is removed. • Verify that the fan control module No.2 connector is disconnected. • Inspect for continuity between cooling fan relay No.2 terminal C (wiring harness-side) and fan control module No.2 terminal A (wiring harness-side). • Is there continuity?	Yes	Go to Step 16.
		No	Repair or replace the wiring harness for a possible open circuit, then go to Step 16.
10	**INSPECT FAN CONTROL MODULE NO.2 GROUND CIRCUIT FOR OPEN CIRCUIT** • Verify that the fan control module No.2 connector is disconnected. • Switch the ignition off. • Inspect for continuity between fan control module No.2 terminal C (wiring harness-side) and 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 16.
11	**INSPECT FAN CONTROL MODULE NO.2 SIGNAL CIRCUIT FOR SHORT TO GROUND** • Verify that the fan control module No.2 connector is disconnected. • Inspect for continuity between fan control module No.2 terminal B (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-D 2.2].) Go to Step 16.
		No	Go to the next step.
12	**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 16.
		No	Go to the next step.
13	**INSPECT FAN CONTROL MODULE NO.2 SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Verify that the fan control module No.2 and PCM connectors are disconnected. • Switch the ignition ON (engine off). • Measure the voltage at the fan control module No. 2 terminal B (wiring harness-side). • Is the voltage **0 V**?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible short to power supply, then go to Step 16.
14	**INSPECT FAN CONTROL MODULE NO.2 SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Verify that the fan control module No.2 and PCM connectors are disconnected. • Switch the ignition off. • Inspect for continuity between fan control module No.2 terminal B (wiring harness-side) and PCM terminal 2AW (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 16.
15	**INSPECT FAN CONTROL MODULE NO.2** • Inspect the fan control module No.2. (See FAN CONTROL MODULE INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Replace the fan control module No.2, then go to the next step. (See COOLING FAN MOTOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.

STEP	INSPECTION		ACTION
16	**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 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.
17	**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.