DTC P0A94:00 [SKYACTIV-D 2.2]

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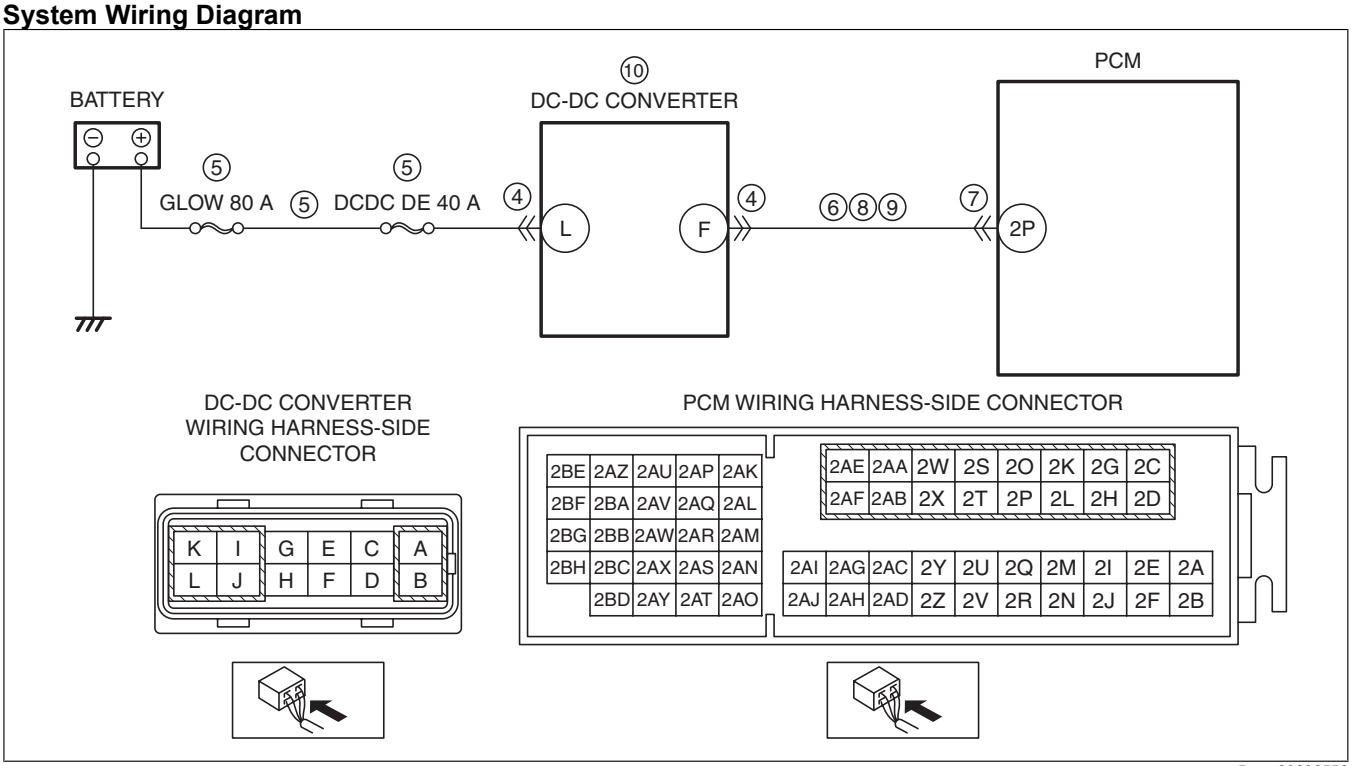
Details On DTCs

DESCRIPTION	**DC-DC converter: control circuit signal error**	
DETECTION CONDITION	Determination conditions	• Internal malfunction signal from DC-DC converter via front body control module (FBCM) is received.(CAN/LIN communication). • Input signal from the DC-DC converter limits the pressure increase time. • Input signal from the DC-DC converter does not implement pressure increase after a pressure increase command to the DC-DC converter.
	Preconditions	• Not applicable
	Drive cycle	• 1
	Self test type	• CMDTC self test
	Sensor used	• Not applicable
FAIL-SAFE FUNCTION	• Inhibits engine-stop by operating the i-stop function.	
VEHICLE STATUS WHEN DTCs ARE OUTPUT	• Flashes i-stop warning light (amber).	
POSSIBLE CAUSE	• Connector or terminal malfunction of the following parts: — PCM — Battery — DC-DC converter • Short to ground in wiring harness between the following terminals: — DC-DC converter terminal L—GLOW 80 A fuse — GLOW 80 A fuse and/or DCDC DE 40 A fuse malfunction — Battery positive terminal—GLOW 80 A fuse • Open circuit in wiring harness between the following terminals: — DC-DC converter terminal L—GLOW 80 A fuse — GLOW 80 A fuse and/or DCDC DE 40 A fuse malfunction — Battery positive terminal—GLOW 80 A fuse • Battery malfunction • DC-DC converter malfunction • Front body control module (FBCM) malfunction • PCM malfunction	

System Wiring Diagram



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Function Explanation (DTC Detection Outline)

- The DC-DC converter is equipped with a boost function to stabilize the power supply to the vehicle's electrical devices when the engine is restarted by i-stop. If the DC-DC converter does not operate, the supply voltage to the vehicle's electrical devices decreases. In this diagnostic, the response condition of the DC-DC converter to the boost demand from the PCM, or the boost by the on-board diagnostic function of the DC-DC converter is not detected, and verification of vehicle malfunctions/safety assurance is performed.

Repeatability Verification Procedure

1. Clear the DTC from the PCM memory using the M-MDS. (See AFTER REPAIR PROCEDURE [SKYACTIV-D 2.2].)
2. Start the engine.
3. Stop the engine by operating the i-stop function.

PID Item/Simulation Item Used In Diagnosis

- Not applicable

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: VERIFY IF BATTERY VOLTAGE IS FALSELY RECOGNIZED BY DTC RELATED CAN OR LIN COMMUNICATION** • Perform the PCM and front body control module (FBCM) DTC inspection using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-D 2.2].) (See DTC INSPECTION [FRONT BODY CONTROL MODULE (FBCM)].) • Are DTCs related CAN or LIN communication recorded?	Yes	Repair or replace the malfunctioning part according to the applicable DTC troubleshooting. (See DTC TABLE [SKYACTIV-D 2.2].) (See DTC TABLE [FRONT BODY CONTROL MODULE (FBCM)].)
		No	Go to the troubleshooting procedure to perform the procedure from Step 1.

STEP	INSPECTION	RESULTS	ACTION
3	**PURPOSE: VERIFY IF THE CURRENT SENSOR IS MISIDENTIFYING MALFUNCTIONS DUE TO A FBCM MALFUNCTION** • Perform the front body control module (FBCM) DTC inspection using the M-MDS. (See DTC INSPECTION [FRONT BODY CONTROL MODULE (FBCM)].) • Is the PENDING CODE for this DTC present?	Yes	Repair or replace the malfunctioning part according to the applicable DTC troubleshooting. (See DTC TABLE [FRONT BODY CONTROL MODULE (FBCM)].)
		No	Go to the troubleshooting procedure to perform the procedure from Step 1.

Troubleshooting Diagnostic Procedure
Intention of troubleshooting procedure

- Step 1
  - — Perform a unit inspection of the battery.
- Step 2—8
  - — Verify if a malfunction is occurring due to a malfunction in each signal transmission and the boost demand line.
- Step 9—10
  - — Verify that the primary malfunction is resolved and there are no other malfunctions.

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	**INSPECT BATTERY** • Switch the ignition off. • Inspect the battery. (See BATTERY INSPECTION [SKYACTIV-D 2.2].) • Is there any malfunction?	Yes	Recharge or replace the battery, then go to Step 8. (See BATTERY RECHARGING [SKYACTIV-D 2.2].)
		No	Go to the next step.
2	**INSPECT DC-DC CONVERTER CONNECTOR CONDITION** • Switch the ignition off. • Disconnect the DC-DC converter 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 8.
		No	Go to the next step.
3	**INSPECT DC-DC CONVERTER POWER SUPPLY CIRCUIT FOR SHORT TO GROUND OR OPEN CIRCUIT** • Verify that the DC-DC converter connector is disconnected. • Measure the voltage at the DC-DC converter terminal L (wiring harness-side). • Is the voltage **B+**?	Yes	Go to the next step.
		No	Inspect the GLOW 80 A fuse and DCDC DE 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 8.
4	**INSPECT DC-DC CONVERTER SIGNAL CIRCUIT FOR SHORT TO GROUND** • Verify that the DC-DC converter connector is disconnected. • Inspect for continuity between DC-DC converter terminal F (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 8.
		No	Go to the next step.

STEP	INSPECTION		ACTION
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 8.
		No	Go to the next step.
6	**INSPECT DC-DC CONVERTER SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY** • Verify that the DC-DC converter and PCM connectors are disconnected. • Switch the ignition ON (engine off). • Measure the voltage at the DC-DC converter terminal F (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 8.
7	**INSPECT DC-DC CONVERTER SIGNAL CIRCUIT FOR OPEN CIRCUIT** • Verify that the DC-DC converter and PCM connectors are disconnected. • Switch the ignition off. • Inspect for continuity between DC-DC converter terminal F (wiring harness-side) and PCM terminal 2P (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 8.
8	**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 KOER self test. (See KOEO/KOER SELF TEST [SKYACTIV-D 2.2].) • Is the same DTC present?	Yes	Replace the DC-DC converter, and then perform Step 8 again. (See DC-DC CONVERTER REMOVAL/INSTALLATION [SKYACTIV-D 2.2].) • 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.
9	**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.