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Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [03/2023 -]
Title: HYBRID / BATTERY CONTROL: HYBRID CONTROL SYSTEM (for PHEV Model): P1CCC49; DC/DC Converter Internal Electronic Failure; 2023 - 2024 MY Prius Prime [03/2023 -]		

DTC	**P1CCC49**	**DC/DC Converter Internal Electronic Failure**

DESCRIPTION

The DC/DC converter converts the voltage from the HV battery to supply power to the vehicle lights, audio system and various ECUs, etc.

At the same time, it performs charging of the auxiliary battery, controlling the output voltage to maintain a specific voltage at the auxiliary battery terminal.

Via CAN communication, the hybrid vehicle control ECU sends stop commands to the DC/DC converter, and receives DC/DC converter Normal/Malfunction status signals.

When the DC/DC converter is stopped due to a circuit malfunction and the auxiliary battery voltage becomes 11 V or less during READY ON, this DTC is stored.

This DTC may also be stored if a high-voltage insulation malfunction occurs.

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
P1CCC49	DC/DC Converter Internal Electronic Failure	Any of the following conditions are met: • DC/DC converter is malfunction, and auxiliary battery voltage is 11 V or less* • DC/DC converter is malfunction for 5 seconds or more (1 trip detection logic)	• Hybrid vehicle control ECU • Inverter with converter assembly • Hybrid vehicle transaxle assembly • Wire harness or connector • DC/DC fuse • PCU NO. 2 fuse	Does not come on	Master Warning: Comes on	Hybrid Control	A	SAE Code: P1CCC

HINT:

*: If the DC/DC converter is malfunctioning, its operation and charging will be stopped and the auxiliary battery voltage will drop.

WIRING DIAGRAM

Refer to the wiring diagram for DTC P19E100.

Click here INFO

CAUTION / NOTICE / HINT

CAUTION:

Refer to the precautions before inspecting high voltage circuit.

Click here INFO

NOTICE:

- After the ignition switch is turned off, there may be a waiting time before disconnecting the auxiliary negative (-) battery terminal.

  Click here INFO
- When disconnecting and reconnecting the auxiliary battery.

HINT:

When disconnecting and reconnecting the auxiliary battery, there is an automatic learning function that completes learning when the respective system is used.

Click here INFO

HINT:

- After repair, clear the DTCs, turn the ignition switch off and wait for 30 seconds or more and perform the following procedure to confirm that the auxiliary battery low voltage indicated by this DTC has been repaired.

  a. Wait for 2 minutes with the shift lever in P, the ignition switch ON (READY) and the following conditions met, then confirm that Data List item "BATT Voltage (Hybrid control system)" is between 13.0 and 15.0 V.

  (If charging is not performed and the electrical load increases, +B voltage may not be steady and will gradually drop.)

  i. Headlight switch is in the HI position.
  ii. A/C blower fan switch is in the HI position.
  iii. Window defogger switch is turned on.
- By performing the following procedure, the DC/DC converter function can be checked.

  a. Connect the AC/DC 400 A probe to the positive (+) auxiliary battery cable.

  i. Turn the ignition switch to ON (READY) and leave the vehicle as is until the electric current flowing to the auxiliary battery becomes 10 A or less.
  ii. Turn the ignition switch to ON (READY) and turn the headlight switch and A/C blower fan switch to the HI position and the window defogger on.
  iii. Confirm that the current drawn from the auxiliary battery is 0 A or lower and the auxiliary battery voltage is between 13.0 and 15.0 V.
- This DTC may be also stored when a part other than the DC/DC converter is malfunctioning or depending on user operation.
- If this vehicle is used to jump start another vehicle with a discharged battery, a fuse may blow due to overcurrent or the DC/DC converter self-protection may be activated. Also, if this vehicle is jump started by a vehicle with a 24 V battery, the same malfunction may occur and this DTC may be stored. (The suspended DC/DC converter control will return to normal by clearing the DTCs and turning the ignition switch off.)
- Check whether high electrical load equipment such as a high-capacitance audio device or electric kettle is used in the vehicle. (A fuse of the auxiliary battery may be blown due to overcurrent.)
- If the DC/DC converter is malfunctioning, the auxiliary battery cannot be charged. Therefore, once the ignition switch is turned off, it may be impossible to turn it to ON (READY) again if the auxiliary battery is completely discharged. In this case, charge the auxiliary battery. Be careful as charging is not performed during the inspection.

- If the ignition switch turns off immediately after it is turned to ON (READY), the auxiliary battery voltage may be low. Charge the auxiliary battery.
- P1CCC49 may be output as a result of the malfunction indicated by the DTCs in table below.

a. The chart above is listed in inspection order of priority.
b. Check DTCs that are output at the same time by following the listed order. (The main cause of the malfunction can be determined without performing unnecessary inspections.)

MALFUNCTION CONTENT	SYSTEM	RELEVANT DTC	
Insulation Malfunction	Hybrid control system	P1C7C49	Hybrid/EV Battery Voltage System Isolation (A/C Area) Internal Electronic Failure
		P1C7D49	Hybrid/EV Battery Voltage System Isolation (Hybrid/EV Battery Area) Internal Electronic Failure
		P1C7E49	Hybrid/EV Battery Voltage System Isolation (Transaxle Area) Internal Electronic Failure
		P1C7F49	Hybrid/EV Battery Voltage System Isolation (Direct Current Area) Internal Electronic Failure
		P1C8049	Hybrid/EV Battery Voltage System Isolation (Rear Motor Area) Internal Electronic Failure
High Voltage Circuit Malfunction	Hybrid control system	P0AA649	Hybrid/EV Battery Voltage System Isolation Internal Electronic Failure
		P0AD911	Hybrid/EV Battery Positive Contactor Circuit Short to Ground
		P0ADD11	Hybrid/EV Battery Negative Contactor Circuit Short to Ground
		P1C8449	High Voltage Power Resource Circuit Short during Ready ON
		P300449	High Voltage Power Resource Circuit Short during Pre-Charge
System malfunction	Hybrid control system	U01BD87	Lost Communication with DC/DC Converter Control Module "C"

PROCEDURE

1.	**CHECK FUSE (DC/DC)**

Click here INFO

NG ▶ **GO TO STEP 15**

OK ▼

2.	**CHECK CONNECTOR CONNECTION CONDITION (HYBRID VEHICLE CONTROL ECU CONNECTOR)**

Click here INFO

NG ▶ **CONNECT SECURELY**

OK ▼

3.	**CHECK CONNECTOR CONNECTION CONDITION (INVERTER WITH CONVERTER ASSEMBLY CONNECTOR)**

Click here INFO

RESULT	PROCEED TO
OK	A
NG (The connector is not connected securely.)	B
NG (The terminals are not making secure contact or are deformed, or water or foreign matter exists in the connector.)	C

B ▶ **CONNECT SECURELY**

C ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

A ▼

4.	**CHECK FUSE (PCU NO. 2)**

Click here INFO

NG ▶ **REPLACE FUSE (PCU NO. 2)**

OK ▼

5.	**CHECK HARNESS AND CONNECTOR (DC/DC CONVERTER POWER SOURCE CIRCUIT)**

Click here INFO

NG ▶ **REPLACE MALFUNCTIONING PARTS**

OK ▼

6.	**CHECK AMD TERMINAL VOLTAGE**

Click here INFO

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

7.	**CHECK AMD TERMINAL CONNECTION CONDITION**

Click here INFO

RESULT		PROCEED TO
There are no arc marks.	The terminal is connected securely and there are no contact problems.	A
There are no arc marks.	The terminal is not connected securely and there is a contact problem.	B
There are arc marks.	-	C

B ▶ **CONNECT SECURELY**

C ▶ **REPLACE MALFUNCTIONING PARTS**

A ▼

8.	**CHECK GROUND WIRE CONNECTION CONDITION (INVERTER WITH CONVERTER ASSEMBLY)**

Click here INFO

OK:
The ground wire is securely installed.

NG ▶ **CONNECT SECURELY**

OK ▼

9.	**CHECK HARNESS AND CONNECTOR (HYBRID VEHICLE CONTROL ECU - INVERTER WITH CONVERTER ASSEMBLY)**

Click here INFO

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

10.	**INSPECT HYBRID VEHICLE CONTROL ECU**

Click here INFO

NG ▶ **REPLACE HYBRID VEHICLE CONTROL ECU**

OK ▼

11.	**CHECK DC/DC CONVERTER FUNCTION**

Click here INFO

OK ▶ **REPLACE INVERTER WITH CONVERTER ASSEMBLY**

NG ▼

12.	**CHECK HIGH VOLTAGE INSULATION**

Click here INFO

OK ▶ **REPLACE INVERTER WITH CONVERTER ASSEMBLY**

NG

▼

13.	**CHECK GENERATOR HIGH-VOLTAGE CIRCUIT**

Click here INFO

NEXT

▼

14.	**CHECK MOTOR HIGH-VOLTAGE CIRCUIT**

Click here INFO

HINT:

If the "Motor High-voltage Circuit" inspection results are normal, perform the next step.

NEXT ▶ **REPLACE INVERTER WITH CONVERTER ASSEMBLY**

15.	**CHECK HARNESS AND CONNECTOR (INVERTER WITH CONVERTER ASSEMBLY - NO. 1 ENGINE ROOM RELAY BLOCK AND NO. 1 JUNCTION BLOCK ASSEMBLY)**

Click here INFO

NG ▶ **GO TO STEP 18**

OK

▼

16.	**CHECK INVERTER WITH CONVERTER ASSEMBLY (AMD TERMINAL)**

Click here INFO

OK ▶ **REPLACE FUSE (DC/DC)**

NG

▼

17.	**REPLACE INVERTER WITH CONVERTER ASSEMBLY**

HINT:

Click here INFO

NEXT ▶ **REPLACE FUSE (DC/DC)**

18.	**REPAIR OR REPLACE HARNESS OR CONNECTOR**

NEXT ▶ **REPLACE FUSE (DC/DC)**