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Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [03/2023 -]
Title: HYBRID / BATTERY CONTROL: PLUG-IN CHARGE CONTROL SYSTEM (for PHEV Model): P308F49; High Voltage Charging Circuit Short during Pre-Charge; 2023 - 2024 MY Prius Prime [03/2023 -]		

DTC	**P308F49**	**High Voltage Charging Circuit Short during Pre-Charge**

DTC SUMMARY

MALFUNCTION DESCRIPTION

The plugin charge control ECU assembly monitors the high-voltage wiring between the HV battery and electric vehicle charger assembly or HV battery and solar energy control ECU assembly and detects an open circuit malfunction.

The cause of this malfunction may be one of the following:

High voltage system malfunction

- HV battery malfunction
- No. 1 traction battery device box malfunction
- High-voltage wire harness malfunction
- High-voltage connector or connection malfunction

Low-voltage circuit (12 V) malfunction

- Plugin charge control ECU assembly malfunction
- No. 1 traction battery device box malfunction
- Battery ECU assembly
- Low voltage wire harness malfunction
- Low voltage connector malfunction

Battery current sensor (IB) circuit malfunction

- Battery current sensor (IB) malfunction
- Communication (wire harness) malfunction

Solar energy control ECU internal voltage sensor (VSOL) circuit malfunction

- Voltage sensor (VSOL) malfunction
- Solar energy control ECU assembly malfunction
- Communication (wire harness) malfunction

DESCRIPTION

Refer to the description for DTC P0D0700.

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DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
P308F49	High Voltage Charging Circuit Short during Pre-Charge	The output voltage of the electric vehicle charger assembly is not boosted during precharging (from when CHRP is turned on until CHRG is turned on). (1 trip detection logic)	• No. 1 traction battery device box • HV supply battery assembly • Solar energy control ECU assembly • Battery ECU assembly • Wire harness or connector	Comes on	Master Warning: Comes on	Plug-in Control	B	SAE Code: P308F

MONITOR DESCRIPTION

The plugin charge control ECU assembly monitors the operating state of the CHR relay. If the voltage in the solar energy control ECU assembly does not increase during pre-charging (from the time when CHRP turns ON to the time when CHRG turns ON), the plugin charge control ECU assembly judges that there is a malfunction and illuminates the MIL and stores a DTC.

MONITOR STRATEGY

Related DTCs	P308F: High Voltage Power Resource Circuit Abort Pre-charge
Required sensors/components	No. 1 traction battery device box Solar energy control ECU assembly Battery ECU
Frequency of operation	-
Duration	TMC's intellectual property
MIL operation	1 driving cycle
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

The monitor will run whenever the following DTCs are not stored	TMC's intellectual property
Other conditions belong to TMC's intellectual property	-

TYPICAL MALFUNCTION THRESHOLDS

TMC's intellectual property	-

COMPONENT OPERATING RANGE

Plugin charge control ECU assembly	DTC P308F49 is not detected

CONFIRMATION DRIVING PATTERN

HINT:

- After repair has been completed, clear the DTC and then check that the vehicle has returned to normal by performing the following All Readiness check procedure.

  Click here INFO
- When clearing the permanent DTCs, refer to the "CLEAR PERMANENT DTC" procedure.

  Click here INFO

1. Connect the GTS to the DLC3.
2. Turn the ignition switch to ON and turn the GTS on.
3. Clear the DTCs (even if no DTCs are stored, perform the clear DTC procedure).
4. Turn the ignition switch off and wait for 2 minutes or more.
5. Confirm to start solar charging and wait for 30 seconds or more. [*1]

HINT:

[*1]: Normal judgment procedure.

The normal judgment procedure is used to complete DTC judgment and also used when clearing permanent DTCs.

6. Enter the following menus: Powertrain / Plug-in Control / Utility / All Readiness.
7. Check the DTC judgment result.

HINT:

- If the judgment result shows NORMAL, the system is normal.
- If the judgment result shows ABNORMAL, the system has a malfunction.
- If the judgment result shows INCOMPLETE or N/A, perform the normal judgment procedure again.

WIRING DIAGRAM

Refer to the wiring diagram for DTC P0D0700.

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CAUTION / NOTICE / HINT

CAUTION:

Refer to the precautions before inspecting high voltage circuit.

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NOTICE:

- After clearing the DTCs (or after disconnecting the cable from the auxiliary battery terminal) before repairs are performed, do not park the vehicle in direct sunlight, etc., as solar charging may be performed which may cause a malfunction of other components.
- After the ignition switch is turned off, there may be a waiting time before disconnecting the negative (-) auxiliary 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

PROCEDURE

1.	**CHECK DTC OUTPUT (HYBRID CONTROL, HV BATTERY, PLUG-IN CONTROL)**

Pre-procedure1

(a) Enter the following menus:

Powertrain > Hybrid Control > Trouble Codes
Powertrain > HV Battery > Trouble Codes
Powertrain > Plug-in Control > Trouble Codes

Procedure1

(b) Check for DTCs.

RESULT	PROCEED TO
P308F49 only is output, or DTCs except the ones in the table below are also output. (w/ Solar Charging System)	A
DTCs of Hybrid Control System in the tables below are output.	B
DTCs of Hybrid Battery System in the tables below are output.	C
DTCs of Plug-in Charge Control System in the tables below are output.	D

MALFUNCTION CONTENT	SYSTEM	RELEVANT DTC	
Microcomputer malfunction	Hybrid Control System	P060A47	Hybrid/EV Powertrain Control Module Monitoring Processor Watchdog / Safety MCU Failure
		P060B1C	Hybrid/EV Powertrain Control Module A/D Processing Voltage Out of Range
		P060B49	Hybrid/EV Powertrain Control Module A/D Processing Internal Electronic Failure
		P060B71	Hybrid/EV Powertrain Control Module A/D Processing Actuator Stuck
		P06881F	ECM/PCM Power Relay Sense Circuit Intermittent
		P1C9E9F	Hybrid/EV System Reset Stuck Off
		P1CE31C	Hybrid/EV Powertrain Control Module Monitoring Processor A/D Processing Voltage Out of Range

MALFUNCTION CONTENT	SYSTEM	RELEVANT DTC	
		P1CE349	Hybrid/EV Powertrain Control Module Monitoring Processor A/D Processing Internal Electronic Failure
		P1CE371	Hybrid/EV Powertrain Control Module Monitoring Processor A/D Processing Actuator Stuck
	Plug-in Charge Control System	P06881F	DC Quick Charging Control Module Power Relay Sense Circuit Intermittent
	Hybrid Battery System	P060A47	Hybrid/EV Battery Energy Control Module Monitoring Processor Watchdog / Safety MCU Failure
		P060B16	Hybrid/EV Battery Energy Control Module A/D Processing Circuit Voltage Below Threshold
		P060B49	Hybrid/EV Battery Energy Control Module A/D Processing Internal Electronic Failure
		P0E2D00	Hybrid/EV Battery Energy Control Module Hybrid/EV Battery Monitor Performance
Communication system malfunction	Hybrid Battery System	P060687	Hybrid/EV Battery Energy Control Module Processor to Monitoring Processor Missing Message
		P060A87	Hybrid/EV Battery Energy Control Module Processor from Monitoring Processor Missing Message
	Plug-in Charge Control System	U113A87	Lost Communication with Solar Charging Control Module Missing Message
		U117B87	Lost Communication with Hybrid/EV Battery Energy Control Module "A" (ch2) Missing Message
Sensor and actuator circuit malfunction	Hybrid Control System	P060687	Hybrid/EV Powertrain Control Module Processor to Monitoring Processor Missing Message
		P060A87	Hybrid/EV Powertrain Control Module Processor from Monitoring Processor Missing Message
	Hybrid Battery System	P0D0A11	Hybrid/EV Battery Charging System Positive Contactor Control Circuit Short to Ground
		P0D0A15	Hybrid/EV Battery Charging System Positive Contactor Control Circuit Short to Auxiliary Battery or Open
		P0D1111	Hybrid/EV Battery Charging System Negative Contactor Control Circuit Short to Ground
		P0D1115	Hybrid/EV Battery Charging System Negative Contactor Control Circuit Short to Auxiliary Battery or Open
		P0E6D11	Hybrid/EV Battery Charging System Precharge Contactor Control Circuit Short to Ground
		P0E6D15	Hybrid/EV Battery Charging System Precharge Contactor Control Circuit Short to Auxiliary Battery or Open
		P1A001C	Hybrid Battery Stack 2 Cell Voltage Detection Voltage Out of Range
		P301A1C	Hybrid Battery Stack 1 Cell Voltage Detection Voltage Out of Range

MALFUNCTION CONTENT	SYSTEM	RELEVANT DTC	
	Plug-in Charge Control System	P1EA41C	Solar Charging Voltage Sensor Circuit Voltage Out of Range
System malfunction	Hybrid Control System	P060647	Hybrid/EV Powertrain Control Module Processor Watchdog / Safety MCU Failure

HINT:

- P308F49 may be output as a result of the malfunction indicated by the DTCs above.

  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.)

Post-procedure1

(c) Turn the ignition switch off.

B ▶ **GO TO DTC CHART (HYBRID CONTROL SYSTEM)**

C ▶ **GO TO DTC CHART (HYBRID BATTERY SYSTEM)**

D ▶ **GO TO DTC CHART (PLUG-IN CHARGE CONTROL SYSTEM)**

A ▼

2.	**CHECK CONNECTOR CONNECTION CONDITION (SOLAR ENERGY CONTROL ECU ASSEMBLY CONNECTOR)**

Click here INFO

RESULT		PROCEED TO
The terminals are connected securely and there are no contact problems.	There is neither foreign matter nor arc marks.	A
The terminals are not connected securely and there is a contact problem.	There is any of foreign matter or arc marks.	B
The terminals are not connected securely and there is a contact problem.	There is neither foreign matter nor arc marks.	C
The terminals are connected securely and there are no contact problems.	There is any of foreign matter or arc marks.	B

B ▶ **REPLACE MALFUNCTIONING PARTS**

C ▶ **CONNECT SECURELY**

A

3.	**CHECK CONNECTOR CONNECTION CONDITION (FLOOR UNDER WIRE CONNECTOR)**

Click here INFO

RESULT		PROCEED TO
The terminals are connected securely and there are no contact problems.	There is neither foreign matter nor arc marks.	A
The terminals are not connected securely and there is a contact problem.	There is any of foreign matter or arc marks.	B
The terminals are not connected securely and there is a contact problem.	There is neither foreign matter nor arc marks.	C
The terminals are connected securely and there are no contact problems.	There is any of foreign matter or arc marks.	B

B ▶ **REPLACE MALFUNCTIONING PARTS**

C ▶ **CONNECT SECURELY**

A

4.	**CHECK CONNECTOR CONNECTION CONDITION (NO. 1 TRACTION BATTERY DEVICE BOX CONNECTOR)**

Click here INFO

RESULT		PROCEED TO
The terminals are connected securely and there are no contact problems.	There is neither foreign matter nor arc marks.	A
The terminals are not connected securely and there is a contact problem.	There is any of foreign matter or arc marks.	B
The terminals are not connected securely and there is a contact problem.	There is neither foreign matter nor arc marks.	C

RESULT		PROCEED TO
The terminals are connected securely and there are no contact problems.	There is any of foreign matter or arc marks.	B

B ▶ **REPLACE MALFUNCTIONING PARTS**

C ▶ **CONNECT SECURELY**

A

5.	**CHECK CONNECTOR CONNECTION CONDITION (NO. 1 TRACTION BATTERY DEVICE BOX CONNECTOR)**

Click here INFO

RESULT		PROCEED TO
The terminals are connected securely and there are no contact problems.	There is neither foreign matter nor arc marks.	A
The terminals are not connected securely and there is a contact problem.	There is any of foreign matter or arc marks.	B
The terminals are not connected securely and there is a contact problem.	There is neither foreign matter nor arc marks.	C
The terminals are connected securely and there are no contact problems.	There is any of foreign matter or arc marks.	B

B ▶ **REPLACE MALFUNCTIONING PARTS**

C ▶ **CONNECT SECURELY**

A

6.	**CHECK CONNECTOR CONNECTION CONDITION (BATTERY ECU CONNECTOR)**

Click here INFO

NG ▶ **CONNECT SECURELY**

OK

7.	**CHECK CONNECTOR CONNECTION CONDITION (NO. 1 TRACTION BATTERY DEVICE BOX CONNECTOR)**

Click here INFO

NG ▶ **CONNECT SECURELY**

OK

8.	**CHECK HARNESS AND CONNECTOR (BATTERY ECU ASSEMBLY - NO. 1 TRACTION BATTERY DEVICE BOX)**

Click here INFO

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

OK

9.	**CHECK HARNESS AND CONNECTOR (NO. 1 TRACTION BATTERY DEVICE BOX - BODY GROUND)**

Click here INFO

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

OK

10.	**CHECK HARNESS AND CONNECTOR (SOLAR ENERGY CONTROL ECU ASSEMBLY - FLOOR UNDER WIRE)**

Click here INFO

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

OK ▼

11.	**CHECK HARNESS AND CONNECTOR (NO. 1 TRACTION BATTERY DEVICE BOX - HIGH VOLTAGE WIRE)**

Click here INFO

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

OK ▼

12.	**SIMULATION TEST**

Pre-procedure1

(a) Clear the DTCs and freeze frame data.

Powertrain > Plug-in Control > Clear DTCs

(b) Turn the ignition switch off and wait for 2 minutes or more.

(c) Confirm to start solar charging and wait for 2 minutes or more.

Procedure1

(d) Check if DTCs are output.

Powertrain > Plug-in Control > Trouble Codes

RESULT	PROCEED TO
P308F49 is not output	A
P308F49 is output	B

Post-procedure1

(e) Turn the ignition switch off.

B ▶ **REPLACE SOLAR ENERGY CONTROL ECU ASSEMBLY**

A

13.	REPLACE NO. 1 TRACTION BATTERY DEVICE BOX

HINT:

Click here INFO

NEXT

14.	READ VALUE USING GTS (CHECK FOR NORMAL OPERATION)

Pre-procedure1

(a) Clear the DTCs.

Powertrain > Plug-in Control > Clear DTCs

(b) Turn the ignition switch off and wait for 2 minutes or more.

(c) Confirm to start solar charging and wait for 2 minutes or more.

Procedure1

(d) According to the display on the GTS, read the Data List and monitor the values of "Hybrid/EV Battery Total Voltage" and "Solar Charging Boosting DC/DC Converter Voltage" for 3 minutes.

Powertrain > Plug-in Control > Data List

TESTER DISPLAY
Solar Charging Boosting DC/DC Converter Voltage
HV/EV Battery Total Voltage

RESULT	PROCEED TO
Difference between "Hybrid/EV Battery Total Voltage" and "Solar Charging Boosting DC/DC Converter Voltage" is always less than 50 V.	A
Difference between "Hybrid/EV Battery Total Voltage" and "Solar Charging Boosting DC/DC Converter Voltage" is 50 V or more.	B

Post-procedure1

(e) Turn the ignition switch off.

A END

B

15.	**REPLACE NO. 1 TRACTION BATTERY DEVICE BOX**

HINT:

Click here INFO

NEXT REPLACE BATTERY ECU ASSEMBLY