Last Modified: 12-04-2024	6.11:8.1.0	**Doc ID:** RM1000000028ZVL
Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [12/2022 -]
Title: HYBRID / BATTERY CONTROL: HYBRID CONTROL SYSTEM (for M20A-FXS): P0C7600; Hybrid/EV Battery System Discharge Time Too Long; 2023 - 2024 MY Prius Prius Prime [12/2022 -]		

DTC	**P0C7600**	**Hybrid/EV Battery System Discharge Time Too Long**

DTC SUMMARY

MALFUNCTION DESCRIPTION

When the ignition switch is turned from ON (READY) to off, the hybrid vehicle control ECU detects that the high-voltage capacitor inside the inverter with converter assembly is not discharged.

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

Inverter voltage sensor (VH) internal circuit malfunction

- Voltage sensor (VH) malfunction
- Motor generator control ECU (MG ECU) malfunction
- Communication (wire harness) malfunction

High voltage system malfunction

Inverter with converter assembly malfunction

Shutdown signal circuit malfunction

- Hybrid vehicle control ECU malfunction
- Wire harness malfunction
- Inverter with converter assembly malfunction

DESCRIPTION

For a description of the inverter.

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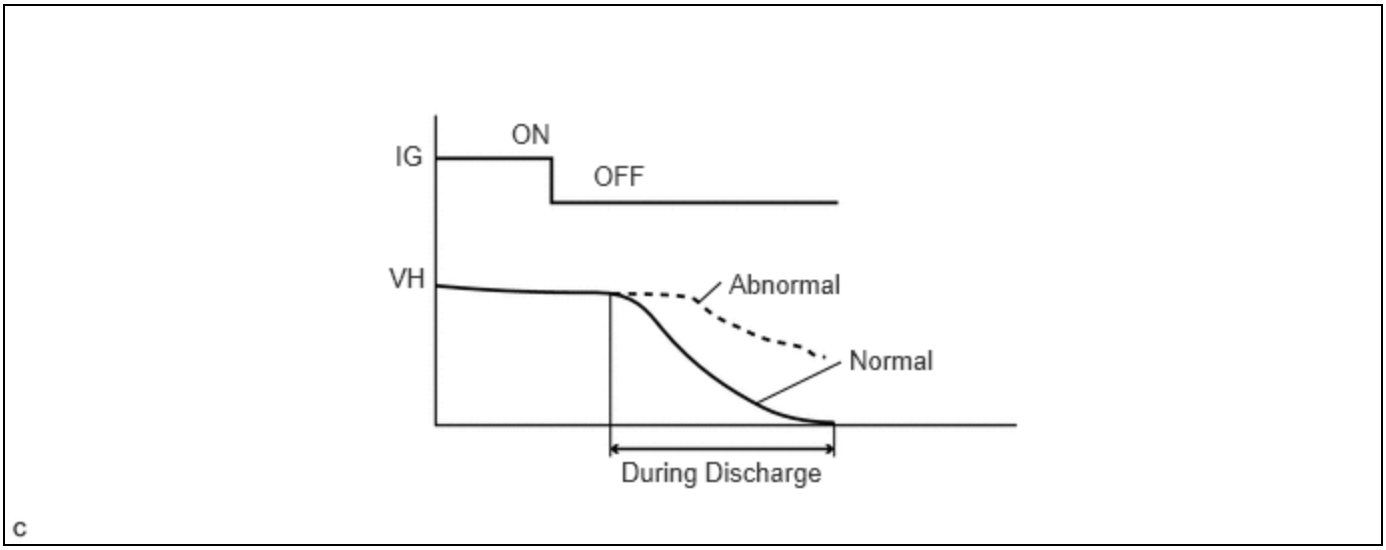
DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
P0C7600	Hybrid/EV Battery System Discharge Time Too Long	The inverter voltage (VH) does not drop during discharge. (Discharge: Offsetting of the residual pressure in the high-voltage side after ignition switch is turned off)	• Inverter with converter assembly • Wire harness or connector • Hybrid vehicle control ECU	Does not come on	Master Warning: Comes on	Hybrid Control	A	SAE Code: P0C76

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
		(1 trip detection logic)						

HINT:

When the ignition switch is turned from ON (READY) to off, the MG ECU discharges voltage stored in the inverter by allowing current to flow to motor (MG2) without generating torque. When the vehicle is normal, VH voltage becomes approximately 0 V after discharging. If VH voltage exceeds a specified value, this DTC is stored.



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.

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1. Clear the DTCs (even if no DTCs are stored, perform the clear DTC procedure).
2. Turn the ignition switch off and wait for 2 minutes or more.
3. Turn the ignition switch to ON (READY) and wait for 30 seconds or more.
4. Turn the ignition switch off and wait for 2 minutes or more.
5. Enter the following menus: Powertrain / Hybrid Control / Utility / All Readiness.
6. 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, perform driving pattern again.

WIRING DIAGRAM

Refer to the wiring diagram for the Shut Down Signal Circuit.

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CAUTION / NOTICE / HINT

CAUTION:

Refer to the precautions before inspecting high voltage circuit.

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NOTICE:

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

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- 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.

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HINT:

- P0C7600 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	
Microcomputer malfunction	Hybrid Control System	P060647	Hybrid/EV Powertrain Control Module Processor Watchdog / Safety MCU Failure
		P060687	Hybrid/EV Powertrain Control Module Processor to Monitoring Processor Missing Message
		P060A47	Hybrid/EV Powertrain Control Module Monitoring Processor Watchdog / Safety MCU Failure
		P060A87	Hybrid/EV Powertrain Control Module Processor from Monitoring Processor Missing Message
		P0A1B49	Drive Motor "A" Control Module Internal Electronic Failure
		P1C9E9F	Hybrid/EV System Reset Stuck Off
	Motor Generator Control System	P0A1B1F	Generator Control Module Circuit Intermittent
		P0A1A47	Generator Control Module Watchdog / Safety MC Failure
		P0A1A49	Generator Control Module Internal Electronic Failure
		P1C2A1C	Generator A/D Converter Circuit Circuit Voltage Out of Range
		P1C2A49	Generator A/D Converter Circuit Internal Electronic Failure
		P1C2B1C	Drive Motor "A" Control Module A/D Converter Circuit Voltage Out of Range
		P1C2B49	Drive Motor "A" Control Module A/D Converter Circuit Internal Electronic Failure
		P1CAC49	Generator Position Sensor Internal Electronic Failure

MALFUNCTION CONTENT	SYSTEM	RELEVANT DTC	
		P1CAD49	Drive Motor "A" Position Sensor Internal Electronic Failure
		P1CAF38	Generator Position Sensor REF Signal Cycle Malfunction Signal Frequency Incorrect
		P1CB038	Drive Motor "A" Position Sensor REF Signal Frequency Incorrect
		P313383	Communication Error from Generator to Drive Motor "A" Value of Signal Protection Calculation Incorrect
		P313386	Communication Error from Generator to Drive Motor "A" Signal Invalid
Power source circuit malfunction	Motor Generator Control System	P06D61C	Generator Control Module Offset Power Circuit Voltage Out of Range
		P06B01C	Generator Control Module Position Sensor REF Power Source Circuit Voltage Out of Range
Communication system malfunction	Motor Generator Control System	P313387	Communication Error from Generator to Drive Motor "A" Missing Message
Sensor and actuator circuit malfunction	Hybrid Control System	P0AD911	Hybrid/EV Battery Positive Contactor Circuit Short to Ground
		P0AD915	Hybrid/EV Battery Positive Contactor Circuit Short to Auxiliary Battery or Open
		P0ADD11	Hybrid/EV Battery Negative Contactor Circuit Short to Ground
		P0ADD15	Hybrid/EV Battery Negative Contactor Circuit Short to Auxiliary Battery or Open
	Motor Generator Control System	P0A3F16	Drive Motor "A" Position Sensor Circuit Voltage Below Threshold
		P0A4B16	Generator Position Sensor Circuit Voltage Below Threshold
		P0A4B21	Generator Position Sensor Signal Amplitude < Minimum
		P0A4B22	Generator Position Sensor Signal Amplitude > Maximum
		P0C5013	Drive Motor "A" Position Sensor Circuit "A" Circuit Open
		P0C5016	Drive Motor "A" Position Sensor Circuit "A" Circuit Voltage Below Threshold
		P0C5017	Drive Motor "A" Position Sensor Circuit "A" Circuit Voltage Above Threshold
		P0C5A13	Drive Motor "A" Position Sensor Circuit "B" Circuit Open
		P0C5A16	Drive Motor "A" Position Sensor Circuit "B" Circuit Voltage Below Threshold
		P0C5A17	Drive Motor "A" Position Sensor Circuit "B" Circuit Voltage Above Threshold

MALFUNCTION CONTENT	SYSTEM	RELEVANT DTC	
		P0C6413	Generator Position Sensor Circuit "A" Circuit Open
		P0C6416	Generator Position Sensor Circuit "A" Circuit Voltage Below Threshold
		P0C6417	Generator Position Sensor Circuit "A" Circuit Voltage Above Threshold
		P0C6913	Generator Position Sensor Circuit "B" Circuit Open
		P0C6916	Generator Position Sensor Circuit "B" Circuit Voltage Below Threshold
		P0C6917	Generator Position Sensor Circuit "B" Circuit Voltage Above Threshold
System malfunction	Hybrid Control System	P0D2D1C	Drive Motor "A" Inverter Voltage Sensor Voltage Out of Range
		P1C8349	High Voltage Power Resource Circuit Voltage Sensor after Boosting Malfunction
	Motor Generator Control System	P0D2D16	Drive Motor "A" Inverter Voltage Sensor (VH) Circuit Voltage Below Threshold
		P0D2D17	Drive Motor "A" Inverter Voltage Sensor (VH) Circuit Voltage Above Threshold
		P1CB69E	Drive Motor "A" Inverter Voltage Sensor (VH) Stuck On

PROCEDURE

1.	**CHECK SHUT DOWN SIGNAL CIRCUIT**

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HINT:

If the "Shut Down Signal Circuit" inspection results are normal, perform the next step.

NEXT **REPLACE INVERTER WITH CONVERTER ASSEMBLY**