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Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [03/2023 -]
Title: HYBRID / BATTERY CONTROL: MOTOR GENERATOR CONTROL SYSTEM (for PHEV Model): P0BE512,...,P0BED1F; Drive Motor "A" Phase U Current Sensor Circuit Short to Battery; 2023 - 2024 MY Prius Prime [03/2023 -]		

DTC	**P0BE512**	**Drive Motor "A" Phase U Current Sensor Circuit Short to Battery**

DTC	**P0BE514**	**Drive Motor "A" Phase U Current Sensor Circuit Short to Ground or Open**

DTC	**P0BE51F**	**Drive Motor "A" Phase U Current Sensor Circuit Intermittent**

DTC	**P0BE912**	**Drive Motor "A" Phase V Current Sensor Circuit Short to Battery**

DTC	**P0BE914**	**Drive Motor "A" Phase V Current Sensor Circuit Short to Ground or Open**

DTC	**P0BE91F**	**Drive Motor "A" Phase V Current Sensor Circuit Intermittent**

DTC	**P0BED12**	**Drive Motor "A" Phase W Current Sensor Circuit Short to Battery**

DTC	**P0BED14**	**Drive Motor "A" Phase W Current Sensor Circuit Short to Ground or Open**

DTC	**P0BED1F**	**Drive Motor "A" Phase W Current Sensor Circuit Intermittent**

DTC SUMMARY

MALFUNCTION DESCRIPTION

These DTCs indicate that the current sensor value is abnormal. The cause of this malfunction may be one of the following:

Internal inverter malfunction

Inverter with converter assembly internal circuit malfunction

Inverter low-voltage circuit malfunction

The connectors are not connected properly

DESCRIPTION

The motor generator control ECU (MG ECU), which is built into the inverter with converter assembly, monitors the motor inverter current sensor. These DTCs indicate the malfunction of current sensors and do not indicate a malfunction of the high-voltage system.

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
P0BE512	Drive Motor "A" Phase U Current Sensor Circuit Short to Battery	Malfunction in motor inverter current sensor (phase U main sensor) (Short to +B) (1 trip detection logic)	• Inverter with converter assembly • Wire harness or connector	Comes on	Master Warning: Comes on	Motor Generator	A	SAE Code: P0BE8
P0BE514	Drive Motor "A" Phase U Current Sensor Circuit Short to Ground or Open	Malfunction in motor inverter current sensor (phase U main sensor) (Open or short to ground) (1 trip detection logic)	• Inverter with converter assembly • Wire harness or connector	Comes on	Master Warning: Comes on	Motor Generator	A	SAE Code: P0BE7
P0BE51F	Drive Motor "A" Phase U Current Sensor Circuit Intermittent	Short to +B, open or short to ground detected in motor inverter current sensor (phase U main sensor) when DTC P0C7917, P0E5717, P0D3319, P1C5D19, P1C5F19 or P1C5E19 is stored. (1 trip detection logic)	• Inverter with converter assembly • Wire harness or connector	Does not come on	Master Warning: Does not come on	Motor Generator	A	SAE Code: P1C40
P0BE912	Drive Motor "A" Phase V Current Sensor Circuit	Malfunction in motor inverter current sensor (phase V main sensor)	• Inverter with converter assembly • Wire harness or	Comes on	Master Warning: Comes on	Motor Generator	A	SAE Code: P0BEC

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
	Short to Battery	(Short to +B) (1 trip detection logic)	connector					
P0BE914	Drive Motor "A" Phase V Current Sensor Circuit Short to Ground or Open	Malfunction in motor inverter current sensor (phase V main sensor) (Open or short to ground) (1 trip detection logic)	• Inverter with converter assembly • Wire harness or connector	Comes on	Master Warning: Comes on	Motor Generator	A	SAE Code: P0BEB
P0BE91F	Drive Motor "A" Phase V Current Sensor Circuit Intermittent	Short to +B, open or short to ground detected in motor inverter current sensor (phase V main sensor) when DTC P0C7917, P0E5717, P0D3319, P1C5D19, P1C5F19 or P1C5E19 is stored. (1 trip detection logic)	• Inverter with converter assembly • Wire harness or connector	Does not come on	Master Warning: Does not come on	Motor Generator	A	SAE Code: P1C41
P0BED12	Drive Motor "A" Phase W Current Sensor Circuit Short to Battery	Malfunction in motor inverter current sensor (phase W main sensor) (Short to +B) (1 trip detection logic)	• Inverter with converter assembly • Wire harness or connector	Comes on	Master Warning: Comes on	Motor Generator	A	SAE Code: P0BF0
P0BED14	Drive Motor "A" Phase W Current Sensor Circuit Short to Ground or Open	Malfunction in motor inverter current sensor (phase W main sensor) (Open or short to ground)	• Inverter with converter assembly • Wire harness or connector	Comes on	Master Warning: Comes on	Motor Generator	A	SAE Code: P0BEF

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
		(1 trip detection logic)						
P0BED1F	Drive Motor "A" Phase W Current Sensor Circuit Intermittent	Short to +B, open or short to ground detected in motor inverter current sensor (phase W main sensor) when DTC P0C7917, P0E5717, P0D3319, P1C5D19, P1C5F19 or P1C5E19 is stored. (1 trip detection logic)	• Inverter with converter assembly • Wire harness or connector	Does not come on	Master Warning: Does not come on	Motor Generator	A	SAE Code: P1C42

MONITOR DESCRIPTION

The motor generator control ECU monitors the motor inverter current sensor. If the motor generator control ECU detects a malfunction, it will illuminate MIL and store a DTC.

MONITOR STRATEGY

Related DTCs	P0BE8 (INF P0BE512): Drive Motor "A" Phase U Current Sensor Range check (High voltage) P0BE7 INF (P0BE514): Drive Motor "A" Phase U Current Sensor Range check (Low voltage) P0BEC (INF P0BE912): Drive Motor "A" Phase V Current Sensor Range check (High voltage) P0BEB (INF P0BE914): Drive Motor "A" Phase V Current Sensor Range check (Low voltage) P0BF0 (INF P0BED12): Drive Motor "A" Phase W Current Sensor Range check (High voltage) P0BEF (INF P0BED14): Drive Motor "A" Phase W Current Sensor Range check (Low voltage)
Required sensors/components	Motor inverter phase U current sensor Motor inverter phase V current sensor Motor inverter phase W current sensor
Frequency of operation	Continuous
Duration	TMC's intellectual property
MIL operation	Immediately
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

Motor generator control ECU	DTC P0BE8 (INF P0BE512) is not detected DTC P0BE7 (INF P0BE514) is not detected DTC P0BEC (INF P0BE912) is not detected DTC P0BEB (INF P0BE914) is not detected DTC P0BF0 (INF P0BED12) is not detected DTC P0BEF (INF P0BED14) 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. 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 and wait for 5 seconds or more. [*1]
4. Turn the ignition switch to ON (READY) and wait for 5 seconds or more. [*2]
5. Depress the accelerator pedal of the vehicle with the engine stopped and the shift lever in P to start the engine. [*3]
6. Drive the vehicle forward with the shift lever in D for 5 m (16 ft.) or more. [*4]
7. Drive the vehicle backward with the shift lever in R for 5 m (16 ft.) or more. [*5]

HINT:

[*1] to [*5]: Normal judgment procedure.

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

8. Enter the following menus: Powertrain / Motor Generator / Utility / All Readiness.
9. 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 the normal judgment procedure again.

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 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

HINT:

P0BE512, P0BE514, P0BE51F, P0BE912, P0BE914, P0BE91F, P0BED12, P0BED14 and P0BED1F 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	RELEVANT DTC	
Power source circuit malfunction	P06B01C	Generator Control Module Position Sensor REF Power Source Circuit Voltage Out of Range
	P06D61C	Generator Control Module Offset Power Circuit Voltage Out of Range
System malfunction	P0A7873	Drive Motor "A" Inverter Actuator Stuck Closed

PROCEDURE

1.	**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

A ▶ **REPLACE INVERTER WITH CONVERTER ASSEMBLY**

B ▶ **CONNECT SECURELY**

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