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Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [12/2022 -]
Title: HYBRID / BATTERY CONTROL: MOTOR GENERATOR CONTROL SYSTEM (for M20A-FXS): P0BF112,...,P0BF91F; Drive Motor "B" Phase U Current Sensor Circuit Short to Battery; 2023 - 2024 MY Prius Prius Prime [12/2022 -]		

DTC	**P0BF112**	**Drive Motor "B" Phase U Current Sensor Circuit Short to Battery**

DTC	**P0BF114**	**Drive Motor "B" Phase U Current Sensor Circuit Short to Ground or Open**

DTC	**P0BF11F**	**Drive Motor "B" Phase U Current Sensor Circuit Intermittent**

DTC	**P0BF512**	**Drive Motor "B" Phase V Current Sensor Circuit Short to Battery**

DTC	**P0BF514**	**Drive Motor "B" Phase V Current Sensor Circuit Short to Ground or Open**

DTC	**P0BF51F**	**Drive Motor "B" Phase V Current Sensor Circuit Intermittent**

DTC	**P0BF912**	**Drive Motor "B" Phase W Current Sensor Circuit Short to Battery**

DTC	**P0BF914**	**Drive Motor "B" Phase W Current Sensor Circuit Short to Ground or Open**

DTC	**P0BF91F**	**Drive Motor "B" 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:

Inverter internal 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 rear 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
P0BF112	Drive Motor "B" Phase U Current Sensor Circuit Short to Battery	Malfunction in rear motor inverter current sensor (phase U main sensor) (Short to +B) (1 trip detection logic)	• Wire harness or connector • Inverter with converter assembly	Comes on	Master Warning: Comes on	Motor Generator	A	SAE Code: P0BF4
P0BF114	Drive Motor "B" Phase U Current Sensor Circuit Short to Ground or Open	Malfunction in rear motor inverter current sensor (phase U main sensor) (Open or short to ground) (1 trip detection logic)	• Wire harness or connector • Inverter with converter assembly	Comes on	Master Warning: Comes on	Motor Generator	A	SAE Code: P0BF3
P0BF11F	Drive Motor "B" Phase U Current Sensor Circuit Intermittent	Short to +B, open or short to ground detected in rear motor inverter current sensor (phase U main sensor) when DTC P0C7917, P0E5717, P0D3319, P1C5D19, P1C5F19 or P1C5E19 is stored. (1 trip detection logic)	• Wire harness or connector • Inverter with converter assembly	Does not come on	Master Warning: Does not come on	Motor Generator	A	SAE Code: P1C43

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
P0BF512	Drive Motor "B" Phase V Current Sensor Circuit Short to Battery	Malfunction in rear motor inverter current sensor (phase V main sensor) (Short to +B) (1 trip detection logic)	• Wire harness or connector • Inverter with converter assembly	Comes on	Master Warning: Comes on	Motor Generator	A	SAE Code: P0BF8
P0BF514	Drive Motor "B" Phase V Current Sensor Circuit Short to Ground or Open	Malfunction in rear motor inverter current sensor (phase V main sensor) (Open or short to ground) (1 trip detection logic)	• Wire harness or connector • Inverter with converter assembly	Comes on	Master Warning: Comes on	Motor Generator	A	SAE Code: P0BF7
P0BF51F	Drive Motor "B" Phase V Current Sensor Circuit Intermittent	Short to +B, open or short to ground detected in rear motor inverter current sensor (phase V main sensor) when DTC P0C7917, P0E5717, P0D3319, P1C5D19, P1C5F19 or P1C5E19 is stored. (1 trip detection logic)	• Wire harness or connector • Inverter with converter assembly	Does not come on	Master Warning: Does not come on	Motor Generator	A	SAE Code: P1C44
P0BF912	Drive Motor "B" Phase W Current Sensor Circuit Short to Battery	Malfunction in rear motor inverter current sensor (phase W main sensor) (Short to +B) (1 trip detection logic)	• Wire harness or connector • Inverter with converter assembly	Comes on	Master Warning: Comes on	Motor Generator	A	SAE Code: P0BFC

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
P0BF914	Drive Motor "B" Phase W Current Sensor Circuit Short to Ground or Open	Malfunction in rear motor inverter current sensor (phase W main sensor) (Open or short to ground) (1 trip detection logic)	• Wire harness or connector • Inverter with converter assembly	Comes on	Master Warning: Comes on	Motor Generator	A	SAE Code: P0BFB
P0BF91F	Drive Motor "B" Phase W Current Sensor Circuit Intermittent	Short to +B, open or short to ground detected in rear motor inverter current sensor (phase W main sensor) when DTC P0C7917, P0E5717, P0D3319, P1C5D19, P1C5F19 or P1C5E19 is stored. (1 trip detection logic)	• Wire harness or connector • Inverter with converter assembly	Does not come on	Master Warning: Does not come on	Motor Generator	A	SAE Code: P1C45

MONITOR DESCRIPTION

The motor generator control ECU monitors the rear 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	P0BF4 (INF P0BF112): Drive Motor "B" Phase U Current Sensor Range check (High voltage) P0BF3 INF (P0BF114): Drive Motor "B" Phase U Current Sensor Range check (Low voltage) P0BF8 (INF P0BF512): Drive Motor "B" Phase V Current Sensor Range check (High voltage) P0BF7 (INF P0BF514): Drive Motor "B" Phase V Current Sensor Range check (Low voltage) P0BFC (INF P0BF912): Drive Motor "B" Phase W Current Sensor Range check (High voltage) P0BFB (INF P0BF914): Drive Motor "B" Phase W Current Sensor Range check (Low voltage)

Required sensors/components	Rear motor inverter phase U current sensor Rear motor inverter phase V current sensor Rear 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 P0BF4 (INF P0BF112) is not detected DTC P0BF3 INF (P0BF114) is not detected DTC P0BF8 (INF P0BF512) is not detected DTC P0BF7 (INF P0BF514) is not detected DTC P0BFC (INF P0BF912) is not detected DTC P0BFB (INF P0BF914) 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:

P0BF112, P0BF114, P0BF11F, P0BF512, P0BF514, P0BF51F, P0BF912, P0BF914 or P0BF91F may be output as a result of the malfunctions indicated by the DTCs in table below.

1. The chart above is listed in inspection order of priority.
2. 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	
Power source circuit malfunction	Motor generator control system	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	Motor generator control system	P0A7973	Drive Motor "B" 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**