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Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [12/2022 -]
Title: HYBRID / BATTERY CONTROL: HYBRID BATTERY SYSTEM (for M20A-FXS): P0A9B1C,P0AC51C,P0ACA1C,P0AE81C,P0BC21C,P0C331C; Hybrid/EV Battery Temperature Sensor "A" Voltage Out of Range; 2023 - 2024 MY Prius Prius Prime [12/2022 -]		

DTC	**P0A9B1C**	**Hybrid/EV Battery Temperature Sensor "A" Voltage Out of Range**

DTC	**P0AC51C**	**Hybrid/EV Battery Temperature Sensor "B" Voltage Out of Range**

DTC	**P0ACA1C**	**Hybrid/EV Battery Temperature Sensor "C" Voltage Out of Range**

DTC	**P0AE81C**	**Hybrid/EV Battery Temperature Sensor "D" Voltage Out of Range**

DTC	**P0BC21C**	**Hybrid/EV Battery Temperature Sensor "E" Voltage Out of Range**

DTC	**P0C331C**	**Hybrid/EV Battery Temperature Sensor "F" Voltage Out of Range**

DESCRIPTION

Refer to the description for DTC P0A9B11.

Click here INFO

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
P0A9B1C	Hybrid/EV Battery Temperature Sensor "A" Voltage Out of Range	The performance of battery temperature sensor 0 is abnormal; the difference in output between it and other battery temperature sensors is excessively large. (1 trip detection logic)	• HV battery • Battery ECU assembly	Comes on	Master warning: Comes on	HV Battery	A	SAE Code: P0A9C

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
P0AC51C	Hybrid/EV Battery Temperature Sensor "B" Voltage Out of Range	The performance of battery temperature sensor 1 is abnormal; the difference in output between it and other battery temperature sensors is excessively large. (1 trip detection logic)	• HV battery • Battery ECU assembly	Comes on	Master warning: Comes on	HV Battery	A	SAE Code: P0AC6
P0ACA1C	Hybrid/EV Battery Temperature Sensor "C" Voltage Out of Range	The performance of battery temperature sensor 2 is abnormal; the difference in output between it and other battery temperature sensors is excessively large. (1 trip detection logic)	• HV battery • Battery ECU assembly	Comes on	Master warning: Comes on	HV Battery	A	SAE Code: P0ACB
P0AE81C	Hybrid/EV Battery Temperature Sensor "D" Voltage Out of Range	The performance of battery temperature sensor 3 is abnormal; the difference in output between it and other battery temperature sensors is excessively large. (1 trip detection logic)	• HV battery • Battery ECU assembly	Comes on	Master warning: Comes on	HV Battery	A	SAE Code: P0AE9

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
P0BC21C	Hybrid/EV Battery Temperature Sensor "E" Voltage Out of Range	The performance of battery temperature sensor 4 is abnormal; the difference in output between it and other battery temperature sensors is excessively large. (1 trip detection logic)	• HV battery • Battery ECU assembly	Comes on	Master warning: Comes on	HV Battery	A	SAE Code: P0BC3
P0C331C	Hybrid/EV Battery Temperature Sensor "F" Voltage Out of Range	The performance of battery temperature sensor 5 is abnormal; the difference in output between it and other battery temperature sensors is excessively large. (1 trip detection logic)	• HV battery • Battery ECU assembly	Comes on	Master warning: Comes on	HV Battery	A	SAE Code: P0C34

HINT:

If the vehicle as is left as is for 24 hours, the value of "Hybrid/EV Battery Temperature" will be almost the same as the ambient temperature.

MONITOR DESCRIPTION

If the battery ECU assembly detects a malfunction in the HV battery temperature sensor, the battery ECU assembly illuminates the MIL and set a DTC.

MONITOR STRATEGY

Related DTCs	P0A9C (INF P0A9B1C), P0AC6 (INF P0AC51C), P0ACB (INF P0ACA1C), P0AE9 (INF P0AE81C), P0BC3 (INF P0BC21C), P0C34 (INF P0C331C): Battery temperature sensor malfunction (stuck)
Required sensors/components	Battery temperature sensor
Frequency of operation	Continuous
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

Battery ECU assembly	DTC P0A9C (INF P0A9B1C) is not detected DTC P0AC6 (INF P0AC51C) is not detected DTC P0ACB (INF P0ACA1C) is not detected DTC P0AE9 (INF P0AE81C) is not detected DTC P0BC3 (INF P0BC21C) is not detected DTC P0C34 (INF P0C331C) 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. With ignition switch ON and wait for 10 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.

4. Enter the following menus: Powertrain / HV Battery / Utility / All Readiness.
5. 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.

WIRING DIAGRAM

Refer to the wiring diagram for DTC P0A9B11.

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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

PROCEDURE

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

Pre-procedure1

(a) None

Procedure1

(b) Check for DTCs.

Powertrain > HV Battery > Trouble Codes
Powertrain > Hybrid Control > Trouble Codes

RESULT	PROCEED TO
"P0A9B1C, P0AC51C, P0ACA1C, P0AE81C, P0BC21C or P0C331C" only is output, or DTCs except the ones in the table below are also output.	A
DTCs of hybrid battery system in the table below are output.	B
DTCs of hybrid control system in the table below are output.	C

SYSTEM	RELEVANT DTC	
Hybrid battery system	P060A47	Hybrid/EV Battery Energy Control Module Monitoring Processor Watchdog / Safety MCU Failure
	P060B49	Hybrid/EV Battery Energy Control Module A/D Processing Internal Electronic Failure
	P060687	Hybrid/EV Battery Energy Control Module Processor to Monitoring Processor Missing Message

SYSTEM	RELEVANT DTC	
Hybrid control system	P0A1F94	Hybrid/EV Battery Energy Control Module Unexpected Operation

Post-procedure1

(c) Turn the ignition switch off.

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

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

A

2.	**CHECK DTC**

(a) Check the DTCs that were output when the vehicle was brought to the workshop.

RESULT	PROCEED TO
"P0A9B1C, P0AC51C or P0ACA1C" is also output.	A
"P0AE81C, P0BC21C or P0C331C" is also output.	B

B ▶ **GO TO STEP 4**

A

3.	**CHECK HV BATTERY (BATTERY TEMPERATURE SENSOR 0 to 2)**

Click here INFO

OK ▶ **REPLACE BATTERY ECU ASSEMBLY**

NG ▶ **REPLACE HV BATTERY**

4.	**CHECK HV BATTERY (BATTERY TEMPERATURE SENSOR 3 to 5)**

Click here INFO

OK ▶ **REPLACE BATTERY ECU ASSEMBLY**

NG ▶ **REPLACE HV BATTERY**