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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): P0A9B2A,...,P306A62; Hybrid/EV Battery Temperature Sensor "A" Signal Stuck In Range; 2023 - 2024 MY Prius Prius Prime [12/2022 -]		

DTC	**P0A9B2A**	**Hybrid/EV Battery Temperature Sensor "A" Signal Stuck In Range**

DTC	**P0AC52A**	**Hybrid/EV Battery Temperature Sensor "B" Signal Stuck In Range**

DTC	**P0ACA2A**	**Hybrid/EV Battery Temperature Sensor "C" Signal Stuck In Range**

DTC	**P0AE82A**	**Hybrid/EV Battery Temperature Sensor "D" Signal Stuck In Range**

DTC	**P0BC22A**	**Hybrid/EV Battery Temperature Sensor "E" Signal Stuck In Range**

DTC	**P0C332A**	**Hybrid/EV Battery Temperature Sensor "F" Signal Stuck In Range**

DTC	**P306562**	**Hybrid/EV Battery Temperature Sensor "Group 1" Signal Compare Failure**

DTC	**P306A62**	**Hybrid/EV Battery Temperature Sensor "Group 2" Signal Compare Failure**

DESCRIPTION

Refer to the description for DTC P0A9B11.

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DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
P0A9B2A	Hybrid/EV Battery Temperature Sensor "A" Signal Stuck In Range	The performance of battery temperature sensor 0 is abnormal and its output is stuck. (2 trip detection logic)	• HV battery • Battery ECU assembly	Comes on	Master warning: Comes on	HV Battery	A	SAE Code: P0A9C
P0AC52A	Hybrid/EV Battery Temperature Sensor "B" Signal Stuck In Range	The performance of battery temperature sensor 1 is abnormal and its output is stuck. (2 trip detection logic)	• HV battery • Battery ECU assembly	Comes on	Master warning: Comes on	HV Battery	A	SAE Code: P0AC6
P0ACA2A	Hybrid/EV Battery Temperature Sensor "C" Signal Stuck In Range	The performance of battery temperature sensor 2 is abnormal and its output is stuck. (2 trip detection logic)	• HV battery • Battery ECU assembly	Comes on	Master warning: Comes on	HV Battery	A	SAE Code: P0ACB
P0AE82A	Hybrid/EV Battery Temperature Sensor "D" Signal Stuck In Range	The performance of battery temperature sensor 3 is abnormal and its output is stuck. (2 trip detection logic)	• HV battery • Battery ECU assembly	Comes on	Master warning: Comes on	HV Battery	A	SAE Code: P0AE9
P0BC22A	Hybrid/EV Battery Temperature Sensor "E" Signal Stuck In Range	The performance of battery temperature sensor 4 is abnormal and its output is stuck. (2 trip detection logic)	• HV battery • Battery ECU assembly	Comes on	Master warning: Comes on	HV Battery	A	SAE Code: P0BC3

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
P0C332A	Hybrid/EV Battery Temperature Sensor "F" Signal Stuck In Range	The performance of battery temperature sensor 5 is abnormal and its output is stuck. (2 trip detection logic)	• HV battery • Battery ECU assembly	Comes on	Master warning: Comes on	HV Battery	A	SAE Code: P0C34
P306562	Hybrid/EV Battery Temperature Sensor "Group 1" Signal Compare Failure	The performance of any battery temperature sensor (0 to 2) is abnormal and the difference in output between it and each other battery temperature sensor is excessively large. (1 trip detection logic)	• HV battery • Battery ECU assembly	Comes on	Master warning: Comes on	HV Battery	A	SAE Code: P3065
P306A62	Hybrid/EV Battery Temperature Sensor "Group 2" Signal Compare Failure	The performance of any battery temperature sensor (3 to 5) is abnormal and the difference in output between it and each other battery temperature sensor is excessively large. (1 trip detection logic)	• HV battery • Battery ECU assembly	Comes on	Master warning: Comes on	HV Battery	A	SAE Code: P306A

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 P0A9B2A), P0AC6 (INF P0AC52A), P0ACB (INF P0ACA2A), P0AE9 (INF P0AE82A), P0BC3 (INF P0BC22A), P0C34 (INF P0C332A): Battery temperature sensor malfunction (stuck) P3065 (INF P306562), P306A (INF P306A62): Battery temperature sensor malfunction (deviation)
Required sensors/components	Battery temperature sensor
Frequency of operation	Continuous
Duration	TMC's intellectual property
MIL operation	1 driving cycle / 2 driving cycles
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 P0A9B2A) is not detected DTC P0AC6 (INF P0AC52A) is not detected DTC P0ACB (INF P0ACA2A) is not detected DTC P0AE9 (INF P0AE82A) is not detected DTC P0BC3 (INF P0BC22A) is not detected DTC P0C34 (INF P0C332A) is not detected DTC P3065 (INF P306562) is not detected DTC P306A (INF P306A62) 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.

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

  Click here INFO

P0A9B2A, P0AC52A, P0ACA2A, P0AE82A, P0BC22A, P0C332A:

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. Drive the vehicle for approximately 10 minutes according to the freeze frame data items "Vehicle Speed", "Accelerator Position", "Hybrid/EV Battery Temperature 1 to 6" and "Hybrid/EV Battery Current" when ambient temperature is -10°C (14°F) or higher.[*1]

HINT:

- Check that the output of each battery temperature sensor varies.
- Check that the difference in output between each battery temperature sensor is not excessively large.
- [*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.

P306562, P306A62:

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. Turn the ignition switch to ON and turn the GTS on.
6. With ignition switch ON and wait for 10 seconds or more when the ambient temperature is -10°C (14°F) or higher.[*1]

HINT:

- Check that the difference in output between each battery temperature sensor is not large.
- [*1]: Normal judgment procedure.

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

7. Enter the following menus: Powertrain / HV Battery / Utility / All Readiness.
8. 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 P0A9B11.

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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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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
"P0A9B2A, P0AC52A, P0ACA2A, P0AE82A, P0BC22A, P0C332A, P306562 or P306A62" 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
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
"P0A9B2A, P0AC52A, P0ACA2A or P306562" is also output.	A
"P0AE82A, P0BC22A, P0C332A or P306A62" 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