Last Modified: 12-04-2024	6.11:8.1.0	**Doc ID:** RM1000000029A4R
Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [12/2022 -]
Title: HYBRID / BATTERY CONTROL: HYBRID BATTERY SYSTEM (for M20A-FXS): P0AAC11,P0AAC15; Hybrid/EV Battery Air Temperature Sensor "A" Circuit Short to Ground; 2023 - 2024 MY Prius Prius Prime [12/2022 -]		

DTC	**P0AAC11**	**Hybrid/EV Battery Air Temperature Sensor "A" Circuit Short to Ground**

DTC	**P0AAC15**	**Hybrid/EV Battery Air Temperature Sensor "A" Circuit Short to Auxiliary Battery or Open**

DESCRIPTION

The inlet air temperature sensor (HV battery) is mounted on the HV battery. The resistance of the sensor varies in accordance with changes in the intake air temperature. The characteristics of the inlet air temperature sensor are the same as those of the battery temperature sensors (Click here INFO). The battery ECU assembly uses signals from the inlet air temperature sensor to control the air volume of the battery cooling blower assembly.

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
P0AAC11	Hybrid/EV Battery Air Temperature Sensor "A" Circuit Short to Ground	The inlet air temperature sensor output voltage is lower than the specified value (short circuit) and the detected temperature is higher than the specified value. (1 trip detection logic)	• No. 3 HV battery pack wire • Battery ECU assembly • Wire harness or connector	Does not come on	Master Warning: Comes on	HV Battery	A	SAE Code: P0AAE

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
P0AAC15	Hybrid/EV Battery Air Temperature Sensor "A" Circuit Short to Auxiliary Battery or Open	The inlet air temperature sensor output voltage is higher than the standard value (short to +B or open) and the detected temperature is lower than the specified value. (1 trip detection logic)	• No. 3 HV battery pack wire • Battery ECU assembly • Wire harness or connector	Does not come on	Master Warning: Comes on	HV Battery	A	SAE Code: P0AAF

HINT:

After checking for the above DTCs, check the hybrid system Data List item "Hybrid/EV Battery Cooling Fan Intake Air Temperature 1" using the GTS.

DISPLAYED TEMPERATURE	MALFUNCTION
-45°C (-49°F) or less	Open or +B short circuit
95°C (203°F) or more	GND short

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.

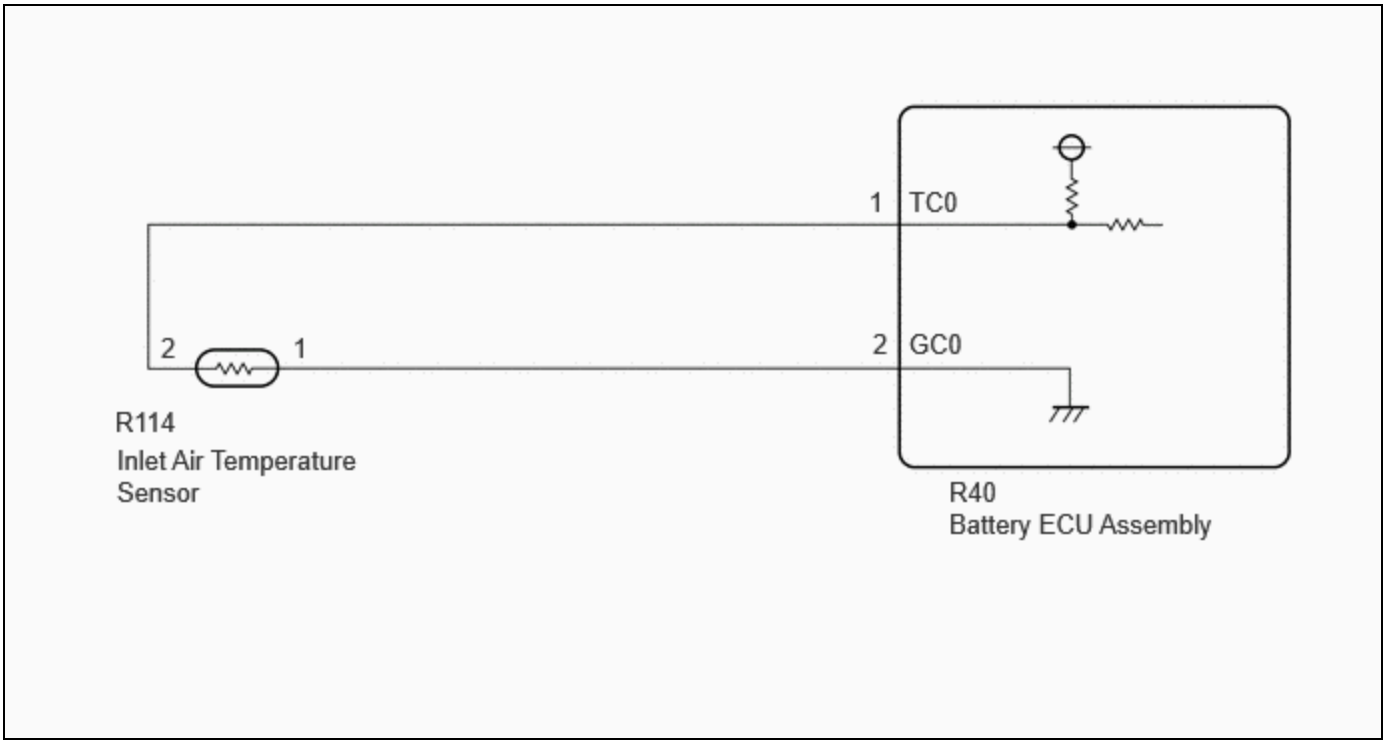
Click here INFO

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 5 seconds or more.
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 driving pattern again.

WIRING DIAGRAM



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
"P0AAC11 or P0AAC15" 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 CONNECTOR CONNECTION CONDITION (BATTERY ECU ASSEMBLY CONNECTOR)

CAUTION:

Be sure to wear insulated gloves and protective goggles.

Pre-procedure1

(a) Check that the service plug grip is not installed.

NOTICE:

After removing the service plug grip, do not turn the ignition switch to ON (READY), unless instructed by the repair manual because this may cause a malfunction.

Procedure1

(b) Check the connector connections and contact pressure of the relevant terminals for the battery ECU assembly.

HINT:

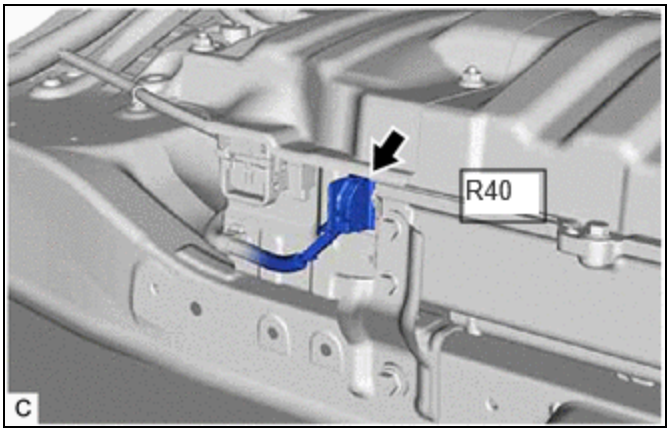
Click here INFO

OK:

The connector is connected securely and there are no contact problems.

Result:

PROCEED TO
OK
NG



Post-procedure1

(c) None

NG ▶ **CONNECT SECURELY**

OK ▼

3.	CHECK INSTALLATION OF INLET AIR TEMPERATURE SENSOR

CAUTION:

Be sure to wear insulated gloves and protective goggles.

Pre-procedure1

(a) Check that the service plug grip is not installed.

NOTICE:

After removing the service plug grip, do not turn the ignition switch to ON (READY), unless instructed by the repair manual because this may cause a malfunction.

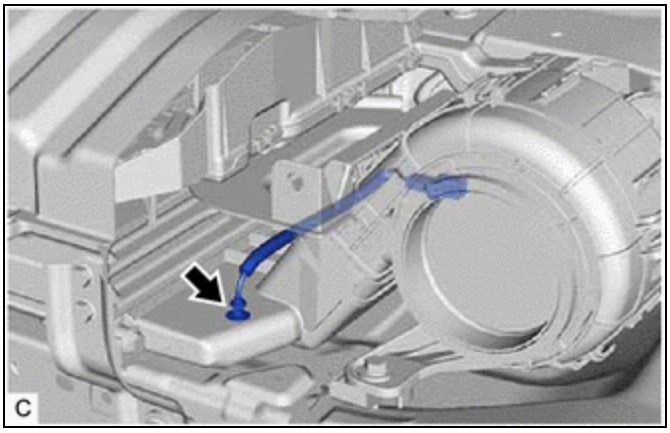
Procedure1

(b) Visually check the installation condition of the inlet air temperature sensor.

Result:

RESULT	PROCEED TO
The inlet air temperature sensor is installed in the correct location and its claws are engaged securely.	A

RESULT	PROCEED TO
The claws of the inlet air temperature sensor are damaged.	B
The inlet air temperature sensor is not installed correctly, but its claws are not damaged.	C



Post-procedure1

(c) Turn the ignition switch off.

B ▶ **REPLACE NO. 3 HV BATTERY PACK WIRE**

C ▶ **INSTALL PARTS CORRECTLY**

A ▼

4.	**CHECK BATTERY ECU ASSEMBLY (BATTERY CURRENT SENSOR OUTPUT VOLTAGE)**

CAUTION:

Be sure to wear insulated gloves and protective goggles.

Pre-procedure1

(a) Check that the service plug grip is not installed.

NOTICE:

After removing the service plug grip, do not turn the ignition switch to ON (READY), unless instructed by the repair manual because this may cause a malfunction.

(b) Disconnect the No. 3 HV battery pack wire (inlet air temperature sensor) connector.

NOTICE:

Before disconnecting the connector, check that it is not loose or disconnected.

(c) Connect the cable to the negative (-) auxiliary battery terminal.

(d) Turn the ignition switch to ON.

Procedure1

(e) Measure the voltage according to the value (s) in the table below.

Standard Voltage:

EWD INFO

Click Location & Routing(R114)
Click Connector(R114)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
R114-2 - R114-1	Ignition switch ON	4.5 to 5.5 V

NOTICE:

Be sure not to damage or deform the terminal being inspected.

Post-procedure1

(f) Turn the ignition switch off.

(g) Disconnect the cable from the negative (-) auxiliary battery terminal.

(h) Reconnect the No. 3 HV battery pack wire (inlet air temperature sensor) connectors.

NG ▶ **GO TO STEP 6**

OK ▼

5.	**CHECK NO. 3 HV BATTERY PACK WIRE (INLET AIR TEMPERATURE SENSOR)**

CAUTION:

Be sure to wear insulated gloves and protective goggles.

Pre-procedure1

(a) Check that the service plug grip is not installed.

NOTICE:

After removing the service plug grip, do not turn the ignition switch to ON (READY), unless instructed by the repair manual because this may cause a malfunction.

(b) Disconnect the No. 3 HV battery pack wire (inlet air temperature sensor) connector.

NOTICE:

Before disconnecting the connector, check that it is not loose or disconnected.

Procedure1

(c) Measure the resistance according to the value (s) in the table below.

Standard Resistance:

EWD INFO

Click Location & Routing(R114)
Click Connector(R114)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
R114-1 - R114-2	Ignition switch off 0 to 10°C (32 to 50°F)	17.67 to 27.83 kΩ
	Ignition switch off 10 to 20°C (50 to 68°F)	11.94 to 18.25 kΩ
	Ignition switch off 20 to 30°C (68 to 86°F)	8.21 to 12.24 kΩ
	Ignition switch off 30 to 40°C (86 to 104°F)	5.73 to 8.41 kΩ
	Ignition switch off 40 to 50°C (104 to 122°F)	4.08 to 5.91 kΩ

Post-procedure1

(d) Reconnect the No. 3 HV battery pack wire (inlet air temperature sensor) connector.

OK ▶ **REPLACE HV BATTERY**

NG ▶ **REPLACE NO. 3 HV BATTERY PACK WIRE**

6.	**CHECK HARNESS AND CONNECTOR (BATTERY ECU ASSEMBLY - NO. 3 HV BATTERY PACK WIRE)**

CAUTION:

Be sure to wear insulated gloves and protective goggles.

Pre-procedure1

(a) Check that the service plug grip is not installed.

NOTICE:

After removing the service plug grip, do not turn the ignition switch to ON (READY), unless instructed by the repair manual because this may cause a malfunction.

(b) Disconnect the battery ECU assembly connector.

(c) Disconnect the No. 3 HV battery pack wire (inlet air temperature sensor) connector.

Procedure1

(d) Measure the resistance according to the value (s) in the table below.

Standard Resistance (Check for Open):

EWD INFO

Click Location & Routing(R40,R114)
Click Connector(R40)
Click Connector(R114)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
R40-1 (TC0) - R114-2	Ignition switch off	Below 1 Ω
R40-2 (GC0) - R114-1	Ignition switch off	Below 1 Ω

Standard Resistance (Check for Short):

EWD INFO

Click Location & Routing(R40,R114)
Click Connector(R40)
Click Connector(R114)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
R40-1 (TC0) or R114-2 - Body ground and other terminals	Ignition switch off	10 kΩ or higher
R40-2 (GC0) or R114-1 - Body ground and other terminals	Ignition switch off	10 kΩ or higher

Post-procedure1

(e) Reconnect the battery ECU assembly connector.

(f) Reconnect the No. 3 HV battery pack wire (inlet air temperature sensor) connector.

OK ▶ **REPLACE BATTERY ECU ASSEMBLY**

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**