Last Modified: 12-04-2024	6.11:8.1.0	**Doc ID:** RM100000002BHWC
Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [03/2023 -]
Title: HYBRID / BATTERY CONTROL: HYBRID BATTERY SYSTEM (for PHEV Model): P0AA749; Hybrid/EV Battery Voltage Isolation Sensor Circuit Internal Electronic Failure; 2023 - 2024 MY Prius Prime [03/2023 -]		

DTC	**P0AA749**	**Hybrid/EV Battery Voltage Isolation Sensor Circuit Internal Electronic Failure**

DESCRIPTION

The hybrid vehicle control ECU monitors the insulation monitoring circuit located in the battery ECU assembly and detects malfunctions.

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
P0AA749	Hybrid/EV Battery Voltage Isolation Sensor Circuit Internal Electronic Failure	Malfunction in the insulation monitoring circuit (output is above threshold during self diagnosis) (1 trip detection logic)	• Battery ECU assembly • Battery voltage sensor • Wire harness or connector	Comes on	Master Warning: Comes on	HV Battery	A	SAE Code: P0AA7

MONITOR DESCRIPTION

A malfunction will be detected and the MIL illuminated if any of the following conditions are met :

- P0AA749: The voltage of hybrid/EV battery voltage isolation sensor is higher than the threshold during the rationality check.

MONITOR STRATEGY

Related DTCs	P0AA7 (INF P0AA749): Hybrid Battery Voltage Isolation Sensor Circuit
Required sensors/components	Hybrid/EV battery voltage isolation 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

Battery ECU assembly	DTC P0AA7 (INF P0AA749) 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 70 seconds or more. [*1]

   HINT:

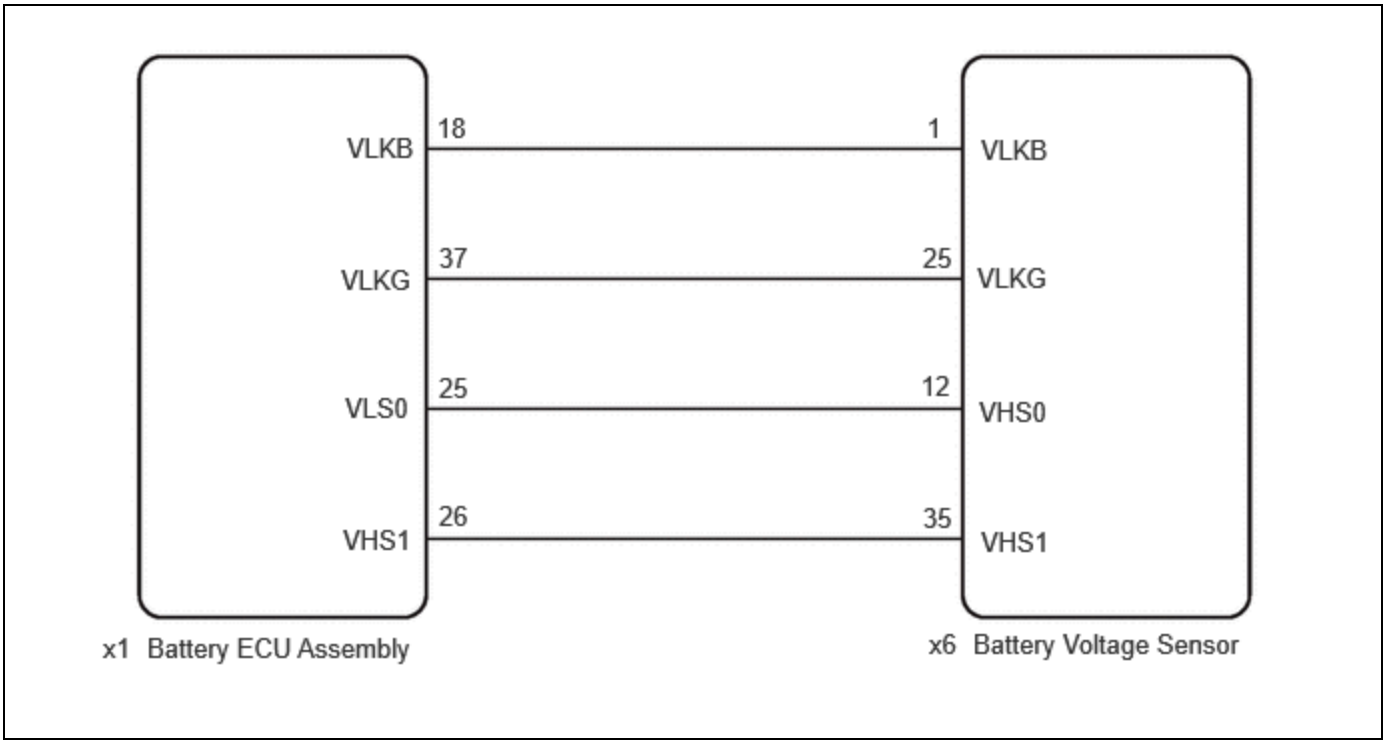
   [*1] : Normal judgment procedure.

   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 or N/A, perform the normal judgment procedure 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 auxiliary negative (-) 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.	**CLEAR DTC (HV BATTERY)**

Click here INFO

NEXT

2.	**SIMULATION TEST**

Pre-procedure1

(a) Turn the ignition switch to ON and wait for 70 seconds or more.

NOTICE:

Do not turn the ignition switch off until step 3 is complete.

Procedure1

(b) Check if DTCs are output.

Powertrain > HV Battery > Trouble Codes

RESULT	PROCEED TO
P0AA749 is not output	A
P0AA749 is output	B

Post-procedure1

(c) None

B ▶ **GO TO STEP 4**

A ▼

3.	**SIMULATION TEST**

NOTICE:

Do not turn the ignition switch off while performing this inspection.

Pre-procedure1

(a) With the vehicle and engine stopped, turn the ignition switch to ON (READY) with park (P) selected and wait for 70 seconds or more. (If the engine starts, wait until the engine stops.)

(b) While depressing the brake pedal without depressing the accelerator pedal, move the shift lever to D and wait for 1 minute. (Step A)

(c) Drive the vehicle 0.5 m (1.6 ft.) forward and perform step A.

(d) Drive the vehicle another 0.5 m (1.6 ft.) forward and perform step A. Repeat this procedure 5 times (minimum total driving distance: 2 m (6.6 ft.)).

Procedure1

(e) Check if DTCs are output.

Powertrain > Hybrid Control > Trouble Codes

RESULT	PROCEED TO
P0AA649 is not output	A
P0AA649 is output	B

Post-procedure1

(f) None

A **REPLACE BATTERY ECU ASSEMBLY AND BATTERY VOLTAGE SENSOR**

Battery ECU assembly: Click here INFO

Battery voltage sensor: Click here INFO

B **GO TO DTC CHART (P0AA649)**

4.	**CHECK HARNESS AND CONNECTOR (BATTERY ECU ASSEMBLY - BATTERY VOLTAGE SENSOR)**

CAUTION:

Be sure to wear insulated gloves and protective goggles.

NOTICE:

Make sure to use tester probes with a diameter of approximately 0.5 mm (0.0197 in.) when measuring the voltage of each HV battery cell.

Pre-procedure1

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

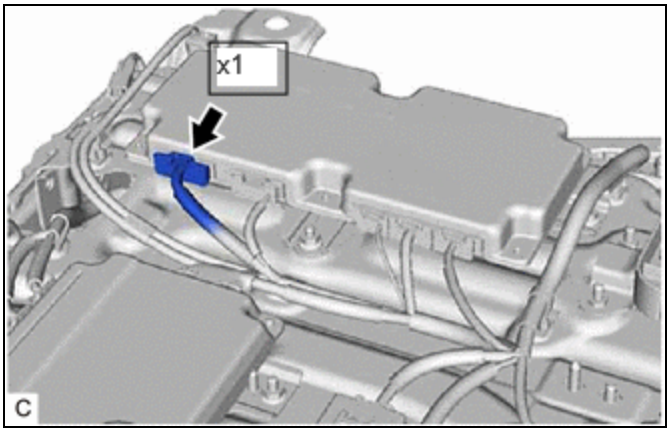
NOTICE:

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.

NOTICE:

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



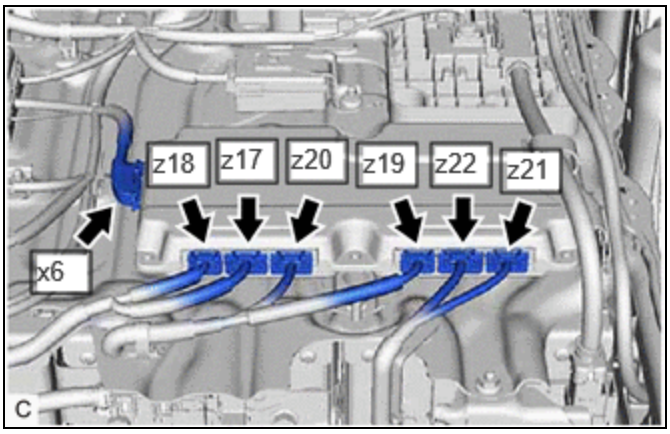
(c) Disconnect the x6 battery voltage sensor connector.

CAUTION:

When disconnecting connector x6 of the battery voltage sensor, first disconnect connectors z17, z18, z19, z20, z21 and z22 from the battery voltage sensor.

NOTICE:

- Insulate each disconnected high-voltage connector with insulating tape. Wrap the connector from the wire harness side to the end of the connector.
- Before disconnecting the connector, check that it is not loose or disconnected.



Procedure1

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

Standard Resistance:

EWD INFO

Click Location & Routing(x1,x6)
Click Connector(x1)
Click Connector(x6)

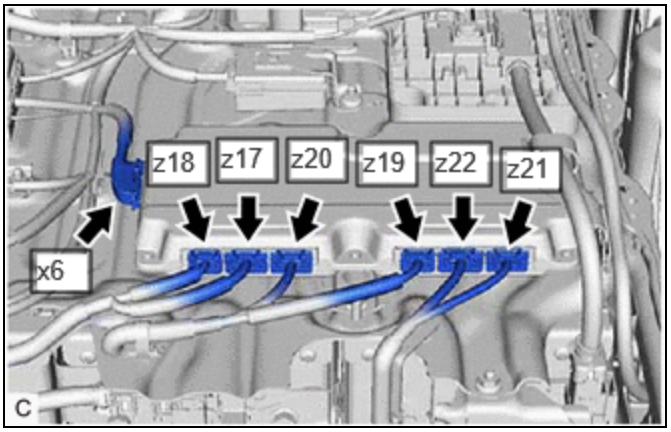
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
x1-18 (VLKB) - x6-1 (VLKB)	Ignition switch off	Below 1 Ω	Ω
x1-37 (VLKG) - x6-25 (VLKG)	Ignition switch off	Below 1 Ω	Ω
x1-25 (VLS0) - x6-12 (VHS0)	Ignition switch off	Below 1 Ω	Ω
x1-26 (VHS1) - x6-35 (VHS1)	Ignition switch off	Below 1 Ω	Ω

Post-procedure1

(e) Reconnect the o8 battery voltage sensor connector.

CAUTION:

When connecting connectors z17, z18, z19, z20, z21 and z22 of the battery voltage sensor, first connect connector x6 to the battery voltage sensor.



(f) Reconnect the battery ECU assembly connector.

OK ▶ **REPLACE BATTERY ECU ASSEMBLY AND BATTERY VOLTAGE SENSOR**

Battery ECU assembly: Click here INFO

Battery voltage sensor: Click here INFO

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