Last Modified: 12-04-2024	6.11:8.1.0	**Doc ID:** RM100000002BIHG
Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [03/2023 -]
Title: HYBRID / BATTERY CONTROL: HYBRID CONTROL SYSTEM (for PHEV Model): P0ABF00; Hybrid/EV Battery Current Sensor "A" Circuit Range/Performance; 2023 - 2024 MY Prius Prime [03/2023 -]		

DTC	P0ABF00	Hybrid/EV Battery Current Sensor "A" Circuit Range/Performance

DESCRIPTION

A battery current sensor, which is mounted on the positive cable side of each No. 2 traction battery device box assembly, detects the current flowing to or from the battery pack. The battery current sensor sends a voltage, which varies between 0 and 5 V in proportion to the amperage, to the IB0 terminal of the battery ECU assembly. Similarly, it sends a voltage, which varies between 0 and 5 V in inverse proportion to the amperage, to the IB1 terminal of the battery ECU assembly. When the voltage at the IB0 terminal is above 1.696 V and the voltage at the IB1 terminal is below 3.304 V, this indicates that the HV battery is being discharged. Additionally, Meanwhile, when the voltage at of the IB0 terminal is below 1.696 V and the voltage at of the IB1 terminal is above 3.304 V, this indicates that the HV battery is being charged. The battery ECU assembly determines the charging and discharging amount of the HV battery based on the voltages input to the IB0 terminal and IB1 terminal and calculates the SOC of the HV battery through the accumulated amperage.
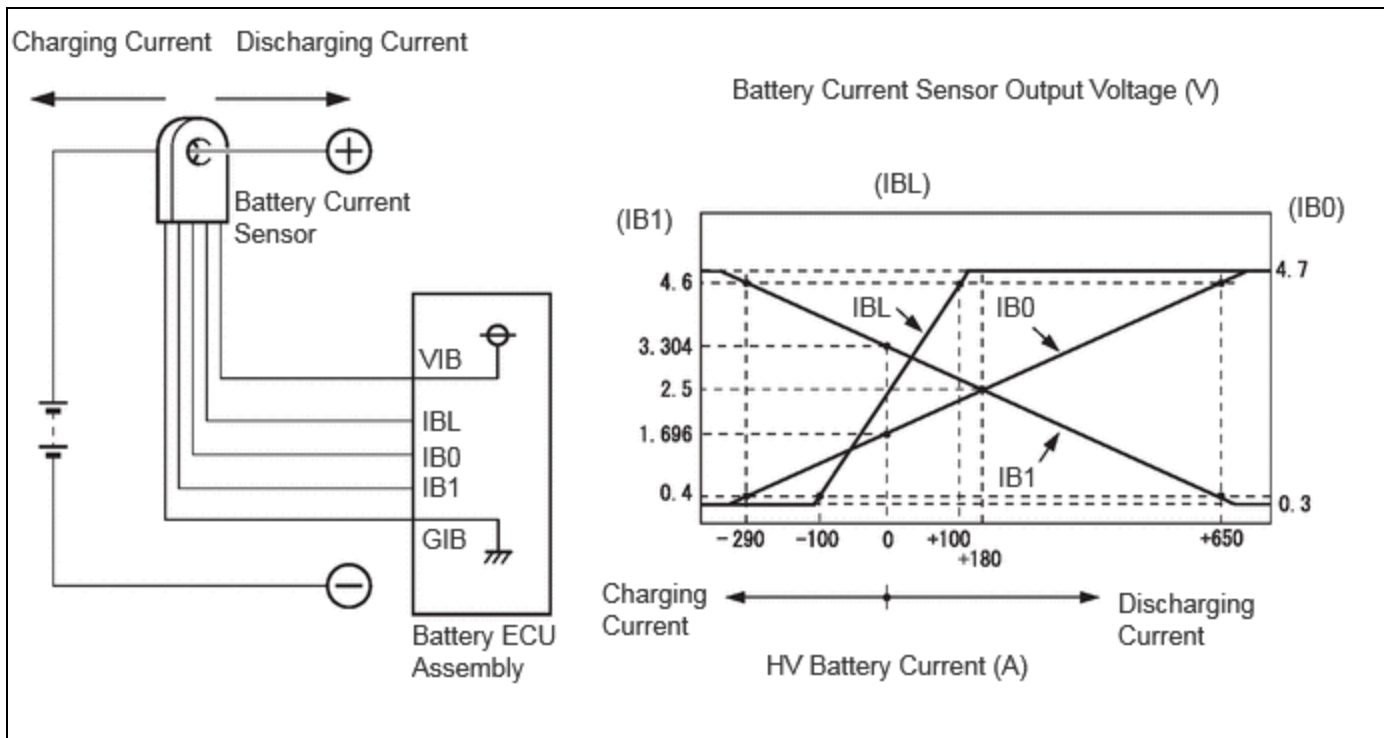
DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
P0ABF00	Hybrid/EV Battery Current Sensor "A" Circuit Range/Performance	Based on hybrid system consumption and HV	• No. 2 traction battery device	Comes on	Master Warning Light: Comes on	Hybrid Control	A	SAE Code: P0AC0

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
		battery output. (1 trip detection logic)	box assembly • Battery ECU assembly • Wire harness or connector					

MONITOR DESCRIPTION

The hybrid vehicle control ECU detects malfunctions of the battery current sensor by monitoring motor and generator torque. If the hybrid vehicle control ECU detects a battery current sensor malfunction, the hybrid vehicle control ECU will illuminate the MIL and store a DTC.

MONITOR STRATEGY

Related DTCs	P0AC0 (INF P0ABF00): Current sensor malfunction (gain or offset)
Required sensors/components	Battery current 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

Hybrid vehicle control ECU	DTC P0AC0 (INF P0ABF00) 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. Drive the vehicle for approximately 10 minutes according to the freeze frame data items "Vehicle Speed", "Accelerator Position", "Hybrid/EV Battery Current", "Motor Torque" and "Generator Torque". [*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 / Hybrid Control / Utility / All Readiness.
5. Check the DTC judgment result.

> **HINT:**
>
> o If the judgment result shows NORMAL, the system is normal.
> o If the judgment result shows ABNORMAL, the system has a malfunction.
> o If the judgment result shows INCOMPLETE or N/A, perform the normal judgment procedure again.

WIRING DIAGRAM

x11
No. 1 Traction Battery Device Box Assembly
(Battery Current Sensor)

x4
Battery ECU Assembly
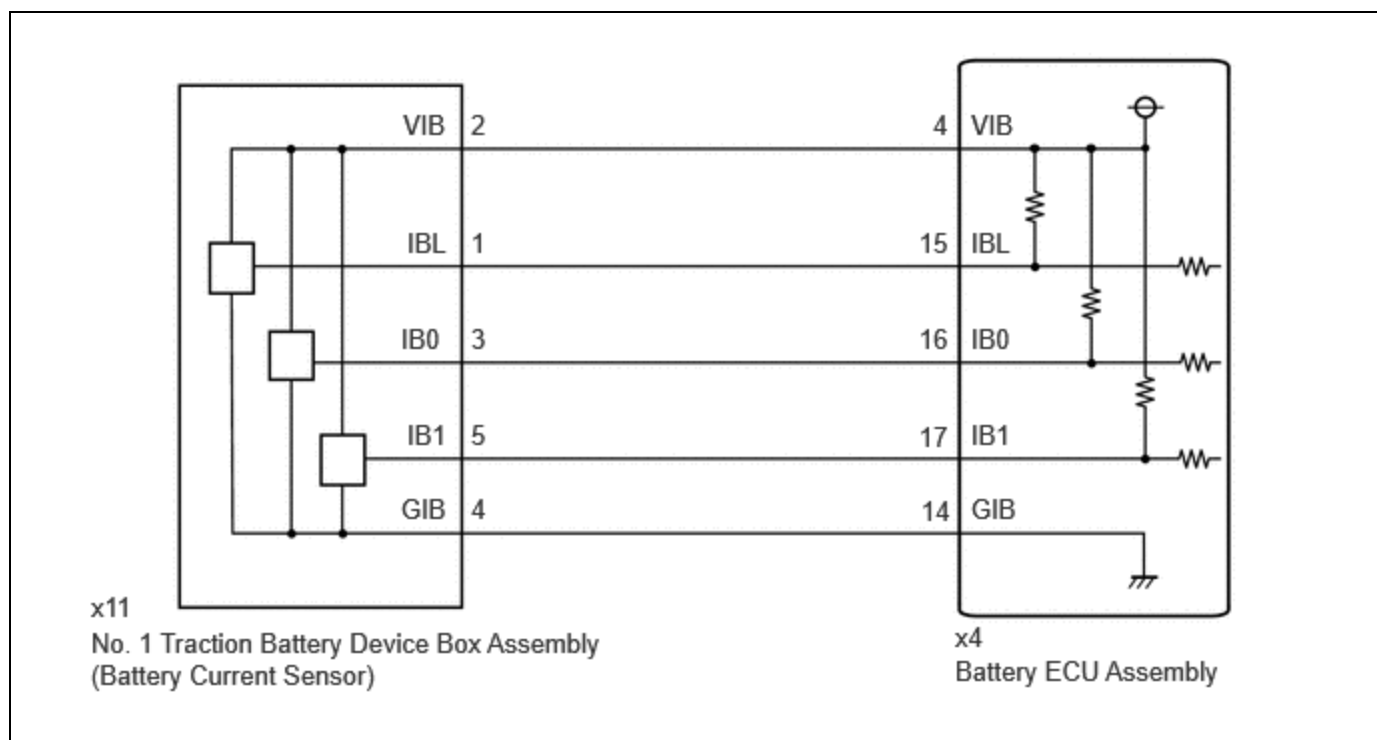
CAUTION / NOTICE / HINT

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 HARNESS AND CONNECTOR (BATTERY ECU ASSEMBLY - NO. 1 TRACTION BATTERY DEVICE BOX ASSEMBLY)

CAUTION:

Be sure to wear insulated gloves and protective goggles.

Pre-procedure1

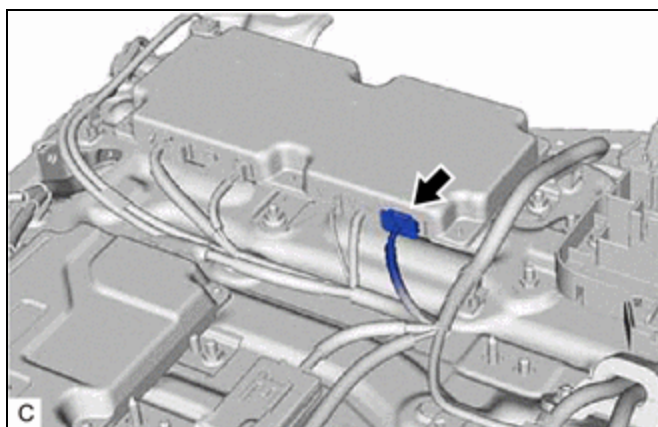(a) Check that the service plug grip is not installed.

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.

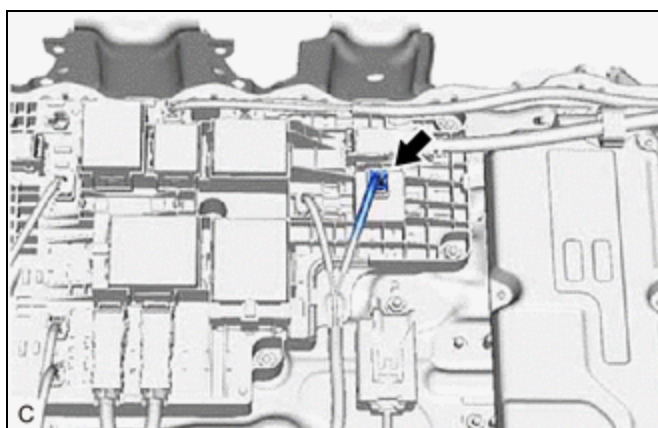(b) Disconnect the battery ECU assembly connector.

NOTICE:

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

(c) Disconnect the No. 1 traction battery device box assembly connector.

NOTICE:

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

Procedure1

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

Standard Resistance (Check for Open):

EWD INFO

Click Location & Routing(x11,x4)
Click Connector(x11)
Click Connector(x4)

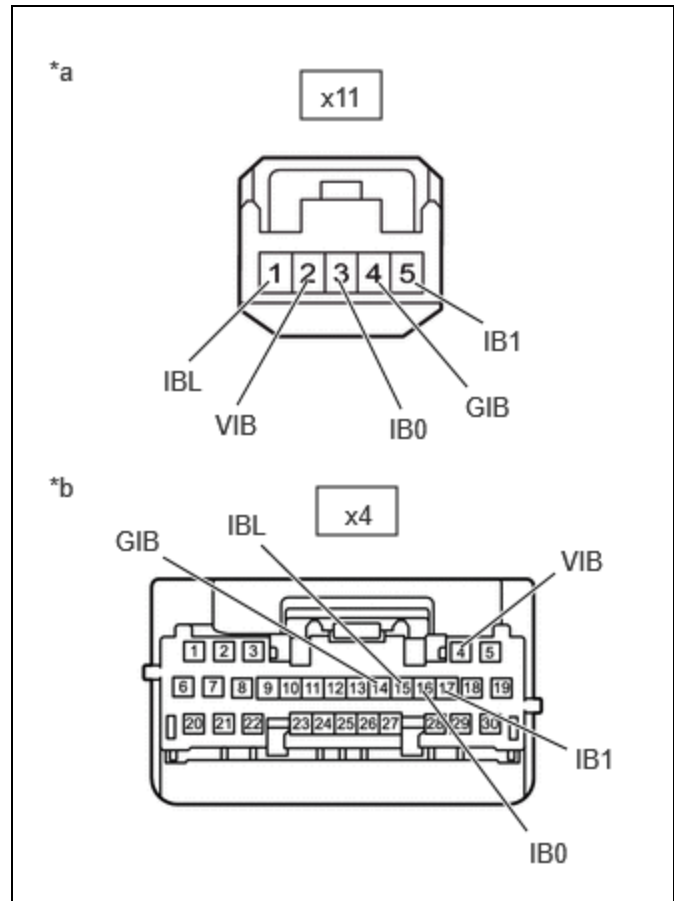| TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
x11-1 (IBL) - x4-15 (IBL)	Ignition switch off	Below 1 Ω	Ω
x11-5 (IB1) - x4-17 (IB1)	Ignition switch off	Below 1 Ω	Ω
x11-4 (GIB) - x4-14 (GIB)	Ignition switch off	Below 1 Ω	Ω
x11-3 (IB0) - x4-16 (IB0)	Ignition switch off	Below 1 Ω	Ω
x11-2 (VIB) - x4-4 (VIB)	Ignition switch off	Below 1 Ω	Ω

Standard Resistance (Check for Short):

EWD INFO

Click Location & Routing(x11,x4)
Click Connector(x11)
Click Connector(x4)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
x11-1 (IBL) or x4-15 (IBL) - Body ground and other terminals	Ignition switch off	10 kΩ or higher	kΩ
x11-5 (IB1) or x4-17 (IB1) - Body ground and other terminals	Ignition switch off	10 kΩ or higher	kΩ
x11-4 (GIB) or x4-14 (GIB) - Body ground and other terminals	Ignition switch off	10 kΩ or higher	kΩ
x11-3 (IB0) or x4-16 (IB0) - Body	Ignition switch off	10 kΩ or higher	kΩ

*a	Front view of wire harness connector (to No. 1 Traction Battery Device Box Assembly)
*b	Front view of wire harness connector (to Battery ECU Assembly)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
ground and other terminals			
x11-2 (VIB) or x4-4 (VIB) - Body ground and other terminals	Ignition switch off	10 kΩ or higher	kΩ

Result:

PROCEED TO
OK
NG

Post-procedure1

(e) Reconnect the No. 1 traction battery device box assembly connector.

(f) Reconnect the battery ECU assembly connector.

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

OK
▼

2.	REPLACE NO. 1 TRACTION BATTERY DEVICE BOX ASSEMBLY

HINT:

Click here **INFO**

NEXT
▼

3.	CLEAR DTC

Click here **INFO**

NEXT
▼

4.	PERFORM ROAD TEST

Pre-procedure1

(a) Turn the ignition switch to ON (READY).

Procedure1

(b) Drive the vehicle for approximately 10 minutes according to the freeze frame data items "Vehicle Speed", "Accelerator Position", "Hybrid/EV Battery Current", "Motor Torque" and "Generator Torque".

Powertrain > Hybrid Control > DTC(P0ABF00) > Freeze Frame Data

TESTER DISPLAY
Vehicle Speed
Accelerator Position
Generator Torque
Motor Torque
Hybrid/EV Battery Current

Post-procedure1

(c) Turn the ignition switch off.

NEXT
▼

5.	CHECK DTC OUTPUT (HYBRID CONTROL)

Pre-procedure1

(a) None.

Procedure1

(b) Check for DTCs.

Powertrain > Hybrid Control > Trouble Codes

RESULT	PROCEED TO
P0ABF00 is not output	A
P0ABF00 is output	B

Post-procedure1

(c) Turn the ignition switch off.

A ▶ COMPLETED

B ▶ **REPLACE BATTERY ECU ASSEMBLY**