

<b>Last Modified:</b> 12-04-2024	6.11:8.1.0	<b>Doc ID:</b> RM10000002BHWI
<b>Model Year Start:</b> 2023	<b>Model:</b> Prius Prime	<b>Prod Date Range:</b> [03/2023 - ]
<b>Title:</b> HYBRID / BATTERY CONTROL: HYBRID BATTERY SYSTEM (for PHEV Model): P0D1A18,P0D1A19,P1F6900; Hybrid/EV Battery Pack Coolant Control Valve "B" Control Circuit Low Circuit Current Below Threshold; 2023 - 2024 MY Prius Prime [03/2023 - ]		

<b>DTC</b>	<b>P0D1A18</b>	<b>Hybrid/EV Battery Pack Coolant Control Valve "B" Control Circuit Low Circuit Current Below Threshold</b>
------------	----------------	-------------------------------------------------------------------------------------------------------------

<b>DTC</b>	<b>P0D1A19</b>	<b>Hybrid/EV Battery Pack Coolant Control Valve "B" Control Circuit High Circuit Current Above Threshold</b>
------------	----------------	--------------------------------------------------------------------------------------------------------------

<b>DTC</b>	<b>P1F6900</b>	<b>Hybrid/EV Battery Pack Coolant Control Valve "B" Monitor Performance</b>
------------	----------------	-----------------------------------------------------------------------------

## DESCRIPTION

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
P0D1A18	Hybrid/EV Battery Pack Coolant Control Valve "B" Control Circuit Low Circuit Current Below Threshold	When the motor is being operated, there is an open or short in the magnet valve (No. 1 traction battery cooler tube) circuit or the magnet valve (No. 1 traction battery cooler tube) is overheating  (1 trip detection logic)	<ul style="list-style-type: none"> <li>Wire harness or connector</li> <li>Battery ECU assembly</li> <li>Magnet valve (No. 1 traction battery cooler tube)</li> </ul>	Comes on	Master Warning: Comes on	HV Battery	A	SAE Code: P0D1D
P0D1A19	Hybrid/EV Battery Pack Coolant Control Valve "B" Control Circuit High Circuit Current Above Threshold	When the motor is being operated, there is an open or short in the magnet valve (No. 1 traction battery cooler tube) circuit or the magnet valve (No. 1 traction	<ul style="list-style-type: none"> <li>Wire harness or connector</li> <li>Battery ECU assembly</li> <li>Magnet valve (No. 1 traction battery</li> </ul>	Comes on	Master Warning: Comes on	HV Battery	A	SAE Code: P0D1E

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
		battery cooler tube) is overheating  (1 trip detection logic)	cooler tube)					
P1F6900	Hybrid/EV Battery Pack Coolant Control Valve "B" Monitor Performance	When the motor is being operated, there is an open or short in the magnet valve (No. 1 traction battery cooler tube) circuit or the magnet valve (No. 1 traction battery cooler tube) is overheating  (1 trip detection logic)	<ul style="list-style-type: none"> <li>Wire harness or connector</li> <li>Battery ECU assembly</li> <li>Magnet valve (No. 1 traction battery cooler tube)</li> </ul>	Comes on	Master Warning:  Comes on	HV Battery	A	SAE Code:  P1F69

## MONITOR DESCRIPTION

If the battery ECU assembly detects a malfunction in a magnet valve, the battery ECU assembly will illuminate the MIL and store a DTC.

## MONITOR STRATEGY

Related DTCs	P0D1D (INF P0D1A18): Hybrid Battery Pack Coolant Control Valve 2 (Battery Refrigerant Electric Expansion Valve) Range check (Low current) P0D1E (INF P0D1A19): Hybrid Battery Pack Coolant Control Valve 2 (Battery Refrigerant Electric Expansion Valve) Range check (High current) P1F69 (INF P1F6900): Hybrid Battery Pack Coolant Control Valve 2 (Battery Refrigerant Electric Expansion Valve) Performance
Required sensors/components	Magnet valve
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 P0D1D (INF P0D1A18) is not detected DTC P0D1E (INF P0D1A19) is not detected DTC P1F69 (INF P1F6900) 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](#)

- Clear the DTCs (even if no DTCs are stored, perform the clear DTC procedure).
- Turn the ignition switch off and wait for 2 minutes or more.
- Drive the vehicle on urban roads for approximately 10 minutes.[\*1]

### HINT:

[\*1]: Normal judgment procedure.

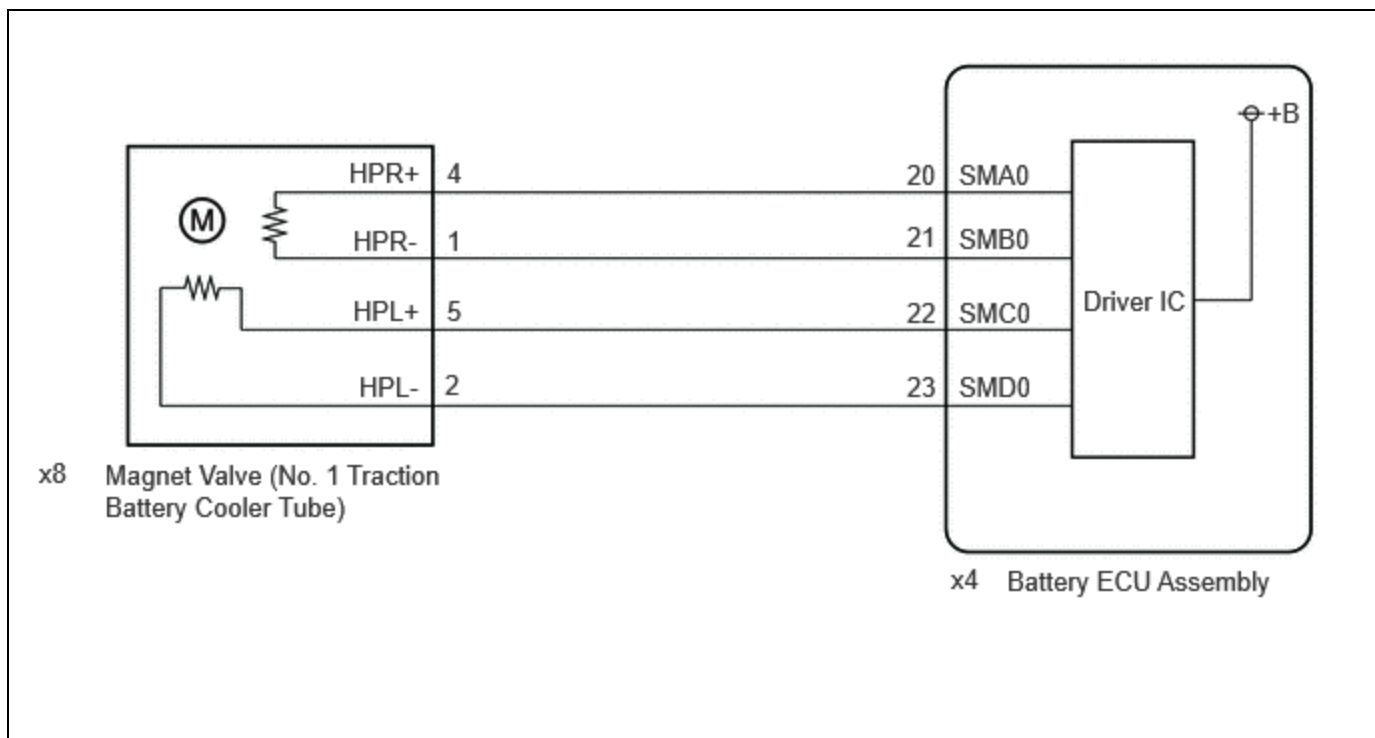
The normal judgment procedure is used to complete DTC judgment and also used when clearing permanent DTCs.

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

<b>1.</b>	<b>CHECK HARNESS AND CONNECTOR (MAGNET VALVE (NO. 1 TRACTION BATTERY COOLER TUBE) - BATTERY ECU ASSEMBLY)</b>
-----------	---------------------------------------------------------------------------------------------------------------

### CAUTION:

Be sure to wear insulated gloves and protective goggles.

Pre-procedure1

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

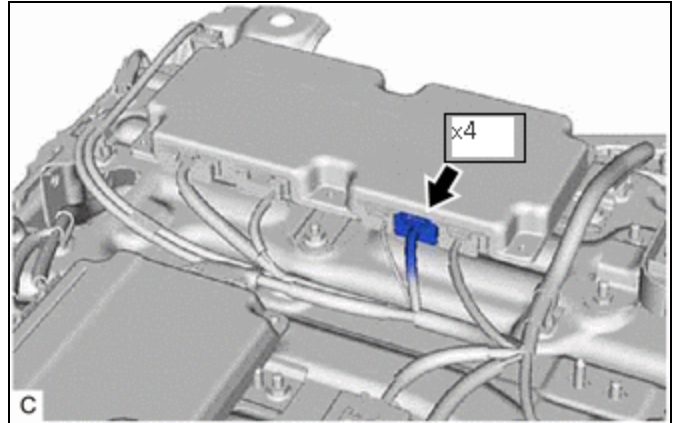
### NOTICE:

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:**

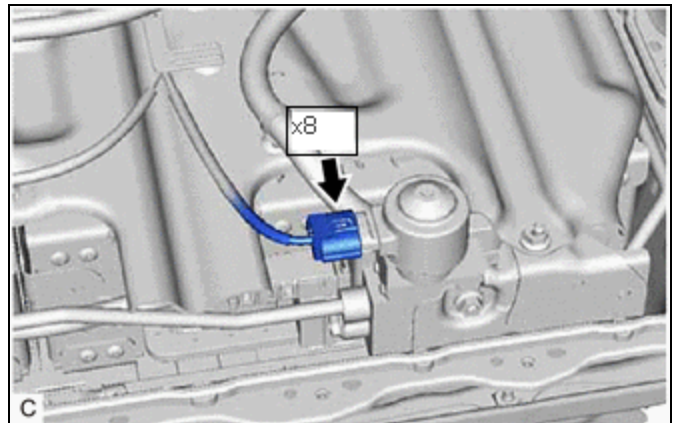
Before disconnecting the connector, check that it is not loose or disconnected.



(c) Disconnect the magnet valve (No. 1 traction battery cooler tube) 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 table below.

Standard Resistance:



[Click Location & Routing\(x8,x4\)](#)

[Click Connector\(x8\)](#)

[Click Connector\(x4\)](#)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
x8-4 (HPR+) - x4-20 (SMA0)	Ignition switch off	Below 1 Ω	Ω
x8-1 (HPR-) - x4-21 (SMB0)	Ignition switch off	Below 1 Ω	Ω
x8-5 (HPL+) - x4-22 (SMC0)	Ignition switch off	Below 1 Ω	Ω

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
x8-2 (HPL-) - x4-23 (SMD0)	Ignition switch off	Below 1 $\Omega$	$\Omega$
x8-4 (HPR+) or x4-20 (SMA0) - Body ground and other terminals	Ignition switch off	10 k $\Omega$ or higher	k $\Omega$
x8-1 (HPR-) or x4-21 (SMB0) - Body ground and other terminals	Ignition switch off	10 k $\Omega$ or higher	k $\Omega$
x8-5 (HPL+) or x4-22 (SMC0) - Body ground and other terminals	Ignition switch off	10 k $\Omega$ or higher	k $\Omega$
x8-2 (HPL-) or x4-23 (SMD0) - Body ground and other terminals	Ignition switch off	10 k $\Omega$ or higher	k $\Omega$

Post-procedure1

- (e) Reconnect the magnet valve (No. 1 traction battery cooler tube) connector.
- (f) Reconnect the battery ECU assembly connector.

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

**OK**



<b>2.</b>	<b>INSPECT MAGNET VALVE (NO. 1 TRACTION BATTERY COOLER TUBE)</b>
-----------	------------------------------------------------------------------

**CAUTION:**

Be sure to wear insulated gloves and protective goggles.

Pre-procedure1

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

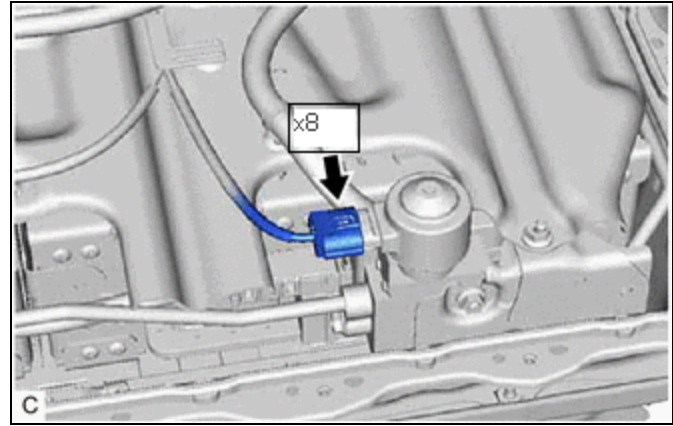
**NOTICE:**

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 magnet valve (No. 1 traction battery cooler tube) 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.

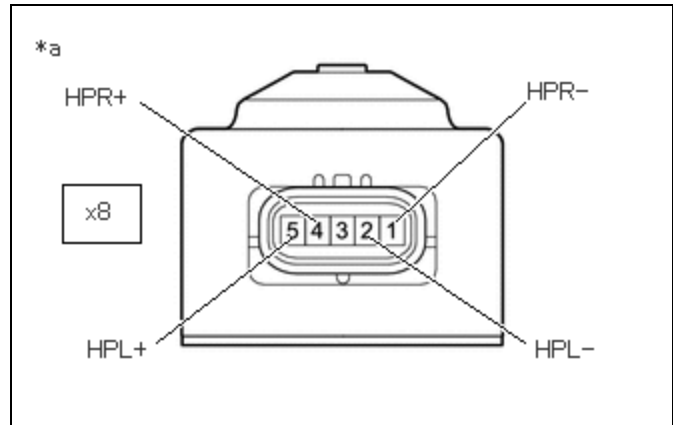
Standard Resistance:



[Click Location & Routing\(x8\)](#)

[Click Connector\(x8\)](#)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
x8-4 (HPR+) - x8-1 (HPR-)	Ignition switch off	5 to 25 Ω	Ω
x8-5 (HPL+) - x8-2 (HPL-)	Ignition switch off	5 to 25 Ω	Ω
x8-4 (HPR+) - x8-5 (HPL+)	Ignition switch off	10 kΩ or higher	kΩ



\*a Component without harness connected Magnet Valve (No. 1 traction battery cooler tube)

Result:

PROCEED TO
OK
NG

Post-procedure1

(d) Reconnect the magnet valve (No. 1 traction battery cooler tube) connector.

**NG** **REPLACE NO. 1 TRACTION BATTERY COOLER TUBE**

**OK****3. CHECK BATTERY ECU ASSEMBLY (OUTPUT WAVEFORM)****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) Connect the SST.

**HINT:**

Click here 

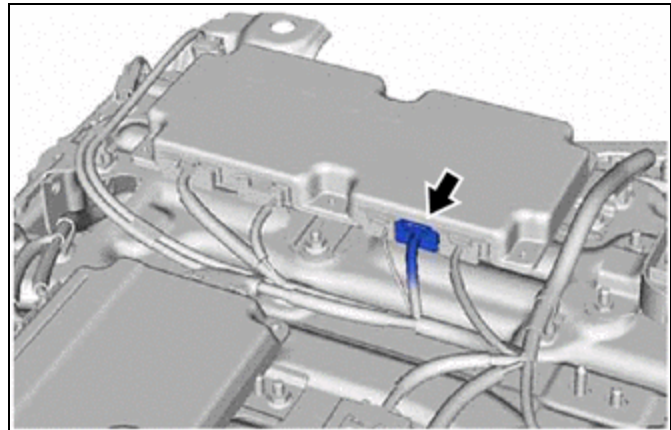
(c) Connect the cable to the negative (-) auxiliary battery terminal.

Procedure1

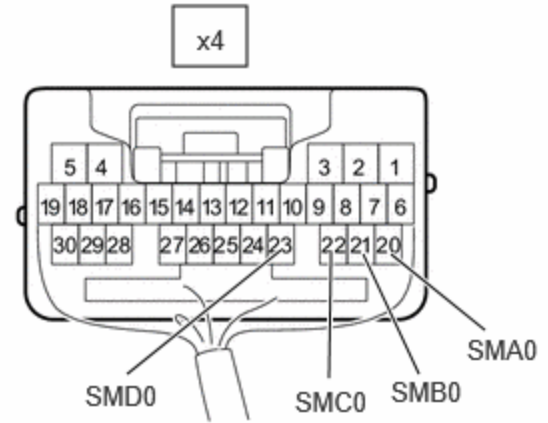
(d) Check the output waveform.

(1) Connect an oscilloscope to terminal.





\*a



*a	Component with harness connected (Battery ECU Assembly)
----	------------------------------------------------------------

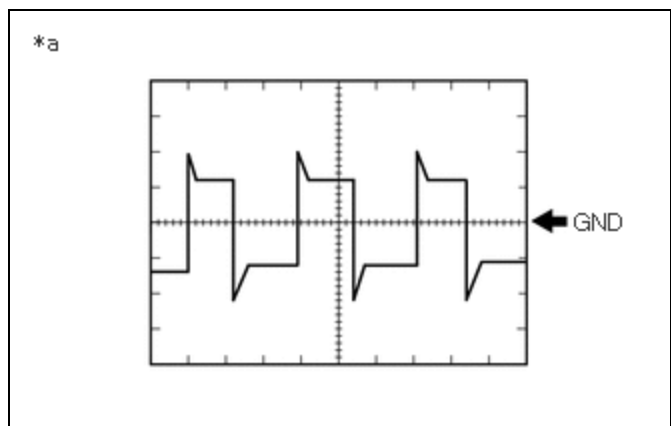
(2) Enter the following menus.

**Powertrain > HV Battery > Active Test**

TESTER DISPLAY
Hybrid/EV Battery Refrigerant Cooling Valve

(3) Check the signal waveform according to the condition(s) in the table below.

ITEM	CONDITION
Measurement terminal	x4-20 (SMA0) - x4-21 (SMB0)
	x4-22 (SMC0) - x4-23 (SMD0)
Tool setting	10 V/DIV., 5 ms./DIV.
Vehicle condition	Ignition switch ON, during Active Test



**NOTICE:**

Turning the ignition switch to ON with the service plug grip removed causes other DTCs to be stored. Clear the DTCs after performing this inspection.

*a	Waveform 1
----	------------

RESULT	PROCEED TO
Normal (The pulse output of waveform 1)	A
No pulse generation	B

Post-procedure1

- (e) Turn the ignition switch off.
- (f) Disconnect the cable from the negative (-) auxiliary battery terminal.
- (g) Disconnect the SST.

**A** ► REPLACE NO. 1 TRACTION BATTERY COOLER TUBE

**B** ► REPLACE BATTERY ECU ASSEMBLY

