

<b>Last Modified:</b> 12-04-2024	6.11:8.1.0	<b>Doc ID:</b> RM10000002AQOE
<b>Model Year Start:</b> 2023	<b>Model:</b> Prius Prime	<b>Prod Date Range:</b> [03/2023 - ]
<b>Title:</b> HEATING / AIR CONDITIONING: AIR CONDITIONING SYSTEM (for PHEV Model): B138571; A/C Cooling Electric Expansion Valve Actuator Stuck; 2023 - 2024 MY Prius Prime [03/2023 - ]		

<b>DTC</b>	<b>B138571</b>	<b>A/C Cooling Electric Expansion Valve Actuator Stuck</b>
------------	----------------	--

## DESCRIPTION

When the valve opening angle does not change even though the cooling electric expansion valve (cooler expansion valve) received a signal from the heat pump ECU assembly, this DTC is stored.

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	MEMORY	DTC OUTPUT FROM	PRIORITY	NOTE
B138571	A/C Cooling Electric Expansion Valve Actuator Stuck	Diagnosis condition:  During battery cooling  Malfunction status:  Cooling electric expansion valve (cooler expansion valve) open stuck  Detection time:  Continuously for 10 minutes or more  Trip:  2 trip detection logic	<ul style="list-style-type: none"> <li>Cooling electric expansion valve (cooler expansion valve)</li> <li>Heat pump ECU assembly</li> </ul>	Come on	Memorized	Air Conditioner	A	SAE Code:  B1385

**HINT:**

Battery cooling control can be performed from the Active Test of the hybrid battery system.

Click here [INFO](#)

## MONITOR DESCRIPTION

This DTC is stored when it is detected that the cooling electric expansion valve (cooler expansion valve) is stuck open.

When any of the conditions shown in Typical Malfunction Thresholds are met, the air conditioning amplifier assembly illuminates the MIL and stores this DTC.

## **MONITOR STRATEGY**

Related DTCs	B1385: A/C Cooling Electric Expansion Valve Actuator Stuck
Required Sensors/Components (Main)	Cooling electric expansion valve (cooler expansion valve)
Required Sensors/Components (Related)	-
Frequency of Operation	Continuous
Duration	5 minutes
MIL Operation	2 driving cycles
Sequence of Operation	None

## **TYPICAL ENABLING CONDITIONS**

Monitor runs whenever the following DTCs are not stored	<p>B3A0A (A/C Refrigerant Expansion Valve Actuator Stuck/Open)</p> <p>P0EC9 (A/C Refrigerant Distribution Valve "A" Stuck/Open)</p> <p>P153A (A/C Refrigerant Temperature/Ambient Air Temperature Performance)</p> <p>P0531 (A/C Refrigerant Pressure Sensor "A" Circuit Range/Performance )</p> <p>P0531 (A/C Refrigerant Pressure Sensor "A" Circuit Range/Performance (Vcc))</p> <p>P0532 (A/C Refrigerant Pressure Sensor "A" Circuit Low)</p> <p>P0533 (A/C Refrigerant Pressure Sensor "A" Circuit High)</p> <p>P0EBD (A/C Refrigerant Temperature Sensor "A" Circuit High)</p> <p>P0EBE (A/C Refrigerant Temperature Sensor "A" Circuit Low)</p> <p>P2612 (A/C Refrigerant Distribution Valve "A" Control Circuit Low)</p> <p>P2613 (A/C Refrigerant Distribution Valve "A" Control Circuit High)</p> <p>B3A0C (A/C Refrigerant Expansion Valve Actuator Control Circuit Low)</p> <p>B3A0D (A/C Refrigerant Expansion Valve Actuator Control Circuit High)</p> <p>B1388 (A/C Refrigerant Expansion Valve Actuator "B" Control Circuit Low)</p> <p>B1389 (A/C Refrigerant Expansion Valve Actuator "B" Control Circuit High)</p> <p>U0111 (Lost Communication With Battery Energy Control Module "A" )</p>
---	--

	B14B0 (Lost Communication With Heat Pump Control Module) P0C43 (Hybrid/EV Battery Refrigerant temperature Sensor "A" Circuit Range/Performance) P0CD6 (Hybrid/EV Battery Refrigerant temperature Sensor "B" Circuit Range/Performance) P1B7A (Hybrid/EV Battery Refrigerant temperature Sensor "C" Circuit Range/Performance) P1B7F (Hybrid/EV Battery Refrigerant temperature Sensor "D" Circuit Range/Performance)
Battery voltage	11 V or higher
Outer heat exchanger refrigerant temperature sensor (No. 1 air conditioning thermistor assembly)	4°C or less
Temperature of battery cooling refrigerant temperature sensor (outlet) (No. 1 traction battery cooler conductor)	20°C or higher

## TYPICAL MALFUNCTION THRESHOLDS

A malfunction is detected if any of the following conditions apply

### Condition 1

Refrigerant Cycle	A/C Cooling and Battery Cooling
Battery Cooling after Test Mode	ON
Opening angle of the cooling electric expansion valve (cooler expansion valve)	Less than 19 %
Opening angle of battery cooling expansion valve (No. 1 traction battery cooler tube)	14 % or higher

### Condition 2

Refrigerant Cycle	Battery Cooling
Battery Cooling after Test Mode	ON
Opening angle of battery cooling expansion valve (No. 1 traction battery cooler tube)	10 % or higher

## 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. Connect the GTS to the DLC3.
2. Turn the ignition switch to ON.
3. Turn the GTS on.
4. Clear the DTCs (even if no DTCs are stored, perform the clear DTC procedure).
5. Turn the ignition switch off and wait for at least 30 seconds.
6. Turn the ignition switch to ON (READY) [A].
7. Turn the GTS on.

8. Check that the following conditions are met and perform the Active Test according to the display on the GTS.  
[B]

Enter the following menus: Powertrain / HV Battery / Active test / Hybrid/EV Battery Refrigerant Cooling Control.

#### Condition

Ambient temperature	5 °C or higher
Operation time	10 minutes

#### HINT:

- In order to perform "Hybrid/EV Battery Refrigerant Cooling Control", the HV battery minimum temperature must be 20°C (68°F) and the refrigerant temperature must be 20°C (68°F) or higher.

If the above conditions are not established, perform the "Hybrid/EV Battery Heater Relay" Active Test in an environment with an ambient temperature of 5°C (41°F) or higher and increase the HV battery temperature.

The temperature will drop after the heater is stopped, so increase the values of "Hybrid/EV Battery Temperature 1 to 15, Hybrid/EV Battery Refrigerant Temperature (Duct Outlet 1)" in the Data List to 21°C (70°F) or higher.

(At an ambient temperature of 5°C (41°F), "Hybrid/EV Battery Heater Relay" will need to be performed for approximately 10 hours.)

- Perform this step with the A/C blower switch off.

9. Wait 5 minutes or more. [C]

10. Enter the following menus: Body Electrical / Air Conditioner / Trouble Codes [D].

11. Read the pending DTCs.

#### HINT:

- If a pending DTC is output, the system is malfunctioning.
- If a pending DTC is not output, perform the following procedure.

12. Enter the following menus: Body Electrical / Air Conditioner / Utility / All Readiness.

13. Input the DTC: B138571.

14. Check the DTC judgment result.

GTS DISPLAY	DESCRIPTION
NORMAL	<ul style="list-style-type: none"> <li>◦ DTC judgment completed</li> <li>◦ System normal</li> </ul>
ABNORMAL	<ul style="list-style-type: none"> <li>◦ DTC judgment completed</li> <li>◦ System abnormal</li> </ul>
INCOMPLETE	<ul style="list-style-type: none"> <li>◦ DTC judgment not completed</li> <li>◦ Perform driving pattern after confirming DTC enabling conditions</li> </ul>

#### HINT:

- If the judgment result is NORMAL, the system is normal.
- If the judgment result is ABNORMAL, the system is malfunctioning.
- If the judgment result is INCOMPLETE, perform steps [B] through [D] again.
- [A] to [D]: Normal judgment procedure.

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

- When clearing the permanent DTCs, do not disconnect the cable from the auxiliary battery terminal or attempt to clear the DTCs during this procedure, as doing so will clear the universal trip and normal judgment histories.

## PROCEDURE

<b>1.</b>	<b>CHECK COOLING ELECTRIC EXPANSION VALVE (COOLER EXPANSION VALVE)</b>
-----------	--

Pre-procedure1

- (a) Install a manifold gauge set.

**HINT:**

[Click here](#) INFO

Procedure1

- (b) Perform the Active Test according to the display on the GTS.

**Body Electrical > Air Conditioner > Active Test**

TESTER DISPLAY	MEASUREMENT ITEM	CONTROL RANGE	DIAGNOSTIC NOTE
Cooling Electric Expansion Valve	This test activates cooling electric expansion valve to a target position.  (Cooling electric expansion valve (cooler expansion valve))	0%: Min.  100%: Max.	<ul style="list-style-type: none"> <li>• Ignition switch ON (READY)</li> <li>• Blower: Manual Hi</li> <li>• Set Temperature: Manual Lo</li> <li>• Ambient Temperature: 0°C (32°F) or more than 0°C (32°F)</li> </ul>

**Body Electrical > Air Conditioner > Active Test**

TESTER DISPLAY
Cooling Electric Expansion Valve

OK:

Read the gauge of the manifold gauge set and check that the value is changing.

Post-procedure1

- (c) None

**NG** ▶ REPLACE COOLING ELECTRIC EXPANSION VALVE (COOLER EXPANSION VALVE)

**OK**



<b>2.</b>	<b>CHECK DTC (AIR CONDITIONING SYSTEM)</b>
-----------	--

(a) Check for DTCs.

**Body Electrical > Air Conditioner > Trouble Codes**

**HINT:**

Check even when the DTCs detected for temporary failures.

RESULT	PROCEED TO
P15017A is not output	A
P15017A is output	B

**B** ► [GO TO DTC CHART \(P15017A\)](#)

**A**  
▼

<b>3.</b>	<b>CHECK DTC (HYBRID BATTERY CONTROL SYSTEM)</b>
-----------	--

(a) Check for DTCs.

**Powertrain > HV Battery > Trouble Codes**

**HINT:**

Check even when the DTCs detected for temporary failures.

RESULT	PROCEED TO
P0D1A71 is not output	A
P0D1A71 is output	B

RELEVANT DTC	
P0D1A71	Hybrid/EV Battery Pack Coolant Control Valve "B" Performance/Stuck Off Actuator Stuck

**A** ► [REPLACE HEAT PUMP ECU ASSEMBLY](#)

**B** ► [GO TO DTC CHART \(P0D1A71\)](#)

