

<b>DTC</b>	<b>P1116</b>	<b>Coolant Temperature Sensor Circuit Stack for Coolant Heat Storage</b>
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**DESCRIPTION**

Refer to DTC P1115 (see page [ES-309](#)).

DTC No.	DTC Detection Condition	Trouble Area
P1116	<ul style="list-style-type: none"> <li>• Temperature change during hot coolant recovering: 3°C (1.8°F) or less</li> <li>• Difference between CHS tank outlet temperature and engine coolant temperature during hot coolant recovering: More than 25°C (45°F)</li> </ul>	<ul style="list-style-type: none"> <li>• Coolant heat storage tank outlet temperature sensor</li> <li>• Cooling system (clogging)</li> </ul>

**ES****MONITOR DESCRIPTION**

The coolant heat storage (CHS) tank outlet temperature sensor is used for monitoring coolant temperature in the vicinity of the outlet port of the heat storage tank of the CHS system. The resistance of the sensor increases when the CHS tank outlet temperature is low, and conversely, the resistance decreases when the temperature is high. The changes in resistance are reflected in the voltage that is output by the sensor. The ECM monitors the sensor voltage and uses this value to control CHS system properly.

If the sensor output voltage deviates from the normal operating range, the ECM determines that the CHS tank outlet temperature sensor circuit has malfunctioned, and sets a DTC.

Examples:

- 1) No changes occur in the CHS tank outlet temperature sensor signal (over 1°C [1.8°F]) after a predetermined length of time has elapsed from the start of the coolant recovering.
- 2) A significant difference (over 25°C [45°F]) exists between the engine coolant temperature signal and the CHS tank outlet temperature sensor signal after a predetermined length of time has elapsed from the start of the coolant recovering.

**MONITOR STRATEGY**

Related DTCs	P1116 : Coolant temperature sensor circuit range check (stuck)
Required sensors/components	Main: Coolant heat storage tank outlet temperature sensor Related: Engine coolant temperature sensor
Frequency of operation	Once per driving cycle
Duration	45 seconds
MIL operation	2 driving cycles
Sequence of operation	None

**TYPICAL ENABLING CONDITIONS**

The monitor will run whenever the following DTCs are not present	None
Coolant heat storage system malfunction	Not detected
Coolant heat recovering	ON
Difference between engine coolant temperature and CHS tank outlet temperature	More than 30°C (54°F)

**TYPICAL MALFUNCTION THRESHOLDS**

Temperature variation of CHS tank outlet during hot coolant recovery	3°C (1.8°F) or less
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Difference between temperatures of CHS tank outlet and engine coolant during hot coolant recovery	More than 25°C (45°F)
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**WIRING DIAGRAM**

Refer to DTC P1115 (see page [ES-311](#)).

**INSPECTION PROCEDURE**

**CAUTION:**

Be careful when replacing any part in the system or changing the coolant because the coolant in the heat storage tank is hot even if the engine is cold.

**HINT:**

- To check the coolant heat storage (CHS) system, the ECM may cause the water pump of the CHS system to operate 5 hours after the power switch has been turned OFF.
- Read freeze frame data using the intelligent tester. The ECM records vehicle and driving condition information as freeze frame data the moment a DTC is stored. When troubleshooting, freeze frame data can be helpful in determining whether the vehicle was running or stopped, whether the engine was warmed up or not, whether the air/fuel ratio was lean or rich, as well as other data recorded at the time of a malfunction.

**ES**

**1 CHECK OTHER DTC OUTPUT (IN ADDITION TO DTC P1116)**

- (a) Connect the intelligent tester to the DLC3.
- (b) Turn the power switch ON (IG).
- (c) Turn the tester ON.
- (d) Enter the following menus: DIAGNOSIS / ENHANCED OBD II / DTC INFO / CURRENT CODES.
- (e) Read the DTCs.

**Result**

Display (DTC output)	Proceed to
P1116	A
P1116 and other DTCs	B

**HINT:**

If any other codes besides P1116 are output, perform troubleshooting for those DTCs first.

**B** → **GO TO DTC CHART**

**A**

**2 CHECK COOLING SYSTEM (CHECK FOR CLOGGING IN THE COOLANT SYSTEM)**

**OK:**

Coolant passage has no blockage.

**NG** → **REPAIR OR REPLACE COOLING SYSTEM**

**OK**

**REPLACE TEMPERATURE SENSOR (CHS TANK OUTLET TEMPERATURE SENSOR)**