

<b>DTC</b>	<b>P0116</b>	<b>ENGINE COOLANT TEMPERATURE CIRCUIT RANGE/PERFORMANCE PROBLEM</b>
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## CIRCUIT DESCRIPTION

Refer to DTC P0115 on page 05-490.

DTC No.	DTC Detection Condition	Trouble Area
P0116	<p>If the engine coolant temperature between was <math>-40^{\circ}\text{C}</math> (<math>-40^{\circ}\text{F}</math>) and <math>60^{\circ}\text{C}</math> (<math>140^{\circ}\text{F}</math>) at engine start, and condition (a) and (b) are met:</p> <p>(2 trip detection logic)</p> <p>(a) Vehicle is driven at varying speeds (under acceleration and deceleration)</p> <p>(b) Engine coolant temperature remains within <math>3^{\circ}\text{C}</math> (<math>5.4^{\circ}\text{F}</math>) of the engine starting temperature</p>	<ul style="list-style-type: none"> <li>Engine coolant temperature sensor</li> </ul>

## MONITOR DESCRIPTION

The engine coolant temperature sensor is used to monitor the engine coolant temperature. The engine coolant temperature sensor has a thermistor that varies its resistance depending on the temperature of the engine coolant. When the coolant temperature is low, the resistance in the thermistor increases. When the temperature is high, the resistance drops. The variations in resistance are reflected in the voltage output from the sensor. The ECM monitors the sensor voltage and uses this value to calculate the engine coolant temperature. When the sensor voltage output has virtually no variation, the ECM interprets this as a fault in the engine coolant temperature sensor and sets the DTC.

Examples:

Upon starting the engine, the engine coolant temperature was between  $-40^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$ ) and  $60^{\circ}\text{C}$  ( $140^{\circ}\text{F}$ ). If after driving for a few minutes, the engine coolant temperature still remains within  $3^{\circ}\text{C}$  ( $5.4^{\circ}\text{F}$ ) of the starting temperature, the DTC will be set (2 trip detection logic).

## INSPECTION PROCEDURE

HINT:

- If DTCs P0115 and P0116 are output simultaneously, the engine coolant temperature sensor may have an open or a short circuit. Perform troubleshooting for those DTCs first.
- Read freeze frame data using the intelligent tester II. Freeze frame data record the engine conditions when a malfunctions are detected. When troubleshooting, freeze frame data can help determine if the vehicle was moving or stationary, if the engine was warmed up or not, if the air-fuel ratio was lean or rich, and other data from the time the malfunction occurred.

### REPLACE ENGINE COOLANT TEMPERATURE SENSOR