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|------------|--------------|---------------------------------------------------------------|
| <b>DTC</b> | <b>P0116</b> | <b>Engine Coolant Temp. Circuit Range/Performance Problem</b> |
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## CIRCUIT DESCRIPTION

Refer to DTC P0115 (Engine coolant temp. Circuit Malfunction) on page [DI-33](#).

| DTC No. | DTC Detecting Condition                                                                                                                                                                                                                                                                                        | Trouble Area                                                                                              |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| P0116   | If THW < -6.4°C (20°F) at engine start, 20 min. or more after starting engine, engine coolant temp. sensor value is 20°C (68°F) or less (2 trip detection logic)                                                                                                                                               | <ul style="list-style-type: none"> <li>• Engine coolant temp. sensor</li> <li>• Cooling system</li> </ul> |
|         | If THW ≥ -6.4°C (20°F) and < 10°C (50°F) at engine start, 5 min. or more after starting engine, engine coolant temp. sensor value is 20°C (68°F) or less (2 trip detection logic)                                                                                                                              |                                                                                                           |
|         | If THW ≥ 10°C (50°F) at engine start, 2 min. or more after starting engine, engine coolant temp. sensor value is 20°C (68°F) or less (2 trip detection logic)                                                                                                                                                  |                                                                                                           |
|         | When THW ≥ 35°C (95°F) and 60°C (140°F), THA ≥ -6.7°C (19.9°F), when starting engine, condition (a) and (b) continues:<br>(a) Vehicle speed is changing (Not stable)<br>(b) Water temperature change is lower than 3°C (37.4°F) from water temperature since when starting the engine (2 trip detection logic) |                                                                                                           |

## INSPECTION PROCEDURE

### HINT:

- If DTCs P0115 (Engine Coolant Temp. Circuit Malfunction) and P0116 (Engine Coolant Temp. Circuit Range/Performance) are output simultaneously, engine coolant temp. sensor circuit may be open. Perform troubleshooting of DTC P0115 first.
- Read freeze frame data using TOYOTA hand-held tester or OBD II scan tool. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

|          |                                                                    |
|----------|--------------------------------------------------------------------|
| <b>1</b> | <b>Are there any other codes (besides DTC P0116) being output?</b> |
|----------|--------------------------------------------------------------------|

**YES**

**Go to relevant DTC chart (See page [DI-14](#)).**

**NO**

|   |                                                     |
|---|-----------------------------------------------------|
| 2 | Check thermostat (See page <a href="#">CO-12</a> ). |
|---|-----------------------------------------------------|

NG

Replace thermostat.

OK

Replace engine coolant temp. sensor.