| DTC | P0125 | Insufficient Coolant Temperature for Closed Loop Fuel Control |
|---|---|---|

## DESCRIPTION

A thermistor is built into the Engine Coolant Temperature (ECT) sensor, of which the resistance value varies according to the ECT.
The structure of the sensor and its connection to the ECM are the same as those of the Intake Air Temperature (IAT) sensor.

| DTC No. | DTC Detection Condition | Trouble Area |
|---|---|---|
| P0125 | **Case 1:**<br>Engine coolant temperature (ECT) is less than -19.45°C (-3°F) at engine and following conditions are met (2 trip detection logic):<br>(a) 20 minutes elapsed since engine starts<br>(b) ECT sensor value remains below closed-loop fuel control enabling temperature<br>**Case 2:**<br>ECT is between -19.45°C and -8.34°C (-3°F and 17°F) at engine start and following conditions are met (2 trip detection logic):<br>(a) 109 seconds elapsed since engine starts<br>(b) ECT sensor value remains below closed-loop fuel control enabling temperature<br>**Case 3:**<br>ECT is between -8.34°C ( 17°F) at engine start and following conditions are met (2 trip detection logic):<br>(a) 74 seconds elapsed since engine starts<br>(b) ECT sensor value remains below closed-loop fuel control enabling temperature | • Engine coolant temperature sensor<br>• Cooling system<br>• Thermostat |

ES

## MONITOR DESCRIPTION

The resistance of the ECT varies in proportion to the actual ECT. The ECT supplies a constant voltage to the sensor and monitors the signal output voltage of the sensor. The signal voltage output varies according to the changing resistance of the sensor. After the engine is started, the ECT is monitored through this signal. If the ECT sensor indicates that the engine is not yet warm enough for closed-loop fuel control, despite a specified period of time having elapsed since the engine was started, the ECM interprets this as a malfunction in the sensor or cooling system and sets the DTC.
Example:
The ECT is 0°C (32°F) at engine start. After 5 minutes running time, the ECT sensor still indicates that the engine is not warm enough to begin closed-loop fuel (air-fuel ratio feedback) control. The ECM interprets this as a malfunction in the sensor or cooling system and sets the DTC.

## MONITOR STRATEGY

| | |
|---|---|
| Related DTCs | P0125: Insufficient engine coolant temperature for closed-loop fuel control |
| Required Sensors/Components (Main) | Thermostat, cooling system |
| Required Sensors/Components (Related) | Engine coolant temperature sensor and mass air flow meter |
| Frequency of Operation | Once per driving cycle |
| Duration | 74 seconds: Closed-loop enable temperature - 8.34°C (17°F) or more<br>109 seconds: Closed-loop enable temperature - 19.45 to - 8.34°C (- 3 to 17°F)<br>20 minutes: Less than closed-loop enable temperature - 19.45°C (- 3°F) |
| MIL Operation | 2 driving cycles |
| Sequence of Operation | None |

## TYPICAL ENABLING CONDITIONS

| | |
|---|---|
| Monitor runs whenever following DTCs not present | P0100, P0101, P0102, P0103 (MAF sensor)<br>P0110, P0112, P0113 (IAT sensor)<br>P0115, P0116, P0117, P0118 (ECT sensor) |
| Fuel cut | OFF |
| Engine | Running |
| Idle | OFF |

## TYPICAL MALFUNCTION THRESHOLDS

| | |
|---|---|
| Time until actual engine coolant temperature reaches closed-loop fuel control enabling temperature | 74 seconds or more: Engine coolant temperature at engine start -8.34°C (17°F) or more<br>109 seconds or more: Engine coolant temperature at engine start -19.45 to -8.35°C (-3 to 17°F)<br>20 minutes or more: Engine coolant temperature at engine start less than -19.45°C (-3°F) |

ES

## WIRING DIAGRAM

Refer to DTC P0115 (See page ES-101).

HINT:

- If any of DTCs P0115, P0116, P0117 or P0118 are set simultaneously with DTC P0125, the Engine Coolant Temperature (ECT) sensor may have an open or a short circuit. Troubleshoot those DTCs first.
- 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 help determine if the vehicle was running or stopped, 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.

| 1 | CHECK OTHER DTCS OUTPUT (IN ADDITION TO DTC P0125) |
|---|---|

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

**Result**

| Display (DTC Output) | Proceed to |
|---|---|
| P0125 | A |
| P0125 and other DTCs | B |

HINT:
If any DTCs other than P0125 are output, troubleshoot those DTCs first.

B → GO TO RELEVANT DTC CHART

A

| 2 | INSPECT THERMOSTAT |
|---|---|

(a) Remove the thermostat (See page CO-18 ).
(b) Check the valve opening temperature of the thermostat.

**Standard:**
**80 to 84°C (176 to 183°F)**
HINT:
In addition to the above check, confirm that the valve is completely closed when the temperature is below the standard.

(c) Reinstall the thermostat (See page CO-19).

NG → **REPLACE THERMOSTAT**

OK ↓

| 3 | CHECK COOLING SYSTEM |
|---|---|

(a) Check for defects in the cooling system that might cause the system to be too cold, such as abnormal radiator fan operation or any modifications.
**OK:**
**There is no modification of cooling system.**

NG → **REPAIR OR REPLACE COOLING SYSTEM**

OK ↓

**REPLACE ENGINE COOLANT TEMPERATURE SENSOR**