DTC	P0125	INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL

CIRCUIT DESCRIPTION

Refer to DTC P0115 on page 05–103.

DTC No.	DTC Detection Condition	Trouble Area
P0125	When ECT or IAT was less than –6.6˚C (20˚F) when starting engine, ECT sensor value is 20˚C (68˚F) or less even if 20 minutes or more has passed after engine start (2 trip detection logic)	• Cooling system • Engine coolant temperature sensor • Thermostat
P0125	If ECT and IAT was between –6.6˚C (20˚F) and 10˚C (50˚F) when starting engine, ECT sensor value is 20˚C (68˚F) or less even if more than 5 minutes has passed after engine start (2 trip detection logic)	• Cooling system • Engine coolant temperature sensor • Thermostat
P0125	If ECT and IAT were higher than 10˚C (50˚F) when starting engine, ECT sensor value is 20˚C (68˚F) or less even if more than 2 minutes has passed after engine start	• Cooling system • Engine coolant temperature sensor • Thermostat

HINT:
ECT represents engine coolant temperature, and IAT represents intake air temperature.

MONITOR DESCRIPTION

The engine coolant temperature (ECT) sensor is used to monitor the temperature of the engine coolant. The resistance of the sensor varies with the actual engine coolant temperature. The ECM applies voltage to the sensor and the varying resistance of the sensor causes the signal voltage to vary. The ECM monitors the ECT signal voltage after engine start–up. If, after sufficient time has passed, the sensor still reports that the engine is not warm enough for closed–loop fuel control, the ECM interprets this as a fault in the sensor or cooling system and sets a DTC.
Example:
The engine coolant temperature was 0°C (32°F) at engine start. After driving 5 minutes, the ECT sensor still indicates that the engine is not warm enough to begin the air–fuel ratio feedback control. The ECM interprets this as a fault in the sensor or cooling system and will set a DTC.

MONITOR STRATEGY

Case 1

Related DTCs	P0125: Insufficient coolant temperature for closed loop fuel control
Required sensors/components	Main: Engine coolant temperature sensor, cooling system, thermostat Related: Mass air flow meter
Frequency of operation	Continuous
Duration	2 minutes (engine starting temperature is 10°C (50°F) or more)
MIL operation	2 driving cycles
Sequence of operation	None

Case 2

Related DTCs	P0125: Insufficient coolant temperature for closed loop fuel control
Required sensors/components	Main: Engine coolant temperature sensor, cooling system, thermostat Related: Mass air flow meter
Frequency of operation	Continuous
Duration	5 minutes (engine starting temperature is –6.6°C (20°F) to 10°C (50°F))
MIL operation	2 driving cycles
Sequence of operation	None

Case 3

Related DTCs	P0125: Insufficient coolant temperature for closed loop fuel control
Required sensors/components	Main: Engine coolant temperature sensor, cooling system, thermostat Related: Mass air flow meter
Frequency of operation	Continuous
Duration	20 minutes (engine starting temperature is less than –6.6°C (20°F))
MIL operation	2 driving cycles
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

The monitor will run whenever the following DTCs are not present	See page 05–20
Intake air amount per second	0.1 g/sec or more
Fuel cut	OFF

TYPICAL MALFUNCTION THRESHOLDS

Case 1

Time until monitored engine coolant temperature reaches feedback start temperature

Engine starting temperature is 10°C (50°F) or more	Engine coolant temperature is less than ”closed–loop enabling temperature” even if 2 minutes or more passed after engine start

Case 2

Time until monitored engine coolant temperature reaches feedback start temperature

Engine starting temperature is –6.6°C (20°F) to 10°C (50°F)	Engine coolant temperature is less than ”closed–loop enabling temperature” even if 5 minutes or more passed after engine start

Case 3

Time until monitored engine coolant temperature reaches feedback start temperature

Engine starting temperature is –6.6°C (20°F) or less	Engine coolant temperature is less than ”closed–loop enabling temperature” even if 20 minutes or more passed after engine start

WIRING DIAGRAM

Refer to DTC P0115 on page 05–103.

INSPECTION PROCEDURE

HINT:

- If DTCs P0115, P0116, P0117, P0118 and P0125 are output simultaneously, engine coolant temperature sensor circuit may be open or short. Perform troubleshooting on DTC P0115, P0117 or P0118 first.
- Read freeze frame data using the hand−held tester or the OBD II scan tool. Freeze frame data records the engine condition when malfunction is detected. 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 DTC OUTPUT(IN ADDITION TO DTC P0125)

(a) Connect the hand–held tester or the OBD II scan tool to the DLC3.
(b) Turn the power switch ON (IG).
(c) Turn the hand–held tester or the OBD II scan tool ON.
(d) On the hand–held tester, select the item: DIAGNOSIS / ENHANCED OBD II / ENGINE AND ECT / DTC INFO / CURRENT CODES.
(e) Read DTCs using the hand–held tester or the OBD II scan tool.
Result:

Display (DTC output)	Proceed to
P0125	A
P0125 and other DTCs	B

HINT:
If any other codes besides P0125 are output, perform troubleshooting for those DTCs first.

B → **GO TO RELEVANT DTC CHART (See page 05–55)**

A

2	INSPECT THERMOSTAT (See page 16–4)

(a) Check the valve opening temperature of the thermostat.
OK:
Thermostat valve begins to open at temperature of 80 to 84°C (176 to 183°F).
HINT:
Also check that the valve is completely closed below temperature shown above.

NG → **REPLACE THERMOSTAT (See page 16–18)**

OK

REPLACE ENGINE COOLANT TEMPERATURE SENSOR (See page 10–5)