DTC	P0128	Coolant Thermostat (Coolant Temperature Below Thermostat Regulating Temperature)

HINT:
This DTC relates to the thermostat.

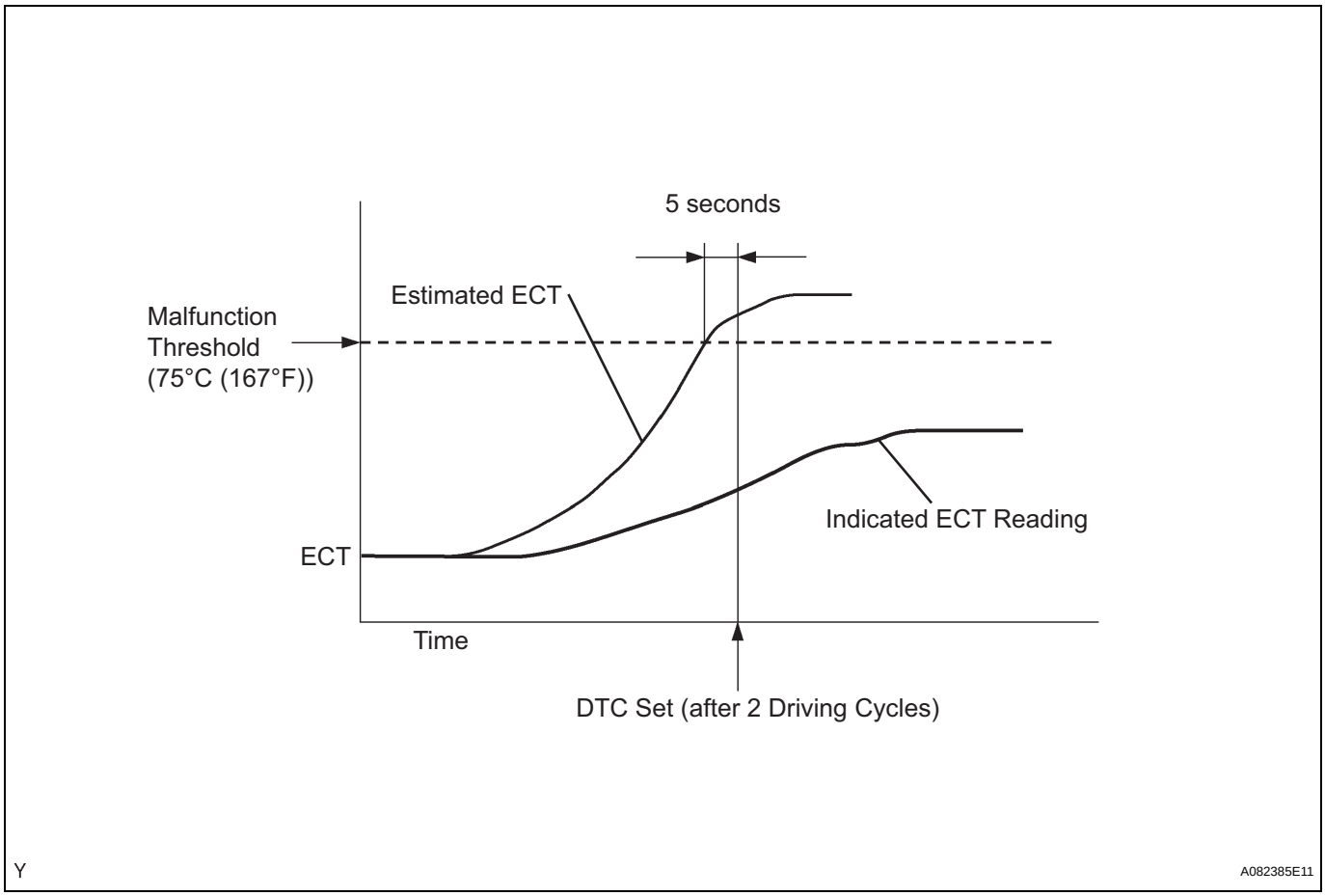
DESCRIPTION

This DTC is set when the Engine Coolant Temperature (ECT) does not reach 75°C (167°F) despite sufficient engine warm-up time.

DTC No.	DTC Detection Condition	Trouble Area
P0128	Conditions (a), (b) and (c) are met for 5 seconds (2 trip detection logic): (a) Cold start (b) Engine warmed up (c) ECT less than 75°C (167°F)	• Thermostat • Cooling system • ECT sensor • ECM

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MONITOR DESCRIPTION



The ECM estimates the ECT based on the starting temperature, engine loads, and engine speeds. The ECM then compares the estimated temperature with the actual ECT. When the estimated ECT reaches 75°C (167°F), the ECM checks the actual ECT. If the actual ECT is less than 75°C (167°F), the ECM interprets this as a malfunction in the thermostat or the engine cooling system and sets the DTC.

MONITOR STRATEGY

Related DTCs	P0128: Coolant Thermostat
Required Sensors / Components (Main)	Thermostat

Required Sensors / Components (Related)	Engine Coolant Temperature (ECT) sensor, Intake Air Temperature (IAT) sensor, Vehicle speed sensor
Frequency of Operation	Once per driving cycle
Duration	900 seconds
MIL Operation	2 driving cycles
Sequence of Operation	None

TYPICAL ENABLING CONDITIONS

The monitor will run whenever these DTCs are not present	P0010, P0020 (VVT VSV 1, 2), P0011, P0012 (VVT System 1-Advance, Retard), P0021, P0022 (VVT System 2-Adavance, Retard), P0031, P0032, P0051, P0052 (A/F Sensor Heater Sensor 1), P0100, P0101, P0102, P0103 (MAF Sensor), P0110, P0112, P0113 (IAT Sensor), P0115, P0116, P0117, P0118 (ECT Sensor), P0125 (Insufficient ECT for Closed Loop), P0136, P0156 (O2 Sensor 2), P0171, P0172 (Fuel System), P0300, P0301, P0302, P0303, P0304, P0305, P0306 (Misfire), P0335 (CKP Sensor), P0340 (CMP sensor), P0345 (VVT sensor), P0351, P0352, P0353, P0354, P0355, P0356 (Ignitor), P0500 (VSS), P2196, P2198(A/F Sensor (Rationality)), P2A00, P2A03 (A/F Sensor (Slow Response))
Battery voltage	11 V or more
Either of following conditions is met:	Condition 1 or 2
1. All of following conditions are met:	Conditions (a), (b) and (c)
(a) ECT at engine start - IAT at engine start	-15 to 7°C (5 to 45°F)
(b) ECT at engine start	-10 to 56°C (14 to 133°F)
(c) IAT at engine start	-10 to 56°C (14 to 133°F)
2. All of following conditions are met:	Conditions (d), (e) and (f)
(d) ECT at engine start - IAT at engine start	More than 7°C (45°F)
(e) ECT at engine start	56°C (133°F) or less
(f) IAT at engine start	-10°C (14°F) or more
Accumulated time that vehicle speed is 80 mph (128 km/h) or more	Less than 20 seconds

TYPICAL MALFUNCTION THRESHOLDS

Duration that all of the following conditions 1 and 2 are met	5 seconds or more
1. Estimated ECT	75°C (167°F) or more
2. ECT sensor output	Less than 75°C (167°F)

INSPECTION PROCEDURE

HINT:
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.

1	**CHECK ANY OTHER DTCS OUTPUT (IN ADDITION TO DTC P0128)**

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch to the ON position.
(c) Turn the tester on.
(d) Select the following menu items: DIAGNOSIS / ENHANCED OBD II / DTC INFO / CURRENT CODES.
(e) Read the DTCs.

Result

Display (DTC Output)	Proceed to
P0128	A
P0128 and other DTCs	B

HINT:
If any DTCs other than P0128 are output, troubleshoot those DTCs first.

B → **GO TO DTC CHART (See page ES-56)**

A

2 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.

NG → **REPAIR OR REPLACE COOLING SYSTEM**

OK

3 INSPECT THERMOSTAT

(a) Remove the thermostat (See page CO-16).
(b) Check the valve opening temperature of the thermostat (See page CO-17).
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-17).

NG → **REPLACE THERMOSTAT (See page CO-16)**

OK

REPLACE ECM (See page ES-498)

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