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

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 rip 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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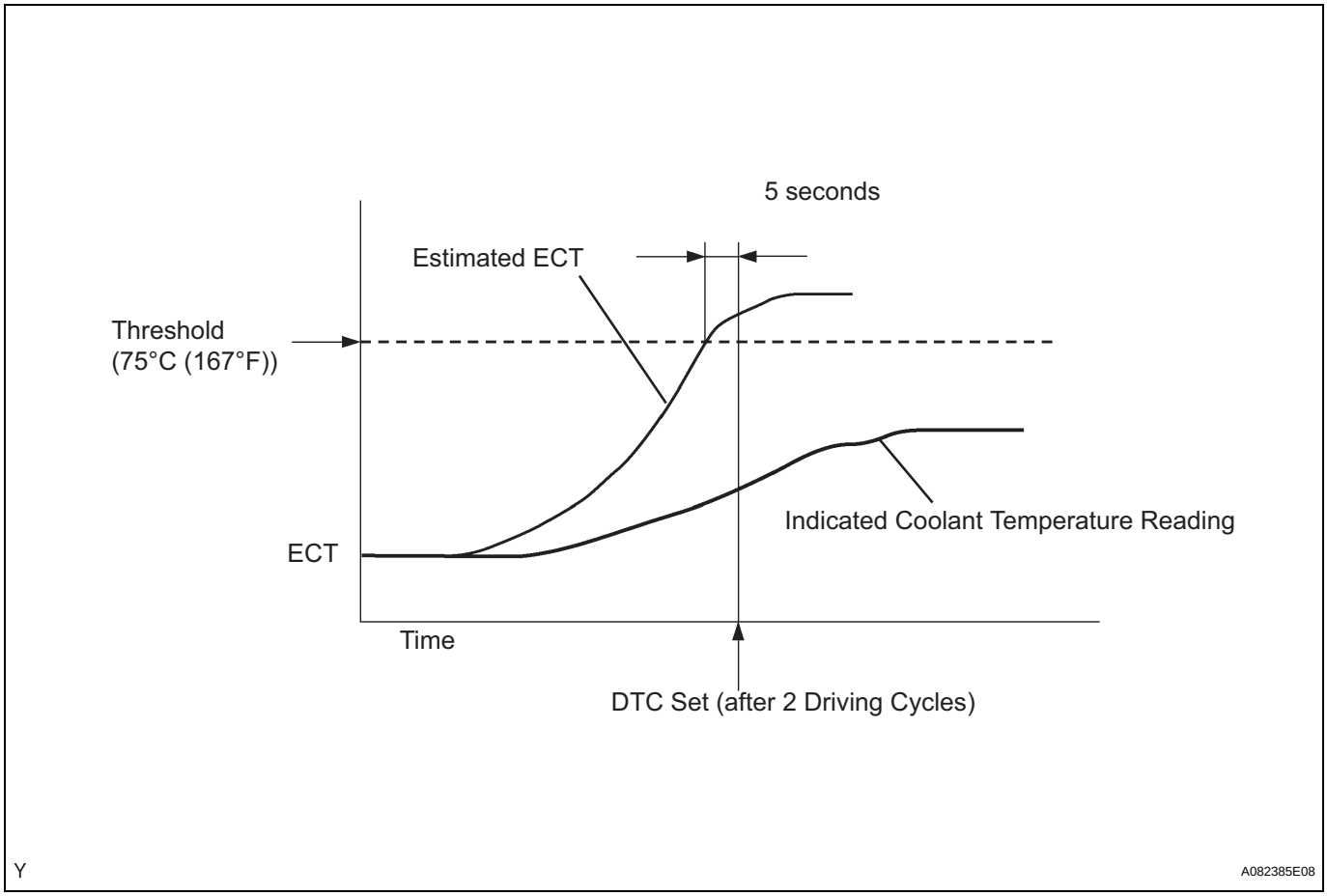
MONITOR DESCRIPTION



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 drive cycle

Duration	900 seconds Once per driving cycle
MIL Operation	2 driving cycles
Sequence of Operation	None

TYPICAL ENABLING CONDITIONS

Monitor will run whenever this DTC is not present	P0010, P0020 (VVT VSV), P0011, P0012, P0021, P0022 (VVT system-Advance, Retard), P0031, P0032, P0051, P0052 (O2 sensor heater sensor 1), P0031, P0032, P0051, P0052 (A/F sensor heater sensor 1), P0100, P0102, P0103 (MAF sensor), P0110, P0112, P0113 (IAT sensor), P0115, P0116, P0117, P0118 (ECT sensor), P0125 (Insufficient ECT for closed loop), P0136, P0137, P0138 (O2 sensor 1), P0171, P0172, P0174, P0175 (Fuel system), P0300, P0301, P0302, P0303, P0304, P0305, P0306 (Misfire), P0335 (CKP sensor), P0340, P0341 (CMP sensor), P0340, P0341, P0345, P0346 (VVT sensor), P0351, P0352, P0353, P0354, P0355, P0356 (Igniter), 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 1 or 2 met:	-
1. All of following conditions met:	-
• ECT at engine start - IAT at engine start	-15 to 7°C (-27 to 12.6°F)
• ECT at engine start	-10 to 56°C (14 to 132.8°F)
• IAT at engine start	-10 to 56°C (14 to 132.8°F)
2. All of following conditions met:	-
• ECT at engine start - IAT at engine start	More than 7°C (12.6 °F)
• ECT at engine start	56°C (132.8°F) or less
• IAT at engine start	-10°C (14°F) or more
Accumulated time with 128 km/h (80 mph) or more of vehicle speed	Less than 20 seconds

TYPICAL MALFUNCTION THRESHOLDS

Duration that all following conditions (a) and (b) set	5 seconds or more
(a) Simulated ECT	75°C (167°F) or more
(b) ECT sensor output	Less than 75°C (167°F)

MONITOR RESULT

Refer to CHECKING MONITOR STATUS (See page ES-14).

The test value and test limit information are described as shown in the following table. Check the monitor result and test values after performing the monitor drive pattern (refer to "Confirmation Monitor").

- TID (Test Identification Date) is assigned to each emissions-related component.
- TLT (Test Limit Type):
  If TLT is 0, the component is malfunctioning when the test value is higher than the test limit.
  If TLT is 1, the component is malfunctioning when the test value is lower than the test limit.
- CID (Component Identification Date) is assigned to each test value.
- Unit Conversion is used to calculate the test value indicated on generic OBD II scan tools.

TID $08: Thermostat

TILT	CID	Unit Conversion	Description of Test Date	Description of Test Limit
1	$01	Multiply by 0.625 and subtract 40 (°C)	ECT sensor output when estimated ECT has reached to malfunction criterion	Malfunction criteria for thermostat

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 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	INSPECT THERMOSTAT

(a) Inspect the thermostat (See page CO-19).

NG → REPLACE THERMOSTAT

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2	CHECK OTHER DTC OUTPUT (IN ADDITION TO DTC P0128)

(a) Read the DTC using the intelligent tester or the OBD II scan tool.

Result

Display (DTC Output)	Proceed to
Only P0128 is output	A
P0128 and other DTCs are output	B

HINT:
If any other codes besides P0128 are output, perform the troubleshooting for those DTCs first.

B → GO TO RELEVANT DTC CHART

A

REPLACE ECM