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| DTC | P0128 | Thermostat Malfunction |
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DESCRIPTION

HINT:

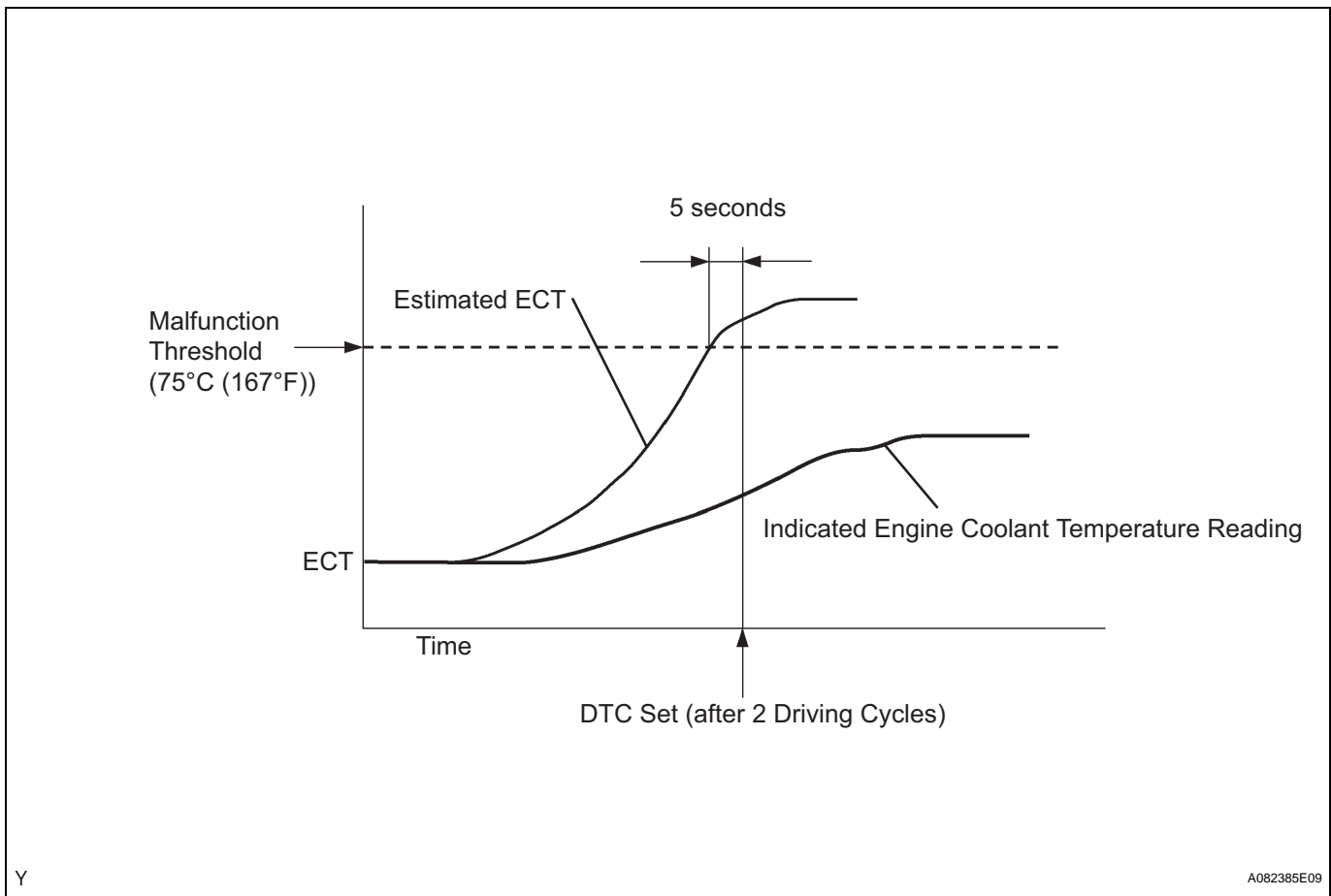
This DTC relates to the thermostat.

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) met for 5 seconds (2 trip detection logic): (a) Cold start (b) Engine warmed up (c) ECT less than 75°C (167°F) | <ul style="list-style-type: none"> Thermostat Cooling system Engine Coolant Temperature (ECT) sensor ECM |

ES

MONITOR DESCRIPTION



The ECM estimates the ECT based on 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 will interpret this as a malfunction in the thermostat or the engine cooling system and sets the DTC.

MONITOR STRATEGY

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|---------------------------------------|--|
| 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 | 400 seconds |
| MIL operation | 2 driving cycles |
| Sequence of operation | None |

TYPICAL ENABLING CONDITIONS

| | |
|--|--|
| Monitor runs whenever following DTCs not present | P0010 (VVT OCV) P0011 (VVT system 1 - advance) P0012 (VVT system 1 - retard) P0031, P0032 (heated oxygen sensor 1) P0100 - P0103 (MAF meter) P0110 - P0113 (IAT sensor) P0115 - P0118 (ECT sensor) P0125 (insufficient ECT for closed loop) P0130 (heated oxygen sensor 1) P0134 (heated oxygen sensor 1) P0171, P0172 (fuel system) P0300 - P0304 (misfire) P0335 (crankshaft position sensor) P0340 (camshaft position sensor) P0351 - P0354 (igniter) P0441 - P0456 (EVAP system) P0500 (VSS) |
| Battery voltage | 11 V or more |
| Intake air temperature at engine start (IAT) | -10°C (14°F) or more, and 35°C (95°F) or less |
| Engine coolant temperature at engine start (ECT) | -10°C (14°F) or more, and 35°C (95°F) or less |
| ECT at engine start - IAT at engine start | -15°C (-27°F) or more, and 7°C (12.6°F) or less |
| Accumulated time that vehicle speed is 128 km/h (80 mph) or more | Less than 20 seconds |

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TYPICAL MALFUNCTION THRESHOLDS

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|--|------------------------|
| Duration that both conditions below are met: | 5 seconds or more |
| Estimated engine coolant temperature | 75°C (167°F) or more |
| ECT sensor output | Less than 75°C (167°F) |

MONITOR RESULT

Refer to CHECKING MONITOR STATUS (see page [ES-19](#)).

HINT:

Read freeze frame data using the intelligent tester. Freeze frame data records the engine conditions when malfunctions are 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 P0128)

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

A

ES

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-12](#)).
- (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.

NG → **REPLACE THERMOSTAT**

OK

REPLACE ECM