

DTC	P0505	Idle Air Control System
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CIRCUIT DESCRIPTION

The idle speed is controlled by the ETCS (Electronic Throttle Control System).

The ETCS is composed of the throttle motor which operates the throttle valve, and the throttle position sensor, which detects the opening angle of the throttle valve.

The ECM controls the throttle motor to provide the proper throttle valve opening angle to obtain the target idle speed.

DTC No.	DTC Detection Condition	Trouble Area
P0505	Idle speed continues to vary greatly from target speed (2 trip detection logic)	<ul style="list-style-type: none"> • ETCS • Air induction system • PCV hose connection • ECM

MONITOR DESCRIPTION

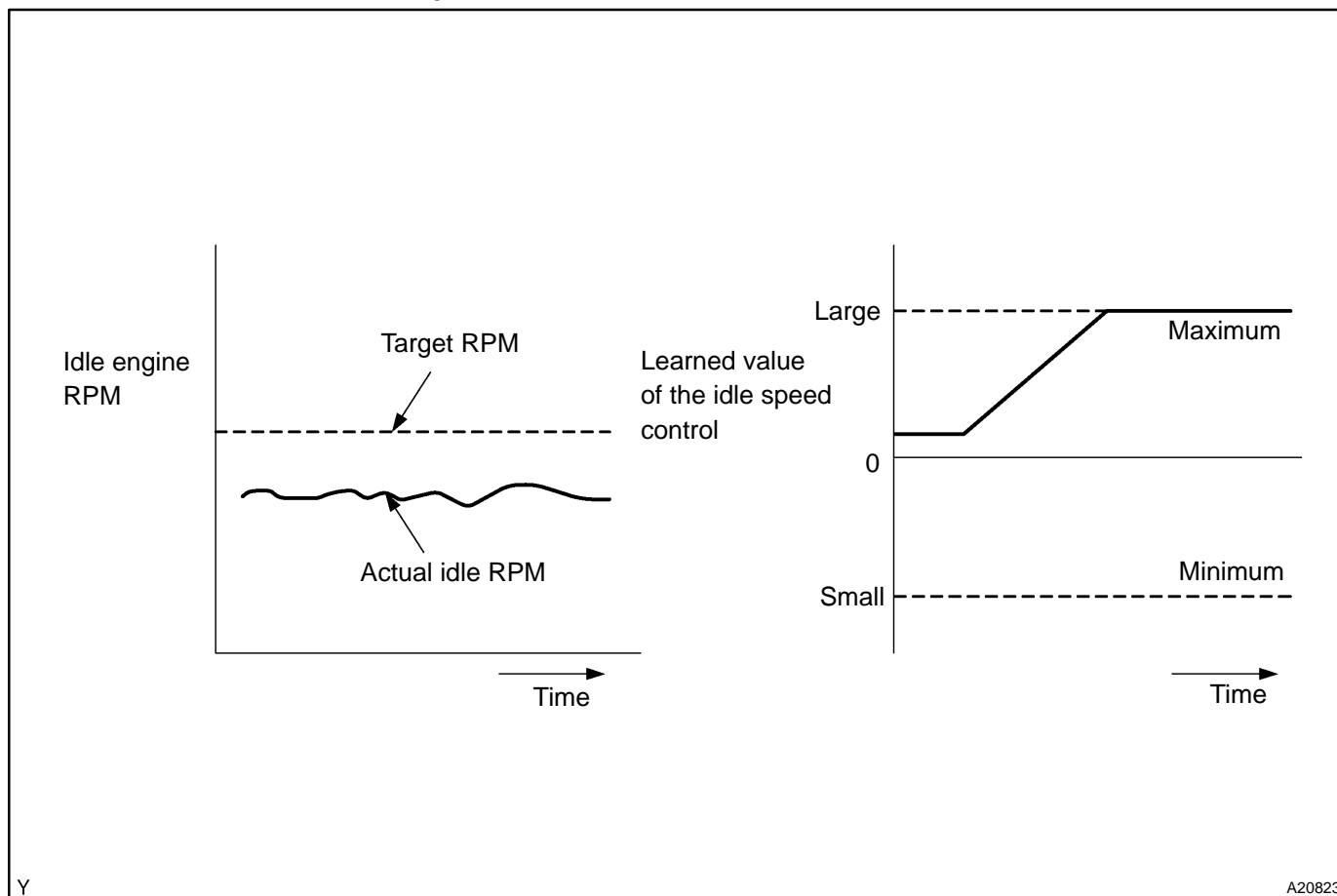
The ECM regulates the idle speed by opening and closing the throttle valve using the ETCS. The ECM concludes that the idle speed control ECM function is malfunctioning if: 1) the actual idle RPM varies more than the specified amount, or 2) a learning value of the idle speed control remains at the maximum or minimum five times or more during a driving cycle. The ECM will turn on the MIL and set a DTC.

Example:

If the actual idle RPM varies from the target idle RPM by more than 100 (*1) rpm five times during a driving cycle, the ECM will turn on the MIL and a DTC is set.

HINT:

*1: RPM threshold varies with engine load.



MONITOR STRATEGY

Related DTCs	P0505	Idle air control malfunction
Required sensors/components	Main sensors/components	Crankshaft position sensor
	Related sensors/components	Vehicle speed sensor, Engine coolant temperature sensor
Frequency of operation	Once per driving cycle	
Duration	10 min.	
MIL operation	2 driving cycles	
Sequence of operation	None	

TYPICAL ENABLING CONDITIONS

Item	Specification	
	Minimum	Maximum
The monitor will run whenever this DTC is not present	See page DI-18	
Engine	Running	

TYPICAL MALFUNCTION THRESHOLDS

Detection Criteria	Threshold
Either of the following conditions is met:	Condition 1 or 2
1. Frequency that both of the following conditions (a) and (b) are met:	5 times or more
(a) Engine RPM – target engine RPM	Less than –100 rpm or more than 150 rpm
(b) Vehicle condition	Stop after vehicle was driven by 6.25 mph (10 km/h) or more
2. Frequency that both of the following conditions (c) and (d) are met:	Once
(c) Engine RPM – target engine RPM	Less than –100 rpm or more than 150 rpm
(d) Intake air control flow rate learning value	1.3 L/sec. or less, or 8.5 L/sec. or more

INSPECTION PROCEDURE

HINT:

- When the throttle position is slightly opened (the accelerator pedal is slightly depressed) because a floor carpet is overlapped on the accelerator pedal, or if the accelerator pedal is not fully released, etc., DTC P0505 will possibly be detected.
- Read freeze frame data using the hand–held tester. Freeze frame data records the engine conditions when a 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, as well as other data from the time when a malfunction occurred.

1	Are there any other codes (besides P0505) being output?
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PREPARATION:

- Connect the hand–held tester to the DLC3.
- Turn the ignition switch to ON and push the hand–held tester main switch ON.
- When using hand–held tester, enter the following menu: DIAGNOSIS / ENHANCED OBD II / DTC INFO / CURRENT CODES.

CHECK:

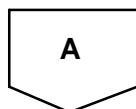
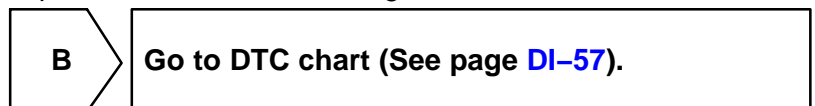
Read the DTC using the hand–held tester.

RESULT:

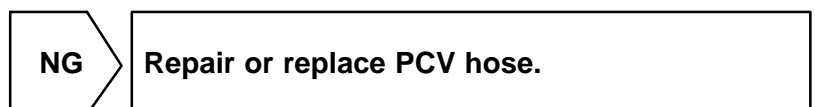
Display (DTC Output)	Proceed to
P0505	A
"P0505" and other DTCs	B

HINT:

If any other codes besides P0505 are output, perform the troubleshooting for those DTCs first.



2	Check connection of PCV hose.
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3	Check air induction system (See page SF-1).
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CHECK:

Check for vacuum leaks in air induction system.

OK:

No leakage.

NG

Repair or replace air induction system.

OK

Check electric throttle control system
(See page [SF-39](#)).

DTC	P050A	Cold Start Idle Air Control System Performance
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DTC	P050B	Cold Start Ignition Timing Performance
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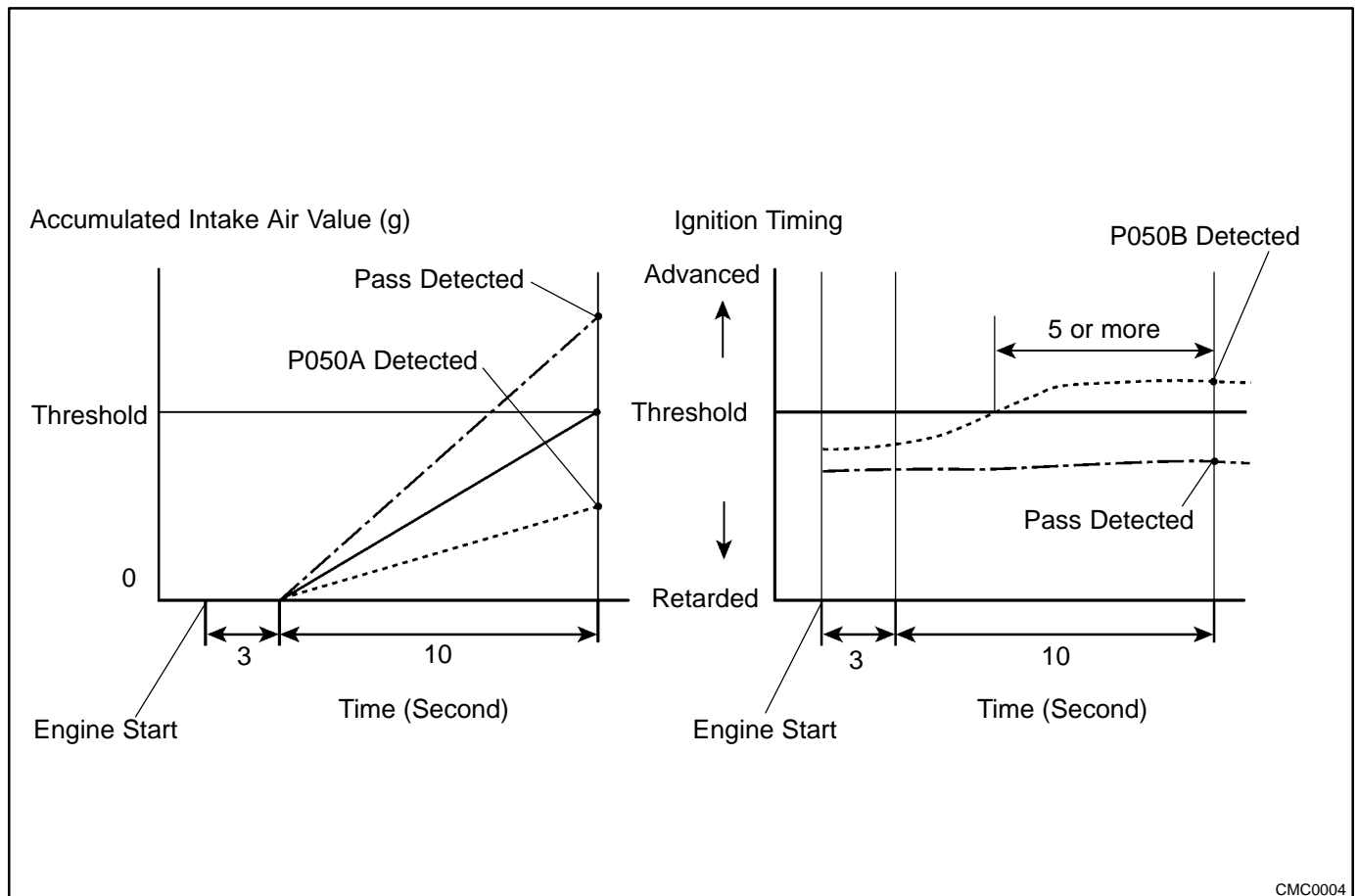
DESCRIPTION

The Electronic Throttle Control System (ETCS) controls the engine idling speed. The ETCS operates the throttle actuator to open and close the throttle valve, and adjusts the intake air amount to achieve the target idling speed.

In addition, the ECM retards the ignition timing and the ETCS increases the intake air amount to quickly increase the catalyst temperature at cold start.

DTC No.	DTC Detection Conditions	Trouble Areas
P050A	Accumulated intake air amount during 10 seconds of idling after cold start, less than threshold (2 trip detection logic)	<ul style="list-style-type: none"> • Throttle body assembly • Mass air flow meter • Air induction system • PCV hose connections • ECM
P050B	Ignition timing retard value insufficient for 5 seconds or more during 10 seconds of P050A monitoring duration at cold start (2 trip detection logic)	<ul style="list-style-type: none"> • Throttle body assembly • Mass air flow meter • Air induction system • PCV hose connections • ECM

MONITOR DESCRIPTION



The ECM monitors the intake air amount during idling and the ignition timing.

When the engine coolant temperature is between -10°C and 50°C (14°F and 122°F), the ECM calculates the idling intake air amount for 10 seconds, beginning 3 seconds after the engine starts.

When the accumulated value is below the threshold, the ECM interprets this as a malfunction in the Idle Speed Control (ISC) system at cold start.

The ECM also monitors the ignition timing at cold start, and judges it to be incorrect when it is advanced to the same value for a warm engine for 5 seconds or more of the 10 second monitoring period.

Example:

P050A is detected when all conditions below are met (2 trip detection logic).

1. The engine coolant temperature is -10°C (14°F) or more when the engine starts.
2. The engine idles for 13 seconds after engine start.
3. The accumulated intake air amount is below the threshold.

If a malfunction is not repaired successfully, the ECM sets the DTC and illuminates the MIL 13 seconds after the engine is next started.

NOTICE:

When the negative battery terminal is disconnected during inspection or repairs, the ISC learning values are cleared. The ISC learning must be performed by warming up the engine and idling for 5 minutes with the engine coolant temperature at 75°C (167°F) or more because DTCs cannot be detected with the ISC learning values cleared.

MONITOR STRATEGY

Related DTCs	P050A	Idle speed control problem at cold
	P050B	Idle ignition timing problem at cold
Required Sensors/Components (Main)	Mass air flow meter	
Required Sensors/Components (Related)	Engine Coolant Temperature (ECT) sensor, Throttle position sensor, Vehicle speed sensor	
Frequency of Operation	Once per driving cycles	
Duration	10 seconds	
MIL Operation	2 driving cycles	
Sequence of Operation	None	

TYPICAL ENABLING CONDITIONS

Item	Specification	
	Minimum	Maximum
The monitor will run whenever these DTCs are not present	See page DI-18	
P050A:		
Battery voltage	8 V	–
Time after engine start	3 seconds	–
Starter	OFF	
ECT at engine start	–10°C (14°F)	–
ECT	–10°C (14°F)	50°C (122°F)
Engine idling time	3 seconds	–
Fuel-cut	OFF	
Vehicle speed	–	1.875 mph (3 km/h)
Time after shift position changed	1 second	–
P050B:		
Battery voltage	8 V	–
Time after engine start	3 seconds	–
Starter	OFF	
ECT at engine start	–10°C (14°F)	–
ECT	–10°C (14°F)	50°C (122°F)
Engine idling time	3 seconds	–
Fuel-cut	OFF	
Vehicle speed	–	1.875 mph (3 km/h)

TYPICAL MALFUNCTION THRESHOLDS

P050A:

Accumulated air flow amount (M/T)	Varies with ECT (Example: Less than 42.5 g)
Accumulated air flow amount (A/T)	Varies with ECT (Example: Less than 47.5 g, or less than 42.5 g)

P050B:

Accumulated time when ignition timing retard is cut off	5 seconds or more
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INSPECTION PROCEDURE

HINT:

Read the freeze frame data using the intelligent tester. The freeze frame data records the engine condition when malfunctions are detected. When troubleshooting, the freeze frame data can help determine if the vehicle was moving or stationary, 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 any other DTCs output (In addition to DTC P050A and/or P050B).

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

Result:

Display (DTC Output)	Proceed To
P050A and/or P050B	A
P050A and/or P050B and other DTCs	B

HINT:

If any DTCs other than P050A and P050B are output, troubleshoot those DTCs first.

B

Go to DTC chart.

A

2 Read value using intelligent tester (Fuel trim).

HINT:

Calculate the total fuel trim values to check the characteristic deviation of the mass air flow meter.

- (a) Connect the intelligent tester to the DLC3.
- (b) Turn the ignition switch ON.
- (c) Turn the tester ON.
- (d) Select the following menu items: DIAGNOSIS / ENHANCED OBD II / DATA LIST / PRIMARY / SHORT FT #1 and LONG FT #1.
- (e) Read the values displayed on the tester.
- (f) Add together the SHORT FT #1 and LONG FT #1 values to obtain the total FUEL TRIM.

OK:

Total of the SHORT FT #1 and LONG FT #1 values is between –20 % and 20 %.

OK**Go to step 8.****NG****3****Check PCV hose connections.****OK:****PCV hose is connected correctly and is not damaged.****NG****Go to step 5.****OK****4****Check air induction system.**

(a) Check the air induction system for vacuum leakage.

OK:**No leakage from the air induction system.****OK****Go to step 6.****NG****Go to step 7.****5****Repair or replace PCV hose.****NEXT****Go to step 11.****6****Replace mass air flow meter.****NEXT****Go to step 11.****7****Repair or replace air induction system.****NEXT****Go to step 11.**

8 Check throttle valve.

(a) Check for deposits around the throttle valve.

OK:**No deposits around the throttle valve.****OK****Go to step 9.****NG****Go to step 10.****9 Replace ECM.****NEXT****Go to step 11.****10 Replace throttle body assembly.****NEXT****11 Check whether DTC output recurs (DTC P050A and/or P050B).****NOTICE:****In this operation, the engine must be cold (the same level as the engine coolant temperature recorded in the freeze frame data).**

- (a) Connect the intelligent tester to the DLC3.
- (b) Turn the ignition switch ON.
- (c) Turn the tester ON.
- (d) Clear DTCs (See page DI-42).
- (e) Switch the ECM from normal mode to check mode using the tester (See page DI-43)
- (f) Start the engine to idle for a minute.

OK:**Stable fast idling.**

- (g) Read DTCs.

OK:**No DTCs output.****NEXT****END**