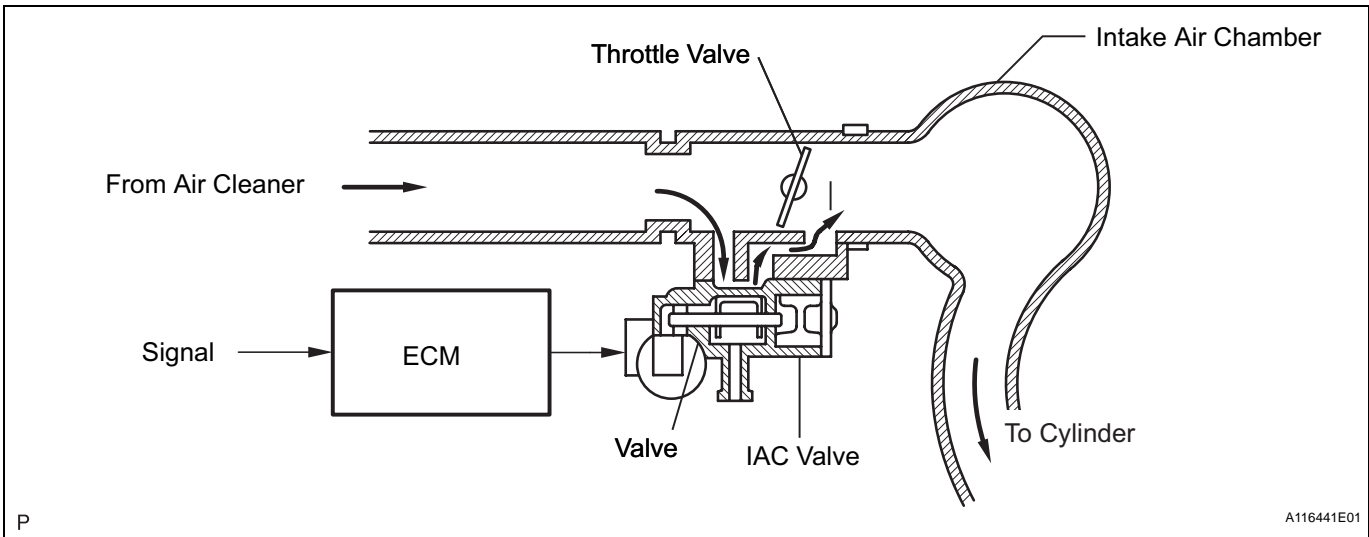


DTC	P0505	Idle Control System Malfunction
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DTC	P0511	Idle Air Control Circuit
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DESCRIPTION

The Idle Air Control (IAC) valve, a rotary solenoid type, is located under the throttle body. Intake air bypassing the throttle valve flows into the IAC valve through a passage. The valve regulates the volume of intake air that bypasses the throttle valve and allows the engine idling speed to be controlled. The IAC valve is used by the ECM to perform idle-up and its feedback signal is used as one factor in target engine idling speed regulation.

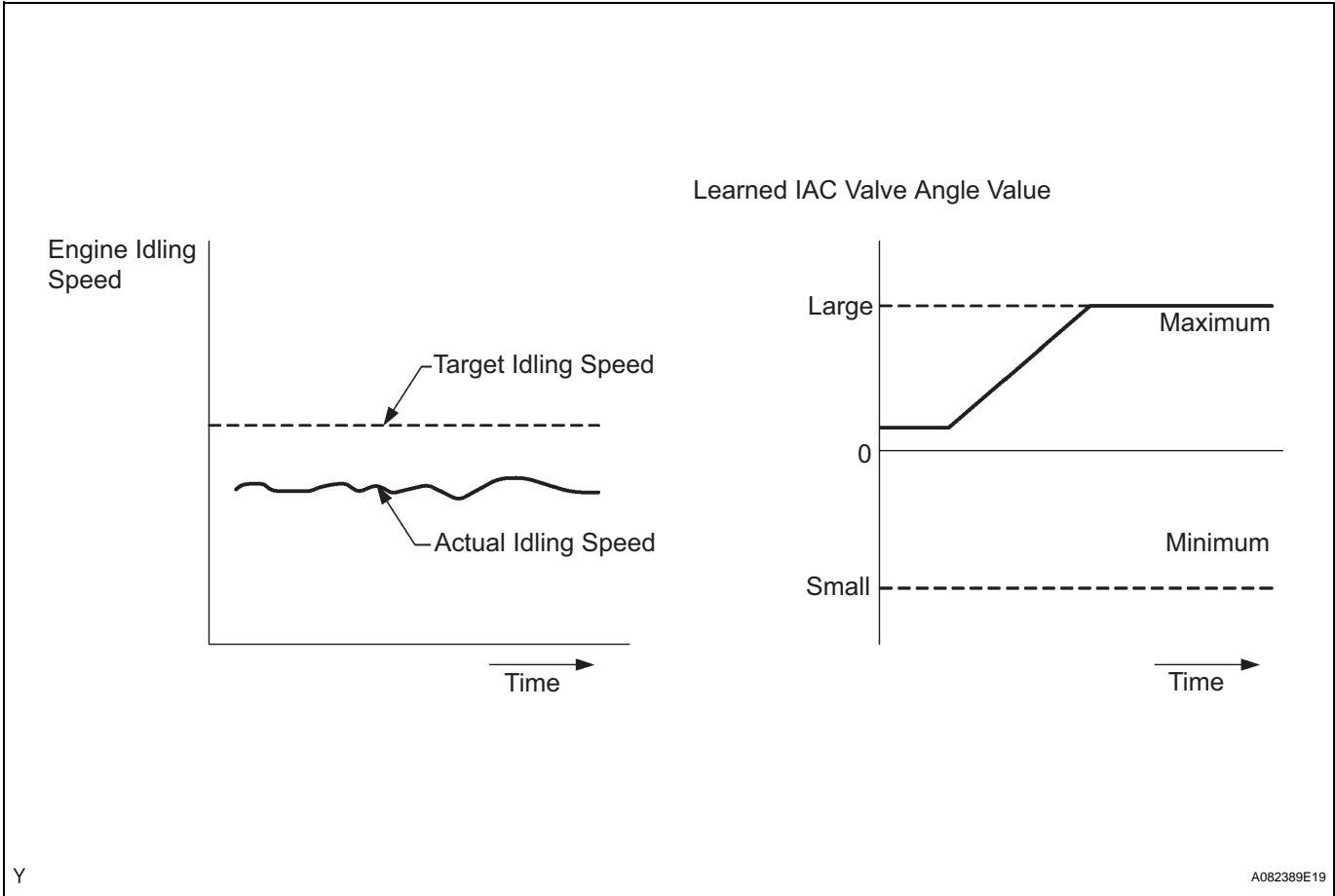


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DTC No.	DTC Detection Condition	Trouble Area
P0505	Engine idling speed continues to vary greatly from target idling speed (2 trip detection logic)	<ul style="list-style-type: none"> • Open or short in IAC valve circuit • IAC valve stuck or closed • A/C switch circuit • Air induction system • Ventilation valve and hose • ECM
P0511	Open or short IAC valve circuit (1 trip detection logic)	<ul style="list-style-type: none"> • Open or short in IAC valve circuit • IAC valve stuck or closed • ECM

MONITOR DESCRIPTION

ES



The IAC valve controls the volume of air that bypasses the throttle valve. Idling speed is determined by the volume of air that passes through the Intake Air Control (IAC) valve. When the volume is large, the idling speed increases. Conversely, when it is small, the idling speed decreases. The ECM sends a duty signal to the IAC valve and drives the IAC valve motor to regulate this air volume.

If any of the following conditions apply, the ECM determines that the IAC system is malfunctioning, and illuminates the MIL and sets a DTC. The actual engine idling speed does not reach the target idling speed, the IAC learned valve angle remains at the maximum or minimum, or the duty ratio signal to the IAC valve is stuck.

Example:

The ECM sets DTC P0505 if either of the following conditions applies:

- The difference between the actual and target engine idling speeds exceeds 200* rpm while the engine idles, and this occurs 5 times.
- The IAC learned valve angle remains at the maximum or minimum for 5 seconds.

The ECM sets DTC P0511 (open/short circuit) if the following condition applies:

- The duty ratio signal to the IAC valve is stuck at 0 or 100%.

*: The threshold varies according to engine load.

MONITOR STRATEGY

Related DTCs	P0505: Idle Air Control (IAC) valve P0511: Idle Air Control (IAC) valve
Required Sensors/Components (Main)	Crankshaft position (CKP) sensor
Required Sensors/Components (Related)	Engine Coolant Temperature (ECT) sensor and Vehicle Speed Sensor (VSS)
Frequency of Operation	P0505 Functional check: once per driving cycle P0505 Range check, P0511: continuous

Duration	10 minutes: IAC functional check 10 seconds: IAC range check
MIL Operation	P0505 Functional check: 2 driving cycles P0505 Range check, P0511: Immediate
Sequence Operation	None

TYPICAL ENABLING CONDITIONS

The monitor will run whenever these DTCs are not present	None
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P0505 IAC functional check:

Engine	Running
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P0505 IAC range check:

IAC duty ratio	10 to 90%
Battery voltage	10 V or more

ES

P0511:

IAC duty ratio	10 to 90%
Battery voltage	10 V or more
Time after first missing of voltage change	10 seconds or more

TYPICAL MALFUNCTION THRESHOLDS

P0505 IAC functional check:

When either condition below is met:	1 or 2
1. Frequency that both of following conditions (a) and (b) set	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 10 km/h (6.25 mph) or more
2. Frequency that both of following conditions (c) and (d) set	Once
(c) Engine rpm - Target engine rpm	Less than -100 rpm, or more than 150 rpm
(d) IAC flow rate learning value	0.55 L/sec. or less, or 2.75 L/sec. or more

P0505 IAC range check:

Number of missed output voltage change	2,000 times or more
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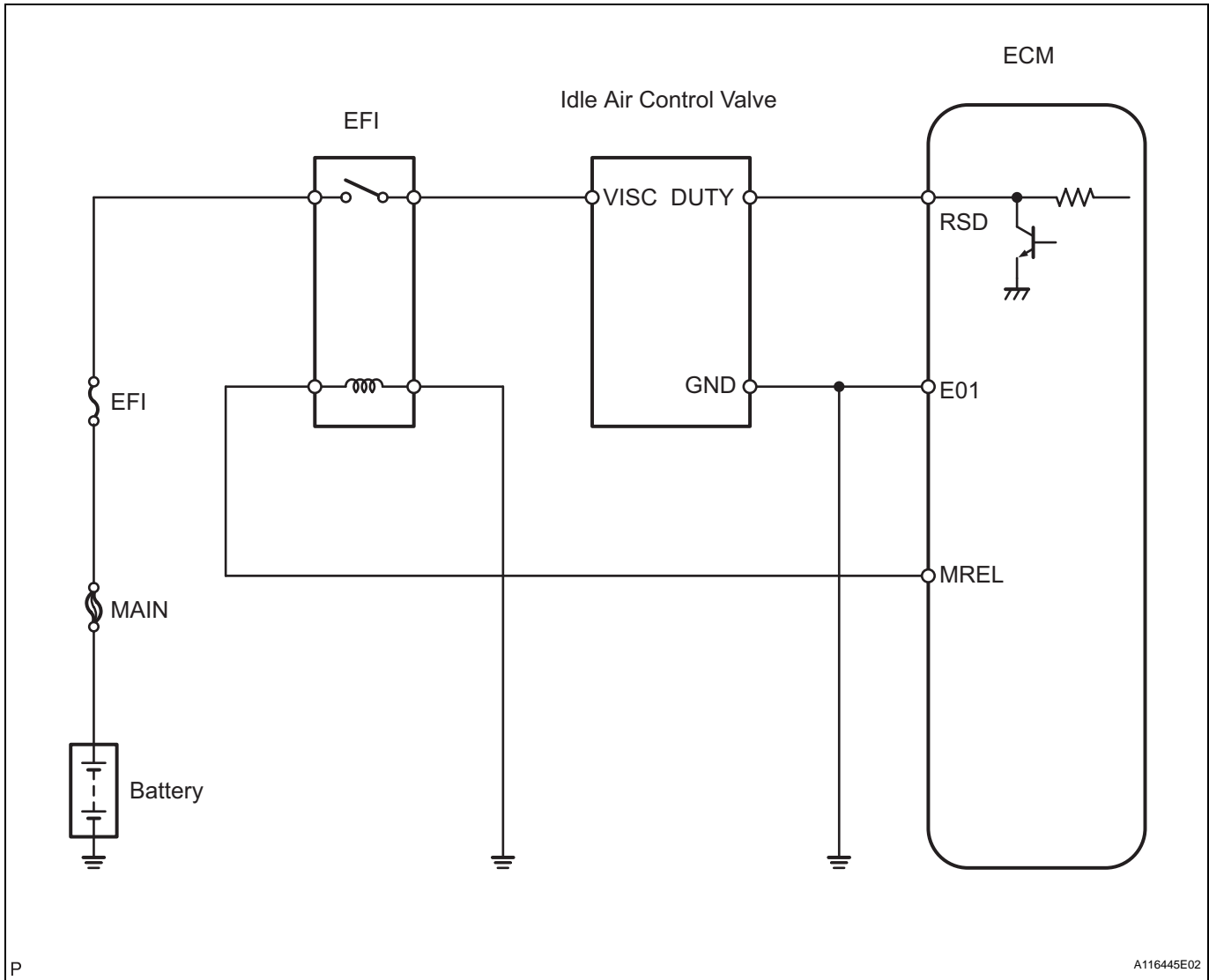
P0511:

Number of miss output voltage change	1,000 times or more
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COMPONENT OPERATING RANGE

Time with no missed voltage change	0.5 seconds or more
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WIRING DIAGRAM



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 not fully releasing the accelerator pedal, etc., DTC P505 will possibly be detected.
- Read freeze frame data using the intelligent tester. Freeze frame data records the engine condition when malfunctions are detected. When troubleshooting, 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 P0505)

- Connect the intelligent tester to the DLC3.
- Turn the ignition switch ON and turn the tester ON.
- Enter the following menus: DIAGNOSIS / ENHANCED OBD II / DTC INFO / CURRENT CODES.
- Read DTCs (see page [ES-48](#)).

Result

Display (DTC Output)	Proceed to
P0505	A
P0511	B

B → **Go to step 7**

A

2 CHECK VENTILATION HOSE CONNECTIONS

OK:
Ventilation hose is connected correctly and is not damaged.

ES

NG → **REPAIR OR REPLACE VENTILATION HOSE**

OK

3 CHECK AIR INDUCTION SYSTEM

(a) Check the air induction system for vacuum leakage.
OK:
No leakage from air induction system.

NG → **REPAIR OR REPLACE AIR INDUCTION SYSTEM**

OK

4 PERFORM ACTIVE TEST BY INTELLIGENT TESTER (CHECK IAC VALVE OPERATION)

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch ON and turn the tester ON.
(c) Start the engine and warm it up to the normal operating temperature.
(d) Switch off all the accessories (if on).
(e) Switch off A/C (if on).
(f) Move the gear selector lever to the N position.
(g) Enter the following menus: DIAGNOSIS / ENHANCED OBD II / ACTIVE TEST / IAC STEP POS.
(h) Check that the engine speed varies when the Idle Air Control (IAC) step position is changed using the tester.
OK:
Engine speed fluctuates according to IAC step position variation.

OK → **CHECK FOR INTERMITTENT PROBLEMS**

NG

5 CHECK A/C SIGNAL CIRCUIT

(a) Check the A/C signal circuit (see page AC-11).

NG → **REPAIR OR REPLACE MALFUNCTIONING PARTS, COMPONENT AND AREA**

OK

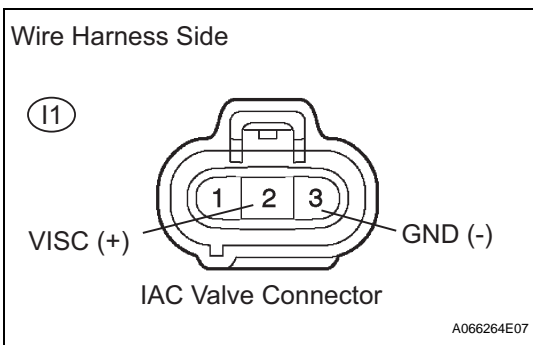
6 CHECK FOR BLOCKAGE IN IAC VALVE AND PASSAGE TO BYPASS THROTTLE VALVE

ES

NG → **REPLACE IDLE AIR CONTROL VALVE**

OK

7 CHECK HARNESS AND CONNECTOR (BATTERY - IAC VALVE, IAC VALVE - BODY GROUND)



- (a) Disconnect the I1 IAC valve connector.
- (b) Turn the ignition switch ON.
- (c) Measure the voltage between the terminals of the IAC valve wire harness side connector.

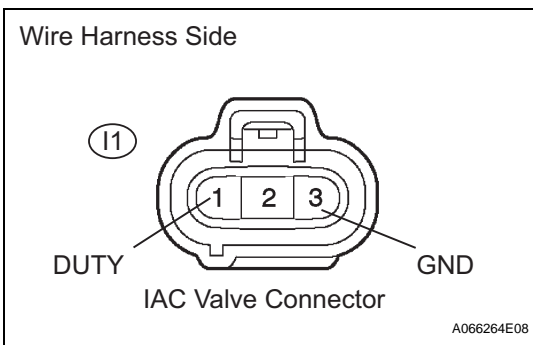
Standard voltage

Tester Connection	Specified Condition
VISC (I1-2) - GND (I1-3)	9 to 14 V

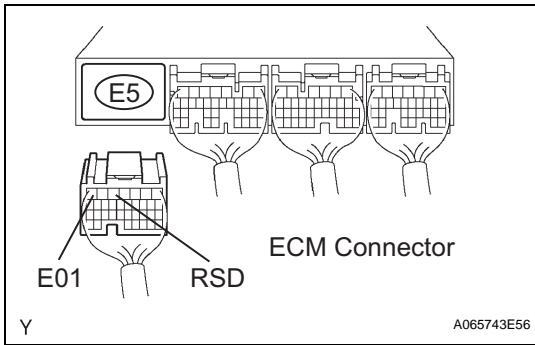
NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

8 CHECK HARNESS AND CONNECTOR (IAC VALVE - ECM)



- (a) Disconnect the I1 IAC valve connector.



- (b) Disconnect the E5 ECM connector.
- (c) Measure the resistance of the wire harness side connectors.

Standard resistance (Check for open)

Tester Connection	Specified Condition
DUTY (I1-1) - RSD (E5-5)	Below 1 Ω
GND (I1-3) - E01 (E5-7)	Below 1 Ω

Standard resistance (Check for short)

Tester Connection	Specified Condition
DUTY (I1-1) or RSD (E5-5) - Body ground	10 kΩ or higher

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

ES

OK

9 INSPECT IDLE AIR CONTROL VALVE

- (a) Inspect the IAC valve (see page [ES-351](#)).

NG → **REPLACE IDLE AIR CONTROL VALVE**

OK

REPLACE ECM