

<b>Last Modified:</b> 7-25-2017	6.8:8.0.51	<b>Doc ID:</b> RM000001BFY00MX
<b>Model Year Start:</b> 2007	<b>Model:</b> LS460	<b>Prod Date Range:</b> [09/2006 -     ]
<b>Title:</b> 1UR-FSE ENGINE CONTROL SYSTEM: SFI SYSTEM: P050A,P050B; Cold Start Idle Air Control System Performance; 2007 MY LS460 [09/2006 -     ]		

<b>DTC</b>	<b>P050A</b>	<b>Cold Start Idle Air Control System Performance</b>
------------	--------------	---

<b>DTC</b>	<b>P050B</b>	<b>Cold Start Ignition Timing Performance</b>
------------	--------------	---

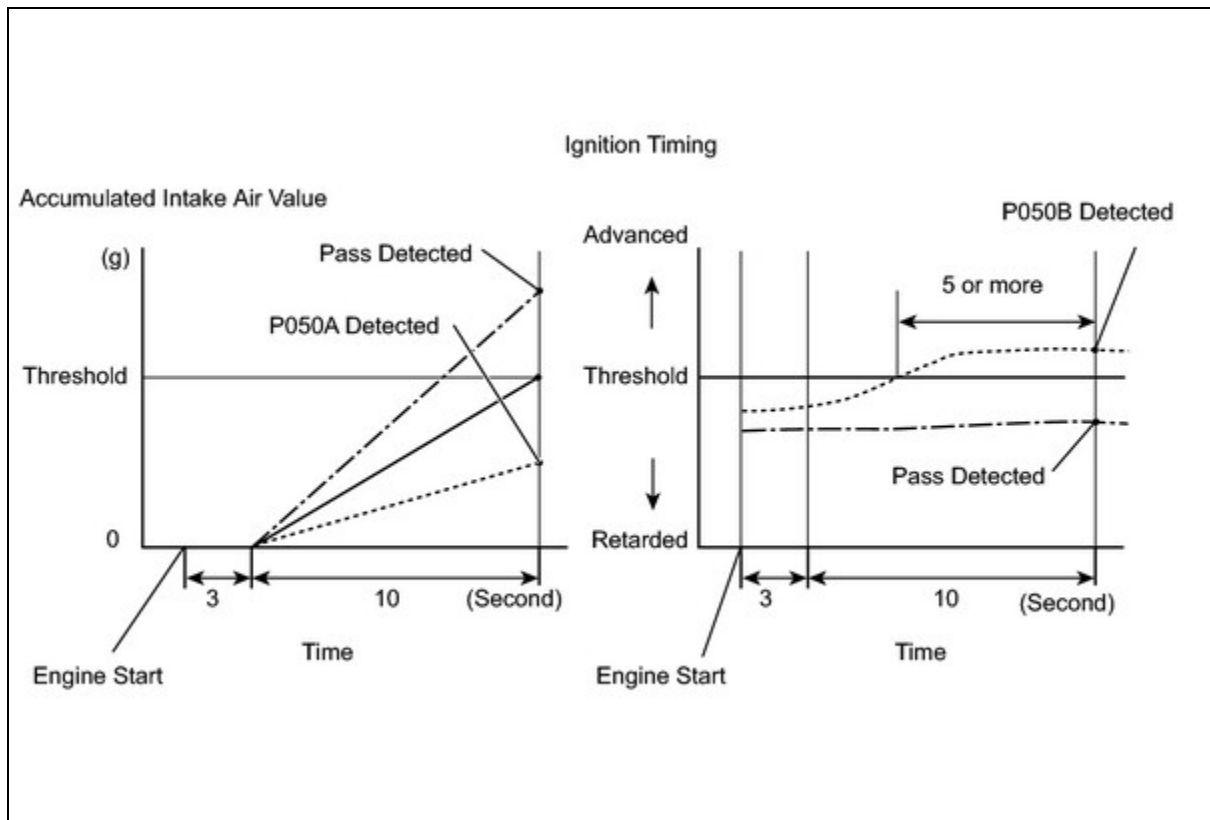
## **DESCRIPTION**

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 to reduce emissions.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
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"> <li>• Throttle body assembly</li> <li>• Mass air flow meter</li> <li>• Air induction system</li> <li>• Ventilation hose connections</li> <li>• Air cleaner filter element</li> <li>• ECM</li> </ul>
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"> <li>• Throttle body assembly</li> <li>• Mass air flow meter</li> <li>• Air induction system</li> <li>• Ventilation hose connections</li> <li>• MD VVT system</li> <li>• ECM</li> </ul>

## MONITOR DESCRIPTION



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

When the Engine Coolant Temperature (ECT) is between  $-10^{\circ}\text{C}$  and  $60^{\circ}\text{C}$  ( $14^{\circ}\text{F}$  and  $140^{\circ}\text{F}$ ), 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 as 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 ECT is between  $-10^{\circ}\text{C}$  and  $60^{\circ}\text{C}$  ( $14^{\circ}\text{F}$  and  $140^{\circ}\text{F}$ ) when the engine starts.
2. The engine idles for 13 seconds after engine start.
3. The accumulated intake air amount is below the threshold.

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 ECT at  $75^{\circ}\text{C}$  ( $167^{\circ}\text{F}$ ) 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 cycle
Duration	10 seconds
MIL Operation	2 driving cycles
Sequence of Operation	None

## TYPICAL ENABLING CONDITIONS

### **P050A:**

Battery voltage	8 V or more
Time after engine start	3 seconds or more
Starter	OFF
ECT at engine start	-10°C (14°F) or more
ECT	-10°C to 60°C (14°F to 140°F)
Engine idling time	3 seconds or more
Fuel-cut	OFF
Vehicle speed	Less than 1.875 mph (3 km/h)
Atmospheric pressure	76 kPa (570 mmHg) or more

### **P050B:**

Battery voltage	8 V or more
Time after engine start	3 seconds or more
Starter	OFF
ECT at engine start	-10°C (14°F) or more
ECT	-10°C to 60°C (14°F to 140°F)
Engine idling time	3 seconds or more
Vehicle speed	Less than 1.875 mph (3 km/h)

# TYPICAL MALFUNCTION THRESHOLDS

## **P050A:**

Accumulated air flow amount	Varies with ECT (Example: Less than 78 g)
-----------------------------	---

## **P050B:**

Accumulated time when ignition timing retard value insufficient	5 seconds or more
---	-------------------

# INSPECTION PROCEDURE

### **HINT:**

Read freeze frame data using the intelligent tester or Techstream. 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.

# PROCEDURE

<b>1.</b>	<b>CHECK ANY OTHER DTCS OUTPUT (IN ADDITION TO DTC P050A AND/OR P050B)</b>
-----------	--

- (a) Connect the intelligent tester or Techstream to the DLC3.
- (b) Turn the engine switch on (IG).
- (c) Turn the tester ON.
- (d) Enter the following menus:
  - (1) Intelligent tester - Select: DIAGNOSIS / ENHANCED OBD II / DTC INFO / CURRENT CODES.
  - (2) Techstream - Select: Powertrain / Engine / Trouble Codes.
- (e) Read the DTCs.

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**



<b>2.</b>	<b>READ VALUE USING INTELLIGENT TESTER OR TECHSTREAM (FUEL TRIM)</b>
-----------	--

**HINT:**

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

- (a) Connect the intelligent tester or Techstream to the DLC3.
- (b) Turn the engine switch on (IG).
- (c) Turn the tester ON.
- (d) Enter the following menus:
  - (1) Intelligent tester - Select: DIAGNOSIS / ENHANCED OBD II / DATA LIST / A/F CONTROL SYS / SHORT FT #1 and LONG FT #1, or SHORT FT #2 and LONG FT #2.
  - (2) Techstream - Select: Powertrain / Engine / Data List / A/F Control System / Short FT #1 and Long FT #1, or Short FT #2 and Long FT #2.
- (e) Read the values displayed on the tester.
- (f) Add together the SHORT FT #1 (Short FT #1) and LONG FT #1 (Long FT #1), or SHORT FT #2 (Short FT #2) and LONG FT #2 (Long FT #2) values to obtain the total Fuel Trim.

OK:  
Total of SHORT FT #1 (Short FT #1) and LONG FT #1 (Long FT #1), or SHORT FT #2 (Short FT #2) and LONG FT #2 (Long FT #2) values is between -20% and 20%.

**OK**  **GO TO STEP 12**

**NG**



<b>3.</b>	<b>PERFORM ACTIVE TEST USING INTELLIGENT TESTER OR TECHSTREAM (MD VVT SYSTEM)</b>
-----------	---

- (a) Connect the intelligent tester or Techstream to the DLC3.
- (b) Turn the engine switch on (IG) and turn the tester ON.
- (c) Start the engine and warm it up.
- (d) Engine is idling.
- (e) Enter the following menus:

(1) Intelligent tester - Select: DIAGNOSIS / ENHANCED OBD II / ACTIVE TEST / MD VVT B1 or MD VVT B2 / PRIMARY / MD VVT AIM ANG1 and VVT CHNG ANG#1 or MD VVT AIM ANG2 and VVT CHNG ANG#2.

(2) Techstream - Select: Powertrain / Engine / Active Test / Control the MD VVT Linear (Bank1) or Control the MD VVT Linear (Bank2) / All Data / MD VVT Aim Angle (Bank1) and VVT Change Angle (Bank1) or MD VVT Aim Angle (Bank2) and VVT Change Angle (Bank2).

(f) Perform the Active Test operation with the engine speed at 1,500 rpm.

OK:

ACTIVE TEST MOVEMENT ORDER	DIFFERENCE BETWEEN "MD VVT AIM ANGLE" AND "VVT CHANGE ANGLE"
0 deg → 10 deg → 20 deg → 40 deg → 10 deg → 0 deg → 10 deg → END	Within 4 DegFR

**NG**  **GO TO STEP 8**

**OK**



<b>4.</b>	<b>CHECK VENTILATION HOSE CONNECTIONS</b>
-----------	---

OK:

Ventilation hose is connected correctly and is not damaged.

**NG**  **GO TO STEP 9**

**OK**



<b>5.</b>	<b>CHECK AIR INDUCTION SYSTEM</b>
-----------	-----------------------------------

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

OK:

No leakage from air induction system.

**NG**  **GO TO STEP 10**

**OK**



**6. CHECK AIR CLEANER FILTER ELEMENT SUB-ASSEMBLY**

(a) Visually check that the air cleaner filter element is not excessively contaminated with dirt or oil.

OK:


Air cleaner filter element is not excessively contaminated with dirt or oil.

**NG** ► **GO TO STEP 11**

**OK**



**7. REPLACE MASS AIR FLOW METER**

(a) Replace the mass air flow meter  .


**NEXT** ► **GO TO STEP 15**

**8. CHECK AND REPAIR MD VVT SYSTEM**

(a) Check and repair the MD VVT System  .

**NEXT** ► **GO TO STEP 15**

**9. REPAIR OR REPLACE VENTILATION HOSE**

(a) Repair or replace the ventilation hose  .

**NEXT** ► **GO TO STEP 15**

**10. REPAIR OR REPLACE AIR INDUCTION SYSTEM**

**NEXT** ► **GO TO STEP 15**

**11. REPLACE AIR CLEANER FILTER ELEMENT SUB-ASSEMBLY**

**NEXT** ► **GO TO STEP 15**

**12. CHECK THROTTLE VALVE**

(a) Check for deposits around the throttle valve and throttle valve condition.

OK:

No deposits around throttle valve and throttle valve moves smoothly.

**NG** ► **GO TO STEP 14**

**OK**



**13. REPLACE ECM**

(a) Replace the ECM **INFO** .

**NEXT** ► **GO TO STEP 15**

**14. REPAIR OR REPLACE THROTTLE BODY ASSEMBLY**

(a) Repair or replace the throttle body assembly **INFO** .

**NEXT**



**15. 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 or Techstream to the DLC3.



(b) Turn the engine switch on (IG).

(c) Turn the tester ON.

(d) Clear DTCs  .

(e) Switch the ECM from normal mode to check mode using the tester  .

(f) Start the engine to idle for a minute.

OK:

Stable fast idling.

(g) Read DTCs.

OK:

No DTC output.

**NEXT**  **END**

