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<b>Model Year Start:</b> 2010	<b>Model:</b> GX460	<b>Prod Date Range:</b> [11/2009 -     ]
<b>Title:</b> 1UR-FE ENGINE CONTROL: SFI SYSTEM: P0505; Idle Control System Malfunction; 2010 MY GX460 [11/2009 -     ]		

<b>DTC</b>	<b>P0505</b>	<b>Idle Control System Malfunction</b>
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## DESCRIPTION

The idling speed is controlled by the ETCS (Electronic Throttle Control System). The ETCS is comprised of: 1) the one valve type throttle body; 2) the throttle actuator, which operates the throttle valve; 3) the throttle position sensor, which detects the opening angle of the throttle valve; 4) the accelerator pedal position sensor, which detects the accelerator pedal position; and 5) the ECM, which controls the ETCS. Based on the target idling speed, the ECM controls the throttle actuator to provide the proper throttle valve opening angle.

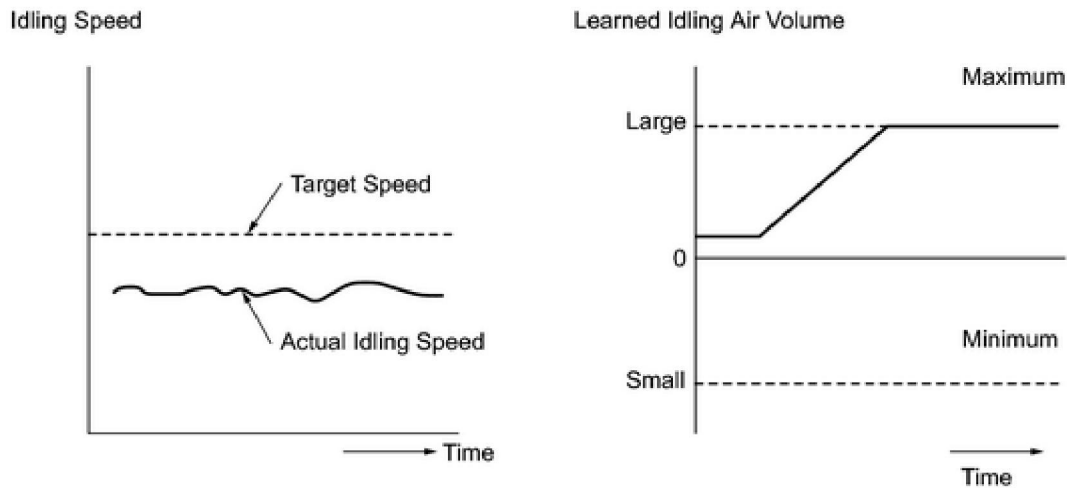
DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
P0505	Idling speed continues to vary greatly from the target idling speed (2 trip detection logic).	<ul style="list-style-type: none"> <li>• ETCS</li> <li>• Air induction system</li> <li>• PCV hose connections</li> <li>• EGR valve assembly</li> <li>• ECM</li> </ul>

## MONITOR DESCRIPTION

The ECM monitors the idling speed and idling air flow volume to conduct Idle Speed Control (ISC). The ECM determines that the ISC system is malfunctioning if either of the following conditions is met:

- The difference between the target engine idling speed and actual engine idling speed exceeds the threshold and the IAC flow rate learned value is stuck at the upper or lower limit for 5 seconds or more.
- After driving at a vehicle speed of 10 km/h (6.25 mph) or more, the difference between the target and actual engine idling speed exceeds the threshold 5 times or more during a driving cycle, and then the system determines that the IAC flow rate learned value is stuck at the upper or lower limit, or that the IAC flow rate learned value has been changed by an amount that exceeds the threshold.

Example:



Y

## **MONITOR STRATEGY**

Related DTCs	P0505: ISC function
Required Sensors/Components (Main)	ETCS
Required Sensors/Components (Related)	Crankshaft position sensor, Engine coolant temperature sensor, and Vehicle speed sensor
Frequency of Operation	Once per driving cycle
Duration	10 minutes
MIL Operation	2 driving cycles
Sequence of Operation	None

## **TYPICAL ENABLING CONDITIONS**

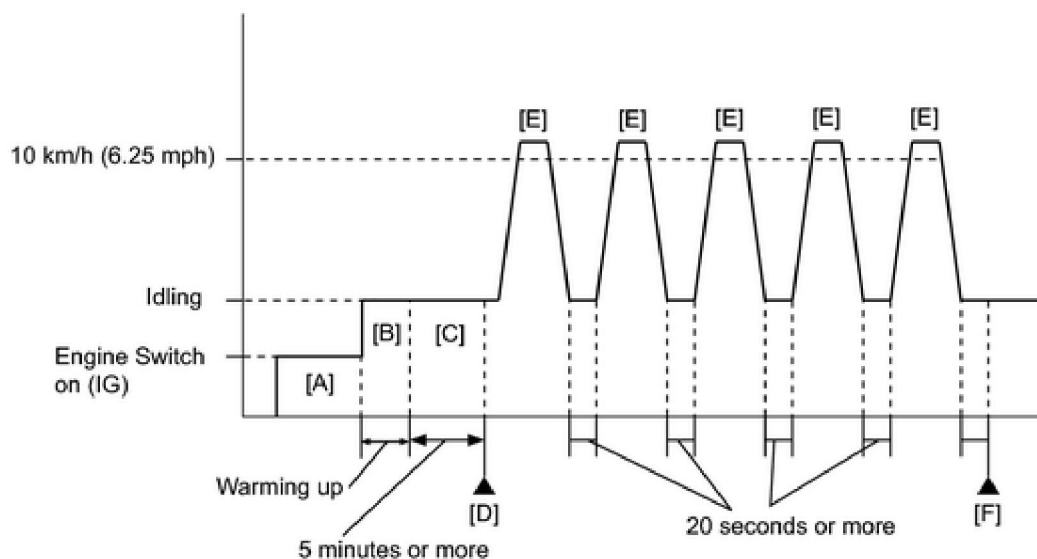
Monitor runs whenever following DTCs not present	<p>P0010, P0020 (VVT oil control valve)</p> <p>P0011, P0021 (VVT system - Advance)</p> <p>P0012, P0022 (VVT system - Retard)</p> <p>P0013, P0023 (Exhaust VVT oil control valve)</p> <p>P0014, P0024 (Exhaust VVT system - Advance)</p> <p>P0015, P0025 (Exhaust VVT system - Retard)</p> <p>P0016, P0018 (VVT system - Misalignment)</p> <p>P0017, P0019 (Exhaust VVT system - Misalignment)</p> <p>P0031, P0032, P0051, P0052, P101D, P103D (Air fuel ratio sensor heater)</p> <p>P006A, P0107, P0108 (Manifold absolute pressure)</p> <p>P0102, P0103 (Mass air flow meter)</p> <p>P0115, P0117, P0118 (Engine coolant temperature sensor)</p> <p>P0120, P0121, P0122, P0123, P0220, P0222, P0223, P2135 (Throttle position sensor)</p>
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	P0125 (Insufficient coolant temperature for closed loop fuel control) P0171, P0172, P0174, P0175 (Fuel system) P0301 - P0308 (Misfire) P0335 (Crankshaft position sensor) P0340, P0342, P0343, P0345, P0347, P0348 (VVT sensor) P0351 - P0358 (Igniter) P0365, P0367, P0368, P0390, P0392, P0393 (Exhaust VVT sensor) P0401 (EGR system) P0451, P0452, P0453 (EVAP system) P0500 (Vehicle speed sensor) P1340 (Camshaft position sensor) P2195, P2196, P2197, P2198, P2237, P2238, P2239, P2240, P2241, P2242, P2252, P2253, P2255, P2256, P2A00, P2A03 (Front oxygen/Air fuel ratio sensor) P0705 (Shift lever position switch) P0748, P0778 (Pressure control solenoid) P0850 (PNP sensor) P0973, P0974, P0976, P0977, P0979, P0980, P0982, P0983, P0985, P0986 (Shift solenoid)
Engine	Running

## **TYPICAL MALFUNCTION THRESHOLDS**

Either condition is met	1 or 2
1. Both of following conditions A and B met	-
A. Engine speed - Target engine speed	Less than -100 rpm, or more than 150 rpm (A/C off and NSW off) Less than -100 rpm, or more than 200 rpm (A/C on or NSW on)
B. IAC flow rate learned value	2.48 L/sec. or less, or 11.0 L/sec. or more for 5 seconds or more
2. Both of following conditions C and D met	-
C. Frequency that both of following conditions (a) and (b) met	5 times or more
(a) Engine speed - Target engine speed	Less than -100 rpm, or more than 150 rpm (A/C off and NSW off) Less than -100 rpm, or more than 200 rpm (A/C on or NSW on)
(b) Vehicle condition	Stopped after being driven at 10 km/h (6.25 mph) or more
D. Either condition is met	(c) or (d)
(c) IAC flow rate learned value	2.48 L/sec. or less, or 11.0 L/sec. or more
(d) Amount of change of IAC flow rate learned value	+2.86 L/sec. or more, or -4.69 L/sec. or less

## **CONFIRMATION DRIVING PATTERN**



1. Connect the Techstream to the DLC3.
2. Turn the engine switch on (IG) and turn the Techstream on.
3. Clear DTCs (even if no DTCs are stored, perform the clear DTC operation).
4. Turn the engine switch off and wait for at least 30 seconds.
5. Turn the engine switch on (IG) and turn the Techstream on [A].
6. Start the engine and warm it up until the engine coolant temperature is 75°C (167°F) or higher with all the accessories switched off [B].
7. Idle the engine for 5 minutes or more [C].

**HINT:**

In order to keep the idling stable, turn off the A/C and all other electric loads and do not perform any shift operations.

8. Enter the following menus: Powertrain / Engine and ECT / Trouble Codes [D].
9. Read the pending DTCs.

**HINT:**

- If a pending DTC is output, the system is malfunctioning.
- If a pending DTC is not output, perform the following procedure.

10. Enter the following menus: Powertrain / Engine and ECT / Utility / All Readiness.
11. Input the DTC: P0505.
12. Check the DTC judgment result.

TECHSTREAM DISPLAY	DESCRIPTION
NORMAL	<ul style="list-style-type: none"> <li>• DTC judgment completed</li> <li>• System normal</li> </ul>
ABNORMAL	<ul style="list-style-type: none"> <li>• DTC judgment completed</li> <li>• System abnormal</li> </ul>
INCOMPLETE	<ul style="list-style-type: none"> <li>• DTC judgment not completed</li> <li>• Perform driving pattern after confirming DTC enabling conditions</li> </ul>

TECHSTREAM DISPLAY	DESCRIPTION
UNKNOWN	<ul style="list-style-type: none"> <li>Unable to perform DTC judgment</li> <li>Number of DTCs which do not fulfill DTC preconditions has reached ECU memory limit</li> </ul>

**HINT:**

- If the judgment result shows NORMAL, the system is normal.
- If the judgment result shows ABNORMAL, the system has a malfunction.
- If the judgment result shows INCOMPLETE or UNKNOWN, perform steps [E] and [F].

- Accelerate the vehicle to 10 km/h (6.25 mph) or more, and then idle the engine for 20 seconds or more [E].
- Repeat step [E] 5 times.
- Enter the following menus: Powertrain / Engine and ECT / Trouble Codes [F].
- Read the pending DTCs.

**HINT:**

- If a pending DTC is output, the system is malfunctioning.
- If a pending DTC is not output, perform the following procedure.

- Enter the following menus: Powertrain / Engine and ECT / Utility / All Readiness.
- Input the DTC: P0505.
- Check the DTC judgment result.

TECHSTREAM DISPLAY	DESCRIPTION
NORMAL	<ul style="list-style-type: none"> <li>DTC judgment completed</li> <li>System normal</li> </ul>
ABNORMAL	<ul style="list-style-type: none"> <li>DTC judgment completed</li> <li>System abnormal</li> </ul>
INCOMPLETE	<ul style="list-style-type: none"> <li>DTC judgment not completed</li> <li>Perform driving pattern after confirming DTC enabling conditions</li> </ul>
UNKNOWN	<ul style="list-style-type: none"> <li>Unable to perform DTC judgment</li> <li>Number of DTCs which do not fulfill DTC preconditions has reached ECU memory limit</li> </ul>

**HINT:**

- If the judgment result shows NORMAL, the system is normal.
- If the judgment result shows ABNORMAL, the system has a malfunction.

- If the judgment result is INCOMPLETE or UNKNOWN and no pending DTC is output, perform a universal trip and check for permanent DTCs .

**HINT:**


- If a permanent DTC is output, the system is malfunctioning.
- If no permanent DTC is output, the system is normal.

## INSPECTION PROCEDURE

**HINT:**

- The following conditions may also cause DTC P0505 to be stored:

- a. The floor carpet overlapping slightly onto the accelerator pedal, causing the accelerator pedal to be slightly depressed and therefore the throttle valve position to be slightly open.
- b. The accelerator pedal being not fully released.

- Read freeze frame data using the 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.
- Refer to "Data List / Active Test" [Engine Speed, ISC Feedback Value and ISC Learning Value]  .

## PROCEDURE

### 1. CHECK FOR ANY OTHER DTCS OUTPUT (IN ADDITION TO DTC P0505)

- (a) Connect the Techstream to the DLC3.
- (b) Turn the engine switch on (IG).
- (c) Turn the Techstream on.
- (d) Enter the following menus: Powertrain / Engine and ECT / Trouble Codes.
- (e) Read DTCs.

#### Result

RESULT	PROCEED TO
P0505 is output	A
P0505 and other DTCs are output	B

#### HINT:


If any DTCs other than P0505 are output, troubleshoot those DTCs first.

**B**  **GO TO DTC CHART**

**A**



### 2. CHECK PCV HOSE CONNECTIONS

- (a) Check the PCV hose connections  .

OK:

PCV hose is connected correctly and is not damaged.

**NG**  **REPAIR OR REPLACE PCV HOSE**

**OK**



### 3. CHECK AIR INDUCTION SYSTEM

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

OK:

No leaks in air induction system.

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

**OK**



#### **4. PERFORM ACTIVE TEST USING TECHSTREAM (CONTROL THE EGR STEP POSITION)**

(a) Connect the Techstream to the DLC3.

(b) Start the engine and warm it up until the engine coolant temperature reaches 75°C (167°F) or higher.

**HINT:**

- When performing the Active Test, make sure the shift lever is in P or N.
- The A/C switch and all accessory switches should be off.

(c) Turn the Techstream on.

(d) Enter the following menus: Powertrain / Engine and ECT / Active Test / Control the EGR Step Position.

(e) Confirm that Throttle Idle Position is ON and check the engine idling condition and the value of MAP in the Data List while performing the Active Test.

**HINT:**

- Do not leave the EGR valve open for 10 seconds or more during the Active Test.
- Be sure to return the EGR valve to step 0 when the Active Test is completed.

OK:

MAP and idling condition change in response to EGR step position as follows.

Standard:

-	EGR STEP POSITION (ACTIVE TEST)	
	STEP 0	STEP 0 TO 30
Idling condition	Steady idling	Idling changes from steady to rough idling or engine stalls
MAP (Data List)	20 to 40 kPa (150 to 300 mmHg)	MAP value is at least 10 kPa (75 mmHg) higher than when EGR valve is fully closed

**OK**  **GO TO STEP 6**

**NG**  **GO TO STEP 5**

#### **5. INSPECT EGR VALVE ASSEMBLY**

(a) Remove the EGR valve assembly  .

(b) Check if the EGR valve is stuck open.

OK:

EGR valve is tightly closed.

**NG**  **REPLACE EGR VALVE ASSEMBLY**

**OK**



**6. INSPECT THROTTLE BODY ASSEMBLY**

(a) Check for contamination between the throttle valve and housing, and check that the throttle valve moves smoothly.

OK:

Throttle valve is not contaminated with foreign objects and moves smoothly.

**NG**  **REPLACE THROTTLE BODY ASSEMBLY**

**OK**



**7. CONFIRM WHETHER DTC OUTPUT RECURS**

(a) Connect the Techstream to the DLC3.

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

(c) Turn the Techstream on.

(d) Drive the vehicle in accordance with the driving pattern described in Confirmation Driving Pattern.

(e) Read the DTCs.

**Result**

RESULT	PROCEED TO
P0505 is output	A
No DTC is output	B

**B**  **END**

**A**  **REPLACE ECM**

