2006 Lexus GX470 : Engine Performance & Emission Controls > 2UZ-FE Engine Control System > SFI System > P0300-P0308: Random / Multiple Cylinder Misfire Detected

Listen

P0300-P0308: Random / Multiple Cylinder Misfire Detected

DESCRIPTION

- When a misfire occurs in the engine, hydrocarbons (HC) enter the exhaust in high concentrations. If the HC concentration is too high, exhaust emissions levels may increase. High concentrations of HC can also cause the temperature of the catalyst to increase, possibly damaging the catalyst. To prevent the increase in emissions and limit the possibility of thermal damage, the ECM monitors the misfire rate. When the temperature of the catalyst reaches a point of thermal degradation, the ECM will begin flashing the MIL. For monitoring misfires, the ECM uses both the Camshaft Position (CMP) sensor and the Crankshaft Position (CKP) sensor. The CMP sensor is used to identify misfiring cylinders and the CKP sensor is used to measure variations in the crankshaft rotation speed. The misfire counter records how many times the crankshaft rotation speed variations exceed threshold values.

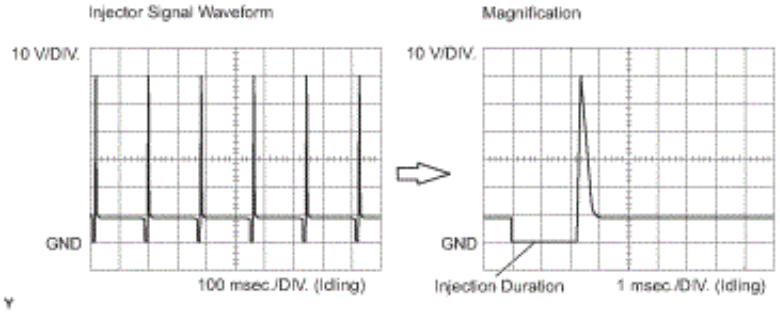
  If the misfiring rate exceeds the threshold value and could cause emissions to deteriorate, the ECM illuminates the MIL.

DTC No.	DTC Detection Condition	Trouble Area
P0300	Misfiring of random cylinder is detected	▪ Open or short in engine wire harness ▪ Connector connection ▪ Vacuum hose connections ▪ Ignition system ▪ Injector ▪ Fuel pressure ▪ Mass Air Flow (MAF) meter ▪ Engine Coolant Temperature (ECT) sensor ▪ Compression pressure ▪ Valve timing ▪ Valve clearance ▪ PCV valve and hose ▪ PCV hose connections ▪ ECM
P0301 P0302 P0303 P0304		

P0305 P0306 P0307 P0308	Misfiring of each cylinder is detected	Same as DTC No. P0300

NOTE

HINT:
In some cases, several DTCs for misfired cylinders (DTCs P0301 to P0308) are recorded but the random/multiple cylinder misfire DTC (P0300) is not recorded. This is an indication that the misfires were detected and recorded at different times. Random misfire codes are recorded only when several misfires occur at the same time.
Reference: Inspect using an oscilloscope.
With the engine idling, check the waveform between terminals #1 to #8 and E01 of the ECM connectors.
The correct waveform is as shown.



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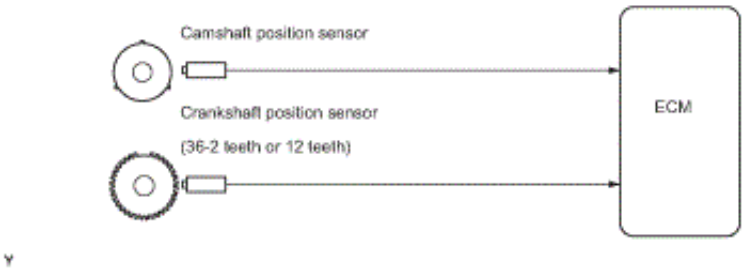
MONITOR DESCRIPTION



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The ECM illuminates the MIL (2 trip detection logic) if:

When the percentage of misfire exceeds the specified limit per 1,000 engine revolutions. One occurrence of excessive misfire during engine start will set the MIL. Four occurrences are required to set the MIL 1,000 revolutions after engine start.

The ECM begins blinking the MIL as follows (2 trip detection logic is used and DTC is stored after 2 trip detection):

- Within 200 crankshaft revolutions at a high rpm, the threshold for "percent of misfires causing catalyst damage" is reached once.
- Within 200 crankshaft revolutions at a normal rpm, the threshold for "percent of misfires causing catalyst damage" is reached 3 times.

MONITOR STRATEGY

Related DTCs	P0300: Multiple cylinder misfire P0301: Cylinder 1 misfire P0302: Cylinder 2 misfire P0303: Cylinder 3 misfire P0304: Cylinder 4 misfire P0305: Cylinder 5 misfire P0306: Cylinder 6 misfire P0307: Cylinder 7 misfire P0308: Cylinder 8 misfire
Required Sensors/Components (Main)	Camshaft position sensor, Crankshaft position sensor
Required Sensors/Components (Related)	Engine coolant temperature sensor, Intake air temperature sensor, Throttle position sensor
Frequency of Operation	Continuous
Duration	Every 1,000 revolutions (soon after engine is started: 1 time, other: 4 times) (emission related misfire) Every 200 revolutions (1 or 3 times) (catalyst deteriorating misfire)
MIL Operation	2 driving cycles: MIL ON Blinking immediately: Catalyst-damaged-misfire
Sequence of Operation	None

TYPICAL ENABLING CONDITIONS

Monitor will run whenever these DTCs are not present	P0100 - P0103 (MAF meter) P0110 - P0113 (IAT sensor) P0115 - P0118 (ECT sensor) P0120 - P0223, P2135 (TP sensor) P0125 (Insufficient ECT for closed loop) P0327 - P0333 (knock sensor)

	P0335 (CKP sensor) P0340, P0341 (CMP sensor) P0500 (VSS)
Battery voltage	8 V or more
Throttle position learning	Completed
VVT system	Not operate by scan tool
Engine RPM	400 to 5,700 rpm
All of following conditions are met	Conditions 1 and 2
1. ECT	-10°C (14°F) or more
2. Either of following conditions is met	Conditions (a) or (b)
(a) Engine start ECT	Higher than -7°C (19°F)
(b) ECT	Higher than 20°C (68°F)
Fuel cut	OFF

Monitor period of emission-related misfire:

First 1,000 revolutions after engine start, or Check Mode	Crankshaft 1,000 revolutions
Except above	Crankshaft 1,000 revolutions x 4

Monitor period of emission-related misfire:

All of following conditions 1, 2 and 3 are met	Crankshaft 200 revolutions
Except above	Crankshaft 200 revolutions x 3
1. Driving cycles	1st

2. Check Mode	OFF
3. RPM	Less than 2,800 revolutions

TYPICAL MALFUNCTION THRESHOLDS

Emission-related-misfire:

Misfire rate	1.2 % or more

Catalyst-damage-misfire (MIL blinks):

Number of misfire per 200 revolutions	93 or more (varies with intake air amount and RPM)
Multiple cylinders misfire	Detected

MONITOR RESULT

Refer to CHECKING MONITOR STATUS **(Click here for more information)** for detailed information.

The test value and test limit information are described as shown in the following table. Check the monitor result and test values after performing the monitor drive pattern (refer to "Confirmation Monitor").

- MID (Monitor Identification Data) is assigned to each emissions-related component.
- TID (Test Identification Data) is assigned to each test value.
- Scaling is used to calculate the test value indicated on generic OBD II scan tools.

Misfire monitor - All cylinders

MID	TID	Scaling	Description of Test Value	Minimum Test Limit	Maximum Test Limit
$A1	$0B	Multiply by 1 (time)	Exponential Weighted Moving Average misfire counts for last 10 driving cycles - total	0	65535
$A1	$0C	Multiply by 1 time)	Misfire counts for last and current driving cycles - total	0	65535

Misfire monitor - Cylinder 1

MID	TID	Scaling	Description of Test Value	Minimum Test Limit	Maximum Test Limit
$A2	$0B	Multiply by 1 (time)	Exponential Weighted Moving Average misfire counts for last 10 driving cycles - total	0	65535

$A2	$0C	Multiply by 1 (time)	Misfire counts for last and current driving cycles - total	0	65535

Misfire monitor - Cylinder 2

MID	TID	Scaling	Description of Test Value	Minimum Test Limit	Maximum Test Limit
$A3	$0B	Multiply by 1 (time)	Exponential Weighted Moving Average misfire counts for last 10 driving cycles - total	0	65535
$A3	$0C	Multiply by 1 (time)	Misfire counts for last and current driving cycles - total	0	65535

Misfire monitor - Cylinder 3

MID	TID	Scaling	Description of Test Value	Minimum Test Limit	Maximum Test Limit
$A4	$0B	Multiply by 1 (time)	Exponential Weighted Moving Average misfire counts for last 10 driving cycles - total	0	65535
$A4	$0C	Multiply by 1 (time)	Misfire counts for last and current driving cycles - total	0	65535

Misfire monitor - Cylinder 4

MID	TID	Scaling	Description of Test Value	Minimum Test Limit	Maximum Test Limit
$A5	$0B	Multiply by 1 (time)	Exponential Weighted Moving Average misfire counts for last 10 driving cycles - total	0	65535
$A5	$0C	Multiply by 1 (time)	Misfire counts for last and current driving cycles - total	0	65535

Misfire monitor - Cylinder 5

MID	TID	Scaling	Description of Test Value	Minimum Test Limit	Maximum Test Limit
$A6	$0B	Multiply by 1 (time)	Exponential Weighted Moving Average misfire counts for last 10 driving cycles - total	0	65535
		Multiply by			

$A6	$0C	1 (time)	Misfire counts for last and current driving cycles - total	0	65535

Misfire monitor - Cylinder 6

MID	TID	Scaling	Description of Test Value	Minimum Test Limit	Maximum Test Limit
$A7	$0B	Multiply by 1 (time)	Exponential Weighted Moving Average misfire counts for last 10 driving cycles - total	0	65535
$A7	$0C	Multiply by 1 (time)	Misfire counts for last and current driving cycles - total	0	65535

Misfire monitor - Cylinder 7

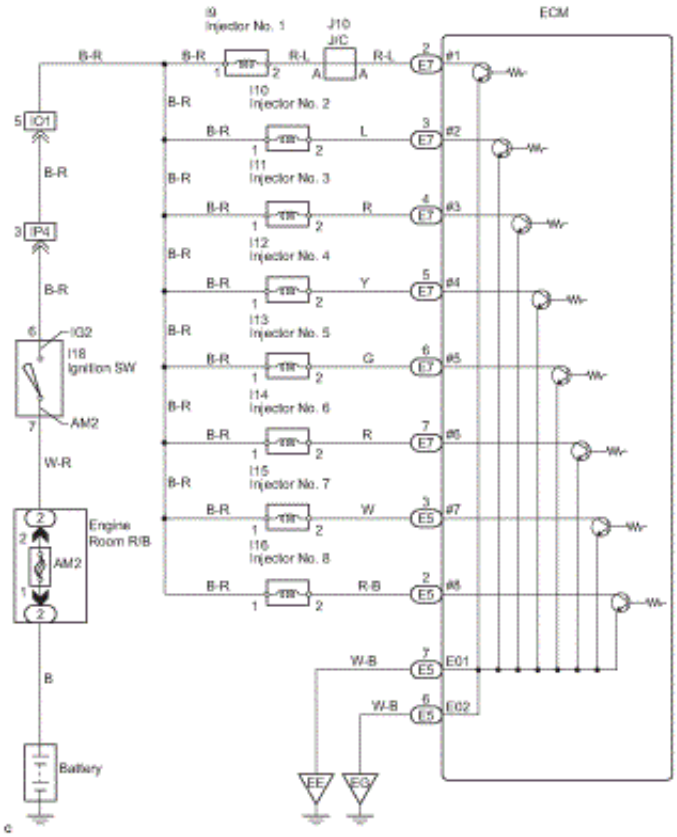
MID	TID	Scaling	Description of Test Value	Minimum Test Limit	Maximum Test Limit
$A8	$0B	Multiply by 1 (time)	Exponential Weighted Moving Average misfire counts for last 10 driving cycles - total	0	65535
$A8	$0C	Multiply by 1 (time)	Misfire counts for last and current driving cycles - total	0	65535

Misfire monitor - Cylinder 8

MID	TID	Scaling	Description of Test Value	Minimum Test Limit	Maximum Test Limit
$A9	$0B	Multiply by 1 (time)	Exponential Weighted Moving Average misfire counts for last 10 driving cycles - total	0	65535
$A9	$0C	Multiply by 1 (time)	Misfire counts for last and current driving cycles - total	0	65535

WIRING DIAGRAM

Refer to DTC P0351 **(Click here for more information)** for the wiring diagram of the ignition system.



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CONFIRMATION DRIVING PATTERN

1. Connect the intelligent tester to the DLC3 with CAN VIM.
2. Record the DTC and freeze frame data.
3. Set check mode on the intelligent tester **(Click here for more information)**.
4. Read the value on the misfire counter for each cylinder when idling. If the value is displayed on the misfire counter, skip the following procedure of confirmation driving.
5. Drive the vehicle several times while using the DATA LIST's MISFIRE RPM and MISFIRE LOAD menu items to keep track of the vehicle's engine speed, load and its surrounding range.

   If you have no intelligent tester, turn the ignition switch OFF after the symptom is simulated once. Then repeat the simulation process.

> **NOTE**
>
> HINT:
> In order to force output of the DTC, it is necessary to drive with MISFIRE RPM and MISFIRE LOAD selected in the

DATA LIST for the period of time in the chart below. Do not turn the ignition switch OFF. Turning the ignition switch OFF switches the diagnosis system from check mode to normal mode and all DTCs, freeze frame data and other data are erased.

Engine RPM	Time
Idling	3.5 minutes or more
1,000 rpm	3 minutes or more
2,000 rpm	1.5 minutes or more
3,000 rpm	1 minute or more

6. Check if a misfire occurs by monitoring DTC output and the freeze frame data. Then, record the DTCs, freeze frame data and misfire counter data.
7. Turn the ignition switch OFF and wait for at least 5 seconds.

INSPECTION PROCEDURE

NOTE

HINT:

- If DTCs other than misfire DTCs are output simultaneously, troubleshoot the non-misfire DTCs first.
- 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.
- If the misfire does not occur when the vehicle is brought to the workshop, the misfire can be confirmed by reproducing the conditions recorded in the freeze frame data. Also, after finishing repairs, confirm that no misfire occurs (see confirmation driving pattern).
- On 6 and 8 cylinder engines, cylinder-specific misfire fault codes are disabled at high engine speeds.

  If the misfire starts in a high engine speed range or the misfire occurs only in a high engine speed area, only general fault code P0300 will be stored.

  When only P0300 is stored:

  - Erase the general misfire fault code from the intelligent tester.

- Start the engine and drive the confirmation pattern (see confirmation driving pattern).
- Read the value of the misfire ratio for each cylinder. Or, check if a DTC was output.
- Perform repairs on the cylinder that has a high misfire ratio. Or repair the cylinder indicated by any output DTCs.
- After finishing repairs, drive the confirmation pattern again and confirm that no misfire occurs.

- If either SHORT FT #1, LONG FT #1, SHORT FT #2 or LONG FT #2 in the freeze frame data is +-20 %, there is a possibility that the air fuel ratio is becoming RICH (-20 % or less) or LEAN (+20 % or more).
- When COOLANT TEMP in the freeze frame data is less than 75°C (167°F), a misfire is only possible during engine warm-up.
- If the misfire cannot be reproduced, the cause may be: 1) low fuel in the vehicle, 2) improper fuel in the vehicle, 3) a contaminated ignition plug, or 4) another problem.
- Be sure to check the value on the misfire counter after repairs.

PROCEDURE

1. CHECK OTHER DTC OUTPUT (IN ADDITION TO MISFIRE DTCS)

- Connect the intelligent tester to the DLC3 with CAN VIM.
- Turn the ignition switch ON and turn the intelligent tester ON.
- Enter the following menus: DIAGNOSIS / ENHANCED OBD II / DTC INFO / CURRENT CODES.
- Read the CURRENT CODES.

Result	
Display (DTC Output)	**Proceed to**
P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307 or P0308	A
P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307 or P0308 and other DTCs	B

NOTE

HINT:
If any DTCs other than P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307 and P0308 are output, troubleshoot those DTCs first.

B	**(Click here for more information)**
A	See the next step

2. READ VALUE USING INTELLIGENT TESTER (MISFIRE RPM AND MISFIRE LOAD)

- Connect the intelligent tester to the DLC3 with CAN VIM.
- Turn the ignition switch ON and turn the intelligent tester ON.
- Enter the following menus: DIAGNOSIS / ENHANCED OBD II / DATA LIST / MISFIRE / MISFIRE RPM and MISFIRE LOAD.
- Read and note the MISFIRE RPM and the MISFIRE LOAD (engine load) with the DATA LIST.

NOTE

HINT:
The MISFIRE RPM and MISFIRE LOAD displays have vehicle data that can help lead to successful repairs of any misfiring cylinders.

NEXT	See the next step

3. CHECK CONNECTION OF VENTILATION HOSE

OK
PCV hose is connected correctly and is not damaged.

NG	**(Click here for more information)**
OK	See the next step

4. CHECK MISFIRE COUNT (CYL #1, #2, #3, #4, #5, #6, #7, #8)

- Connect the intelligent tester to the DLC3 with CAN VIM.
- Turn the ignition switch ON and turn the intelligent tester ON.
- Clear the DTCs.
- Enter the following menus: DIAGNOSIS / ENHANCED OBD II / DATA LIST / ALL / CYL#1 to CYL#8.
- Allow the engine to idle.
- Read the misfire count of the cylinders #1 to #8.

  If no misfire is counted for all of the cylinders, move the shift lever into

the D position and repeat the 2 previous steps.

If misfires are still not counted, perform the next 2 steps.

- Drive the vehicle with MISFIRE RPM and MISFIRE LOAD selected in the DATA LIST.
- Read the misfire count of cylinders #1 to #8, or check for any output DTCs.

Result	
Misfire count in each cylinder	**Proceed to**
1 or 2 cylinders have some misfire counts	A
3 cylinders or more have some misfire counts	B

B	**(Click here for more information)**
A	See the next step

5. PERFORM ACTIVE TEST USING INTELLIGENT TESTER (FUEL CUT #1 TO #8)

- Connect the intelligent tester to the CAN VIM. Then connect the CAN VIM to the DLC3.
- Turn the ignition switch ON and turn the intelligent tester ON.
- Allow the engine to idle.
- Enter the following menus: DIAGNOSIS / ENHANCED OBD II / ACTIVE TEST / FUEL CUT #1 (to #8).
- If a cylinder has a high misfire count, cut fuel to the cylinder. Compare the misfire count of the cylinder before fuel cut and after fuel cut.

Result	
Misfire count in each cylinder	**Proceed to**
Misfire count of the cylinder before fuel cut and after fuel cut are roughly the same	A
Misfire count of the cylinder before fuel cut is lower than after fuel cut	B

NOTE

HINT:
If the misfire count of the cylinder before fuel cut and after fuel cut are roughly the same, the cylinder is misfiring.
If the misfire count of the cylinder before fuel cut is lower than after fuel cut, the cylinder misfires sometimes.

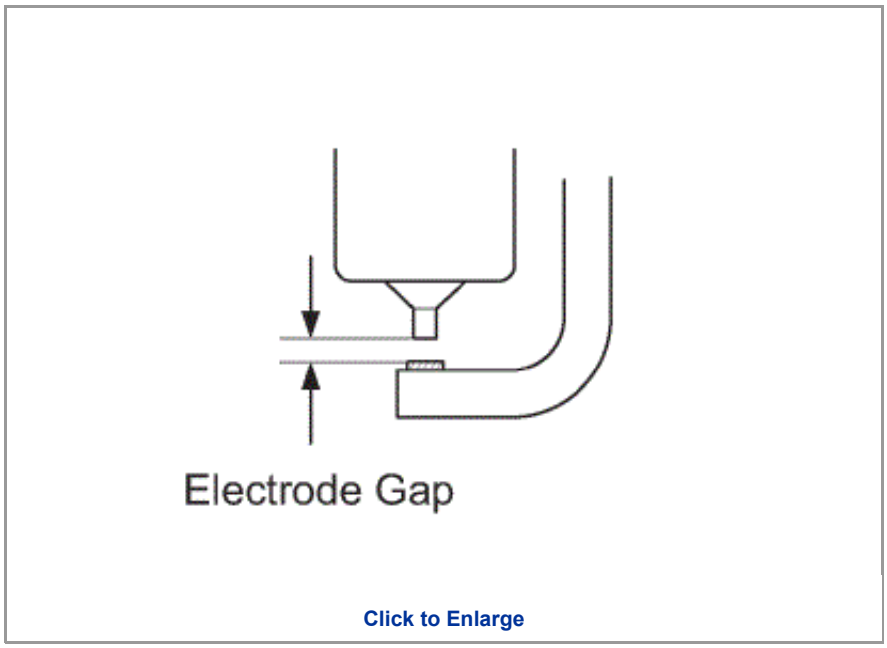
NOTE

This ACTIVE TEST cannot be performed while the vehicle is being driven.

B	**(Click here for more information)**
A	See the next step

6. INSPECT SPARK PLUG

- Remove the engine cover.



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- Remove the ignition coil and the spark plug of the misfire cylinder.
- Measure the spark plug electrode gap.

Standard
The electrode gap is 1.3 mm (0.051 in.)

- Check the electrode for carbon deposits.

Recommended spark plug

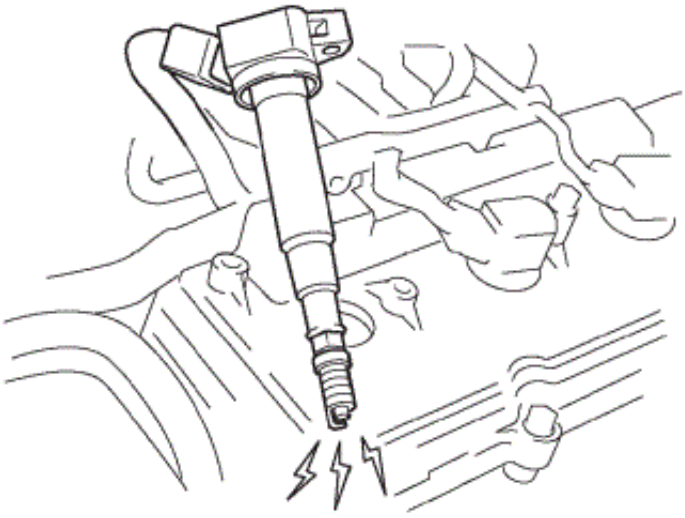
Manufacturer	Spark Plug Type
DENSO	SK20R11
NGK	IFR6A11

NOTE
If the electrode gap is larger than the standard, replace the spark plug. Do not adjust the electrode gap.

NG	(Click here for more information)
OK	See the next step

7. CHECK SPARK AND IGNITION

- Disconnect the fuel injector connectors to prevent the engine from starting.



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- Install the spark plug to the ignition coil.
- Attach the spark plug to the cylinder head cover.
- Crank the engine for 2 seconds or less and check if a spark occurs.

OK
Spark occurs

NG	**(Click here for more information)**
OK	See the next step

8. CHECK CYLINDER COMPRESSION PRESSURE ON MISFIRING CYLINDER

- Measure the cylinder compression pressure of the misfiring cylinder.

OK	**(Click here for more information)**
NG	**(Click here for more information)**

9. CHANGE NORMAL SPARK PLUG AND CHECK SPARK OF MISFIRING CYLINDER

- For inspection purposes, remove the current spark plug and install a normally functioning spark plug.
- Perform a spark test.

WARNING
Always disconnect each injector connector.

NOTE
Do not crank the engine for more than 5 to 10 seconds.

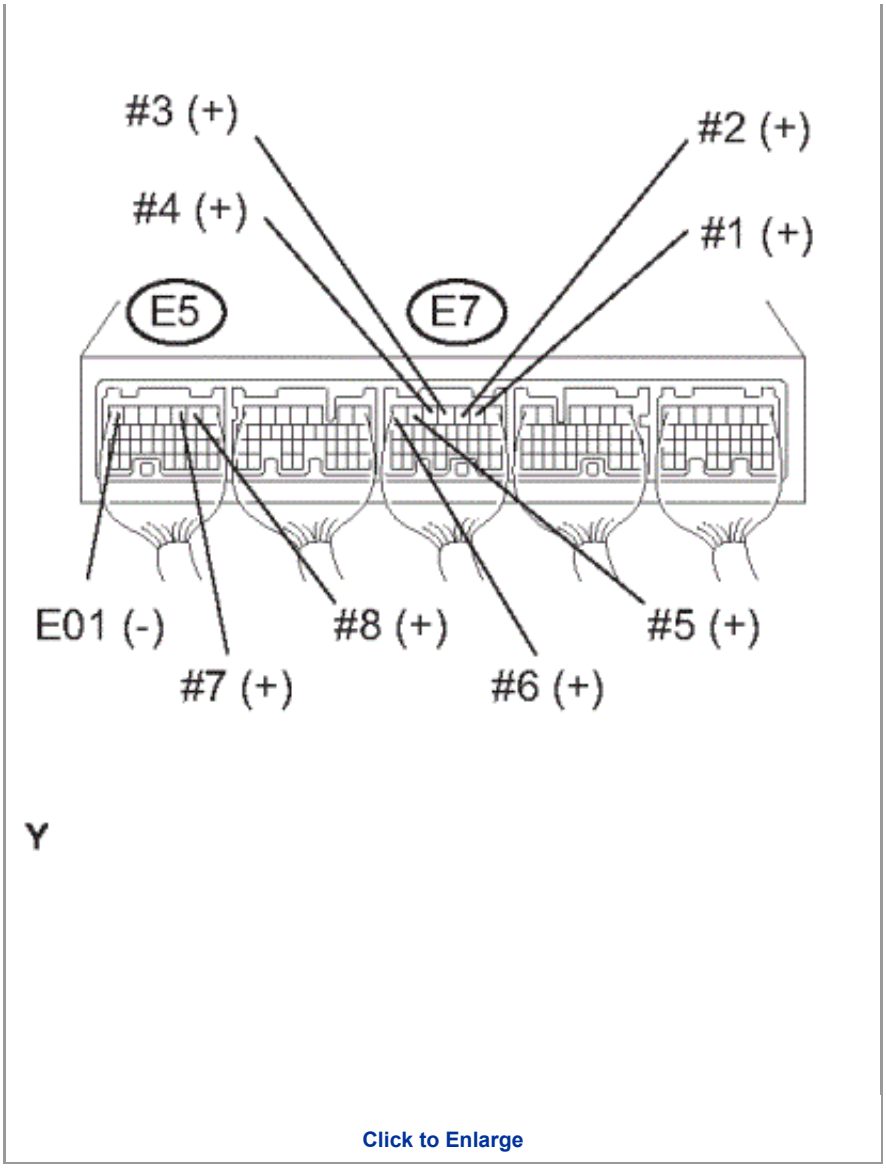
- Install the spark plug to the ignition coil and connect the ignition coil connector.
- Disconnect the injector connector.
- Ground the spark plug.
- Check if a spark occurs while the engine is being cranked.

OK
Spark jumps across electrode gap.

OK	**(Click here for more information)**
NG	**(Click here for more information)**

10. CHECK ECM (#1, #2, #3, #4, #5, #6, #7, #8 VOLTAGE)

- Turn the ignition switch ON.



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- Measure the voltage of the ECM connectors.

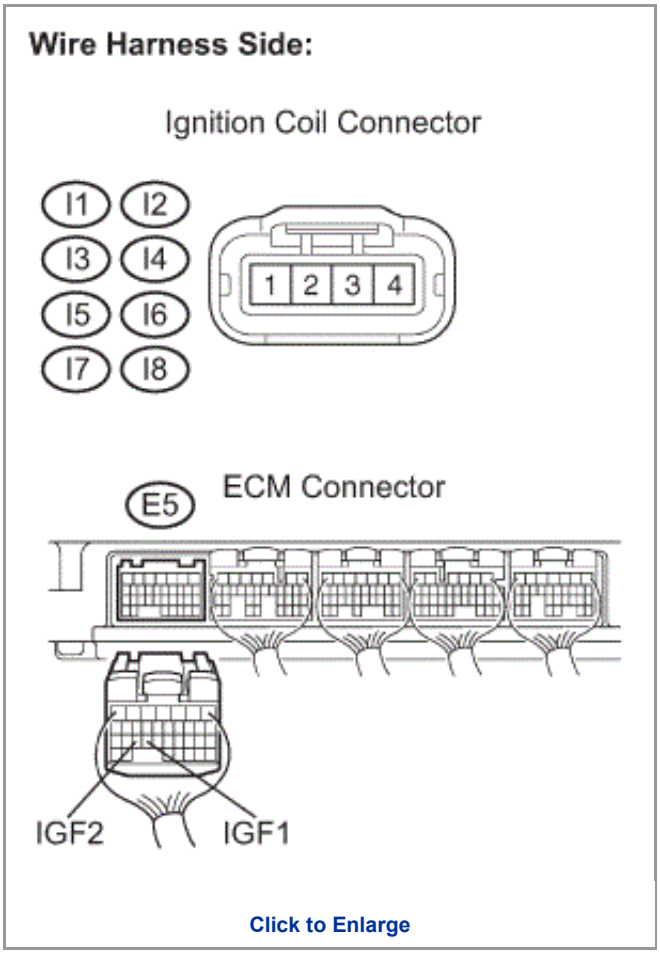
Standard voltage	
Tester Connection	**Specified Condition**
#1 (E7-2) - E01 (E5-7)	9 to 14 V
#2 (E7-3) - E01 (E5-7)	
#3 (E7-4) - E01 (E5-7)	
#4 (E7-5) - E01 (E5-7)	

#5 (E7-6) - E01 (E5-7)	
#6 (E7-7) - E01 (E5-7)	
#7 (E5-3) - E01 (E5-7)	
#8 (E5-2) - E01 (E5-7)	

OK	**(Click here for more information)**
NG	See the next step

11. CHECK HARNESS AND CONNECTOR (FUEL INJECTOR - ECM)

- Check the harness and connector between the ignition coil and ECM (IGF terminal).



- Disconnect the I1, I2, I3, I4, I5, I6, I7 or I8 ignition coil connector.
- Disconnect the E5 ECM connector.

- Check the resistance between the wire harness side connectors.

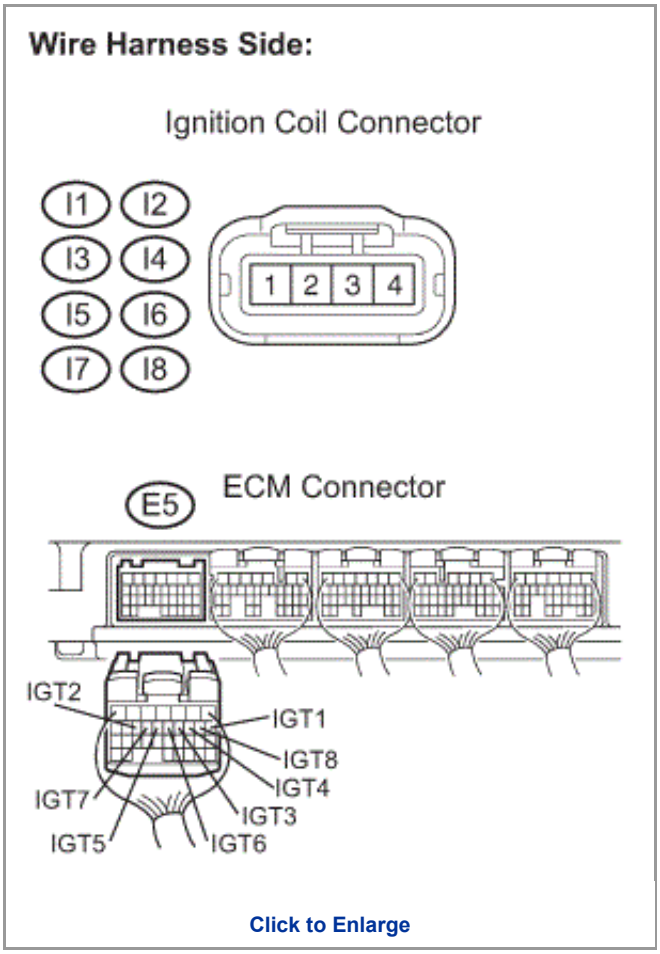
Standard resistance (Check for open)	
Tester Connection	**Specified Condition**
IGF (I1-2) - IGF1 (E5-24)	Below 1 Ω
IGF (I2-2) - IGF2 (E5-25)	
IGF (I3-2) - IGF2 (E5-25)	
IGF (I4-2) - IGF1 (E5-24)	
IGF (I5-2) - IGF2 (E5-25)	
IGF (I6-2) - IGF1 (E5-24)	
IGF (I7-2) - IGF1 (E5-24)	
IGF (I8-2) - IGF2 (E5-25)	

Standard resistance (Check for short)	
Tester Connection	**Specified Condition**
IGF (I1-2) or IGF1 (E5-24) - Body ground	10 kΩ or higher
IGF (I2-2) or IGF2 (E5-25) - Body ground	
IGF (I3-2) or IGF2 (E5-25) - Body ground	
IGF (I4-2) or IGF1 (E5-24) - Body ground	
IGF (I5-2) or IGF2 (E5-25) - Body ground	
IGF (I6-2) or IGF1 (E5-24) - Body ground	

IGF (I7-2) or IGF1 (E5-24) - Body ground	
IGF (I8-2) or IGF2 (E5-25) - Body ground	

- Reconnect the ignition coil connector.
- Reconnect the ECM connector.

- Check the harness and connector between the ignition coil and ECM (IGT terminals).



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- Disconnect the I1, I2, I3, I4, I5, I6, I7 or I8 ignition coil connector.
- Disconnect the E5 ECM connector.
- Check the resistance between the wire harness side connectors.

Standard resistance (Check for open)	
Tester Connection	**Specified Condition**

IGT (I1-3) - IGT1 (E5-8)	Below 1 Ω
IGT (I2-3) - IGT2 (E5-15)	
IGT (I3-3) - IGT3 (E5-11)	
IGT (I4-3) - IGT4 (E5-10)	
IGT (I5-3) - IGT5 (E5-13)	
IGT (I6-3) - IGT6 (E5-12)	
IGT (I7-3) - IGT7 (E5-14)	
IGT (I8-3) - IGT8 (E5-9)	

Standard resistance (Check for short)

Tester Connection	Specified Condition
IGT (I1-3) or IGT1 (E5-8) - Body ground	10 kΩ or higher
IGT (I2-3) or IGT2 (E5-15) - Body ground	
IGT (I3-3) or IGT3 (E5-11) - Body ground	
IGT (I4-3) or IGT4 (E5-10) - Body ground	
IGT (I5-3) or IGT5 (E5-13) - Body ground	
IGT (I6-3) or IGT6 (E5-12) - Body ground	
IGT (I7-3) or IGT7 (E5-14) - Body ground	
IGT (I8-3) or IGT8 (E5-9) - Body ground	

- Reconnect the ignition coil connector.

- Reconnect the ECM connector.

NG	**(Click here for more information)**
OK	See the next step

12. CHECK FUEL INJECTOR OF MISFIRING CYLINDER

- Check the injector injection (whether fuel volume is high or low, and whether injection pattern is poor).

NG	**(Click here for more information)**
OK	See the next step

13. CHECK VALVE CLEARANCE OF MISFIRING CYLINDER

NG	**(Click here for more information)**
OK	See the next step

14. CHECK AIR INDUCTION SYSTEM

- Check the air induction system for vacuum leakage.

OK
No leakage from air induction system

NG	**(Click here for more information)**
OK	See the next step

15. CHECK VALVE TIMING

- Remove the engine cover.
- Remove the drive belt.
- Remove the timing belt cover LH and RH.
- Turn the crankshaft to align the matchmarks of the crankshaft.
- Align the notch of the crankshaft pulley with the "0" position.
- Confirm whether the matchmarks of the camshaft pulley and cylinder head cover are facing each other.
- If the matchmarks are not facing each other, turn the crankshaft clockwise by 360°. Confirm again if the matchmarks are facing each other.

OK
The matchmarks of the camshaft pulley and the cylinder head cover face each other when the notch of the crankshaft pulley is in the "0" position.

NG	**(Click here for more information)**
OK	See the next step

16. CHECK FUEL PRESSURE

- Check the fuel pressure **(Click here for more information)**.

NG	**(Click here for more information)**
OK	See the next step

17. READ VALUE USING INTELLIGENT TESTER (COOLANT TEMP)

- Connect the intelligent tester to the DLC3 with CAN VIM.
- Turn the ignition switch ON and turn the intelligent tester ON.
- Enter the following menus: DIAGNOSIS / ENHANCED OBD II / DATA LIST / PRIMARY / COOLANT TEMP.
- Read the COOLANT TEMP value when the engine is cold and warmed-up.

Standard
ECT when the engine is cold: Same as ambient temperature
ECT when the engine is warmed-up: 75 to 95°C (167 to 203°F)

NG	**(Click here for more information)**
OK	See the next step

18. READ VALUE USING INTELLIGENT TESTER (MAF)

- Connect the intelligent tester to the DLC3 with CAN VIM.
- Turn the ignition switch ON and turn the intelligent tester ON.
- Enter the following menus: DIAGNOSIS / ENHANCED OBD II / DATA LIST / PRIMARY / MAF and COOLANT TEMP.
- Allow the engine to idle until the COOLANT TEMP reaches 75°C (167°F) or more.
- Read the MAF with the engine in an idling condition and at an engine speed of 2,500 rpm.

Standard
MAF at idle rpm: 4.0 to 8.0 g/s (shift lever is in N position and A/C is OFF)
MAF at 2,500 rpm: 10.0 to 20.0 g/s (shift lever is in N position and A/C is OFF)

NG	(Click here for more information)
OK	(Click here for more information)

19. GO TO RELEVANT DTC CHART

20. REPAIR OR REPLACE VENTILATION HOSE

21. REPLACE SPARK PLUG

22. CHECK ENGINE TO DETERMINE CAUSE OF LOW COMPRESSION

23. REPLACE SPARK PLUG

24. REPLACE IGNITION COIL (THEN CONFIRM THAT THERE IS NO MISFIRE)

25. REPAIR OR REPLACE HARNESS OR CONNECTOR

26. REPLACE FUEL INJECTOR ASSEMBLY

27. ADJUST VALVE CLEARANCE

28. REPAIR OR REPLACE AIR INDUCTION SYSTEM

29. ADJUST VALVE TIMING

30. CHECK AND REPLACE FUEL PUMP, FUEL PRESSURE REGULATOR, FUEL PIPE LINE AND FILTER

31. REPLACE ENGINE COOLANT TEMPERATURE SENSOR

32. REPLACE MASS AIR FLOW METER

33. CHECK FOR INTERMITTENT PROBLEMS