

DTC	P0300	RANDOM/MULTIPLE CYLINDER MISFIRE DETECTED
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DTC	P0301	CYLINDER 1 MISFIRE DETECTED
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DTC	P0302	CYLINDER 2 MISFIRE DETECTED
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DTC	P0303	CYLINDER 3 MISFIRE DETECTED
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DTC	P0304	CYLINDER 4 MISFIRE DETECTED
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CIRCUIT DESCRIPTION

Misfire: The ECM uses the crankshaft position sensor and camshaft position sensor to monitor changes in the crankshaft rotation for each cylinder.

The ECM counts the number of times the engine speed change rate, indicating that misfire has occurred. And when the misfire rate equals to or exceeds the count indicating that the engine condition has deteriorated, the MIL lights up.

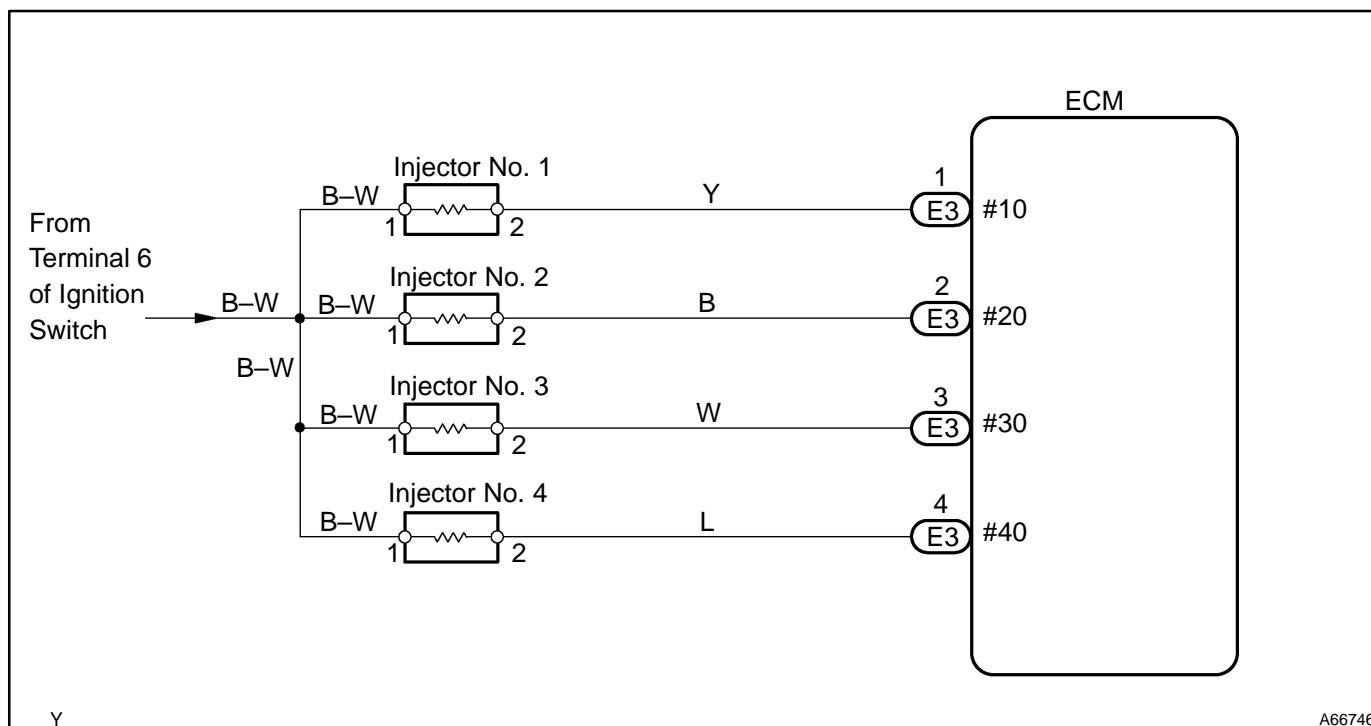
If the misfire rate is high enough and the driving conditions will cause catalyst to overheating, the MIL blinks when misfire occurs.

DTC No.	DTC Detecting Condition	Trouble Area
P0300	Misfire of random cylinders is detected during any particular 200 or 1,000 revolutions	<ul style="list-style-type: none"> • Open or short in engine wire • Connector connection • Vacuum hose connection • PCV hose • Ignition system • Injector • Fuel pressure • Mass air flow meter • Engine coolant temp. sensor • Compression pressure • Valve clearance • Valve timing • ECM
P0301 P0302 P0303 P0304	For any particular 200 revolutions for engine, misfiring is detected which can cause catalyst overheating (This causes MIL to blink)	
	For any particular 1,000 revolutions of engine, misfiring is detected which causes a deterioration in emissions (2 trip detection logic)	

HINT:

When the 2 or more codes for a misfiring cylinder are recorded repeatedly but no random misfire code is recorded, it indicates that the misfires were detected and recorded at different times.

WIRING DIAGRAM



CONFIRMATION DRIVING PATTERN

- Connect the hand-held tester or OBD II scan tool to the DLC3.
- Record the DTC and freeze frame data.
- Use the hand-held tester to set to the check mode (See page 05-5).
- Drive the vehicle several times with the engine speed, load and its surrounding range shown with ENGINE SPD, CALC LOAD in the freeze frame data or MISFIRE RPM, MISFIRE LOAD in the data list. If you have no hand-held tester, turn the ignition switch OFF after the symptom is simulated once. Then repeat the simulation process again.

HINT:

In order to memorize the DTC of the misfire, it is necessary to drive around MISFIRE RPM, MISFIRE LOAD in the following data list.

Engine Speed	Time
Idling	3 minutes and 30 seconds or more
1000 rpm	3 minutes or more
2000 rpm	1 minutes 30 seconds or more
3000 rpm	1 minute or more

- Check whether there is misfire or not by monitoring the DTC and the freeze frame data, and then, record them.
- Turn the ignition switch OFF and wait at least 5 seconds.

INSPECTION PROCEDURE

HINT:

- If the other DTCs besides misfire are memorized simultaneously, first perform the troubleshooting for them.
- Read freeze frame data using the hand-held tester, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.
- If the misfire is not occurred when the vehicle is brought to the workshop, it can be confirmed by reproducing the condition of the freeze frame data. After finishing the repair, confirm that there is no misfire (See the confirmation driving pattern).
- When either of SHORT FT #1, LONG FT #1, SHORT FT #2 or LONG FT #2 in the freeze frame data is over the range of $\pm 20\%$, there is a possibility that the air-fuel ratio is inclining either to "RICH" (-20% or less) or "LEAN" ($+20\%$ or more).
- When COOLANT TEMP in the freeze frame data is less than 80°C (176°F), there is a possibility of misfire only during warming up.
- In case that the misfire cannot be reproduced, this may be because of the driving with the shortage of fuel, the use of improper fuel, a stain of ignition plug and etc.

1 CHECK WIRE HARNESS, CONNECTOR AND VACUUM HOSE IN ENGINE ROOM

- Check the connection conditions of the wire harness and connector.
- Check the disconnection, piping and break in the vacuum hose.

NG

REPAIR OR REPLACE, THEM CONFIRM THAT THERE IS NO MISFIRE

OK

2 CHECK CONNECTION OF PCV HOSE

NG

REPAIR OR REPLACE PCV HOSE

OK

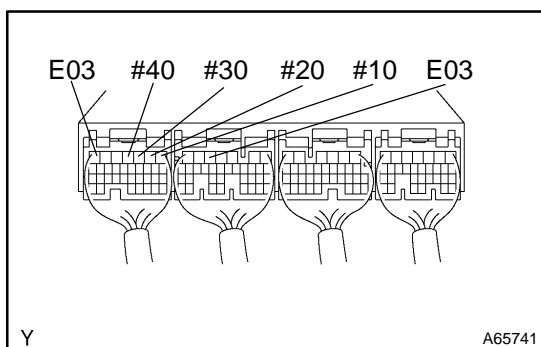
3 INSPECT SPARK PLUG

NG

REPAIR OR REPLACE IGNITION SYSTEM

OK

4 INSPECT ECM(CHECK VOLTAGE)



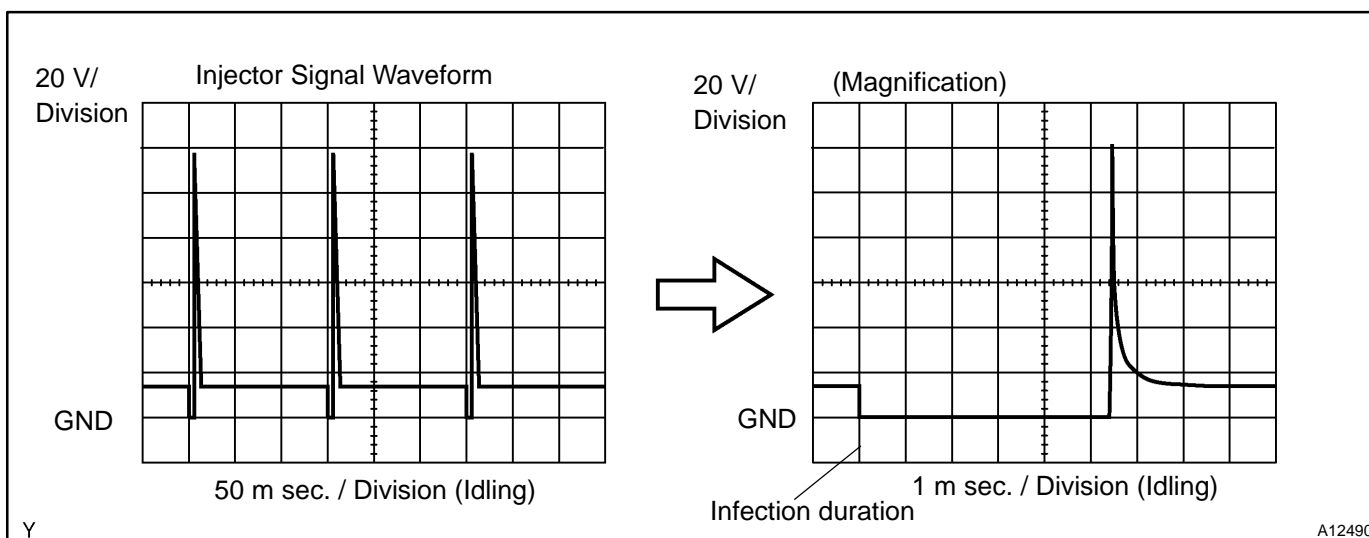
- (a) Turn the ignition switch ON.
- (b) Measure the voltage between applicable terminal and E03 of the ECM connector.

Voltage: 9 – 14 V

- (c) Reference:
Inspection using oscilloscope injector signal waveform.
- (1) With the engine idling, check the waveforms between terminals #10 – #40 and E01 of the ECM connector.

HINT:

The correct waveforms are shown below.



OK

Go to step 6

NG

5 INSPECT FUEL INJECTOR ASSY (See page 11-7)

NG

REPLACE FUEL INJECTOR ASSY

OK

CHECK WIRE HARNESS OR CONNECTOR

6 CHECK FUEL PRESSURE (See page 11-5)

NG

REPAIR OR REPLACE FUEL PUMP, FUEL PIPE LINE AND FILTER

OK

7 INSPECT FUEL INJECTOR ASSY (See page 11-7)**NG** → **REPLACE FUEL INJECTOR ASSY****OK****8 INSPECT INTAKE AIR FLOW METER SUB-ASSY (See page 10-2)****NG** → **REPAIR OR REPLACE INTAKE AIR FLOW METER SUB-ASSY****OK****9 INSPECT E.F.I. ENGINE COOLANT TEMPERATURE SENSOR (See page 10-2)****NG** → **REPLACE E.F.I. ENGINE COOLANT TEMPERATURE SENSOR****OK****CHECK COMPRESSION PRESSURE, VALVE CLEARANCE AND VALVE TIMING**