DTC	P0300/93	RANDOM/MULTIPLE CYLINDER MISFIRE DETECTED

DTC	P0301/93	CYLINDER 1 MISFIRE DETECTED

DTC	P0302/93	CYLINDER 2 MISFIRE DETECTED

DTC	P0303/93	CYLINDER 3 MISFIRE DETECTED

DTC	P0304/93	CYLINDER 4 MISFIRE DETECTED

DTC	P0305/93	CYLINDER 5 MISFIRE DETECTED

DTC	P0306/93	CYLINDER 6 MISFIRE DETECTED

CIRCUIT DESCRIPTION

Misfire: The ECM uses the crank 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 indicates that misfire has occurred. When the misfire rate equals or exceeds the count indicating that the engine condition has deteriorated, the MIL lights up.

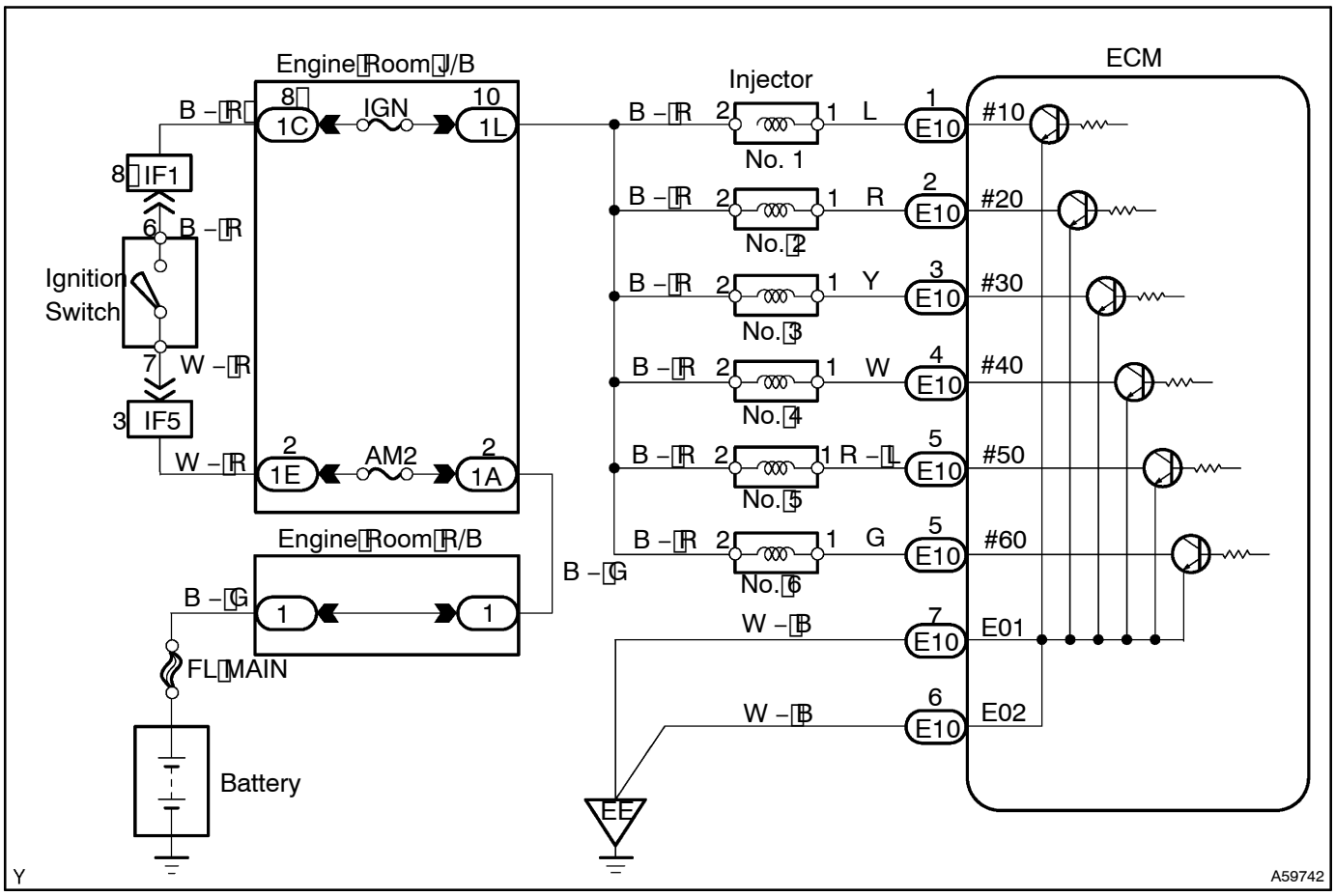
If the misfire rate is high enough and the driving conditions will cause catalyst overheating, the CHK ENG blinks when misfiring occurs.

DTC No.	DTC Detecting Condition	Trouble Area
P0300/93	Misfiring of random cylinders is detected during any particular 200 or 1,000 revolutions	• Open or short in engine wire • Connector connection • Vacuum hose connection • Ignition system • Injector • Fuel pressure • Intake air flow meter • E.F.I. engine coolant temperature sensor • Compression pressure • Valve clearance • Valve timing • ECM
P0301/93 P0302/93 P0303/93 P0304/93 P0305/93 P0306/93	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 emission (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

(a) Connect the hand–held tester.

(b) Record the DTC and the freeze frame data.

(c) Use the hand–held tester to set to the check mode (See page 05–290).

(d) Drive the vehicle several times with the engine speed, load and its surrounding range shown with the ENGINE SPD, CALC LOAD in the freeze frame data or the 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 the first time. Then repeat the simulation process again.

HINT:

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

Engine speed	Time
Idling	3 minutes 30 seconds or more
1,000 rpm	3 minutes or more
2,000 rpm	1 minute 30 seconds or more
3,000 rpm	1 minute or more

(e) Check whether there is misfire or not by monitoring DTC and the freeze frame data. After that, record them.

(f) Turn the ignition switch OFF and wait at least 5 seconds.

INSPECTION PROCEDURE

HINT:

- If is case that DTC besides misfire is memorized simultaneously, first perform the troubleshooting for them.
- Read freeze frame data using hand–held tester. Because 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.
- When the vehicle is brought to the workshop and the misfire is not occurred, misfire can be confirmed by reproducing the condition or freeze frame data. Also, 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 besides the range of ±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 or misfire only during warming up.
- In the case that misfire cannot be reproduced, the reason may be because of the driving with lack or fuel, the use of improper fuel, a stain of ignition plug, and etc.

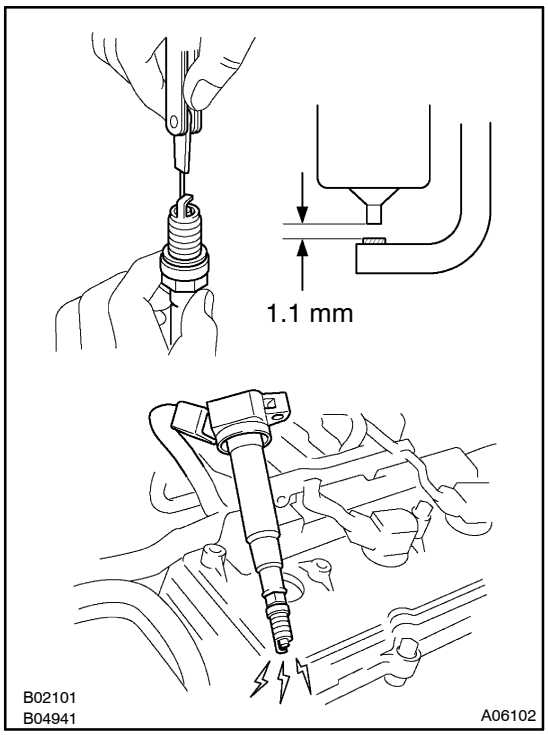
1	CHECK WIRE HARNESS, CONNECTOR AND VACUUM HOSE IN ENGINE ROOM

(a) Check the connection conditions of wire harness and connector.
(b) Check the disconnection, piping and break of vacuum hose.

NG → **REPAIR OR REPLACE, THEN CONFIRM THAT THERE IS NO MISFIRE**

OK

2	INSPECT SPARK PLUG

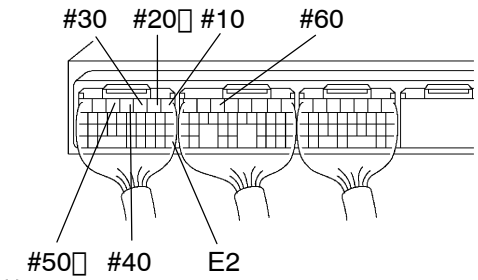


(a) Check electrode gap.
OK: 1.1 mm (0.043 in.)
(b) Install the spark plug to the ignition coil, and connect the ignition coil connector.
(c) Disconnect the injector connector.
(d) Ground the spark plug.
(e) Check if spark occurs while engine is being cranked.
OK: Spark jumps across electrode gap.

NG → **REPAIR OR REPLACE IGNITION SYSTEM**

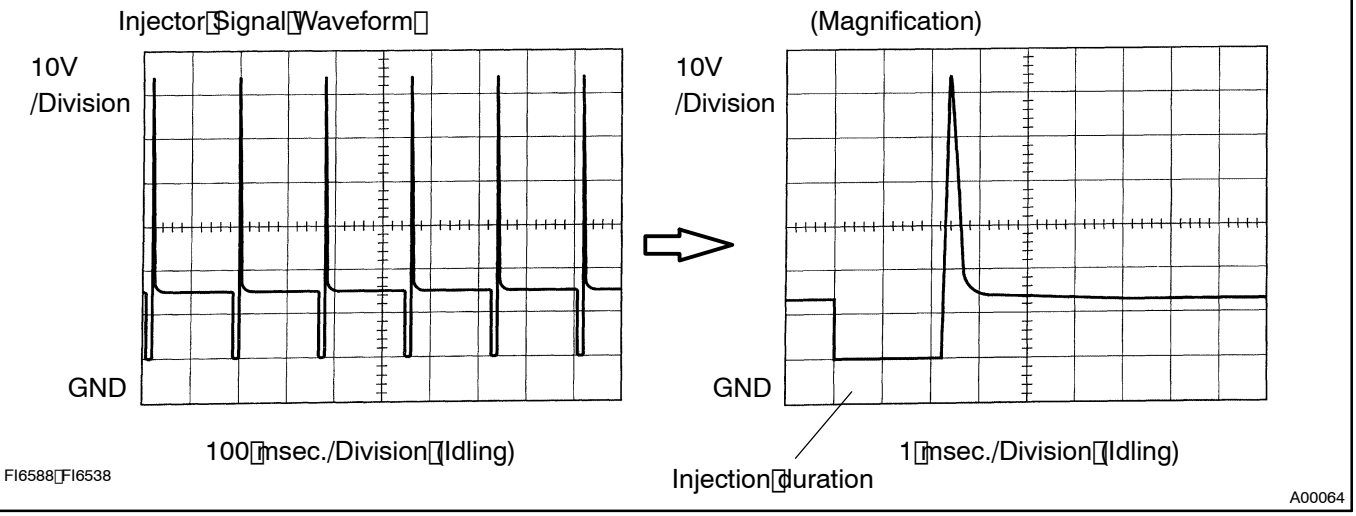
OK

3	INSPECT ECM



(a) Turn the ignition switch ON.
(b) Measure the voltage between #10–#60 and E2 terminal of the ECM connector.
Voltage: 9 – 14 V

HINT:
With the engine idling, check the waveform between terminals #10 – #60 and E01 of the ECM connector.



OK	Go to step 6

NG

4	INSPECT FUEL INJECTOR ASSY (RESISTANCE) (See page 11–55)

NG	REPLACE FUEL INJECTOR ASSY

OK

5	CHECK FUEL PRESSURE (See page 11–52)

NG	REPAIR OR REPLACE FUEL SYSTEM

OK

CHECK HARNESS AND CONNECTOR

6	INSPECT FUEL INJECTOR ASSY (INJECTION) (See page 11–55)

NG → REPLACE FUEL INJECTOR ASSY

OK

7	CHECK EGR SYSTEM (See page 12–16)

NG → REPLACE EGR SYSTEM

OK

8	INSPECT INTAKE AIR FLOW METER SUB–ASSY (See page 10–14)

NG → REPAIR OR REPLACE INTAKE AIR FLOW METER SUB–ASSY

OK

9	INSPECT E.F.I. ENGINE COOLANT TEMPERATURE SENSOR (See page 10–14)

NG → REPAIR OR REPLACE E.F.I. ENGINE COOLANT TEMPERATURE SENSOR

OK

CHECK COMPRESSION PRESSURE, VALVE CLEARANCE AND VALVE TIMING