DI8FG–01

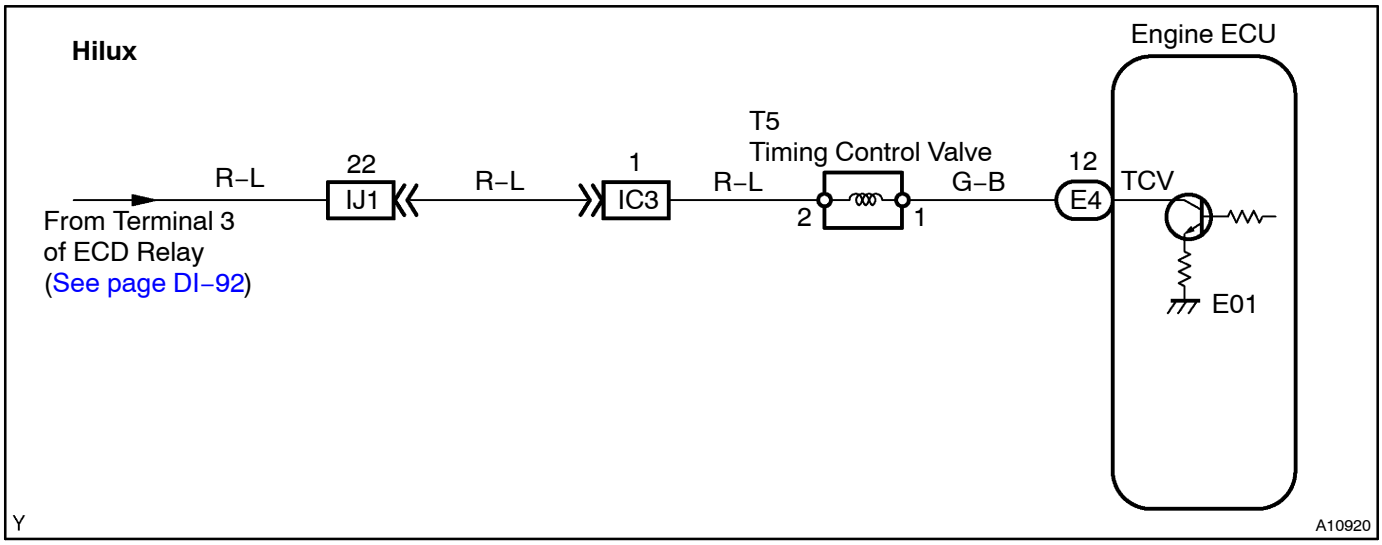
DTC	14	Timing Control System Malfunction

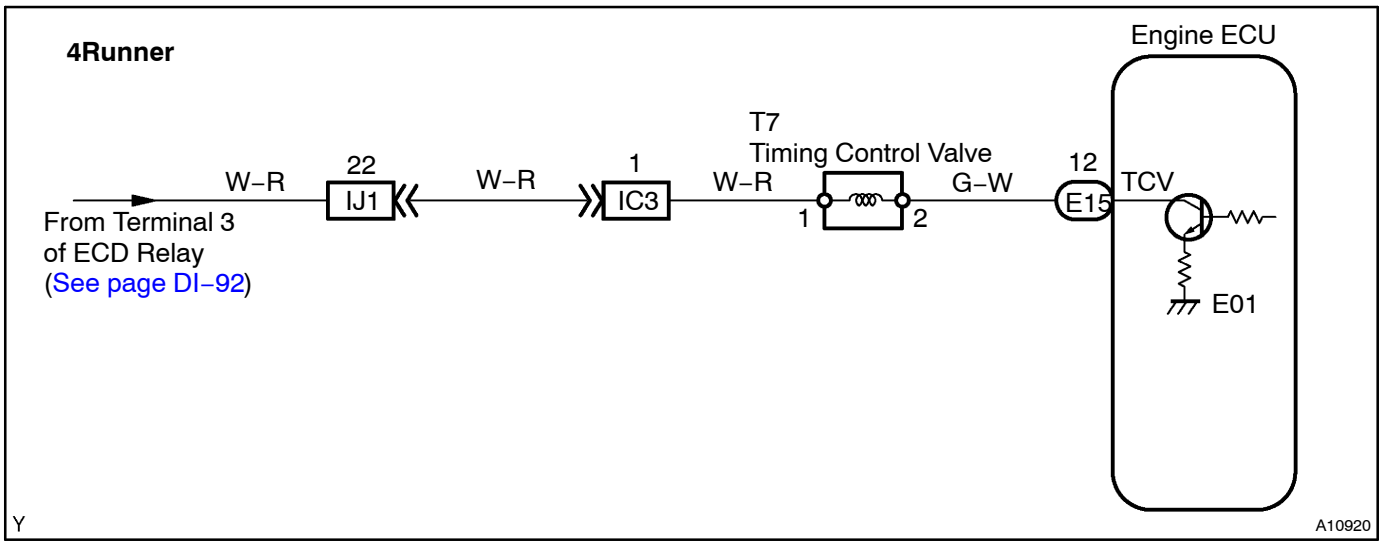
CIRCUIT DESCRIPTION

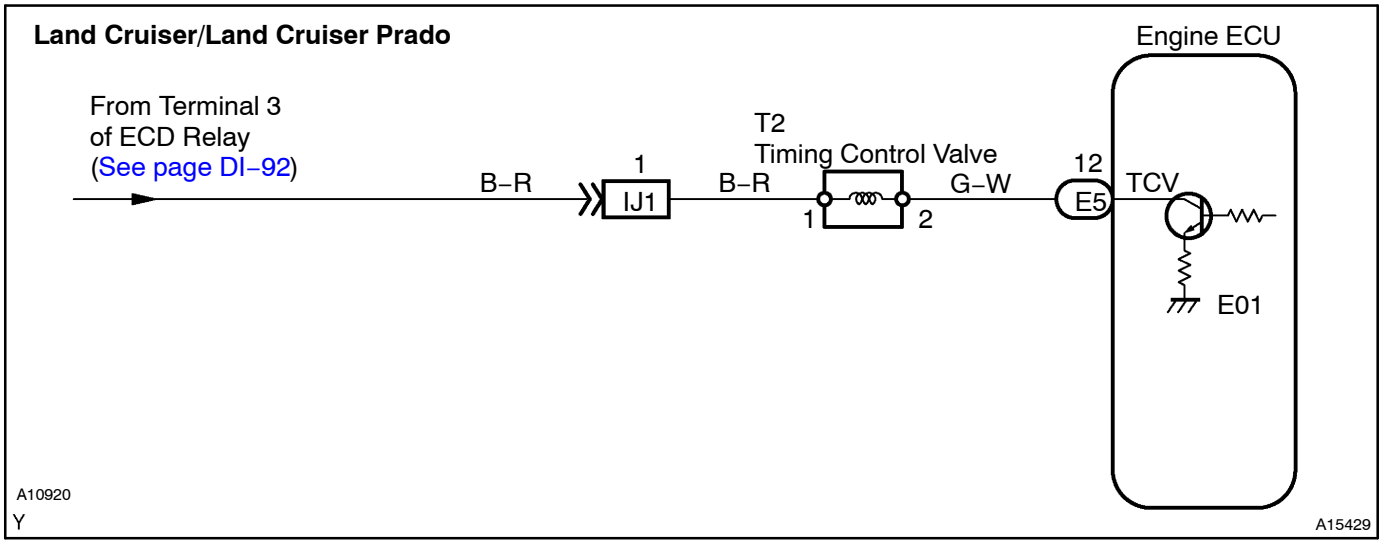
The engine ECU controls the injection timing by actuating the timing control valve. The timing control valve is mounted on the injection pump and delay one by duty control of pump internal fuel pressure.
The engine ECU detects the injection advance angle by TDC and NE signals.

DTC No.	DTC Detection Condition	Trouble Area
14	After engine warmed up and during, actual injection timing is different from target value of engine ECU calculated for several sec.	• Open or short in timing control valve circuit • Timing control valve • Fuel filter (Clogging) • Fuel (Freezing, Air in) • Injection pump (Internal pressure and timing control valve) • Engine ECU

WIRING DIAGRAM







INSPECTION PROCEDURE

HINT:

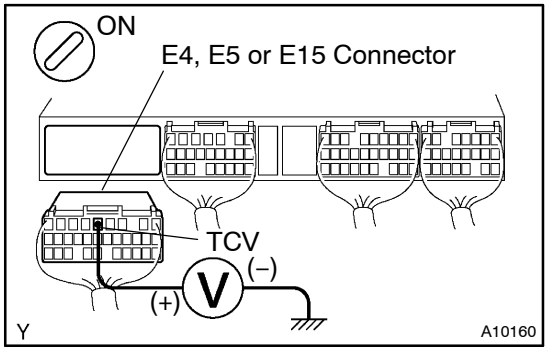
Read freeze frame data using hand–held tester, as freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

1	**Check timing control valve (See page FU–5).**

NG → **Replace timing control valve.**

OK

2	**Check voltage between terminal TCV of engine ECU connector and body ground.**



PREPARATION:

(a) Remove the glove compartment door.
(b) Disconnect the E4 (Hilux), E5 (Land Cruiser/Land Cruiser Prado) or E15 (4Runner) connector of the engine ECU.
(c) Turn the ignition switch ON.

CHECK:

Measure the voltage between terminal TCV of the engine ECU connector and the body ground.

OK:

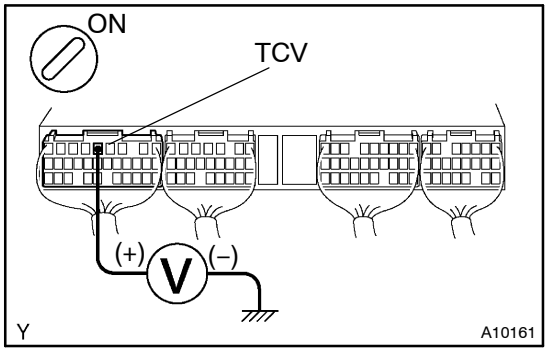
Voltage: 9 – 14 V

OK → **Go to step 3.**

NG

Check for open or short in harness and connector between timing control valve and engine ECU, and timing control valve and ECD main relay (Marking: ECD) (See page IN–20).

3	Check voltage between terminal TCV of engine ECU connector and body ground.



PREPARATION:

(a) Remove the glove compartment door.

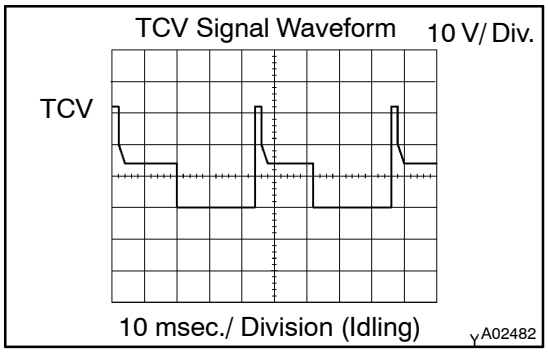
(b) Turn the ignition switch ON.

CHECK:

Measure the voltage between terminal TCV of the engine ECU connector and the body ground.

OK:

Voltage: 9 – 14 V



Reference: INSPECTION USING OSCILLOSCOPE

During idling, check the waveform between terminals TCV and E1 of the engine ECU connector.

HINT:

The correct waveform is as shown.

NG → **Check and replace engine ECU (See page IN–20).**

OK

4	Check fuel filter being clogged, fuel freezing and fuel air in.

NG → **Replace or repair.**

OK

Check and replace injection pump (See page FU–5).