DI31O–05

CIRCUIT INSPECTION

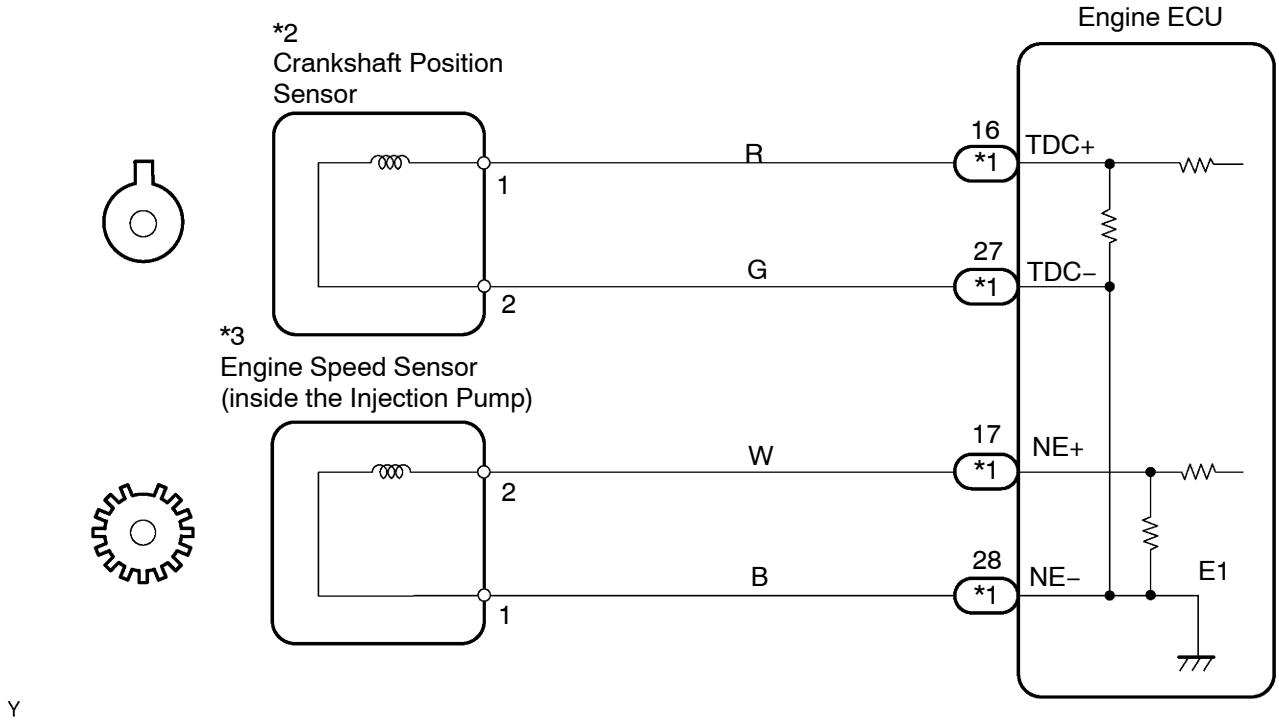
DTC	12	Crankshaft Position Sensor Circuit Malfunction

CIRCUIT DESCRIPTION

The crankshaft position sensor in the Engine Control System contains a signal plate and a pickup coil for a TDC signal. The TDC signal plate has 1 tooth on its outer circumference. The TDC signal sensor generates 1 signal for every engine revolution. The engine ECU detects the top dead center by the TDC signals.
The engine speed sensor in the Engine Control System contains a signal plate and a pickup coil for a NE signal. The NE signal plate has 78 teeth and is mounted in the injection pump. The NE signal sensor generates 78 signals of 2 engine revolutions. The engine ECU detects the engine speed and cam lift position of the injection pump. The engine ECU uses TDC signal and NE signals for injection timing control. And NE signal is used for injection volume control, too.

DTC No.	DTC Detection Condition	Trouble Area
12	No TDC signal to engine ECU at 400 rpm or more	• Open or short in crankshaft position sensor circuit • Crankshaft position sensor • Engine ECU

WIRING DIAGRAM



*2:
C15 (Hilux),
C4 (Land Cruiser/Land Cruiser Prado),
C3 (4Runner)

*1:
E4 (Hilux),
E5 (Land Cruiser/Land Cruiser Prado),
E15 (4Runner)

*3
E9 (Hilux)
E12 4Runner)
P1 Pick–up Sensor
(Land Cruiser/Land Cruiser Prado)

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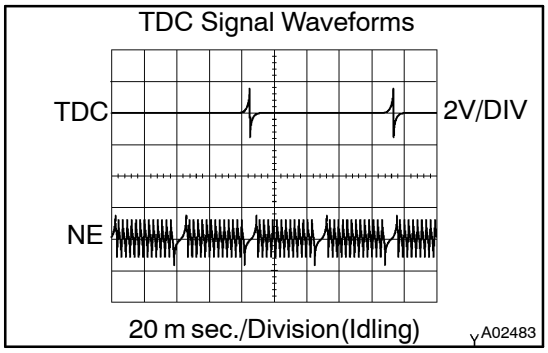
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INSPECTION PROCEDURE

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 resistance of crankshaft position sensor (TDC) (See Pub. No. RM710E, ED section).**



Reference: INSPECTION USING OSCILLOSCOPE
During cranking or idling, check the wveforms between terminals TDC+ and TDC–, and NE+ and NE– of the engine ECU connector.
HINT:
The correct wavaforms are as shown.

NG → **Replace crankshaft position sensor.**

OK

2	**Check for open and short in harness and connector between engine ECU and crankshaft position sensor (See page IN–20).**

NG → **Repair or replace harness or connector.**

OK

3	**Inspection sensor installation.**

NG → **Tighten sensor.**

OK

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