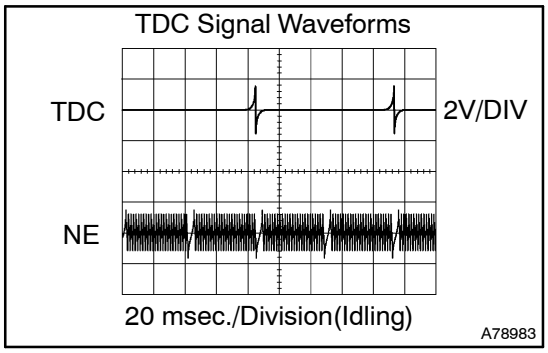
DTC	12	ENGINE SPEED SENSOR CIRCUIT MALFUNCTION1 (TDC OR G1 CIRCUIT)

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 every engine revolution. The ECM 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 84 teeth and is mounted in the injection pump. The NE signal sensor generates 84 signals every 2 engine revolutions. The ECM detects the engine speed and cam lift position of the injection pump. The ECM uses a TDC signal and a NE signal for injection timing control. Also a NE signal is used for injection volume control.

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



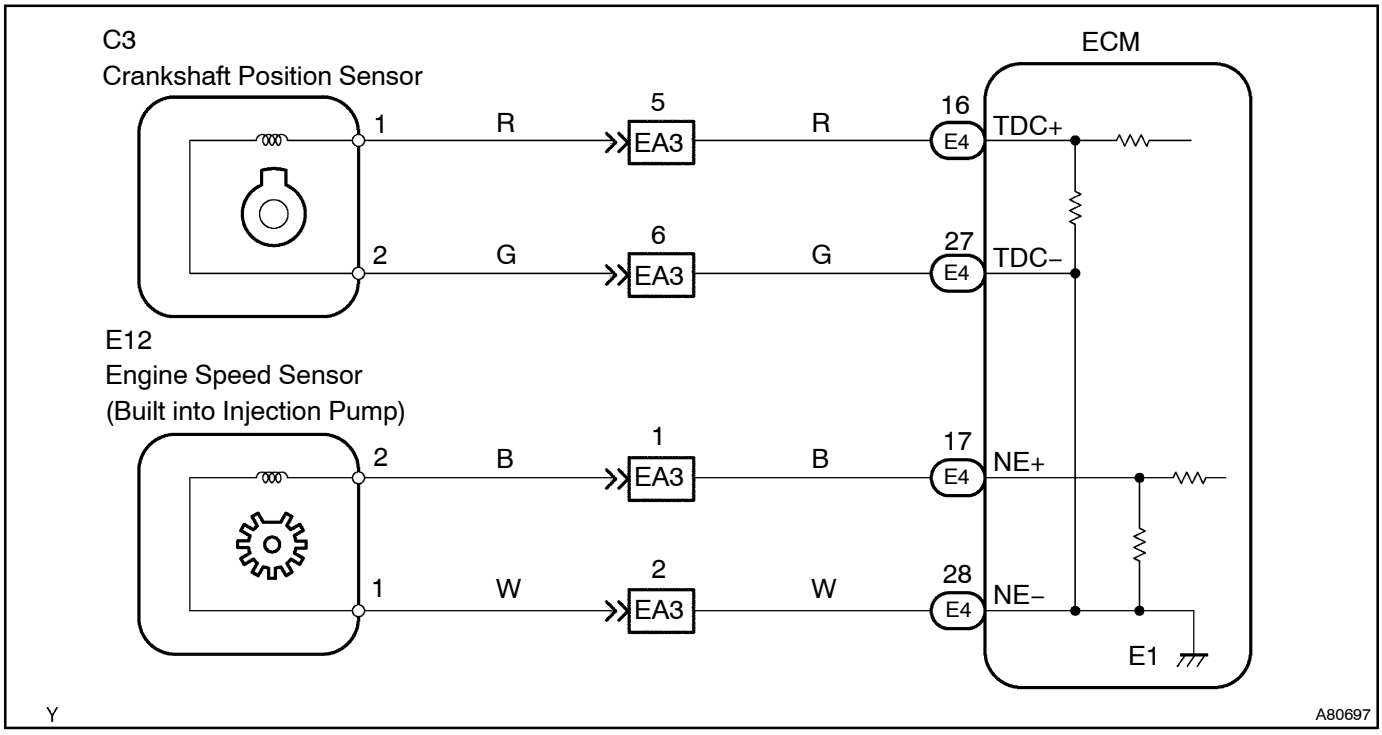
Reference: Inspection using oscilloscope

(a) While cranking or idling, check the waveforms between terminals TDC+ and TDC– of the ECM connector.

HINT:

The correct wavaforms are as shown in the illustration.

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

- Perform troubleshooting of DTC 12 first. If no trouble is found, troubleshoot the following mechanical system.
- Read freeze frame data using the 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 CRANKSHAFT POSITION SENSOR (See page 10–1)

NG → REPLACE CRANKSHAFT POSITION SENSOR

OK

2	CHECK WIRE HARNESS (ECM ⇔ CRANKSHAFT POSITION SENSOR) (See page 01–27)

NG → REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

3	INSPECT SENSOR INSTALLATION

NG → TIGHTEN SENSOR

OK

CHECK AND REPLACE ECM (See page 01–27)