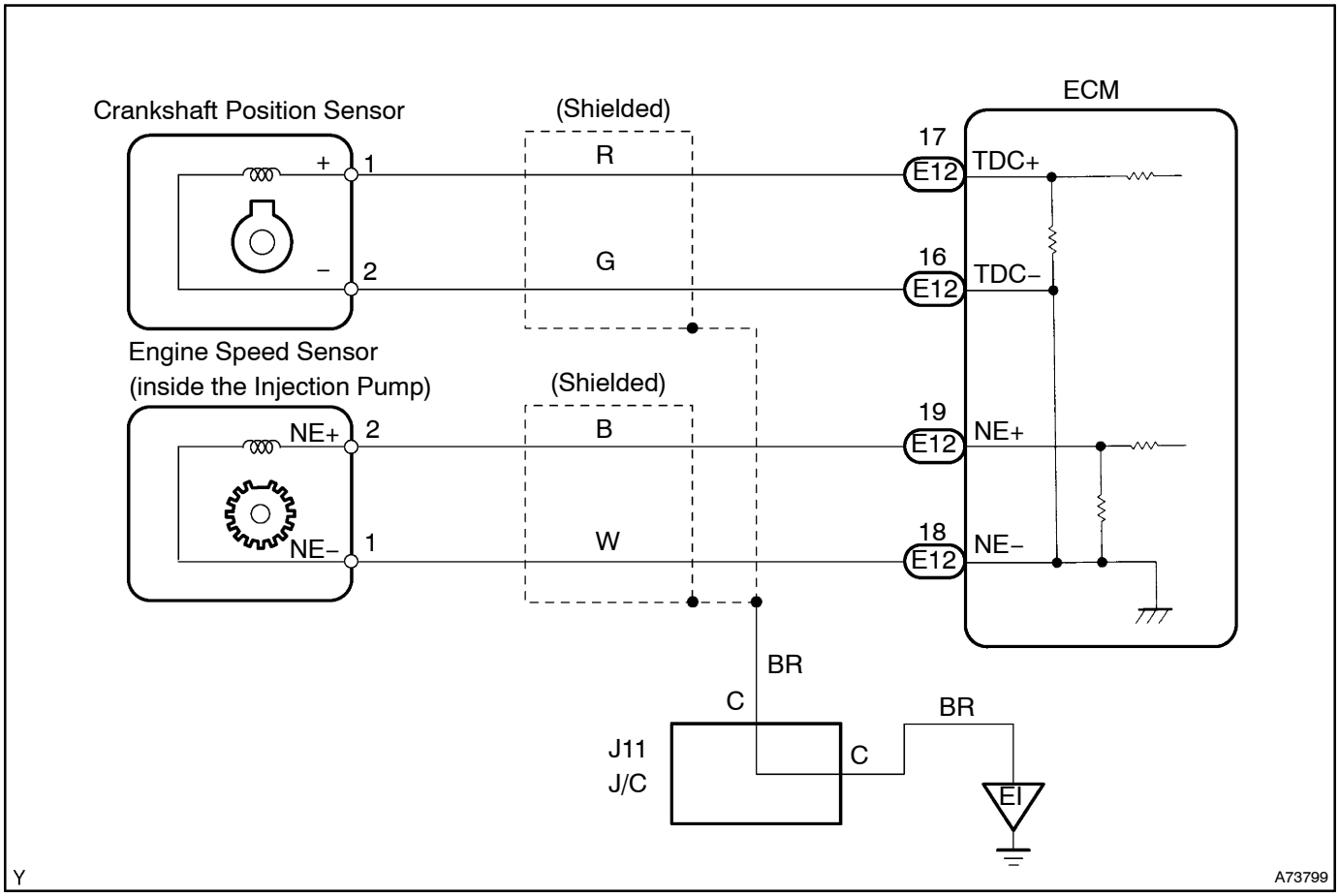
DTC	12	ENGINE SPEED SENSOR CIRCUIT MALFUNCTION1 (TDC OR G1 CIRCUIT)

CIRCUIT DESCRIPTION

The crankshaft position sensor in the Engine Control System contains signal plate and a pickup coil for 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 ECM detects the top dead center by the TDC signals.
The engine speed sensor in the Engine Control System contains signal plate and a pickup coil for NE signal. The NE signal plate has 56 teeth and is mounted in the injection pump. The NE signal sensor generates 56 signals of engine 2 revolutions. The ECM detects the engine speed and cam lift position of the injection pump. The ECM uses TDC signal and NE signals for injection timing control. And NE signal is used for injection volume control, also.

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 • Crankshaft position sensor • ECM

WIRING DIAGRAM



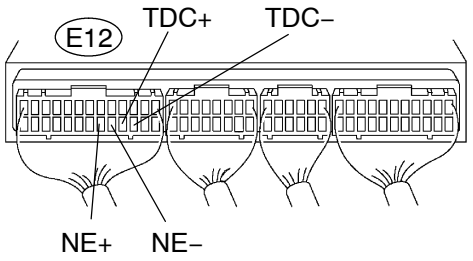
INSPECTION PROCEDURE

1	INSPECT CRANKSHAFT POSITION SENSOR

(a) Measure the resistance between terminals.
Resistance:

Cold	19 – 32 Ω
Hot	24 – 37 Ω

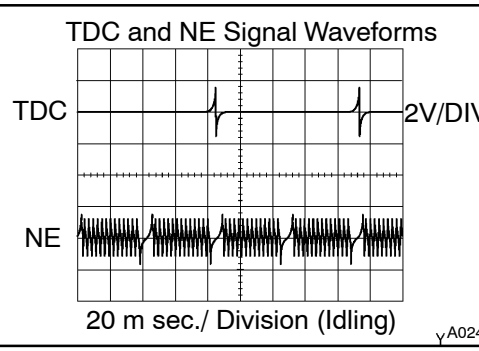
HINT:
"Cold" and "Hot" in the following sentence express the temperature of the sensor itself. "Cold" is from–10°C (14°F) to 50°C (122°F) and "Hot" is from 50°C (122°F) to 100°C (212°F)



(b) Check the output wave form.

Item	Contents
Terminal	TDC+ ⇔ TDC– NE+ ⇔ NE–
Equipment set	2 V/DIV, 20 ms/DIV
Condition	During idling

HINT:
The correct waveforms are as shown.

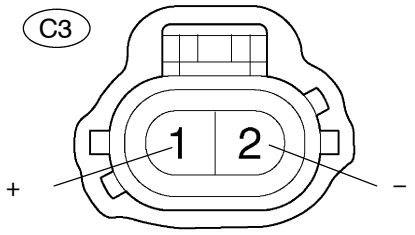


NG → **REPLACE CRANKSHAFT POSITION SENSOR**

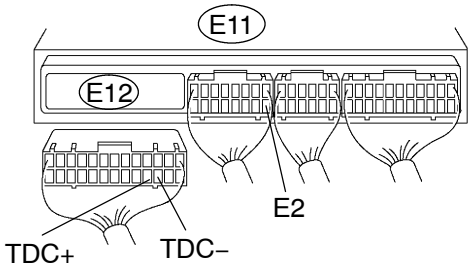
OK

2 CHECK HARNESS AND CONNECTOR(ECM – CRANKSHAFT POSITION SENSOR)

Wire Harness Side



Crankshaft Position Sensor Connector A74548



ECM Connector A62420

(a) Disconnect the crankshaft position sensor connector.
(b) Disconnect the ECM E12 connector.
(c) Check the continuity between the wire harness side connector.

Standard (Check for open):

Symbols (Terminal No.)	Specified condition
+ (C3 – 1) ⇔ TDC+ (E12 – 17)	Continuity
– (C3 – 2) ⇔ TDC– (E12 – 16)	

Standard (Check for short):

Symbols (Terminal No.)	Specified condition
TDC+ (E12 – 17) ⇔ TDC– (E12 – 16)	No continuity
TDC+ (E12 – 17) ⇔ E2 (E11 – 9)	
TDC– (E12 – 16) ⇔ E2 (E11 – 9)	

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

3 CHECK SENSOR INSTALLATION

(a) Check the crankshaft position sensor installation.

NG → **TIGHTEN SENSOR**

OK

CHECK AND REPLACE ECM