DTC	P0325/52	KNOCK SENSOR 1 CIRCUIT MALFUNCTION (BANK 1)

CIRCUIT DESCRIPTION

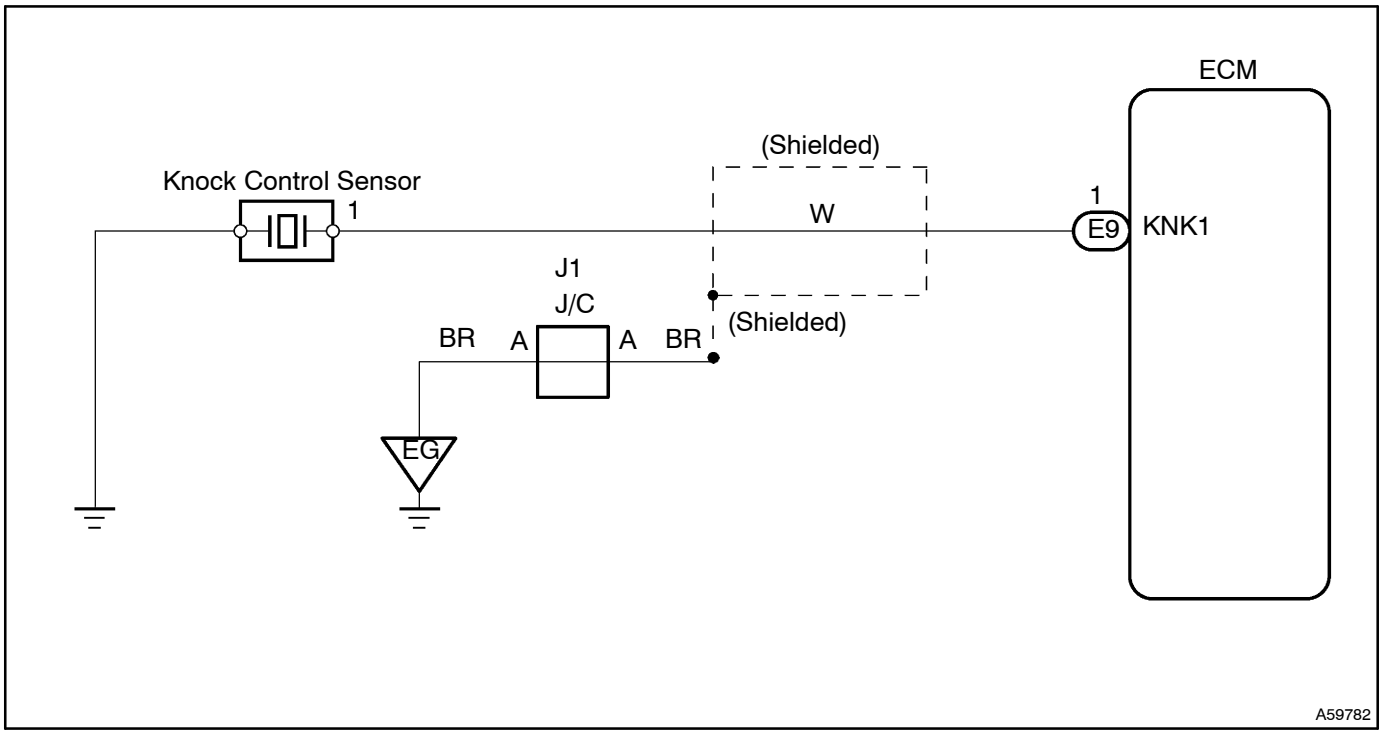
The knock sensor is fitted to the cylinder block to detect the engine knocking. This sensor contains a piezo-electric element which generates a voltage when it becomes deformed. This occurs when the cylinder block vibrates due to knocking. If the engine knocking occurs, the ignition timing is delayed to suppress it.

DTC No.	DTC Detecting Condition	Trouble Area
P0325/52	No knock sensor signal to ECM with engine speed, 2,000 rpm or more	• Open or short in knock sensor circuit • Knock control sensor (looseness) • ECM

HINT:

If the ECM detects above diagnosis conditions, it operates the fail safe function in which the corrective retard angle value is set to the maximum value.

WIRING DIAGRAM

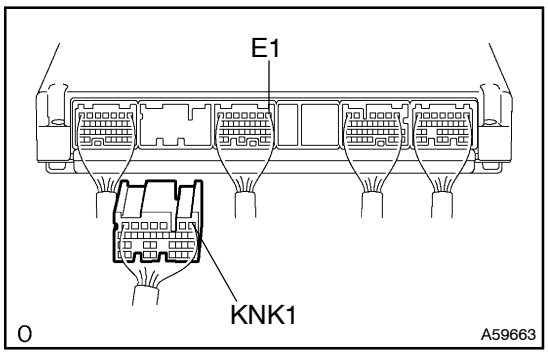


INSPECTION PROCEDURE

HINT:

Read freeze frame data using the hand–held tester, as 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.

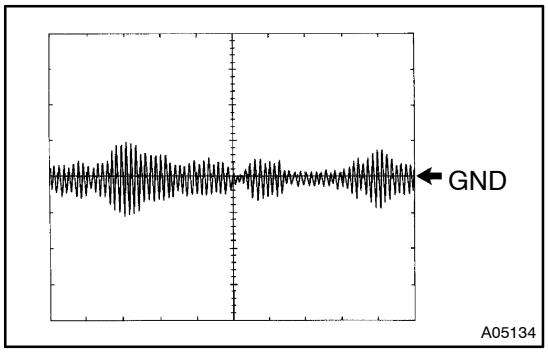
1	CHECK WIRE HARNESS OR CONNECTOR



(a) Check for short on the wire harness between the ECM and the knock control sensor.
  (1) Disconnect the ECM E9 connector.
  (2) Check for short between the terminals KNK1 of ECM connector and E1 of ECM connector.
  Resistance: 1 MΩ or more

(b) Reference:
Inspection using the oscilloscope.
  (1) With the engine racing at 4,000 rpm, check the waveform between terminal KNK1 of the ECM connector and the body ground.

HINT:
The correct waveforms are as shown in the left.



  (2) Spread the time on the horizontal axis, and confirm that period of the wave is 80 μ seconds
  (Normal mode vibration frequency of knock sensor: 7.6 kHz).

HINT:
If normal mode vibration frequency is not 7.6 kHz, the sensor is out of order.

OK	Go to step 3

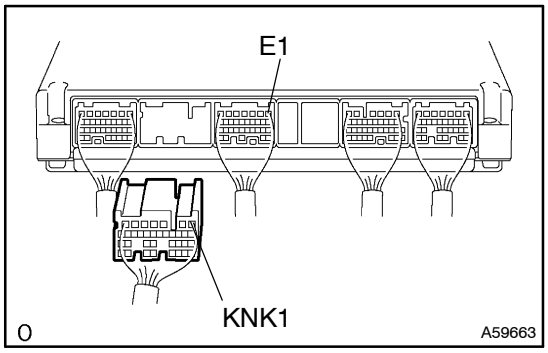
NG

2	INSPECT KNOCK CONTROL SENSOR (See page 10–7)

NG	REPLACE KNOCK CONTROL SENSOR

OK

3	CHECK WIRE HARNESS OR CONNECTOR(ECM–KNOCK CONTROL SENSOR)



(a) Disconnect the knock control sensor connector.
(b) Disconnect the ECM E9 connector.
(c) Check continuity between the terminals KNK1 of the ECM connector and 1 of the knock control sensor connector.
  Resistance: 1 Ω or less
(d) Check for short between the terminals KNK1 of the ECM connector and E1 of the ECM connector.
  Resistance: 1 MΩ or more

NG	REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR

OK

4	CONFIRM THE MALFUNCTION DISAPPEAR WHEN A GOOD KNOCK SENSOR IS INSTALLED

SST 09816–30010

(a) Change the knock sensor to a new one
  (1) Remove the knock control sensor.
  (2) Install the knock control sensor.
  Torque: 44 N·m (450 kgf·cm)

(b) Perform the driving test.

(c) Read DTC.
  Result:

	A	B
RESULT	P0325/52 is output	P0325/52 is not output

B → **REPLACE KNOCK CONTROL SENSOR**

A

CHECK AND REPLACE ECM