DI6AW–03

DTC	P0325/52	Knock Sensor 1 Circuit Malfunction (Bank 1)

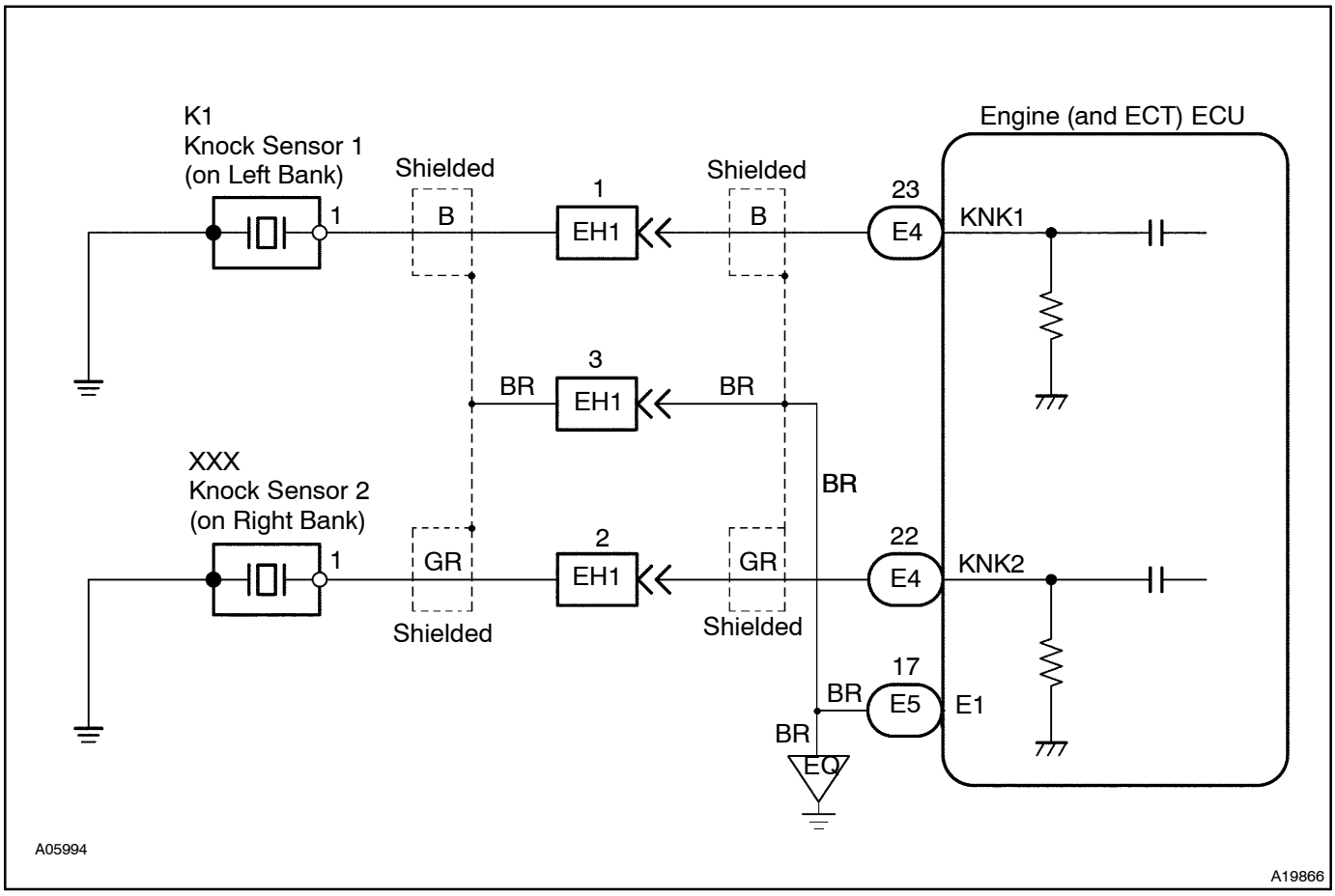
DTC	P0330/55	Knock Sensor 2 Circuit Malfunction (Bank 2)

CIRCUIT DESCRIPTION

Knock sensors are fitted to the right bank and left bank of the cylinder block to detect the engine knocking. This sensor contains a piezoelectric element which generates a voltage when the cylinder block vibrates and is deformed by knocking. If the engine knocking occurs, ignition timing is retarded to suppress it.

DTC No.	DTC Detecting Condition	Trouble Area
P0325/52	No knock sensor 1 signal to engine (and ECT) ECU with engine speed between 1,750 rpm and 5,600 rpm	• Open or short in knock sensor 1 circuit • Knock sensor 1 (looseness) • Engine (and ECT) ECU
P0330/55	No knock sensor 2 signal to engine (and ECT) ECU with engine speed between 1,750 rpm and 5,600 rpm	• Open or short in knock sensor 2 circuit • Knock sensor 2 (looseness) • Engine (and ECT) ECU

WIRING DIAGRAM



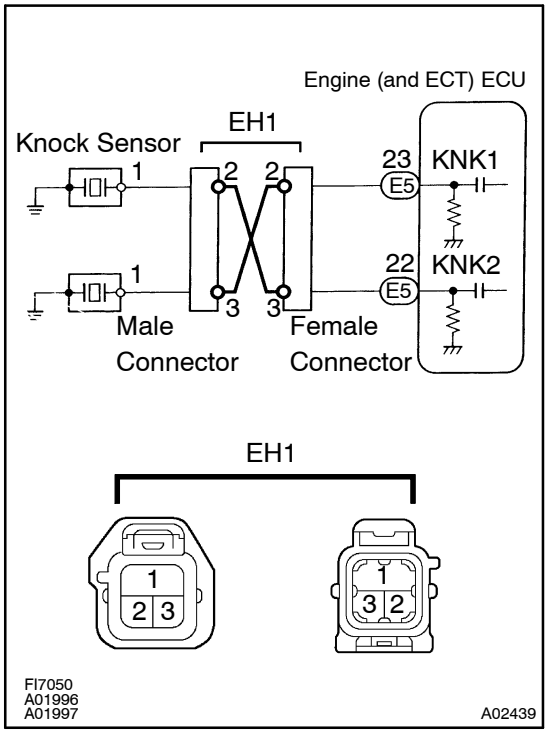
INSPECTION PROCEDURE

HINT:

- DTC P0325/52 is for the left bank knock sensor circuit.
- DTC P0330/55 is for the right bank knock sensor circuit.
- Read the freeze frame data on the hand–held tester, which is recorded when a malfunction is detected on the engine. When troubleshooting, it is useful to determine whether the vehicle was running or stopped, the engine warmed up or not, the air–fuel ratio lean or rich, etc. at the time of a malfunction.

When using hand–held tester:

1	**Check knock sensor circuit.**



PREPARATION:

(a) Connect the hand–held tester to the DLC3.

(b) Disconnect the EH1 connector.

(c) Connect the terminals of the disconnected EH1 male connector and EH1 female as follows.

Male connector ↔ Female connector
Terminal 1 ↔ Terminal 2
Terminal 2 ↔ Terminal 1

(d) Turn the ignition switch ON and switch the hand–held tester main switch ON.

(e) After the engine is warmed up, perform a quick racing to 4,000 rpm 3 times.

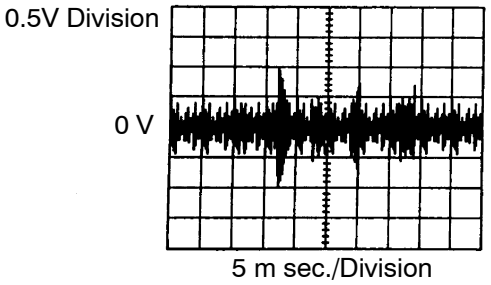
CHECK:

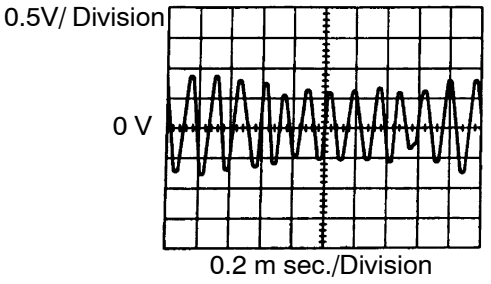
Check the DTC.

RESULT:

A	DTC same as when vehicle brought in. P0325/52 → P0325/52 or P0330/55 → P0330/55
B	DTC different to when vehicle brought in. P0325/52 → P0330/55 or P0330/55 → P0325/52

KNK signal waveform





A00068

Reference: INSPECTION USING OSCILLOSCOPE

- With the engine racing (4,000 rpm), check the waveform between terminal KNK1, KNK2 of the engine (and ECT) ECU connector and the body ground.

HINT:

The correct waveforms are as shown in the illustration.

- Spread the time on the horizontal axis, and confirm that the period of the wave is 0.13 msec (Normal mode vibration frequency of knock sensor: 8.1 kHz).

HINT:

If the normal mode vibration frequency is not 8.1 kHz, the sensor is malfunctioning.

A	**Go to step 3.**

B

2	**Check for open and short in harness and connector between EH1 connector and engine (and ECT) ECU (See page IN–20).**

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

OK

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

3	**Check for open and short in harness and connector between EH1 connector and knock sensor (See page IN–20).**

HINT:
- If DTC P0325/52 has changed to P0330/55, check the knock sensor circuit on the left bank.
- If DTC P0330/55 has changed to P0325/52, check the knock sensor circuit on the right bank.

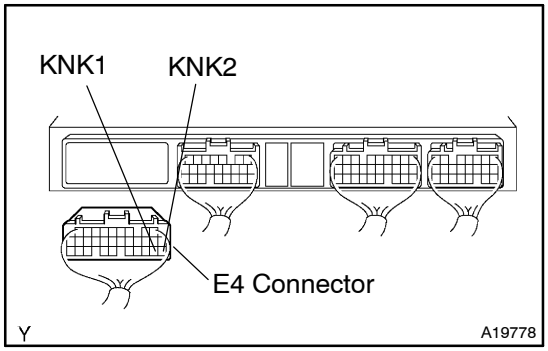
NG → **Repair or replace harness or connector.**

OK

Replace knock sensor.

When not using hand–held tester:

1	**Check continuity between terminal KNK1, KNK2 of engine (and ECT) ECU connector and body ground.**



PREPARATION:
(a) Remove the glove compartment door.
(b) Disconnect the E4 connector of the engine (and ECT) ECU.

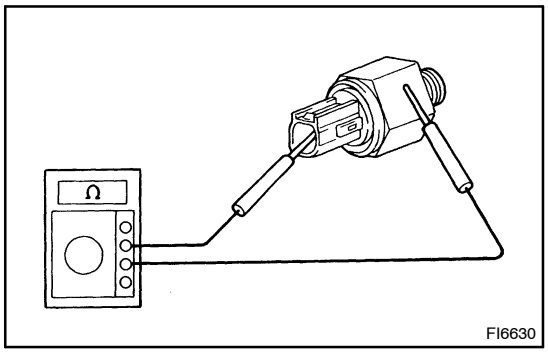
CHECK:
Check that there is no continuity between terminal KNK1, KNK2 of the engine (and ECT) ECU connector and the body ground.

OK:
No continuity

OK → **Go to step 3.**

NG

2	Check knock sensor.



PREPARATION:
Disconnect the knock sensor connector.
CHECK:
Check that there is no continuity between the knock sensor terminal and the body ground.
OK:
No continuity

NG → **Replace knock sensor.**

OK ↓

3	Check for open and short in harness and connector between engine (and ECT) ECU and knock sensor (See page IN–20).

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

OK ↓

4	Does malfunction disappear when a good knock sensor is installed?

YES → **Replace knock sensor.**

NO ↓

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