DI2SA–02

DTC	P0325/52	Knock Sensor 1 Circuit Malfunction

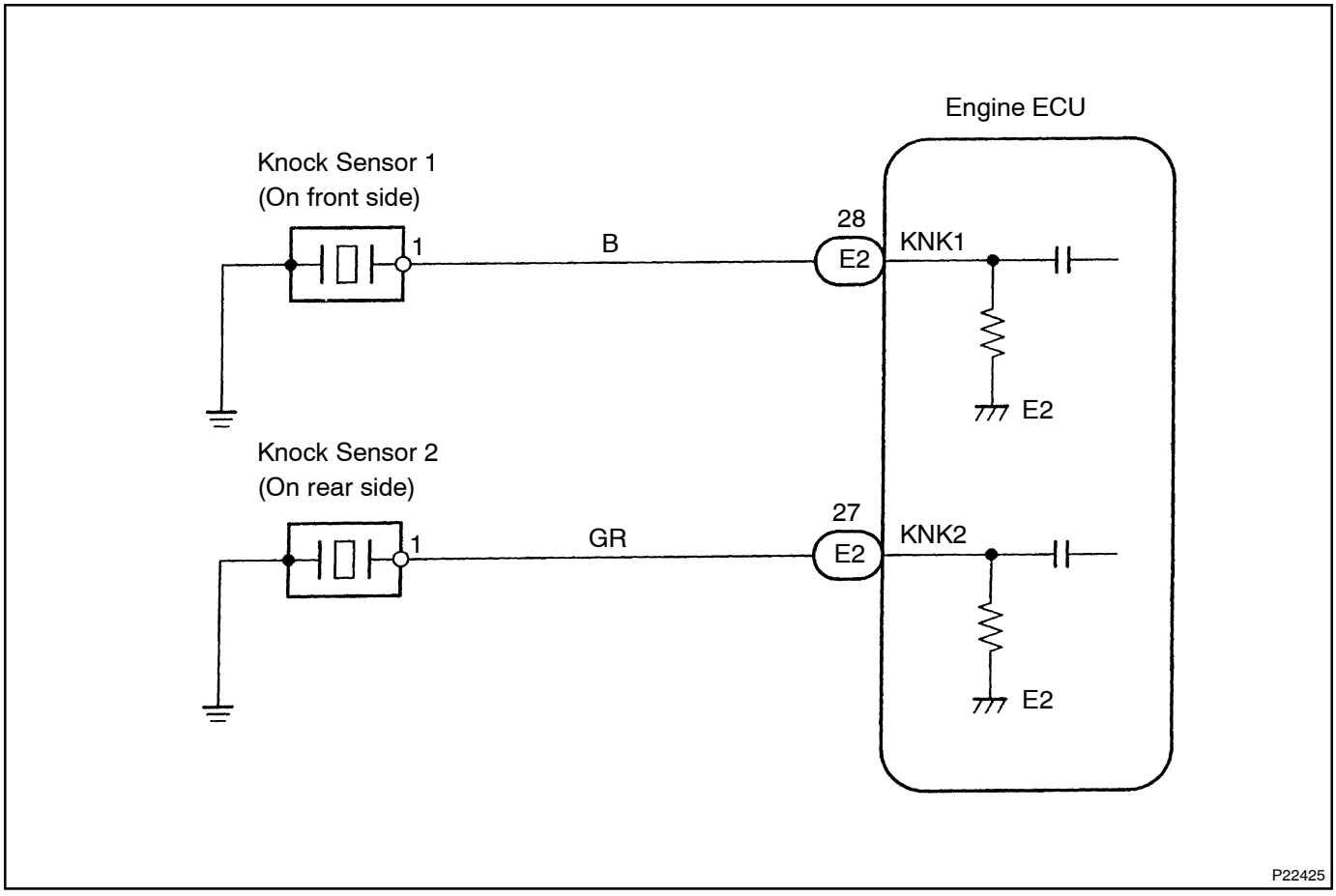
DTC	P0330/55	Knock Sensor 2 Circuit Malfunction

CIRCUIT DESCRIPTION

Knock sensors are fitted one to the right bank and left bank of the cylinder block to detect engine knocking. This sensor contains a piezoelectric element which generates a voltage when it becomes deformed, which occurs when the cylinder block vibrates due to knocking. If 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 ECU with engine speed between 1,600 rpm and 5,200 rpm	• Open or short in knock sensor 1 circuit • Knock sensor 1 (looseness) • engine ECU
P0330/55	No knock sensor 2 signal to engine ECU with engine speed between 1,600 rpm and 5,200 rpm	• Open or short in knock sensor 2 circuit • Knock sensor 2 (looseness) • engine ECU

WIRING DIAGRAM

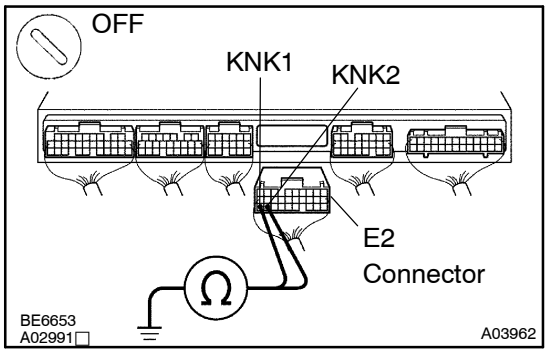


INSPECTION PROCEDURE

HINT:

- Read freeze frame data using hand–held tester. Because freeze frame 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 warmed up or not, the air–fuel ratio lean or rich, etc. at the time of the malfunction.

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



PREPARATION:

(a) Remove the engine room engine ECU hood and cover.

(b) Disconnect the E2 connector from the engine ECU.

CHECK:

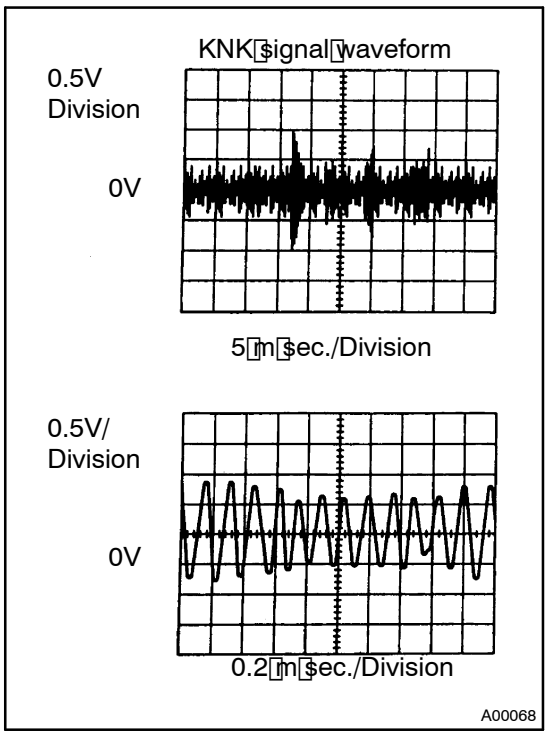
Measure resistance between terminal KNK1, KNK2 of the engine ECU and body ground.

HINT:

- Connect terminal KNK1 to knock sensor 1.
- Connect terminal KNK2 to knock sensor 2.

OK:

Resistance: 1 MΩ or higher



Reference: INSPECTION USING OSCILLOSCOPE

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

HINT:

The correct waveforms are as shown.

- Spread the time on the horizontal axis, and confirm that period of the wave is 0.141 m sec.
  (Normal mode vibration frequency of knock sensor: 7.1 kHz)

HINT:

If normal mode vibration frequency is not 7.1 kHz, the sensor is malfunctioning.

OK	**Go to step 3.**

NG

2	**Check knock sensor (See page FI–59).**

NG → Replace knock sensor.

OK

3	Check for open and short in harness and connector between engine ECU and knock sensor (See page IN–29).

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 ECU (See page IN–29).