

DTC	P0325	Knock Sensor 1 Circuit Malfunction
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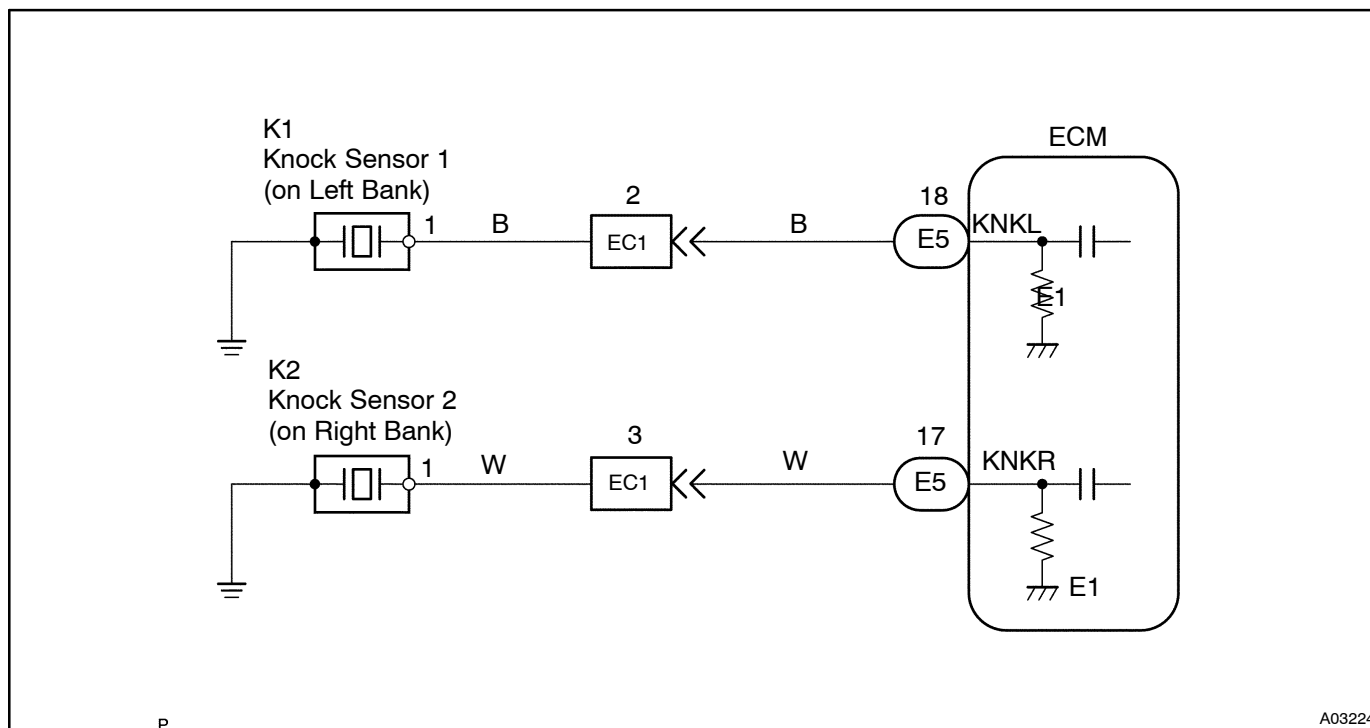
DTC	P0330	Knock Sensor 2 Circuit Malfunction
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CIRCUIT DESCRIPTION

Each knock sensor is fitted 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	No knock sensor 1 signal to ECM with engine speed between 1,700 rpm and 5,400 rpm	• Open or short in knock sensor 1 circuit • Knock sensor 1 (looseness) • ECM
P0330	No knock sensor 2 signal to ECM with engine speed between 1,700 rpm and 5,400 rpm	• Open or short in knock sensor 2 circuit • Knock sensor 2 (looseness) • ECM

WIRING DIAGRAM



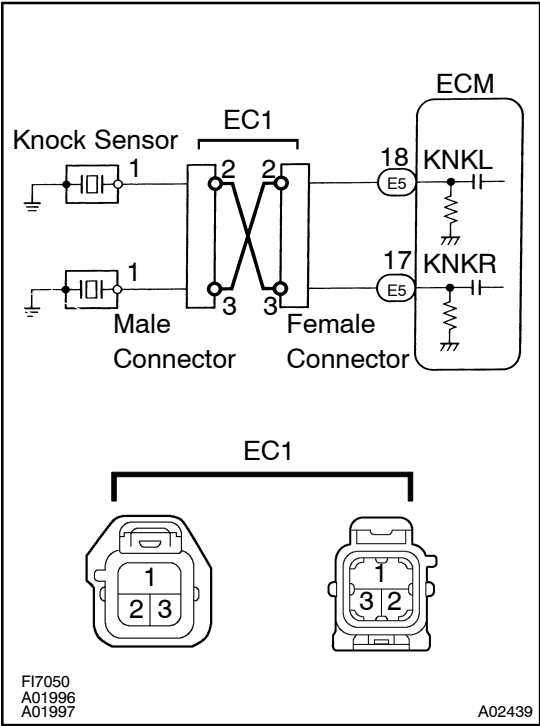
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INSPECTION PROCEDURE

HINT:

- DTC P0325 is for the left bank knock sensor circuit.
- DTC P0330 is for the right bank knock sensor circuit.
- Read freeze frame data using TOYOTA hand-held tester or OBD II scan tool. 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 was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

1	Connect OBD II scan tool or TOYOTA hand-held tester, and check knock sensor circuit.
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PREPARATION:

- (a) Connect the OBD II scan tool or TOYOTA hand-held tester to the DLC3.
- (b) Disconnect the wire to wire connector EC1.
- (c) Connect the terminals of the disconnected EC1 male connector and EC1 female as follows.

Male connector ↔ Female connector
Terminal 2 ↔ Terminal 3
Terminal 3 ↔ Terminal 2

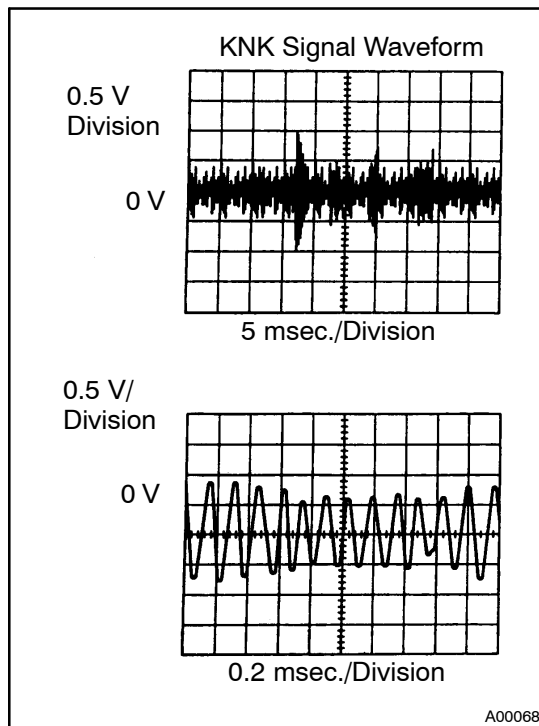
- (d) Turn ignition switch ON and push the OBDII scan tool or TOYOTA hand-held tester main switch ON.
- (e) After the engine is warmed up, perform quick racing to 4,000 rpm 3 times.

CHECK:

Check the DTC.

RESULT:

Type I	DTC same as when vehicle brought in P0325 → P0325 or P0330 → P0330
Type II	DTC different to when vehicle brought in P0325 → P0330 or P0330 → P0325

**Reference: INSPECTION USING OSCILLOSCOPE**

- With the engine racing (4,000 rpm), check the waveform between terminal KNK1, KNK2 of the ECM 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 0.13 msec. (Normal mode vibration frequency of knock sensor: 8.1 kHz)

HINT:

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

Type II**Go to step 3.****Type I****2****Check for open and short in harness and connector between EC1 connector and ECM (See page [IN-34](#)).****NG****Repair or replace harness or connector.****OK****Check and replace ECM (See page [IN-34](#)).**

3	Check for open and short in harness and connector between EC1 connector and knock sensor (See page IN-34).
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HINT:

- If DTC P0325 has changed to P0330, check the knock sensor circuit on the left bank side.
- If DTC P0330 has changed to P0325, check the knock sensor circuit on the right bank side.

NG**Repair or replace harness or connector.****OK****Replace knock sensor.**