

DTC	P0325	Knock Sensor 1 Circuit (Bank 1 or Single Sensor)
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DTC	P0330	Knock Sensor 2 Circuit (Bank 2)
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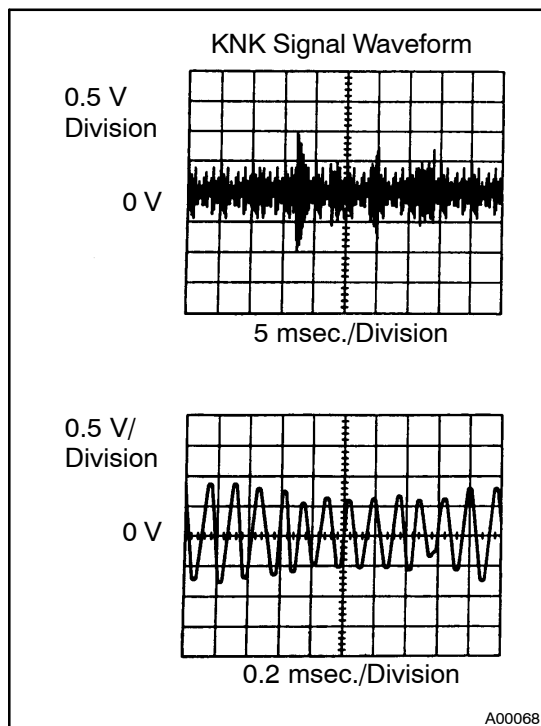
CIRCUIT DESCRIPTION

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. The piezoelectric element sends a signal to the ECM, 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 signal of knock sensor 1 signal to ECM with engine speed between 2,000 rpm and 5,400 rpm	• Open or short in knock sensor 1 circuit • Knock sensor 1 (looseness) • ECM
P0330	No signal of knock sensor 2 signal to ECM with engine speed between 2,000 rpm and 5,400 rpm	• Open or short in knock sensor 2 circuit • Knock sensor 2 (looseness) • ECM

HINT:

- Bank 1 refers to the bank that includes cylinder No. 1.
- Bank 2 refers the the bank that does not include cylinder No. 1.



Reference: INSPECTION USING OSCILLOSCOPE

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

HINT:

The correct waveform is 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 has malfunction.

MONITOR DESCRIPTION

The knock sensor located on the cylinder block, detects spark knock.

When spark knock occurs, the sensor pick-up vibrates in a specific frequency range. When the ECM detects the voltage in this frequency range, it retards the ignition timing to suppress the spark knock.

The ECM also senses background engine noise with the knock sensor and uses this noise to check for faults in the sensor. If the knock sensor signal level is too low for more than 10 sec., and if the knock sensor output voltage is out of normal range, the ECM interprets this as a fault in the knock sensor and sets a DTC.

MONITOR STRATEGY

Related DTCs	P0325	Knock sensor (Bank 1) range check or rationality
	P0330	Knock sensor (Bank 2) range check or rationality
Required sensors/components	Main sensors/components	Knock sensor
	Related sensors/components	None
Frequency of operation	Continuous	
Duration	10 sec.	
MIL operation	Immediate	
Sequence of operation	None	

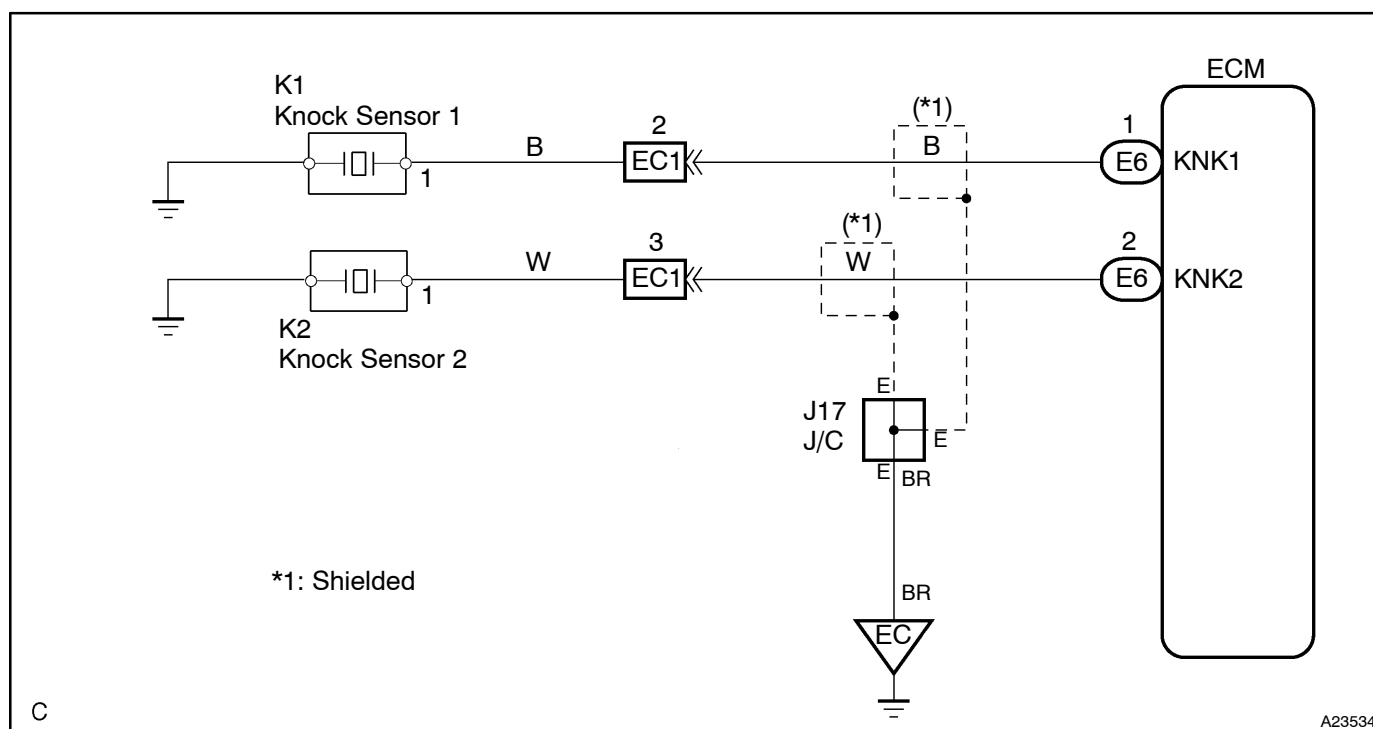
TYPICAL ENABLING CONDITIONS

Item	Specification
Sensor signal level	Lower than thresholds
Battery voltage	10 V or higher
Idle	OFF
Engine coolant temperature	60°C (140°F) or higher
Intake air amount per revolution	0.45 g/rev or more
Engine RPM	2,000 to 5400 rpm

TYPICAL MALFUNCTION THRESHOLDS

Detection Criteria	Threshold
Cumulative time that knock sensor is fail	10 seconds or more

WIRING DIAGRAM

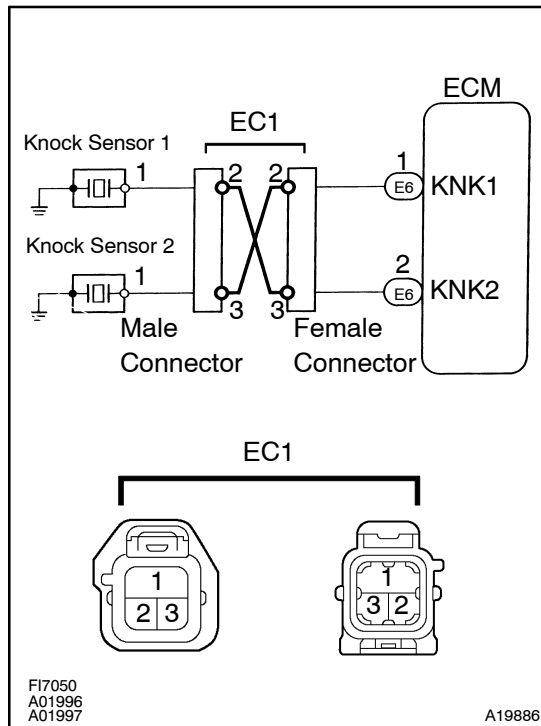


INSPECTION PROCEDURE

HINT:

- DTC P0325 is for the bank 1 knock sensor circuit.
- DTC P0330 is for the bank 2 knock sensor circuit.
- Read freeze frame data using the hand-held tester or the OBD II scan tool. Freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting, freeze frame data can help determine if the vehicle was running or stopped, if the engine was warmed up or not, if the air-fuel ratio was lean or rich, as well as other data from the time when a malfunction occurred.

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



PREPARATION:

- Connect the OBD II scan tool or hand-held tester to the DLC3.
- Disconnect the EC1 connector.
- 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

- Turn ignition switch ON and push the OBD II scan tool or hand-held tester main switch ON.
- 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

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-36).
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NG**Repair or replace harness or connector.****OK****Replace ECM (See page [SF-60](#)).**

3	Check for open and short in harness and connector between EC1 connector and knock sensor (See page IN-36). 
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HINT:

- If DTC P0325 has changed to P0330, check the knock sensor circuit on the bank 1 side.
- If DTC P0330 has changed to P0325, check the knock sensor circuit on the bank 2 side.

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