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|------------|--------------|---|
| DTC | P0325 | KNOCK SENSOR 1 CIRCUIT (BANK 1 OR SINGLE SENSOR) |
|------------|--------------|---|

| | | |
|------------|--------------|--|
| DTC | P0330 | KNOCK SENSOR 2 CIRCUIT (BANK 2) |
|------------|--------------|--|

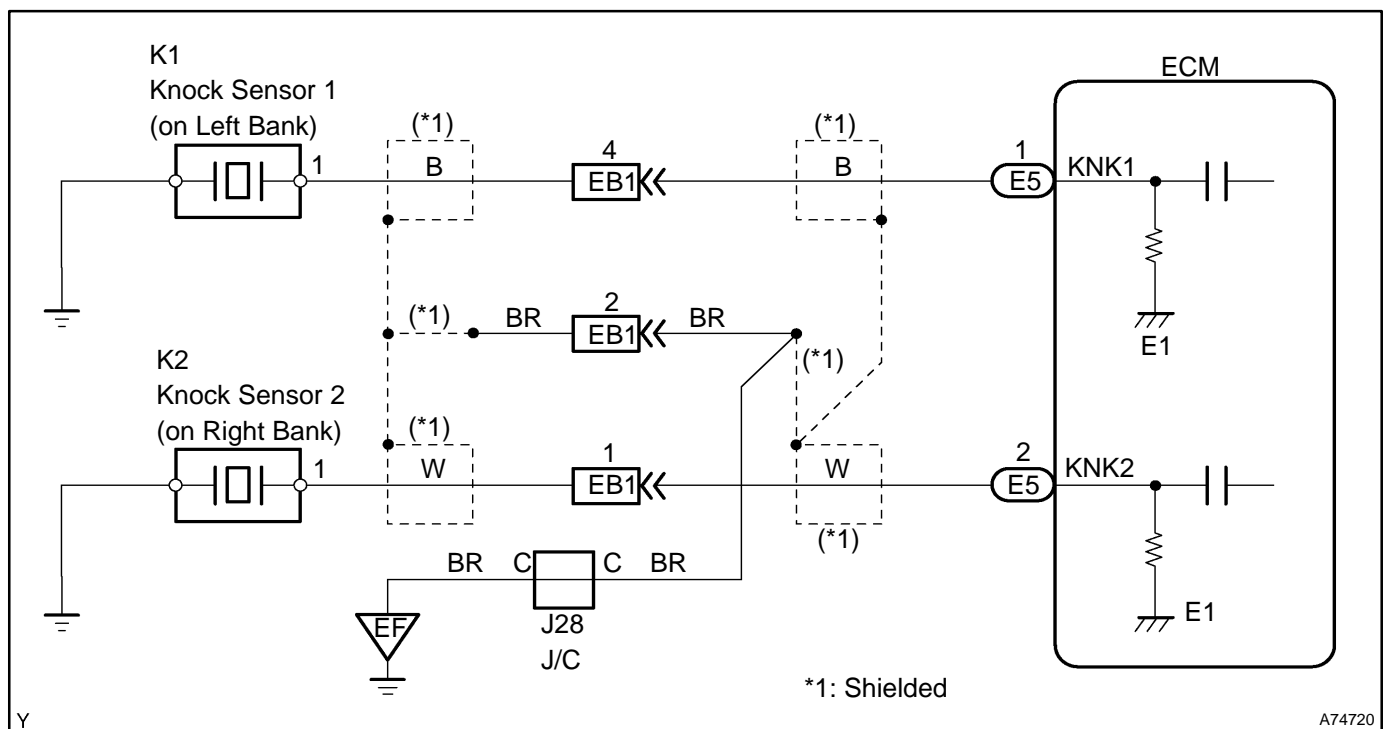
CIRCUIT DESCRIPTION

The each knock sensors are fitted on the right bank and left bank of the cylinder block to detect the engine knocking.

Each sensor contains a piezoelectric element which generates a voltage when it becomes deformed, which occurs when the cylinder block vibrates due to the knocking. If the engine knocking occurs, the ignition timing is retarded to suppress it.

| DTC No. | DTC Detection Condition | Trouble Area |
|---------|---|--|
| P0325 | No knock sensor 1 signal to ECM with engine speed between 1,700 rpm and 5,400 rpm | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • Open or short in knock sensor 2 circuit • Knock sensor 2 (looseness) • ECM |

WIRING DIAGRAM

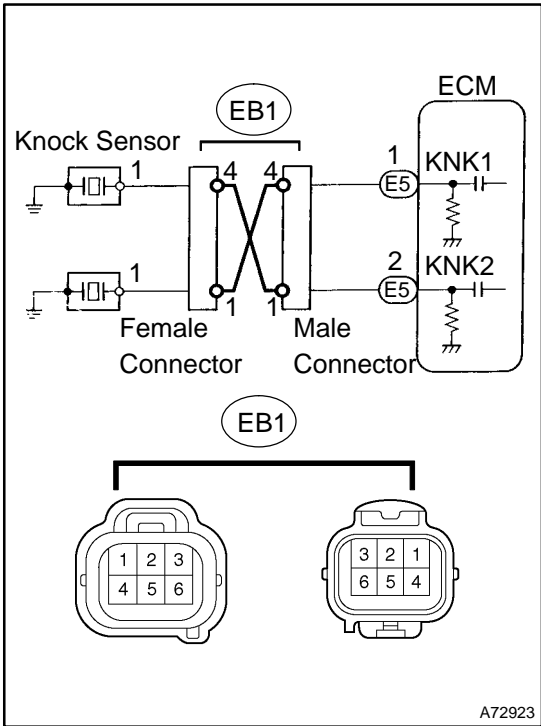


INSPECTION PROCEDURE

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 the hand-held tester or the OBD II scan tool, as freeze frame data records the engine conditions when a 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.

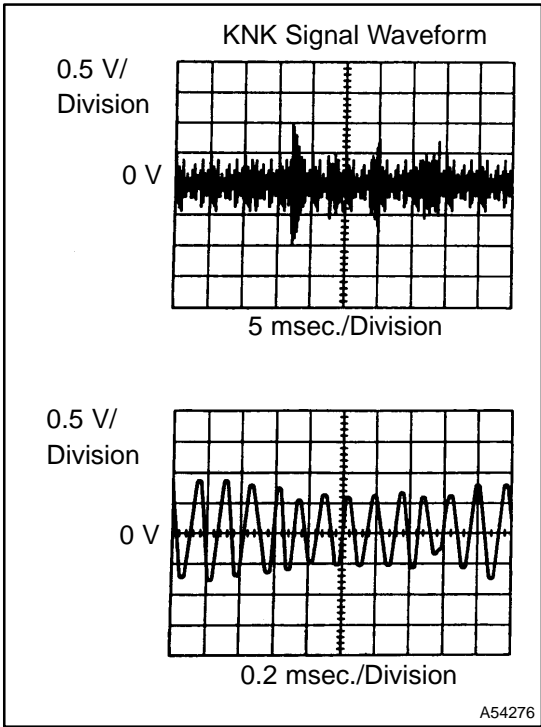
1 READ OUTPUT DTC(CHECK KNOCK SENSOR CIRCUIT)



- (a) Disconnect the EB1 connector.
- (b) Using lead wires, connect the EB1 connectors as follows.

| |
|-----------------------------------|
| Male connector ↔ Female connector |
| Terminal 4 ↔ Terminal 1 |
| Terminal 1 ↔ Terminal 4 |
- (c) Warm up the engine.
- (d) Perform a quick racing to 4,000 rpm 3 times.
- (e) Check the DTC.

| Display | Proceed to |
|---|------------|
| DTC same as when vehicle brought in P0325 → P0325 or P0330 → P0330 | A |
| DTC different from when vehicle brought in P0325 → P0330 → P0325 | B |



- (f) Reference (Using an oscilloscope):
 - (1) Check the waveform between the terminals KNK1/KNK2 of the ECM connector and body ground at 4,000 rpm.
Standard: Refer to the illustration.
 - (2) Spread the time on the horizontal axis and confirm that period of the wave is 0.123 msec. (Normal mode vibration frequency of knock sensor: 8.1 kHz)
- If the normal mode vibration frequency is not 8.1 kHz, the sensor is malfunctions.

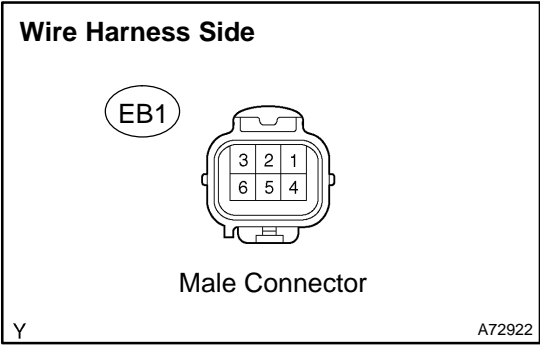
A

B

Go to step 3

2

CHECK HARNESS AND CONNECTOR(EB1 CONNECTOR - ECM)



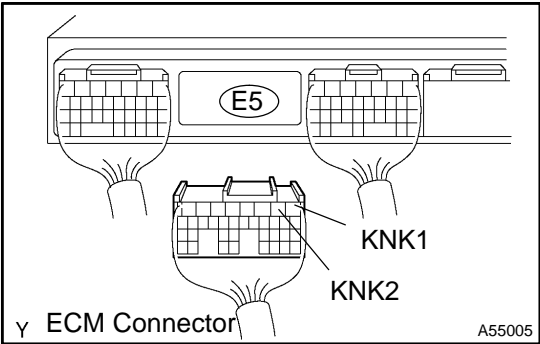
- (a) Disconnect the EB1 connector.
- (b) Disconnect the E5 ECM connector.
- (c) Check the continuity between the wire harness side connectors.

Standard (Check for open):

| Symbols (Terminal No.) | Specified condition |
|------------------------------------|---------------------|
| EB1 male connector 4 ⇔ KNK1 (E5-1) | Continuity |
| EB1 male connector 1 ⇔ KNK1 (E5-2) | |

Standard (Check for short):

| Symbols (Terminal No.) | Specified condition |
|---|---------------------|
| EB1 male connector 4 or KNK1 (E5-1) ⇔ Body ground | No Continuity |
| EB1 male connector 1 or KNK2 (E5-2) ⇔ Body ground | |



OK

CHECK AND REPLACE ECM
(See page 01-35)

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REPAIR OR REPLACE HARNESS OR CONNECTOR

3

CHECK HARNESS AND CONNECTOR(EB1 CONNECTOR - KNOCK SENSOR)

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.

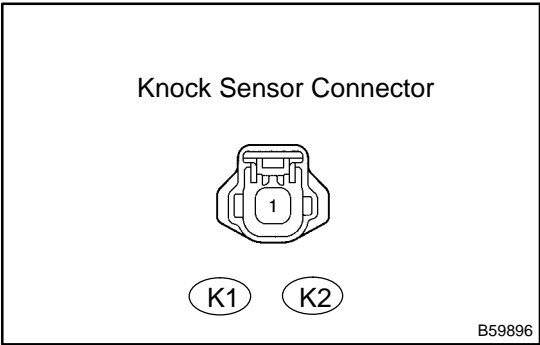
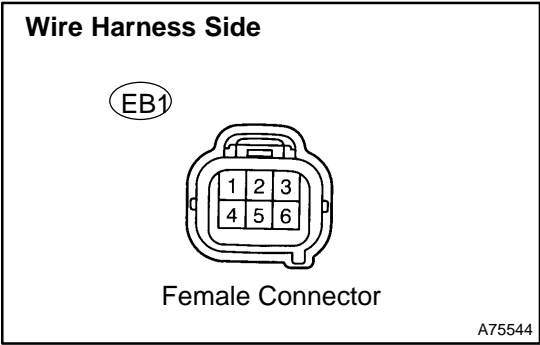
- (a) Disconnect the EB1 connector.
- (b) Disconnect the K1 and K2 knock sensor connectors.
- (c) Check the continuity between the wire harness side connectors.

Standard (Check for open):

| Terminal No. | Specified condition |
|-------------------------------|---------------------|
| EB1 female connector 4 ⇔ K1-1 | Continuity |
| EB1 female connector 1 ⇔ K2-1 | |

Standard (Check for short):

| Terminal No. | Specified condition |
|--|---------------------|
| EB1 female connector 4 or K1-1 ⇔ Body ground | No continuity |
| EB1 female connector 1 or K2-1 ⇔ Body ground | |



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REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

REPLACE KNOCK SENSOR