

Diag. Code 52,53,55 Knock Sensor Circuit

— CIRCUIT DESCRIPTION —

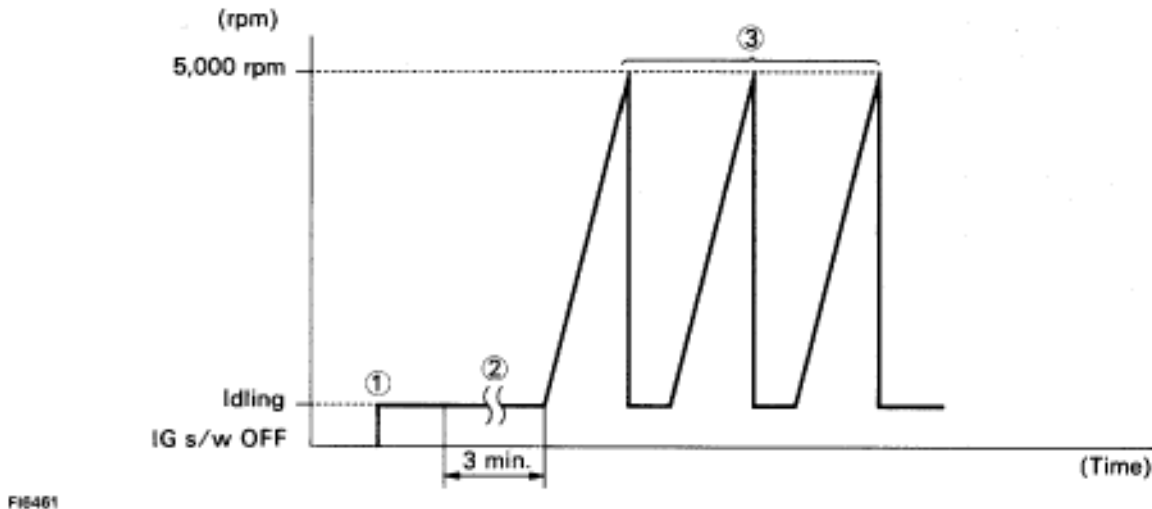
Knock sensors are fitted one each to the right bank and left bank of the cylinder block to detect engine knocking. This sensor contains a piezoelectric element which generates a voltage when it becomes deformed, which occurs when the cylinder block vibrates due to knocking. If engine knocking occurs,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

Code No.	Diagnostic Code Detecting Condition	Trouble Area
52	No No. 1 knock sensor signal to ECU for 3 crank revolutions with engine speed between 1,600 rpm 5,200 rpm.	<ul style="list-style-type: none"> •Open or short in No. 1 knock sensor circuit. •No. 1 knock sensor (looseness) •ECU
53	Engine control computer (for knock control) malfunction at engine speed between 650 rpm and 5,200 rpm.	<ul style="list-style-type: none"> •ECU
55	No No. 2 knock sensor signal to ECU for 3 crank revolutions with engine speed between 1,600 rpm 5,200 rpm.	<ul style="list-style-type: none"> •Open or short in No. 2 knock sensor circuit. •No. 2 knock sensor (looseness) •ECU

If the ECU detects the above diagnosis conditions, it operates the fail safe function in which the corrective retard angle value is set to the maximum value.

— CIRCUIT DESCRIPTION (Cont'd)**DIAGNOSIS CODE DETECTION DRIVING PATTERN****Purpose of the driving pattern.**

- (a) To simulate diag. code detecting condition after diag. code is recorded.
- (b) To check that the malfunction is corrected when the repair is completed confirming that diag. code is no longer detected.

Malfunction: Open or Short in Knock Sensor

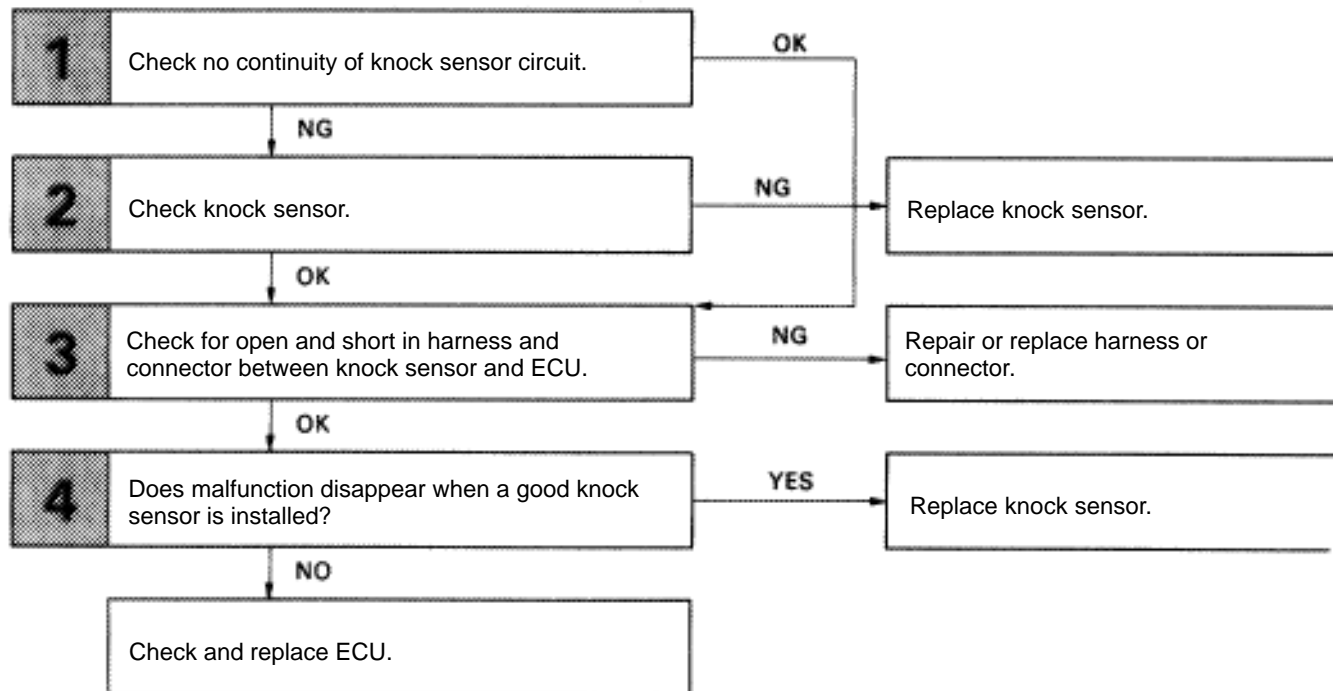
- ① Start engine and warm up.
- ② After engine is warmed up, let it idle for 3 min.
- ③ With the A/C ON, perform quick racing (5,000 rpm) three times.
(Rapidly depress the accelerator pedal and suddenly release it.)

HINT: If a malfunction exists, the "CHECK" engine warning light will light up when sudden racing is performed.

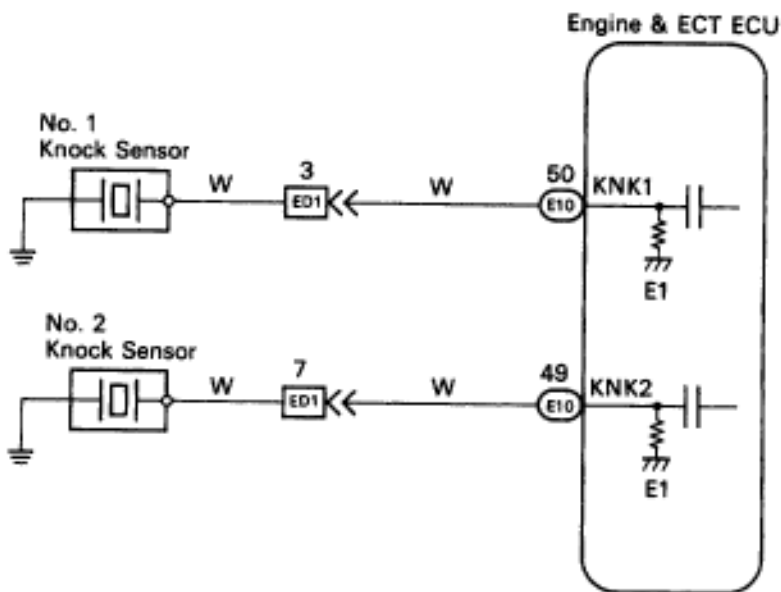
NOTICE: If the conditions in this test are not strictly followed, detection of the malfunction will not be possible.

DIAGNOSTIC CHART

HINT: If diag. code 52 is displayed, check No. 1 knock sensor (for left bank) circuit.
 If diag. code 55 is displayed, check No. 2 knock sensor (for right bank) circuit.
 If diag. code 53 is displayed, replace engine & ECT ECU.

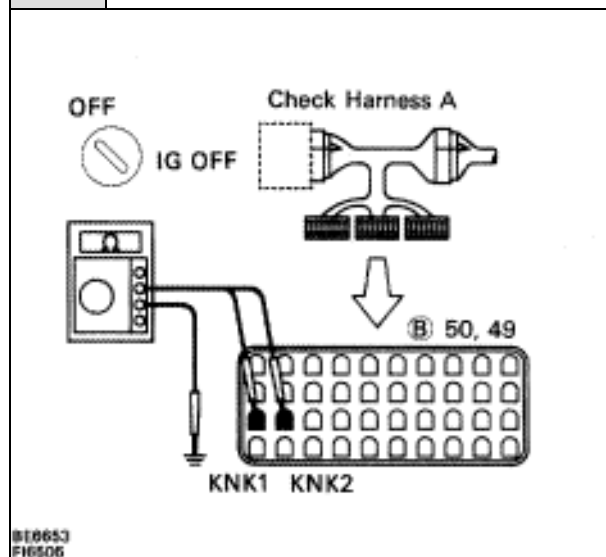


WIRING DIAGRAM



INSPECTION PROCEDURE

- 1** Check continuity between terminals KNK1, KNK2 of engine & ECT ECU connector and body ground.



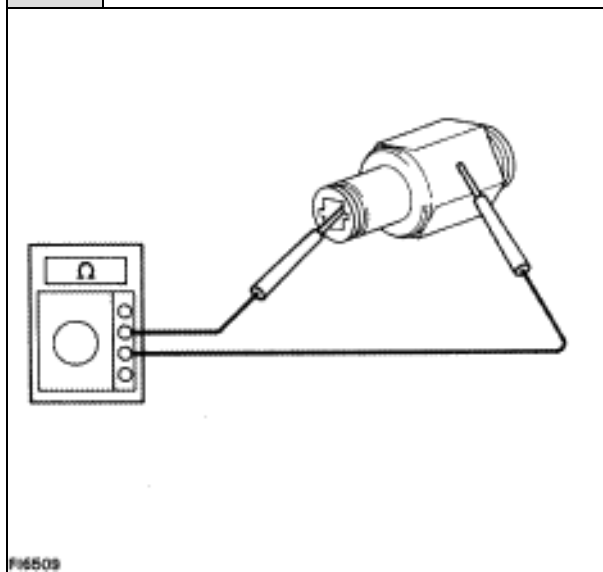
- P** (2) Connect the Check Harness A.
(See page [TR-30](#))
- (2) Disconnect the engine & ECT ECU connector.
- C** Measure resistance between terminals KNK1, KNK2 of engine & ECT ECU connector and body ground.
- OK** Resistance: 1 MΩ or higher

NG

OK

Go to step 3.

- 2** Check knock sensor.



- P** Disconnect knock sensor connector.
- C** Measure resistance between the knock sensor terminal and body.
- OK** Resistance: 1 MΩ or higher

OK

NG

Replace knock sensor (See page [FI-108](#)).

3

Check for open and short in harness and connectors between engine & ECT ECU and knock sensor (See page [IN-27](#))

OK**NG**

Repair or replace harness or connector.

4

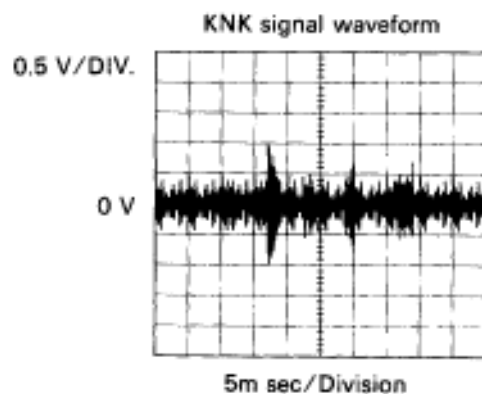
Does malfunction disappear when a good knock sensor is installed?

NO**YES**

Replace knock sensor (See page [FI-108](#)).

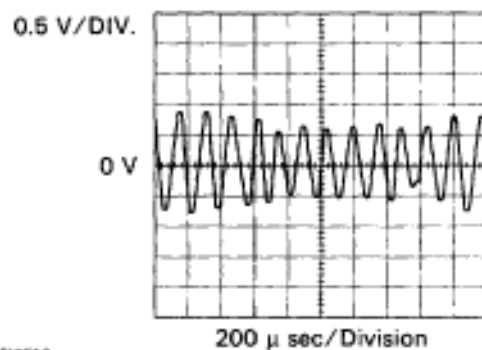
Check and replace engine & ECT ECU.

Reference | INSPECTION USING OSCILLOSCOPE



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

HINT: The correct waveform appears as shown in the illustration on the left.



- Spread the time on the horizontal axis, and confirm that period of the wave is 151 sec. (Normal mode vibration frequency of knock sensor: 6.6 KHz).

HINT: If normal mode vibration frequency is not 6.6 KHz, the sensor is malfunctioning.

FIG510
FIG511

—MEMO—