

DTC	52, 53, 55	Knock Sensor Circuit
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— CIRCUIT DESCRIPTION —

Knock sensors are fitted one each to the front and rear of the left side 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.	Diagnostic Trouble Code Detecting Condition	Trouble Area
52	No No. 1 knock sensor signal to ECM for 4 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) • ECM
53	Engine control computer (for knock control) malfunction at engine speed between 650 rpm and 5,200 rpm.	<ul style="list-style-type: none"> • ECM
55	No No. 2 knock sensor signal to ECM for 4 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) • ECM

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

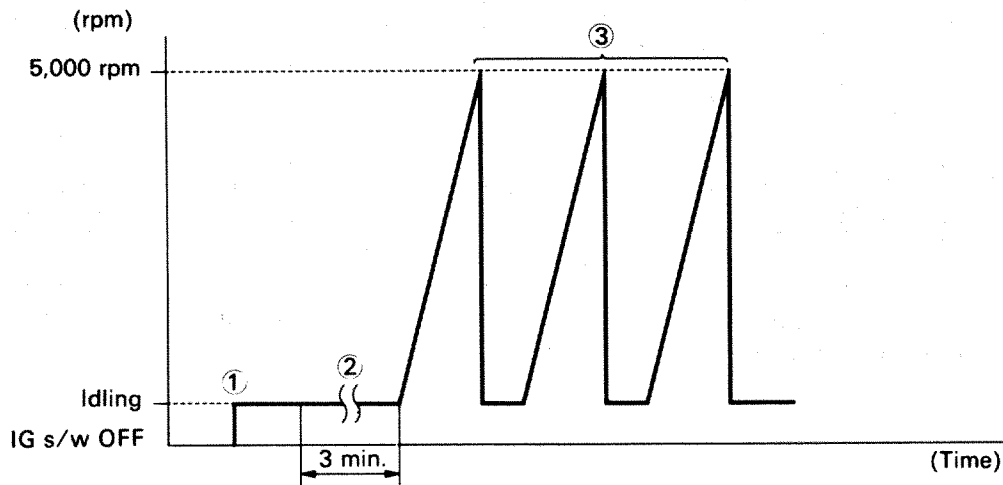
— CIRCUIT DESCRIPTION (Cont'd) —

DIAGNOSIS TROUBLE CODE DETECTION DRIVING PATTERN

Purpose of the driving pattern:

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

Malfunction: Open or Short in Knock Sensor



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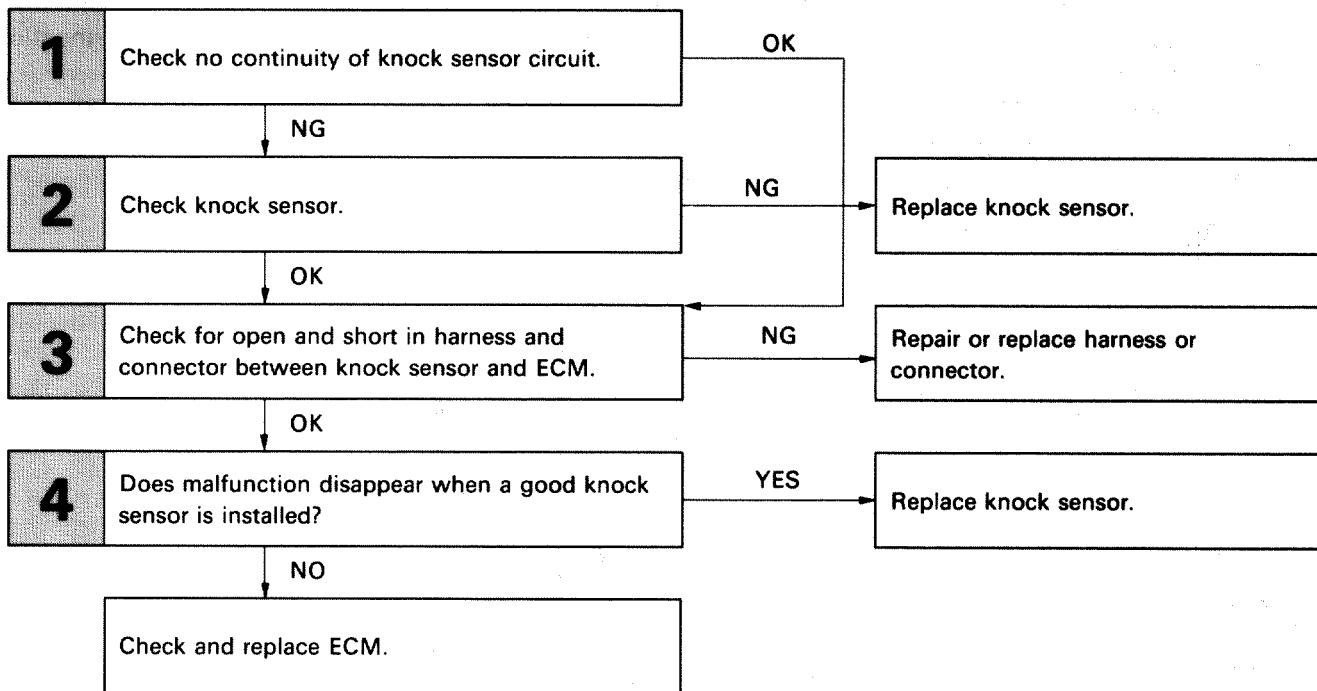
- ① Start the engine and warm up.
- ② After the engine is warmed up, let it idle for 3 min.
- ③ With the A/C ON, perform quick racing (5,000 rpm) 3 times.
(Rapidly depress the accelerator pedal and suddenly release it.)

HINT: If a malfunction exists, the malfunction indicator lamp will light up when sudden racing is performed.

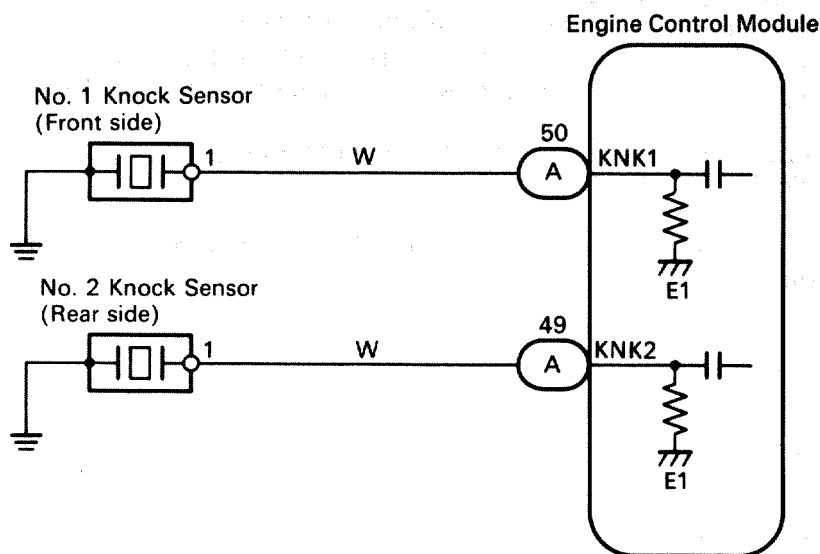
NOTICE: If the conditions in this test are not strictly followed, detection of the malfunction will not be possible.

DIAGNOSTIC CHART

HINT: If diagnostic trouble code 52 is displayed, check No. 1 knock sensor (for left bank) circuit.
 If diagnostic trouble code 55 is displayed, check No. 2 knock sensor (for right bank) circuit.
 If diagnostic trouble code 53 is displayed, replace engine control module.



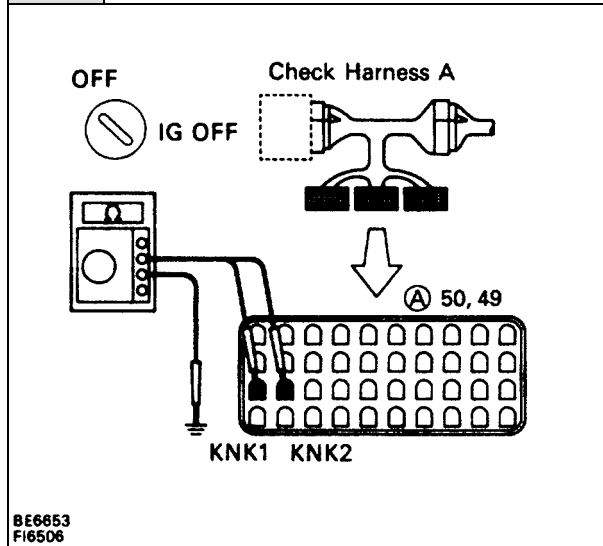
WIRING DIAGRAM



Connector Mark	(A)	(B)
ECM for A/T	E12	E11
ECM for M/T	E14	E13

INSPECTION PROCEDURE

1 Check continuity between terminals KNK1, KNK2 of engine control module connector and body ground.

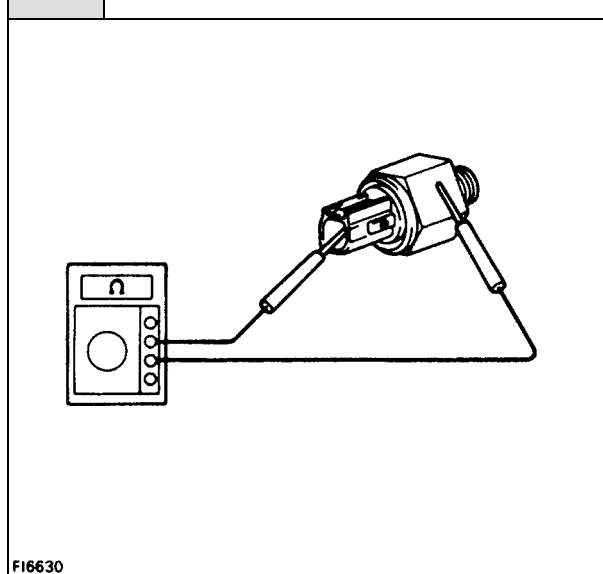


- P** 1. Connect the Check Harness A.
(See page [EG-328](#))
2. Disconnect the engine control module connectors.
- C** Measure resistance between terminals KNK1, KNK2 of engine control module connector and body ground.
- OK** Resistance: 1MΩ or higher.

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 [EG-241](#)).

3 Check for open and short in harness and connectors between engine control module and knock sensor (See page [IN-33](#)).

OK

NG

Repair or replace harness or connector.

4 Does malfunction disappear when a good knock sensor is installed?

NO

YES

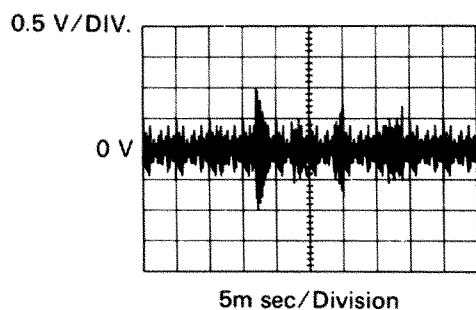
Replace knock sensor (See page [EG-241](#)).

Check and replace engine control module.

Reference

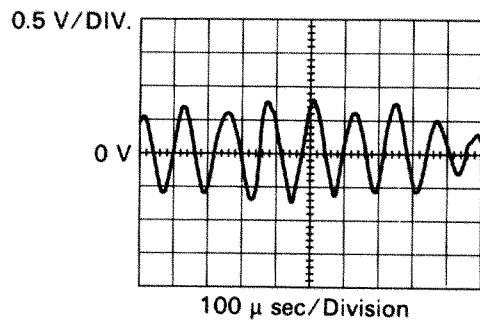
INSPECTION USING OSCILLOSCOPE

KNK signal waveform



- With the engine racing (4,000 rpm) measure waveform between terminals KNK1, KNK2 of engine control module 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 123 μ sec. (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.

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