

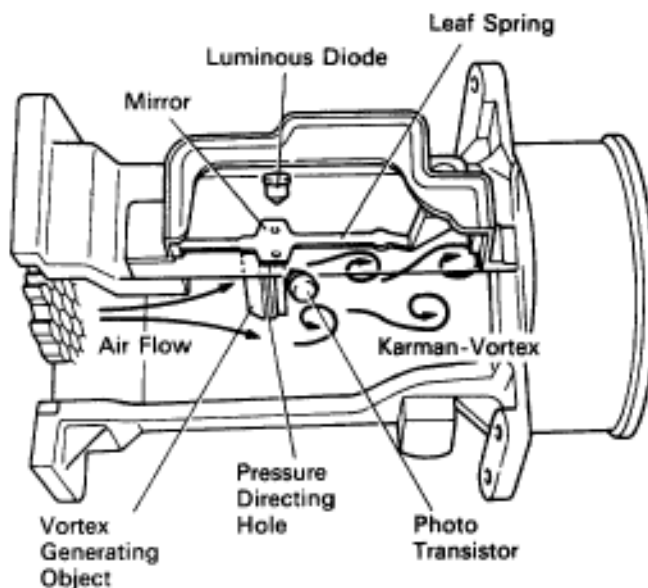
Diag. Code 31**Air Flow Meter Circuit****— CIRCUIT DESCRIPTION —**

As shown in the figure at right, when a pillar (Vortex generating body) is placed in the path of a uniform flow, vortices called Karman-Vortex are generated downstream of the object. Using this principle, a vortex generator is placed inside the air flow meter. By measuring the frequency of the vortices generated, the ECU can determine the volume of air flowing through the air flow meter. The vortices are detected by their exerting pressure on thin metal foil (mirror) surfaces and a light emitting element and light receptor (LED and photo transistor) positioned opposite the mirror which senses the vibrations in the mirror optically. The ECU uses these signals mainly for calculation of the basic injection volume and the basic ignition advance angle.



Karman-Vortex

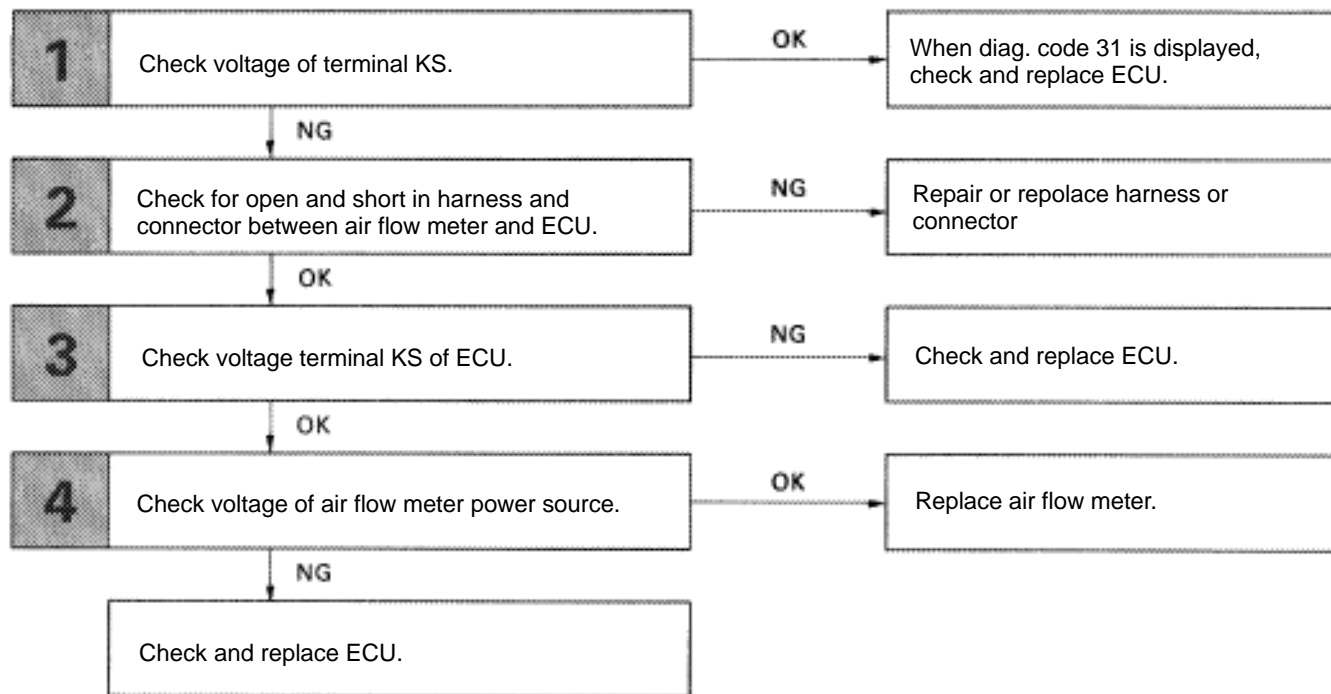
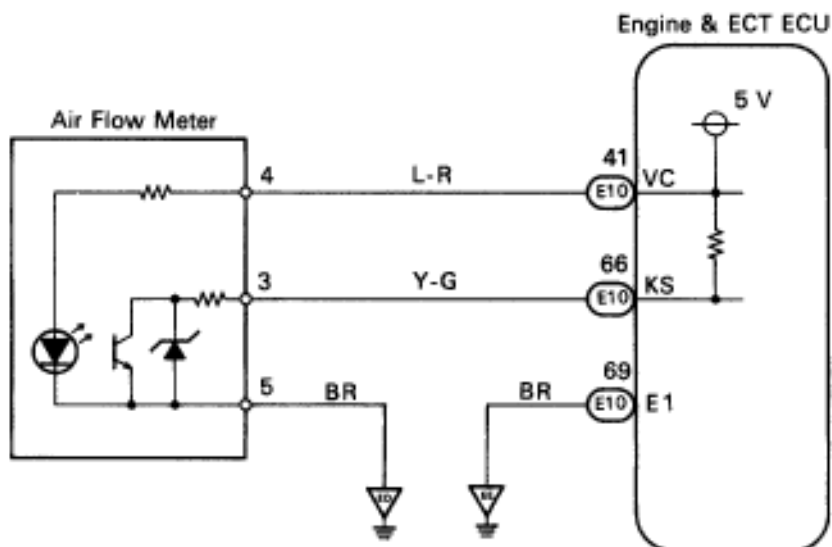
FI4504



FI3045

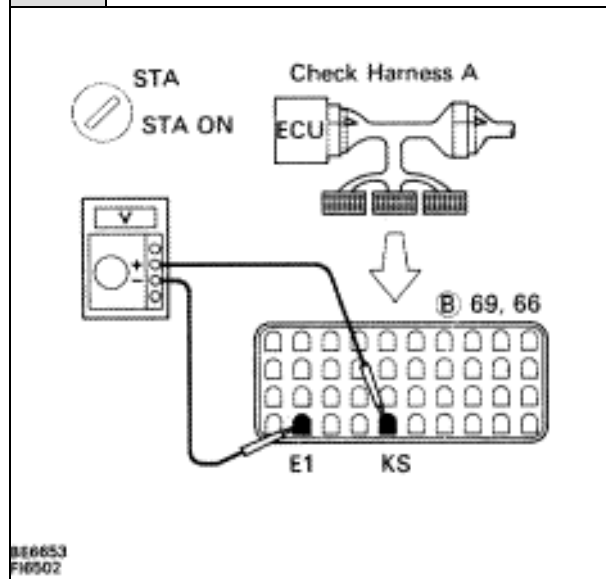
Code No.	Diagnostic Code Detecting Condition	Trouble Area
31	<p>All conditions below are detected.</p> <p>(a) No air-flow meter signal to ECU for 2 sec. when engine speed is above 300 rpm.</p> <p>(b) Engine stall.</p>	<ul style="list-style-type: none"> • Open or short in air flow meter circuit • Air flow meter • ECU

If the ECU records diagnostic code "31", it enters fail safe mode (See page [TR-22](#)).

DIAGNOSTIC CHART**WIRING DIAGRAM**

INSPECTION PROCEDURE

1 Check voltage between terminals KS and E1 of engine & ECT ECU connector.

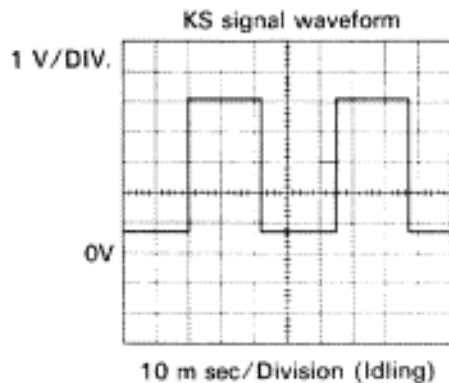


P Connect the check harness A.
(See page [TR-30](#))

C Measure voltage between terminals KS and E1 of engine & ECT ECU connector while engine is cranked.

OK Voltage: 2.0 – 4.0 V
(Neither 0 V nor 5 V)

Reference INSPECTION USING OSCILLOSCOPE



- During cranking or idling, measure between terminals KS and E1 of engine & ECT ECU.

HINT: The correct waveform appears as shown in the illustration on the left, with rectangle waves.

NG

OK

When diag. code 31 is displayed, check and replace engine & ECT ECU.

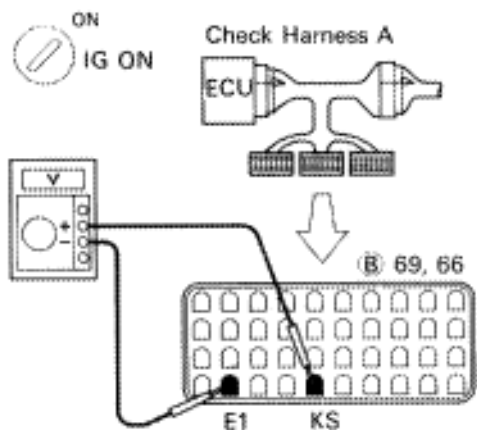
2 Check for open and short in harness and connector between engine & ECT ECU and air flow meter (See page [IN-27](#)).

OK

NG

Repair or replace harness or connector.

3 Disconnect air flow meter connector and check voltage between terminals KS and E1 of engine & ECT ECU.

B6653
F16502

P Disconnect the air flow meter connector.
Turn ignition switch on.

C Measure voltage between terminals KS and E1 of engine & ECT ECU.

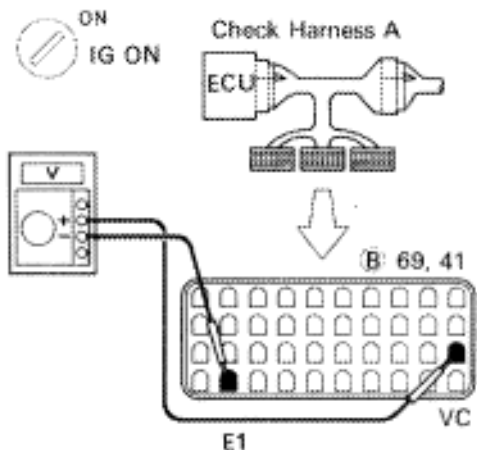
OK Voltage: 4 – 6 V

OK

NG

Check and replace ECU.

4 Disconnect air flow meter connector and check voltage between terminals VC and E1 of engine & ECT ECU.

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F16508

P Disconnect the air flow meter connector.
Turn ignition switch on.

C Measure voltage between terminals VC and E1 of engine & ECT ECU.

OK Voltage: 4 – 6 V

NG

OK

Replace air flow meter.

Check and replace engine & ECT ECU.