DI9S4–01

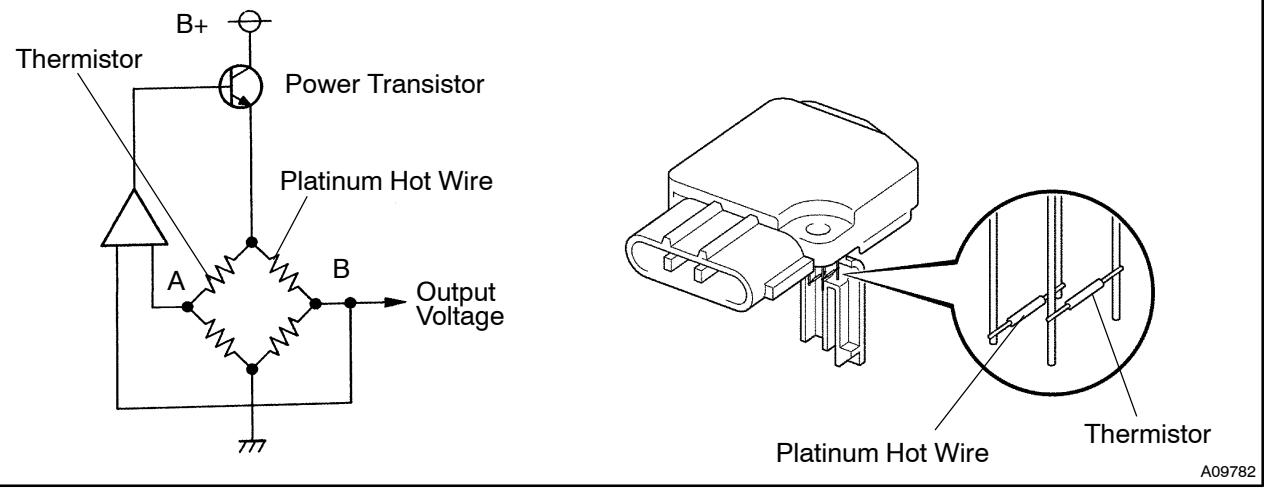
DTC	31 (1)	Air Flow Circuit Malfunction

CIRCUIT DESCRIPTION

The air flow meter uses a platinum hot wire. The hot wire air flow meter consists of a platinum hot wire, thermistor and a control circuit installed in a plastic housing. The hot wire air flow meter works on the principle that the hot wire and thermistor located in the intake air bypass of the housing detect any changes in the intake air temperature.

The hot wire is maintained at the set temperature by controlling the current flow through the hot wire. This current flow is then measured as the output voltage of the air flow meter.

The circuit is designed so that the platinum hot wire and thermistor can provide a bridge circuit, while the power transistor is controlled so that the potential of A and B remains equal to maintain the set temperature.



DTC No.	DTC Detecting Condition	Trouble Area
31 (1)	Open or short in air flow meter circuit for more than 3 sec.	• Open or short in air flow meter circuit • Air flow meter • Engine ECU

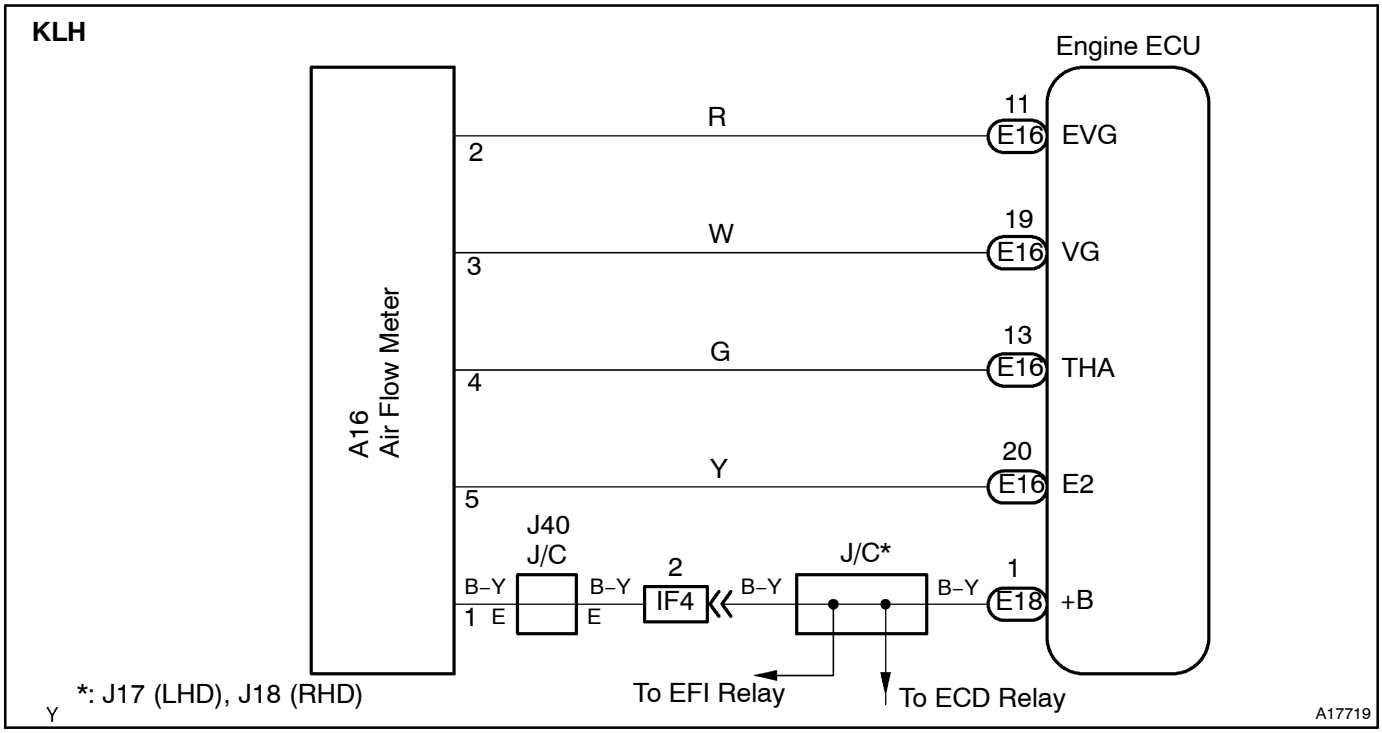
HINT:

After confirming DTC 31, use the hand–held tester to confirm the air flow ratio from the CURRENT DATA.

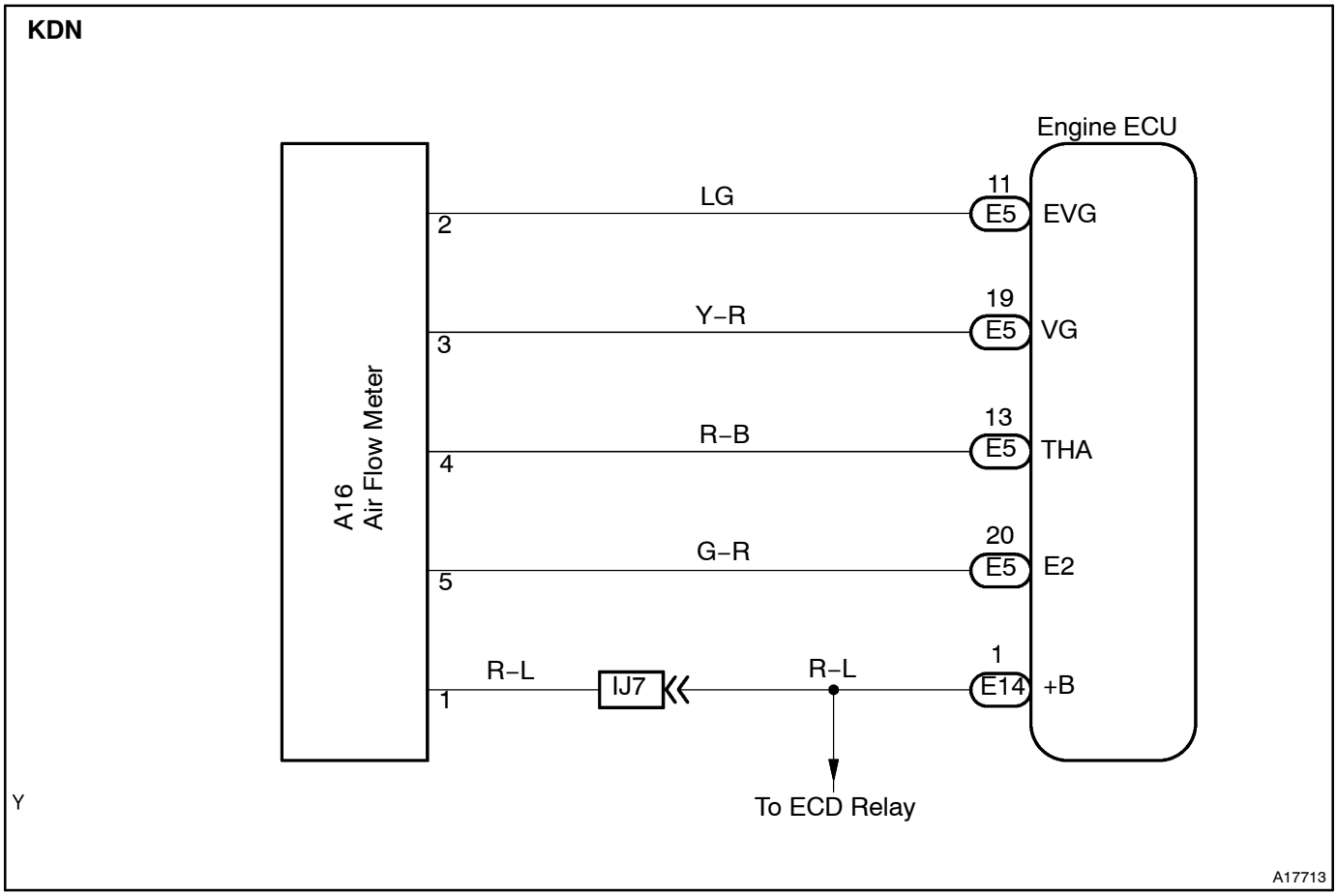
Air Flow Value (gm/sec.)	Malfunction
Approx. 0.0	• Air flow meter power source circuit open • VG circuit open or short
135.0 or more	• EVG circuit open

WIRING DIAGRAM

KLH



KDN



INSPECTION PROCEDURE

HINT:

Read freeze frame data on the hand–held tester. Because freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, etc. at the time of the malfunction.

When using hand–held tester:

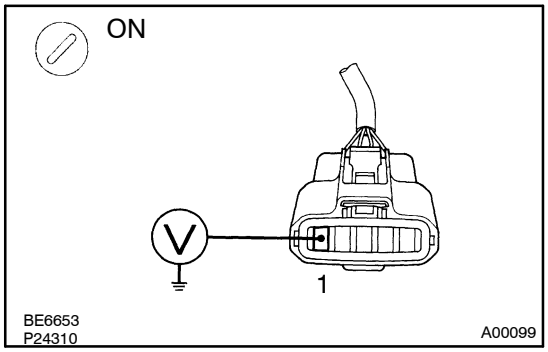
1	**Read value of air flow rate on hand–held tester.**

RESULT:

	A	B
Air Flow Rate (gm/sec.)	0.0	271.0 or more

A	**Go to step 2.**
B	**Go to step 5.**

2	**Check voltage of air flow meter power source.**



PREPARATION:

(a) Disconnect the air flow meter connector.

(b) Turn the ignition switch ON.

CHECK:

Measure the voltage between terminal 1 of the air flow meter connector and the body ground.

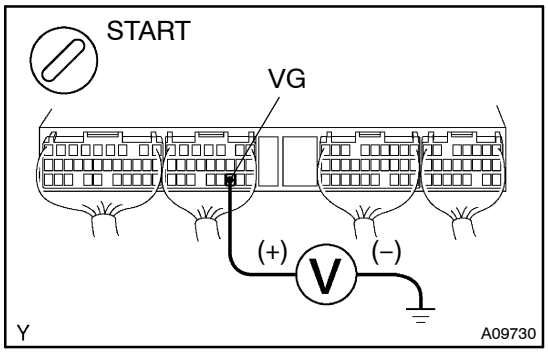
OK:

Voltage: 9 – 14 V

NG	**Check for open in harness and connector between EFI main relay (Marking: EFI) and air flow meter (See page IN–20).**

OK

3	Check voltage between terminals VG of engine ECU connector and body ground.



PREPARATION:

(a) Remove the glove compartment box.

(b) Start the engine.

CHECK:

Measure the voltage between terminal VG and the body ground at idle.

OK:

Voltage:

0.5 – 3.0 V (P or N position and A/C switch OFF)

OK	Check and replace engine ECU (See page IN–20).

NG

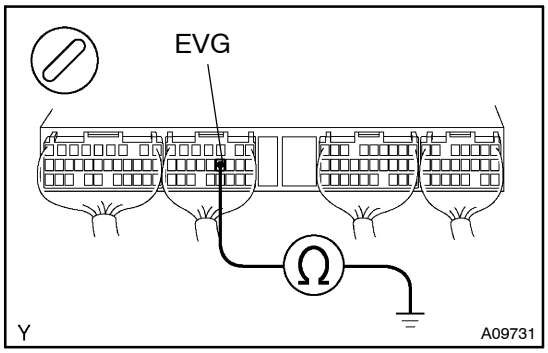
4	Check for open and short in harness and connector between air flow meter and engine ECU (See page IN–20).

NG	Repair or replace harness or connector.

OK

Replace air flow meter.

5	Check continuity between terminal EVG of engine ECU connector and body ground.



PREPARATION:

Remove the glove compartment box.

CHECK:

Check the continuity between terminal EVG of the engine ECU connector and the body ground.

OK:

Continuity (1 Ω or less)

NG	Check and replace engine ECU (See page IN–20).

OK

6	Check for open in harness and connector between air flow meter and engine ECU (See page IN–20).

NG → Repair or replace harness or connector.

OK

Replace air flow meter.

When not using hand–held tester:

1	Check voltage of air flow meter power source (See step 2 when using hand–held tester).

NG → Check for open in harness and connector between EFI main relay (Marking: EFI) and air flow meter (See page IN–20).

OK

2	Check voltage between terminals VG of engine ECU connector and body ground (See step 3 when using hand–held tester).

OK → Check and replace engine ECU (See page IN–20).

NG

3	Check for open in harness and connector between air flow meter and engine ECU (See page IN–20).

NG → Repair or replace harness or connector.

OK

Replace air flow meter.