

Emission Control System

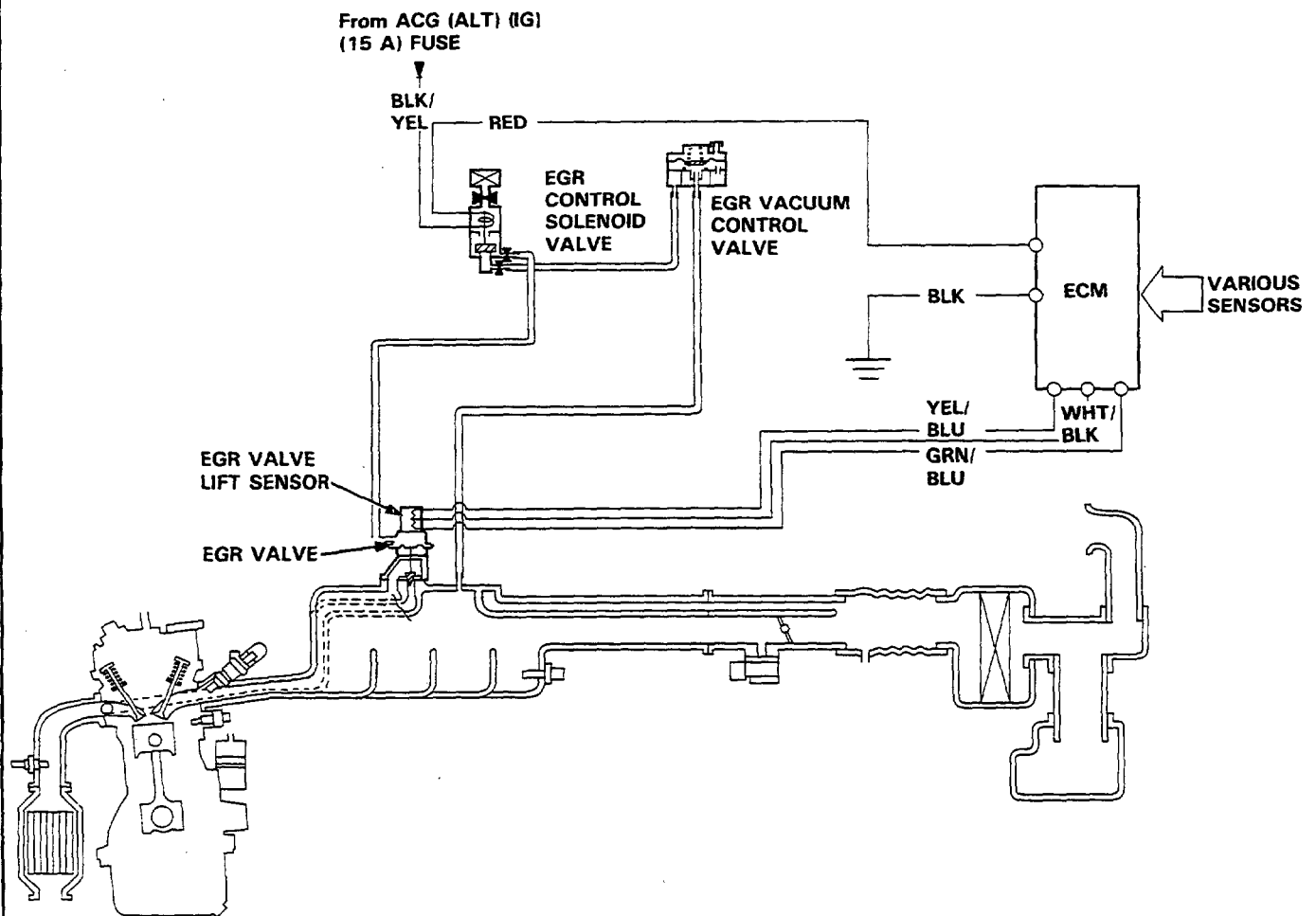
Exhaust Gas Recirculation (EGR) System [D15Z3 engine]



The Malfunction Indicator Lamp (MIL) indicates code 12: A problem in the Exhaust Gas Recirculation (EGR) system.

The EGR system is designed to reduce oxides of nitrogen emissions (NOx) by recirculating exhaust gas through the EGR valve and the intake manifold into the combustion chambers. It is comprised of the EGR valve, EGR vacuum control valve, EGR control solenoid valve, ECM and various sensors.

The ECM contains memories for ideal EGR valve lifts for varying operating conditions. The EGR valve lift sensor detects the amount of EGR valve lift and sends the information to the ECM. The ECM then compares it with the ideal EGR valve lift which is determined by signals sent from the other sensors. If there is any difference between the two, the ECM cuts current to the EGR control solenoid valve to reduce vacuum applied to the EGR valve.





- The MIL has been reported on.
- With the SCS short connector connected (see page 11-14), code 12 is indicated.

Do the ECM Reset Procedure (see page 11-15).

Connect the SCS short connector to the service check connector (see page 11-14).

Road test necessary: Start the engine. Hold the engine at 3,000 rpm (min^{-1}) with no load (M/T in neutral) until the radiator fan comes on, then let it idle. Drive the car on the road for approx. 10 minutes. With the transmission in 1st or 2nd gear, try to keep the engine speed in the 1,700–2,800 rpm (min^{-1}).

Does the MIL blink and does it indicate code 12?

NO

YES

With the engine at idle, disconnect the #16 hose from the EGR valve and connect a vacuum pump/gauge to the hose.

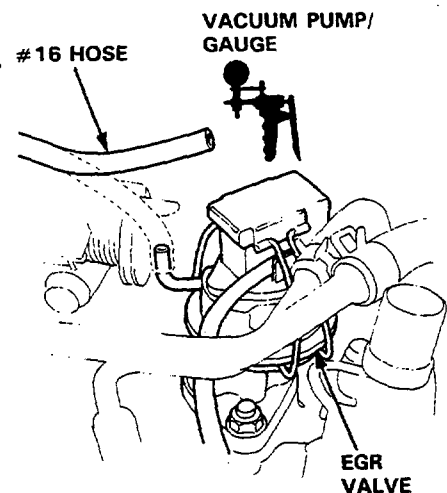
Is there any vacuum?

YES

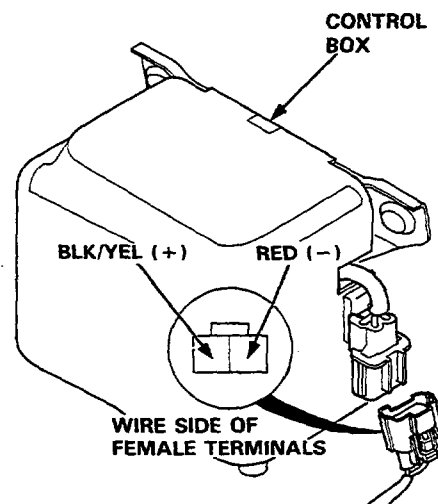
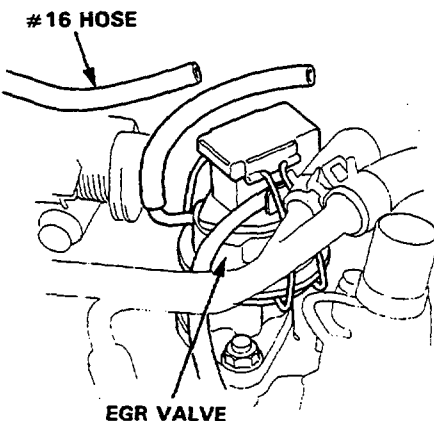
NO

Move the vacuum pump/gauge to the EGR valve.

Intermittent failure, system is OK at this time.
Check for poor connections or loose wires between the EGR valve lift sensor, EGR control solenoid valve and ECM.



Disconnect 2P connector from the control box and check the #16 hose for vacuum again.



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(cont'd)

Emission Control System

Exhaust Gas Recirculation (EGR) System [D15Z3 engine] (cont'd)

(From page 11-105)

A

With the engine at idle, apply 26.7 kPa (200 mmHg, 7.87 in. Hg) of vacuum to the EGR valve.

Does the engine stall or run rough and does the EGR valve hold vacuum?

YES

Turn the ignition switch OFF.

Disconnect the 2P connector from the control box.

Turn the ignition switch ON.

Measure voltage between BLK/YEL (+) terminal and body ground.

Is there battery voltage?

YES

Reconnect the vacuum pump/gauge to the #16 hose.

Start the engine and allow it to idle.

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B

Is there any vacuum?

YES

Check vacuum hose routing of the entire EGR system. If hose routing is OK, replace EGR control solenoid valve.

NO

Turn the ignition switch OFF and disconnect the "A" connector from the ECM.

Check for continuity to ground on RED wire of 2P connector.

Is there continuity?

YES

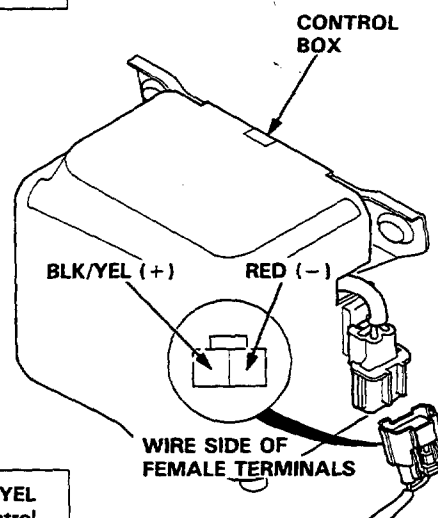
Repair short in RED wire between EGR control solenoid valve and ECM (A11).

NO

Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

NO

Replace the EGR valve.



Repair open or short in BLK/YEL wire between the EGR control solenoid valve and No. 12 (with SRS: No. 24) ACG (ALT) (IG) (15 A) fuse in the under-dash fuse/relay box.

NO



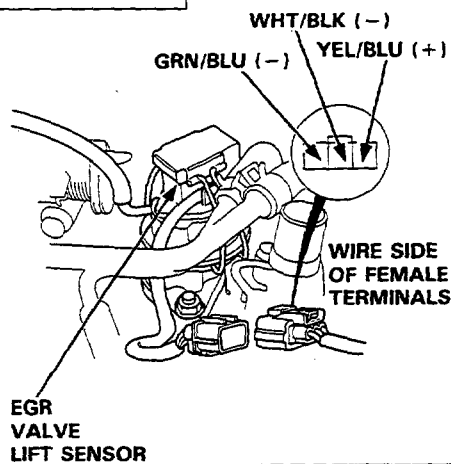
(From page 11-106)

Connect the battery positive terminal to the A terminal of the 2P connector. While watching the vacuum gauge, connect the battery negative terminal to the B terminal.

Is there approx. 26.7 kPa (200 mmHg, 7.87 in. Hg) within 1 second?

YES

Turn the ignition switch OFF and reconnect the 2P connector.



Disconnect 3P connector from the EGR valve lift sensor.

Turn the ignition switch ON.

Measure voltage between YEL/BLU (+) terminal and GRN/BLU (-) terminal.

Is there approx. 5V?

YES

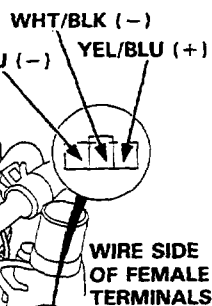
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NO

Turn the ignition switch OFF and inspect the #16 and #10 hoses for leaks, restrictions, or mis-routing.

Are the hoses OK?

YES



Disconnect the lower hose on EGR control solenoid valve and connect a vacuum gauge to the hose.

Start the engine and allow it to idle.

Is there 20.0–33.3 kPa (150–250 mmHg, 5.91–9.84 in. Hg) of vacuum?

YES

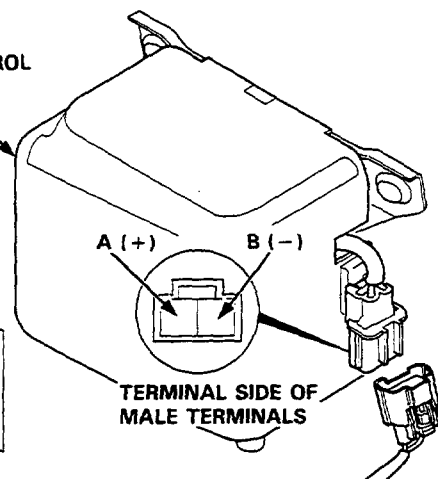
Replace the EGR control solenoid valve.

NO

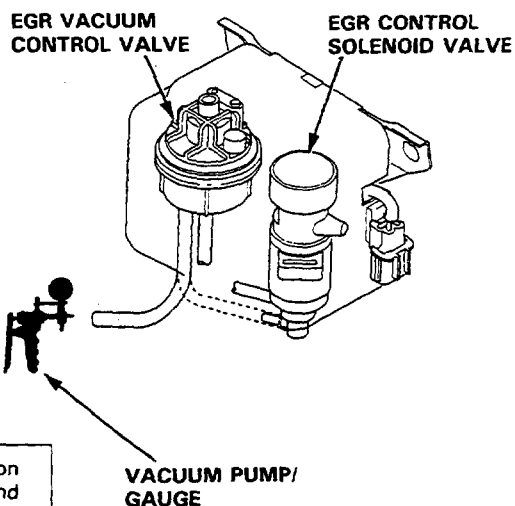
Measure voltage between YEL/BLU (+) terminal and body ground.

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CONTROL BOX



Correct as necessary.



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Emission Control System

Exhaust Gas Recirculation (EGR) System [D15Z3 engine] (cont'd)

(From page 11-107)

A

Turn the ignition switch OFF.

Reconnect the 3P connector to the EGR valve.

Connect the test harness between the ECM and connectors (see page 11-17).

Turn the ignition switch ON.

Measure voltage between D12 (+) terminal and D22 (-) terminal.

Is the voltage approx. 1.2 V with no vacuum applied and approx. 4.3 V with 26.7 kPa (200 mmHg, 7.87 in. Hg) of vacuum applied to the EGR valve?

YES

Does the voltage consistently increase/decrease as the vacuum increases/decreases?

YES

Reconnect the #16 hose to the EGR valve.

Start the engine and allow it to idle.

Connect A11 terminal to A26 terminal with a jumper wire.

Did the engine stall or run rough?

YES

Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

(From page 11-107)

B

Is there approx. 5 V?

YES

Repair open in GRN/BLU wire between EGR valve lift sensor and ECM (D22).

NO

Turn the ignition switch OFF.

Connect the test harness "D" connector to the ECM only, not to the main wire harness (see page 11-17).

Turn the ignition switch ON.

Measure voltage between D20 (+) terminal and D22 (-) terminal.

Is there approx. 5 V?

YES

Repair open or short in YEL/BLU wire between EGR valve lift sensor and ECM (D20).

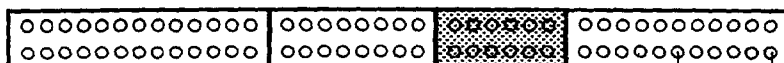
NO

Substitute a known-good ECM and recheck. If prescribed voltage is now available, replace the original ECM.

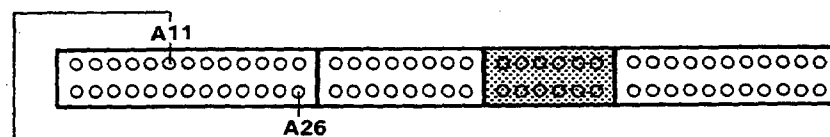
— Check for an open or short in WHT/BLK wire between EGR valve lift sensor and ECM (D12).
— If wire is OK, replace the EGR valve.

NO

Replace the EGR valve.



D12 (+) D22 (-)



JUMPER WIRE

Repair open in RED wire between ECM (A11) and EGR control solenoid valve.

NO