

Emission Control System

Exhaust Gas Recirculation (EGR) System

Troubleshooting

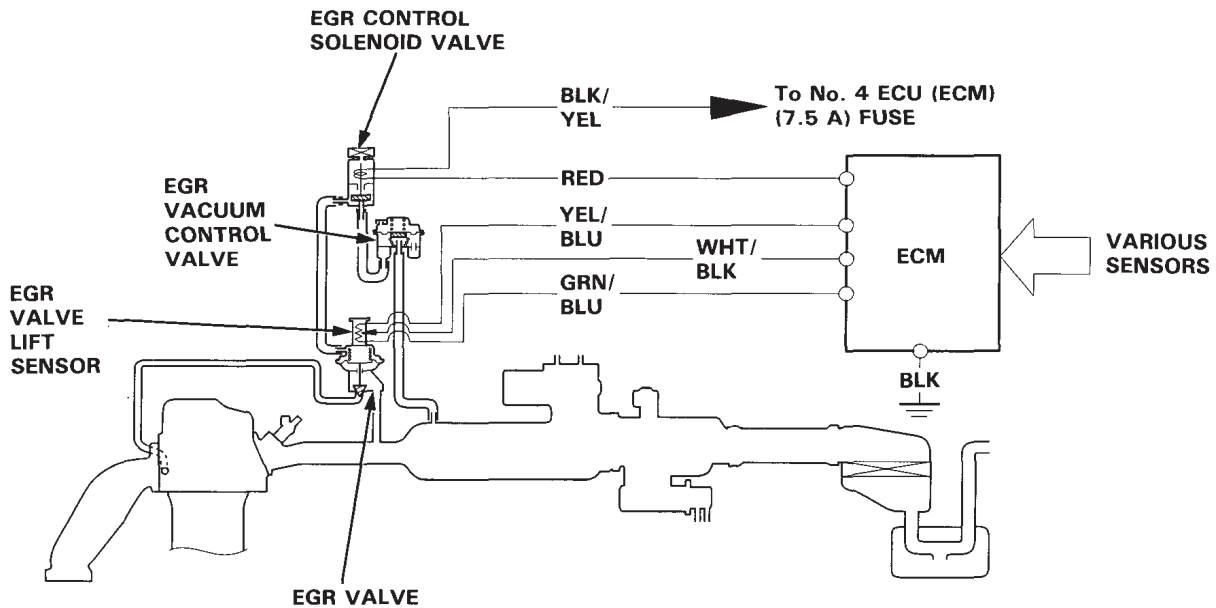


12

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

The EGR system is designed to reduce oxides of nitrogen emissions (NO_x) by recirculating exhaust gas through the EGR valve and the intake manifold into the combustion chambers. It is composed 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 11-18), code 12 is indicated.

Do the ECM Reset Procedure (see page 11-19).

Connect the SCS short connector to the service check connector (see page 11-18).

Road test necessary: Start the engine. Hold the engine at 3,000 rpm (min^{-1}) with no load (A/T in **N** or **P** position, M/T in neutral) until the radiator fan comes on, then let it idle. Drive the car on the road for approx. 10 minutes. Try to keep the engine speed in the 1,700–2,500 rpm (min^{-1}).

Does the MIL blink and does it indicate code 12?

NO

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

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?

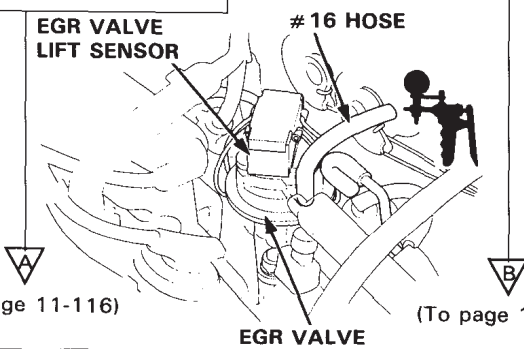
YES

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

NO

Move the vacuum pump/gauge to the EGR valve.

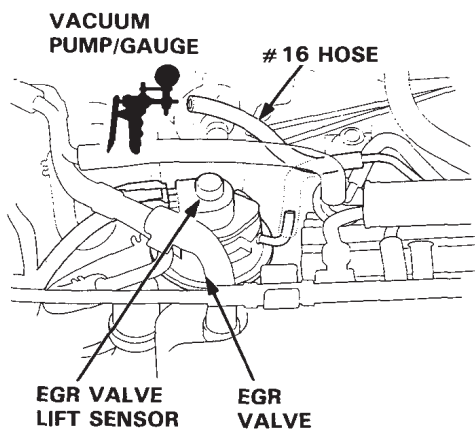
F22B2 engine:



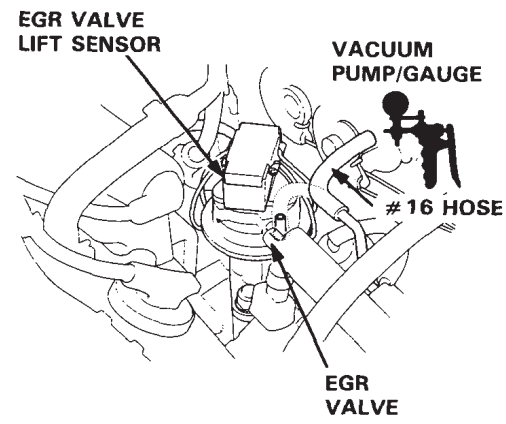
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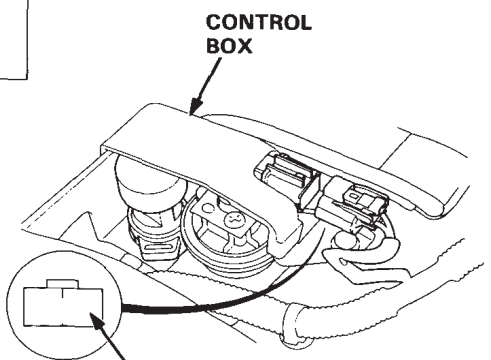
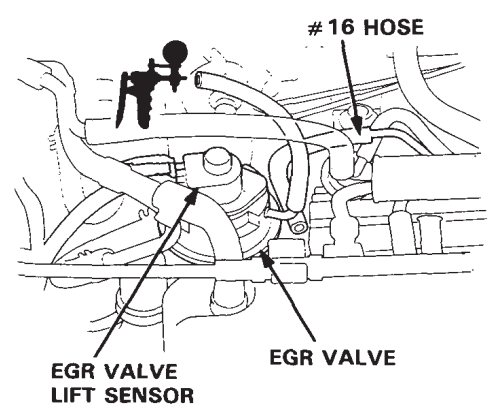
Except F22B2 engine:



F22B2 engine:



Except F22B2 engine:



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With the engine at idle, apply 200 mm Hg (8 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 on the main wire harness 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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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?

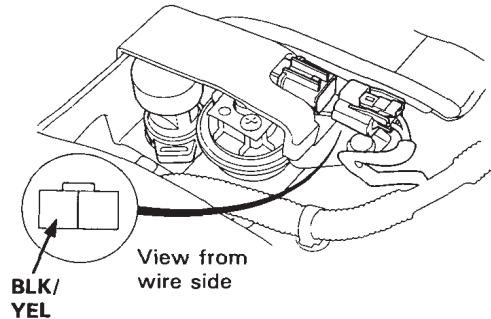
YES

Repair short in RED wire between EGR control solenoid valve and ECM (A6).

NO

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

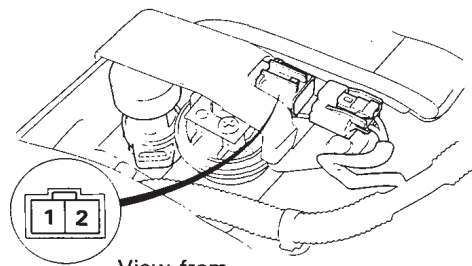
Replace the EGR valve.





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Connect the battery positive terminal to the No. 1 terminal of the 2P connector. While watching the vacuum gauge, connect the battery negative terminal to the No. 2 terminal.



View from terminal side

Is there approx. 200 mm Hg (8 in. Hg) within 1 second?

NO

Turn the ignition switch OFF and inspect the # 16 and # 24 hoses for leaks, restrictions, or mis-routing.

YES

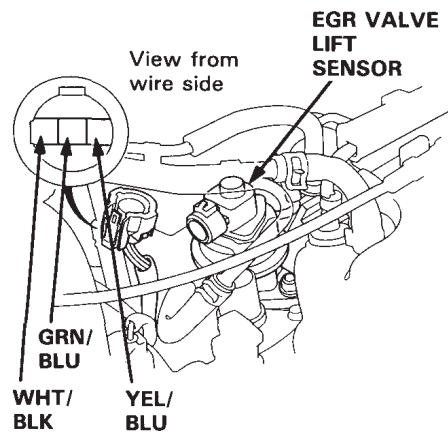
Turn the ignition switch OFF and reconnect the 2P connector.

Are the hoses OK?

NO

Correct as necessary.

Except F22B2 engine:

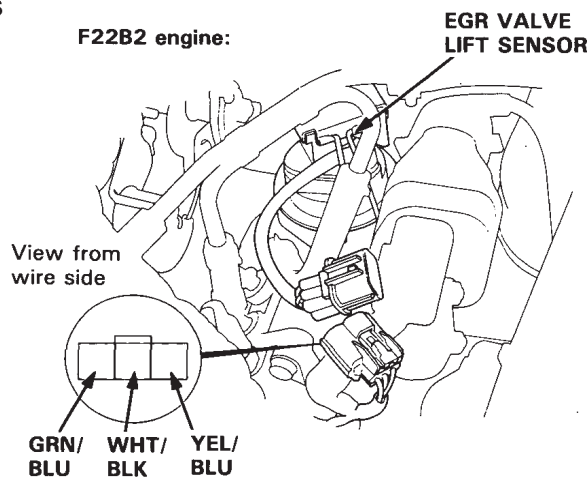


EGR VALVE LIFT SENSOR

View from wire side

YES

F22B2 engine:



EGR VALVE LIFT SENSOR

View from wire side

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

Disconnect 3P connector from the EGR valve lift sensor.

Turn the ignition switch ON.

Start the engine and allow it to idle.

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

Is there 150–250 mm Hg (6–10 in. Hg) of vacuum?

NO

Replace the EGR vacuum control valve.

YES

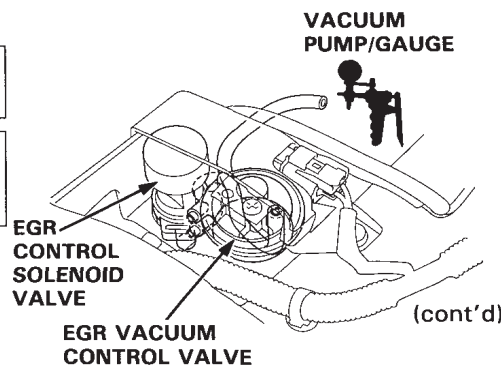
Replace the EGR control solenoid valve.

Is there approx. 5 V?

NO

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

YES



VACUUM PUMP/GAUGE

EGR CONTROL SOLENOID VALVE

EGR VACUUM CONTROL VALVE

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Is there approx. 5 V?

YES

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

NO

Connect the test harness "D" connector to the ECM only, not to the main wire harness (see page 11-21).

Turn the ignition switch ON.

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

Is there approx. 5 V?

YES

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

NO

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

Turn the ignition switch OFF.

Reconnect the 3P connector to the EGR valve lift sensor.

Connect the test harness between the ECM and connectors (see page 11-21).

Turn the ignition switch ON.

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

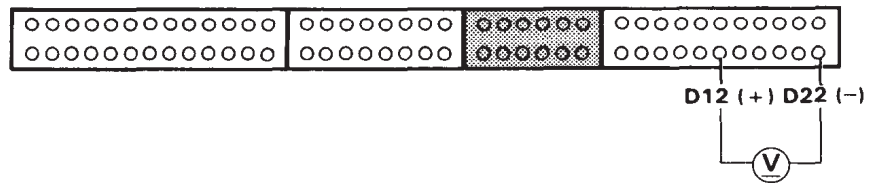
Is the voltage approx. 1.2 V with no vacuum applied and approx. 4.3 V with 200 mm Hg (8 in. Hg) of vacuum applied to the EGR valve?

NO

- 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.

YES

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