

DTC	P0401	Exhaust Gas Recirculation Flow Insufficient Detected
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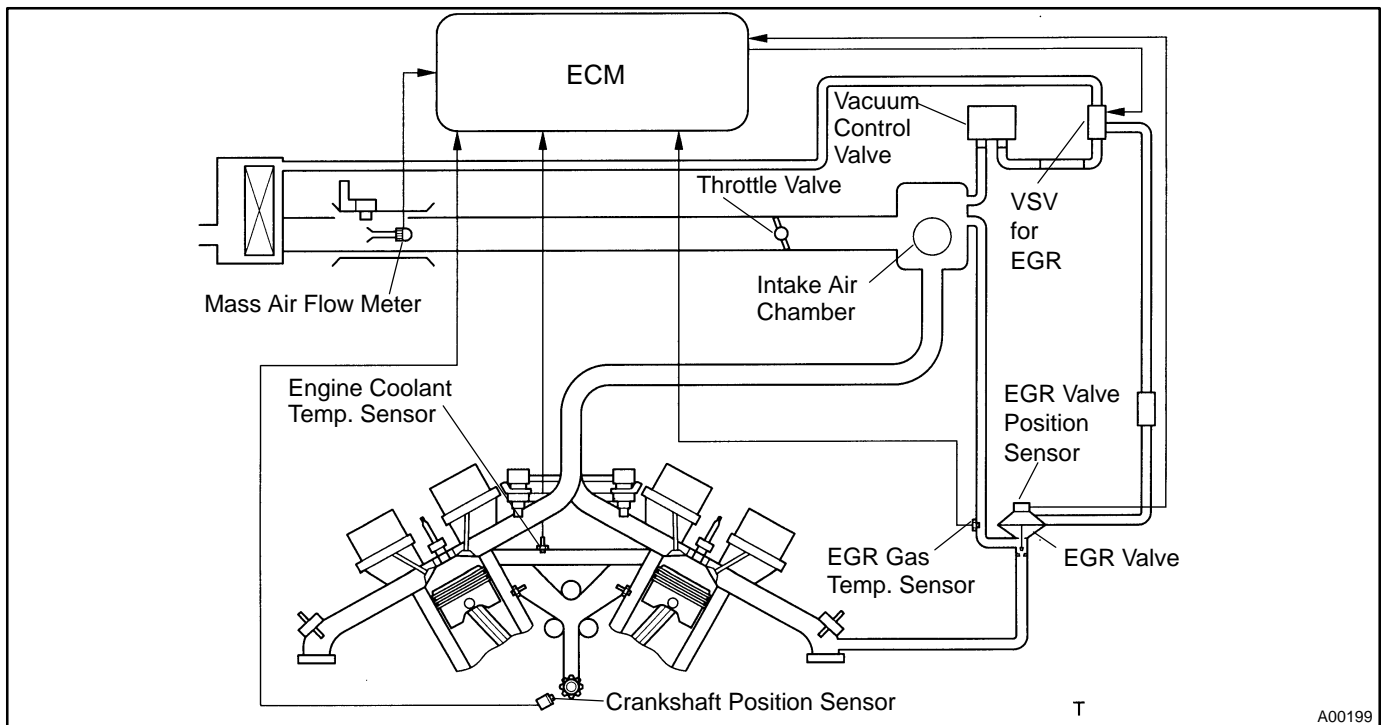
CIRCUIT DESCRIPTION

The EGR system recirculates exhaust gas, which is controlled to the proper quantity to suit the driving conditions, into the intake air mixture to slow down combustion, reduce the combustion temperature and reduce NOx emissions.

The lift amount of EGR valve is controlled by the vacuum which is regulated by the Duty-VSV operated by the ECM. The lift amount of EGR valve is detected by the EGR valve position sensor which is mounted on the EGR valve and it provides feedback to the ECM to control the lift amount of EGR valve in response to engine operating conditions.

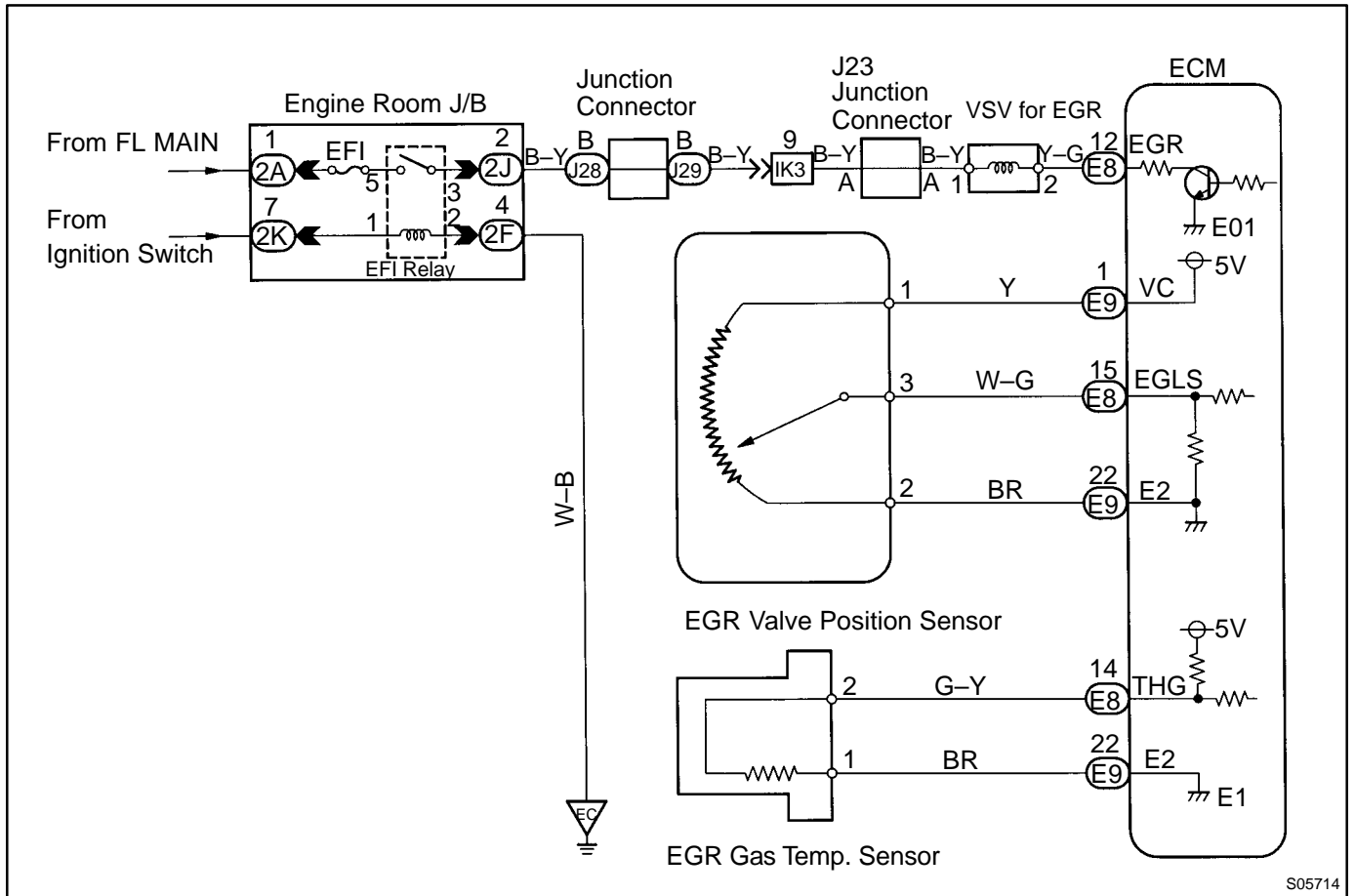
Under the following conditions, EGR is cut to maintain driveability.

- Before the engine is warmed up
- During deceleration (throttle valve closed)
- Light engine load (amount of intake air very small)
- Engine speed over 4,000 rpm
- Engine idling



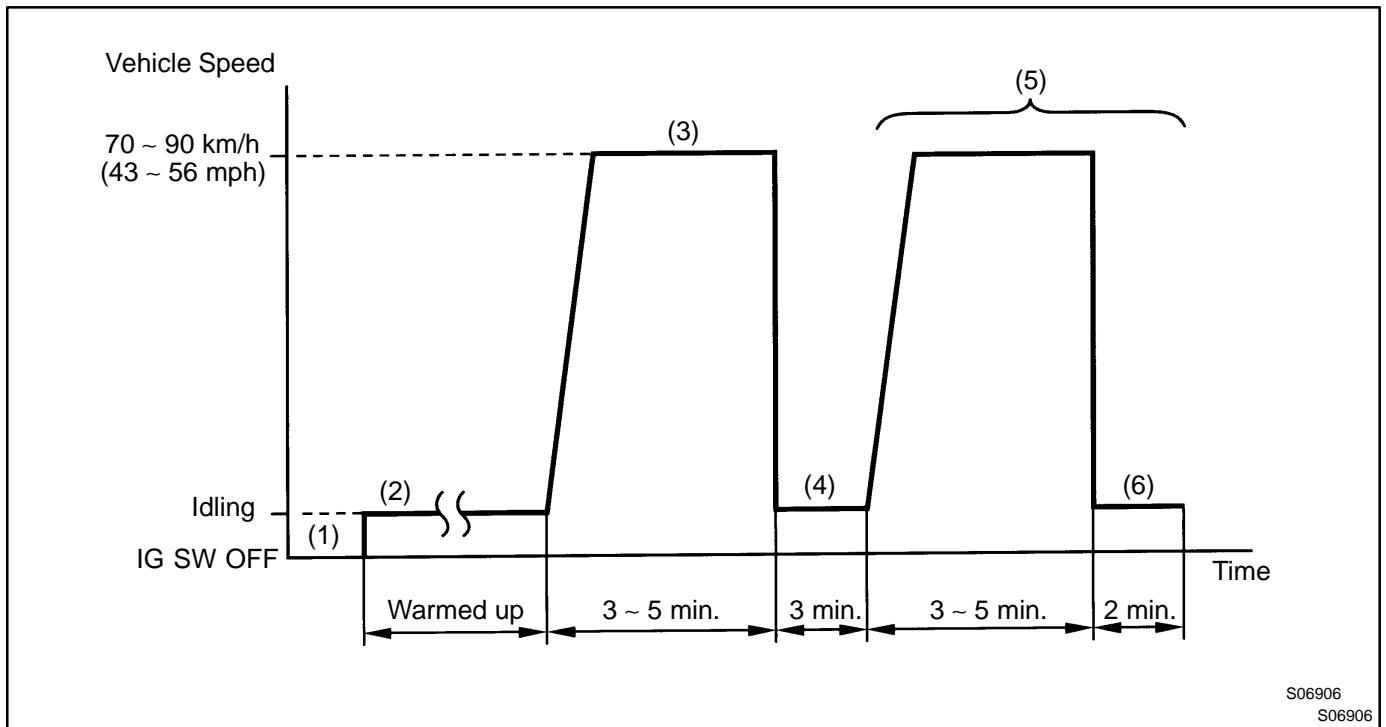
DTC No.	DTC Detecting Condition	Trouble Area
P0401	After the engine is warmed up and run at 80 km/h (50 mph) for 3 to 5 min. the EGR gas temperature sensor valve does not exceed 35°C (95°F) above the ambient air temperature (2 trip detection logic)	<ul style="list-style-type: none"> • EGR valve (stuck closed) • Open or short in EGR gas temp. sensor circuit • EGR gas temp. sensor • Open in VSV circuit for EGR • VSV for EGR • Vacuum control valve • Vacuum hose disconnected or blocked • ECM

WIRING DIAGRAM



S05714

SYSTEM CHECK DRIVING PATTERN



- (1) Connect the OBD II scan tool or LEXUS hand-held tester to the DLC3.
 - (2) Start and warm up the engine with all accessories switched OFF.
 - (3) Run the vehicle at 70 ~ 90 km/h (43 ~ 56 mph) for 3 min. or more.
 - (4) Idle the engine for about 2 min.
 - (5) Start the engine and do steps (3) and (4) again.
 - (6) Check the READINESS TESTS mode on the OBD II scan tool or LEXUS hand-held tester.
- If COMPL is displayed and the MIL does not light up, the system is normal.
 If INCMPL is displayed and the MIL does not light up, run the vehicle step (5) for some times and check it.
- HINT:INCMPL is displayed when either condition (a) or (b) exists.
- (a) The system check is incomplete.
 - (b) There is a malfunction in the system.
- If there is a malfunction in the system, the MIL light up after steps (2) to (5) above are done again.

INSPECTION PROCEDURE

LEXUS hand-held tester

1	Connect LEXUS hand-held tester and read value of EGR gas temperature.
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PREPARATION:

- (a) Connect the LEXUS hand-held tester to the DLC3.
- (b) Warm up the engine.

CHECK:

Read EGR gas temperature on LEXUS hand-held tester during idling.

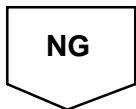
OK:

EGR gas temp. : 10°C (50°F) ~ 150°C (302°F) (Not immediately after driving)

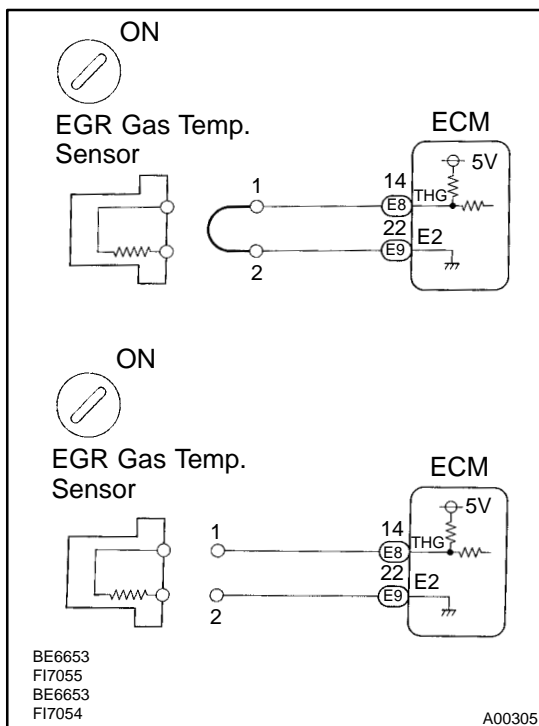
HINT: If there is an open circuit, LEXUS hand-held tester indicates 3.1°C (37.6°F).

If there is an short circuit, LEXUS hand-held tester indicates 159.3°C (318.7°F).

OK	Go to step 4.
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2	Check for open or short in harness or ECM.
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For open circuit

PREPARATION:

- (a) Disconnect the EGR gas temp. sensor connector.
- (b) Connect sensor wire harness terminals together.
- (c) Turn ignition switch ON.

CHECK:

Read EGR gas temperature on the LEXUS hand-held tester.

OK:

EGR gas temp. : 159.3°C (318.7°F)

For short circuit

PREPARATION:

Disconnect the EGR gas temp. sensor connector.

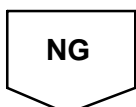
CHECK:

Read EGR gas temperature on the LEXUS hand-held tester.

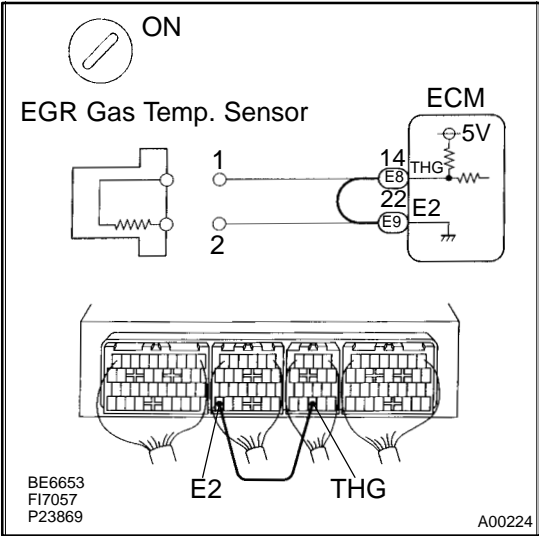
OK:

EGR gas temp. : 3.1°C (37.6°F)

OK	Confirm good connection at sensor. If OK, check and replace EGR gas temp. sensor.
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3 Check for open or short in harness or ECM.



For open circuit

PREPARATION:

- (a) Remove the glove compartment (See page SF-64).
- (b) Connect between terminals THG and E2 of ECM connectors.

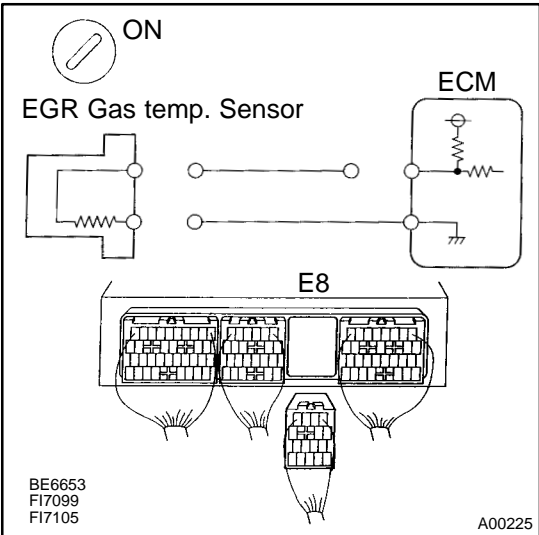
HINT: EGR gas temp. sensor connector is disconnected. Before checking, do a visual check and contact pressure check for the ECM connector (See page IN-27).

CHECK:

Read EGR gas temperature on the LEXUS hand-held tester.

OK:

EGR gas temp. : 159.3°C (318.7°F)



For short circuit

PREPARATION:

- (a) Remove the glove compartment (See page SF-64).
- (b) Disconnect the E8 connector of ECM.

CHECK:

Read EGR gas temperature on the LEXUS hand-held tester.

OK:

EGR gas temp. : 3.1°C (37.6°F)

OK Repair or replace harness.

NG

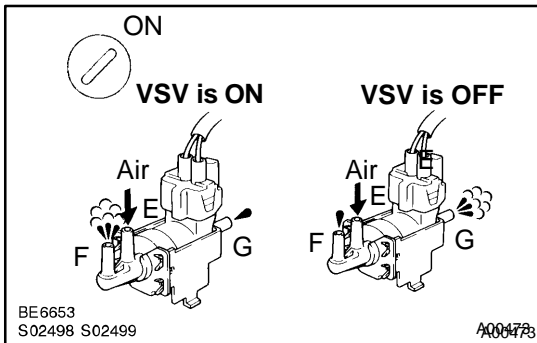
**Confirm connection at ECM.
If OK, check and replace ECM.**

4 Check connection and blockage of vacuum hose (See page EC-7).

NG Repair or replace vacuum hose.

OK

5	Check VSV for EGR.
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**PREPARATION:**

Select the ACTIVE TEST mode on the LEXUS hand-held tester.

CHECK:

Check operation VSV when it is operated by the LEXUS hand-held tester.

OK:

VSV is ON:

Air from pipe E is flowing out through pipe F.

VSV is OFF:

Air from pipe E is flowing out through pipe G.

OK	Go to step 7.
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NG

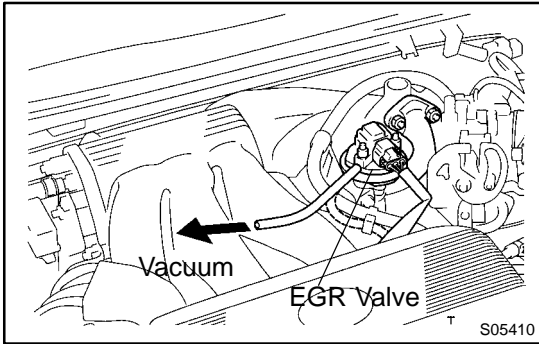
6	Check operation of VSV for EGR (See page SF-50).
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NG	Replace VSV for EGR.
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OK

Check for open in harness and connector between engine room J/B and ECM.

7 Check EGR valve.



PREPARATION:

- (a) Disconnect the vacuum hose from EGR valve.
- (b) Start the engine.

CHECK:

Check whether the engine stall when apply vacuum to EGR valve.

OK:

Engine runs rough or stall.

NG → **Repair or replace EGR valve.**

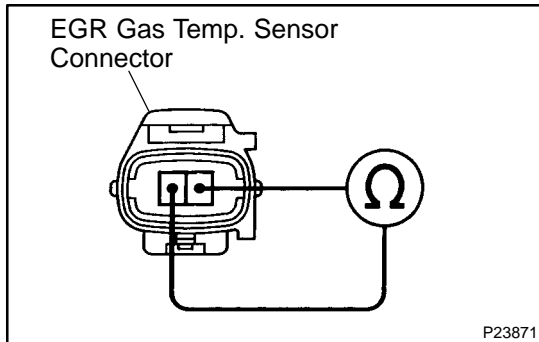
OK

8 Check vacuum control valve (See page EC-7).

NG → **Replace vacuum control valve.**

OK

Check and replace ECM (See page IN-27).

OBDII scan tool (excluding LEXUS hand-held tester)**1 Check resistance of EGR gas temp. sensor.****PREPARATION:**

Disconnect the EGR gas temp. sensor connector.

CHECK:

Measure resistance between terminals of EGR gas temp. sensor connector.

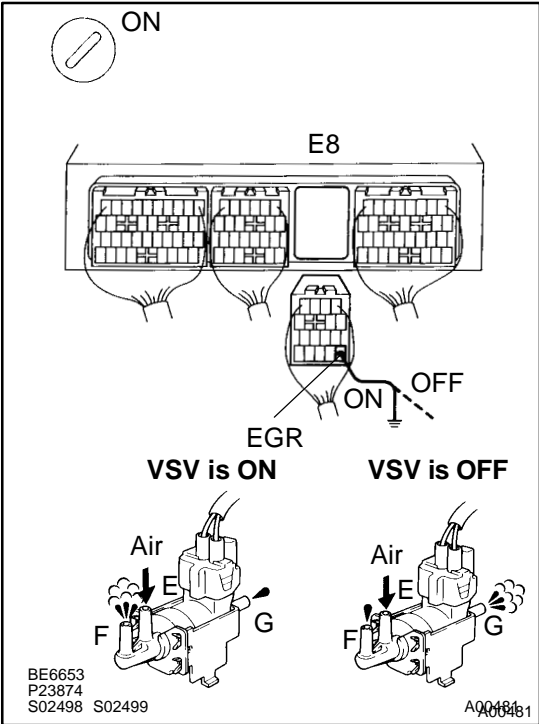
OK:

Resistance: 2.5 kΩ ~ 600 kΩ
(Not immediately after driving)

HINT: If there is open circuit, ohmmeter indicates 720 kΩ or more. If there is short circuit, ohmmeter indicates 200 Ω or less.

NG**Replace EGR gas temp. sensor.****OK****2 Check for open and short in harness and connector between EGR gas temp. sensor and ECM (See page [IN-27](#)).****NG****Repair or replace harness or connector.****OK****3 Check connection and blockage of vacuum hose (See page [EC-7](#)).****NG****Repair or replace vacuum hose.****OK**

4 Check VSV for EGR.



PREPARATION:

- (a) Remove the glove compartment (See page SF-64).
- (b) Disconnect the E8 connector of ECM..
- (c) Turn ignition switch ON.

CHECK:

Check VSV function.

- (1) Connect between terminal EGR of ECM and body ground (VSV is ON).
- (2) Disconnect between terminal EGR of ECM and body ground (VSV is OFF).

OK:

- (1) VSV is ON:
Air from pipe E flows out through pipe F.
- (2) VSV is OFF:
Air from pipe E flows out through pipe G.

OK → Go to step 6.

NG

5 Check operation of VSV for EGR (See page SF-50).

NG → Replace VSV for EGR.

OK

Check for open in harness and connector between engine room J/B and ECM.

6 Check EGR valve (See page EC-7).

NG → Repair or replace EGR valve.

OK

7	Check vacuum control valve (See page EC-7).
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NG	Replace vacuum control valve.
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OK

Check and replace ECM (See page [IN-27](#)).