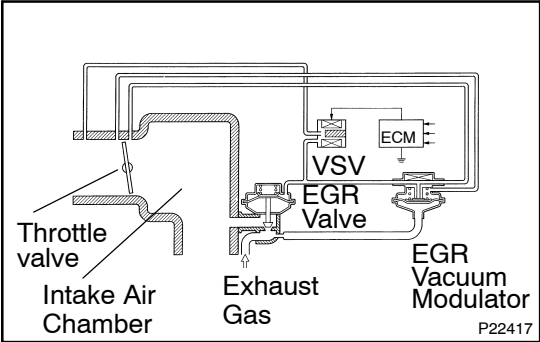


DTC	P0401	Exhaust Gas Recirculation Flow Insufficient Detected
-----	-------	--

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 temp. and reduce NOx emissions. The amount of EGR is regulated by the EGR vacuum modulator according to the engine load.



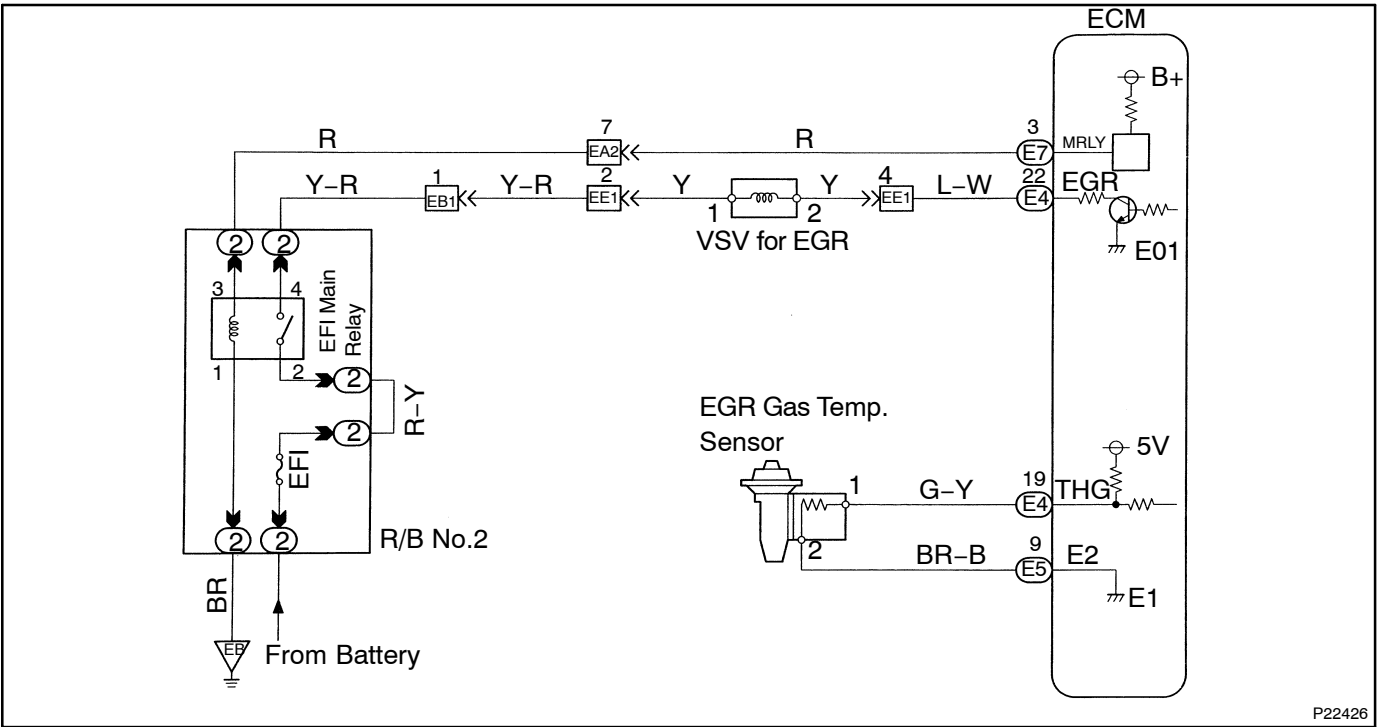
If even one of the following conditions is fulfilled, the VSV is turned ON by a signal from the ECM.

This results in atmospheric air acting on the EGR valve, closing the EGR valve and shutting off the exhaust gas (EGR cut-off). Under the following conditions, EGR is cut to maintain driveability.

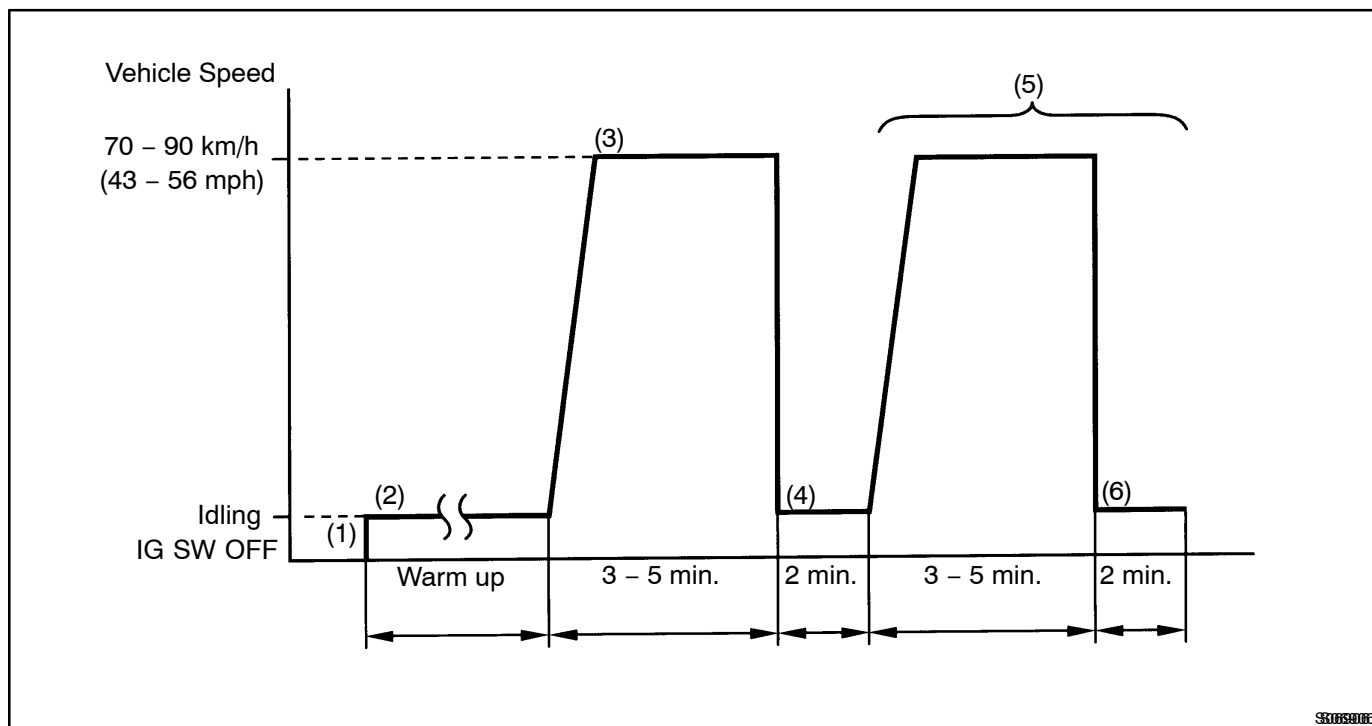
- Before the engine is warmed up.
- During deceleration (throttle valve closed).
- Light engine load (amount of intake air very small).
- Engine racing.

DTC No.	DTC Detection Condition	Trouble Area
P0401	After engine is warmed up and run at 80 km/h (50 mph) for 3 to 5 min., EGR gas temperature sensor value does not exceed 38 °C (100.4 °F) above ambient air temperature. (2 trip detection logic)	• EGR valve stuck closed • Short in VSV circuit for EGR • Open in EGR gas temp. sensor circuit • EGR hose disconnected • ECM

WIRING DIAGRAM



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) 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 (6) 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 will 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 temp. value.
----------	--

PREPARATION:

- (a) Remove the fuse cover on the instrument panel.
- (b) Connect the LEXUS hand-held tester to the DLC3.
- (c) Turn the ignition switch ON and push the LEXUS hand-held tester main switch ON.

CHECK:

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

OK:

EGR gas temperature: 10°C (50°F) or more

HINT:

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

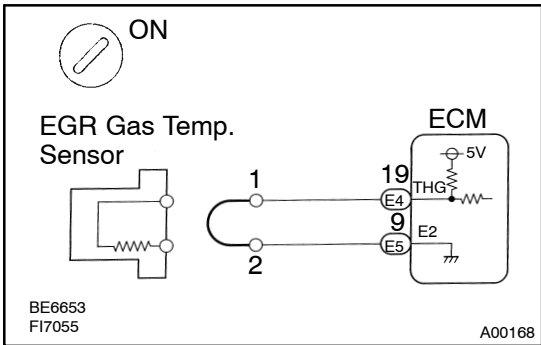
OK

Go to step 4.

NG

2

Check for open in harness or ECM.



PREPARATION:

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

CHECK:

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

OK:

EGR gas temperature: Approx. 157.5°C (315.5°F)

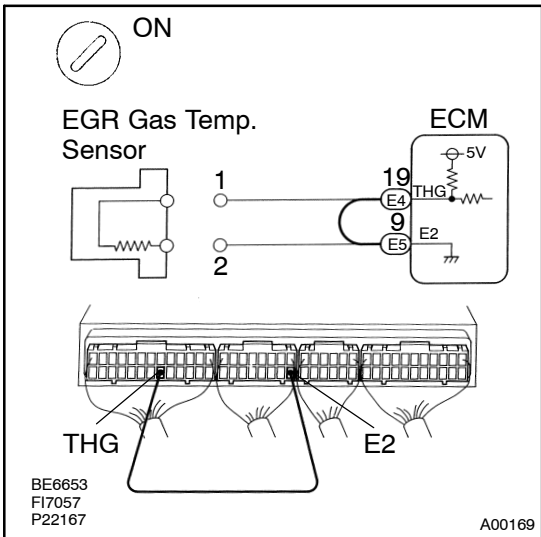
OK

Confirm good connection at sensor. If OK, replace EGR gas temp. sensor.

NG

3

Check for open in harness or ECM.



PREPARATION:

- (a) Remove the instrument panel speaker No.1 panel (See page [SF-63](#)).
- (b) Connect between terminals THG and E2 of ECM connector.

HINT:

The EGR gas temperature sensor connector is disconnected. Before checking, do a visual check and contact pressure check for the ECM connector (See page [IN-27](#)).

CHECK:

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

OK:

EGR gas temperature: Approx. 157.5°C (315.5°F)

OKOpen in harness between terminals E2 or THG.
Repair or replace harness.**NG**

Confirm connection at ECM. If OK, replace ECM.

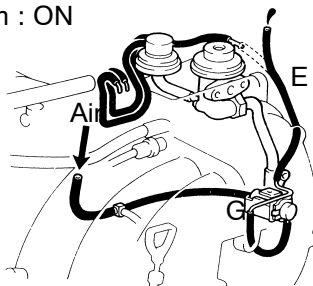
4Check connection of vacuum hose, EGR hose (See page [EC-2](#)).**NG**

Repair or replace.

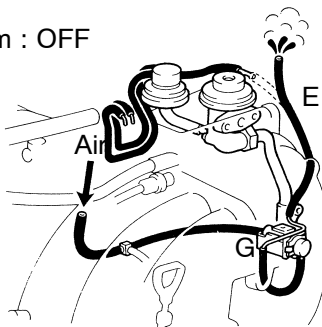
OK**5**

Check VSV for EGR.

System : ON



System : OFF

P22963
P22964

A00170

PREPARATION:

- Remove the fuse cover on the instrument panel.
- Connect the LEXUS hand-held tester to the DLC3.
- Turn the ignition switch ON and push the LEXUS hand-held tester main switch ON.
- Select the ACTIVE TEST mode on the LEXUS hand-held tester.

CHECK:

Check operation of VSV, When it is operated by the LEXUS hand-held tester.

OK:**EGR system is ON:**

Air does not flow from pipe G to pipe E.

EGR system is OFF:

Air from pipe G is flowing out through pipe E.

OK

Go to step 7.

NG

6 Check operation of VSV for EGR (See page [SF-57](#)).

NG

Replace VSV for EGR.

OK

Check for open in harness and connector between VSV and ECM (See page [IN-27](#)).

7 Check EGR vacuum modulator (See page [EC-10](#)).

NG

Repair or replace.

OK

8 Check EGR valve (See page [EC-10](#)).

NG

Repair or replace.

OK

9 Check value of EGR gas temp. sensor.

PREPARATION:

- (a) Remove the fuse cover on the instrument panel.
- (b) Connect the LEXUS hand-held tester to the DLC3.
- (c) Turn the ignition switch ON and push the LEXUS hand-held tester main switch ON.
- (d) Select the ACTIVE TEST mode on the LEXUS hand-held tester (EGR system ON).
- (e) Race the engine at 4,000 rpm for 3 mins.

CHECK:

Measure the EGR gas temperature while racing engine at 4,000 rpm.

OK:

EGR gas temperature after 3 mins.: 140°C (284°F) or more

NG

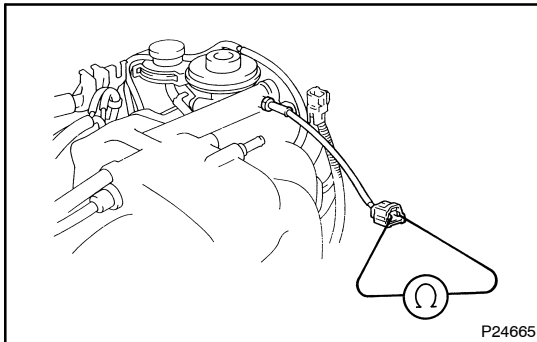
Replace EGR gas temp. sensor.

OK

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

OBD II scan tool (excluding LEXUS hand-held tester):

1 Check resistance of EGR gas temp. sensor.



PREPARATION:

Disconnect the EGR gas temperature sensor connector.

CHECK:

Measure the resistance between terminals of EGR gas temperature sensor connector.

OK:

Resistance: 600 kΩ or less

HINT:

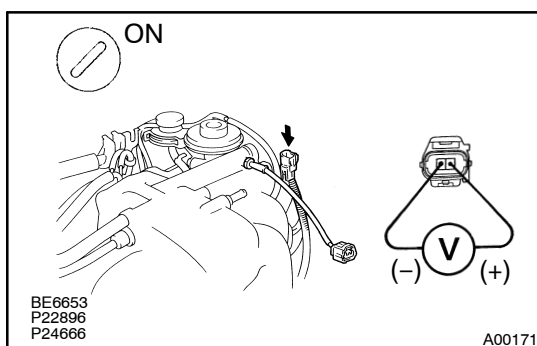
If there is open circuit, ohmmeter indicates 720 kΩ or more.

NG

Check and replace EGR gas temp. sensor (See page [SF-60](#)).

OK

2 Check for open in harness or ECM.



PREPARATION:

(a) Disconnect the EGR gas temp. sensor connector.

(b) Turn the ignition switch ON.

CHECK:

Measure the voltage between terminals of EGR gas temperature sensor wire harness side connector.

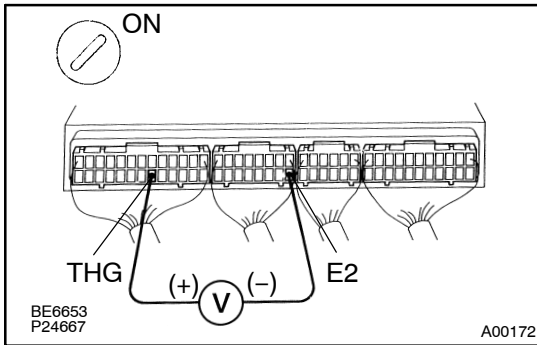
OK:

Voltage: 4.5 – 5.5 V

OK

Go to step 4.

NG

3 Check for open in harness or ECM.**PREPARATION:**

- (a) Remove the instrument panel speaker No.1 panel (See page [SF-63](#)).
- (b) Turn the ignition switch ON.

CHECK:

Measure the voltage between terminals of THG and E2 of ECM connector.

HINT:

EGR gas temperature sensor connector is disconnected.

OK:

Voltage: 4.5 – 5.5 V

OK

**Open in harness between terminals E2 or THG.
Repair or replace harness.**

NG

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

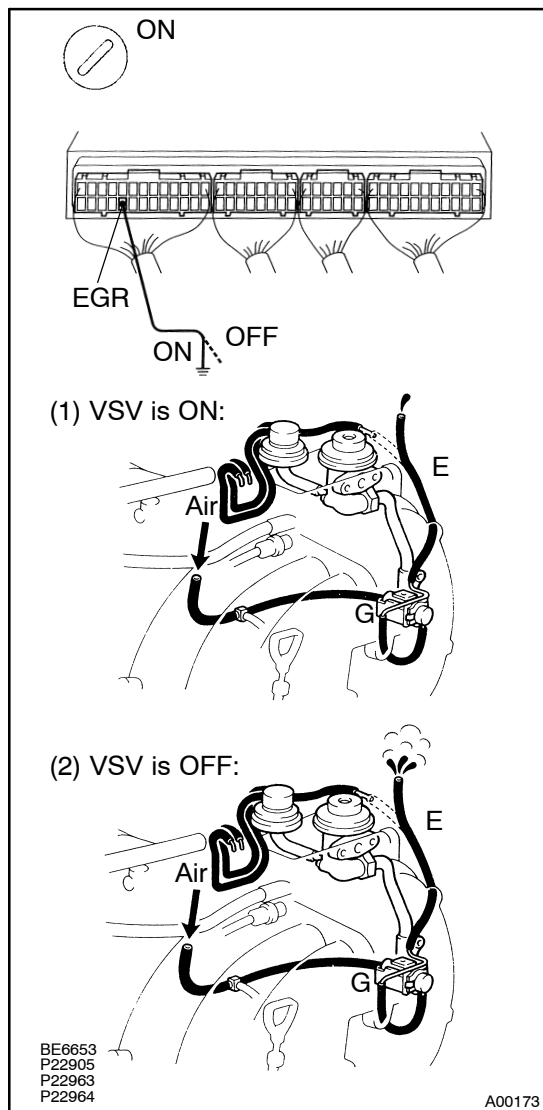
4 Check connection of vacuum hose, EGR hose (See page [EC-2](#)).

NG

Repair or replace.

OK

5 Check for VSV for EGR.



PREPARATION:

- Remove the instrument panel speaker No.1 panel (See page [SF-63](#)).
- Turn the ignition switch ON.

CHECK:

Check VSV function

- Connect between terminal EGR of ECM and body ground (ON).
- Disconnect between terminal EGR of ECM and body ground (ON).

OK:

- VSV is ON:
Air does not flow from pipe G to pipe E.
- VSV is OFF:
Air from pipe G flows out through pipe E.

OK

Go to step 7.

NG

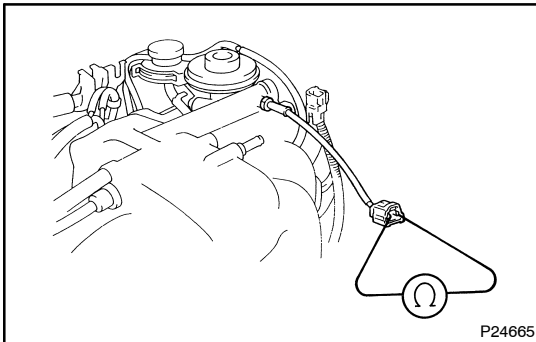
6 Check operation for the VSV for EGR (See page [SF-57](#)).

NG

Replace VSV for EGR.

OK

Check for open in harness and connector between R/B No.2 and ECM (See page [IN-27](#)).

7 Check EGR vacuum modulator (See page EC-10).**NG****Repair or replace.****OK****8 Check EGR valve (See page EC-10).****NG****Repair or replace.****OK****9 Check resistance of EGR gas temp. sensor.****PREPARATION:**

- (a) Disconnect the EGR gas temperature sensor connector.
- (b) Start the engine and warm it up.
- (c) Disconnect the VSV connector for EGR.
- (d) Race the engine at 4,000 rpm or 3 mins.

CHECK:

Measure the resistance of the EGR gas temperature sensor while racing the engine at 4,000 rpm.

OK:

**Resistance of EGR gas temp. sensor after 3 mins.:
4.3 kΩ or less**

HINT:

At 20°C (68°F): 188.6 – 439.0 kΩ for resistance

NG**Replace EGR gas temp. sensor.****OK****Check and replace ECM (See page IN-27).**