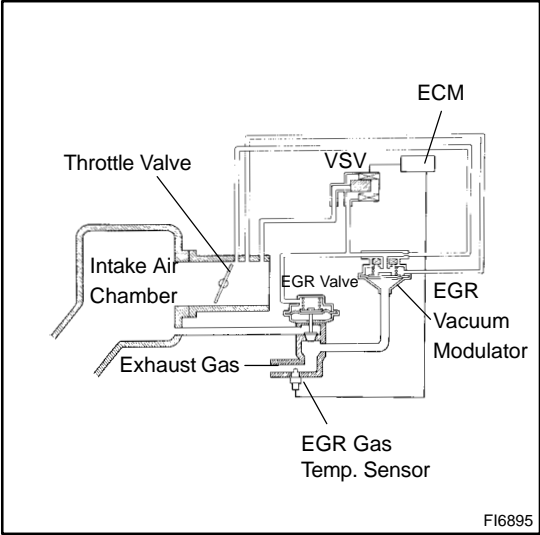


DTC	P0401	Exhaust Gas Recirculation Flow Insufficient Detected
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CIRCUIT DESCRIPTION



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 amount of EGR is regulated by the EGR vacuum modulator according to the engine load.

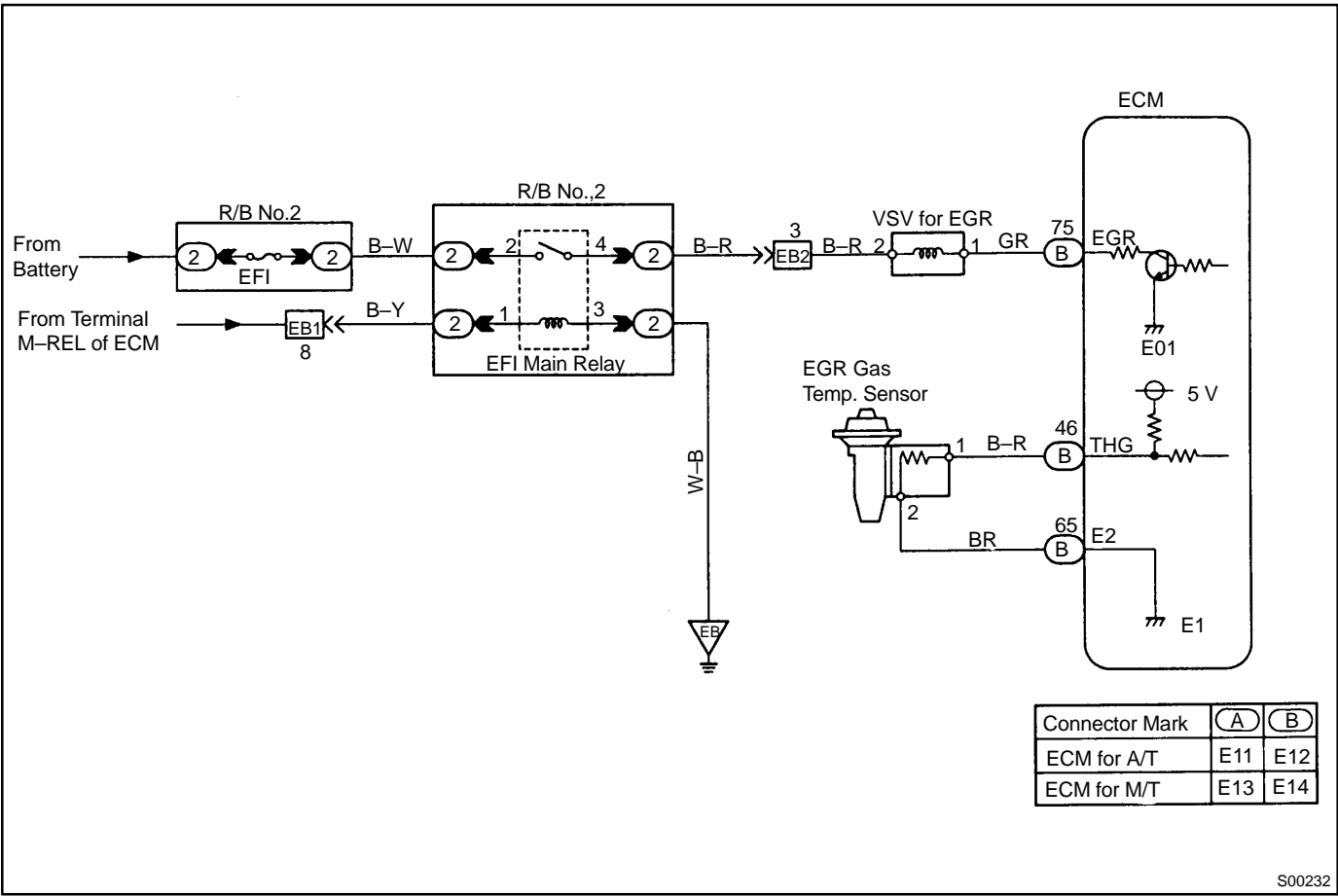
If even one of the following conditions is fulfilled, the VSV is turned ON by a signal from the ECM. This results in atmospheric air acting on the EGR valve, closing the EGR valve and shutting off the exhaust gas (EGR cut-off).

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 idling.

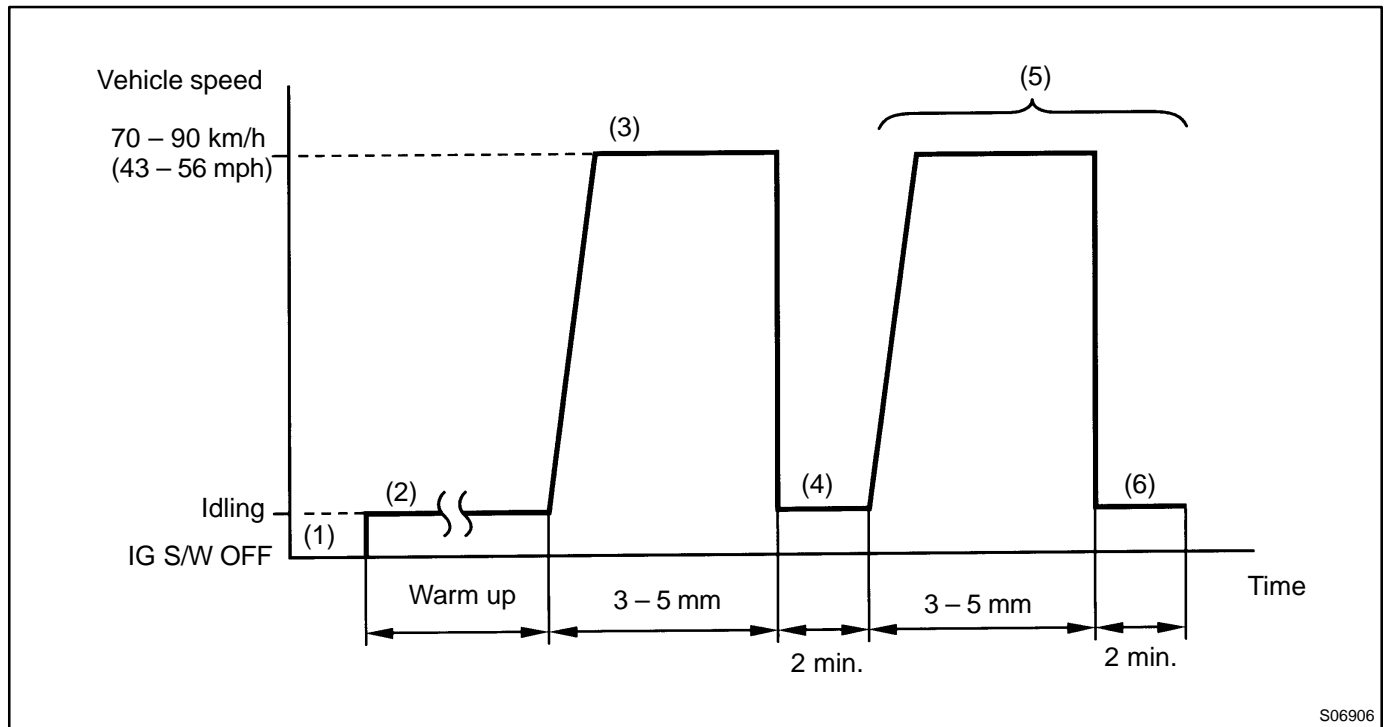
DTC No.	DTC Detecting Condition	Trouble Area
P0401	After the engine is warmed up and run at 80 km/h (50 mph) for 3 to 5 min. the EGR gas temperature sensor value does not exceed 40°C (72°F) above the ambient air temperature (2 trip detection logic)	<ul style="list-style-type: none">• EGR valve stuck closed• Short in VSV circuit EGR• Open in EGR gas temp. sensor circuit• EGR hose disconnected• ECM

WIRING DIAGRAM



S00232

SYSTEM CHECK DRIVING PATTERN



S06906

- (1) Connect the OBDII scan tool or LEXUS hand-held tester to the DLC3.
 - (2) Start the engine and warm it up 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 OBDII 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 will light up after steps (2) to (5) above are done again.

NOTICE:

If the conditions in this test are not strictly followed, detection of the malfunction will not be possible.

INSPECTION PROCEDURE**LEXUS hand-held tester:**

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

PREPARATION:

- (a) Connect the LEXUS hand-held tester to the DLC3.
- (b) Turn ignition switch ON and LEXUS hand-held tester main switch ON.

CHECK:

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

OK:

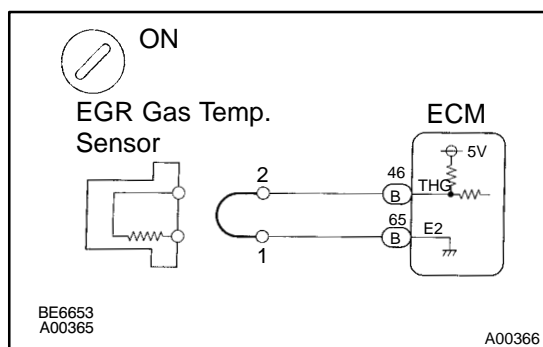
EGR gas temp.: 10°C (50°F) or more.

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 ignition switch ON.

CHECK:

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

OK:

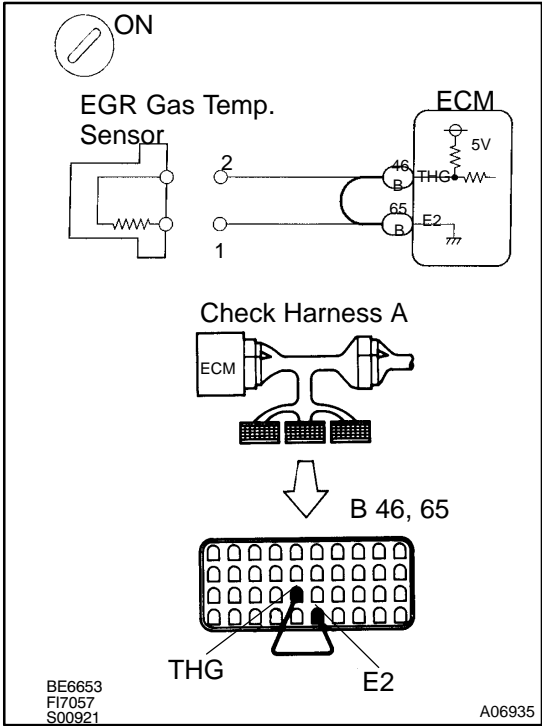
EGR gas temp.: 159.3°C (318.7°F)

OK

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

NG

3 Check for open in harness or ECM.



PREPARATION:

- (a) Connect Check Harness A (See page [DI-18](#)).
- (b) Connect between terminals THG and E2 of ECM.

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-29](#)).

CHECK:

Read EGR temperature on the LEXUS hand-held tester.

OK:

EGR gas temp.: 159.3°C (318.7°F)

OK

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

NG

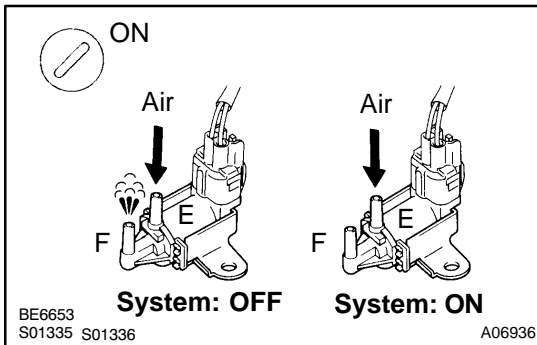
Confirm connection at ECM.
If OK, replace ECM.

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

NG

Repair or replace.

OK

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

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

CHECK:

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

OK:

EGR system is OFF:

Air from pipe E flows out through pipe F.

EGR system is ON:

Air does not flow from pipe E to F.

OK**Go to step 7.****NG****6 Check operation of the VSV for EGR (See page SF-67).****NG****Replace VSV for EGR.****OK**

Check for open in harness and connector between VSV and ECM (See page [IN-29](#)).

7 Check EGR vacuum modulator (See page EC-8).**NG****Repair or replace.****OK**

8 Check EGR valve (See page EC-8).

NG

Repair or replace.

OK

9 Check valve of EGR gas temp. sensor.

PREPARATION:

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

CHECK:

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

OK:

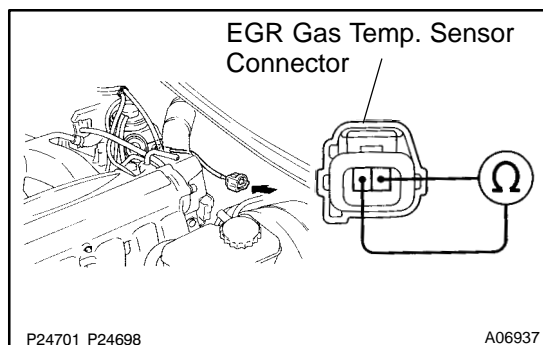
EGR gas temp. after 3 min.: 140°C (284°F) or more.

NG

Replace EGR gas temp. sensor.

OK

Check and replace ECM (See page IN-29).

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

Disconnect EGR gas temp. sensor connector.

CHECK:

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

OK:

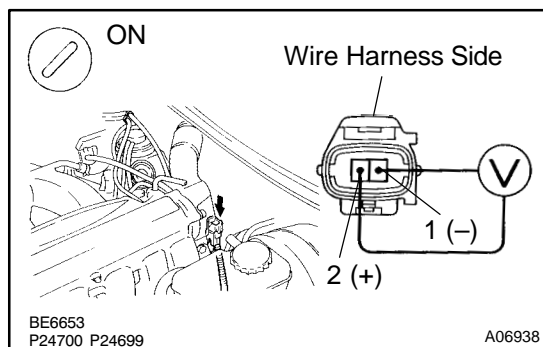
Resistance: 600 kΩ or less.

HINT:

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

NG

Check and replace EGR gas temp. sensor (See page SF-76).

OK**2 Check for open in harness or ECM.****PREPARATION:**

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

(b) Turn ignition switch ON.

CHECK:

Measure resistance between terminals of EGR gas temp. sensor wire harness side connector.

OK:

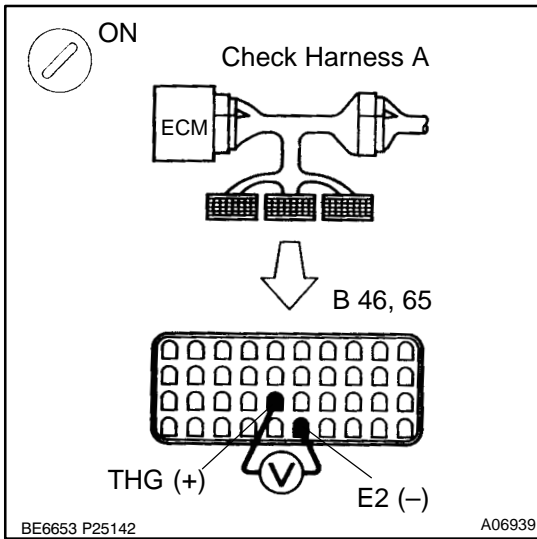
Voltage: 4.5 – 5.5 V

OK

Go to step 4.

NG

3 Check for open in harness or ECM.



PREPARATION:

- (a) Connect Check Harness A (See page [DI-18](#)).
- (b) Turn ignition switch ON.

CHECK:

Measure voltage between terminals THG and E2 of ECM connector.

HINT:

EGR gas temp. 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.**

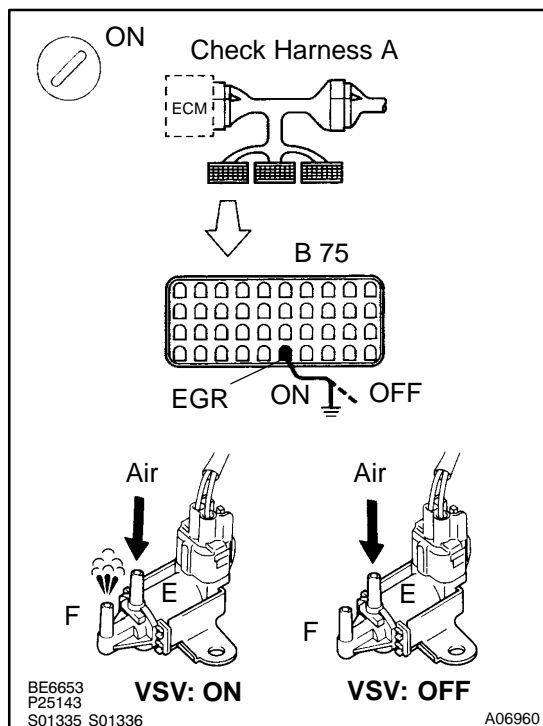
4 Check connection of vacuum hose, EGR hose (See page EC-2).

NG

Repair or replace.

OK

5 Check the VSV for EGR.



PREPARATION:

(a) Connect Check Harness A to the connectors on the wire harness side (See page [DI-18](#)).

HINT:

The other side of Check Harness A is not connected to the ECM terminals.

(b) Turn ignition switch ON.

CHECK:

Check VSV function.

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

OK:

(1) VSV is ON:

Air from pipe E flows out through pipe F.

(2) VSV is OFF:

Air does not flow from pipe E to F.

OK

Go to step 7.

NG

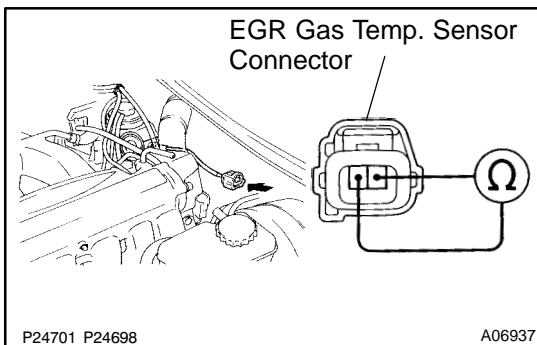
6 Check operation of the VSV for EGR (See page [SF-67](#)).

NG

Replace VSV for EGR.

OK

Check for open in harness and connector between R/B No.2 and ECM (See page [IN-29](#)).

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

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

CHECK:

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

OK:

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

HINT:

Resistance 188.6 – 439.0 kΩ at 20°C (68°F).

NG**Replace EGR gas temp. sensor.****OK****Check and replace ECM (See page [IN-29](#)).**