DI3SC–03

EGR Control Circuit

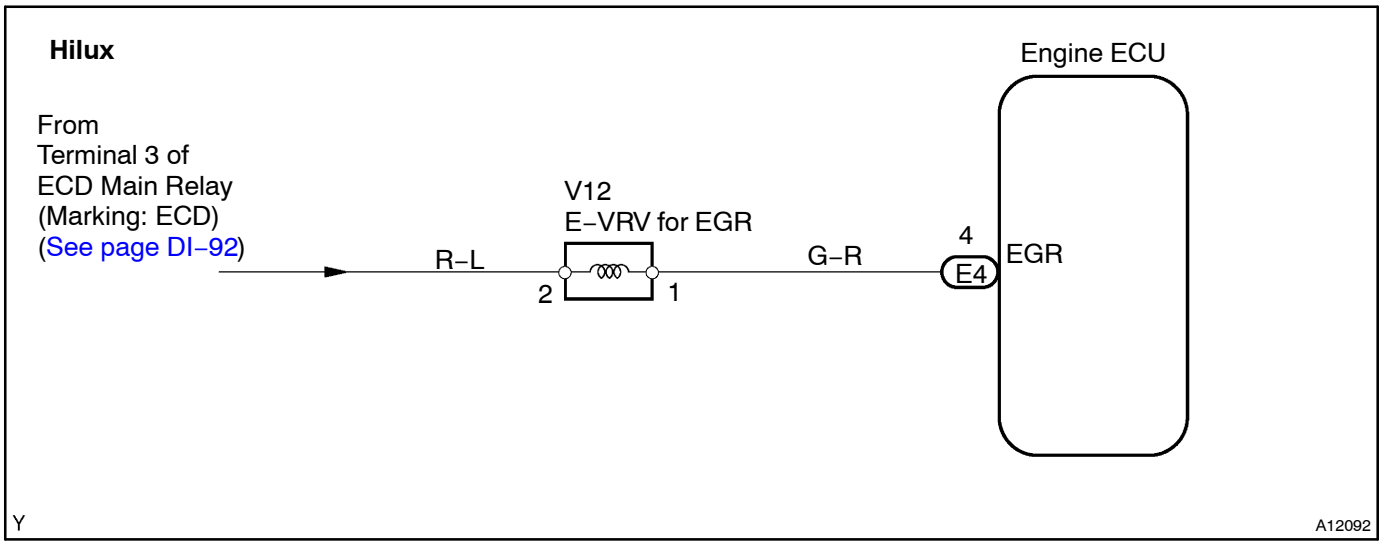
CIRCUIT DESCRIPTION

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 the EGR valve is controlled by the vacuum which is regulated by the E–VRV operated by the engine ECU.
If even one of the following conditions is fulfilled, the E–VRV for EGR is turned ON by a signal from the ECU. This results in atmospheric air acting on the EGR valve, closing the EGR valve and shutting off the exhaust gas (EGR cutoff).
Under the following conditions, the EGR is cut to maintain driveability.

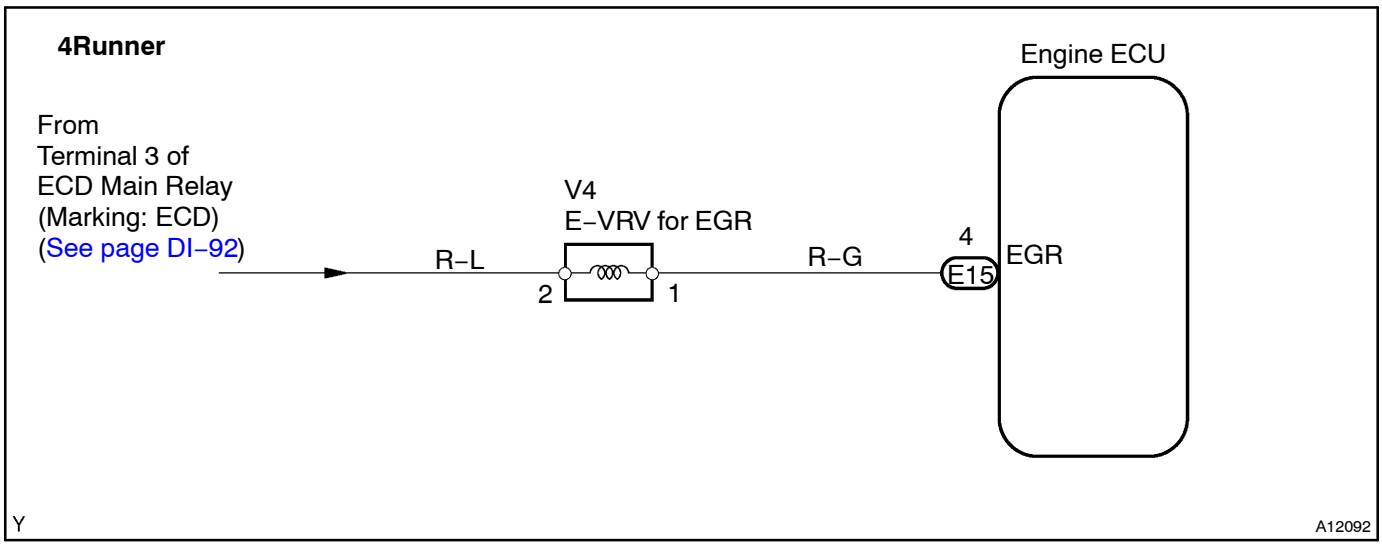
- Before the engine is warmed up
- During deceleration (Diesel throttle valve closed)
- Light engine load (very small amount of intake air)
- Engine speed over 3,000 rpm

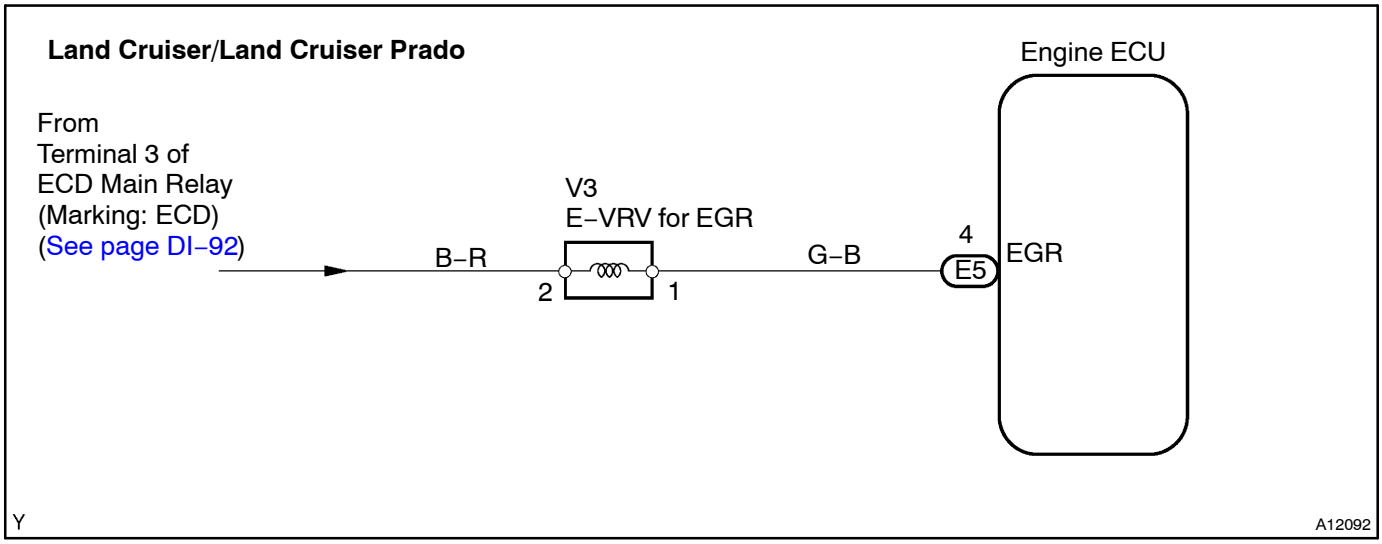
WIRING DIAGRAM

Hilux



4Runner





INSPECTION PROCEDURE

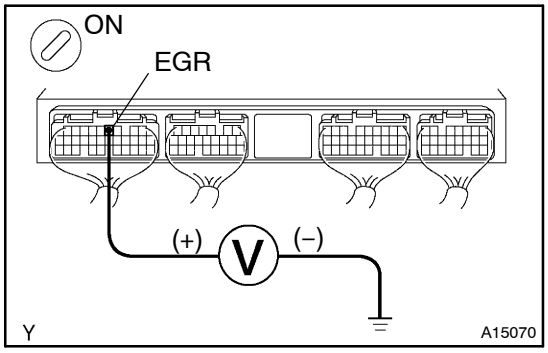
When using hand–held tester:

1	**Check connection of vacuum hose.**

NG → **Repair or replace.**

OK

2	**Check voltage between terminal EGR of engine ECU and body ground.**



PREPARATION:

(a) Remove the glove compartment door.

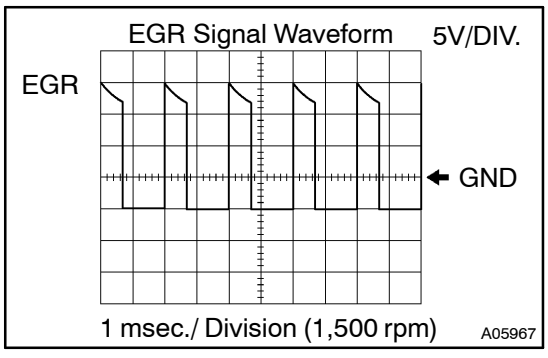
(b) Turn the ignition switch ON.

CHECK:

Measure the voltage between terminal EGR of the engine ECU connector and the body ground.

OK:

Voltage: 9 – 14 V



Reference: INSPECTION USING OSCILLOSCOPE

While EGR system is ON (engine speed 1,500 rpm), check the waveform between terminals EGR and E1 of the engine ECU connector.

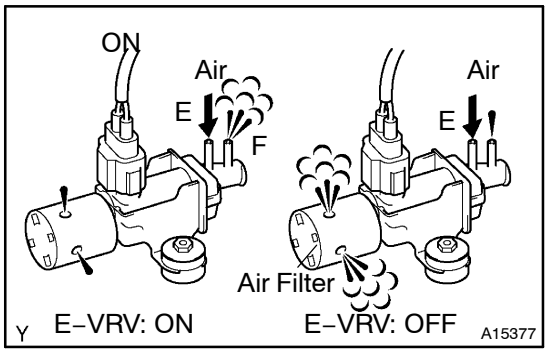
HINT:

The correct waveform is as shown.

NG	Check and replace engine ECU (See page IN–20).

OK

3	Check operation of E–VRV for EGR.



PREPARATION:

(a) Disconnect the vacuum hoses from the E–VRV.
(b) Connect the hand–held tester to the DLC3.
(c) Turn the ignition switch ON and push the hand–held tester main switch ON.
(d) Select the ACTIVE TEST mode on the hand–held tester.

CHECK:

Check the operation of the E–VRV when it is operated by the hand–held tester.

OK:

E–VRV ON:
Air from port E is flows out through port F.
E–VRV OFF:
Air from port E is flows out through air filter.

OK	Go to step 10.

NG

4	Check E–VRV for EGR (See page EC–3).

NG	Replace E–VRV for EGR.

OK

5	Check for open and short in harness and connector between E–VRV and engine ECU, and E–VRV and ECD main relay (Marking: ECD) (See page IN–20).

NG	Repair or replace harness or connector.

OK

6	Check EGR valve (See page EC–3).

NG → Replace EGR valve.

OK →

Check and replace engine ECU (See page IN–20).

When not using hand–held tester:

1	Check connection of vacuum hose.

NG → Repair or replace.

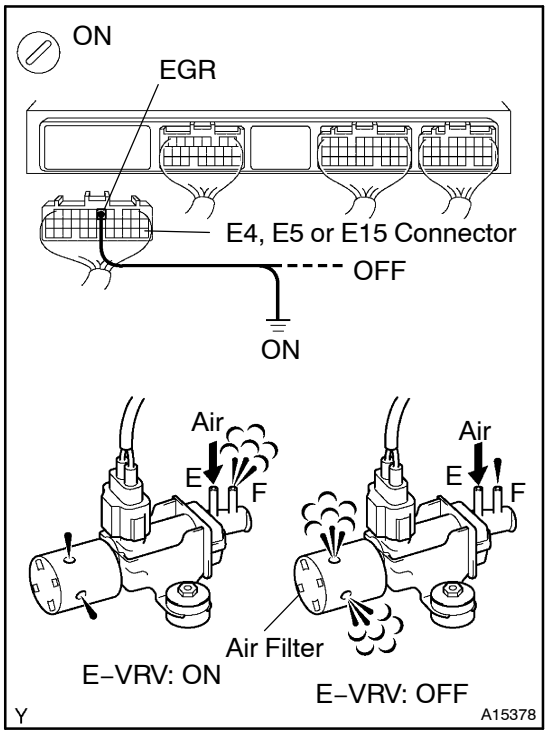
OK →

2	Check voltage between terminal EGR of engine ECU connector and body ground (See page DI–109, Step 5).

NG → Check and replace engine ECU (See page IN–20).

OK →

3	Check operation of E–VRV for EGR.



PREPARATION:

(a) Remove the glove compartment door.

(b) Disconnect the E4 (Hilux), E5 (Land Cruiser Land Cruiser Prado) or E15 (4Runner) connector of the engine ECU.

(c) Turn the ignition switch ON.

CHECK:

Check the E–VRV operation.

(1) Connect terminal EGR of the engine ECU connector and the body ground (ON).

(2) Disconnect terminal EGR of the engine ECU connector and the body ground (OFF).

OK:

E–VRV ON:
Air from port E flows out through port F.
E–VRV OFF:
Air from port E flows out through air filter.

OK	Go to step 9.

NG

4	Check E–VRV for EGR (See page EC–3).

NG	Replace E–VRV for EGR.

OK

5	Check for open and short in harness and connector between E–VRV for EGR and engine ECU, and E–VRV for EGR and ECD main relay (Marking: ECD) (See page IN–20).

NG	Repair or replace harness or connector.

OK

6	Check EGR valve (See page EC–3).

NG → Replace EGR valve.

OK →

Check and replace engine ECU (See page IN–20).