EGR Control Circuit

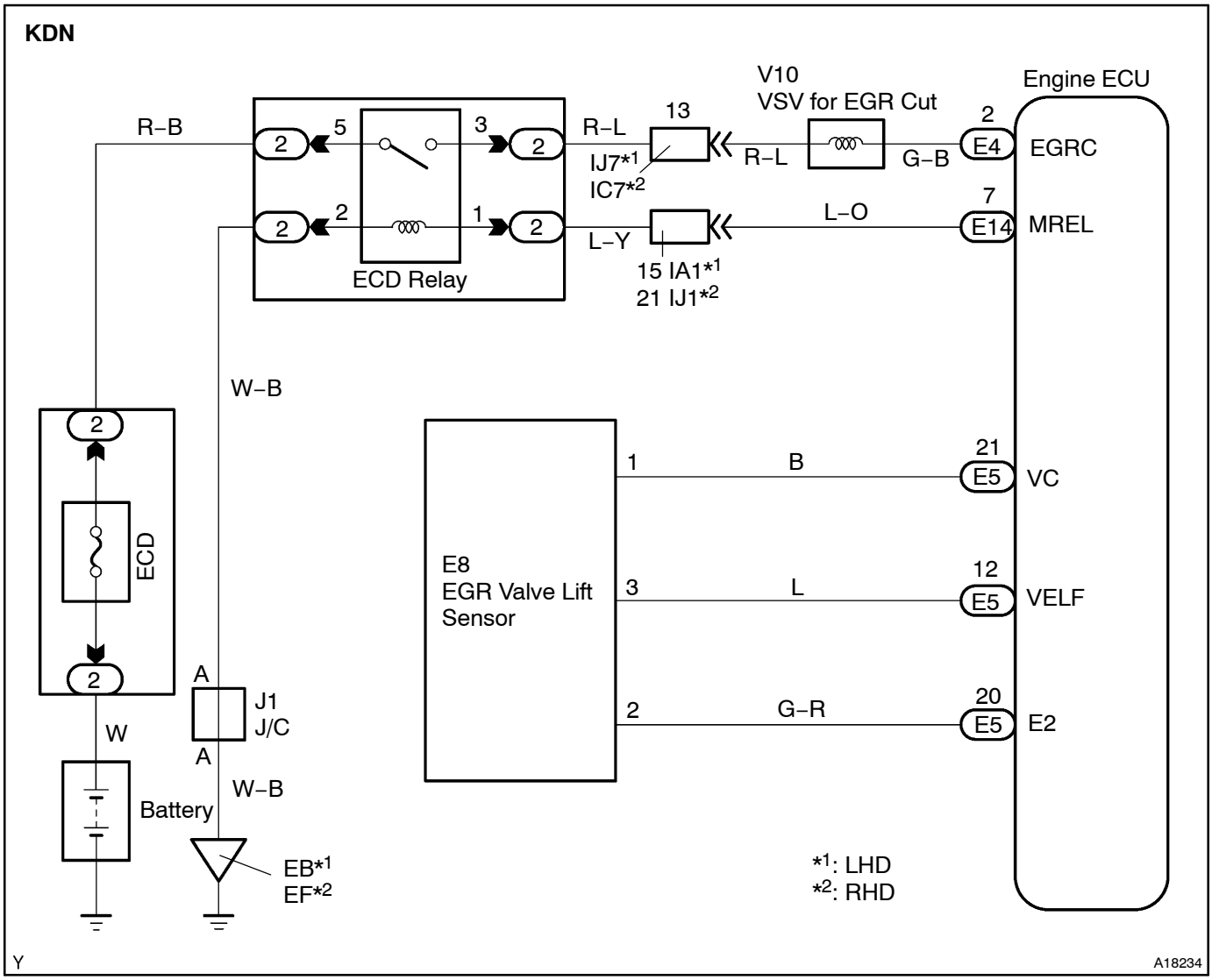
CIRCUIT DESCRIPTION

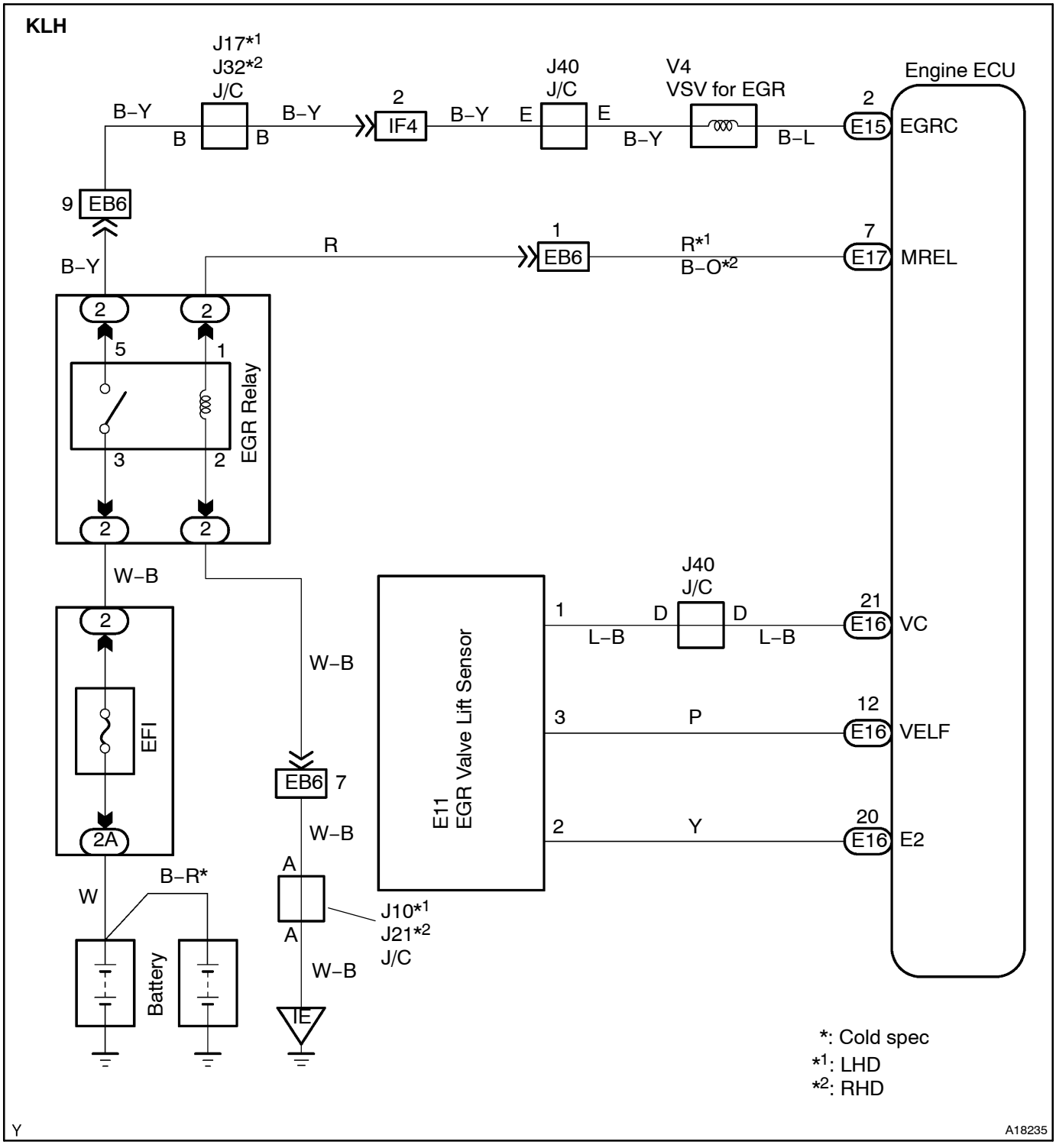
The EGR system recirculates exhaust gas, which is controlled to the proper quantity to suit the driving conditions into the intake air mixture to slow down combustion, reduce the combustion temperature and reduce NOx emissions. The lift amount of EGR valve is controlled by the vacuum which is regulated by the VSV operated by the engine ECU. If even one of the following conditions is fulfilled, the VSV 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.

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

- Before the engine is warmed up
- Engine speed over 4,000 rpm

WIRING DIAGRAM

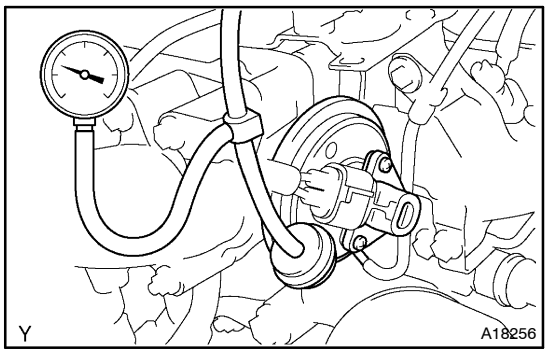



KLH
J17*1
J32*2
J/C
B–Y
B
B
B–Y
2
IF4
B–Y
J40
J/C
E
E
B–Y
V4
VSV for EGR
B–L
Engine ECU
2
E15
EGRC
9
EB6
B–Y
R
1
EB6
R*1
B–O*2
7
E17
MREL
2
2
5
1
EGR Relay
3
2
2
2
W–B
2
EFI
2A
W–B
EB6
7
W–B
A
A
J10*1
J21*2
J/C
W–B
IE
B–R*
W
Battery
J40
J/C
1
L–B
D
D
L–B
21
E16
VC
E11
EGR Valve Lift Sensor
3
P
12
E16
VELF
2
Y
20
E16
E2
*: Cold spec
*1: LHD
*2: RHD
Y
A18235

INSPECTION PROCEDURE

When using hand–held tester:

1	Check vacuum between EGR valve and VSV for EGR.



PREPARATION:

(a) Using a 3–way connector, connect a vacuum gauge to the hose between the VSV and EGR valve.

(b) Warm up the engine to above 80˚C (176˚F).

CHECK:

Check the vacuum at 1,500 rpm.

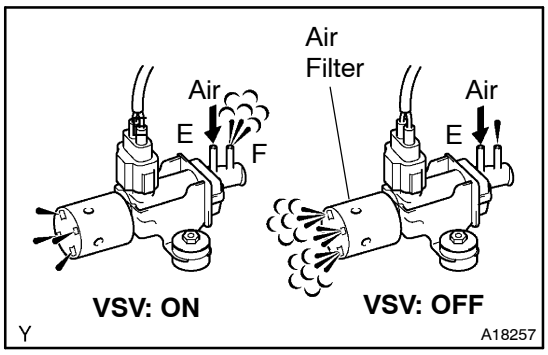
RESULT:

Type	Vacuum
A	0 kPa (0 mmHg, 0 in. Hg)
B	Above 28 kPa (210 mmHg, 8.3 in. Hg)

A	Check vacuum hose.

B

2	Check VSV for EGR operation.



PREPARATION:

(a) Disconnect the vacuum hose from the VSV.

(b) Connect the hand–held tester to the DLC3.

(c) Select the ACTIVE TEST mode on the hand–held tester.

CHECK:

Check the VSV operation on the hand–held tester.

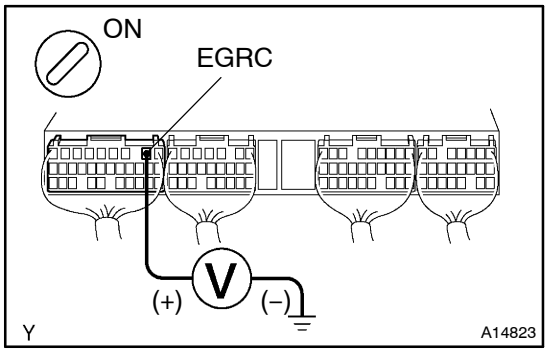
OK:

VSV is ON:
Air from port E flows out through air filter.
VSV is OFF:
Air does not flow from port E to air filter.

NG	Replace VSV for EGR.

OK

3	Check voltage between terminal EGRC of engine ECU connector and body ground.



PREPARATION:

(a) Remove the glove compartment box.

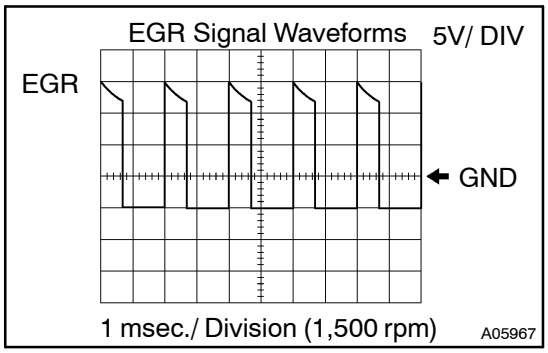
(b) Turn the ignition switch ON.

CHECK:

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

OK:

Voltage: 9 – 14 V



Reference: INSPECTION USING OSCILLOSCOPE

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

HINT:

The correct waveform is shown in the illustration.

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

OK

4	Check for open and short in harness and connector between VSV for EGR and engine ECU (See page IN–20).

NG	Repair or replace harness or connector.

OK

Replace EGR valve.

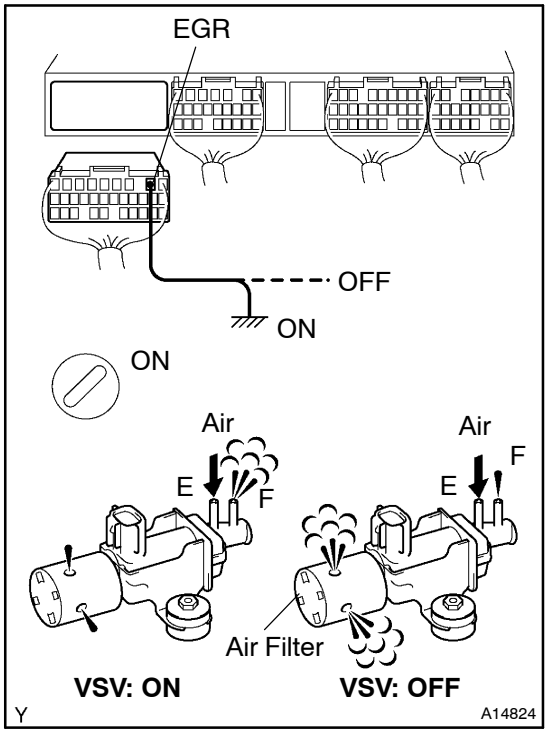
When not using hand–held tester:

1	**Check vacuum between EGR valve and VSV for EGR (See step 2 when using hand–held tester).**

A → **Check vacuum hose.**

B

2	**Check operation of VSV for EGR.**



PREPARATION:

(a) Remove the glove compartment box.
(b) KLH:
Disconnect the E15 connector from the engine ECU.
(c) KDN:
Disconnect the E4 connector from the engine ECU.
(d) Turn the ignition switch ON.

CHECK:

Check the VSV operation.

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

OK:

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

NG → **Check connection, damage and blockage of vacuum hose.**

OK

3	Check voltage between terminal EGRC of engine ECU connector and body ground (See step 3 when using hand–held tester).

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

OK ↓

4	Check for open and short in harness and connector between VSV for EGR and engine ECU (See page IN–20).

NG → Repair or replace harness or connector.

OK ↓

Replace EGR valve.