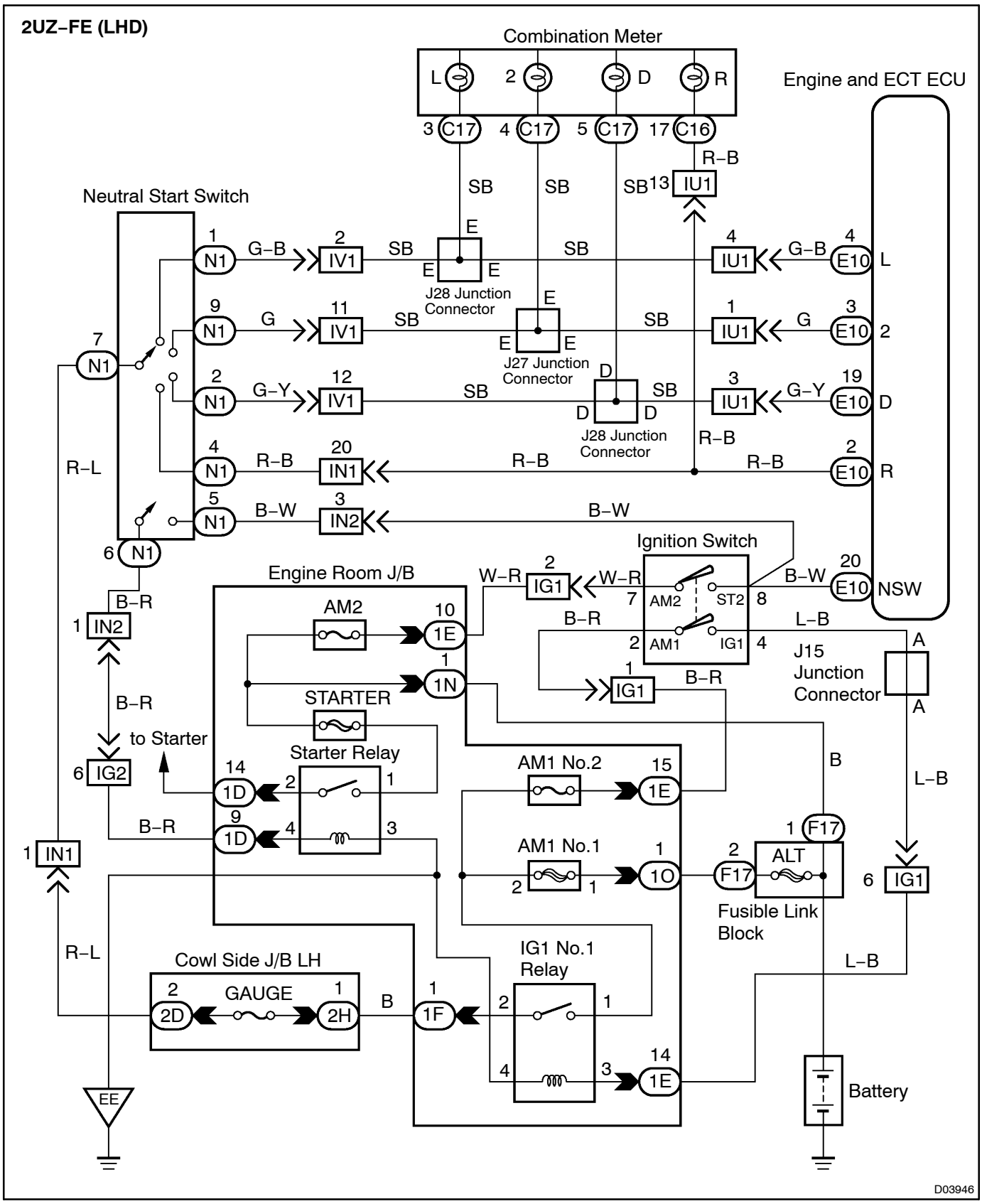
DI3RA–01

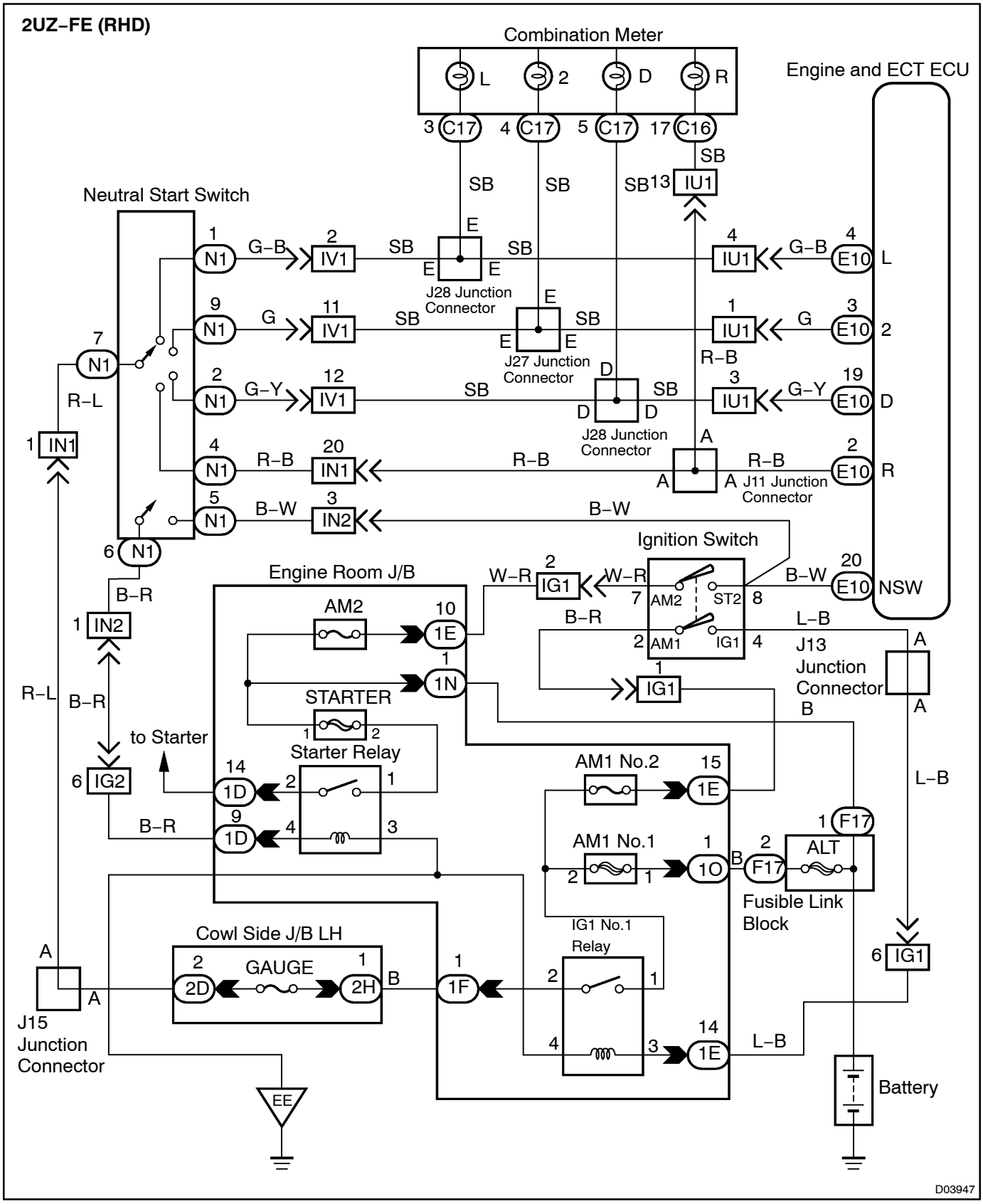
Neutral Start Switch Circuit Malfunction

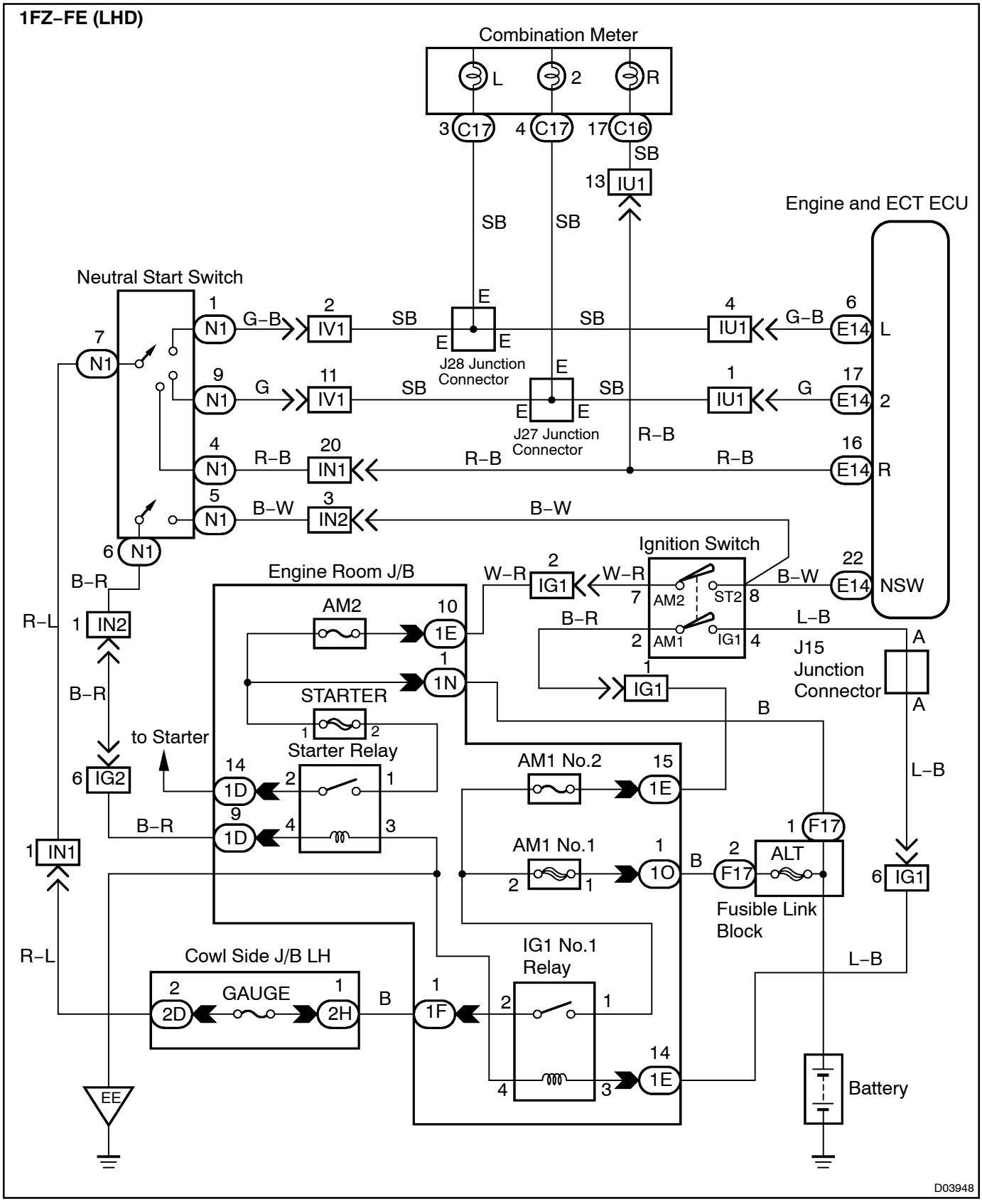
CIRCUIT DESCRIPTION

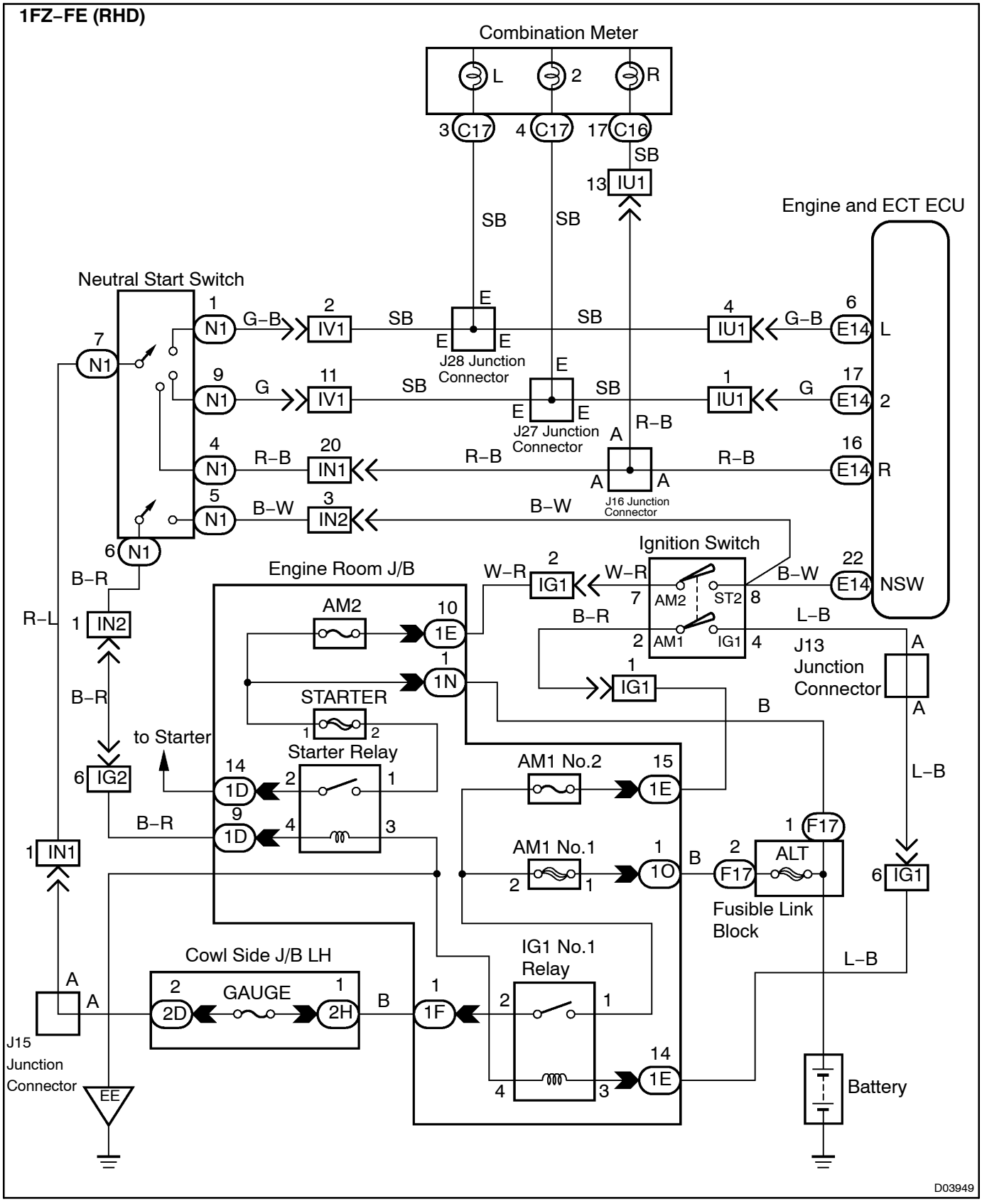
The neutral start switch detects the shift lever range and sends signals to the Engine and ECT ECU (2UZ–FE, 1FZ–FE) or ECT ECU (1HZ, 1HD–T, 1HD–FTE).
The Engine and ECT ECU receives signals (NSW, R, 2 and L) or ECT ECU receives signals (P, R, N, 2 and L) from the neutral start switch. When the signal is not sent to the Engine and ECT ECU (2UZ–FE, 1FZ–FE) or ECT ECU (1HZ, 1HD–T, 1HD–FTE) from the neutral start switch, the Engine and ECT ECU (2UZ–FE, 1FZ–FE) or ECT ECU (1HZ, 1HD–T, 1HD–FTE) judges that the shift lever is in D range.

WIRING DIAGRAM

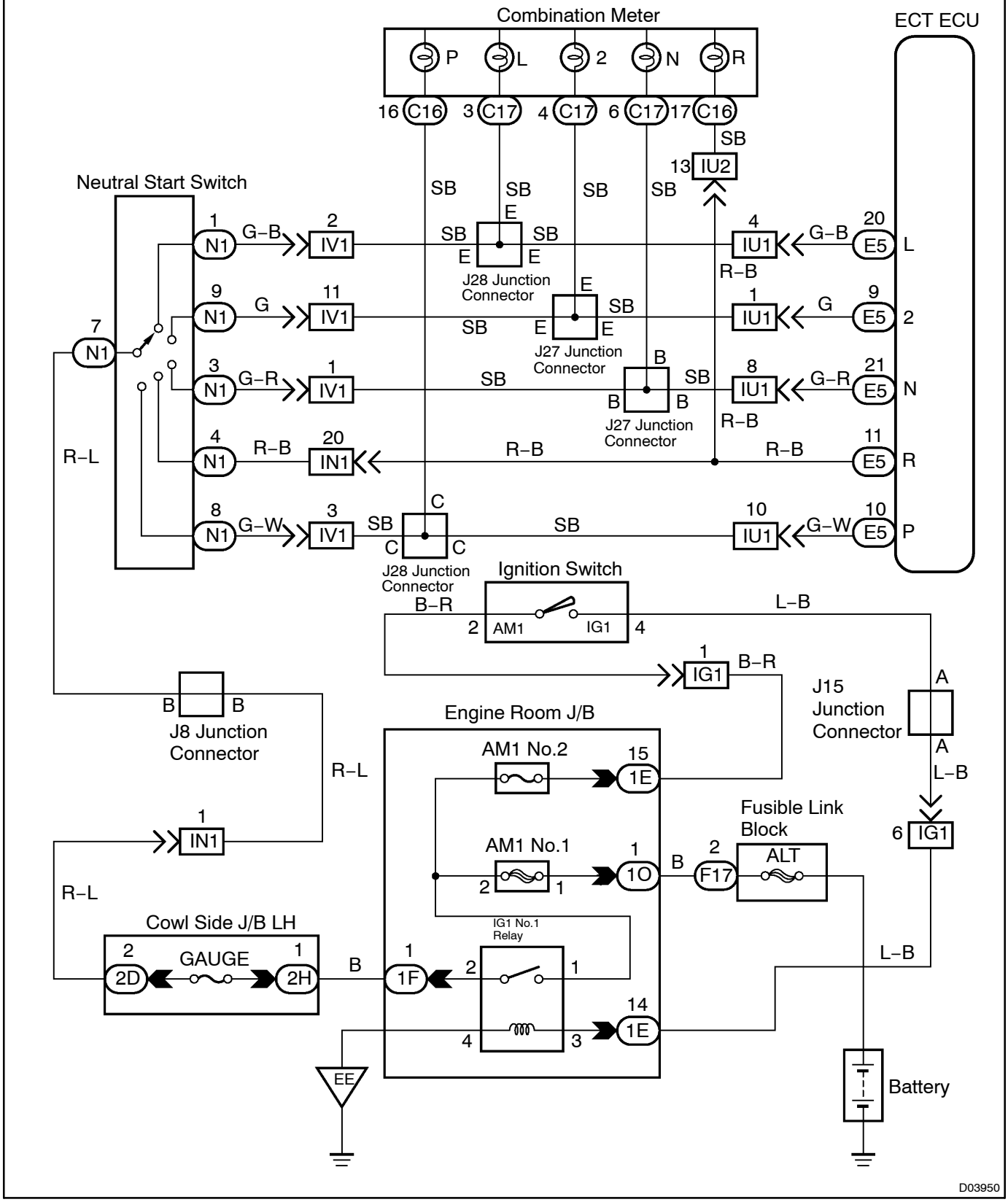



2UZ–FE (RHD)
Combination Meter
L
2
D
R
Engine and ECT ECU
3 C17
4 C17
5 C17
17 C16
SB
13 IU1
Neutral Start Switch
J28 Junction Connector
J27 Junction Connector
J28 Junction Connector
J11 Junction Connector
Ignition Switch
Engine Room J/B
AM2
STARTER
Starter Relay
to Starter
AM1 No.2
AM1 No.1
IG1 No.1 Relay
J13 Junction Connector
Fusible Link Block
ALT
Cowl Side J/B LH
GAUGE
J15 Junction Connector
Battery
EE
NSW
G–B
G
G–Y
R–B
B–W
B–R
R–L
L–B
W–R
D03947

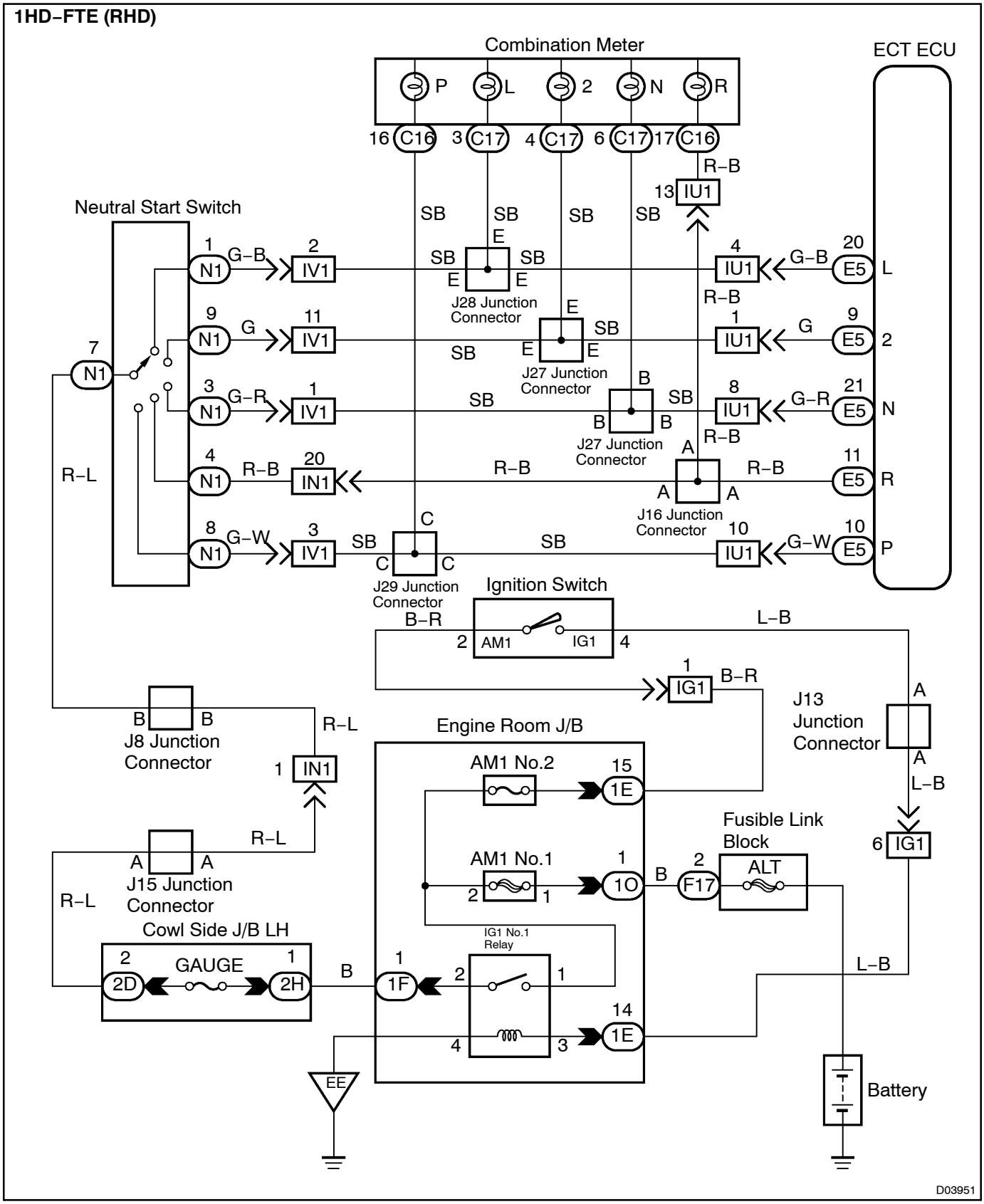

1FZ–FE (LHD)
Combination Meter
L
2
R
3 C17
4 C17
17 C16
SB
13 IU1
Engine and ECT ECU
SB
SB
Neutral Start Switch
1 N1
G–B
2 IV1
SB
E
J28 Junction Connector
SB
4 IU1
G–B
6 E14 L
7 N1
9 N1
G
11 IV1
SB
E
J27 Junction Connector
SB
1 IU1
G
17 E14 2
R–B
4 N1
R–B
20 IN1
R–B
R–B
16 E14 R
5 N1
B–W
3 IN2
B–W
6 N1
Ignition Switch
Engine Room J/B
W–R
2 IG1
W–R
7 AM2
ST2 8
B–W
22 E14 NSW
B–R
R–L
1 IN2
AM2
10 1E
B–R
2 AM1
IG1 4
L–B
J15 Junction Connector
A
A
1 1N
1 IG1
STARTER
B
1 2
to Starter
Starter Relay
6 IG2
14 1D
2
1
AM1 No.2
15 1E
L–B
9 1D
B–R
4
3
1 IN1
AM1 No.1
1 1O
B
2 F17
ALT
1 F17
6 IG1
Fusible Link Block
R–L
Cowl Side J/B LH
IG1 No.1 Relay
L–B
2 2D
GAUGE
1 2H
B
1 1F
2
1
14 1E
4
3
EE
Battery
D03948


1FZ–FE (RHD)
Combination Meter
L
2
R
3 C17
4 C17
17 C16
SB
13 IU1
Engine and ECT ECU
SB
SB
Neutral Start Switch
1 N1
G–B
2 IV1
SB
E
SB
4 IU1
G–B
6 E14 L
7 N1
J28 Junction Connector
9 N1
G
11 IV1
SB
E
SB
1 IU1
G
17 E14 2
J27 Junction Connector
R–B
A
4 N1
R–B
20 IN1
R–B
R–B
16 E14 R
A
A
J16 Junction Connector
5 N1
B–W
3 IN2
B–W
6 N1
Ignition Switch
Engine Room J/B
W–R
2 IG1
W–R
B–W
22 E14 NSW
B–R
AM2
10 1E
7 AM2
ST2 8
B–R
L–B
R–L
1 IN2
1
1N
2 AM1
IG1 4
J13 Junction Connector
A
1
IG1
STARTER
B
B–R
1
2
to Starter
Starter Relay
AM1 No.2
15 1E
14 1D
2
1
6 IG2
9 1D
4
3
B–R
1 F17
AM1 No.1
1
2
ALT
1 IN1
2
1
1O
B
F17
6 IG1
Fusible Link Block
L–B
Cowl Side J/B LH
IG1 No.1 Relay
A
2
GAUGE
1
L–B
A
2D
2H
B
1
1F
2
1
J15 Junction Connector
14
1E
4
3
Battery
EE
D03949

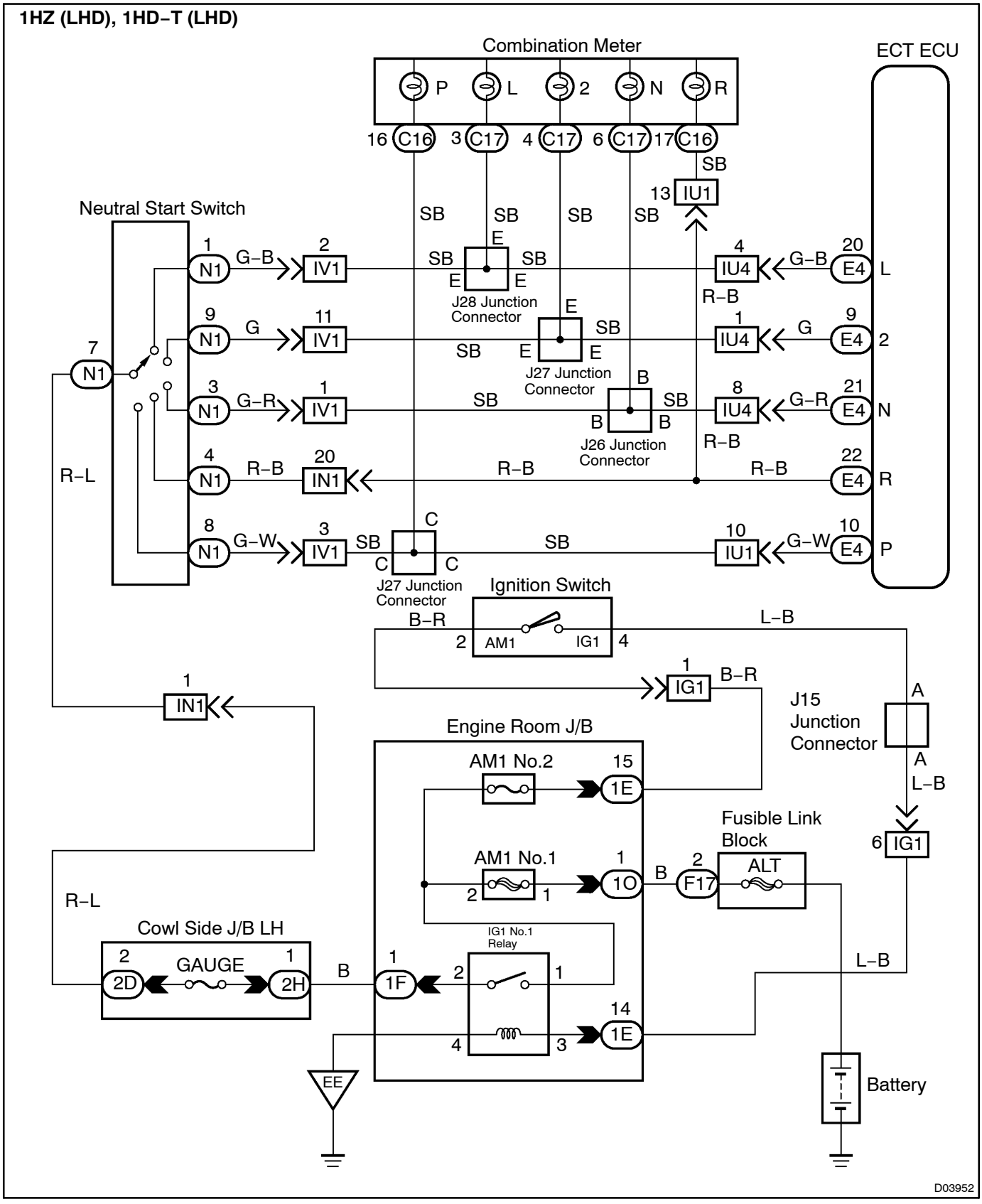
1HD–FTE (LHD)


Combination Meter
ECT ECU
P
L
2
N
R
16 C16
3 C17
4 C17
6 C17
17 C16
SB
13 IU2
Neutral Start Switch
SB
SB
SB
SB
E
1
N1
G–B
2
IV1
SB
SB
E
E
J28 Junction Connector
4
IU1
G–B
20
E5
L
R–B
9
N1
G
11
IV1
E
SB
SB
E
E
J27 Junction Connector
1
IU1
G
9
E5
2
7
N1
3
N1
G–R
1
IV1
SB
B
SB
B
B
J27 Junction Connector
8
IU1
G–R
21
E5
N
R–B
4
N1
R–B
20
IN1
R–L
R–B
R–B
11
E5
R
C
8
N1
G–W
3
IV1
SB
C
C
SB
10
IU1
G–W
10
E5
P
J28 Junction Connector
Ignition Switch
B–R
L–B
2
AM1
IG1
4
1
IG1
B–R
J15 Junction Connector
A
A
L–B
6
IG1
B
B
J8 Junction Connector
Engine Room J/B
AM1 No.2
15
1E
R–L
1
IN1
Fusible Link Block
AM1 No.1
1
1O
B
2
F17
ALT
2
1
R–L
Cowl Side J/B LH
IG1 No.1 Relay
2
GAUGE
1
2D
2H
B
1
1F
2
1
L–B
14
1E
4
3
EE
Battery
D03950

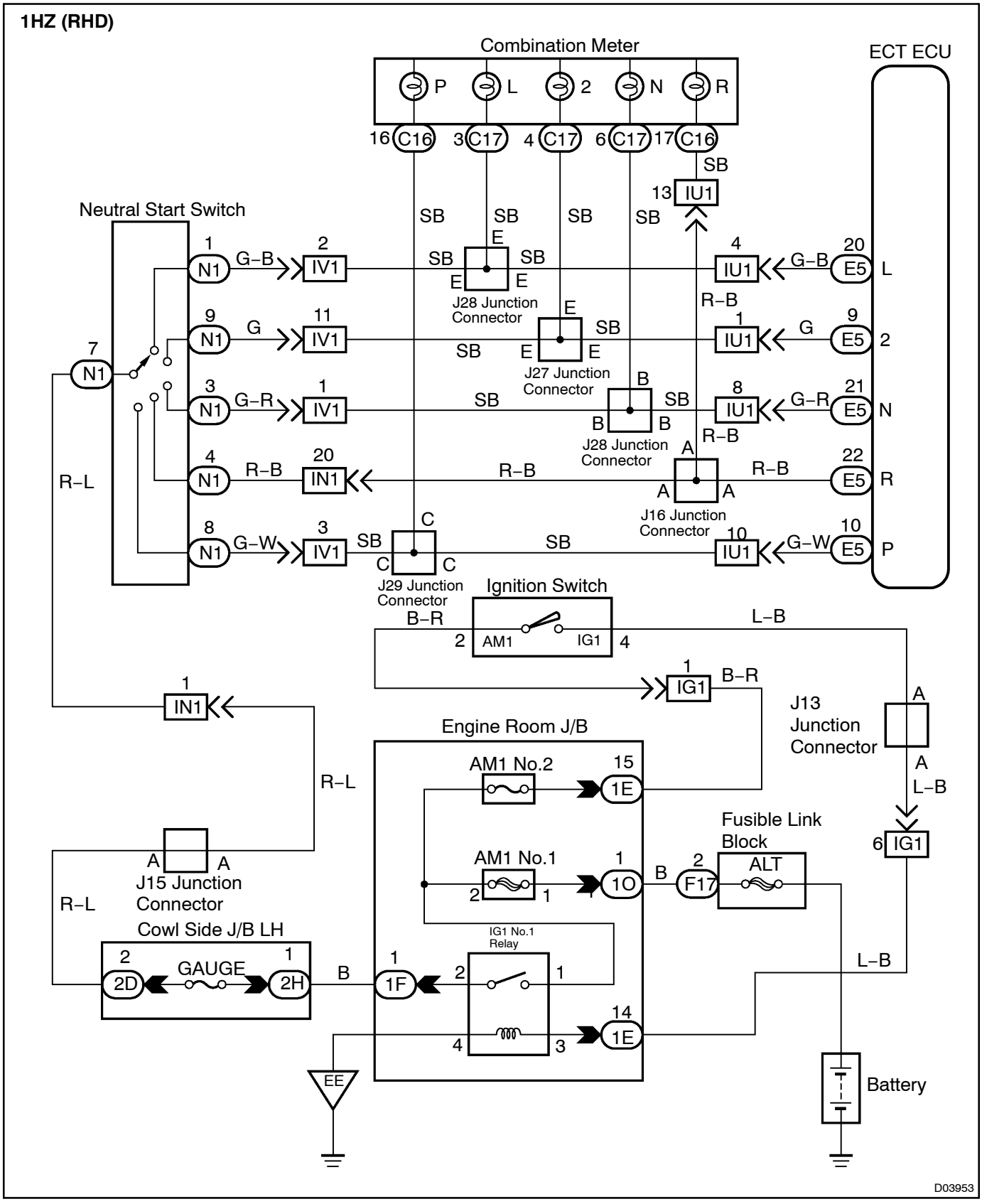
1HD–FTE (RHD)


Combination Meter
ECT ECU
P
L
2
N
R
16 C16
3 C17
4 C17
6 C17
17 C16
R–B
13 IU1
Neutral Start Switch
SB
SB
SB
SB
E
1 N1
G–B
2 IV1
SB
SB
E
E
J28 Junction Connector
4 IU1
G–B
20 E5
L
9 N1
G
11 IV1
E
SB
SB
E
E
J27 Junction Connector
1 IU1
G
9 E5
2
7 N1
3 N1
G–R
1 IV1
SB
B
SB
B
B
J27 Junction Connector
8 IU1
G–R
21 E5
N
R–B
4 N1
R–B
20 IN1
R–B
A
R–B
11 E5
R
R–L
A
A
J16 Junction Connector
8 N1
G–W
3 IV1
SB
C
SB
10 IU1
G–W
10 E5
P
C
C
J29 Junction Connector
Ignition Switch
B–R
2 AM1
IG1 4
L–B
1 IG1
B–R
J13 Junction Connector
A
A
L–B
6 IG1
B
B
J8 Junction Connector
R–L
1 IN1
Engine Room J/B
AM1 No.2
15 1E
Fusible Link Block
R–L
A
A
J15 Junction Connector
AM1 No.1
1
2
1
1O
B
2
F17
ALT
R–L
Cowl Side J/B LH
IG1 No.1 Relay
2
GAUGE
1
2D
2H
B
1
1F
2
1
L–B
14
4
3
1E
EE
Battery
D03951

1HZ (LHD), 1HD–T (LHD)



1HZ (RHD)


Combination Meter
P
L
2
N
R
ECT ECU
16 C16
3 C17
4 C17
6 C17
17 C16
SB
13 IU1
Neutral Start Switch
SB
SB
SB
SB
E
J28 Junction Connector
J27 Junction Connector
J28 Junction Connector
J16 Junction Connector
J29 Junction Connector
1 N1
G–B
2 IV1
4 IU1
G–B
20 E5
L
9 N1
G
11 IV1
1 IU1
G
9 E5
2
7 N1
3 N1
G–R
1 IV1
8 IU1
G–R
21 E5
N
R–B
4 N1
R–B
20 IN1
22 E5
R
R–L
8 N1
G–W
3 IV1
10 IU1
G–W
10 E5
P
C
Ignition Switch
B–R
L–B
2
AM1
IG1
4
1 IG1
B–R
1 IN1
R–L
J13 Junction Connector
A
L–B
6 IG1
Engine Room J/B
AM1 No.2
15
1E
AM1 No.1
1
1O
B
2
F17
ALT
Fusible Link Block
J15 Junction Connector
Cowl Side J/B LH
2
GAUGE
1
2D
2H
B
1
1F
IG1 No.1 Relay
14
1E
EE
Battery
D03953

INSPECTION PROCEDURE

HINT:
In case of using the hand–held tester, start the inspection from step 1 and in case of not using the hand–held tester, start from step 2.

1	**Read PNP, REVERSE, DRIVE, 2ND and LOW signals.**

PREPARATION:
(a) Remove the DLC3 cover.
(b) Connect a hand–held tester to the DLC3.
(c) Turn the ignition switch ON and hand–held tester main switch ON.

CHECK:
Shift lever into the P, R, N, D, 2 and L ranges, and read the PNP, REVERSE, DRIVE, 2ND and LOW signals on the hand–held tester.

OK:

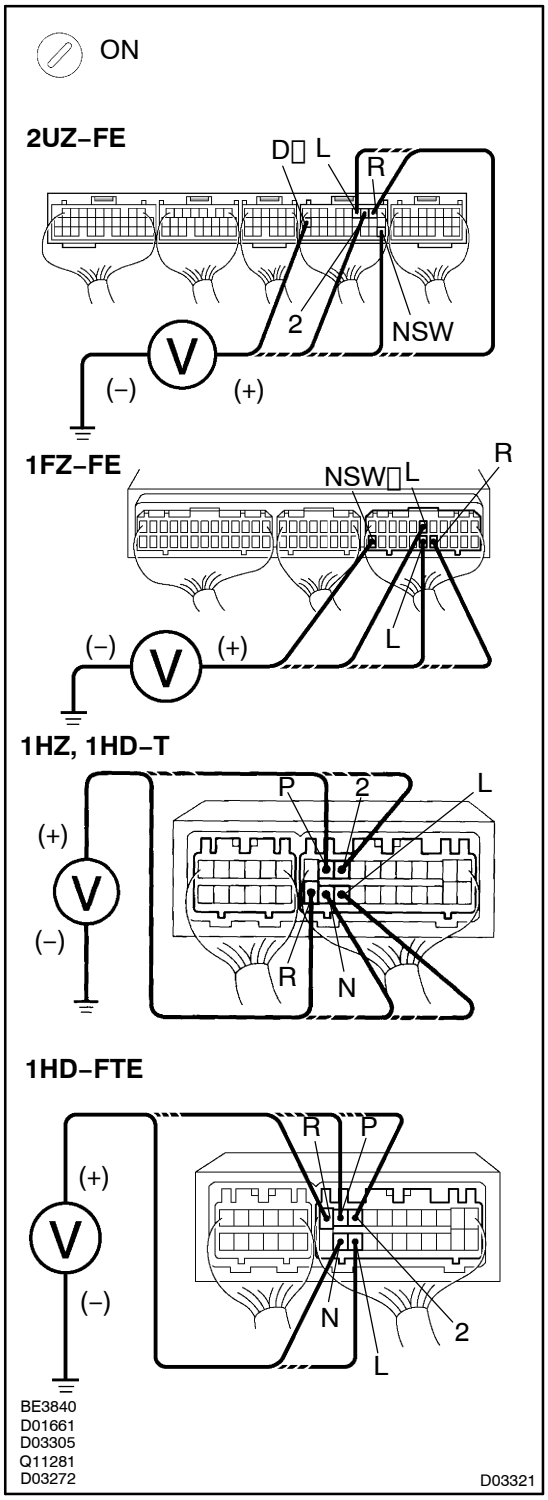
Shift range	Signal
P, N	PNP : OFF → ON
R	REVERSE : OFF → ON
D	DRIVE : OFF → ON
2	2ND : OFF → ON
L	LOW : OFF → ON

OK → **Check and replace the Engine and ECT ECU or ECT ECU (See page IN–35).**

NG

→ **Go to step 3.**

2	**Measure voltage between each terminals of NSW, R, 2, and L of Engine and ECT ECU or P, R, N, 2 and L of ECT ECU and body ground.**



PREPARATION:

Turn the ignition switch ON.

CHECK:

Measure voltage between each terminals NSW, R, N, 2 and L of Engine and ECT ECU and body ground when the shift lever is shifted to the following positions.

OK:

2UZ–FE:

Tester connection	Condition	Specified condition
NSW – Body ground	Shift lever range : P, N	No battery positive voltage
R – Body ground	Shift lever range : R	Battery positive voltage*
D – Body ground	Shift lever range : D	Battery positive voltage
2 – Body ground	Shift lever range : 2	Battery positive voltage
L – Body ground	Shift lever range : L	Battery positive voltage

1FZ–FE:

Tester connection	Condition	Specified condition
NSW – Body ground	Shift lever range : P, N	No battery positive voltage
R – Body ground	Shift lever range : R	Battery positive voltage*
2 – Body ground	Shift lever range : 2	Battery positive voltage
L – Body ground	Shift lever range : L	Battery positive voltage

1HZ, 1HD–T, 1HD–FTE:

Tester connection	Condition	Specified condition
P – Body ground	Shift lever range : P	Battery positive voltage
N – Body ground	Shift lever range : N	Battery positive voltage
R – Body ground	Shift lever range : R	Battery positive voltage*
2 – Body ground	Shift lever range : 2	Battery positive voltage
L – Body ground	Shift lever range : L	Battery positive voltage

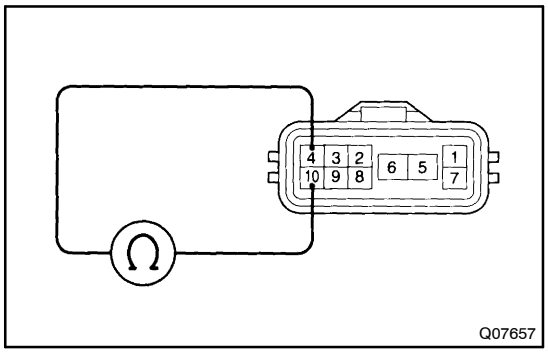
HINT:

*: The voltage will drop slightly due to lighting up of the back up light.

OK	**Check and replace the Engine and ECT ECU or ECT ECU (See page IN–35).**

NG

3	Check neutral start switch.



PREPARATION:

(a) Jack up the vehicle.

(b) Remove the neutral start switch.

CHECK:

Check continuity between each terminal shown below when the shift lever is moved to each range.

OK:

Shift Range	Terminal No. to continuity	Terminal No. to continuity
P	4 – 7	5 – 6
R	4 – 8	–
N	4 – 10	5 – 6
D	4 – 9	–
2	2 – 4	–
L	2 – 3	–

NG → Replace the neutral start switch.

OK →

Repair or replace harness and connector between battery and neutral start switch, neutral start switch and Engine and ECT ECU or ECT ECU (See page IN–35).