DTC	C1311/11	OPEN CIRCUIT IN MAIN RELAY 1

DTC	C1312/12	SHORT CIRCUIT IN MAIN RELAY 1

DTC	C1313/13	OPEN CIRCUIT IN MAIN RELAY 2

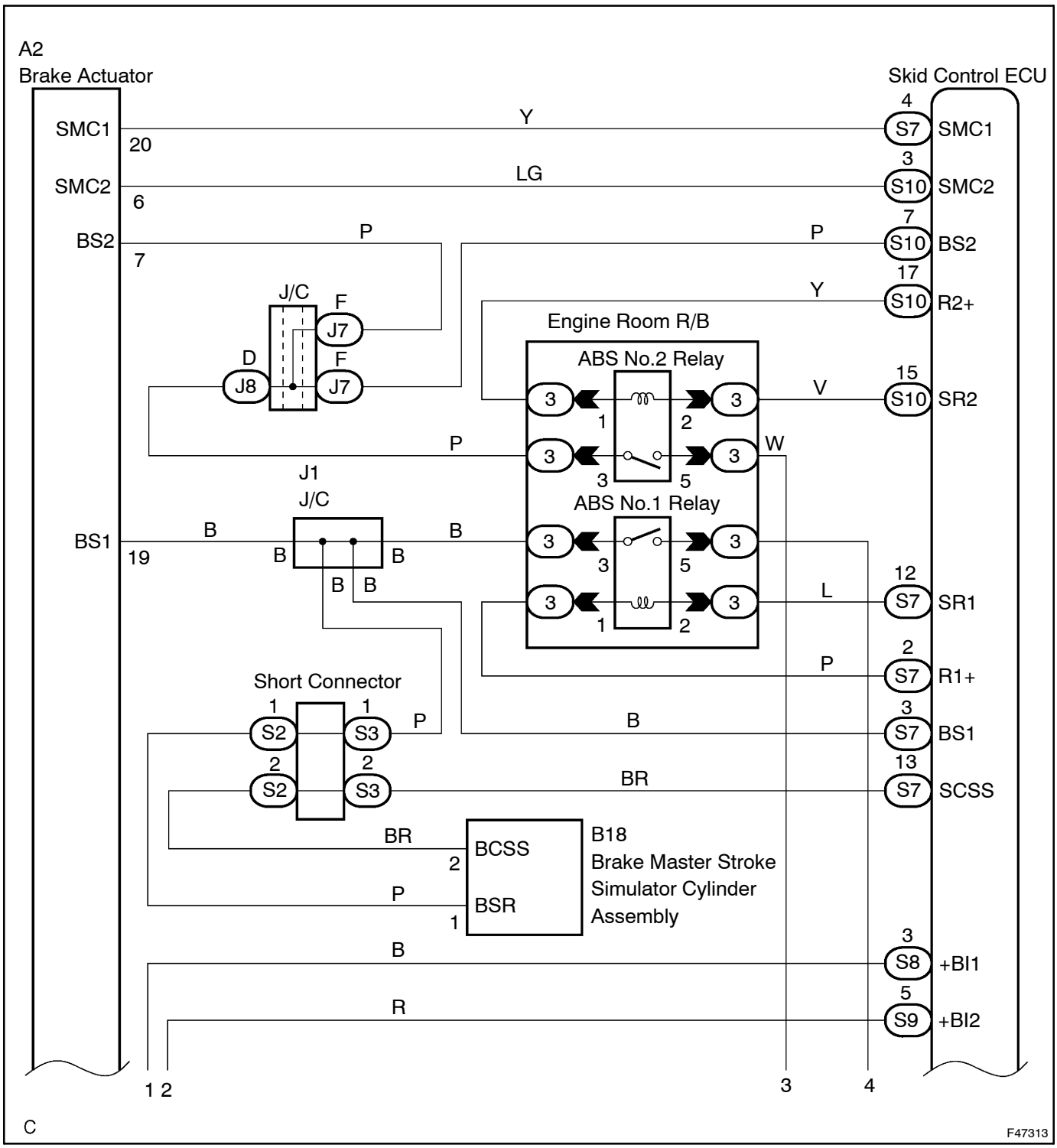
DTC	C1314/14	SHORT CIRCUIT IN MAIN RELAY 2

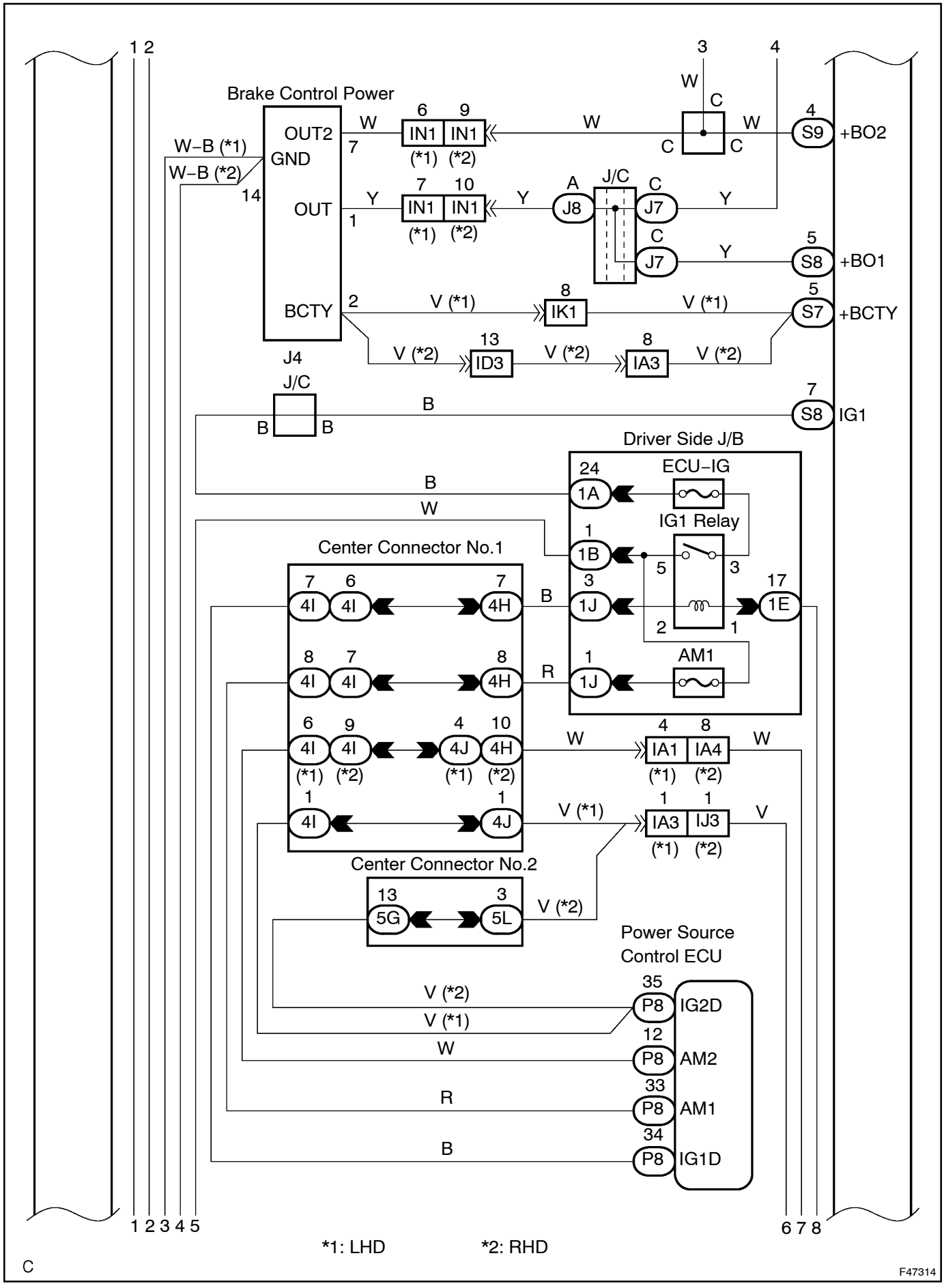
CIRCUIT DESCRIPTION

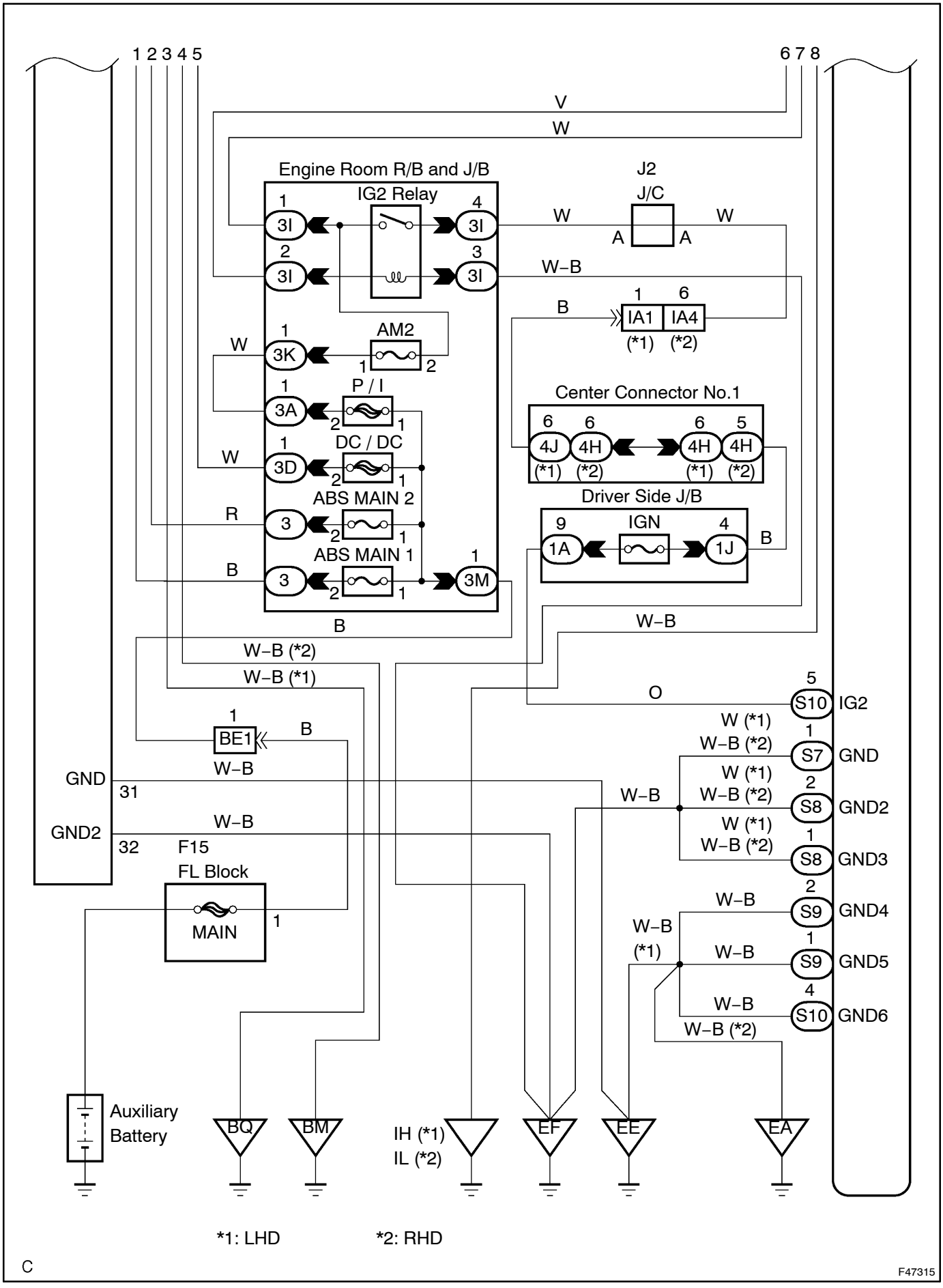
ABS main relay 1 (ABS No.1 relay) supplies power to the changeover solenoid and the linear solenoid. ABS main relay 2 (ABS No.2 relay) goes on for approximately 5 seconds after the power switch is turned off and the braking effort signal input is terminated. ABS main relay 2 (ABS No.2 relay) supplies electricity and maintains operating condition for the brake system when the power switch is off.

DTC No.	Detailed Code	DTC Detecting Condition	Trouble Area
C1311/11	1	• Relay contact is off (BS 1 terminal is less than 3.5 V) for at least 0.2 sec. when R1+ terminal voltage is 9.5 V or more and main relay 1 is on. • R1+ terminal voltage is less than 9.5 V and main relay 1 cannot be on for at least 0.2 sec. when main relay 1 is turned on (BS 1 terminal is 3.5 V or more).	• ABS main relay 1 (ABS No.1 relay) • Skid control ECU • Harness and connector
C1312/12	3	Relay contact is on for at least 4 sec. when main relay 1 is off.	• ABS main relay 1 (ABS No.1 relay) • Skic control ECU • Harness and connector
C1313/13	4	• Relay contact is off (BS2 terminal is less than 3.5 V) for at least 0.2 sec. when R2+ terminal voltage is 9.5 V or more and main relay 2 is on. • R2+ terminal voltage is less than 9.5 V and main relay 2 cannot be on for at least 2 sec. when main relay 2 is turned on (BS 1 terminal is 3.5 V or more).	• ABS main relay 2 (ABS No.2 relay) • Skid control ECU • Harness and connector
C1314/14	6	Relay contact is on for at least 4 sec. when main relay 2 is off.	• ABS main relay 2 (ABS No.2 relay) • Skid control ECU • Harness and connector

WIRING DIAGRAM




Brake Control Power
OUT2
GND
OUT
BCTY
W–B (*1)
W–B (*2)
14
7
1
2
W
Y
V (*1)
V (*2)
6 9
IN1 IN1
(*1) (*2)
7 10
IN1 IN1
(*1) (*2)
8
IK1
13
ID3
8
IA3
J4
J/C
B
B
B
3
4
W
C
C
C
W
W
A
J/C
C
J8
J7
Y
Y
C
J7
Y
4
S9
+BO2
5
S8
+BO1
5
S7
+BCTY
7
S8
IG1
Driver Side J/B
24
1A
ECU–IG
IG1 Relay
1
1B
5
3
2
1
3
1J
17
1E
1
1J
AM1
Center Connector No.1
7 6
4I 4I
7
4H
8 7
4I 4I
8
4H
6 9
4I 4I
(*1) (*2)
4 10
4J 4H
(*1) (*2)
1
4I
1
4J
4 8
IA1 IA4
(*1) (*2)
1 1
IA3 IJ3
(*1) (*2)
V (*1)
V
Center Connector No.2
13
5G
3
5L
V (*2)
Power Source
Control ECU
35
P8
IG2D
12
P8
AM2
33
P8
AM1
34
P8
IG1D
V (*2)
V (*1)
W
R
B
1 2
1 2 3 4 5
6 7 8
*1: LHD
*2: RHD
C
F47314


1 2 3 4 5
6 7 8
V
W
Engine Room R/B and J/B
IG2 Relay
J2
J/C
W
W–B
B
AM2
P / I
DC / DC
ABS MAIN 2
ABS MAIN 1
Center Connector No.1
Driver Side J/B
IGN
W–B (*2)
W–B (*1)
O
W (*1)
IG2
GND
GND2
BE1
F15
FL Block
MAIN
Auxiliary Battery
BQ
BM
IH (*1)
IL (*2)
EF
EE
EA
*1: LHD
*2: RHD
C
F47315

INSPECTION PROCEDURE

1	PERFORM ACTIVE TEST BY INTELLIGENT TESTER II (ABS NO.1 RELAY, ABS NO.2 RELAY OPERATION)

(a) Connect the intelligent tester II to the DLC3.
(b) Turn the power switch ON (READY).
(c) Select the ACTIVE TEST mode on the intelligent tester II.
(d) Check the operation sound of the ABS No.1, ABS No.2 relay.

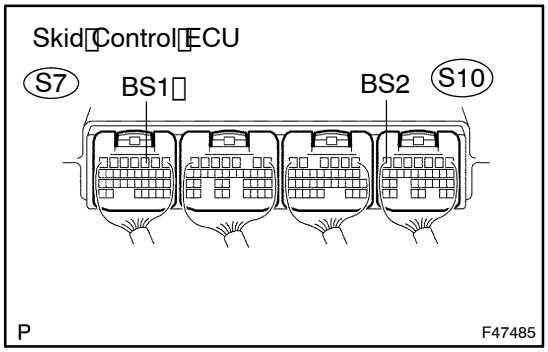
Item	Vehicle Condition / Test Details	Diagnostic Note
ECB Main Relay 1	Turns MAIN RELAY 1 ON / OFF	Operation of solenoid (clicking sound) can be heard
ECB Main Relay 2	Turns MAIN RELAY 2 ON / OFF	Operation of solenoid (clicking sound) can be heard

OK:
Operation sound of ABS No.1 relay and ABS No.2 relay should be heard.

NG → **Go to step 3**

OK

2	INSPECT SKID CONTROL ECU TERMINAL VOLTAGE (BS1, BS2 TERMINAL)



(a) Measure the voltage according to the value(s) in the table below.

HINT:
Measure the voltage from behind the connector with the connector connected to the skid control ECU.

Standard:

Tester Connection	Specified Condition
S7–3 (BS1) – Body ground	10 to 14 V
S10–7 (BS2) – Body ground	10 to 14 V

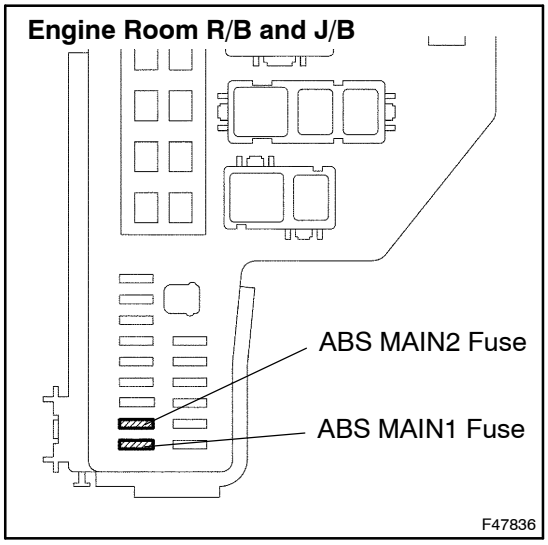
NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

REPLACE SKID CONTROL ECU ASSY (SEE PAGE 32–81 or 32–82)

NOTICE:
When replacing the skid control ECU assy, perform initialization of linear solenoid valve and calibration (see page 05–721).

3 INSPECT FUSE (ABS MAIN 1, ABS MAIN 2 FUSE)



(a) Remove the ABS MAIN 1 and ABS MAIN 2 fuse.
(b) Measure the resistance according to the value(s) in the table below.

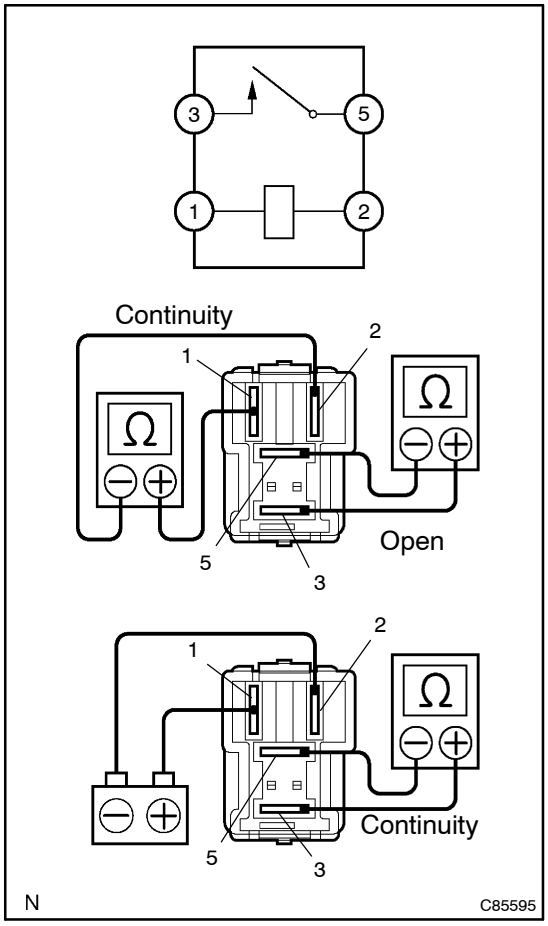
Standard:

ABS MAIN 1 Fuse	Below 1 Ω (Continuity)
ABS MAIN 2 Fuse	Below 1 Ω (Continuity)

NG → **CHECK FOR SHORT IN ALL HARNESS AND CONNECTOR CONNECTED TO FUSE AND REPLACE FUSE**

OK

4 INSPECT ABS RELAY(ABS MAIN RELAY 1, ABS MAIN RELAY 2)



(a) Remove the ABS main relay 1 (ABS No.1 relay) and ABS main relay 2 (ABS No.2 relay).
(b) Measure the resistance according to the value(s) in the table below.

Standard:

Tester Connection	Specified Condition
Terminal 1 – Terminal 2	100 Ω
Terminal 3 – Terminal 5	10 kΩ or higher (No Continuity)

(c) Apply battery voltage between terminals 1 and 2.
(d) Measure the resistance according to the value(s) in the table below.

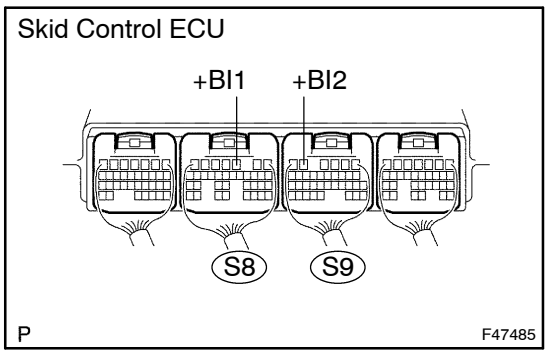
Standard:

Tester Connection	Specified Condition
Terminal 3 – Terminal 5	Below 1 Ω (Continuity)

NG → **REPLACE ABS RELAY**

OK

5 INSPECT SKID CONTROL ECU TERMINAL VOLTAGE(+BI1, +BI2 TERMINAL)



(a) Measure the voltage according to the value(s) in the table below.

HINT:

Measure the voltage from behind the connector with the connector connected to the skid control ECU.

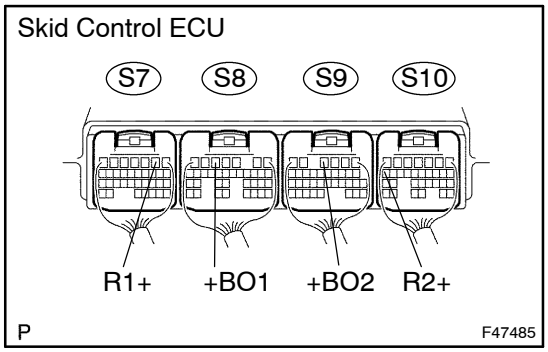
Standard:

Tester Connection	Specified Condition
S8–3 (+BI1) – Body ground	10 to 14 V
S9–5 (+BI2) – Body ground	10 to 14 V

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

6 INSPECT SKID CONTROL ECU TERMINAL VOLTAGE(+BO1, +BO2, R1+, R2+ TERMINAL)



(a) Measure the voltage according to the value(s) in the table below.

HINT:

Measure the voltage from behind the connector with the connector connected to the skid control ECU.

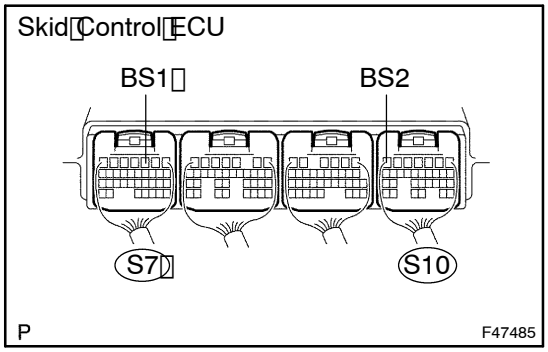
Standard:

Tester Connection	Specified Condition
S7–2 (R1+) – Body ground	10 to 14 V
S8–5 (+BO1) – Body ground	10 to 14 V
S9–4 (+BO2) – Body ground	10 to 14 V
S10–17 (R2+) – Body ground	10 to 14 V

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

7	INSPECT SKID CONTROL ECU TERMINAL VOLTAGE(BS1, BS2 TERMINAL)



(a) Measure the voltage according to the value(s) in the table below.

HINT:

Measure the voltage from behind the connector with the connector connected to the skid control ECU.

Standard:

Tester Connection	Specified Condition
S7–3 (BS1) – Body ground	10 to 14 V
S10–7 (BS2) – Body ground	10 to 14 V

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

REPLACE SKID CONTROL ECU ASSY (SEE PAGE 32–81 or 32–82)

NOTICE:

When replacing the skid control ECU assy, perform initialization of linear solenoid valve and calibration (see page 05–721).