CHECK CAN BUS LINE FOR SHORT TO GND (LHD)

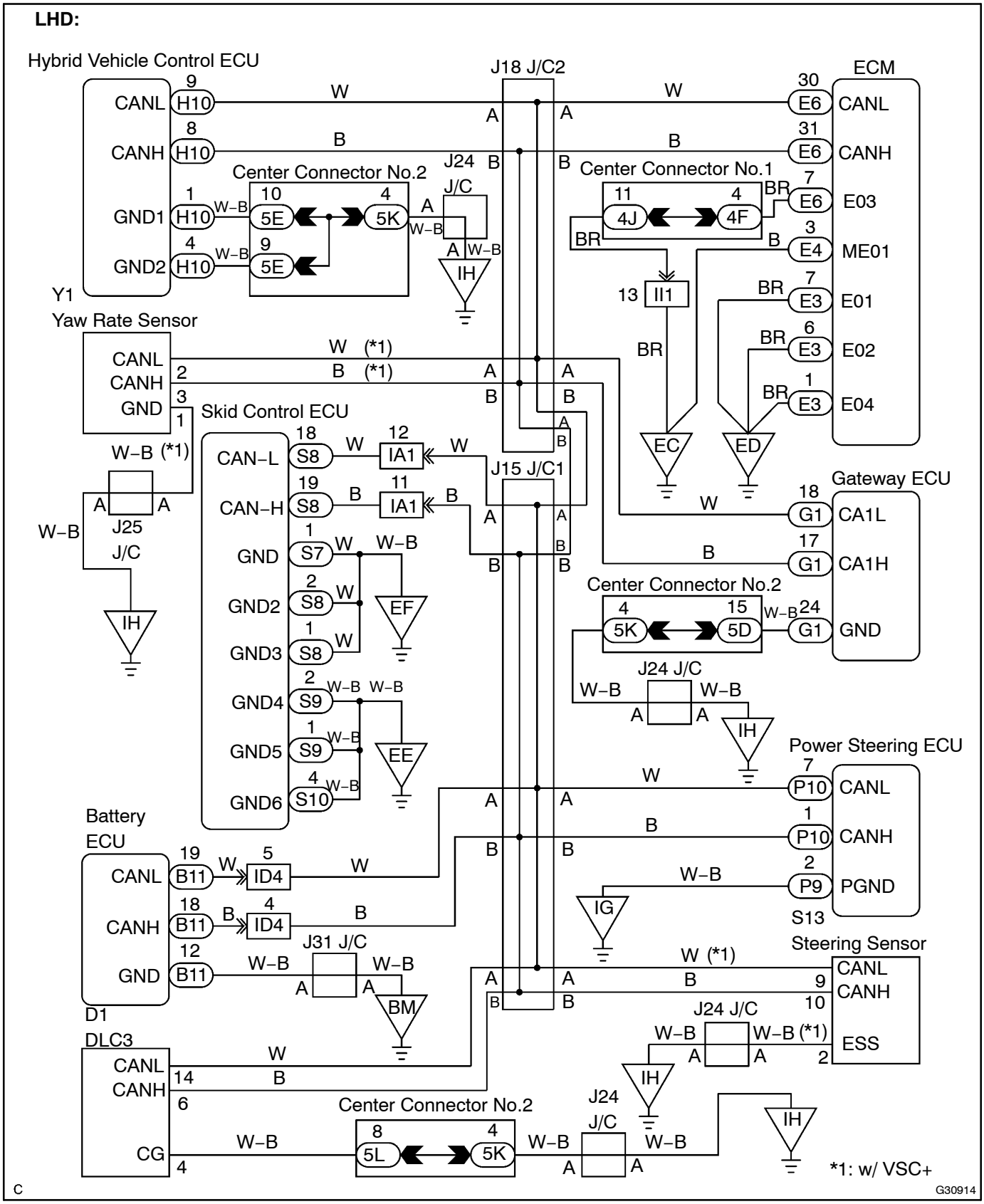
CIRCUIT DESCRIPTION

There may be a short circuit between the CAN bus line and GND when there is resistance between terminals 6 (CANH) and 4 (CG) or terminals 14 (CANL) and 4 (CG) of the DLC3.

Symptom	Trouble Area
There is resistance between terminals 6 (CANH) and 4 (CG) or terminals 14 (CANL) and 4 (CG) of the DLC3.	• Short to GND • Hybrid vehicle control ECU • Battery ECU • ECM • Skid control ECU • Steering sensor • Yaw rate sensor • Power steering ECU

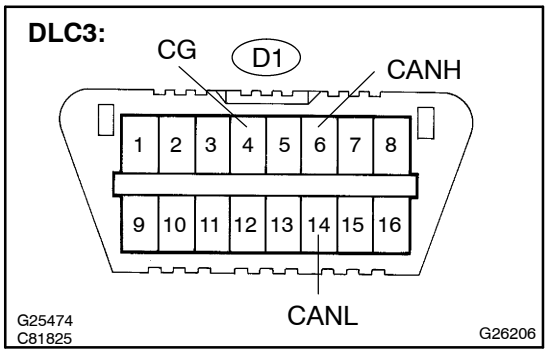
WIRING DIAGRAM

LHD:



INSPECTION PROCEDURE

1 CHECK CAN BUS LINE FOR SHORT TO GND(DLC3 SUB BUS LINE)



(a) Turn the power switch off.
(b) Disconnect the J/C1 connector (J15).
(c) Measure the resistance according to the value(s) in the table below.

Standard:

Tester connection	Condition	Specified value
D1–6 (CANH) – D1–4 (CG)	Power Switch OFF	1 MΩ or more
D1–14 (CANL) – D1–4 (CG)	Power Switch OFF	1 MΩ or more

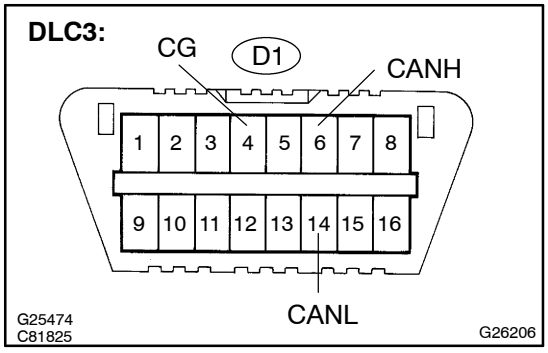
NG → **REPLACE DLC3 SUB BUS LINE OR CONNECTOR (CAN–H, CAN–L)**

OK

2 CONNECT CONNECTOR

(a) Reconnect the J/C1 connector (J15).

3 CHECK CAN BUS LINE FOR SHORT TO GND(CAN BUSES TO J/C2)



(a) Disconnect the J/C2 connector (J18).
(b) Measure the resistance according to the value(s) in the table below.

Standard:

Tester connection	Condition	Specified value
D1–6 (CANH) – D1–4 (CG)	Power Switch OFF	1 kΩ or more
D1–14 (CANL) – D1–4 (CG)	Power Switch OFF	1 kΩ or more

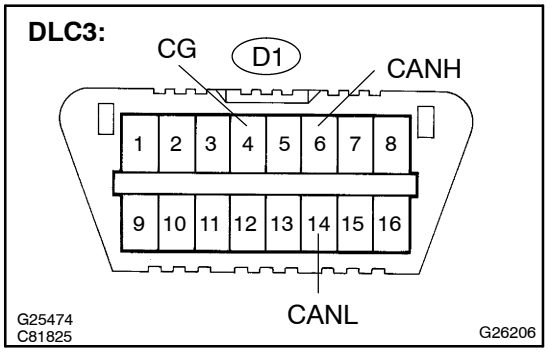
OK → **Go to step 16**

NG

4 CONNECT CONNECTOR

(a) Reconnect the J/C2 connector (J18).

5 CHECK CAN BUS LINE FOR SHORT TO GND(BATTERY ECU)



(a) Disconnect the battery ECU connector (B11).
(b) Measure the resistance according to the value(s) in the table below.

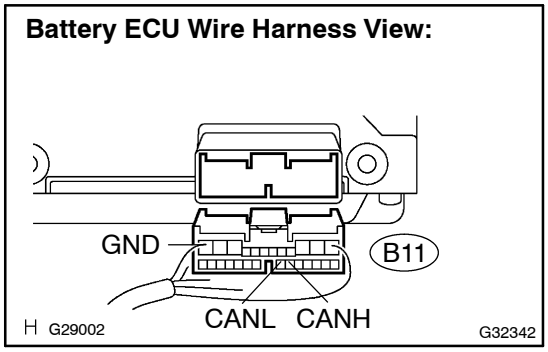
Standard:

Tester connection	Condition	Specified value
D1–6 (CANH) – D1–4 (CG)	Power Switch OFF	1 kΩ or more
D1–14 (CANL) – D1–4 (CG)	Power Switch OFF	1 kΩ or more

OK → **REPLACE BATTERY ECU ASSY (SEE PAGE 21–100)**

NG

6 CHECK CAN BUS LINE FOR SHORT TO GND(BATTERY ECU – J/C1)



(a) Disconnect the J/C1 connector (J15).
(b) Measure the resistance according to the value(s) in the table below.

Standard:

Tester connection	Condition	Specified value
B11–18 (CANH) – B11–12 (GND)	Power Switch OFF	1 MΩ or more
B11–19 (CANL) – B11–12 (GND)	Power Switch OFF	1 MΩ or more

HINT:
Measure the resistance with the battery ECU connector (B11) disconnected.

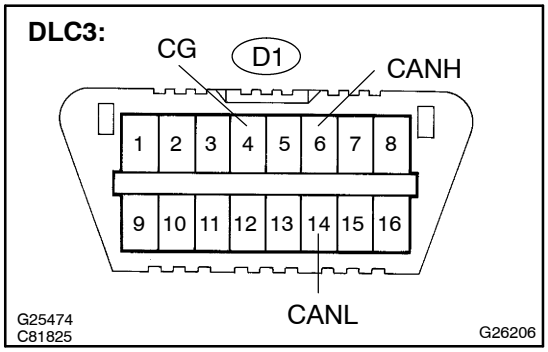
NG → **REPLACE CAN MAIN BUS LINE OR CONNECTOR (BATTERY ECU – J/C1)**

OK

7 CONNECT CONNECTOR

(a) Reconnect the battery ECU connector (B11) and J/C1 connector (J15).

8 CHECK CAN BUS LINE FOR SHORT TO GND(POWER STEERING ECU)



(a) Disconnect the power steering ECU connector (P10).
(b) Measure the resistance according to the value(s) in the table below.

Standard:

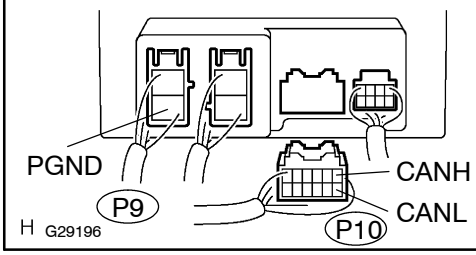
Tester connection	Condition	Specified value
D1–6 (CANH) – D1–4 (CG)	Power Switch OFF	1 kΩ or more
D1–14 (CANL) – D1–4 (CG)	Power Switch OFF	1 kΩ or more

OK → **REPLACE POWER STEERING ECU ASSY (SEE PAGE 50–17)**

NG

9 CHECK CAN BUS LINE FOR SHORT TO GND(POWER STEERING ECU SUB BUS LINE)

Power Steering ECU
Wire Harness View:



(a) Disconnect the J/C1 connector (J15).
(b) Measure the resistance according to the value(s) in the table below.

Standard:

Tester connection	Condition	Specified value
P10–1 (CANH) – P9–2 (PGND)	Power Switch OFF	1 MΩ or more
P10–7 (CANL) – P9–2 (PGND)	Power Switch OFF	1 MΩ or more

HINT:
Measure the resistance with the power steering ECU connector (P10) disconnected.

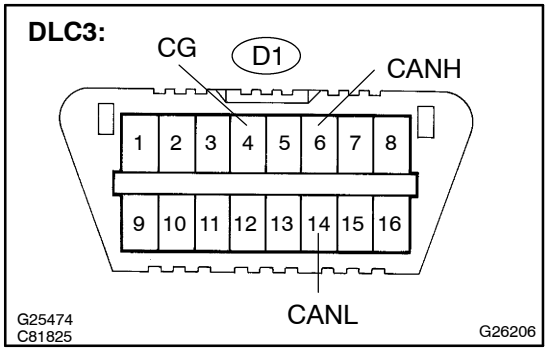
NG → **REPLACE POWER STEERING ECU SUB BUS LINE OR CONNECTOR (CAN–H, CAN–L)**

OK

10 CONNECT CONNECTOR

(a) Reconnect the power steering ECU connector (P8) and J/C1 connector (J15).

11 CHECK CAN BUS LINE FOR SHORT TO GND(STEERING SENSOR)



NOTICE:

For vehicles without VSC+, go to step 14.

(a) Disconnect the steering sensor connector (S13).

(b) Measure the resistance according to the value(s) in the table below.

Standard:

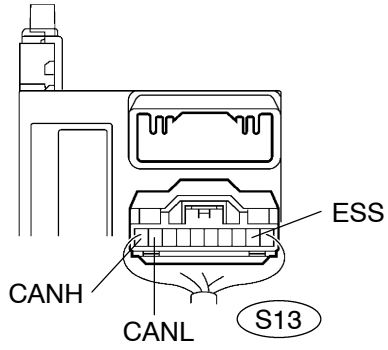
Tester connection	Condition	Specified value
D1–6 (CANH) – D1–4 (CG)	Power Switch OFF	1 kΩ or more
D1–14 (CANL) – D1–4 (CG)	Power Switch OFF	1 kΩ or more

OK → **REPLACE STEERING SENSOR (SEE PAGE 32–85)**

NG

12 CHECK CAN BUS LINE FOR SHORT TO GND(STEERING SENSOR SUB BUS LINE)

Steering Sensor
Wire Harness View:



(a) Disconnect the J/C1 connector (J15).

(b) Measure the resistance according to the value(s) in the table below.

Standard:

Tester connection	Condition	Specified value
S13–10 (CANH) – S13–2 (ESS)	Power Switch OFF	1 MΩ or more
S13–9 (CANL) – S13–2 (ESS)	Power Switch OFF	1 MΩ or more

HINT:

Measure the resistance with the steering sensor connector (S13) disconnected.

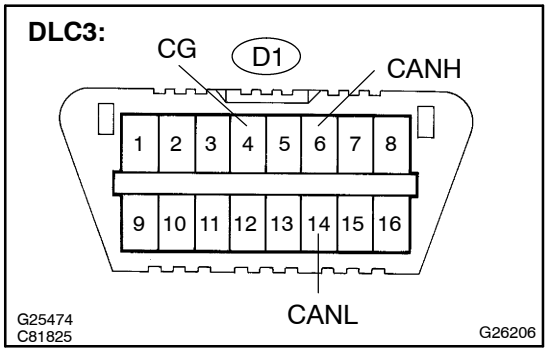
NG → **REPLACE STEERING SENSOR SUB BUS LINE OR CONNECTOR (CAN–H, CAN–L)**

OK

13 CONNECT CONNECTOR

(a) Reconnect the steering sensor connector (S13) and J/C1 connector (J15).

14 CHECK CAN BUS LINE FOR SHORT TO GND(SKID CONTROL ECU)



(a) Disconnect the skid control ECU connector (S8).
(b) Measure the resistance according to the value(s) in the table below.

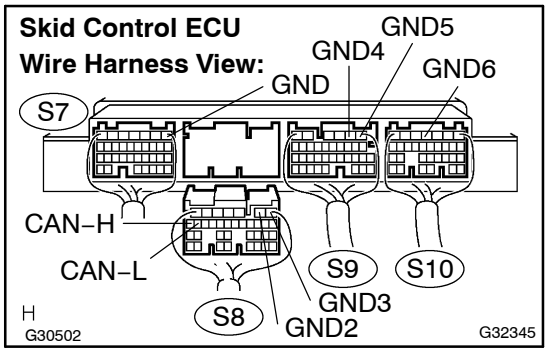
Standard:

Tester connection	Condition	Specified value
D1–6 (CANH) – D1–4 (CG)	Power Switch OFF	1 kΩ or more
D1–14 (CANL) – D1–4 (CG)	Power Switch OFF	1 kΩ or more

OK → **REPLACE SKID CONTROL ECU ASSY (SEE PAGE 32-81 OR 32-82)**

NG

15 CHECK CAN BUS LINE FOR SHORT TO GND(SKID CONTROL ECU SUB BUS LINE)



(a) Disconnect the J/C1 connector (J15).
(b) Measure the resistance according to the value(s) in the table below.

Standard:

Tester connection	Condition	Specified value
S8–19 (CAN–H) – S7–1 (GND), S8–2 (GND2) S8–1 (GND3), S9–2 (GND4) S9–1 (GND5), S10–4 (GND6)	Power Switch OFF	1 MΩ or more
S8–18 (CAN–L) – S7–1 (GND), S8–2 (GND2) S8–1 (GND3), S9–2 (GND4) S9–1 (GND5), S10–4 (GND6)	Power Switch OFF	1 MΩ or more

HINT:
Measure the resistance with the skid control ECU connector (S8) disconnected.

NG → **REPLACE SKID CONTROL ECU SUB BUS LINE OR CONNECTOR (CAN–H, CAN–L)**

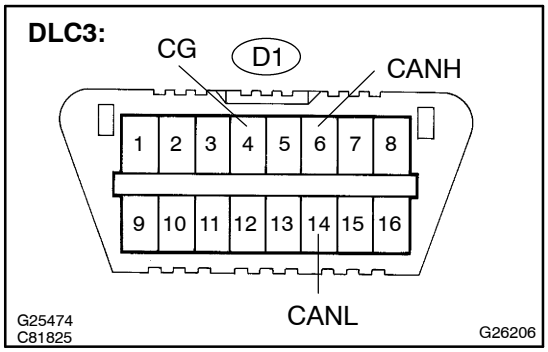
OK

REPLACE CAN MAIN BUS LINE OR CONNECTOR (J/C1 – J/C2)

16 CONNECT CONNECTOR

(a) Reconnect the J/C2 connector (J18).

17 CHECK CAN BUS LINE FOR SHORT TO GND(ECM)



(a) Disconnect the ECM connector (E6).
(b) Measure the resistance according to the value(s) in the table below.

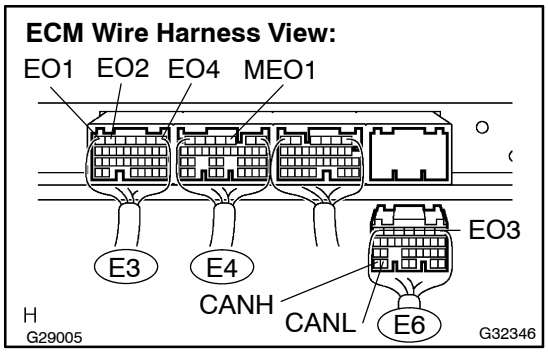
Standard:

Tester connection	Condition	Specified value
D1–6 (CANH) – D1–4 (CG)	Power Switch OFF	1 kΩ or more
D1–14 (CANL) – D1–4 (CG)	Power Switch OFF	1 kΩ or more

OK → **REPLACE ECM (SEE PAGE 10–24)**

NG

18 CHECK CAN BUS LINE FOR SHORT TO GND(ECM – J/C2)



(a) Disconnect the J/C2 connector (J18).
(b) Measure the resistance according to the value(s) in the table below.

Standard:

Tester connection	Condition	Specified value
E6–31 (CANH) – E3–7 (EO1), E3–6 (EO2) E6–7 (EO3), E3–1 (EO4) E4–3 (MEO1)	Power Switch OFF	1 MΩ or more
E6–30 (CANL) – E3–7 (EO1), E3–6 (EO2) E6–7 (EO3), E3–1 (EO4) E4–3 (MEO1)	Power Switch OFF	1 MΩ or more

HINT:
Measure the resistance with the ECM connector (E6) disconnected.

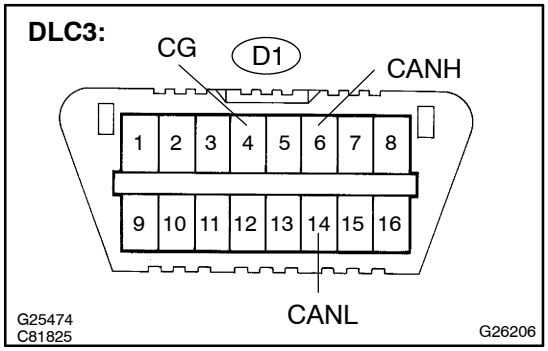
NG → **REPLACE CAN MAIN BUS LINE OR CONNECTOR (ECM – J/C2)**

OK

19 CONNECT CONNECTOR

(a) Reconnect the ECM connector (E6) and J/C2 connector (J18).

20 CHECK CAN BUS LINE FOR SHORT TO GND(YAW RATE SENSOR)



NOTICE:

For vehicles without VSC+, go to step 23.

(a) Disconnect the yaw rate sensor connector (Y1).

(b) Measure the resistance according to the value(s) in the table below.

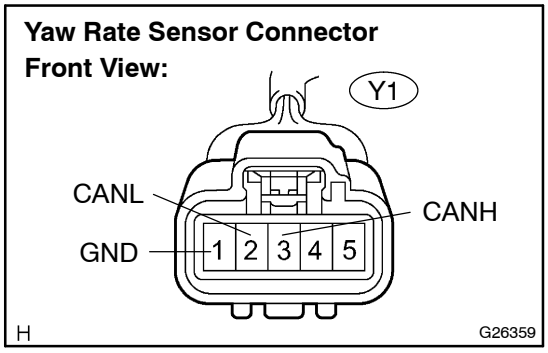
Standard:

Tester connection	Condition	Specified value
D1–6 (CANH) – D1–4 (CG)	Power Switch OFF	1 kΩ or more
D1–14 (CANL) – D1–4 (CG)	Power Switch OFF	1 kΩ or more

OK → **REPLACE YAW RATE SENSOR (SEE PAGE 32–84)**

NG

21 CHECK CAN BUS LINE FOR SHORT TO GND(YAW RATE SENSOR SUB BUS LINE)



(a) Disconnect the J/C2 connector (J18).

(b) Measure the resistance according to the value(s) in the table below.

Standard:

Tester connection	Condition	Specified value
Y1–3 (CANH) – Y1–1 (GND)	Power Switch OFF	1 MΩ or more
Y1–2 (CANL) – Y1–1 (GND)	Power Switch OFF	1 MΩ or more

HINT:

Measure the resistance with the yaw rate sensor connector (Y1) disconnected.

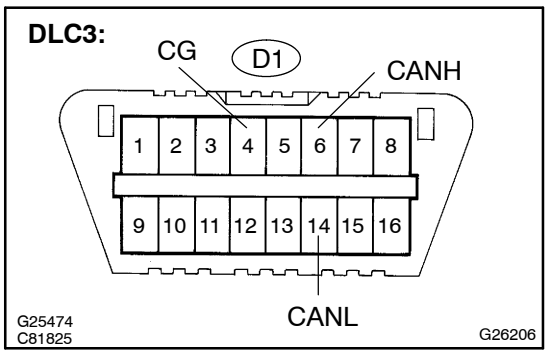
NG → **REPLACE YAW RATE SENSOR SUB BUS LINE OR CONNECTOR (CAN–H, CAN–L)**

OK

22 CONNECT CONNECTOR

(a) Reconnect the yaw rate sensor connector (Y1) and J/C2 connector (J18).

23 CHECK CAN BUS LINE FOR SHORT TO GND(HYBRID VEHICLE CONTROL ECU)



(a) Disconnect the hybrid vehicle control ECU connector (H10).

(b) Measure the resistance according to the value(s) in the table below.

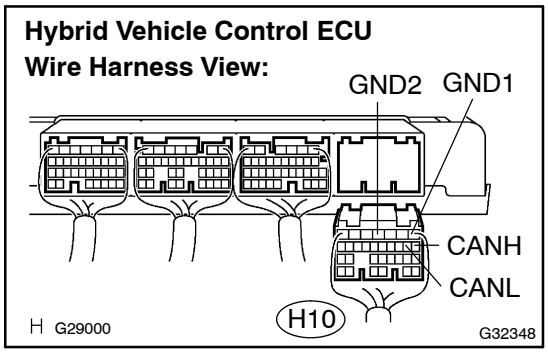
Standard:

Tester connection	Condition	Specified value
D1–6 (CANH) – D1–4 (CG)	Power Switch OFF	1 kΩ or more
D1–14 (CANL) – D1–4 (CG)	Power Switch OFF	1 kΩ or more

OK → **REPLACE HYBRID VEHICLE CONTROL ECU (SEE PAGE 21–128)**

NG

24 CHECK CAN BUS LINE FOR SHORT TO GND(HYBRID VEHICLE CONTROL ECU SUB BUS LINE)



(a) Disconnect the J/C2 connector (J18).

(b) Measure the resistance according to the value(s) in the table below.

Standard:

Tester connection	Condition	Specified value
H10–8 (CANH) – H10–1 (GND1), H10–4 (GND2)	Power Switch OFF	1 MΩ or more
H10–9 (CANL) – H10–1 (GND1), H10–4 (GND2)	Power Switch OFF	1 MΩ or more

HINT:

Measure the resistance with the hybrid vehicle control ECU (H10) disconnected.

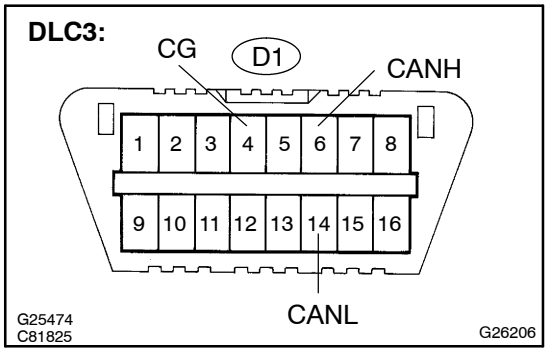
NG → **REPLACE HYBRID VEHICLE CONTROL ECU SUB BUS LINE OR CONNECTOR (CAN–H, CAN–L)**

OK

25 CONNECT CONNECTOR

(a) Reconnect the hybrid vehicle control ECU connector (H10) and J/C2 connector (J18).

26	CHECK CAN BUS LINE FOR SHORT TO GND(GATEWAY ECU)



(a) Disconnect the gateway ECU connector (G1).
(b) Measure the resistance according to the value(s) in the table below.

Standard:

Tester connection	Condition	Specified value
D1–6 (CANH) – D1–4 (CG)	Power Switch OFF	1 kΩ or more
D1–14 (CANL) – D1–4 (CG)	Power Switch OFF	1 kΩ or more

OK → **REPLACE GATEWAY ECU (SEE PAGE 67–26)**

NG

REPLACE GATEWAY ECU SUB BUS LINE OR CONNECTOR(CAN–H, CAN–L)