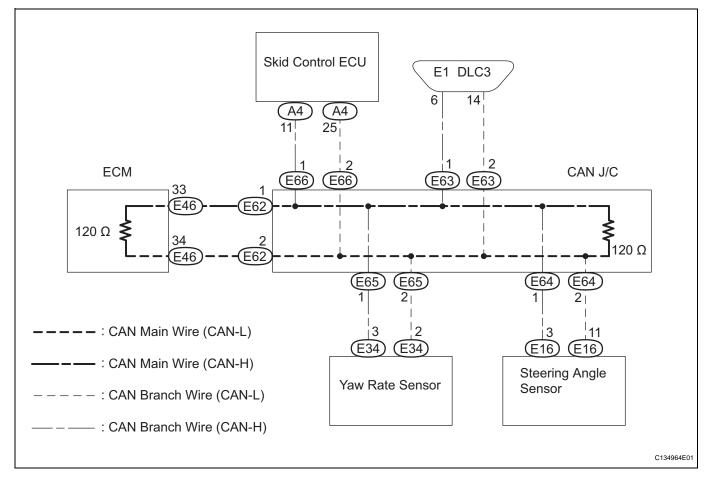
# Short to GND in CAN Bus Line

## DESCRIPTION

A short to GND is suspected in the CAN bus line when there is continuity between terminals 4 (CG) and 6 (CANH) or terminals 4 (CG) and 14 (CANL) of the DLC3.

| Symptoms   | Trouble Area   |
|--|--|
| There is continuity between terminals 4 (CG) and 6 (CANH) or terminals 4 (CG) and 14 (CANL) of the DLC3. | <ul> <li>Short to GND in CAN bus line</li> <li>ECM</li> <li>Skid control ECU</li> <li>Yaw rate sensor</li> <li>Steering angle sensor</li> <li>CAN J/C</li> </ul> |

## WIRING DIAGRAM



## **INSPECTION PROCEDURE**

NOTICE:

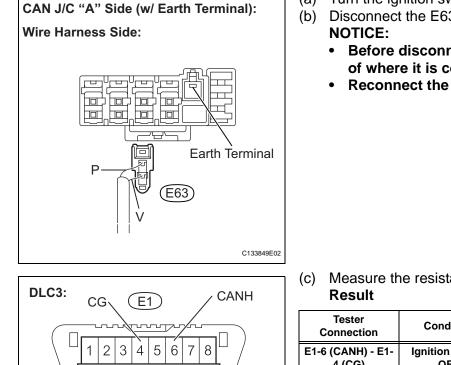
- Turn the ignition switch off before measuring the resistances of the CAN main wire and the CAN branch wire.
- After the ignition switch is turned off, check that the key reminder warning system is not in operation.

Before measuring the resistance, leave the vehicle as is for at least 1 minute and do not operate • the ignition switch, any other switches or the doors. If doors need to be opened in order to check connectors, open the doors and leave them open. HINT:

Operating the ignition switch, any switches or any doors triggers related ECU and sensor communication with the CAN, which causes resistance variation.

#### 1

#### CHECK CAN BUS LINE FOR SHORT TO GND (DLC3 BRANCH WIRE)



(a) Turn the ignition switch OFF.

- (b) Disconnect the E63 DLC3 branch wire connector.
  - Before disconnecting the connector, make a note of where it is connected.
  - Reconnect the connector to its original position.

Measure the resistance.

| Tester<br>Connection        | Condition              | Specified<br>Condition | Proceed to |
|-----------------------------|------------------------|------------------------|------------|
| E1-6 (CANH) - E1-<br>4 (CG) | Ignition switch<br>OFF | 1 $\Omega$ or more     | ок         |
| E1-14 (CANL) -<br>E1-4 (CG) | Ignition switch<br>OFF | 1 $\Omega$ or more     | ок         |
| E1-6 (CANH) - E1-<br>4 (CG) | Ignition switch<br>OFF | Below 1 $\Omega$       | NG         |
| E1-14 (CANL) -<br>E1-4 (CG) | Ignition switch<br>OFF | Below 1 $\Omega$       | NG         |

NG

C118856E47

#### **REPAIR OR REPLACE CAN BRANCH WIRE** CONNECTED TO DLC3 (CAN-H, CAN-L)

#### 2 CONNECT CONNECTOR

OK

NEXT

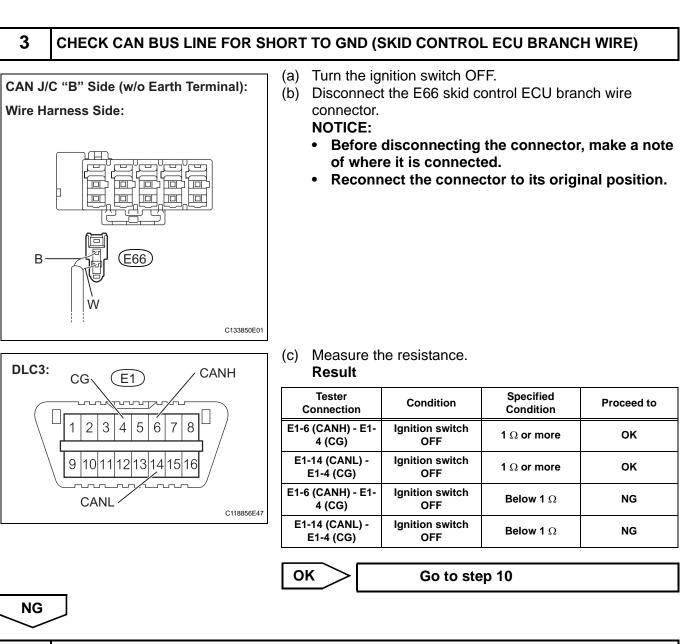
9 10 11 12

CANL

13 1 ⁄ 1 15 16

(a) Reconnect the DLC3 branch wire connector.





#### CONNECT CONNECTOR

(a) Reconnect the skid control ECU branch wire connector.

4

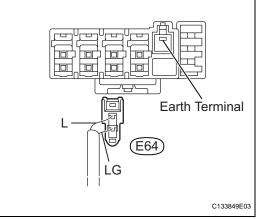
CA

CA-57

#### 5 CHECK CAN BUS LINE FOR SHORT TO GND (YAW RATE SENSOR BRANCH WIRE)

CAN J/C "A" Side (w/ Earth Terminal):

#### Wire Harness Side:



(E1)

4

9 10 11 12 13

CANL ·

5 6

CG

2 3

1

CANH

C118856E47

8

6

7

14|15

(a) Turn the ignition switch OFF.

(b) Disconnect the E64 yaw rate sensor branch wire connector.

NOTICE:

- Before disconnecting the connector, make a note of where it is connected.
- Reconnect the connector to its original position.

(c) Measure the resistance.

| Tester<br>Connection        | Condition              | Specified<br>Condition | Proceed to |
|-----------------------------|------------------------|------------------------|------------|
| E1-6 (CANH) - E1-<br>4 (CG) | Ignition switch<br>OFF | 1 $\Omega$ or more     | ОК         |
| E1-14 (CANL) -<br>E1-4 (CG) | Ignition switch<br>OFF | 1 $\Omega$ or more     | ок         |
| E1-6 (CANH) - E1-<br>4 (CG) | Ignition switch<br>OFF | Below 1 $\Omega$       | NG         |
| E1-14 (CANL) -<br>E1-4 (CG) | Ignition switch<br>OFF | Below 1 $\Omega$       | NG         |

NG Go to step 12

6 CONNECT CONNECTOR

(a) Reconnect the yaw rate sensor branch wire connector.



ΟΚ

DLC3:

CA

# 7 CHECK CAN BUS LINE FOR SHORT TO GND (STEERING ANGLE SENSOR BRANCH WIRE)

| CAN J/C "A" Side (w/ Earth Terminal):<br>Wire Harness Side: | (a)<br>(b) | Disconnector.<br>NOTICE:<br>• Before<br>of wher | nition switch OF<br>t the E65 steerin<br>disconnecting<br>e it is connect<br>nect the connect | ng angle senso<br>the connector<br>ed. | , make a note |
|---|------------|---|---|--|---------------|
|   | (c)        | Measure th                                      | ne resistance.  |  |               |
| DLC3: CG E1 CANH  |            | Result  |   |  |               |
|   | c          | Tester<br>connection                            | Condition   | Specified<br>Condition                 | Proceed to    |
|   | E1-6       | 6 (CANH) - E1-<br>4 (CG)                        | Ignition switch<br>OFF  | 1 $\Omega$ or more                     | ок            |
| 9 10 11 12 13 14 15 16                                      |            | -14 (CANL) -<br>E1-4 (CG)                       | Ignition switch<br>OFF  | 1 $\Omega$ or more                     | ок            |
| CANL C119856E47   | E1-6       | 6 (CANH) - E1-<br>4 (CG)                        | Ignition switch<br>OFF  | Below 1 $\Omega$                       | NG            |
| C110030E47  |            | -14 (CANL) -<br>E1-4 (CG)                       | Ignition switch<br>OFF  | Below 1 $\Omega$                       | NG            |
|   | 0          | $\sim$  | Go to ste   | р 14                                   |               |
| NG  |            |   |   |  |               |
| $\sim$  |            |   |   |  |               |

## 8 CONNECT CONNECTOR

(a) Reconnect the steering angle sensor branch wire connector.

NEXT

#### 9 CHECK CAN BUS LINE FOR SHORT TO GND (ECM MAIN WIRE) (a) Turn the ignition switch OFF. CAN J/C "A" Side (w/ Earth Terminal): (b) Disconnect the E62 ECM main wire connector. Wire Harness Side: NOTICE: · Before disconnecting the connector, make a note of where it is connected. Reconnect the connector to its original position. Earth Terminal W (E62) R C133849E01 Measure the resistance. (C) DLC3: Result CANH (E1)CG Tester Specified Condition Proceed to Condition Connection 2 3 4 5 6 7 8 1 E1-6 (CANH) - E1-Ignition switch 1 $\Omega$ or more OK 4 (CG) OFF E1-14 (CANL) -Ignition switch 9 10111213 15 14 6 1 $\Omega$ or more ОΚ OFF E1-4 (CG) E1-6 (CANH) - E1-Ignition switch

C118856E47

 
 4 (CG)
 OFF
 Below 1 Ω

 E1-14 (CANL) -E1-4 (CG)
 Ignition switch OFF
 Below 1 Ω

 OK
 Go to step 16
 NG

NG

NG

#### REPLACE CAN J/C

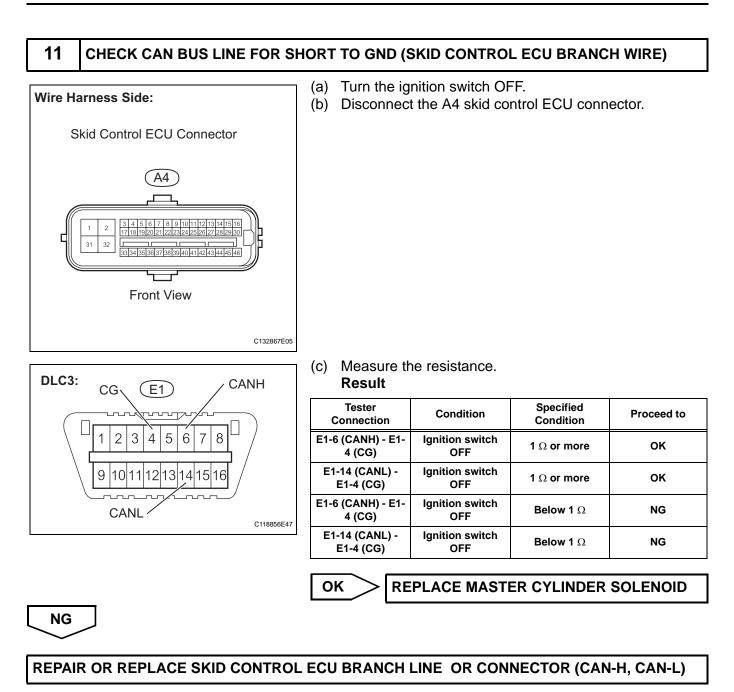
CANL

## **10** CONNECT CONNECTOR

(a) Reconnect the skid control ECU connector.

NEXT

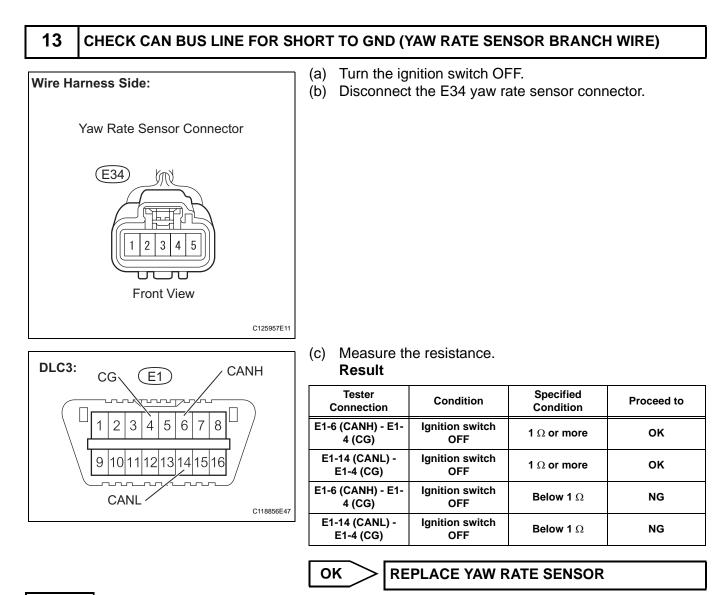
CA



#### **12** CONNECT CONNECTOR

(a) Reconnect the yaw rate sensor branch wire connector.

NEXT



NG

# REPAIR OR REPLACE CAN BRANCH WIRE CONNECTED TO YAW RATE SENSOR (CAN-H, CAN-L)

## 14 CONNECT CONNECTOR

(a) Reconnect the steering angle sensor branch wire connector.

NEXT

CA

# 15 CHECK CAN BUS LINE FOR SHORT TO GND (STEERING ANGLE SENSOR BRANCH WIRE)

| Wire Harness Side:              |                                 | nition switch OF<br>t the E16 steeri | FF.<br>ng angle senso  | r connector. |
|---------------------------------|---------------------------------|--------------------------------------|------------------------|--------------|
| Steering Angle Sensor Connector |                                 |                                      |                        |              |
| (E16)                           |                                 |                                      |                        |              |
| 12345678<br>910111213141516     |                                 |                                      |                        |              |
| Front View                      |                                 |                                      |                        |              |
| C133843E04                      |                                 |                                      |                        |              |
| DLC3: CG (E1) CANH              | (c) Measure th<br><b>Result</b> | ne resistance.                       |                        |              |
|                                 | Tester<br>Connection            | Condition                            | Specified<br>Condition | Proceed to   |
|                                 | E1-6 (CANH) - E1-<br>4 (CG)     | Ignition switch<br>OFF               | 1 $\Omega$ or more     | ок           |
| 9 10 11 12 13 14 15 16          | E1-14 (CANL) -<br>E1-4 (CG)     | Ignition switch<br>OFF               | 1 $\Omega$ or more     | ок           |
| CANL C118856E47                 | E1-6 (CANH) - E1-<br>4 (CG)     | Ignition switch<br>OFF               | Below 1 Ω              | NG           |
|                                 | E1-14 (CANL) -<br>E1-4 (CG)     | Ignition switch<br>OFF               | Below 1 $\Omega$       | NG           |
|                                 |                                 | PLACE STEEF                          | RING ANGLE S           | ENSOR        |

NG

# REPAIR OR REPLACE CAN BRANCH WIRE CONNECTED TO STEERING ANGLE SENSOR (CAN-H, CAN-L)

| 16 | CONNECT CONNECTOR |
|----|-------------------|
|----|-------------------|

(a) Reconnect the ECM main wire connector.

NEXT

#### 17 CHECK CAN BUS LINE FOR SHORT TO GND (ECM MAIN WIRE) (a) Turn the ignition switch OFF. Wire Harness Side: Disconnect the E46 ECM connector. (b) **ECM** Connector C132870E02 Measure the resistance. (c) DLC3: Result CANH (E1) CG Tester Specified Condition Proceed to . Condition Connection 2 5 6 8 3 4 7 1 E1-6 (CANH) - E1-Ignition switch οк 1 $\Omega$ or more 4 (CG) OFF E1-14 (CANL) -Ignition switch 9 101112 13 15 4 6 1 $\Omega$ or more ОΚ E1-4 (CG) OFF E1-6 (CANH) - E1-Ignition switch Below 1 $\Omega$ NG CANL · 4 (CG) OFF C118856E47 E1-14 (CANL) -Ignition switch Below 1 $\Omega$ NG E1-4 (CG) OFF

OK REPLACE ECM

NG

#### REPAIR OR REPLACE CAN MAIN WIRE CONNECTED TO ECM (CAN-H, CAN-L)